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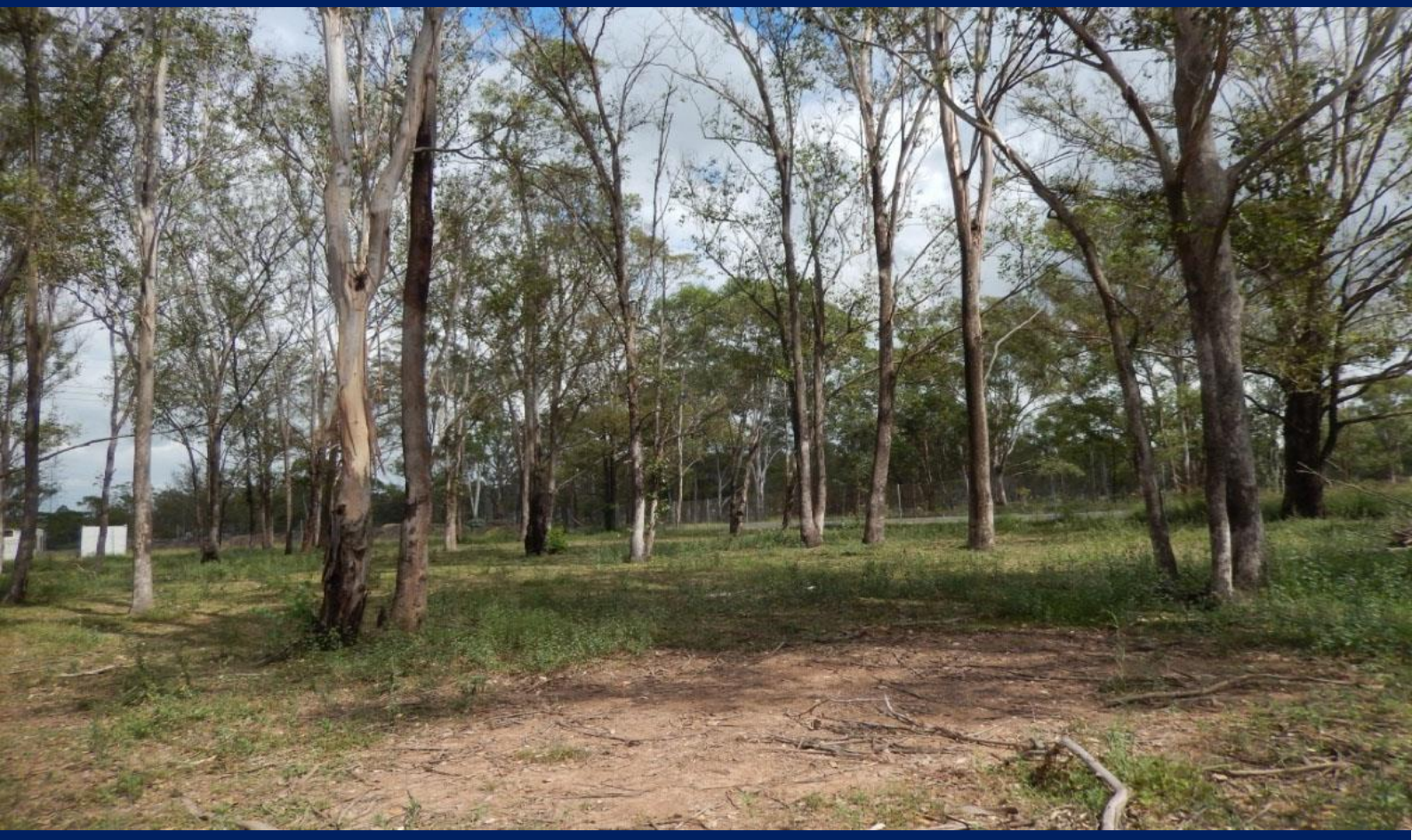
Biodiversity Management Plan



Alspec Industrial Park, Luddenham Road, Orchard Hills NSW

Biodiversity Management Plan

Prepared for: HBB Property

24 September 2024 Version: 1.5.1 – Final

PROJECT NUMBER	2024-027			
PROJECT NAME	Biodiversity Management Plan			
PROJECT ADDRESS	Alspec Industrial Park, Luddenham Road, Orchard Hills NSW			
PREPARED FOR	HBB Property			
AUTHOR/S	Ailis Chapman; Erin Leslie			
REVIEW	**Technical**	**QA**	**Version**	**Date to client**
	Robert Humphries		1.0 - Draft	26 March 2024
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	Robert Humphries		1.2 - Final	27 March 2024
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	Erin Leslie		1.5 – Final	13 September 2024
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Glossary and abbreviations

Acronym	Description
AIBP	Alspec Industrial Business Park
BC Act	*NSW Biodiversity Conservation Act* 2016
Biodiversity Conservation SEPP	State Environmental Planning Policy (Biodiversity Conservation) 2021
Biosecurity Act	*NSW Biosecurity Act 2015*
BMP	Biodiversity Management Plan
BMP area	The area assessed as part of this report.
CE	Critically Endangered
Council	Penrith City Council
CPCP	Cumberland Plain Conservation Plan 2022
DA	Development Application
DPE	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act* 1999
ha	Hectares
HBT	Habitat Tree
KPI	Key Performance Indicators
LGA	Local Government Area
PCT	Plant Community Type

Acronym	Description
Subject land	The lot that contains the development footprint that would be directly impacted by the proposed development.
SVTM	State Vegetation Type Map
TEC	Threatened Ecological Community. TECs is an umbrella term that comprises Vulnerable Ecological Communities (VECs), Endangered Ecological Communities (EECs) and Critically Endangered Ecological Communities (CEECs).
VMP	Vegetation Management Plan
WoNS	Weed of National Significance

1 Introduction

1.1 Background

Ecoplanning has been engaged by HBB Property to prepare a Biodiversity Management Plan (BMP) to accompany a Development Application (DA) for the proposed Bulk Earthworks and Subdivision into Nine Lots, Including Vegetation Removal, New Roads, and Basins (for Lot 1 // DP 1293805, 211-227, Lot 2 // DP 1293805, 289-317 and Lot 99 // DP 1282927, 211a Luddenham Road Orchard Hills). The BMP is a requirement of the DA and, as a minimum, addresses the Penrith City Council (PCC) pre-lodgement condition that:

- A Biodiversity Management Plan (BMP) demonstrating compliance with the mitigation measure guidelines within Appendix E of *The Cumberland Plain Conservation Plan* (CPCP) (DPIE 2022) and the *State Environmental Planning Policy (SEPP) Biodiversity and Conservation 2021* (DPE 2024).

This report provides management methods for Biodiversity Certified - Urban Capable Land as required by CPCP. Following a request for information (RFI) from PCC, Version 1.4 of the BMP has been updated to include additional impacts in areas zoned 'Certified – Major Transport Corridor' land.

1.2 Purpose and objectives of this BMP

The CPCP provides strategic biodiversity certification for development under Part 8 of the NSW Biodiversity Conservation Act 2016 (BC Act). The subject land is mapped as Certified - Urban Capable Land and 'Certified – Major Transport Corridor' land under the CPCP. Part 13.5 of the Biodiversity Conservation SEPP provides development controls for these zonings under the CPCP. The Biodiversity Conservation SEPP states that development consent must not be granted to development on 'Certified - Urban Capable Land' or 'Certified – Major Transport Corridor' land, unless the consent authority has considered whether the development is consistent with the CPCP Mitigation Measures Guideline (DPE 2022). The measures relevant to the development type and growth centre are listed in **Section 3** of this BMP.

The purpose of this BMP is to provide feasible management actions to implement all the required mitigation measures within the CPCP guideline.

1.3 Location

This BMP applies to Biodiversity Certified - Urban Capable Land and water storage basins within the subject land mapped under the CPCP as Certified – Major Transport Corridor land. Details of the subject land and biodiversity certification are provided in **Table 1.1** and shown in **Figure 1.1**.

All Avoided Land under the CPCP will be managed under a Vegetation Management Plan (VMP) and are not covered by this BMP, see **Figure 1.1**.

Table 1.1 Subject lot details

Feature	Description
Site address	Luddenham Road, Orchard Hills NSW
Property identifier (Lot and DP)	Lot 1//DP1293805 Lot 2//DP1293805 Lot 99//DP1282927
Subject lot	125.43ha
BMP area	76.19
Local Government Area (LGA)	Penrith City Council
Zoning	E4 – General Industrial

1.4 Proposed Development

The proposed development consists of the Bulk Earth Works as part of the subdivision for the Alspec Industrial Business Park (AIBP) development shown in **Figure 1.2.** The proposed works involve vegetation clearing, bulk earthworks and the construction of flood detention basins.

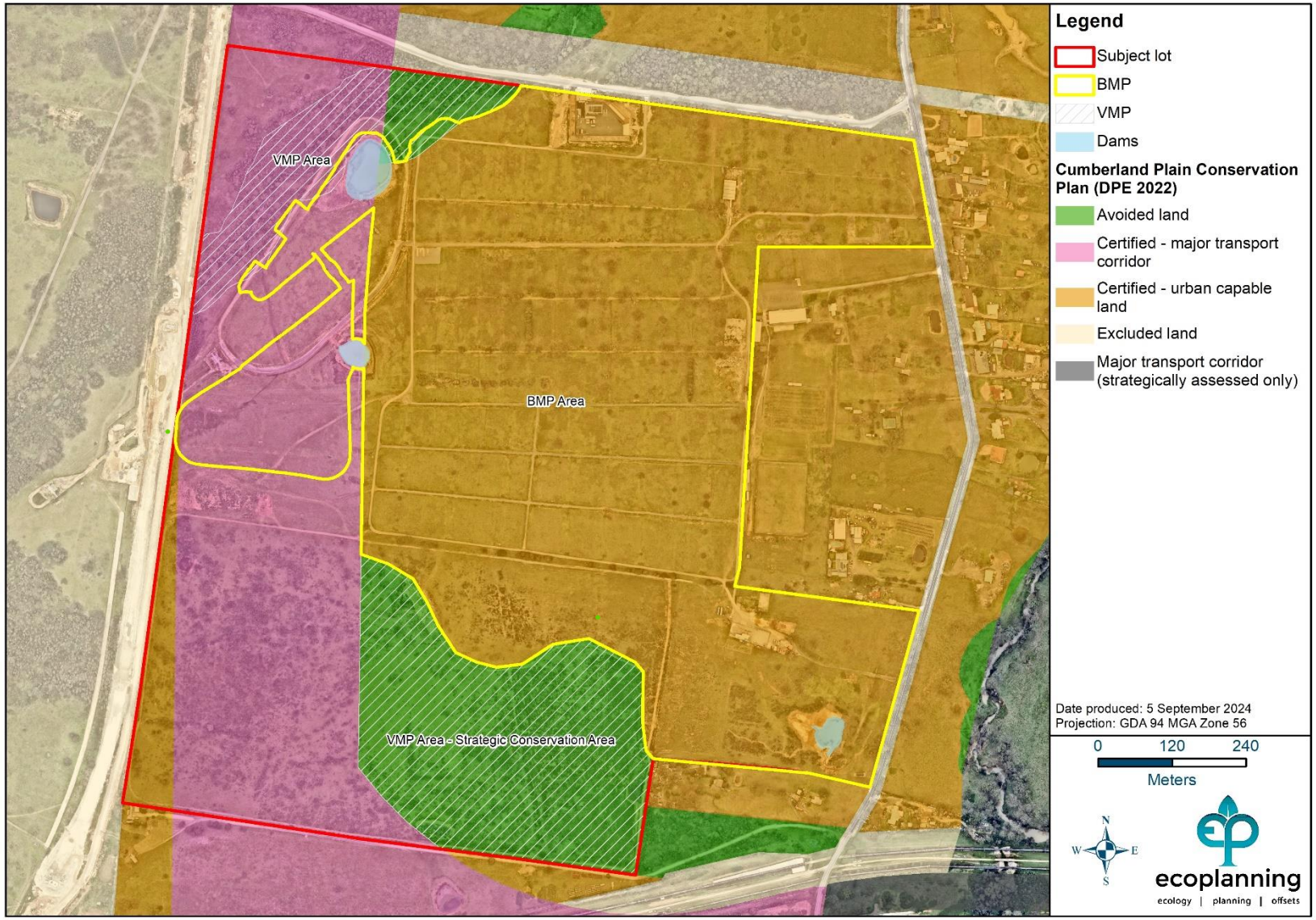

Figure 1.1: BMP area, subject lot and Cumberland Plain Conservation Plan land category mapping.

ALSPEC INDUSTRIAL BUSINESS PARK	
14-Mar-24	DA105
TOTAL LANDTAKE (m²)	1,253,773

Constraints Name	Constraints Area (m²)
40m Luddenham Road Widening Corridor	18,947
Access Road	2,326
Collector Road (25.6 m)	34,138
EE	6,372
Residual Land	612,763
Constraints Total Area(m²)	674,545

Pad Name	Pad Area (m²)
Pad 1	83,563
Pad 2	36,878
Pad 3a	53,360
Pad 3b	60,747
Pad 3c	33,249
Pad 4a	90,404
Pad 4b	122,263
Pad 4c	52,443
Pad 5a	26,588
Pad 5b	19,733
Total Developable Area (m²)	579,228

Figure 1.2: Proposed development.

1.5 Field Assessment

Field assessment while not required for certified land under the CPCP was used to address the required mitigation measures listed in this report.

A field survey was undertaken by Ailis Chapman (Consultant Ecologist) on 15 March 2024. The inspection involved assessing current site condition, surveying weed species and large trees and habitat features such as nests.

Previous surveys included a field survey on 17 August 2023 by Ailis Chapman (Consultant Ecologist) and Amy Mortell (Consultant Ecologist) for the adjacent riparian area. This survey included vegetation mapping and a survey for potential threatened species habitat (Ecoplanning 2023a).

Additionally, a site inspection was conducted on 30 and 31 March 2020 by Brian Towle (Senior Ecologist), Bret Stewart (Senior Ecologist) and Ben Brown (Ecologist). This survey included traversing these lots to determine the extent of native vegetation and surveying the study area for potential fauna habitat, including recording any hollow bearing trees (HBT), stags, decorticating bark, mature/old growth tree, winter flowering eucalypts etc. Vegetation zones across the study area were sampled within floristic plots conducted in accordance with the BAM. Opportunistic observations threatened flora were recorded (Ecoplanning 2023b).

Targeted surveys for the Green and Golden Bell Frog (*Litoria aurea*) were undertaken between 30 November and 13 January over four nights in 2022 by Ed Cooper (Senior Ecologist), Gemma Gillette, Nicholas Agostino and Simon Lee (Ecologists). Microbat surveys were undertaken over 16 nights beginning on 13 January 2022. Opportunistic observations of fauna were recorded (Ecoplanning 2023b).

2 Existing environment

2.1 Vegetation Communities

The BMP area consists of cleared paddocks with scattered trees adjacent to a vegetated riparian corridor and waterway. Historically, the site was used for agriculture.

Previous assessments identified the following three legacy Plant Community Types (PCTs);

- PCT 724 - Castlereagh Shale - Gravel Transition Forest,
- PCT 849 - Cumberland Shale Plains Woodland, and
- PCT 835 - Cumberland Riverflat Forest.

These legacy PCT which have been revised and simplified under the new State Vegetation Type Map (SVTM) (DPE 2023) to PCT 3448 Castlereagh Ironbark Forest and PCT 3320 Cumberland Shale Plains Woodland. Site assessment performed in March 2024 confirmed that the vegetation within the BMP area is most similar to these two revised PCTs. Adjacent riparian vegetation was verified to be PCT 4025 – Cumberland Riverflat Forest.

The BMP overlaps with the VMP, where land is zoned as a Certified Major Transport Corridor. Avoided Land is also covered in the VMP but is not covered by this BMP.

PCT 3448 occurs as two condition classes within the BMP area, paddock trees and regenerating understory, and PCT 3320 occurs as once condition class, paddock trees, see **Figure 2.1**. A small encroachment into PCT 4025 occurs. Other vegetation on site consists of exotic grassland, planted exotic trees and artificial.

2.2 Threatened Ecological Communities

PCT 3448 and PCT 3320 are both associated with Threatened Ecological Communities (TECs), listed in **Table 2.1**, however only two are present, see **Figure 2.2**.

Table 2.1: Threatened Ecological Communities

PCT	TEC	Listing Status	Presence within the BMP Area
PCT 3448 all condition zones	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E – BC Act CE – EPBC Act	**No** (Ecoplanning 2023b).
	Shale Gravel Transition Forest in the Sydney Basin Bioregion	E – BC Act	**Yes** – vegetation within the BMP most closely resembles the floristic characteristics of this TEC commonly including *Eucalyptus fibrosa* (Broad-leaved Ironbark); a moderately dense mid-storey of *Melaleuca* spp. (Paperbarks); with the presence of iron-indurated gravels (Ecoplanning 2023b).
	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act	CE – EPBC Act	**No** – the vegetation within the BMP area does not meet the condition thresholds to be considered this TEC (Ecoplanning 2023b)
PCT 3320 all condition zones	Cumberland Plain Woodland in the Sydney Basin Bioregion	CE – BC Act	**Yes** – vegetation within the BMP most closely resembles the floristic characteristics of this TEC and iron-indurated gravels are absent (Ecoplanning 2023b).
	Shale Gravel Transition Forest in the Sydney Basin Bioregion	E – BC Act	**No** (Ecoplanning 2023b).
	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act	CE – EPBC Act	**No** – the vegetation within the BMP area does not meet the condition thresholds to be considered this TEC (Ecoplanning 2023b).
PCT 4025 – Cumberland Red Gum Riverflat Forest	River-Flat Eucalypt Forest on Coastal Floodplains of the	Endangered – BC Act	**Yes** – The PCT on site is consistent with the description listed within the final determination for this TEC including floristic

	New South Wales North Coast, Sydney Basin and South East Corner Bioregions		composition, structure elevation and bioregion (DPE 2011).
	River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered – EPBC Act	**Yes** – The PCT on site meets the key diagnostic criteria listed in section 5.1.1 in the conservation advice for this TEC (DCCEEW 2020)

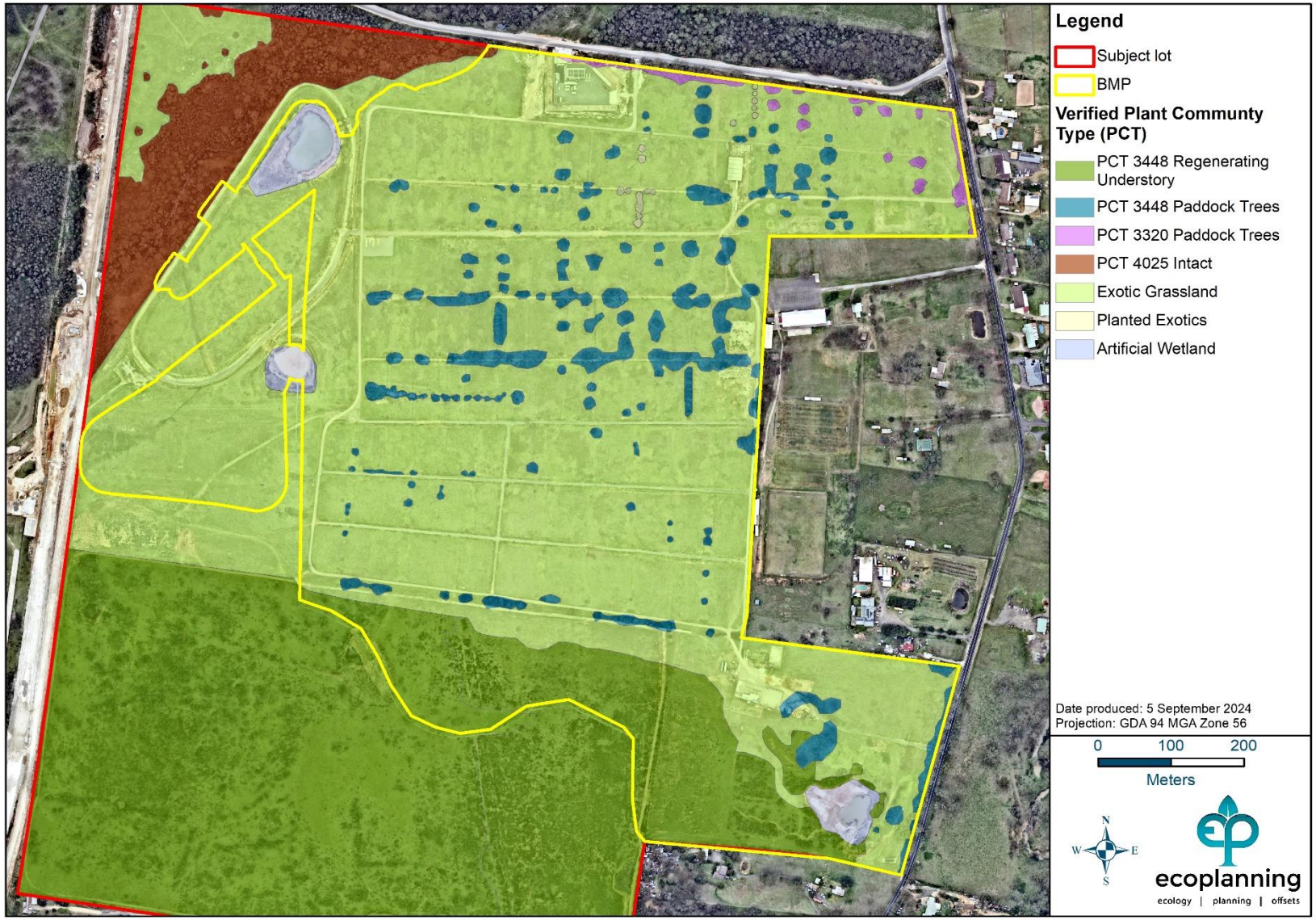

Figure 2.1: Validated vegetation (Ecoplanning 2024).

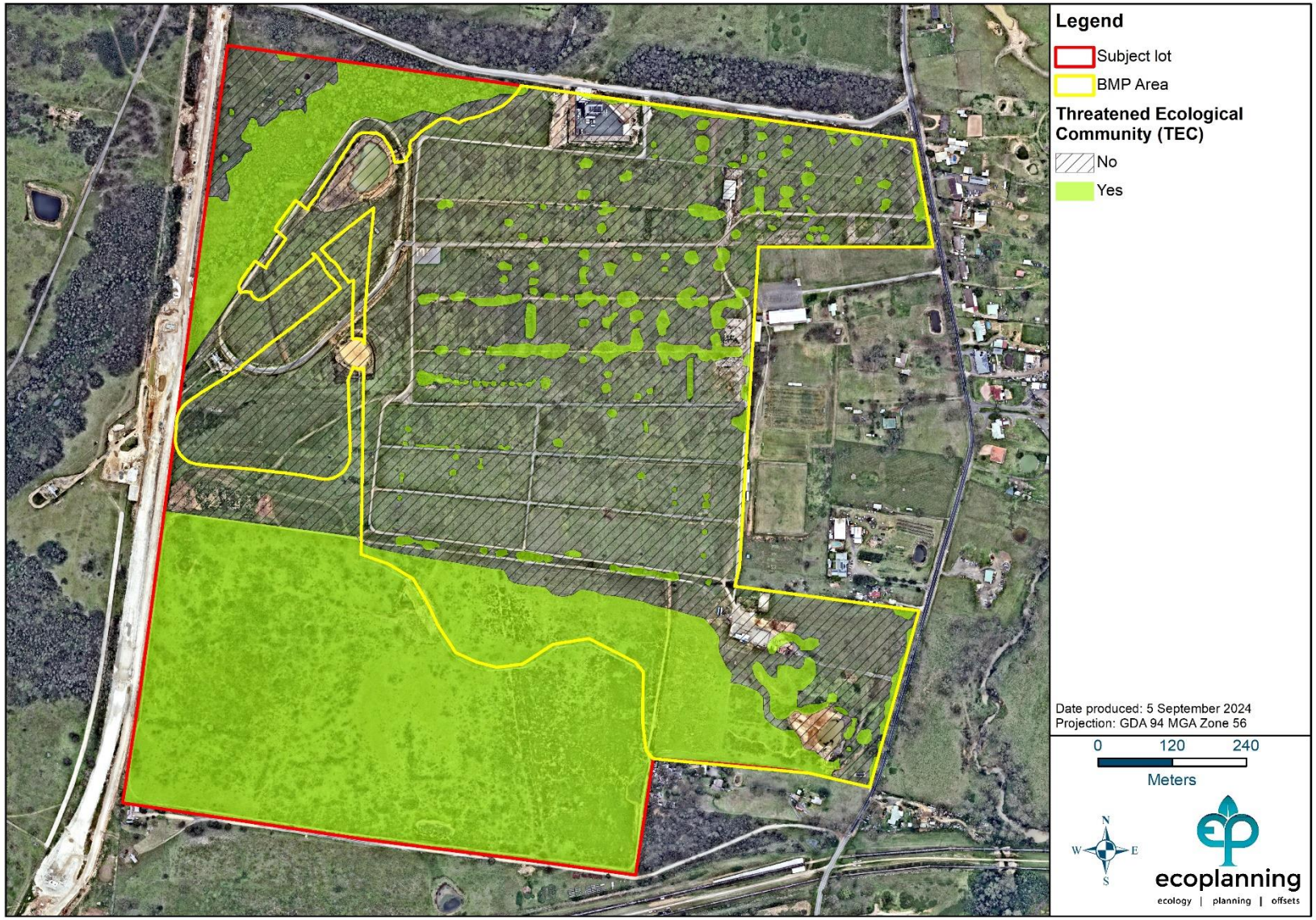

Figure 2.2: Threatened Ecological Communities (Ecoplanning 2024).

2.3 Threatened Species

Field survey in March 2020 confirmed the presence of the three threatened flora species previously recorded within the southern portion of the BMP area (Lot 242 // DP 1088991):

- *Dillwynia tenuifolia* vulnerable under the BC Act
- *Grevillea juniperina* subsp. *juniperina* (Juniper-leaved Grevillea) vulnerable under the BC Act
- *Pultenaea parviflora* endangered under the BC Act and vulnerable under the EPBC Act

These were restricted to Lot 242 // DP 1088991 and are widespread within this area, **see Figure 2.3.**

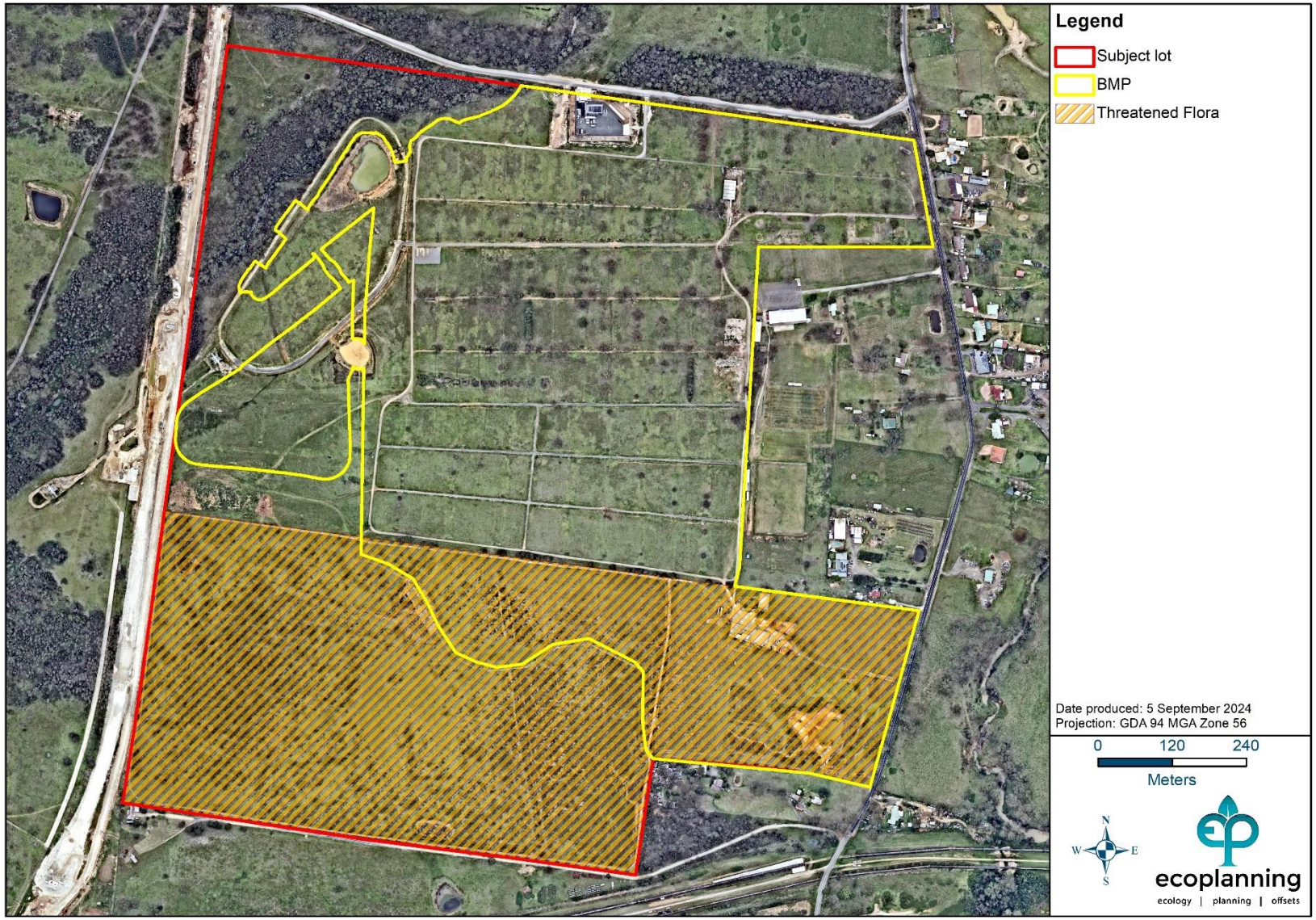

Figure 2.3: Threatened flora area.

During the March 2024 surveys the vulnerable migratory species Latham's Snipe (*Gallinago hardwickii*) under the EPBC Act, was incidentally observed, however the observation was unable to be confirmed. Regardless, the species has been deemed highly likely to occur within the BMP area.

Additionally, the following threatened fauna species were observed or recorded on or above site during previous surveys:

- Little Eagle (*Hieraaetus morphnoides*) vulnerable under the BC Act
- Cumberland Plain Land Snail (*Meridolum corneovirens*) endangered under the BC Act
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) vulnerable under the BC Act
- Greater Broad-nosed Bat (*Scoteanax rueppellii*) vulnerable under the BC Act
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) endangered under the BC Act

Targeted microbat surveys in January 2022 and recorded potentially seven additional threatened microbat species:

- Eastern Bent-winged Bat (*Miniopterus orianae oceanensis*) vulnerable under the BC Act
- Eastern Cave Bat (*Vespadelus troughtoni*) vulnerable under the BC Act
- Little Bent-winged Bat (*Miniopterus australis*) vulnerable under the BC Act
- Southern Myotis (*Myotis macropus*) vulnerable under the BC Act

The microbats species were assumed to occur or highly likely to occur within the VMP area (Ecoplanning 2023b).

Additionally, the Grey-headed Flying-fox (*Pteropus poliocephalus*) has also been deemed highly likely to occur within the VMP area (Ecoplanning 2023a).

2.4 Dams

Three dams are present within the BMP area, **Figure 1.1**. These dams were partially drained at the time of the March 2024 surveys, however still had standing water, vegetation and wetland bird species present.

2.5 Weeds

Seven exotic weed species were identified during the site survey that are priority weeds listed under the *Biosecurity Act 2015* and/or as Weeds of National Significance (WoNS). These are listed in **Table 2.2** with their biosecurity duty.

Table 2.2: Priority weed species present within the BMP area and their biosecurity duties.

Scientific Name	Common Name	Biosecurity Duty
Araujia sericifera	Moth Vine	**General Biosecurity Duty** All pest plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.
Cinnamomum camphora	Camphor Laurel	
Cirsium vulgare	Spear Thistle	
Eragrostis curvula	African Lovegrass	
Rubus fruticosus sp. agg.	Blackberry complex	
Senecio madagascariensis	Fireweed	
Tradescantia fluminensis	Trad	

3 Management Actions

3.1 CPCP mitigation measures

The mitigation measures in **Table 3.1** are from Part 2 of Appendix E of the CPCP are to be implemented in the subject land as part of the bulk earth works. Only mitigation measures relevant to the Greater Penrith Eastern Creek Growth Centre and for Certified Urban Capable and Certified Major Transport Corridor land have been listed.

Table 3.1: CPCP mitigation measures and management actions

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Retain large trees (including dead trees but excluding noxious weeds) (≥50cm DBH) during precinct planning where possible and avoid impacts to soil within the dripline of these trees during construction.	It is not possible to retain any trees within the BMP area.	N/A	N/A	N/A
Retain areas of high density Proteaceae shrubs where possible, particularly along riparian corridors.	No areas of high density Proteaceae shrubs are present within the BMP area.	A water storage basin will have an encroachment of 0.22 ha into the outer 50% riparian corridor. This has been 'offset' by assigning an equivalent area on the north-western bank protection and improvement under a VMP.	Construction contractor / Project Manager, Project Ecologist	Pre-construction and 5-years following implementation

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Undertake preconstruction surveys prior to removal or disturbance (seasonally dependent, before torpor) to human made structures to ensure any roosting habitat for microbat species including mine shafts, storm water tunnels, old or derelict buildings, bridges and culverts, are retained where possible.	No human made structures that are suitable for microbat roosting are present within the BMP area. However, there are hollow bearing trees which may function as roosting habitat for microbats present.	Prior to clearing, trees are to be inspected by a suitably qualified ecologist for the presence of microbats and their roosting habitat. All trees that contain potential roosting habitat are to be recorded. An Ecologist must be present for clearing of identified actual and potential microbat roost trees. All microbats found are to be relocated safely to a suitable location. If clearing occurs in winter, all microbats are to be given to a qualified and licenced wildlife carer (e.g. WIRES) to be cared for and released in spring when weather is suitable. Habitat supplementation, in the form of artificial roost boxes may be used if appropriate for the relocated species. This is to be done by a qualified ecologist.	Construction contractor / Project Manager, Project Ecologist	Pre-construction and construction
Modify pest control techniques implemented during construction and operation of the development and under the pest control strategy to reduce the risk of secondary poisoning (e.g., from Pindone or second-generation rodenticides).	No pest control will be performed during the works.	N/A	N/A	N/A

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Establish a 100 m minimum setback for development around flying fox camps. The setback area should be maintained free of flying fox roosting habitat.	No flying fox camps are within 100m of the subject land.	N/A	N/A	N/A
Raptor nests require a 500 m circular setback from nest locations in undisturbed bushland or 250 m for nests adjacent to existing development. Owl nests require a 100 m circular setback from nest locations	No raptor nests were observed during previous surveys, however suitable raptor nest trees are present within the BMP area.	Prior to clearing, trees are to be inspected by a suitably qualified ecologist for the presence of raptor and owl nests. Potential nests identified are to be watched during the day for raptors and at night for owls to confirm use over three days and/or nights. If nests are in use, clearing cannot occur until the breeding season of the animal is over and the birds have vacated the nest. Where appropriate, nests are to be relocated into the strategic conservation area. An Ecologist must be present for clearing of identified actual and potential nest trees. All birds found are to be relocated safely to a suitable location. Habitat supplementation, in the form of artificial nest boxes may be used if appropriate for the relocated species. This is to be done by a qualified ecologist.	Construction contractor / Project Manager, Project Ecologist	Pre-construction and construction

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Incorporate best-practice site hygiene protocols to manage the potential spread of pathogens, such as *Phytophthora* and myrtle rust within or adjacent to potential habitat for relevant species	No signs of phytophthora were observed on site; however the disease is known to occur in the greater locality.	Manage the spread of *Phytophthora cinnamomi* as far as practical. Provide washdown stations for vehicles, machinery and personnel at site entry using a 1:3 mix of methylated spirits and water. Washdown tires and boots upon entering and leaving site.	All personnel	Pre-construction and construction
Consult with relevant land managers to implement critical actions for Cumberland Plain land snail under the Save our Species program (EES, 2020) on public land adjacent to urban development during construction and operation of the development, taking into account relevant guidance in the weed control implementation strategy and the fire management strategy.	Cumberland Plain Land Snails have been observed within the BMP area.	Prior to construction vegetation is to be surveyed by a qualified ecologist for Cumberland Plain Land Snail. Any identified snails are to be relocated to a suitable area outside of the construction zone. Future fire management strategies must consider indirect impacts to Cumberland Plain Land Snails.	Construction contractor / Project Manager	Pre-construction

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Implement 'open structure design' when designing structures such as roads adjacent to known populations of Cumberland Plain land snail where possible, consistent with the critical actions for this species under the Save our Species program (EES 2020)	The proposal consists of earthworks and the construction of flood detention basins, no other infrastructure will be constructed.	N/A	N/A	N/A
Manage weeds for flora populations and habitat adjacent to urban and infrastructure development during construction and operation of the development, considering relevant guidance in the weed control implementation strategy.	A widespread threatened flora population exists in the southern portion of the BMP area and the adjacent VMP area. The threatened flora within the BP area are being removed however, weeds must still be managed to prevent spread into the VMP and Strategic Conservation Area.	Manage weeds using best practice hygiene methods in accordance with the NSW Biosecurity Act. Any waste containing weed propagules must be disposed of at an appropriately license waste facility. See **Section 2.4** for the priority weeds present on site and their biosecurity duties.	Construction contractor / Project Manager	Construction

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Consult with managers of land containing known populations or habitat for relevant species (*Dillwynia tenuifolia*, *Grevillea juniperina* subsp. *juniperina Pultenaea parviflora*) to mitigate indirect impacts from fire during construction and operation of the development, considering guidance in the fire management strategy.	A widespread threatened flora population exists in the southern portion of the BMP area and the adjacent VMP area. The threatened flora within the BP area are being removed however, fire must still be managed to prevent indirect impacts into the VMP and Strategic Conservation Area.	Future fire management strategies must consider indirect impacts to threatened flora.	N/A	N/A

CPCP Mitigation Measure	Site Specific Application	Management Action	Responsibility	Timing
Consult with land managers of land containing known populations or habitat for relevant species (*Dillwynia tenuifolia*, *Grevillea juniperina* subsp. *juniperina Pultenaea parviflora*) to mitigate indirect impacts from human disturbance during construction and operation of the development, including controlling public access, managing maintenance activities such as mowing and slashing, and managing rubbish dumping.	A widespread threatened flora population exists in the southern portion of the BMP area and the adjacent VMP area. The threatened flora within the BP area are being removed however, fire must still be managed to prevent indirect impacts into the VMP and Strategic Conservation Area.	Adjacent threatened flora population to be retained will be demarcated as a “No-Go Zone” and protected throughout the entire duration of works. No access for vehicles, machinery or personnel are to be permitted within this Zone. See the VMP (Ecoplanning 2024) for more details.	All personnel	Pre-construction and construction

3.2 Other Management Actions

The following management actions have been included to further reduce impacts on biodiversity based on best practice methods.

Table 3.2: Other management actions

Safeguards	Responsibility	Timing
Dewatering of the three dams on site is to be done in accordance with the Dam dewatering protocol in **Appendix A.**	Construction contractor	Construction
All protected native vegetation will be protected during the entire extent of the works, e.g. temporary fencing, flagging and tree protection. No personnel or machinery are to enter the protected area.	Construction contractor/Project Manager	Pre-construction and construction
If any vertebrate fauna are identified during works and require rescue, a qualified Ecologist, or fauna rescue volunteer, will be notified. Works will not continue until the animal has been rescued. Call either WIRES on 1300 094 737.	All personnel on site	Pre-construction and construction
During clearing works or construction works, if any vertebrate fauna are identified in the works area, works will stop immediately and a qualified Ecologist should be contacted. A macropod management protocol is included in as **Appendix B**.	All personnel on site	Pre-construction and construction
No sediment will be allowed to move from the works area into the protected area. Erosion and sediment control will be detailed in a Construction and Environmental Management Plan (CEMP), including types of control, method of installation, locations, maintenance regime, responsibilities, and stockpile storage. All sedimentation and erosion control measures will be designed, installed, and maintained using procedures outlined in the *Standards of the Soil Conservation Service of NSW, WR Volume 4* and *Managing Urban Stormwater: Soils and Construction 2004 4th edition* (Landcom 2004). Controls are to maintained daily and installed prior to any construction activity.	Construction contractor	Pre-construction
Manage biosecurity in accordance with the *NSW Biosecurity Act 2015* (see NSW Weedwise)	All personnel on site	Pre-construction and construction

Safeguards	Responsibility	Timing
, including disposal of weeds to a licenced waste disposal facility.		
Best practice hygiene will be implemented to prevent the spread of invasive weeds. Vehicles and plants will be inspected for mud and soils before entering and leaving site. Stockpiles of materials containing invasive weed plant matter will be covered and bunded to prevent spread.	All personnel on site	Pre-construction and construction
Stockpiling or refuelling will be undertaken in allocated areas such as existing asphalt and/or hard standing or cleared grassy area. Stockpiles and refuelling areas will be clearly marked and have appropriate bunding and erosion and sediment controls in place.	Construction contractor/Project Manager	Pre-construction and construction
Heavy machinery, plant or equipment are to be stored in on existing hardstand areas or previously cleared areas.	Construction contractor/Project Manager	Pre-construction and construction
Waste and excess spoil will be managed in accordance with the *NSW EPA Waste Classification Guidelines* (EPA, 2014). Waste (including weed materials) will be disposed of at an appropriately licenced facility.	Construction contractor/Project Manager	Pre-construction and construction
All waste will be stored in ancillary areas and removed from site to a suitably licenced waste facility.	Construction contractor/Project Manager	Pre-construction and construction
Hollows if encountered during clearing works are to be salvaged as much as possible and relocated into the Riparian area of the VMP (VMZ 1). They are to be placed under the supervision of a qualified ecologist and only if the placement will not damage the existing native vegetation in any way. Section 4.4 of the Riparian VMP and Section	Construction contractor/Project Manager	Construction

4 Monitoring and reporting

All management actions described above in **Table 3.1** and **Table 3.2** must be implemented and documented. The following sections describe reporting and monitoring requirements to demonstrate compliance.

4.1 Key Performance Indicators

The Key Performance Indicators (KPIs) listed in **Table 4.1** allow measurable outcomes for management actions of this BMP. At the completion of the project all KIPs must have been met.

Table 4.1: Key Performance Indicators

Key Performance Indicators	Responsibility	Timing
Preclearance surveys undertaken for microbat habitat, raptor and owl nests and Cumberland Plain Land Snails	Construction contractor / Project Manager, Project Ecologist	Minimum 14 days prior to vegetation clearing.
Clearing supervision of identified habitat trees. Injury to fauna is avoided as much as practicable. All recovered fauna during clearing supervision recorded and safely relocated an appropriate location within nearby bushland. Any relevant habitat features are salvaged, relocated or supplemented as far as practical.	Construction contractor / Project Manager, Project Ecologist	Vegetation clearing.
Implement best practise measures to minimise the spread of *Phytophthora cinnamomi* as far as practical.	Construction contractor / Project Manager	Pre-construction and construction
Weeds are managed using best practice hygiene methods in accordance with the NSW Biosecurity Act. All waste containing weed propagules disposed of at an appropriately license waste facility.	Construction contractor / Project Manager	Pre-construction and construction
Adjacent threatened flora population to be retained demarcated as a “No-Go Zone” and protected throughout the entire duration of works.	Construction contractor / Project Manager	Pre-construction and construction

4.2 Monitoring and Reporting

A report is to be prepared by a suitable qualified ecologist prior to vegetation clearing and after vegetation clearing to demonstrate compliance with this BMP.

At completion of the works all KPIs must be met and a report prepared by a qualified ecologist demonstrating compliance.

5 References

Ecoplanning (2023a). Flora Fauna Assessment– Alspec Industrial Park, Luddenham Road, Orchard Hills NSW. Prepared for HBB Property.'

Ecoplanning (2023b). Ecological Constraints Assessment– Alspec Industrial Park, Luddenham Road, Orchard Hills NSW. Prepared for HBB Property.'

NSW Department of Planning and Environment (DPE) (2022a) Cumberland Plain Conservation Plan Mitigation Measures Guidelines, Published by the NSW Department of Planning and Environment August 2022.

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Appendix A Dam dewatering protocol

Background

This protocol has been prepared for the dewatering of the three dams located within the BMP area to reduce the risk of accidental injury of displaced fauna.

Licenses

A search of the NSW Water Register did not indicate that the dams are licenced with NSW DPI Water. However, not all licences that apply to a particular lot may appear on the Register due to inaccuracies in the land referencing information in Water NSW's licence database. In the event of licencing, it is required that DPI Water are notified of dam decommission so they are removed from the register.

Website: https://waterregister.waternsw.com.au/water-register-frame

Email: water.enquiries@waternsw.com.au; Phone: 1300 662 077

To relocate aquatic fauna safely and ethically, the following licences are required to be held by the person or persons overseeding the activity:

- Animal Research Authority (Animal Care and Ethics), issued by the Secretary's Animal Care and Ethic Committee.
- NSW Fisheries - Section 37 – Scientific Collection Permit, required for fish relocation.
- NSW National Park and Wildlife Service – Section 120 General Licence (not required if DA specifies relocation as a condition) required for turtles, frogs and wetland birds.

Dewatering Method and Timeline

The following method outlines how water should be pumped from the dams. Following these instructions should minimise the volume of water leaving the property. **Table A.1** identifies the timeline for dam dewatering.

- Prior to dewatering, dams should be inspected for the presence of water weeds
- Dewatering should occur before vegetation removal from the irrigation land.
- To filter any excess overland flow, sediment controls should be in place.
- To minimise refilling with rainwater, placement of an upslope diversion bund may be required, deflecting any flows around the dam.
- Water from the dams should be irrigated overland and allowed to infiltrate the soil (see Figure 2).
- The rate of pumping should allow for maximum soil infiltration with minimal overland flow (estimated 36 mm/hr).
- If saturation of the soil occurs, irrigation should be adjusted by either relocating the pump out location or until conditions will allow for irrigation to commence again.
- Depending upon the size of the pump used (see Figure 3), it is anticipated that the dewatering process could be completed in a single 8-hour day.

Table A.1: Dam dewatering methods, timeline, and responsibilities

Day - Stage	Steps	Responsibility
Site assessments	• Dam assessed for presence of water weeds. • Treatment of weed species prior to beginning dewatering process. This may involve manual weeding and in areas with a large abundance of weeds, herbicide treatments may be required. Bush regenerators should be consulted.	Bush Regenerator Contractor
1 Preparation	• Install bunds, erosion controls and prepare pumps. • Position pump intake over deepest part of each dam on a floating device. Anchor with ropes. • Test discharge and diversion to ensure no erosion and/or sedimentation occurs downstream. • Do not disturb vegetation in areas where soil irrigation will occur. • Notify ecologist.	Site Manager
2 Pumping and fauna rescue	• Pump and irrigate at a rate which allows for infiltration to the soil (open pumping). • Check sediment controls if surface runoff occurs, pumping rate may need to be adjusted. • Rescue fauna during final 0.3-0.5 m of water, see plan of action below. • Water will become turbid, discharge turbid water away from drainage lines. For rapid fauna rescue, allow pump inlet to suck sediment. • Earthworks machinery can also push sediment across dam to assist final fauna capture (based on Ecologist's instructions). • Partially remove wall to prevent re-filling and stabilise if needed. Grade fauna escape ramp.	Site Manager, Excavator Operater & Ecologist
3 Vegetation clearing	• Clear surrounding vegetation • Leave fauna escape ramp for two nights.	Excavator Operator
Final steps	• Remove sediment and wall, commence construction works.	Excavator Operator

Expected fauna and capture and release plan

Fauna

The following aquatic species were recorded during previous field assessments, which may be found during the dam dewatering process however more species may be present.

- Common Eastern Froglet (*Crinia signifera*)
- Spotted Marsh Frog (*Limnodynastes peronii*)
- Striped Marsh Frog (*Limnodynastes tasmaniensis*)
- Dwarf Tree Frog (*Litoria fallax*)
- Peron's Tree Frog (*Litoria peronii*)
- Smooth Toadlet (*Uperoleia laevigata*)
- Mosquito Fish (*Gambusia holbrooki*)

Any exotic species found within the dam will be humanely euthanised onsite and if necessary, disposed of at a waste disposal facility. It is recommended that fish be sedated using Aqui-S or clove oil followed by decapitation.

Plan of action for fauna present

Handling of any aquatic fauna found during dewatering should be undertaken by an appropriately qualified ecologist. The ecologist should hold the licences identified above. The recommended aquatic fauna handling procedures are detailed below in Table 3:

Table A.2: Fauna capture and release plan

1. Notification	• **NSW Fisheries must be notified of the dewatering 48 hours prior to commencing works.** • **NSW Fisheries requires specific permits to be held by the ecologist (refer to licenses above).** • If working in a public area, signage should also be displayed showing Scientific Collection Permit number.
2. PREPARATION	• Ensure dewatering schedule has allocated sufficient time for fish rescue. This is especially important during the final 0.3-1.0 m of water (to be advised by ecologist). Fauna capture should be completed in one day. • Pump placement is important and needs to be in a location where it is not impeded by mud and debris, ideally in the deepest part of the dam. The pump intake also needs to be of an adequate size. • If wetland birds or young birds (chicks) are observed nesting or using the dam an aquatic ecologist should be immediately consulted. Depending on species and age, birds may need to be relocated. Chicks will need temporary refuge.

3. CAPTURE	*Safety: At least two people are required when wading and handling heavy containers of water/fish. Excavate steps/ramp for access if needed.* • During capture target large fish first. Small fauna will likely remain uncaptured until dam water becomes very shallow. When the water is very low, fauna may head towards the pump intake, in the deepest part. Monitor this area to intercept fauna, standing next to intake pump. • **Fish**: should be collected by hand nets which are most effective when the water is <0.3 m deep. Dissolved oxygen concentration will drop as water volume decreases, especially in warmer weather. • **Eels:** Best captured by large hand nets in water <0.3 m deep. May burrow into the mud. • **Turtles**: Will burrow into the mud. They may require observation and rescue, however, they can move themselves to suitable nearby habitat if an escape ramp is graded.
4. RELOCATION	• Species in containers should not be overstocked or left in the direct sun. If aeration is required, use battery aquarium pumps or manual turbulence. • **Fish/Eels:** Native fish in a healthy condition should be contained and transported in an appropriate aerated container to a similar creek/lake/dam. Following NSW Fishery advice, host location should be large enough to accommodate additional fish, especially predatory species. If not, additional release sites should be found. • **Turtles:** Can be transported in shaded container with wet hessian bag for moisture/comfort. • **Tadpoles:** small buckets can be used.
5. RELEASE	• When releasing fauna, take care not to transfer weeds or invasive species. Release animals via hand nets rather than tipping the container. • **Water:** Carefully mix water from receiving waterbody with the container water over a 5-to-10-minute period. This helps fish acclimatise to the new water conditions. • **Eels:** can be released a few meters from the water's edge and directed towards the water.
6. PESTS	• **Exotic Fish:** Intercept, euthanise and disposed of at a licensed waste depot. • **Exotic species:** If *Trachemys scripta* (Red-eared Slider Turtle) is found, they are to be contained humanely and OEH notified immediately. The live turtle will be collected from the ecologist.

7. POST DEWATERING	• Earthworks staff should notify appointed ecologist if stranded fish, eels or turtles are observed post dewatering. • **Escape Ramp:** Should be graded to allow trapped fauna time to escape overnight. The ramp should be left for two nights unless the ecologist confirms that no fauna remains.

Captured fauna will be relocated to the riparian waterway in the Northwest corner of the site.

Appendix B Macropod Management Protocol

Objective

The goal of this protocol is to identify and safely manage macropods, ensuring their exclusion from areas where they could face harm or interfere with management activities, including preventing their entrapment in the Strategic Conservation Area (SCA) Vegetation Management Plan (VMP) area following installation of permanent fencing.

Procedure

Ecological supervision

A suitably qualified ecologists experienced in macropod detection and handling will conduct surveys during the installation of temporary fencing, prior to construction activities and installation of permanent fencing.

Fencing Installation

Temporary fencing should be installed in the following stages to effectively exclude macropods from the development area, prior to installation of permanent fencing.

- Stage 1: Begin at the corner of Patons Lane and Luddenham Road, moving west.
- Stage 2: Begin at the corner of Patons Lane and Luddenham Road, moving south.
- Stage 3: Begin in the south-east corner of the development footprint, moving west.

This phased approach will enable any macropods identified within the development footprint to be safely herded away from Luddenham Road, into adjacent habitat.

After ensuring the development footprint is macropod-free, permanent fencing will be installed as outlined in other approved documents, including the SCA VMP.

Permanent fencing designs and locations have been selected to facilitate the movement of macropods into and out of the VMP area while excluding them from the BMP area and Luddenham Road.

Herding Techniques

Low-impact, gentle herding methods will be used to minimise stress on the macropods, guiding them towards safer areas.

Reporting

The ecologist engaged for supervision works will prepare a brief letter summarizing the results of pre-clearance surveys, including details of any macropods encountered and the outcome of their relocation.