

# Springvale MPPS Water Treatment Facility Biodiversity Management Plan



## DOCUMENT CONTROL

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**NSW/SV Biodiversity Management Plan**

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## DEFINITIONS AND ACRONYMS

Term	Definition
BMA	Biodiversity Management Area
BMP	Biodiversity Management Plan
CoDC	Conditions of the Development Consent (SSD 7592)
Customer	<ul style="list-style-type: none"> <li>• Boulder Mining Pty Limited (ABN 85 112 796 308) (Boulder Mining);</li> <li>• Centennial Springvale Pty Limited (ABN 64 052 096 812); and</li> <li>• EnergyAustralia NSW Pty Limited (ABN 75 163 935 635).</li> </ul>
D&C Contract	Water Treatment Facility Design and Construct Contract
DPE	NSW Department of Planning, Industries and Environment (previously known as DPIE)
EA	Energy Australia NSW
EECs	Endangered Ecological Communities as defined under the <i>NSW Threatened Species Conservation Act 1995</i>
EESG	Environmental Energy and Science Group (formerly OEH)
EIS, 2016	Environmental Impact Statement, prepared by GHD
EMS	Environmental Management System
EN	Environmental Nominee
ESCMPs	Erosion and Sediment Control Management Plans
Facility	Water Transfer System (WTS) and the Water Treatment Facility (WTF)
HBTs	Hollow-bearing trees
HDPE	High density polyethylene
MPPS	Mount Piper Power Station
NSW	New South Wales
OEH	Environment and Heritage Group of the Department of Planning and Environment.
OEMP	Operational Environmental Management Plan
PMP	Project Management Plan

SEE	Statement of Environmental Effects
SCSO	Springvale Coal Services Operations (formerly known as Western Coal Services)
SMPPS WTP or Project	Springvale MPPS Water Treatment Project or Springvale Water Treatment Project
SPA	Service Provider Agreement
WTF	Water Treatment Facility
WTSC	Water Treatment Services Contract
WTS	Water Transfer System
VANZ or Veolia	Veolia Australia and New Zealand

# TABLE OF CONTENTS

<b>1. Introduction</b>	<b>8</b>
1.1. Background	8
1.2. Relationship to other management plans	8
1.3. Scope of the BMP	9
1.4. Aim and objectives of the BMP	9
1.5. Consultation	9
<b>2. Facility Description</b>	<b>10</b>
2.1. Facility overview	10
2.2. Facility area	10
<b>3. Statutory Requirements</b>	<b>11</b>
3.1. Relevant Legislation and Guidelines	11
3.1.1. Guidelines and standards	11
3.2. Development Consent	11
3.3. Roles and responsibilities	12
3.4. Training	12
<b>4. Implementation</b>	<b>13</b>
4.1. Existing Environment	13
4.1.1. Assessment overview	13
4.1.2. Vegetation	13
4.1.3. Flora species	14
4.1.4. Fauna species	15
4.1.5. Fauna habitat	17
4.2. Environmental Impacts and Risks	17
4.2.1. Key threatening processes	17
4.2.2. Aggressive exclusion of birds from woodland and forest habitat	18
4.2.3. Impacts on fauna habitat – HBTs/ Dead wood and trees	18
4.2.4. Loss of riparian vegetation	19
4.2.5. Invasion of native plant communities (Weeds)	19
<b>5. Key Risks and Biodiversity Management</b>	<b>20</b>
5.1. Key risks, management measures and performance objectives	20
<b>6. Biodiversity Management Areas</b>	<b>21</b>
6.1. BMA 1 – WTF site	22
6.1.1. Location	22
6.1.2. WTF and pipeline route	23
6.1.3. Description of operation works	23
6.1.4. Vegetation communities in the BMA 1	23
6.1.5. Threatened fauna and flora in the BMA	23
6.1.6. Weeds and Pests	23
6.2. BMA 4 – Emplacement area	24

6.2.1. Location	24
6.2.2. Pipeline route	24
6.2.3. Vegetation in the BMA4	24
6.4.4. Threatened flora and fauna	26
6.4.5. Weeds and Pests	26
6.3. BMA 5 – Newnes Plateau	27
6.3.1. Location	27
6.3.2. Pipeline route	27
6.3.3. Vegetation communities in the BMA	27
6.5.4. Threatened flora and fauna management	29
6.5.5. Weeds and Pests	30
<b>7. Vegetation, Fauna and Habitat Management</b>	<b>31</b>
7.1. Integration with existing biodiversity management plans	31
7.2. Weed management	31
7.2.1. Identifying weeds	32
7.3. Pest management	32
7.3.1. Pest species in the region	32
7.3.2. Treatment and timing	33
7.3.3. Inspections and reporting	33
7.4. Rehabilitation activities	33
7.5. Bushfire management	34
7.6. General fauna and flora management measures	35
7.6.1. Maintenance Access	35
7.6.2. Vehicles travelling on the existing formed tracks	35
7.6.3. Vehicles working off tracks	35
7.6.4. Walking	35
7.7. Phytophthora and Chytrid fungi	35
7.8. Contingency plan	35
7.9. Biodiversity offsets	36
<b>8. Review and Improvement</b>	<b>37</b>
8.1. Monitoring and reporting	37
8.2. Non-conformance and corrective action	37
8.3. Complaints	38
8.4. Review and improvement	38
<b>9. References</b>	<b>39</b>
<b>APPENDIX A - BIODIVERSITY MAPS</b>	<b>40</b>
<b>APPENDIX B - RE-USE OF WOODY DEBRIS AND BUSHROCK</b>	<b>41</b>
<b>Appendix C - Consultation Table</b>	<b>42</b>
<b>Appendix D - Consultation Documents</b>	<b>46</b>

# 1. Introduction

## 1.1. Background

The Springvale and Angus Place Mines are located in the western coalfields of New South Wales near Lithgow. The Springvale Mine is the primary source of coal for Mount Piper Power Station (MPPS), which is the newest and most efficient coal-fired power station in New South Wales.

The Springvale Coal Mine is owned by Springvale Coal Pty Limited (Springvale Coal), a joint venture comprising Boulder Mining Pty Limited and Centennial Springvale Pty Limited.

MPPS is owned and operated by Energy Australia NSW Pty Limited (EA), and is a key part of the New South Wales' electricity system, supplying approximately 15% of the State's energy requirements.

In addition to coal, MPPS requires water of low salinity for its cooling water system. This need is currently supplied from a number of alternate water sources including storage dams owned and operated by EA, which are fed by a combination of local rainfall and discharge water from the Springvale and Angus Place Mines. Freshwater is also sourced from the Fish River scheme and the Thompsons Creek Reservoir (TCR). The Springvale Water Treatment Project was initiated to improve the environmental outcomes and water quality in the Upper Cocks River catchment and to achieve compliance with the water management performance measures required under the Springvale Mine Extension Project (MEP) development consent.

The project received approval on 19 June 2017 for the construction and operation under State Significant Development (SSD 7592) in accordance with section 89(C) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Implementation of the Springvale Water Treatment Facility (WTF) will eliminate direct mine water discharges from the Springvale Delta Water Transfer Scheme (WTS) into the Cocks River catchment. The WTF involves the transfer of water from existing dewatering facilities on the Newnes Plateau to a new water treatment plant located at the MPPS.

Treated water will be used as a priority within the MPPS cooling water system and excess treated water transferred to TCR for storage and subsequent reuse in the power station operations.

## 1.2. Relationship to other management plans

A Facility Operational Management Plan (MAN-3649) outlines the management approach to be used by Veolia in its capacity as Operation Contractor to deliver the scope of works as described under the WTSC.

This Biodiversity Management Plan (BMP) is part of the environmental management framework for the Facility, as described in the Operational Environmental Management Plan (OEMP)(MAN-3652). The OEMP is a sub-plan within the overall OMP framework.

## 1.3. Scope of the BMP

The BMP has been prepared in order to fulfil the regulatory requirements for the Facility and to provide Veolia employees and contractors with a clear understanding of the requirements of this plan.

The purpose of the BMP is to contribute to the maintenance and protection of existing biodiversity values and minimise the potential long-term effects of clearing required for construction works on the surrounding vegetation communities and habitats.

The modified Development Consent (See [Section 3.2](#)) includes several changes, predominantly related to a revised WTS pipeline alignment and revised WTF design and management strategy for commissioning. Modification 2 (SSD 7592 MOD2) returned the pipeline alignment near Skelly Road approved under Modification 1 (SSD 7592 MOD1) to the original design outlined in the EIS (GHD, 2016a) and eliminated additional impact related to the biodiversity value.

This BMP has been revised to address the modified Development Consent and to outline the biodiversity requirements and management measures for the operation stage of the Facility.

***NOTE: All document [hyperlinks](#) included in this Plan related to Veolia ANZ's Business Management System (BMS), can only be opened on Veolia's network and can't be accessed by external users. Document codes have been included as a reference where an external user can request from Veolia to provide.***

## 1.4. Aim and objectives of the BMP

The primary aim of the BMP is to demonstrate how the Facility will maintain or enhance benchmark biodiversity values throughout the landscape following construction. This BMP addresses the management of all flora and fauna, including aquatic and riparian habitats, undertaken during construction of the project, and which will continue through the operation of the Facility.

Key biodiversity management objectives for the Facility are:

- to manage weeds in the Facility footprint;
- to encourage the recovery and reuse of existing natural resources (e.g. cleared vegetation, bush rock, topsoil, leaf litter) and to reduce material disposal offsite;
- avoid impacts on threatened species, populations and ecological communities;
- to describe monitoring and reporting strategies to monitor impacts on flora and fauna and assess the effectiveness of any mitigation measures during operation;
- protect native vegetation and key fauna habitat outside of the approved disturbance area.

## 1.5. Consultation

Consultation (Appendix C & D) was undertaken with Office Environment and Heritage<sup>1</sup> (OEH) in the preparation of this plan and their feedback has been included.

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<sup>1</sup> Now Environmental Energy and Science Group (EESG), within the DPIE.

## 2. Facility Description

### 2.1. Facility overview

The Facility aims to improve water quality in the upper Cox's River catchment through the transfer of water from existing underground mine dewatering facilities for reuse at the MPPS cooling towers as a first priority, rather than discharge into the upper catchment of the Cox's River.

The Facility comprises the following elements:

#### 1. Water transfer system (WTS)

The WTS is a 15 km pipeline, which transfers up to 42 ML/day (megalitres a day) of mine water from existing underground mine dewatering facilities (operated by Springvale Coal Pty Ltd) to MPPS (operated by EnergyAustralia NSW Pty Ltd).

It also includes a 5 km residuals pipeline from the WTF site to the Springvale Coal Services Area.

#### 2. Water treatment facility (WTF)

The WTF is a desalination plant which treats the mine water for use in the cooling towers. Excess treated water is discharge to Thompson's Creek Reservoir (TCR) if required; discharge of treated water will only occur when MPPS is not operating at full capacity

### 2.2. Facility area

The Facility area comprises a number of infrastructure elements primarily including a 10 m wide linear pipeline corridor extending from the existing Gravity Tank on Newnes Plateau to the WTF located within the MPPS site.

The WTS corridor is partially situated within the Newnes State Forest, extending from the east on Newnes Plateau to west into lower lying vegetated and disturbed lands. In these portions of the WTS corridor, connected vegetation occurs for a distance of greater than two kilometres to the north, east and south-east. Being a State Forest in these portions of land, the native vegetation is periodically selectively logged but there are no areas of clear felling of native vegetation.

The Newnes State Forest is connected to the Gardens of Stone National Park and Wollemi National Park to the north, Blue Mountains National Park to the east and Ben Bullen State Forest to the north-west. As a result of the almost complete vegetative cover within and external to the WTS corridor, the habitat linkages both throughout and surrounding are sufficient for fauna movement and are of high quality.

The western half of the WTS corridor is situated on largely disturbed lands due to existing farming lands, roads, easements and mining lands. Remnant vegetation exists to the south of the pipeline, which tentatively connects to the northern side. Castlereagh Highway creates a wide disconnection between vegetation tracts further north, and that situated to the north of the western portion of the Pipeline area.

The WTF site at MPPS was extensively cleared and modified for construction of the power station and associated infrastructure, and offers minimal biodiversity value.

The Facility footprint was initially divided into five Biodiversity Management Areas (BMAs) and were identified for the project based upon vegetation types and cover, land use, land management and construction activities. Since construction, the access to the BMAs have changed and this only some as accessible to the facility. Each of these BMA's is described in more detail in [Section 6](#).

## 3. Statutory Requirements

### 3.1. Relevant Legislation and Guidelines

Details about the legislation, planning instruments and guidelines considered during development of this plan are listed below, with specific details provided in the Legislation Register within Appendix A1 of the Springvale MPPS Water Treatment Operational Environmental Management Plan [MAN-3652] (OEMP).

- *Environmental Planning and Assessment Act 1979 (EP&A Act);*
- *National Parks and Wildlife Act 1974 (NPW Act);*
- *Biodiversity Conservation Act 2016 (BC Act);*
- *Fisheries Management Act 1994 (FM Act);*
- *Biosecurity Act 2015; and*
- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).*

#### 3.1.1. Guidelines and standards

Additional guidelines and standards have also been referenced during the development of this document and procedures in this plan:

- *Noxious and Environmental Weed Control Handbook 5th Edition, NSW Department of Primary Industries;*
- *Standards Australia, AS 4970 Protection of trees on development sites.*

### 3.2. Development Consent

The NSW Department of Planning and Environment (DP&E) (now the Department of Planning, Environment and Industry – DPIE) assessed the State Significant Development (SSD 7592) in accordance with section 89(C) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The then DP&E delegated SSD 7592 to the Planning Assessment Commission (PAC) for determination under the Minister's delegation of 14 September 2011. The project was determined by PAC on 19 June 2017.

Following approval, a number of Modification Applications were submitted and approved. These are modifications can be found on the DPE website -

<https://www.planningportal.nsw.gov.au/major-projects/projects/springvale-water-treatment-facility>

### 3.3. Roles and responsibilities

Roles and responsibilities of key personnel for operation under this BMP are outlined in **Table 1**.

*Table 1 – Roles and Responsibilities*

Action	Responsibility
Overall implementation of the BMP	Operation Manager
Coordinate monitoring and compile reports	Operation Manager and Environmental Nominee
Maintain internal records of monitoring/checks	Environmental Nominee
Collate and maintain records of complaints, respond to complainant	Environmental Nominee
Authorise and confirm the implementation of mitigation measures	Operation Manager
Informing the supervisor of any flora and fauna issues as they rise	Facility Personnel
Ensure that appropriate flora and fauna management measures are implemented and maintained on site. In the event of identified potential or actual breaches, implement appropriate corrective or preventative actions to fulfil the requirements of this Plan	Operation Manager
Ensure that post-construction weed management are implemented	Environmental Nominee

### 3.4. Training

All personnel, including employees, contractors and subcontractors, are required to complete an induction containing relevant environmental information before they are authorised to work on any parts of the Facility.

Flora and fauna specific information is covered in the Facility induction and includes:

- Relevant operational procedures
- Weed management procedure;
- Response procedures in the event of an unexpected threatened species find;
- Pest reporting procedure; and
- Incident response procedures.

Records of all training activities, including inductions, will be maintained. Records will include the name and role of the attendee, the name of the course and, where applicable, reference to the document-controlled version of the material presented, and a copy of the assessment completed.

For specialised tasks, appropriately qualified and experienced personnel will be engaged. For example this will include ecologists for biodiversity advice and monitoring and landscape professionals for revegetation and weed control activities.

## 4. Implementation

### 4.1. Existing Environment

#### 4.1.1. Assessment overview

A comprehensive biodiversity assessment was undertaken to identify the potential impacts on biodiversity as part of the Environmental Impact Statement (EIS, 2016), prepared by GHD Pty.

The following sections summarise the findings of the Biodiversity Assessment Report (RPS, 2016).

#### 4.1.2. Vegetation

Fifteen vegetation types within the Facility footprint. These are shown in **Table 2**.

Table 2 – Vegetation around the Facility

Vegetation Map Unit Number (MU) and description Landscape	Area around the pipeline Area (ha)
Newnes Plateau Narrow-leaved Peppermint Mountain Gum Brown Stringybark Layered Forest	2.25
Newnes Sheltered Peppermint - Brown Barrel Shrubby Forest	1.45
Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest	1.27
Newnes Plateau Narrow-leaved Peppermint- Silver-top Ash Layered Open Forest	3.55
Sandstone Plateau and Ridge Scribbly Gum- Silvertop Ash Shrubby Woodland	0.00
Sandstone Slopes Sydney Peppermint Shrubby Forest	0.22
Tableland Broad-leaved Peppermint Brittle Gum- Red Stringybark Grassy Open Forest	0.85
Tableland Gully Mountain Gum - Broad-leaved Peppermint Grassy Forest	0.00
Cox's Permian Red Stringybark- Brittle Gum Woodland	6.71
Pagoda Rock Sparse Shrubland	0.00
Sandstone Plateaux Tea Tree- Dwarf Sheoak-Banksia Rocky Heath	0.00
Mountain Hollow Grassy Fen	0.02
Acacia Thickets	21.92
Non-native Vegetation - Pine Plantation /Woodlot / Shelter	0.01
Unclassified	0.13
Cleared/disturbed lands	41.73
<b>Total</b>	<b>80.11</b>

### 4.1.3. Flora species

A total of 157 flora species were identified around the pipeline. This included 129 native species, 28 exotic species and 3 threatened flora species (RPS, 2016).

In addition, a further two threatened flora species were detected immediately adjacent to the facility, with potential juvenile species also occurring around the pipeline.

Threatened flora species identified within or immediately around the pipeline are provided in **Table 3**.

Table 3 – Threatened flora species (RPS, 2016)

Scientific name	Common name status	NSW Status	Commonwealth Status
<i>Caesia parviflora</i> var. <i>minor</i>	Small Pale Grass Lily	Endangered	
<i>Persoonia hindii</i>		Endangered	
<i>Veronica blakelyi</i>		Vulnerable	
<i>Eucalyptus aggregate</i>	Black Gum	Vulnerable	Vulnerable
<i>Eucalyptus cannonii</i>	Capertee Stringybark	Vulnerable	

### Groundwater dependent ecosystems

The biodiversity assessment also identified 0.02 ha of a groundwater dependent ecosystem – *MU53 Mountain Hollow Grassy Fen* around the Pipeline.

#### 4.1.4. Fauna species

A total of 89 fauna species including 64 bird species, 22 mammal species, one reptile species and two amphibian species were identified around the pipeline area. Of these, eight species are listed as Vulnerable under the *Threatened Species Conservation (TSC) Act 1995* (noting that this Act has now been repealed by the *Biodiversity Conservation Act 2016* as of 25 August 2017), including:

- Scarlet Robin (*Petroica boodang*);
- Little Eagle (*Hieraetus morphnoides*);
- Gang-gang Cockatoo (*Callocephalon fimbriatum*);
- Glossy Black-Cockatoo (*Calyptorhynchus lathamni*);
- Powerful Owl (*Ninox strenua*);
- Brown Treecreeper (eastern subsp.) (*Climacteris picumnus victoriae*);
- Large-eared Pied Bat (*Chalinolobus dwyren*) and
- Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*).

Additionally, two species are listed as Vulnerable under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*:

- Greater Glider (*Petauroides volans*);
- Large-eared Pied Bat (*Chalinolobus dwyer*).

Based on the surveys and the habitats present, the following NSW and Commonwealth listed threatened fauna species occur or have been assessed as having potential to occur in the pipeline area (See **Table 4**).

Table 4 – Threatened fauna species to occur

Scientific name	Common name (* - species detected during survey)	NSW Status	Commonwealth Status
<b>Invertebrates</b>			
<i>Paralucia spinifera</i>	Bathurst Copperwing Butterfly	Endangered	
<b>Amphibians</b>			
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Vulnerable	Vulnerable
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog	Vulnerable	Vulnerable
<i>Pseudophryne australis</i>	Red-crowned Toadlet	Vulnerable	
<b>Reptiles</b>			
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	Endangered	<b>Vulnerable</b>
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	Vulnerable	
<b>Birds</b>			
<i>Hieraaetus morphnoides</i>	Little Eagle*	Vulnerable	
<i>Lophoictinia isura</i>	Square-tailed Kite	Vulnerable	
<i>Callocephalon fimbriatum</i>	Gang-Gang Cockatoo*	Vulnerable	
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo*	Vulnerable	
<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable	
<i>Ninox connivens</i>	Barking Owl	Vulnerable	
<i>Ninox strenua</i>	Powerful Owl*	Vulnerable	
<i>Tyto novaehollandiae</i>	Masked Owl	Vulnerable	
<i>Tyto tenebricosa</i>	Sooty owl	Vulnerable	
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subsp.)*	Vulnerable	
<i>Chthonicola sagittate</i>	Speckled Warbler	Vulnerable	
<i>Anthochaera Phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered
<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater	Vulnerable	
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	Vulnerable	
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable	
<i>Melanodryas cucullate</i>	Hooded Robin	Vulnerable	
<i>Petroica boodang</i>	Scarlet Robin*	Vulnerable	
<i>Petroica phoenicea</i>	Flame Robin	Vulnerable	
<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	

<b>Mammals</b>			
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Endangered
<i>Isoodon obesulus</i>	Southern Brown Bandicoot	Endangered	Endangered
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	Vulnerable
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	Vulnerable	
<i>Petaurus australis</i>	Yellow-bellied Glider	Vulnerable	
<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable	
<i>Petauroides Volans</i>	Greater Glider*		Vulnerable
<i>Petrogale penicilata</i>	Brush-tailed Rock- wallaby	Endangered	Vulnerable
<i>Pseudomys novaehollandiae</i>	New Holland Mouse		Vulnerable
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat*	Vulnerable	
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	Vulnerable	
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat*	Vulnerable	Vulnerable
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable	
<i>Miniopterus schreibersi subsp oceanensis</i>	Eastern Bentwing Bat	Vulnerable	
<i>Scoteanax rueppelli</i>	Greater Broad-nosed	Vulnerable	
<i>Vespadelus trougton</i>	Eastern Cave Bat	Vulnerable	

#### 4.1.5. Fauna habitat

Broad habitat types detected around the pipeline area are included:

- Open forest/woodland areas;
- Wet sclerophyll areas;
- Cleared/disturbed areas.

Forest habitats cover around 50% of area around the pipeline area, predominantly associated with the Newnes Plateau. A varied understory layer of native shrubs provides ground cover for small mammals and reptiles as well as foraging opportunities for woodland birds. Ground cover is further enhanced by woody debris and leaf litter, which is most abundant in gullies, low depressions, and recently logged areas. Small mammals utilise hollows and fissures in fallen logs, while reptiles shelter underneath logs and dense leaf litter.

Grasses comprise a significant portion of the ground vegetation in many areas and support grazing macropods and wombats. Open woodlands with sparse understoreys, particularly in close proximity to tracks and disturbed areas are suitable habitats for the threatened plant *P.hindii* and *C.parviflora* var. *minor*, which has been detected across the pipeline area.

Ridgetops often feature rock piles and exposed sandstone where terrestrial fauna can shelter in cracks and under loose slabs. Sandstone outcrops provide ideal conditions for many reptiles which shelter

under slabs and bask on exposed rock. The dense heath covering the skeletal soils that surround exposed rocky areas provides additional cover and foraging opportunities for reptiles, birds and small mammals. Macropods often shelter beneath overhangs amongst larger rock formations.

The cleared/disturbed areas occurring around the pipeline area are of low value in terms of providing habitat for native fauna species aside from providing foraging habitat along the ecotone between cleared and forested areas (such as foraging by microchiropteran bat species and owls).

## 4.2. Environmental Impacts and Risks

### 4.2.1. Key threatening processes

Activities that had the potential to impact on flora and fauna were identified in the EIS (GHD 2016). The major risks (Key Threatening Processes) to biodiversity were identified in the Biodiversity Assessment Report (RPS, 2016) and included:

- Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners
- Loss of hollow-bearing trees
- Removal of dead wood and dead trees
- Clearing of native vegetation
- Anthropogenic climate change
- Degradation of native riparian vegetation along watercourses
- Invasion of native plant communities by exotic perennial grasses (Weeds).

The following sections outline these risks in more detail.

### 4.2.2. Aggressive exclusion of birds from woodland and forest habitat

Noisy Miners are aggressive towards other birds and often form coterries to attack and drive away other native bird species. An increase in a noisy miner population in an area has been correlated with the reduction of avian diversity in human-affected landscapes. They prefer disturbed open woodland, particularly the edges of vegetation patches. Noisy Miners often colonise new areas along the edges of vegetated areas.

The *Western Operations Regional Biodiversity Management Plan (Centennial Coal, 2017)* does not identify Noisy Miners dispersal as a significant issue in their areas of management. About 50% of the raw water pipeline and the entire residual pipeline are located within the Western Operations area.

BMA1 already contains Noisy Miners as it is adjacent to the MPPS and Noisy Miners are known to colonise and forage in industrial environments.

The pipeline corridor in BMA5 on the Newnes Plateau has the greatest risk for further dispersal of Noisy Miners. However as noted in the Biodiversity Assessment Report (RPS, 2016) the dense bushland beyond the pipeline corridor will limit its dispersal deeper into the surrounding areas.

### 4.2.3. Impacts on fauna habitat – HBTs/ Dead wood and trees

The location of the Facility does not include expansive areas of particularly rocky habitats such as large rock platforms or cliffs, however it passes through some areas considered suitable for the

Broad-headed Snake. Caves or similar structures that may be used by cave dwelling microbats were recorded in close proximity to the Facility footprint. Based on the biodiversity assessment provided in the EIS, no loss of caves or similar structures was expected as a result of construction.

The eastern portion of the Facility on the Newnes Plateau is surrounded by large areas containing contiguous forest, woodland, heath, swamp and rocky habitats. These habitats continue throughout the Newnes State Forest and into the Gardens of Stone National Park, Blue Mountains National Park and Wollemi National Park. The local populations of species with high mobility, such as threatened birds, bats, arboreal mammals and terrestrial mammals would continue into these surrounding areas.

The clearance of a 10 m wide corridor was not expected to have significant impacts on the habitat values and connectivity. Also, the majority of the pipeline is located along the edge of existing cleared areas or within cleared areas.

As well as vegetation clearing, other risks to the habitat of threatened and non-threatened fauna identified in the Biodiversity Assessment Report (RPS, 2016) included the removal of HBTs, dead trees and wood. Hollows are used by a wide range of fauna for roosting, nesting or protection. Dead trees and wood also may provide hollows and protection for a variety of fauna and may also provide foraging habitat particularly for birds. HBTs were identified with the pipeline corridor and some were cleared for construction. Generally dead wood and trees were cleared from the pipeline route.

#### 4.2.4. Loss of riparian vegetation

While this was identified as a key risk in the Biodiversity Assessment Report (RPS, 2016), the actual risk was substantially lower than that predicted in EIS. The Cox River and an adjacent tributary was underbored using directional drilling avoiding impacts on riparian vegetation.

Only two small ephemeral waterways on the Newnes Plateau were crossed using an excavation method. The disturbance of riparian vegetation was minimised by reducing the construction footprint (ie the width of the WTS construction corridor was reduced from 10 m to 8 m).

#### 4.2.5. Invasion of native plant communities (Weeds)

Weed infestation varies between BMAs – with the degree of infestation linked to land disturbance. The Biodiversity Assessment Report (RPS, 2016) did not contain detailed information on weeds including location and type.

Data on weed infestation was collected during the baseline ecological survey and a weed management program will be prepared by a suitable qualified person.

Within the SCSP sites weeds primarily occur within areas of recent disturbance or historical agricultural areas. Typical noxious weeds identified throughout the Western Operation sites include, but are not limited to:

- Blackberry (*Rubus fruticosus*);
- Patterson's Curse (*Echium plantagineum*);
- St John's Wort (*Hypericum perforatum*);
- African Olive (*Olea europaea L. subsp. cuspidate*);
- Scotch Broom (*Cytisus scoparius*);
- Serrated Tussock (*Nassella trichotoma*).

# 5. Key Risks and Biodiversity Management

## 5.1. Key risks, management measures and performance objectives

The Biodiversity Assessment Report (RPS, 2016) identified a number of key risks to biodiversity from the Facility. There are also a number of other risks which although are not significant, require management measures to be developed and implemented. All identified risks, their ranking, management measures, performance objectives and monitoring are presented in **Table 5**.

The risks and management measures detailed in the table are to be used as the basis of managing biodiversity in each of the BMAs. For some BMA's a risk may have a lower ranking generally due to land clearing and existing infrastructure and a lesser level of management may be appropriate in these BMAs for specific risks.

For all BMAs there are a series of standard biodiversity protection measures that will be implemented (See [Section 6](#)) and these will address many of the low ranked risks that are not explicitly assessed in the **Table 5**.

Table 5 – Key risks and management measures

Risk	Aspects	Impact	Ranking without controls	Controls	Ranking with controls	Performance Objectives	Monitoring
Invasion of native plant communities by exotic perennial grasses (Weeds).	<ul style="list-style-type: none"> <li>WTS and WTF Maintenance</li> <li>Vehicle/plant movements</li> <li>Use of equipment during maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Unauthorised vehicle and plant movements in adjoining vegetation outside the approved access area</li> <li>Facilitation of spread of pathogens and weeds</li> </ul>	High – section of the pipeline traverses native vegetation with minimal weed infestation. Other sections traverse areas with already high weed infestations	Weed mapping ( <b>Section 7.2</b> ) Weed management ( <b>Section 7.2</b> ) Integration with existing weed management programs ( <b>Section 7.1</b> )	Moderate	No substantial weed issue 50% reduction in weed cover every year	During pipeline maintenance inspections
Impacts on native fauna and flora from feral animals and pests	WTS and WTF		Moderate – there is no evidence of significant feral animal problems	Monitoring of pests ( <b>Section 7.3</b> ) Integration with existing pest management programs ( <b>Section 7.1</b> )	Low	No substantial feral animal issue Successful integration with existing programs	During pipeline maintenance inspections

## 6. Biodiversity Management Areas

Five Biodiversity Management Areas (BMAs) were identified for the initial project based upon vegetation types and cover, land use, land management and construction activities (refer to **Table 6**). However due to access restrictions, the facility is only able to monitor BMA1, BMA4 and BMA5. Thus this plan will only cover the aforementioned BMAs in detail. BMA1 is the WTF site whereas the other BMA's are along the raw water and residuals pipeline routes.

Table 6 – Biodiversity management areas

BMA	Name	General Characteristic
1	WTP site	Rehabilitated coal mining site dominated by pioneer Acacia regrowth
2	Raw water pipeline from WTF to Agricultural land and Residuals pipeline	Conveyer corridor through cleared and woodland areas
3	Raw water pipeline through agricultural land	Cleared agricultural land with isolated trees
4	Raw water pipeline through Emplacement area	Heavily disturbed emplacement area surrounded by woodland vegetation
5	Raw water pipeline through Newnes Plateau	State Forest with high biodiversity values

BMA5 on the Newnes Plateau has the highest biodiversity values and potential impacts. BMA1 and BMA3 have the lowest biodiversity values due to previous clearing and land disturbance.

The pipeline running through BMA 2 - 5 is a fully buried pipeline traversing lands not under the control of Veolia. Veolia maintains an access corridor through BMA 4 and BMA 5.

Further information is provided for each BMA in the following sections, Each section addresses:

- Environmental features
- WTS and WTF Maintenance
- Vehicle/plant movements
- Use of equipment during maintenance
- Weeds and pests

[Appendix A](#) contains detailed mapping which shows vegetation, threatened species, weeds and other environmental and construction features.

To further address environmental and biodiversity risks and management, a Trigger Action Response Plan (TARP) (**Table 7**) shows aspects taken into account for areas around the pipelines and BMAs. Due to the nature of the landscape and activities it is possible for the triggers described to be spread throughout, thus making each trigger, action and response applicable to any monitored BMA.

Table 7 – Trigger Action Response Plan (TARP)

Target	Trigger	Action	Response
Weed Cover - 50% reduction in weed cover every year	≥ 10 Individual or isolated weeds observed in BMA 1, 4 and 5	Individual or isolated weeds observed during monthly inspection	Weeds will be manually removed and disposed of and logged on the inspection sheet.
	Site wide weed growth observed in BMA 1. Covering increased by more than 20% from the previous year.	Weed growth observed during monthly inspections	Clearing of weeds as per the BMP External contractors can be engaged for Weed control/removal over large areas Physical and Chemical clearing of weeds
	Weed growth observed along pipeline areas (BMA4 and 5). Covering increased by more than 20% of road area from previous year	Weed growth observed during monthly pipeline inspections	Once identified, relevant parties to be notified to conduct clearing. Monitoring to be continued to track progress and recurrence. See <b>Section 7.2.</b> Weed Management
Pest sightings - > 12 pest sightings per year within the BMA's	≤ 1 sighting of pest species observed in BMA 1, 4 and 5.	Pest or pest activity spotted during monthly pipeline inspection.	Once identified, monitoring should be continued to track progress and recurrence. Notify relevant parties. See <b>Section 7.3</b> Pests Management
Seeded vegetation areas must achieve 60% soil surface coverage before soil and erosion controls can be removed	Any soil erosion < 0.5 M <sup>3</sup> observed in BMA1, 4 and 5.	Soil erosion observed during monthly pipeline inspections.	Soil and erosion controls to be installed or replaced to minimise damage.  Access is limited to authorised personnel.
Zero pollution or litter in waterways	≤ 1 M <sup>3</sup> of visible pollution close to or in nearby waterways	Immediate clean up of the area and notification to the NSW Environment team in the event of a spill and the OEMP and Incident and Emergency Response Management Plan engaged.	An investigation is advised to determine the source and scope of the pollution. Outcomes that aren't already in the BMP should be included. See <b>Section 7.8.</b> Contingency Plan

## 6.1. BMA 1 – WTF site

### 6.1.1. Location

BMA1 consists of the WTF site adjacent to the MPPS. The WTF was constructed on a rehabilitated ex-coal mining site.

### 6.1.2. WTF and pipeline route

The WTF consists of various treatment units, ponds and other auxiliary infrastructure connected with pipes and cabling. The area around and between the treatment process units was cleared and a 10 m bushfire asset protection zone was established.

A 100 m section of the raw water pipeline and residuals pipeline was under bored to pass underneath the hill from the WTF to the boundary of the site and BMA. The WTF site was a rehabilitated coal mining area and vegetation consists of the regrowth of pioneer Acacias species (mostly wattle trees).

### 6.1.3. Description of operation works

Maintenance works of the WTS corridor will be undertaken to maintain the track access for regular inspections of the pipeline. No works are expected to be undertaken outside of the corridor.

### 6.1.4. Vegetation communities in the BMA 1

Table 8 – Vegetation communities – BMA 1

Vegetation Community	Description and Occurrence	Key risks and impacts (Including clearing estimates for BMA)	Management Measures
HN570 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Poor condition	<p>The regrowth of vegetation on this highly disturbed site has been classified in this area.</p> <p>The condition of vegetation is poor because it is primarily pioneer species such as wattle and other Acacias.</p>	<ul style="list-style-type: none"> <li>Clearing of native vegetation over approved limits</li> <li>Invasion of native plant communities by exotic perennial grasses (weeds).</li> <li>Erosion of cleared areas</li> </ul>	<p>See Table 5 for general management measures and monitoring schedule</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>None</li> </ul>

### 6.1.5. Threatened fauna and flora in the BMA

No threatened flora and fauna have been recorded in BMA1.

### 6.1.6. Weeds and Pests

Table 9 – Weeds and pests – BMA 1

Weeds and Pests	Description and Occurrence	Management Measures	Monitoring
Blackberry ( <i>Rubus fruticosus</i> )	Low density infestations along the western portion of the route with spot locations of significant infestations	See Table 5 for specific management	See Table 5 for details on relevant monitoring programs

		measures for key risks Other management measures include: None	Other monitoring measures include: None
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## 6.2. BMA 4 – Emplacement area

### 6.2.1. Location

The BMA 4 is cleared and severely disturbed land and located between agricultural land and Newnes Plateau. Approximately 2 km of the WTS was constructed within this BMA, along Centennial Coal emplacement area.

### 6.2.2. Pipeline route

The WTS route in this BMA is located within an existing, disturbed pipeline corridor which services the emplacement area and along an access track to the eastern extent of the emplacement area. The pipeline corridor continues along the edge of the Centennial Coal emplacement area and follows an emplacement access track to the eastern extent of the emplacement area. The TWS was buried in the BMA.

### 6.2.3. Vegetation in the BMA4

The vegetation communities in BMA4 are described in **Table 10**.

Table 10 – Vegetation types – BMA 4

Vegetation Community	Description and Occurrence	Key risks and impacts (Including clearing estimates for BMA)	Management Measures
<p>HN570 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highland</p>	<ul style="list-style-type: none"> <li>• <b>Description:</b> This vegetation community occurs on low slopes above finer-grained Permian age sediments, ranging in altitude from 840 to 1,020 metres above sea level. Open understorey and little groundcover beneath a woodland to open forest canopy of brittle gum.</li> <li>• <b>Canopy Layer:</b> 7 to 15 m – 20-40 PFC. Dominant species include; <i>Eucalyptus radiata</i> (Sydney peppermint), with lesser occurrences of <i>E. mannifera</i> (Brittle Gum) <i>E. dives</i> (Broadleaved Peppermint) and <i>E. rossii</i> (Inland Scribbly Gum).</li> <li>• <b>Shrub Layer:</b> 0.6 to 2 m – 5 to 10 PFC. Dominant shrub species included <i>Monotoca scoparia</i>, <i>Acacia buxifolia</i> (Box-leaf Wattle), <i>Exocarpos cupressiformis</i>(Native Cherry), <i>Podolobium ilicifolium</i> (Prickly Shaggy Pea), <i>Leucopogon lanceolata</i>, <i>Lissanthe strigosa</i>, and <i>Acacia obtusifolia</i> (Blunt-leaf Wattle). Ground Layer: 0 to 0.8 m – 5 to 70 PFC. Dominant species included; <i>Poa sieberiana</i>, <i>Dianella revoluta</i> (Blue Flax Lily), <i>Joycea pallida</i> (Wallaby Grass), <i>Gonocarpus tetragynus</i>, <i>Lomandra longifolia</i> (Mat Rush), <i>Billardiera scandens</i> (Apple berry), <i>Lomandra filiformis</i> (Wattle Mat-rush).</li> <li>• <b>Classification:</b> Not commensurate with any TSC Act or EPBC Act listed EEC.</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation over approved limits</li> <li>• Invasion of native plant communities by exotic perennial grasses (weeds).</li> <li>• Erosion of cleared areas</li> </ul>	<p>See Table 5 for specific management measures for key risks</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>• 1 HBT predicted to be removed will avoided if possible by micrositing</li> </ul>
<p>HN572 Ribbon Gum-Snow Gum grassy forest on damp flats, eastern South Eastern Highlands</p>	<ul style="list-style-type: none"> <li>• <b>Description:</b> This vegetation community occurs as a tall forest with a dense grassy groundcover. Occupies lower slopes, gullies and flats on a range of geological substrates.</li> <li>• <b>Canopy layer:</b> 20 to 40 m – 20-50 PFC. Dominant species include: <i>Eucalyptus rubida</i> subsp. <i>Rubida</i> (Candlebark) and <i>E. viminalis</i> (Ribbon Gum).</li> <li>• <b>Shrub Layer:</b> 1 to 2 m – 10-40 PFC. Dominant shrub species included: <i>Acacia implexa</i> (Hickory Wattle), <i>Leptospermum obovatum</i>, <i>Leptospermum polygalifolium</i> (Tantoon),</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation over approved limits</li> <li>• Invasion of native plant communities by exotic perennial grasses (weeds).</li> </ul>	<p>See Table 5 for specific management measures for key risks</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>• None</li> </ul>

	<p><i>Acacia dealbata</i> (Silver Wattle) and <i>Cassinia aculeata</i> (Dolly Bush).</p> <ul style="list-style-type: none"> <li>• <b>Ground layer:</b> 0 to 0.5 m – 5-20 PFC. Dominant species included: <i>Cynodon dactylon</i> (Common Couch), <i>Microlaena stipoides</i> (Weeping Grass), <i>Echinopogon ovatus</i> (Forest Hedgehog Grass), <i>Centella asiatica</i> (Indian Pennywort) and <i>Blechnum cartilagineum</i> (Gristle Fern).</li> <li>• <b>Classification:</b> This community corresponds to the TSC Act listed EEC <i>Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions.</i></li> </ul>	<ul style="list-style-type: none"> <li>• Erosion of cleared areas</li> </ul>	
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#### 6.4.4. Threatened flora and fauna

No threatened flora and fauna were recorded in this BMA.

#### 6.4.5. Weeds and Pests

Table 11 – Weeds and Pests – BMA 4

Weeds and Pests	Description and Occurrence	Management Measures	Monitoring
Blackberry ( <i>Rubus fruticosus</i> ).	Found in low density in the western area of the BMA along the existing overland pipeline corridor	See Table 5 for specific management measures for key risks  Other management measures include: • None	See Table 5 for details on relevant monitoring programs  Other monitoring measures include: • None
Sweet briar ( <i>Rosa rubiginosa</i> )	Found in low density in the western area of the BMA along the existing overland pipeline corridor	See Table 5 for specific management measures for key risks  Other management measures include: • None	See Table 5 for details on relevant monitoring programs  Other monitoring measures include: • None
African Olive ( <i>Olea europaea L. subsp. cuspidate</i> ).	Found in low density in the western area of the BMA along the existing overland pipeline corridor	See Table 5 for specific management measures for key risks  Other management measures include: • None	See Table 5 for details on relevant monitoring programs  Other monitoring measures include: • None

## 6.3. BMA 5 – Newnes Plateau

### 6.3.1. Location

BMA5 is between the Centennial Coal emplacement area to an existing above ground storage tank on the Newnes Plateau.

Approximately a 5 km section of the raw water pipeline was constructed in this BMA through the Newnes State Forest.

### 6.3.2. Pipeline route

The pipeline route in this BMA was located along an existing logging track – which had been cleared but was partially overgrown. Dense vegetated areas exist on either side of the track. The pipeline would also cross two small ephemeral creeks.

### 6.3.3. Vegetation communities in the BMA

The vegetation communities in BMA5 are described in **Table 12**.

Table 12 – Vegetation types – BMA 5

Vegetation Community	Description and Occurrence	Key risks and impacts (Including clearing estimates for BMA)	Management Measures
<p>HN558 Narrow-leaved Peppermint Mountain Gum- Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands</p>	<ul style="list-style-type: none"> <li>• <b>Description:</b> A tall to very tall forest with a relatively open understorey.</li> <li>• <b>Canopy Layer:</b> 22 to 38 m – 44% Percentage Foliage Cover (PFC). Dominant species include: <i>Eucalyptus radiata</i> (Narrow-leaved Peppermint), <i>Eucalyptus oreades</i> (Blue Mountains Ash) and <i>Eucalyptus dalrympleana</i> (Mountain Gum). Other non-dominant species include: <i>Eucalyptus sieberi</i> (Silvertop Ash).</li> <li>• <b>Shrub Layer:</b> 1 to 2 m – 60 PFC. Dominant shrub species included: <i>Daviesia latifolia</i> (Hop Bitter-pea) and <i>Leucopogon lanceolatus</i> (Lance-leaf Beard-heath). Other non-dominant species include <i>Hakea dactyloides</i> (Broad-leaved Hakea) and <i>Acacia dorothea</i> (Dorothy's Wattle).</li> <li>• <b>Ground Layer:</b> 0 to 0.5 m – 33 PFC. Dominant species included: <i>Poa sieberiana</i> var. <i>cyanophylla</i>, <i>Monotoca scoparia</i> (Crinkle Bush), <i>Joycea pallida</i> (Silvertop Wallaby Grass), <i>Patersonia sericea</i> (Silky Purple Flag), <i>Lomandra longifolia</i> (Spiny-headed Mat-rush) and <i>Pteridium esculentum</i> (Bracken).</li> <li>• <b>Classification:</b> Not commensurate with any TSC Act or EPBC Act listed EEC.</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation over approved limits</li> <li>• Invasion of native plant communities by exotic perennial grasses (weeds).</li> <li>• Erosion of cleared areas</li> </ul>	<p>See <b>Table 5</b> for specific management measures for key risks</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>• None</li> </ul>
<p>HN600 Sydney Peppermint Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin</p>	<ul style="list-style-type: none"> <li>• <b>Description:</b> This vegetation community forms tall woodlands on the ridgetops and central plateaux. This vegetation community was generally open in structure with a sparse shrub layer.</li> <li>• <b>Canopy Layer:</b> 12 to 30 m – 30 PFC. Dominant species included: <i>Eucalyptus sieberi</i> (Silvertop Ash), <i>Eucalyptus radiata</i> (Narrow-leaved Peppermint) and <i>Eucalyptus blaxlandii</i> (Red Stringybark). Non dominant species included <i>E. dalrympleana</i> (Mountain Gum) and <i>E.oreades</i>.</li> <li>• <b>Shrub Layer:</b> 1 to 4 m – 2 to 25 PFC. Dominant shrub species included: <i>Daviesia latifolia</i> (Hop Bitterpea), <i>Acacia dorothea</i> (Dorothy's Wattle), <i>Persoonia levis</i> (Broad-leaved Geebung), and <i>Pteridium esculentum</i> (Bracken).</li> <li>• <b>Ground Layer:</b> 0 to 1 m – 30 PFC. Dominant species included: <i>Lomatia silaifolia</i> (Crinklebush), <i>Poa sieberiana</i> var. <i>cyanophylla</i>, <i>Rytidosperma pallida</i></li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation over approved limits</li> <li>• Invasion of native plant communities by exotic perennial grasses (weeds).</li> <li>• Erosion of cleared areas</li> </ul>	<p>See <b>Table 5</b> for specific management measures for key risks</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>• None</li> </ul>

	<p>(Silvertop Wallaby Grass), <i>Microlaena stipoides</i> (Weeping Grass), <i>Lomandra glauca</i> (Pale Mat-rush), <i>Lomandra multiflora</i> (Many-flowered Mat-rush) and <i>Entolasia stricta</i> (Wiry Panic).</p> <ul style="list-style-type: none"> <li>• <b>Classification:</b> Not commensurate with any TSC Act or EPBC Act listed EEC.</li> </ul>		
<p>HN599 Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin</p>	<ul style="list-style-type: none"> <li>• <b>Description:</b> This vegetation forms open woodlands with moderately dense understorey vegetation on the more sheltered lower slopes of hills, typically in association with gullies and the slopes above drainage lines.</li> <li>• <b>Canopy Layer:</b> 22 to 40 m – 31 PFC. The overall dominant species was <i>Eucalyptus fastigata</i> (Brown Barrel).</li> <li>• <b>Shrub Layer:</b> 1 to 2 m – 75 PFC. Dominant shrub species included: <i>Maytenus silvestris</i> (Orange Bush), <i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> (Tantoon), <i>Cassinia aculeate</i> (Dolly Bush), <i>Acacia obtusifolia</i> (Blunt-leaf Wattle) and <i>Acacia falciformis</i> (Broad-leaved Hickory).</li> <li>• <b>Ground Layer:</b> 0 to 1 m – 60 PFC. Dominant species included: <i>Lomandra longifolia</i> (Mat Rush), <i>Pteridium esculentum</i> (Bracken), <i>Coronidium scorpioides</i> (Button Everlasting), <i>Blechnum cartilagineum</i> (Gristle Fern), <i>Oxalis perrenans</i>, <i>Centella asiatica</i> (Indian Pennywort) and <i>Gonocarpus teuroides</i> (Raspwort).</li> <li>• <b>Classification:</b> Not commensurate with any TSC Act or EPBC Act listed EEC.</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation over approved limits</li> <li>• Invasion of native plant communities by exotic perennial grasses (weeds).</li> <li>• Erosion of cleared areas</li> </ul>	<p>See <b>Table 5</b> for specific management measures for key risks</p> <p>Other management measures include:</p> <ul style="list-style-type: none"> <li>• None</li> </ul>

### 6.5.4. Threatened flora and fauna management

Table 13 – Threatened flora species – BMA5

Threatened Species	Description and Occurrence	Key risks and impacts
<i>Caesia parviflora</i> var. <i>minor</i> (Small Pale Grass Lily)	6 individuals in or adjacent to pipeline corridor	Clearing of threatened species over approved limits
<i>Persoonia hindii</i>	10+ individuals in or adjacent to pipeline corridor	Clearing of threatened species over approved limits
<i>Veronica blakelyi</i>	Incorrectly identified in the EIS biodiversity surveys	N/A

Table 14 – Threatened flora – BMA 5

Threatened fauna	Description and Occurrence	Key risks and impacts
Gang Gang Cockatoo	Was observed several times in or in close proximity to WTS corridor within BMA 5 during assessment period	Loss of habitat; Mortality of fauna
Brown Tree creeper	Was observed once in WTS corridor within BMA 5 during assessment period	
Large-eared Pied Bat	Was not observed in BMA 5 during assessment period	
Yellow-bellied Sheathtail Bat	Was not observed in BMA 5 during assessment period	
Varied Sittella	Was observed several times in BMA 5 during assessment period	
Glossy Black-Cockatoo	Was observed once in BMA 5 during assessment period	
Greater Glider	Was observed several in or in close proximity to WTS corridor within BMA 5 during assessment period	
Powerful Owl	Was observed once in a close proximity to WTS corridor within BMA 5 during assessment period	

### 6.5.5. Weeds and Pests

Typical noxious weeds identified throughout the Western Operation sites are identified in [Section 7.2](#).

No weeds and pests were detected during the biodiversity survey undertaken in BMA 5.

If any weeds are detected within the cleared area of the WTS, the type and location of weeds will be collected and recorded.

# 7. Vegetation, Fauna and Habitat Management

## 7.1. Integration with existing biodiversity management plans

The Facility is located on land which is owned and managed by various organisations. Biodiversity on these lands is managed through existing Biodiversity Management Plans prepared by each organisation. This includes:

- Mount Piper Power Station;
- Springvale Coal Services Operations (formerly known as Western Coal Services) Area including conveyors;
- EnergyAustralia emplacement area;
- Newnes State Forest - Ecologically Sustainable Forest Management Plan.

A coordinated and integrated approach to biodiversity management between the Facility and existing landowners will produce better biodiversity outcomes.

Operational impacts and scale of the buried pipelines are relatively minor in comparison to the existing infrastructure and activities undertaken within the Facility footprint, and as such, the biodiversity management measures for the Facility are not as significant as those for the existing land uses (eg. Coal services area).

Typical biodiversity management measures where an integrated approach will produce better biodiversity outcomes include:

- Weed management;
- Pest management;
- Ecological monitoring;
- Rehabilitation and stabilisation activities.

## 7.2. Weed management

Typical noxious weeds identified throughout the Western Operation sites include, but are not limited to:

- Blackberry (*Rubus fruticosus*).
- Patterson's Curse (*Echium plantagineum*).
- St John's Wort (*Hypericum perforatum*).
- African Olive (*Olea europaea L. subsp. cuspidate*).
- Scotch Broom (*Cytisus scoparius*).
- Serrated Tussock (*Nassella trichotoma*).

Information on the type and location of weeds within each BMA is detailed in Section 6.

Following identification of any weed species, Veolia's Environmental Nominee will propose a weed removal/spraying program, including nomination of the methods / chemicals to be used.

Weed removal/spraying is conducted as required following approval by Veolia. Ongoing weed monitoring will be implemented, and potential weed infestations will be appropriately managed to ensure surrounding communities are protected from invasive species.

Transport of weed materials and seeds will be minimised by cleaning vehicles and equipment and removing weed material following activities in weed infested areas.

If required, the spread of pathogens in vulnerable areas will be minimised by cleaning and disinfecting boots, personal items and all components of vehicles and equipment of soil and vegetation.

Further detailed procedures for the management of specific weeds will be developed after the baseline mapping of weed infestations is completed.

### 7.2.1. Identifying weeds

Weeds of national significance (WONS) are those weeds prioritised by the state and territory governments based on their invasiveness, potential for spread and environmental, social and economic impacts.

There are currently 32 listed WONS. Each WONS has a strategic plan that outlines strategies and actions required to control the weed and identify responsibilities for each action.

A list of WONS is available at:

<http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>

In addition, the WONS website provides a simple weed identification page for identification of WONS and other common noxious weeds:

<http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weedidtool.pl>

and at

<http://www.environment.gov.au/cgi-bin/biodiversity/invasive/weeds/weedspeciesindex.pl?id=701>

There is also a booklet provided by the local council of Lithgow with further information about weeds. The booklet provides a guide to identify and control local noxious and environmental weeds.

The booklet can be found at:

<https://council.lithgow.com/environment/weeds-management/>

## 7.3. Pest management

### 7.3.1. Pest species in the region

Introduced species pose direct and indirect threats to native fauna either through predation or competition. Pests such as the feral European rabbit (*Oryctolagus cuniculus*) and feral goat (*Capra hircus*) pose intense ecological threats on native flora through grazing. Their management is important for the protection of native flora, particularly post-rehabilitation works.

Pest species such as the European fox (*Vulpes vulpes*), feral dogs (*Canis lupus familiaris*) and feral cats (*Felis catus*) pose a threat to native fauna species, particularly small mammals and reptiles. Their management is important for maintaining current fauna populations and encouraging recolonization into rehabilitated areas.

Predation by the European fox and feral cat is listed as *key threatening processes* under Schedule 4 of the NSW *Biodiversity Conservation Act 2016*, along with competition and grazing by the European rabbit and feral goat.

### 7.3.2. Treatment and timing

To control feral species, several management techniques must be employed over an extended period of time. Typical management actions for pest species include, but are not limited to:

- Regular inspections by the Facility personnel or a qualified ecologist to detect pest species diversity and abundance on site;
- Sightings of pest species to be notified to the site's Environmental Nominee;
- 1080 baiting for rabbits, cats and foxes;
- Destruction of rabbit warrens;
- Trapping and removal program for feral cats;
- Maintaining a clean, rubbish free environment as to not attract feral species scavenging;
- Restriction of domestic species on work sites.

### 7.3.3. Inspections and reporting

Ongoing monitoring for the Facility will include recording the extent and location of pest species occurrence, the type of species found and their approximate density.

This information will inform the particular actions required to manage pests and protect threatened flora and ecological communities.

## 7.4. Rehabilitation activities

The extent of rehabilitation is relatively minor as the area disturbed for construction is small, and in some areas rehabilitation was not required (e.g. pipeline on the surface, directional drilled sections, pipeline in road reserve).

The immediate intent of rehabilitation actions throughout construction was to re-establish site surfaces as soon as possible after disturbance to assist with erosion mitigation and prevent the establishment of weed species. Successful rehabilitation performance criteria was set up for post-construction rehabilitation. This includes:

- self-sustaining vegetative cover;
- no signs of subsidence or erosion;
- representative of species richness and diversity of pre-disturbed condition;
- plants showing healthy growth and signs of recruitment;
- free of noxious weeds.

Dead trees and other suitable mature native trees cleared were placed at the edges of cleared areas along the WTS corridor in BMA 1, BMA 2 and BMA 5. Placement of cleared vegetation immediately adjacent to the conveyor was not possible due to the bushfire asset protection zones around the conveyor route.

The *RMS Biodiversity Guidelines Guide 5: Re-use of woody debris and bushrock* was used to guide placement activities and is presented in [Appendix B](#).

Construction of the WTS sections was completed March 2019. The progressive rehabilitation works of the WTS corridor zones have commenced and will continue through the commissioning stage.

**Table 15** provides site rehabilitation and maintenance management measures which will be progressively implemented throughout post-construction and during operation stages.

Ongoing monitoring and maintenance will be conducted within the rehabilitated areas, at quarterly intervals for the first 12 months, and then twice yearly until all seeded vegetation has achieved 85% soil surface coverage.

All seeded vegetation areas must achieve 60% soil surface coverage before soil and erosion controls can be removed.

*Table 15 – Rehabilitation management measures during and post-construction*

Activity	Management Practices	Responsibility
Rehabilitation Monitoring	Monitoring of rehabilitation against rehabilitation success criteria (all seeded vegetation must achieve 60% soil surface coverage before soil and erosion controls can be removed). Ongoing treatment of weed infestations is required for post-construction rehabilitation and throughout operation phases. Identification of required maintenance actions.	Environmental Nominee
Rehabilitation Maintenance	Weed control measures such as spraying, physical removal, or planting native species to suppress weed growth.	Environmental Nominee

## 7.5. Bushfire management

Bushfire management of the Facility boundary is undertaken in accordance with the *Incident and Emergency Response Management Plan [IERMP][MAN-3651]* and includes provisions for the following:

- Perimeter asset protection zones;
- Fuel load reduction where necessary; and
- Works in hotter months of the year;
- Work restrictions during the threat period.

## 7.6. General fauna and flora management measures

### 7.6.1. Maintenance Access

Maintenance works will be undertaken within a 10 m wide corridor and no works are expected to be undertaken outside of the corridor.

### 7.6.2. Vehicles travelling on the existing formed tracks

Vehicles accessing the pipeline for construction, maintenance and inspection will use the existing tracks to minimise disturbance of the vegetation.

Vehicles using the existing tracks do not have to be washed down or inspected before going to another property. For the purposes of construction and maintenance, work tracks should be treated as a 'clean' work area.

### 7.6.3. Vehicles working off tracks

If vehicles are required to travel off track, the following mitigation measures will be implemented:

- Vehicles will be fitted with a mesh cover (typically shed cloth) over the radiator to minimise weed seed spread. This mesh is required to be removed and cleaned periodically while on a property and before leaving a property (be aware that the mesh may hinder effective operation of the vehicle cooling system, therefore check gauges frequently while the mesh is in place);
- Any mud accumulated in the wheel wells, running boards or on the vehicles underside must be physically removed from the vehicle;
- All cleaning shall be conducted away from any watercourses or wet areas.

### 7.6.4. Walking

If walking off track (e.g. through vegetation) the following protection measures shall be in place:

- Wear long pants;
- On completion of work at each site (property), check socks, boots and bottom of the pants, ) for the presence of seeds prior to entering the vehicle and moving from site.

## 7.7. Phytophthora and Chytrid fungi

If machinery is transported from an area of confirmed infection of Phytophthora or Chytrid fungus, stringent wash down will be completed before leaving the area to remove all soil and vegetative material from cabins, trays, and under carriages.

## 7.8. Contingency plan

An emergency incident plan has been developed to respond to uncontrolled discharges of fuels, oils and chemicals/unforeseen events and has been included in the OEMP [MAN-3652]. A response procedure for protection of the water environment aims to:

- Contain and control emergency incidents;
- Protect drainage paths and waterways;
- Minimise damage to the environment and property;
- Identify appropriate disposal techniques for contaminated soils and water.

Suitable containment and clean up materials are maintained within easy and quick access.

All reporting will be in accordance with Veolia's incident reporting management system. Similarly, complaints will be addressed through the site complaints register.

Compliance with statutory requirements will be assessed through implementation of Veolia's site audit program.

These activities will be used to ensure appropriate corrective actions are in place and to verify appropriate close out actions, follow up and reporting has occurred. More details of auditing and incident reporting is provided in the OEMP [MAN-3652].

## 7.9. Biodiversity offsets

Springvale Coal is working towards the development of a Biodiversity Offset Package for the cleared areas.

Veolia conducted vegetation clearing during construction in accordance with the Vegetation Clearing procedure and completed the surveys to record the location and size of areas cleared. All collected information was provided to Springvale Coal for the Biodiversity Offset requirements.

# 8. Review and Improvement

## 8.1. Monitoring and reporting

Inspections, observations, monitoring and reporting requirements relevant to the management of flora and fauna are identified in **Table 16**.

Table 16 – Monitoring requirements relevant to the management of flora and fauna

Facility Activity	Frequency	Standards	Reporting	Responsibility
<b>Monitoring</b>				
Rehabilitation monitoring	Quarterly for the first 12 months	Until rehabilitation performance criteria are achieved (see <b>Section 7.4</b> ) Weed and hygiene controls in place No new weed incursion / establishment	Environmental Inspection Checklist	Environmental Nominee
	Bi-annually	Until all seeded area have achieved 85% soil surface coverage (see <b>Section 7.4</b> )	Environmental Inspection Checklist	Environmental Nominee
Weed Monitoring	During pipeline maintenance inspections	No new weed incursion / establishment	Removal/Spraying program	Environmental Nominee
<b>Reporting</b>				
Annual report	Annually	As per Consent Condition Schedule 4 Condition 5	Annual report	Environmental Nominee
Incident	As required	As per incident response reporting	Incident Report	Environmental Nominee

## 8.2. Non-conformance and corrective action

Environmental inspection, observation and monitoring results are interpreted to identify actual and potential non-compliances conformances and events that may result in nuisance, environmental harm and unacceptable loss of amenity or community complaints.

The Facility and/or Customer, and/or a public authority may also raise a non-conformance or improvement notice. Where non-conformances are identified during regular inspections, corrective actions are raised, tracked and closed out through the inspection records if the actions can be closed out within 72 hours.

All other non-conformances shall be recorded and reported as Environmental incidents in Veolia’s incident reporting management system and managed in accordance with the Incident and Emergency Response Management Plan (IERMP)(MAN-3651)

## 8.3. Complaints

Complaints will be managed in accordance with the Complaints Management System outlined in the *Operational Management Plan [MAN-3649]* and also summarised in the *OEMP [MAN-3652]*.

Information about complaints will be recorded and include location of complaint, time(s) of occurrence and perceived source. Complaints will be responded in a timely manner and action taken will be recorded.

## 8.4. Review and improvement

Continual improvement is achieved through constant measurement and evaluation, audit and review of the effectiveness of the plan, and adjustment and improvement of the Veolia's Environmental Management System, project environmental outcomes.

Annual reviews will be undertaken by the Veolia's Environmental Nominee to identify improvements in the environmental management system and/or this BMP.

This plan will be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment or changes in law;
- Where requested or required by the NSW Department of Planning, Industry and Environment (DPIE) or any other Authority; and
- In response to internal/ external audits and annual reviews.

Any updates to the plan will be approved internally by Veolia management and provided to the Facility and Customer for review and comment and, if required, forwarded to the EES Group of DPE for consultation.


The updated BMP will be submitted to the Secretary of DPE for approval.

## 9. References

- DP&E, 2017. Development Consent. Springvale Water Treatment Project SSD 7592. Dated 19 June 2017.
- DPIE, 2019. Consolidated Consent for Modifications 1-4. Dated 5 November 2019.
- GHD, 2016a. Springvale Water Treatment Project State Significant Development 7592 Environmental Impact Statement. Prepared by GHD Pty Ltd. Dated September 2016
- GHD, 2016b. Springvale Water Treatment Project Amendment to Development Application. Prepared by GHD Pty Ltd. Dated December 2016
- GHD, 2019a. Springvale Water Treatment Project Modification 3. Modification Report. Prepared by GHD Pty Ltd. Dated March 2019
- GHD, 2019b. Springvale Water Treatment Project Modification 4. Modification Report. Prepared by GHD Pty Ltd. Dated September 2019;
- Jacobs, 2017. Springvale Water Treatment Project - Overview of the Biodiversity Management Areas. Dated October 2017.
- RPS, 2016. Springvale Water Treatment Project – Biodiversity Assessment Report, Dated 28 July 2016.

# Appendix A - Biodiversity Maps



**Key**  
 Pipeline corridor (2017.10.10)

**Figure 1 : Overview of the Biodiversity Management Areas**  
 Springvale MPPS Water Treatment Project - Biodiversity Management Plan

**Key**

- Raw water pipeline route boundary (2017.10.10)
- Residuals water pipeline route boundary (2017.10.10)
- Project Application Area - Water Treatment Plant
- Water Treatment Plant

**Threatened fauna sightings**

- Scarlet Robin

**Threatened flora sightings**

- Eucalyptus cannonii
- Eucalyptus cannonii x macrorhyncha hybrid (likely)

**Threatened fauna sightings (EIS, RPS 2016)**

- Brown Treecreeper
- Scarlet Robin

**Threatened flora sightings (EIS, RPS 2016)**

- Eucalyptus cannonii

**Other fauna habitat features**

- Wombat Burrow

**High threat weeds**

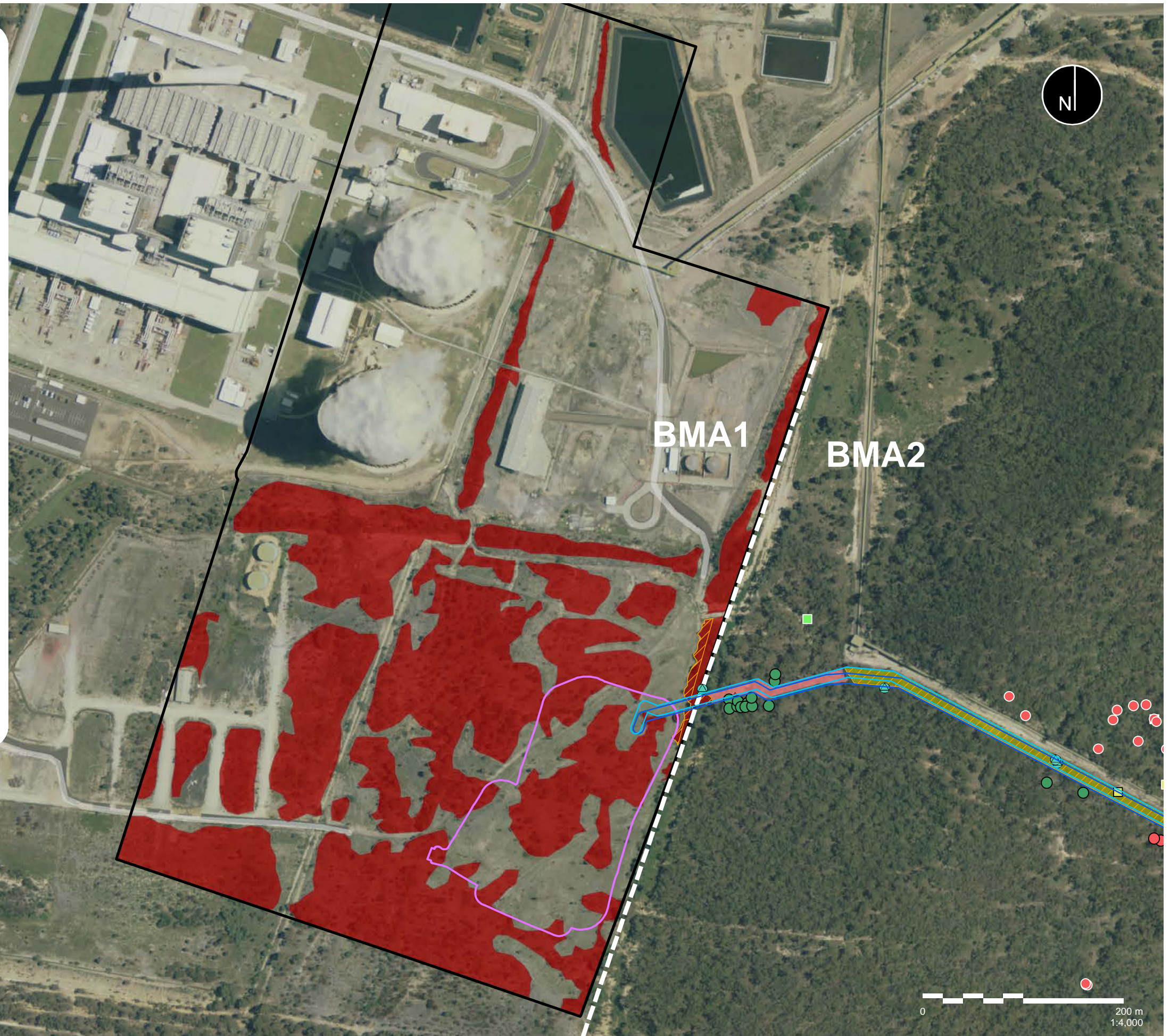
- Blackberry

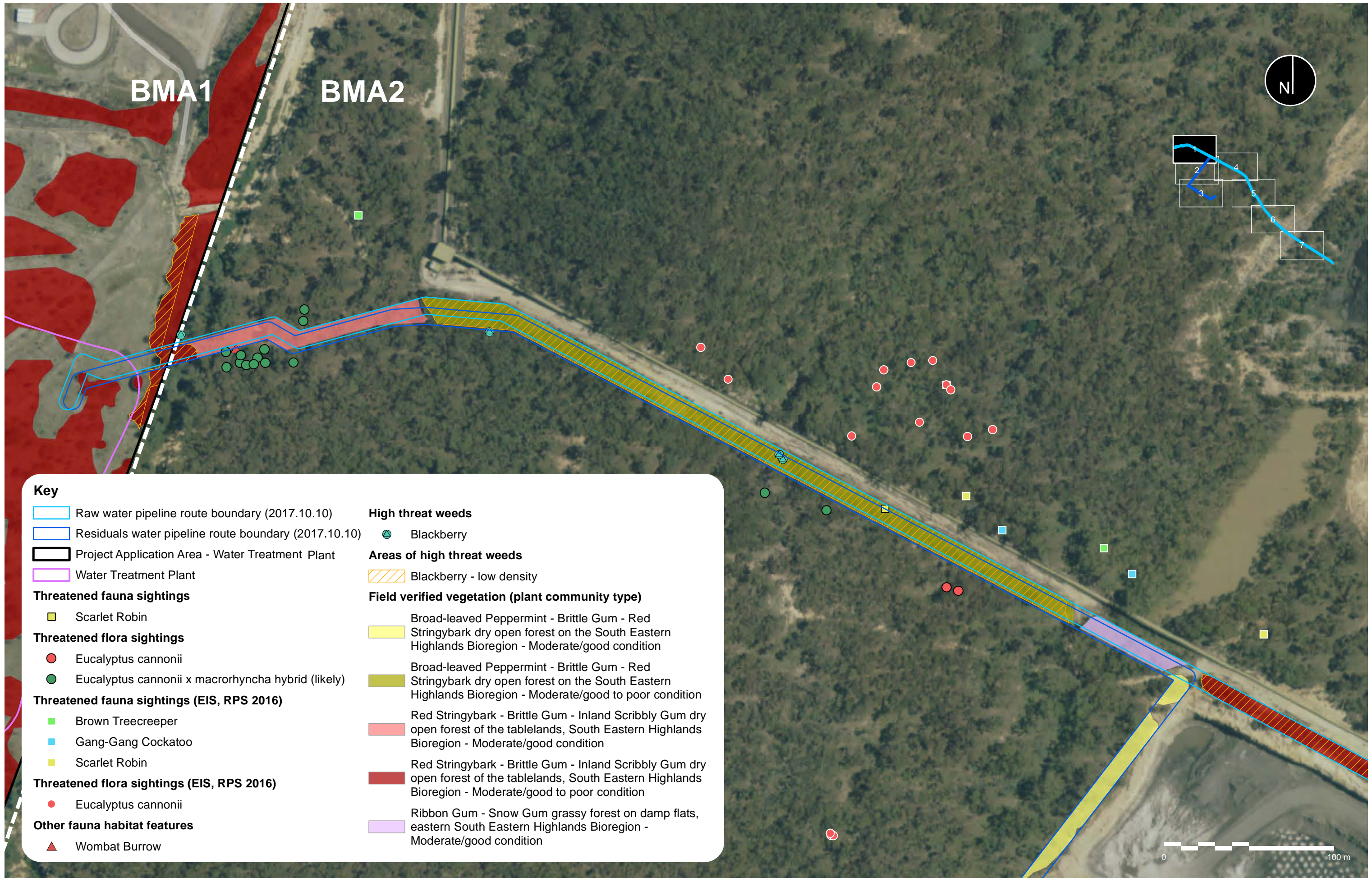
**Areas of high threat weeds**

- Blackberry - low density

**Field verified vegetation (plant community type)**

- Broad-leaved Peppermint - Brittle Gum - Red Stringybark dry open forest on the South Eastern Highlands Bioregion - Moderate/good to poor condition
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition












**Key**

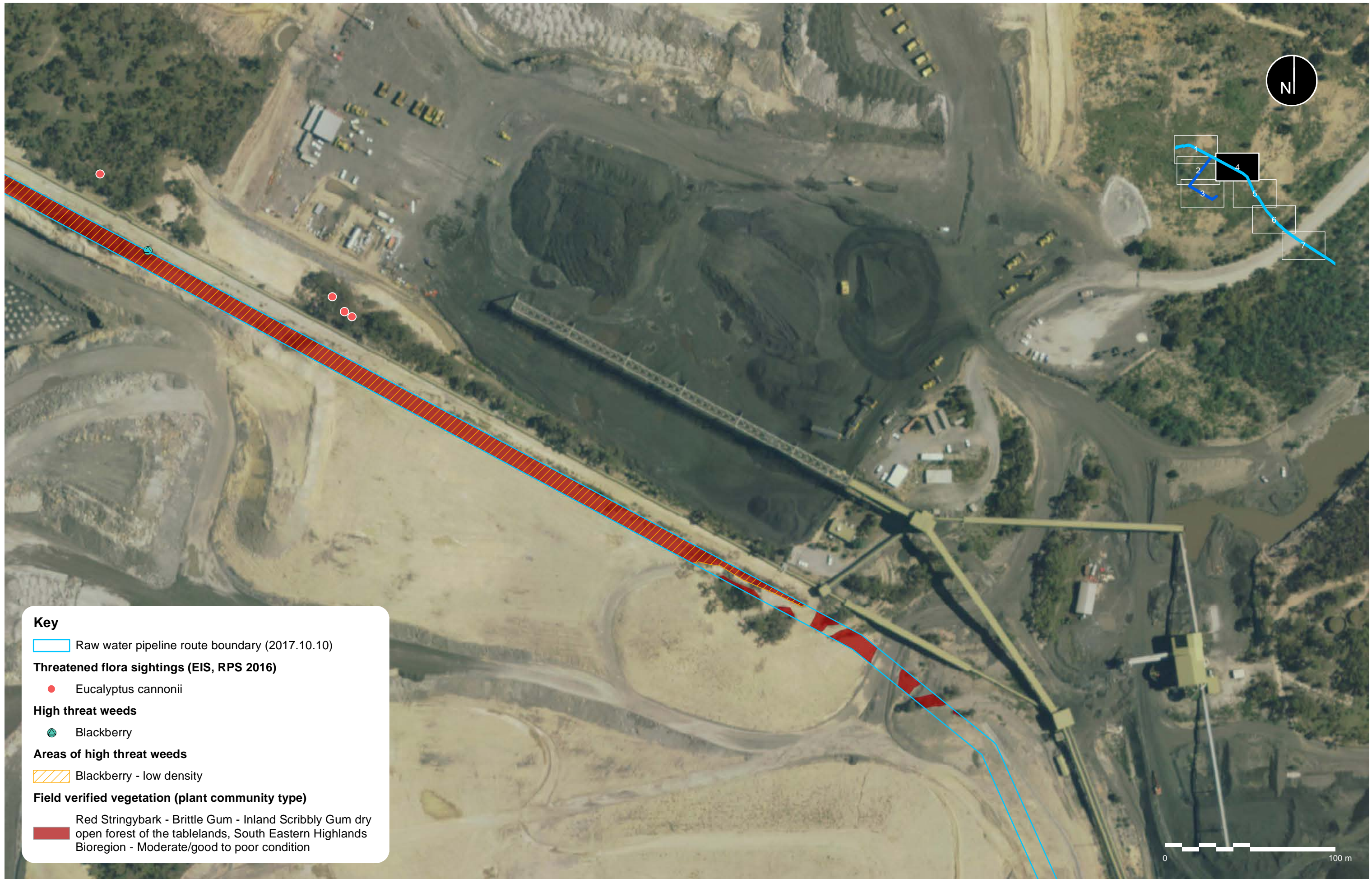
 Residuals water pipeline route boundary (2017.10.10)

**Field verified vegetation (plant community type)**

 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition

 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition

0 100 m



**Key**

- Raw water pipeline route boundary (2017.10.10)

**Threatened flora sightings (EIS, RPS 2016)**

- Eucalyptus cannonii

**High threat weeds**

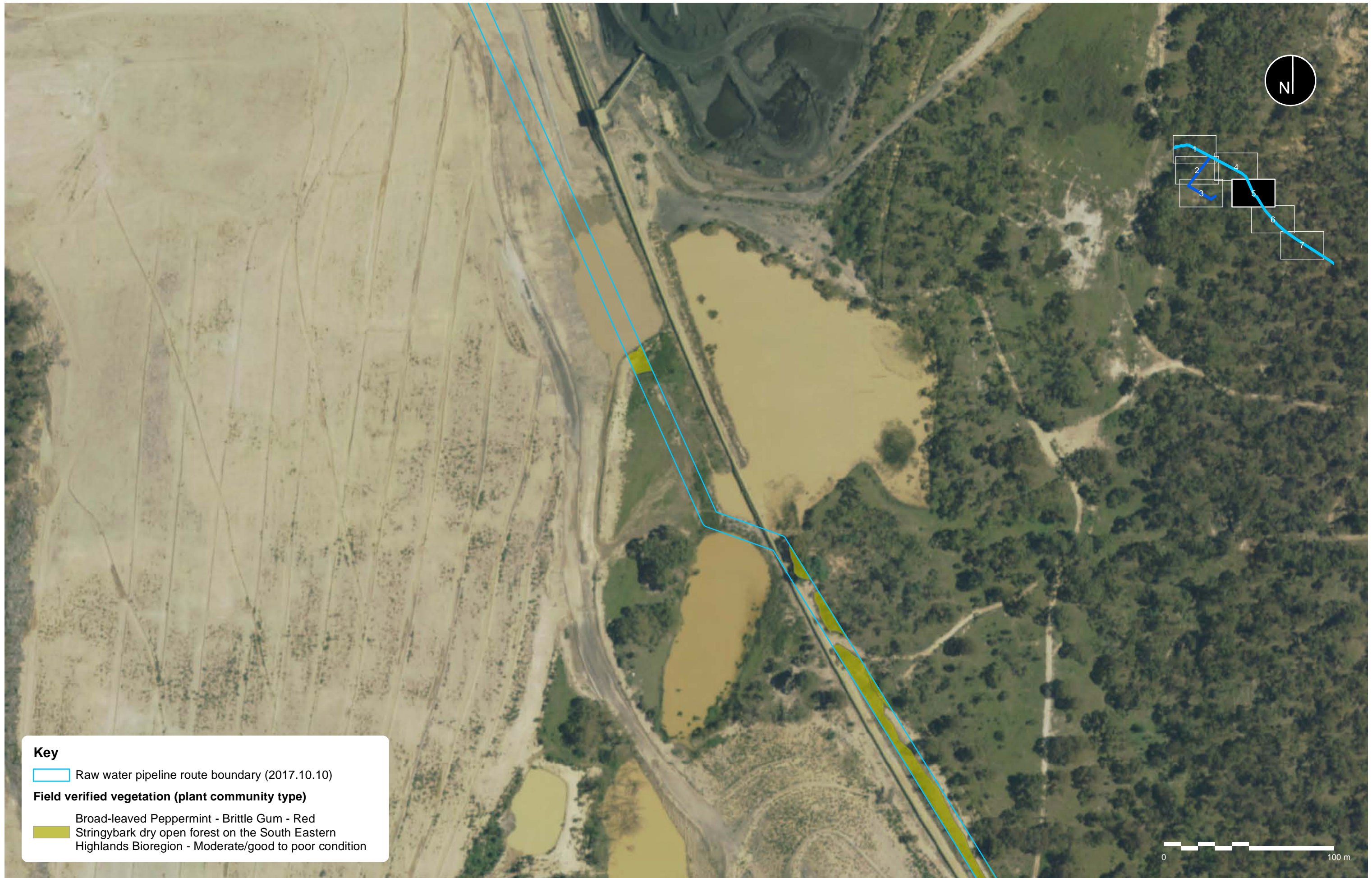
- Blackberry

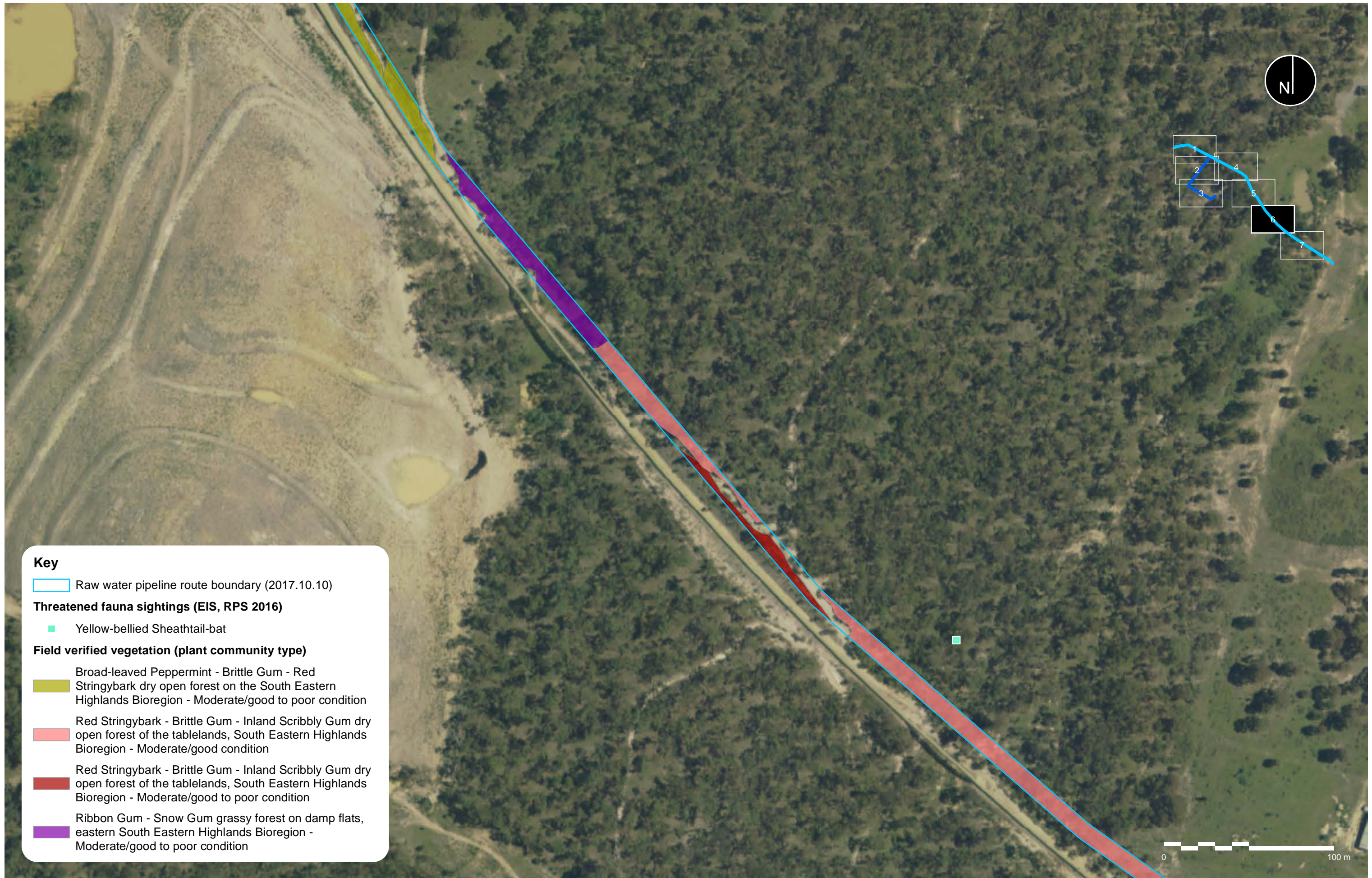
**Areas of high threat weeds**

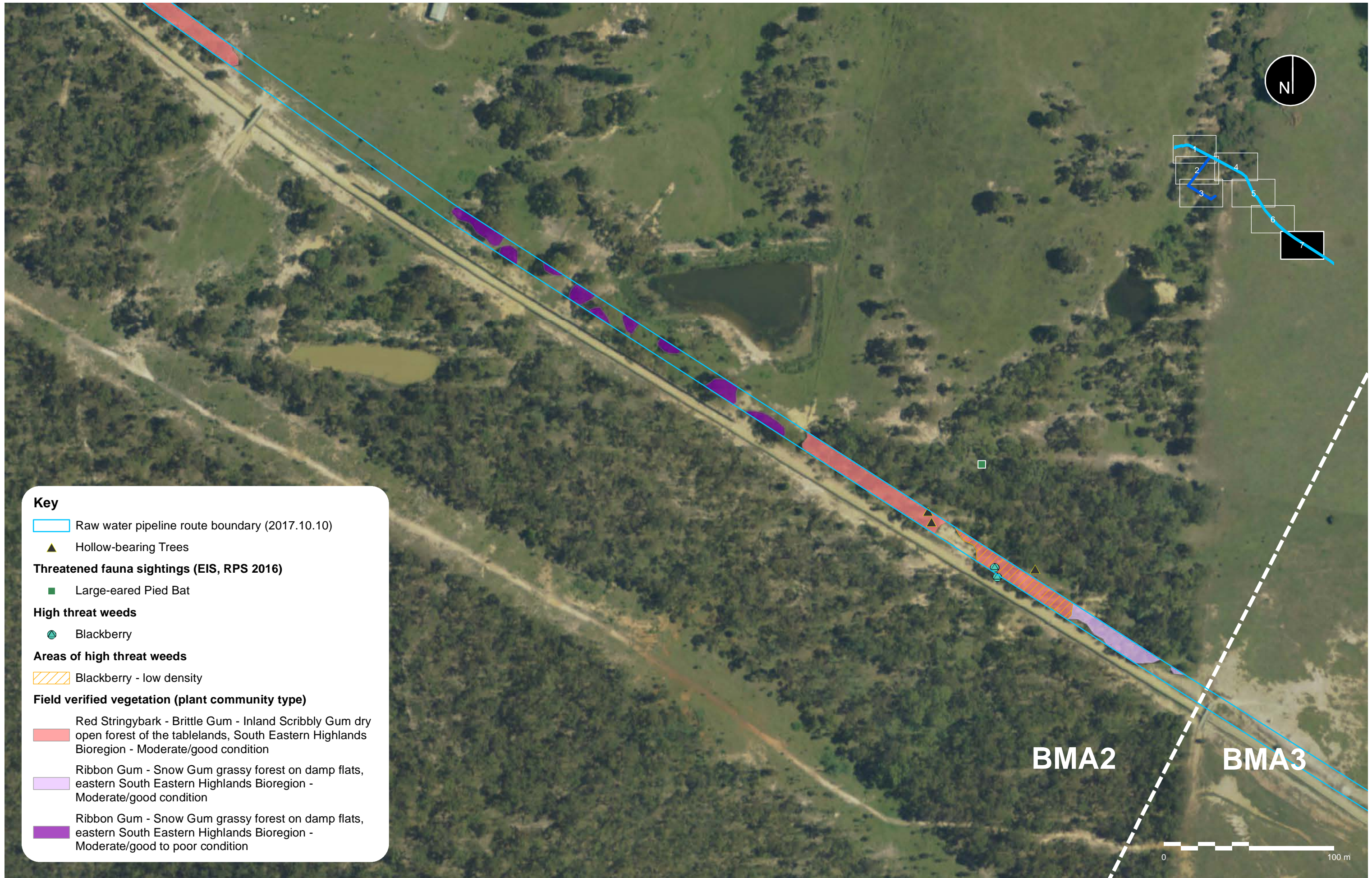
- Blackberry - low density

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition







**Key**

Raw water pipeline route boundary (2017.10.10)

Hollow-bearing Trees

**Threatened fauna sightings (EIS, RPS 2016)**

Large-eared Pied Bat

**High threat weeds**

Blackberry

**Areas of high threat weeds**

Blackberry - low density

**Field verified vegetation (plant community type)**

Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition

Ribbon Gum - Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion - Moderate/good condition

Ribbon Gum - Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion - Moderate/good to poor condition

BMA2

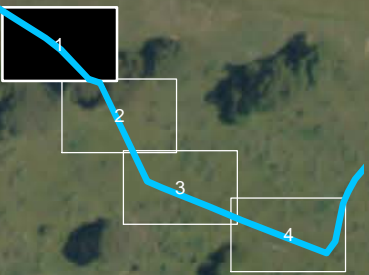
BMA3

0 100 m




BMA2


BMA3




**Key**


 Raw water pipeline route boundary (2017.10.10)

**Areas of high threat weeds**

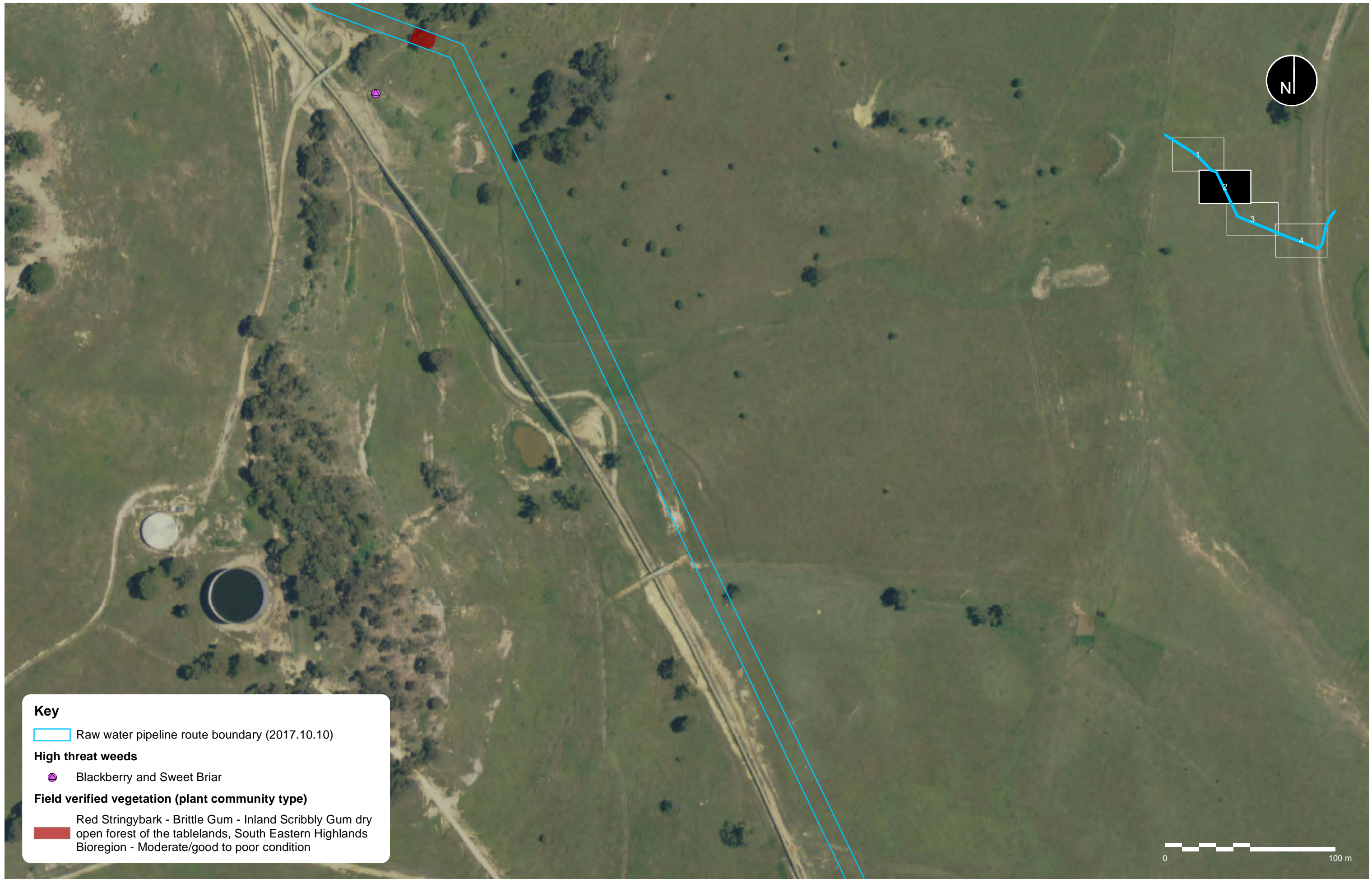
 Blackberry - low density

**Field verified vegetation (plant community type)**

 Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition

 Ribbon Gum - Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion - Moderate/good condition

0 100 m



**Key**

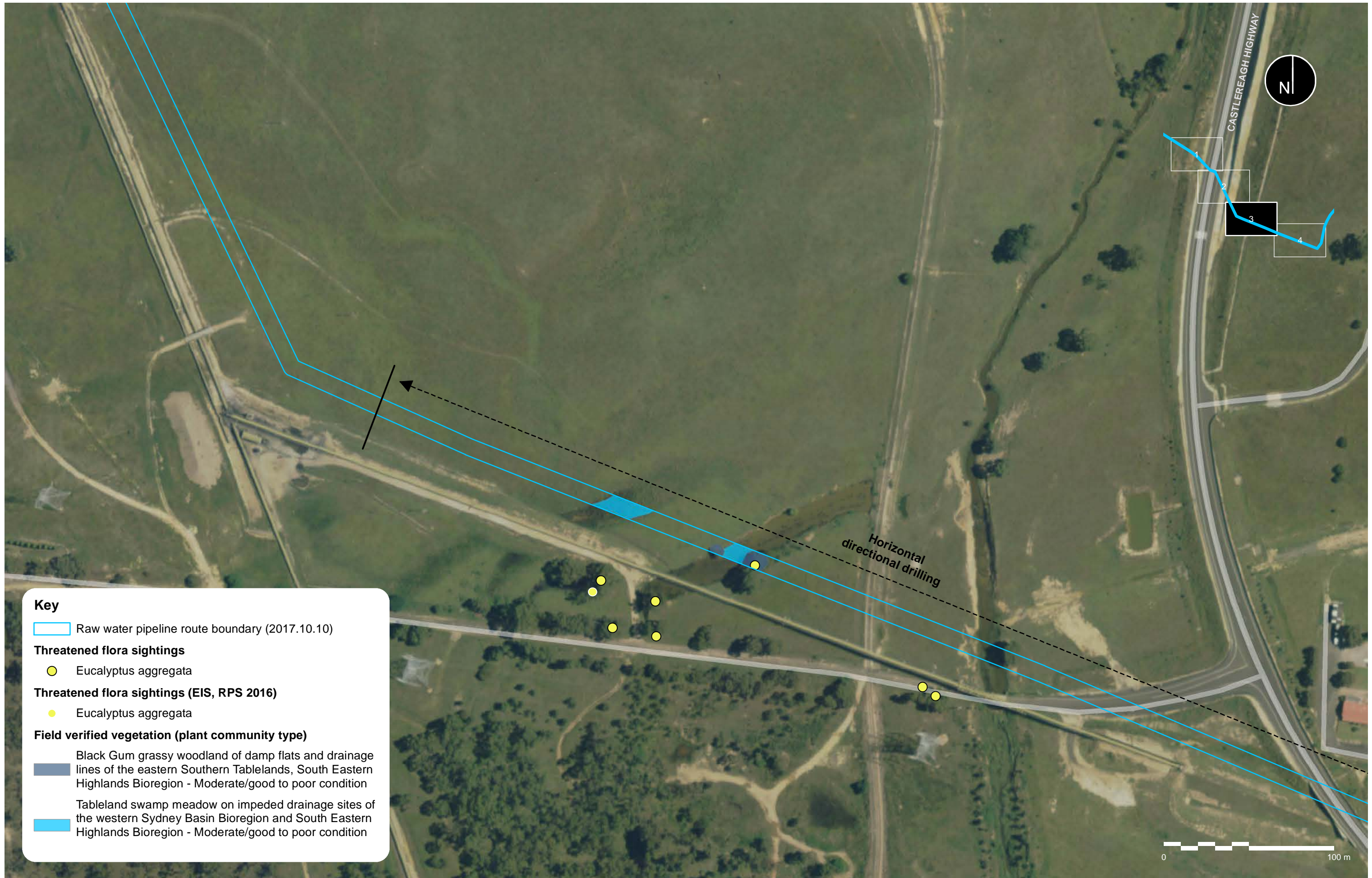
- Raw water pipeline route boundary (2017.10.10)

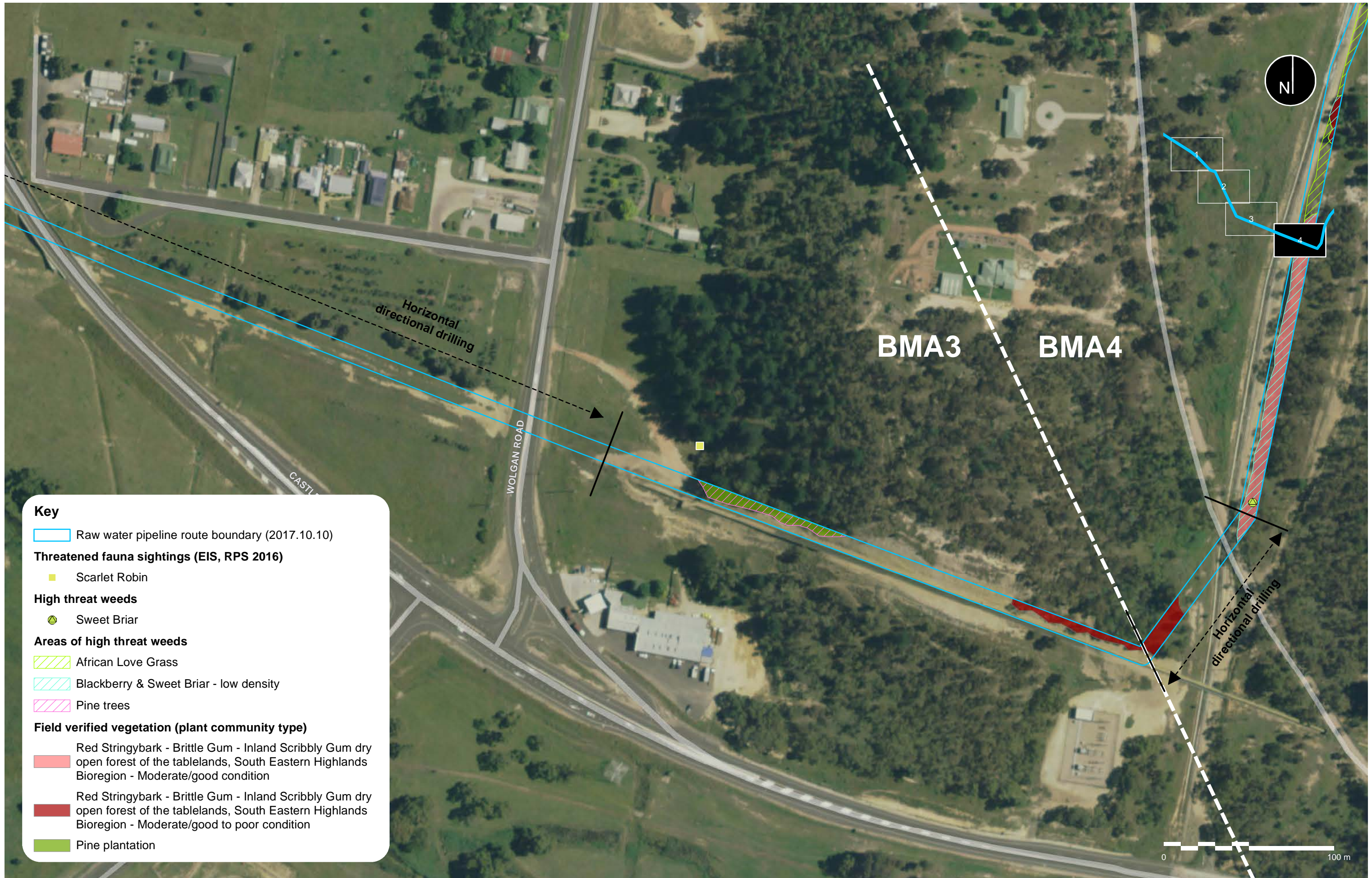
**High threat weeds**

- △ Blackberry and Sweet Briar

**Field verified vegetation (plant community type)**

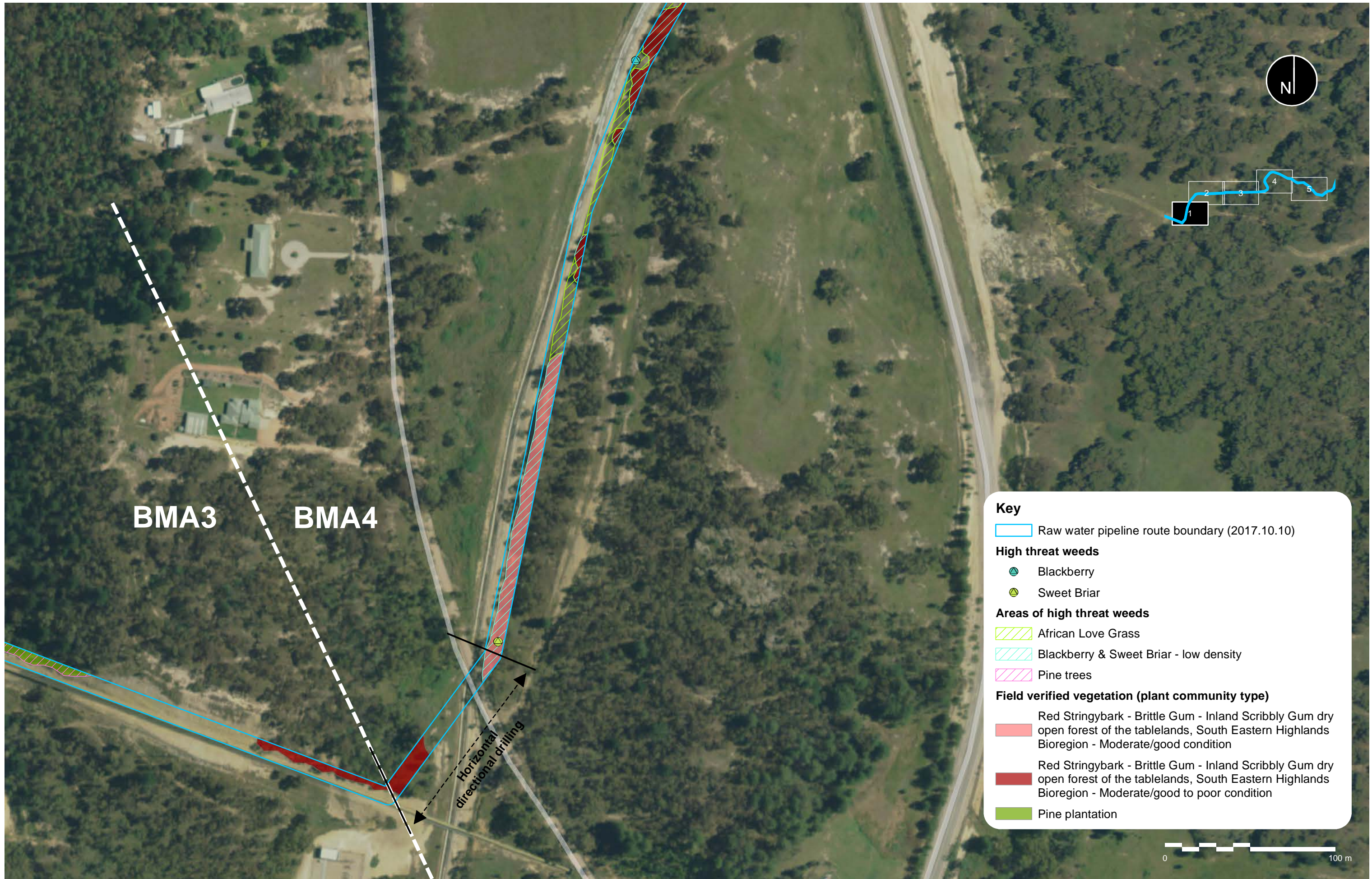
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition





**Key**

- Raw water pipeline route boundary (2017.10.10)
- Threatened fauna sightings (EIS, RPS 2016)**
- Scarlet Robin
- High threat weeds**
- Sweet Briar
- Areas of high threat weeds**
- African Love Grass
- Blackberry & Sweet Briar - low density
- Pine trees
- Field verified vegetation (plant community type)**
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition
- Pine plantation



BMA3

BMA4

Horizontal  
directional drilling

**Key**

- Raw water pipeline route boundary (2017.10.10)

**High threat weeds**

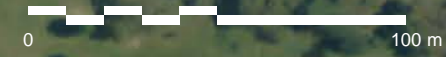
- ⊗ Blackberry
- ⊗ Sweet Briar

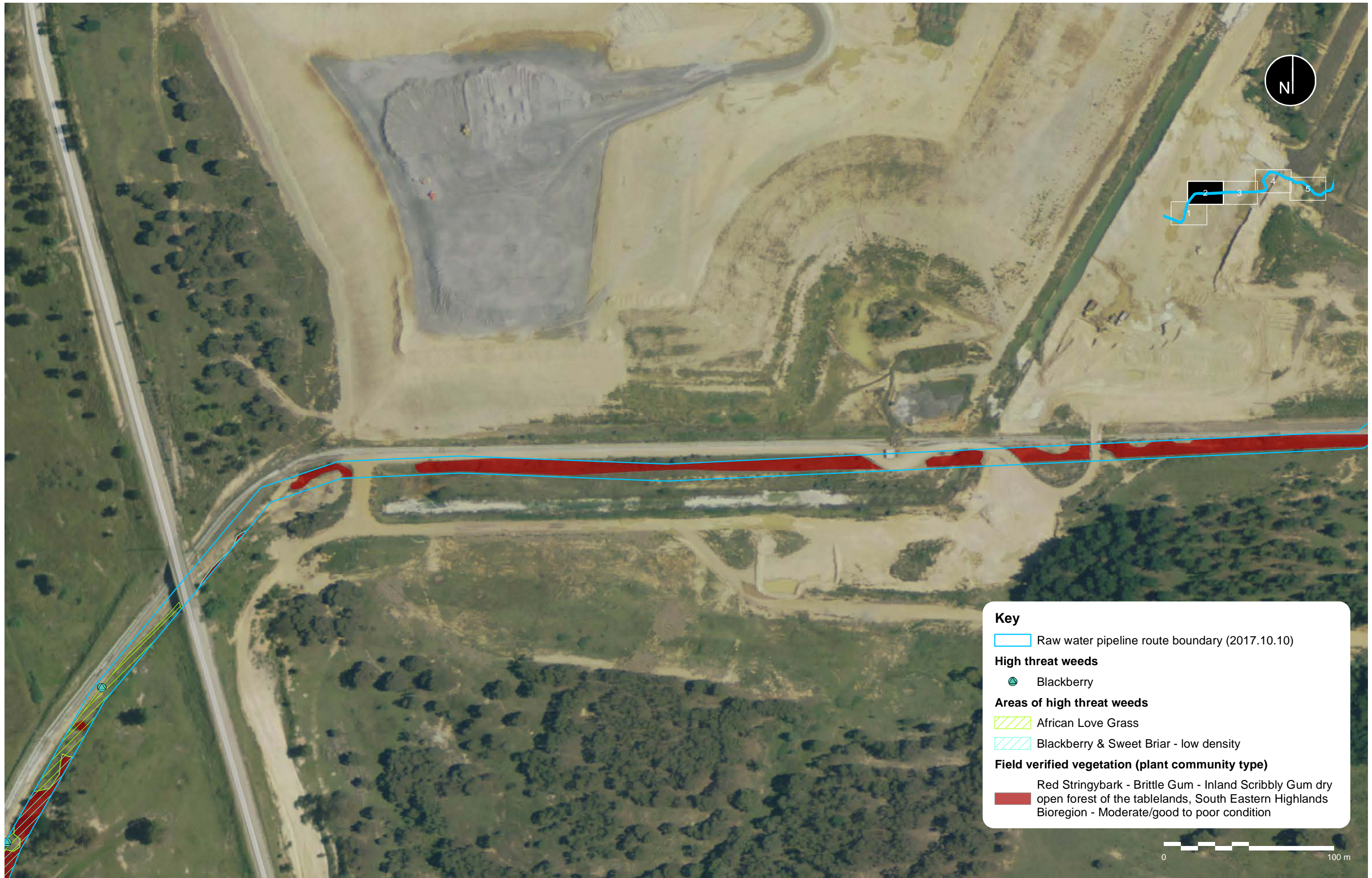
**Areas of high threat weeds**

- African Love Grass
- Blackberry & Sweet Briar - low density
- Pine trees

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good condition
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition
- Pine plantation





**Key**

- Raw water pipeline route boundary (2017.10.10)

**High threat weeds**

- Blackberry

**Areas of high threat weeds**

- African Love Grass
- Blackberry & Sweet Briar - low density

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition





**Key**

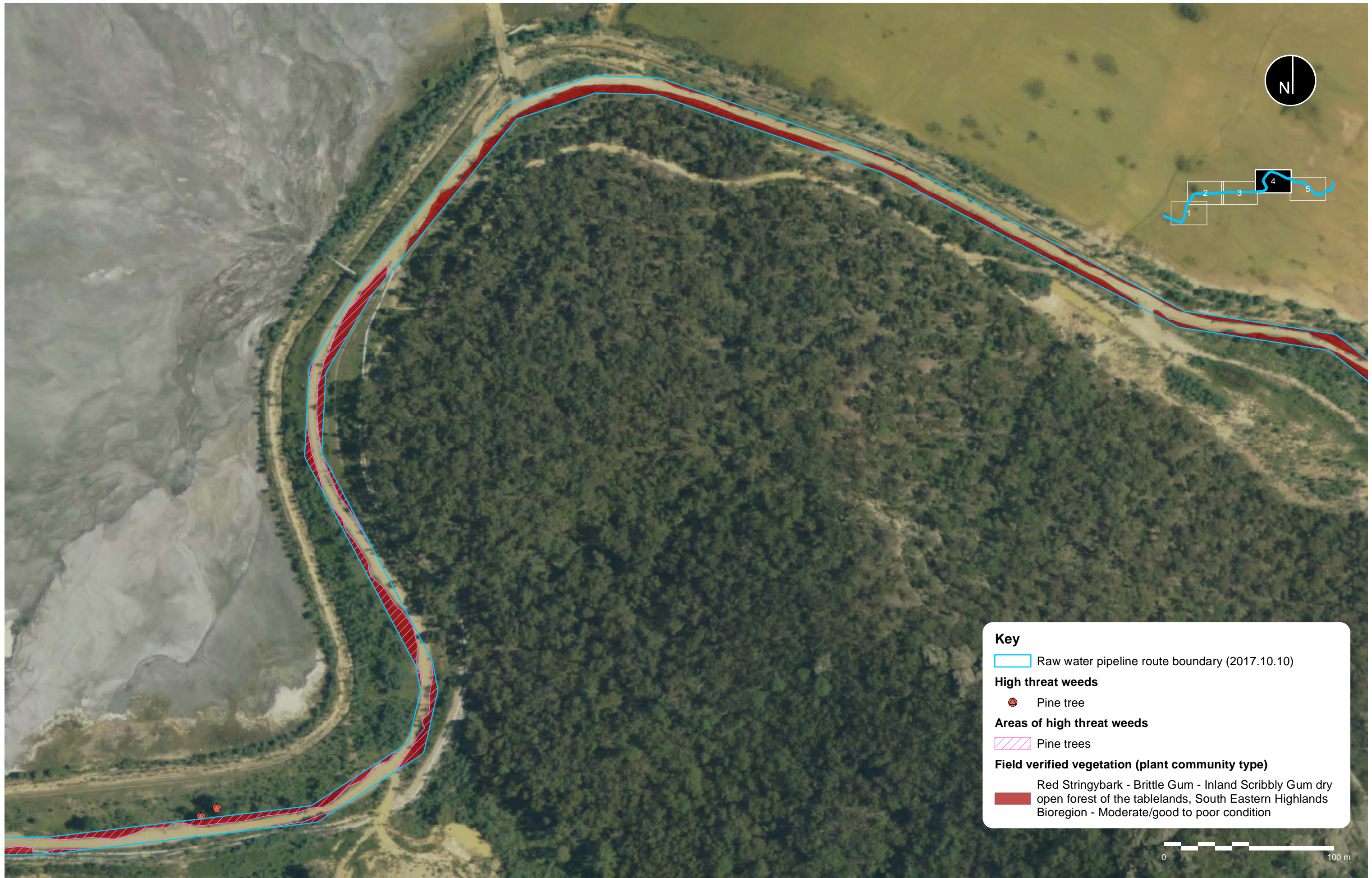
- Raw water pipeline route boundary (2017.10.10)

**Areas of high threat weeds**

- Pine trees

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition



**Key**

- Raw water pipeline route boundary (2017.10.10)

**High threat weeds**

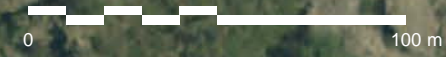
- Pine tree

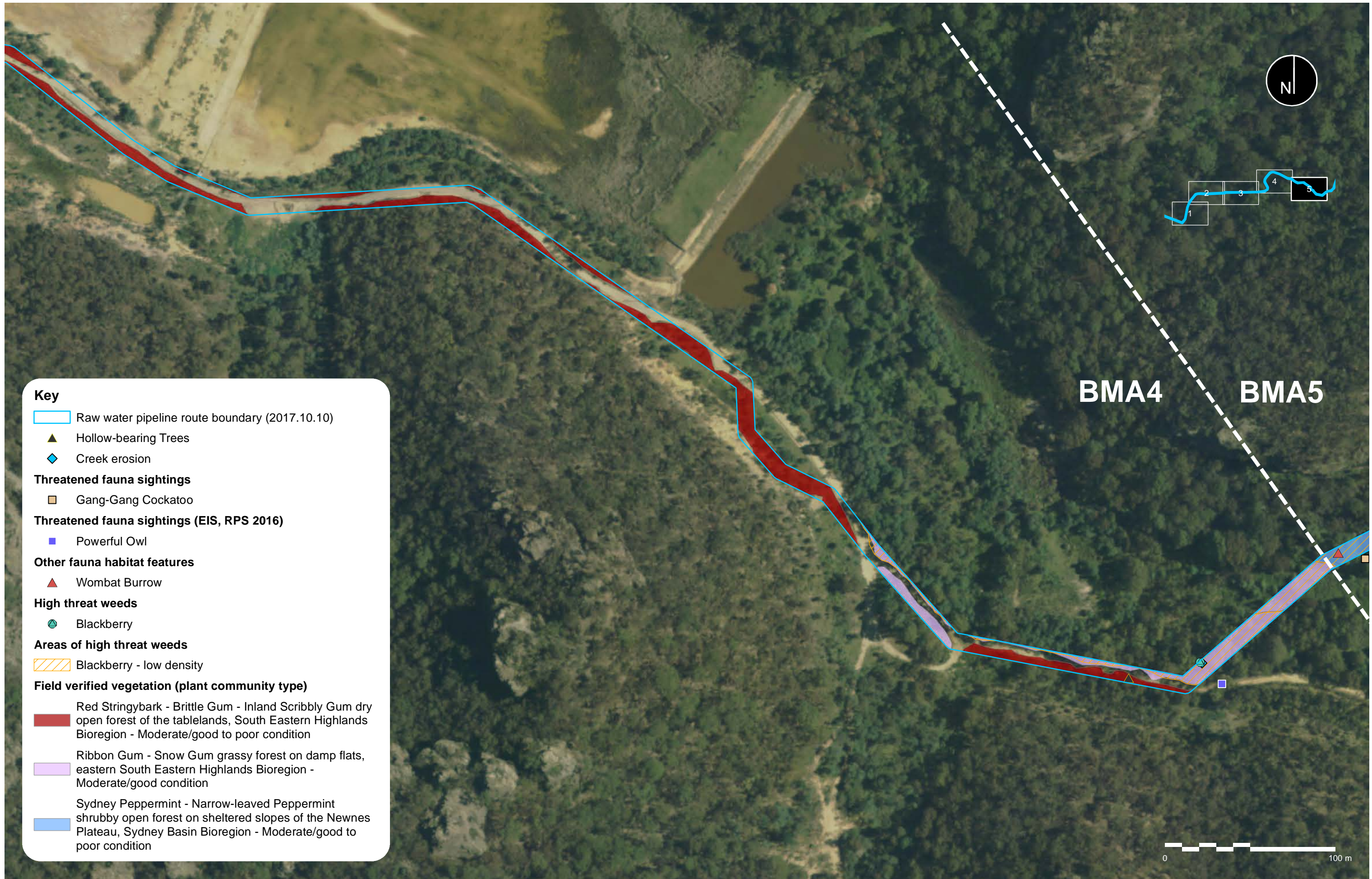
**Areas of high threat weeds**

- Pine trees

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition





**Key**

- Raw water pipeline route boundary (2017.10.10)
- ▲ Hollow-bearing Trees
- ◆ Creek erosion

**Threatened fauna sightings**

- Gang-Gang Cockatoo

**Threatened fauna sightings (EIS, RPS 2016)**

- Powerful Owl

**Other fauna habitat features**

- ▲ Wombat Burrow

**High threat weeds**

- Blackberry

**Areas of high threat weeds**

- Blackberry - low density

**Field verified vegetation (plant community type)**

- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition
- Ribbon Gum - Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion - Moderate/good condition
- Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin Bioregion - Moderate/good to poor condition

**BMA4**      **BMA5**





BMA4 BMA5



**Key**

- Raw water pipeline route boundary (2017.10.10)
- ▲ Hollow-bearing Trees
- ◆ Creek erosion
- Threatened fauna sightings**
- Gang-Gang Cockatoo
- Threatened fauna sightings (EIS, RPS 2016)**
- Blown Treecreeper
- Gang-Gang Cockatoo
- Glossy Black-Cockatoo
- Powerful Owl
- Varied Sittella
- Other fauna habitat features**
- ▲ Glossy Black-Cockatoo Feed Tree
- ▲ Wombat Burrow
- High threat weeds**
- Blackberry
- Areas of high threat weeds**
- Blackberry - low density
- Field verified vegetation (plant community type)**
- Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion - Moderate/good to poor condition
- Ribbon Gum - Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion - Moderate/good condition
- Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin Bioregion - Moderate/good to poor condition


0 100 m




**Key**

-  Raw water pipeline route boundary (2017.10.10)
-  Hollow-bearing Trees



**Other fauna habitat features**

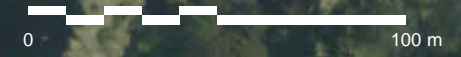
-  Termite Mound

**Areas of high threat weeds**

-  Blackberry - low density

**Field verified vegetation (plant community type)**

-  Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin Bioregion - Moderate/good to poor condition
-  Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion - Moderate/good condition

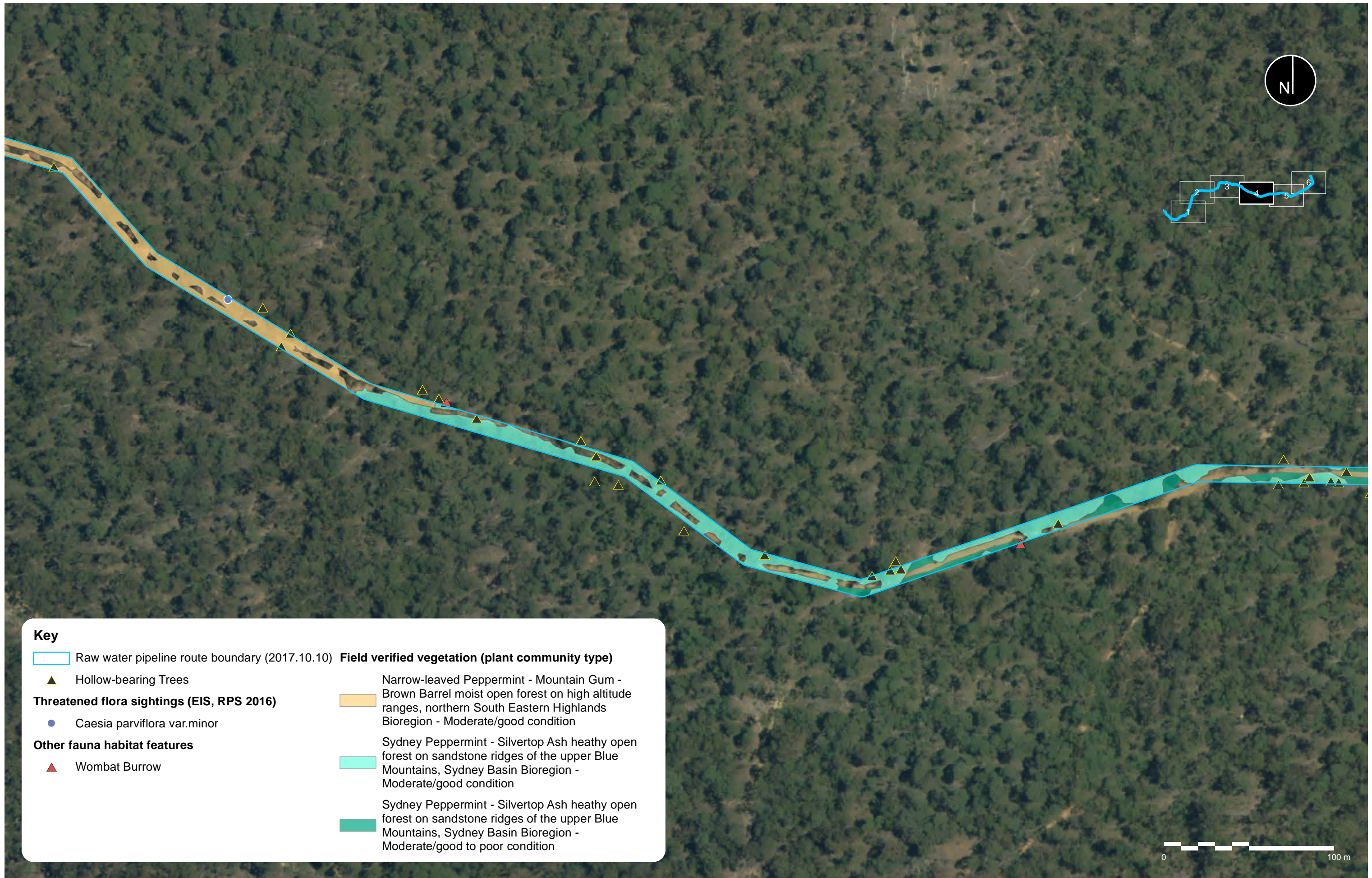


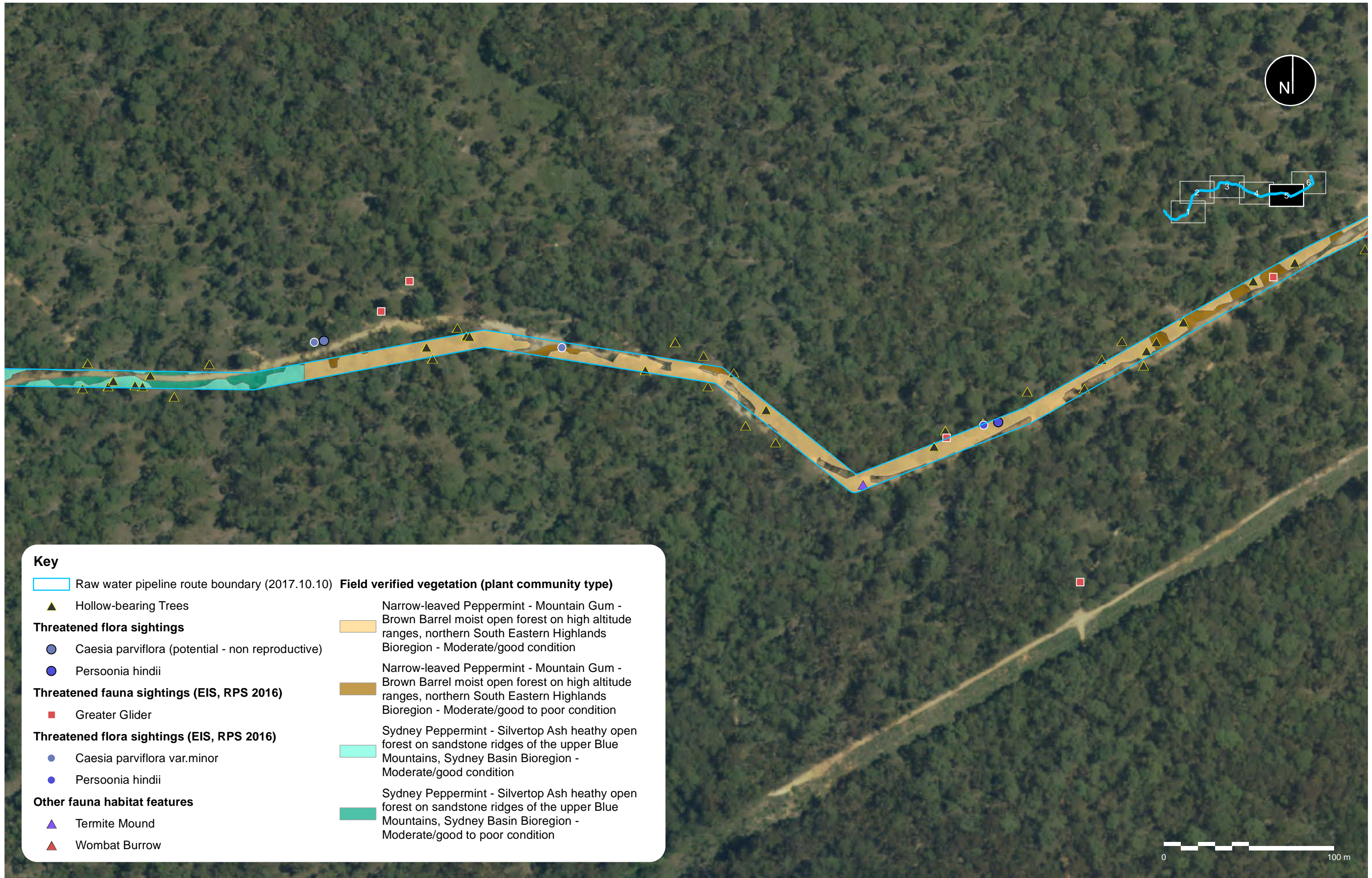


**Key**

- Raw water pipeline route boundary (2017.10.10)
- ▲ Hollow-bearing Trees
- Gang-Gang Cockatoo
- ▲ Termite Mound
- ▲ Wombat Burrow
- Field verified vegetation (plant community type)  
Narrow-leaved Peppermint - Mountain Gum - Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands Bioregion - Moderate/good condition
- Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion - Moderate/good condition
- Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin Bioregion - Moderate/good to poor condition

0 100 m





**Key**

Raw water pipeline route boundary (2017.10.10)

Hollow-bearing Trees

**Threatened fauna sightings**

Scarlet Robin

**Threatened flora sightings**

Persoonia hindii

**Threatened fauna sightings (EIS, RPS 2016)**

Greater Glider

**Threatened flora sightings (EIS, RPS 2016)**

Caesia parviflora var. minor

Persoonia hindii

**Other fauna habitat features**

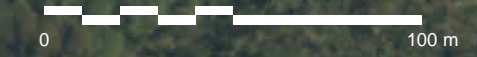
Termite Mound

Wombat Burrow

**Field verified vegetation (plant community type)**

Narrow-leaved Peppermint - Mountain Gum - Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands Bioregion - Moderate/good condition

Narrow-leaved Peppermint - Mountain Gum - Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands Bioregion - Moderate/good to poor condition



# Appendix B - Re-use of Woody Debris and Bushrock

Guide 5 of Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects Revision 0/September 2011

<https://www.dccew.gov.au/sites/default/files/env/consultations/86a0e23b-c4b0-466c-8b61-4403ea27436c/files/e2021-0190-biodiversity-guidelines-rta.pdf>

# Appendix C - Consultation Table

Description of Consultation	How Addressed in Management Plan	Reference
<b>Letter to OEH 22 August 2017</b>		
Biodiversity Management Plan (BMP) is provided with letter via email (Liz.Mazzer@environment.nsw.gov.au)		
<b>Letter from OEH 14 September 2017 and reply Letter to OEH 16 October 2017</b>		
1. Include measurable performance indicators, targets, trigger points and corrective actions in the BMP.	Measurable performance indicators, targets, trigger points and corrective actions have been specified in the BMP.	Section 4 of the BMP
2. Detailed biodiversity benchmark data is to be included in the BMP, covering the main project area and any ancillary infrastructure.	Detailed biodiversity benchmark data has been provided based upon the biodiversity data in the EIS and the preconstruction condition assessment surveys.	Section 2 of the BMP
3. The project area is to be divided into clearly identified zones for biodiversity management, with management objectives stated for each zone.	The Project has been divided in 5 separate Biodiversity Management Areas (BMAs) based upon vegetation types Sections 5 of the BMP	Sections 5 of the BMP
4. Locations of bushfire management activities are to be mapped, and descriptions of each activity included in the BMP.	A bushfire management plan has been prepared and has been included in the BMP. The bush fire management plan contains actions that will be implemented to minimise bushfire risks during construction and maintenance activities. The only two project elements that will require Asset Protection Zones (APZ) are the water treatment facility. A 10m APZ has been adopted for both elements. The pipeline and the break tank on the pipeline route would not require any APZ as it is buried. Other bushfire management activities for operations would be developed in consultation with respective land owners and would be	Section 6.11 and Appendix D of the BMP

Description of Consultation	How Addressed in Management Plan	Reference
	detailed in the operational environmental management plan.	
5. Clear maps showing locations of threatened species records and extent of endangered ecological communities at an appropriate scale are to be included in the BMP.	Maps showing threatened species locations and records at an appropriate scale have been provided.	Appendix A of the BMP
6. The ability to microsite infrastructure to avoid threatened species should be discussed.	The process of micro-siting infrastructure has been described in the BMP. The first stage of this has already been implemented and significant areas of clearing and impacts to threatened species has already been avoided	Section 6.2 of the BMP
7. The requirement of each threatened species to be impacted is to be discussed, along with how the requirements will be met.	7. The requirement of each threatened species to be impacted is to be discussed, along with how the requirements will be met. The requirements for threatened species protection and how they will be met have been provided in the BMP.	Section 5 of the BMP
8. The BMP is to identify threats to biodiversity and include any relevant baseline information.	Threats to biodiversity and baseline data have been identified based upon the biodiversity assessment (EIS, 2016) and preconstruction condition assessment surveys.	Section 3 of the BMP
9. A risk assessment (including threats, performance criteria, mitigation measures and risk level) be prepared following the example provided in table 1.	Key risks were identified in the biodiversity assessment (EIS, 2016) – and these have been expanded and supplemented with additional risks and mitigation measures.	Section 4 of the BMP
10. Strategies to manage threats to biodiversity, and the timeframe for each strategy, are to be included in the BMP.	Strategies and timeframes for the management of threats to biodiversity have been identified and included in the BMP.	Section 4 of the BMP
11. A detailed monitoring	Monitoring programs have been proposed and the first	Section 5 of

Description of Consultation	How Addressed in Management Plan	Reference
<p>program is to be implemented that will assess the effectiveness of the management and mitigation strategies against the management objectives and performance indicators and targets.</p>	<p>stage of monitoring has already been undertaken. The monitoring programs would be used to assess the effectiveness of mitigation strategies and used to assess performance against the indicators and targets.</p>	<p>the BMP</p>
<p>12. Upper limits of impacts on native vegetation and threatened species are clearly stated in the BMP, and a commitment made to ensuring these limits are not exceeded.</p>	<p>The upper limits of native vegetation and threatened species to be cleared have been specified in the EIS and project approval. The project is committed to not exceeding these clearing limits and aims to clear significantly less vegetation. Based on data collected during the preconstruction surveys, the area of native vegetation cleared will be about a third of that predicted in the EIS and many of the threatened species that were predicted to be impacted either don't exist</p>	<p>Section 3.4 of the BMP</p>
<p>13. Include a discussion of the relationship between this BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region.</p>	<p>The relationship between the BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region have been described.</p>	<p>Section 6.1 and Section 6.15 of the BMP</p>
<p><b>Email from OEH 18 October 2017</b></p>		
<p>Advising that there was no need for further clarification.</p>		
<p><b>Email from DPE 23 August 2023</b></p>		
<p>1. Appendix A is missing. Please attach Appendix A.</p>	<p>Please note this is an error on Centennial's behalf, no action required from Veolia Team- will be rectified upon receipt of response.</p>	<p>Appendix A</p>
<p>2. Revision 14 Appendix C consultation identifies Section 4 as addressing OEH' comment, to "Include</p>	<p>These were scattered throughout the BMP but have been condensed into the TARP table in section 5</p>	<p>Section 5 and Section 6</p>

Description of Consultation	How Addressed in Management Plan	Reference
measurable performance indicators, targets, trigger points and corrective actions in the BMP', however Section 4 presents a summary of RPS' 2016 Biodiversity Assessment Report on the then Existing Environment and Environmental Impacts and Risks, but no performance indicators, targets, triggers points or corrective actions (management measures)		
3. No Trigger Actions Response Plan is provided in the BMP. Please clearly identify measurable performance indicators, targets, triggers points and corrective actions per OEH' comments. Additional information on how to address OEH' comments is contained in Attachment B of OEH' letter dated 14 September 2017.	These were scattered throughout the BMP but have been condensed into the TARP table in section 5	Section 5 and Section 6
4. Note, OEH is now known as the Environment and Heritage Group of the Department of Planning and Environment.	Noted	
5. Consultation attached to the Plan is now almost 5 years old. Please include any further engagement or consultation comments from the Environment and Heritage Group and ensure that triggers, action and adaptive managements are consistent with conditions of consent.	The latest correspondence has been added to Appendix C	Appendix C

Description of Consultation	How Addressed in Management Plan	Reference
<b>Letter from DPE 15 November 2023</b>		
Please provide clear triggers and actions consistent with OEH advice, in a Trigger Action Response Plan (TARP) as part of BMP	Included a TARP table in BMP section 6. Biodiversity Management Areas, Table 7	Section 6, Table 7
<b>Letter from DPE 5 December 2023</b>		
Please provide clear triggers and actions consistent with OEH advice, in a Trigger Action Response Plan (TARP) as part of BMP	Revised the TARP to include targets and triggers that are measurable and achievable.	Section 6, Table 7

# Appendix D - Consultation Documents



SMMPS-O-00-M13-00-09

**22 August 2017**

ATT: Liz Mazzer  
Conversation Planning Officer  
Regional Operation, North West  
Office of Environment and Heritage  
PO Box 2111, Dubbo, NSW, 2830

Dear Ms Mazzer,

**Re: Springvale Water Treatment Project (SSD 7592) – Consultation for Preparation of Biodiversity Management Plan**

With reference to Development Consent for the Springvale Water Treatment Project (SSD 7592) which was approved by the Planning Assessment Commission on 19 June 2017. Veolia Australia and New Zealand (Veolia) has been selected as specialist water Service Company to finance, design, construct, commission and operate the Springvale Water Treatment Project (Project).

As part of its responsibilities under the contract, Veolia is required to prepare, obtain approval and implement environmental management systems and plans as defined under the Conditions of the Development Consent (Consent).

In accordance with condition 8, schedule 3 of the Consent, a Biodiversity Management Plan (BMP) detailing flora and fauna management measures for the Project are to be developed in consultation with the Office of Environment and Heritage (OEH).

Veolia understands that OEH was invited to provide comments as part of the Project assessment process, including the Environmental Impact Statement, and the Submission Report. Consequently, we would like request feedback from OEH for any additional considerations in preparation of the BMP

The BMP (electronic copy) is provided with this letter via email ([Liz.Mazzer@environment.nsw.gov.au](mailto:Liz.Mazzer@environment.nsw.gov.au)).

We look forward to your consideration of this request. Please do not hesitate to contact myself or Environmental Planning Lead, Elena Ivanova (+61 (0) 415 556 620; [elena.ivanova@veolia.com](mailto:elena.ivanova@veolia.com)) should you have any questions or if any item requires discussion.

Yours sincerely,

A handwritten signature in blue ink that reads "Nick Stokes-Hughes". The signature is written in a cursive, flowing style.

**Nick Stokes-Hughes**

Project Director - Veolia Australia and New Zealand

M: +61 (0) 428 672 115 | E: [nicholas.stokeshughes@veolia.com](mailto:nicholas.stokeshughes@veolia.com)



DOC17/436024  
SSD 7592

Mr Nick Stokes - Hughes  
Project Director  
Veolia Environmental Services  
nicholas.stokeshughes@veolia.com

Dear Mr Stokes - Hughes

**Springvale water treatment project (SSD 7592) draft biodiversity management plan**

I refer to your email dated 22 August 2017 requesting advice from the Office of Environment and Heritage (OEH) regarding the draft biodiversity management plan for the Springvale water treatment project.

A Biodiversity Management Plan (BMP) sets out a commitment and a methodology to manage, enhance and protect biodiversity values. The purpose of a BMP is to:

- document the biodiversity values of a site
- outline strategies to prevent, minimise, mitigate and/or offset impacts and threatening processes on biodiversity from a project's activities
- outline performance criteria to judge the success of the implementation of the plan including monitoring and reporting of management actions and outcomes
- set out how adaptive management will be achieved through evaluation of performance.

Commitments contained within a BMP should be clear and auditable. The BMP should cover impacts that may arise from activities conducted throughout the life of the project. It should cover any biodiversity conditions related to the development's impacts as well as the management of any biodiversity offset areas. These can potentially be in a single or multiple documents.

All monitoring objectives and targets should adhere to the SMART principles, that is, be specific, measurable, achievable, realistic and timely.

A summary of our recommendations is provided in Attachment A, and detailed comments are in Attachment B.

If you have any queries, please contact Liz Mazzer, Conservation Planning Officer on 6883 5325 or email [liz.mazzer@environment.nsw.gov.au](mailto:liz.mazzer@environment.nsw.gov.au).

Yours sincerely

A handwritten signature in black ink, appearing to read "Peter Christie". The signature is fluid and cursive, with the first name "Peter" being more prominent than the last name "Christie".

**PETER CHRISTIE**  
**Director, North West**  
**Regional Operations Division**

Contact officer: LIZ MAZZER  
6883 5325

14 September 2017

cc: Paul Freeman - Department of Planning and Environment

## Summary of OEH recommendations

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- 1 Include measurable performance indicators, targets, trigger points and corrective actions in the BMP.
- 2 Detailed biodiversity benchmark data is to be included in the BMP, covering the main project area and any ancillary infrastructure.
- 3 The project area is to be divided into clearly identified zones for biodiversity management, with management objectives stated for each zone.
- 4 Locations of bushfire management activities are to be mapped, and descriptions of each activity included in the BMP.
- 5 Clear maps showing locations of threatened species records and extent of endangered ecological communities at an appropriate scale are to be included in the BMP.
- 6 The ability to microsite infrastructure to avoid threatened species should be discussed.
- 7 The requirement of each threatened species to be impacted is to be discussed, along with how the requirements will be met.
- 8 The BMP is to identify threats to biodiversity and include any relevant baseline information.
- 9 A risk assessment (including threats, performance criteria, mitigation measures and risk level) be prepared following the example provided in table 1.
- 10 Strategies to manage threats to biodiversity, and the timeframe for each strategy, are to be included in the BMP.
- 11 A detailed monitoring program is to be implemented that will assess the effectiveness of the management and mitigation strategies against the management objectives and performance indicators and targets.
- 12 Upper limits of impacts on native vegetation and threatened species are clearly stated in the BMP, and a commitment made to ensuring these limits are not exceeded.
- 13 Include a discussion of the relationship between this BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region.

## OEH detailed comments on the draft Springvale water treatment project biodiversity management plan

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### Performance indicators and targets need to be measurable

The BMP needs to include measurable performance indicators and targets that will be used to demonstrate the extent to which the biodiversity management objectives have been achieved. The performance indicators and targets will relate directly to the key biodiversity management objectives and the requirements of the consent conditions for the project.

The performance targets should reflect the difference stages of succession of biodiversity management (and vegetation succession) throughout the life of the project.

Targets should relate to actual biodiversity outcomes, including species requirements (see Appendix A [2]), at different times rather than simply inputs and outputs (see Appendix A [7]).

State the trigger points and subsequent corrective actions to be implemented if the monitoring program identifies that the performance targets and therefore biodiversity management objectives are not being met.

*For example, the trigger point for applying a corrective action to a weed infestation may be when the weed species increases in area by 5 ha. The corrective action (implementing weed management activities) should then be detailed.*

Monitoring and reporting will then relate directly to the performance indicators and targets.

### Recommendation

- 1 Include measurable performance indicators, targets, trigger points and corrective actions in the BMP.

### Benchmark data is needed

To meet the primary aim of the BMP, and to fulfil the development consent conditions for the project, biodiversity benchmark data is needed. This should be incorporated in the BMP.

The primary aim of the BMP is to demonstrate how the project will maintain or enhance benchmark biodiversity values throughout the landscape during and post construction. The development consent conditions for the project require that the BMP includes updated baseline mapping of the vegetation communities and key fauna habitat on site.

More detailed information about the current biodiversity values is required. The values should include detailed descriptions of:

- vegetation communities in each biodiversity management area, including:
  - a map and photographs depicting these vegetation communities
  - the area and the condition state of each vegetation community, described as per the BioBanking Assessment Methodology (see Appendix A [1]) or an equivalent or better method
  - a description of rare or significant flora (e.g.. species at the edge of their range, taxonomically unusual, etc).

It is recommended that vegetation should be described as per the NSW Vegetation Information System and the Native Vegetation Interim Type Standard [see Appendix B]. Permanent vegetation plots should be established.

- fauna assemblages in the project area and their habitat, including maps of known records and identified areas of significant habitat for particular threatened or declining species
- riparian areas including a map identifying their location in the project area, and photographs
- groundwater dependent ecosystems that are present

- any other important habitat values that are present (e.g. caves, cliff lines, raptor nests, hollow-bearing trees, etc)

The descriptions should include the presence of important structural, floristic and habitat elements. Include additional mapping, and/or imagery, and photographs that illustrate:

- the footprint of the project site compared to the surrounding biodiversity values;
- areas of high conservation significance; and

Note that classification of vegetation communities should use plant community types (PCT) as presented in figure 2 and table 7 of the BMP rather than the map unit numbers in table 4.

It is important that benchmark data is also collected for ancillary infrastructure such as new access tracks and laydown areas.

### **Recommendation**

- 2 Detailed biodiversity benchmark data is to be included in the BMP, covering the main project area and any ancillary infrastructure.

## **Biodiversity management areas should be identified**

The project area should be divided into discrete zones for biodiversity management. These may be divided by vegetation type, condition classes, or any other practical delineation. The BMP should clearly identify the locations and boundaries of these zones, including appropriate mapping.

A description for each management zone should be provided which includes details of the biodiversity values. The description should outline the level of intervention activities proposed in each management zone. Areas where salvage of biodiversity resources will occur within impacted areas (e.g. collection of tree stems or hollows, plants or animals for translocation) should be indicated.

Objectives for managing biodiversity values should be stated for each management zone.

### **Recommendation**

- 3 The project area is to be divided into clearly identified zones for biodiversity management, with management objectives stated for each zone.

## **More information is needed about bushfire management**

The BMP outlines bushfire management activities, such as asset protection zones, fuel load reduction and maintenance of tracks.

Locations of bushfire management activities should be mapped. Descriptions of each activity, and how these will be implemented in each biodiversity management zone, should be included in the BMP.

### **Recommendation**

- 4 Locations of bushfire management activities are to be mapped, and descriptions of each activity included in the BMP.

## **More detailed information is needed for threatened species**

Detailed information about the locations and planned management of threatened species is needed.

The BMP provides some information about threatened flora and fauna species. OEH notes that two flora species were detected immediately adjacent to the project area and there is potential for seedlings of these plants to occur in the areas to be cleared. While a list of threatened flora species within the project area is provided, the two located adjacent to the areas to be cleared are not identified.

The BMP needs to provide details of the known and predicted occurrence of threatened species, populations and ecological communities listed under the *Environment Protection and Biodiversity Conservation Act 1999*, *Threatened Species Conservation Act 1995*, and the *Fisheries Management Act 1994*.

Figure 2 of the BMP provides some of this information, but due to the resolution of the map, and scale used, this is unclear.

Clear maps showing locations of threatened species records and extent of endangered ecological communities at an appropriate scale are needed. This is particularly important to show individuals and populations of threatened flora species near areas to be cleared. Rather than grouping records into 'threatened fauna' and 'threatened flora' (as is the case in figure 2 of the BMP), the maps should show locations of the individual species and indicate whether these will be impacted.

The ability to microsite infrastructure to avoid threatened species should be discussed.

The BMP should outline the species requirements for each threatened species that will be impacted by the development, and how these requirements will be provided for, particularly in any areas to be re-vegetated (see Appendix A [2]).

### Recommendations

- 5 Clear maps showing locations of threatened species records and extent of endangered ecological communities at an appropriate scale are to be included in the BMP.
- 6 The ability to microsite infrastructure to avoid threatened species should be discussed.
- 7 The requirement of each threatened species to be impacted is to be discussed, along with how the requirements will be met.

### Threats to biodiversity need to be identified

The BMP needs to provide details of the threats to biodiversity that currently exist on site and those that may occur in the future. These may include:

- Pest animals, including native pest animals (see Appendix A [3])
- Noxious and environmental weeds
- Erosion
- Current land use practices
- Altered hydrological processes
- Fire regimes
- Existing infrastructure

Include additional mapping, and/or imagery, and photographs that illustrate threats that can be mapped, such as weeds and erosion.

Baseline data that describes the current extent of each threat described in the BMP is also required.

*For example, for weeds this may include details on the area or number of plants that currently exist. If weed infestations occur at multiple locations the extent at each location should be detailed.*

Baseline information is required to assess the change in the level of the threat and to monitor success over time against relevant performance criteria.

Some threats may become more apparent or relevant as regeneration and rehabilitation activities progress. These threats should also be discussed.

*For example, agricultural land that has previously been fertilised may present difficulties in increasing the native species ground cover diversity (see Appendix A [4]).*

Section 4.7 of the BMP should also include a discussion of the potential threats to biodiversity from predators such as foxes, wild dogs and cats that may use the pipeline route and new access tracks. The presence of these and other vertebrate pests needs to be included in the BMP, and any intended monitoring and control activities detailed.

### Recommendation

- 8 The BMP is to identify threats to biodiversity and include any relevant baseline information.

## Prepare a risk assessment

A risk assessment that details how each threat may impact on the success of achieving each relevant performance target must be undertaken.

For example (table 1):

Threat	Relevant performance criteria	Mitigation measures	Risk level
Grazing from domestic stock	Increase groundcover species diversity by 10% by 2020 in Management Area A	Management Area A to be fenced and domestic stock to be removed.	Low

The risk assessment should be used as a tool to determine the level of management that each threat requires.

*For example, 10 weed species may be present but only one is considered to be a high risk to maintaining ground cover diversity. The management action (including effort and period of implementation) would then be determined by the level of reduction required for that weed species to decrease to an acceptable level. The trigger levels for corrective actions describe the point at which current management actions need to be reviewed and potentially amended to ensure the performance indicators and targets are being met.*

The mitigation measures summarised in this risk assessment should be explained in detail.

### Recommendation

- A risk assessment (including threats, performance criteria, mitigation measures and risk level) be prepared following the example provided in table 1.

## Include biodiversity management and mitigation strategies

The BMP should detail the strategies to be implemented to manage biodiversity threats and to ensure that impacts on biodiversity values are minimised. While some of these are outlined in the draft BMP, more detail is required.

The timing of each strategy should also be outlined (whether they will be implemented over the short, medium or long term).

Mitigation measures and clearing protocols should include the recommendations in section 4.3 of the biodiversity assessment report for the Springvale water treatment project (RPS 2016<sup>1</sup>).

### Pre-development phase

Strategies to be undertaken in the pre-development phase may include, but not be limited to:

- pre-clearance surveys (see discussion in Appendix A [5])
- salvage of resources from the development area (including rocks, logs, hollows and soil resources) for habitat enhancement during the operational and rehabilitation phases
- transplanting and/or propagating threatened flora and native grassland and any other significant species
- managing soil disturbance, including conserving and reusing topsoil and subsoils to meet rehabilitation objectives

<sup>1</sup> RPS (2016) *Biodiversity Assessment Report Springvale Water Treatment Project*. Prepared for Springvale Coal Pty Ltd.

## Operational and post-development phase

Strategies to be implemented during the operational phase and as part of the post-development activities may include, but not be limited to:

- use of resources for habitat enhancement that were salvaged in the pre-development phase
- management of remnant vegetation and habitat
- revegetation and regeneration including the establishment (where relevant) of canopy, sub-canopy, understorey and ground strata
- rehabilitation of riparian areas and aquatic habitat
- catering for threatened species requirements where the rehabilitation or revegetation of areas of potential habitat will occur
- managing impacts on fauna, including catering for fauna that are to be relocated from the impacted areas on the project site
- controlling weeds and pest animals, including native pest animals
- managing soil disturbance
- controlling access
- integrating management with adjoining landholders
- wildfire and ecological fire management (see Appendix A [6])

## Rehabilitation

Whilst detailed rehabilitation objectives and procedures for areas to be impacted by the development may be contained in a separate document to the BMP, an outline of any rehabilitation activities to be undertaken should be provided. This should include:

- objectives of any rehabilitation activities, particularly any that relate to biodiversity
- a summary of proposed rehabilitation activities, including timeframes for the implementation of these activities (short, medium or long term)
- measures of how the success of rehabilitation will be measured, for example comparisons to vegetation benchmarks and condition prior to the project implementation or comparisons to established control sites
- management options if rehabilitation is not achieving the measures described above
- an explanation as to how rehabilitation activities will relate to the biodiversity management actions outlined in this plan
- description of intended final land use
- a map outlining where rehabilitation will occur

## Recommendation

- 10 Strategies to manage threats to biodiversity, and the timeframe for each strategy, are to be included in the BMP.

## Monitoring and reporting

The BMP needs to detail the monitoring program to be implemented that will assess the effectiveness of the management and mitigation strategies against the management objectives and performance indicators and targets. The need for, and difference between input, output and outcome criteria is discussed in Appendix A [7].

The monitoring program should:

- contain clear objectives and targets that relate to the biodiversity management objectives. All monitoring objectives and targets should adhere to the SMART principles (specific, measurable, achievable, realistic, timely)
- describe the intended monitoring methods and proposed analysis to be used
- measure any differences between predicted and actual impacts and outcomes
- identify any unpredicted impacts requiring remedial measures

- consider seasonal variability of certain biodiversity components when determining the timing of the monitoring
- monitor species recovery throughout the life of the project (and beyond) including establishing a succession pathway for key species and monitoring progress along this pathway at regular intervals
- be implemented throughout the construction, operation and (where appropriate) decommissioning of the project
- articulate how the results of the monitoring program will have an adaptive management feedback to the biodiversity management strategies that are being implemented

Depending on the actions required, the levels of monitoring may vary over the length of the project. For example, intense weed management initially may require frequent (annually or less) monitoring but in the long-term the rates may decrease as the weed infestation is controlled or removed. Alternatively, other monitoring rates may increase as cleared land or poor condition vegetation communities are regenerated or rehabilitated.

The nature and frequency of the reporting that will be undertaken should be described, including outlining who will be the recipients of the reports.

### Recommendation

- 11 A detailed monitoring program is to be implemented that will assess the effectiveness of the management and mitigation strategies against the management objectives and performance indicators and targets.

## Impacts must be within the limits specified in the development consent for the project

Schedule 2, conditions 6 and 7 of the development consent for the Springvale water treatment project specify upper limits for clearing of native vegetation (totalling 27.84 hectares) and for impacts on threatened species.

Table 2 of the development consent conditions specifies the maximum area of each vegetation type that can be cleared. Table 3 presents species credit requirements for three species, which can be expressed as the maximum number of individuals, or area of habitat, that can be impacted:

Species	Species credits required	Maximum number of individuals or area of habitat that can be impacted
<i>Eucalyptus cannonii</i> (Capertee stringybark)	39	3 individuals
<i>Caesia parviflora</i> var. <i>minor</i> (pale grass-lily)	42	3 individuals
<i>Chalinolobus dwyeri</i> (large-eared pied bat)	9	0.73 ha

Any impacts exceeding these limits would constitute a breach of the conditions of development consent.

The BMP must ensure that impacts on native vegetation and threatened species listed in tables 2 and 3 of the development consent conditions do not exceed the limits identified in these two tables.

### Recommendation

- 12 Upper limits of impacts on native vegetation and threatened species are clearly stated in the BMP, and a commitment made to ensuring these limits are not exceeded.

The relationship between this BMP and other management plans should be described

Centennial Coal has developed several management plans for their western operations region. These include:

- *Biodiversity Offset Package: Western Region*
- *Western Operations Regional Biodiversity Management Plan*

The relationship between these two plans and the BMP should be discussed.

**Recommendation**

- 13 Include a discussion of the relationship between this BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region.

# APPENDIX A: EXPLANATORY NOTES

## 1. Condition assessment

The vegetation communities present in each biodiversity management area should be identified within the BMP. The condition state(s) of each vegetation type should also be identified as per the BioBanking Assessment Methodology (see Appendix B).

These condition states include:

### *Low condition vegetation:*

Woody native vegetation with native over-storey percent foliage cover less than 25% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type, and

- less than 50% of ground cover vegetation is indigenous species, or
- greater than 90% of ground cover vegetation is cleared.

Native grassland, wetland or herbfield where:

- less than 50% of ground cover vegetation is indigenous species, or
- more than 90% of groundcover vegetation is cleared.

If native vegetation is not in low condition, it is in moderate to good condition.

### *Moderate to good condition vegetation:*

Native vegetation that is not in low condition, as defined above.

## 2. Species requirements

For each threatened species that will be impacted by the development, the requirements for that species and how they will be catered for across the non-impacted and/or offset areas should be detailed. Elements to be discussed should include preferred vegetation structure, floristic composition, food resources, minimum patch size, landscape connectivity, and breeding, nesting and roosting requirements. Knowledge of threats to the species and how these will be managed should be outlined.

An example of these species requirements for the Brown Treecreeper (*Climacteris picumnus victoriae*) is provided below. A BMP should provide this information and outline how each element will be provided for at the project site.

*Vegetation type and structure:* Eucalypt woodland, generally those lacking a dense understorey.

*Landscape position:* Low to moderate relief, particularly fertile patches.

*Diet:* Ants, beetles and larvae taken from ground, fallen logs and tree trunks.

*Competition:* Noisy Miners dominate fragmented woodlands and will exclude smaller species from territories. Starlings compete for nesting hollows.

*Breeding locations:* Nests in tree hollows 5-15 cm in size. Utilises a wide variety of tree species – not selective.

*Connectivity:* Will use paddock trees for dispersal across open country. These trees should preferably be less than 100m apart with 230m being the greatest recorded distance moved between paddock trees. Suitable habitat patches need to be no more than two kilometres apart and preferably one kilometre apart. Dispersal of females critical to maintain viable populations.

*Patch Size:* Unable to maintain viable populations in remnants less than 200 ha.

## 3. Native pest species

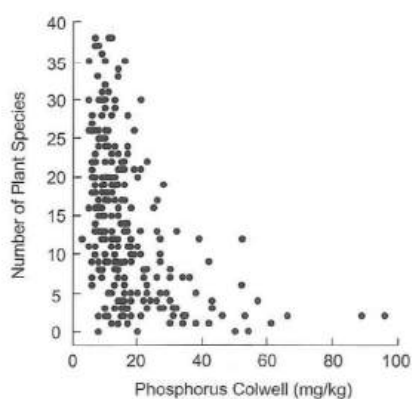
Some opportunistic native species compete with, and have a detrimental impact on other native species. An example is the Noisy Miner (*Manorina melanocephala*). This bird's aggressive behaviour can exclude many other birds from the patches they inhabit. Where Noisy Miners are present a BMP

should outline the management actions that will be implemented to reduce their impact on other species. This may include:

- implementing a control program;
- ensuring habitat patches are large enough to prevent the penetration of the species into habitat interiors; and/or
- ensuring grassland areas are densely vegetated as Noisy Miners prefer short heavily grazed pasture; and
- ensuring that rehabilitation and revegetation programs establish habitat with structural complexity.

#### 4. Past land use and rehabilitation/revegetation success

Whilst tree planting in degraded landscapes and rehabilitation areas is generally successful, the restoration of understorey species can be a difficult task. Pastures with a history of fertiliser application tend to be dominated by perennial grasses and weeds which can hamper the regeneration and establishment of native species. As soil phosphorus increases the ability of native vegetation to cope with the enhanced fertility decreases, impacting on native plant diversity and ground cover.



This graph shows how diversity of native plants (as measured by number of species) declines as available soil phosphorus increases.

\*From Dorrrough, Stol & McIntyre (2008)

This issue should be considered when rehabilitation and regeneration activities are being planned. Focusing regeneration activities on land that has been fertilised is likely to reduce the success of re-establishing a fully functioning vegetation community, and the time frame for establishment may be greatly extended.

#### 5. Pre-clearing surveys

Detailed information on the fauna to be impacted by the development should have been provided in the original environmental assessment. It is acknowledged that the development will result in the loss of habitat. However, research also indicates that most individuals in cleared areas will die in situ or in adjoining areas (Cogger *et al* 2003; Tyndale-Biscoe and Smith 1969; Woinarski *et al* 2006). The success rate of displaced individuals being able to establish in surrounding habitat (if present) is very low. In order to minimise direct deaths from clearing activities it is recommended that established pre-clearing guidelines like those developed by the Roads and Traffic Authority are utilised and the details are incorporated into the BMP.

Where a particular species of interest occurs, or further information is required on the density of a particular species, additional effort on pre-clearing surveys may be needed. This additional effort should be described in the BMP.

#### 6. Wildfire and ecological fire management

A fire management regime should be described that outlines the intensity, frequency and seasons that will form the basis of a wildfire and ecological fire program. The ecological requirements and

sensitivities of the vegetation communities that are present should be considered and the program developed accordingly. The regime should form a long-term strategy rather than be an activity that is developed on a short-term basis (three years or less).

## 7. Performance indicators and targets

Establishing appropriate criteria that will be monitored regularly to determine whether management objectives have been met is essential. The assessment criteria may take three forms:

1. Input – what action will be undertaken (e.g. 10 trees will be planted).
2. Output – what result is expected to be achieved by a particular action (eg. The trees will reach a height of 5 metres in 5 years; the trees will have medium-sized hollows by 100 years).
3. Outcome – the consequence of the output (eg. regeneration activities will establish habitat for the Brown Treecreeper within 80 years).

The proposed outcomes may need to be assessed at specific intervals in relation to expected succession timeframes. For example, the revegetation of an area to support the Brown Treecreeper may be a management objective. The establishment of a fully functioning habitat patch may not occur for 80 years or longer. Performance indicators should be established at regular intervals (for example 5 years) to determine:

- (1) if the expected successional trajectory is occurring; and
- (2) if not, appropriate adaptive management measures that can be applied to the site to ensure a successful outcome.

For example, if 1000 native trees were planted at the commencement of a revegetation program, and after 10 years only 200 trees remained and the groundcover was predominantly exotic species, then additional tree planting and/or weed management would need to be implemented. Monitoring undertaken in the vegetation community should also assess whether species that are expected to re-colonise the vegetation are in fact returning. For example, it may be expected that a range of small woodland-dependant birds should be recorded by year 5 and by year 20 there should be at least 15 different understorey plants present. Thus, the progress criteria might state:

- A range of small woodland dependent birds present at year 5 (examples could include thornbills, superb fairy-wren, robins and honeyeaters)
- at least 25 different understorey plant species present at year 20.

## 8. References

- Cogger, H., Ford, H., Johnson, C., Holman, J. and Butler, D. (2003) *Impacts of land clearing on Australian wildlife in Queensland*, WWF Australia; Sydney.
- Dorrough, J., Stol, J. and McIntosh, S. (2008) *Biodiversity in the paddock – a land managers guide*, Future Farm Industries CRC, Canberra.
- Tyndale-Biscoe, C.H. and Smith, R.F.C. (1969) Studies on the marsupial glider *Schoinobates volans* (Kerr) III Response to habitat destruction. *Journal of Animal Ecology* **38**: 651-659.
- Wilkins, S., Keith, D.A. and Adams, P. (2003) Measuring success: Evaluating the restoration of a grassy eucalypt woodland on the Cumberland plain, Sydney, Australia. *Restoration Ecology* **11**:489-503.
- Woinarski, J.C.Z., McCosker, J.C., Gordon, G., Lawrie, B., James, C., Augusteyn, J., Slater, L. and Danvers, T. (2006) Monitoring change in the vertebrate fauna of central Queensland, Australia, over a period of broadscale vegetation clearance, 1973-2002. *Wildlife Research* **33**: 263-274.

## APPENDIX B: GUIDELINES

Additional guidelines and information sources that may assist with the development of a BMP include:

### **BioBanking Assessment Methodology:**

<http://www.environment.nsw.gov.au/biobanking/assessmethodology.htm>

### **Pre-clearing surveys**

*Biodiversity guidelines – protecting and managing biodiversity on RTA projects* (Roads and Traffic Authority of NSW, September 2011)

[http://www.rta.nsw.gov.au/environment/downloads/biodiversity\\_guidelines.pdf](http://www.rta.nsw.gov.au/environment/downloads/biodiversity_guidelines.pdf)

### **Threatened species:**

OEH threatened species website

<http://www.environment.nsw.gov.au/threatenedspecies/>

### **Translocation of threatened fauna:**

*Policy for the translocation of threatened fauna in NSW* (NSW National Parks and Wildlife Service, October 2001)

<http://www.environment.nsw.gov.au/resources/nature/policyFaunaTranslocation.pdf>

### **Vegetation mapping:**

- NSW Vegetation Information System  
<http://www.environment.nsw.gov.au/research/VegetationInformationSystem.htm>
- *Native Vegetation Interim Type Standard* (Department of Environment, Climate Change and Water, January 2010)  
<http://www.environment.nsw.gov.au/resources/nativeveg/10060nvinttypestand.pdf>

### **Vegetation management:**

- A Guide to Managing Box Gum Woodlands  
<http://www.nrm.gov.au/resources/publications/stewardship/pubs/bggw-handbook.pdf>
- *Managing and Conserving Grassy Woodlands* (S. McIntyre, J McIvor and K Heard, 2002, CSIRO Publishing)
- *Managing Native Grassland: a Guide to Management for Conservation, Production and Landscape Protection*  
[http://awsassets.wwf.org.au/downloads/fl005\\_managing\\_native\\_grassland\\_1jul02.pdf](http://awsassets.wwf.org.au/downloads/fl005_managing_native_grassland_1jul02.pdf)
- *Biodiversity in the Paddock: a Land Managers Guide*  
<http://www.futurefarmonline.com.au/publications/other-publications.htm>

### **Revegetation**

*Planting for Wildlife: A Practical Guide to Restoring Native Woodlands.* (N. Munro and D. Lindenmayer 2011. CS



16 October 2017

Ref: SMPPS-O-00-M13-00-33

ATT: Liz Mazzer  
Conversation Planning Officer  
Regional Operation, North West  
Office of Environment and Heritage  
PO Box 2111, Dubbo, NSW, 2830

Dear Ms Mazzer,

**Re: Springvale Water Treatment Project (SSD 7592) – Consultation for Preparation of Biodiversity Management Plan**

Veolia Australia and New Zealand (Veolia) refers to correspondence received on 15 September 2017 (ref: DOC17/466024) from Office of Environment and Heritage (OEH) with queries pertaining to the draft Biodiversity Management Plan (BMP) for Springvale Water Treatment Project.

Veolia also hereby provides a response to recommendations provided by OEH as outlined in the table below.

The revised BMP and associated mitigation and management measures have been prepared in the context of:

- Apart from the Newnes Plateau, the buried pipelines will be located in cleared disturbed land where possible or along the edges of existing cleared corridors;
- In the Newnes Plateau the pipeline will follow an old logging track which is partially cleared but overgrown;
- Directional drilling will be used in at least one location and possibly others to avoid biodiversity and other impacts. The major crossing of the Cox River and one of its tributaries will be underbored, avoiding significant impacts on riparian corridors and other vegetation;
- Precondition biodiversity surveys have been completed and clearing estimates recalculated. A significantly smaller area of native vegetation will be cleared than predicted in the EIS as well as some of the threatened flora species have been re-identified and found not to be a threatened species – and the number of individual threatened flora plants potentially impacted have been reduced;
- Once construction is completed, the main biodiversity management measures will be maintaining a stable, weed-free and pest-free pipeline corridor and water treatment facility site. There are no other operational impacts.
- The pipelines pass through land owned and managed by different organisations and with existing Biodiversity Management Plans. Veolia will not own the project land or any surrounding land and therefore some biodiversity management measures the most effective solution is to integrate with existing land owners BMPs – especially for issues such as weed management.

OEH Recommendations	Veolia's Response	Reference
1. Include measurable performance indicators, targets, trigger points and corrective actions in the BMP.	Measurable performance indicators, targets, trigger points and corrective actions have been specified in the BMP.	Section 4 of the BMP
2. Detailed biodiversity benchmark data is to be included in the BMP, covering the main project area and any ancillary infrastructure.	Detailed biodiversity benchmark data has been provided based upon the biodiversity data in the EIS and the preconstruction condition assessment surveys.	Section 2 of the BMP

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3. The project area is to be divided into clearly identified zones for biodiversity management, with management objectives stated for each zone.	The Project has been divided in 5 separate Biodiversity Management Areas (BMAs) based upon vegetation types	Sections 5 of the BMP
4. Locations of bushfire management activities are to be mapped, and descriptions of each activity included in the BMP.	A bushfire management plan has been prepared and has been included in the BMP. The bush fire management plan contains actions that will be implemented to minimise bushfire risks during construction and maintenance activities. The only two project elements that will require Asset Protection Zones (APZ) are the water treatment facility. A 10m APZ has been adopted for both elements. The pipeline and the break tank on the pipeline route would not require any APZ as it is buried. Other bushfire management activities for operations would be developed in consultation with respective land owners and would be detailed in the operational environmental management plan.	Section 6.11 and Appendix D of the BMP
5. Clear maps showing locations of threatened species records and extent of endangered ecological communities at an appropriate scale are to be included in the BMP.	Maps showing threatened species locations and records at an appropriate scale have been provided.	Appendix A of the BMP
6. The ability to microsite infrastructure to avoid threatened species should be discussed.	The process of micro-siting infrastructure has been described in the BMP. The first stage of this has already been implemented and significant areas of clearing and impacts to threatened species has already been avoided	Section 6.2 of the BMP
7. The requirement of each threatened species to be impacted is to be discussed, along with how the requirements will be met.	The requirements for threatened species protection and how they will be met have been provided in the BMP.	Section 5 of the BMP
8. The BMP is to identify threats to biodiversity and include any relevant baseline information.	Threats to biodiversity and baseline data have been identified based upon the biodiversity assessment (EIS, 2016) and preconstruction condition assessment surveys.	Section 3 of the BMP
9. A risk assessment (including threats, performance criteria, mitigation measures and risk level) be prepared following the example provided in table 1.	Key risks were identified in the biodiversity assessment (EIS, 2016) – and these have been expanded and supplemented with additional risks and mitigation measures.	Section 4 of the BMP
10. Strategies to manage threats to biodiversity, and the timeframe for each strategy, are to be included in the BMP.	Strategies and timeframes for the management of threats to biodiversity have been identified and included in the BMP.	Section 4 of the BMP
11. A detailed monitoring program is to be implemented that will assess the effectiveness of the management and mitigation strategies against the management objectives and performance indicators and targets.	Monitoring programs have been proposed and the first stage of monitoring has already been undertaken. The monitoring programs would be used to assess the effectiveness of mitigation strategies and used to assess performance against the indicators and targets.	Section 5 of the BMP
12. Upper limits of impacts on native vegetation and threatened species are clearly stated in the BMP, and a commitment made to ensuring these limits are not exceeded.	The upper limits of native vegetation and threatened species to be cleared have been specified in the EIS and project approval. The project is committed to not exceeding these clearing limits and aims to clear significantly less vegetation. Based on data collected during the preconstruction surveys, the area of native vegetation cleared will be about a third of that predicted in the EIS and many of the threatened species that were predicted to be impacted either don't exist	Section 3.4 of the BMP
13. Include a discussion of the relationship between this BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region.	The relationship between the BMP and Centennial's Biodiversity Offset Package and Regional Biodiversity Management Plan for the Western Operations Region have been described.	Section 6.1 and Section 6.15 of the BMP



A revised BMP is provided with this letter via email (Liz.Mazzer@environment.nsw.gov.au).

Should you wish for further clarification, please do not hesitate to contact myself or Environmental Planning Lead, Elena Ivanova (+61 (0) 415 556 620; elena.ivanova@veolia.com).

Yours sincerely,

A handwritten signature in blue ink that reads "Nick Stokes-Hughes". The signature is written in a cursive style and is positioned above a horizontal dotted line.

**Nick Stokes-Hughes**

Project Director - Veolia Australia and New Zealand

M: +61 (0) 428 672 115 | E: nicholas.stokeshughes@veolia.com



Ivanova, Elena &lt;elena.ivanova@veolia.com&gt;

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**RE: Springvale Water Treatment Project (7592) - Biodiversity Management Plan**

1 message

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**Liz Mazzer** <Liz.Mazzer@environment.nsw.gov.au>  
To: "Ivanova, Elena" <elena.ivanova@veolia.com>

18 October 2017 at 11:24

Hi Elena

Thank-you for sending the additional information and revised plan.

There is no need for further clarification.

Regards

Liz

**From:** Ivanova, Elena [mailto:[elena.ivanova@veolia.com](mailto:elena.ivanova@veolia.com)]  
**Sent:** Monday, 16 October 2017 4:58 PM  
**To:** Liz Mazzer <[Liz.Mazzer@environment.nsw.gov.au](mailto:Liz.Mazzer@environment.nsw.gov.au)>  
**Subject:** Springvale Water Treatment Project (7592) - Biodiversity Management Plan

Hi Liz,

Please find the attached Veolia's letter response to OEH comments dated 14.09.2017 and a revised Biodiversity Management Plan for the Project.

Thanks.

**Best Regards,**

**Elena Ivanova**  
*Project Manager*  
**HEAD OFFICE**

cell: +61 415 556 620

Level 4, 65 Pirrama Road / Pyrmont NSW 2009 Australia

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## Upload RFI Response

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**Warning!** The Department has requested you amend your response to this request. Please amend your response to address the matters below and re-upload it in its entirety

### Additional information requested by Planner

#### Requested Information

Appendix A is missing. Please attach Appendix A.

Revision 14 Appendix C consultation identifies Section 4 as addressing OEH' comment, to "Include measurable performance indicators, targets, trigger points and corrective actions in the BMP", however Section 4 presents a summary of RPS' 2016 Biodiversity Assessment Report on the then Existing Environment and Environmental Impacts and Risks, but no performance indicators, targets, trigger points or corrective actions (management measures).


No Trigger Action Response Plan is provided in the BMP. Please clearly identify measurable performance indicators, targets, trigger points and corrective actions per OEH' comments. Additional information on how to address OEH' comments is contained in Attachment B of OEH' letter dated 14 September 2017.

Note, OEH is now known as the Environment and Heritage Group of the Department of Planning and Environment.

Consultation attached to the Plan is now almost 5 years old. Please include any further engagement or consultation comments from the Environment and Heritage Group and ensure that triggers, actions and adaptive management are consistent with contemporary conditions of consent.

### Details of Request

#### Attachments

 RFI Request for Post Approval\_25112022\_0...  
RFI-51305465 | RFI On Post Approval | Jessie Evans

### Upload Response

Regards

**Norman Green**

Manager Water Engineering



p: +61 (0) 2 4935 8902 | m: +61 (0) 4 7736 7047

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# Springvale Water - Biodiversity Management Plan More Information Required

Post Approval (SSD-7592-PA-30) > Request for Information (RFI-51305465)

## Upload RFI Response

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### Additional information requested by Planner

Requested Information

A Biodiversity Management Plan (BMP) sets out a commitment and a methodology to manage, enhance and protect biodiversity values (OEH, September 2017).

The Department notes that Condition 8, Schedule 3 of Development Consent SSD 7592 requires for the Biodiversity Management Plan to be prepared in consultation with the Biodiversity and Conservation Division (BCD).

Section 1.3 of the Biodiversity Management Plan states the following: *Consultation was undertaken with Office Environment and Heritage (OEH) in the preparation of this plan and their feedback has been included.*

You are requested to provide evidence of consultation undertaken with the BCD and demonstrate how the BCD's feedback has been incorporated into the Biodiversity Management Plans.

OEH (now BCD's) 2017 feedback requested "measurable performance indicators, targets, trigger points and corrective actions in the BMP."

The TARP in new Table 7 does not include measurable performance indicators targets or trigger points. It includes non-quantifiable performance triggers and actions, for example 'Aspect: Native Wildlife. Trigger: Increase in wildlife through visual inspection'.

Please clearly identify measurable indicators, targets, trigger points and corrective actions per OEH' comments. Additional information on how to address OEH' comments is contained in Attachment B of OEH' letter dated 14 September 2017.

OEH (2017) commented "commitments contained within a BMP should be clear and auditable. The BMP should cover impacts that may arise from activities conducted throughout the life of the project. It should cover any biodiversity conditions related to the development's impacts as well as the management of any biodiversity offset areas. These can potentially be in a single or multiple documents. All monitoring objectives and targets should adhere to the SMART principles, that is, be specific, measurable, achievable, realistic and timely."

### Details of Request

#### Attachments

RFI Request for Post Approval\_25112022\_0...  
RFI-51305465 | RH On Post Approval | Jessie Evans

### Summary

 <b>15-Dec-2023</b> Stage Deadline Date	 <b>11</b> Days Remaining	 <b>10</b> Urgency
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Details Resources

#### Current Stage

Initiate RFI

Response to RFI

Review Response

Close

#### Related Projects

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#### Additional information requested by Planner

##### Requested Information

Please provide clear triggers and actions consistent with OEH' advice, in a Trigger Action Response Plan (TARP) as part of the BMP.

OEH' (now BCD's) 2017 feedback requested 'measurable performance indicators, targets, trigger points and corrective actions in the BMP'.

The TARP referenced as contained in Section 5 does not include *measurable* performance indicators targets or trigger points. Table 5 in section 5 includes non-quantifiable performance objectives, for example 'no substantial weed issue'. Please clearly identify *measurable* performance indicators, targets, trigger points and corrective actions per OEH' comments. Additional information on how to address OEH' comments is contained in Attachment B of OEH' letter dated 14 September 2017.

#### Details of Request

##### Attachments

 RFI Request for Post Approval\_25112022\_0...  
RFI-51305465 | RFI On Post Approval | Jessie Evans

#### Upload Response

 **Attach Documents**

Upload your response to the request. If you are submitting a revised document then you are required to upload a tracked changes version in addition to an unmarked version.

##### Attachments

[Add attachment](#) +

#### Summary

 <b>29-Nov-2023</b> Stage Deadline Date	 <b>15</b> Days Remaining	 <b>10</b> Urgency
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- Review Response
- Close
- Related Projects ^