PROJECT

DRAIN MAINTENANCE MANAGEMENT PLAN KINGS FOREST STAGE 1 KINGS FOREST NEW SOUTH WALES

PREPARED FOR

PROJECT 28 PTY LTD

DECEMBER 2020

GILBERT SUTHERLAND

DOCUMENT CONTROL

DOCUMENT 12066 DMMP SAM10F.docx
TITLE Drain Maintenance Management Plan, Kings Forest Stage 1 Development, Kings Forest, New South Wales
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CLIENT Project 28 Pty Ltd
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CLIENT REFERENCE –

SYNOPSIS This management plan establishes responsibilities and procedures for the management of drain maintenance across Kings Forest Stage 1 development, Kings Forest, New South Wales.

REVISION HISTORY

REVISION #	DATE	EDITION BY	APPROVED BY
1	06/11	M. Foster	N. Zurig /L. Varcoe
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10	10/20	E. Holton	E. Holton
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DISTRIBUTION

DISTRIBUTION	REVISION NUMBER												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Project 28 Pty Ltd	3	1	1	1	1	1	1	1	1	1	1	1	1
Dept of Planning Industry& Environment - Water				1	1	1							
DPIE - Biodiversity and Conservation				1	1	1		1	1	1	1	1	1
Tweed Shire Council						1		1	1	1	1	1	1
JBA Planning	1		1										
Darryl Anderson Consulting Pty Ltd		1	1	1	1	1	1	1	1	1	1	1	1

SUMMARY

Project 28 Pty Ltd commissioned Gilbert & Sutherland Pty Ltd (G&S) to prepare a Drain Maintenance Management Plan (DMMP) for the Kings Forest Stage 1 development. This DMMP is required to address Condition 38 of Major Project Approval No. MP08_0194, Kings Forest Stage 1 (and associated Modifications). That condition is repeated below in italic text:

Drain Maintenance Management Plan

38.

1. *The implementation schedule of the DMMP shall be revised to include specific map references to identify the area of works for each action*
2. *The Plan must be consistent with NSW Office of Water's [DPIE] Guidelines for riparian corridors on waterfront land (July 2012) and Guidelines for Controlled Activities.*
3. *The use and/or maintenance of existing and proposed roads within 40 metres of any watercourse must be carried out consistently with the Guidelines for Controlled Activities.*
4. *The methodology for determining the proposed maintenance requirements shall be included in the revised Plan.*
5. *Details of a monitoring program and methodology for determining 'significant silt deposits' should be provided.*
6. *Any trails adjacent Blacks Creek that are proposed to be maintained for the purpose of the DMMP must be clearly identified and excluded from Offset Lands identified for transfer to OEH as additions to Cudgen Nature Reserve.*

The DMMP considers the findings of investigations conducted by G&S which are incorporated into the G&S report *Kings Forest Stage 1 Project Application Drainage Maintenance Impact Assessment* (July 2012) produced for Project 28 Pty Ltd (the 'DMIA report').

The DMIA report identifies potential impacts associated with drainage maintenance works including hydrological impacts, the disturbance of acid sulfate soils, water quality impacts, erosion and sedimentation and impacts to flora and fauna. These potential impacts trigger the need for a DMMP.

This DMMP relates to Stage 1 within the Kings Forest development site, which drains to Blacks Creek.

GILBERT SUTHERLAND

CONTENTS

Kings Forest, Stage 1 - Summary and Implementation Table, Drain Maintenance Management Plan

Action No	ACTION	Location (reference to Map)	Purpose	TIMING and FREQUENCY	RESPONSIBILITY	PERFORMANCE MEASURE	MONITORING and reporting	Further Details
DMMP 1	Mechanical drainage maintenance	Existing access trails on Blacks Creek (drawing No. 12066_003)	To minimise soil disturbance during the mechanical removal of sediment, weeds or debris from Blacks Creek	As necessary (approximately once every ten years or if the sediment/silt deposit depth is 20 cm or greater)	Contractor's Site Manager, Environmental Consultant	Drain maintenance operations must aim to minimise physical drain disturbance during sediment removal	Visual inspections of bank stability and vegetation root stock during drain maintenance works. Records of sedimentation, flooding, water quality and aquatic species mortality will be retained on site. Records of annual silt depth maintained and kept onsite.	Table 1.4.1
DMMP 2	Acid sulfate soil treatment	Blacks Creek Existing access trails on Blacks Creek (drawing No. 12066_003)	No acid sulfate drain spoil is to be disturbed or excavated without appropriate treatment	In conjunction with drain maintenance	Contractor's Site Manager, Environmental Consultant	All material excavated from drains to be limed at prescribed rate before stockpiling	Records of lime delivery and calculated liming rates to be kept on site during maintenance operations and available for inspection at all times	Table 1.4.2
DMMP 3	Sediment and erosion control	Blacks Creek Existing access trails on Blacks Creek	To prevent the displacement of sediment and soil from or into drains particularly	Visual inspections following rainfall events (>25mm in 24hrs) Annual silt depth measurements	Consulting Engineer, Contractor's Site Manager	Minimise erosion and the resultant turbidity of discharge waters	Reporting to TSC, only required if insufficient sediment and erosion measures are identified	Table 1.4.3

		(drawing No. 12066_003)	during storm events	taken as well as after significant rainfall events				
DMMP 4	Surface water quality management	Drawing No. 12017 – 001 Monitoring locations	To prevent adverse impacts to surface water quality in the downstream receiving environment	Daily in situ testing and weekly collection of samples for laboratory analysis during drain maintenance works	Contractor's Site Manager	Surface water quality downstream of sediment and erosion control measures to comply with Table 1.4.4.	• Results to be recorded and kept onsite • TSC to be notified immediately of breaches. • Water quality reports to be provided to TSC or DPIE upon request	Table 1.4.4
DMMP 5	Flora Maintenance	Blacks Creek Existing access trails on Blacks Creek (drawing No. 12066_003)	To avoid damage to native flora and prevent invasive species cuttings entering drain while conducting invasive flora removal.	Annually or as necessary	Contractor's Site Manager, Environmental Consultant	Flora maintenance must aim to minimise damage to native plant species in the VRZ as well as minimise water quality disturbance and sediment disturbance complying with table 1.4.3	• Plant species identified prior to removal. • Measurement of weight of flora removal in VRZ	Table 1.4.5

1.1 Introduction

The Kings Forest Development site covers approximately 870 hectares and is situated south-west of the town of Cudgen. The boundary of the development is shown on Drawing No. 12066_003 included as Appendix 1.

The Project Approval (MP08_0194) provides the following description of the development:

- subdivision of the site into 10 development lots in four stages;
- bulk earthworks across the site;
- roadworks comprising:
  - construction of the entrance road and associated intersection works with Tweed Coast Road;
  - construction of the Kings Forest Parkway from Tweed Coast Road via Precincts 4 and 5 through to the western site precincts; and
  - construction of two roads providing access to the southern site precincts;
- Plan of Development for Precinct 5;
- development of 998 sqm of floorspace for a service station and food and drink premises and access arrangements to Precinct 1;
- construction of subdivision and infrastructure works along Kings Forest Parkway and within Precincts 1 and 5;
- subdivision of Precinct 5 into 376 residential lots comprising:
  - one townhouse lot (7,860 sqm)
  - 37 terrace house lots (minimum lot size 150 sqm)
  - 25 duplexes (minimum lots size 450 sqm)
  - 192 zero lot dwellings (minimum lot size 240 sqm)
  - 121 traditional detached dwellings (minimum lot size 400 sqm).

1.1.1 Background

The Director General of the Department of Planning issued amended Environmental Assessment Requirements (DGRs) for the project application on 23 December 2010. The DGRs require that specialist advice be provided to address the following Key Issue:

> *Key Issue 7.6: Assess the necessity of drains currently in operation across the site and, for those required into the future, assess the impact of any ongoing maintenance required to ensure their effectiveness.*

The *Drainage Maintenance Impact Assessment* (DMIA) report identifies several potential impacts associated with drainage maintenance works including; hydrological impacts, the disturbance of acid sulfate soils, water quality impacts, erosion and sedimentation and impacts to flora and fauna.

The identification of these issues necessitated the production of a DMMP. This management plan has taken into consideration the NSW Department of Planning, Industry and Environment's (DPIE) *'Guidelines for riparian corridors on waterfront land'* (July 2012) and with reference to the Natural Resource Access Regulator (NRAR) – Guidelines for controlled activities on waterfront land, Riparian Corridors, May 2018 (included in Appendix 2)

1.1.2 Objectives

This report constitutes the DMMP for Stage 1 of the Kings Forest development. The aim of this report is to detail strategies to mitigate the potential environmental impacts associated with the ongoing maintenance of Blacks Creek at the Kings Forest site in terms of:

- hydrological impacts
- disturbance of acid sulfate soils
- surface water quality impacts
- erosion and sedimentation
- impacts to flora and fauna.

1.1.3 Scope of this DMMP

This DMMP is required to address Condition 38 of Major Project Approval No. MP08_0194 Stage 1 (and associated Modifications). That condition is repeated below in italic text:

Drain Maintenance Management Plan

38.

1. *The implementation schedule of the DMMP shall be revised to include specific map references to identify the area of works for each action.*
2. *The Plan must be consistent with NSW Office of Water's [DPIE] Guidelines for riparian corridors on waterfront land (July 2012) and Guidelines for Controlled Activities.*
3. *The use and/or maintenance of existing and proposed roads within 40 metres of any watercourse must be carried out consistently with the Guidelines for Controlled Activities.*
4. *The methodology for determining the proposed maintenance requirements shall be included in the revised Plan.*
5. *Details of a monitoring program and methodology for determining 'significant silt deposits' should be provided.*
6. *Any trails adjacent Blacks Creek that are proposed to be maintained for the purpose of the DMMP must be clearly identified and excluded from Offset Lands identified for transfer to OEH as additions to Cudgen Nature Reserve.*

1.2 Site drainage

Drainage at Kings Forest has been studied by several previous investigations. The site drainage network was the subject of a report by Phillip Bell & Partners (Kings Forest Stormwater Management Plan, 2001). The drainage system ranges from natural, largely unmodified waterways to minor overland flow paths.

The site is located within the Cudgen Creek catchment and is predominantly drained in an easterly direction by Blacks Creek. Runoff from the site also enters Cudgen Creek under Old Bogangar Road to the north of the site and via the lowlands adjacent to the southern site boundary.

Drainage from the north-eastern portion of the site flows into a State Environmental Planning Policy (Coastal Management) 2018 (herein Coastal Management SEPP) wetland area prior to discharging from the Kings Forest site. The '*Coastal Management SEPP Fact Sheet 4: Mapping of Coastal Management Areas'* defines wetland communities (as per Adam et al., 1985) as those being dominated by;

- Mangroves
- Saltmarshes
- Melaleuca forests
- Casuarina forests
- Sedgelands
- Brackish and freshwater swamps
- Wet meadows.

1.2.1 Drainage maintenance

The flood modelling conducted previously for the site assumed that only Blacks Creek would be maintained to minimise potential build-up of sediment and growth of vegetation within and across the channel.

In response to submissions received, the management regime has been modified and the flood modelling has been revised to reflect a much less intrusive management regime, which would not involve the removal or realignment of snags or clearing or trimming of vegetation with the exception of the removal of invasive vegetative species.

Under the Department of Primary Industries Policy and Guidelines for Fish Habitat conservation and management (2013), a snag is considered to be;

> *'…any piece of woody debris that is both greater than 3m in length and 300 mm in diameter, or any rock larger than 500 mm in two dimensions, that is located within a waterway (either fresh, estuarine or marine) and is, or would be, wholly or partly submerged at a 'bank-full' flow level or highest astronomical tide level. This policy definition does not include exotic plant species, such as willow and camphor laurel trees.'*

However, it may be necessary to address sedimentation within the drain at some time in the future and this management plan provides appropriate management techniques to minimise potential impacts associated with any necessary maintenance activity within Blacks Creek.

All other drains are modelled as not maintained. The resolution of the model is such that the drainage function of the minor drains has been disregarded by the model, so the maintenance of these drains is not required to achieve the level of flood immunity predicted for the developed site.

Black's Creek needs to be maintained to provide adequate drainage for the site and to ensure appropriate flood conveyance. The likely frequency of disturbance within the waterway would be low (approximately once every ten years or when sediment is 20 cm deep or greater). However, necessary maintenance works could potentially result in hydrological impacts, the disturbance of acid sulfate soils, water quality impacts, erosion and sedimentation and impacts to flora and fauna. Prior to commissioning maintenance, silt depth should be measured to ensure that it is necessary.

Maintenance of flora on the edge of the watercourse is necessary due to an invasive plant species that is present, *Urochloa mutica (para grass).* Left un-maintained, para grass causes

increased sedimentation within the water body (Humphries et al 1994).

The best way to maintain para grass is usually using an herbicide, however this approach is not proposed. Weed control on Blacks Creek will be by grubbing or slashing followed by removal of the weed and disposal in an appropriate manner to minimise further spread of the weed. This means that all cuttings will be collected and disposed of in accordance to the Australian Government recommendations of practicing 'weed hygiene'.[1]

An access trail will be provided along the northern bank of Blacks Creek as identified on Drawing 12066_003. The access trail is multi-functional providing essential access for;

- periodic maintenance of Blacks Creek
- planting and maintenance of Koala Compensatory Habitat.
- bushfire risk management.

The identified trail is an existing access track substantially cleared of native vegetation as identified in the JWA Pty Ltd, *Koala Plan of Management, Kings Forest* (Figure 7 Vegetation Communities). The trail would be maintained to the minimum width required (maximum of 3 metres) to allow vehicle access and will avoid/minimise the disturbance of native vegetation (if found to be present).

The trail is located within mapped Compensatory Habitat as shown on Drawing 12066_004 Rev 1 and 12066_005. The extent of the overlap within each vegetation community is itemised below;

- Compensatory Wallum Sedge Frog breeding habitat (Sedgeland) – 72m^2
- Compensatory Dry Primary Koala Habitat – 301m^2
- Compensatory Wet Primary Koala Habitat – 2370m^2
- Compensatory Dry Primary Koala Habitat E-W Corridor – 129m^2
- Compensatory Wet Primary Koala Habitat E-W Corridor – 1,909m^2
- Existing Primary Koala Habitat – 96m^2
- Existing Secondary (A) Koala Habitat – 1,762m^2

Compensatory plantings will occur up to the edges of the track to ensure a continuous canopy is provided and negligible impact to the compensatory footprint. Use of the trail for the essential purposes identified above will not result in disturbance of this canopy. Regardless, any overlap between the existing maintenance track and mapped Compensatory or existing habitat will be compensated for through identifying additional offset areas elsewhere. JWA Pty Ltd Figure 1 in Appendix 7 identifies potential locations where these additional compensatory habitat areas may be found. This process will occur in accordance with the adaptive management provisions of the approved Koala Plan of Management. Recommendations for this approach were provided by Tweed Shire Council. The details of the Adaptive Management Approach (AMA) as determined by TSC is included in Appendix 7.

Once determined through the AMA process, details in relation to the additional offset areas will be included in the site's Vegetation and Weed Management Plan (prepared by JWA).

The trail is excluded from Offset Lands identified for transfer to BCD (formerly OEH) as additions to Cudgen Nature Reserve as identified

in the LandSurv Pty Ltd Drawing – Plan of proposed areas to be dedicated to NPWS, Kings Forest Development (Appendix 3).

The NSW Department of Planning, Industry and Environment (DPIE) seeks to maintain/rehabilitate a Vegetative Riparian Zone (VRZ) with fully structured native vegetation in accordance with Table 1 of NSW DPIE's *'Guidelines for riparian corridors on waterfront land'* (July 2012).

A list of aquatic weed species that have the potential to occur within the drainage line of

[1] 'Arrive Clean, Leave Clean, Commonwealth of Australia 2015', viewed 9 December 2019, < http://www.environment.gov.au/system/files/resources/773abcad-39a8-469f-8d97-23e359576db6/files/arrive-clean-leave-clean.pdf>

Blacks Creek and the recommended methods to remove them is included in Appendix 4. It is important to note that this is a list of potential species that are known to occur within Northern NSW not a list of weed species recorded at the site.

Appendix 8 provides a table of indicative costsings of each aspect associated with drain maintenance activities.

1.3 DMMP structure

This DMMP acknowledges the potential environmental impacts associated with future drain maintenance required at the Kings Forest site, and details strategies to mitigate them.

Each control strategy is based upon proven environmental management methods and is presented as a commitment. The commitments made within this document will form the basis of future assessments, which will be made available to the Tweed Shire Council (TSC) for review.

The DMMP is based on a series of tables for use during drain maintenance. The person responsible for the implementation of the measures detailed is written on the table itself. The tables then detail the issue, the performance criteria, the implementation strategy, monitoring, auditing, reporting, failure identification and the corrective action. The detachable pages within each section detail the provisions of the DMMP. The format is presented below for reference purposes.

#.# Title

Person responsible	This is the person who has accepted the responsibility of implementing the DMMP provisions detailed on this page.
Issue	The issue with which the table deals.
Operational policy	The operational policy or management objective that applies to the element.
Performance criteria	Performance criteria (outcomes) for each element of the operation.
Implementation strategy	The strategies or tasks (to nominated operational design standards) that will be implemented to achieve the performance criteria.
Monitoring	The monitoring requirements which will measure actual performance (i.e. specified limits to pre-selected indicators of change).
Auditing	The auditing requirements, which will verify implementation of, agreed construction and operation phase environmental management strategies and compliance with agreed performance criteria.
Reporting	Content, timing and responsibility for reporting and auditing of monitoring results.
Identification of incident or failure	The circumstances under which the agreed performance criteria are unlikely to be met and the risk of environmental harm increases dramatically.
Corrective action	The action to be implemented in case a performance requirement is not reached and the person(s) / company(s) responsible for action.

Commitment #

What the management has committed the company to.

An objective of the tabular format is to allow for change and allow the DMMP to be a working document. If items need altering, changes may be made to the individual tables after appropriate consultation with the statutory authorities.

1.3.1 Commitments

Commitment 1

The Developer undertakes to comply with the environmental implementation strategy as contained within the approved Drain Maintenance Management Plan (DMMP).

Commitment 2

The Developer undertakes to fulfil all commitments made in this DMMP and to carry out its activities on the project site in accordance with relevant current statutory requirements and approved amendments.

Commitment 3

The Contractor's Site Manager will appropriately implement drainage maintenance works to minimise physical drain disturbance during sediment removal (Refer to Table 1.4.1).

Commitment 4

The Contractor's Site Manager will ensure that no acid sulfate drain spoil is disturbed or excavated without appropriate treatment (Refer to Table 1.4.2).

Commitment 5

The Contractor's Site Manager will ensure that appropriate and adequate erosion and sediment control measures are installed and maintained for the duration of drainage maintenance works (Refer to Table 1.4.3).

Commitment 6

The Contractor's Site Manager will ensure, through inspection and in situ analysis that no adverse impact on surface water quality results from drainage maintenance on site (Refer to Table 1.4.3).

Commitment 7

The Contractor's Site Manager will ensure that weeds are appropriately maintained and disposed of during flora maintenance work on the edge of Blacks Creek (Refer to Table 1.4.3).

1.3.2 Definitions

In this DMMP the terms have the following meanings;

- ASS means Acid Sulfate Soils. The term includes both Actual and Potential Acid Sulfate Soils.
- Maintenance means the removal of accumulated sediment from Blacks Creek for the purposes of maintaining conveyance.
- Developer/Proponent means the party undertaking the development of the land and includes the person nominated as having the responsibility for implementing the provisions of the DMMP.
- Development means the development of the site as defined in this Project Application and future project applications.

- DPIE Biodiversity and Conservation means the Department of Planning, Industry and Environment – Biodiversity and Conservation Division (formally Office of Environment (OEH)).
- DMMP means the approved Drain Maintenance Management Plan and includes any amendments.
- DPIE means NSW Department of Planning, Industry and Environment.
- POEO Act means the NSW Protection of the Environment Operations Act, 1997.
- Sediment means unconsolidated, fine-grained material (typically derived from the weathering of rocks), that is transported by water and settles on the floor of seas, rivers streams and other bodies of water.
- Silt means sediment having particles finer than sand and coarser than clay (i.e. 2 to 63μm).
- Significant silt deposit refers to a single deposit of silt/ sediment greater than 20 cm deep or containing monosulfidic black ooze ('black drain sludge').
- Suspended solids means the concentration of filterable particles in water (retained on a 1.2μm filter) and reported by volume (mg/L).
- TSC means the Tweed Shire Council.
- Turbidity means a measure of the cloudiness of water, which is determined by the amount of light scattered by suspended particles.

1.4 Management of potential impacts

The DMMP requires mitigation of the potential environmental impacts associated with the maintenance of Blacks Creek.

During drain maintenance activities, a visual inspection of water quality within the drain is to be conducted to ensure waters are not excessively turbid or discoloured and that no degradation to flora or fauna has occurred.

1.4.1 Mechanical maintenance

Person responsible	Contractor's Site Manager

Issue	Mechanical maintenance and control of sedimentation in Blacks Creek.
Operational policy	To minimise soil disturbance during the mechanical removal of sediment from Blacks Creek.
Performance criteria	Drain maintenance operations must minimise physical drain disturbance during sediment removal.
Implementation strategy	• Ensure existing trails are used to access Blacks Creek for mechanical maintenance (e.g. excavator, sucker trucks) in a manner that is consistent with DPIE's Guidelines for Controlled Activities. Refer to Drawing 12066_003 for location of maintenance trail. • Mechanical maintenance only conducted once every ten years, when silt depth is greater than 20 cm or when drainage is impeded. • When mono-sulfidic black ooze is present, mechanical maintenance with a sucker truck or treatment/handling in accordance with Table 1.4.2 below is required. Advice on appropriate course of action must be sort from the Environmental Consultant. • Conduct mechanical maintenance in stages to minimise disturbance to aquatic species. • Avoid the disturbance of deeper holes, snags and gravel bars during necessary maintenance works. • Ensure the minimum vegetated riparian zone (VRZ) widths outlined in the NSW DPIE's *'Guidelines for riparian corridors on waterfront land'* (July 2012) are maintained or established. • Control sediment and acid generation by ensuring that drain maintenance operations are not be conducted during runoff events. • Drain maintenance must not enlarge or alter the original drain profile. • Drain maintenance operations must maintain drain stability by minimising disturbance to vegetation root stock. • Ensure any sediment that is removed is treated in accordance with Table 1.4.2 and disposed of in an appropriate manner, which will not enable it to become re-entrained in surface flows.

	• Culverts and causeways must be maintained in accordance with NSW Fisheries *'Why do Fish Need to Cross the Road?*[2] • All temporary works, flow diversion barriers and in-stream sediment control barriers must be removed as soon as practicable and in a manner that does not promote future channel erosion.
Monitoring	• Carry out visual inspections during drain maintenance to ensure there has been minimal disturbance to the drain profile. • Visually inspect bank stability and vegetation root stock to ensure it is not excessively disturbed by drain maintenance operations. • During the earthworks phase of the development, inspections of the depth of accumulated silt are to be undertaken annually and after large rainfall events to verify if there has been a significant silt deposit or if silt levels are greater than 20 cm deep. • Following drain maintenance activities, visual inspections are to be carried out after significant rainfall events to verify that runoff has not degraded the profile and stability of the drain.
Auditing	Auditing will be undertaken by the site manager and/or the developer's nominated representative. Alternatively, auditing can be carried out by an independent consultant. The audit will include an inspection of site activities, monitoring, complaints, corrective actions and reporting to assess compliance with the provisions of the DMMP.
Reporting	The following records shall be maintained onsite for inspection by local and state authorities if requested; • Drain maintenance records. • Records of issues (if they arise) such as sedimentation, flooding, water quality and aquatic species mortality within drains. • Records of evidence of drain instability or bank erosion if they occur. • Any fish kills at the site must be recorded and reported to TSC. **Incident reporting** Within 24 hours of detecting any incident during construction that causes (or may cause) significant harm to the environment, the Proponent shall notify the Council and other relevant agencies of the incident and identify the following: • Describe the date, time, and nature of the incident. • Identify the cause (or likely case) of the incident. • Describe what action has been taken to date. • Describe any proposed measures to address the incident.
Identification of incident or failure	• Degradation of drain stability. • Excessive removal of vegetation root stock. • Degradation of surface water quality. • A recorded fish kill.

[2] Fairfull, S. & Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla.

Corrective action	• Identify the reason for stability failure and amend the drain maintenance procedures and/or decrease/increase maintenance intensity as necessary. • Repair the instability in consultation with a suitably qualified Environmental Consultant. • Replace vegetation where necessary based on advice from a suitably qualified ecologist. • Manage surface water quality/cause of fish kill in consultation with a suitably qualified Environmental Consultant and TSC. **Complaints procedure** At the commencement of construction the Proponent shall ensure that the following are available for community complaints during construction: • A 24 hour telephone number on which complaints about construction activities at the site may be registered. • A postal address to which written complaints may be sent. • An email address to which electronic complaints may be transmitted. • Name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted outside working hours. • Name, address and telephone number of the Project Manager and PCA • The telephone number, the postal address, email address, the name of the site/project manager and the approved hours of work, shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public. The Proponent shall record details of all complaints received through the means listed above in an up-to-date Complaints Register. The Proponent shall provide an initial response to any complaints made in relation to the project during construction within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in the Complaints Register.

1.4.2 Acid sulfate soil treatment

Person responsible	Contractor's Site Manager

Issue	Assessment and treatment of acid sulfate soils identified within Stage 1.
Operational policy	No acid sulfate drain spoil is to be disturbed or excavated without appropriate treatment.
Performance criteria	All material excavated from drains to be treated with lime at the prescribed rate before stockpiling.
Implementation strategy	Access along Blacks Creek for the purpose of flora maintenance will be via the maintenance trail identified on Drawing 12066_003 (Appendix 1). Lime treatment of drain spoil removed from drains situated below RL 5.0m AHD is to be undertaken according to the following treatment measures: **Lime treatment** • All spoil removed from drains situated below RL 5.0m AHD is to be treated with lime at the required rate based on CRS/TAA testing (or equivalent) undertaken during excavation. • To aid mixing, half the lime must be applied as a pad onto which the removed drain spoil material is placed. • The remaining half of the lime must be added to the spoil and mixed by mechanical means. • Exposed drain batters must be surface limed within 24 hours following drain maintenance. • Limed drain spoil must not be stockpiled within 40m of an existing drain. • Lime in the treatment pad is to be thoroughly mixed into the stockpiled drain spoil as soon as the spoil material is dry enough to cultivate. • If monosulfides ('black drain sludge') are removed from the drain, this material must be limed at the prescribed rate and cultivated into the topsoil as soon as the material is dry.
Monitoring	• Collect lime delivery dockets and compare with calculated amounts required. • Verification testing at a rate of 1 sample per 1,000m^3 must be conducted to ensure that the spoil material has been appropriately treated. In the event that additional liming is required, the treatment process and verification testing must continue until adequate treatment has been achieved.
Auditing	Auditing will be undertaken by the site manager and/or the developer's nominated representative. Alternatively, auditing may be carried out by an independent consultant. The audit must include an inspection of site activities, monitoring, complaints, corrective actions and reporting to assess compliance with the provisions of the DMMP.

Reporting	The following records shall be maintained onsite for inspection by local and state authorities if requested; • Drain maintenance records. • Records of issues (if they arise) such as sedimentation, flooding, water quality and aquatic species mortality within drains. • Records of evidence of drain instability or bank erosion. • Any fish kills at the site must be recorded and reported to TSC. • Lime delivery dockets. • Treatment rates and verification results. **Incident reporting** Within 24 hours of detecting any incidents during construction that causes (or may cause) significant harm to the environment, the Proponent shall notify the Council and other relevant agencies of the incident and identify the following: • Describe the date, time, and nature of the incident. • Identify the cause (or likely case) of the incident. • Describe what action has been taken to date. • Describe any proposed measures to address the incident.
Identification of incident or failure	Examination of works for evidence of; • Yellow efflorescence on soil surface, • Iron staining of soils or water, • Sulphurous odour and; • Low pH in water bodies.
Corrective action	Testing of drain spoil materials using POCAS or CRS/TAA method and re-evaluation of prescribed liming rate. **Complaints procedure** At the commencement of construction the Proponent shall ensure that the following are available for community complaints during construction: • A 24 hour telephone number on which complaints about construction activities at the site may be registered. • A postal address to which written complaints may be sent. • An email address to which electronic complaints may be transmitted. • Name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted outside working hours. • Name, address and telephone number of the Project Manager and PCA • The telephone number, the postal address, email address, the name of the site/project manager and the approved hours of work, shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public. The Proponent shall record details of all complaints received through the means listed above in an up-to-date Complaints Register.

	The Proponent shall provide an initial response to any complaints made in relation to the project during construction within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in the Complaints Register.

1.4.3 Sediment and erosion control

Person Responsible	Contractor's Site Manager

Issue	Sediment and erosion control.
Operational policy	To prevent the displacement of sediment and soil from drains particularly during storm events. Compliance with the NSW POEO Act (1997).
Performance criteria	Drain maintenance operations must minimise erosion and the resultant turbidity of discharge waters.
Implementation strategy	• Access along Blacks Creek for the purpose of flora maintenance will be via the maintenance trail identified on Drawing 12066_003 (Appendix 1). • To contain sediment during drain maintenance, temporary sediment and erosion control measures (including silt fences, floating silt curtains and sediment fence isolation barriers) are to be installed prior to commencement of maintenance works. • Ensure any sediment that is removed is treated in accordance with Table 1.4.2 and disposed of in an appropriate manner, which will not enable it to become re-entrained in surface flows. • Sediment and erosion control measures throughout the development footprint will be implemented in accordance with the approved erosion and sediment control plans for each phase of development.
Monitoring	• Carry out visual inspections during drain maintenance to ensure there has been minimal disturbance to the drain profile. • Visually inspect bank stability and vegetation root stock to ensure it is not excessively disturbed by drain maintenance operations. • During the earthworks phase of the development, inspections of the depth of accumulated silt are to be undertaken annually and after large rainfall events to verify if there has been a significant silt deposit or if silt levels are greater than 20 cm deep. • During the earthworks phase of the development, annual push tube tests for black drain sludge are to be undertaken. • Following drain maintenance activities, visual inspections are to be carried out after significant rainfall events to verify that runoff has not degraded the profile and stability of the drain.
Auditing	Auditing will be undertaken by the site manager and/or the developer's nominated representative. Alternatively, auditing can be carried out by an independent consultant. The audit must include an inspection of site activities, monitoring, complaints, corrective actions and reporting to assess compliance with the provisions of the DMMP.
Reporting	The following records shall be maintained onsite for inspection by local and state authorities if requested; • Drain maintenance records.

	• Records of issues (if they arise) such as sedimentation, flooding, water quality and aquatic species mortality within drains. • Records of evidence of drain instability or bank erosion. • Any fish kills at the site must be recorded and reported to TSC. **Incident reporting** Within 24 hours of detecting any incidents during construction that causes (or may cause) significant harm to the environment, the Proponent shall notify the Council and other relevant agencies of the incident and identify the following: • Describe the date, time, and nature of the incident. • Identify the cause (or likely case) of the incident. • Describe what action has been taken to date. • Describe any proposed measures to address the incident.
Identification of incident or failure	• Signs of erosion on site. • Damaged or failed erosion control devices. • Deteriorating water quality as identified by Environmental Consultant. • Excessive build-up of sediment. • Drain instability.
Corrective action	Apply remedial measures to improve sediment and erosion measures. This may include: • maintenance or replacement of existing controls • additional controls or structures as directed by the Environmental Consultant or the developer's nominated representative • removal of excessive built-up sediment • stabilisation of drain in consultation with a suitably qualified Environmental Consultant. **Complaints procedure** At the commencement of construction the Proponent shall ensure that the following are available for community complaints during construction: • A 24 hour telephone number on which complaints about construction activities at the site may be registered. • A postal address to which written complaints may be sent. • An email address to which electronic complaints may be transmitted. • Name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted outside working hours. • Name, address and telephone number of the Project Manager and PCA • The telephone number, the postal address, email address, the name of the site/project manager and the approved hours of work, shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public.

	The Proponent shall record details of all complaints received through the means listed above in an up-to-date Complaints Register. The Proponent shall provide an initial response to any complaints made in relation to the project during construction within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in the Complaints Register

1.4.4 Surface water quality management

Person responsible	Contractor's Site Manager

Issue	Surface water quality in Blacks Creek and the receiving environment (including Cudgen Creek).
Operational policy	To prevent adverse impacts to surface water quality in the downstream receiving environment as a result of drain maintenance activities.
Performance criteria	Surface water quality in Cudgen Creek and associated watercourses will not be adversely impacted by drain maintenance activities in Blacks Creek. Surface water quality at the identified surface water monitoring locations (Drawing 12017_001 in Appendix 1) will comply with the relevant water quality objectives detailed in the site's Overall Water management Plan Table 5.9.
Implementation strategy	Surface water monitoring will be undertaken at the surface water locations (SW) immediately upstream and downstream of the drain maintenance works area and compared with the site specific water quality objectives. All monitoring equipment shall be maintained in a functional condition, calibrated and serviced at a frequency compliant with the manufacturers' specifications.
Monitoring	In situ testing of pH, electrical conductivity, suspended solids, turbidity, dissolved oxygen, litter and gross pollutants and oil and grease will be conducted daily during drain maintenance works. Collection of samples for laboratory analysis will occur weekly while undertaking drain maintenance. If iron floc, sediments or iron staining are observed downstream of works, samples must also be taken for laboratory analysis and works halted until water has been treated to adequate levels. Iron indicator strips will be used if practicable. Visual assessment shall be undertaken for evidence of: • yellow efflorescence on soil surface, and/or • iron staining of soils or water.
Auditing	Auditing will be undertaken by the site manager and/or the developer's nominated representative. Alternatively, auditing can be carried out by an independent consultant. The audit must include an inspection of site activities, monitoring, complaints, corrective actions and reporting to assess compliance with the provisions of the DMMP.
Reporting	Water quality monitoring results will be recorded and kept onsite for inspection by local and state government officers. Water quality monitoring reports will be provided to TSC or DPIE at the completion of the Drain Maintenance works. **Incident reporting** Within 24 hours of detecting any incidents during construction that causes (or may cause) significant harm to the environment, the Proponent shall notify the Council and other relevant agencies of the incident and identify the following:

	• Describe the date, time, and nature of the incident. • Identify the cause (or likely case) of the incident. • Describe what action has been taken to date. • Describe any proposed measures to address the incident.
Identification of incident or failure	• Failure to undertake water quality monitoring. • Exceedance of the water quality objectives that are directly as a result of the drain maintenance activities. • Deterioration in surface water quality downstream of the drain maintenance works.
Corrective action	• Drainage maintenance works to cease until appropriate monitoring has occurred. • Take necessary steps in consultation with a suitably qualified Environmental Consultant to address the problem and prevent a recurrence. • Addition of hydrated lime to contained waters to increase pH to within the recommended range (consistent with the receiving environment). • Addition of gypsum to contained waters to reduce suspended solids as required. **Complaints procedure** At the commencement of construction the Proponent shall ensure that the following are available for community complaints during construction: • A 24 hour telephone number on which complaints about construction activities at the site may be registered. • A postal address to which written complaints may be sent. • An email address to which electronic complaints may be transmitted. • Name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted outside working hours. • Name, address and telephone number of the Project Manager and PCA • The telephone number, the postal address, email address, the name of the site/project manager and the approved hours of work, shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public. The Proponent shall record details of all complaints received through the means listed above in an up-to-date Complaints Register. The Proponent shall provide an initial response to any complaints made in relation to the project during construction within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in the Complaints Register

1.4.5 Flora maintenance

Person responsible	Contractor's Site Manager

Issue	Maintenance to control invasive flora blocking drainage in Blacks Creek
Operational policy	Removal of invasive flora conducted in a manner to minimise harm to native plants and waterway condition at Blacks Creek.
Performance criteria	Flora maintenance operations aims to minimise any disturbance to native flora or fauna as well as disturbance to water quality during removal of invasive plant species.

Implementation strategy	• Access along Blacks Creek for the purpose of flora maintenance will be via the maintenance trail identified on Drawing 12066_003 (Appendix 1).
	• Prior to the commencement of any vegetation clearing works a baseline assessment of the subject area is to be undertaken in accordance with the Baseline Data Proforma (adopted from *JWA Pty Ltd, Kings Forest – Proposed Precincts 12 -14 Weed Management Plan*, version RW3 or current version at the time of the maintenance activity) included in Appendix 6.
	• Ensure any maintenance clearing in the vegetated riparian zone (VRZ) widths is undertaken in accordance with NSW DPIE's '*Guidelines for riparian corridors on waterfront land'* (July 2012).
	• Ensure the minimum (VRZ) widths outlined in the NSW DPIE's *'Guidelines for riparian corridors on waterfront land'* (July 2012) are maintained or established.
	• Whilst maintenance is being undertaken, care must be taken to avoid disturbance, damage or removal of any native vegetation in accordance with Table 4.3.37 of the Kings Forest Summary of Management Plans "Fauna & Flora Protection – General Provisions".
	• Do not disturb any fauna species or injure any native fauna species within the area being cleared including (but not limited to) reptiles, amphibians and fish species. Protection of fauna shall be undertaken in accordance with the Fauna Protection measures contained in the *'Kings Forest Proposed Precinct 12-14 Threatened Species Management Plan'* (version RW3 or current version at the time of the maintenance activity). Measures shall be location/activity specific but may include;
	  ◦ Provision of a Spotter Catcher
	  ◦ Pre-clearing site inspection
	  ◦ Pre-clearing fauna trapping
	  ◦ Protection of significant habitat features
	• Maintenance to be conducted annually in October prior to the growth in summer and before flowering can cause seed dispersion.

	• Maintenance is to be undertaken in stages manually to reduce cuttings entering water way and to prevent the use of water quality altering herbicides. This is to be undertaken by grubbing and/ or slashing. • Removal of invasive flora in a controlled method to minimise spread of seed/ cuttings that cause rejuvenation. • A list of aquatic weed species that have the potential to occur within the drainage line of Blacks Creek and the recommended methods to remove them is included in Appendix 4. • Disposal of invasive flora must be undertaken in a way that eliminates re-growth from removed plant material including bagging and removal of weeds offsite.
Monitoring	Daily visual inspections whilst maintenance is being undertaken to check all cuttings are being collected and no native flora has been damaged or removed. Weekly visual inspections to be undertaken during maintenance to ensure correct disposal.
Auditing	Auditing will be undertaken by the site manager and/or the developer's nominated representative. Alternatively, auditing may be carried out by an independent consultant. The audit must include an inspection of site activities, complaints, corrective actions and reporting to assess compliance with the provisions of the DMMP.
Reporting	Report date of visual monitoring - any other reporting only required if evidence of incident or failure. **Incident reporting** Within 24 hours of detecting any incidents during construction that causes (or may cause) significant harm to the environment, the Proponent shall notify the Council and other relevant agencies of the incident and identify the following: • Describe the date, time, and nature of the incident. • Identify the cause (or likely case) of the incident. • Describe what action has been taken to date. • Describe any proposed measures to address the incident.
Identification of incident or failure	• Removal and/ or damage to native flora in the VRZ. • Cuttings of invasive species found in the watercourse or found onsite – not completely collected after grubbing/ slashing • Waste cuttings being disposed of in a manner that is not consistent with weed hygiene – i.e. in a shallow hole or where vegetation can rejuvenate.
Corrective action	• Identification of native flora damaged and/ or removed and replacement with like species. • Immediate removal of uncollected cuttings and undertake staff and/ or contractor training in correct collection method.

- Dispose cuttings appropriately and conduct staff and/ or contractor training in correct weed hygiene disposal.

Complaints procedure

At the commencement of construction the Proponent shall ensure that the following are available for community complaints during construction:

- A 24 hour telephone number on which complaints about construction activities at the site may be registered.
- A postal address to which written complaints may be sent.
- An email address to which electronic complaints may be transmitted.
- Name, address, contractor licence number and telephone number of the principal contractor, including a telephone number at which the person may be contacted outside working hours.
- Name, address and telephone number of the Project Manager and PCA
- The telephone number, the postal address, email address, the name of the site/project manager and the approved hours of work, shall be displayed on a sign near the entrance to the site, in a position that is clearly visible to the public.

The Proponent shall record details of all complaints received through the means listed under this condition of this approval in an up-to-date Complaints Register.

The Proponent shall provide an initial response to any complaints made in relation to the project during construction within 48 hours of the complaint being made. The response and any subsequent action taken shall be recorded in the Complaints Register.

1.5 Administration of the DMMP

1.5.1 Adaptive management for minor plan inconsistencies

DPIE recognises and acknowledges (correspondence in Appendix 7) that minor inconsistencies may arise in approved management plans as the various remaining management plans are reviewed, updated and approved. An approach of adaptive management has been agreed by DPIE, BCD and Council for resolving these inconsistencies as detailed below;

1. Approved management plans can only be updated using this approach where the inconsistency:
    a. results following the approval of an associated management plan, and
    b. is in response to advice from, or acknowledged in writing by,Council or a relevant State agency, and
    c. is genuinely minor and/or administrative in nature,and
    d. results in no additional environmental impact.
2. Discretion as to whether approved management plans may be updated using this approach (or may require re-satisfaction or a modification of the Project Approval) rests with the Department, in consultation with Council, BCD and any other relevant agencies.
3. Updates must be consistent with the rationale, aims, objectives and expected outcomes of the relevant management plan (for example, the principles of the Koala Plan of Management) and continue to comply with any relevant benchmarks.
4. Updates must ensure the management plan continues to comply with the relevant conditions of the Project Approval.
5. All relevant stakeholders may raise issues and provide examples of minor conflicts as they are detected during the management plan review process.
6. Implementation of the relevant management plan must include all agreed management responses, including those identified through the adaptive management approach, and reflected in the annual reporting for the relevant management plan.
7. The Applicant is to keep all management plans on its project website, clearly indicating current and archived versions.
8. The Applicant is to publish a log of changes to each management plan on its project website, updated monthly. This log shall include (as a minimum), the date, the title of the plan affected, an explanation of the inconsistency and update made, and confirmation that the Council, BCD or any relevant agencies support the amendment.

1.5.2 Amendment of the DMMP

The Developer may make an application to Tweed Shire Council to amend the provisions of this DMMP. The application shall:

be in writing; and

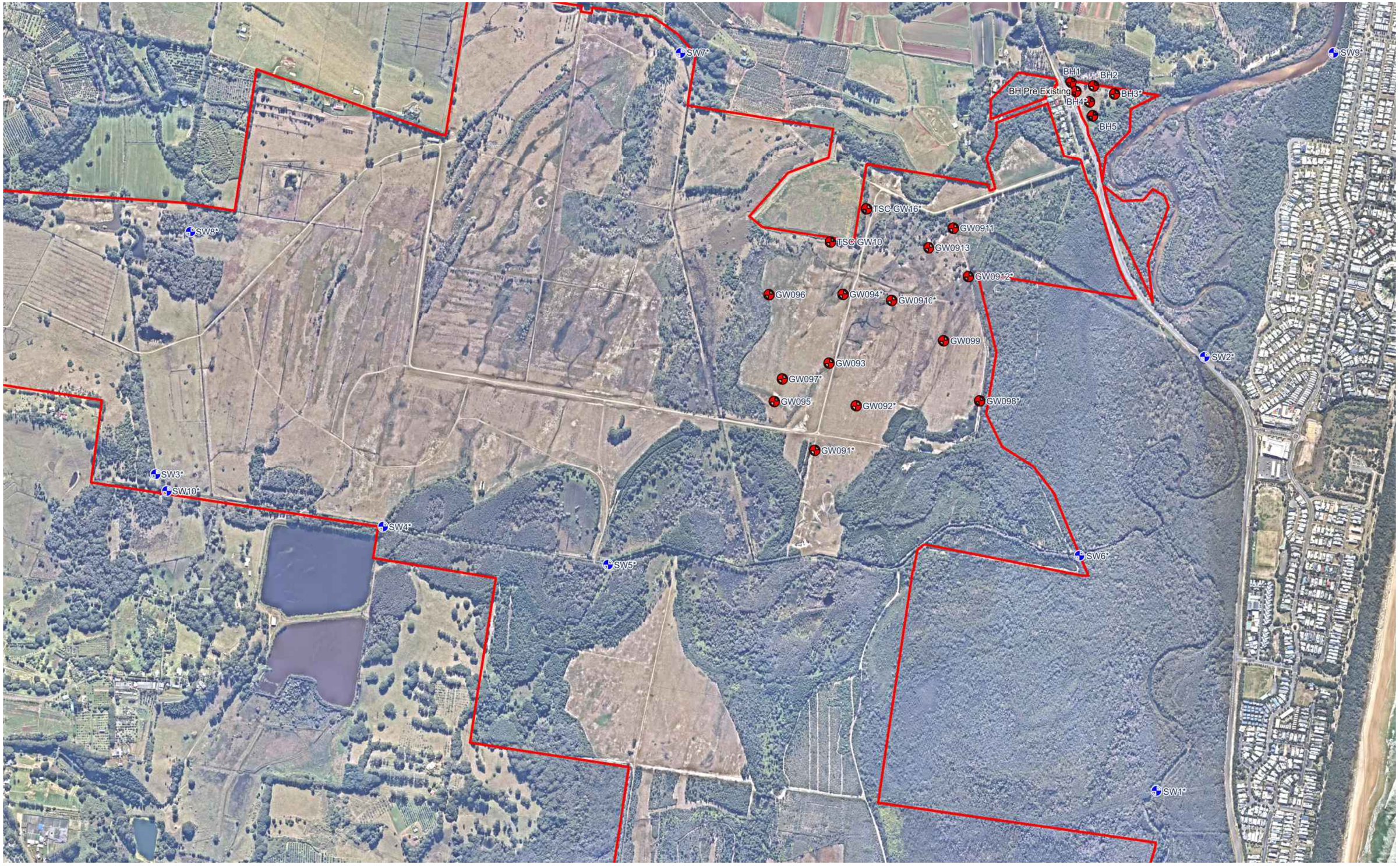
specify the provisions of the DMMP to which the application relates; and

state how the proposed amendments achieve the objectives of the provisions to which the amendments relate.

4.1.1 Incident management

The Developer and any person appointed by the Developer as having responsibility for a control strategy set out in this DMMP have clearly defined responsibilities under the NSW *Protection of the Environment Operations Act* (1997) to report any incidents likely to cause material or serious environmental harm.

4.2 Appendix 1 – Drawings



ORIENTATION

SCALE

100 200 300 400 500
metres

ROBINA
PO Box 4115 Robina QLD4230 07 5578 9944
Email robina@access.gs **www.access.gs**

LEGEND

- Cadastral boundaries
- Site boundary
- Groundwater monitoring boreholes
- Surface water monitoring locations

SOURCES

Image: Nearmap image dated 15/07/2019.

NOTES

1. Field in-situ monitoring conducted at all locations.
2. Laboratory samples collected at monitoring locations with an asterix*.

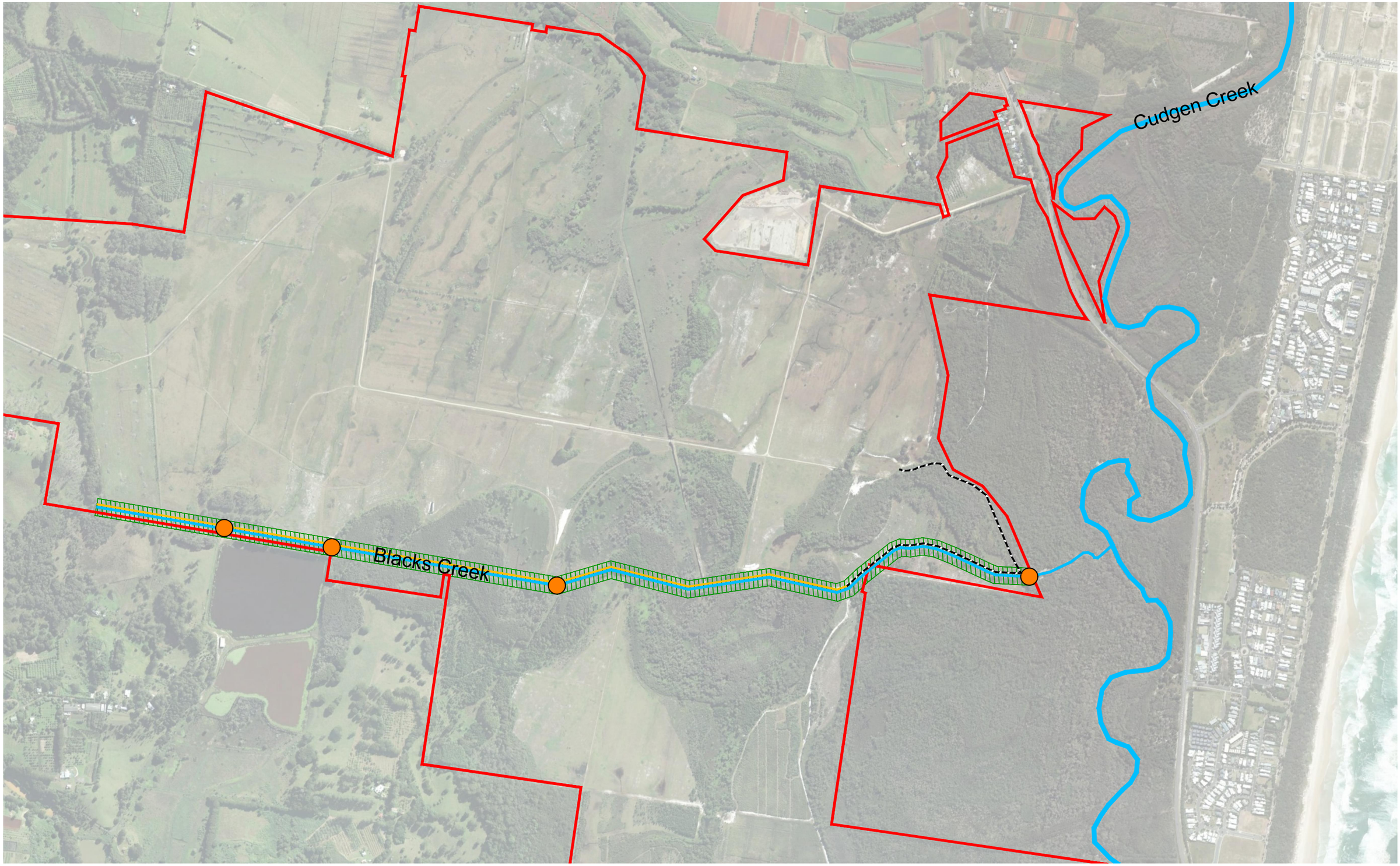
PROJECT
KINGS FOREST

CLIENT
PROJECT 28 PTY LTD

DRAWING
BASELINE MONITORING LOCATIONS

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:12,500@A3	12/09/2019	AJF	NMS	12017	001	-

GILBERT SUTHERLAND



ORIENTATION

SCALE 1:12 500

100 200 300 400 500 600 metres

ROBINA

PO Box 4115 Robina QLD4230 07 5578 9944
Email robina@access.gs **www.access.gs**

LEGEND

- Site Boundary
- Creek
- Maintenance Trail
- Revegetation Maintenance Trail
- Blacks Creek Road Access
- Riparian Corridor

SOURCES

Imagery: Google Earth Pro 2017, *NSW Globe*, Dated: 5/05/2012, Accessed: 6/02/2018.

PROJECT
KINGS FOREST STAGE 1

CLIENT
PROJECT 28 PTY LTD

DRAWING
BLACKS CREEK - ROAD ACCESS AND MAINTENANCE TRAIL

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:12 500@A3	18/12/2019	SWP	ELH	12066	003	-

GILBERT SUTHERLAND

Blacks Creek

Scale: 1:10000@A3

Extent of trail within Dry Primary E-W Corridor Koala Compensatory Habitat (110m²)

Extent of trail within Wet Primary Koala Compensatory Habitat (177m²)

Extent of trail within Dry Primary E-W Corridor Koala Compensatory Habitat (19m²)

Extent of trail within Wet Primary E-W Corridor Koala Compensatory Habitat (1032m²)

Extent of trail within Wet Primary E-W Corridor Koala Compensatory Habitat (877m²)

Extent of trail within Dry Primary Koala Compensatory Habitat (301m²)

Scale: 1:5000@A3

Extent of trail within WSF breeding Compensatory Habitat (72m²)

Extent of trail within Wet Primary Koala Compensatory Habitat (1287m²)

Extent of trail within Wet Primary Koala Compensatory Habitat (565m²)

Extent of trail within Wet Secondary Koala Compensatory Habitat (112m²)

Extent of trail within Wet Primary Koala Compensatory Habitat (341m²)

Scale: 1:5000@A3

ORIENTATION

SCALE 1:10 000

100 200 300 400 500 metres

ROBINA

PO Box 4115 Robina QLD4230 07 5578 9944

Email robina@access.gs **www.access.gs**

LEGEND

- Site Boundary
- Creek
- Maintenance Trail
- Revegetation Maintenance Trail
- Blacks Creek Road Access
- Compensatory WSF breeding habitat (Sedgeland) (72m²)
- Dry Primary Koala Habitat (301m²)
- Wet Primary Koala Habitat (2370m²)
- Wet Secondary Koala Habitat (112m²)
- Dry primary Koala habitat E-W Corridor (129m²)
- Wet primary Koala habitat E-W Corridor (1909m²)

SOURCES

Imagery: Nearmap, image dated 06/11/2019.

Koala & WSF Compensatory Habitat: JWA Pty Ltd, Drawing No. *N97017_Mgt Zones (06.07.20).dwg*, Received 06/07/2020.

PROJECT

KINGS FOREST STAGE 1

CLIENT

PROJECT 28 PTY LTD

DRAWING

BLACKS CREEK MAINTENANCE TRAIL WITHIN COMPENSATORY HABITAT

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:10 000@A3	13/07/2020	SWP	ELH	12066	004	1

GILBERT SUTHERLAND

Blacks Creek

Scale: 1:10000@A3

Extent of trail within Primary Koala Retained Habitat (96m²)

Extent of trail within Secondary (A) Koala Retained Habitat (1762m²)

Scale: 1:5000@A3

Blacks Creek

Scale: 1:5000@A3

ORIENTATION

SCALE 1:10 000

100 200 300 400 500 metres

ROBINA

PO Box 4115 Robina QLD4230 07 5578 9944

Email robina@access.gs **www.access.gs**

LEGEND

- Site Boundary
- Creek
- Maintenance Trail
- Revegetation Maintenance Trail
- Blacks Creek Road Access
- Primary Koala Habitat (96m²)
- Secondary (A) Koala habitat (1762m²)

SOURCES

Imagery: Nearmap, image dated 06/11/2019.

Koala Retained Habitat: JWA Pty Ltd, Drawing No. *N97017_KPOM Retained KH (25.11.20).dwg*, Received 25/11/2020.

PROJECT
KINGS FOREST STAGE 1

CLIENT
PROJECT 28 PTY LTD

DRAWING
BLACKS CREEK MAINTENANCE TRAIL WITHIN RETAINED HABITAT

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:10 000@A3	25/11/2020	SWP	ELH	12066	005	-

GILBERT SUTHERLAND

4.3 Appendix 2 – NOW and NRAR guidelines for controlled activities in riparian corridors

Guidelines for controlled activities on waterfront land

Riparian corridors

Published by NSW Department of Industry

Guidelines for controlled activities on waterfront land—Riparian corridors

First published May 2018.

More information

Natural Resources Access Regulator

industry.nsw.gov.au/nrar

INT19/15607

Guidelines for controlled activities on waterfront land

Contents

Natural Resources Access Regulator

The Natural Resources Access Regulator (NRAR) is an independent regulator established under the NSW *Natural Resources Access Regulator Act 2017*. The current regulatory focus of NRAR is water regulation, a key part of which is to prevent, detect and stop illegal water activities.

The NRAR seeks to ensure effective, efficient, transparent and accountable compliance and enforcement measures through the natural resources management legislation and, in doing so, maintain public confidence in the enforcement of natural resources management legislation.

Controlled activities on waterfront land

Controlled activities carried out in, on, or under waterfront land are regulated by the *Water Management Act 2000* (WM Act). The NRAR administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity.

Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary.

This means that applicants must obtain a controlled activity approval from the NRAR before commencing the controlled activity.

What is a riparian corridor?

A riparian corridor (RC) forms a transition zone between the land, also known as the terrestrial environment, and the river or watercourse or aquatic environment. Riparian corridors perform a range of important environmental functions such as:

- providing bed and bank stability and reducing bank and channel erosion
- protecting water quality by trapping sediment, nutrients and other contaminants
- providing diversity of habitat for terrestrial, riparian and aquatic plants (flora) and animals (fauna)
- providing connectivity between wildlife habitats
- conveying flood flows and controlling the direction of flood flows
- providing an interface or buffer between developments and waterways
- providing passive recreational uses.

The protection, restoration or rehabilitation of vegetated riparian corridors is important for maintaining or improving the shape, stability (or geomorphic form) and ecological functions of a watercourse.

Changes to controlled activities within riparian corridors

On 1 July 2012, new rules commenced regarding controlled activities within riparian corridors. The new rules amend the riparian corridor widths that apply to watercourses, providing more flexibility in how riparian corridors can be used and making it easier for applicants to determine the NRAR-controlled activity approval requirements. Key aspects of the changes include:

- provision of greater flexibility in the allowable uses and works permitted within riparian corridors
- the core riparian zone and vegetated buffer have been combined into a single vegetated riparian zone (VRZ)
- the width of the VRZ within the riparian corridor has been pre-determined and standardised for first, second, third and fourth-order and greater watercourses
- where suitable, applicants may undertake non-riparian corridor works or development within the

outer 50 per cent of a VRZ, as long as they offset this activity by connecting an equivalent area to the RC within the development site

- a new 'riparian corridors matrix' enables applicants to determine what activities can be considered in riparian corridors.

These changes will simplify the controlled activities application and assessment process; provide greater flexibility; help make more land available for housing; support floodplain, stormwater and bush fire management; and allow riparian corridors to be used for public amenity whilst continuing to deliver environmental outcomes required under the WM Act.

The riparian corridor consists of:

- the channel which comprises the bed and banks of the watercourse (to the highest bank) and
- the vegetated riparian zone (VRZ) adjoining the channel.

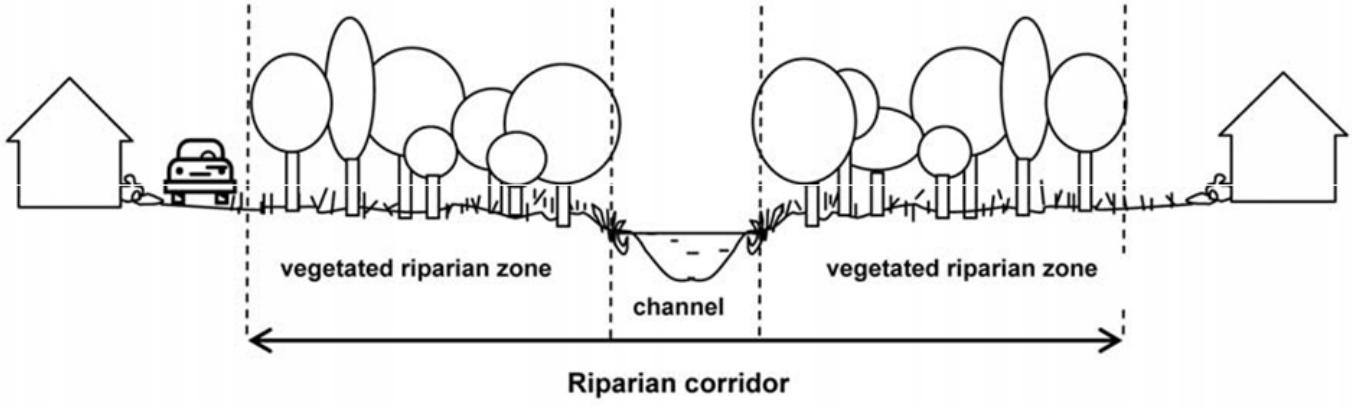


Figure 1. Riparian corridor

Riparian corridor widths

The NRAR recommends a VRZ width based on watercourse order as classified under the Strahler System of ordering watercourses and using Hydroline Spatial Data which is published on the department's website . The width of the VRZ should be measured from the top of the highest bank on both sides of the watercourse (see Figure 2 and Table 1).

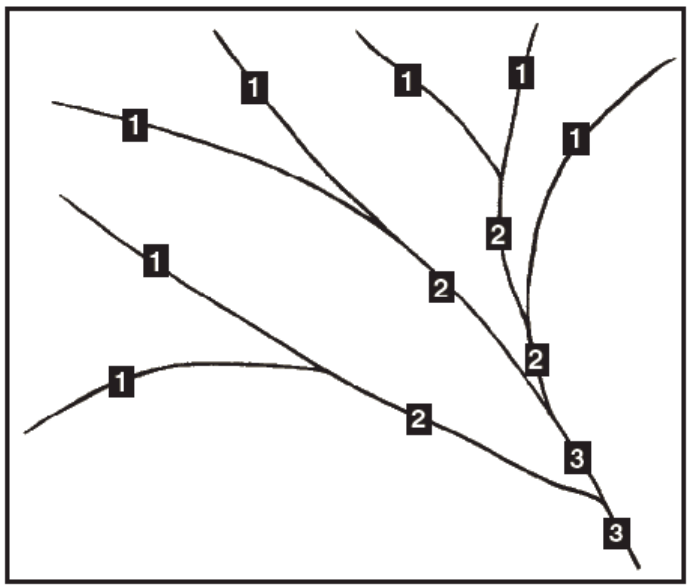


Figure 2. The Strahler System

Table 1. Recommended riparian corridor (RC) widths

Watercourse type	VRZ width (each side of watercourse)	Total RC width
1st order	10 metres	20 metres + channel width
2nd order	20 metres	40 metres + channel width
3rd order	30 metres	60 metres + channel width
4th order and greater (includes estuaries, wetlands and parts of rivers influence by tidal waters)	40 metres	80 metres + channel width

Note: Where a watercourse does not exhibit the features of a defined channel with bed and banks, the NRAR may determinethat the watercourse is not waterfront land for the purposes of the WM Act.

Objectives for riparian corridor management

The overarching objective of the controlled activities provisions of the WM Act is to establish and preserve the integrity of riparian corridors.

Ideally, the environmental functions of riparian corridors should be maintained or rehabilitated by applying the following principles:

- identify whether or not there is a watercourse present and determine its order in accordance with the Strahler System
- if a watercourse is present, define the RC/VRZ on a map in accordance with Table 1
- seek to maintain or rehabilitate a RC/VRZ with fully structured native vegetation in accordance with Table 1
- seek to minimise disturbance and harm to the recommended RC/VRZ
- minimise the number of creek crossings and provide perimeter road separating development from the RC/VRZ
- locate services and infrastructure outside of the RC/VRZ. Within the RC/VRZ provide multiple service easements and/or utilise road crossings where possible.
- treat stormwater run-off before discharging into the RC/VRZ.

NRAR however, does allow for a range of works and activities on waterfront land and in riparian corridors to better meet the needs of the community, so long as they cause minimal harm as outlined in the riparian corridor matrix below.

What is the averaging rule?

Non-riparian corridor works and activities can be authorised within the outer riparian corridor, so long as the average width of the vegetated riparian zone can be achieved over the length of the watercourse within the development site. That is, where appropriate, 50 per cent of the outer vegetated riparian zone width may be used for non-riparian uses including asset protection zones, recreational areas, roads, development lots and infrastructure. However, an equivalent area connected to the riparian corridor must be offset on the site (see Figure 3) and the inner 50 per cent of the vegetated riparian zone must be fully protected and vegetated with native, endemic, riparian plant species.

Bridges, cycleways, paths, stormwater outlets and other essential services do not need to be offset, but must comply with the requirements set out in the riparian corridor matrix (Table 2) and other relevant controlled activities guidelines. Offline detention basins do not need to be offset so long as

there is anequivalent VRZ for the corresponding watercourse and they are built in compliance with *Controlled activities: Guidelines for watercourse crossings* and *Controlled activities: Guidelines for in-stream works.* [1]

If a proposed basin will not have an equivalent VRZ for the corresponding watercourse, it may still be built in the outer 50 per cent of the VRZ but must be offset.

The averaging rule should generally be applied to cleared waterfront land. Development proposals involving waterfront lands that contain existing native vegetation should seek to preserve that riparian vegetation in accordance with the minimum riparian corridor requirements outlined in Table 1.

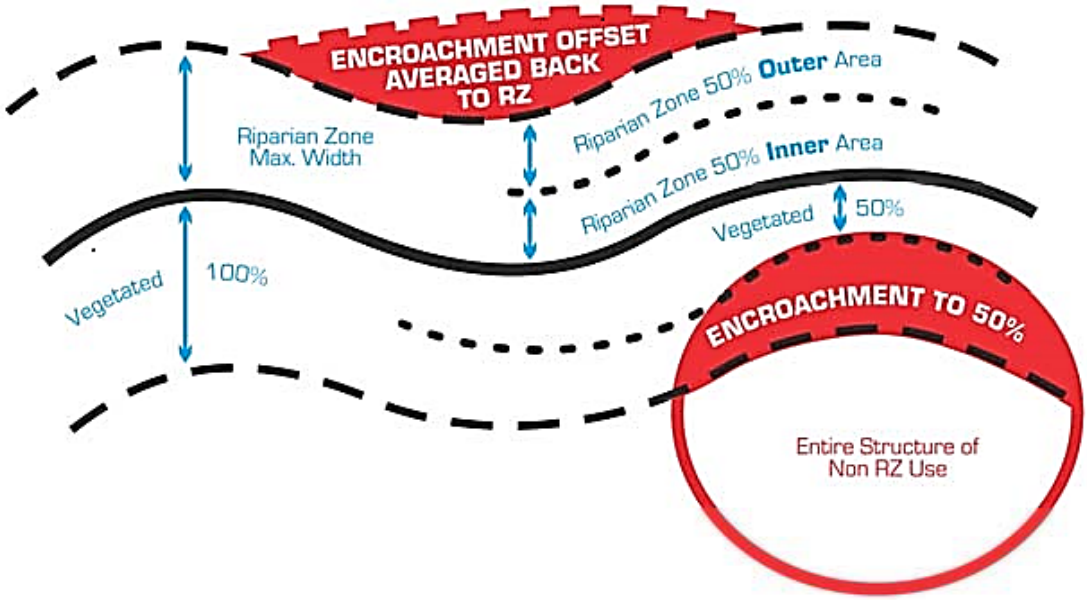


Figure 3. Averaging rule

Riparian corridor matrix

The riparian corridor matrix enables applicants to identify certain works and activities that can occur on waterfront land and in riparian corridors. Applicants should note that the matrix relates to controlled activity approvals under the WM Act only. Applicants are still required to comply with other relevant government legislation, such as threatened species, flood planning levels and fisheries guidelines.

[1] www.industry.nsw.gov.au/nrar

Table 2. Riparian corridor matrix

Stream order	Vegetated riparian zone(VRZ)	RC offsetting for non-RC users	Cycleways andpaths	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1st	10 m	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
2nd	20 m	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
3rd	30 m	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
4th	40 m	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes

Key

Stream order: The watercourse order as classified under the Strahler System using Hydrospatial data as published on the Department's website. A full list is provided at Part 2, Schedule 2 of the Water Management (General) Regulation 2011.

Vegetated riparian zone (VRZ): The required width of the VRZ measured from the top of the high bank on each side of the watercourse.

Riparian corridor (RC) off-setting for non RC uses: Non-riparian uses, such as Asset Protection Zones are allowed within the outer 50 per cent of the VRZ, so long as offsets are provided in accordance with the averaging rule as seen in Figure 3.

Cycleways and paths: Cycleways or paths no wider than four metres total disturbance footprint can be built in the outer 50 per cent of the VRZ.

Detention basins: Detention basins can be built in the outer 50 per cent of the VRZ or online where indicated. Online basins must:

- be dry and vegetated
- be for temporary flood detention only, with no permanent water holding
- have an equivalent VRZ for the corresponding watercourse order
- not be used for water quality treatment purposes.

Stormwater outlet structures and essential services: Stormwater outlets or essential services are allowed in the RC. Works for essential services on a fourth order or greater stream are to be undertaken by directional drilling or tied to existing crossings.

Stream realignment: Indicates that a watercourse may be realigned

Road crossings: Indicates permitted road crossing methods

Applications for controlled activity approvals

Applications for controlled activities approvals should be informed by the riparian corridor matrix shown in Table 2 and prepared using the *Application for a Controlled Activity Approval* for works on waterfront land form and the Guideline for completing an application for a Controlled Activity Approval.

Other controlled activity guidelines are available on the NRAR website and outline relevant considerations for applicants when proposing activities and works on waterfront lands.

Streamlined assessment

Where applications are presented in accordance with the riparian corridor matrix (Table 2) and other controlled activity guidelines, the NRAR will assess them under a streamlined process. This may decrease the amount of time it takes the NRAR to make a determination, saving applicants time and money.

Applications that do not conform to the matrix and/or relevant controlled activity guidelines will continue to be subject to merit assessment to ensure that the proposals meet the requirements of the WM Act. All applications will still need to demonstrate that minimal harm will occur to waterfront land before the NRAR will issue a controlled activity approval.

More information

Find out more about controlled activities on the NRAR website at www.industry.nsw.gov.au/nrar

Contact us

By phone on 1800 633 362 or by email at nrar.enquiries@nrar.nsw.gov.au

Department of Primary Industries
Office of Water

CONTROLLED ACTIVITIES ON WATERFRONT LAND

Guidelines for riparian corridors on waterfront land

Controlled activities carried out in, on or under waterfront land are regulated by the *Water Management Act 2000* (WM Act). The NSW Office of Water administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity.

Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary.

This means that a controlled activity approval must be obtained from the Office of Water before commencing the controlled activity.

What is a riparian corridor?

A riparian corridor (RC) forms a transition zone between the land, also known as the terrestrial environment, and the river or watercourse or aquatic environment. Riparian corridors perform a range of important environmental functions such as:

- providing bed and bank stability and reducing bank and channel erosion
- protecting water quality by trapping sediment, nutrients and other contaminants
- providing diversity of habitat for terrestrial, riparian and aquatic plants (flora) and animals (fauna)
- providing connectivity between wildlife habitats
- conveying flood flows and controlling the direction of flood flows
- providing an interface or buffer between developments and waterways
- providing passive recreational uses.

The protection, restoration or rehabilitation of vegetated riparian corridors is important for maintaining or improving the shape, stability (or geomorphic form) and ecological functions of a watercourse.

Changes to controlled activities within riparian corridors

On 1 July 2012 new rules commenced regarding controlled activities within riparian corridors. The new rules amend the riparian corridor widths that apply to watercourses, providing more flexibility in how riparian corridors can be used and making it easier for applicants to determine the Office of Water controlled activity approval requirements. Key aspects of the changes include:

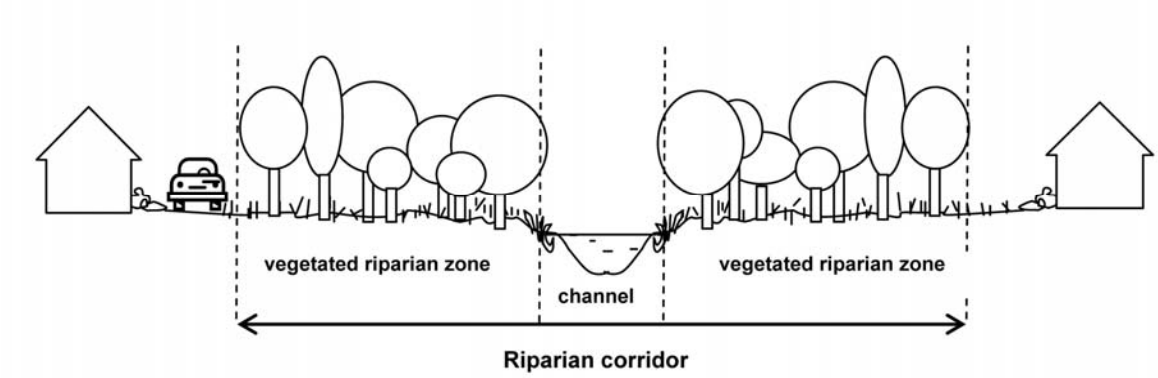
- Provision of greater flexibility in the allowable uses and works permitted within riparian corridors.
- The core riparian zone and vegetated buffer have been combined into a single vegetated riparian zone (VRZ).
- The width of the VRZ within the riparian corridor has been pre-determined and standardised for first, second, third and fourth order and greater watercourses.
- Where suitable, applicants may undertake non-riparian corridor works or development within the outer 50 per cent of a VRZ, as long as they offset this activity by connecting an equivalent area to the RC within the development site.
- A new ‘riparian corridors matrix’ enables applicants to determine what activities can be considered in riparian corridors.

These changes will simplify the controlled activities application and assessment process, provide greater flexibility, help make more land available for housing, support floodplain, stormwater and bush fire management, and allow riparian corridors to be used for public amenity whilst continuing to deliver environmental outcomes required under the WM Act.

The riparian corridor consists of:

- the channel which comprises the bed and banks of the watercourse (to the highest bank) and
- the vegetated riparian zone (VRZ) adjoining the channel.

Figure 1. The riparian corridor



Riparian corridor widths

The Officer of Water recommends a VRZ width based on watercourse order as classified under the Strahler System of ordering watercourses and using current 1:25 000 topographic maps (see Figure 2 and Table 1). The width of the VRZ should be measured from the top of the highest bank on both sides of the watercourse.

Figure 2. The Strahler System

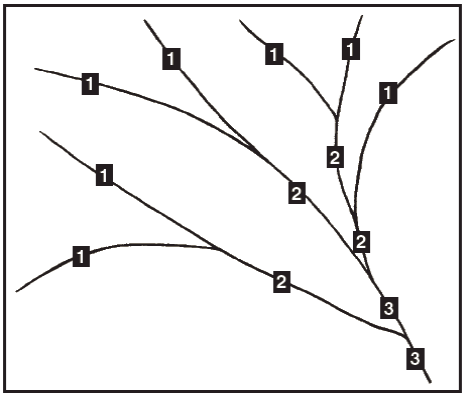


Table 1. Recommended riparian corridor (RC) widths

Watercourse type	**VRZ width** (each side of watercourse)	**Total RC width**
1st order	10 metres	20 m + channel width
2nd order	20 metres	40 m + channel width
3rd order	30 metres	60 m + channel width
4th order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 metres	80 m + channel width

Note: where a watercourse does not exhibit the features of a defined channel with bed and banks, the Office of Water may determine that the watercourse is not waterfront land for the purposes of the WM Act

Objectives for riparian corridor management

The overarching objective of the controlled activities provisions of the WM Act is to establish and preserve the integrity of riparian corridors.

Ideally the environmental functions of riparian corridors should be maintained or rehabilitated by applying the following principles:

- Identify whether or not there is a watercourse present and determine its order in accordance with the Strahler System.
- If a watercourse is present, define the RC/VRZ on a map in accordance with Table 1.
- Seek to maintain or rehabilitate a RC/VRZ with fully structured native vegetation in accordance with Table 1.
- Seek to minimise disturbance and harm to the recommended RC/VRZ.
- Minimise the number of creek crossings and provide perimeter road separating development from the RC/VRZ.
- Locate services and infrastructure outside of the RC/VRZ. Within the RC/VRZ provide multiple service easements and/or utilise road crossings where possible.
- Treat stormwater run-off before discharging into the RC/VRZ.

The Office of Water however, does allow for a range of works and activities on waterfront land and in riparian corridors to better meet the needs of the community, so long as they cause minimal harm as outlined in the riparian corridor matrix below.

Riparian corridor matrix

The riparian corridor matrix enables applicants to identify certain works and activities that can occur on waterfront land and in riparian corridors. Applicants should note that the matrix relates to controlled activity approvals under the WM Act only. They are still required to comply with other relevant government legislation, such as threatened species, flood planning levels and fisheries guidelines.

Table 2. Riparian corridor matrix

Stream order	Vegetated Riparian Zone (VRZ)	RC off-setting for non RC uses	Cycleways and paths	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1st	10m	●	●	●	●	●	●	●		
2nd	20m	●	●	●	●	●		●		
3rd	30m	●	●	●		●			●	●
4th +	40m	●	●	●		●			●	●

Key

Stream order: The watercourse order as classified under the Strahler System based on 1:25,000, 1:50,000 or 1:100,000 topographic maps whichever is the smallest scale available. A full list is provided at Part 2, Schedule 2 of the Water Management (General) Regulation 2011.

Vegetated riparian zone (VRZ): The required width of the VRZ measured from the top of the high bank on each side of the watercourse.

Riparian corridor (RC) off-setting for non RC uses: Non-riparian uses, such as Asset Protection Zones are allowed within the outer 50 per cent of the VRZ, so long as offsets are provided in accordance with the averaging rule as seen in Figure 3.

Cycleways and paths: Cycleways or paths no wider than four metres total disturbance footprint can be built in the outer 50 per cent of the VRZ.

Detention basins: Detention basins can be built in the outer 50 per cent of the VRZ or online where indicated. Refer to the Office of Water's *Controlled activities. Guidelines for outlet structures* and *Controlled activities. Guidelines for instream works*. Online basins must:

- be dry and vegetated
- be for temporary flood detention only with no permanent water holding
- have an equivalent VRZ for the corresponding watercourse order
- not be used for water quality treatment purposes.

Stormwater outlet structures and essential services: Stormwater outlets or essential services are allowed in the RC. Works for essential services on a fourth order or greater stream are to be undertaken by directional drilling or tied to existing crossings. Refer to the Office of Water's *Controlled activities. Guidelines for laying pipes and cables in watercourses* and *Controlled activities. Guidelines for outlet structures.*

Stream realignment: Indicates that a watercourse may be realigned. Refer to the Office of Water's *Controlled activities. Guidelines for instream works.*

Road crossings: Indicates permitted road crossing methods. Refer to the Office of Water's *Controlled activities. Guidelines for watercourse crossings* and NSW DPI policy and guidelines for fish friendly waterway crossings for Class 1 and 2 waterways.

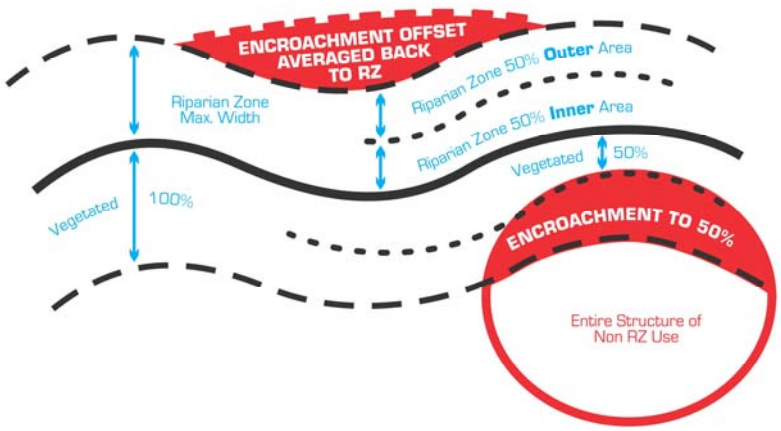
What is the averaging rule?

Non riparian corridor works and activities can be authorised within the outer riparian corridor, so long as the average width of the vegetated riparian zone can be achieved over the length of the watercourse within the development site. That is, where appropriate 50 per cent of the outer vegetated riparian zone width may be used for non-riparian uses including asset protection zones, recreational areas, roads, development lots and infrastructure. However, an equivalent area connected to the riparian corridor must be offset on the site (see Figure 3) and the inner 50 per cent of the vegetated riparian zone must be fully protected and vegetated with native endemic riparian plant species.

Bridges, cycleways, paths, stormwater oulets and other essential services do not need to be offset, but must comply with the requirements set out in the riparian corridor matrix (Table 2) and other relevant Office of Water controlled activities guidelines. Offline detention basins do not need to be offset so long as there is an equivalent VRZ for the corresponding watercourse and they are built in compliance with the Office of Water's *Controlled activities: Guidelines for watercourse crossings* and *Controlled activities: Guidelines for in-stream works*. If a proposed basin will not have an equivalent VRZ for the corresponding watercourse, it may still be built in the outer 50 per cent of the VRZ but must be offset.

The averaging rule should generally be applied to cleared waterfront land. Development proposals involving waterfront lands that contain existing native vegetation should seek to preserve that riparian vegetation in accordance with the minimum riparian corridor requirements outlined in Table 1.

Figure 3. Averaging rule



Applications for controlled activity approvals

Applications for controlled activities approvals should be informed by the riparian corridor matrix shown in Table 2 and prepared using the *Application for a Controlled Activity Approval for works on waterfront land* form and the *Guideline for completing an application for a Controlled Activity Approval*.

Other controlled activity guidelines are available on the Office of Water website and outline relevant considerations for applicants when proposing activities and works on waterfront lands.

Streamlined assessment

Where applications are presented in accordance with the riparian corridor matrix (Table 2) and other Office of Water controlled activity guidelines, they will be assessed under a streamlined process. This may decrease the amount of time it takes the Office of Water to make a determination, saving applicants time and money.

Applications that do not conform to the matrix and/or relevant Office of Water controlled activity guidelines will continue to be subject to merit assessment to ensure that the proposals meet the requirements of the WM Act. All applications will still need to demonstrate that minimal harm will occur to waterfront land before a controlled activity approval will be issued.

Where do I go for additional information?

Find out more about controlled activities at the Office of Water website www.water.nsw.gov.au.

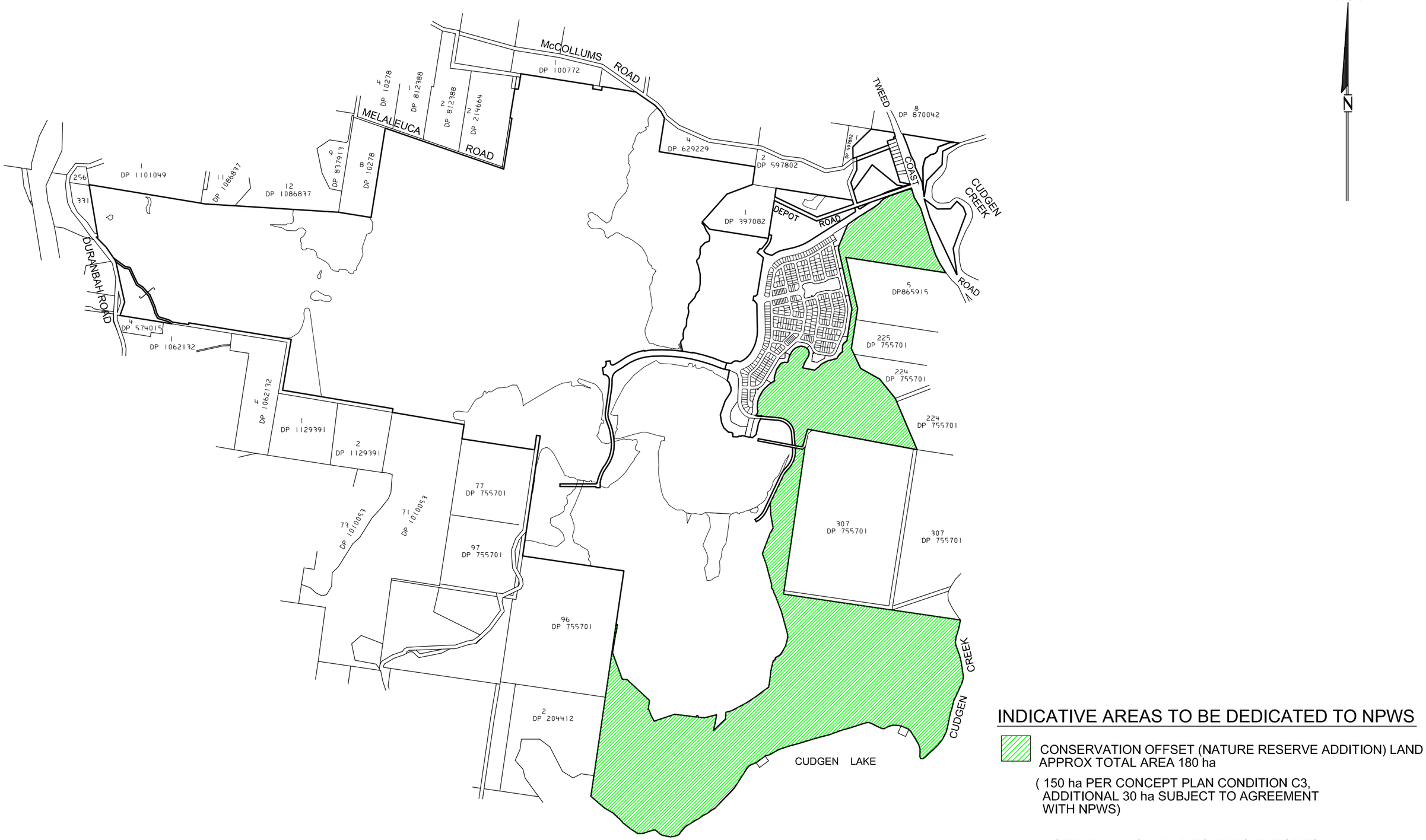
Contact us

Contact a water regulatory officer as listed on the Office of Water website www.water.nsw.gov.au, free call the licensing information on 1800 353 104 or email information@water.nsw.gov.au.

Published by the Department of Primary Industries, a division of NSW Department of Trade and Investment, Regional Infrastructure and Services.

NOW 12_136_e

4.4 Appendix 3 – Plan of areas proposed to be dedicated to NPWS - Kings Forest Development



INDICATIVE AREAS TO BE DEDICATED TO NPWS

CONSERVATION OFFSET (NATURE RESERVE ADDITION) LAND
APPROX TOTAL AREA 180 ha

(150 ha PER CONCEPT PLAN CONDITION C3,
ADDITIONAL 30 ha SUBJECT TO AGREEMENT
WITH NPWS)

NOTE: FINAL BOUNDARIES ARE SUBJECT TO
AGREEMENT WITH DEPT OF PLANNING
AND INFRASTRUCTURE

ALL UNDERGROUND SERVICES
SHOULD BE LOCATED ON SITE
BY RELEVANT AUTHORITIES
BEFORE ANY WORK IS COMMENCED

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LANDSURV PTY LTD
REGISTERED SURVEYORS & DEVELOPMENT CONSULTANTS
14 ENID STREET TWEED HEADS NSW 2485
Ph. (07) 55366467 Fax (07)55367489 email: macsurv@landsurv.com.au

TITLE
PLAN OF PROPOSED AREAS TO BE
DEDICATED TO NPWS
KINGS FOREST DEVELOPMENT

CLIENT : PROJECT 28 PTY LTD

LEVEL DATUM	
DATE OF SURVEY	
DATE	23.08.12
DRAWN	GMB
CHECKED	DVE
CAD FILE No.	34860-2_DEDICATE

SCALE 1: 20000
REVISION C
SHEET 1 OF 1
JOB No 34860-2

4.5 Appendix 4 – List of potential aquatic weed species and control methods

Reference: NSW Department of Primary Industries – Priority weeds for the North Coast Region

Aquatic Weed	Control methods summary (Manual methods only)
Aleman grass (*Echinochloa polystachya*)	A local council weeds officer will assist with identification, control information, removal and eradication. Aleman grass is capable of spreading from plant fragments and requires strict hygiene procedures during its removal.
Cabomba (*Cabomba caroliniana*)	Physical removal methods either via hand or machine. Successful weed control requires follow up after the initial efforts. This means looking for and killing regrowth or new seedlings. Using a combination of control methods is usually more successful. • Act quickly to control new infestations. • Check for regrowth after treatments and follow up as soon as more plants are seen. • Be very careful not to transport plant parts to new locations.
Cat's claw creeper (*Dolichandra unguis-cati*)	Dense infestations of cat's claw creeper are very difficult to control due to its numerous lianas, abundant seed and ability to re-sprout from the tubers, sometimes for years. In selecting the most suitable control techniques it is essential to minimise adverse impacts on native vegetation and to encourage its subsequent recovery. The methods chosen must be adapted to the type of native vegetation invaded, stage in the restoration program, size and growth stage of the weeds and level of infestation. Weeding must proceed gradually as creation of large gaps can lead to further weed invasion. Follow up is essential. Regrowth must be treated before it reaches the foliage of the host tree, or the hanging ends of previously cut stems of cat's claw creeper. Regrowth may require treatment for five or more years and ongoing monitoring is needed.

Chinese tallow tree (*Triadica sebifera*)	Small plants and seedlings can be manually removed. Roots must be fully removed using this method as trees can quickly regenerate from root suckers. Manual removal is best conducted when the ground is soft and plants are easier to remove without breaking the root.
East Indian hygrophila (*Hygrophila polysperma*)	East Indian hygrophila is difficult to control due to its stem fragmentation. Small infestations may be removed by hand. But it can quickly reinfest an area if fragments are left behind. Contact your local council weed officer for advice.
Hygrophila (*Hygrophila costata*)	Control of hygrophila is very difficult as new infestations can form from any remaining pieces of the plant. Contact your local council weeds officer for assistance if you suspect you have found hygrophila.
Sagittaria (*Sagittaria platyphylla*)	Physical removal involves excavation with machinery or manual digging by hand. Physical removal allows water movement to be restored quickly in waterways blocked by infestations. It is also a technique used in areas where herbicide use is inappropriate, such as near sensitive waterways or irrigation channels under continual use.
Salvinia (*Salvinia molesta*)	Floating booms or nets on waterways have been used to help contain salvinia infestations and limit the spread of the plant to other areas or waterways. These barriers, however, give only short-term relief and are best used along with chemical control programs. Mechanical removal is an option for small infestations only (due to their high costs) and care needs to be taken to remove all plants to prevent rapid re-growth.
Water hyacinth (*Eichhornia crassipes*)	Early control attempts concentrated on removing plants from the water with pitchforks, dumping the accumulated mass on land to die. Manually removing plants from small areas of water such as farm dams and drains is an effective form of controlling water hyacinth, but only when the rate of removal is faster than the rate of regrowth. On a larger scale, manual removal is less likely to achieve control of water hyacinth. There are instances where mechanical harvesting of large infestations has been effective, although costly. As a guide, it takes between 600 and 900 hours to harvest one hectare of dense water hyacinth – which should be undertaken prior to flowering and seed set. Fifty million tonnes of water hyacinth are removed from the White Nile annually, and the Panama Canal is kept clear of the weed by mechanical harvesting.

4.6 Appendix 5 – Baseline data proforma

APPENDIX 7 - BASELINE DATA PROFORMA

Native Plant Species List

The following list details the native plant species present and their abundance within the work area:

WORK AREA NUMBER:	**DATE:**	**CLIMATIC CONDITION:**
VEGETATION TYPE: ☐Rainforest ☐Sclerophyll Forest ☐Wetland ☐Woodland ☐Heath ☐Riparian vegetation		

Stratum	Native Plant Species Name		Abundance
	Common name	Scientific name	
Lower			
Mid			
Upper			

Native Regeneration Scoring at Time of Assessment:

☐Negligible ☐Poor ☐Moderate ☐Good ☐Exceptional

Threatened plant species/endangered ecological communities list

List of threatened plant species/ Endangered Ecological Communities found at the work area:

Species & Threatened Species Status	Number of plants	Management implications

Endangered Ecological Community	Management implications
Eg. Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	

Habitat Features

Fauna habitat features present on site:

Fauna observed: EXAMPLE Turkey mound present on site.	
☐Hollows in trees	☐Riparian areas
☐Mature or overmature trees	☐Wet or damp areas (including soaks and springs)
☐Dead standing trees	☐Leaf litter
☐Rocks and boulders	☐Native grasses, rushes and sedges
☐Fallen logs	☐Fleshy fruited trees and shrubs *(sapling present)*
☐Caves, mineshafts or overhangs	☐Nectar bearing trees and shrubs *(sapling present)*
☐Springs	☐Dense understorey shrubs
☐lagoons	☐Prickly understorey shrubs
☐pool	☐Seasonal cracks in the soil
☐Watercourses/ Gully	☐Other, please specify
Comments:	

Environmental Weed Species List

ZONE NUMBER:	**DATE:**	**CLIMATIC CONDITION:**

Stratum (lower, mid, upper)	Environmental weeds: list of major ones	Percentage cover %
Lower		
Mid		
Upper		

Other Threats or Impacts

Feral Animal presence, list major one:	Area of most disturbance (Zone No)	Impact	Management implications
EXAMPLE: Cane Toad	***Open disturbed area***	***On native fauna***	***Monitor presence***

Possible negative impacts	Impact	Management implications
EXAMPLE **☒Stock intrusion**	***On regenerating native plants***	***Stock intrusion is unlikely, however if evidence of significant negative impact of regenerating native vegetation is detected, then fencing of stock may be required.***
EXAMPLE **☒Herbicide drift**	***On threatened XXXX plant and on native plants***	***Use of herbicides to control weeds around the threatened plants will have to be done with utmost care and only by experienced bush regenerators. In any case weed control using herbicides must comply with current Best Management Practice***

Environmental Restoration Issues

- **Weaknesses**
  EXAMPLE
  - ***Exposed, no canopy, high light.***
  - ***Copious weed regeneration following disturbance.***
  - ***Sloping site difficult to work in.***
  - ***XXX threatened species present in abundance; this will slow down weed control speed.***
- **Strengths**
  EXAMPLE
  - ***Good seed source for native recruitment.***
  - ***Some native regeneration occurring.***

Restoration Objectives for Work Area

EXAMPLE: ***To undertake all enhancement plantings and the first stage weed control program by the release of the subdivision certificate, and to achieve an 80% native species canopy cover in all areas by November 2009.***

4.7 Appendix 6 – Consultation record

Council Reference: DA11/0565
Your Reference: MP08_0194

TWEED SHIRE COUNCIL

Customer Service | 1300 292 872 | (02) 6670 2400

tsc@tweed.nsw.gov.au
www.tweed.nsw.gov.au

PO Box 816
Murwillumbah NSW 2484

Please address all communications to the General Manager

ABN: 90 178 732 496

6 August 2020

The Director Urban Assessments
Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

jane.flanagan@planning.nsw.gov.au

Dear Madam

Re: MP08_0194 Kings Forest – Updated (Revision 8) Drain Maintenance Management Plan Kings Forest Stage 1, July 2020 - Tweed Shire Council Consultation

Thank you for the opportunity to comment on the most recent Updated Drain Maintenance Management Plan (DMMP) Kings Forest Stage 1 prepared by Gilbert + Sutherland Pty Ltd and dated July 2020 (Revision 8).

Council officers have reviewed the updated report and advised as follows:

1. The adaptive management section (Section 1.5.1) should make reference to the procedures outlined in Appendix 7.

2. Appendix 7 may need to be amended to reflect any specific advice provided by DPIE in response to DAC Planning letter of 1 June 2020.

3. The unit costings in Appendix 8 appear reasonable however the costs for each item should be presented on a per annum basis with any assumptions stated (See Table 18 of the approved Koala Plan of Management).

   For example in row 4 of Appendix 8 visual inspections are anticipated annually and after large rainfall events. An estimate should be made on how many "*large rainfall events*" per year would be involved. Similarly daily rates are provided for vegetation management in the waterway but no indication of how many days per year this may involve. Note if there are any upfront ("Establishment Period") costs beyond annual maintenance, these should be noted but excluded from the annual ongoing cost estimates. (Note the purpose of all this is to assist in determining a special rate for future land owners to cover the costs of ongoing environmental management – hence the need for annualised costs).

4. It is also noted in the second last row of Appendix 8 on p43 the management action refers to "*Maintenance of flora along access trails*" whereas in Table 1.4.5 this action actually involves "*Maintenance to control invasive flora blocking*

drainage in Blacks Creek". These are quite different actions with different cost implications.

Council is prepared to discuss this letter with both the Department and the proponent as necessary to ensure that the project moves forward. In this regard, we are happy for the proponent's consultant Gilbert + Sutherland to contact us directly to discuss resolving any of the items raised above.

For further information regarding this matter, please contact Valerie Conway on (02) 6670 2605.

Yours faithfully

Per

Lindsay McGavin
Manager Development Assessment and Compliance

Council Reference: DA11/0565
Your Reference: MP08_0194

TWEED SHIRE COUNCIL

Customer Service | 1300 292 872 | (02) 6670 2400

tsc@tweed.nsw.gov.au
www.tweed.nsw.gov.au

PO Box 816
Murwillumbah NSW 2484

Please address all communications to the General Manager

ABN: 90 178 732 496

21 September 2020

The Director Urban Assessments
Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

jane.flanagan@planning.nsw.gov.au

Dear Madam

Re: MP08_0194 Kings Forest – Updated (Revision 9) Drain Maintenance Management Plan Kings Forest Stage 1, August 2020 - Tweed Shire Council Consultation

Thank you for the opportunity to comment on the most recent Updated Drain Maintenance Management Plan (DMMP) Kings Forest Stage 1 prepared by Gilbert + Sutherland Pty Ltd and dated August 2020 (Revision 9).

Council officers have reviewed the updated report and advised as follows:

Council's comments - Revision 8, July 2020		**Proponent's response – Rev 9, August 2020**	**Council's comments on Rev 9, August 2020**
1	The adaptive management section (Section 1.5.1) should make reference to the procedures outlined in Appendix 7.	Section 1.5.1 has been amended to reflect and reference Appendix 7.	Noted.
2	Appendix 7 may need to be amended to reflect any specific advice provided by DPIE in response to DAC Planning letter of 1 June 2020.	Further correspondence was received from DPIE (dated 10 August 2020) agreeing to the adaptive management approach. This has been included in Appendix 7 with relevant extracts also repeated in Section 1.5.1 of the DMMP.	Noted.
3	The unit costings in Appendix 8 appear reasonable however the costs for each item should be presented on a per annum basis with any assumptions	Additional detail has been added to the costings in Appendix 8 and a 'per maintenance event' and annual cost allowance have been included.	There are still problems with Appendix 8. Table 8.1 states that the costings are now annualised over a 10 year period. For example, in the first row the annual budget for mechanical drain maintenance is $660 which reflects one tenth of the

	stated (See Table 18 of the approved Koala Plan of Management). For example in row 4 of Appendix 8 visual inspections are anticipated annually and after large rainfall events. An estimate should be made on how many "*large rainfall events*" per year would be involved. Similarly daily rates are provided for vegetation management in the waterway but no indication of how many days per year this may involve. Note if there are any upfront ("Establishment Period") costs beyond annual maintenance, these should be noted but excluded from the annual ongoing cost estimates. (Note the purpose of all this is to assist in determining a special rate for future land owners to cover the costs of ongoing environmental management – hence the need for annualised costs).		previous lump sum estimate of $6,600 however second last row of the table sums up all these "per annum" costs (to give $50,540) then in the last row of the table divides this figure again by 10 to yield a "cost per annum (assuming 1 event every 10 years)" of $5,054. If the individual costs are in fact annual estimates (as in the case of the first row) then the total should represent the total annual cost. On the other hand some of the other individual costs (e.g. Mechanical maintenance reporting is $3000 for one report presumably over 10 years) do not appear to be annualised. The proponent is requested to review the costs thoroughly and amend to address these and any other inconsistencies.
4	It is also noted in the second last row of Appendix 8 on p43 the management action refers to "*Maintenance of flora along access trails*" whereas in Table 1.4.5 this action actually involves "*Maintenance to control invasive flora blocking drainage in Blacks Creek*". These are quite different actions with different cost implications.	Appendix 8 has been corrected to refer to 'maintenance to control invasive flora'.	Noted

Table 8.1 Indicative costings for drain maintenance activities

Management Strategy	Management Action	Frequency	Responsibility	Performance measure	Indicative budget (per annum)[3]
Mechanical maintenance	Mechanical drain maintenance (using excavator) *Assuming daily rate of excavator and operator hire: $165 plus GST Float for the machine is $165/hr to mobilse to site	Once every 10 years – when silt depth is greater than 20 cm or when drainage is impeded	Contractor	Sediment and snags removed/adjusted to improve creek flow	$660
	Culvert and causeway maintenance	As required	Contractor	Improved performance of culvert and causeway	N/A
	Visual inspections	During drain maintenance (estimated to occur once every 10 years)	Environmental Consultant	To identify any potential issues	$300
		During earthworks phase – inspect depth annually and after large rainfall events (assuming four			$1,875
				Total estimated cost per drain maintenance event	$50,541
				Cost per annum (assuming 1 event every 10 years)	$5,054

[3] Assuming drain maintenance occurs once every 10 years.

Council is happy for the proponent's consultant Gilbert + Sutherland to contact us directly to discuss resolving the outstanding item raised above.

For further information regarding this matter, please contact Valerie Conway on (02) 6670 2605.

Yours faithfully

Valerie Conway

Per

Lindsay McGavin
Manager Development Assessment and Compliance

Planning, Industry & Environment

Mr Darryl Anderson
Director
DAC Planning Pty Ltd
Suite 7, Corporate House
8 Corporation Circuit
TWEED HEADS SOUTH NSW 2486

23/09/2020

Dear Mr Anderson,

Kings Forest Residential Subdivision, Stage 1 Bulk Earthworks, Roadworks and Subdivision of Precinct 5 Project Approval (MP 08_0194)
Drain Maintenance Management Plan - Request for Additional Information

I refer to the Drain Maintenance Management Plan (DMMP) submitted to the Department as required under the conditions of approval for the Kings Forest Project Approval. After careful consideration, the Department is requesting that you provide additional information.

The Department has received submissions on the August 2020 version of the DMMP from the Biodiversity and Conservation Division (dated 16/9/2020), and from Tweed Shire Council (dated 21/9/2020), copies of which are attached and available on the portal.

Please address the Council's submission by making the necessary amendments to the DMMP.

Whilst BCD has no further comments to make on the DMMP, it emphasises the requirement for information in accordance with the endorsed adaptive management approach (Department's letter dated, 10/8/2020).

We note that the adaptive management approach is for resolving minor inconsistencies between approved management plans and those remaining plans being finalised. Therefore, we require a response which demonstrates that the inconsistency is minor, and how the shortfall in the approved biodiversity offsets is consistent with the endorsed adaptive management approach, particularly the items listed at points 1. and 2. below.

Please specify in your response whether the offset shortfall will be made up on or off site, supported by detailed maps and plans.

1. The inconsistency:
- results following the approval of an associated management plan, and is in response to advice from, or acknowledged in writing by, Council or a relevant State agency, and
- is genuinely minor and/or administrative in nature, and
- results in no additional environmental impact.

2. Updates to approved management plans must:

- be consistent with the rationale, aims, objectives and expected outcomes of the relevant management plan (for example, the principles of the Koala Plan of Management) and continue to comply with any relevant benchmarks
- ensure the management plan continues to comply with the relevant conditions of the Project Approval.

You are requested to provide the information, or notification that the information will not be provided, to the Department by Tues 06 October, 2020. If you are unable to provide the requested information within this timeframe, you are required to provide, and commit to, a timeframe detailing the provision of this information.

If you have any questions, please contact Jane Flanagan, who can be contacted on 9274 6416, or at jane.flanagan@planning.nsw.gov.au.

Yours sincerely,

Silvio Falato
Team Leader Regional Assessments
Regional Assessments

Our Ref: AM/97017/Lw2

26th November 2020

Project 28 Pty Ltd
46 Cavill Avenue
Surfers Paradise QLD 4217

Attention: Michael Geale

Dear Michael,

RE: Kings Forest Stage 1 - Drain Maintenance Management Plan, November 2020 (MP08_0194)

I refer to formal correspondence from the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the Department of Planning, Industry and Environment (DPIE) (dated 11th November 2020), and also to an informal request for further information left as a message on the DPIE Major Project portal. The BCD correspondence and portal message relate to the draft Drainage Management Maintenance Plan (DMMP) for the Kings Forest development, dated November 2020 and prepared by Gilbert and Sutherland.

The BCD in their formal correspondence (dated 11th November 2020) state the following:

> *"…..the existing koala habitat to be protected and other areas within the Environmental Protection Zones for protection and/or rehabilitation have not been considered.*
>
> *Figure 18 of the approved Koala Plan of Management (KPOM) shows the areas not considered and they overlap with the proposed DMMP maintenance trail.*
>
> *The biodiversity loss associated with the DMMP maintenance trail overlapping existing koala habitat and other areas nominated for rehabilitation and/or conservation also needs to be identified and recognised in the DMMP.*
>
> *This total area of biodiversity loss associated with the DMMP maintenance trail will need to be addressed through the agreed adaptive management approach."*

The portal message states the following:

> *"To clarify, although some parts of the required DMMP trail exist on site, the Koala Plan of Management (KPoM) did not take this into account. Instead, it proposed that those areas be protected and fully rehabilitated.*
>
> *Now that the DMMP requires this maintenance trail, the KPoM can not (sic) be fully implemented in those areas, i.e., the rehabilitation of all of the vegetation community strata from canopy, mid storey and understorey vegetation.*

Please address the comments made by BCD."

As you are aware, JWA Pty Ltd were engaged to prepare the Koala Plan of Management (KPoM) (JWA 2019) mentioned by the BCD above. The mapping of existing koala habitat across the Kings Forest site was originally completed by Phillips *et al*. (2011) and was refined by JWA between 2015 – 2019 during the preparation of the KPoM. The koala habitat mapping completed by JWA was also independently verified by MJD Environmental (2019) as required by MP08_0194 condition 45A. As is standard practice, vegetation/habitat mapping was completed utilising a combination of GPS points overlaid onto recent aerial photography. The boundaries of vegetation/habitat areas was taken as the dripline (edge of canopy) of each individual plant community type.

I have reviewed the latest version of the DMMP (G&S 2020) and with regards to the formal BCD correspondence (dated 11th November 2020) I note the following:

- The DMMP proposed to utilise an **existing** vehicular access trail for the purposes of drain maintenance;
- The approved Koala Plan of Management (KPoM) (JWA 2019) maps some areas of **existing** koala habitat (totalling 1,858 m^2 – **ATTACHMENT 1**) that overlap the **existing** vehicular access trail proposed to be utilised for drain maintenance purposes;
- Although the **existing** trail in some locations occurs within the mapped extent of the **existing** koala habitat, the trail itself does not contain or provide any habitat values. As discussed above, the extent of koala habitat mapping completed by JWA (and independently verified) is based on the dripline (edge of canopy). As the proposed drain maintenance trail already exists, the overlap of mapped koala habitat must relate to an overhanging tree canopy.

In relation to the portal message, it is noted that Section 7.5 - Management of Retained Koala Habitat of the approved KPoM (JWA 2019) states:

> *"Retained habitat will be maintained/improved through **weed control** and **assisted natural rehabilitation** ……".*

Despite BCD's comments in the portal message, there is no mention of "*the rehabilitation of all of the vegetation community strata from canopy, mid storey and understorey vegetation*" of retained habitat within the approved KPoM (JWA 2019). Furthermore, Section 7.5 of the KPoM (JWA 2019) goes on to list numerous "additional management strategies will be implemented to ensure that the retained koala habitat is protected and managed" which includes "**providing appropriate access and/or fire trails**".

With consideration of the above, I can confirm that the proposed use of the **existing** trail within the mapped extent of **existing** koala habitat will not result in any impacts/biodiversity loss. The overlap of mapped koala habitat relates to an overhanging tree canopy. Furthermore, the use of the **existing** trail is not in contradiction to the management of retained Koala habitat as per the requirements of the KPoM (JWA 2019).

Regardless, it is understood that in an effort to resolve this minor issue and satisfy BCD, Project 28 Pty Ltd are willing to provide an additional 1,858 m^2 of compensatory koala habitat in

accordance with the adaptive management provisions of the approved KPoM (JWA 2019). The exact location of the additional compensatory koala habitat area to offset the perceived shortfall in retained koala habitat will be detailed via the agreed adaptive management process at the appropriate time with potential options including lands within the southern portion of Precinct 5 or within Precinct 14.

Please do not hesitate to contact me if any further clarification is required regarding this issue.

Yours faithfully,

JWA Pty Ltd

Adam McArthur
Director / Principal Ecologist

References:

Gilbert and Sutherland (G&S) (2020) Draft Drain Maintenance Management Plan. Report prepared for Project 28 Pty Ltd

JWA (2019) Koala Plan of Management, Kings Forest (Volume 1 and 2). Report prepared for Project 28 Pty Ltd.

MJD Environmental (2019) Independent Verification Report – Koala Habitat. Kings Forest, Kingscliff. Report prepared for Leda Developments Pty Ltd

Phillips, S., Hopkins, M., and Shelton, M. (2011) Tweed Coast Koala Habitat Study. Report to Tweed Shire Council. Biolink Ecological Consultants.

Attachment 1

Blacks Creek

Scale: 1:10000@A3

Extent of trail within Primary Koala Retained Habitat (96m²)

Extent of trail within Secondary (A) Koala Retained Habitat (1762m²)

Scale: 1:5000@A3

Blacks Creek

Scale: 1:5000@A3

ORIENTATION

SCALE 1:10 000

100 200 300 400 500 metres

ROBINA

PO Box 4115 Robina QLD4230 07 5578 9944

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LEGEND

- Site Boundary
- Creek
- Maintenance Trail
- Revegetation Maintenance Trail
- Blacks Creek Road Access
- Primary Koala Habitat (96m²)
- Secondary (A) Koala habitat (1762m²)

SOURCES

Imagery: Nearmap, image dated 06/11/2019.

Koala Retained Habitat: JWA Pty Ltd, Drawing No. *N97017_KPOM Retained KH (25.11.20).dwg*, Received 25/11/2020.

PROJECT
KINGS FOREST STAGE 1

CLIENT
PROJECT 28 PTY LTD

DRAWING
BLACKS CREEK MAINTENANCE TRAIL WITHIN RETAINED HABITAT

SCALE	DATE	DRAWN	CHECKED	PROJECT	DRAWING	REVISION
1:10 000@A3	25/11/2020	SWP	ELH	12066	005	-

GILBERT SUTHERLAND

Council Reference: DA11/0565
Your Reference: MP08_0194

TWEED SHIRE COUNCIL

Customer Service | 1300 292 872 | (02) 6670 2400

tsc@tweed.nsw.gov.au
www.tweed.nsw.gov.au

PO Box 816
Murwillumbah NSW 2484

Please address all communications to the General Manager

ABN: 90 178 732 496

28 October 2020

The Director Urban Assessments
Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

jane.flanagan@planning.nsw.gov.au

Dear Madam

Re: MP08_0194 Kings Forest – Updated (Revision 10) Drain Maintenance Management Plan Kings Forest Stage 1, October 2020 - Tweed Shire Council Consultation

Thank you for the opportunity to comment on the most recent Updated Drain Maintenance Management Plan (DMMP) Kings Forest Stage 1 prepared by Gilbert + Sutherland Pty Ltd and dated October 2020 (Revision 10).

Council officers have reviewed the updated report and advised that there still appears to be a costing error in relation to the mechanical drain maintenance set out in Appendix 8:

Table 8.1 Indicative costings for drain maintenance activities

Line item	Management Strategy	Management Action	Frequency	Assumptions	Cost
1	Mechanical maintenance	Mechanical drain maintenance (using excavator)	Once every 10 years – when silt depth is greater than 20 cm or when drainage is impeded.	10 day maintenance event*Assuming daily rate of excavator and operator hire: $165 plus GST. Float for the machine is $165/hr to mobilse to site	$1,815
2		Culvert and causeway maintenance	As required	Requirements can ot be estimated at this time.	N/A
3		Visual inspections	During drain maintenance (estimated to occur once every 10 years)	2 hour inspection by Environmental Consultant (rate $150/hour) undertaken daily during works	$3,000
4			During earthworks phase – inspect depth annually and after large rainfall events	Assume that earthworks phase is active for 4 of the 10 years, therefore 4, 2 hour annual inspections by Environmental Consultant (rate $150/hour). Assume four rainfall events per annum therefore a total of 20, 2 hour inspections during the 10 year maintenance period.	$7,200
5			Following drain maintenance, after rainfall events (assuming four rainfall events per annum) for one year.	Assume four rainfall events per year and an inspection period of one year following completion of drain maintenance activities.	$1,200
6		Reporting	As required	Assume one report is required before and after the maintenance activities. Initial report would include findings of black drain sludge assessment if required. And one report each year during earthworks phases. Six reports in total over a 10 year period. Report prepared by Enviro. Consultant at a rate of $2500/report.	$15,000

We understand that Item 1 (mechanical drain maintenance) is a once in every ten year event and that the event has a ten day duration, however the costing appears to be based on one day only. Gilbert + Sutherland Pty Ltd have been made aware of this discrepancy and we understand that they are addressing this in an updated report.

Council is happy for the proponent's consultant Gilbert + Sutherland to contact us directly to discuss resolving the outstanding item raised above.

For further information regarding this matter, please contact Valerie Conway on (02) 6670 2605.

Yours faithfully

Per

Lindsay McGavin
Manager Development Assessment and Compliance

Council Reference: DA11/0565
Your Reference: MP08_0194

TWEED SHIRE COUNCIL

Customer Service | 1300 292 872 | (02) 6670 2400

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PO Box 816
Murwillumbah NSW 2484

Please address all communications to the General Manager

ABN: 90 178 732 496

4 June 2020

The Director Urban Assessments
Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

jane.flanagan@planning.nsw.gov.au

Dear Jane

Re: Council comment - MP08_0194-PA-7 Kings Forest Stage 1 Drain Maintenance Management Plan

Thank you for the opportunity to comment on the Drain Maintenance Management Plan Kings Forest Stage 1 prepared by Gilbert Sutherland and dated May 2020 (reference 12066 DMMP SAM3f.docx Rev 6).

This Drain Maintenance Management Plan (DMMP) has been prepared to address Condition 38 of MP08_0194:

Drain Maintenance Management Plan

38. The following revisions are to be made to the Drain Maintenance Management Plan (DMMP), to the satisfaction of the NSW Office of Water and the OEH:

1) The implementation schedule of the DMMP shall be revised to include specific map references to identify the area of works for each action
2) The Plan must be consistent with NSW Office of Water's Guidelines for riparian corridors on waterfront land (July 2012) and Guidelines for Controlled Activities.
3) The use and/or maintenance of existing and proposed roads within 40 metres of any watercourse must be carried out consistently with the Guidelines for Controlled Activities.
4) The methodology for determining the proposed maintenance requirements shall be included in the revised Plan.
5) Details of a monitoring program and methodology for determining 'significant silt deposits' should be provided.
6) Any trails adjacent Blacks Creek that are proposed to be maintained for the purpose of the DMMP must be clearly identified and excluded from Offset Lands identified for transfer to OEH as additions to Cudgen Nature Reserve.

In general, the plan is well structured, succinct and appropriate for its purpose. A few minor comments/improvements are noted below:

1. References to SEPP 14 should be updated to recognise the Coastal Management SEPP which replaced SEPP 14.

2. The commentary on the definition of a "coastal wetland" should be consistent with the Coastal Management SEPP Fact Sheet 4: Mapping of Coastal Management Areas.

   (Refer to https://www.planning.nsw.gov.au/-/media/Files/DPE/Factsheets-and-faqs/fact-sheet-4-technical-mapping-coastal-management-sepp-2018-04.pdf?la=en)

3. It is suggested that the "*Commitment*" statements are made immediately before the management tables. Alternatively they could be listed together at Section 1.3.1 with a reference to the appropriate table where relevant.

4. For consistency, it is recommended that Section 1.5.1 is renamed "*Adaptive Management and Amendment to the DMMP*"

5. As noted by Biodiversity and Conservation Division (BCD), the figures show an apparent overlap of koala offset plantings over the existing drainage maintenance track.

   It is recommended that this be addressed in accordance with advice provided to the proponent on resolving minor inconsistences among management plans (Refer to Attachment 1 – *KFOR Letter DoPIE re Minor Conflicts Between Management Plans 1 June 2020*).

   This will require an amendment to the current draft Drain Maintenance Management Plan to acknowledge this issue and recommend it is addressed through the adaptive management provisions of the approved Koala Plan of Management.

6. Consistent with the other Management Plans, it is recommended that a section on indicative costings is included to itemise the expected costs of the management actions required by the plan. Where relevant any assumptions underpinning the indicative costs should be noted.

Should you have any queries in relation to the above, please contact Valerie Conway on 02 6670 2605.

Yours faithfully

Valerie Conway

per

Lindsay McGavin
Manager Development Assessment and Compliance

Council Reference: DA11/0565
Your Reference: MP08_0194

TWEED SHIRE COUNCIL

Customer Service | 1300 292 872 | (02) 6670 2400

tsc@tweed.nsw.gov.au
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PO Box 816
Murwillumbah NSW 2484

Please address all communications to the General Manager

ABN: 90 178 732 496

29 June 2020

The Director Urban Assessments
Department of Planning Industry & Environment
GPO Box 39
Sydney NSW 2001

jane.flanagan@planning.nsw.gov.au

Dear Madam

Re: MP08_0194 Kings Forest – Updated Drain Maintenance Management Plan Kings Forest Stage 1- Tweed Shire Council Consultation

Thank you for the opportunity to comment on the Updated Drain Maintenance Management Plan (DMMP) Kings Forest Stage 1 prepared by Gilbert + Sutherland Pty Ltd and dated June 2020.

Council officers have reviewed the updated report and advised that the issues raised in our previous letter of 4 June 2020 have generally been satisfactorily addressed with the exception of the request to include indicative costings:

> *'Consistent with the other Management Plans, it is recommended that a section on indicative costings is included to itemise the expected costs of the management actions required by the plan. Where relevant any assumptions underpinning the indicative costs should be noted.'*

It is noted that the mechanical drainage maintenance is specified as being approximately once every ten years or when the sediments/silt deposit depth is 20cm or greater. It is also noted that invasive flora maintenance may be annually or as necessary.

Council's request for indicative costings is to allow us to estimate future maintenance costs which according to the DMMP could include the following:

- monitoring and reporting of annual silt depth and mechanical drainage maintenance when silt deposit is 20cm or greater;
- acid sulfate soil treatment of affected drain spoil;
- sediment and erosion control during/after storm events;
- water quality monitoring; and
- annual invasive flora maintenance.

Council officers understand that Gilbert + Sutherland Pty Ltd are currently in the process of preparing indicative costs which would be included in the plan.

Subject to the inclusion of indicative costs, Council considers that the updated DMMP would be acceptable.

Council is prepared to discuss this letter with both the Department and the proponent as necessary to ensure that the project moves forward.

For further information regarding this matter, please contact Valerie Conway on (02) 6670 2605.

Yours faithfully

Per

Lindsay McGavin
Manager Development Assessment and Compliance

Contact: Ellie Randall
Email: ellie.randall@nrar.nsw.gov.au

Erin Holton
Managing Director/Principal Environmental Scientist & Engineer
Gilbert & Sutherland

email: Holton.el@access.gs

Our ref: OUT20/4376

Dear Erin,

21 April 2020

Kings Forest Precinct – Acid Sulfate Soil Management Plan and Drainage Maintenance Management Plan

Thank you for giving the Department of Planning, Industry and Environment – Water (DPIE-Water) the opportunity to review the Acid Sulfate Management Plan and the Drainage Maintenance Management Plan for the Kings Forest Precinct. DPIE-Water has reviewed the plans and provides the following comments:

1. The Acid Sulfate Soil Management Plan is to report on water quality discharge criteria. This is not shown in Table 27 as referenced.
2. The Acid Sulfate Soil Management Plan is to report on the Lime Treatment Implementation Strategy which is missing from Section 3.7.
3. The project is to identify if there is a requirement to dewater greater than 3ML of water per year. If this is a requirement, then the project must conduct an assessment against the NSW Aquifer Interference Policy (2012) and obtain the relevant licences prior to the commencement of works.

Should you have any further queries in relation to this submission please do not hesitate to contact the Natural Resources Access Regulator's Service Support Team at nrar.servicedesk@industry.nsw.gov.au.

Yours sincerely

Alison Collaros
Licensing and Approvals Manager (East)
Natural Resources Access Regulator
Department of Planning, Industry and Environment

Our Ref: DOC20/720984
Your Ref: Draft DMMP MP08_0194-PA-7

Planning and Assessment Group
Department of Planning, Industry and Environment
4 Parramatta Square (Locked Bag 5022)
Parramatta NSW 2124

Attention: Ms Jane Flanagan

Dear Ms Flanagan

RE: Kings Forest Stage 1 - Drain Maintenance Management Plan August 2020 (MP08_0194) (Tweed Shire)

Thank you for your notification dated 1 September 2020 about the draft Drain Maintenance Management Plan (DMMP) at Kings Forest seeking comments from the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

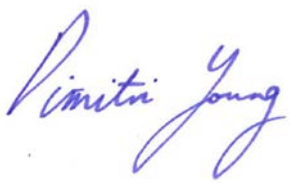
I understand that the draft DMMP dated August 2020 has been updated to address the matters we raised in our previous letter of 3 August 2020. We have reviewed the August 2020 DMMP and have no further comments in relation to the content of that document.

However, this is the first environmental management plan for the Kings Forest major project that is relying on the Department's endorsed adaptive management approach to address minor conflicts. The adaptive management approach is attached as Appendix 7 to the DMMP. Prior to finalising the DMMP, the Planning and Assessment Group should ensure that the required information for the adaptive management approach has been adequately submitted.

Further, I understand that the DMMP requires maintenance trails in biodiversity offset areas approved in the Koala Plan of Management for rehabilitation and conservation. In accordance with the adaptive management approach, further information should be provided by the proponent that identifies how this shortfall in the approved biodiversity offsets will be addressed.

If you have any questions about this advice, please do not hesitate to contact Mr Krister Waern, Senior Operations Officer, at krister.waern@environment.nsw.gov.au or 6640 2503.

Yours sincerely



16 September 2020

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

From: **Dimitri Young** Dimitri.Young@environment.nsw.gov.au
Subject: BCD Response - Kings Forest (08_0194 - Drainage Maintenance Management Plan for consultation
Date: 30 April 2020 at 11:06 am
To: holton.el@access.gs
Cc: Krister Waern krister.waern@environment.nsw.gov.au, Jane Flanagan Jane.Flanagan@planning.nsw.gov.au

DY

Dear Ms Holton

Thank you for your e-mail below to the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the Department of Planning, Industry and Environment, seeking our comments on a further revised version of the Drainage Maintenance Management Plan (DMMP) for the King Forest major project development (MP08_0194). I appreciate the opportunity to provide further input on the draft DMMP prior it being submitted to the Planning and Assessment Group of the Department.

We provided our initial comments on the DMMP on 4 March 2020 and I understand that this next version has attempted to address our previous recommendations.

Since receiving the updated DMMP, I understand that Mr Krister Waern of our office has briefly discussed some matters for further consideration, including the following:

1. The DMMP should provide further evidence and preferably more detailed mapping, to show that the access track adjacent to Blacks Creek will not impact on any proposed conservation or rehabilitation areas.

2. The DMMP has referenced the James Warren & Associates, *Vegetation Management Plan, Precincts 12 – 14, Kings Forest.* This document has not been approved and as such should not be referenced in the DMMP.

3. The Koala Plan of Management for Kings Forest has been approved and details the conservation and rehabilitation areas. This document should be reviewed to ensure the draft DMMP is consistent.

As a next step in the process of finalising the DMMP I would encourage you to address points 1, 2 and 3 above and then submit the draft document to the Planning and Assessment Group to formalise the review process.

I understand that at this stage of the DMMP you have only sought comments from the Office of Water and the BCD. It is likely that further review and consultation will be required once it has been formally submitted.

If you have any further questions please contact Mr Krister Waern, Senior Operations Officer, in the first instance on (02) 6640 2503, or at krister.waern@environment.nsw.gov.au.

Yours sincerely

Dimitri Young
Senior Team Leader Planning, North East Branch

Biodiversity and Conservation | Department of Planning, Industry and Environment
T 02 6659 8272 | **F** 6651 5356 | **E** dimitri.young@environment.nsw.gov.au
Locked Bag 914, (Level 8, 24 Moonee Street), Coffs Harbour NSW 2450
www.dpie.nsw.gov.au

From: Erin Holton <holton.el@access.gs>
Sent: Monday, 20 April 2020 10:12 AM
To: Dimitri Young <Dimitri.Young@environment.nsw.gov.au>
Cc: Krister Waern <krister.waern@environment.nsw.gov.au>; Adam Oehlman <landuse.enquiries@dpi.nsw.gov.au>; Michael Geale <mgeale@ledaholdings.com.au>; 'Jenny – Secretary to Darryl Anderson' <jenny@dacplanning.com.au>; Brandon Yeats <brandon.yeats@ledaholdings.com.au>; Brett McDonald <brett.mcdonald@ledaholdings.com.au>; Neil Sutherland <sutherland.nm@access.gs>; Sarah McGhee <mcghee.sa@access.gs>
Subject: Re: BCD Response - Kings Forest (08_0194 - Drainage Maintenance Management Plan for consultation [12066]

Hi Dimitri,
Please find below a link to download the revised Drain Maintenance Management Plan for King Forest.

https://www.dropbox.com/s/lerjms2twull3ta/12066%20DMMP%20SAM2F%5BCOMPLETE%5D.pdf?dl=0

To assist your review, a brief summary of the amendments made in response to BCD's comments (items 1 and 2) is provided below;

1. *Further detail needs to be provided in relation to the protection of biodiversity values as part of the flora maintenance phase.*

Additional details have been added to the Flora maintenance table in the document including;

- the requirement to undertake a baseline assessment of the subject area prior to commencement of any vegetation clearing works and inclusion of a baseline data proforma to ensure sufficient detail is captured.
- Additional details on the measures to be implemented to protect fauna prior to and during clearing activities have been included.
- A list of potential weed species that may be encountered within Blacks Creek and recommended methods of control have been included (Appendix 4 of the DMMP).

2. *The DMMP should confirm that its requirements are consistent with the management of proposed conservation and rehabilitation areas of the Kings Forest project.*

Additional detail has been added to the plan indicating that access along Blacks Creek for the purpose of flora and creek maintenance will be via the maintenance trail identified on Drawing 12066_003. The identified trail is located along the northern bank of Blacks Creek and is an existing access track substantially cleared of native vegetation as identified in the JWA Pty Ltd, *Vegetation Management Plan, Precincts 12 – 14, Kings Forest* (Figure 6). The trail would be maintained to the minimum width required (maximum of 4 metres) to allow vehicle

access and will avoid/minimise the disturbance of native vegetation (if found to be present). Any impact to mapped compensatory habitat will be negligible with the access trail being used for the dual purpose of maintaining compensatory plantings and periodic maintenance of Black's Creek. The trail is excluded from Offset Lands identified for transfer to OEH as additions to Cudgen Nature Reserve as identified in the LandSurv Pty Ltd Drawing – Plan of proposed areas to be dedicated to NPWS, Kings Forest Development (Appendix 3).

Kind regards,
Erin

Erin Holton
Managing Director/Principal Environmental Scientist & Engineer
BEnvSc MEng(Env) CPESC

5/232 Robina Town Centre Drive, Robina, QLD 4226
Phone (+61) 7 5578 9944 I Email holton.el@access.gs
www.access.gs I Download vCard

From: Dimitri Young <Dimitri.Young@environment.nsw.gov.au>
Date: Wednesday, 4 March 2020 at 5:37 pm
To: Erin Holton <holton.el@access.gs>
Cc: Krister Waern <krister.waern@environment.nsw.gov.au>
Subject: BCD Response - Kings Forest (08_0194 - Drainage Maintenance Management Plan for consultation [12066]

Hi Erin
Our response is attached.
The original has been posted.
Cheers
D

Dimitri Young
Senior Team Leader Planning, North East Branch

Biodiversity and Conservation | Department of Planning, Industry and Environment
T 02 6659 8272 | **F** 6651 5356 | **E** dimitri.young@environment.nsw.gov.au
Locked Bag 914, (Level 8, 24 Moonee Street), Coffs Harbour NSW 2450
www.dpie.nsw.gov.au

---------- Forwarded Message ----------
From: Erin Holton [holton.el@access.gs]
Sent: 28/01/2020 10:16
To: info@environment.nsw.gov.au
Cc: jenny@dacplanning.com.au; mgeale@ledaholdings.com.au; mcghee.sa@access.gs
Subject: Kings Forest (08_0194 - Drainage Maintenance Management Plan for consultation [12066]

Good Morning,

I am contacting you on behalf of Project 28 Pty Ltd with respect to the Kings Forest Development in northern NSW. Please find attached an updated Drainage Maintenance Management Plan (DMMP) prepared for the development in accordance with Condition 38 of the approval (Application No. 08_0194).
Condition 38 requires the DMMP to be prepared in consultation with the NSW Office of Water and Office of Environment and Heritage (OEH). I have been provided this contact email for OEH. Can you please review the attached and provide any comments or queries via return email.
Please do not hesitate to contact this office if you require any further details or elaboration.
Kind regards,
Erin

Erin Holton
Managing Director/Principal Environmental Scientist & Engineer
BEnvSc MEng(Env) CPESC

5/232 Robina Town Centre Drive, Robina, QLD 4226
Phone (+61) 7 5578 9944 I Email holton.el@access.gs
www.access.gs I Download vCard

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Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the NSW Office of Environment and Heritage.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Planning, Industry & Environment

Our Ref: DOC20/88105
Your Ref: email dated 28 January 2020

Gilbert and Sutherland
5/232 Robina Town Centre Drive
Robina QLD 4226

Attention: Ms Erin Holton

Dear Ms Holton

RE: Kings Forest (08_0194 - Drainage Maintenance Management Plan for consultation

Thank you for your e-mail dated 28 January 2020 about the draft Drainage Maintenance Management Plan (DMMP) for the Kings Forest development seeking comments from the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the NSW Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

We have reviewed the documents supplied and have identified several issues for biodiversity and coastal matters. These issues are discussed in detail in **Attachment 1** to this letter.

In summary, the BCD recommends that:

1. Further detail needs to be provided in relation to the protection of biodiversity values as part of the flora maintenance phase.

2. The DMMP should confirm that its requirements are consistent with the management of proposed conservation and rehabilitation areas of the Kings Forest project.

If you have any questions about this advice, please do not hesitate to contact Mr Krister Waern, Senior Operations Officer, at krister.waern@environment.nsw.gov.au or 6640 2503.

Yours sincerely

Dimitri Young 4 March 2020

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

Enclosure: Attachment 1 - Detailed BCD Comments - Drainage Maintenance Management Plan for consultation

Attachment 1: Detailed BCD Comments – Drainage Maintenance Management Plan for consultation

Biodiversity matters

The Biodiversity and Conservation Division (BCD) has reviewed the Drainage Maintenance Management Plan (DMMP) dated December 2019, prepared by Gilbert and Sutherland and provide the following comments.

Background and Scope of DMMP

The Background of the DMMP identifies a Key Issue being, *Assess the necessity of drains currently in operation across the site and, for those required into the future, assess the impact of any ongoing maintenance required to ensure their effectiveness.*

In response to that Key Issue, a Drainage Maintenance Impact Assessment (DMIA) report has been prepared which has identified several potential impacts associated with drainage maintenance works. Although this report is not included, the identification of these issues required the development of this DMMP.

Flora Maintenance

The flora maintenance section of the DMMP relates to the removal of 'invasive species' within the drainage line. The DMMP should clarify the potential weed species and restrict management to these exotic plants.

The methods used to remove the exotic plant species from the drainage line have not been adequately described. Different techniques should be described based on the type and extent of exotic weed species present.

The implementation strategy for Flora Maintenance states that it will not disturb or injure any native fauna. This is a good aspirational target, however further details need to be provided to state which actions will be implemented to achieve this.

Considering that the flora maintenance is only to be implemented annually or as required, the DMMP should require an ecological assessment of the biodiversity values of the areas proposed for clearing out the exotic plants to ensure that biodiversity values are not inadvertently impacted.

BCD Recommendation

1. Further detail needs to be provided in relation to the protection of biodiversity values as part of the flora maintenance phase.

Consistency with proposed biodiversity offsets

We note that the DMMP requires a maintenance trail along the side of Blacks Creek and may require other cleared areas to ensure operational machinery can gain access. It is not clear how these cleared areas relate to the proposed conservation and rehabilitation areas of the Kings Forest project.

BCD Recommendation

2. The DMMP should confirm that its requirements are consistent with the management of proposed conservation and rehabilitation areas of the Kings Forest project.

Coastal matters

This site for which this DMMP is proposed is within the Coastal Zone and contains three coastal management areas, including the coastal environment area, coastal use area, and the coastal wetland and littoral rainforest area.

Therefore, the State Environmental Planning Policy (Coastal Management 2018) (Coastal SEPP) and the objectives of the *Coastal Management Act 2016* (CM Act) apply to the development at the site. The objectives of the Coastal Zone Management Plan (CZMP) for the Tweed Coast Estuaries have also been considered in the review of the DMMP.

The DMMP for the site appears to adequately meet the requirements/objectives of the Coastal SEPP, CM Act and the CZMP for the Tweed Coast Estuaries. The reasoning for this is as follows:

- The DMMP has been adapted to ensure only one drainage channel is maintained at the site which is the Blacks Creek channel at the southern end of the site, to allow for natural process and minimal natural disturbance within the other drainage channels at the site. This indicates that this plan has been designed to ensure minimal impact to the natural environment and processes.

- Maintenance of the Black Creek channel is minimally invasive and sensitive to the natural environment and processes.

- Within the DMMP, there is a clearly defined and comprehensive list of potential impacts and management plan with steps to strategically deal with these potential impacts, such as issues with mechanical maintenance and timing, acid sulfate soil treatment, sediment and erosion control, surface water quality management and flora maintenance.

- The DMMP also states that the plan is to be adaptive and subject to change if required to ensure better environmental outcomes with consultation and approval from statutory authorities.

If the site is managed in accordance with this DMMP, the objectives of the Coastal SEPP, Coastal Act and CZMP should be met.

Planning, Industry & Environment

Our Ref: DOC20/409427
Your Ref: Draft DMMP MP08_0194-PA-7

Department of Planning, Industry and Environment
Planning and Assessment Group
4 Parramatta Square (Locked Bag 5022)
Parramatta NSW 2124

Attention: Ms Jane Flanagan

Dear Ms Flanagan

RE: Kings Forest Stage 1 - Drain Maintenance Management Plan (MP08_0194-PA-7) (Tweed Shire)

Thank you for your notification dated 28 May 2020 about the draft Drain Maintenance Management Plan at Kings Forest seeking comments from the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

Prior to the draft Drainage Management Maintenance Plan (DMMP) being formally submitted to the Planning and Assessment Group, the BCD provided comments directly to Gilbert and Sutherland on earlier drafts of the document.

In our previous comments dated 25 May 2020 we provided the following statements.

> *The DMMP identifies (section 1.2.1) that the maintenance trail required for the DMMP is located within the areas proposed for rehabilitation and conservation as part of the approved Koala Plan of Management (KPOM), i.e. the koala compensatory habitat. It also appears that the maintenance trail will extend further west into the rehabilitation area known as the east-west corridor within precinct 10.*

The formally submitted version of the DMMP dated June 2020 acknowledges the above overlap of the maintenance trail with areas proposed for rehabilitation and conservation. The DMMP states (page 10) that, '*any overlap between the existing maintenance track and mapped Compensatory habitat will be managed in accordance with the adaptive management provisions of the approved Koala Plan of Management*'.

The DMMP needs to provide the exact area of overlap of the maintenance trail with all areas proposed for rehabilitation and conservation, including the east-west corridor. It should also identify which vegetation communities or proposed rehabilitation areas are affected.

The DMMP will reduce the agreed offset areas as identified in the approved KPOM. Once the reduced offset areas have been determined and documented, the DMMP should also provide a response to how this impact will be addressed, i.e. the proposed adaptive management provisions.

I understand that DAC Planning wrote to the Department on 1 June 2020 outlining an approach to address minor conflicts between management plans. This approach may be applicable to the conflict between the DMMP and the approved KPOM in this instance.

Using an adaptive management approach may provide the Department with the flexibility to approve management plans which have a minor conflict with other management plans. However, the reduced offset area identified in the DMMP would need to be addressed through identifying additional offset areas elsewhere, which may include offsite offsets, to compensate for this offset reduction.

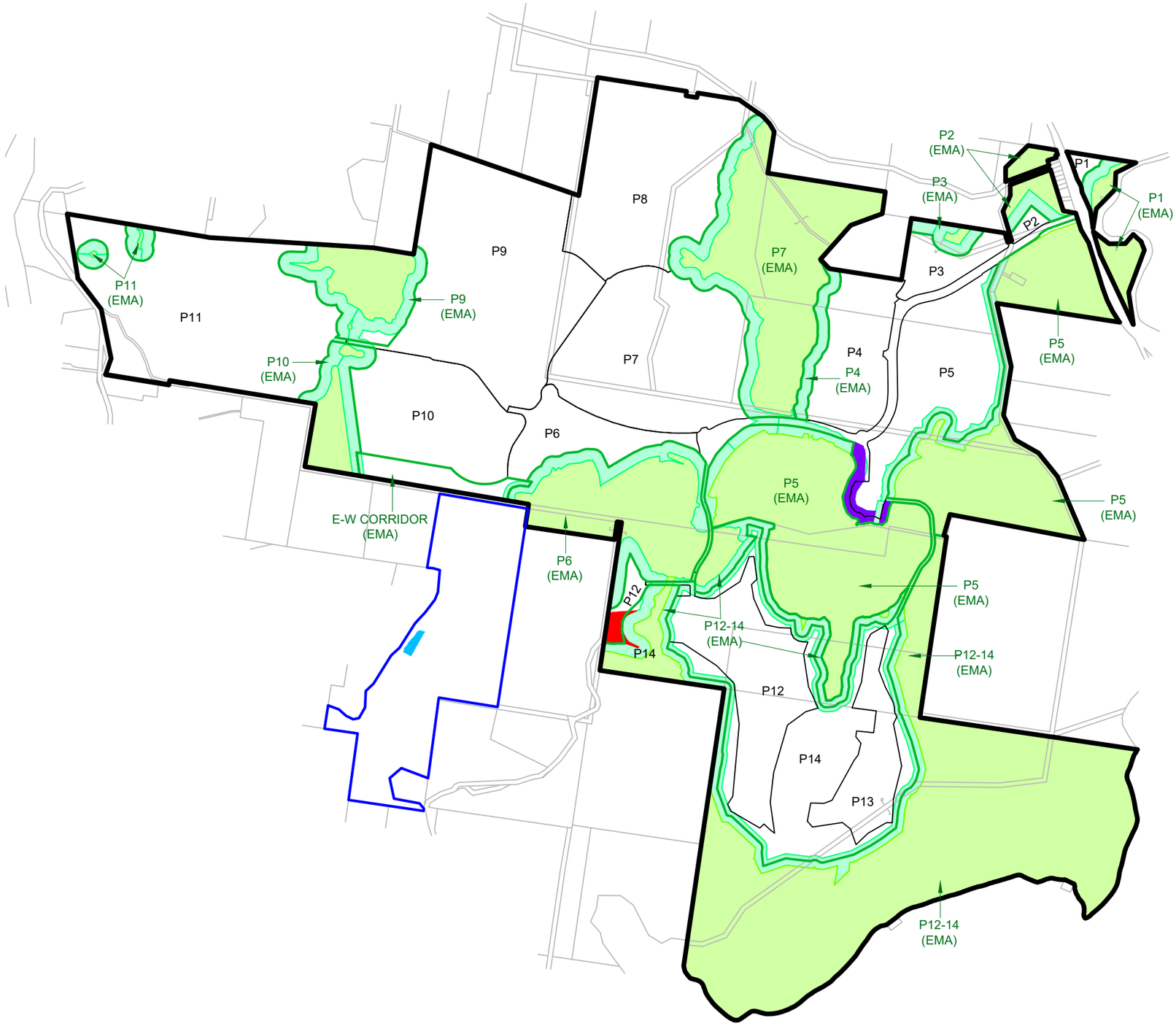
If you have any questions about this advice, please do not hesitate to contact Mr Krister Waern, Senior Operations Officer, at krister.waern@environment.nsw.gov.au or 6640 2503.

Yours sincerely

Dimitri Young 16 June 2020

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

4.8 Appendix 7 – Resolving minor conflicts between management plans



LEGEND

- Environmental Management Area (EMA) Boundary (#)
- Precinct Boundary
- Kings Forest Boundary
- Turners Land Boundary

Potential Additional Compensatory Habitat Areas

- Precinct 12 Southern Area (1.22ha)
- Precinct 5 Council Reserve (2.48ha)
- Turners Land Excess Offsite Offset Area (0.37ha)

Note:
To assist in identifying the staging of rehabilitation and management actions, EPZs and buffer areas have been associated with a relevant development precinct and are collectively titled as Environmental Management Areas (EMAs).

0 500m
1 : 20 000

SOURCE: Near Map 08/08/18 Aerial

SCALE: 1 : 20 000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Project 28 Pty Ltd

PROJECT
Kings Forest
Melaleuca Drive, Duranbah, NSW
Shire of Tweed

FIGURE 1

PREPARED: BW
DATE: 10 December 2020
FILE: N97017_Add Offsets_201210.dwg

TITLE
POTENTIAL ADDITIONAL COMPENSATORY HABITAT AREAS

1 June 2020

Our Ref: KFOR 17/14

Secretary
Department of Planning, Industry and Environment
GPO Box 39
Sydney NSW 2001

Attention: Brendon Roberts

Dear Sir

Kings Forest MP08-0194 (as modified) Minor Conflicts Between Management Plans

With respect to minor conflicts among the Management Plans, Dr Mark Kingston, Tweed Shire Council's Senior Policy Officer – Biodiversity Natural Resource Management Unit, spoke to Krister Waern of the Biodiversity Conservation Division on 27 May 2020.

Both recognise that the sorts of minor conflicts raised by BCD (with respect to the drainage maintenance trail) and by Council (in relation to bushfire trails and issues relating to the precise location of the fauna fencing) are likely to continue to arise as we progress through the process of reviewing and signing off on the various Management Plans. However, given that these issues are relatively minor in scale and nature they don't think there is a need to revisit the approved plans (in these cases, the approved KPoM) at this stage. Instead, they take the view that these sorts of issues can be addressed through the adaptive management process. However they do feel it is important to continue to acknowledge any issues that arise and maintain transparency in the collective decision-making by Agencies. They suggest the following approach be adopted:

1. The issues continue to be raised as they are detected during the Management Plan review process.

2. The Management Plan under review is amended to acknowledge the issue(s) of concern and recommend that such issues are addressed through the adaptive management provisions of the other affected plan. This should occur whether the affected plan is approved or not.

3. Once the plans commence implementation, the recommended adaptive management issues and the agreed management response should be implemented and included in the annual reporting for the affected Management Plan. Of course, the agreed adaptive management response should be consistent with the expected outcomes of the plan. For example, where offsetting has been inadvertently proposed over existing trails to be retained it would be expected that alternative offset sites be found to satisfy the overall offset commitment.

4. When Management Plans are updated (which is required for each new stage of the development) any changes made to the plan because of adaptive management are included in the updated plan.

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Project 28 Pty Ltd considers that the arrangement outlined above will provide a timely and efficient mechanism to address minor conflicts between Management Plans.

Accordingly, the Department is requested to approve the proposed arrangement.

Please do not hesitate to contact Darryl Anderson or Michael Geale should you require any further information in relation to this matter.

Yours faithfully
DAC Planning Pty Ltd

Darryl Anderson
Director

Planning, Industry & Environment

Your ref.: KFOR 17/14

Mr Darryl Anderson
DAC Planning Pty Ltd
Suite 7, Corporate House
8 Corporation Circuit
TWEED HEADS SOUTH NSW 2486

10 August 2020

Dear Mr Anderson,

Kings Forest Stage 1 Project Approval (MP 08_0194, as modified)
Adaptive Management Plan Approach

Thank you for your letter, dated 1 June 2020, proposing an adaptive management approach to resolving minor inconsistencies between approved management plans and those remaining plans being finalised.

The Department recognises that minor inconsistencies may arise in approved management plans as the various remaining management plans are reviewed, updated and approved. This includes for example those inconsistencies identified by the Biodiversity and Conservation Division (BCD) (in relation to the drainage maintenance trail) and Tweed Shire Council (Council) (in relation to bushfire trails and issues relating to the precise location of the fauna fencing).

Noting the support from BCD and Council, the Department also supports the proposed adaptive management approach to resolving these inconsistencies, subject to the following:

- approved management plans can only be updated using this approach where the inconsistency:
    - results following the approval of an associated management plan, and
    - is in response to advice from, or acknowledged in writing by, Council or a relevant State agency, and
    - is genuinely minor and/or administrative in nature, and
    - results in no additional environmental impact
- discretion as to whether approved management plans may be updated using this approach (or may require re-satisfaction or a modification of the Project Approval) rests with the Department, in consultation with Council, BCD and any other relevant agencies
- updates must be consistent with the rationale, aims, objectives and expected outcomes of the relevant management plan (for example, the principles of the Koala Plan of Management) and continue to comply with any relevant benchmarks
- updates must ensure the management plan continues to comply with the relevant conditions of the Project Approval
- all relevant stakeholders may raise issues and provide examples of minor conflicts as they are detected during the management plan review process.
- implementation of the relevant management plan must include all agreed management responses, including those identified through the adaptive management approach, and reflected in the annual reporting for the relevant management plan

- the Applicant is to keep all management plans on its project website, clearly indicating current and archived versions
- the Applicant is to publish a log of changes to each management plan on its project website, updated monthly. This log shall include (as a minimum), the date, the title of the plan affected, an explanation of the inconsistency and update made, and confirmation that the Council, BCD or any relevant agencies support the amendment.

Importantly, in order for the Department to be satisfied that progress is being made on the finalisation of relevant management plans, it is requested that:

- you provide a "roadmap" identifying a timetable for the submission of all remaining management plans, the relevant stakeholders involved in the review and/or approval and any approved management plans that may need to be updated through the adaptive management approach
- the Bushfire Management Plan is prioritised, as this is key to finalising several other management plans.

Should you wish to discuss this further or have any queries, please do not hesitate to contact Jane Flanagan at the Department on 9274 6416.

Yours sincerely,

Brendon Roberts
Acting Director
Regional Assessments

4.9 Appendix 8 – Indicative costings for drain maintenance activities

The indicative budget provided in the table below is based on 2020 fee estimates on a per annum basis. The mechanical maintenance requirements for this DMMP are likely to occur once in a 10 year period, with costs distributed on a per annum basis for the purpose of forward planning. The type and scale of drain maintenance activities can not be predicted and as such the estimated fees provided in table 8.1 below are indicative only.

Table 8.1 Indicative costings for drain maintenance activities

Line item	Management Strategy	Management Action	Frequency	Assumptions	Cost
1	Mechanical maintenance	Mechanical drain maintenance (using excavator)	Once every 10 years – when silt depth is greater than 20 cm or when drainage is impeded.	10 day maintenance event*Assuming daily rate of excavator and operator hire: $165 plus GST (8 hour day). Float for the machine is $165/hr to mobilse to site (assume 1 hour)	$13,365
2		Culvert and causeway maintenance	As required	Requirements can ot be estimated at this time.	N/A
3		Visual inspections	During drain maintenance (estimated to occur once every 10 years)	2 hour inspection by Environmental Consultant (rate $150/hour) undertaken daily during works	$3,000
4			During earthworks phase – inspect depth annually and after large rainfall events	Assume that earthworks phase is active for 4 of the 10 years, therefore 4, 2 hour annual inspections by Environmental Consultant (rate $150/hour). Assume four rainfall events per annum therefore a total of 20, 2 hour inspections during the 10 year maintenance period.	$7,200
5			Following drain maintenance, after rainfall events (assuming four rainfall events per annum) for one year.	Assume four rainfall events per year and an inspection period of one year following completion of drain maintenance activities.	$1,200
6		Reporting	As required	Assume one report is required before and after the maintenance activities. Initial report would include findings of black drain sludge assessment if required. And one report each year during earthworks phases. Six reports in total over a 10 year period. Report prepared by Enviro. Consultant at a rate of $2500/report.	$15,000
7	Corrective measures during mechanical maintenance (only if required)	Repair bank stability	If required	Repair of any bank instability completed as part of mechanical drain maintenance. Costs included in line item 1.	Included in line item 1
8		Replace vegetation where necessary	If required	Horticulturalist at a rate of $150 per hour and purchase of plants assuming area of vegetation damage is minor.	$3,000
9	Acid Sulfate Soil treatment	Lime treatment of drain spoil. Assuming liming rate of 34kg/m3.	During excavation (once every 10 years)	Assuming up to 20 cm of spoil is removed from up to half the length of the drain (estimated at 1.5km) of average width 2m. Results in approximately 600 cubic metres of spoil requiring treatment at an estimated rate of 34kg/cubic metre. Assuming typical cost of lime spread ranges between $80-$90/t, depending on quality and transport.	$1,836
10		Surface lime applied to drain batters	Within 24 hours following drain maintenance	Assuming lime is only required in areas where batter maintenance has been undertaken. Liming undertaken at a rate of 10kg/m2. Assuming 5 locations with each location being 50m2 (100m*0.5m).Assuming typical cost of lime spread ranges between $80-$90/t, depending on quality and transport.	$225
11		Collection and interrogation of lime dockets	Upon receipt of liming material	Undertaken during daily site inspections as part of Line item 3.	Included in Line item 3.
12		Verification testing of spoil material	During mechanical drain maintenance	Assuming Lab analysis of soil samples ($61.00 per sample) - testing at a rate of 1 sample per 1,000m3. Assuming approximate soil material removed is 600m3 = 1 sample)	$61
13		Reporting	As required.	Included in line item 6.	Included in Line item 6.
14	Corrective measures during acid sulfate soil treatment (if required)	Further laboratory analysis to confirm adequate lime treatment.	Only if required.	Assuming Lab analysis of soil samples ($61.00 per sample) - testing at a rate of 1 sample per 1,000m3. Assuming approximate soil material removed is 600m3 = 1 sample)	$61
15	Sediment and Erosion Control	Install temporary sediment and erosion control measures (silt fences, floating silt curtains and sediment fence isolation barriers)	Prior to commencement of maintenance works	Assuming the following cost of materials; Silt fences @$5 per metre, floating silt curtains at $45 per metre, Sediment fence isolation barriers at $5 per metre. Approximately $1000 for installation costs. Exact requirments unknown but allowance made for a combination of 200m of silt fence/or sediment fence isolation barriers and 20 metres of floating silt curtains	$2,900
16		Visual inspections	During drain maintenance (estimated to occur once every 10 years)	Included in line item 3	Included in line item 3
17			During earthworks phase – inspect depth annually and after large rainfall events (assuming four rainfall events per annum)	Included in line item 4	Included in line item 4
18			Following drain maintenance, after rainfall events (assuming four rainfall events per annum)	Included in line item 5	Included in line item 5
19		Push test tubes for black drain sludge	During earthworks phase, annually	Assuming sampling undertaken by an Environmental Consultant at a rate of $150/hr with investigation taking 7 hours. Assuming one push tube sample every 100m of 1.5km maintenance length at a cost of $61.00 per sample. Assuming 4 earthworks periods in 10 years.	$4,710
20		Reporting	As required	Included in line item 6.	Included in line item 6.
21	Corrective measures related to erosion and sediment control works	Maintenance or replacement of existing controls	Only if required.	Exact nature of possible corrective measures unknown. Allowance of $1500 for additional maintenance of controls.	$1,500
22		Requirement for additional controls or structures	Only if required.	Allowance of $1500 for additional controls.	$1,500
23		Removal of excessive built-up sediment	Only if required.	Requirements unknown. Allowance of $1000.	$1,000
24		Stabilisation of drain	Only if required.	Requirements unknown. Allowance of $2500.	$2,500

25	Surface Water Quality Management	Surface water quality monitoring in-situ - pH, electrical conductivity, suspended solids, turbidity, litter and gross pollutants and oil and grease	Conducted daily during drain maintenance works inspecions.	Included in line item 3.	Included in line item 3.
26		Laboratory analysis	Conducted weekly while undertaking drain maintenance	Samples collected by Environmental Consultant once per week during daily inspections. Assume 3 samples per week. For a 10 day maintenance campaign.Assuming lab analysis: dependant on what parameters are analysed (Iron analysis: $9 per sample, $40 laboratory admin fee, $60 freight)	$654
27			As required if iron floc, sediments or iron staining are observed downstream of works	Included in sampling regime above.	NA
28		Reporting	As required	Included in line item 6.	Included in line item 6.
29	Corrective measures related to surface water quality management	Addition of hydrated lime to contained waters to increase pH to within recommended range (assuming required only during mechanical maintenance @ $12 per 10kg)	Only if required.	Exact requirments for corrective actions involving lime addition unknown. Allowance of $120 for cost of small quantity of lime.	$120
30		Addition of gypsum to contained waters to reduce suspended solids as required (Generally applied at a rate of 30 kg per 100m^3 of stored water @ $13 per 10kg).	Only if required.	Exact requirments corrective actions involving gypsum addition unknown. Allowance of $130 for cost of small quantity ofgypsum.	$130
31	Flora Maintenance	Maintenance to control invasive flora blocking drainage in Blacks Creek	Conducted annually in October prior to the growth in summer and prior to flowering which can cause seed dispersion.	Annual maintenance event over 10 year costing period. Assuming an hourly rate of $150/hour for 1 x horticulturalist to map weed infestations (assuming 1 day of mapping). Assume weed removal required over 10% of Blacks Creek (300m) each year. Assume weed removal undertaken by excavator or similar and that each maintenance event takes 2 days (8 hour days). Assuming hourly rate of excavator and operator hire: $165/hr plus GST.	$38,400
32		Inspections	Daily visual inspections whilst maintenance is being undertaken to check all cuttings are being collected and no native flora has been damaged or removed	Included in line item 3.	Included in Line item 3.
33			Weekly visual inspections to be undertaken during maintenance to ensure correct disposal	Included in line item 3.	Included in line item 3.
34		Reporting	As required	Included in line item 6.	Included in line item 6.
				Total estimated cost over a ten year period	$98,362
				Cost allowance per annum (assuming 1 event every 10 years)	$9,836

Key Assumptions

Maintenance of Blacks Creek is required once in a 10 year period.

All costs in Table 8.1 are total costs for the activity over a 10 year period (assuming one maintenance event is undertaken).

Kings Forest earthworks phase in Blacks Creek Catchment is active for four years during the 10 year costing period.

For treatment of acid sulfate soils, liming rate calculations were completed using data gathered by G&S in the soil survey and acid sulfate assessment for the site conducted in 1998 (the 1998 ASSA Report).[1] Median Titratable Peroxide Acidity (TPA) results in soil boreholes BH13, BH41, BH42, BH55 and BH58 (located adjacent to Blacks Creek) were used to estimate and provide an indicative budget for the treatment of spoil material.