Appendix B: Revised Biodiversity Development Assessment Report

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RYE PARK WIND FARM

Biodiversity Development Assessment Report

FINAL

August 2020

RYE PARK WIND FARM

Biodiversity Development Assessment Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Rye Park Renewable Energy Wind Farm Pty Ltd

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Report No.	4107/R05/Final
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This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Executive Summary

Rye Park Renewable Energy Pty Ltd (which is a wholly owned subsidiary of Tilt Renewables Australia Pty Ltd) (RPRE) is seeking a modification to the existing State Significant Development (SSD) approval (SSD 6693) for the Rye Park Wind Farm Project. This includes a reduction in proposed wind turbines, increased maximum tip height, increased Rotor Swept Area (RSA), reduction of operational and maintenance facilities as well as a number of other changes to associated infrastructure.

The Development Corridor – Wind Farm is located on a long ridgeline running generally north-south, near the townships of Rye Park, north of Yass and east of Boorowa, NSW (refer to **Figures 1.1** and **1.2**). The Indicative Development Footprints span three Local Government Areas (LGA), being the Hilltops Council, Upper Lachlan Shire Council and Yass Valley Council. The Indicative Development Footprints (Wind Farm, Permanent Met Masts and External Roads) cover an area of approximately 516 hectares within the larger Development Corridors totalling approximately 1,327 hectares.

The Rye Park Wind Farm Project was originally assessed as a Major Project, under Part 3A of the NSW *Environmental Planning and Assessment Act 1979.* The project was subsequently transitioned from being a transitional Part 3A project to being state significant development (SSD) under the EP&A Act by an order made on 21 March 2014. NSW Development Consent for the Rye Park Wind Farm Project was granted on 22 May 2017 by the NSW Planning Assessment Commission (PAC) (DPE 2017) under the former Section 89E of the EP&A Act. As the Proposed Modification seeks to modify a major project approval, it requires a Biodiversity Assessment Method (BAM) assessment under the *Biodiversity Conservation Act 2016* (BC Act).

This Biodiversity Development Assessment Report (BDAR) has been prepared by Umwelt on behalf of RPRE to assess the potential biodiversity impacts of the Proposed Modification in accordance with the BAM.

The Indicative Development Footprints support four Plant Community Types (PCTs) and five species credit species, being:

- 0.78 hectares of PCT 289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion. **This vegetation community was not previously assessed (NGH Environmental 2014 and 2016).**
- 5.50 hectares of PCT 335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion. **This vegetation community was not previously assessed (NGH Environmental 2014 and 2016).**
- 37.60 hectares of PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion. **Compared with the 50.2 hectares previously assessed (NGH Environmental 2014 and 2016), this presents a decrease of 12.60 hectares.**
- 351.83 hectares of PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion. **Compared with the 190.6 hectares previously assessed (NGH Environmental 2014 and 2016), this presents an increase of 161.23 hectares.**

- 3.58 hectares of habitat for striped legless lizard (*Delma impar*). **This presents a decrease of 45.92 hectares to what was previously assessed (NGH Environmental 2014 and 2016).**
- 0.03 hectares of habitat for southern myotis (*Myotis macropus*). **This species was not previously assessed (NGH Environmental 2014 and 2016).**
- 102.97 hectares of habitat for squirrel glider (*Petaurus norfolcensis*). **This species was not previously assessed (NGH Environmental 2014 and 2016).**
- 20.08 hectares of habitat for superb parrot (*Polytelis swainsonii*). **This presents decrease of 4.82 hectares to what was previously assessed (NGH Environmental 2014 and 2016).**
- 43.20 hectares of habitat for golden sun moth (*Synemon plana*). **This presents a decrease of 23.74 hectares to what was previously assessed (NGH Environmental 2014 and 2016).**

The Project will impact a total of 37.50 hectares of White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act within Vegetation Zones 3 (20.08 hectares) and 4 (17.42 hectares); and 35.73 hectares of *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* under the EPBC Act within Vegetation Zones 3 (19.38 hectares) and 4 (16.35 hectares). **Please refer to Section 3.2.3.1 with regard to updates to conservation status of White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act.**

Impacts to the CEEC under the BC Act are less (**12.70 hectares**) than the impact threshold of 50.2 hectares for this TEC as identified in Consent Condition 19(a) of the existing State Approval, successfully avoiding 12.70 hectares of CEEC (BC Act) threshold. Impacts to the CEEC under the EPBC Act is 26.23 hectares more than the impact threshold of 9.5 hectares for this TEC as identified in Condition 3 of the existing Federal Approval (EPBC 2014/7163).

Following the application of avoidance and minimisation measures, the BAM assessment identified the following biodiversity credits required to offset the impacts of the Project:

- **26 ecosystem credits** for **PCT 289** Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- **125 ecosystem credits** for **PCT 335** Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- **883 ecosystem credits** for **PCT 350** Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
- **5,353 ecosystem credits** for **PCT 351** Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
- **27 species credits** for **striped legless lizard** (*Delma impar*)
- **1 species credit** for **southern myotis** (*Myotis macropus*)
- **3,635 species credits** for **squirrel glider** (*Petaurus norfolcensis*)
- **579 species credits** for **superb parrot** (*Polytelis swainsonii*)
- **716 species credits** for **golden sun moth** (*Synemon plana*).

Although the Indicative Development Footprints for the Project are greater in size compared with the previously approved Project, the modified project has employed numerous steps to adequately avoid significant biodiversity values. The modified project has a smaller impact on White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act; habitat for striped legless lizard, superb parrot and golden sun moth. It is noted however that the modified project has a greater impact on *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* under the EPBC Act, and hollow bearing trees suitable for superb parrot.

RPRE is committed to delivering a Biodiversity Offset Strategy that appropriately compensates for the unavoidable loss of biodiversity values as a result of the Project as required under the BC Act. This will be undertaken using one or more of the following options:

- The establishment and retirement of credits within Stewardship sites.
- Securing required credits through the open credit market and/or
- Payments to the Biodiversity Conservation Fund.

Glossary

BAM	Biodiversity Assessment Methodology
BC Act	NSW *Biodiversity Conservation Act 2016*
BCD	Biodiversity Conservation Division (formerly Office of Environment and Heritage) – part of NSW Department of Planning, Industry and Environment
BDAR	Biodiversity Development Assessment Report
CCS	Composition condition score (part of the BAM)
CEEC	Critically endangered ecological community
DAWE	Commonwealth Department of Agriculture, Water and the Environment (previously Department of the Environment and Energy)
Development Corridor – Permanent Met Masts	Land to which the BAM is applied to assess the biodiversity values of the land. It includes the Indicative Development Footprint – Permanent Met Masts in its entirety as well as areas of adjoining land. It does not overlap with the Development Corridor – Wind Farm, described below.
Development Corridor – Wind Farm	Land to which the BAM is applied to assess the biodiversity values of the land. It includes the Indicative Development Footprint – Wind Farm in its entirety as well as areas of adjoining land. It does not include the Indicative Development Footprint – External Roads. It does not overlap with the Development Corridor – Permanent Met Masts, described above.
DoEE	(Former) Commonwealth Department of the Environment and Energy (now DAWE)
DNG	Derived native grassland
DPIE	NSW Department of Planning, Industry and Environment
Ecosystem credit	A measurement of the value of threatened ecological communities and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity value at a development site and the gain in biodiversity value at an offset site.
EEC	Endangered ecological community
EP	Endangered population
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FCS	Function condition score (part of the BAM)
GIS	Geographic information system
HBT	Hollow bearing tree
IBRA	Interim Biogeographic Regionalisation for Australia (Version 7)
Indicative Development Footprint – External Roads	The total indicative impact zone associated with the external road upgrades associated with the Wind Farm, excluding all wind farm specific components of the Project. The *Indicative Development Footprint – Wind Farm* provides for additional detailed design that may be undertaken by RPRE once contractor(s) are established.
Indicative Development Footprint – Permanent Met Masts	The total indicative impact zone associated with the permanent met mast specific components of the Project, excluding all other wind farm infrastructure and external road upgrades. The *Indicative Development Footprint – Permanent Met Masts* provides for additional detailed design that may be undertaken by RPRE once contractor(s) are established.

Indicative Development Footprint – Wind Farm	The total indicative impact zone associated with the wind farm specific components of the Project, excluding the external road upgrades. The *Indicative Development Footprint – Wind Farm* provides for additional detailed design that may be undertaken by RPRE once specific turbine specifications and contractor(s) are established.
Indicative Development Footprints	Equivalent to the *Development Footprint* terminology in the BAM; this is a combination of the *Indicative Development Footprint – Wind Farm, Indicative Development Footprint – Permanent Met Masts* and the *Indicative Development Footprint – External Roads*, and comprises the entirety of the Indicative Development Footprint for the Rye Park Wind Farm.
LGA	Local government area
MGA	Map Grid of Australia
MNES	Matters of National Environmental Significance
NSW	New South Wales
PCT	Plant Community Type
PMST	Protected Matters Search Tool
RPRE	Rye Park Renewable Energy Pty Ltd
RSA	Rotor Swept Area
SCS	Structure condition score (part of the BAM)
SEH	South Eastern Highlands IBRA bioregion
Species credit	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection database.
SSD	State Significant Development
Strahler Stream Order	Classification system that allocates a waterway an 'order' according to the number of tributaries associated with it.
SWS	NSW – South Western Slopes IBRA bioregion
TEC	Threatened ecological community
TBDC	Threatened Biodiversity Data Collection
VIS	Vegetation Information System

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1 Introduction

1.1 Background

Rye Park Renewable Energy (RPRE) proposes to construct the Rye Park Wind Farm Project in southern NSW broadly between Yass and Boorowa. The biodiversity assessment presented here is the culmination of several years of work, comprising work prepared to support a pre-existing approval, and further work prepared for design alterations and a formal Project Modification. This section provides details on the project's approval history (including existing consent conditions), a background on the ecological surveys undertaken over several years, and details on the proposed project design and operation.

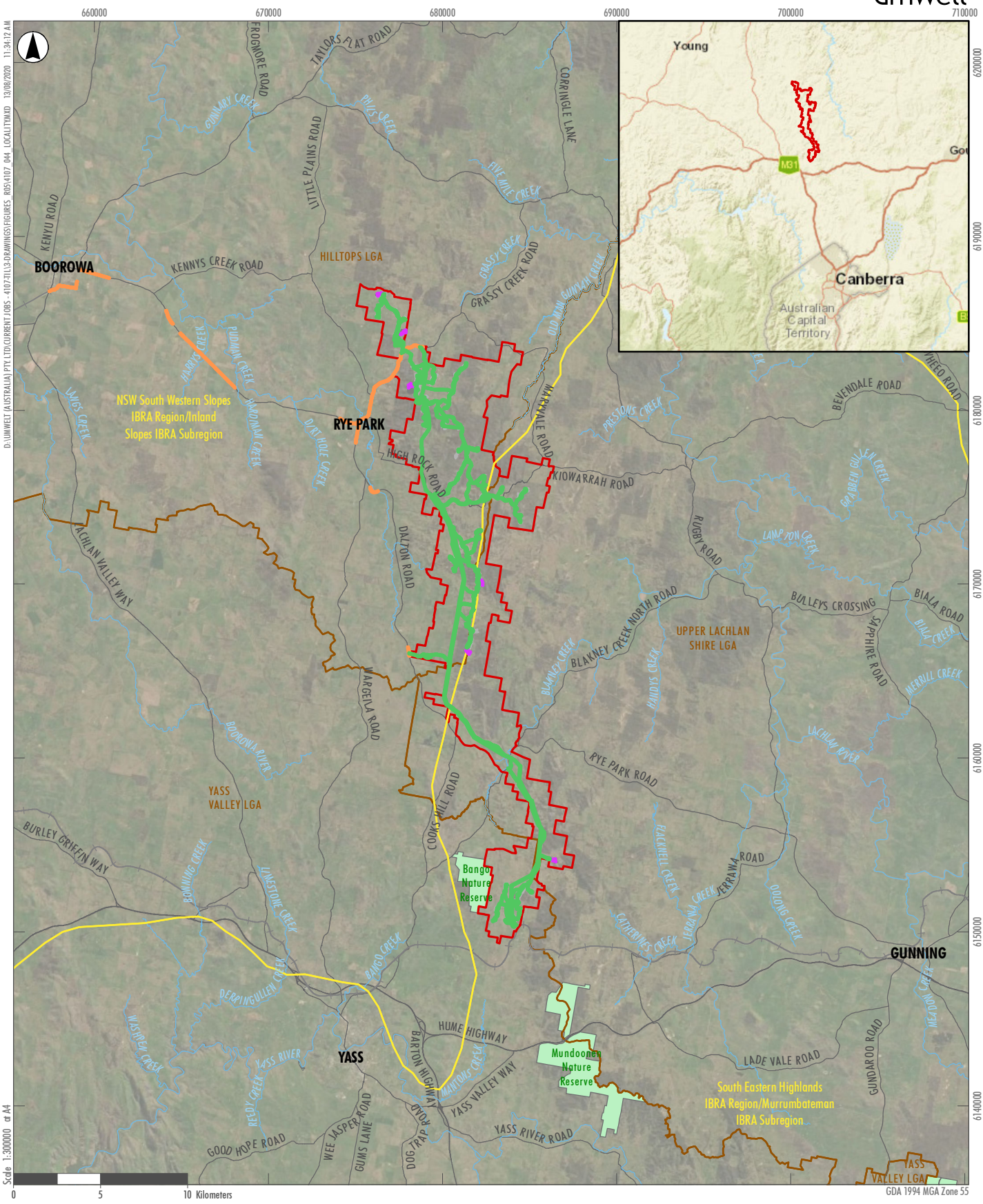
1.1.1 Location

The Development Corridor is located on a long ridgeline running generally north–south, near the townships of Rye Park, north of Yass and east of Boorowa, NSW (refer to **Figure 1.1**). The Development Corridor spans three Local Government Areas (LGAs), being the Hilltops Council, Upper Lachlan Shire Council and Yass Valley Council. The Development Corridors (Wind Farm and Permanent Met Masts) cover an area of approximately 1,327 hectares, whilst the Indicative Development Footprints (Wind Farm, Permanent Met Masts and External Roads) are proposed to impact an area of approximately 516 hectares.

It is surrounded by a mosaic of agricultural land on the valley floor and low rises, with large patches of remnant vegetation restricted to public land (including road reserves and conservation areas), upper slopes and ridgetops. Agricultural land use is dominant throughout the local region both historically and currently. These practises have resulted in the extensive clearing of native vegetation from the local region. Stock grazing (predominantly sheep and, to a lesser degree, cattle) is the dominant agricultural land use, while a variety of crops are also sown in particular areas.

The Development Corridor is located predominantly in the NSW - South Western Slopes IBRA region but it does extend slightly into the South Eastern Highlands IBRA region (refer to **Figure 1.1**). The locality is characterised by agricultural landscapes on the valley floors and low slopes that provide more fertile soil profiles. Substantial areas of intact vegetation are associated with the network of public reserves, upper slopes and ridgetops. Key land agricultural practises include stock grazing (predominantly sheep and, to a lesser degree, cattle), while a variety of crops are also sown in particular areas.

A number of regional roads occur within the locality, including Rye Park Road linking the small township of Rye Park with the larger regional town of Boorowa, NSW. The main thoroughfares between Rye Park and the major regional town of Yass, NSW are Wargeila Road, Dalton Road, Cooks Hill Road and Blakney Creek South Road. However, most relevant to the Development Corridor are Rye Park Road, Dalton Road and Blakney Creek South Road. The Main Southern Railway extends in proximity to the southernmost tip of the Development Corridor but will remain unaffected by the Project. The Hume Highway is located approximately 7 kilometres south of the southernmost tip of the Development Corridor.



Legend

- Rye Park Wind Farm Project Area
- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- IBRA Region/Subregion Area
- Local Government Area (LGA)
- Nature Reserve
- Raod
- Railway
- Watercourses

FIGURE 1.1

Locality Plan

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

1.1.2 Approval History

The Rye Park Wind Farm Project was originally assessed as a Major Project, under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The project was subsequently transitioned to a state significant development (SSD) under the EP&A Act by an order made on 21 March 2014. NSW Development Consent for the Rye Park Wind Farm Project was granted on 22 May 2017 by the NSW Planning Assessment Commission (PAC) (DPE 2017) under the former Section 89E of the EP&A Act.

The Project has a long history in the NSW planning approval system. An application for project approval for the Project was lodged with DPIE (formerly DPE) in January 2011 (Epuron 2011) under Part 3A of the EP&A Act. The Environmental Assessment was then prepared, lodged and placed on public exhibition from 2 May 2014 until 4 July 2014 (Epuron 2014). This included the original Biodiversity Assessment prepared by NGH Environmental (2014). Following the period of public exhibition, the Project received 115 submissions in response to the Environmental Assessment and 244 in the response to submissions.

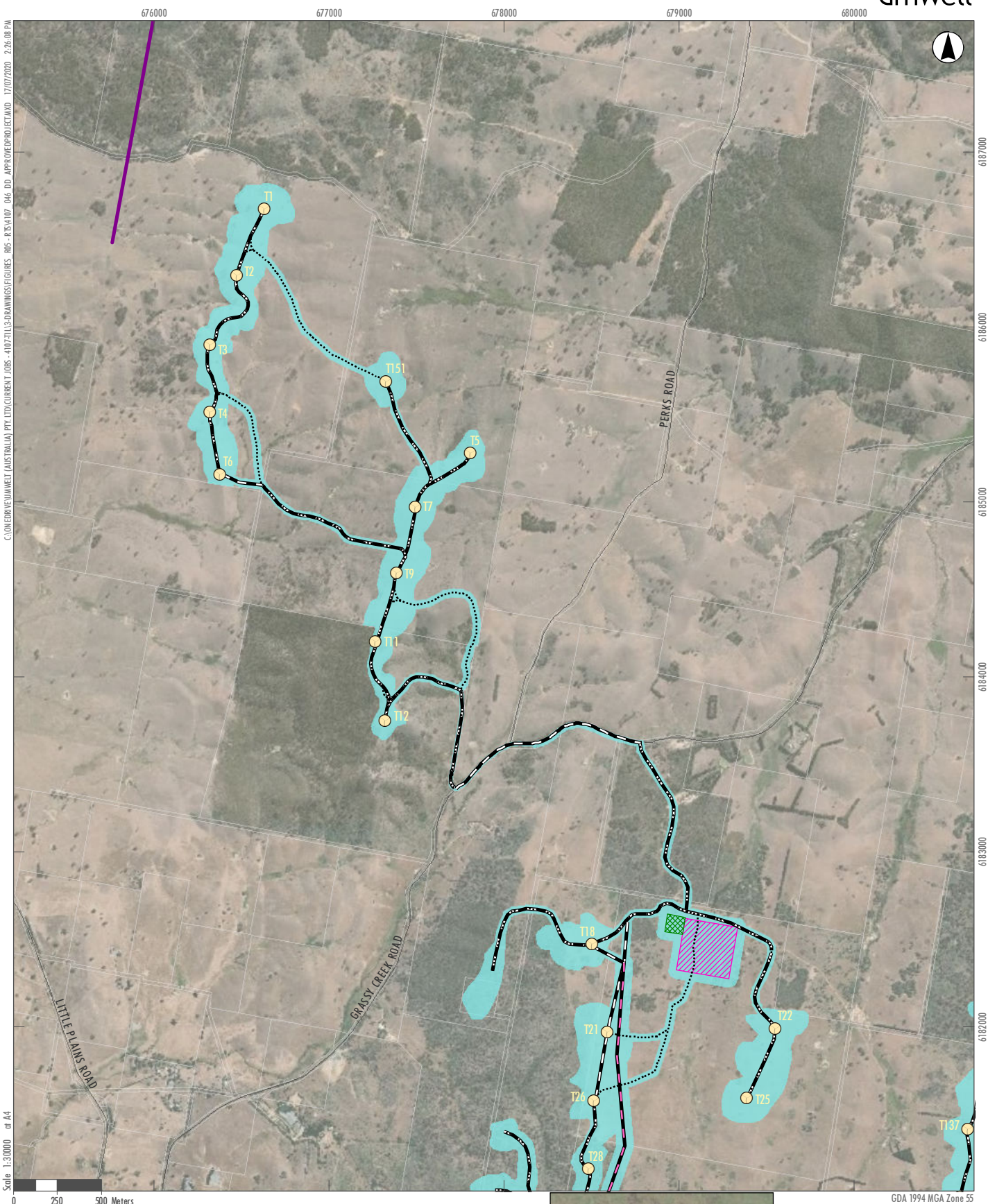
On 12 May 2016 the Project lodged its Response to Submissions (Epuron 2016). A Biodiversity Assessment Addendum was prepared and included as part of the Response to Submissions (NGH Environmental 2016).

In late 2014, Rye Park Wind Farm (Rye Park Renewable Energy Pty Ltd) was acquired by Tilt Renewables Australia Pty Ltd (previously known as Trustpower Australia Limited [1]).

The Project received state approval on 22 May 2017 and federal approval on 6 December 2017. Refer to **Sections 1.1.2.1** and **1.1.2.2** below for the respective development consents.

The approved project is presented in **Figure 1.2**.

[1] Tilt Renewables was established in October 2016, as the result of the demerger from Trustpower Limited.



Legend

- PAC Approved Development Corridor
- PAC Approved Turbine Locations
- Property Boundaries
- Watercourses
- Major Roads
- Access Tracks
- Overhead Powerline
- TxL Connection
- Underground Cabling
- Concrete Batch Plant
- Construction Compound

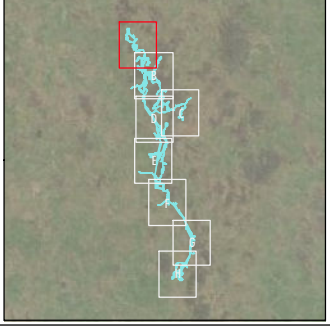


FIGURE 1.2.a

Approved Project Overview

Image Source: ESRI Basemap (2020) Data source: NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

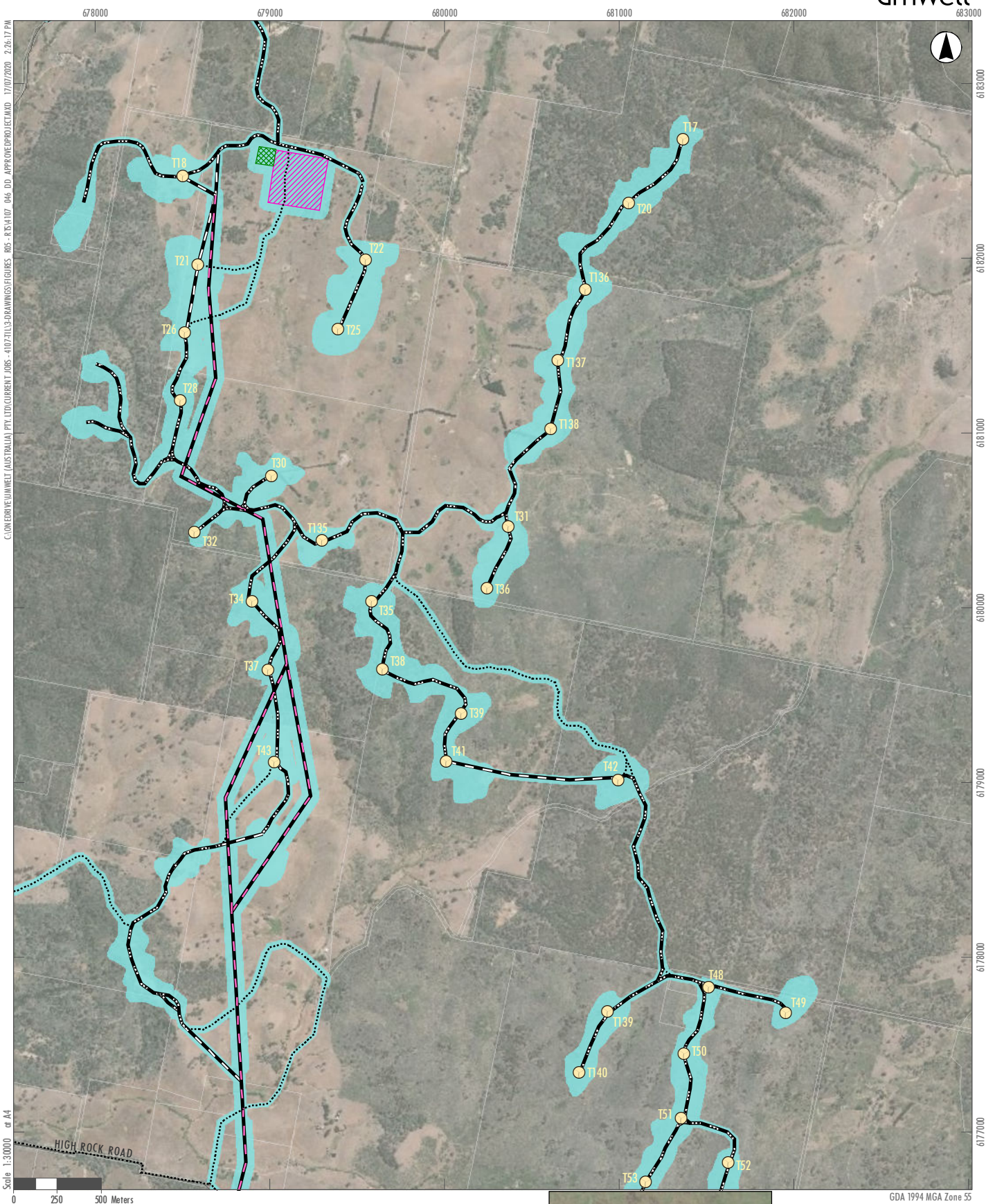


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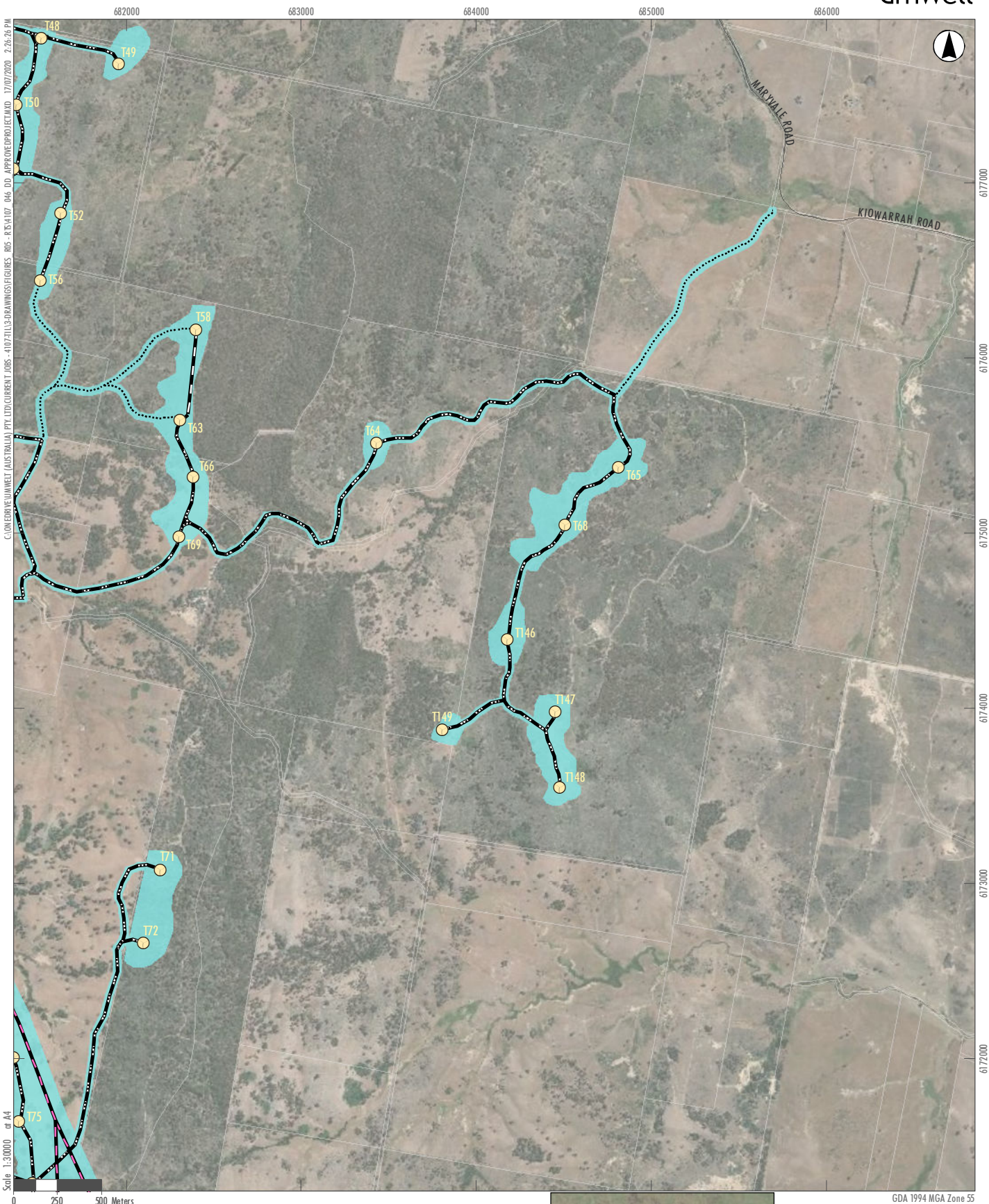
FIGURE 1.2.b

Approved Project Overview

Image Source: ESRI Basemap (2020) Data source: NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



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Legend

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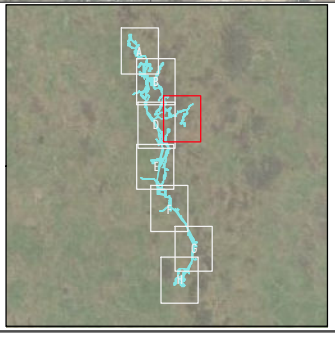

FIGURE 1.2.c

Approved Project Overview

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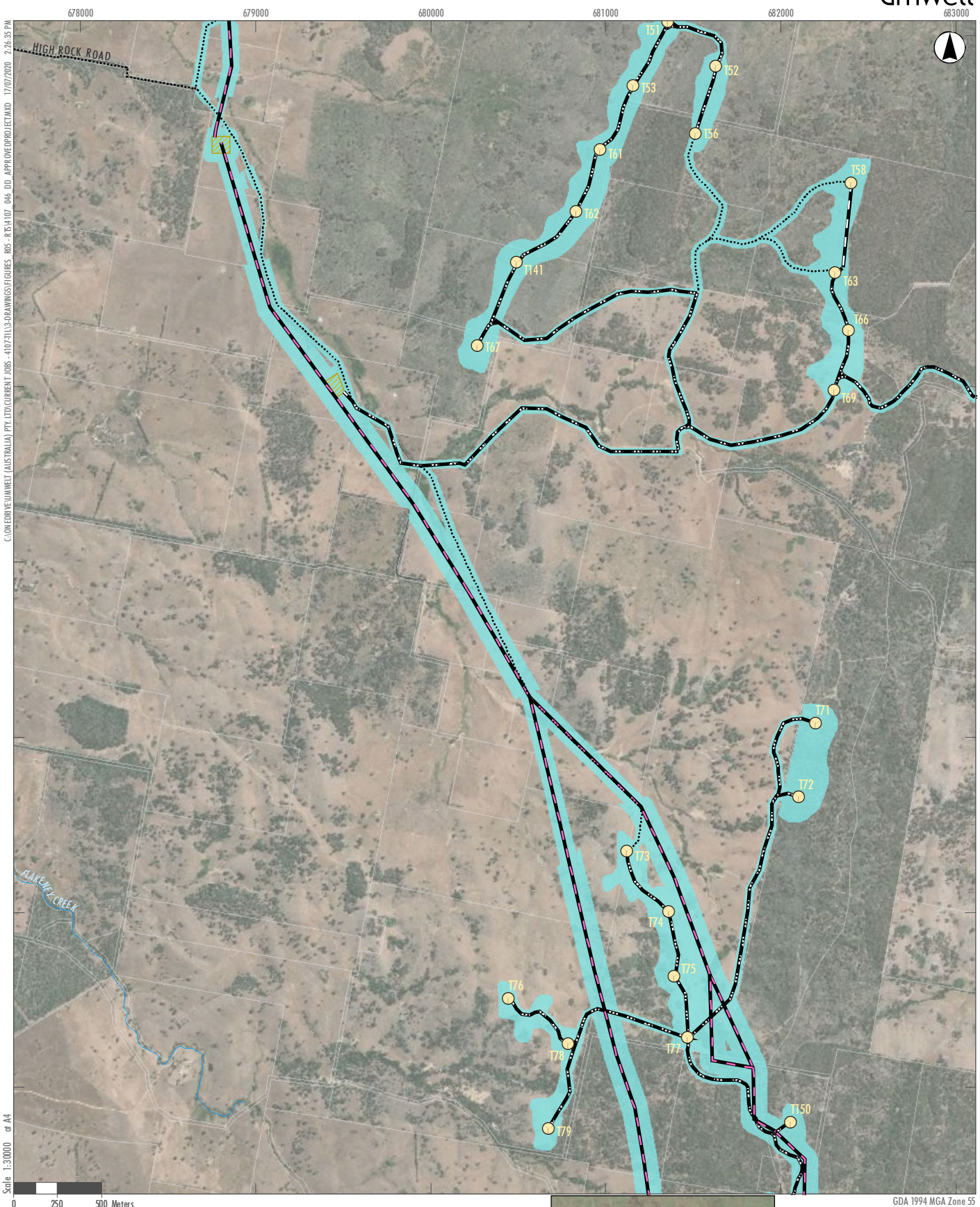

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FIGURE 1.2.d

Approved Project Overview

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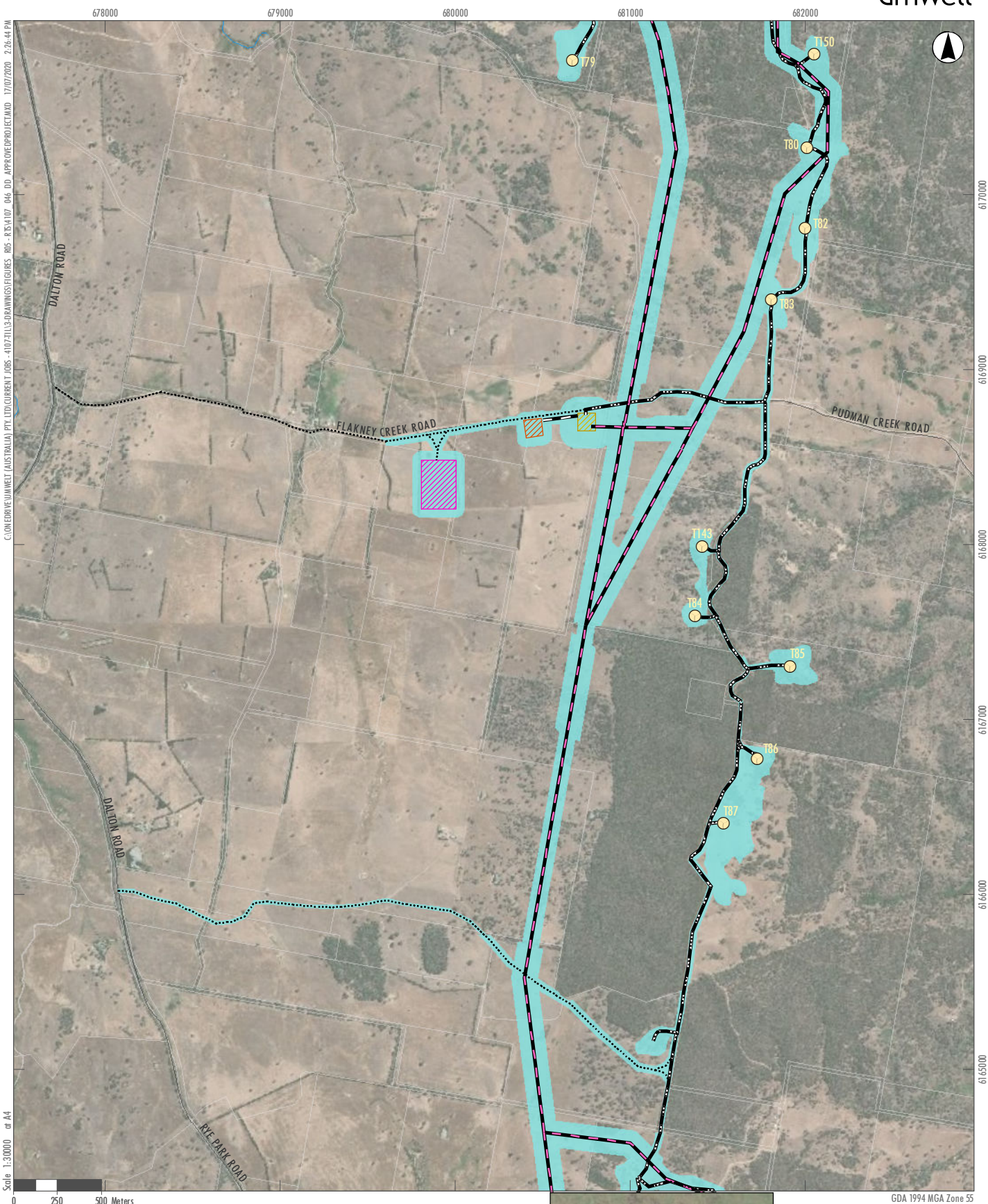

Legend

- PAC Approved Development Corridor
- PAC Approved Turbine Locations
- Property Boundaries
- Watercourses
- Major Roads
- Access Tracks
- Overhead Powerline
- Underground Cabling
- Construction Compound
- Project Related Buildings
- Substations

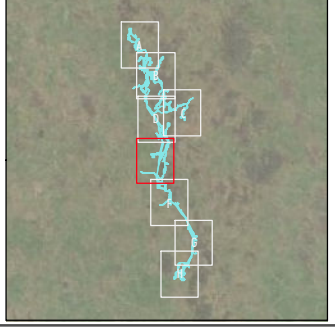

FIGURE 1.2.e

Approved Project Overview

Image Source: ESRI Basemap (2020) Data source: NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- PAC Approved Development Corridor
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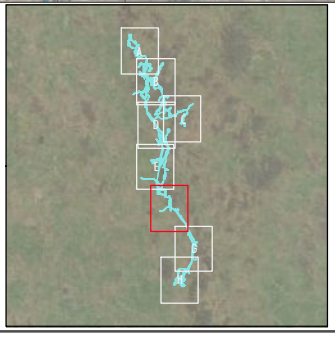

FIGURE 1.2.f

Approved Project Overview

Image Source: ESRI Basemap (2020) Data source: NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- PAC Approved Development Corridor
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- Property Boundaries
- Watercourses
- Major Roads
- Access Tracks
- Overhead Powerline
- Underground Cabling

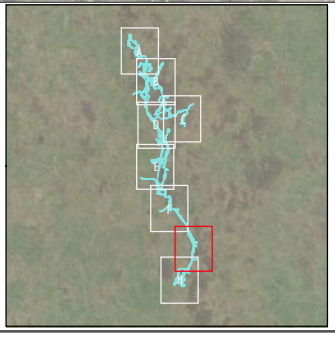
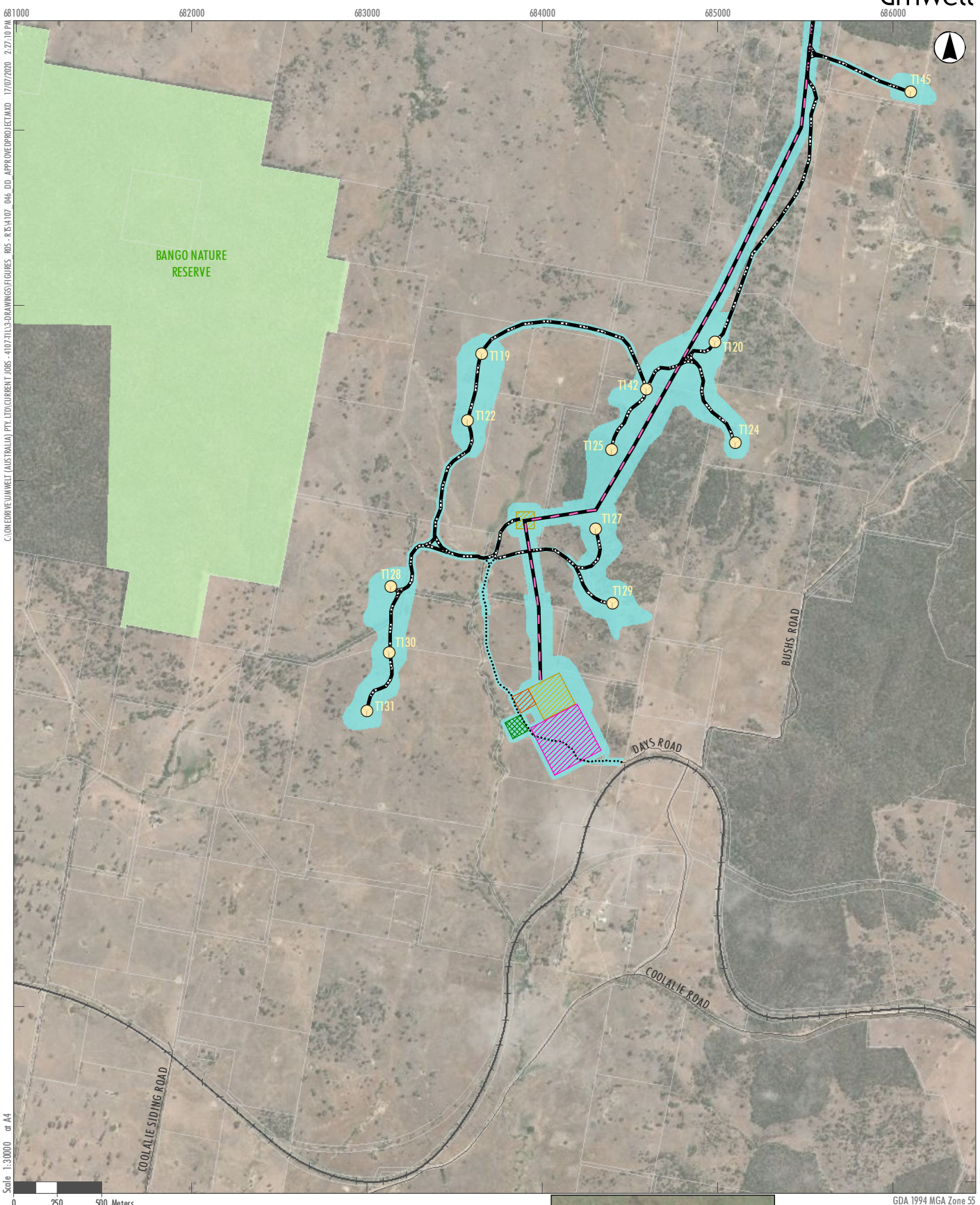


FIGURE 1.2.g

Approved Project Overview

Image Source: ESRI Basemap (2020) Data source: NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- PAC Approved Development Corridor
- PAC Approved Turbine Locations
- Property Boundaries
- Watercourses
- Major Roads
- Railways
- Nature Reserves
- Access Tracks
- Overhead Powerline
- Underground Cabling
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- Substations

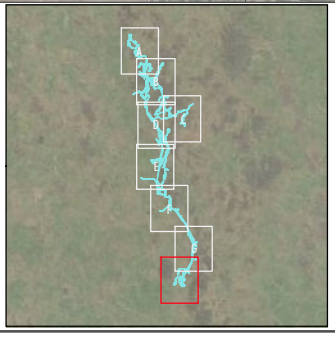


FIGURE 1.2.h

Approved Project Overview

1.1.2.1 State Approved Development Consent

The relevant Development Consent conditions applicable to this BDAR are presented below (DPE 2017). It is important to note that while they are listed below (**Table 1.1**) and are discussed broadly as part of this BDAR, Consent Conditions 22 and 23 are not satisfied by this document, but will be addressed by separate forthcoming documentation.

Table 1.1 State approved Development Consents (SSD 6693)

Development Consent Conditions (DPE 2017)
Consent Condition 19 – The applicant must: a. ensure that no more than 50.2 hectares of the Box Gum Woodland EEC, including Box Gum Woodland derived native grassland, is cleared for the development, unless the Secretary agrees otherwise; b. avoid impacts to the Crimson Spider Orchid (*Caladenia concolor*) and Southern Pygmy Perch (*Nannoperca australis*); c. minimise: • the impacts of the development on hollow-bearing trees and termite mounds; • the impacts of the development on threatened bird and bat populations; and • the clearing of native vegetation and key habitat within the approved disturbance footprint.
Consent Condition 20 – Prior to the commencement of construction, unless the Secretary agrees otherwise, the Applicant must: a. update the baseline mapping of the vegetation and key habitat within the final disturbance area; and b. calculate biodiversity offset credit liabilities for the development in accordance with the *Framework for Biodiversity Assessment* under the *NSW Biodiversity Offset Policy for Major projects*, in consultation with OEH, and to the satisfaction of the Department.
Consent Condition 21 – Within 2 years of the commencement of construction, unless the Secretary agrees otherwise, the Applicant must retire the required biodiversity credits, to the satisfaction of OEH. The retirement of the credits must be carried out in accordance with the NSW *Biodiversity Offsets Policy for Major Projects*, and can be achieved by: a. acquiring or retiring credits under the biobanking scheme in the TSC Act, b. making payment into an offset fund that has been established by the NSW Government, or c. providing suitable supplementary measures.

Development Consent Conditions (DPE 2017)
Consent Condition 22 – Prior to the commencement of construction, the Applicant must prepare a Biodiversity Management Plan for the development to the satisfaction of the Secretary. This plan must: a. be prepared in consultation with OEH; and b. include: • a description of the measures that would be implemented for: o minimising the amount of native vegetation clearing within the approved development footprint; o minimising the loss of key fauna habitat, including tree hollows and termite mounds; o minimising the impacts of fauna on site, including undertaking pre-clearance surveys; o minimising the potential indirect impacts on threatened: ▪ flora species, including the Crimson Spider Orchid (*Caladenia concolor*); and ▪ fauna species, including the Southern Pygmy Perch (*Nannoperca australis*), Golden Sun Moth (*Synemon plana*) and Superb Parrot (*Polytelis swainsonii*); o rehabilitating and revegetating temporary disturbance areas; o protecting native vegetation and key fauna habitat outside the approved disturbance area; o maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse (including fauna habitat enhancement) during the rehabilitation and revegetation of the site; o collecting and propagating seed (where relevant); o controlling weeds and feral pests; o controlling erosion; and o bushfire management; • a detailed program to monitor and report on the effectiveness of these measures. Following the Secretary's approval, the Applicant must implement the Biodiversity Management Plan.
Consent Condition 23 – Prior to the commissioning of any wind turbines, the Applicant must prepare a Bird and Bat Adaptive Management Plan for the development in consultation with OEH, and to the satisfaction of the Secretary. This plan must include: a. at least 12 months' worth of baseline data on threatened and 'at risk' bird and bat species and populations in the locality that could be affected by the development; b. a detailed description of the measures that would be implemented on site for minimising bird and bat strike during operation of the development, including: • minimising the availability of raptor perches; • prompt carcass removal; • controlling pests; and • using best practice methods for bat deterrence, including managing potential lighting impacts; c. trigger levels for further investigation of the potential impacts of the project on particular bird or bat species or populations; d. an adaptive management program that would be implemented if the development is having an adverse impact on a particular threatened or 'at risk' bird and/or bat species or populations; including the implementation of measures to: • reduce the mortality of those species or populations; or • enhance and propagate those species or populations in the locality; and e. a detailed program to monito and report on the effectiveness of these measures, and any bird and bat strikes on site. Following the Secretary's Approval, the Applicant must implement the Bird and Bat Adaptive Management Plan.

Umwelt note that in relation to the State Approval Consent Conditions described above, since this decision was made, the conservation status listing of 'Box Gum Woodland EEC' was updated on 17 July 2020 to a Critically Endangered Ecological Community (CEEC). It is assumed that the reference to clearance thresholds to the 'Box Gum Woodland EEC' will apply to the updated CEEC. Further information is provided below in **Section 3.2.3.**

1.1.2.2 Federal EPBC Approval

The original Project received federal approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 6 December 2017. The relevant Conditions of Approval are presented below (EPBC 2014/7163) (DoEE 2017) in **Table 1.2**. It is important to note that while this BDAR is not a requirement as part of the EPBC Approval, it does present the credit requirement for the Project as per Condition 10. Furthermore, regarding Condition of Approval 3, this BDAR presents a comparison of the potential impacts of the modified Project on Matters of National Environmental Significance (MNES) in **Section 5.5**.

Table 1.2 Federal Conditions of Approval (EPBC 2014/7163)

Federal Conditions
Condition of Approval 3 – In taking the approved action, the approval holder must not clear more than: a. 9.5 ha of Box Gum Woodland b. 66.94 ha of Golden Sun Moth habitat c. 49.5 ha of Striped Legless Lizard habitat d. 24.9 ha of foraging habitat for the Superb Parrot e. 170 hollow bearing trees within Box Gum Woodland
Condition of Approval 4 – The approval holder must protect known and potential Superb Parrot nest trees in Box Gum Woodland by: a. Only conducting blasting and clearing within 100 m of known and potential nest trees from February to August (outside breeding season); and b. Locating onsite infrastructure no closer than 100 m from known and potential nest trees
Condition of Approval 5 – Prior to the commencement of construction, the approval holder must submit to the Minister detailed plans of the final layout as required by condition 10 of Schedule 2 of the State Approval. Construction must not commence unless the Minister is satisfied that the procedure for micro-siting turbines and onsite infrastructure has minimised impacts to protected matters and avoided high use areas for Superb Parrot. The detailed plans of the final layout must identify buffer areas around all onsite infrastructure (as per Appendix D of the final preliminary documentation), on the basis that impacts may occur even if the vegetation remains.
Condition of Approval 6 – In meeting the requirements of condition 20 and 22 of Schedule 3 of the State Approval, the approval holder must also address protected matters. The Biodiversity Management Plan (BMP) must be submitted to the Minister for approval. Construction must not commence unless the BMP has been approved by the Minister. The approved BMP must be implemented. The BMP must include, but is not limited to: a. Evidence that baseline mapping has been conducted to verify the extent of impact on protected matters and hollow bearing trees within the final development footprint. Surveys must have regard to the Commonwealth Listing Advice for the protected matter and must be conducted by a qualified ecologist in accordance with the most recent publication of survey methods. b. Spatial maps, description and quantification f the final disturbance footprint in relation to proposed impacts to protected matters, including the number, type of hollow bearing trees and size of hollows to be removed. c. Management measures to ensure the protection and maintenance of habitat for protected matters during the construction and operational phases of the approved action. This must include a commitment to avoid clearing near nest trees during the breeding season for the Superb Parrot (September to January) to minimise disturbance to the species.

Federal Conditions
Condition of Approval 7 – In meeting the requirements of condition 23 of Schedule 3 of the State Approval, the approval holder must ensure that the Bird and Bat Adaptive Management Plan (BBAMP) addresses impacts to the Superb Parrot. The BBAMP must be submitted to the Minister for approval. The approved BBAMP must be implemented. The BBAMP must, in addition to trigger levels for further investigation, identify trigger levels to shut down any turbines when there is a high risk of collision based on monitoring data and, if applicable, the results of research conducted as part of condition 15 on Superb Parrot habitat use and breeding ecology. The results of the monitoring program must be submitted as part of the annual report in condition 18.
Condition of Approval 8 – Upon the direction of the Minister, the approval holder must shut down any specified wind turbines within specified periods if the Minister considers that, based on monitoring and compliance reporting required by condition 18, they are having an impact on protected matters, in particular the Superb Parrot, greater than the trigger levels specified by condition 7 that cannot be mitigated to a level acceptable to the Minister.
Condition of Approval 9 – In meeting the requirements of condition 26 of Schedule 3 of the State Approval, the approval holder must avoid and minimise the clearance and trimming of roadside vegetation along proposed transport routes to the site for the transport of turbine components and associated infrastructure. Prior to the clearance and trimming of roadside vegetation for the transport of the turbine components and associated infrastructure, the approval holder must submit a Roadside Vegetation Management Plan to the Minister for approval. The approved plan must be implemented. In order to protect foraging and potential breeding habitat for the Superb Parrot, the plan must include the following requirements: a. Final clearance footprint outlining vegetation to be cleared and lopped and evidence that impacts to protected matters will be minimised. b. Evidence that clearing will be within the limits allowable for this approval specified in condition 3. c. Identified of responsible parties who will manage the native vegetation clearance and trimming process. d. Evidence that clearing and trimming of hollow bearing trees in the roadside vegetation has been minimised.
Condition of Approval 10 – Within two years of commencement of construction, to compensate for impacts on protected matters, the approval holder must acquire or retire like-for-like biodiversity credits or fund a biodiversity action that benefits the protected matter impacted, to the satisfaction of the Minister. This must be carried out in accordance with the NSW Biodiversity Offsets Policy for Major Projects, by acquiring or retiring credits under the BioBanking scheme in the *NSW Threatened Species Conservation Act 1995*. The approval holder must not commission any wind turbines until the required credits have been acquired or retired.
Condition of Approval 11 – Prior to the commencement of construction the approval holder must submit the final BioBanking Statement as it relates to relevant protected matters to the Minister for acceptance. Note: relevant protected mattes for this condition are Box Gum Woodland, Golden Sun Moth, Superb Parrot and Striped Legless Lizard.
Condition of Approval 12 – Prior to the commissioning of any wind turbines, the approval holder must submit the BioBanking Credit Retirement Report to the Minister.

Federal Conditions
Condition of Approval 13 – Prior to the commissioning of any wind turbines, the approval holder must submit a copy of the BioBanking Agreement(s) to the Minster for acceptance. The approval holder must ensure that the BioBanking Agreement(s) for the BioBank site(s) include measures for the long term management of protected matters including but not limited to: a. Specific reference to Box Gum Woodland, Golden Sun Moth, Superb Parrot, Striped Legless Lizard, and hollow bearing trees. b. A textual description of the offset sites, including offset attributes, shapefiles, and a map clearly defining the location and boundaries of the proposed offset sites. Establishment of baseline data and documentation of key biodiversity threats and opportunities at each site. c. A detailed description of the management actions and responsibilities designed to protect and improve the ecological quality of Box Gum Woodland and habitat of threatened species on the offset sites. d. Key milestones, performance indicators and timeframes for each management action. e. A monitoring program to determine the effectiveness of the management actions. f. Corrective actions and contingency measures to be implemented where monitoring of the offset site shows that management actions are not effectively achieving key milestones or prescribed performance indicators are not being met or are unlikely to be met.
Condition of Approval 14 – To compensate for impacts on EPBC Act listed Superb Parrot, the approval holder must ensure the biodiversity offset strategy compensates for impacts on hollow bearing trees that are: a. Cleared for construction; and b. Located within the buffer areas for wind turbines described in condition 5. For each hollow bearing tree removed or retained within buffer areas around each turbine, the approval holder must legally protect and secure 10 hollow bearing trees from the same vegetation class within the South-west Slopes of NSW Importance Bird Area. The approval holder must submit the final number of hollow bearing trees to be impacted or removed to the Minister for acceptance as part of condition 6. Prior to the commissioning of any wind turbines, the approval holder must submit evidence to the Minister's satisfaction of the final number of hollow bearing trees to be legally protected and secured. If the required number of hollow bearing trees cannot be protected within the BioBank site(s) established under condition 13, then additional hollow bearing trees must be legally protected and secured to meet the required offset ratio for hollow bearing trees.
Condition of Approval 15 – To compensate for potential cumulative impacts on Superb Parrot, the approval holder must prepare and implement a Superb Parrot Population Monitoring Program (SPPMP) in collaboration with the National Superb Parrot Recovery Team. The SPPMP must be submitted to the Minister for approval prior to commencement of construction. Construction must not commence unless the Minister has approved the SPPMP. The approved SPPMP must be implemented. The SPPMP must contribute to better understanding Superb Parrot habitat use and breeding ecology within the South-west Slopes of NSW Important Bird Area as defined by Birdlife Australia, with a focus on identification of key breeding sites, and a better understanding of local movement patterns during the breeding season and landscape scale movements between the key breeding areas and winter foraging grounds. **The approval holder must provide at least $50,000 each year for five years to fund the conservation research activities outlined in the SPPMP. The first year's contribution must be made within 30 calendar days for the commencement of construction. The SPPMP must be consistent with the National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (2011). The SPPMP must include specific project monitoring objectives, indicative timetable for activities, nomination of persons or organisations responsible for carrying out the activities, and outline commitments to the provision and timing of funding.**

1.1.2.3 Public Exhibition of the Modification

The Modification Report, including the Biodiversity Development Assessment Report (BDAR) for the Rye Park Wind Farm Project – Modification 1 (SSD-6693-Mod-1), was placed on public exhibition from 13 May to 3 June 2020 (21 days).

During the public exhibition period, the Department of Planning, Industry and Environment (DPIE) received a total of 151 submissions including 17 from government agencies, 7 from organisations and 127 from the Public. Whilst 127 Public Submissions were received, 22 of these submissions were duplications (resulting from multiple submissions being lodged by the same person). Accordingly, the total number of Public Submissions was 105, with 85 of these being made by people who objected to the Project and 20 being made by people who supported the Project.

This revised BDAR has been updated in response to relevant submissions, some of which included the provision of additional information. Furthermore, this revised BDAR is the technical document to support the Submissions Report, which contains a summary of relevant sections of this BDAR. The Submissions Report has been prepared by Umwelt on behalf of Tilt and seeks to address the issues raised in agency and community submissions.

1.1.3 Ecology Surveys

As part its long project assessment and approval history, the Project has been subject to numerous ecological surveys, assessment and consideration of potential or likely impacts. The surveys completed by NGH Environmental, as part of the approvals process (including response to submissions), were completed in 2011, 2012, 2013, 2014, 2015 and 2016, all of which include multiple survey rounds (NGH Environmental 2014 and 2016a).

Although the survey effort completed by NGH Environmental was undertaken several years ago, it forms a key part of the extensive work completed for the project that led to the state and federal Project approvals, and is therefore still relevant.

Following approval of the project, Umwelt has worked closely with RPRE in relation to the proposed modification, discussed below in **Section 1.2**. A key part of this included completing a detailed review in 2017 of the previous ecological surveys that were undertaken in order to determine what additional surveys would be required for the project. Based on this review as well as the extent of the modification, Umwelt has since undertaken surveys during 2017, 2018, 2019 and 2020. These are discussed below in **Section 2**. The additional surveys undertaken by Umwelt were primarily focussed on:

- Collection of the necessary Biodiversity Assessment Method (BAM) Vegetation Integrity Plots throughout the Development Corridor and Indicative Development Footprint – External Roads
- Revision and preparation of vegetation mapping and associated PCT allocation throughout the Development Corridor and Indicative Development Footprint – External Roads
- Bird and bat utilisation surveys throughout the Development Corridor
- BAM species credit surveys throughout the Development Corridor for particular species
- BAM species credit surveys throughout the Indicative Development Footprint – External Roads.

1.2 Proposed Modification

RPRE is seeking a modification to the existing State Significant Development (SSD) approval (SSD 6693) for the Rye Park Wind Farm Project (the Project). In summary, the modification includes a reduction in the number of wind turbines, an increase in turbine height, change in clearance limits / split of clearance limits between the wind farm and external road upgrades, and the selection of the preferred external truck route, increase in the rotor swept area (RSA), reduction of operational and maintenance facilities, reduction of substations, changes to the internal access track and cabling network and removal of construction truck routes. All relevant details of the modification are provided below in **Table 1.3**.

The Proposed Modification of the existing approval (SSD 6693) is shown on **Figures 1.3** and **1.4** and includes the components described in **Table 1.3.** A series of other changes to the project that are a result of refined design are described in **Table 1.4**.

Since submission and exhibition of the BDAR for the Rye Park Wind Farm Project – Modification 1 (SSD-6693-Mod-1), the Indicative Development Footprint – Wind Farm has undergone minor amendments resulting from the following design changes:

- an alternative alignment for the section of transmission line crossing Blakney Creek South Road
- six permanent meteorological masts are proposed throughout the Project
- minor amendments to the external transport route, near the township of Rye Park, NSW.

Table 1.3 Rye Park Wind Farm Modification

Parameter	Approved Project	Modification Application	Extent of Modification
Modification			
Number of turbines	92	80	Reduced by 12 turbines (13%)
Rotor diameter	130 m	170 m	Increased by 40 m (31%)
Maximum tip height	157 m	200 m	Increased by 43 m (27%)
Minimum blade ground clearance	27 m	30 m	Increased by 3 m (11%)
RSA per turbine	13,267 m^2	22,698 m^2	Increased by 9,431 m^2 (71%)
Total RSA for wind farm	1,220,564 m^2	1,815,840 m^2	Increased by 595,276 m^2 (49%)
Development Corridor	1,646 ha	1,327 ha	Reduction by 319 ha
External Construction Truck Routes	Not Assessed	1 route	Nil

Table 1.4 Rye Park Wind Farm Refined Design

Parameter	Approved Project	Modification Application	Extent of Change
Refined Design			
Project Area			
Indicative Development Footprint – Wind Farm	256.8 ha	489 ha	Increase 232.2 ha
Indicative Development Footprint – Permanent Met Masts	-	9.17	n/a
Indicative Development Footprint – External Roads	-	18.66 ha	n/a
Internal Access Tracks			
Internal tracks average width (Temporary)	12 m[2]	30 m	Increase by 18 m
Internal tracks average width (Permanent)	5.5 m	5.5 m	Nil
Internal tracks total length	103,400 m	89,060 m	Decrease by 14,340 m
Internal tracks Impact area (Temporary)	124.08 ha	267.2 ha	Increase 143.12 ha
Underground Cabling			
Underground cabling Length	82,350 m[3]	60,324 m	Decrease 22,026 m
Underground cabling Width (Temporary)	12m	15m	Increase 3 m
Underground Cabling area (Temporary)	98.8 ha	90.5 ha	Decrease 8.3ha
Transmission Line Up to 330kV[4]			

[2] During the original environmental assessment, access tracks were given a nominal width of 12m. However, this did not account for the cut and fill required and to construct the project, the widths would likely have been larger.

[3] The approved underground cabling length is calculated based on the approved development plan as there was no specific total length of underground cabling identified in the RTS report. This length of underground cabling is independent of the length of internal access tracks.

[4] The approved project provisioned for a 330kV line. The modified project now proposes a 132Kv line, but may be revised up to 330kV.

Parameter	Approved Project	Modification Application	Extent of Change
Within Woodland and Forest Vegetation (Vegetation Zones 3, 5 and 7)			
Transmission line (Full easement) length	12,510m	6,925m	Decrease of 5,585m
Transmission line (Full easement) width	60m	40m	Decrease of 20m
Transmission line (Full easement) area	73 ha	28.21ha	Decrease of 44.79ha
Within Grassland and Shrubby Vegetation (Vegetation Zones 2, 4, 6, 8, 9 and 10)			
Transmission line (track, poles and string pads) length	18,810m	20,106m	Increase of 1,296m
Transmission line (track, poles and string pads) width	4m for tracks (poles not considered)	12m for tracks and 20m for poles	Increase of 8m for tracks (no comparison for poles)
Transmission line (track, poles and string pads)[5] area	10.3 ha	26.79ha	Increase of 16.49ha
Transmission Line 33kV			
Within Woodland and Forest Vegetation (Vegetation Zones 3, 5 and 7)			
Transmission line (Full easement) length	694m	736m	Increase of 42m
Transmission line (Full easement) width	30m	20m	Decrease by 10m
Transmission line (Full easement) area	2ha	1.44ha	Decrease by 0.56ha
Within Grassland and Shrubby Vegetation (Vegetation Zones 2, 4, 6, 8, 9 and 10)			
Transmission line (track, poles and string pads) length	5,681m	7,085m	Increase of 1,404m
Transmission line (track, poles and string pads) width	4m for tracks (poles not considered)	12m for tracks and 20m for poles	Increase of 8 m for tracks (no comparison for poles)
Transmission line (track, poles and string pads) area	2.2ha	9.59ha	Increase of 7.39ha

[5] Site disturbance for transmission line poles and string pads were not accounted for in the original environmental assessment and approved project

Parameter	Approved Project	Modification Application	Extent of Change
Ancillary Infrastructure			
Operation and maintenance facility	2 facilities	1 facility	Decrease by 1 facility
Collector substations	3 substations	1 substation	Decrease by 2 substations
Batch plants	2 batch plants	3 batch plants	Increase by 1 facility
Construction compounds	3 construction compounds	3 construction compounds	Nil

1.2.1 Development Corridor Information

There are two Development Corridors discussed as part of this BDAR totalling approximately 1,327 hectares, being the Development Corridor – Wind Farm and Development Corridor – Permanent Met Masts.

The Development Corridor – Wind Farm encompasses the Indicative Development Footprint – Wind Farm in its entirety as well areas of adjoining land (refer to **Figure 1.3**). It does not include the Indicative Development Footprint – External Roads, Development Corridor – Permanent Met Masts and Indicative Development Footprint – Permanent Met Masts. The Development Corridor – Wind Farm was considered in full during the application of the BAM to allow further avoidance and minimisation measures to be employed by RPRE.

The Development Corridor – Wind Farm considered in this document is different to that which was approved (NGH Environmental 2014 and 2016). It is understood that the changes to the corridor have been made in response to the revised indicative design, to limit disturbance and allow for avoidance of areas of sensitivity. The approved development corridor totalled 1,646 hectares, while the Development Corridor – Wind Farm currently being assessed totals approximately 1,275 hectares.

Key changes to the Development Corridor – Wind Farm have been made in response to the removal 12 turbines and their associated hardstands, replacement of a 330kV transmission line with a 132kV (noting that further revision), transmission line realignment off a section of ridgeline, removal of access along Flakney Creek Road and replacement with access via internal access track (on the Cotter Property), reduction in substation and operational facilities.

The Development Corridor – Permanent Met Masts are a buffered area completely encapsulating the Indicative Development Footprint – Permanent Met Masts. It totals approximately 52 hectares, has been assessed in full within this BDAR.

1.2.2 Indicative Development Footprint Information

The Indicative Development Footprints will be subject to a range of disturbances as described earlier in this section, as well as in **Section 5.0**. The total indicative impact zone (e.g. all ground disturbance) associated with the wind farm specific components of the Project, excluding the external road upgrades and permanent met masts, is termed Indicative Development Footprint – Wind Farm (approximately 489 hectares) (refer to **Figure 1.3**).

The total indicative impact zone associated with the external road upgrades is termed Indicative Development Footprint – External Roads (approximately 19 hectares) (refer to **Figure 1.3**). The total indicative impact zone associated with the permanent met masts is termed Indicative Development Footprint – Permanent Met Masts (approximately 9 hectares) (refer to **Figure 1.3**).

Equivalent to the *Development Footprint* terminology in the BAM, the Indicative Development Footprints (516.91 hectares) is a combination of the *Indicative Development Footprint – Wind Farm*, the *Indicative Development Footprint – External Roads* and the *Indicative Development Footprint – Permanent Met Masts*, and comprises the entirety of the Indicative Development Footprint for the Rye Park Wind Farm. The Indicative Development Footprint – External Roads and Indicative Development Footprint – Permanent Met Masts have been identified separately as they were not previously considered as part of the existing approval (SSD 6693) process. All development footprints are indicative as they will be finalised through further detailed design once a turbine and preferred contractor(s) is selected. RPRE is committed to further avoiding and minimising additional biodiversity values where feasible.

This report focuses on the Indicative Development Footprints as per BAM (OEH 2017), however the consideration of biodiversity values and surveys completed have considered the wider Development Corridors. Due to the nature of wind farm projects, whereby their impact footprints are finalised at such late stages, understanding the values in surrounding land is essential to facilitating avoidance and minimisation measures through refinement and finalisation of the Development Footprints. Thus, where relevant to do so, Umwelt present and discuss the extent of work completed in the Development Corridors.

The Indicative Development Footprint – Wind Farm and Indicative Development Footprint – Permanent Met Masts occur entirely within the Development Corridors. They comprise disturbed agricultural land and remnant vegetation consistent with the Development Corridors. Intact vegetation is generally in moderate to good condition, including vegetation that has been exposed to historical disturbances, while other areas of agricultural land that have been exposed to more intensive land use practises are dominated by non-native vegetation. Such land uses include but are not limited to ploughing, tilling and pasture improvements. Broadly speaking, components of the Indicative Development Footprint – Wind Farm are consistent with the Biodiversity Assessment and Biodiversity Assessment Addendum (NGH Environmental 2014 and 2016a), comprising wind turbines, internal access tracks, transmission lines, underground cabling and a range of associated infrastructure. However there are a number of changes in the Indicative Development Footprint – Wind Farm: the extent of civil disturbance has increased, the transmission line has been modified from a 330 kV to 132 kV, turbines have been removed and a section of transmission line has been moved off a section of ridgeline.

The Indicative Development Footprint – Permanent Met Masts, which were not previously considered, are all adjacent to the Indicative Development Footprint – Wind Farm, extending slightly beyond this layer.

The Indicative Development Footprint – External Roads comprises a network of existing public roads, including sealed and un-sealed sections, as well as the associated roadside corridors. In certain sections, it extends beyond the public corridors and into private land; this is particularly the case along bends and narrow sections of road. The extent to which this occurs is considered to be minor and in most cases it extends on to land holdings already involved with the Project. In such circumstances, the private land is predominantly disturbed agricultural land, consistent with the description above for Indicative Development Footprint – Wind Farm. As external roads were not previously assessed as part of the Biodiversity Assessment and Biodiversity Assessment Addendum (NGH Environmental 2014 and 2016a), the Indicative Development Footprint – External Roads is a new component of the Project. The main modification report addresses specifically where impacts from the external road extend into private land, including specific discussion about landholder agreements.

A summary of the Development Corridor landscape is provided below in **Table 1.5**.

Table 1.5 Development Corridors Location in the Landscape

Development Corridor Location in the Landscape	
IBRA Bioregions	NSW – South Western Slopes South Eastern Highlands
IBRA Subregions	Inland Slopes (NSW – South Western Slopes) Murrumbateman (South Eastern Highlands)
Mitchell Landscape	Dalton Hills (Dominant) Boorowa Volcanics (Sub-dominant)
LGA	Hilltops Council Upper Lachlan Shire Council Yass Valley Council

Development Corridor Location in the Landscape	
Development Corridors	1,327 hectares (comprising approximately 1,275 hectares of Development Corridor – Wind Farm and approximately 52 hectares of Development Corridor – Permanent Met Masts)
Indicative Development Footprints	516.82 hectares (comprising approximately 489 hectares of Indicative Development Footprint – Wind Farm, approximately 9 hectares of Indicative Development Footprint – Permanent Met Masts and approximately 19 Indicative Development Footprint – External Roads)
Assessment Type	Linear
Lot and DP	Lot 1 DP1032776, Lot 7002 DP1033069, Lot 7001 DP1033069, Lot 14 DP1055548, Lot 3 DP1066057, Lot 2 DP1066057, Lot 4 DP1066057, Lot 1 DP1097507, Lot 4 DP1116827, Lot 7 DP1116827, Lot 5 DP1116827, Lot 1 DP113987, Lot 7301 DP1147658, Lot 1072 DP1170091, Lot 1 DP1178422, Lot 2 DP1179016, Lot 1 DP1179016, Lot 2 DP1180139, Lot 210 DP118333, Lot 4 DP1186361, Lot 1 DP1235519, Lot 1 DP134035, Lot 5 DP1810, Lot 11 DP1810, Lot 29 DP1810, Lot 28 DP1810, Lot 3 DP1810, Lot 2 DP1810, Lot 7 DP1810, Lot 1 DP1810, Lot 13 DP1810, Lot 1 DP1810, Lot 6 DP1810, Lot 12 DP1810, Lot 4 DP1810, Lot 12 DP1810, Lot 1 DP1810, Lot 30 DP1810, Lot 10 DP1810, Lot 9 DP1810, Lot 7 DP1810, Lot 8 DP1810, Lot 6 DP1810, Lot 8 DP1810, Lot 11 DP1810, Lot 5 DP1810, Lot 4 DP1810, Lot 6 DP1810, Lot 11 DP1810, Lot 10 DP1810, Lot 13 DP1810, Lot 9 DP1810, Lot 10 DP1810, Lot 3 DP1810, Lot 8 DP1810, Lot 4 DP1810, Lot 2 DP1810, Lot 12 DP1810, Lot 7 DP1810, Lot 3 DP1810, Lot 9 DP1810, Lot 2 DP1810, Lot 13 DP1810, Lot 5 DP1810, Lot 1 DP211320, Lot 1 DP219928, Lot 1 DP222985, Lot 2 DP321183, Lot 1 DP321183, Lot A DP417584, Lot F DP418849, Lot E DP418849, Lot A DP439287, Lot N DP439287, Lot B DP439287, Lot D DP440134, Lot 1 DP575206, Lot 1 DP580999, Lot 1 DP591580, Lot 2 DP591580, Lot 1 DP601586, Lot 2 DP601586, Lot 1 DP611058, Lot 4 DP661683, Lot 118 DP664556, Lot 2 DP705655, Lot 1 DP705655, Lot 107 DP754099, Lot 59 DP754099, Lot 80 DP754099, Lot 132 DP754099, Lot 117 DP754099, Lot 130 DP754099, Lot 105 DP754099, Lot 108 DP754099, Lot 101 DP754099, Lot 131 DP754099, Lot 129 DP754099, Lot 179 DP754099, Lot 60 DP754102, Lot 54 DP754102, Lot 64 DP754102, Lot 176 DP754102, Lot 55 DP754102, Lot 71 DP754102, Lot 185 DP754102, Lot 11 DP754102, Lot 12 DP754102, Lot 23 DP754102, Lot 90 DP754102, Lot 78 DP754102, Lot 24 DP754102, Lot 175 DP754102, Lot 30 DP754102, Lot 182 DP754102, Lot 79 DP754102, Lot 91 DP754102, Lot 92 DP754102, Lot 29 DP754102, Lot 134 DP754102, Lot 176 DP754102, Lot 63 DP754103, Lot 144 DP754106, Lot 143 DP754106, Lot 339 DP754106, Lot 341 DP754106, Lot 338 DP754106, Lot 361 DP754106, Lot 222 DP754122, Lot 223 DP754122, Lot 209 DP754122, Lot 32 DP754122, Lot 60 DP754135, Lot 61 DP754135, Lot 85 DP754135, Lot 321 DP754135, Lot 77 DP754135, Lot 62 DP754136, Lot 95 DP754136, Lot 15 DP754136, Lot 128 DP754136, Lot 137 DP754136, Lot 150 DP754136, Lot 129 DP754136, Lot 72 DP754136, Lot 110 DP754136, Lot 47 DP754136, Lot 131 DP754136, Lot 161 DP754136, Lot 147 DP754136, Lot 158 DP754136, Lot 48 DP754136, Lot 46 DP754136, Lot 92 DP754136, Lot 56 DP754136, Lot 61 DP754136, Lot 55 DP754136, Lot 117 DP754136, Lot 152 DP754136, Lot 96 DP754136, Lot 88 DP754136, Lot 162 DP754136, Lot 79 DP754136, Lot 93 DP754136, Lot 103 DP754136, Lot 49 DP754136, Lot 63 DP754136, Lot 126 DP754136, Lot 94 DP754136, Lot 108 DP754136, Lot 17 DP754136, Lot 34 DP754136, Lot 149 DP754136, Lot 135 DP754136, Lot 89 DP754136, Lot 18 DP754136, Lot 142 DP754136, Lot 131 DP754136, Lot 144 DP754136, Lot 143 DP754136, Lot 147 DP754136, Lot 127 DP754136, Lot 269 DP754142, Lot 281 DP754142, Lot 214 DP754145, Lot 242 DP754145, Lot 240 DP754145, Lot 118 DP754145, Lot 235 DP754145, Lot 154 DP754145, Lot 128 DP754145, Lot 145 DP754145, Lot 193 DP754145, Lot 239 DP754145, Lot 249 DP754145, Lot 3 DP818601, Lot 1 DP89902, Lot 1 DP945681, Lot B DP948754

1.3 Purpose

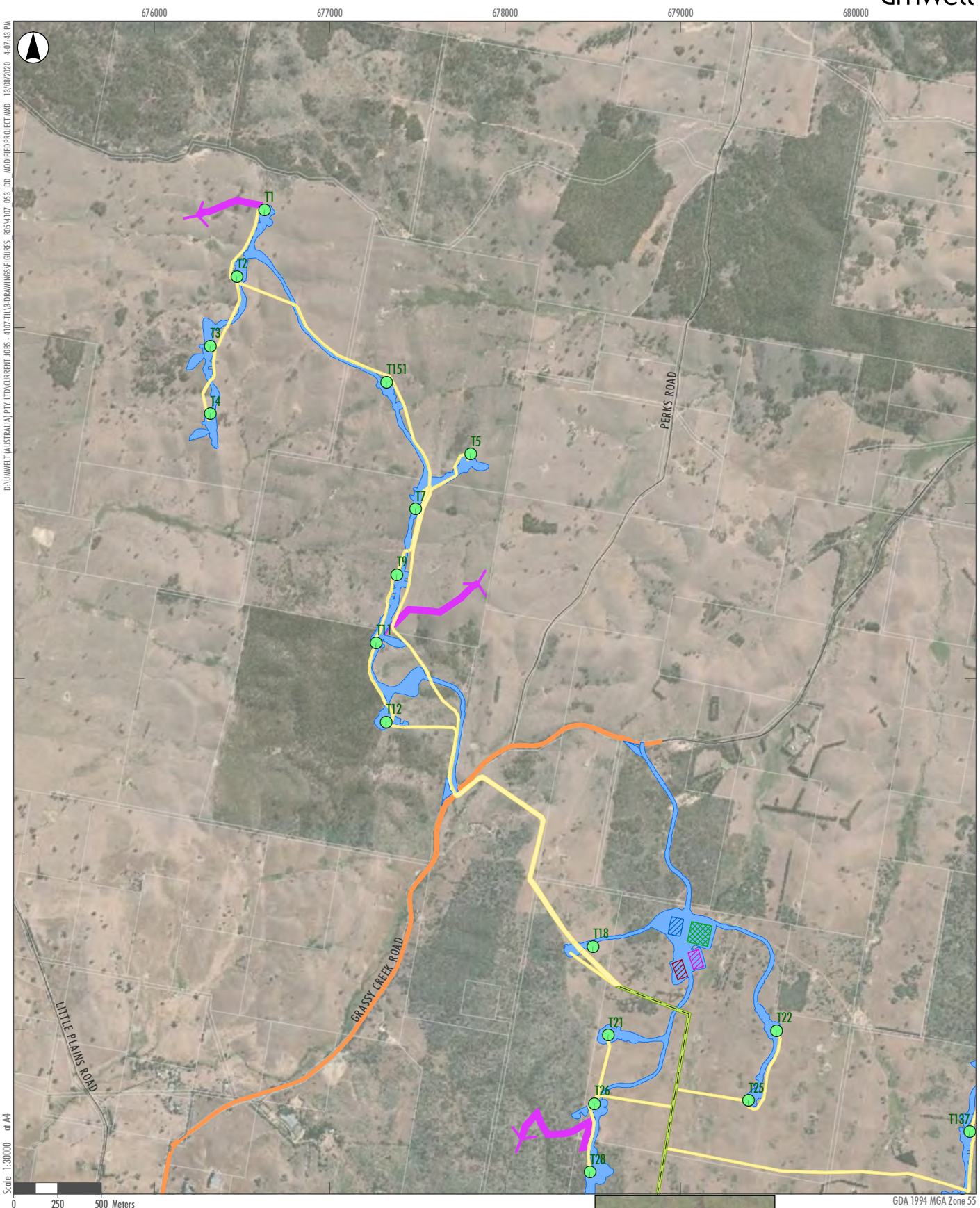
As the Proposed Modification seeks to modify a major project approval it requires a BAM assessment under the *Biodiversity Conservation Act 2016* (BC Act).

This Biodiversity Development Assessment Report (BDAR) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) on behalf of RPRE for two purposes.

Initially a BDAR was being prepared to satisfy Consent Condition 20(b) for the original project (refer to **Section 1.1.2.1** above), to "calculate biodiversity offset credit liabilities for the development in accordance with the *Framework for Biodiversity Assessment* under the *NSW Biodiversity Offset Policy for Major Projects*". Verbal and written consultation occurred with the Biodiversity Conservation Division (BCD) (formerly the Office of Environment and Heritage), DPIE and DoEE to seek approval to use the BAM in order to calculate the credit liability.

Secondly, the BDAR also assesses the potential biodiversity impacts of the Proposed Modification in accordance with the BAM.

This report provides the findings of the Biodiversity Assessment of the Proposed Modification, not the original proposed development. It does however provide comparison of the current project against the approved project where relevant. It addresses the specific requirements of the BAM (OEH 2017a).



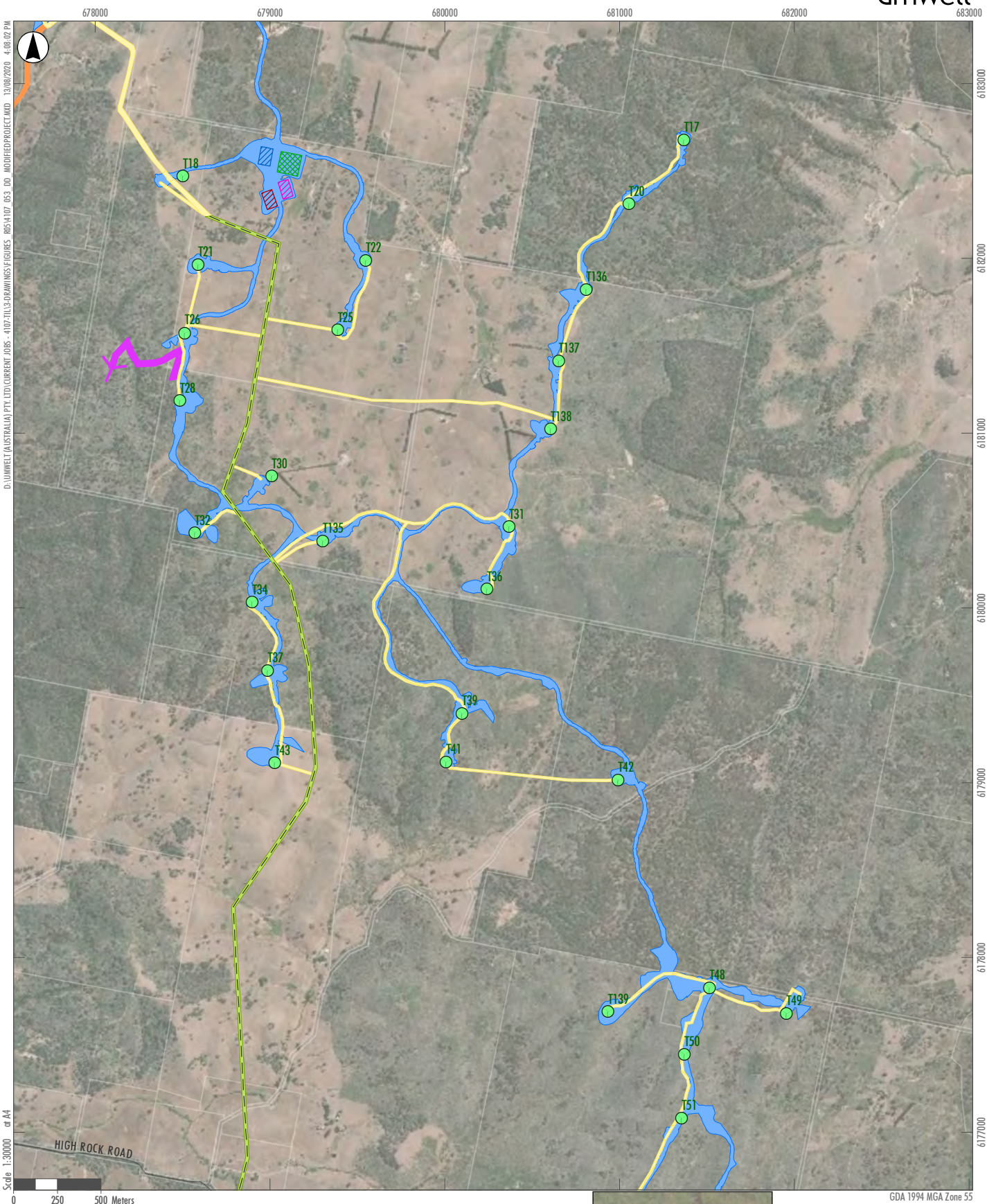
Legend

- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- 33 kV OHL Easement
- Modified Turbine Locations
- 33 kV OHL
- Concrete Batch Plant
- Construction Compound
- Laydown Area
- Project Related Buildings

FIGURE 1.3.a

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



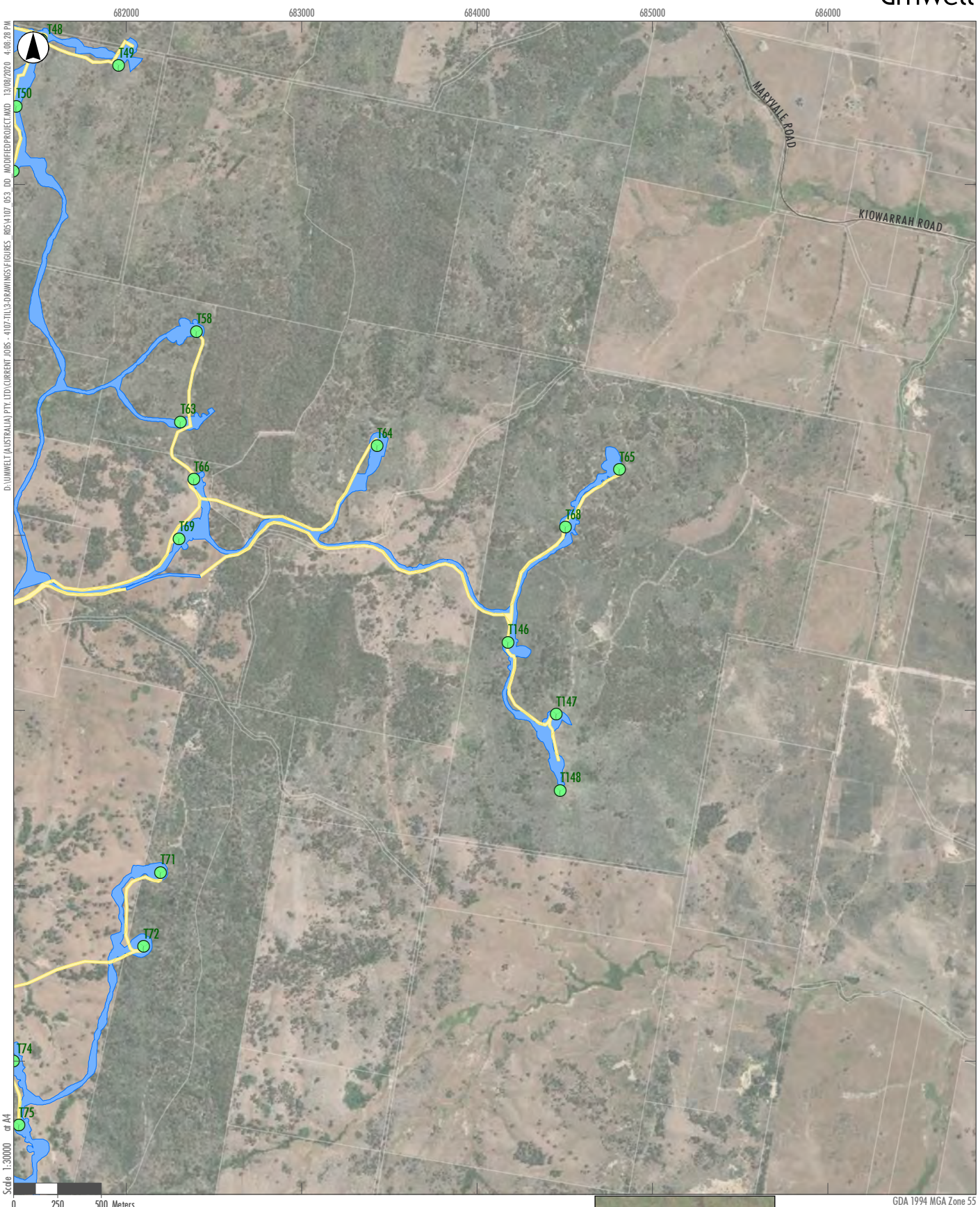
Legend

- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- 33 kV OHL Easement
- Modified Turbine Locations
- 33 kV OHL
- Concrete Batch Plant
- Construction Compound
- Laydown Area
- Project Related Buildings

FIGURE 1.3.b

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- Modified Turbine Locations

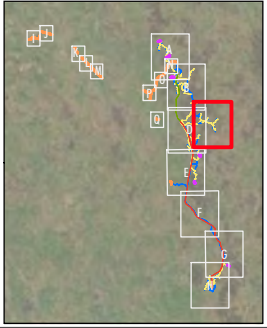
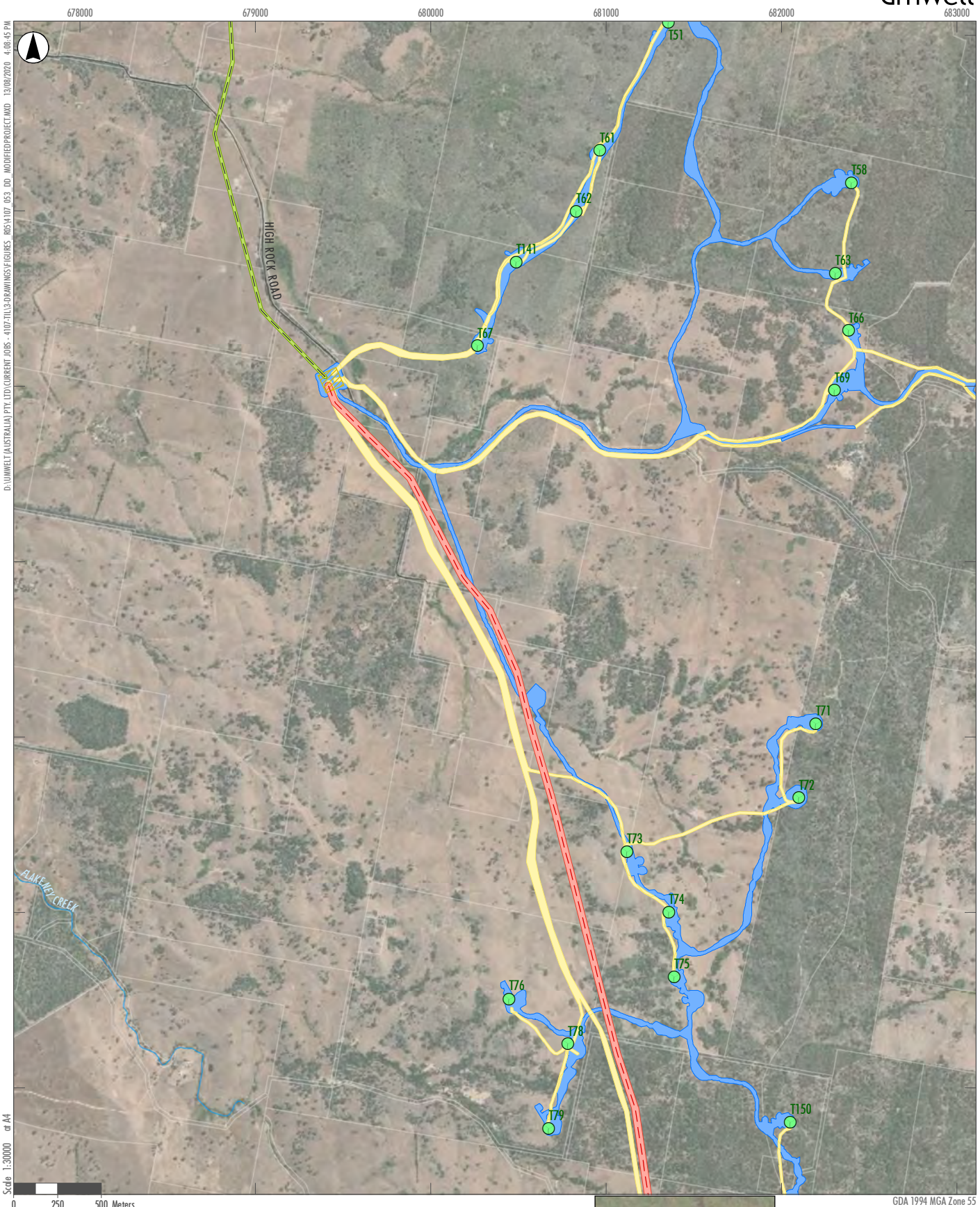


FIGURE 1.3.c

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



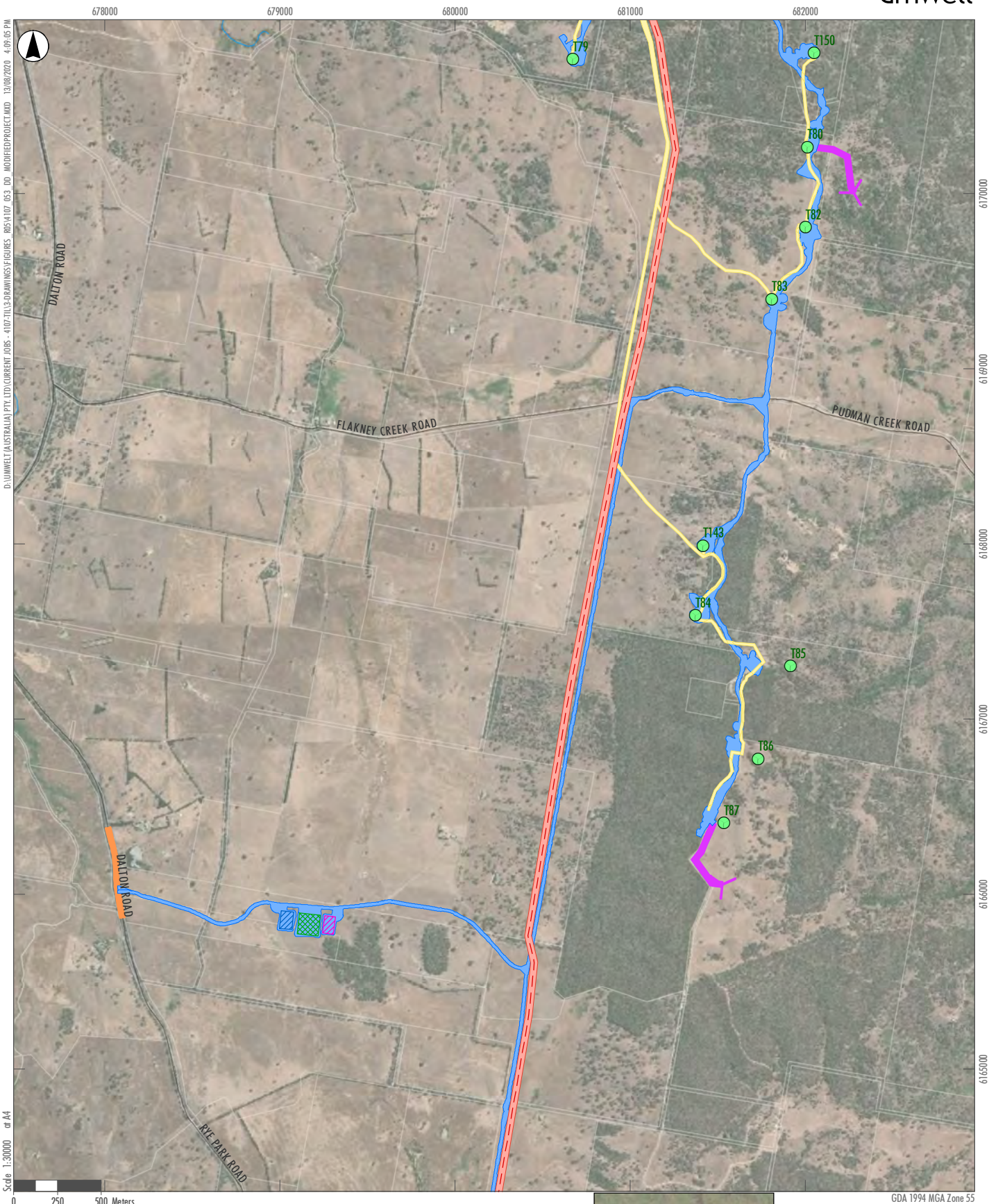
Legend

- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- Up to 330 kV Transmission Line Easement
- 33 kV OHL Easement
- Modified Turbine Locations
- Up tp 330 kV Transmission Line
- 33 kV OHL
- Substations

FIGURE 1.3.d

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- Up to 330 kV Transmission Line Easement
- Modified Turbine Locations
- Up tp 330 kV Transmission Line
- Concrete Batch Plant
- Construction Compound
- Laydown Area

FIGURE 1.3.e

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Civil Disturbance Area
- Up to 330 kV Transmission Line Easement
- Up tp 330 kV Transmission Line

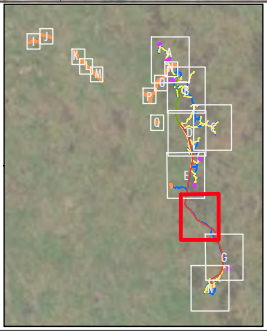


FIGURE 1.3.f

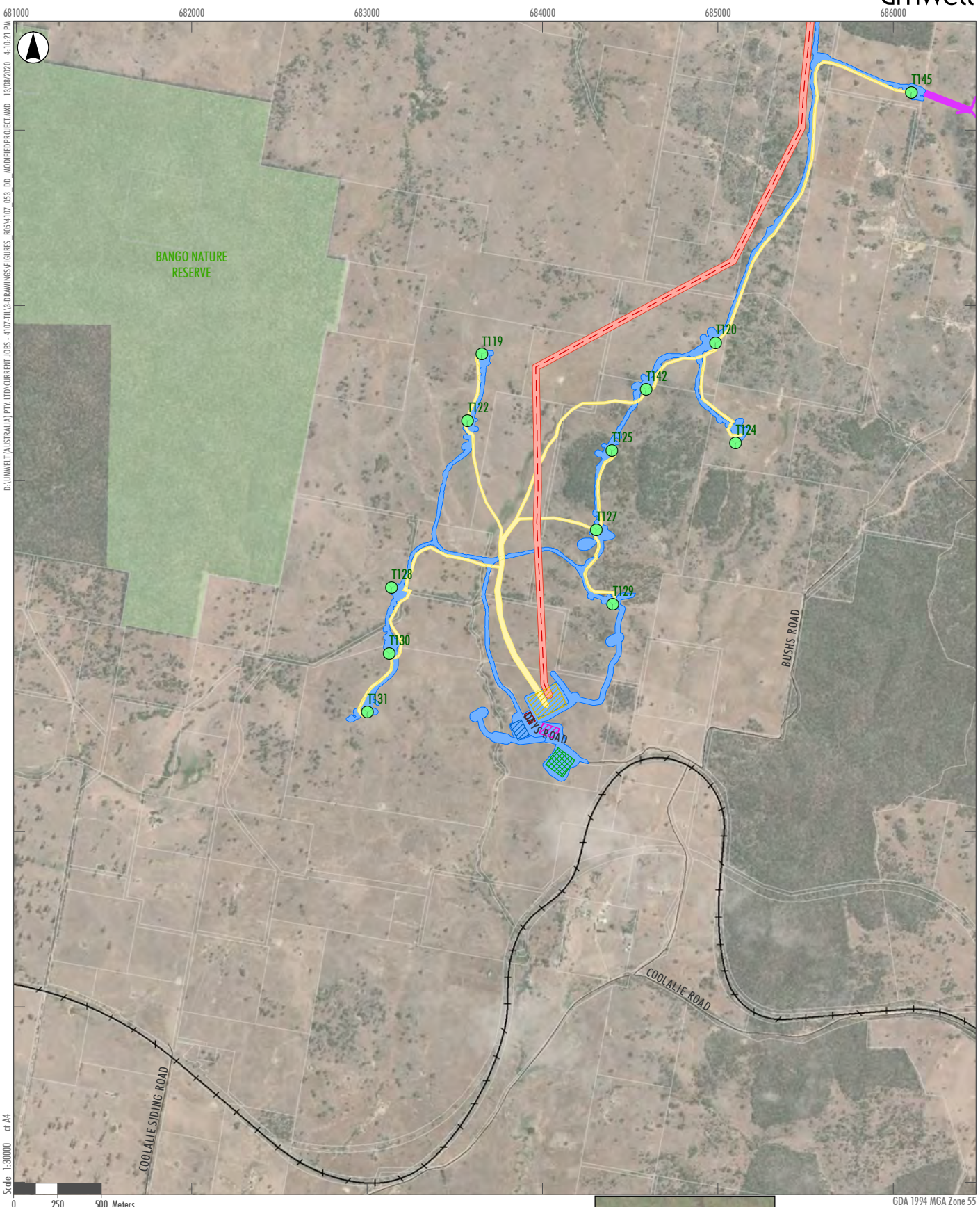
Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.g

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Permanent Met Masts
- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- Up to 330 kV Transmission Line Easement
- Modified Turbine Locations
- Up tp 330 kV Transmission Line
- Concrete Batch Plant
- Construction Compound
- Laydown Area
- Substations
- Project Related Buildings

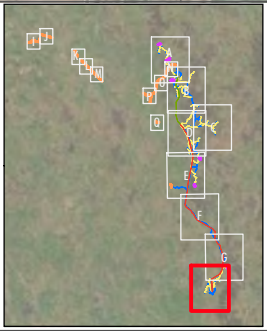


FIGURE 1.3.h

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

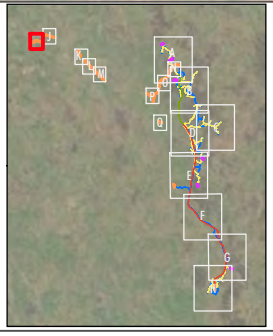


FIGURE 1.3.i

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

FIGURE 1.3.j

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.k

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.I

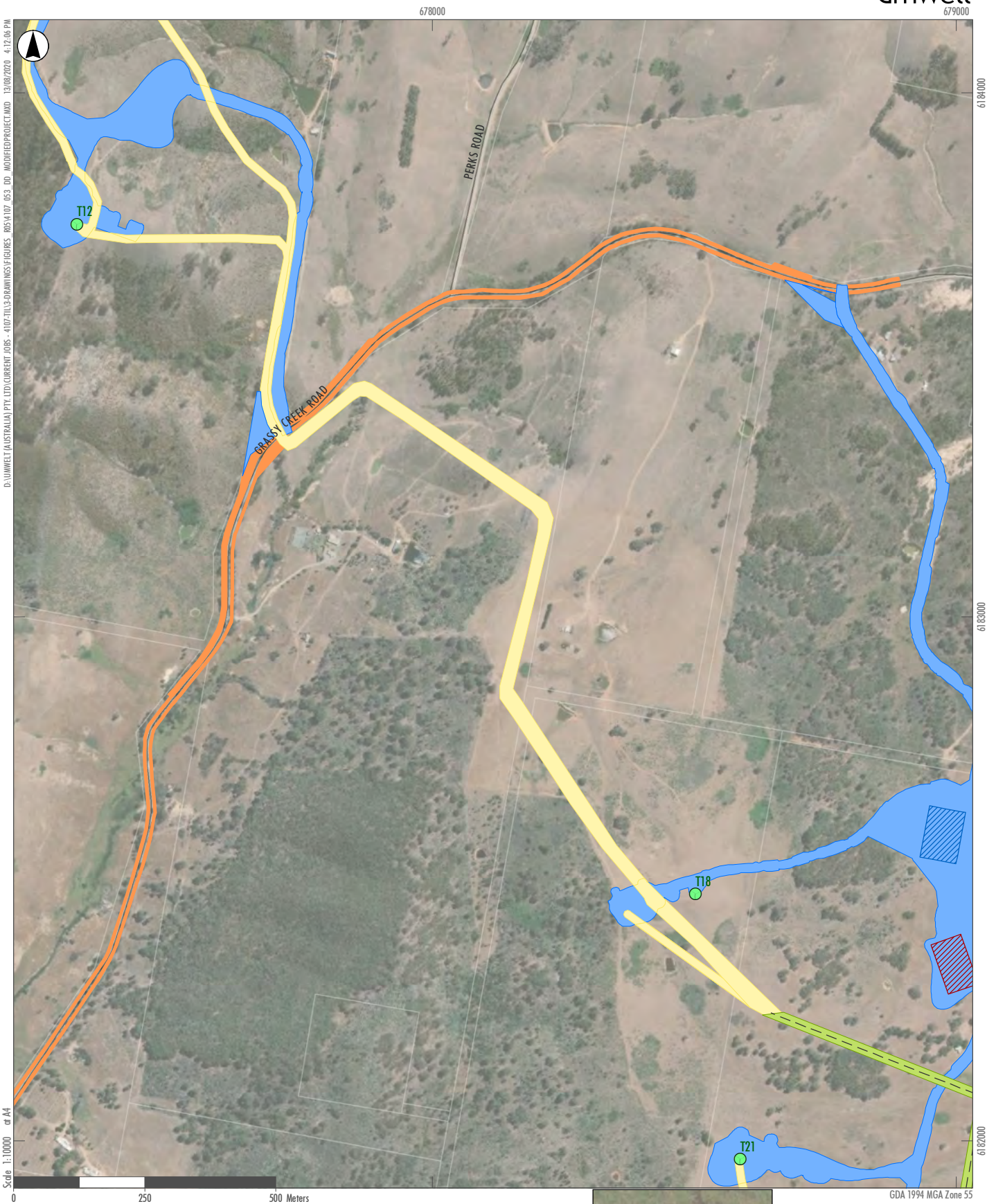
Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.m

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - External Roads
- Civil Disturbance Area
- Total UG 33kV Electrical Disturbance Area
- 33 kV OHL Easement
- Modified Turbine Locations
- 33 kV OHL
- Laydown Area
- Project Related Buildings

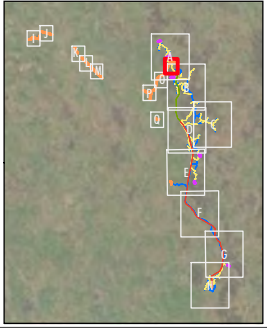


FIGURE 1.3.n

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.o

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Scale 1:10000 at A4

Legend

Indicative Development Footprint - External Roads

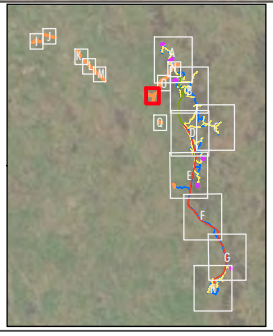


FIGURE 1.3.p

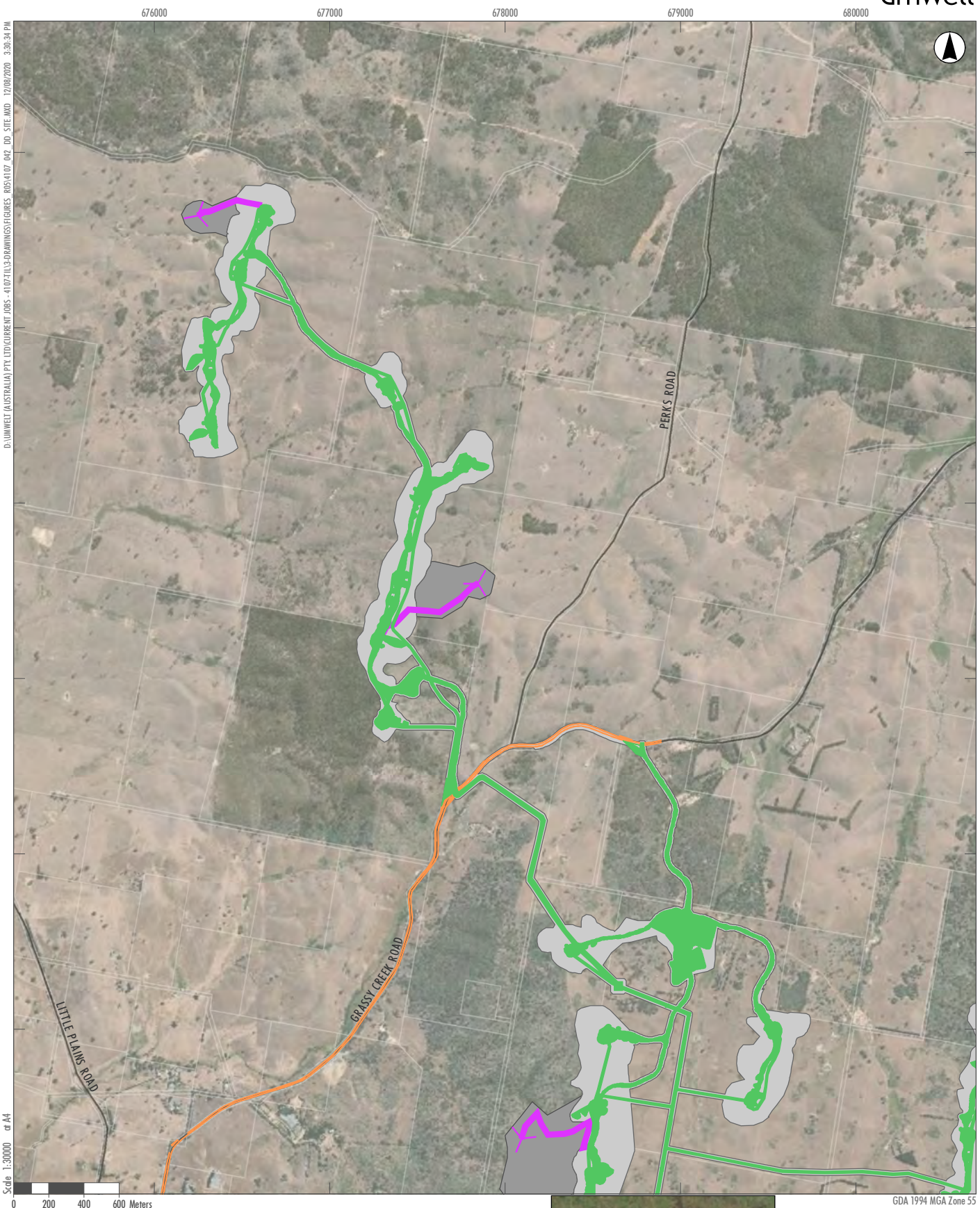
Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.3.q

Modified Project Overview

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads

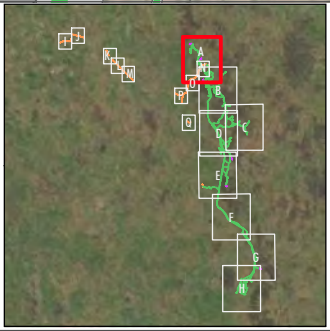
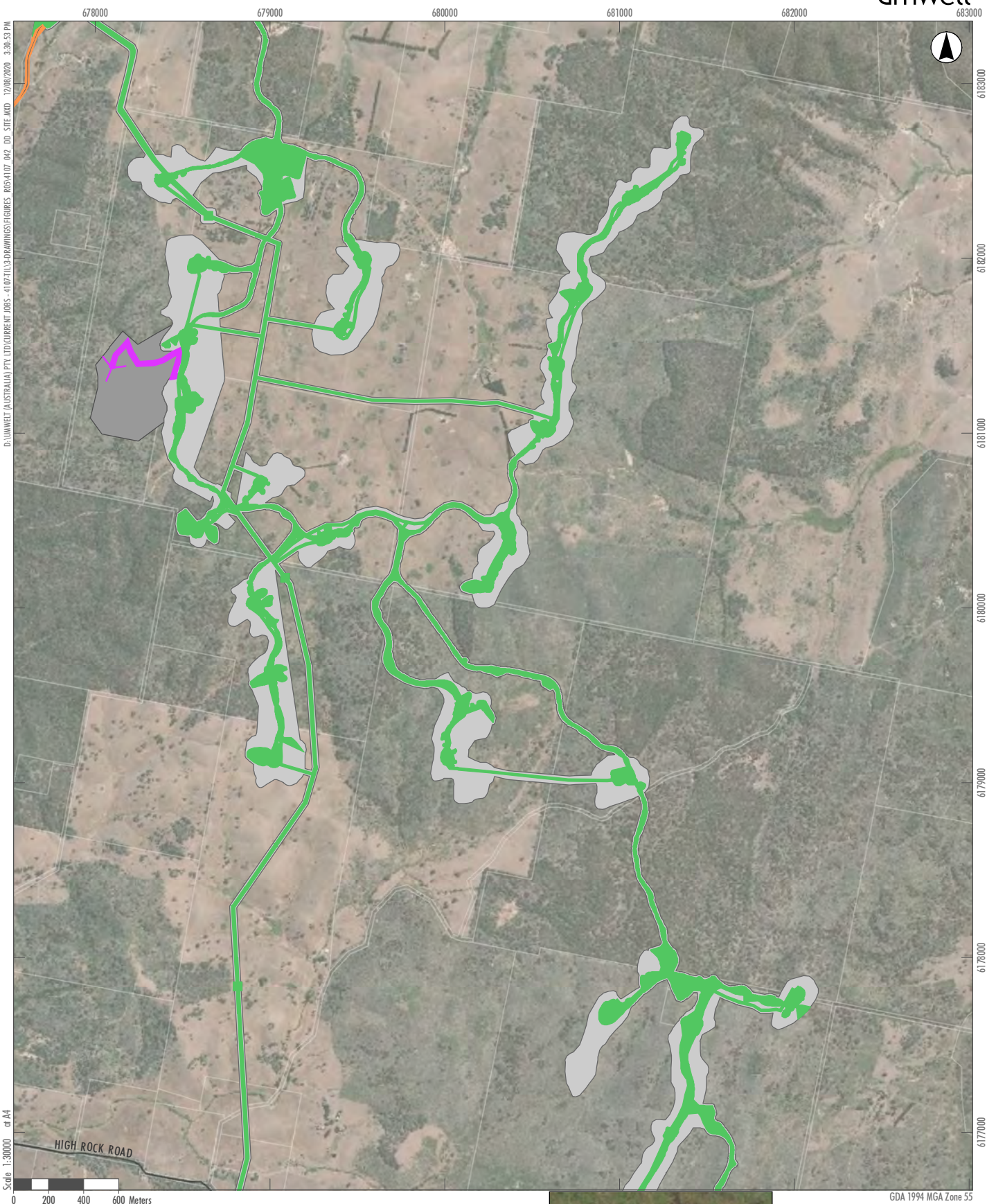


FIGURE 1.4.a

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads

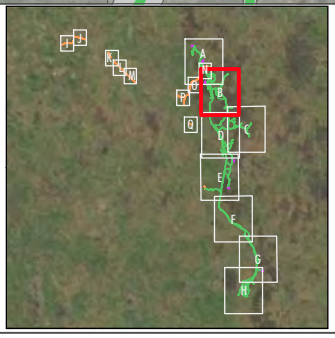


FIGURE 1.4.b

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

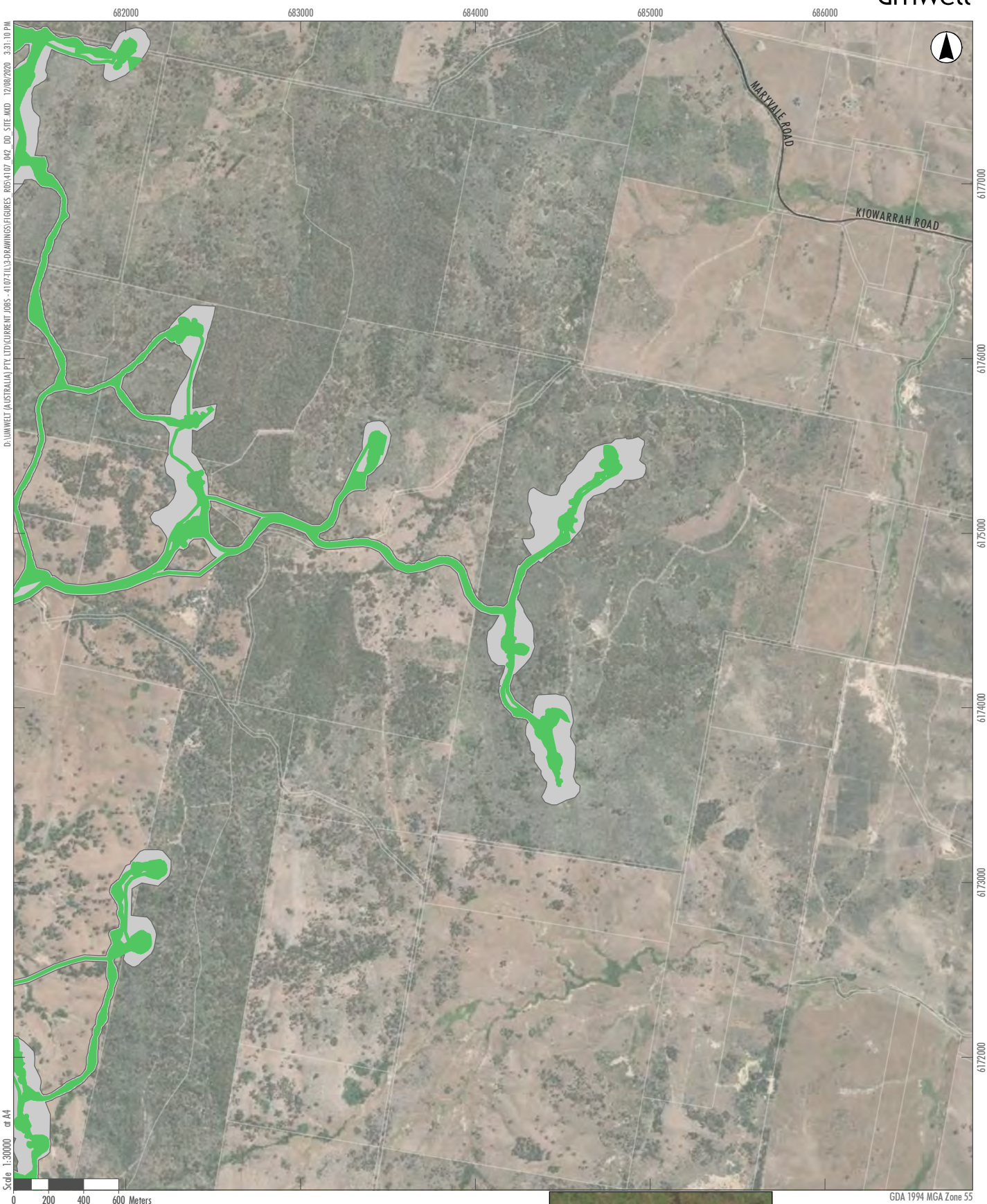


FIGURE 1.4.c

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

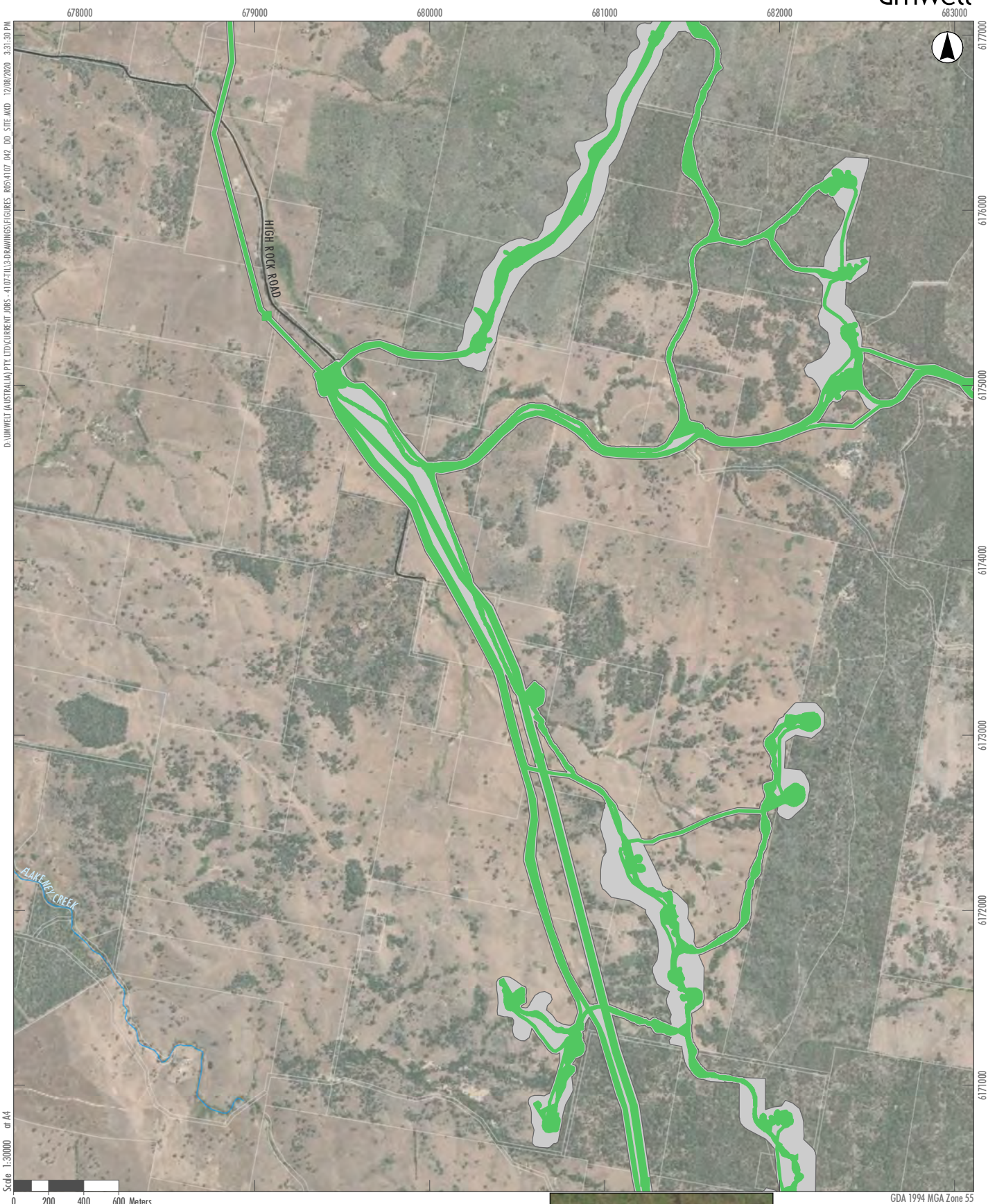


FIGURE 1.4.d

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

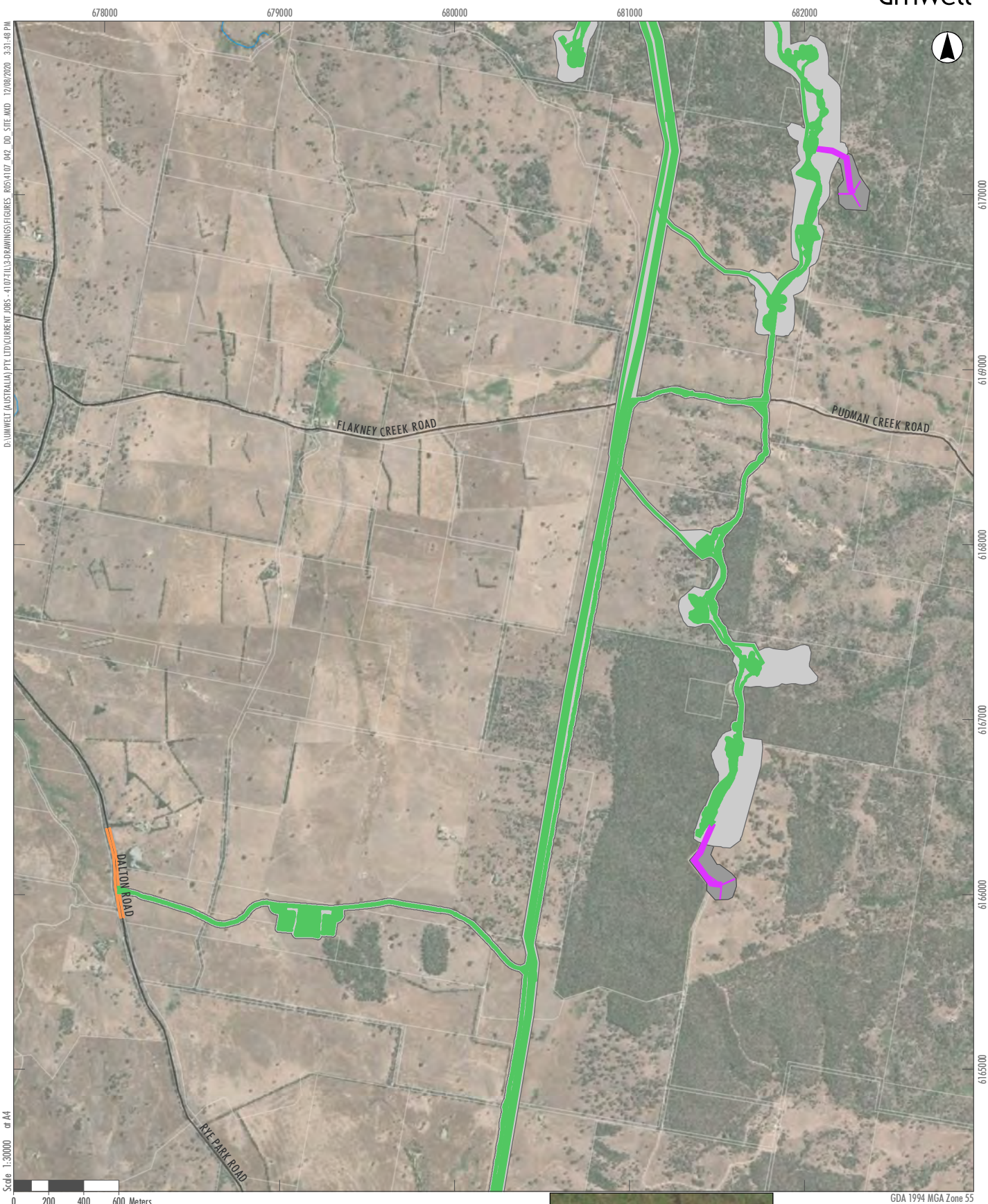


FIGURE 1.4.e

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

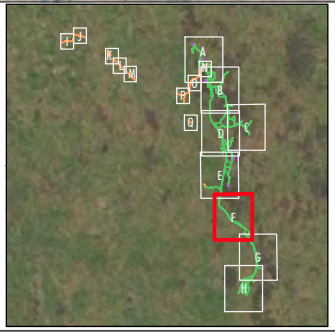


FIGURE 1.4.f

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

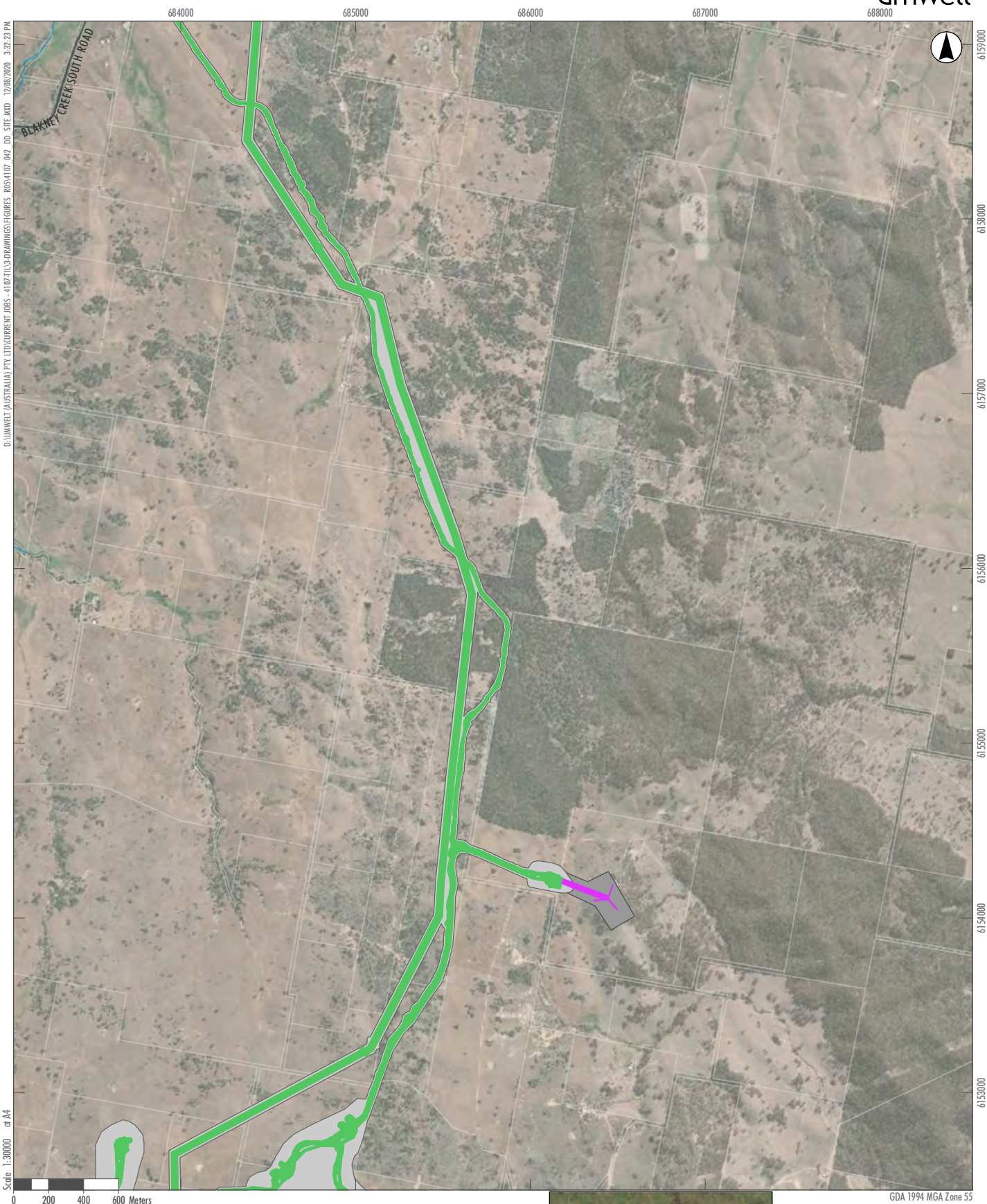
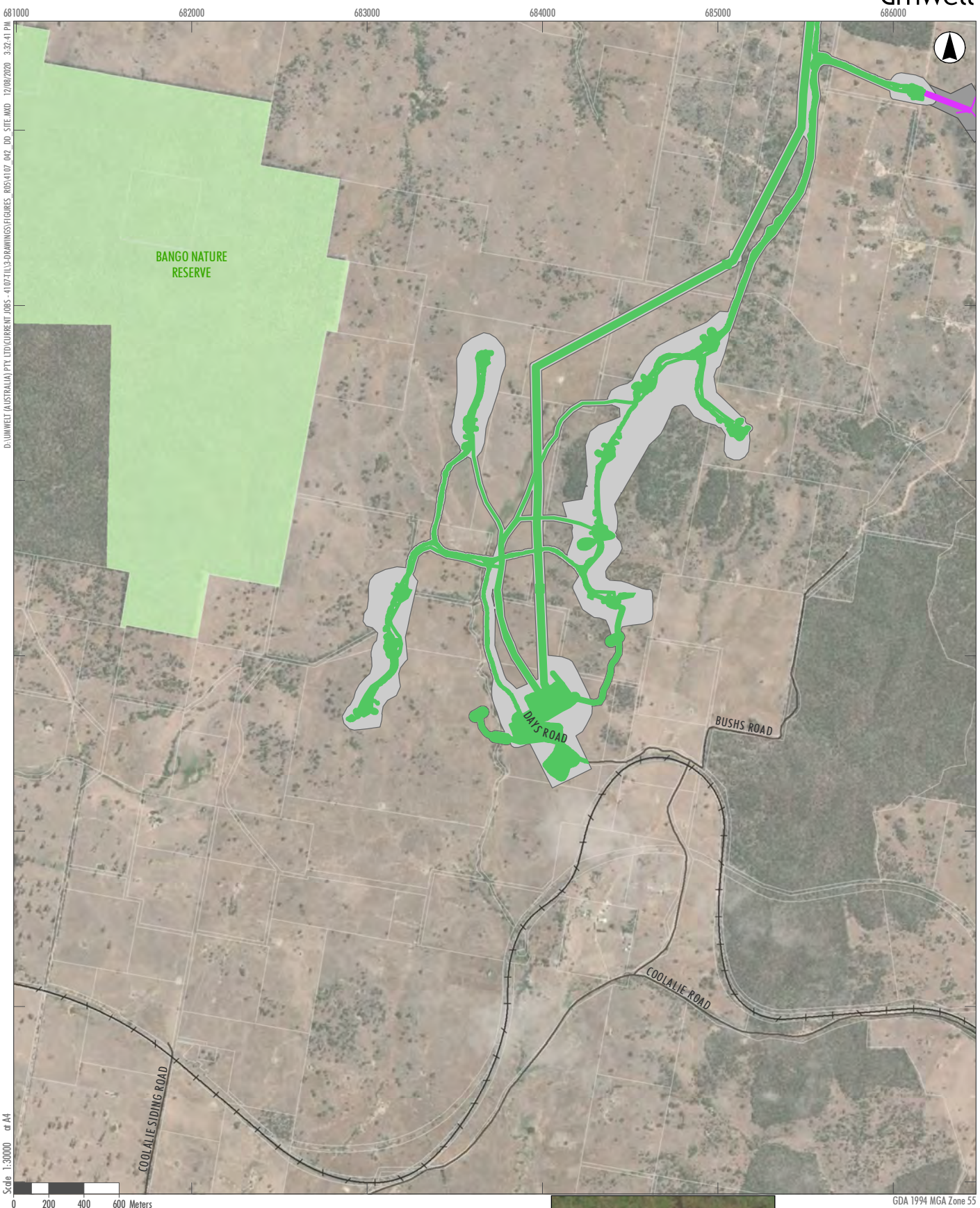


FIGURE 1.4.g

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Property Boundaries
- Watercourses
- Major Roads
- Railways
- Nature Reserves

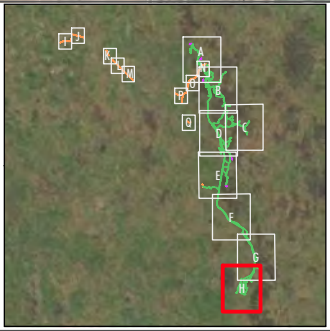


FIGURE 1.4.h

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads
- Railways

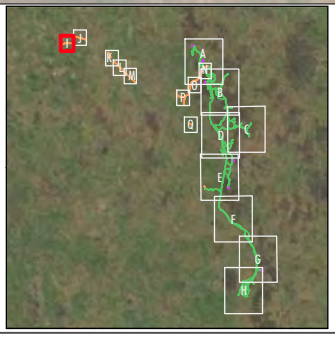


FIGURE 1.4.i

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

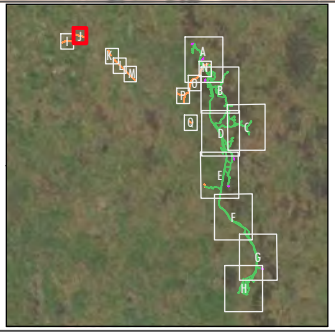


FIGURE 1.4.j

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.4.k

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.4.I

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads

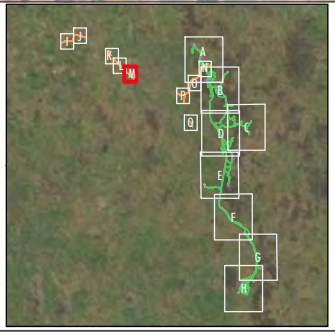
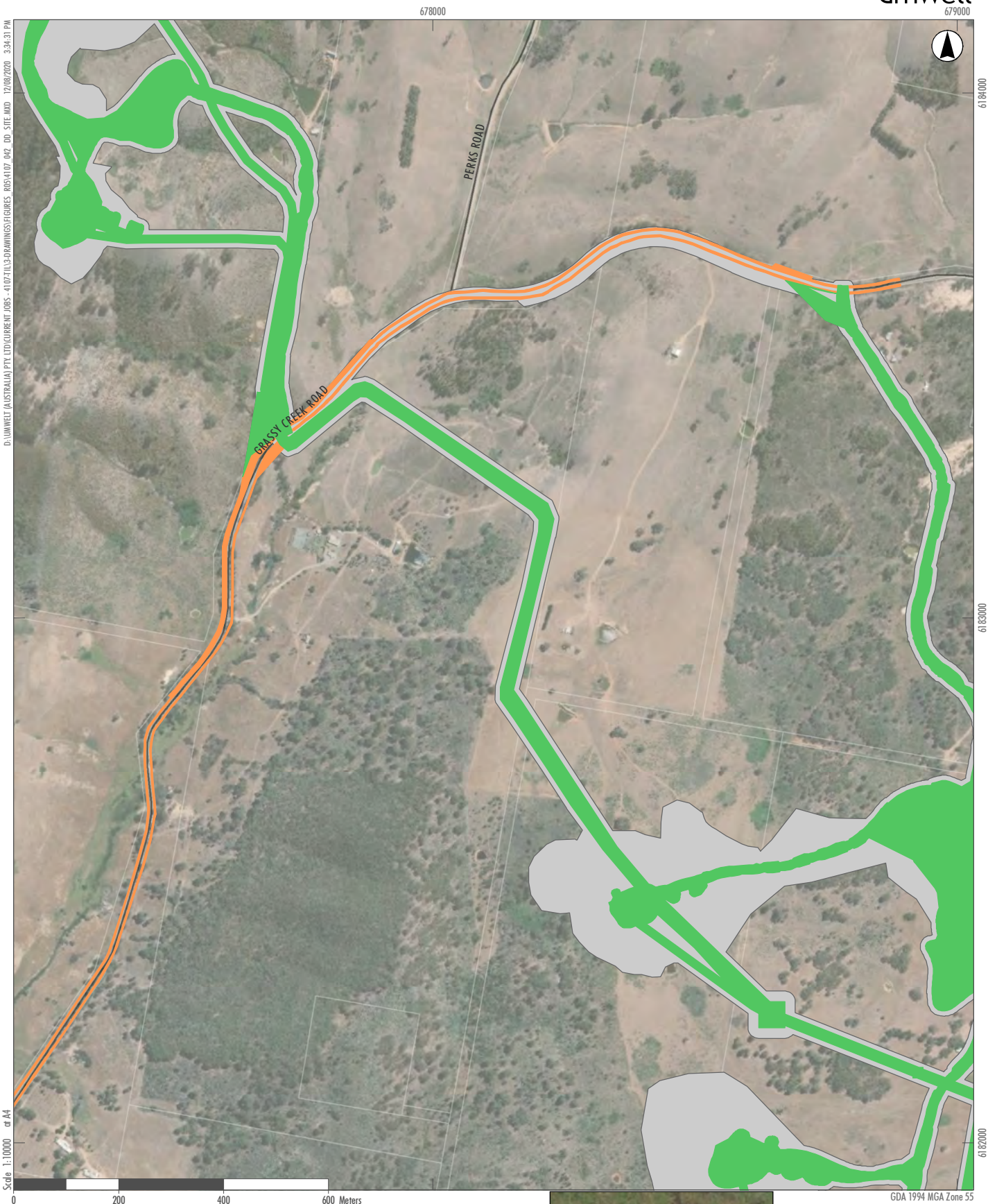


FIGURE 1.4.m

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads

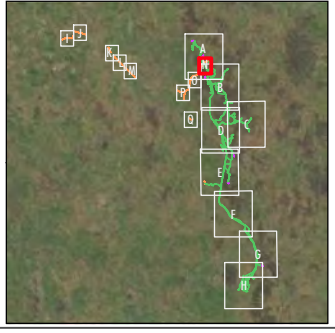


FIGURE 1.4.n

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.4.o

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

Scale 1:10000 at A4

Legend

- Indicative Development Footprint - External Roads
- Property Boundaries
- Watercourses
- Major Roads

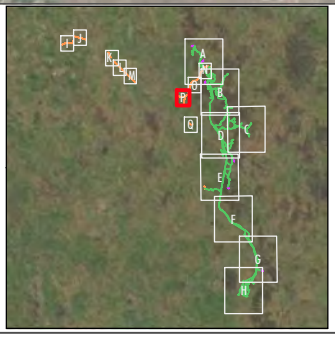


FIGURE 1.4.p

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 1.4.q

Site Map

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

1.4 Key Resources, Policies and Documents

The following key resources, policies and documents were used during the preparation of this BDAR for the Proposed Modification:

Government Guidelines and Resources

- Biodiversity Assessment Method Order 2017
- Biodiversity Assessment Method Operational Manual (Stage 2) (DPIE 2019a)
- Biodiversity Assessment Method Calculator
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities –Working Draft (DEC 2004)
- The Native Vegetation of Boorowa Shire – June 2002 (NSW NPWS 2002)
- BCD Atlas of NSW Wildlife database and mapping tool (BCD 2020a), accessed February 2020
- Threatened Biodiversity Data Collection (TBDC) (BCD 2020b), accessed February 2020
- Vegetation Information System (VIS) Classification Database (BCD 2020c), accessed February 2020
- NSW Guide to Surveying Threatened Plants (OEH 2016) and
- Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (DAWE 2020), accessed February 2020
- Draft Koala Habitat Protection Guideline and Koala Habitat Protection SEPP (DPIE 2020).

Project Assessments

- Biodiversity Assessment Rye Park Wind Farm (NGH Environmental 2014)
- Rye Park Wind Farm, Response to Submissions (SSD 6693) (Trust Power 2016)
- Biodiversity Assessment Addendum – Rye Park Wind Farm (NGH Environmental 2016a)
- Rye Park Wind Farm Crimson Spider Orchid surveys 2016: 16-035 (NGH Environmental 2016b)
- Rye Park Wind Farm Golden Sun Moth 2016 Survey Results: 16-432 (NGH Environmental 2017)
- Rye Park Wind Farm EPBC Preliminary Documentation: EPBC Ref: 2014/7163, 21 April 2017 (Epuron 2017a)
- Rye Park Wind Farm EPBC Preliminary Documentation – Supplementary Report: 7 August 2017 (Epuron 2017b)
- Rye Park Wind Farm State Development Consent (SD 6693) (DPE 2017)
- Rye Park Wind Farm Federal Approval (EPBC 2014/7163) (DoEE 2017)
- Rye Park Wind Farm Modification, Preliminary Biodiversity Assessment Method (BAM) Calculations (NGH Environmental 2019).
- Rye Park Wind Farm, Project Overview and Proposed Modification (Tilt Renewables 2019).

1.5 Report Preparation

This BDAR was prepared by Bill Wallach (Senior Ecologist), with review and technical direction from Travis Peake (National Ecology Leader). Field surveys were undertaken by a range of suitably experienced and qualified Umwelt ecologists under the supervision of Bill Wallach.

Table 1.6 below outlines the details of the Accredited BAM Assessors involved in the survey, calculations and reporting for the Project.

Table 1.6 Accredited BAM Assessors and their Role on this Project

Name	Assessor ID	Role
Travis Peake *National Ecology Leader*	BAAS17081	Review of BDAR, review of BAM calculator, technical direction and consultation with BCD
Bill Wallach *Senior Ecologist*	BAAS17068	BDAR Preparation, BAM calculator application, field surveys and consultation with BCD
David Moore *Principal Ecologist*	BAAS18066	Field surveys
Ryan Parsons *Senior Ecologist – Botanist*	BAAS17048	Field surveys
Jonathan Carr *Senior Ecologist*	BAAS18009	Field surveys
Philippa Fagan *Ecologist*	BAAS18117	Field surveys
Natasha Crook *Ecologist*	BAAS18043	Field surveys

2 Methods

2.1 Landscape Features and Site Context

Landscape features such as IBRA bioregions, IBRA subregions, NSW Mitchell Landscape regions, native vegetation extent within a 500 metre buffer area, cleared areas, rivers, streams, wetlands and connectivity features were identified within the Development Corridors, where appropriate, in accordance with Section 4.2 of the BAM (OEH 2017a).

The Project meets the definition of a Linear Shaped Development under BAM (OEH 2017), being "*development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length*". While there are certain components of the Project that may not appear linear in nature (e.g. turbine locations, substations etc), the extent of the Project spans approximately 36 kilometres from its northern to southern tip with the majority of the Development Corridor consisting of linear corridors.

Determining the 'Site Context' of the Indicative Development Footprints was calculated by assessing the native vegetation cover and patch size within the Indicative Development Footprints in accordance with Section 4.3 of the BAM (OEH 2017a).

The 500 metre buffer area was determined based on the outer extent of the Indicative Development Footprints because a centreline was not applicable for the Project as per Section 4.2.1.2 of the BAM (OEH 2017a). This approach to the 500 metre buffer actually covers a greater area than it would have if it was prepared based on a centreline. The buffer covers the full extent of all works associated with the Project, and includes the full extent of the Development Corridors. Native vegetation cover was mapped within the buffer area using the regional mapping product, Native Vegetation of Boorowa Shire – June 2002 (NSW NPWS 2002) combined with post-processed LiDAR data.

Specifically, raw C3 LAS (LiDAR) files were processed from the following NSW LPI Elevation Program datasets.

- Boorowa201709-LID1
- Yass201709-LID1

The C3 Classified LiDAR was used to differentiate Medium and High Vegetation from ground surface using the height attributes of the LAS point cloud.

This was then further processed, to remove obvious outliers, incorrect LAS classification, buildings, water features and other "noise" from the classified data. Holes were removed from the vegetation polygons using a 2 m tolerance and mapped polygons less than 200 m^2 in size were removed from the data. This final process was undertaken to reduce the occurrence of single trees being mapped as native vegetation.

2.2 Native Vegetation Assessment

2.2.1 Literature and Database Review

A review of previous documents and reports relevant to the Project was undertaken. The information obtained was used to inform survey design, and also to assist in the assessment of potentially occurring threatened and migratory species, endangered populations (EPs) and TECs. The full extent of resources, policies and documents utilised during this review are described above in **Section 1.4**.

2.2.2 Floristic and Vegetation Integrity Survey

Floristic and vegetation integrity surveys were undertaken over the following survey periods:

- 27 to 29 September 2017
- 16 to 19 October 2017
- 22 to 25 January 2018
- 12 to 16 and 26 to 28 February 2018
- 1 to 2 March 2018
- 3 to 4 April 2019
- 11 to 15 November 2019
- 13 to 15 January 2020
- 5 to 6 February 2020
- 1 to 3 July 2020.

A total of 52 BAM Vegetation Integrity Plots, 65 rapid vegetation assessments and ten box-gum woodland assessments were conducted during the surveys undertaken for this assessment (refer to **Figure 2.1**). Every attempt was made to complete the BAM Vegetation Integrity Plots within the Indicative Development Footprints in the first instance and Development Corridors in the second. However, in some circumstances BAM Vegetation Integrity Plots are situated outside of the Indicative Development Footprints, either in the Development Corridors or wider area (refer to **Figure 2.1**). This occurred where avoidance and minimisation measures have been employed by RPRE, some circumstances where modifications to the Project occurred following surveys of a particular area, and to a lesser extent where additional surveys were not required following consideration of the previous ecological surveys. Floristic and vegetation integrity data was collected in accordance with minimum requirements under the BAM (OEH 2017a).

Table 2.1 presents a summary of the extent of vegetation zones identified within the Development Corridors and Indicative Development Footprints.

Table 2.2 outlines the floristic survey effort relevant to the Indicative Development Footprints. Full clarity around the extent to which BAM Vegetation Integrity Plots were completed within the Indicative Development Footprints, within 50 metres and between 50 and 100 metres from the Indicative Development Footprints is provided in **Table 2.2**. It is important to note that all native vegetation zones have met the plot survey requirement in accordance with BAM (OEH 2017). In fact, the majority of

vegetation zones have had more than the minimum number of BAM Vegetation Integrity Plots completed within them. Umwelt has deliberately used all BAM Vegetation Integrity Plot data in the application of the online BAM Credit Calculator as it captures the full variation of vegetation zones across the Project and it provides a more detailed assessment of the biodiversity values to be impacted by the Project.

In relation to oversampling completed by Umwelt in vegetation zones of biodiversity significance:

- Vegetation Zone 3 required four plots based on the minimum plot requirement of BAM (OEH 2017a); Umwelt used data from seven plots within the BAMCC, presenting a surplus of three plots.

- Vegetation Zone 4 required three plots based on the minimum plot requirement of BAM (OEH 2017a); Umwelt used data from five plots within the BAMCC, presenting a surplus of two plots.

- Vegetation Zone 5 required five plots based on the minimum plot requirement of BAM (OEH 2017a); Umwelt used data from eight plots within the BAMCC, presenting a surplus of three plots.

The total minimum BAM Vegetation Integrity Plot requirement is 37, whilst Umwelt completed 52 throughout extensive field surveys. This presents a surplus of 15 BAM Vegetation Integrity Plots. All of these plots were entered into the BAMCC.

Table 2.1 Summary of Vegetation Zones within the Development Corridors and Indicative Development Footprints

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Development Corridors			Area within Indicative Development Footprints			
		Development Corridor – Wind Farm (ha)	Development Corridor – Permanent Masts (ha)	Total in Development Corridors (ha)	Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)
1	289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	0.05	0	**0.05**	0.05	0	0.73	**0.78**
2	335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	14.58	0	**14.58**	5.50	0	0	**5.50**

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Development Corridors			Area within Indicative Development Footprints			
		Development Corridor – Wind Farm (ha)	Development Corridor – Permanent Masts (ha)	Total in Development Corridors (ha)	Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)
3	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Moderate to Good Condition*	36.33	0	**36.33**	18.75	0	1.33	**20.08**
4	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Derived Native Grassland*	32.71	0	**32.71**	16.85	0	0.67	**17.52**

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Development Corridors			Area within Indicative Development Footprints			
		Development Corridor – Wind Farm (ha)	Development Corridor – Permanent Masts (ha)	Total in Development Corridors (ha)	Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)
5	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Moderate Good Condition*	217.26	12.40	**229.66**	83.59	0.47	0.75	**84.81**
6	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Derived Native Grassland*	449.75	17.93	**467.68**	169.08	4.76	0.15	**173.99**

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Development Corridors			Area within Indicative Development Footprints			
		Development Corridor – Wind Farm (ha)	Development Corridor – Permanent Masts (ha)	Total in Development Corridors (ha)	Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)
7	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Acacia Shrubland*	21.99	6.68	**28.67**	7.25	1.25	0.03	**8.53**
8	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Sifton Bush Shrubland*	249.13	9.94	**259.07**	82.80	1.12	0.26	**84.18**

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Development Corridors			Area within Indicative Development Footprints			
		Development Corridor – Wind Farm (ha)	Development Corridor – Permanent Masts (ha)	Total in Development Corridors (ha)	Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)
9	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Argyle Apple Forest*	3.79	0	**3.79**	0.61	0	0.01	**0.62**
10	Non-native Vegetation	229.71	4.07	**233.78**	90.23	1.35	13.60	**105.18**
-	Nil (incl. roads, tracks and waterbodies)	20.27	0.96	**21.23**	14.26	0.22	1.24	**15.72**
TOTAL		**1,275.57**	**51.98**	**1,327.55**	**488.97**	**9.17**	**18.77**	**516.91**

Table 2.2 Adequacy of Floristic and Vegetation Integrity Survey in the Indicative Development Footprints

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Indicative Development Footprints				Number of Floristic and Vegetation Integrity Plots				
		Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)	Required[1]	Total Completed	Completed Within (±10m) Indicative Development Footprints	Completed within 50m of Indicative Development Footprints	Completed >50m of Indicative Development Footprints
1	289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	0.05	0	0.73	**0.78**	1	1	1	-	-
2	335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	5.50	0	0	**5.50**	3	3	2	-	1

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Indicative Development Footprints				Number of Floristic and Vegetation Integrity Plots				
		Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)	Required[1]	Total Completed	Completed Within (±10m) Indicative Development Footprints	Completed within 50m of Indicative Development Footprints	Completed >50m of Indicative Development Footprints
3	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Moderate to Good Condition*	18.75	0	1.33	**20.08**	4	7	2	2	3
4	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Derived Native Grassland*	16.85	0	0.67	**17.52**	3	5	3	-	2

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Indicative Development Footprints				Number of Floristic and Vegetation Integrity Plots				
		Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)	Required[1]	Total Completed	Completed Within (±10m) Indicative Development Footprints	Completed within 50m of Indicative Development Footprints	Completed >50m of Indicative Development Footprints
5	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Moderate Good Condition*	83.59	0.47	0.75	**84.81**	5	8	3	1	4
6	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Derived Native Grassland*	169.08	4.76	0.15	**173.99**	6	10	9	-	1

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Indicative Development Footprints				Number of Floristic and Vegetation Integrity Plots				
		Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)	Required[1]	Total Completed	Completed Within (±10m) Indicative Development Footprints	Completed within 50m of Indicative Development Footprints	Completed >50m of Indicative Development Footprints
7	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Acacia Shrubland*	7.25	1.25	0.03	**8.53**	3	4	3	1	-
8	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Sifton Bush Shrubland*	82.80	1.12	0.26	**84.18**	5	5	2	1	2

Veg. Zone	Plant Community Type (PCT) *Condition Class*	Area within Indicative Development Footprints				Number of Floristic and Vegetation Integrity Plots				
		Indicative Development Footprint – Wind Farm (ha)	Indicative Development Footprint – Permanent Masts (ha)	Indicative Development Footprint – External Roads (ha)	Total Indicative Development Footprints (ha)	Required[1]	Total Completed	Completed Within (±10m) Indicative Development Footprints	Completed within 50m of Indicative Development Footprints	Completed >50m of Indicative Development Footprints
9	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Argyle Apple Forest*	0.61	0	0.01	**0.62**	1	2	-	1	1
10	Non-native Vegetation	90.23	1.35	13.60	**105.18**	6	7	4	-	3
-	Nil (incl. roads, tracks and waterbodies)	14.26	0.22	1.24	**15.72**	NA	NA	NA	NA	NA
Total		**488.97**	**9.17**	**18.77**	**516.91**	**37**	**52**	**29**	**6**	**17**

[1] Calculated against the Indicative Development Footprints

At each floristic and vegetation integrity plot, data was recorded according to Section 5 of the BAM (OEH 2017a). This involved setting out 20 x 50 m, 20 x 20 m and 1 x 1m plots. The location of each plot was recorded using a hand-held GPS with accuracy of ± 5 m. The Map Grid of Australia (MGA) coordinate system was used.

At each plot/transect, roughly 45 to 60 minutes was spent searching for all vascular flora species present within the 20 x 20 m plot. Searches of each 20 x 20 m plot were generally undertaken through parallel transects from one side of the plot to another. Most effort was spent on examining the groundcover, which usually supported well over half of the species present, however the composition of any shrub, mid-storey, canopy and emergent layers were also thoroughly examined.

For each flora species recorded in the plot, the following data was collected in accordance with Table 2 of the BAM (OEH 2017a):

- stratum/layer in which the species occurs
- growth form
- scientific name and common name
- cover
- abundance.

At each vegetation integrity plot the following attributes were recorded in accordance with the BAM (OEH 2017a) to determine the condition of the vegetation zone:

- ***Composition*** - native plant species richness by growth form (within the 20 x 20 m plot)
- ***Structure*** – estimate foliage cover of native and exotic species by growth form (within the 20 x 20 m plot)
- ***Function*** (within the 20 x 50 m plot) including, number of large trees, presence or otherwise of tree stem size classes, presence or otherwise of canopy species regeneration, length of fallen logs, percentage cover for litter (recorded from five 1 x 1 m plots), number of trees with hollows and high threat exotic cover.

2.2.2.1 BAM Vegetation Integrity Plot Location

Following the submission by BCD which refers to the number of BAM Vegetation Integrity Plots that occur outside of the Indicative Development Footprints, further detail is provided below.

Umwelt sampled a larger number of BAM Vegetation Integrity Plots than was required based on the minimum requirement of BAM (OEH 2017a). This was a result of capturing various project design changes since commencing the work in 2017. Many of the design changes were in relation to efforts of avoidance and or minimisation, as is required in BAM. Umwelt used all BAM Vegetation Integrity Plots undertaken for the Project within the online BAM Credit Calculator (BAMCC), despite these presenting a surplus of survey effort.

As discussed further below, many of the BAM Vegetation Integrity Plots are located short distances outside of the Indicative Development Footprints and should therefore actually be considered as within. This would bring down the percentage of plots noted as being situated outside of the Indicative Development Footprints and also the mean distance from the footprints. It is important to note that BAM Vegetation

Integrity Plots were assigned to a particular vegetation zone when the zone has 'considerable homogeneity' and that, based on field inspections, plots would not unduly mis-represent the characteristics of the overall vegetation zone.

Further detail on this is provided below:

- Vegetation Zone 3: Six of the seven plots are identified as occurring outside of Indicative Development Footprints. Three of these six (Plots 31, 6 and DMRP1) however are **located less than 20 metres outside the Indicative Development Footprints**. As this is less than the width of a BAM Vegetation Integrity Plot, these should be deemed within. **The inclusion of these BAM Vegetation Integrity Plots would result in four of the seven plots being within, the minimum plot requirement for Vegetation Zone 3 is just three (OEH 2017).**

- Vegetation Zone 4: Three of the five plots are identified as occurring outside of Indicative Development Footprints. One of these is **less than one metre (0.3 metre) out of the Indicative Development Footprints**. This should be deemed within. **The inclusion of this plot would result in three plots being within, the minimum plot requirement for Vegetation Zone 4 is three (OEH 2017).**

- Vegetation Zone 5: Six of the eight plots are identified as occurring outside of Indicative Development Footprints. Two of these six occur **outside by less than 45 metres** (Plot 8 is 26 metres outside, Plot 42 is 42 metres outside). This distance is less than the length of the BAM 20 x 50m plot. Two of the six occur outside by **less than 150 metres** (Plot 13 is 80 metres outside and Plot 26 is 140 metres outside). These four plots should be deemed within due to proximity, extent of work completed, complex nature of the project and multiple revisions of the project over several years. **The inclusion of the first two plots discussed would result in four plots being within the Indicative Development Footprints. While the inclusion of the four plots discussed would result in six plots being within, the minimum plot requirement for Vegetation Zone 5 is five (OEH 2017).**

Irrespective of the information provided above, Umwelt completed an additional survey within July 2020. This survey was undertaken to capture minor amendments to the Developments Corridors and Indicative Development Footprints (discussed above in **Section 1.2**), in doing so Umwelt completed eight additional BAM Vegetation Integrity Plots within the revised transmission line alignment and proposed permanent met masts. We have considered the location of these eight BAM Vegetation Integrity Plots in the analysis above.

2.2.3 Meandering Transects

Meandering transects were walked across vast areas of the Development Corridors and Indicative Development Footprint – External Roads. Where they were undertaken, they were typically two surveyors who walked in parallel 10 metres apart. Opportunistic sampling of vegetation was undertaken along these transects, particularly searches for threatened and otherwise significant species, endangered populations and TECs. Meandering transects enable floristic sampling across a much larger area than plot-based survey, especially where the number of plots is limited. Records along transects supplemented floristic sampling carried out in plots, however the data collected are in the form of presence records, rather than semi-quantitative cover abundance scores.

Meandering transects provided invaluable information on spatial patterns of vegetation that informed vegetation community mapping of the Development Corridors and Indicative Development Footprint – External Roads.

2.2.4 Digital Aerial Photograph Interpretation

Digital imagery (aerial photographs) of the Development Corridors and Indicative Development Footprints – External Roads was viewed prior to and after vegetation survey to identify spatial patterns in vegetation, land use and landscape features. These informed field survey design and implementation, ecological assessment and vegetation community mapping of the Development Corridors.

Vegetation communities in the Development Corridors and Indicative Development Footprint – External Roads were mapped on-screen overlaying the figures and in Manifold using a ESRI Aerial Imagery Basemap 2020 and DigitalGlobe, Vivid – Australia 01/04/2016 aerial photograph. Mapping was undertaken using the Manifold System 8.0 GIS.

2.2.5 Plant Identification and Nomenclature Standards

All vascular plants recorded or collected within plots and on meandering transects were identified using keys and nomenclature in Harden (1992, 1993, 2000 and 2002). Where known, changes to nomenclature and classification have been incorporated into the results. Updated taxonomy has been derived from PlantNET (Botanic Gardens Trust 2020).

Common names used follow Harden (1992, 1993, 2000 and 2002) where available, and draw on other sources such as local names where these references do not provide a common name.

For herbaceous and graminoid species, such as those belonging to the families Asteraceae, Orchidaceae, Cyperaceae and Poaceae, the allocation of specimens to sub-specific levels was at times affected by the availability of adequate flowering or fruiting material. Where necessary specimens were forwarded to either the National Herbarium of New South Wales or Australian National Herbarium if they were considered to be of potential significance or importance.

2.2.6 Vegetation Mapping

Vegetation mapping was undertaken using best-practice techniques to delineate vegetation communities across the Development Corridors and Indicative Development Footprint – External Roads. The vegetation mapping exercise and product provided in this BDAR is a result of two key components:

- "*updating the baseline mapping of the vegetation…within the final disturbance area*" as per Consent Condition 20(a) (SSD 6693), and

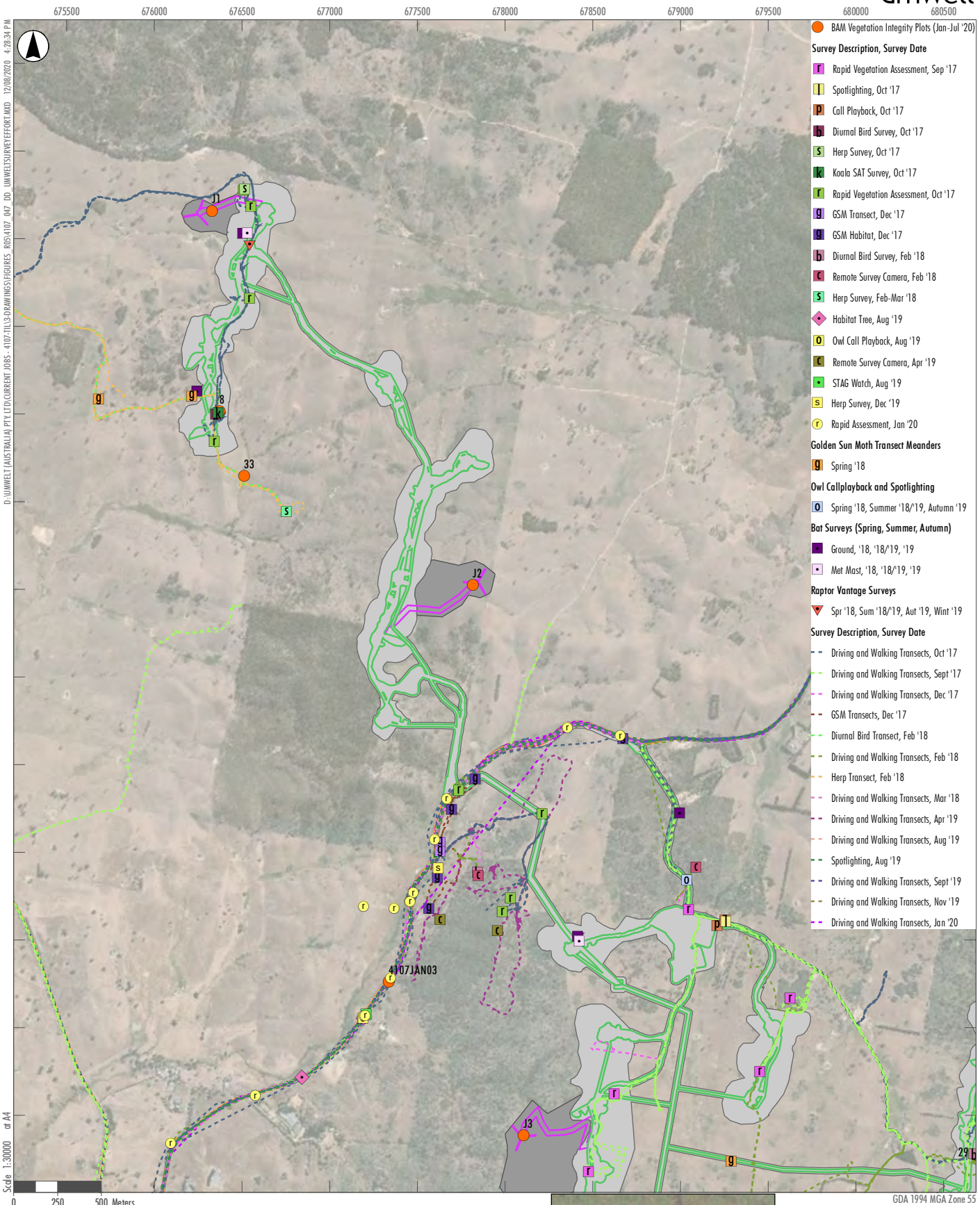
- mapping vegetation within areas of the Development Corridor and Indicative Development Footprint – External Roads that were previously not considered as part of the existing approval.

The baseline mapping of vegetation prepared as part of the approval process which ultimately received both state and federal approval, required considerable amounts of re-working. This was particularly so in relation to the boundaries between vegetation zones, more than the allocation of vegetation communities (i.e. PCTs). Thus, Umwelt's process of updating the baseline mapping of vegetation for the Project initially focussed on tightening boundaries of vegetation zones. Through ongoing surveys since 2017 to 2020, Umwelt have since made further minor amendments to the baseline vegetation mapping. Across the current Development Corridors, Umwelt have not made substantial changes to vegetation communities (i.e. PCTs) unless there was strong evidence to do so.

Vegetation mapping of new and existing components of the Development Corridors and Indicative Development Footprint – External Roads involved the following key steps:

- consideration and analysis of the extensive existing ecological work completed through the existing approval process, particularly:
    - Biodiversity Assessment Rye Park Wind Farm (NGH Environmental 2014)
    - Biodiversity Assessment Addendum – Rye Park Wind Farm (NGH Environmental 2016a)
- preliminary review of digital airborne imagery to explore vegetation distribution patterns as dictated by change in canopy texture, tone and colour, as well as topography
- predicting the distribution of particular vegetation communities based on understanding the distribution of PCTs and their descriptions (BCD 2020c)
- ground-truthing of the vegetation map based on survey effort
- revision of vegetation community floristic delineations based on plot data, and
- revision of the vegetation map based on ground-truthing.

Vegetation communities were delineated through the identification of repeating patterns of plant species assemblages in each of the identified strata.



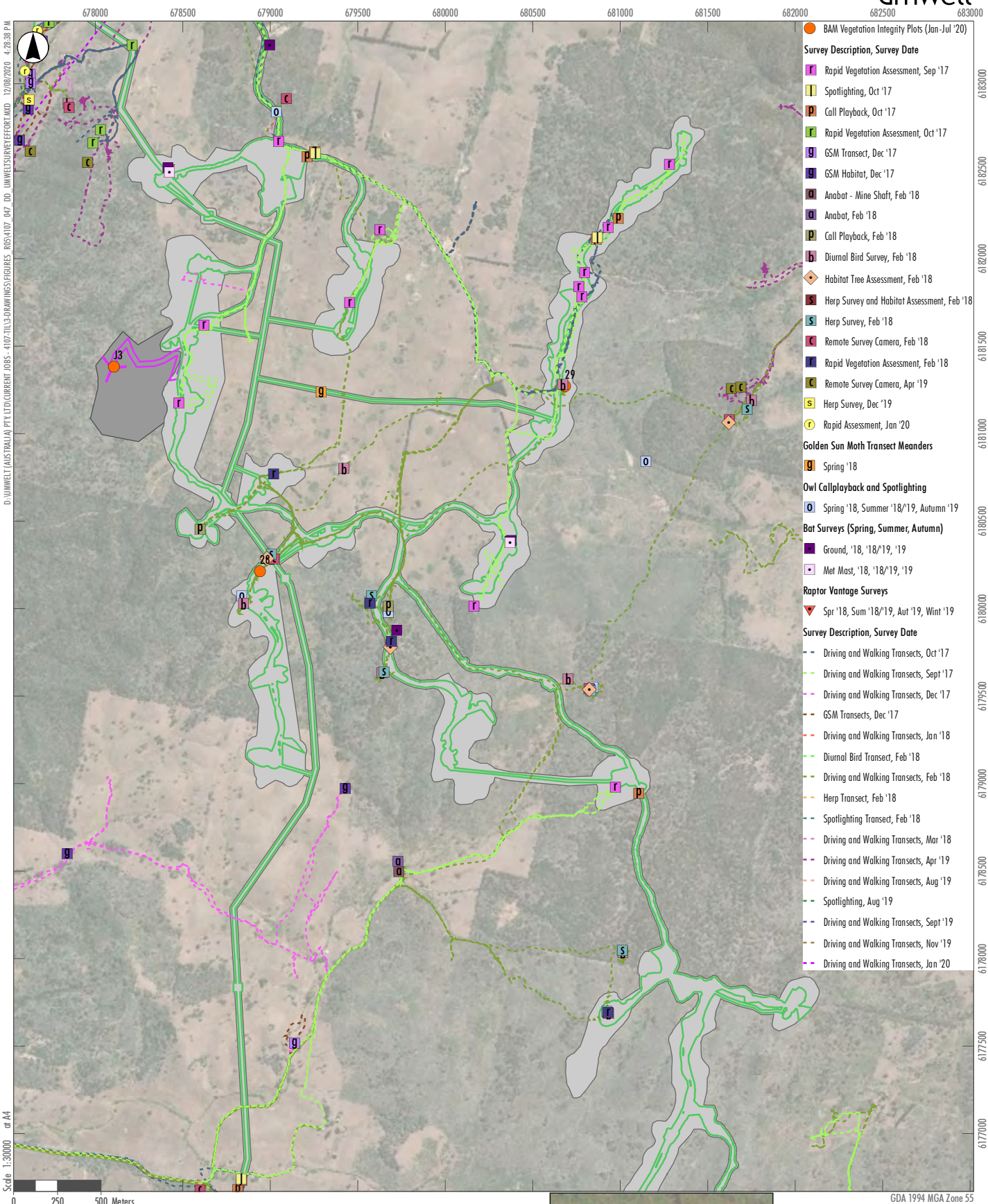
Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

FIGURE 2.1.a

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

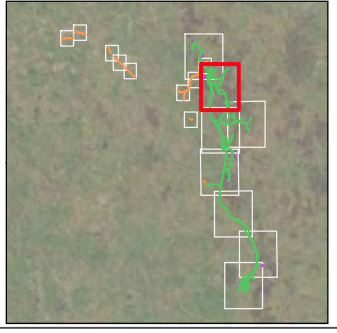
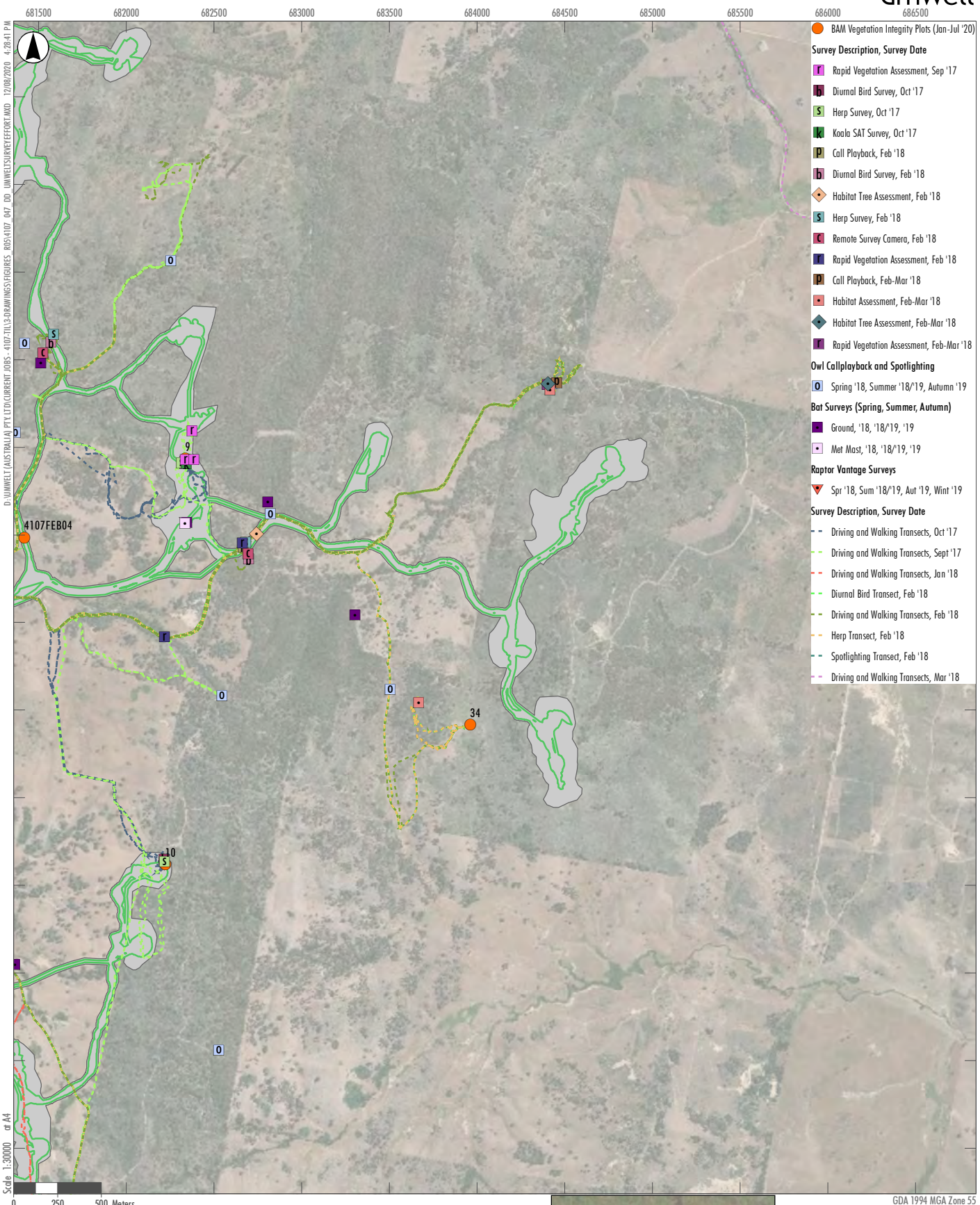


FIGURE 2.1.b

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

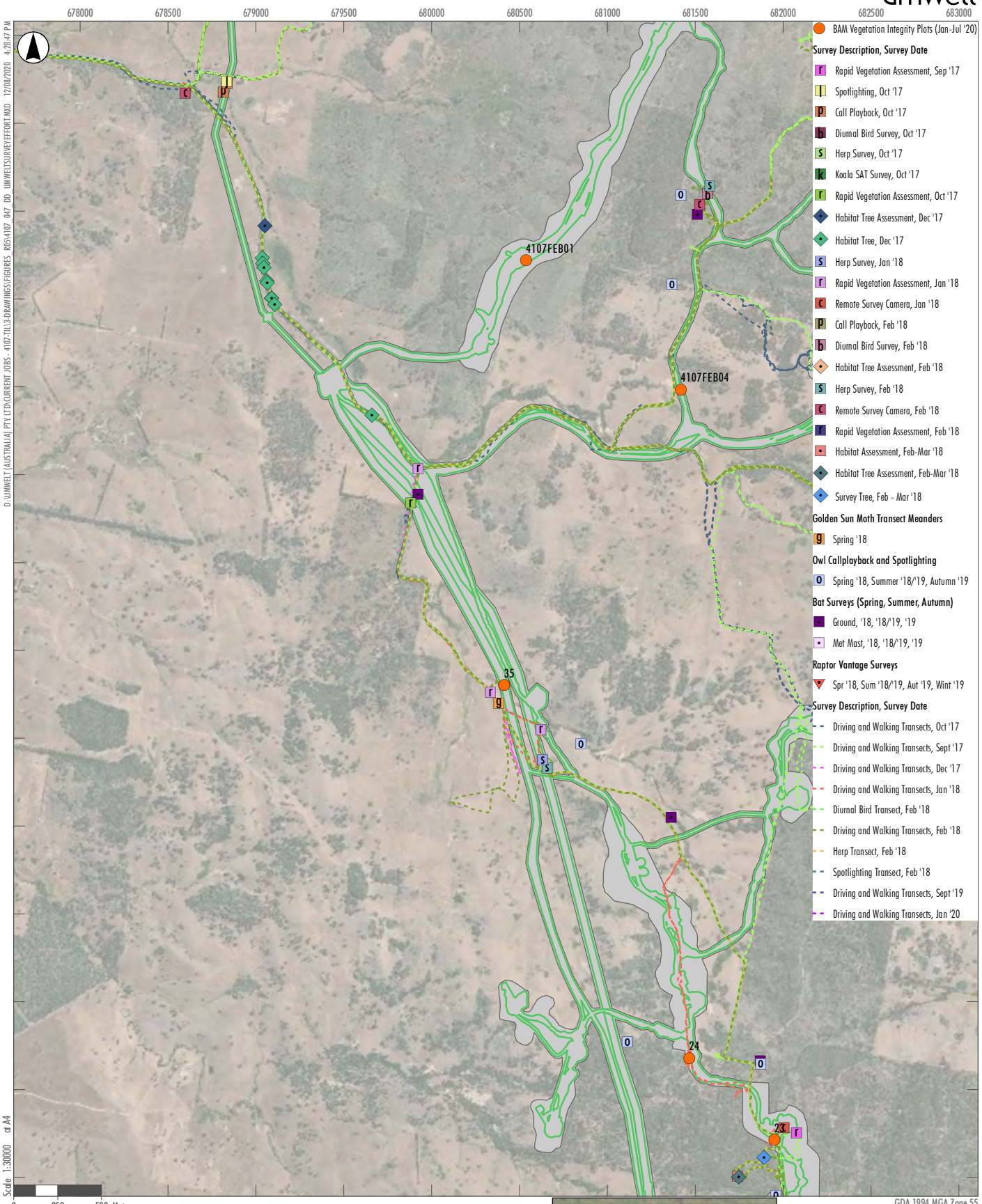
Development Corridor - Wind Farm

Indicative Development Footprint - Wind Farm

FIGURE 2.1.c

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

Development Corridor - Wind Farm

Indicative Development Footprint - Wind Farm

FIGURE 2.1.d

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

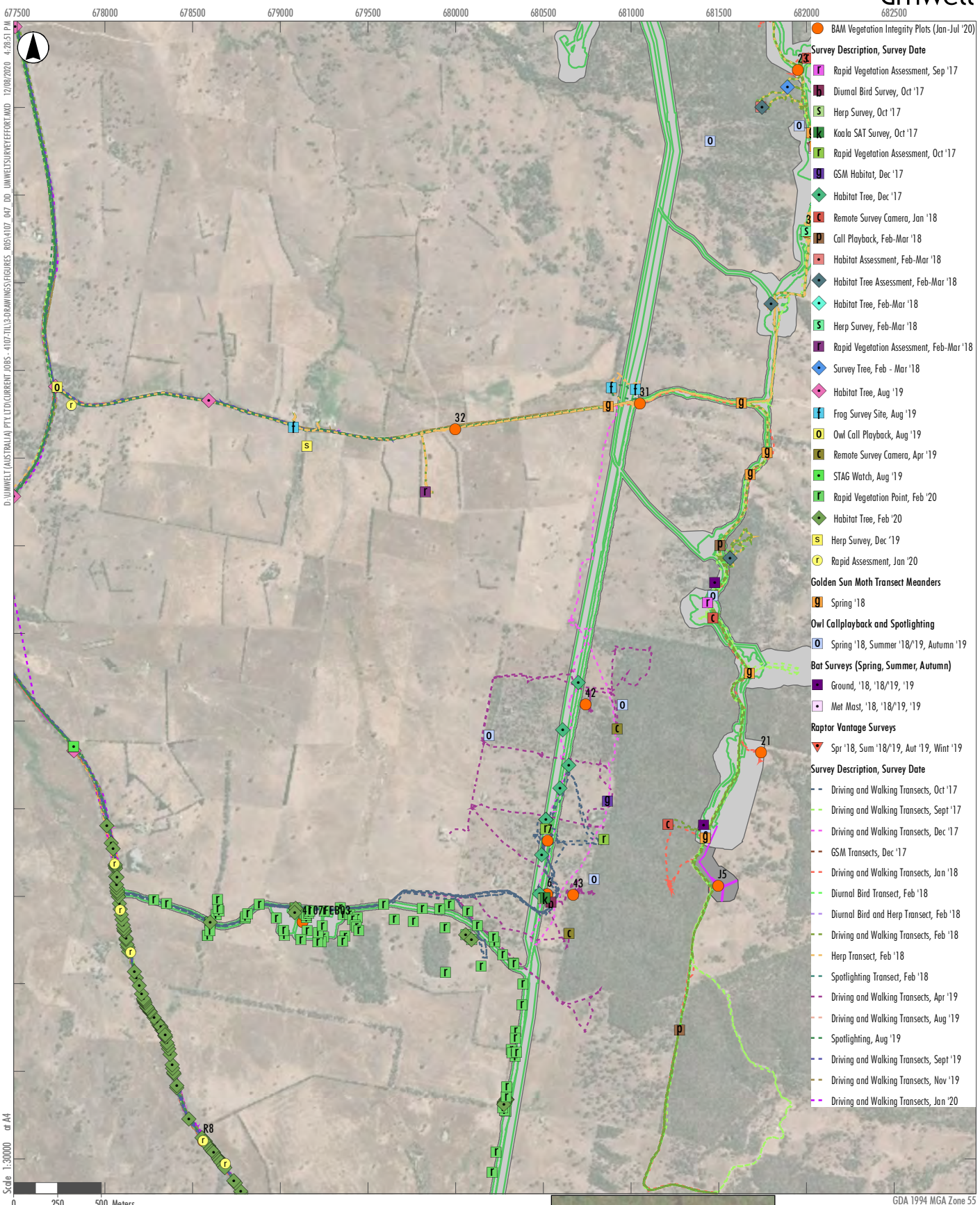
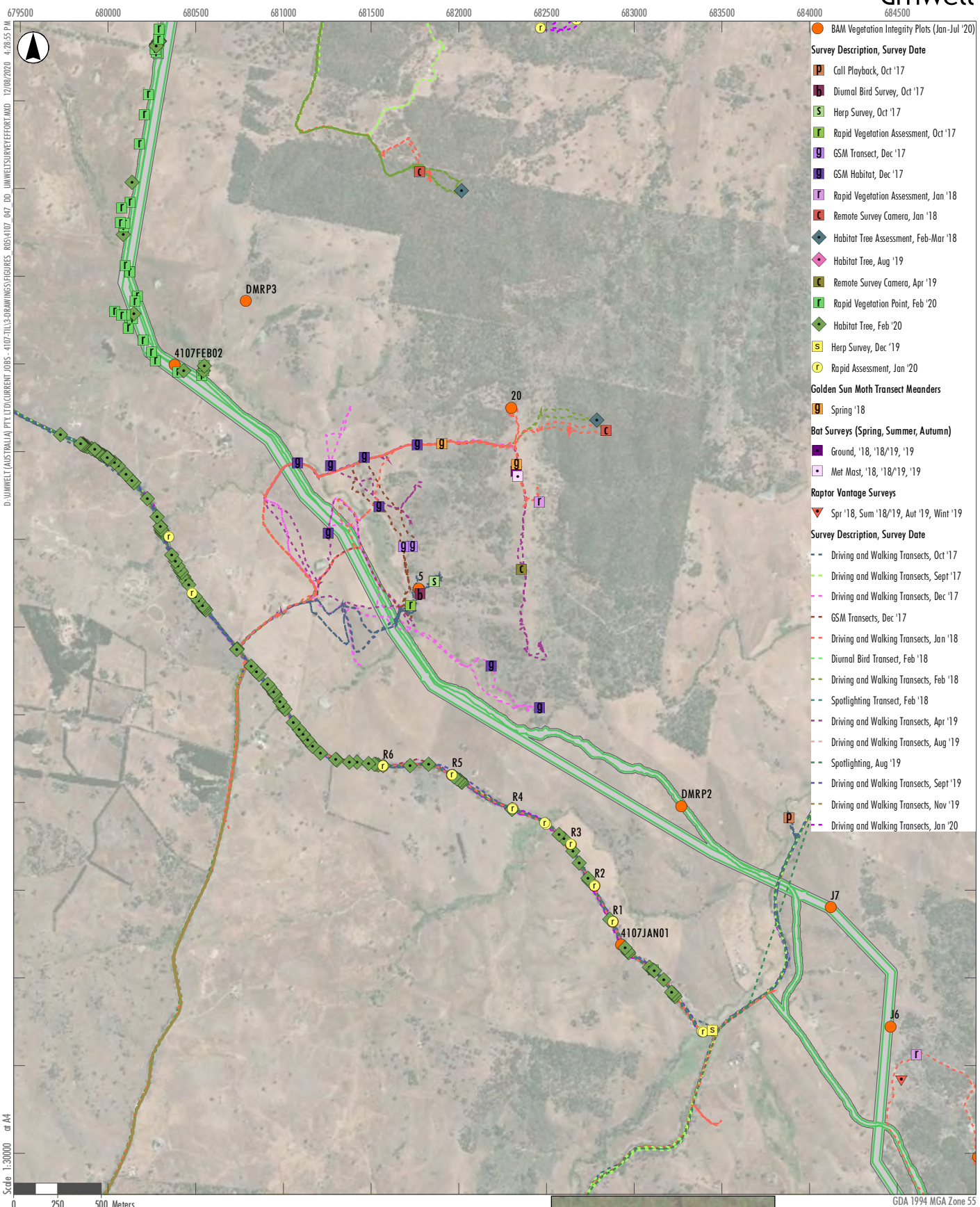


FIGURE 2.1.e

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

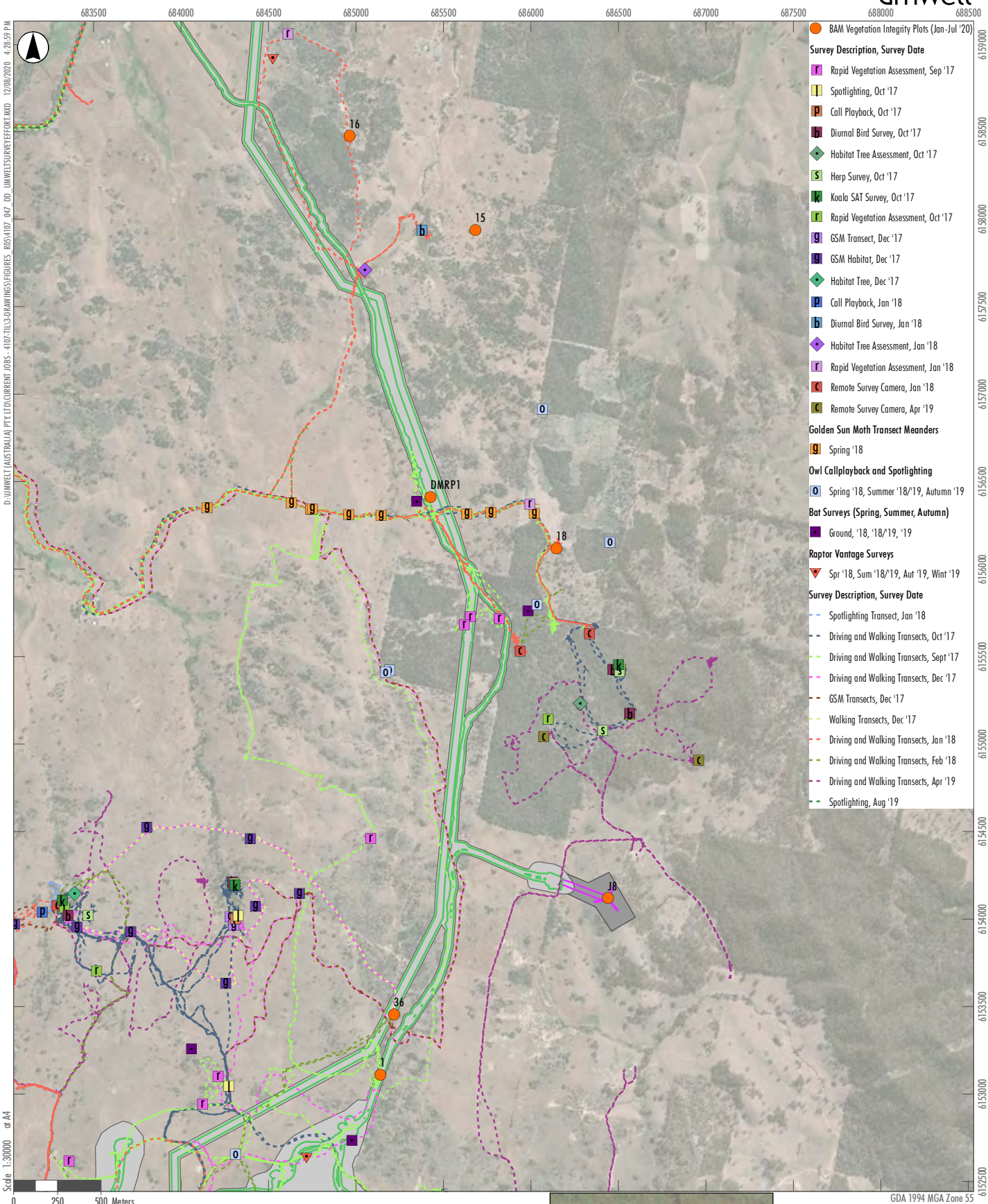
Development Corridor - Wind Farm

Indicative Development Footprint - Wind Farm

FIGURE 2.1.f

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

FIGURE 2.1.g

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

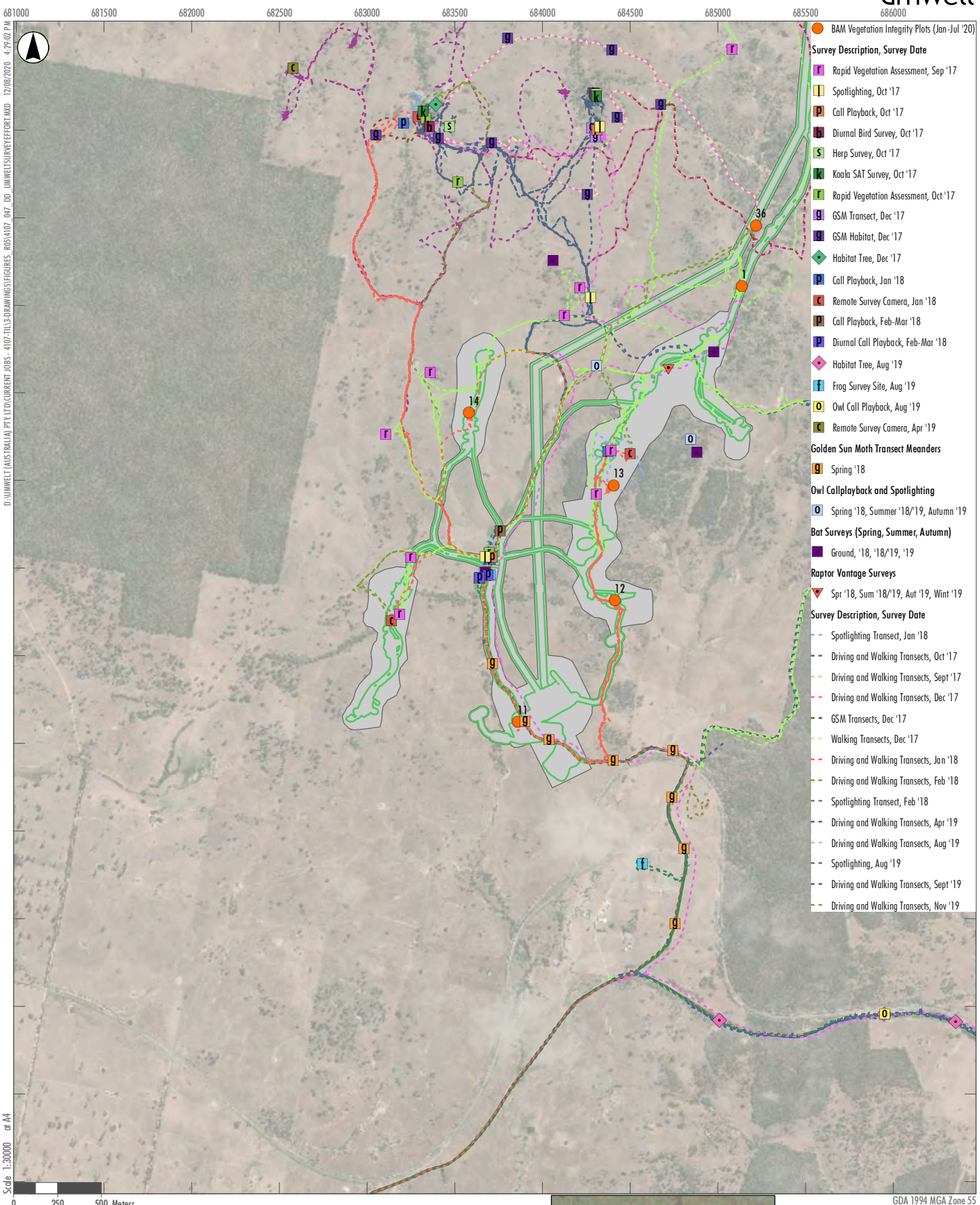


FIGURE 2.1.h

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

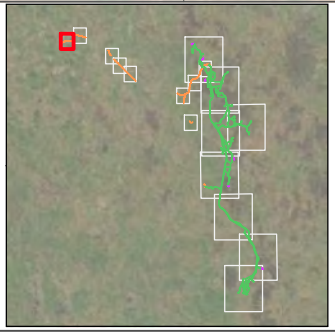
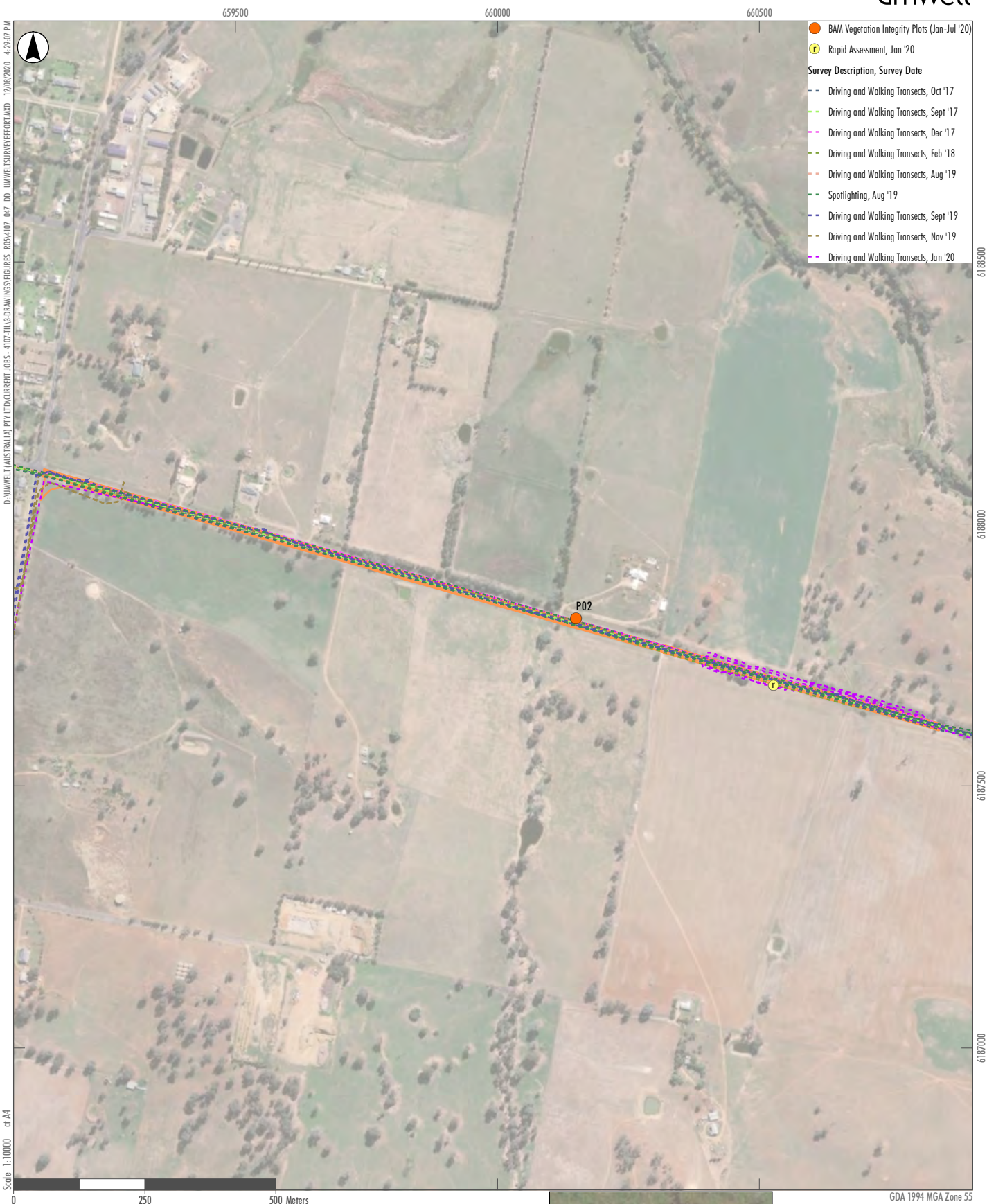


FIGURE 2.1.i

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



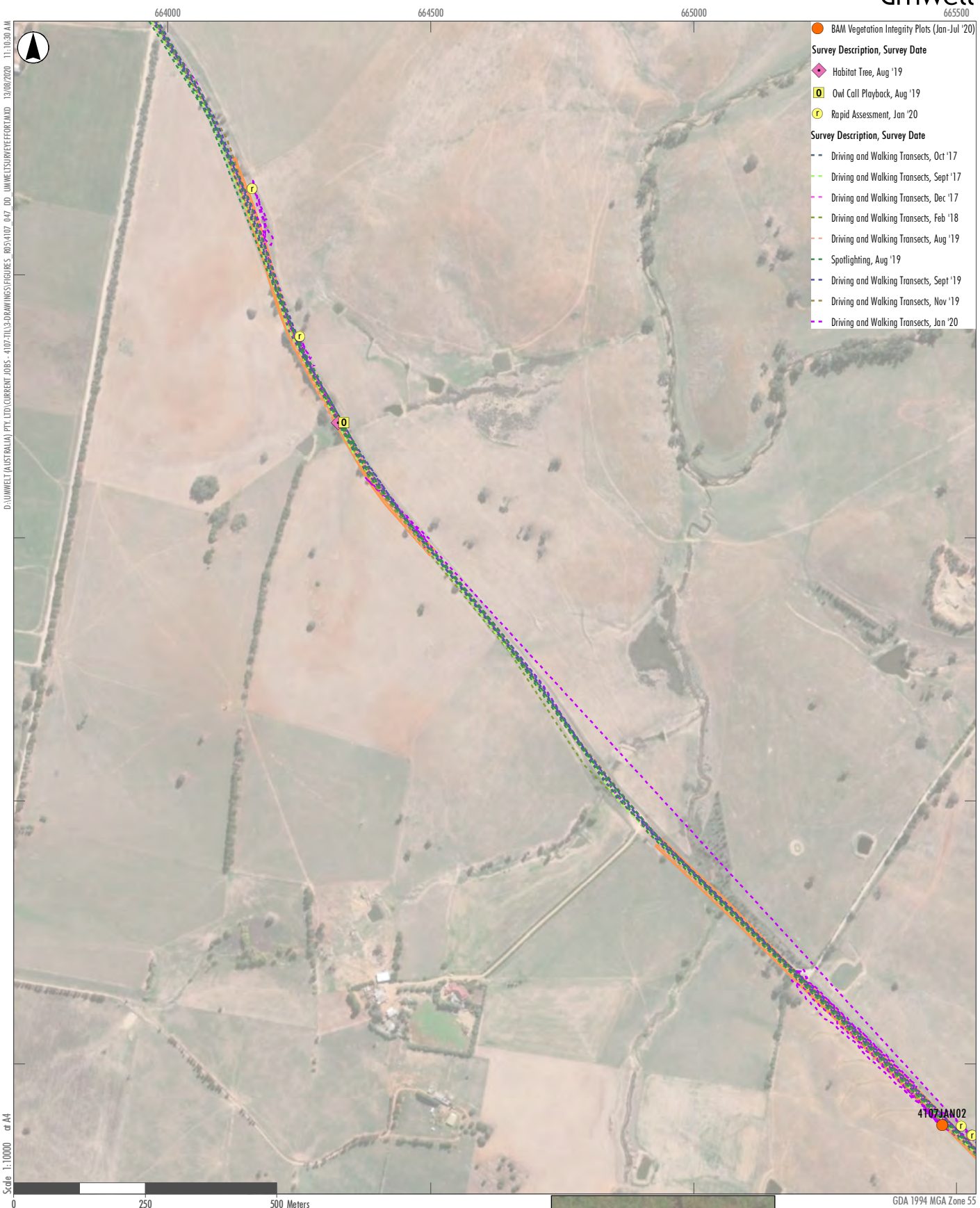
Legend

Indicative Development Footprint - External Roads

FIGURE 2.1.j

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



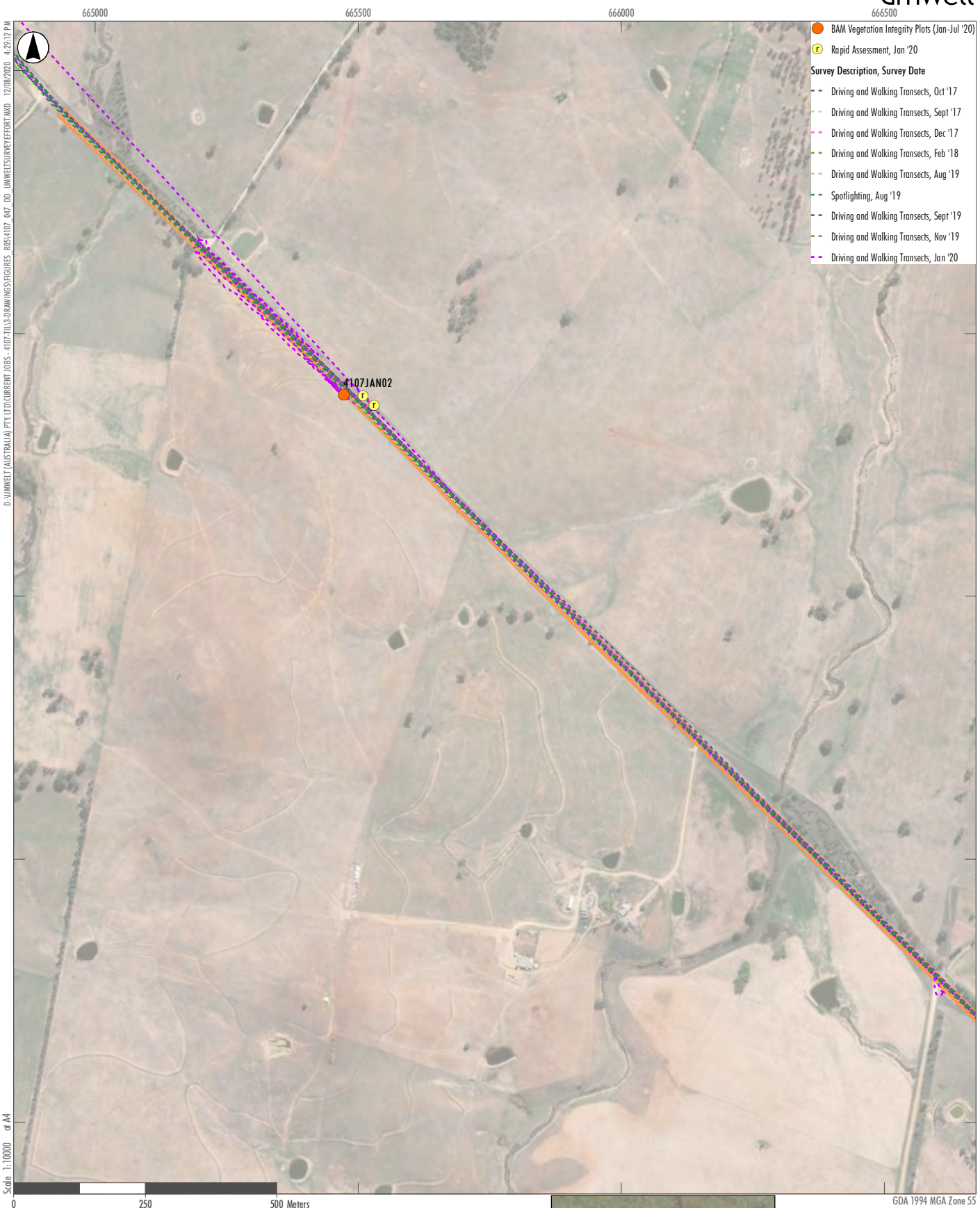
Legend

Indicative Development Footprint - External Roads

FIGURE 2.1.k

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



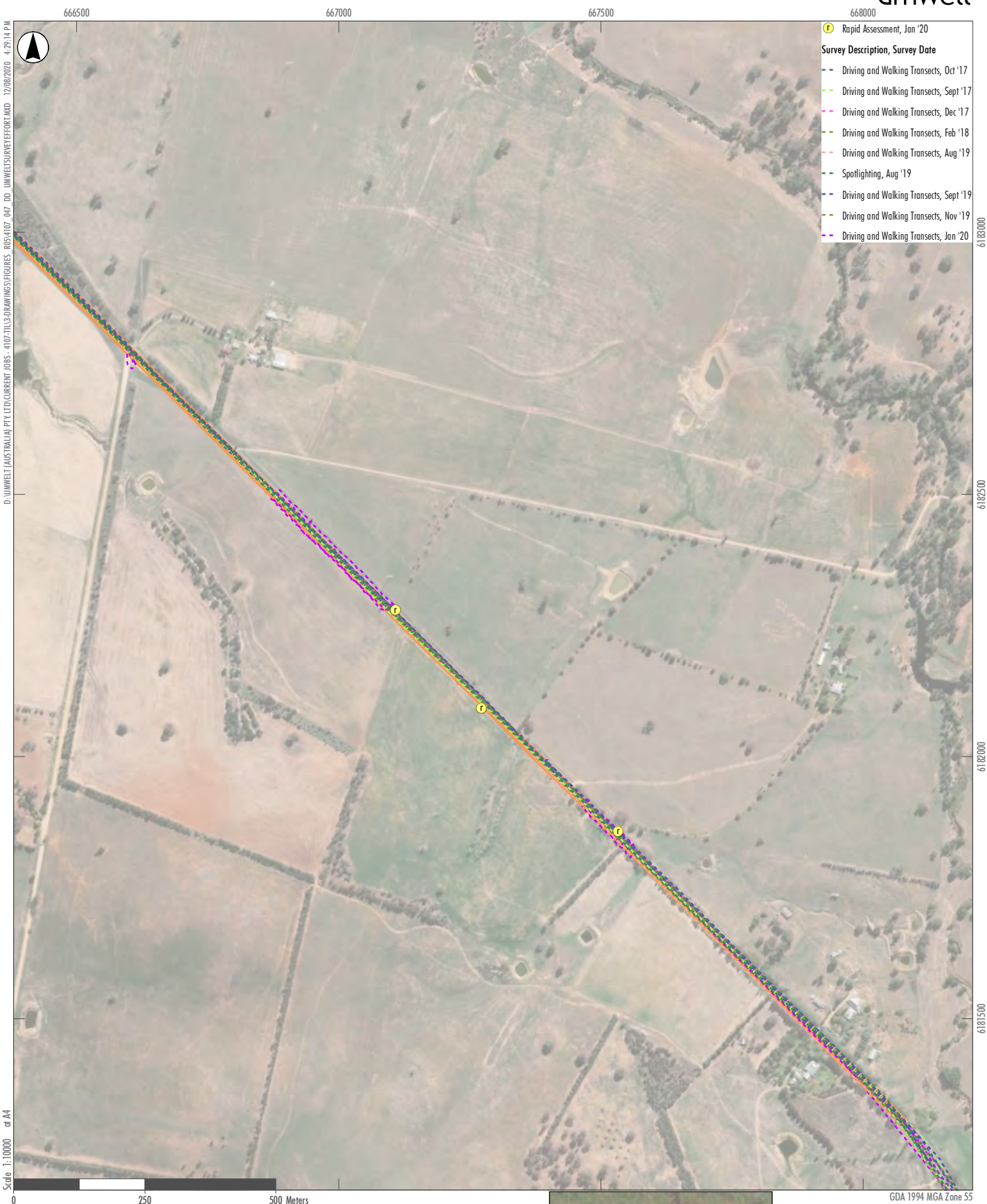
Legend

Indicative Development Footprint - External Roads

FIGURE 2.1.I

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



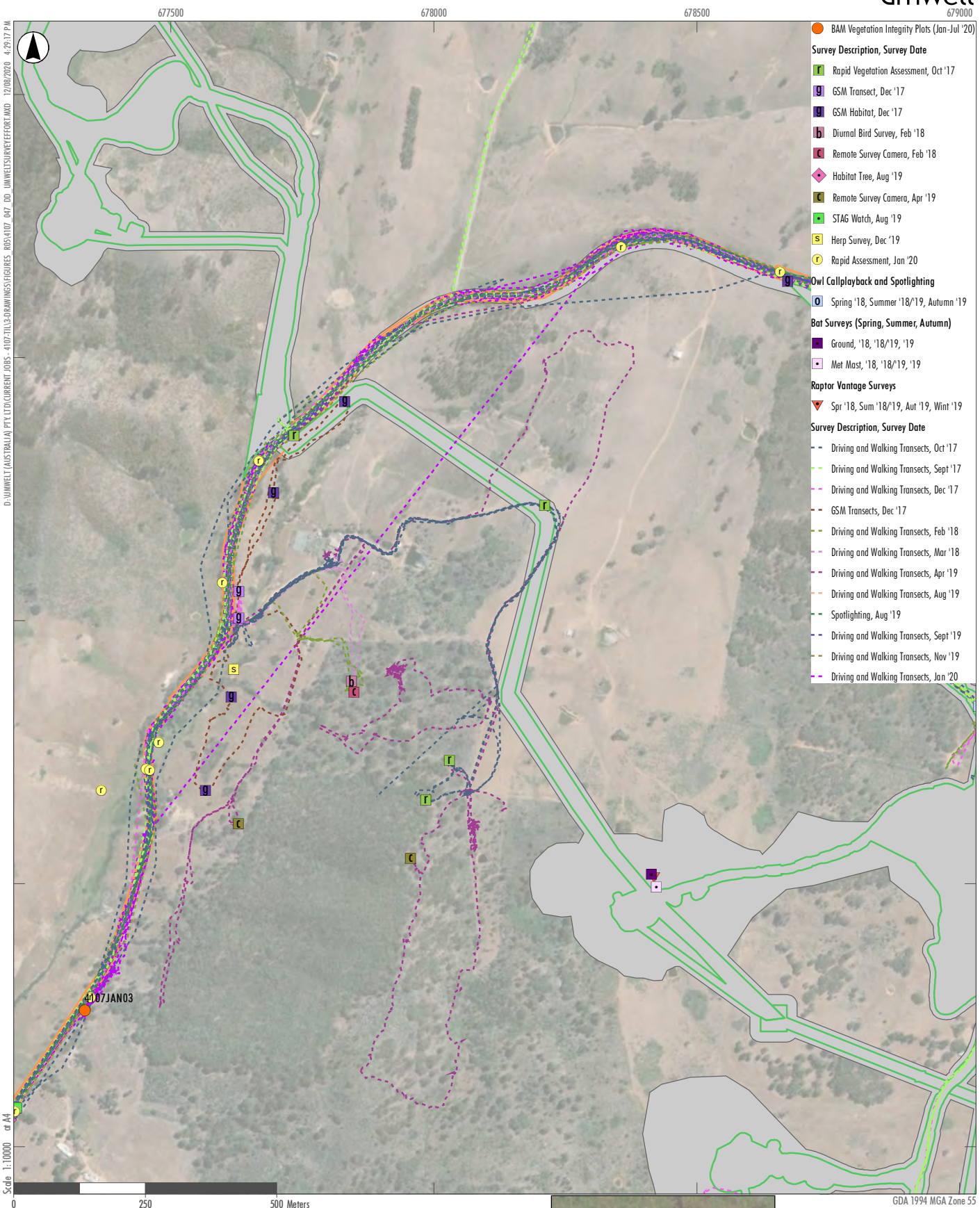
Legend

Indicative Development Footprint - External Roads

FIGURE 2.1.m

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



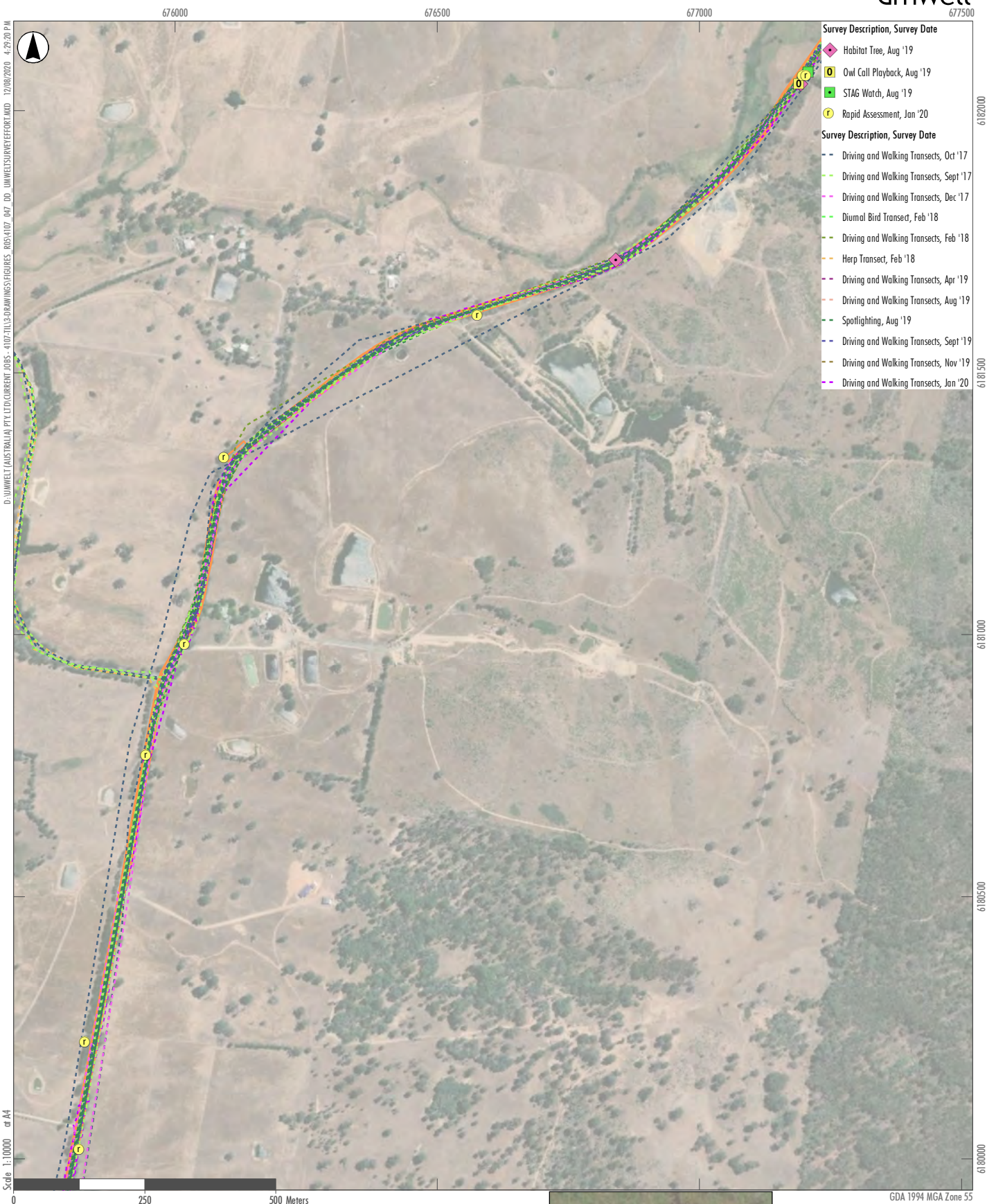
Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - External Roads

FIGURE 2.1.n

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

Indicative Development Footprint - External Roads

FIGURE 2.1.o

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 2.1.p

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

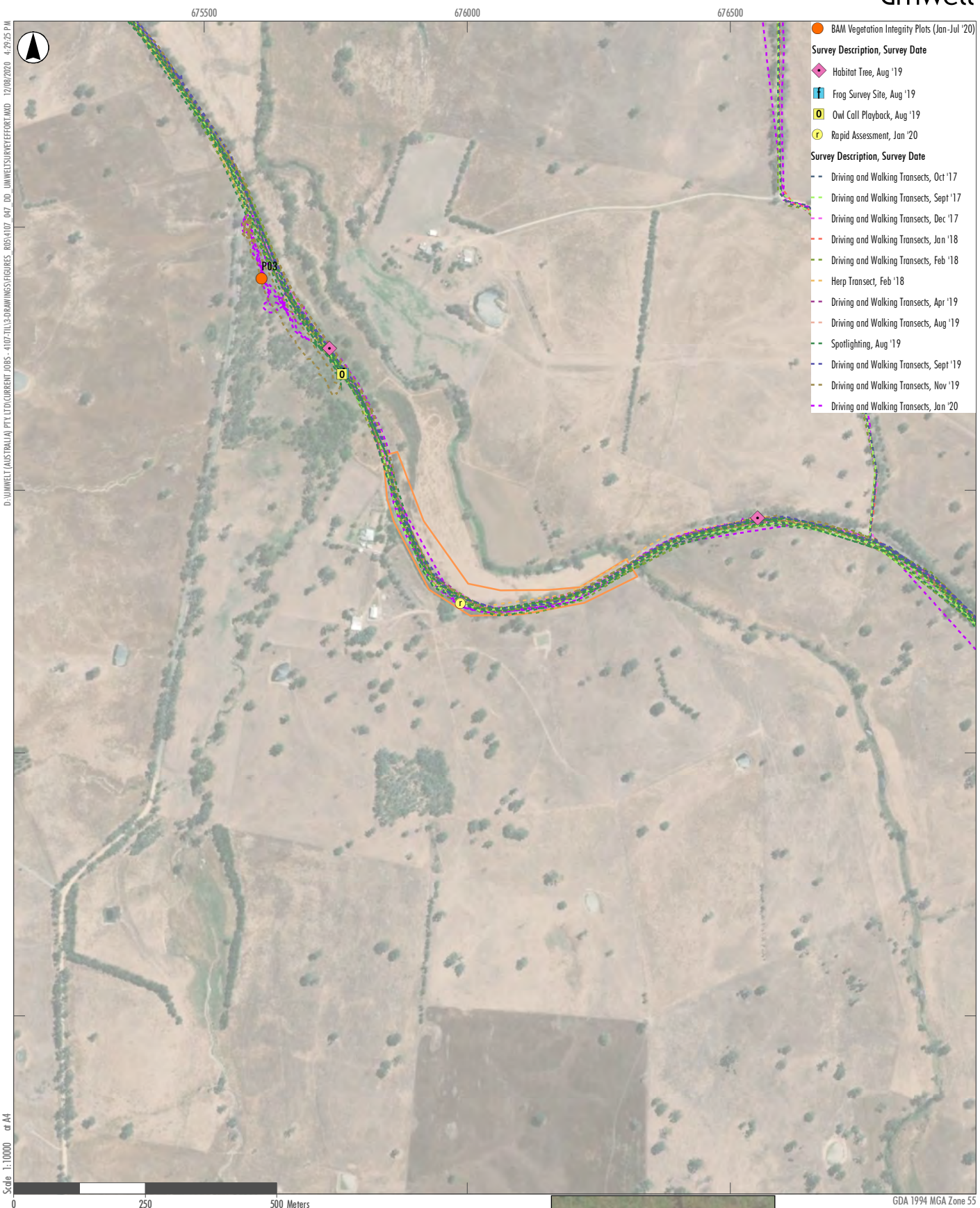


FIGURE 2.1.q

Umwelt Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

2.2.7 Threatened Ecological Community Delineation Techniques

Where vegetation communities mapped within the Development Corridors and Indicative Development Footprint – External Roads had not previously been assessed as part of the existing approval process, Umwelt completed an analysis of TECs listed under the Commonwealth EPBC Act and NSW BC Act and an assessment of similarity with the NSW Threatened Species Scientific Committee Final Determinations and the Commonwealth Threatened Species Scientific Committee Listing and Conservation Advice.

The following approach was used:

- full-floristic plot assessments and meandering surveys to determine floristic composition and structure of each ecological community
- comparison with published species lists, including lists of 'important species' as identified on the listing advice provided by the NSW Threatened Species Scientific Committee and/or Commonwealth Threatened Species Scientific Committee
- comparison with habitat descriptions and distributions for listed TECs
- assessment using guidelines and recovery plans published by the Commonwealth Department of Agriculture, Water and the Environment (DAWE) and the NSW BCD-DPIE
- comparison with other assessments of TECs in the region.

Where vegetation communities were mapped through the existing approval process, the extensive TEC analyses that was completed as part of this process were carefully considered. During the approval process, this included several years of ecological surveys, vegetation community mapping, TEC analysis against the respective determinations and listing/conservation advice, review from regulatory agencies and subsequent revision through the response to submission process. As a result, material changes to the outcomes of the TEC analysis of the existing approval were only completed by Umwelt where there was clear evidence to do so, such as conflicting field data, changes to vegetation community allocation and changes in condition.

2.2.8 Plant Community Type (PCT) Allocation

Each vegetation community described within the Indicative Development Footprints was aligned with an equivalent PCT as detailed in the VIS Classification Database (OEH 2020c). For each vegetation community described in the Indicative Development Footprints, the dominant and characteristic species were entered into the online plant community identification tab and an initial list of PCTs was generated. The profiles for each of the possible PCTs were then interrogated and the most appropriate match assigned based on floristic, structure, soil, landform and distribution details.

Furthermore, the Biodiversity Assessment Addendum (NGH Environmental 2016a) presented a list of Biometric Vegetation Types within the Project. Although a detailed FBA assessment was not completed, a preliminary assessment was undertaken to understand indicative offset requirements. Umwelt initially relied on these Biometric Vegetation Types, however we assessed data from our BAM Vegetation Integrity Plots against PCTs in the VIS Classification Database (BCD 2020c) in accordance with BAM (OEH 2017).

Further detail regarding allocation of PCTs is outlined below in **Table 2.3.**

Table 2.3 PCT Analysis

Vegetation Zone	Assessment
Vegetation Zone 1	Vegetation Zone 1 was aligned with PCT 289 as it supports a number of the species and strata features identified for the PCT as listed on the VIS Classification Database (BCD 2020c). Analysis of plot data for Vegetation Zone 1 found that 19.6 per cent of those species recorded are identified as characteristic of PCT 289 (BCD 2020c). Those recorded characteristic species of PCT 289 make up 47.4 per cent of all species recorded in Vegetation Zone 1. PCT 289 was determined to be the best overall fit in terms of diagnostic species and the community's location in the landscape.
Vegetation Zone 2	Vegetation Zone 2 was aligned with PCT 335 as it supports a number of the species and strata features identified for the PCT as listed on the VIS Classification Database (BCD 2020c). The ground stratum is dominated by tall sedge (*Carex appressa*), a key diagnostic species of PCT 335. Analysis of plot data for Vegetation Zone 2 found that 21.7 per cent of those species recorded are identified as characteristic of PCT 335 (BCD 2020c). Those recorded characteristic species of PCT 335 make up 14.3 per cent of all species recorded in Vegetation Zone 2. PCT 335 was determined to be the best overall fit in terms of diagnostic species and the community's location in the landscape.
Vegetation Zone 3	Vegetation Zone 3 was aligned with PCT 350 as it supports a number of the species and strata features for the PCT as listed on the VIS Classification Database (BCD 2020c). Its canopy is dominated by yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*), while silver wattle (*Acacia dealbata*) and hoary guinea flower (*Hibbertia obtusifolia*) dominate the shrub layer within the middle stratum. All of these are key diagnostic species of PCT 350. Careful analysis of Vegetation Zone 3 was undertaken against the similarly described PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. Both PCTs had detailed descriptions of upper, mid and ground strata within the VIS Classification Database (BCD 2020c). Analysis of plot data (Vegetation Zones 3 and 4) found that it had a higher proportion of species characteristic of PCT 350 (52.6 per cent) compared to PCT 277 (46.2 per cent). Furthermore, those recorded characteristic species comprised a higher proportion of all species recorded within the remnant (Vegetation Zone 3) and derived form (Vegetation Zone 4) of this vegetation for PCT 350 (24 per cent) compared with PCT 277 (14.4 per cent) (BCD 2020c). This analysis concluded that PCT 350 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
Vegetation Zone 4	Vegetation Zone 4 was aligned with PCT 350 based on its position in the landscape, consistency in species composition and proximity to the remnant woodland form of the PCT (Vegetation Zone 3).

Vegetation Zone	Assessment
Vegetation Zone 5	Vegetation Zone 5 was aligned with PCT 351 as it supports a number of the species and strata features identified for the PCT as listed on the VIS Classification Database (BCD 2020c). Its canopy is dominated by brittle gum (*Eucalyptus mannifera*), red stringybark (*Eucalyptus macrorhyncha*) and bundy (*Eucalyptus goniocalyx*) and contains six of the seven key diagnostic canopy species listed in for PCT 351. Careful analysis of Vegetation Zone 5 against the similarly aligned PCT 353, Inland Scribbly Gum - Red Stringybark - box - Daviesia latifolia - snow grass open forest on sandy loam soils from acid volcanics in the Boorowa - Young region of the NSW South Western Slopes Bioregion. Analysis of plot data (Vegetation Zones 5 and 6) found that it had a higher proportion of species characteristic of PCT 351 (54.7 per cent) compared to PCT 353 (42.1 per cent) (BCD 2020c). Furthermore, those recorded characteristic species comprised a higher proportion of all species recorded within the remnant (Vegetation Zone 5) and derived form (Vegetation Zone 6) of this vegetation for PCT 351 (28.7 per cent) compared with PCT 353 (7.9 per cent) (BCD 2020c). Analysis showed that PCT 351 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
Vegetation Zone 6	Vegetation Zone 6 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).
Vegetation Zone 7	Vegetation Zone 7 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).
Vegetation Zone 8	Vegetation Zone 8 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).
Vegetation Zone 9	Vegetation Zone 9 was had the best overall fit with PCT 351, despite the canopy characteristics of this Vegetation Zone being seemingly different (dominance of argyle apple [*Eucalyptus cinerea*]) when compared to the remnant Vegetation Zone 5 of PCT 351. Careful analysis of this Vegetation Zone was undertaken against PCT 653 Apple Box - Yellow Box - Argyle Apple dry open forest of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion. However, it was determined that the overall composition of the upper, mid and ground stratum species for Vegetation Zone 9 more closely aligned with PCT 351. Analysis of plot data for Vegetation Zone 9 found that it had a higher proportion of species characteristic of PCT 653 (41.7 per cent) compared to PCT 351 (34 per cent) (BCD 2020c). However, those recorded characteristic species comprised a substantially higher proportion of all species recorded within Vegetation Zone 9 for PCT 351 (50 per cent) compared with PCT 653 (13.9 per cent) (BCD 2020c). Furthermore, PCT 653 is described to occur on clay loams in broad river flats or moist alluvial fans which is not consistent with Vegetation Zone 9 (BCD 2020c). The analysis found that PCT 351 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
Vegetation Zone 10	Vegetation Zone 10 was aligned with PCT 351 purely for the purpose of applying the vegetation zone within the BAMCC. PCT 351 was selected as being the most appropriate fit being the dominant PCT throughout the Project and its proximity to Vegetation Zone 10.

2.3 Threatened Species

2.3.1 Literature and Database Review

A review of previous documents and reports relevant to the Project was undertaken. This included ecological reports, previous ecological surveys undertaken for the Project, and relevant ecological database searches. The information obtained was used to inform survey design where required and was also used to assist in the assessment of potentially occurring ecosystem-credit and species-credit species. Relevant documents and resources included:

- BCD Atlas of NSW Wildlife database and mapping tool (BCD 2020a), accessed February 2020
- BCD Threatened Biodiversity Data Collection (BCD 2020b), accessed February 2020
- PlantNET (Botanic Gardens Trust) database search for threatened plants within a 10 km radius search from Rye Park and Yass, accessed February 2020
- DAWE Protected Matters Search Tool (DAWE 2020) for known/predicted EPBC Act-listed species, accessed February 2020.

A preliminary assessment using the TBDC was undertaken which provided a list of species-credit species that might require survey and the suitable survey periods for each species. The results of these database searches, literature review and TBDC review were used to design the appropriate survey requirements for species-credit species.

2.3.2 Ecosystem-credit Species

Ecosystem-credit species are those threatened species that can be predicted by vegetation surrogates and landscape features. Ecosystem-credit species are not required to be specifically targeted during field surveys, however an assessment of the suitability of habitat in the Development Corridors and Indicative Development Footprint – External Roads was undertaken to determine the species presence or otherwise in the vegetation zones identified.

Appendix A outlines the ecosystem credit species predicted by the BAM calculator or identified in the literature review.

2.3.3 Species-credit Species

Targeted and opportunistic surveys and walking transects for species-credit species were undertaken across the Development Corridors and Indicative Development Footprint – External Roads (refer to **Figure 2.1**). **Table 2.4** below outlines the dates, methods and species targeted during the surveys. It includes surveys completed as part of the approvals process for the Project by NGH Environmental (2014 and 2016) and Umwelt. **Figure 2.2** displays the survey effort previously completed by NGH Environmental (2014 and 2016).

Table 2.4 Species Credit Species Survey Methodology and Timing

Survey Date	Method	Species Targeted
Umwelt Surveys		
27 to 29 September 2017	BAM vegetation integrity plots	All species
	Orchid transects and habitat assessments	*Caladenia concolor* *Prasophyllum petilum*
	Meandering transects	*Acacia ausfeldii* *Acacia meiantha* *Ammobium craspedioides* *Anthochaera phrygia* *Burhinus grallarius* *Caladenia concolor* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Haliaeetus leucogaster* *Hieraaetus morphnoides* *Lathamus discolor* *Lophoictinia isura* *Petrogale penicillata* *Petroica rodinogaster* *Phascolarctos cinereus* *Polytelis swainsonii* *Prasophyllum petilum* *Senecio garlandii* *Swainsona recta* *Swainsona sericea* *Zieria obcordata*
	Hollow bearing tree surveys Diurnal reptile surveys	*Aprasia parapulchella* *Polytelis swainsonii* *Delma impar*
	Opportunistic observations	All species
16 to 19 October 2017	BAM vegetation integrity plots	All species
	Orchid transects habitat assessments	*Caladenia concolor* *Prasophyllum petilum*
	Meandering transects	*Acacia ausfeldii* *Acacia meiantha* *Ammobium craspedioides* *Anthochaera phrygia* *Burhinus grallarius* *Caladenia concolor* *Callocephalon fimbriatum* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica*

Survey Date	Method	Species Targeted
		Euphrasia arguta *Haliaeetus leucogaster* *Hieraaetus morphnoides* *Lophoictinia isura* *Petrogale penicillata* *Phascolarctos cinereus* *Prasophyllum petilum* *Polytelis swainsonii* *Pteropus poliocephalus* *Pultenaea humilis* *Swainsona recta* *Swainsona sericea* *Synemon plana*
	Hollow-bearing tree surveys Diurnal call-playback for regent honeyeater and swift parrot Diurnal bird surveys Koala SAT surveys Diurnal reptile and amphibian surveys Nocturnal call-playback for koala, squirrel glider and Booroolong frog Spotlighting Opportunistic observations	*Anthochaera phrygia* *Aprasia parapulchella* *Burhinus grallarius* *Callocephalon fimbriatum* *Cercartetus nanus* *Delma impar* *Haliaeetus leucogaster* *Hieraaetus morphnoides* *Lathamus discolor* *Litoria booroolongensis* *Litoria raniformis* *Lophoictinia isura* *Ninox connivens* *Petaurus norfolcensis* *Petrogale penicillata* *Petroica rodinogaster* *Phascogale tapoatafa* *Phascolarctos cinereus* *Polytelis swainsonii* *Pteropus poliocephalus*
18 to 21 December 2017	Habitat mapping for superb parrot Targeted golden sun moth surveys	*Polytelis swainsonii* *Synemon plana*
	Meandering transects	*Acacia ausfeldii* *Ammobium craspedioides* *Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Cullen parvum* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica*

Survey Date	Method	Species Targeted
		Euphrasia arguta *Haliaeetus leucogaster* *Lophoictinia isura* *Petrogale penicillata* *Phascolarctos cinereus* *Prasophyllum petilum* *Pteropus poliocephalus* *Pultenaea humilis* *Senecio garlandii* *Synemon plana*
22 to 25 January 2018	BAM vegetation integrity plots	All species
	Meandering transects	*Acacia ausfeldii* *Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Cullen parvum* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Euphrasia arguta* *Lathamus discolor* *Lophoictinia isura* *Petrogale penicillata* *Petroica rodinogaster* *Phascolarctos cinereus* *Senecio garlandii*
	Hollow-bearing tree surveys Diurnal bird surveys Diurnal reptile and amphibian surveys Nocturnal call-playback for koala, squirrel glider and Booroolong frog Spotlighting Opportunistic observations	*Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Cercartetus nanus* *Litoria aurea* *Litoria booroolongensis* *Litoria raniformis* *Lophoictinia isura* *Petaurus norfolcensis* *Petrogale penicillata* *Petroica rodinogaster* *Phascogale tapoatafa* *Phascolarctos cinereus*
12 to 16, 26 to 28 February and 1 to 2 March 2018	BAM vegetation integrity plots	All species
	Meandering transects	*Acacia ausfeldii* *Anthochaera phrygia* *Burhinus grallarius* *Cullen parvum* *Eucalyptus alligatrix* subsp. *alligatrix*

Survey Date	Method	Species Targeted
		Eucalyptus cannonii *Eucalyptus robertsonii* subsp. *hemisphaerica* *Euphrasia arguta* *Lathamus discolor* *Petrogale penicillata* *Petroica rodinogaster* *Phascolarctos cinereus* *Senecio garlandii*
	Fauna habitat assessment Hollow-bearing tree surveys Micro-bat echolocation recording Diurnal bird surveys Diurnal reptile and amphibian surveys Nocturnal reptile and amphibian surveys Nocturnal call-playback for koala, squirrel glider and frogs Spotlighting Remote Cameras Opportunistic observations	*Anthochaera phrygia* *Burhinus grallarius* *Cercartetus nanus* *Litoria aurea* *Litoria booroolongensis* *Miniopterus orianae oceanensis* *Myotis macropus* *Petaurus norfolcensis* *Petrogale penicillata* *Petroica rodinogaster* *Phascogale tapoatafa* *Phascolarctos cinereus*
1 March 2018	Nocturnal call-playback and spotlighting transects for frogs Nocturnal reptile and amphibian surveys Opportunistic observations	*Litoria aurea* *Litoria booroolongensis* *Litoria raniformis*
22 to 26 October 2018	Targeted superb parrot surveys Bird utilisation surveys Raptor vantage surveys	*Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Haliaeetus leucogaster* *Lathamus discolor* *Lophoictinia isura* *Petroica rodinogaster* *Polytelis swainsonii*
29 to 31 October 2018	Targeted superb parrot surveys Bird utilisation surveys	*Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Haliaeetus leucogaster* *Lathamus discolor* *Lophoictinia isura* *Petroica rodinogaster* *Polytelis swainsonii*
5 to 9 November 2018	Targeted superb parrot surveys Bird utilisation surveys Raptor vantage surveys Micro-bat echolocation recording	*Anthochaera phrygia* *Burhinus grallarius* *Chalinolobus dwyeri* *Callocephalon fimbriatum*

Survey Date	Method	Species Targeted
		Haliaeetus leucogaster *Lathamus discolor* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Petroica rodinogaster* *Polytelis swainsonii*
12 to 16 November 2018	Micro-bat echolocation recording Nocturnal call-playback and spotlighting for forest owls Raptor vantage surveys Golden sun moth meanders	*Chalinolobus dwyeri* *Callocephalon fimbriatum* *Haliaeetus leucogaster* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Ninox connivens* *Synemon plana*
19 to 23 November 2018	Micro-bat echolocation recording Nocturnal call-playback and spotlighting for forest owls Raptor vantage surveys Golden sun moth meanders	*Chalinolobus dwyeri* *Callocephalon fimbriatum* *Haliaeetus leucogaster* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Ninox connivens* *Synemon plana*
28 to 30 November 2018	Micro-bat echolocation recording Nocturnal call-playback and spotlighting for forest owls Raptor vantage surveys	*Callocephalon fimbriatum* *Chalinolobus dwyeri* *Haliaeetus leucogaster* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Ninox strenua* *Ninox connivens*
22 January 2019	Micro-bat echolocation recording	*Chalinolobus dwyeri* *Miniopterus orianae oceanensis* *Myotis macropus*
29 to 31 January and 1 to 13 February 2019	Targeted superb parrot surveys Bird utilisation surveys Raptor vantage surveys Micro-bat echolocation recording	*Anthochaera phrygia* *Burhinus grallarius* *Chalinolobus dwyeri* *Callocephalon fimbriatum* *Lathamus discolor* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Polytelis swainsonii*

Survey Date	Method	Species Targeted
13 to 15 February 2019	Nocturnal call-playback and spotlighting for forest owls	*Ninox strenua* *Ninox connivens* *Tyto novaehollandiae*
8 March 2019	Micro-bat echolocation recording	*Chalinolobus dwyeri* *Myotis macropus* *Miniopterus orianae oceanensis*
25 March 2019	Micro-bat echolocation recording	*Chalinolobus dwyeri* *Myotis macropus* *Miniopterus orianae oceanensis*
1 to 17 April 2019	Targeted superb parrot surveys Bird utilisation surveys Raptor vantage surveys Micro-bat echolocation recording Nocturnal call-playback and spotlighting for forest owls	*Polytelis swainsonii* *Ninox strenua* *Ninox connivens* *Tyto novaehollandiae*
3 and 4 April 2019	BAM vegetation integrity plots Opportunistic observations	All species
	Remote survey cameras	*Cercartetus nanus* *Petaurus norfolcensis* *Phascogale tapoatafa*
	Meandering transects	*Anthochaera phrygia* *Burhinus grallarius* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Lathamus discolor* *Petroica rodinogaster* *Phascolarctos cinereus* *Senecio garlandii*
1 to 8 July 2019	Targeted superb parrot surveys Bird utilisation surveys Raptor vantage surveys Nocturnal call-playback and spotlighting for forest owls Raptor vantage surveys	*Haliaeetus leucogaster* *Lathamus discolor* *Ninox strenua* *Ninox connivens* *Tyto novaehollandiae* *Polytelis swainsonii*
19 to 23 August 2019	Nocturnal call-playback and spotlighting for forest owls Nocturnal call-playback and spotlighting for Sloane's froglet	*Ninox strenua* *Ninox connivens* *Tyto novaehollandiae* *Crinia sloanei*
23 to 25 September 2019	Meandering transects	*Acacia ausfeldii* *Acacia meiantha* *Ammobium craspedioides* *Anthochaera phrygia* *Burhinus grallarius*

Survey Date	Method	Species Targeted
		Caladenia concolor *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* Haliaeetus leucogaster *Hieraaetus morphnoides* *Lathamus discolor* *Lophoictinia isura* *Petroica rodinogaster* *Polytelis swainsonii* *Prasophyllum petilum* *Senecio garlandii* *Swainsona recta* *Swainsona sericea* *Zieria obcordata*
11 to 15 November 2019	BAM vegetation integrity plots	All species
	Meandering transects, including herp habitat	*Ammobium craspedioides* *Anthochaera phrygia* *Aprasia parapulchella* *Burhinus grallarius* *Callocephalon fimbriatum* *Delma impar* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Euphrasia arguta* *Haliaeetus leucogaster* *Lathamus discolor* *Lophoictinia isura* *Petroica rodinogaster* *Polytelis swainsonii* *Prasophyllum petilum* *Pultenaea humilis* *Senecio garlandii* *Swainsona recta* *Swainsona sericea* *Synemon plana*
17 to 18 December 2019	Meandering transects Nocturnal call-playback and spotlighting for several frog species	*Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Cullen parvum* *Delma impar* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Euphrasia arguta*

Survey Date	Method	Species Targeted
		Haliaeetus leucogaster *Lathamus discolor* *Litoria aurea* *Litoria booroolongensis* *Litoria castanea* *Litoria raniformis* *Lophoictinia isura* *Petroica rodinogaster* *Polytelis swainsonii* *Prasophyllum petilum* *Pultenaea humilis* *Senecio garlandii* *Swainsona recta* *Swainsona sericea* *Synemon plana*
19 December 2019	Meandering transects	*Synemon plana*
13 to 15 January 2020	BAM vegetation integrity plots	All species
	Micro-bat echolocation recording Meandering transects	*Anthochaera phrygia* *Burhinus grallarius* *Callocephalon fimbriatum* *Chalinolobus dwyeri* *Cullen parvum* *Eucalyptus alligatrix* subsp. *alligatrix* *Eucalyptus cannonii* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Euphrasia arguta* *Haliaeetus leucogaster* *Lathamus discolor* *Lophoictinia isura* *Miniopterus orianae oceanensis* *Myotis macropus* *Petroica rodinogaster* *Prasophyllum petilum* *Pultenaea humilis* *Senecio garlandii*
21 January 2020	Nocturnal call-playback and spotlighting for several frog species	*Litoria aurea* *Litoria booroolongensis* *Litoria castanea* *Litoria raniformis*
5 and 6 February 2020	BAM vegetation integrity plots	All species
1 to 3 July 2020	BAM vegetation integrity plots GSM Habitat Assessment Transects	All species

Survey Date	Method	Species Targeted
NGH Surveys		
26 to 27 October 2011	Reconnaissance survey	NA
31 October to 4 November 2011	0.04 hectare standard quadrats (20 x 20 metre) / Random meanders within relatively homogenous vegetation of up to 30 minutes in duration and covering up to 1 hectare (59 sites)	*Ammobium craspedioides* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Prasophyllum petilum* *Caladenia concolor* *Swainsona recta* *Swainsona sericea* *Synemon plana* *Acacia ausfeldii* *Euphrasia arguta* *Acacia meiantha*
	Inspection points (128 points)	
	Targeted searches of walked transects approximately 10 metres apart	
	Habitat assessments (54, 100 x 100 metres quadrats)	NA
	Hollow-bearing tree surveys (35, 100 x 100 metres quadrats)	*Polytelis swainsonii* *Lathamus discolor* *Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
	Bird utilisation survey (18 surveys)	NA
	Reptile active searches, including rolling of rocks, logs and branches (11 surveys)	*Delma impar* *Aprasia parapulchella*
	Microbat Anabat surveys (9 nights)	*Falsistrellus tasmaniensis* *Miniopterus orianae oceanensis* *Scoteanax rueppellii* *Saccolaimus flaviventris*
	Nocturnal surveys, including evening listening and stag watches, call playback, spotlighting (foot-based and vehicle-based) (8 surveys)	*Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
10 to 14 April 2012	Habitat Assessments (20, 100 x 100 metres quadrats)	
	Hollow-bearing tree surveys (2, 100 x 100 metres quadrats)	*Polytelis swainsonii* *Lathamus discolor* *Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
	Bird utilisation survey (6 surveys)	NA
	Microbat Anabat surveys (6 nights)	*Falsistrellus tasmaniensis* *Miniopterus orianae oceanensis* *Scoteanax rueppellii* *Saccolaimus flaviventris*

Survey Date	Method	Species Targeted
	Nocturnal surveys, including evening listening and stag watches, call playback, spotlighting (foot-based and vehicle-based) (18 surveys)	*Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
	Cage-trapping and targeted nocturnal surveys for squirrel glider (2 trap sites, comprising 8 traps over four nights and 8 traps over three nights)	*Petaurus norfolcensis* *Phascogale tapoatafa*
November 2012	Targeted surveys for golden sun moth during the known flying time (10 sites)	*Synemon plana*
8 to 12 July 2013	Targeted point-count surveys for swift parrot and mapping of habitat features (10 search areas, 11 surveys)	*Lathamus discolor*
	Bird utilisation survey	NA
July 2013	Installation of 10 artificial tile grids (50 tiles each), targeting striped legless lizard	*Delma impar*
4 to 6 November 2013	Targeted surveys for Yass daisy and hoary sunray (walked transects approximately 10 metres apart)	*Ammobium craspedioides* *Leucochrysum albicans* var. *tricolor* *Ammobium craspedioides* *Eucalyptus robertsonii* subsp. *hemisphaerica* *Prasophyllum petilum* *Caladenia concolor* *Swainsona recta* *Swainsona sericea* *Synemon plana* *Acacia ausfeldii* *Euphrasia arguta* *Acacia meiantha*
4 to 9 November 2013	Targeted surveys for superb parrot to assess flight paths and local use of the site during the breeding season (25 transects and 3 days of flight path mapping by 8 people)	*Polytelis swainsonii*
	General bird surveys, Anabat surveys and nocturnal surveys	*Burhinus grallarius* *Chalinolobus dwyeri* *Lophoictinia isura* *Polytelis swainsonii* *Miniopterus orianae oceanensis* *Myotis macropus* *Anthochaera phrygia* *Callocephalon fimbriatum*

Survey Date	Method	Species Targeted
		Haliaeetus leucogaster
	Targeted surveys for koala including RapSAT searches to determine potential presence of the species (7 grids, totalling 33 plots)	*Phascolarctos cinereus*
	Bird utilisation survey (8 surveys)	*Lophoictinia isura* *Polytelis swainsonii* *Anthochaera phrygia* *Callocephalon fimbriatum* *Haliaeetus leucogaster*
	Microbat Anabat surveys (7 nights)	*Falsistrellus tasmaniensis* *Miniopterus orianae oceanensis* *Scoteanax rueppellii* *Saccolaimus flaviventris*
	Targeted nocturnal surveys (4 sights)	*Petaurus norfolcensis*
	Targeted funnel trap surveys for striped legless lizard (2 sites, comprising 24 traps over 4 nights)	*Delma impar*
	Targeted nocturnal call playback and spotlighting for threatened large forest owls (4 surveys)	*Ninox strenua* *Ninox connivens*
	Hollow-bearing tree surveys (7 search areas, hollows mapped within 100 metres of infrastructure in moderate-good condition vegetation)	*Polytelis swainsonii* *Lathamus discolor* *Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
November to December 2013	Weekly surveys of the 10 artificial tile grids to determine presence of striped legless lizard	*Delma impar*
18 to 20, 23 and 27 November, 3 and 8 December 2013	Targeted surveys for golden sun moth during the known flying time	*Synemon plana*
12 to 15 March 2014	Habitat assessments (transects and quadrats) for striped legless lizard and golden sun moth	*Delma impar* *Synemon plana*
7 to 9 October 2014	Targeted surveys for crimson spider orchid	*Caladenia concolor*
17 to 22 June 2015	0.04 hectare standard quadrats (20 x 20 metre) / random meanders within relatively homogenous vegetation of up to 30 minutes in duration and covering up to 1 hectare	*Eucalyptus robertsonii* subsp. *hemisphaerica*
	Habitat assessments	NA

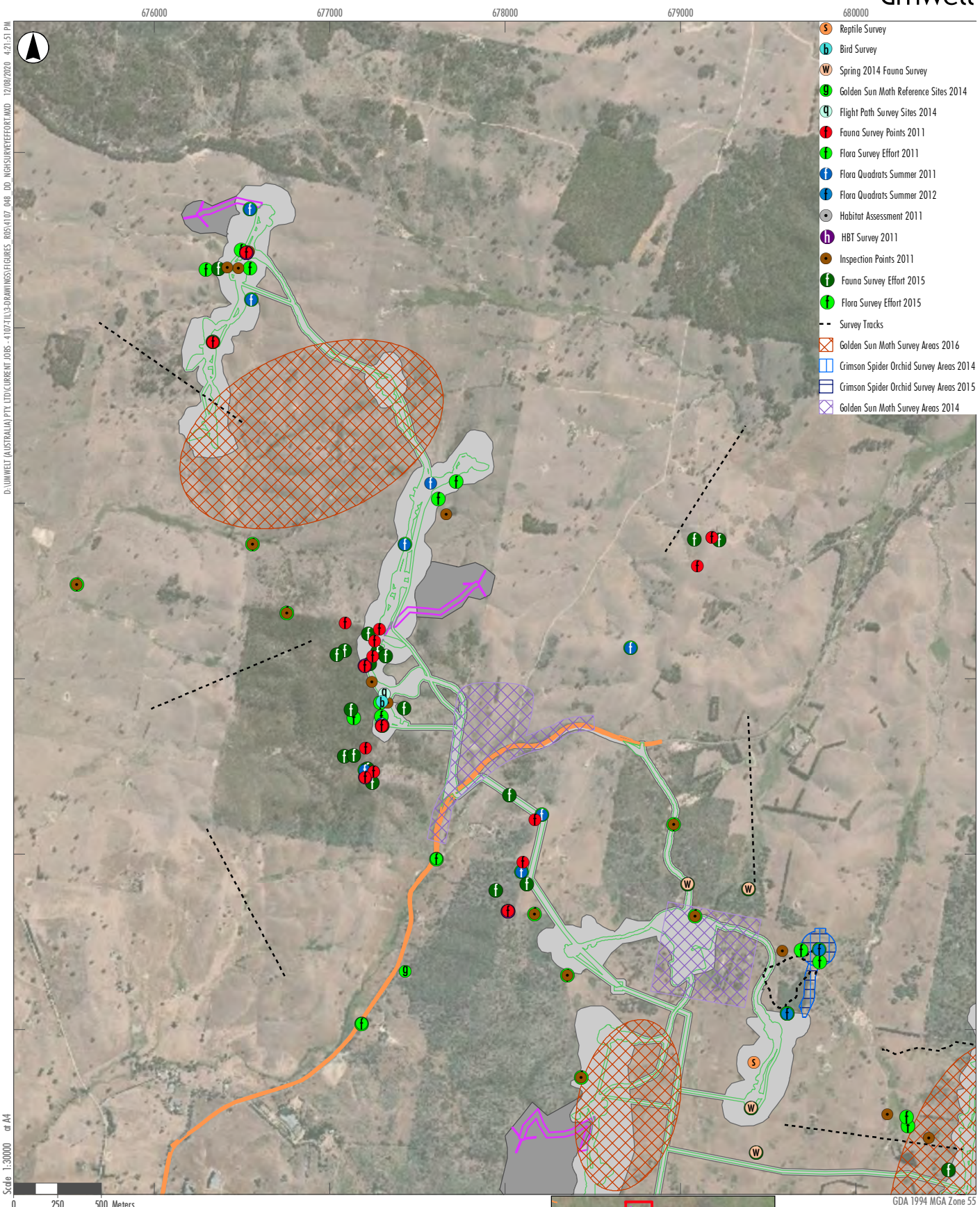
Survey Date	Method	Species Targeted
	Targeted hollow-bearing tree survey and assessment	*Polytelis swainsonii* *Lathamus discolor* *Ninox strenua* *Ninox connivens* *Petaurus norfolcensis*
28 September 2016	Targeted surveys for crimson spider orchid	*Caladenia concolor*

Species-credit surveys considered the following survey guidelines:

- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* – Working Draft (DEC 2004)
- *NSW Guide to Surveying Threatened Plants* (OEH 2016)
- *Threatened species survey and assessment guidelines: field survey methods for fauna – Amphibians* (DECC 2009)
- *Draft Survey Guidelines for Australia's Threatened Orchids* (DoE 2013).

Appendix B outlines the species-credit species predicted by the BAM calculator or identified in the literature review and the targeted survey effort undertaken in accordance with BAM survey requirements.

Appendix B also notes where species-credit species were not considered to require further survey in accordance with Section 6.4 (Step 3) of the BAM (OEH 2017a).



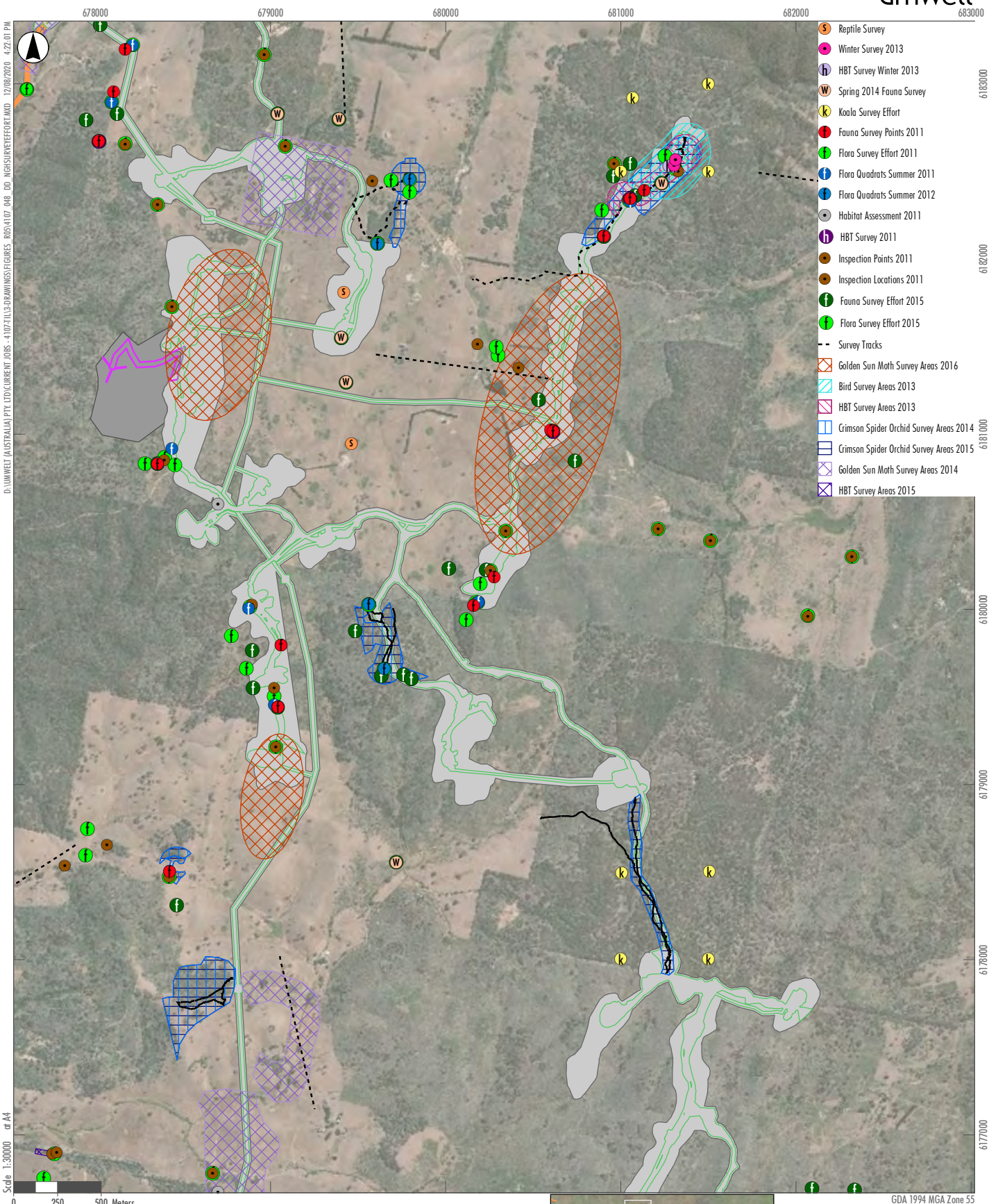
Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

FIGURE 2.2.a

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

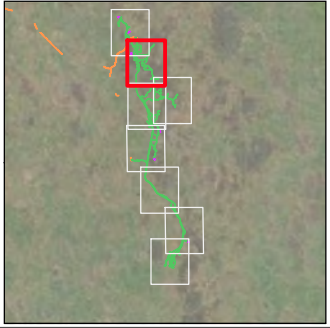


FIGURE 2.2.b

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)

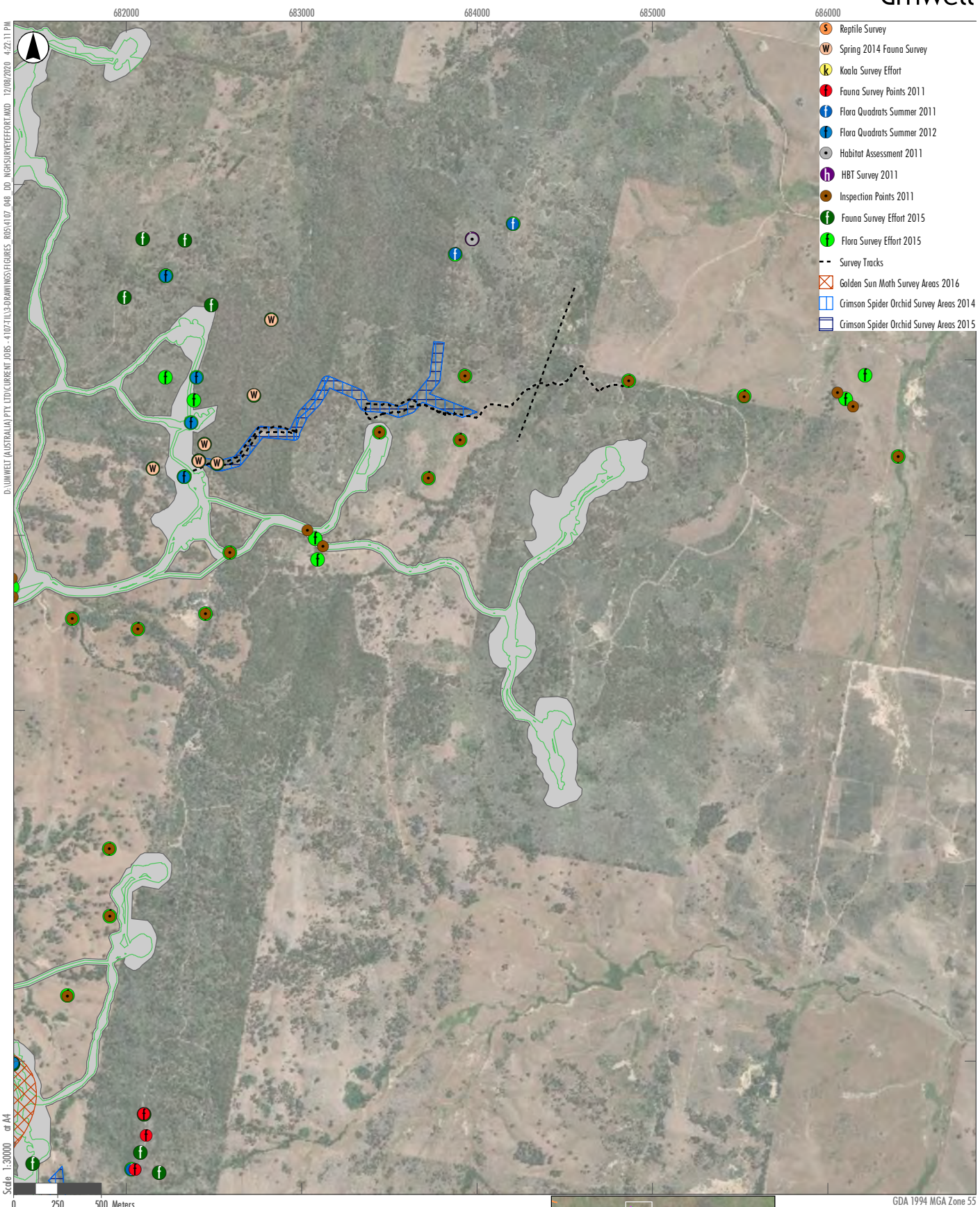
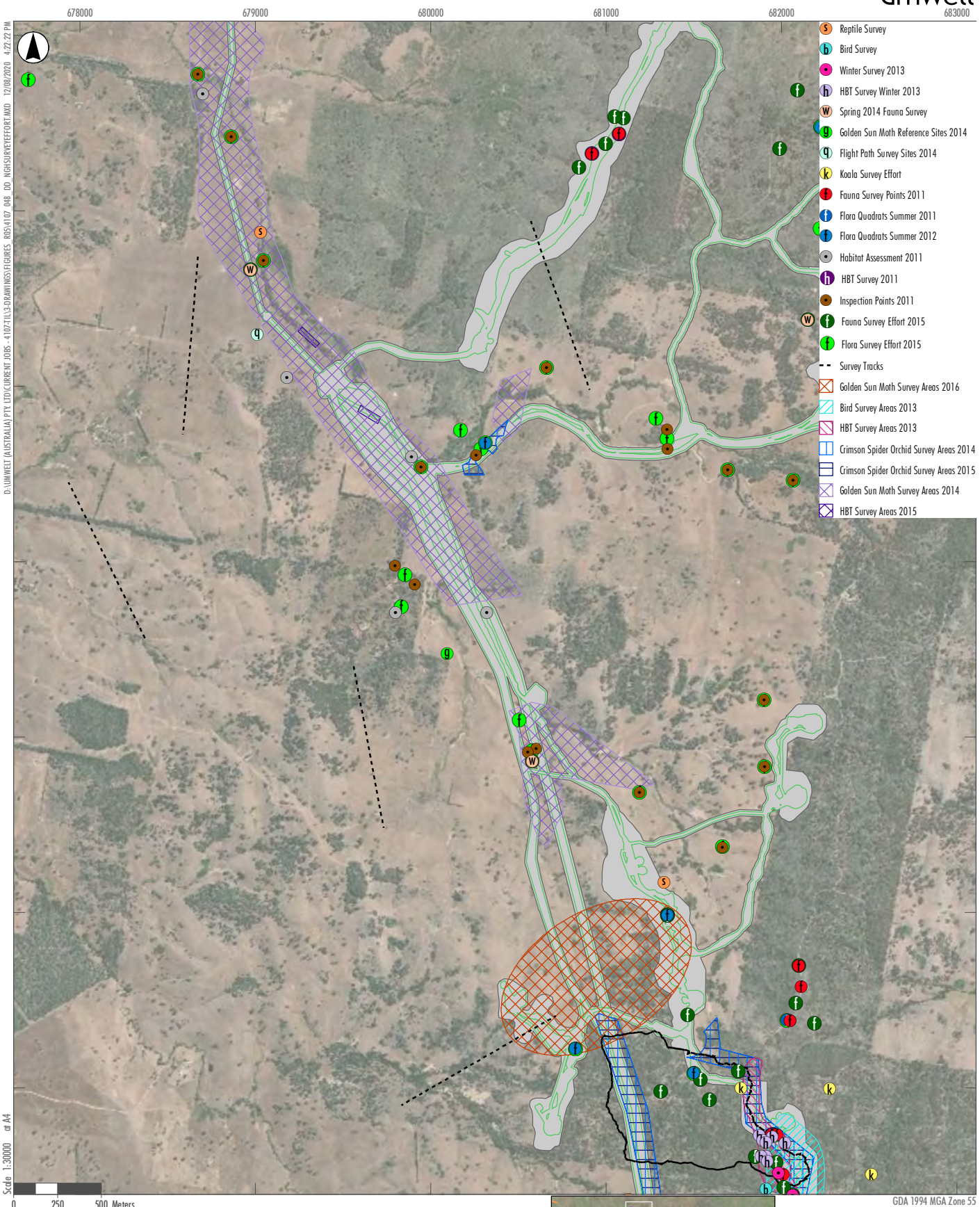


FIGURE 2.2.c

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



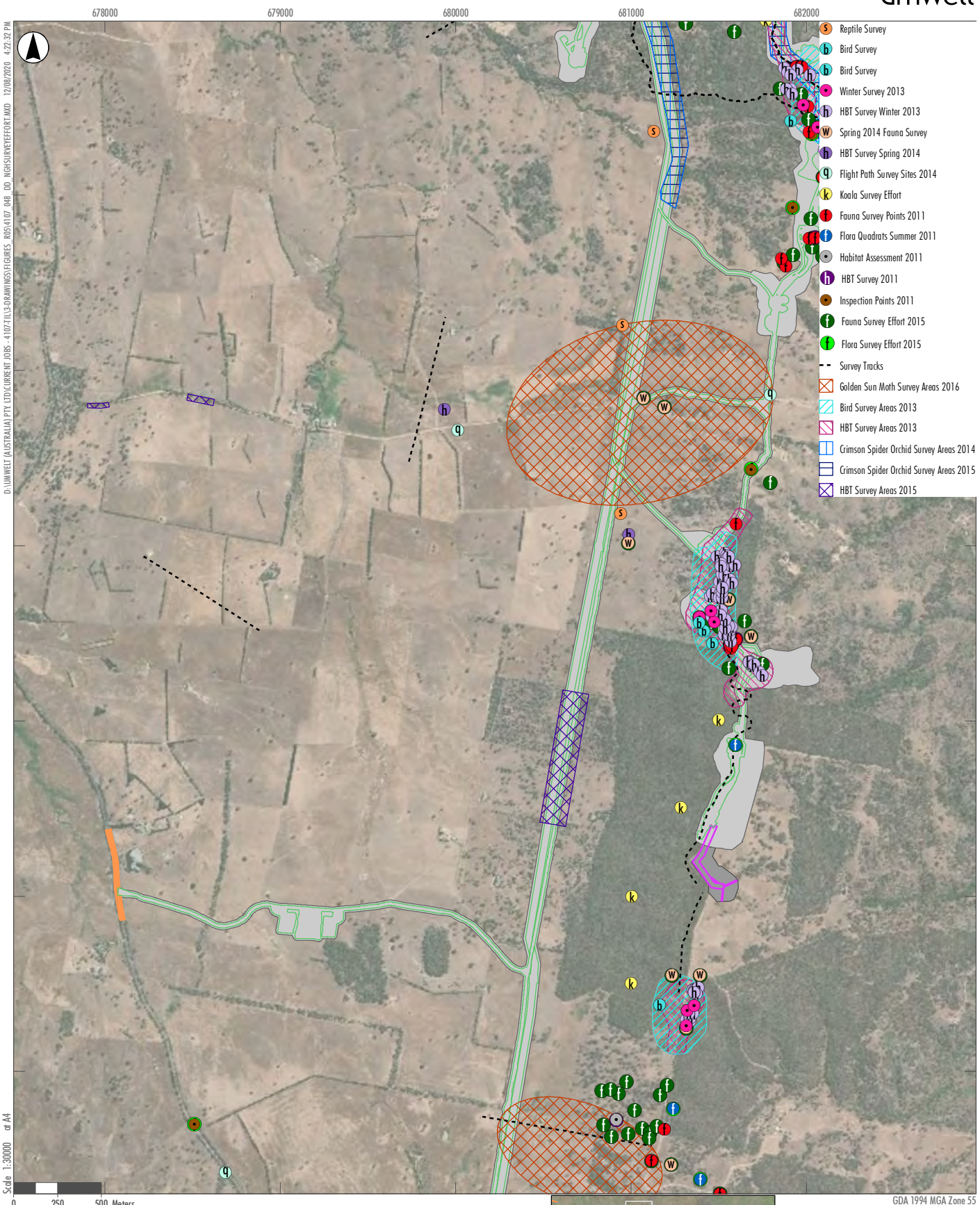
Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm

FIGURE 2.2.d

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



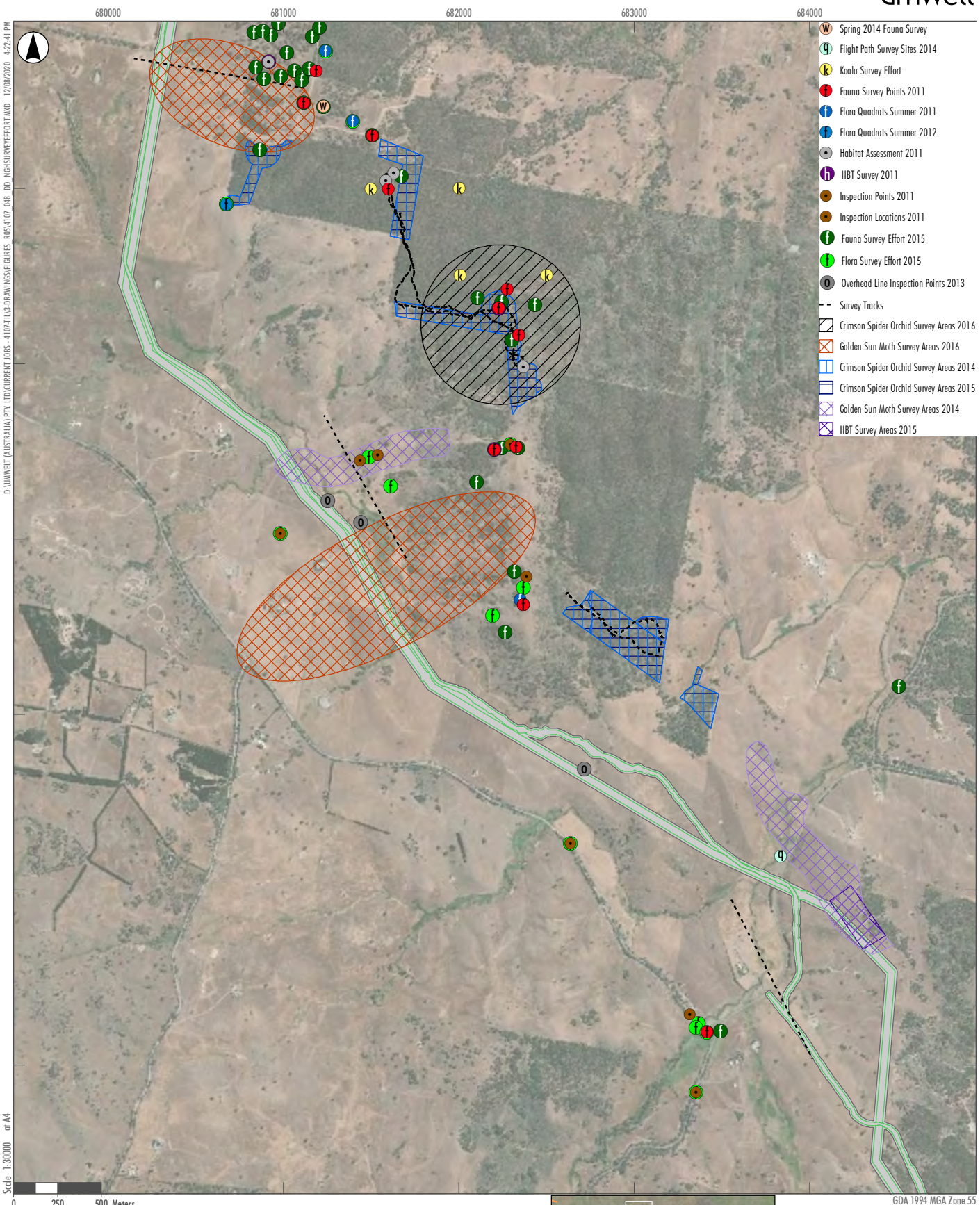
Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

FIGURE 2.2.e

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



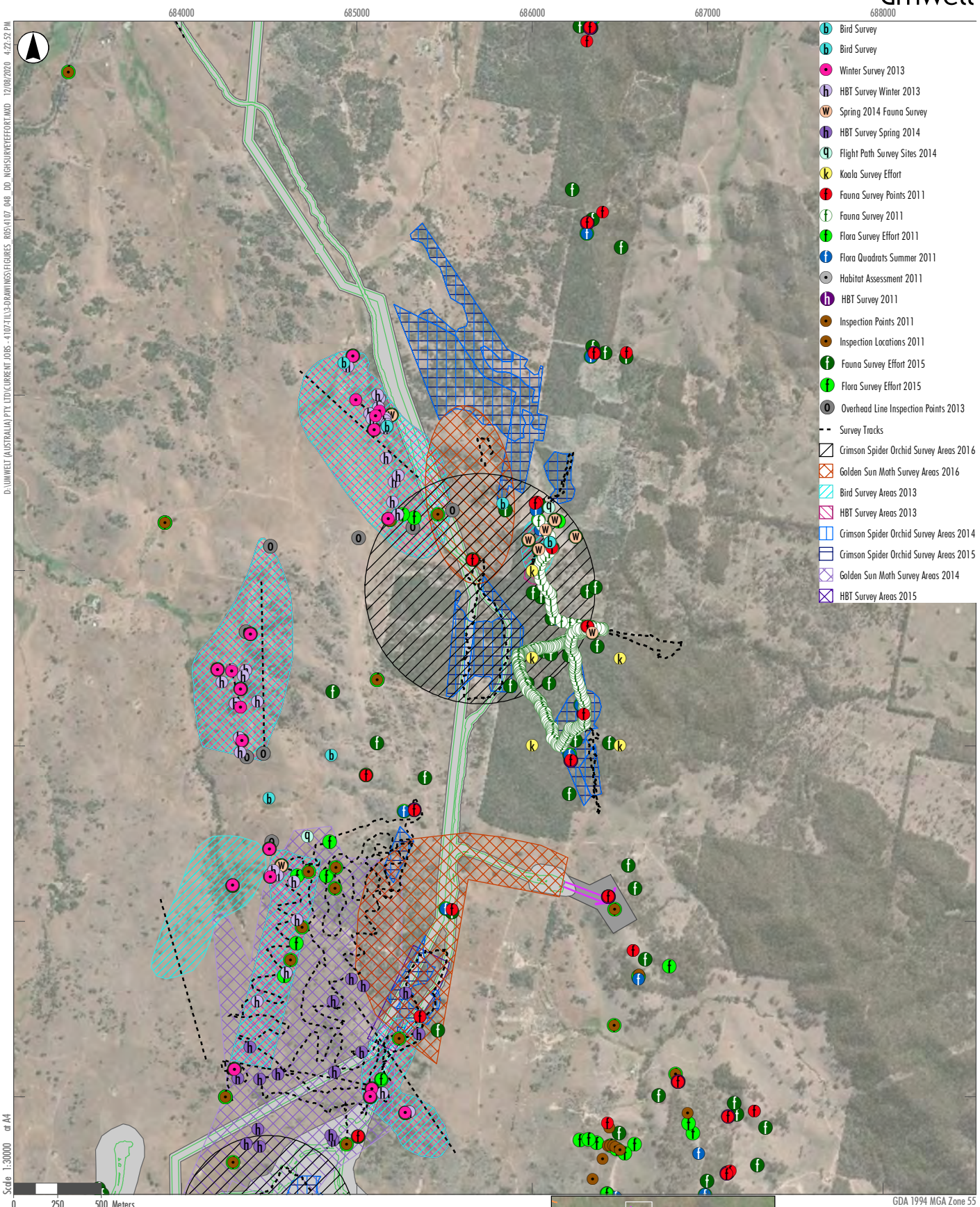
Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm

FIGURE 2.2.f

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



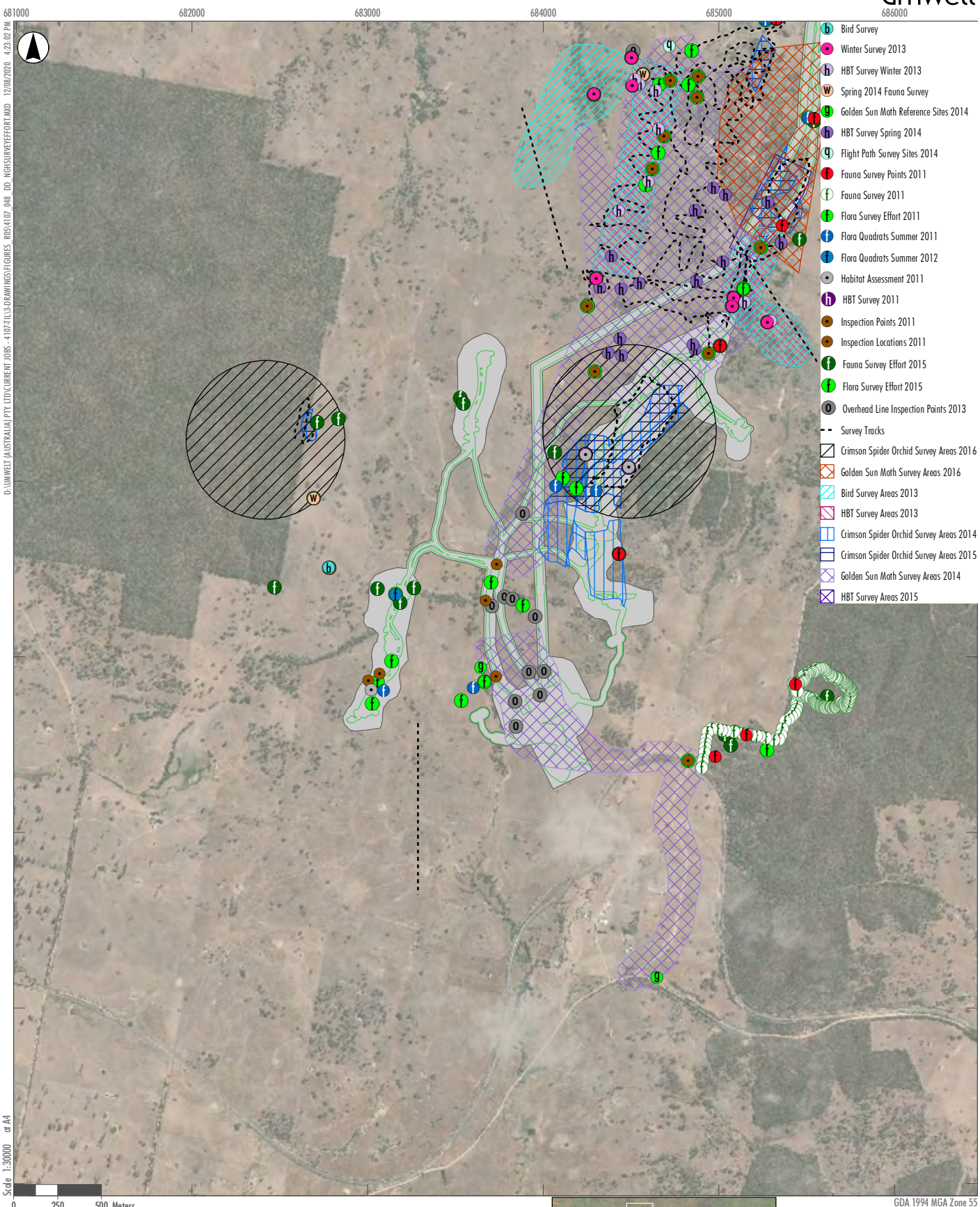
Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

FIGURE 2.2.g

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

FIGURE 2.2.h

NGH Environmental Survey Effort

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NGH Environmental (2018); Rye Park Renewable Energy Pty Ltd (2020)

2.3.4 Weather Conditions and Limitations

Table 2.5 below outlines the weather conditions for the surveys, derived from the Bureau of Meteorology (2020). Temperature data for dates prior to June 2018 are derived from the Yass Rural Fire Service weather station (070358), and post-June 2018 from Burrinjuck Dam (073007). Rainfall data are derived from the weather station in Rye Park (Glenflesk) (070361) (BOM 2020). **Table 2.6** presents the weather information for previous NGH Environmental surveys as described in the Biodiversity Assessment (2014) and Biodiversity Assessment Addendum (2016).

Table 2.5 Weather Conditions for Umwelt Surveys

Date	Daily Data			Monthly Data		
	Min-Max Temp. (°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (mean °C)	Rainfall (total mm)	Relative Humidity (mean %)
27 September 2017	0.2-26.5	0	NR	3.8-17.9	20.0	NR
28 September 2017	12.5-20.9	6.6	NR			
29 September 2017	7.0-NR	1.2	NR			
16 October 2017	4.4-26.2	0	NR	5.3-24.8	56.8	NR
17 October 2017	6.5-28.2	0	NR			
18 October 2017	5.0-28.2	0	NR			
19 October 2017	5.0-28.2	0	NR			
18 December 2017	15.7-33.3	0	NR	13.8-30.7	153.2	NR
19 December 2017	19.7-36.1	0	NR			
20 December 2017	24.0-27.1	0	NR			
21 December 2017	11.1-28.5	5.6	NR			
22 January 2018	13.4-38.4	0	NR	12.6-33.4	50.6	NR
23 January 2018	13.4-38.4	0	NR			
24 January 2018	13.4-38.4	0	NR			
25 January 2018	13.4-35.1	3.4	NR			
12 February 2018	9.0-29.3	0	NR	10.9-30.8	83.0	NR
13 February 2018	15.9-32.1	0	NR			
14 February 2018	12.0-32.5	0	NR			
15 February 2018	6.0-30.2	0	NR			
16 February 2018	11.4-34.4	0	NR			
26 February 2018	11.7-22.0	63.0	NR			
27 February 2018	10.2-31.7	1.6	NR			
28 February 2018	NR-31.7	0	NR			
1 March 2018	9.7-29.8	0	NR	10.2-28.1	3.0	NR
2 March 2018	12.5-32.0	0	NR			
22 October 2018	7.4-24.6	0	NR	9.8-23.9	18.8	NR

Date	Daily Data			Monthly Data		
	Min-Max Temp. (°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (mean °C)	Rainfall (total mm)	Relative Humidity (mean %)
23 October 2018	7.5-29.1	0	NR			
24 October 2018	9.5-23.7	0	NR			
25 October 2018	12.1-25.3	0	NR			
26 October 2018	7.9-26.2	0	NR			
29 October 2018	9.1-27.1	0	NR			
30 October 2018	9.0-27.0	0	NR			
31 October 2018	8.5-31.5	0	NR			
5 November 2018	11.9-25.4	0	NR	11.3-26.4	89.4	NR
6 November 2018	16.3-26.5	3.2	NR			
7 November 2018	15.2-17.8	17.4	NR			
8 November 2018	7.0-18.4	18.2	NR			
12 November 2018	NR-30.5	0	NR			
13 November 2018	14.6-30.8	0	NR			
14 November 2018	17.0-22.5	0	NR			
15 November 2018	14.5-26.5	9.2	NR			
16 November 2018	12.2-28.6	0	NR			
19 November 2018	12.5-NR	0	NR			
20 November 2018	NR-30.5	0	NR			
21 November 2018	13.0-22.0	0	NR			
22 November 2018	8.1-15.3	1.4	NR			
23 November 2018	7.4-13.4	12.8	NR			
28 November 2018	13.3-19.1	6.2	NR			
29 November 2018	8.7-24.9	11.6	NR			
30 November 2018	12.6-NR	0	NR			
29 January 2019	19.0-36.0	0.6	88	19.5-36.3	65.5	72
30 January 2019	20.0-38.6	0	87			
31 January 2019	NR-34.3	0	45			
1 February 2019	16.7-26.8	0	71	15.6-31.2	26.4	72
2 February 2019	16.2-30.2	0	77			
3 February 2019	18.7-37.6	2.0	89			
4 February 2019	18.9-36.8	0	95			
5 February 2019	20.2-31.1	4.4	69			
6 February 2019	19.8-33.7	8.0	71			
7 February 2019	20.3-32.5	0	81			

Date	Daily Data			Monthly Data		
	Min-Max Temp. (°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (mean °C)	Rainfall (total mm)	Relative Humidity (mean %)
8 February 2019	20.5-31.3	0.8	86			
9 February 2019	17.1-23.8	8.2	83			
10 February 2019	8.7-25.4	0	82			
11 February 2019	9.3-28.6	0	68			
12 February 2019	12.3-32.6	0	72			
13 February 2019	11.4-24.6	0	52			
14 February 2019	9.4-30.0	0	75			
15 February 2019	11.4-33.3	0	68			
1 March 2019	18.0-33.4	0.8	85	14.2-27.1	93.4	79
8 March 2019	10.3-30.0	0	85			
25 March 2019	16.8-18.3	8.0	85			
1 April 2019	5.6-22.0	0	84	10.1-23.7	2.0	80
2 April 2019	7.5-24.0	0	83			
3 April 2019	11.0-25.8	0	94			
4 April 2019	11.4-24.0	0	60			
5 April 2019	16.0-25.0	0	75			
6 April 2019	13.0-26.0	0	94			
7 April 2019	9.0-25.0	0	82			
8 April 2019	9.5-26.0	0	72			
9 April 2019	13.0-20.0	1.6	57			
10 April 2019	5.0-19.2	0	80			
11 April 2019	6.4-22.6	0	75			
12 April 2019	11.5-25.3	0	81			
13 April 2019	7.8-24.6	0	85			
14 April 2019	10.3-24.8	0	65			
15 April 2019	14.0-23.8	0.4	73			
16 April 2019	11.3-24.4	0	75			
17 April 2019	11.1-25.6	0	76			
1 July 2019	0.0-11.0	0	100	3.5-13.4	18.6	88
2 July 2019	0.5-13.1	0	96			
3 July 2019	0.7-15.3	0	99			
4 July 2019	2.7-14.7	0	87			
5 July 2019	4.5-17.2	0	79			
6 July 2019	6.2-16.6	0	78			

Date	Daily Data			Monthly Data		
	Min-Max Temp. (°C)	Rainfall (mm)	Relative Humidity (%)	Min-Max Temp (mean °C)	Rainfall (total mm)	Relative Humidity (mean %)
7 July 2019	3.6-14.0	0	96			
8 July 2019	5.5-13.0	2.4	100			
19 August 2019	3.9-8.5	2.4	87	1.8-13.7	33.2	88
20 August 2019	4.0-9.8	0.8	84			
21 August 2019	4.4-13.6	0.6	75			
22 August 2019	8.7-14.0	0	75			
23 August 2019	-1.0-14.8	0	83			
23 September 2019	4.1-12.8	0	85	4.5-18.7	37.6	77
24 September 2019	1.3-16.8	0.6	85			
25 September 2019	2.1-21.0	0	84			
11 November 2019	7.2-25.7	0	83	11.1-27.0	20.4	62
12 November 2019	8.3-26.2	0	65			
13 November 2019	7.4-19.5	0	52			
14 November 2019	7.4-24.2	0	52			
15 November 2019	9.6-25.6	0	53			
17 December 2019	15.0-34.8	0	67	15.1-33.3	8.4	60
18 December 2019	17.2-38.9	0	60			
19 December 2019	17.8-41.2	0	55			
13 January 2020	15.0-30.0	0	58	17.3-34.2	60.9	67
14 January 2020	16.5-NR	0	69			
15 January 2020	NR	NR	NR			
21 January 2020	15.4-28.8	5.4 (46.2 the night before)	78			
5 February 2020	14.7-34.5	0	18.2	16.6-30.3	NR	72
6 February 2020	16.0-26.4	0	NR			
1 July 2020	16.0	0	NR	NR	NR	NR
2 July 2020	14.5	1.8	NR	NR	NR	NR
3 July 202	11.5	0.1	NR	NR	NR	NR

NR = No record

Table 2.6 Weather Conditions for NGH Environmental Surveys

Date	Temperature During Surveys (°C)	Cloud (%)	Wind	Rain (mm)
26 October 2011	18.3	NR	NR	7.4
27 October 2011	22.2	NR	NR	0
31 October 2011	24.1	NR	NR	0
1 November 2011	23.6	NR	NR	0
2 November 2011	22.3	NR	NR	0
3 November 2011	23.0	NR	NR	0
4 November 2011	26.6	NR	NR	0
5 November 2011	18 to 26	Nil	Nil	0
10 April 2012	17.5	NR	NR	0.4
11 April 2012	20.0	NR	NR	0
12 April 2012	NR	NR	NR	0
13 April 2012	23.5	NR	NR	0
14 April 2012	16.5	NR	NR	0
8 July 2013	13.8	NR	NR	0
9 July 2013	3 to 6 in the mornings and 11 to 15 in the afternoons	30	Gentle Breeze	0
10 July 2013		80	Gentle Breeze	0
11 July 2013		100	Mild Breeze	0
12 July 2013		20	Calm	0
4 November 2013	-0.5 to 21	30	Light Wind	0
5 November 2013	1 to 23.5	20	Light Wind	0
6 November 2013	1 to 28	10	Light Wind	0
7 November 2013	5 to 31.5	30	Moderate Wind	0
8 November 2013	10 to 25	80	Moderate Wind	0
9 November 2013	6 to 24	100	Strong Wind	0
15 November 2013	18 to 25	30	Nil	0
18 November 2013	18 to 22	50	Moderate Wind	0
19 November 2013	12 to 27	30	Calm to Slight Breeze	0
20 November 2013	26 to 32	20	Calm	0
22 November 2013	14 to 24	80	Moderate Wind	0
23 November 2013	21 to 24	Nil	Nil	2
27 November 2013	12 to 27	10	Calm to Slight Breeze	4
3 December 2013	20 to 32	10	Calm to Moderate Wind	0
6 December 2013	7.5 to 15	50	Moderate to Strong Wind	0
8 December 2013	25 to 25	0	Calm	0

Date	Temperature During Surveys (°C)	Cloud (%)	Wind	Rain (mm)
10 December 2013	13 to 20	40	Moderate Wind	0
13 December 2013	18 to 26	10	Moderate Wind	0
17 December 2013	18 to 22	Nil	Slight Breeze	0
12 March 2014	27.5	NR	NR	0.8
13 March 2014	25.7	NR	NR	5.4
14 March 2014	29.4	NR	NR	9.0
15 March 2014	26.6	NR	NR	0.6
7 October 2014	NR	NR	NR	8.0
8 October 2014	NR	NR	NR	1.4
9 October 2014	22	NR	NR	0
17 June 2015	14.3	NR	NR	4.6
18 June 2015	11.8	NR	NR	9.0
19 June 2015	14.1	NR	NR	26.6
20 June 2015	11.6	NR	NR	0
21 June 2015	11.9	NR	NR	0
22 June 2015	10.5	NR	NR	0
28 September 2016	20	NR	NR	0

NR = No record

Sourced from the Biodiversity Assessment (NGH Environmental 2014), Biodiversity Assessment Addendum (NGH Environmental 2016a) and BOM (2020).

3 Results

3.1 Landscape Value

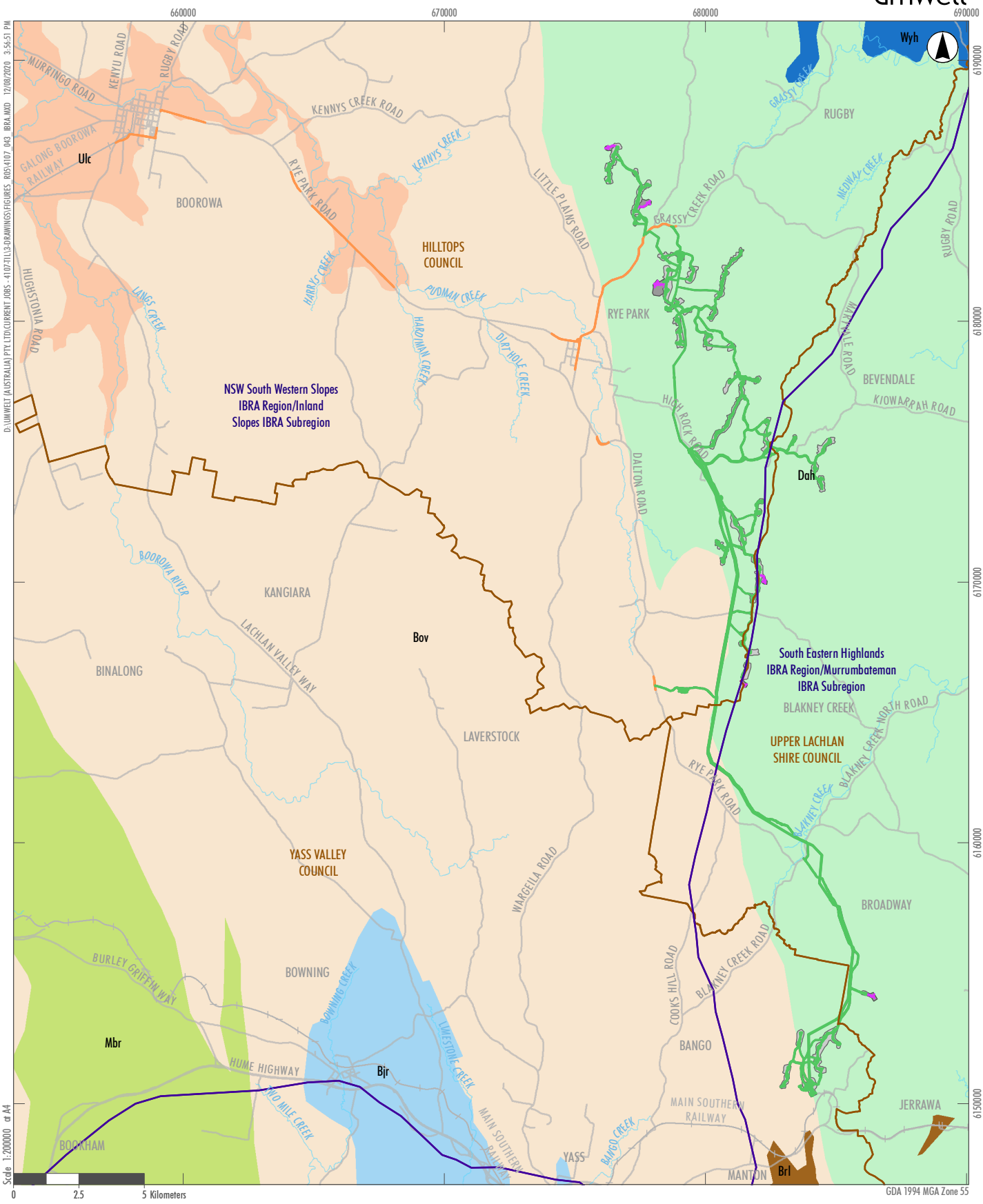
The 500 m buffer area of the Indicative Development Footprints contains a range of landscape features. These landscape features are shown in **Figure 3.1** to **3.2** and outlined in relation to the Indicative Development Footprints in **Table 3.1** below.

Table 3.1 Landscape Features in the Indicative Development Footprints

Landscape Features		Broadly Consistent with Approved Project
IBRA Bioregions	NSW – South Western Slopes South Eastern Highlands	✓
IBRA Subregions (Bioregions)	Inland Slopes (NSW – South Western Slopes) Murrumbateman (South Eastern Highlands)	✓
Mitchell Landscapes	Dalton Hills (Dominant) Boorowa Volcanics (Sub-dominant) Upper Lachlan Channels and Floodplains (Minor)	✓
Rivers, Streams, Estuaries[1]	Barlows Creek (3rd Stream Order) Blakney Creek (1st and 4th Stream Order) Browns Creek (2nd Stream Order) Dry Creek (3rd Stream Order) Flakney Creek (1st and 2nd Stream Order) Grassy Creek (2nd Stream Order) Harrys Creek (4th Stream Order) Lagoon Creek (2nd, 3rd, 4th and 5th Stream Order) Pipeclay Creek (2nd Stream Order) Pudman Creek (5th and 6th Stream Order) Reedy Gully (2nd Stream Order) Ryans Creek (2nd and 3rd Stream Order) Spring Creek (3rd and 4th Stream Order) Urumwalla Creek (2nd and 4th Stream Order)	✓
Wetlands (within, adjacent to and downstream)	Nil	✓
Native Vegetation Covers	500 metre buffer comprises 11,086 hectares (7,867 hectares in SWS IBRA Region and 3,219 hectares in SEH IBRA Region) (**Figure 3.2**) **SWS IBRA Region** 3,716 hectares of native vegetation was mapped in the 500m buffer area (47 per cent) **SHE IBRA Region** 1,734 hectares of native vegetation was mapped in the 500m buffer area (54 per cent)	✓

Landscape Features		Broadly Consistent with Approved Project
Areas of Geological Significance or Soil Hazard Features	None identified	✓
Areas of Outstanding Biodiversity Value	None identified	✓
Cleared Areas	118.78 hectares within the Indicative Development Footprints (including both the Indicative Development Footprint – Wind Farm, Indicative Development Footprint – Permanent Met Masts and the Indicative Development Footprint – External Roads). This comprises 103.18 hectares of Non-native Vegetation and 15.60 hectares of roads, tracks and waterbodies.	✓
Connectivity Features	Broad habitat connectivity corridors have been identified and are presented in **Figure 3.2.** Not identified as an important flyway for migratory species. As part of the BBAMP survey work completed by Umwelt, the migration period of the large bent-wing bat was surveyed (as requested by BCD), to determine the usage of the species when migrating north from their maternity cave at Wee Jasper, NSW. The results of the BBAMP survey confirms that the site is not being used as a migration route by this species.	✓

[1] Strahler, A. N., (1952)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Local Government Area
- IBRA Region/Subregion Area
- Watercourses

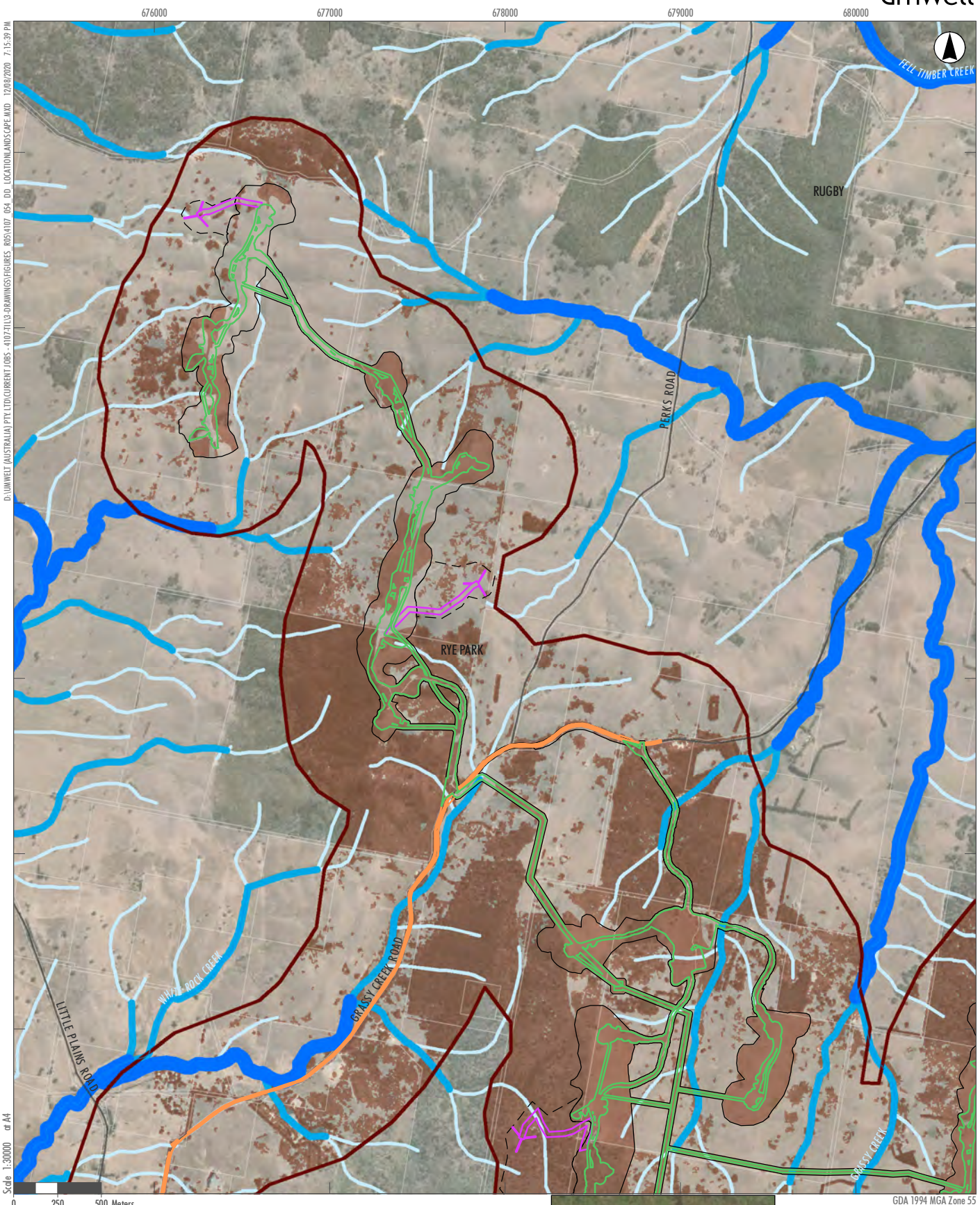
Mitchell Landscapes

- Boorowa Volcanics (Bov)
- Breadalbane Swamps and Lagoons (Brl)
- Burrinjuck Ridges (Bjr)
- Crookwell Basalts and Sands (Ckw)
- Dalton Hills (Dah)
- Gunning Hills (Ghg)
- Marilba Range
- Upper Lachlan Channels and Floodplains (Ulc)
- Wyangla Hills (Wyh)

FIGURE 3.1

Location Map IBRA Regions/Subregions and Local Government Areas

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Australian Government Department of the Environment (2012); OEH (2008); NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

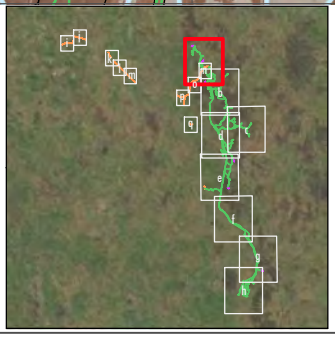
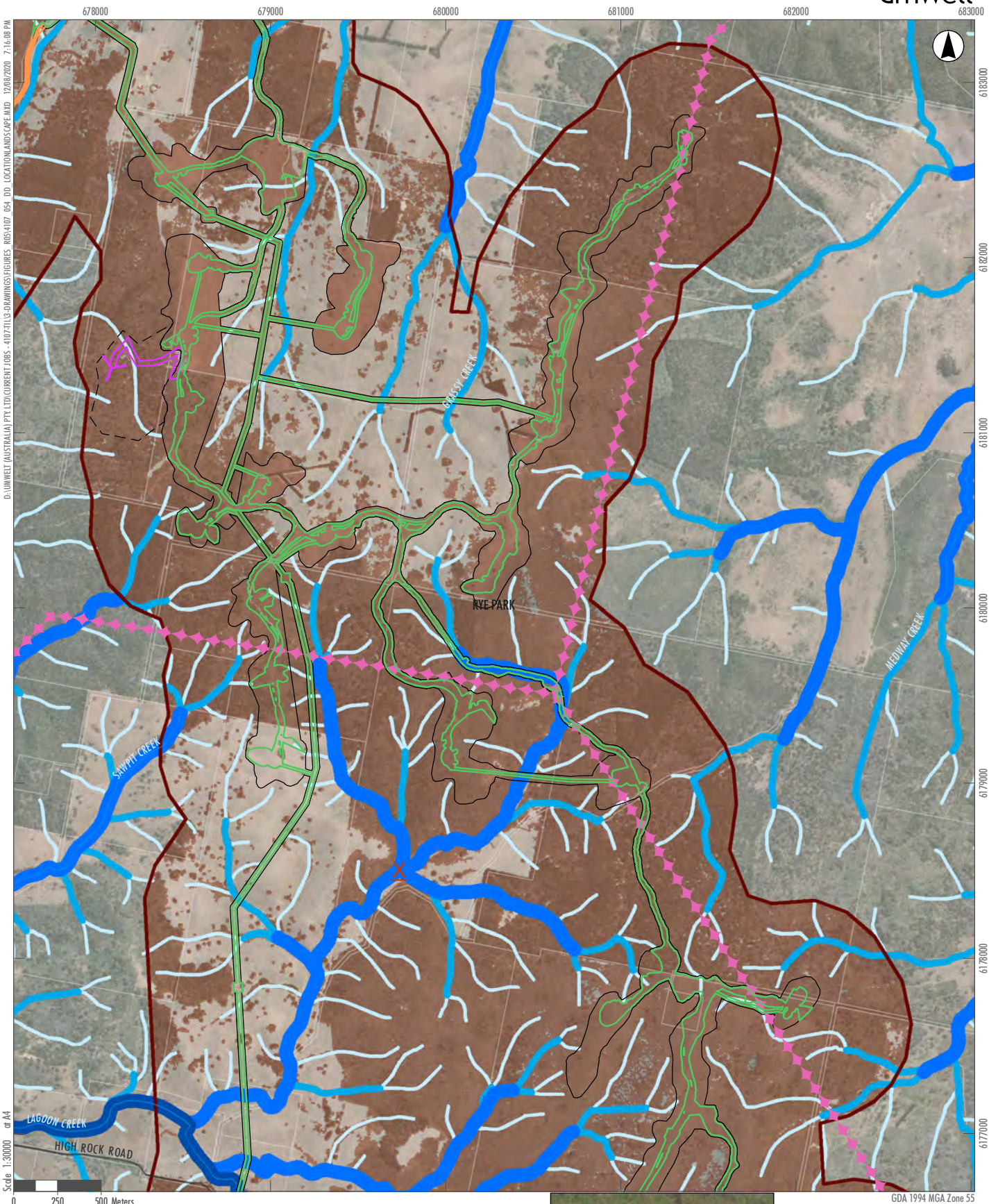


FIGURE 3.2.a

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Property Boundaries
- Watercourses
- Historic Mine Shaft

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

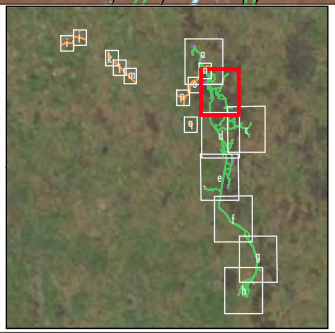
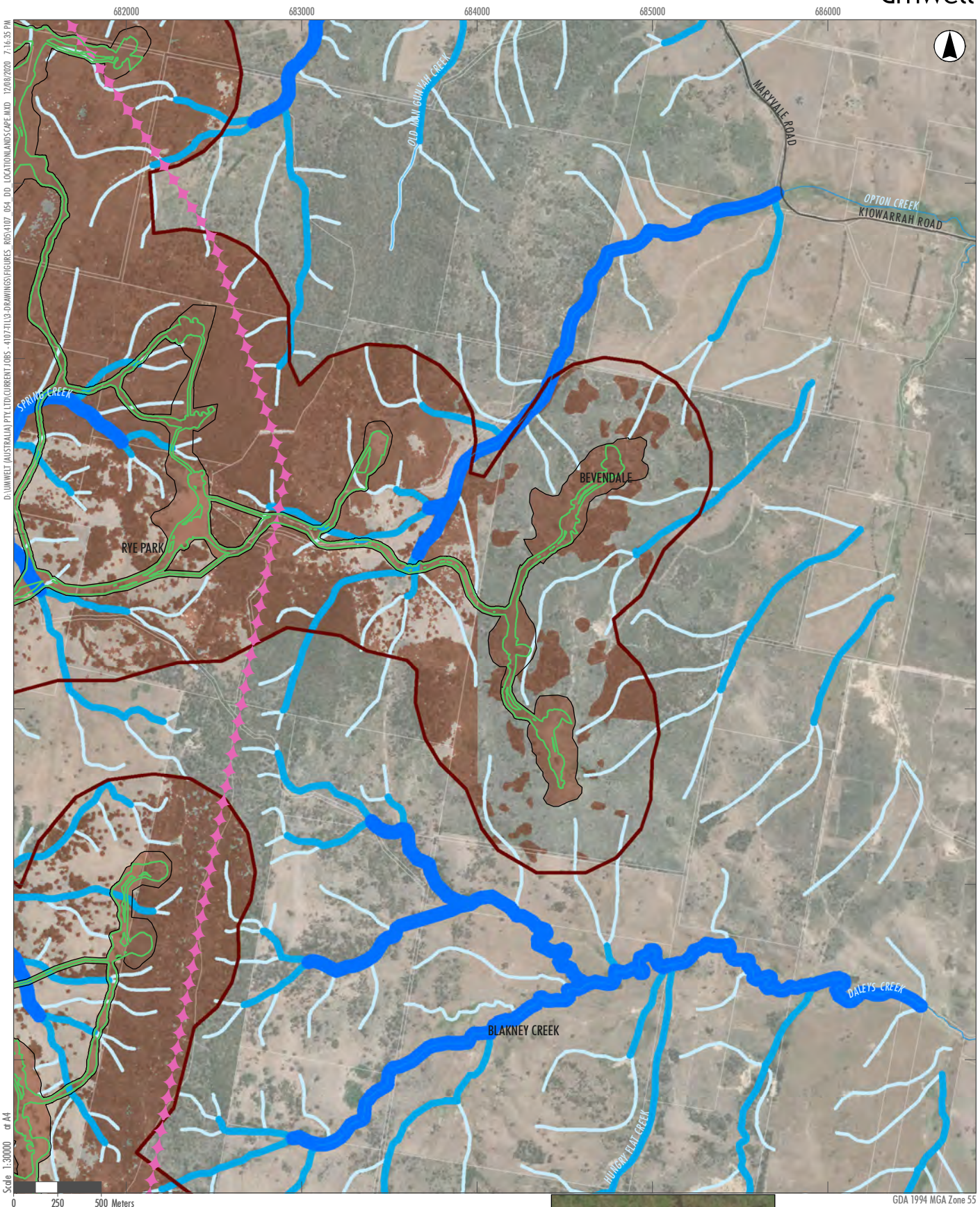


FIGURE 3.2.b

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

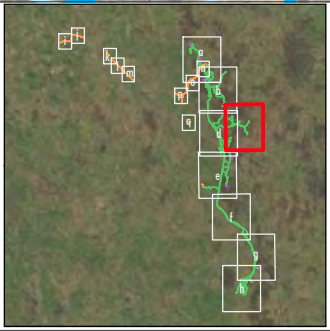
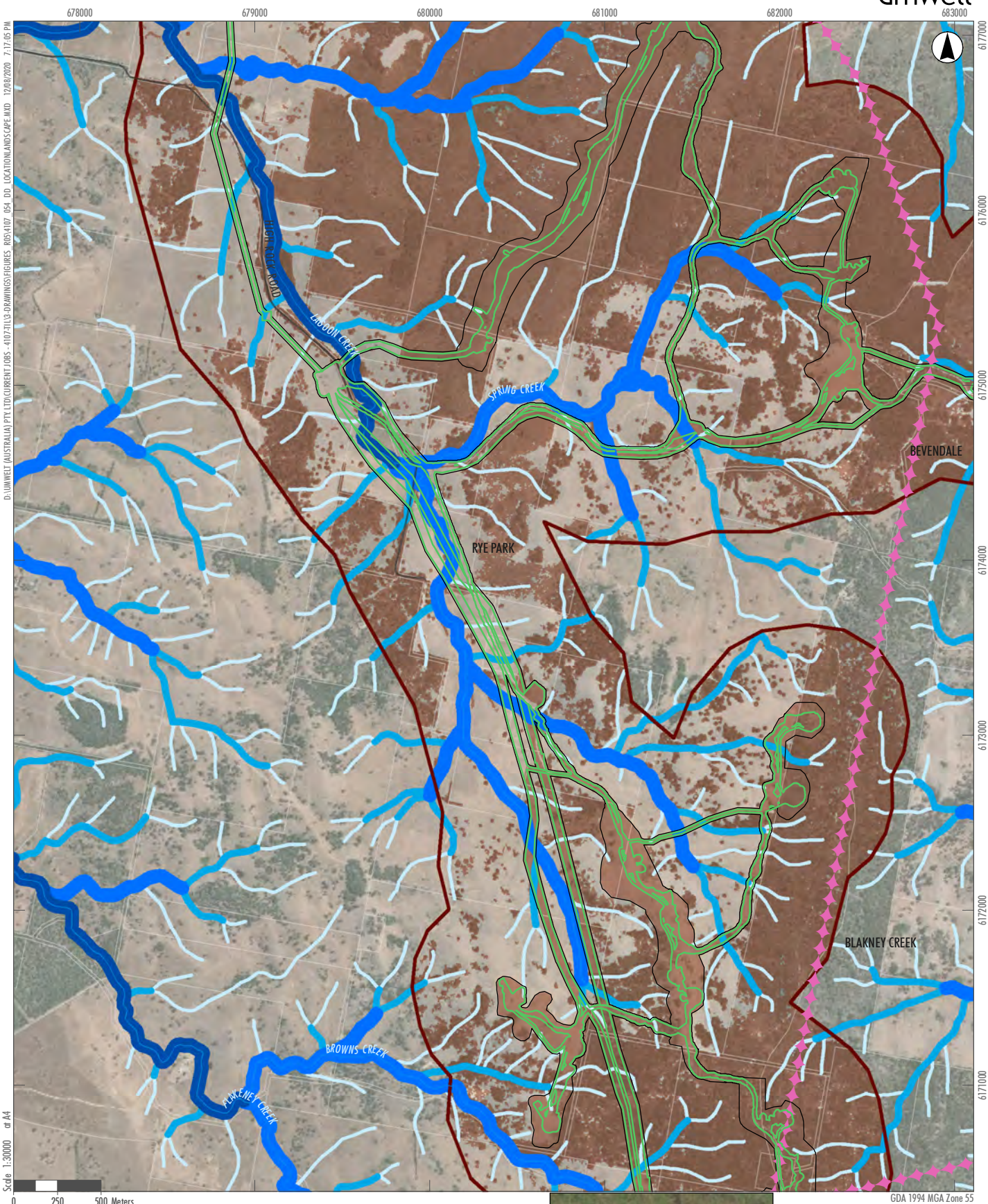


FIGURE 3.2.c

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

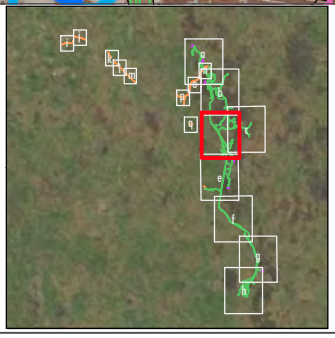
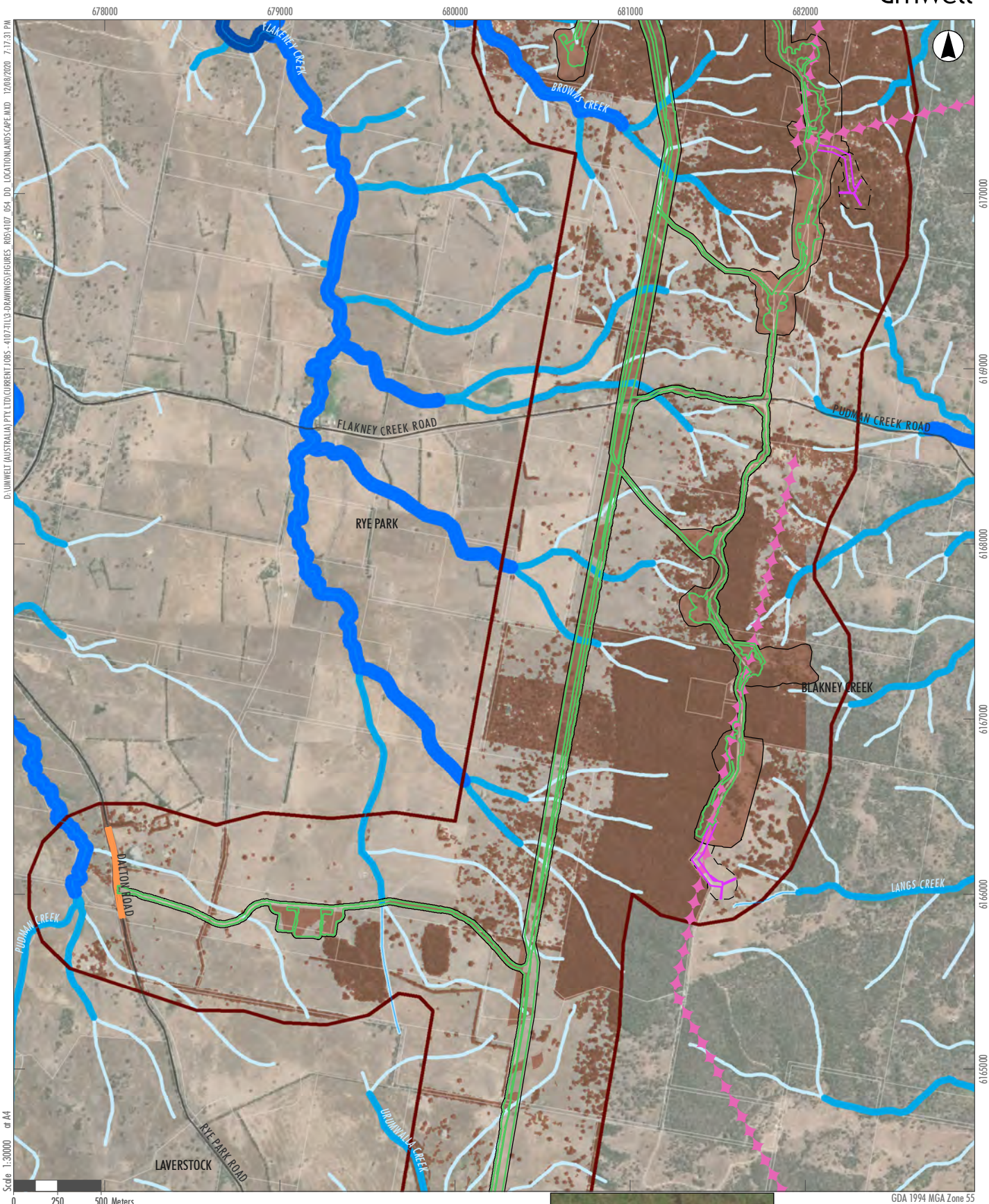


FIGURE 3.2.d

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

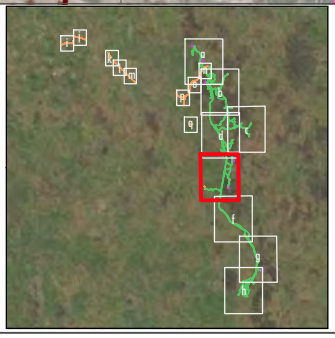
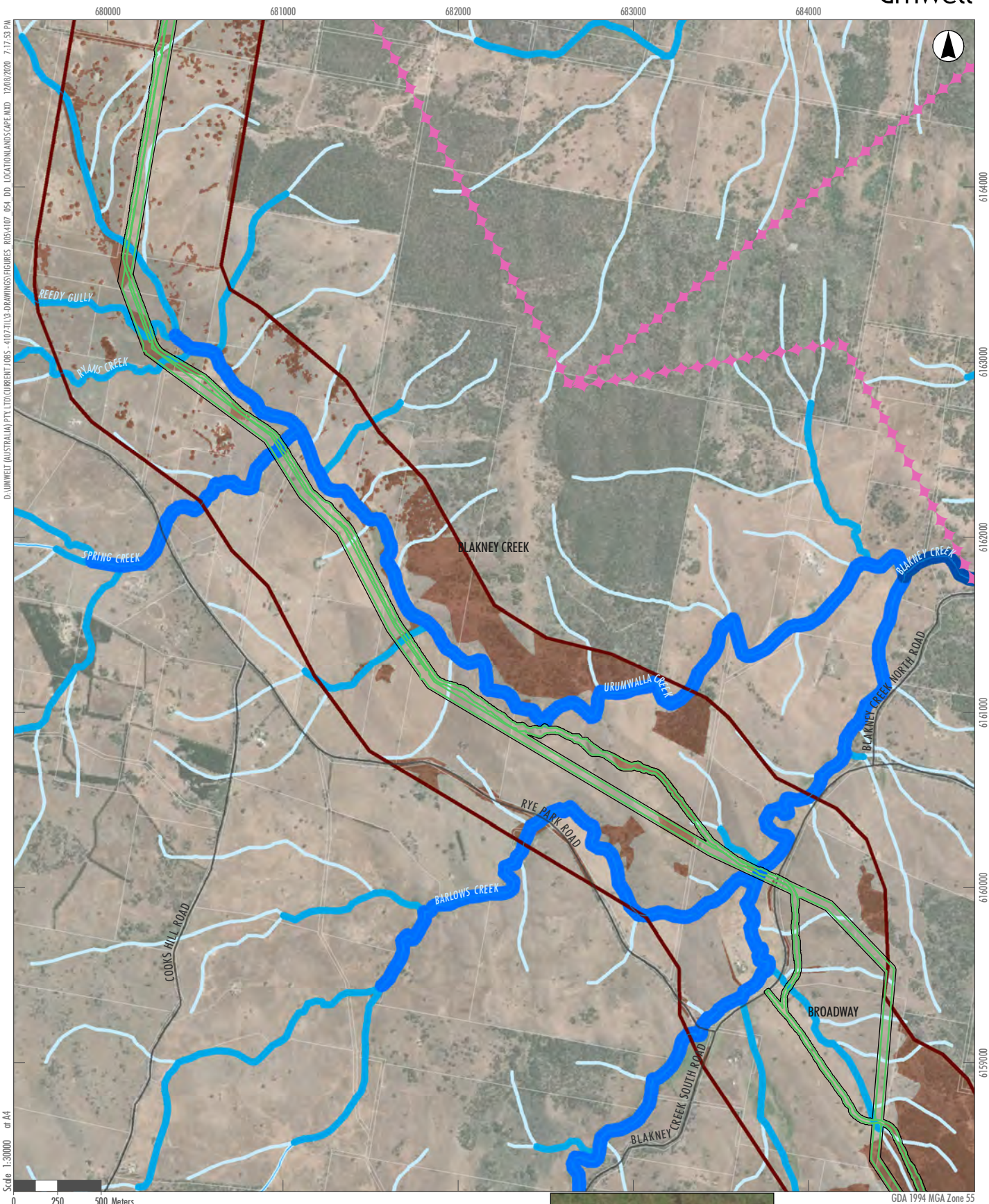


FIGURE 3.2.e

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



D:\UMWELT (AUSTRALIA) PTY LTD\CURRENT JOBS - 4107TIL\3-DRAWINGS\FIGURES R05\4107_054_DD_LOCATIONLANDSCAPE.MXD 12/08/2020 7:17:53 PM

Scale 1:30000 at A4

Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

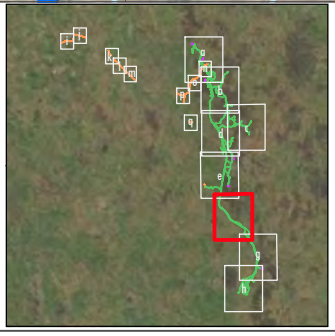
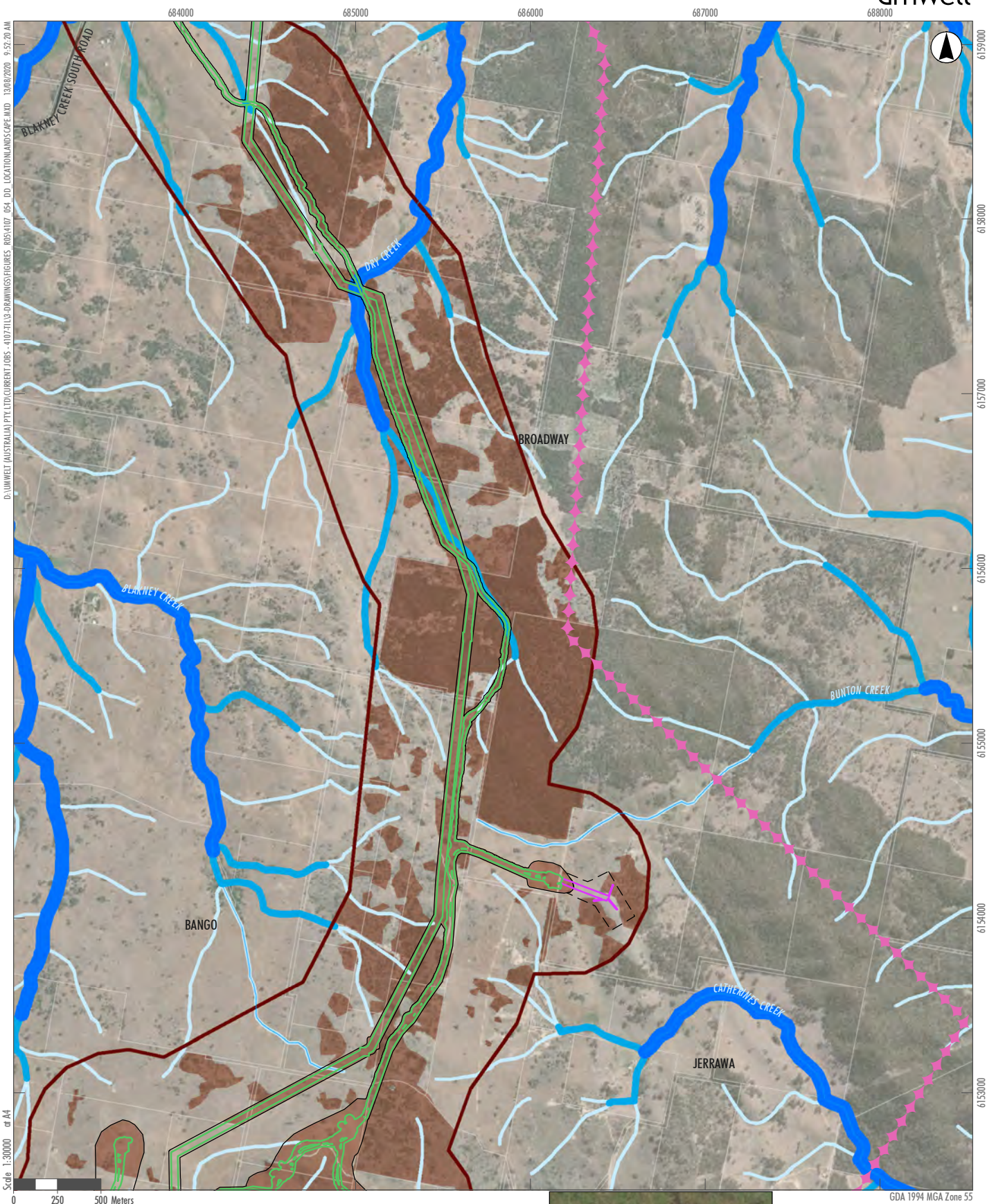


FIGURE 3.2.f

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



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Scale 1:30000 at A4

Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

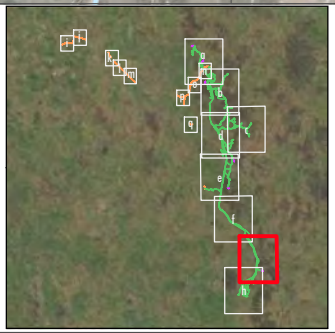
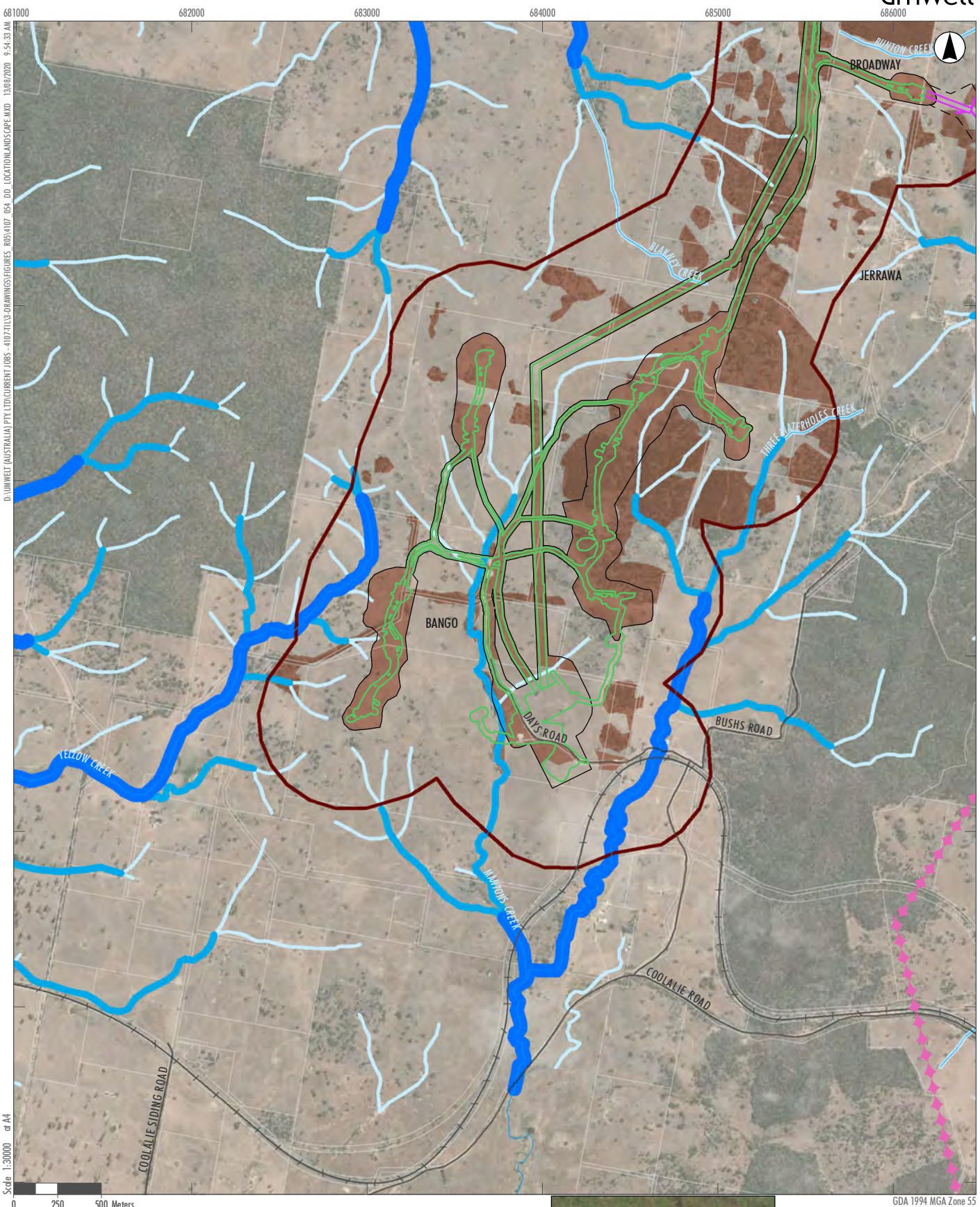


FIGURE 3.2.g

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Native Vegetation
- 500m Development Footprint Buffer
- Indicative Habitat Corridors
- Railways
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

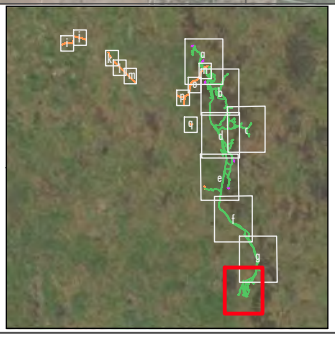


FIGURE 3.2.h

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Railways
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

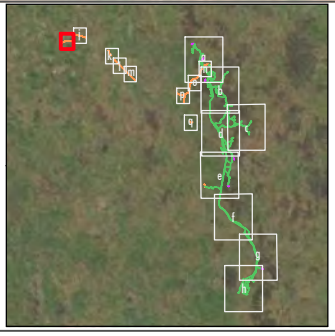


FIGURE 3.2.i

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 50m Riparian Corridor (Stream Orders 5, 6)

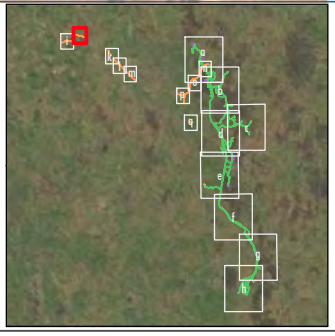


FIGURE 3.2.j

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

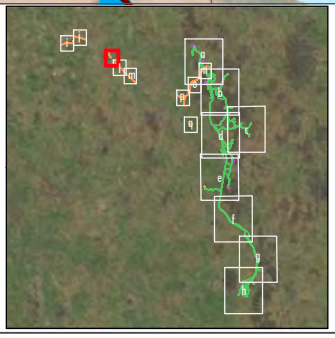


FIGURE 3.2.k

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

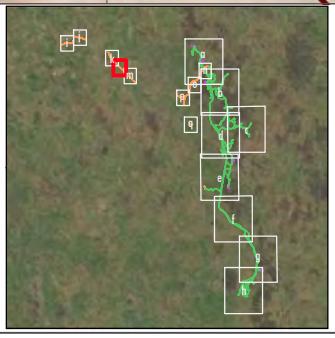


FIGURE 3.2.1

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

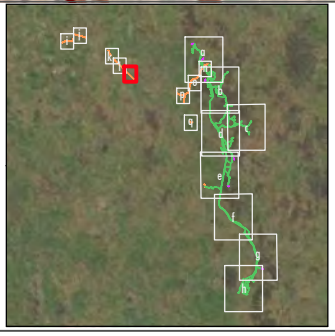


FIGURE 3.2.m

Location Map
Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)

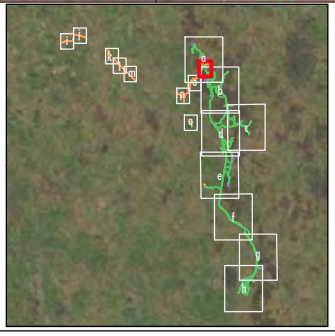


FIGURE 3.2.n

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)

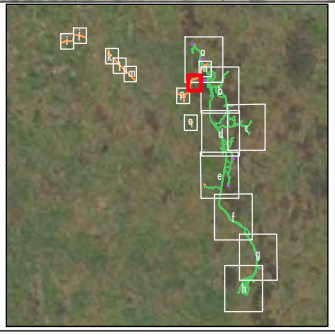


FIGURE 3.2.o

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

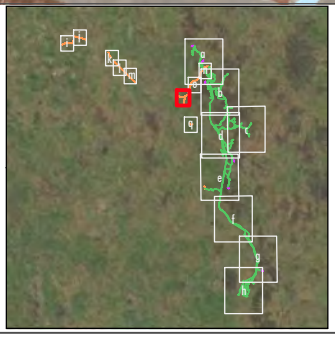


FIGURE 3.2.p

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Native Vegetation
- 500m Development Footprint Buffer
- Property Boundaries
- Watercourses

Riparian Buffers (Strahler Stream Order)

- 10m Riparian Corridor (Stream Orders 0, 1)
- 20m Riparian Corridor (Stream Orders 2, 3)
- 40m Riparian Corridor (Stream Orders 3, 4)
- 50m Riparian Corridor (Stream Orders 5, 6)

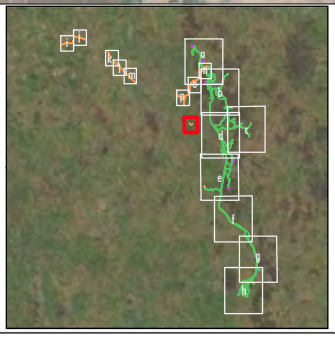


FIGURE 3.2.q

Location Map Landscape Features

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; NSW LPI (2020); Rye Park Renewable Energy Pty Ltd (2020)

3.2 Native Vegetation within the Indicative Development Footprints

3.2.1 Plant Community Types and Vegetation Zones

Surveys of the Indicative Development Footprints identified four PCTs across ten condition classes being (refer to **Figure 3.3**):

- PCT 289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion
    - Moderate to Good
- PCT 335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion
    - Moderate to Good
- PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
    - Moderate to Good
    - Derived Native Grassland
- PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
    - Moderate to Good
    - Derived Native Grassland
    - Acacia Shrubland
    - Sifton Bush Shrubland
    - Argyle Apple Forest
    - Non-native Vegetation

A summary of the extent of each of the vegetation zones recorded within the Development Corridors, Indicative Development Footprints is provided with a comparison against the previous vegetation mapping (NGH Environmental 2016a) in **Table 3.2**.

A description of each vegetation zones is provided below and flora and fauna species lists are included in **Appendix C**.

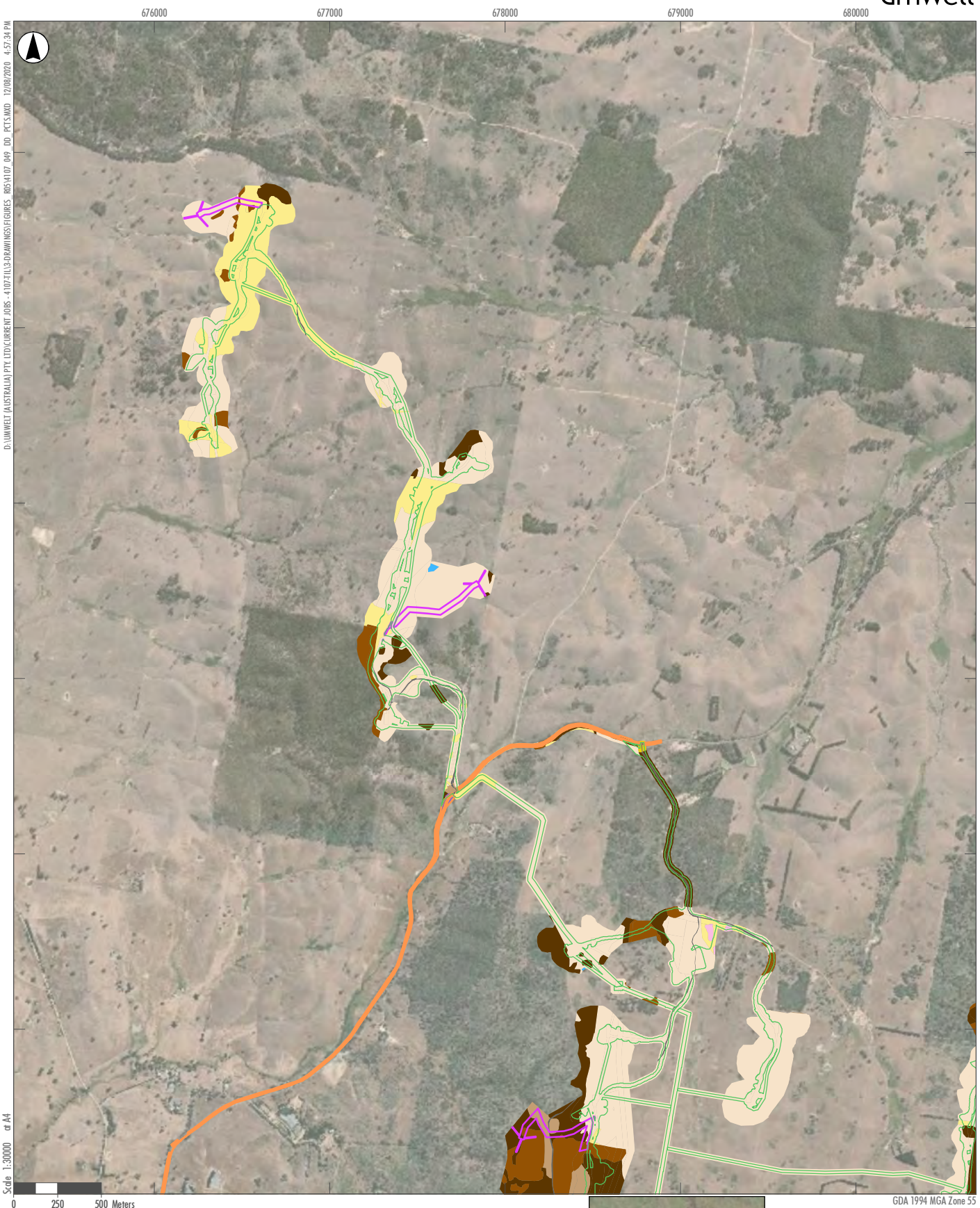
Table 3.2 Summary of Vegetation Zones in Development Corridors and Indicative Development Footprints

Current PCT and Condition	Previous Vegetation Mapping[1]	Area in Development Corridor – Wind Farm (ha)	Area in Development Corridor – Permanent Met Masts (ha)	Total Area in Development Corridors (ha)	Area in Indicative Development Footprint – Wind Farm (ha)	Area in Indicative Development Footprint – Permanent Met Masts (ha)	Area in Indicative Development Footprint – External Road (ha)	Total Area in Indicative Development Footprints (ha)
289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	-	0.05	0	**0.05**	0.05	0	0.73	**0.78**
335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good Condition*	-	14.58	0	**14.58**	5.50	0	0	**5.50**
350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Moderate to Good Condition*	24.9	36.33	0	**36.33**	18.75	0	1.33	**20.08**

Current PCT and Condition	Previous Vegetation Mapping[1]	Area in Development Corridor – Wind Farm (ha)	Area in Development Corridor – Permanent Met Masts (ha)	Total Area in Development Corridors (ha)	Area in Indicative Development Footprint – Wind Farm (ha)	Area in Indicative Development Footprint – Permanent Met Masts (ha)	Area in Indicative Development Footprint – External Road (ha)	Total Area in Indicative Development Footprints (ha)
350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Derived Native Grassland*	25.3	32.71	0	**32.71**	16.85	0	0.67	**17.52**
351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Moderate Good Condition*	87.7	217.26	12.40	**229.66**	83.59	0.47	0.75	**84.81**
351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Derived Native Grassland*	71.6	449.75	17.93	**467.68**	169.08	4.76	0.15	**173.99**
351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Acacia Shrubland*	1.3	21.99	6.68	**28.67**	7.25	1.25	0.03	**8.53**

Current PCT and Condition	Previous Vegetation Mapping[1]	Area in Development Corridor – Wind Farm (ha)	Area in Development Corridor – Permanent Met Masts (ha)	Total Area in Development Corridors (ha)	Area in Indicative Development Footprint – Wind Farm (ha)	Area in Indicative Development Footprint – Permanent Met Masts (ha)	Area in Indicative Development Footprint – External Road (ha)	Total Area in Indicative Development Footprints (ha)
351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Sifton Bush Shrubland*	29.6	249.13	9.94	**259.07**	82.80	1.12	0.26	**84.18**
351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Argyle Apple Forest*	0.4	3.79	0	**3.79**	0.61	0	0.01	**0.62**
Non-native Vegetation	15.8	229.71	4.07	**233.78**	90.23	1.35	13.60	**105.18**
Nil (incl. roads, tracks and waterbodies)	-	20.27	0.96	**21.23**	14.26	0.22	1.24	**15.72**
Totals	**256.8**	**1,275.57**	**51.98**	**1,327.55**	**488.97**	**9.17**	**18.77**	**516.91**

[1] Biodiversity Assessment Addendum (NGH Environmental 2016a)



Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

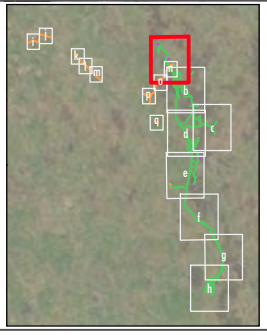
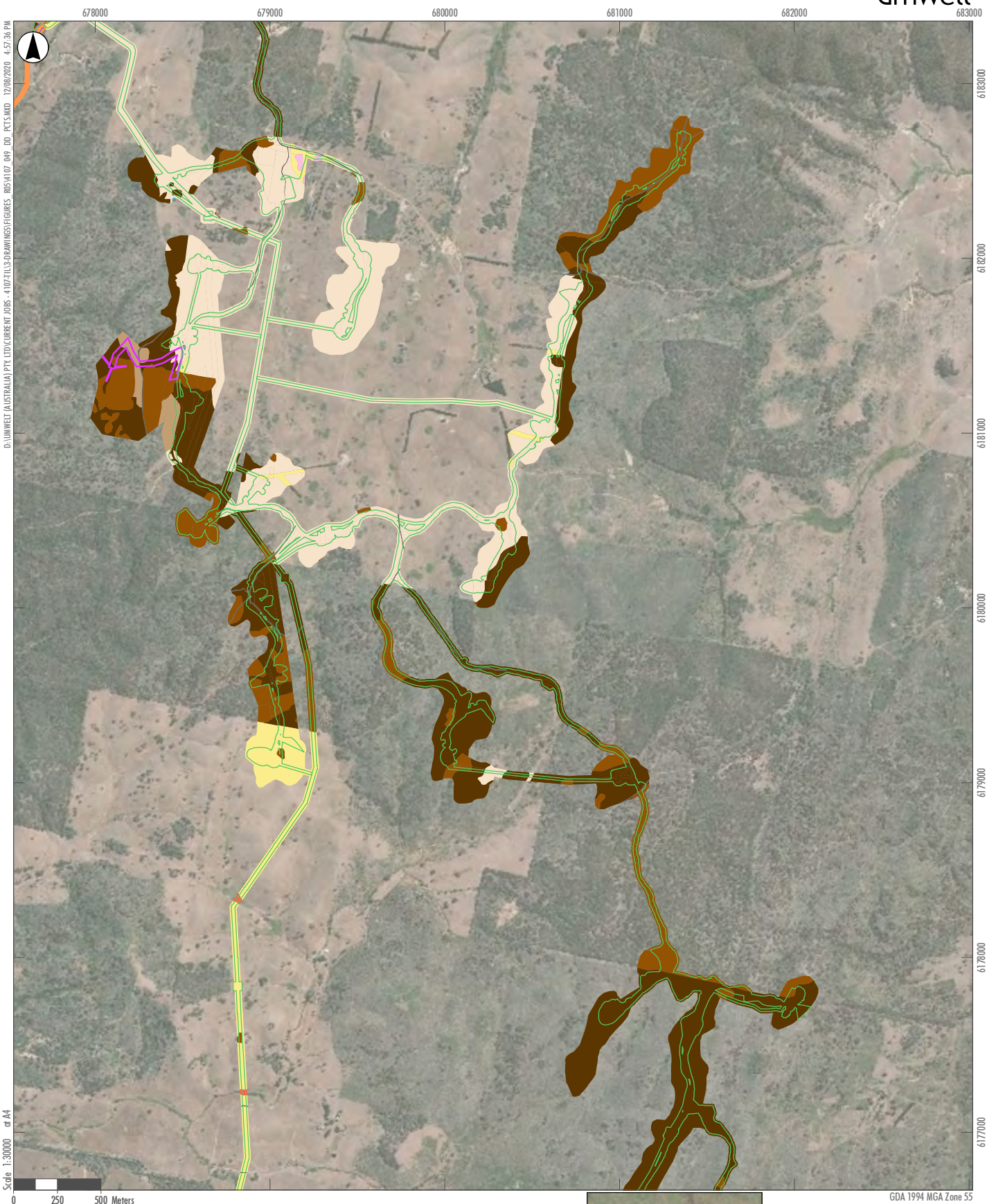


FIGURE 3.3.a

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

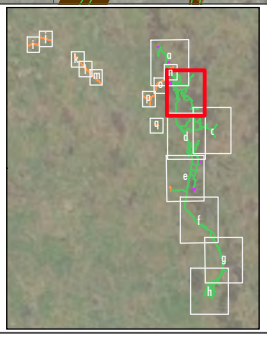
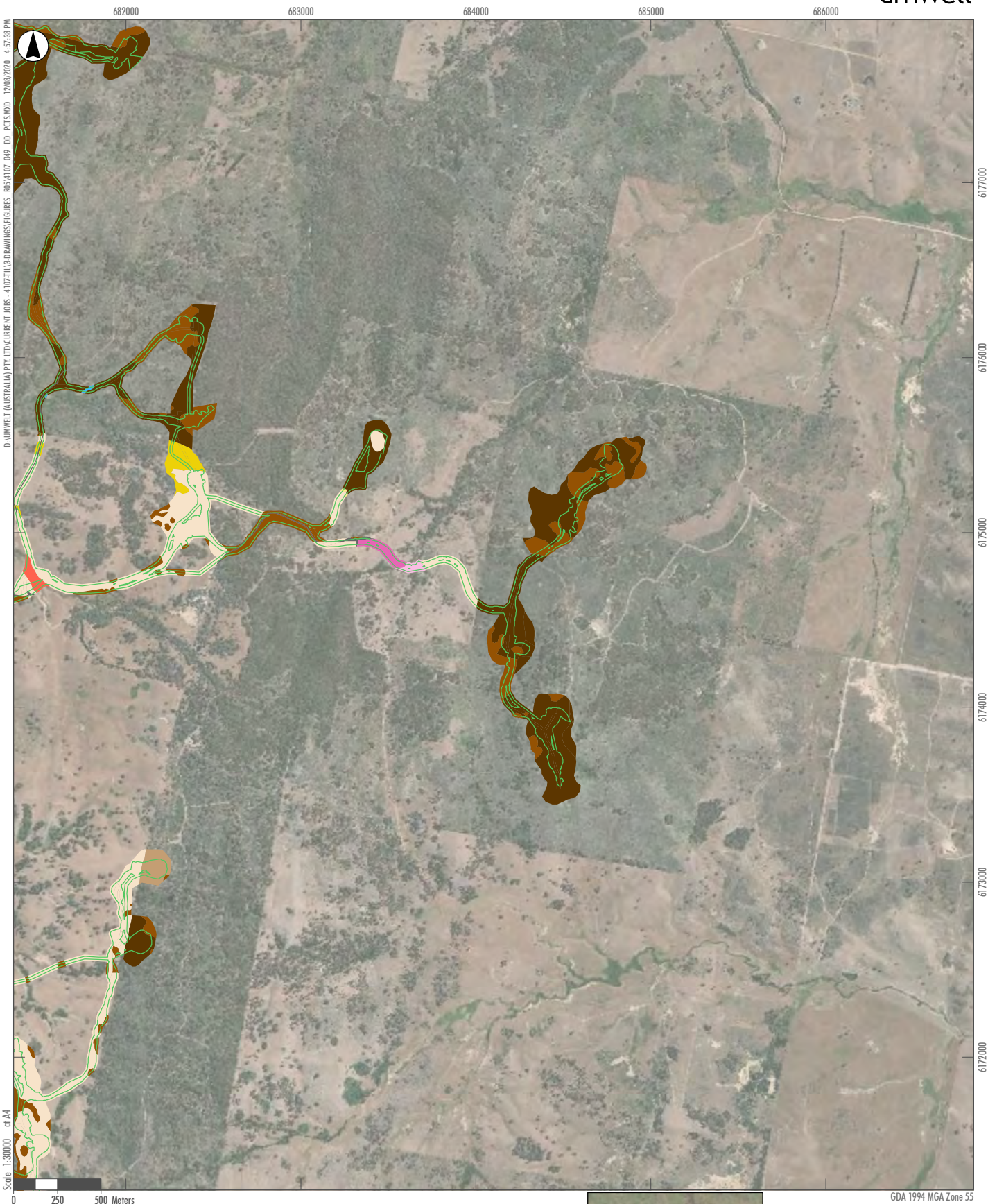


FIGURE 3.3.b

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Wind Farm

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

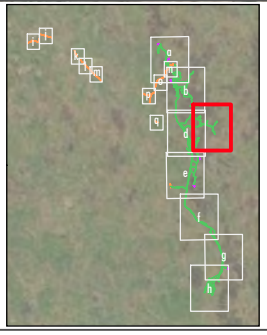


FIGURE 3.3.c

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

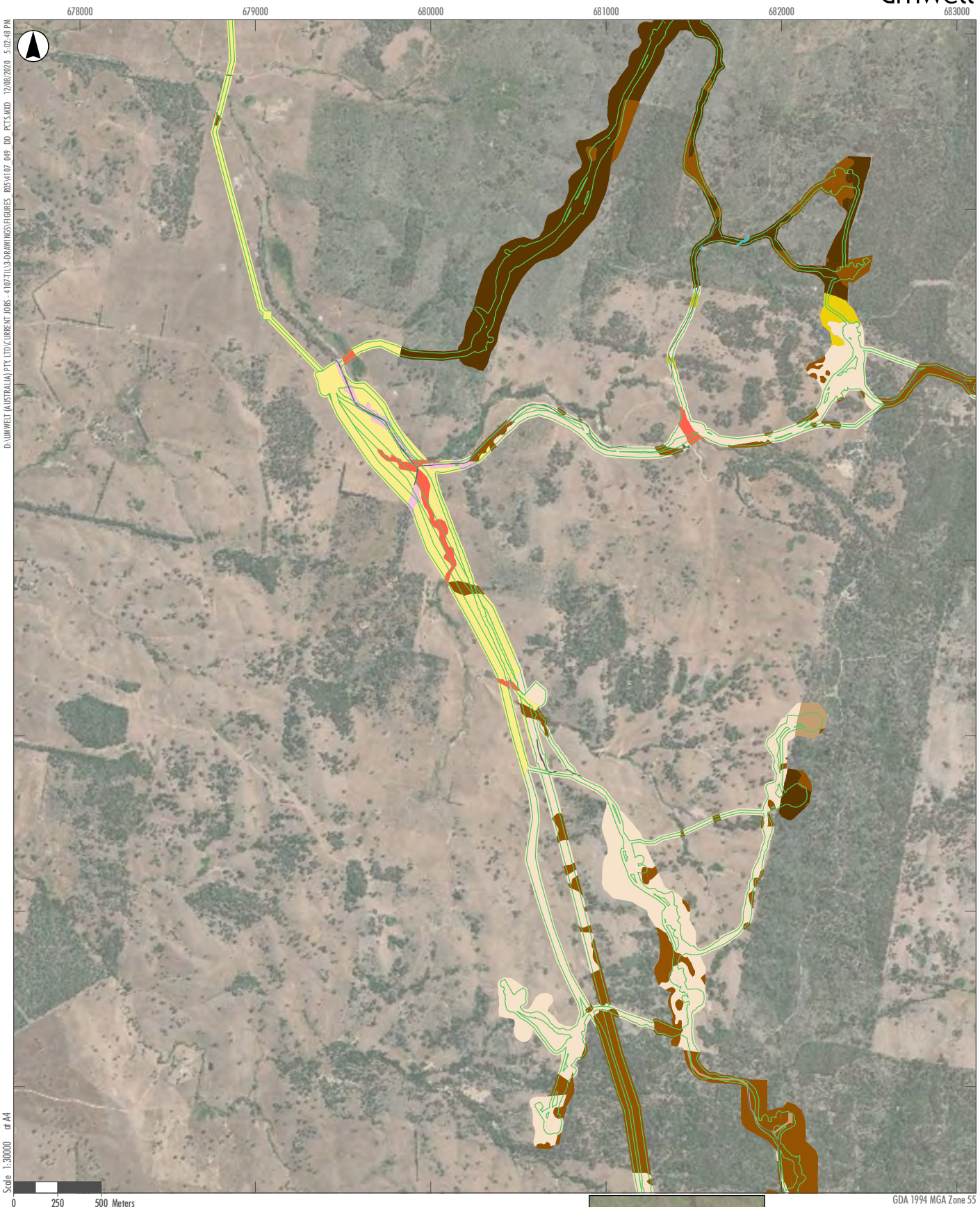


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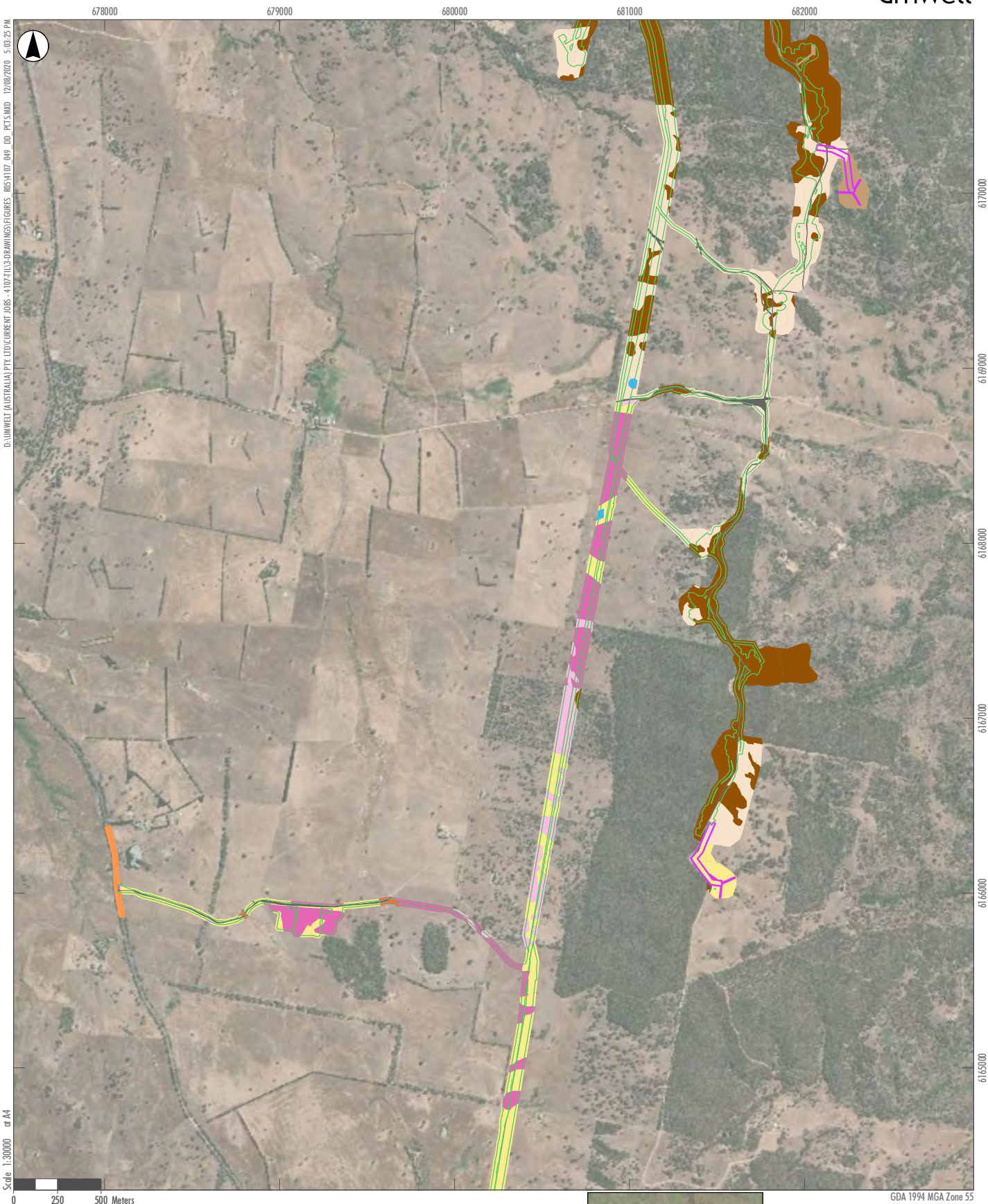
FIGURE 3.3.d

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

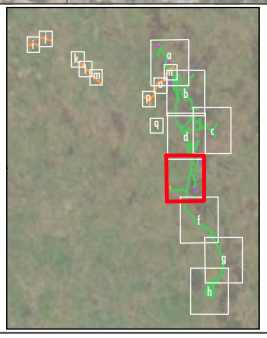


FIGURE 3.3.e

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - Wind Farm

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

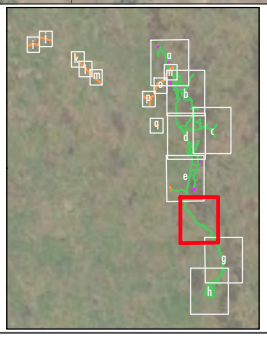


FIGURE 3.3.f

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

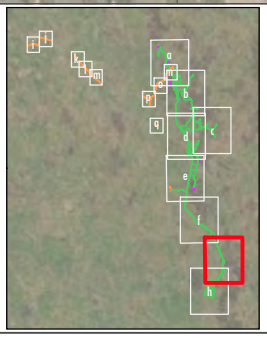
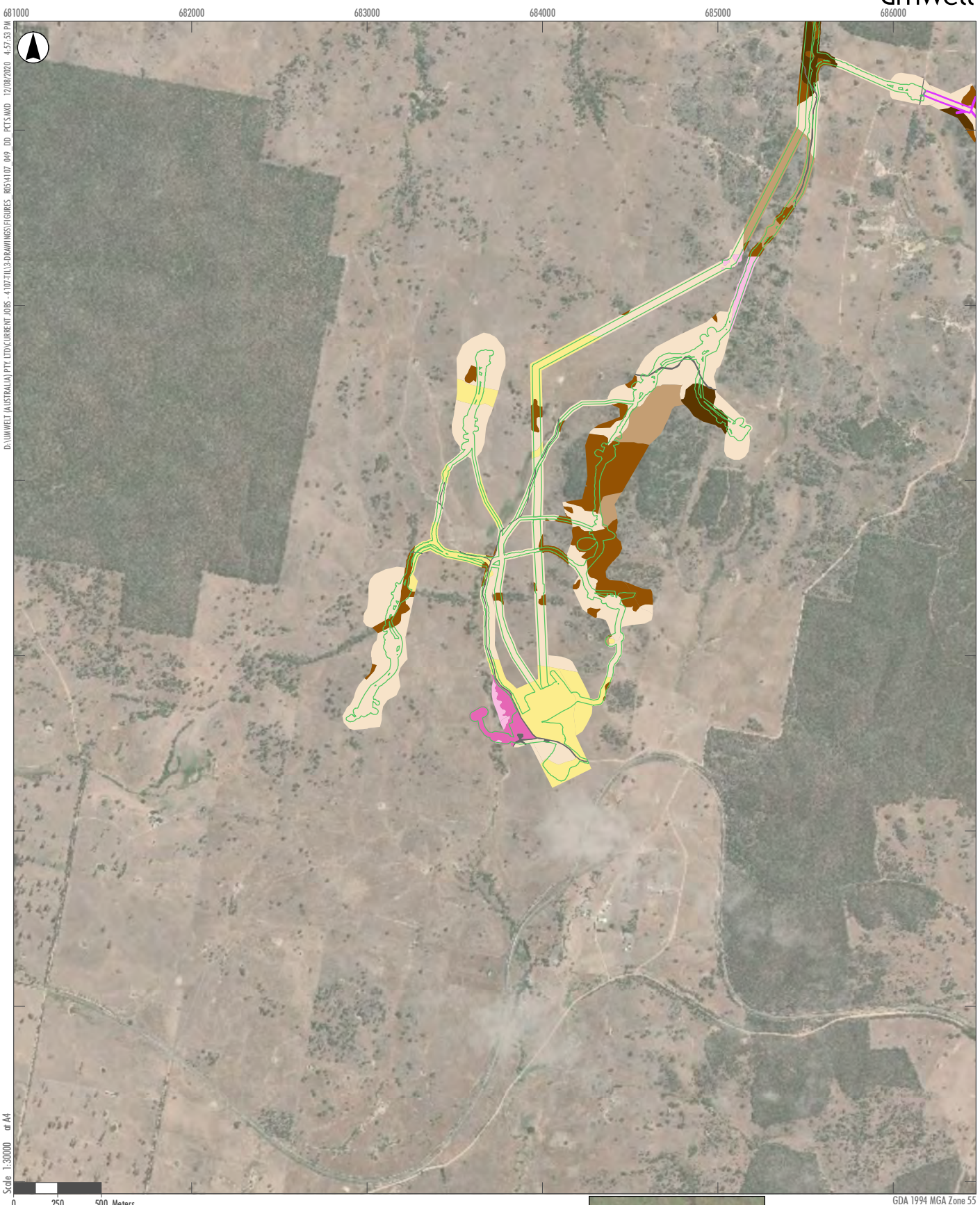


FIGURE 3.3.g

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

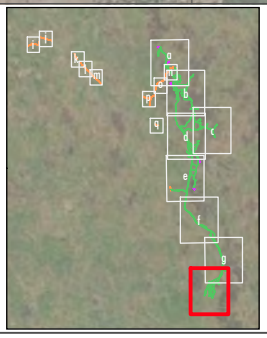


FIGURE 3.3.h

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

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Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

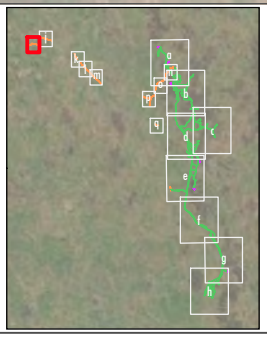


FIGURE 3.3.i

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

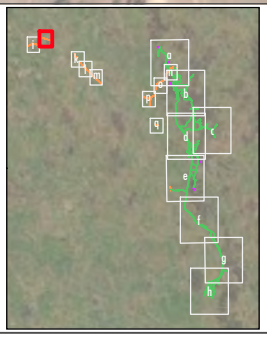


FIGURE 3.3.j

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

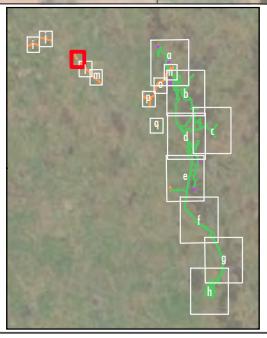


FIGURE 3.3.k

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

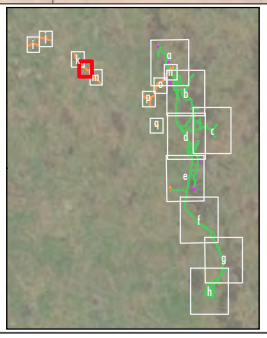


FIGURE 3.3.I

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

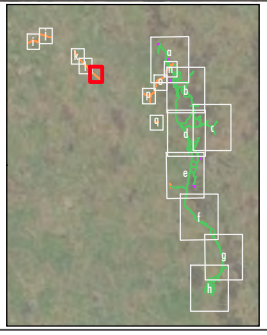


FIGURE 3.3.m

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

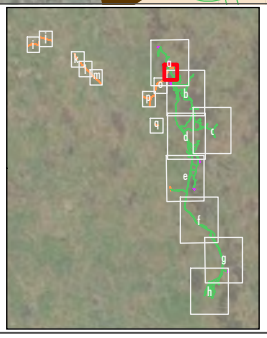


FIGURE 3.3.n

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

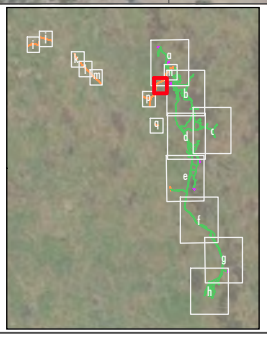


FIGURE 3.3.o

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

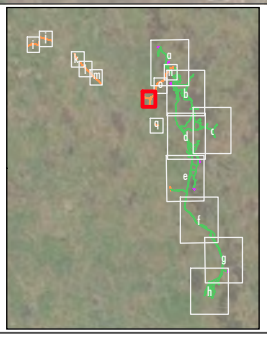


FIGURE 3.3.p

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads

PCT, Condition in the Rye Park Wind Farm

- Zone 1 - PCT289 - Moderate to Good
- Zone 2 - PCT335 - Moderate to Good
- Zone 3 - PCT350 - Moderate to Good
- Zone 4 - PCT350 - Moderate to Good - DNG
- Zone 5 - PCT351 - Moderate to Good
- Zone 6 - PCT351 - Moderate to Good - DNG
- Zone 7 - PCT351 - Moderate to Good - Acacia Shrubland
- Zone 8 - PCT351 - Moderate to Good - Sifton Bush Shrubland
- Zone 9 - PCT351 - Moderate to Good - Argyle Apple Forest
- Zone 10 -Non-native Vegetation
- Access Tracks/Roads
- Water Body

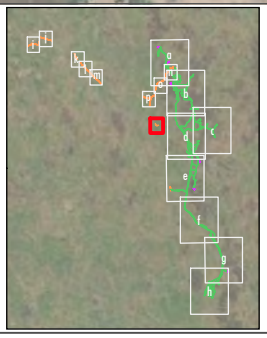


FIGURE 3.3.q

Plant Community Types and Vegetation Zones in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Zone 1 – PCT289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion – Moderate to Good

PCT Name	Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion	
Condition	**Moderate to Good**	
Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)	
Class	Upper Riverina Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	0.78	
Patch Size Class (ha)	101	
General Description	A shrubby open forest recorded within the Indicative Development Footprint – External Roads, specifically within the road reserves along Grassy Creek Road (refer to **Figure 3.3**).	
Canopy Description	An intact open canopy (40 - 50 per cent) of several species of eucalypts, dominated by bundy (*Eucalyptus goniocalyx*), red stringybark (*Eucalyptus macrorhyncha*) and mugga ironbark (*Eucalyptus sideroxylon*). The native mistletoe, *Amyema miquelii*, is also common throughout and contributes to the canopy cover.	
Mid-storey Description	A sparse (20 per cent) mid-storey of emerging canopy species as well as several native shrubs, including early wattle (*Acacia genistifolia*), sifton bush (*Cassinia arcuata*), Parramatta wattle (*Acacia parramattensis*) and *Pultenaea* sp.	
Ground Cover Description	This community supported a mid-dense groundcover of native grasses, sub-shrubs and rushes. Common native grasses included purple wiregrass (*Aristida ramosa*), ringed wallaby grass (*Rytidosperma caespitosum*), redanther wallaby grass (*Rytidosperma pallidum*) and hairy panic (*Panicum effusum*). Other native species characteristic in this stratum included wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), false sarsaparilla (*Hardenbergia violacea*) and *Hovea heterophylla*. Introduced species were also common, including quaking grass (*Briza maxima*) and perennial ryegrass (*Lolium perenne*).	
PCT Allocation	Vegetation Zone 1 was aligned with PCT 289 as it supports nine (19.6 per cent) species of the total 46 species identified as characteristic for the PCT as listed on the VIS Classification Database (BCD 2020c). These nine species make up 47.3 per cent of the total species recorded for Vegetation Zone 1. PCT 289 was determined to be the best overall fit in terms of diagnostic species and the community's location in the landscape.	
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.	
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.	

Zone 2 – PCT 335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion – Moderate to Good

PCT Name	Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion	
Condition	**Moderate to Good**	
Formation	Freshwater Wetlands	
Class	Inland Floodplain Swamps	
Percent cleared	83.00	
Area in Indicative Development Footprints (ha)	5.50	
Patch Size Class (ha)	101	
General Description	This vegetation zone was restricted to watercourses (incl. drainage lines, ephemeral creeks etc) in low lying areas of the Indicative Development Footprints (refer to **Figure 3.3**). All patches of this vegetation zone have been exposed to historical and ongoing grazing (predominantly sheep grazing) and other agricultural pressures. In the absence of fencing, the biodiversity value of this vegetation has been substantially reduced. Species diversity and cover of native species was reduced, while these measures are increased for weed species. Native species diversity was as low as four species in one plot.	
Canopy Description	No canopy layer was present in this vegetation zone.	
Mid-storey Description	No mid-storey layer was present in this vegetation zone.	
Ground Cover Description	The dense groundcover was generally under 1.5 m in height, and was dominated by tall sedge (*Carex appressa*), austral rush (*Juncus australis*), common couch (*Cynodon dactylon*) and *Juncus* sp., with scattered occurrences of tussock grass (*Poa labillardierei* var. *labillardierei*). Exotic species co-dominate this vegetation zone, common species being prairie grass (*Bromus catharticus*), phalaris (*Phalaris aquatica*), spear thistle (*Cirsium vulgare*), catsear (*Hypochaeris radicata*), wild oats (*Avena fatua*) and squirrel tail fescue (*Vulpia bromoides*).	
PCT Allocation	Vegetation Zone 2 was aligned with PCT 335 as it supports a number of the species and stratum specifics identified for the PCT as listed on the VIS Classification Database (BCD 2020c). The ground stratum is dominated by tall sedge (*Carex appressa*), a key diagnostic species of PCT 335, and contains 18% of the species listed on the VIS Classification Database (BCD 2020c). PCT 335 was determined to be the best overall fit in terms of diagnostic species and the community's location in the landscape.	
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.	
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.	

Zone 3 – PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion – Moderate to Good

PCT Name	PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	
Condition	**Moderate to Good**	
Formation	Grassy Woodlands	
Class	Southern Tableland Grassy Woodlands	
Percent cleared	87.00	
Area in Indicative Development Footprints (ha)	20.08	
Patch Size Class (ha)	101	
General Description	Occurred on the fertile soils of the valley floors and lower slopes of the Indicative Development Footprints (refer to **Figure 3.3**). Primarily the patches of remnant woodland were restricted to along or in proximity to road reserves and watercourses (incl. drainage lines, ephemeral creeks etc). All patches of this vegetation zone have been exposed to historical and ongoing grazing (predominantly sheep grazing) and other agricultural pressures. Although the degree to which the patches have been disturbed varies across the site, none of them persist unaffected by such disturbances. Native species diversity and cover are the main characteristics affected.	
Canopy Description	The sparse to mid-dense canopy generally ranged between 8 m and 18 m in height, with emergent trees reaching up to 23 m. It was dominated by yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*). Box mistletoe (*Amyema miquelii*) occurred within mature individuals of these species. There was one location where river red gum (*Eucalyptus camaldulensis*) and apple box (*Eucalyptus bridgesiana*) were also recorded within the canopy. While it wasn't recorded in any plots, several rapid vegetation assessments recorded candlebark (*Eucalyptus rubida* subsp. *rubida*), and although this species occurred in Vegetation Zone, it was not considered to be a characteristic species.	
Mid-storey Description	The mid-storey was generally absent or sparse and, where it occurred, ranged between 0.5 m and 3 m in height. Dominant species included silver tea-tree (*Leptospermum multicaule*), silver wattle (*Acacia dealbata*), black wattle (*Acacia mearnsii*), hoary guinea flower (*Hibbertia obtusifolia*), eggs and bacon (*Dillwynia sericea*), gorse bitter pea (*Daviesia ulicifolia*) and urn heath (*Melichrus urceolatus*). Mid-dense areas of regenerating canopy species, yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*), also occurred in this zone.	

PCT Name	PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Condition	Moderate to Good
Ground Cover Description	The mid-dense to dense groundcover comprised of a range of rushes, sedges and native grasses. Common species include wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), woodrush (*Luzula densiflora*), spiny-headed mat-rush (*Lomandra longifolia*), stinking pennywort (*Hydrocotyle laxiflora*) and tall sedge (*Carex appressa*). Dominant native grasses included weeping grass (*Microlaena stipoides* var. *stipoides*), purple wiregrass (*Aristida ramosa*), threeawn speargrass (*Aristida vagans*), hairy panic (*Panicum effusum*), rough speargrass (*Austrostipa scabra* subsp. falcata), mountain wallaby grass (*Rytidosperma monticola*), wallaby grass (*Rytidosperma* sp.), tussock grass (*Poa labillardierei* var. *labillardierei*) and short wallaby grass (*Rytidosperma carphoides*). Common weeds included catsear (*Hypochaeris radicata*), sheep sorrel (*Acetosella vulgaris*), rat's tail fescue (*Vulpia myuros*), spear thistle (*Cirsium vulgare*), sea barley grass (*Hordeum marinum*), squirrel tail fesque (*Vulpia bromoides*), scarlet pimpernel (*Anagallis arvensis*), great brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*) and perennial ryegrass (*Lolium perenne*).
PCT Allocation	Vegetation Zone 3 was aligned with PCT 350 as it supports a number of the species and stratum specifics identified for the PCT as listed on the VIS Classification Database (BCD 2020c). Its canopy is dominated by yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*), while silver wattle (*Acacia dealbata*) and hoary guinea flower (*Hibbertia obtusifolia*) dominate the shrub layer within the middle stratum. All of these are key diagnostic species of PCT 350. Careful analysis of Vegetation Zone 3 against the similarly described PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion. Both PCTs had detailed descriptions of upper, mid and ground strata within the VIS Classification Database (BCD 2020c). Analysis of plot data (Vegetation Zones 3 and 4) found that it had a higher proportion of species characteristic of PCT 350 (52.6 per cent) compared to PCT 277 (46.2 per cent). Furthermore, those recorded characteristic species comprised a higher proportion of all species recorded within the remnant (Vegetation Zone 3) and derived form (Vegetation Zone 4) of this vegetation for PCT 350 (24 per cent) compared with PCT 277 (14.4 per cent). This analysis concluded that PCT 350 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
BC Act Status	Many patches of this vegetation zone are consistent with the *White Box Yellow Box Blakely's Red Gum Grassy Woodland* and Derived Native Grassland CEEC. Refer to **Section 3.2.3.1** for further information and see **Figure 3.4** for locality.
EPBC Act Status	Many patches of this vegetation zone are consistent with the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC. Refer to **Section 3.2.3.2** for further information and see **Figure 3.4** for locality.

Zone 4 – PCT 350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion – Derived Native Grassland

PCT Name	Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion	
Condition	**Derived Native Grassland**	
Formation	Grassy Woodlands	
Class	Southern Tableland Grassy Woodlands	
Percent cleared	87.00	
Area in Indicative Development Footprints (ha)	17.52	
Patch Size Class (ha)	101	
General Description	Occurred on the fertile soils of the valley floors and lower slopes of the Indicative Development Footprints (refer to **Figure 3.2**). Primarily the patches of derived native grasslands occurred where the land rises out of the watercourses (incl. drainage lines, ephemeral creeks etc). This vegetation zone has all but been removed from the road reserves, other than very restricted patches towards Boorowa, NSW. All patches of this vegetation zone have been exposed to historical and ongoing grazing (predominantly sheep grazing) and other agricultural pressures. Although the degree to which the patches have been disturbed varies across the site, none of them persist unaffected by such disturbances. Native species diversity and cover were the main characteristics affected.	
Canopy Description	No intact canopy layer was present in this vegetation zone, however scattered yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*) do occur.	
Mid-storey Description	No mid-storey layer was present in this vegetation zone.	
Ground Cover Description	The mid-dense (40 to 70 per cent) groundcover was generally very low in height as a result of intensive grazing pressures. Common species included native grasses kangaroo grass (*Themeda australis*), purple wiregrass (*Aristida ramosa*), red grass (*Bothriochloa macra*), weeping grass (*Microlaena stipoides* var. *stipoides*), short wallaby grass (*Rytidosperma carphoides*), rough speargrass (*Austrostipa scabra* subsp. *falcata*), Queensland bluegrass (*Dichanthium sericeum*) and wallaby grass (*Rytidosperma* sp.). Sporadic occurrences of young shrub species included ploughshare wattle (*Acacia gunnii*) and silver wattle (*Acacia dealbata*). Numerous weed species were common throughout the vegetation zone and even become co-dominant in some locations. Dominant species included sheep sorrel (*Acetosella vulgaris*), *Romulea rosea*, common centaury (*Centaurium erythraea*), soft brome (*Bromus molliformis*), smooth catsear (*Hypochaeris glabra*), paspalum (*Paspalum dilatatum*), phalaris (*Phalaris aquatica*), sea barley grass (*Hordeum marinum*), squirrel tail fescue (*Vulpia bromoides*) and lamb's tongue (*Plantago lanceolata*).	

PCT Name	Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion
Condition	**Derived Native Grassland**
PCT Allocation	Vegetation Zone 4 was aligned with PCT 350 based on its position in the landscape, consistency in species composition and proximity to the remnant woodland form of the PCT (Vegetation Zone 3).
BC Act Status	Many patches of this vegetation zone are consistent with the *White Box Yellow Box Blakely's Red Gum Grassy Woodland* and Derived Native Grassland CEEC. Refer to **Section 3.2.3.1** for further information and see **Figure 3.4** for locality.
EPBC Act Status	Many patches of this vegetation zone are consistent with the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEEC. Refer to **Section 3.2.3.2** for further information and see **Figure 3.4** for locality.

Zone 5 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – Moderate to Good

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	
Condition	**Moderate to Good**	
Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Class	Southern Tableland Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	84.81	
Patch Size Class (ha)	101	
General Description	This was the dominant remnant vegetation zone within the Indicative Development Footprints. Occurring as an open forest on the shallow (and at times skeletal) soils of mid to upper slopes of the entire ridgeline across the Project (refer to **Figure 3.3**). In the absence of fencing, the impacts from grazing and agricultural pressures were substantially less compared with PCT 350, as stock appeared to only use these patches for intermittent shelter rather than permanent shelter or for foraging purposes. However, across the Indicative Development Footprints this PCT has been exposed to varying degrees of historical clearing, resulting in a number of condition classes being mapped across the Project (Vegetation Zones 5 to 9).	
Canopy Description	The mid-dense canopy generally ranged between 10 m and 18 m in height. It was dominated by inland scribbly gum (*Eucalyptus rossii*), red stringybark (*Eucalyptus macrorhyncha*), brittle gum (*Eucalyptus mannifera*) and bundy (*Eucalyptus goniocalyx*). Box mistletoe (*Amyema miquelii*) occurred in the canopy throughout the Vegetation Zone, at times in large numbers but generally scattered. Other species included apple box (*Eucalyptus bridgesiana*), broad-leaved peppermint (*Eucalyptus dives*) and red box (*Eucalyptus polyanthemos*).	
Mid-storey Description	The mid-storey was generally sparse or absent, and ranged between 1 and 6 metres in height. It was dominated by regenerating canopy eucalypts, interspersed with shrub species including silver tea-tree (*Leptospermum multicaule*), Parramatta wattle (*Acacia parramattensis*) and daphne heath (*Brachyloma daphnoides*).	

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Condition	Moderate to Good
Ground Cover Description	The mid-dense groundcover was comprised predominately of native grasses. Dominant species included speargrass (*Austrostipa scabra*), redanther wallaby grass *(Rytidosperma pallidum*), mountain wallaby grass (*Rytidosperma monticola*) and short wallaby grass (*Rytidosperma carphoides*), with occurrences of purple wiregrass (*Aristida ramosa*) and snowgrass (*Poa sieberiana*). Rushes, sub-shrubs and heaths also occur in this stratum, with common species including wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), blueberry lily (*Dianella revoluta*), false sarsaparilla (*Hardenbergia violacea*), parrot-pea (*Dillwynia phylicoides*), ivy goodenia (*Goodenia hederacea* subsp. *hederacea*), hoary guinea flower (*Hibbertia obtusifolia*), urn heath (*Melichrus urceolatus*), *Monotoca scoparia* and *Hovea heterophylla*. Weed species occurred scattered throughout but are generally low in diversity and cover. Common species included red brome (*Bromus rubens*), perennial rye grass (*Lolium perenne*) and soft brome (*Bromus molliformis*), sheep sorrel (*Acetosella vulgaris*) and catsear (*Hypochaeris radicata*).
PCT Allocation	Vegetation Zone 5 was aligned with PCT 351 as it supports a number of the species and stratum specifics identified for the PCT as listed on the VIS Classification Database (BCD 2020c). Its canopy is dominated by brittle gum (*Eucalyptus mannifera*), red stringybark (*Eucalyptus macrorhyncha*) and bundy (*Eucalyptus goniocalyx*), and contains six of the seven key diagnostic canopy species listed in for PCT 351. Careful analysis of Vegetation Zone 5 was undertaken against the similarly aligned PCT 353, Inland Scribbly Gum - Red Stringybark - box - Daviesia latifolia - snow grass open forest on sandy loam soils from acid volcanics in the Boorowa - Young region of the NSW South Western Slopes Bioregion. Analysis of plot data (Vegetation Zones 5 and 6) found that it had a higher proportion of species characteristic of PCT 351 (54.7 per cent) compared to PCT 353 (42.1 per cent). Furthermore, those recorded characteristic species comprised a higher proportion of all species recorded within the remnant (Vegetation Zone 5) and derived form (Vegetation Zone 6) of this vegetation for PCT 351 (28.7 per cent) compared with PCT 353 (7.9 per cent). The analysis found that PCT 351 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.

Zone 6 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – Derived Native Grassland

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	
Condition	**Derived Native Grassland**	
Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Class	Southern Tableland Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	173.99	
Patch Size Class (ha)	101	
General Description	This Vegetation Zone occurred where historical clearing occurred but ongoing active land management, predominantly grazing, has largely prevented mid-storey and ground stratum species from recolonising. It predominantly occurs on the mid to upper slopes and ridgelines throughout the Indicative Development Footprints (refer to **Figure 3.3**).	
Canopy Description	No canopy layer was present in this vegetation zone, however scattered canopy trees did occur throughout the Vegetation Zone.	
Mid-storey Description	No intact mid-storey layer was present in this Vegetation Zone, however Parramatta wattle (*Acacia parramattensis*) shrubs were observed scattered throughout.	
Ground Cover Description	The mid-dense to dense groundcover was less than 1 metre in height and was comprised predominately of native grasses, interspersed with sub-shrubs, sedges and rushes. Common native grasses present included rough speargrass (*Austrostipa scabra* subsp. *falcata*), short wallaby grass (*Rytidosperma carphoides*), Queensland bluegrass (*Dichanthium sericeum*), mountain wallaby grass (*Rytidosperma monticola*), weeping grass (*Microlaena stipoides* var. *stipoides*), purple wiregrass (*Aristida ramosa*), redanther wallaby grass (*Rytidosperma pallidum*), windmill grass (*Chloris truncata*) and a barley grass (*Hordeum* sp.). Other species present in this stratum included early wattle (*Acacia genistifolia*), hoary guinea flower (*Hibbertia obtusifolia*), wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), a sedge (*Juncus* sp.), pennyroyal (*Mentha satureioides*) and *Oxalis perennans*. Weed species were common throughout this Vegetation Zone, dominant species included subterranean clover (*Trifolium subterraneum*), sheep sorrel (*Acetosella vulgaris*), wild oats (*Avena fatua*), catsear (*Hypochaeris radicata*), smooth catsear (*Hypochaeris glabra*), lamb's tongue (*Plantago lanceolata*), proliferous pink (*Petrorhagia nanteuilii*), squirrel tail fescue (*Vulpia bromoides*), silvery hairgrass (*Aira cupaniana*), *Oxalis perennans*, paspalum (*Paspalum dilatatum*) and a barley grass (*Hordeum* sp.).	

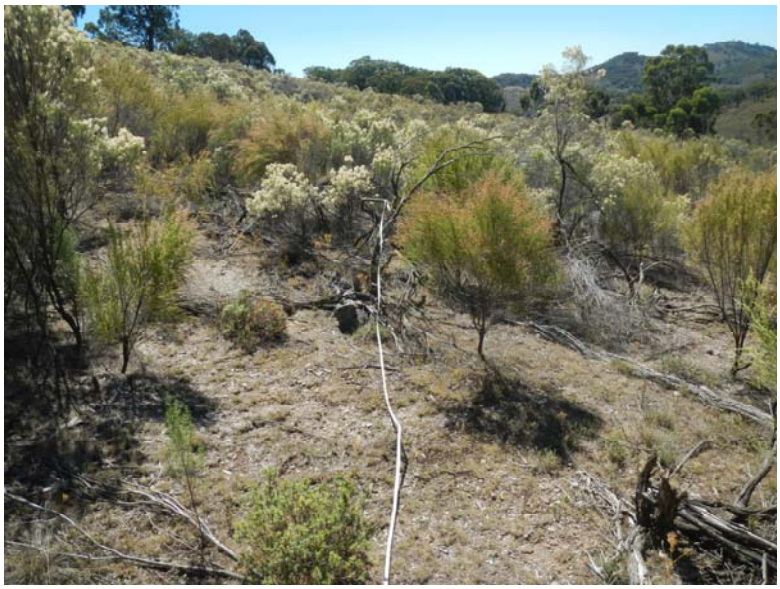
PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Condition	Derived Native Grassland
PCT Allocation	Vegetation Zone 6 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.

Zone 7 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – Acacia shrubland

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	
Condition	**Acacia Shrubland**	
Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Class	Southern Tableland Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	8.53	
Patch Size Class (ha)	101	
General Description	This Vegetation Zone represented the eldest patches of PCT 351 since clearing disturbances (**Figure 3.3**). While no intact canopy strata occurred, remnant canopy trees occur sporadically throughout the Vegetation Zone. The Vegetation Zone was characterised by a mid-storey that was generally med-dense, but did open up in some locations.	
Canopy Description	No canopy layer was present in this vegetation zone, however inland scribbly gum (*Eucalyptus rossii*) was observed as scattered remnant trees.	
Mid-storey Description	The mid-dense mid-storey ranged between 1.5 and 7 metres in height. Dominant species included Parramatta wattle (*Acacia parramattensis*), silver wattle (*Acacia dealbata*) and cough bush (*Cassinia laevis*). A sparse shrub layer was also present, ranging between 0.3 and 1.5 metres in height. Dominant species included silver tea-tree (*Leptospermum multicaule*) and hoary guinea flower (*Hibbertia obtusifolia*), with occurrences of sifton bush (*Cassinia arcuata*), urn heath (*Melichrus urceolatus*) and daphne heath (*Brachyloma daphnoides*).	
Ground Cover Description	The mid-dense to dense groundcover was generally under 0.3 metres in height and is comprised predominately of native grasses. Dominant species included weeping grass (*Microlaena stipoides* var. *stipoides*), mountain wallaby grass (*Rytidosperma monticola*), speargrass (*Austrostipa scabra*), wallaby grass (*Rytidosperma fulva*), short wallaby grass (*Rytidosperma carphoides*) and brown-back wallaby grass (*Rytidosperma duttoniana*), with occurrences of purple wiregrass (*Aristida ramosa*) and snowgrass (*Poa sieberiana*). Other common native species included wattle matt-rush (*Lomandra filiformis* subsp. *coriacea*), poverty raspwort (*Gonocarpus tetragynus*). The cover of weed species was generally low to moderate, common species included silvery hairgrass (*Aira caryophyllea*), catsear (*Hypochaeris radicata*) and silvery hairgrass (*Aira cupaniana*).	

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Condition	Acacia Shrubland
PCT Allocation	Vegetation Zone 7 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.

Zone 8 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – Sifton Bush Shrubland

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	
Condition	**Sifton Bush Shrubland**	
Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Class	Southern Tableland Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	84.18	
Patch Size Class (ha)	101	
General Description	This Vegetation Zone occurred where historical clearing has occurred and in the absence of ongoing active land management, sifton bush (*Cassinia arcuata*) has recolonised to a point where it is structurally dominant. It predominantly occurred on the upper slopes and ridgelines throughout the Indicative Development Footprints (refer to **Figure 3.3**).	
Canopy Description	No canopy layer was present in this vegetation zone.	
Mid-storey Description	The mid-dense to dense mid-storey ranged between 1 and 4 metres in height. The stratum was dominated by sifton bush (*Cassinia arcuata*), with occurrences of dolly bush (*Cassinia aculeata*), cough bush (*Cassinia laevis*), silver wattle (*Acacia dealbata*) and white dogwood (*Ozothamnus diosmifolius*).	
Ground Cover Description	The Vegetation Zone generally supported a sparse groundcover, a likely result from the density of the mid-storey stratum. A range of sub-shrubs, rushes, heaths, ferns and native grasses were recorded throughout. Dominant species included wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), urn heath (*Melichrus urceolatus*), hoary guinea flower (*Hibbertia obtusifolia*), rock fern (*Cheilanthes sieberi*) and rough speargrass (*Austrostipa scabra* subsp. *scabra*), mountain wallaby grass (*Rytidosperma monticola*), purple wiregrass (*Aristida ramosa*), wallaby grass (*Rytidosperma fulva*) and small-flowered wallaby grass (*Rytidosperma setacea*). While weed species are common throughout the Vegetation Zone, they are generally low in cover. Common species included catsear (*Hypochaeris radicata*), sheep sorrel (*Acetosella vulgaris*), spear thistle (*Cirsium vulgare*), St. John's wort (*Hypericum perforatum*), common centaury (*Centaurium erythraea*), silvery grass (*Aira cupaniana*).	
PCT Allocation	Vegetation Zone 8 was aligned with PCT 351 based on its position in the landscape, consistency in species composition and proximity to the remnant forest form of the PCT (Vegetation Zone 5).	
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.	
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.	

Zone 9 – PCT 351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion – Argyle Apple Variant

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion	
Condition	**Argyle Apple Variant**	
Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Class	Southern Tableland Dry Sclerophyll Forests	
Percent cleared	60.00	
Area in Indicative Development Footprints (ha)	0.62	
Patch Size Class (ha)	101	
General Description	This Vegetation Zone occurred as discrete patches within the Indicative Development Footprints (**Figure 3.3**). The Vegetation Zone is associated with minor gullies and other positions of the landscape which capture cool air.	
Canopy Description	The sparse canopy ranges reached up to 25 metres in height and was dominated by argyle apple (*Eucalyptus cinerea*), bundy (*Eucalyptus goniocalyx*), broad-leaved peppermint (*Eucalyptus dives*) and yellow box (*Eucalyptus melliodora*). Mistletoe (*Amyema* sp.) occurred within mature individuals of these species.	
Mid-storey Description	No mid-storey layer was present in this vegetation zone.	
Ground Cover Description	The mid-dense groundcover was generally under 1 metre in height, and was dominated by redanther wallaby grass (*Rytidosperma pallidum*) and snowgrass (*Poa sieberiana*). Other species in this stratum included wattle mat-rush (*Lomandra filiformis* subsp. *coriacea*), urn heath (*Melichrus urceolatus*), eggs and bacon (*Dillwynia sericea*) and hoary guinea flower (*Hibbertia obtusifolia*).	

PCT Name	Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion
Condition	Argyle Apple Variant
PCT Allocation	Vegetation Zone 9 was determined to have the best overall fit with PCT 351, despite the canopy characteristics of this Vegetation Zone being seemingly different (dominance of argyle apple [*Eucalyptus cinerea*]) when compared to the remnant Vegetation Zone 5 of PCT 351. Careful analysis of this Vegetation Zone was undertaken against PCT 653 Apple Box - Yellow Box - Argyle Apple dry open forest of the South Eastern Highlands Bioregion and NSW South Western Slopes Bioregion. However it was determined that the overall composition of the upper, mid and ground stratum species for Vegetation Zone 5 more closely aligned with PCT 351. Analysis of plot data for Vegetation Zone 9 found that it had a higher proportion of species characteristic of PCT 653 (41.7 per cent) compared to PCT 351 (34 per cent). However, those recorded characteristic species comprised a substantially higher proportion of all species recorded within Vegetation Zone 9 for PCT 351 (50 per cent) compared with PCT 653 (13.9 per cent). Furthermore, PCT 653 is described to occur on clay loams in broad river flats or moist alluvial fans which is not consistent with Vegetation Zone 9. The analysis found that PCT 351 was the best overall fit in terms of diagnostic species and the community's location in the landscape.
BC Act Status	This vegetation zone is not consistent with any TEC listed under the BC Act.
EPBC Act Status	This vegetation zone is not consistent with any TEC listed under the EPBC Act.

3.2.2 Non-native Vegetation

The Indicative Development Footprints contained a range of non-native vegetation types, including roads, tracks and waterbodies. A total of 105.18 hectares of this mapping unit was identified within the Indicative Development Footprints.

Broad grassland areas have been extensively cleared of native flora species through the intensive and historic agricultural land use previously discussed in **Section 1.1.1**. These agricultural grasslands predominantly support exotic grasses and herbs (refer to **Plate 3.1**). The most abundant exotic grass species present include squirrel tail fescue (*Vulpia bromoides*), soft brome (*Bromus hordeaceus*), silvery hairgrass (*Aira cupaniana*), prairie grass (*Bromus catharticus*), red brome (*Bromus rubens*) and paspalum (*Paspalum dilatatum*), which dominate the native vegetation in some areas. Subterranean clover (*Trifolium subterraneum*), sheep sorrel (*Acetosella vulgaris*), catsear (*Hypochaeris radicata*) and yellow suckling clover (*Trifolium dubium*) are also abundant in areas. Other areas of non-native vegetation comprise planted windrows and shelter belts of non-native cypress trees.

The introduced grass species, Chilean needle-grass (*Nassella neesiana*), has not been recorded by Umwelt on any of the extensive surveys completed. This is important to note given this species provides suitable habitat for the golden sun moth.

A total of seven BAM Vegetation Integrity Plots were undertaken in the Non-native Vegetation. All BAM Vegetation Integrity Plots were run together within the online BAM Credit Calculator (BAMCC), they have a Vegetation Integrity score of 14.0 for the South West Slopes BAMCC and 11.9 for the South East Highlands BAMCC. Both of which are below the offsetting threshold of 17 (where it is associated with ecosystem-credit habitat or a VEC).

Ten weeds present in the Development Corridors are classed as High Threat Weed species under the BAM, and are identified in the flora species list in **Appendix C**.

Plate 3.1 Non-native Vegetation in the Indicative Development Footprint – Wind Farm

3.2.3 Threatened Ecological Communities

Two threatened ecological communities were recorded within the Indicative Development Footprints, being:

- White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (EPBC Act).

It is noted that in relation to the BC Act listed CEEC above, a Final Determination was made on 17 July 2020 update the conservation status of this TEC from its previous status of EEC to CEEC. At the time of the BDAR that was placed on public exhibition, there was a Preliminary Determination to change the listing status of this TEC to Critically Endangered in NSW.

Analysis of consistency with the scientific determinations for these TECs were undertaken, with consideration of the advice provided by the NSW Threatened Species Scientific Committee and/or the Commonwealth Threatened Species Scientific Committee guidelines for interpreting listings for species, populations and ecological communities under the BC Act and EPBC Act respectively. Detailed analysis of the vegetation zones with respect to the NSW Threatened Species Scientific Committee and/or the Commonwealth Threatened Species Scientific Committee determinations is provided below. Specifically, only Vegetation Zones 3 and 4 were assessed against the TECs described above as the remaining Vegetation Zones do not have the potential to align with these or alternative TECs.

3.2.3.1 White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act

White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as a CEEC under the BC Act. At the time of the BDAR being placed on exhibition originally, this community was known as White Box Yellow Box Blakely's Red Gum Woodland and was listed as an EEC under the BC Act.

The Final Determination to update the conservation status of this TEC from EEC to CEEC only occurred on 17 July 2020. Due to time constraints in relation to the response to submissions phase, Umwelt has not had the opportunity to analyse the data captured for Vegetation Zones 3 and 4 for the Project against the updated Final Determination for the CEEC (BC Act). As the original assessment of these vegetation zones against the Final Determination for the original EEC resulted in almost all of their mapped extents aligning with the EEC, it is not anticipated that the updated conservation status will affect the extent of the newly finalised CEEC (BC Act) within the Project.

The NSW Threatened Species Scientific Committee updated the community to CEEC (BC Act) which is in keeping with the Commonwealth listing (**Section 3.2.3.2**). This is part of reassessments being undertaken using the Common Assessment Method (CAM), whereby all jurisdictions in Australia are seeking to list entities consistently. In addition to a new Final Determination for the CEEC (BC Act), there is also a detailed report by explaining the conservation assessment for the CAM.

In summary, the analysis presented below has been completed against the Final Determination for the original EEC community (NSW Scientific Committee 2002), however we have used the outcomes of this analysis to align the vegetation with the newly listed White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC.

The community is known to occur from the Queensland border in the north, to the Victorian border in the south. It occurs in the tablelands and western slopes of NSW and is characterised by the presence or prior

occurrence of white box (*Eucalyptus albens*), yellow box (*Eucalyptus melliodora*) and/or Blakely's red gum (*Eucalyptus blakelyi*).

A comprehensive analysis of Vegetation Zones 3 and 4 was undertaken to determine if it conforms to the original EEC Final Determination (NSW Scientific Committee 2002). Therefore, the Constituent Species, Assemblage of Species, Particular Area and Supplementary Descriptors sections below refer to an analysis using the Final Determination for the original EEC (NSW Scientific Committee 2002). However the Summary section following these considers the outcome of the analysis against the updated CEEC.

Constituent Species

The species recorded within Vegetation Zones 3 and 4 in the Indicative Development Footprints comprise species, and/or taxa below species rank, as required by the Act.

This included the current or previous presence of canopy species, yellow box (*Eucalyptus melliodora*) and Blakely's red gum (*Eucalyptus blakelyi*).

Assemblage of Species

Due to the broad geographic range of this EEC, the NSW Scientific Committee (2002) lists 95 species as characterising the assemblage of species for *White Box Yellow Box Blakely's Red Gum Woodland* EEC. As part of ecological investigations for the proposal, 12 BAM Vegetation Integrity Plots (7 in Vegetation Zone 3 and five in Vegetation Zone 4) were sampled in *White Box Yellow Box Blakely's Red Gum Woodland EEC* across the Indicative Development Footprints.

Within the Indicative Development Footprints, either yellow box (*Eucalyptus melliodora*) or Blakely's red gum (*Eucalyptus blakelyi*) was recorded in all BAM Vegetation Integrity Plots for Vegetation Zone 3 or nearby for the Vegetation Zone 4. On average, Vegetation Zone 3 supported 23.2 per cent species identified as characteristic of the TEC, this included a maximum of 30.8 per cent and minimum of 13 per cent.

For Vegetation Zone 4, an average of 22.5 per cent of species recorded were characteristic of the TEC, this included a maximum of 33.3 per cent and minimum of 16 per cent.

Particular Area

In relation to the particular area of the *White Box Yellow Box Blakely's Red Gum Woodland* EEC, the NSW Scientific Committee (2002) states that the community occurs within the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and NSW South Western Slopes Bioregions.

The area in which this community occurs within the Indicative Development Footprints is situated within the NSW South Western Slopes Bioregion and South Eastern Highlands (refer to **Section 1.2.2**).

Supplementary Descriptors

In relation to supplementary descriptors, the NSW Scientific Committee (2002) includes the following key information pertaining to the *White Box Yellow Box Blakely's Red Gum Woodland EEC*:

- *occurs on relatively fertile soils, generally between 400 and 800 millimetre isohyets, and at an altitude of circa 170 metres to circa 1200 metres*
- *the shrub layer is generally sparse or absent, though it may be locally common, and*

- *condition states may range from relatively good to highly degraded, such as paddock remnants with a weedy understorey and only a few hardy natives left. The tree layer may be absent as a result of past clearing or thinning.*

Of the above supplementary descriptors, the *White Box Yellow Box Blakely's Red Gum Woodland EEC* present in the Indicative Development Footprints occurs on relatively fertile soil. This community was recorded at altitudes of approximately between 550 metres and 750 metres above sea level. The shrub layer is generally absent to sparse, and while some of this may have been as a result of past clearing and grazing management, shrubs were most likely always sparse. While the overstorey is relatively intact in the woodland components and absent in the derived native grasslands forms, the understorey has also been substantially modified and degraded as a result of the past clearing and grazing management. While some native grasses and herbs persist, the diversity is substantially reduced which is heightened for Vegetation Zone 4 compared with Vegetation Zone 3. Floristic analysis of the relevant Vegetation Zones is provided below in **Table 3.3**.

Table 3.3 Floristic Analysis of *White Box Yellow Box Blakely's Red Gum Woodland EEC*

BAM Vegetation Integrity Plot ID	Total EEC Spp.	Native Plot Spp. (exotic spp.)	No. of EEC Spp. in Plot	% of EEC Spp. in Plot	% of total EEC Spp.	Assessment
Vegetation Zone 3 (PCT350-Moderate/Good)						
Q1	95	28 (7)	8	22.9	8.4	Proportion of TEC species recorded is considered reasonable.
Q06	95	8 (6)	4	28.6	4.2	Proportion of TEC species recorded is considered reasonable.
Q15	95	12 (1)	3	23.1	3.2	Proportion of TEC species recorded is considered reasonable.
Q31	95	16 (5)	4	19.0	4.2	Proportion of TEC species recorded is considered low.
Q43	95	15 (5)	5	25.0	5.3	Proportion of TEC species recorded is considered reasonable.
DMRP1	95	19 (4)	3	13.0	3.2	Proportion of TEC species recorded is considered low.
P03	95	6 (7)	4	30.8	4.2	Proportion of TEC species recorded is considered reasonable.
Average	**NA**	**14.9 (5)**	**4.4**	**23.2**	**4.7**	

BAM Vegetation Integrity Plot ID	Total EEC Spp.	Native Plot Spp. (exotic spp.)	No. of EEC Spp. in Plot	% of EEC Spp. in Plot	% of total EEC Spp.	Assessment
Vegetation Zone 4 (PCT350-DNG)						
Q11	95	15 (10)	4	16.0	4.2	Proportion of TEC species recorded is considered low.
Q32	95	8 (10)	3	16.7	3.2	Proportion of TEC species recorded is considered low.
DMRP3	95	22 (3)	5	20.0	5.3	Proportion of TEC species recorded is considered reasonable.
4107_JAN_02	95	15 (15)	8	26.7	8.4	Proportion of TEC species recorded is considered reasonable.
4107_Feb_03	95	5 (4)	3	33.3	3.2	Proportion of TEC species recorded is considered reasonable.
Average	**na**	**13 (8.4)**	**4.6**	**22.5**	**4.8**	

Summary

Based on the detailed assessment described above, both Vegetation Zones 3 and 4 were found to conform with previous *White Box Yellow Box Blakely's Red Gum Woodland EEC* listed under the BC Act. Both Vegetation Zones were identified as conforming with the four components of the TEC, being Constituent Species, Assemblage of Species, Particular Area and Supplementary Descriptors.

As described above, the conservation status of this community was updated to White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act on 17 July 2020. We have therefore assumed that the outcomes of this analysis is consistent with the new TEC.

The Indicative Development Footprints therefore support a total of 37.50 hectares of White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act within Vegetation Zones 3 (20.08 hectares) and 4 (17.42 hectares) (see **Figure 3.4**). Impacts to the CEEC under the BC Act is less (**12.70 hectares**) than the impact threshold of 50.2 hectares for this TEC as identified in Consent Condition 19(a) of the existing State Approval. While the Project does impact on the CEEC, it has successfully avoided 12.70 hectares of the CEEC threshold. As noted in **Section 1.1.2.1** reference to the EEC was made prior to the determination of the CEEC.

Approximately 69.04 hectares of White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the BC Act was identified within the wider Development Corridors. Therefore, 31.54 hectares of the CEEC in the Development Corridors has been avoided by the Project and considerable amounts of the CEEC occur beyond the Development Corridors in the local region. As described in **Section 4.0**, RPRE has made a number of changes to their detailed design to avoid and minimise impacts to this CEEC.

3.2.3.2 White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as a CEEC under the EPBC Act. This community occurs in and along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of white box, yellow box or Blakely's red gum trees.

A comprehensive analysis of this vegetation community was undertaken to determine if it conformed to Listing Advice provided by the Department of the Environment under the EPBC Act (TSSC 2006).

Particular Area

In relation to the particular area of the *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC*, the TSSC (2006) states that the community occurs within the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions.

The area in which this community occurs within the Indicative Development Footprints is situated within the NSW South Western Slopes and South Eastern Highlands Bioregion (refer to **Section 1.1.1**).

Additional Criteria

Detailed assessment of the vegetation communities described and mapped within the Indicative Development Footprints was undertaken to determine whether the vegetation present met the condition class thresholds identified in the Listing Advice (TSSC 2006). These thresholds have been incorporated into an identification flowchart for the CEEC within the EPBC Act Policy Statement (DEH 2006) for the community which was also utilised during the assessment.

- **Is, or was previously, at least one of the most common overstorey species white box, yellow box or Blakely's red gum?**

Vegetation Zones 3 and 4 identified in the Indicative Development Footprints and assessed against the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC criteria have, or were found to previously have had, either yellow box (*Eucalyptus melliodora*) or Blakely's red gum (*Eucalyptus blakelyi*) as one of the dominant overstorey species.

- **Does the patch have predominantly native understorey?**

A majority of patches of Vegetation Zone 3 and 4 identified in the Indicative Development Footprints were assessed as having a predominantly native understorey, despite these patches having been heavily grazed and pasture improved or at least impacted by adjacent pasture improvement.

- **Is the patch 0.1 hectare or greater in size?**

Due to the restricted nature of the Indicative Development Footprints, a majority of patches strictly within the Development Footprint were smaller than the required 0.1 hectare size. A process was undertaken to identify which patches extended outside the bounds of the Development Footprint and therefore met the area patch requirements of the EPBC Act community. This process utilised the wider mapping of Vegetation Zones in the Development Corridor. Only patches of Vegetation Zones 3 and 4 found to be at least 0.1 hectares in size were considered further in the TEC analysis.

- **Are there 12 or more native understorey species present (excluding grasses), of which at least one is deemed an important species.**

The majority of patches of Vegetation Zone 3 and 4 identified in the Indicative Development Footprints were found to support more than 12 native understorey species (excluding grasses), including a deemed important species. In the absence of meeting this level of diversity and composition, a patch must be at least 2 hectares in size AND support an average of 20 or more mature trees per hectare OR have natural regeneration of the dominant canopy species. Analysis of the relevant Vegetation Zones against these measures is provided below in **Table 3.4**.

Table 3.4 Floristic analysis of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC

BAM Vegetation Integrity Plot ID	Total CEEC Spp.	Native Plot Spp. (exotic spp.)	No. of CEEC Spp. in Plot	% of CEEC Spp. in Plot	% of total CEEC Spp.	12 Native Understorey Spp. (ex. Grasses)	Important Spp.	Is the patch size at least 2 hectares?	Are there at least 20 mature trees per hectare or natural regeneration of canopy species?	Assessment
Vegetation Zone 3 (PCT350-Moderate/Good)										
Q1	473	28 (7)	19	54.3	4.0	Yes	Yes	N/A	N/A	Conforming - Proportion of TEC species recorded is considered reasonable.
Q06	473	8 (6)	6	42.9	1.3	No	No	Yes	Yes	Conforming – based on being a larger patch and supporting mature trees.
Q15	473	12 (1)	7	53.8	1.5	No	Yes	Yes	Yes	Conforming – based on being a larger patch and supporting mature trees.
Q31	473	16 (5)	10	47.6	2.1	No	Yes	No	Yes	Conforming – based on being a larger patch and supporting mature trees.
Q43	473	15 (5)	10	50.0	2.1	No	Yes	Yes	Yes	Conforming – based on being a larger patch and supporting mature trees.
DMRP1	473	19 (4)	11	47.8	2.3	No	Yes	Yes	Yes	Conforming – based on being a larger patch and supporting mature trees.

BAM Vegetation Integrity Plot ID	Total CEEC Spp.	Native Plot Spp. (exotic spp.)	No. of CEEC Spp. in Plot	% of CEEC Spp. in Plot	% of total CEEC Spp.	12 Native Understorey Spp. (ex. Grasses)	Important Spp.	Is the patch size at least 2 hectares?	Are there at least 20 mature trees per hectare or natural regeneration of canopy species?	Assessment
P03	473	6 (7)	6	46.2	1.3	No	Yes	Yes	Yes	Conforming – based on being a larger patch and supporting mature trees.
Average	**NA**	**14.9 (5)**	**9.9**	**48.9**	**2.1**	**14.3**	**85.7**			
Vegetation Zone 4 (PCT350-DNG)										
Q11	473	15 (10)	10	40.0	2.1	No	Yes	Yes	Yes	Conforming - based on being a larger patch (incl. adjoining woodland) and supporting mature trees or regenerating canopy trees.
Q32	473	8 (10)	5	27.8	1.1	No	Yes	Yes	Yes	Conforming - Proportion of TEC species recorded is considered reasonable.
DMRP3	473	22 (3)	18	72.0	3.8	Yes	Yes	N/A	N/A	Conforming - based on being a larger patch (incl. adjoining woodland) and supporting mature trees or regenerating canopy trees.

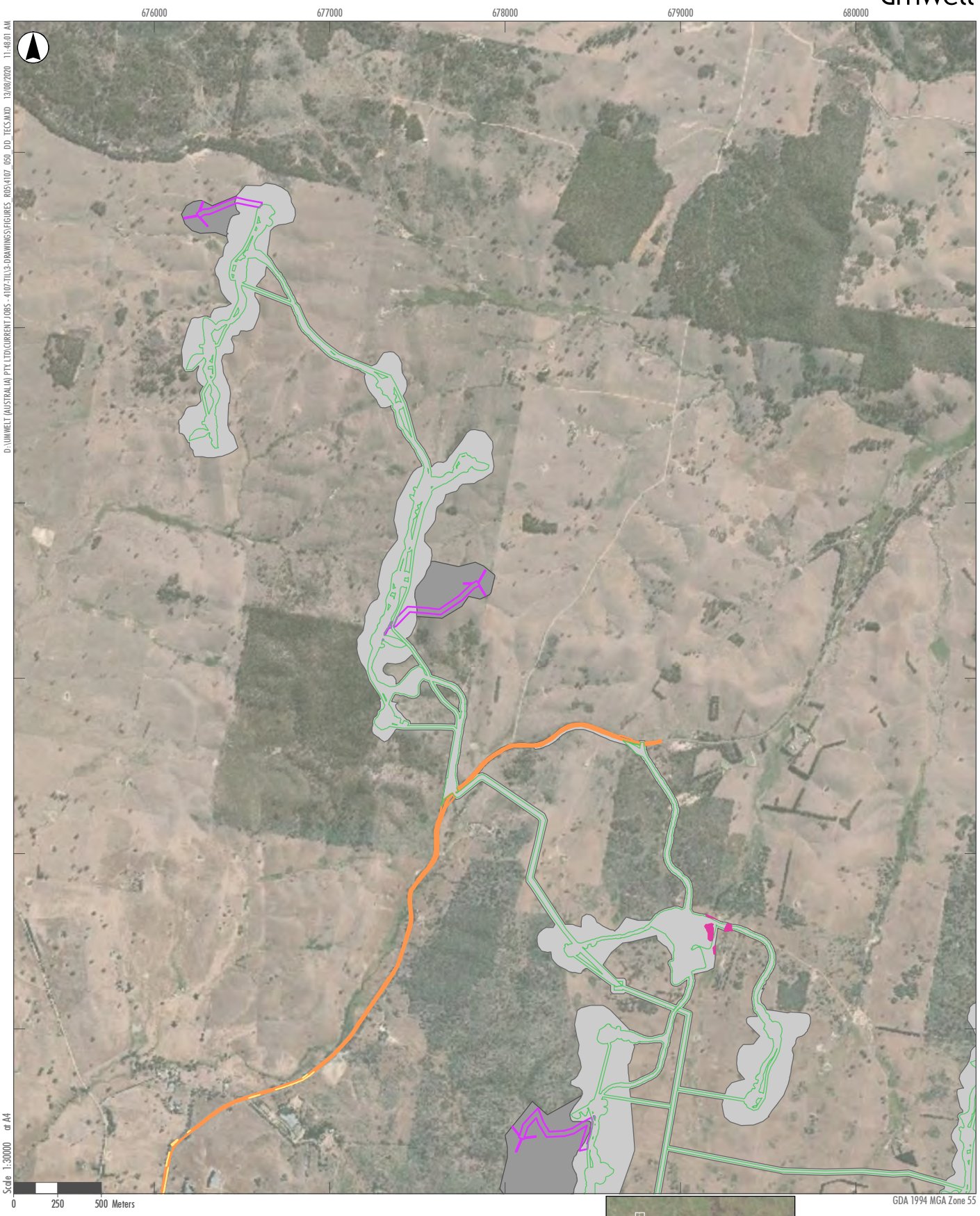
BAM Vegetation Integrity Plot ID	Total CEEC Spp.	Native Plot Spp. (exotic spp.)	No. of CEEC Spp. in Plot	% of CEEC Spp. in Plot	% of total CEEC Spp.	12 Native Understorey Spp. (ex. Grasses)	Important Spp.	Is the patch size at least 2 hectares?	Are there at least 20 mature trees per hectare or natural regeneration of canopy species?	Assessment
4107_JAN_02	473	15 (15)	11	36.7	2.3	No	Yes	Yes	Yes	Conforming - based on being a larger patch (incl. adjoining woodland) and supporting mature trees or regenerating canopy trees.
4107_Feb_03	473	5 (4)	4	44.4	0.8	No	No	Yes	Yes	Conforming - although less than 12 species were recorded, this plot was completed in extremely dry conditions. Therefore, Umwelt have assumed it would meet this requirement in better conditions.

Summary

Based on the detailed assessment described above, both Vegetation Zones 3 and 4 conform with *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* under the EPBC Act. Both Vegetation Zones were identified as conforming with the multiple components of the TEC, being a combination of particular area, condition and size of patch, assemblage of species, density of mature trees and/or presence of natural canopy regeneration.

The Indicative Development Footprints is considered to support 35.73 hectares of *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* within Vegetation Zones 3 (19.38 hectares) and 4 (16.35 hectares). See **Figure 3.4**. Impacts to the CEEC under the EPBC Act is 26.23 hectares more than the impact threshold of 9.5 hectares for this TEC as identified in Condition 3 of the existing Federal Approval (EPBC 2014/7163).

It is noted that 67.64 hectares of *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC* under the EPBC Act was identified within the Development Corridors. Therefore, 31.91 hectares of the CEEC has been avoided by the Project and will persist within the wider Development Corridors, and considerable amounts of the CEEC occur beyond the Development Corridors in the local region.



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

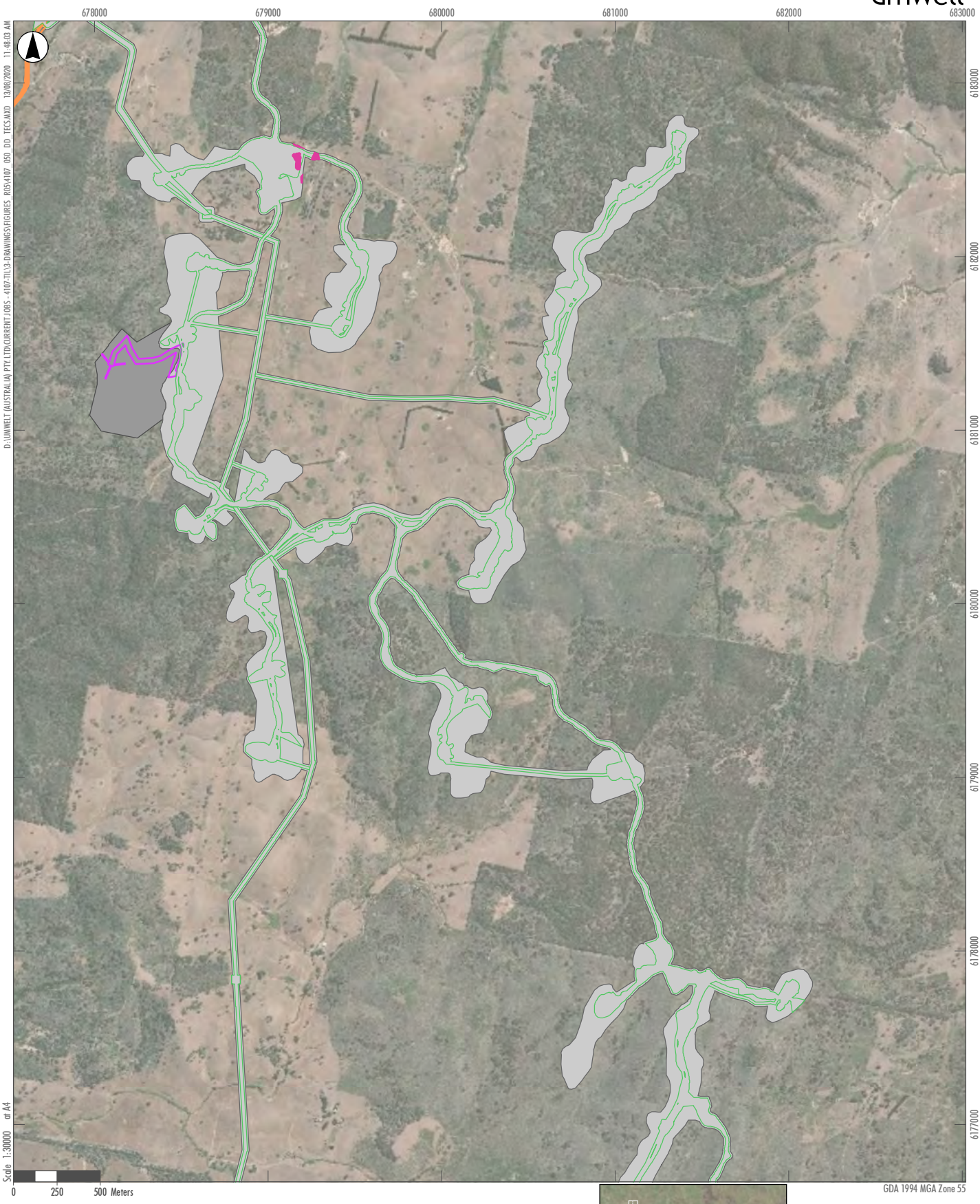
Threatened Ecological Communities (BC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

FIGURE 3.4.a

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

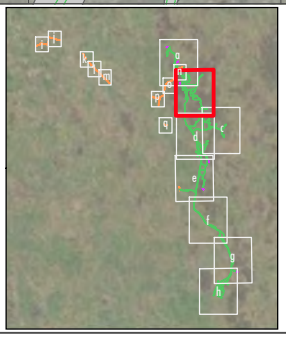


FIGURE 3.4.b

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Development Corridor - Wind Farm

Indicative Development Footprint - Wind Farm

Threatened Ecological Communities (BC Act & EPBC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

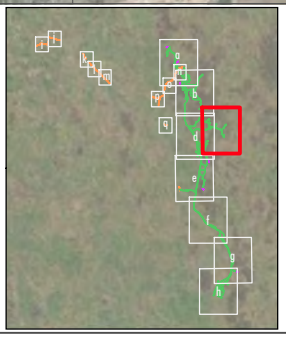
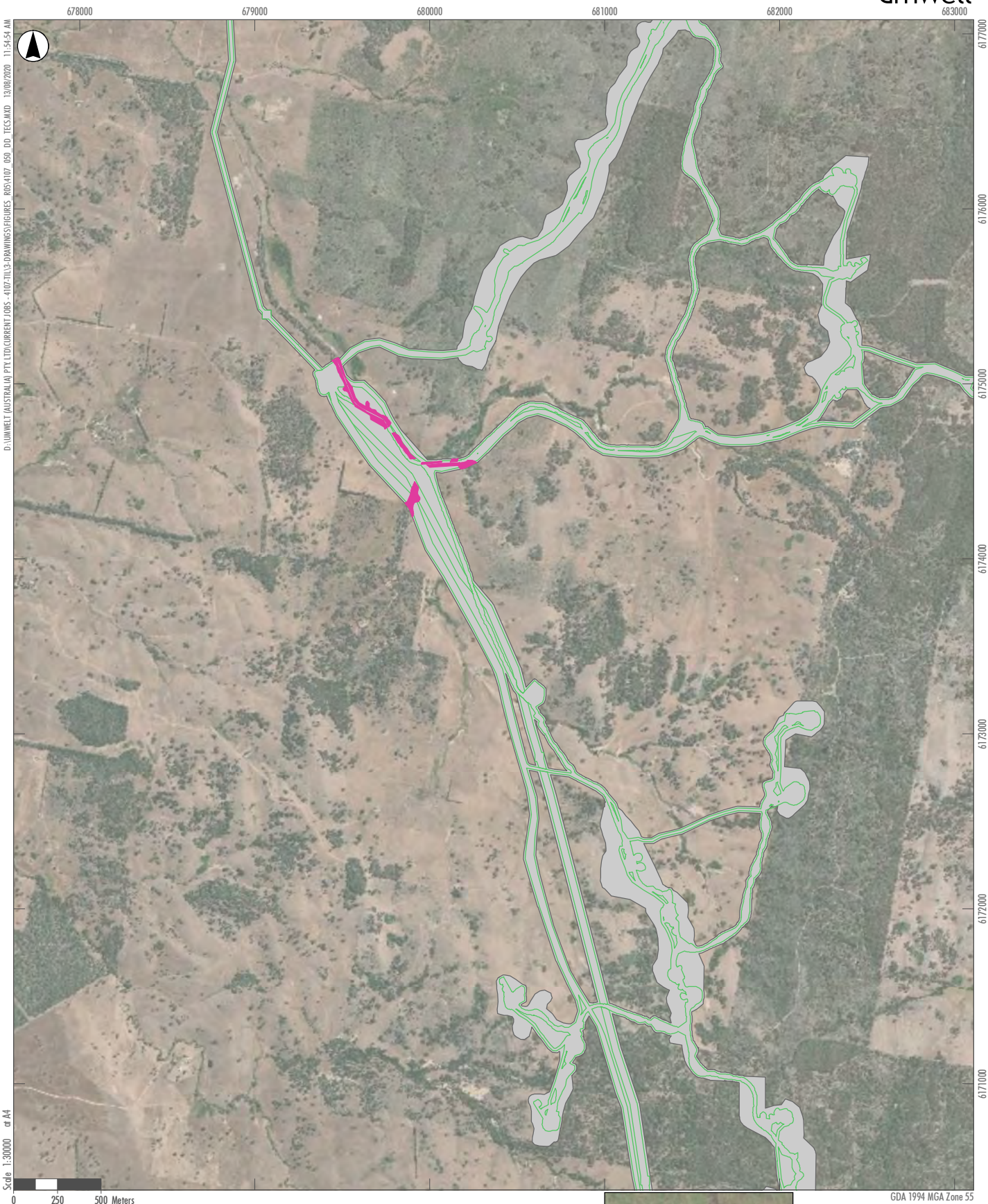


FIGURE 3.4.c

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

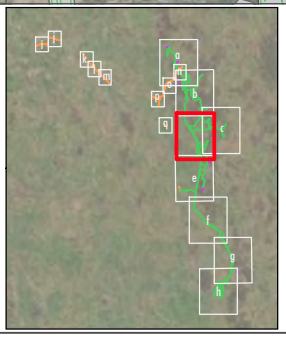
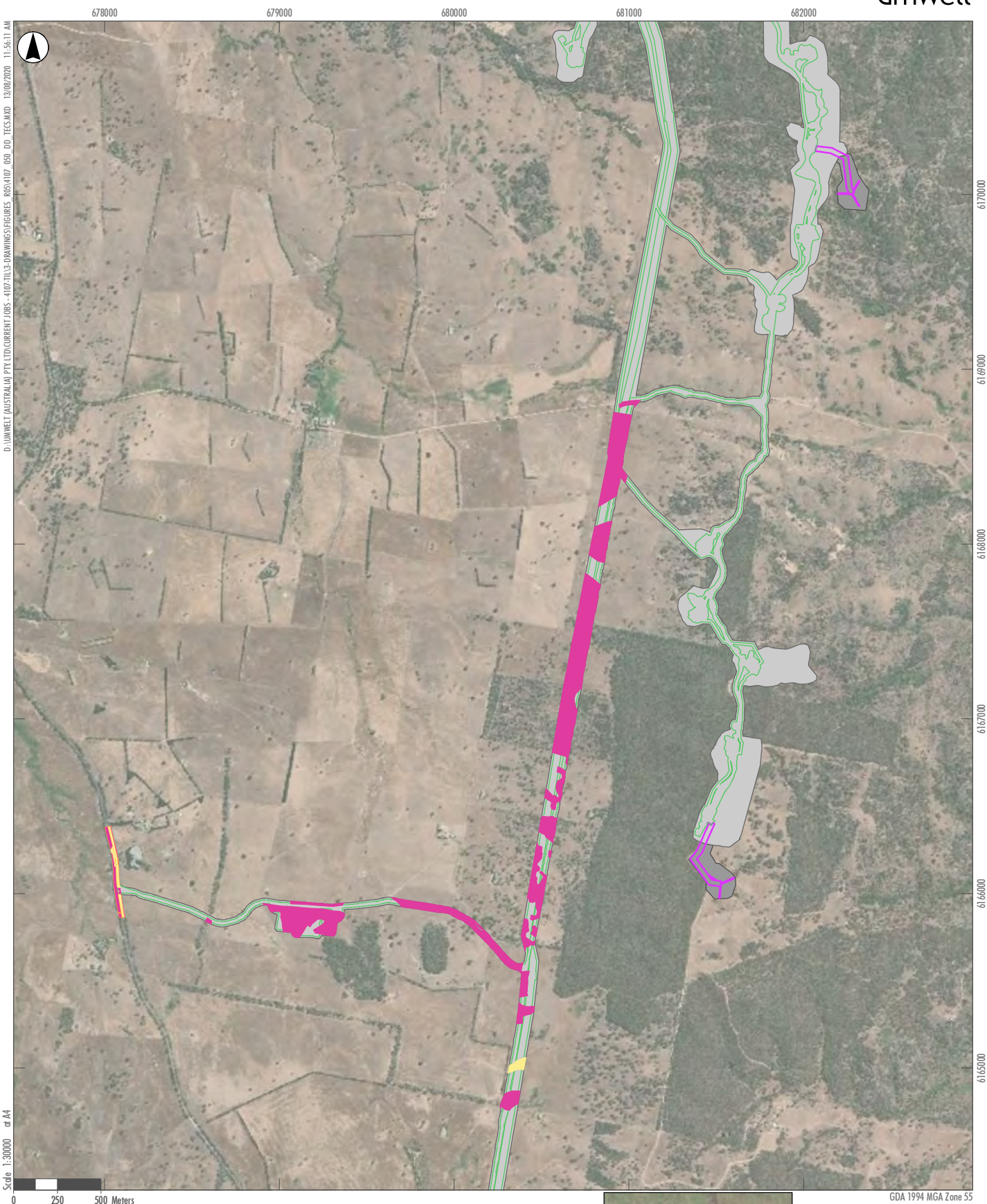


FIGURE 3.4.d

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

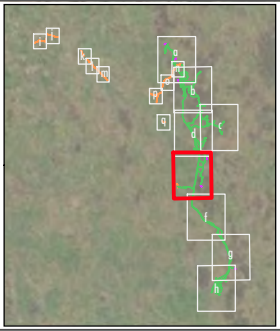


FIGURE 3.4.e

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

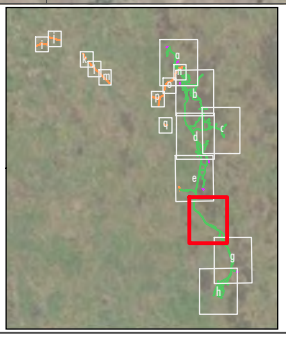
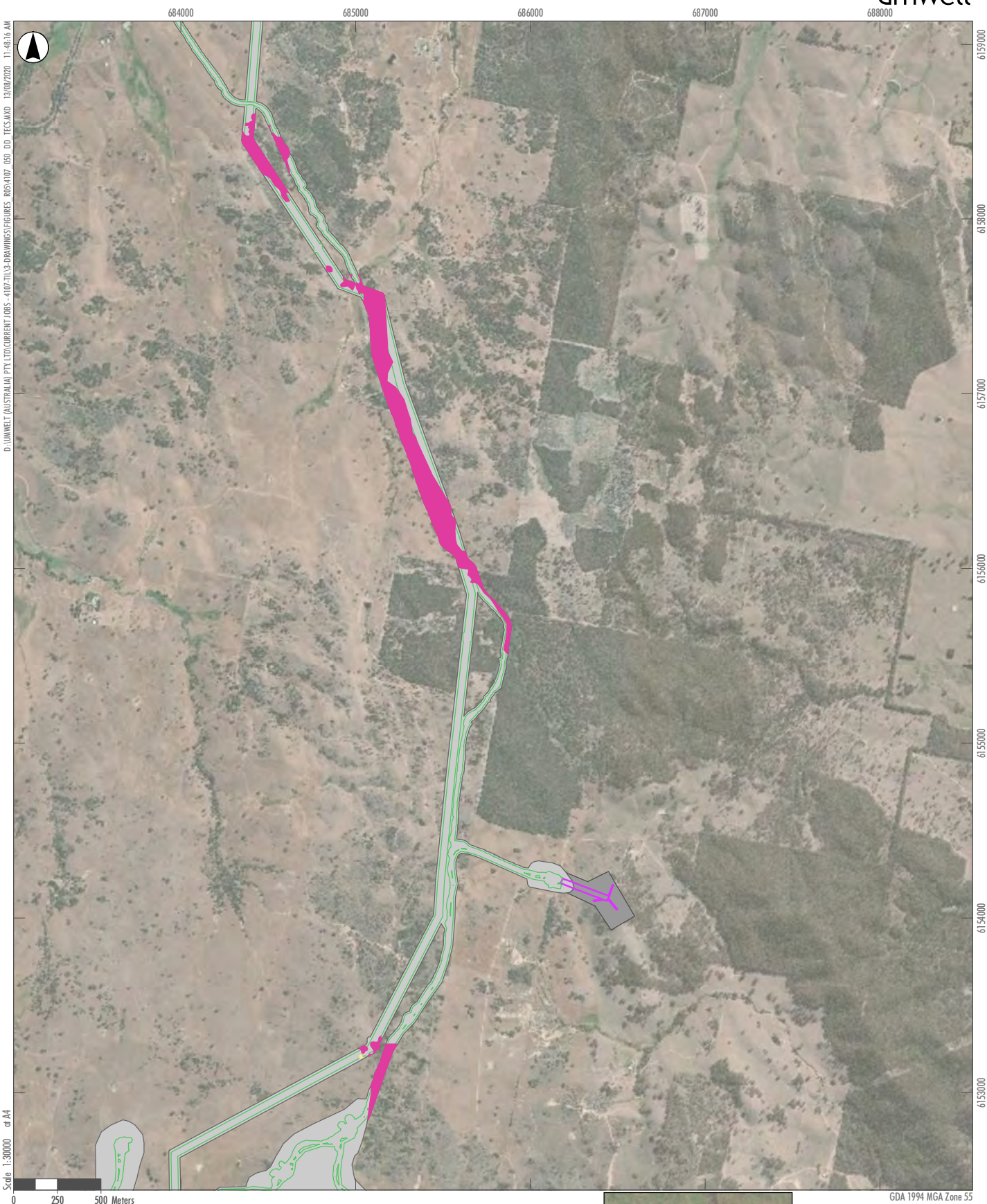


FIGURE 3.4.f

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

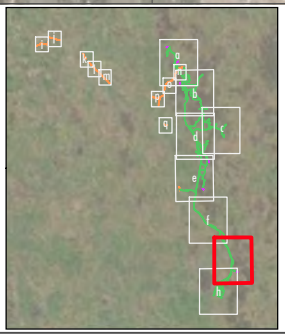


FIGURE 3.4.g

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

D:\UMWELT (AUSTRALIA) PTY LTD\CURRENT JOBS - 4107-TILL3-DRAWINGS\FIGURES_RDS\4107_050_DD_TECS.MXD 13/08/2020 11:48:18 AM

Scale 1:30000 at A4

Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

Threatened Ecological Communities (BC Act & EPBC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

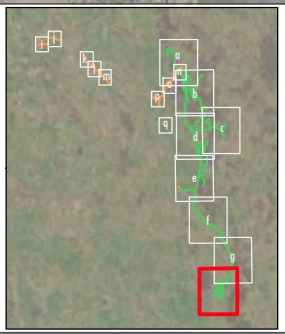


FIGURE 3.4.h

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

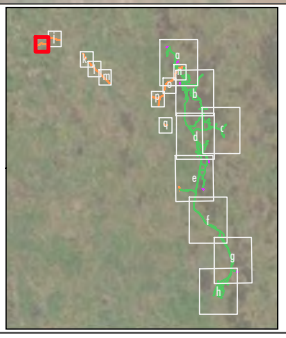


FIGURE 3.4.i

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

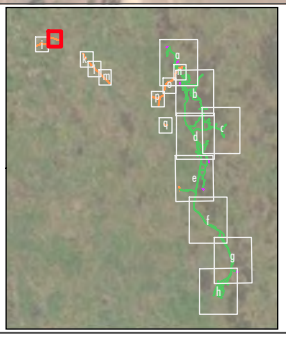


FIGURE 3.4.j

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

FIGURE 3.4.k

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

FIGURE 3.4.I

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

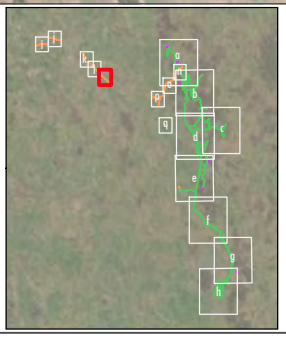


FIGURE 3.4.m

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.4.n

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

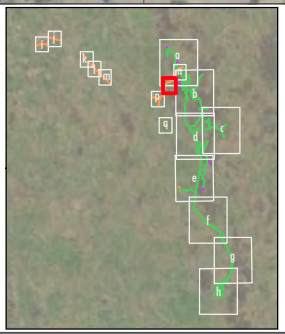


FIGURE 3.4.o

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act & EPBC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act) / White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands CEEC (EPBC Act)

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

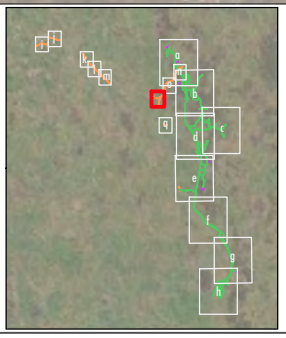


FIGURE 3.4.p

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Ecological Communities (BC Act)

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (BC Act)

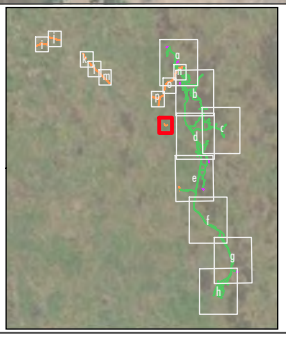


FIGURE 3.4.q

Threatened Ecological Communities in the Indicative Development Footprints

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

3.2.4 Vegetation Integrity Score

Table 3.5 below details the vegetation integrity scores for each vegetation zone in the Indicative Development Footprints. The vegetation integrity data for each of the vegetation zones is provided in **Appendix D**.

Table 3.5 Vegetation Zone Vegetation Integrity Scores

Veg Zone	PCT Name	Composition		Structure		Function		Current Vegetation Integrity Score	
		SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA
1	289 Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good*	55.2	-	80.4	-	94.7	-	**74.9**	-
2	335 Tussock grass - sedgeland fen - rushland - reedland wetland in impeded creeks in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion *Moderate to Good*	35.9	37.1	64.1	24.9	-	-	**47.9**	**30.4**
3	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Moderate to Good*	49.3	34.9	90.7	84.0	99.0	93.5	**76.2**	**65.0**

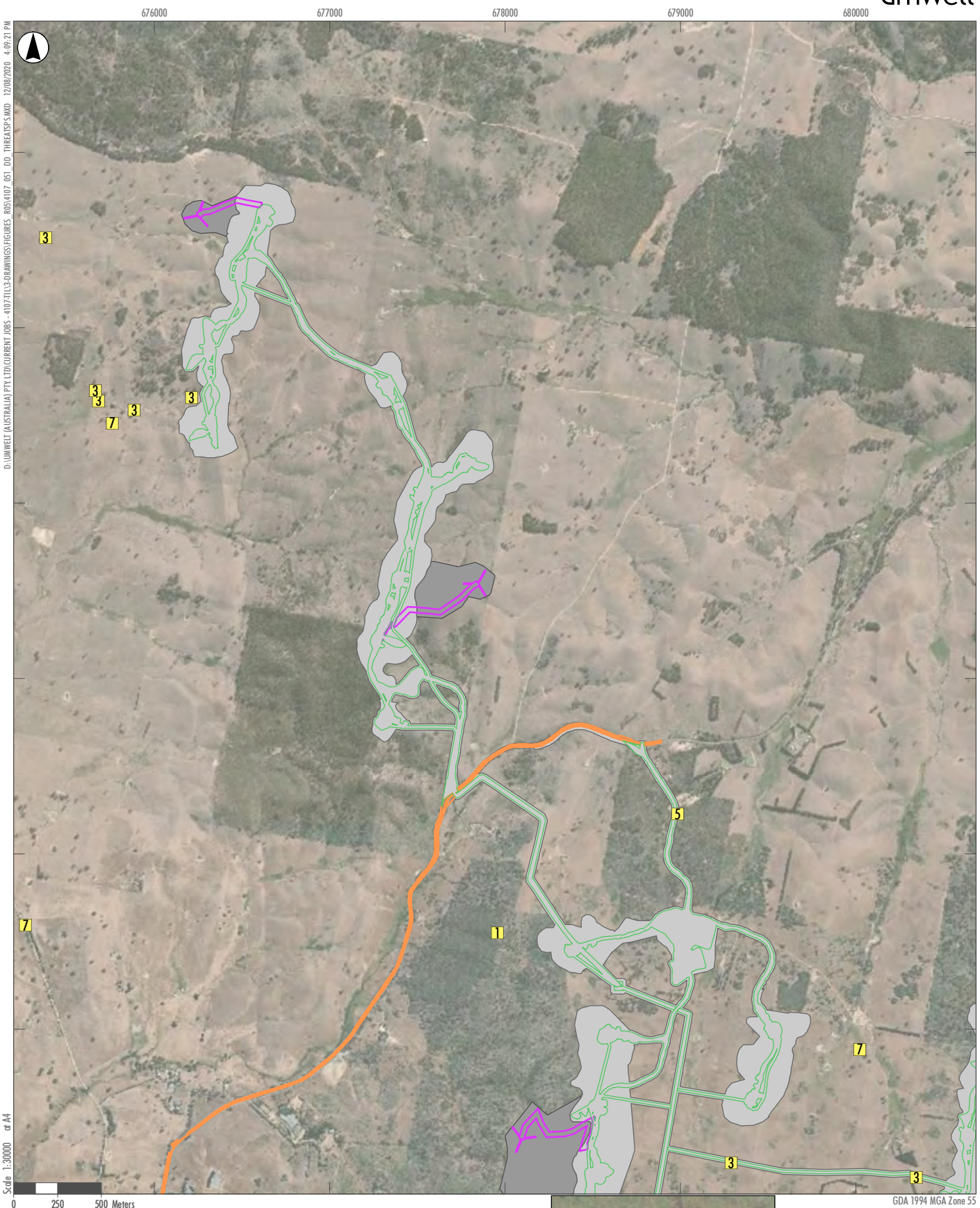
Veg Zone	PCT Name	Composition		Structure		Function		Current Vegetation Integrity Score	
		SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA
4	350 Candlebark - Blakely's Red Gum - Long-leaved Box grassy woodland in the Rye Park to Yass region of the NSW South Western Slopes Bioregion and South Eastern Highland Bioregion *Derived Native Grassland*	37.7	29.1	35.9	51.8	29.7	29.7	**34.3**	**35.5**
5	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Moderate to Good*	68.8	58.1	87.4	95.9	90.6	90.5	**81.7**	**79.6**
6	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Derived Native Grassland*	23.4	22.5	21.4	30.3	16.4	15.6	**20.2**	**22.0**
7	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Acacia Shrubland*	57.5	48.5	49.5	78.4	35.7	34.7	**46.7**	**50.9**

Veg Zone	PCT Name	Composition		Structure		Function		Current Vegetation Integrity Score	
		SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA	SWS IBRA	SEH IBRA
8	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Sifton Bush Shrubland*	33.7	29.2	26.8	41.6	14.2	13.3	**23.4**	**25.3**
9	351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion *Argyle Apple Forest*	56.2	-	59.1	-	97.3	-	**68.6**	**-**
10	Non-native Vegetation	15.9	12.9	6.9	5.2	25.3	25.3	**14.0**	**11.9**

3.3 Threatened Species within the Indicative Development Footprints

3.3.1 Ecosystem-credit Species

A list of the ecosystem-credit species predicted to occur by the BAM Calculator and/or the literature review and whether they are considered likely to occur in the vegetation zones within the Indicative Development Footprints is provided in **Appendix A**. Threatened species records are shown on **Figure 3.5**.



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

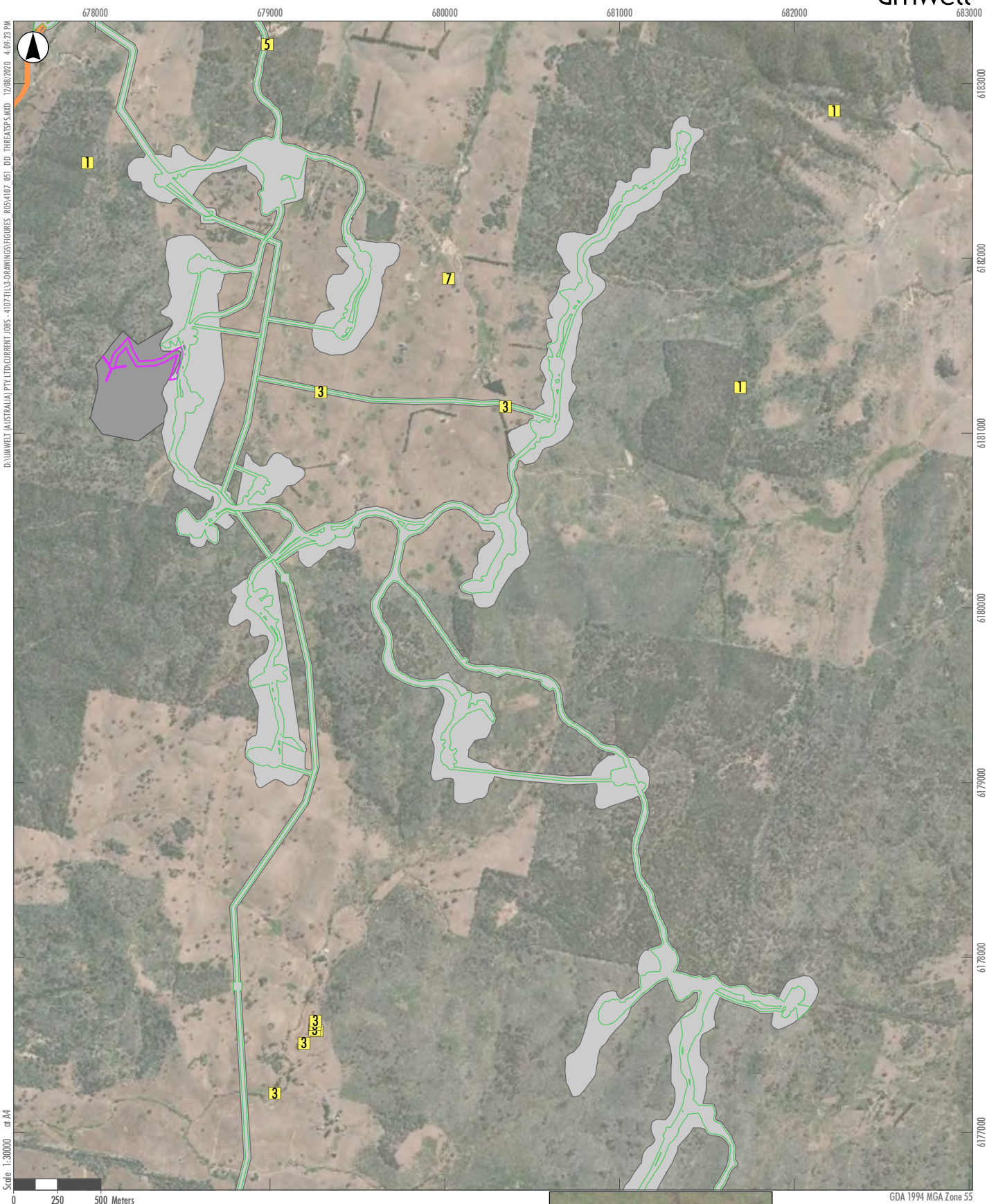
Threatened Species Records

- 1 Glider Sp.
- 3 Golden Sun Moth
- 5 Little Eagle
- 7 Superb Parrot

FIGURE 3.5.a

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads

Threatened Species Records

- 1 Glider Sp.
- 3 Golden Sun Moth
- 5 Little Eagle
- 7 Superb Parrot

FIGURE 3.5.b

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Development Corridor - Wind Farm

Indicative Development Footprint - Wind Farm

Threatened Species Records

6 Southern Myotis

FIGURE 3.5.c

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

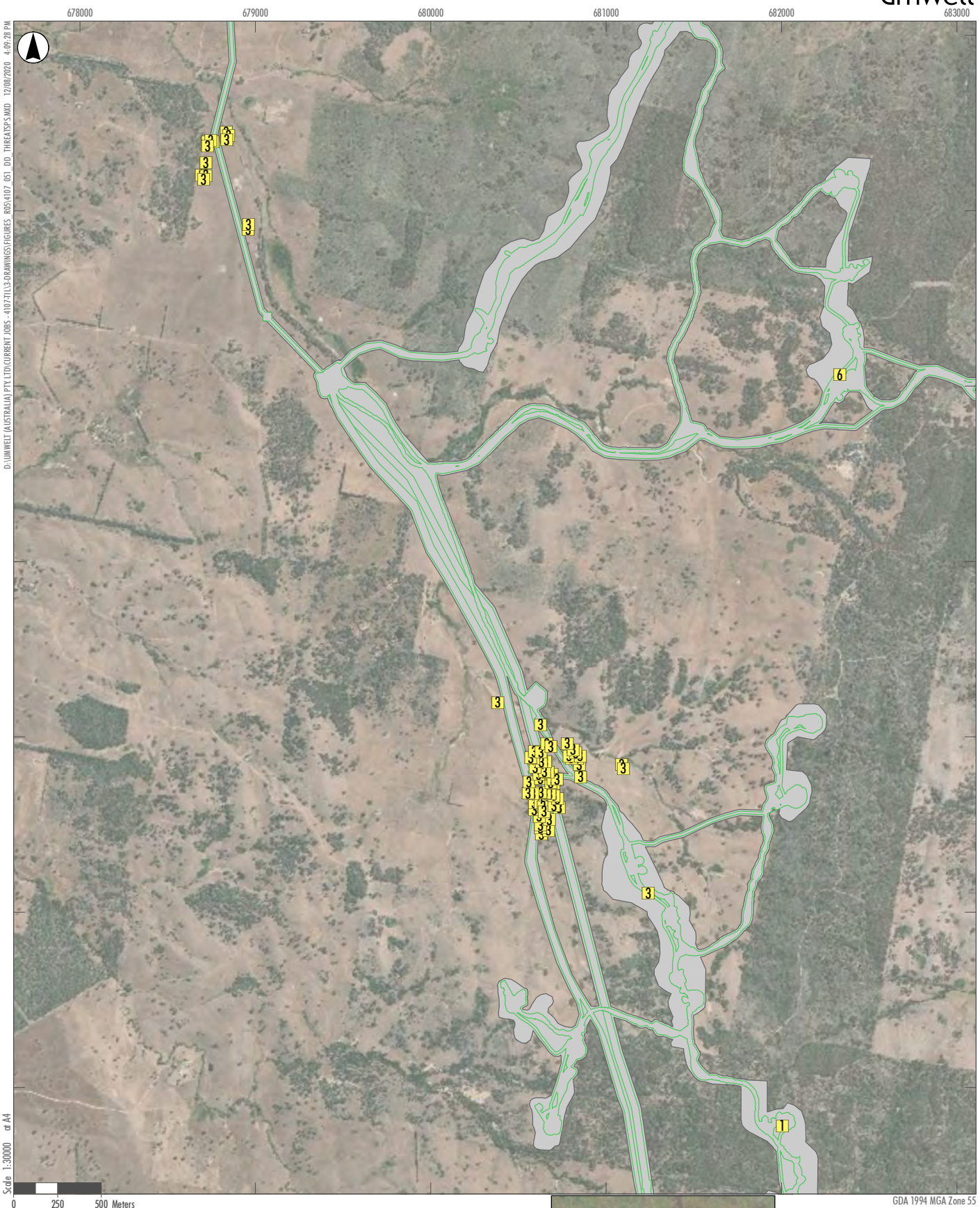


FIGURE 3.5.d

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

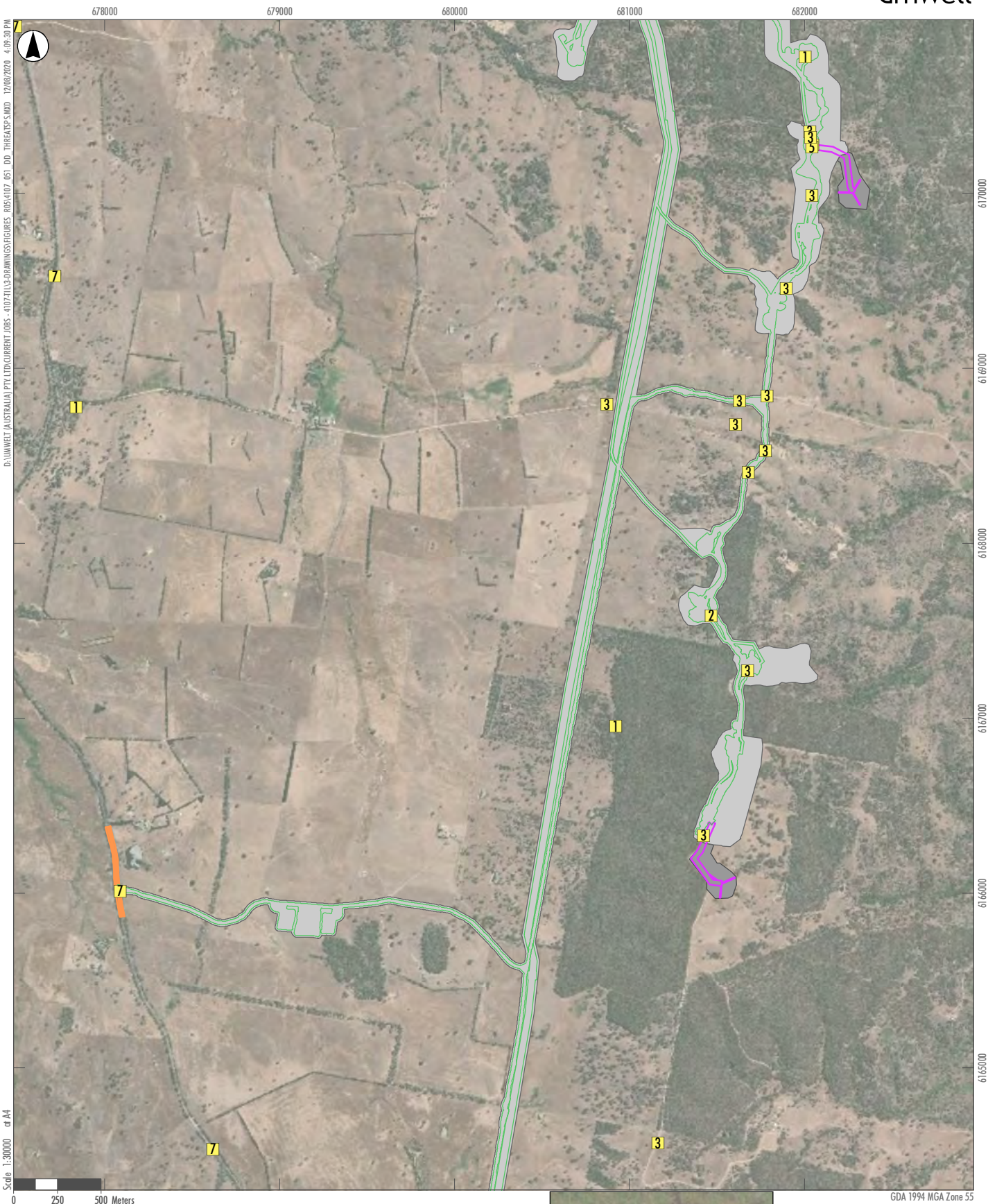


FIGURE 3.5.e

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

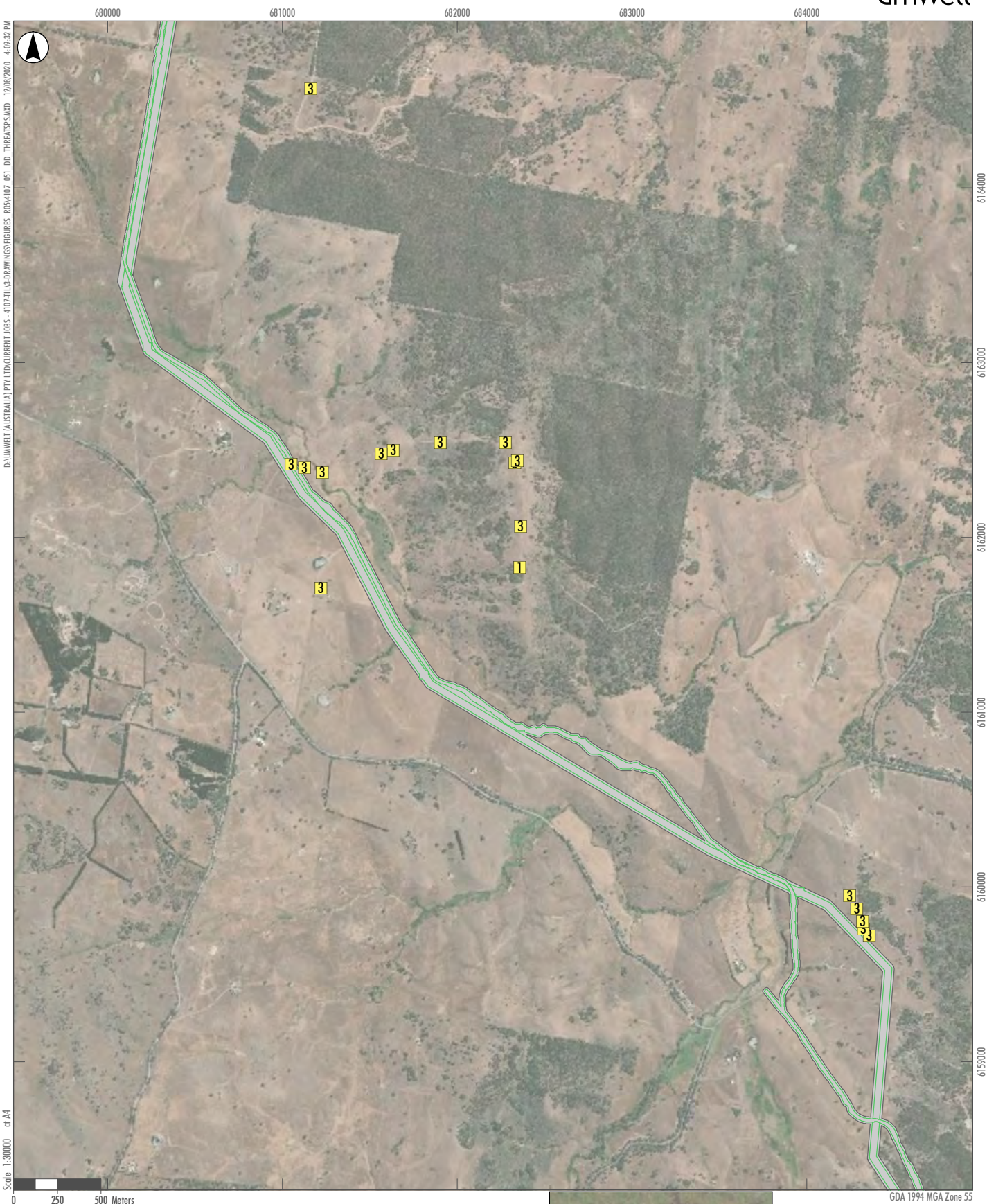
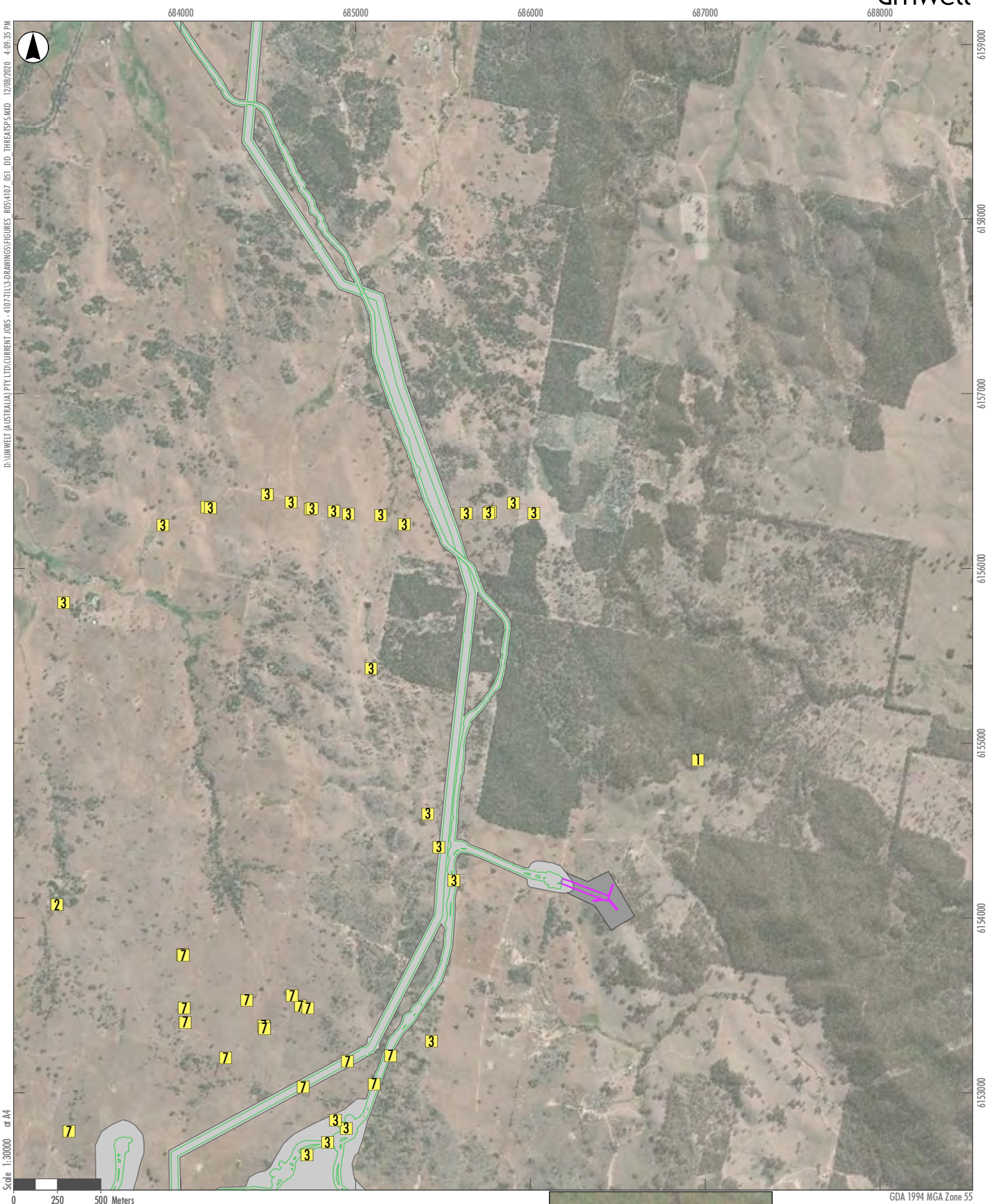


FIGURE 3.5.f

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

Threatened Species Records

- 1 Glider Sp.
- 2 Squirrel Glider
- 3 Golden Sun Moth
- 7 Superb Parrot

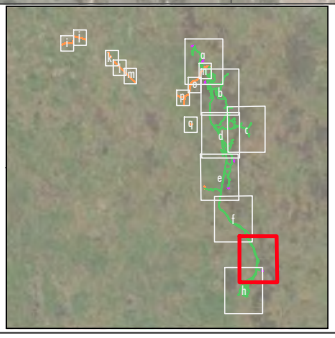
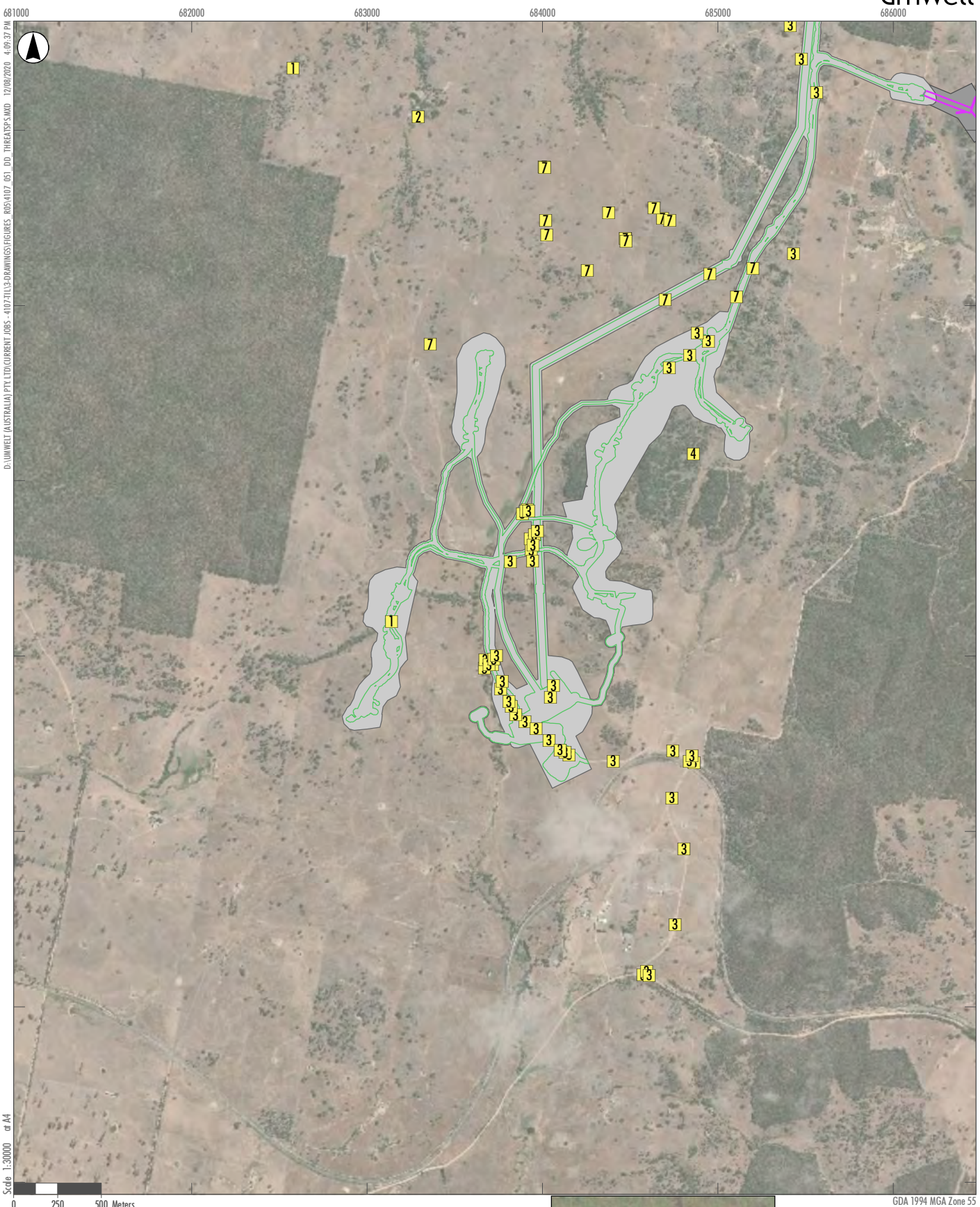


FIGURE 3.5.g

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts

Threatened Species Records

- 1 Glider Sp.
- 2 Squirrel Glider
- 3 Golden Sun Moth
- 4 Large bent-winged bat
- 7 Superb Parrot

FIGURE 3.5.h

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

FIGURE 3.5.i

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.5.j

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

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Scale 1:10000 at A4

FIGURE 3.5.k

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.5.I

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

FIGURE 3.5.m

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.5.n

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.5.o

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.5.p

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

Threatened Species Records

7 Superb Parrot

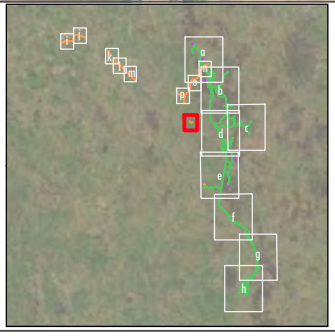


FIGURE 3.5.q

Threatened Species Records

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

3.3.2 Species-credit Species

A list of the species-credit species predicted to occur by the BAM Calculator and/or the literature review and a discussion on their inclusion or exclusion from the calculator assessment is provided in **Appendix B**. Species-credit species recorded or assumed present are shown in **Figure 3.5** and discussed broadly in **Table 3.6.** Further information on the surveys undertaken for these species is provided in **Appendix B**.

Table 3.6 Species-credit Species within the Indicative Development Footprints

Species	BC Act	EPBC Act	Species Presence	Justification
striped legless lizard *Delma impar*	V	V	**Yes (previously recorded by NGH Environmental [2014])**	The species was not recorded by Umwelt. This species was previously recorded at a single location in the north of the Indicative Development Footprint – Wind Farm during the planning approval process (NGH Environmental 2014) (**Figure 3.5**).
southern myotis *Myotis macropus*	V	-	**Yes (Assumed)**	Umwelt had just one confirmed record of the species occurring within the Indicative Development Footprint – External Roads (**Figure 3.5**).
squirrel glider *Petaurus norfolcensis*	V	-	**Yes (surveyed)**	This species was recorded at multiple locations within the Indicative Development Footprints, or in proximity to it, by Umwelt. It was not recorded previously during the planning approval process (NGH Environmental 2014 and 2016). The species was recorded through spotlighting surveys as well as through the use of remote survey cameras (**Figure 3.5**). The latter confirmed use of the site by both squirrel glider and sugar glider (*Petaurus breviceps*). All records for the species occurred in patches of remnant forest from PCTs 289, 350 and 351.
superb parrot *Polytelis swainsonii*	V	V	**Yes (surveyed)**	The species was recorded at several locations within the Indicative Development Footprints by Umwelt (**Figure 3.5**). The species is widely known to occur in the local area and was also recorded previously at several locations during the planning approval process (NGH Environmental 2014) (**Figure 3.5**).
golden sun moth *Synemon plana*	E	CE	**Yes (surveyed)**	The species was recorded at several locations within the Indicative Developments Footprint by Umwelt (**Figure 3.5**). The species was also recorded previously at several locations during the planning approval process (NGH Environmental 2014) (**Figure 3.7**).

3.3.3 Species Habitat Polygons and Biodiversity Risk Weighting

Species habitat polygons have been prepared for the species in the Development Corridors and Indicative Development Footprints outlined in **Table 3.7** below. Polygons are shown on **Figure 3.6**.

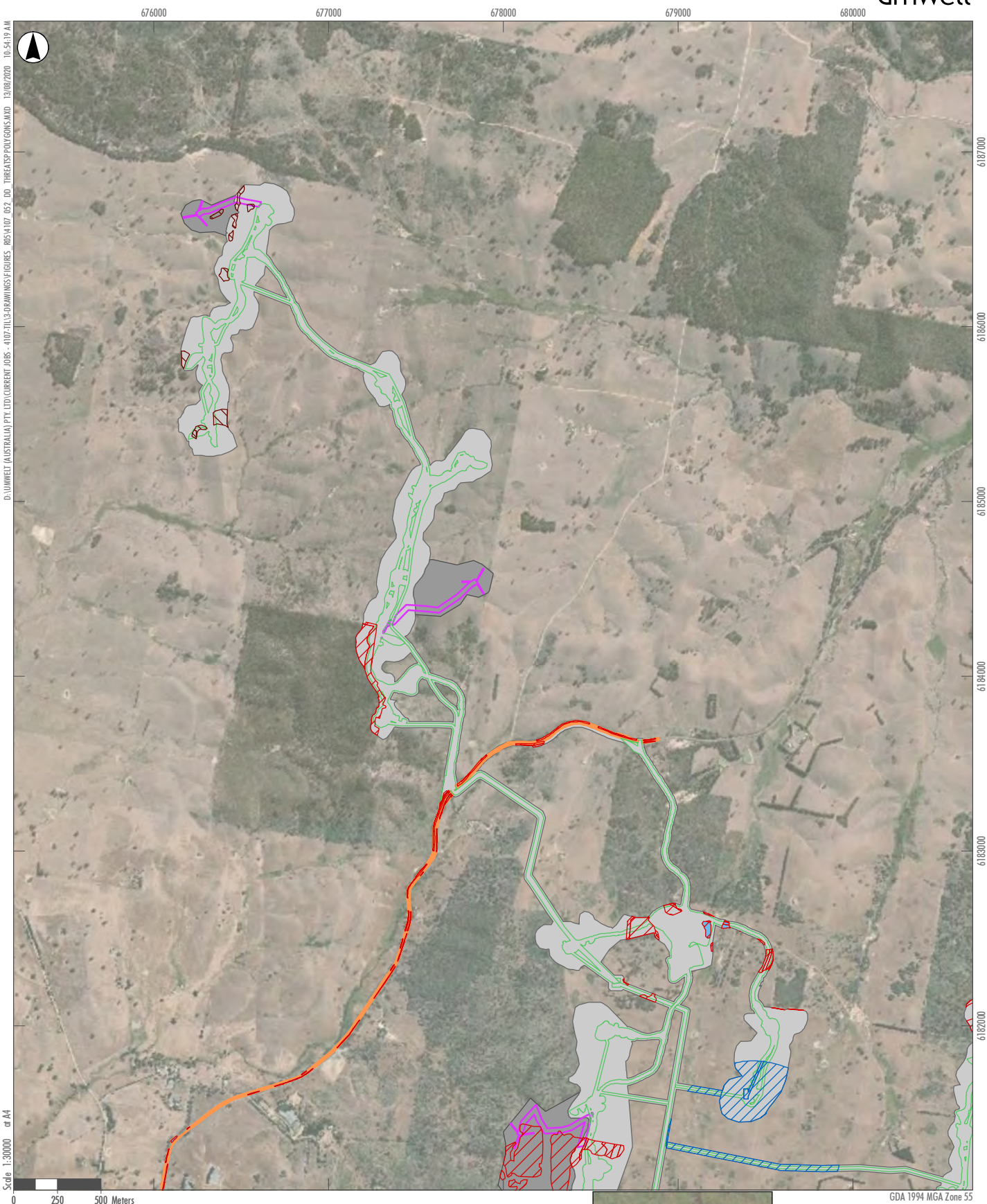
Table 3.7 Predicted Species-credit Species

Species	Biodiversity Risk Weighting	Species Habitat Polygon in Development Corridors (ha)	Species Habitat Polygon in Indicative Development Footprints (ha)	Species Habitat Polygon Description
striped legless lizard *Delma impar*	1.5	13.97	3.58	The species habitat polygon was determined based on the extent of a 500 m buffer from the confirmed record previously (identified by NGH Environmental) which intersects with Vegetation Zone 6 (refer **Figure 3.6**).The project will impact on 3.58 hectares of habitat for this species, avoiding a further 10.39 hectares.
southern myotis *Myotis macropus*	2	0.00	0.03	The TBDC for southern myotis describes the species as being "…dependent on waterways with pools of 3 metres wide or greater for foraging…" (TBDC 2020b). There is just one waterway that supports pools of water 3 m wide or greater, being Pudman Creek. Vegetation Zone 3 is the only remnant vegetation within 200 metres of this waterway, occurring along Grassy Creek Road. This species habitat polygon has been mapped based on patches of Vegetation Zones 3 within 200 metres of Pudman Creek (refer **Figure 3.6**). The project will impact on 0.03 hectares of habitat for this species, occurring entirely within the Indicative Development Footprint – External Roads.

Species	Biodiversity Risk Weighting	Species Habitat Polygon in Development Corridors (ha)	Species Habitat Polygon in Indicative Development Footprints (ha)	Species Habitat Polygon Description
squirrel glider *Petaurus norfolcensis*	2	258.63	102.97	All records for the species occurred in patches of remnant forest from PCTs 289, 350 and 351. There was no identifiable pattern across the Indicative Development Footprints where the species did and didn't occur. Thus, Vegetation Zones 1, 3 and 5 in the Indicative Development Footprints are considered to be suitable habitat for the species. Refer to **Figure 3.6** for the species polygon for this species. The Project will impact on 102.97 hectares of habitat for this species, avoiding a further 155.66 hectares.
superb parrot *Polytelis swainsonii*	2	36.33	20.08	Vegetation Zone 3 within the Indicative Development Footprints is considered to be suitable breeding habitat for the species. Foraging habitat is considered species credit habitat for the superb parrot. Refer to **Figure 3.6** for the species polygon for this species. The Project will impact on 20.08 hectares of habitat for this species, avoiding a further 16.25 hectares.
golden sun moth *Synemon plana*	3	113.89	43.20	Umwelt provide additional information below this table regarding the species polygon for this species. Consistent with the impact assessment for this species in the Biodiversity Assessment and Biodiversity Assessment Addendum (NGH Environmental 2014 and 2016), the species habitat polygon for this species is based on the extent of Vegetation Zones 4 and 6 that intersect with the extent of mapping described above. Refer to **Figure 3.7** for the species polygon for this species. The Project will impact on 43.20 hectares of habitat for this species, avoiding a further 70.69 hectares.

Umwelt has maintained the application of a 200 m buffer from known records of GSM within the Project to determine the extent of the species polygon is suitable and justifiable. Based on current knowledge, this approach is suitable and appropriate for determining the extent of the GSM species polygon. This approach takes into consideration acknowledgment the species will utilise habitat broader than the specific location of the record. With the limited mobility of the species 200 m buffers are considered to appropriate, especially given that in most occasions multiple records were made in proximity to one another. Where multiple records and their associated 200 m buffers do not interconnect, the species polygon mapping between buffers was extended to provide a continuation (and potential over-estimation) of habitat.

As part of the post-submission engagement between Tilt, Umwelt and the BDC, the BCD has provided further information and clarification of their view in the final weeks of preparation of the Submissions Report and the revised BDAR. This information has not been able to be adequately addressed in this Submissions Report, or in the revised BDAR, as the analysis of existing data and/or the collection and analysis of new data could not be undertaken in the limited timeframe available. However, it is noted that further engagement on this subject will be required in the short term to determine any further implications on project impacts and credit requirement for the GSM.



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Squirrel Glider Habitat
- Removed Squirrel Glider Habitat
- Striped Legless Lizard Habitat - Within 500m Buffer
- Superb Parrot - Breeding Habitat

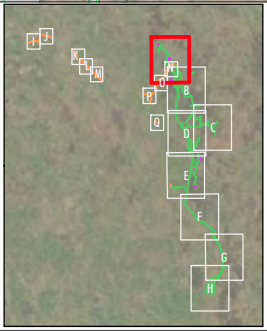
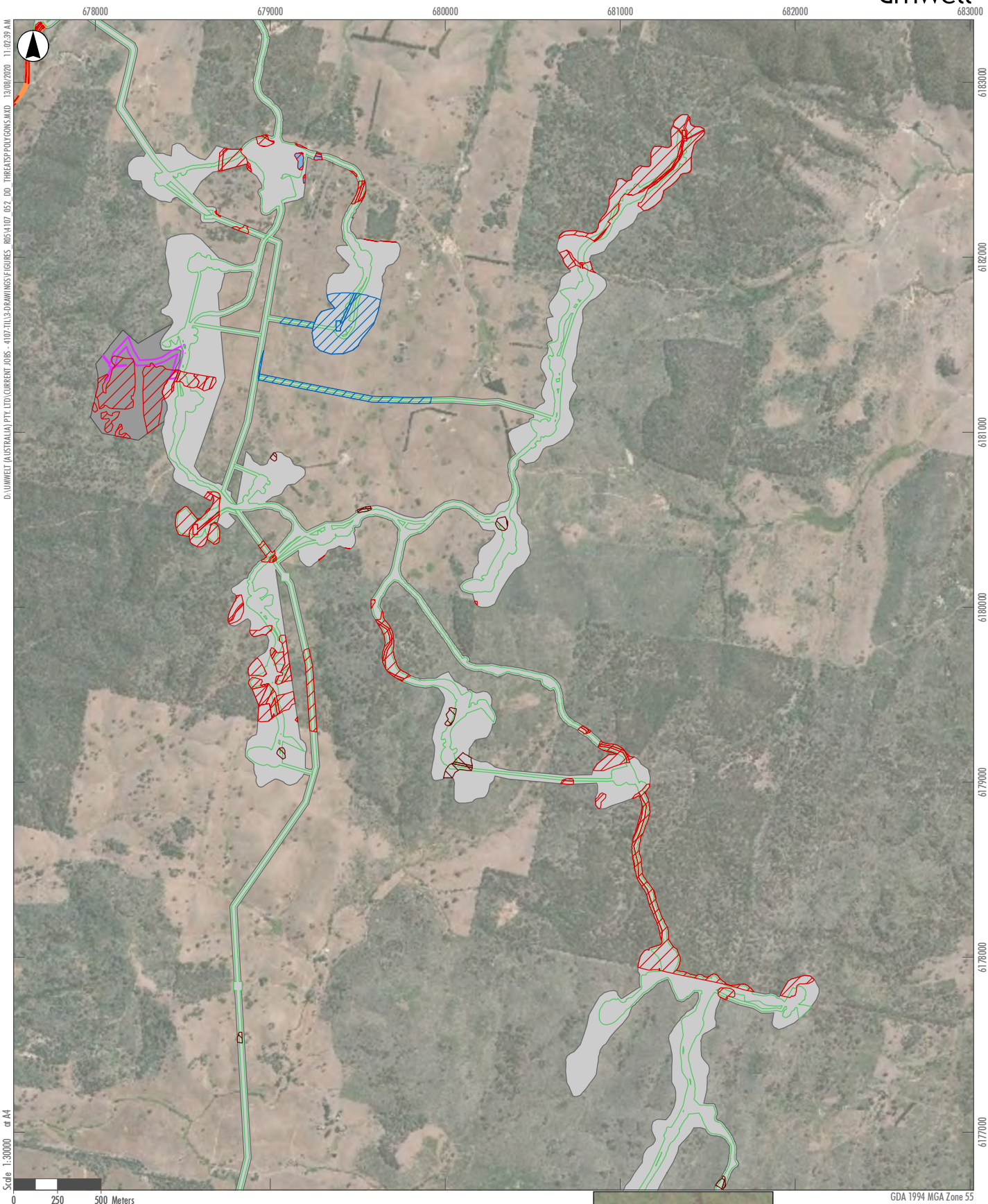


FIGURE 3.6.a

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Squirrel Glider Habitat
- Removed Squirrel Glider Habitat
- Striped Legless Lizard Habitat - Within 500m Buffer
- Superb Parrot - Breeding Habitat

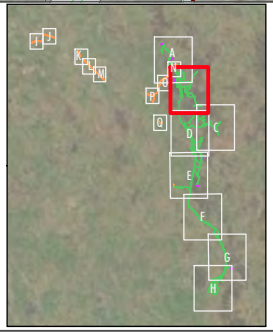


FIGURE 3.6.b

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

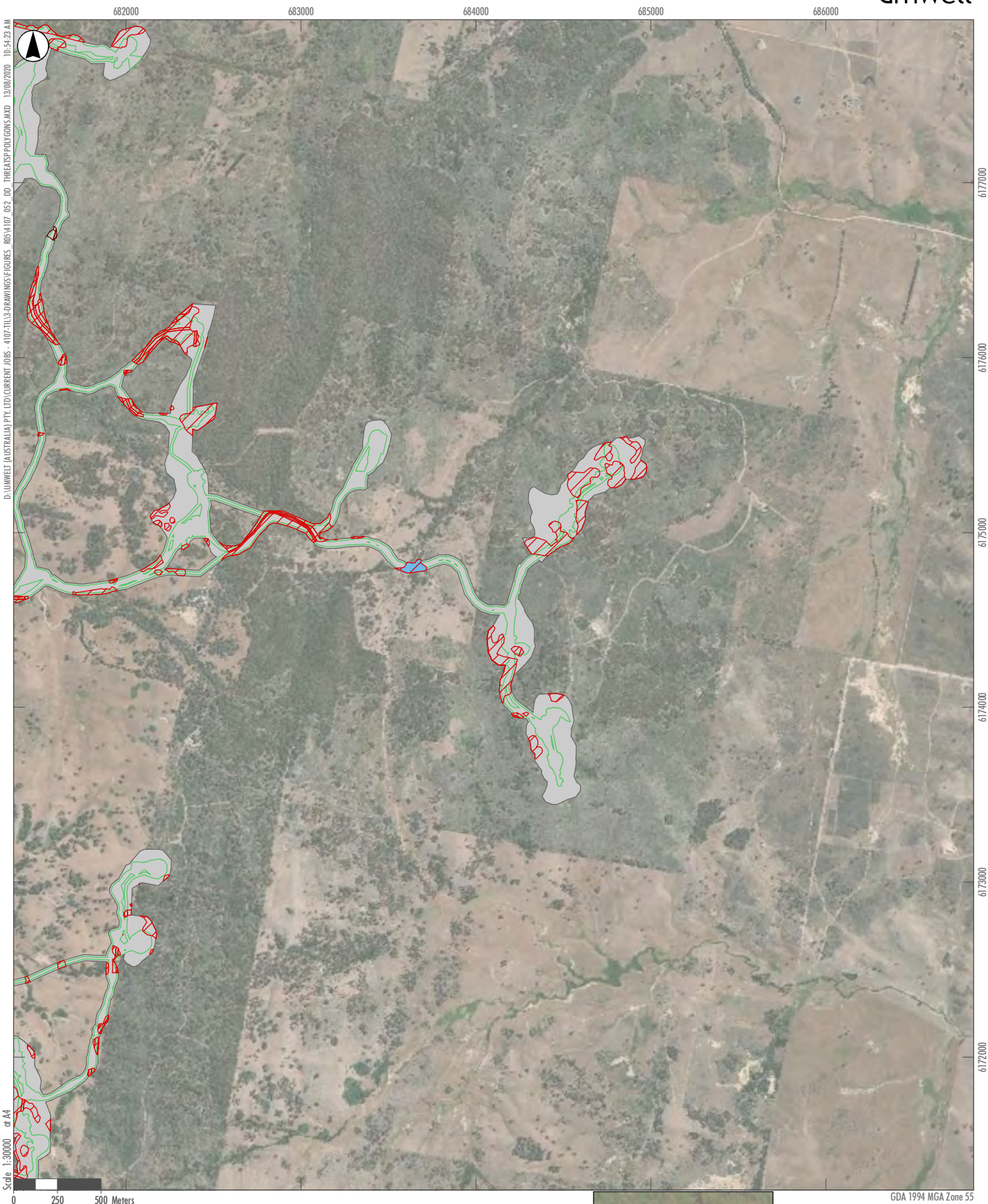
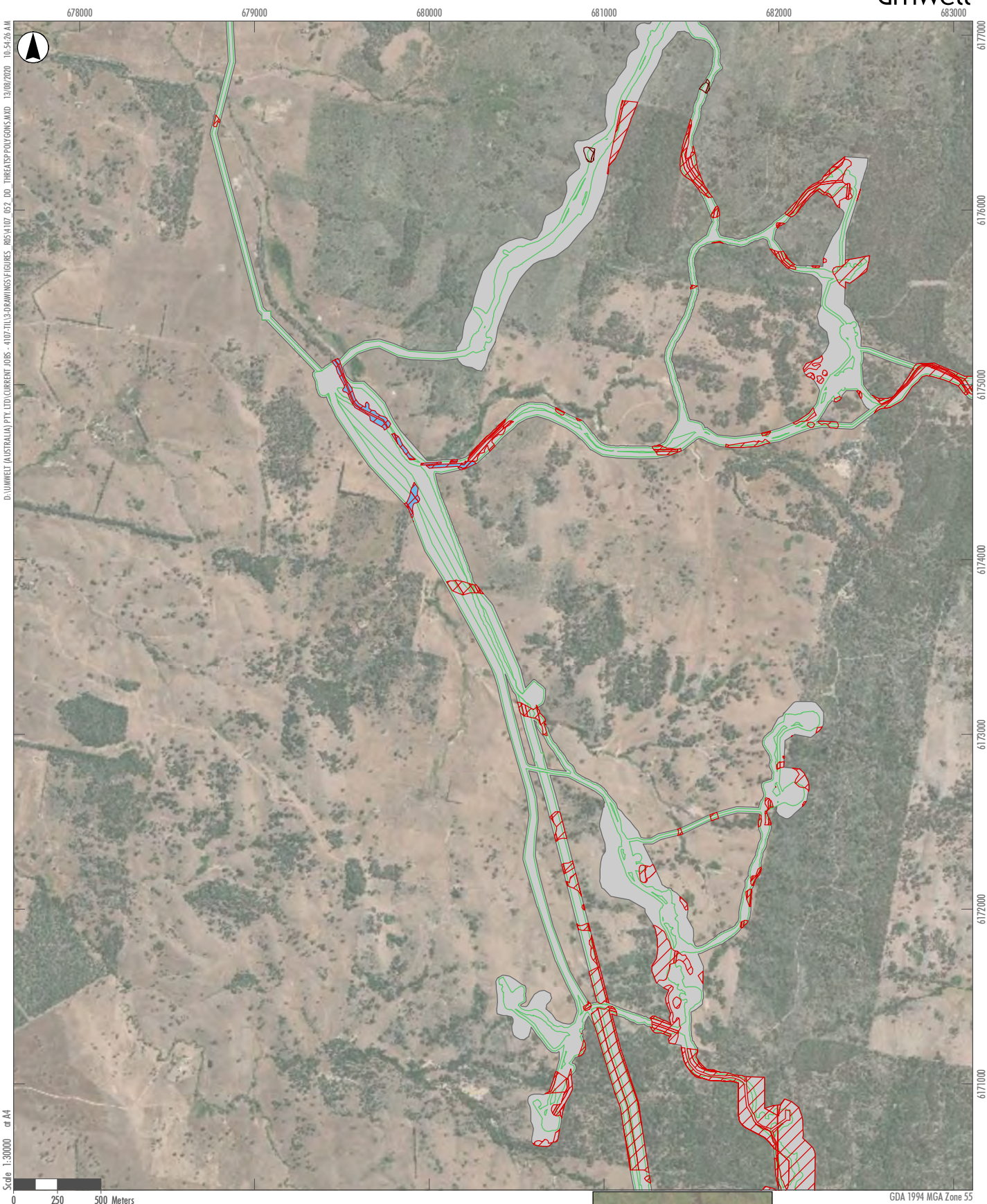


FIGURE 3.6.c

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Squirrel Glider Habitat
- Removed Squirrel Glider Habitat
- Superb Parrot - Breeding Habitat

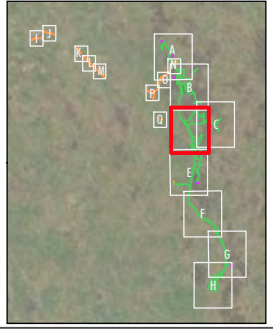


FIGURE 3.6.d

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

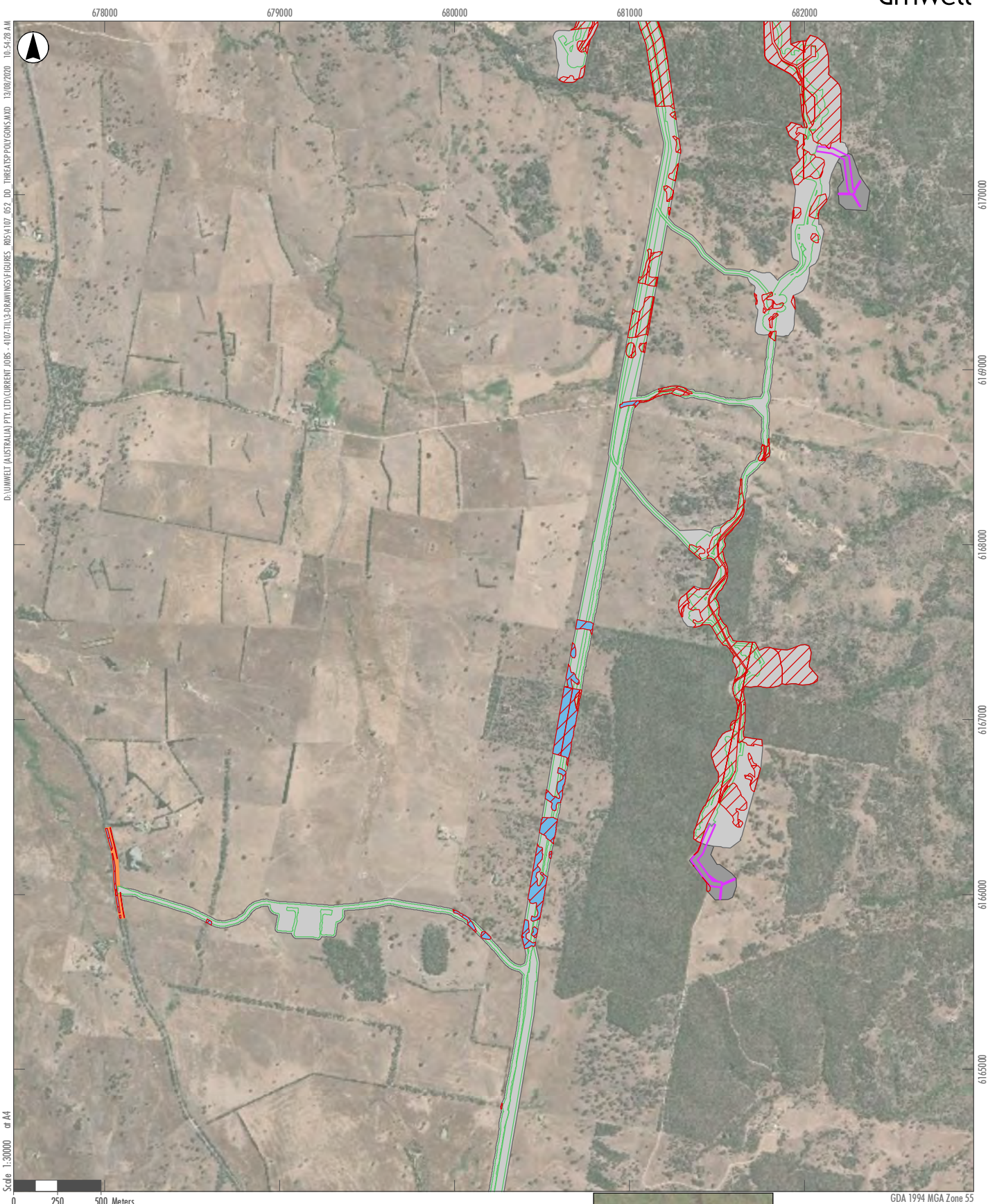


FIGURE 3.6.e

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.f

Species Credit
Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

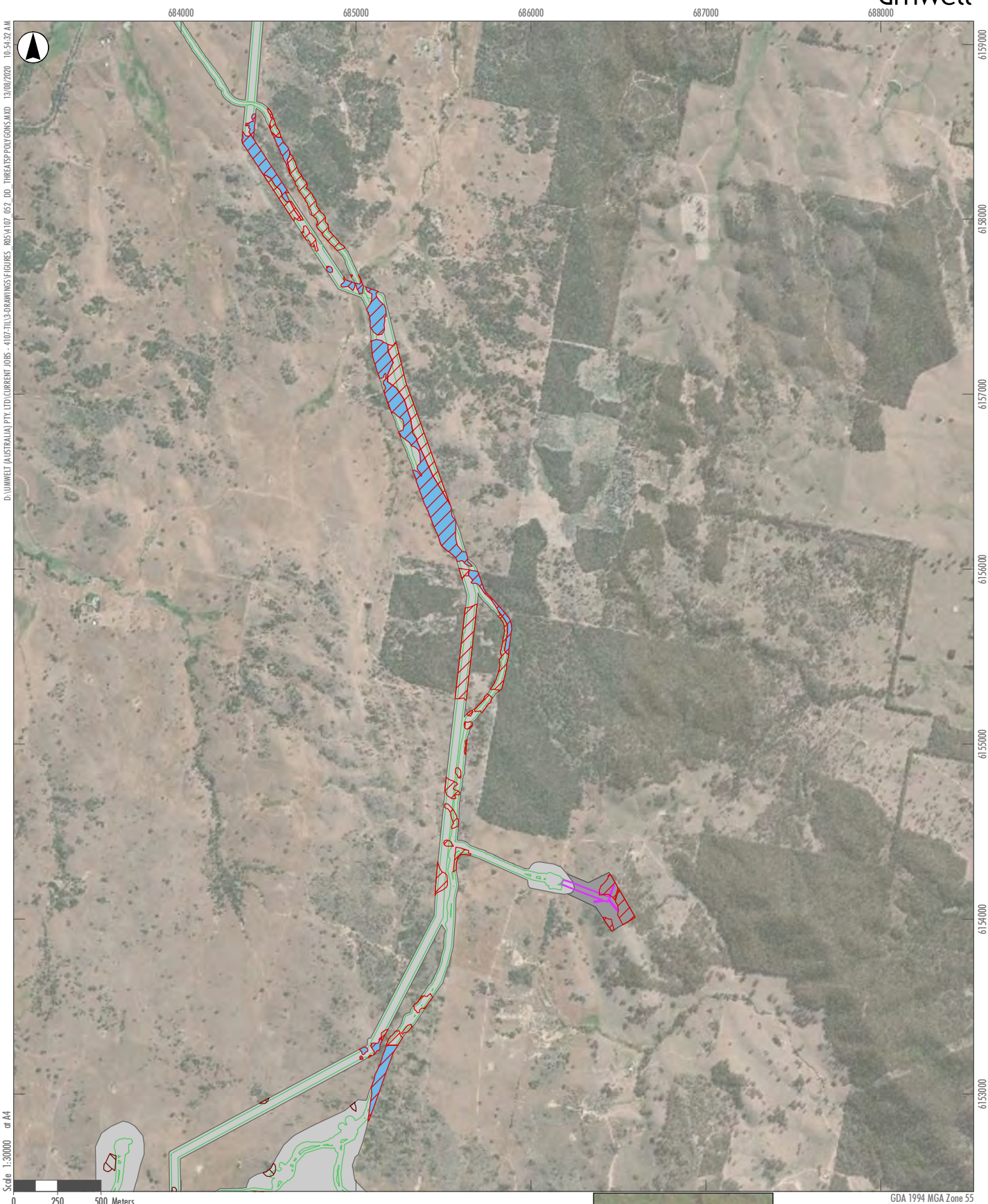
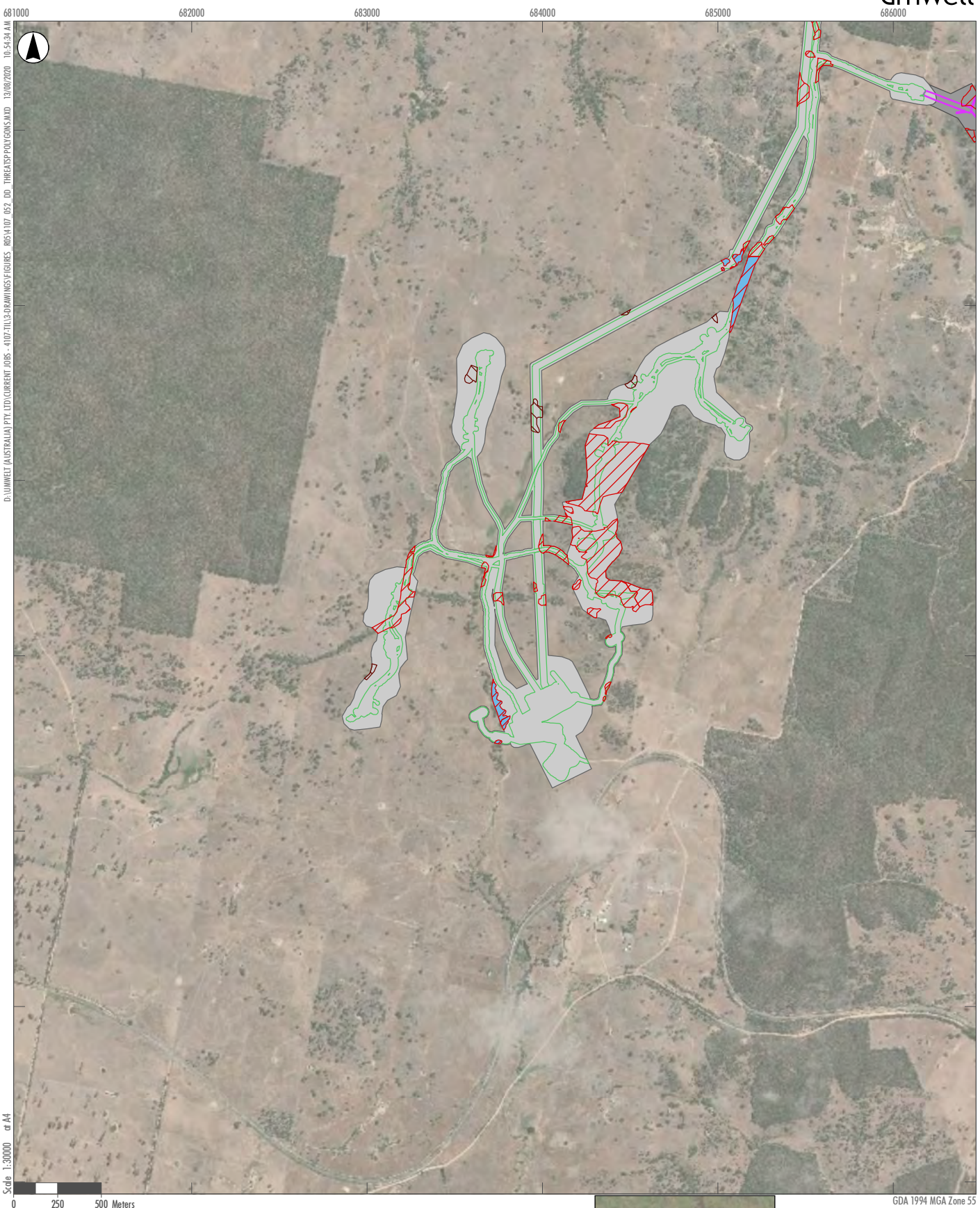


FIGURE 3.6.g

Species Credit
Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Squirrel Glider Habitat
- Removed Squirrel Glider Habitat
- Superb Parrot - Breeding Habitat

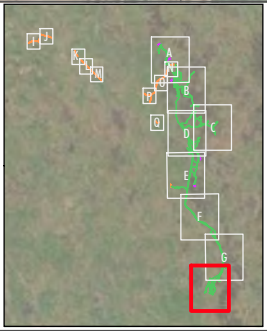


FIGURE 3.6.h

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.i

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.j

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.k

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

Legend

Indicative Development Footprint - External Roads

FIGURE 3.6.I

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

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FIGURE 3.6.m

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

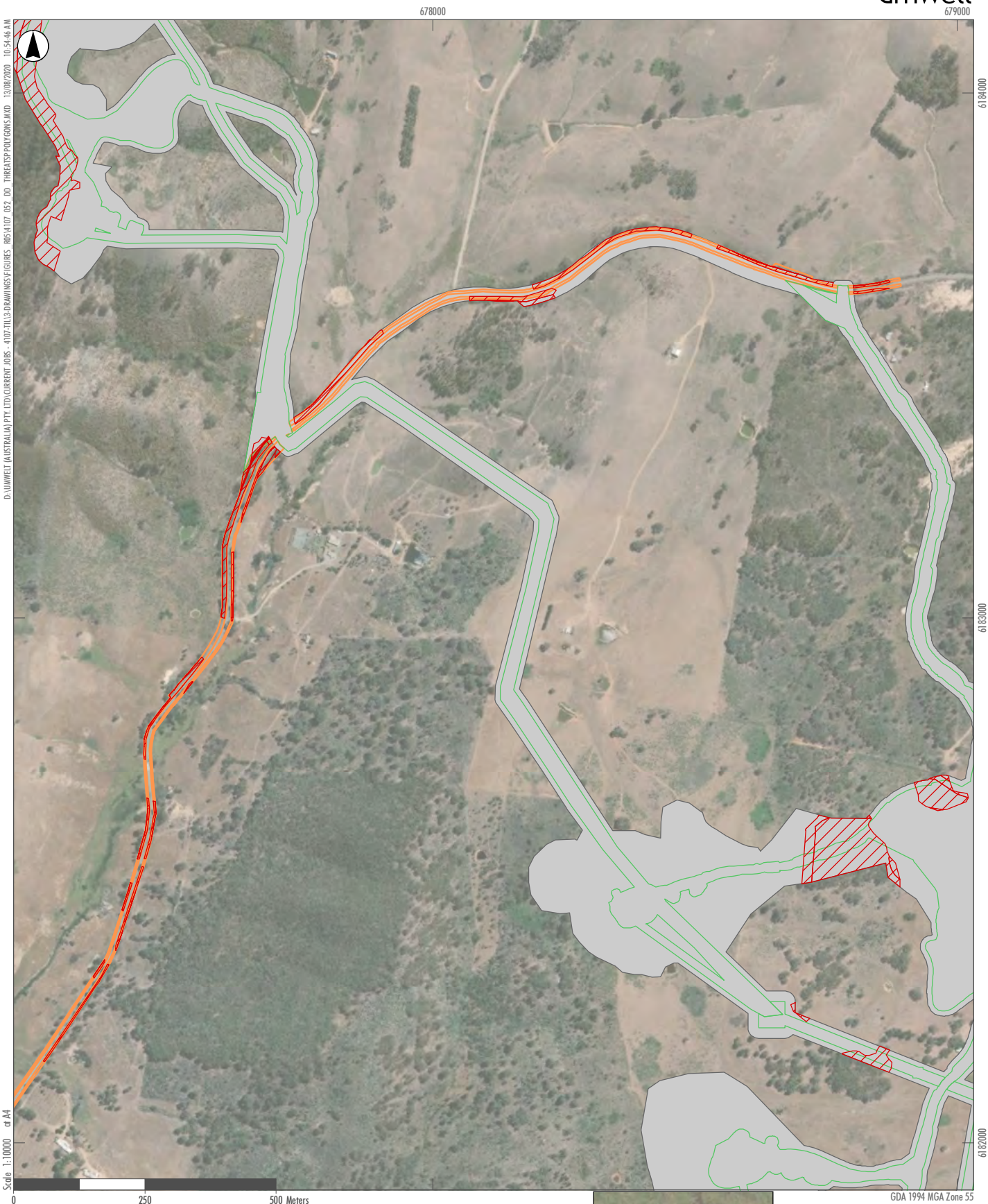


FIGURE 3.6.n

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.o

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.p

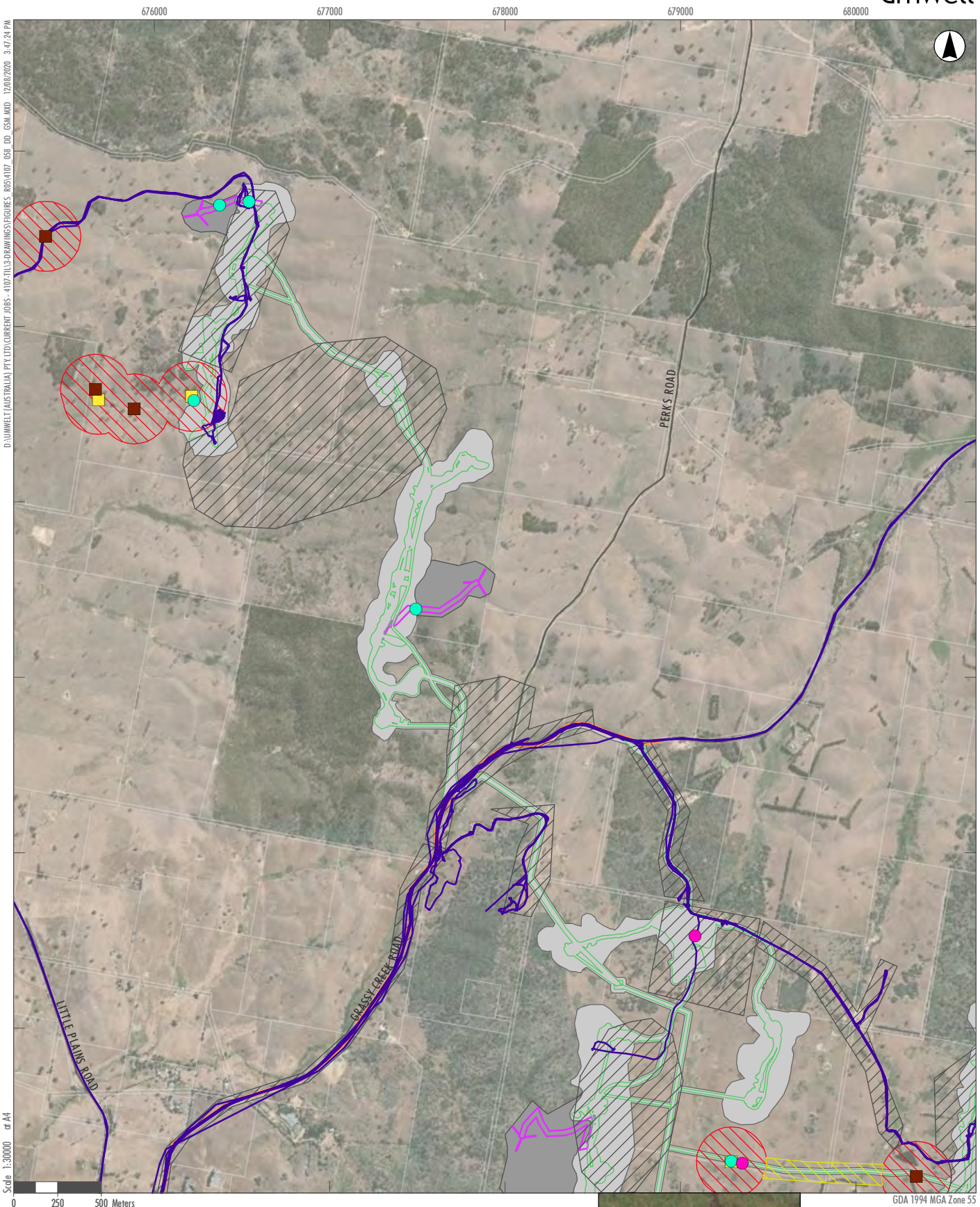
Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)

FIGURE 3.6.q

Species Credit Species Polygons

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Umwelt (2020); Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)

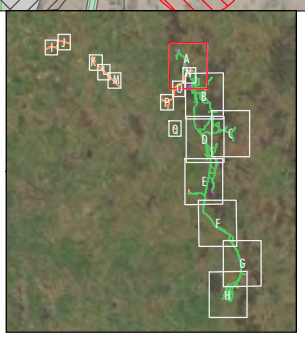
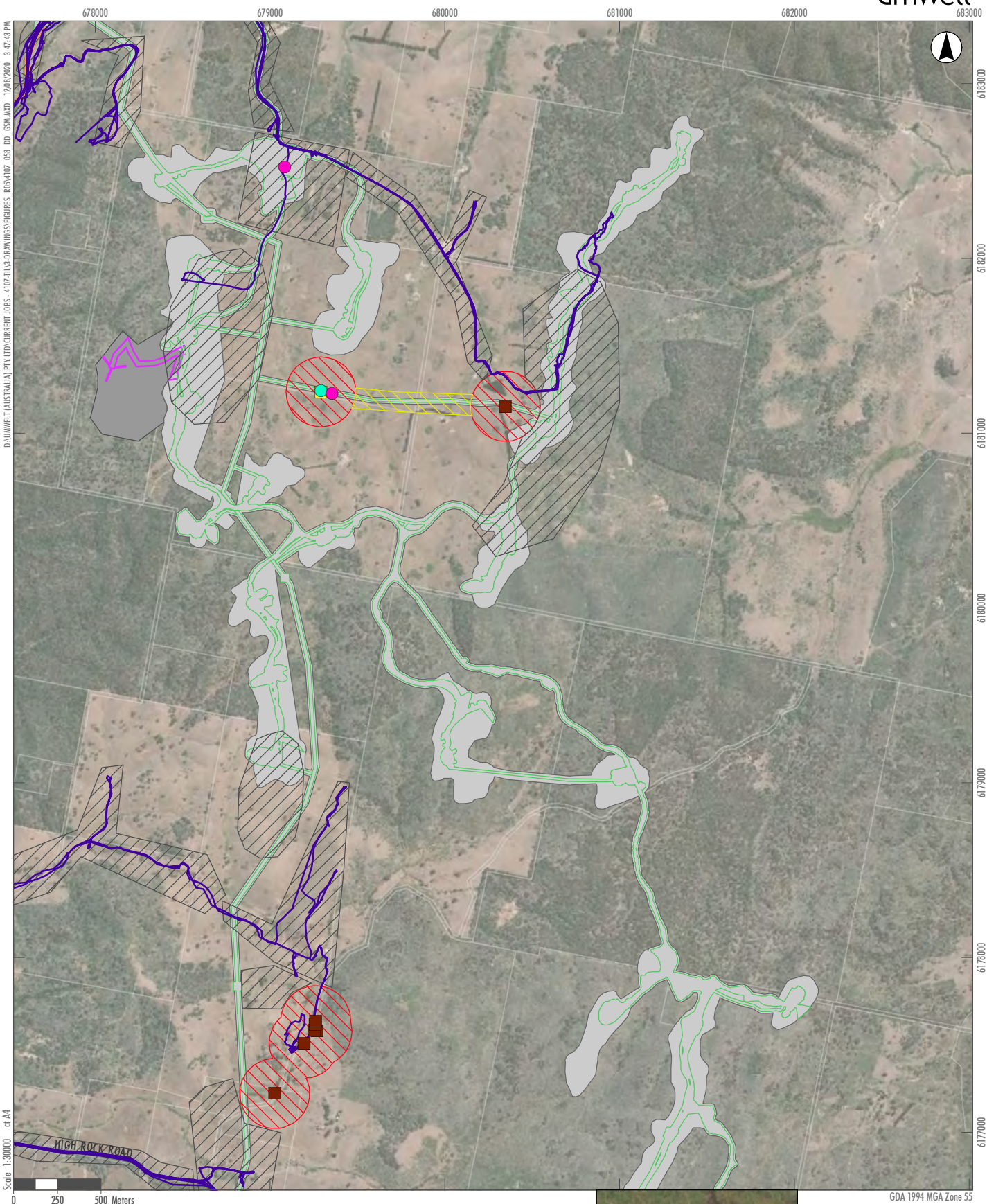


FIGURE 3.7.a

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)

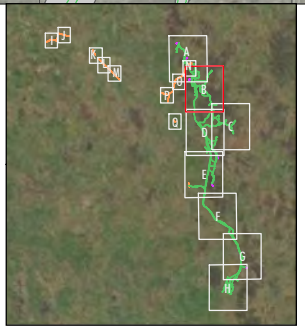
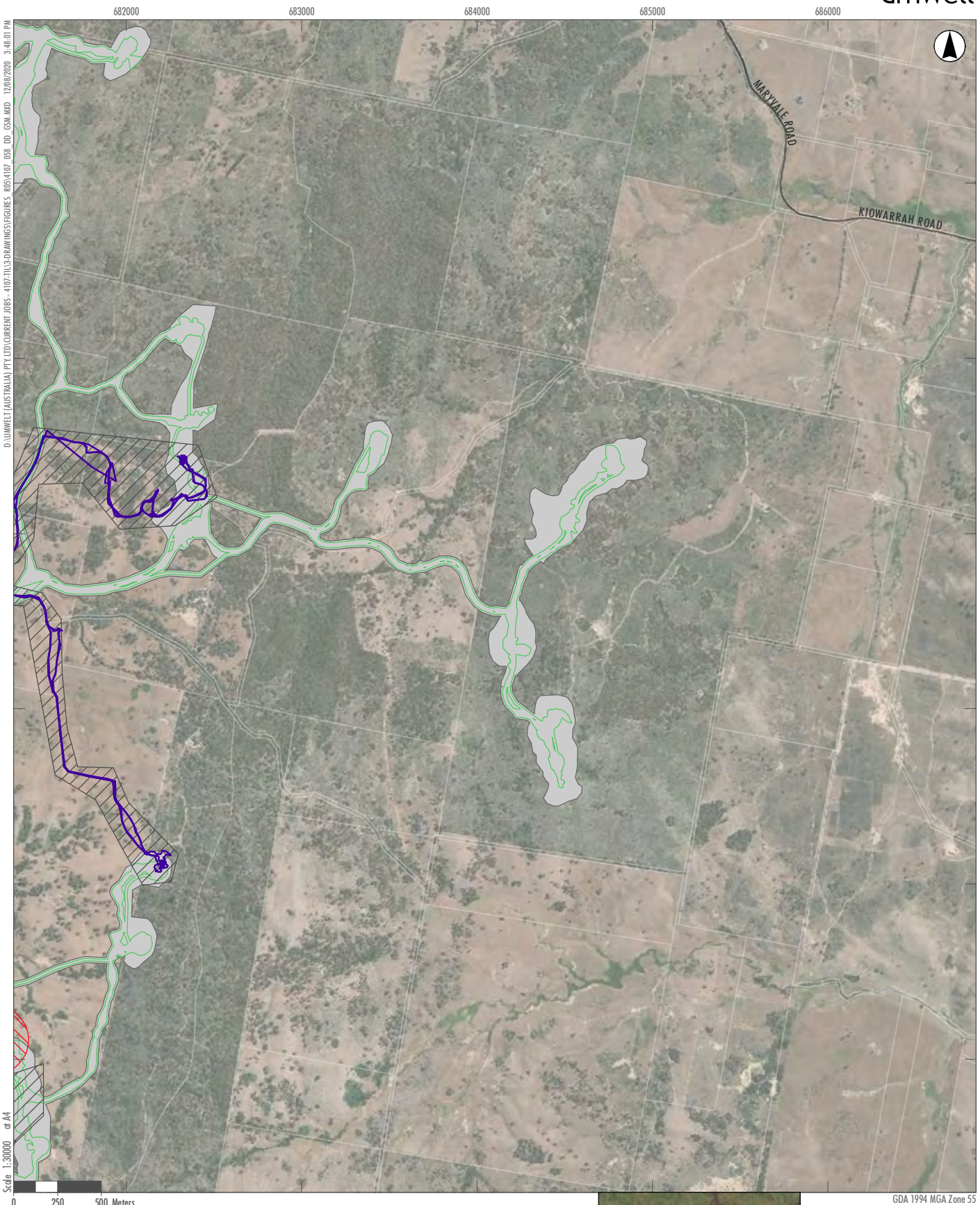


FIGURE 3.7.b

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record 200m Buffer

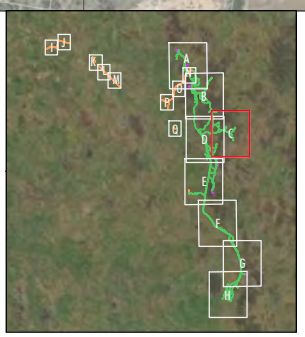
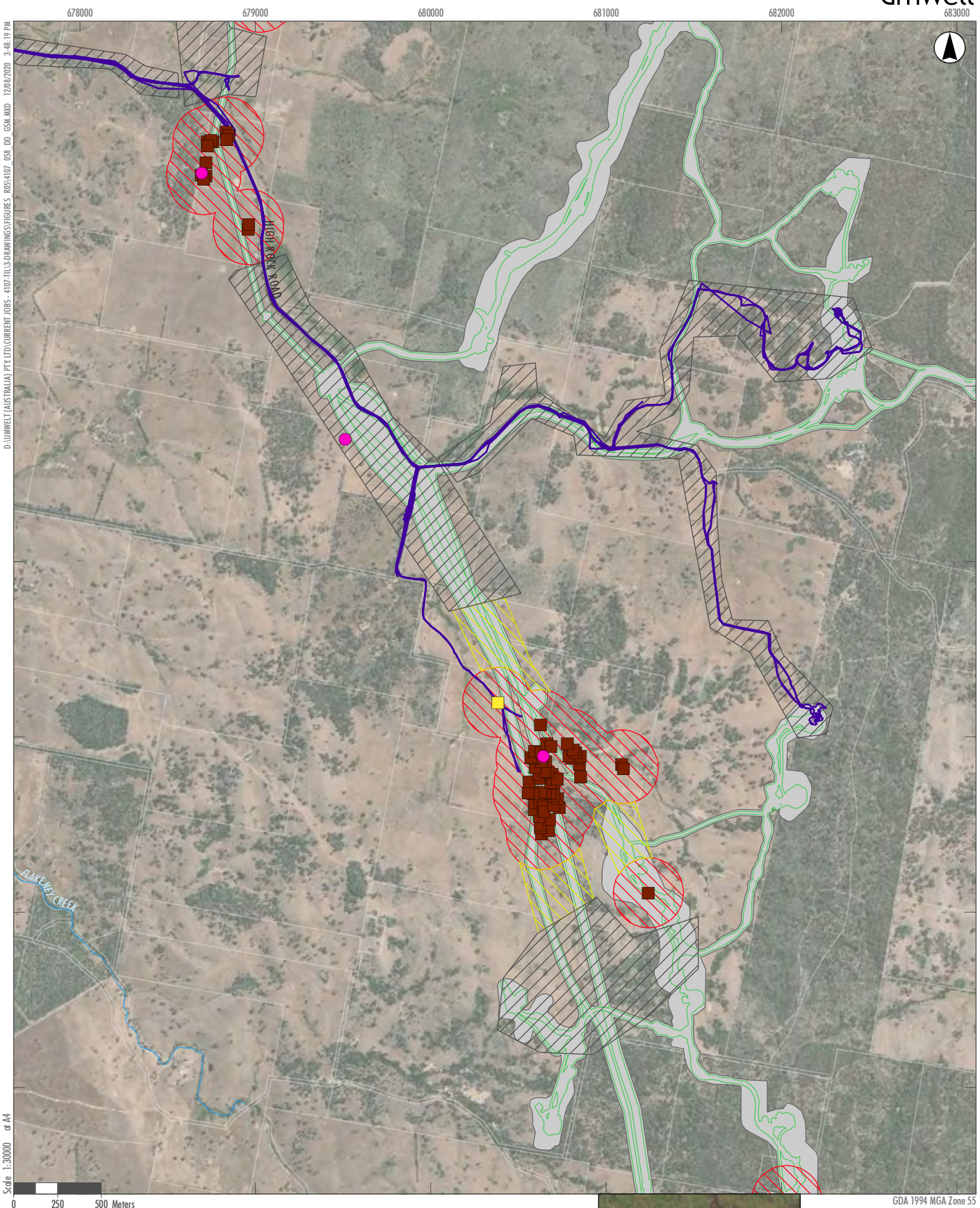


FIGURE 3.7.c

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (NGH)

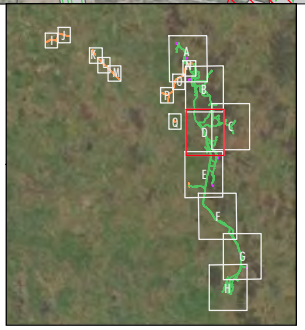
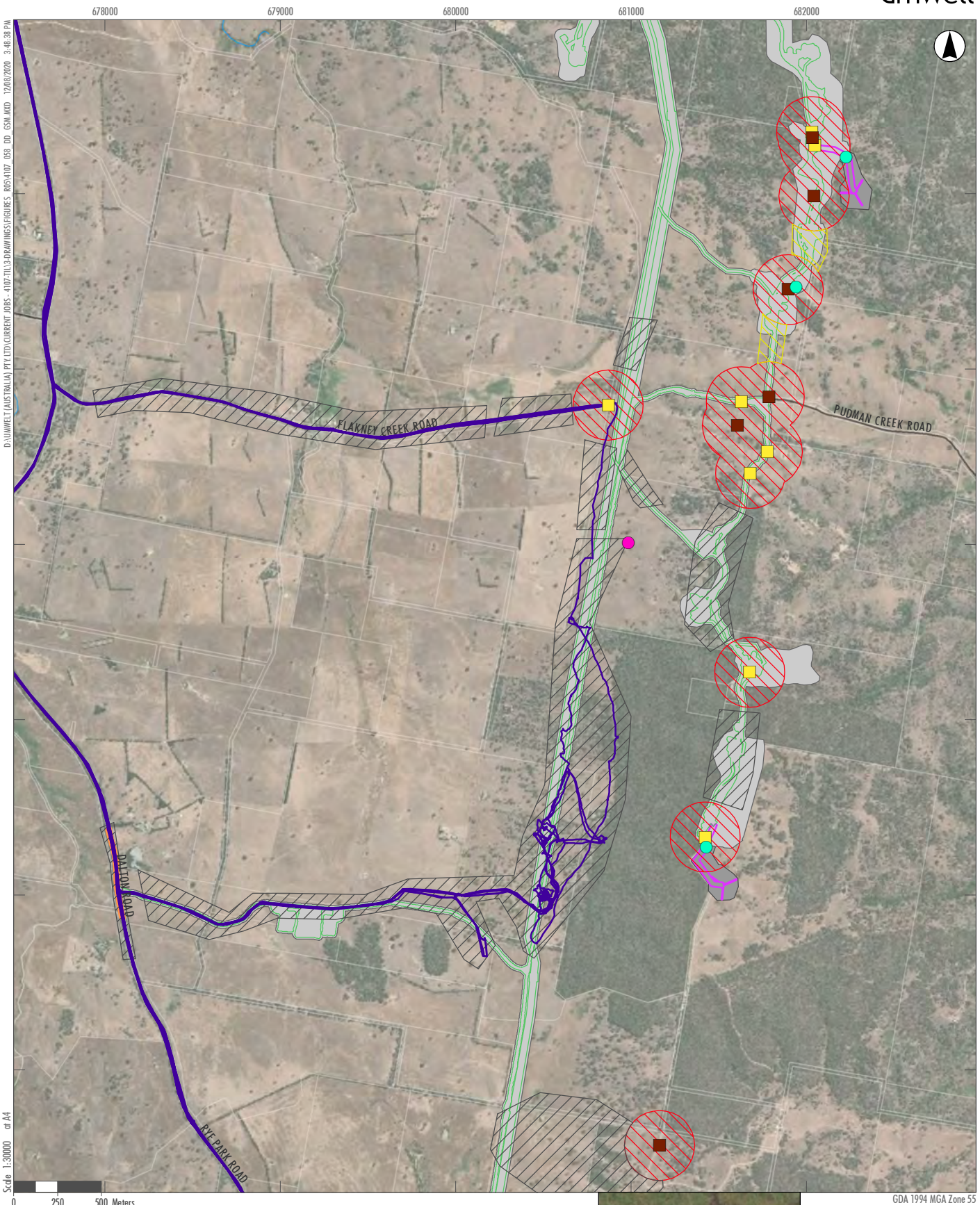


FIGURE 3.7.d

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)

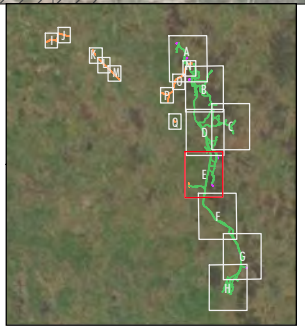
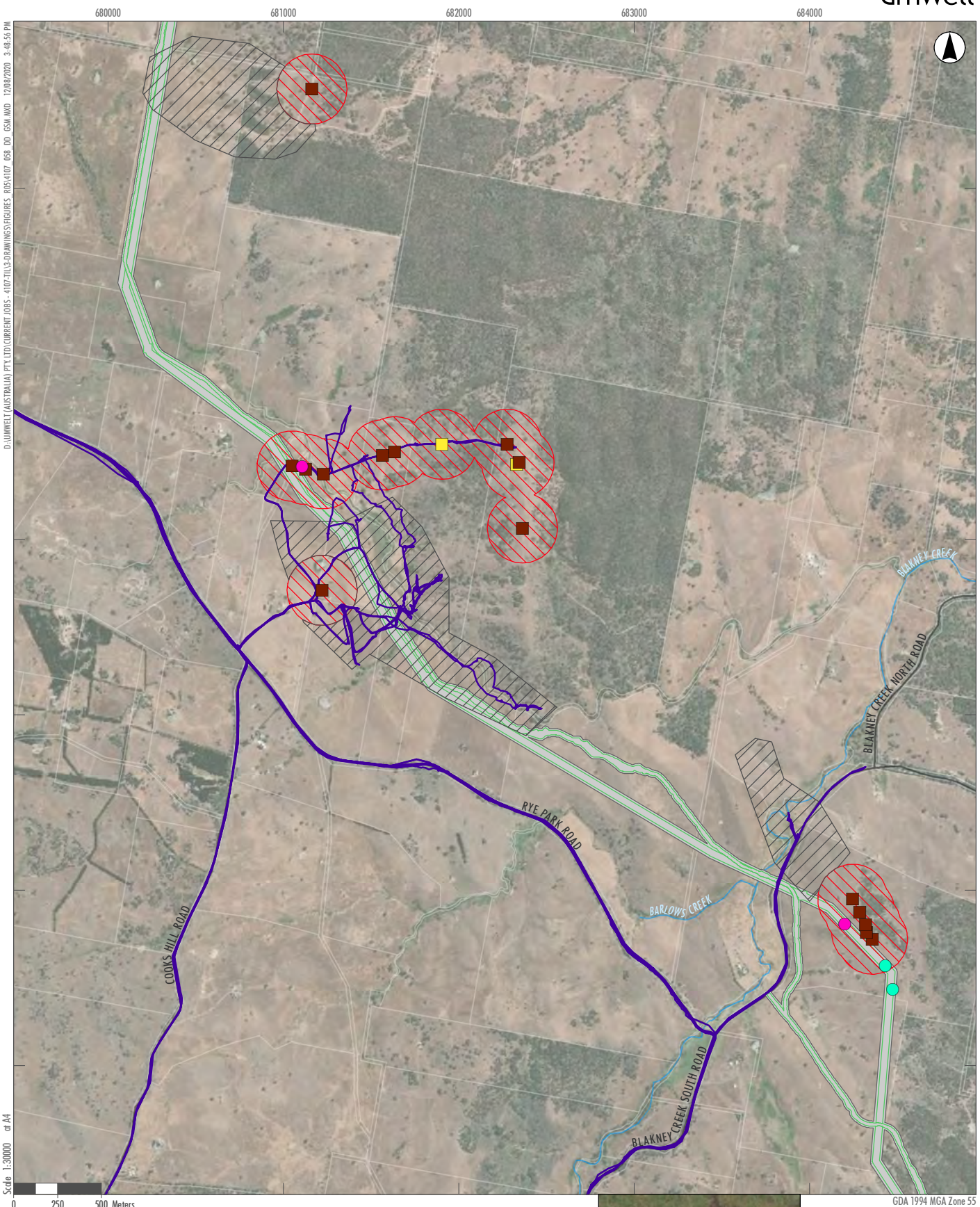


FIGURE 3.7.e

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)

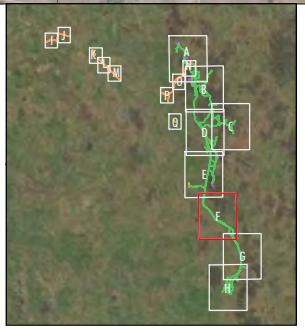
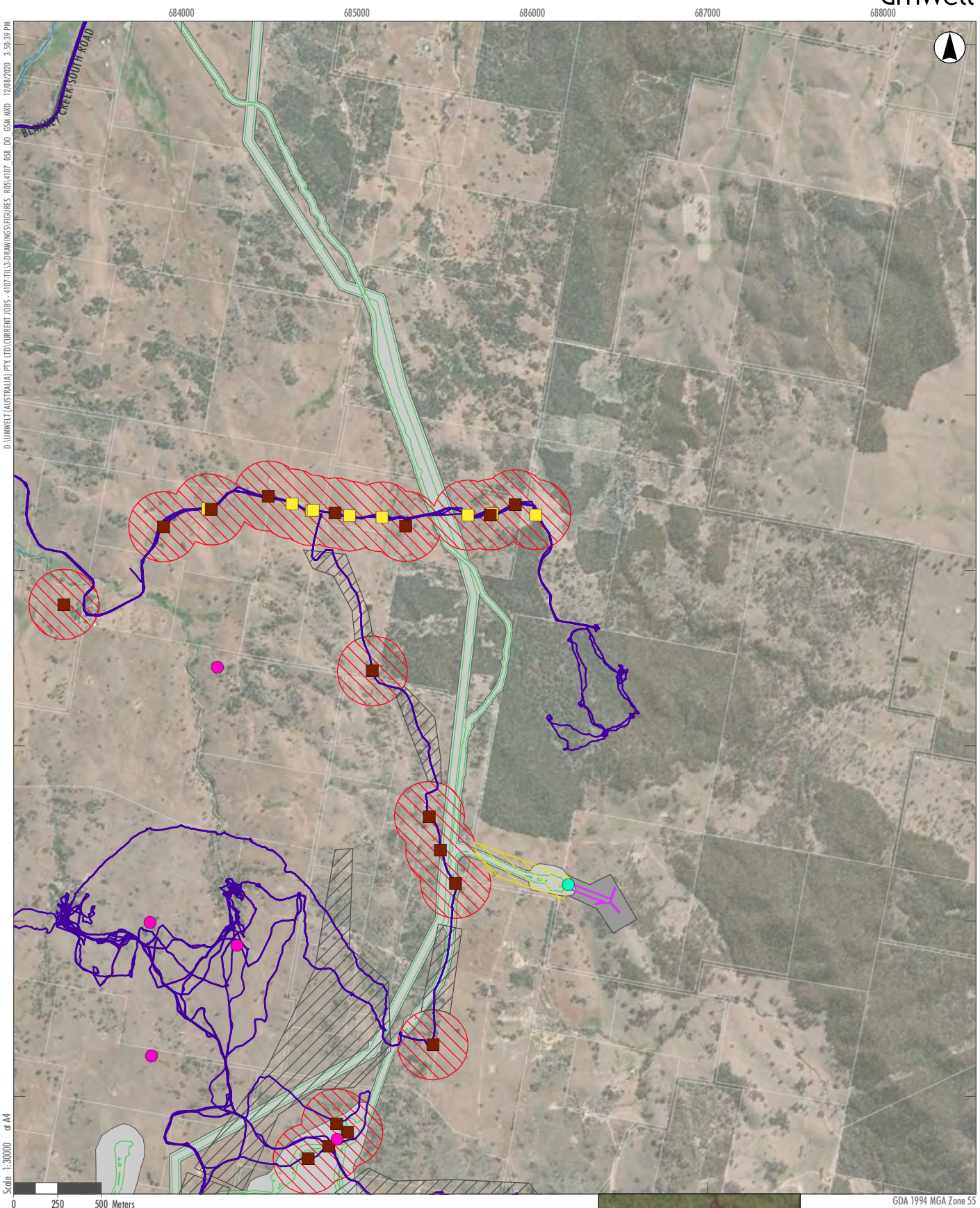


FIGURE 3.7.f

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)

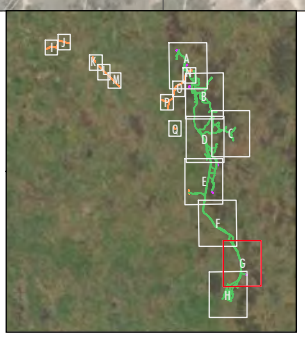
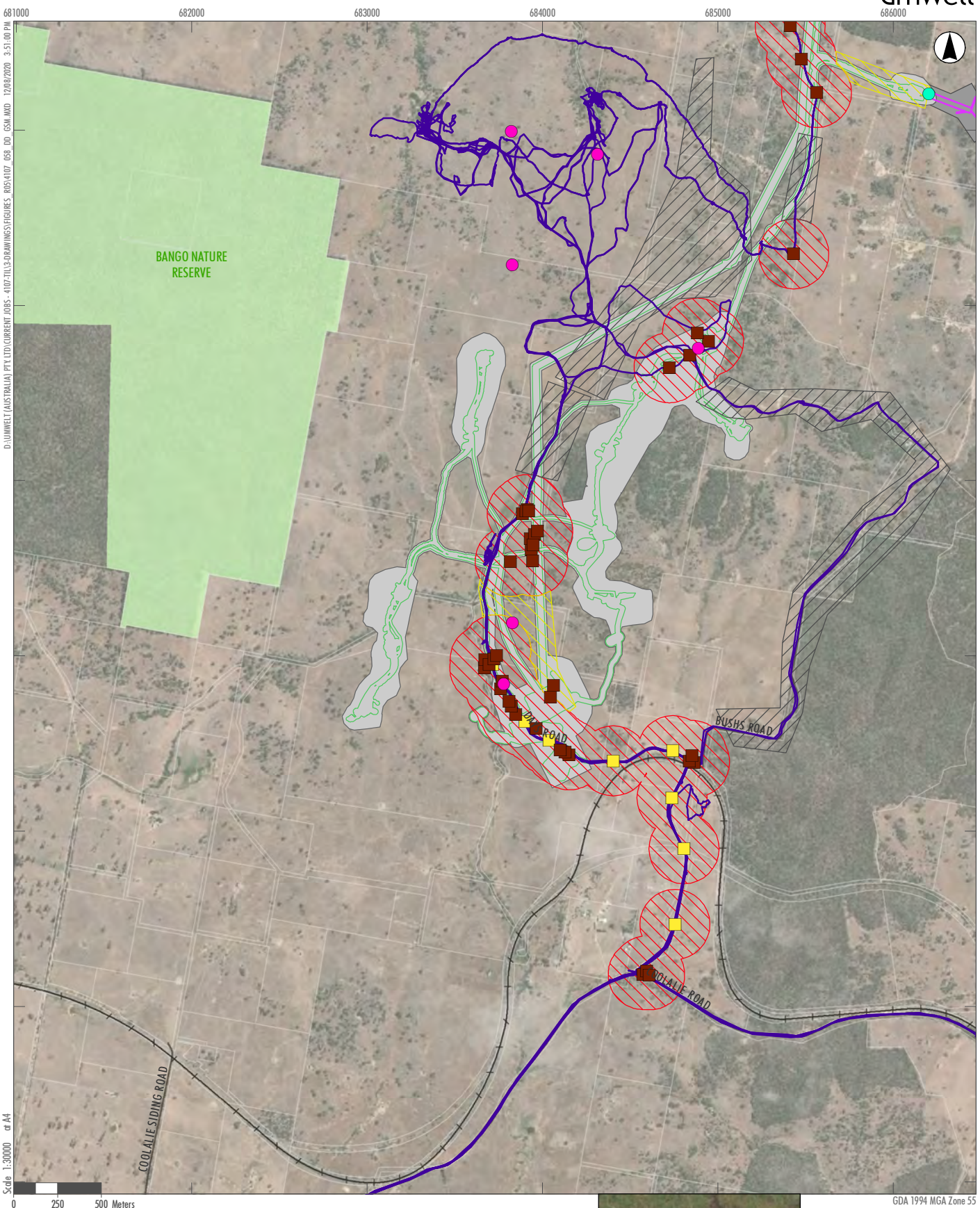


FIGURE 3.7.g

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Development Corridor - Permanent Met Masts
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - Permanent Met Masts
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)
- Golden Sun Moth Record (Umwelt)
- Golden Sun Moth Record (NGH)
- Golden Sun Moth Record 200m Buffer
- Habitat Extension
- Golden Sun Moth Habitat Transects (Umwelt)
- Golden Sun Moth Habitat Transects (NGH)
- Nature Reserves

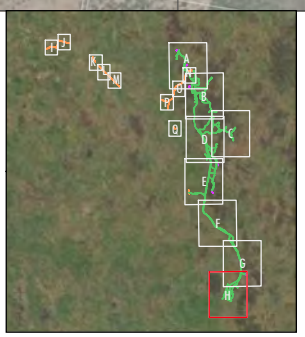


FIGURE 3.7.h

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

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Scale 1:10000 at A4

Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

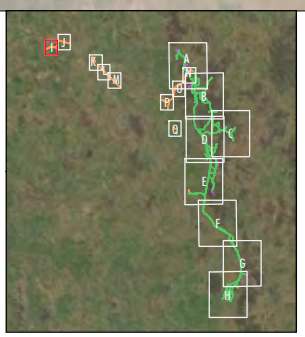


FIGURE 3.7.i

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

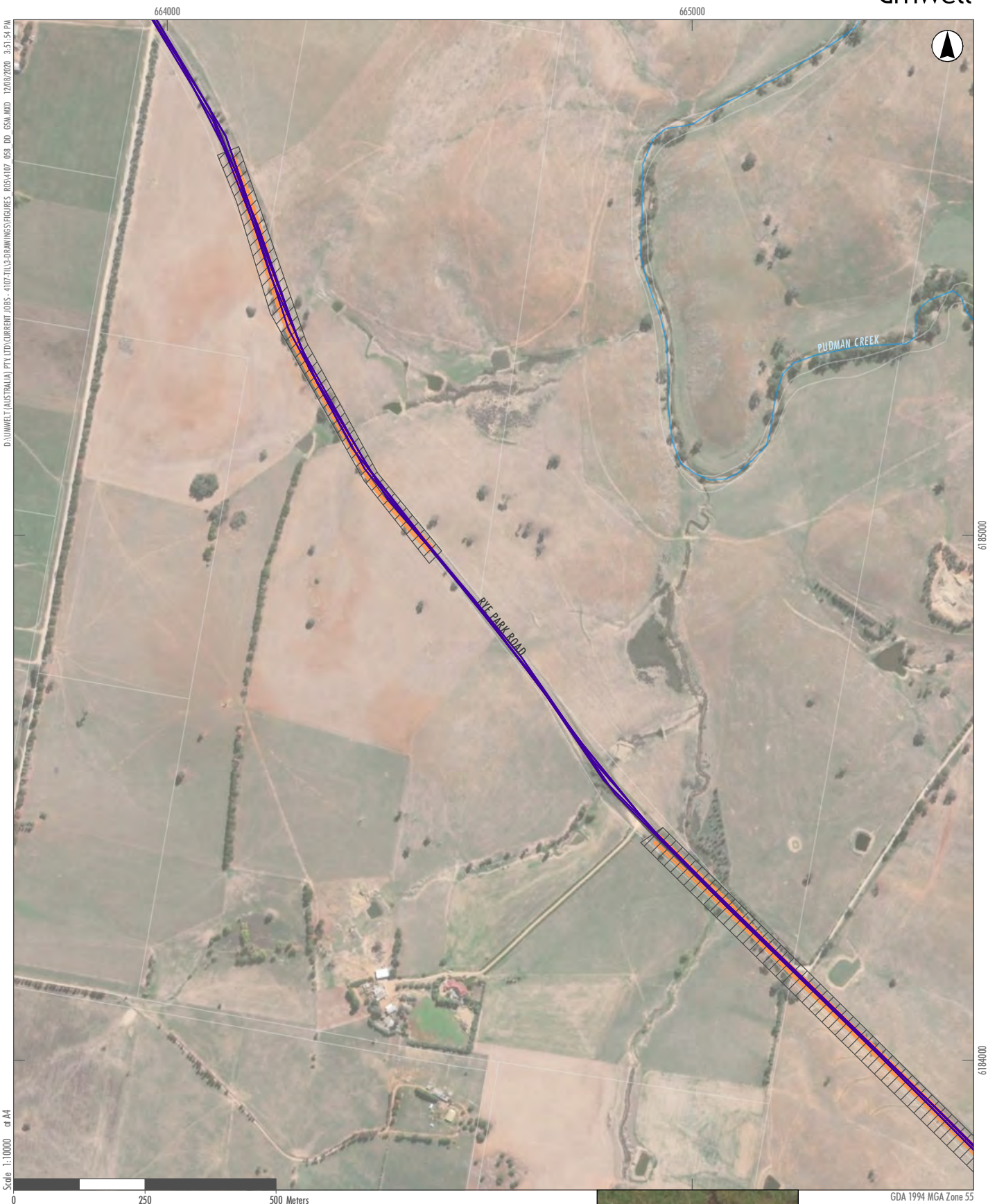
Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

FIGURE 3.7.j

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

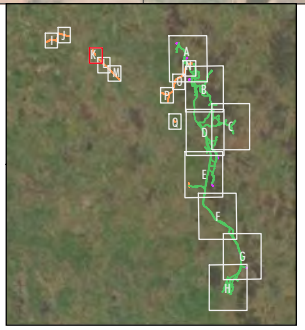


FIGURE 3.7.k

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

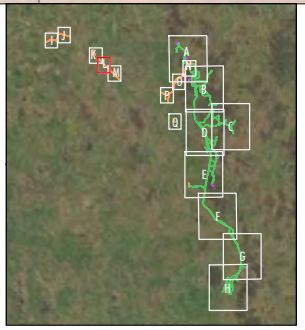


FIGURE 3.7.I

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

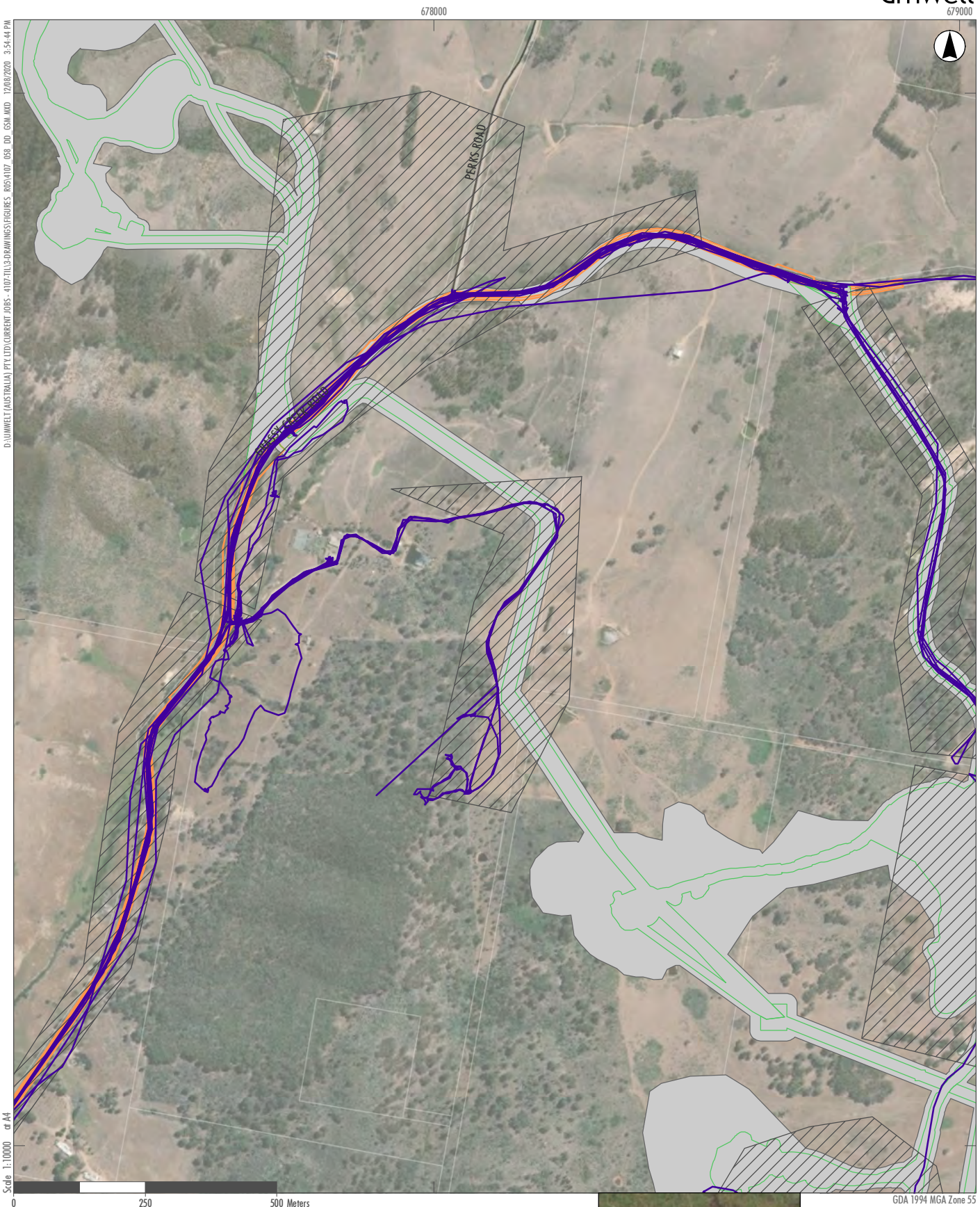
Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

FIGURE 3.7.m

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Development Corridor - Wind Farm
- Indicative Development Footprint - Wind Farm
- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

FIGURE 3.7.n

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

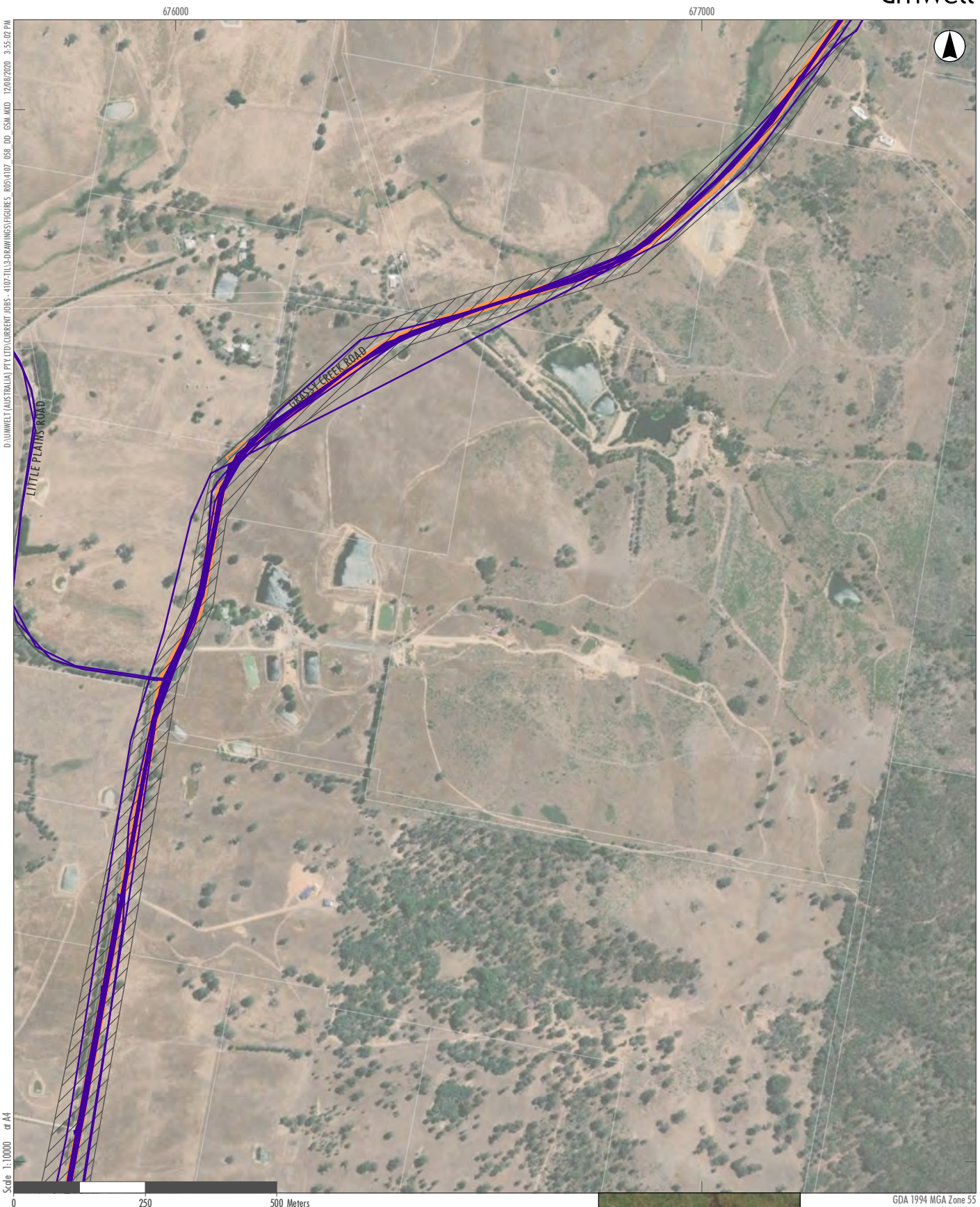
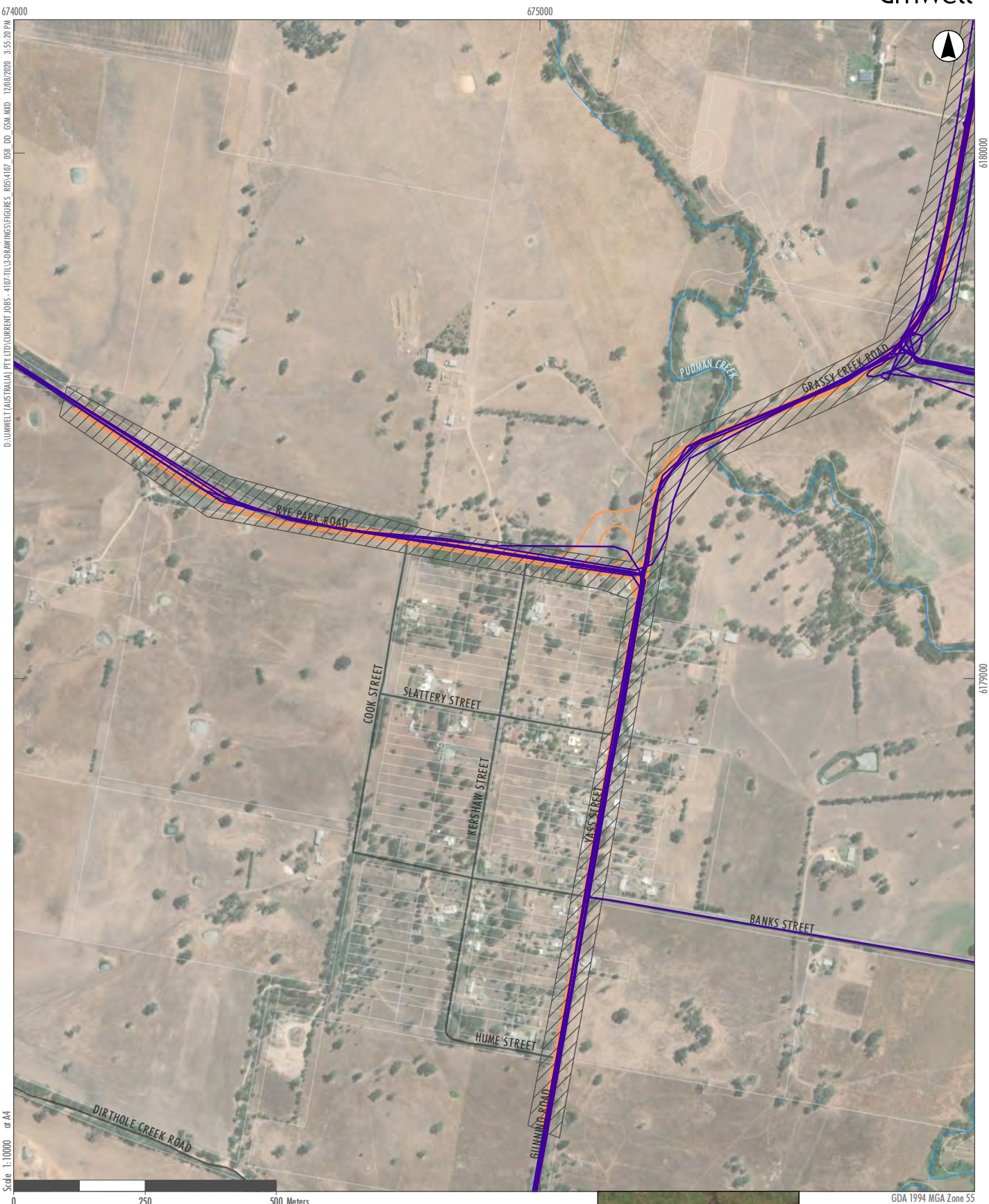


FIGURE 3.7.o

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Scale 1:10000 at A4

Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

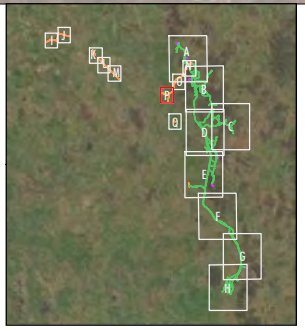
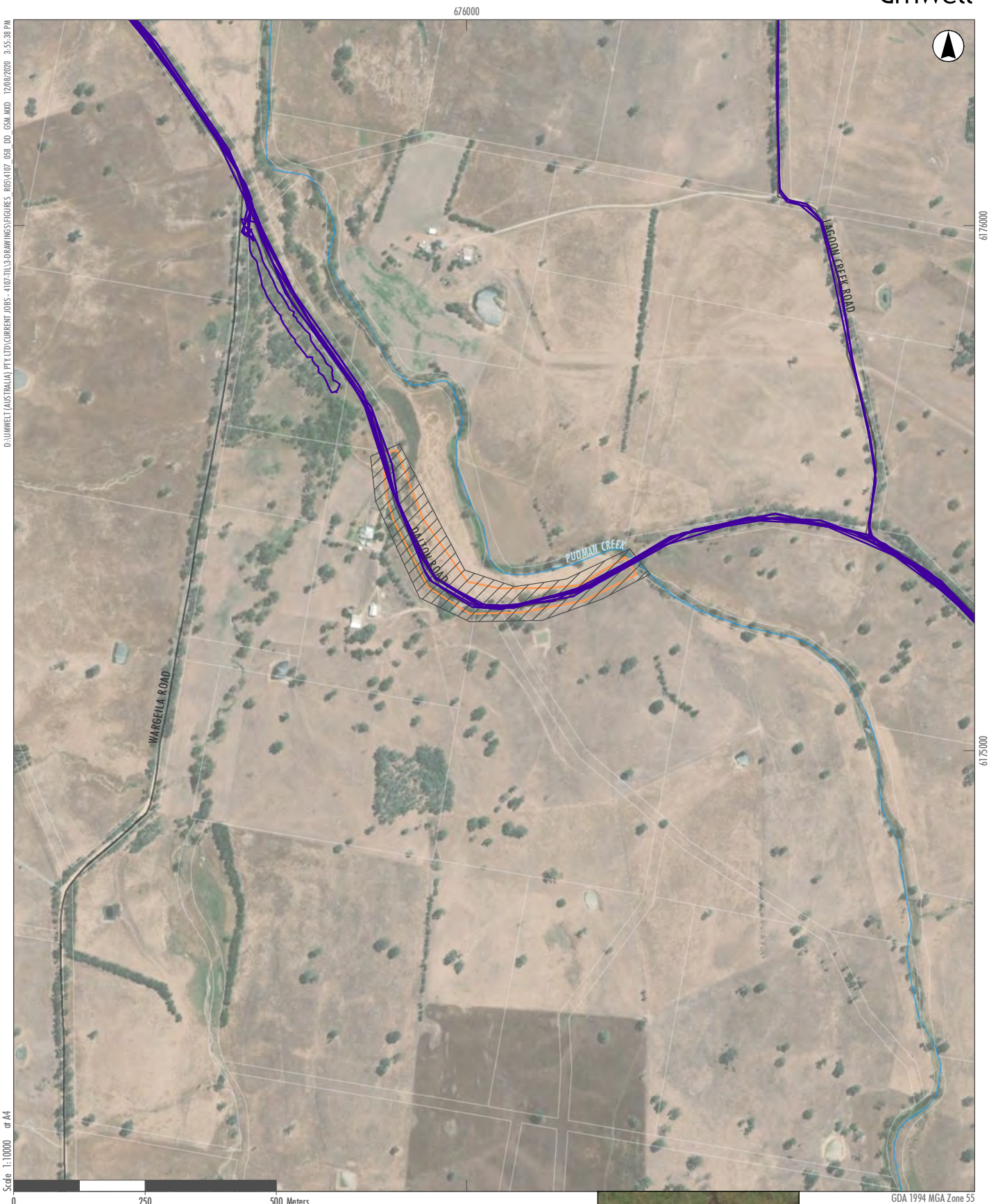


FIGURE 3.7.p

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)



Legend

- Indicative Development Footprint - External Roads
- Seasonally Suitable Golden Sun Moth Survey Tracks (Umwelt)
- Areas Surveyed for Golden Sun Moth - No Records (Umwelt and NGH)

FIGURE 3.7.q

Golden Sun Moth Detailed Analysis

Image Source: ESRI Basemap (2020) Data source: Geoscience Australia; Rye Park Renewable Energy Pty Ltd (2020)

4 Avoidance and Minimisation of Impacts

4.1 Avoidance and Minimisation of Native Vegetation and Habitat

The Project has undergone substantial changes in design since consideration began in 2011, many of which have been the result of specific avoidance measures as identified in Table 8.3 of the Biodiversity Assessment (NGH 2014). Since RPRE took ownership of the project in 2017, they have made additional changes to the project design with a focus on avoiding impacts to native vegetation and habitat where possible. A summary of these avoidance measures is provided below in **Table 4.1**.

We note that RPRE received written communication from BCD in regard to the project (BCD 2020d). Attachment 1 of this document presented BCD's preference of the hierarchy of avoidance for the Project. Unfortunately due to the timing in which it was provided, it was unable to be adequately considered and employed during the modification design changes to the Project. RPRE is committed to implementing the hierarchy of avoidance measures through the final design phase of the Indicative Development Footprints. It is expected that additional avoidance of Box Gum Woodland (BC Act and EPBC Act), superb parrot habitat and hollow bearing trees will be possible for the project, particularly in regard to the finalisation of the Indicative Development Footprint – External Roads. In doing so, RPRE will seek to prioritise avoidance in minimisations in those areas of concern for BCD (2020).

Despite this document not being available through the modification design phase of the Project, and despite the overall footprint of the Project being increased, the avoidance measures detailed below in **Table 4.1** are of significance for the Project. Key areas of Box Gum Woodland TECs (BC Act and EPBC Act), key threatened species habitat for squirrel glider, superb parrot, and golden sun moth, as well as intact patches of PCT 351 have all been avoided by the Project. Furthermore, through assistance from Umwelt, RPRE will continue to seek additional avoidance of these biodiversity values through finalisation of the detailed design once a turbine and preferred contractor(s) is selected.

Table 4.1 Summary of Avoidance Measures

Measure	Outcome
Reduction in number of wind turbines from 92 to 80 (12 less)	• Turbines 6, 35, 38, 52, 53, 56, 77, 102, 103 104, 140 and 149 have been removed. • The 12 turbines being removed occur across the length of the Indicative Development Footprints (north, central and south). • These design modifications **avoid approximately 47.64 hectares** of native vegetation of PCT351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion.
Reduction in number of operation and maintenance facilities, from two to one (reduction of one)	• Removal of operational buildings along Flakney Creek Road **avoids** more than **1 hectare** of native vegetation which is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. The removal of the Flakney Creek Road operational buildings also **avoids** more than **1 hectare** of known habitat for golden sun moth (*Synemon plana*), listed as endangered under the BC Act and critically endangered under the EPBC Act.

Measure	Outcome
Reduction in number of substations, from three to one (reduction of two)	• Removal of substation in the north of the Indicative Development Footprints, near Grassy Creek Road, **avoids** a small area (<1 hectare) of **suitable habitat for striped legless lizard**. • Removal of substation in the north of the Indicative Development Footprints, near High Rock Road, **avoids** a stretch of High Rock Road that is known to support stands of native woodland which is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. Less than **1 hectare** of this vegetation has been **avoided**. This also comprises **hollow bearing trees** providing suitable habitat for **superb parrot**. • Removal of a substation along Flakney Creek Road **avoids** more than **1 hectare** of native vegetation which is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. • The removal of the Flakney Creek Road substation also **avoids** more than **1 hectare** of known habitat for golden sun moth (*Synemon plana*), listed as endangered under the BC Act and critically endangered under the EPBC Act.
Changes to the internal access track and cabling network • The detailed design for the Project has resulted in numerous changes to the internal network of access tracks and cabling (underground and aboveground).	• Decrease in total length of internal access tracks (89,060 m compared with 103,400 m). • Decrease in total length of underground cabling length (60,324 m compared with 82,350 m). • A significant component of this modification includes the re-design of a large section of internal access tracks, cabling network and transmission line route along approximately 4 km of a ridgeline north of Blakney Creek South Road. • This redesign **avoids** a new fragmentation corridor within remnant forest along approximately **4 km**, along a ridgeline north of Blakney Creek Road. • This **avoids** approximately **260 hectares** of PCT351 Brittle Gum - Broad-leaved Peppermint - Red Stringybark open forest in the north-western part (Yass to Orange) of the South Eastern Highlands Bioregion. • Detailed design of the transmission line route has **avoided** a stretch of High Rock Road that is known to support stands of native woodland which is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. Approximately **4.5 hectares** of this vegetation has been **avoided**. This also comprises approximately **9 hollow bearing trees** providing suitable habitat for **superb parrot**. These ecological values are avoided through RPRE moving the transmission line easement into non-native vegetation (pasture) of the adjoining private property. • Approximately **11 hectares** of native woodland which is likely to have aligned with the **Box Gum Woodland TEC** under the BC Act and/or EPBC Act is being avoided by an internal access track south of Turbine 69.
Selection of Preferred Transport Route	• RPRE discontinued a southern transport route, which extended north from the Hume Highway, through the township of Jerrawa before entering the southern tip of the Indicative Development Footprints. Preliminary mapping of this section of the transport route indicates this **avoids** approximately **10 hectares** of native vegetation, of which approximately **5 hectares** is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. • The removal of the southern transport route also **avoids** a known population of hoary sunray (*Leucochrysum albicans* var. *tricolor*), an endangered species under the EPBC Act.

Measure	Outcome
	• The removal of the southern transport route also **avoids** approximately **2 hectares** of known habitat for golden sun moth (*Synemon plana*), listed as endangered under the BC Act and critically endangered under the EPBC Act. • RPRE discontinued a central transport route option, which extended east from Dalton Road, along Flakney Creek Road. Preliminary mapping of this section of the transport route indicates this **avoids** more than **1 hectare** of native vegetation which is likely to have aligned with the Box Gum Woodland TEC under the BC Act and/or EPBC Act. • The removal of the central transport route also **avoids** more than **1 hectare** of known habitat for golden sun moth (*Synemon plana*), listed as endangered under the BC Act and critically endangered under the EPBC Act. • Through consultation with BCD and Hilltops Council LGA, RPRE have successfully modified their preliminary design for the external transport routes. This results in a reduction in the width of the road upgrades that are required, this in turn reduces the impacts to native vegetation within the road reserves. • The detailed design also removed the need to upgrade approximately 12 km of Dalton Road, Rye Park Road and Blakney Creek South Road. This avoidance measure **avoids** approximately **14 hectares** of Box Gum Woodland TEC under the BC Act and/or EPBC Act, **14 hectares** of superb parrot habitat (breeding and foraging) including **223 hollow bearing trees** suitable for superb parrot, and **30 hectares** of habitat for squirrel glider

4.2 Avoidance of Prescribed Impacts

The following impacts are considered 'prescribed impacts' under the BC Regulation:

- impacts on the habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other geological features of significance, rocks, human-made structures or non-native vegetation
- impacts on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range
- impacts on movement of threatened species that maintains their life cycle
- impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities
- impacts of wind turbine strikes on protected animals
- impacts of vehicle strikes on threatened species or on animals that are part of a TEC.

As outlined in **Section 4.1** above, RPRE sought to avoid and minimise the potential impacts on a variety of ecological values of the Project primarily through the careful selection of the disturbance area and detailed design of the Project. RPRE have sought to locate and design the Indicative Development Footprints within existing disturbed areas wherever possible. However, it is acknowledged that substantial areas of the ridgeline where the Project is located supports remnant patches of forest, while the lower slopes and valley floor supports TEC and threatened species habitat.

Further detail on the assessment of prescribed impacts is presented in **Section 5.3**.

4.3 Mitigation Measures

Indicative Development Footprints will be finalised once turbine and contractor(s) are selected by RPRE. In doing so, RPRE will seek to further minimise impacts to biodiversity values. Furthermore, a comprehensive biodiversity mitigation strategy to mitigate the unavoidable impacts of the Project will be prepared and implemented. These measures will be designed and described within the Biodiversity Management Plan (BMP), Bird and Bat Adaptive Management Plan (BBAMP) and Roadside Vegetation Management Plan (RVMP) that will be prepared as per the existing Consent Conditions (**Sections 1.1.2**) for the Project.

While these management plans have not yet been finalised, the following control measures are considered integral to the mitigation of impacts on the biodiversity features of the Indicative Development Footprints and surrounds and are likely to form part of the final management plans. Remaining consistent with the Biodiversity Assessment and Biodiversity Assessment Addendum (NGH Environmental 2014 and 2016a) mitigation measures will include:

- demarcation of approved clearance boundaries
- avoid removal of hollow-bearing trees and termite mounds wherever possible
- implementation of pre-clearance surveys for key fauna habitat (i.e. hollow-bearing trees, termite mounds, large hollow locks, rock piles, large stick nests) to limit impacts to fauna species
- where possible, salvage key fauna habitat from within the Indicative Development Footprints
- rehabilitation and revegetating temporary disturbance areas, include collecting and propagating seeds from the disturbance areas where possible
- scavenger trials and carcass surveys beneath turbine locations
- prioritisation of lopping tree branches that do not contain hollows or nests
- installation of artificial nest boxes (where relevant)
- weed management
- farm animal control
- pest animal control
- fencing and access control
- bushfire management.

Where relevant, the above mitigation measures will be implemented as per the state and federal development consent conditions (DPE 2017 and DoEE 2017). This is particularly applicable for avoiding the removal of hollow bearing trees and termite mounds.

Appropriate environmental management measures will be undertaken as part of the operations to minimise the potential for indirect impacts, including:

- water management systems that seek to minimise the potential for damage to flora and fauna habitats from erosion and unnatural flooding events
- erosion and sedimentation control
- noise control systems
- traffic control and speed limits
- dust control measures
- lighting controls, including the use of red lights atop the turbines to avoid attracting insects, birds and bats.

Each of these control measures will contribute to the maintenance of habitat quality adjacent to the final Development Footprint.

Table 4.2 below summarises the preliminary mitigation measures proposed for the Project including the timing, action, outcome and responsibility of these measures. It is noted that these are preliminary measures at this point in time and will be finalised through the preparation and approval of the Biodiversity Management Plan (BMP), Roadside Vegetation Management Plan (RVMP), as well as the Bird and Bat Adaptive Management Plans (BBAMP) required as part of the existing approval (refer to **Section 1.1.2**). As per the relevant approval conditions, all plans will be prepared to the satisfaction of the Secretary, and where required will be prepared in consultation with BCD.

Table 4.2 Preliminary Mitigation Measures

Measure	Timing	Proposed Techniques	Outcome	Responsibility
Demarcation of approved clearance boundaries	Prior to clearance and during clearance activities	• Establish construction fencing or nightline around areas not proposed for clearance.	• Minimisation of unnecessary and accidental impacts to surrounding vegetation and habitats.	• Site Supervisor
Development of a works schedule	Prior to clearance activities	• Document key breeding and/or nursing periods for threatened species known or with high potential to occur in clearing areas. Avoid works causing high disturbance (i.e. vegetation clearing) during these periods where possible.	• Minimisation of impacts to threatened species during critical life cycle events.	• Project Manager • Site Environmental Officer
Installation of Safe Fish Passageway	Prior, during and following clearance activities	• Ensure any construction within or adjacent to Blakney Creek includes detailed design to avoid impacts to Southern Pygmy Perch. • As per Section 3.2.2 of DPI's policy and guidelines for fish habitat conservation and management, Blakney Creek is likely to meet the definition of Class 1 or Class 2 (DPI 2013). • As per Section 4.2 of DPI's policy and guidelines for fish habitat conservation and management, the access track crossing Blakney Creek require a bridge, arch structure, tunnel, culvert or ford to avoid impacts to the Southern Pygmy Perch (DPI 2013).	• Avoidance of impacts to Southern Pygmy Perch.	• Site Environmental Officer • Site Supervisor

Measure	Timing	Proposed Techniques	Outcome	Responsibility
Pre-clearance surveys for key fauna habitat	Prior to clearance and during clearance activities	• Inspect remnant patches of vegetation (woodland and forests) within final development footprint prior to clearance. • Mark up key fauna habitat (e.g. hollow-bearing trees, hollow logs), to be cleared under the supervision of an ecologist of site environmental officer to capture and release fauna	• Minimise additional impacts to fauna species	• Site Environmental Officer
Salvage key fauna habitat	During clearance activities	• Where key fauna habitat (e.g. hollow bearing trees, hollow logs) occurs in the final Development Footprint but is not required to be impacted through construction work, if possible leave as is • If it needs to be cleared, move into adjacent vegetation	• Minimise additional impacts to fauna species • Minimise the clearance of fauna habitat	• Site Environmental Officer
Salvage key fauna habitat – transmission line easements	During clearance activities	• Where key fauna habitat (e.g. hollow bearing trees, hollow logs) occurs in the final Development Footprint but is not required to be impacted through construction work, if possible leave as is • If it needs to be cleared, move into adjacent vegetation • Allow regeneration of canopy and mid-storey flora species to a height permissible underneath the transmission line • Avoid the mulching of fallen vegetation to avoid smothering of ground-layer flora species	• Minimise additional impacts to fauna species • Minimise the clearance of fauna habitat • Facilitate the maintenance of biodiversity values within the easements	• Site Environmental Officer

Measure	Timing	Proposed Techniques	Outcome	Responsibility
Rehabilitation and revegetating temporary disturbance areas	Proceeding clearance activities	• Revegetate areas of temporary disturbance with previously collected native grasses, prioritising the use of wallaby grasses (*Rytidosperma* spp.) and spear grasses (*Austrostipa* spp.).	• Speeds up the recovery of the land • Secures the stability of the site • Reduces risk of erosion • Reduces risk of weed species taking control • Facilitates future use of the areas by the golden sun moth	• Project Manager
Weed management	Construction and operation	• Chemical and physical removal of invasive weed species in accordance with the *New South Wales Control Handbook* (DPI 2018) • Appropriate vehicle and machinery washing • Avoid inadvertent damage or impacts to native species be ensuring all personnel are competent and experienced in the identification of native flora species	• Minimisation of environmental and noxious weeds in the final Development Footprint • Minimisation of weed spread from and into the wider locality	• Project Manager • Site Environmental Officer

Measure	Timing	Proposed Techniques	Outcome	Responsibility
Weed management – Transmission Line Easements	Construction and operation of the transmission line easements	• Chemical and physical removal of invasive weed species in accordance with the *New South Wales Control Handbook* (DPI 2018) • Appropriate vehicle and machinery washing • Avoid inadvertent damage or impacts to native species be ensuring all personnel are competent and experienced in the identification of native flora species	• Minimisation of environmental and noxious weeds in the transmission line easements • Facilitate the maintenance of biodiversity values within the easements • Prevent out competition of native flora species by introduced flora species • Minimisation of weed spread from and into the wider locality	• Project Manager • Site Environmental Officer
Pest animal control	Operation	• Regular passive monitoring to be undertaken to assess the level of impact by feral animals. This may include incidental observations by RPRE employees, contractors as well as existing landholders. • If an increase in existing species of feral animals, or new species of feral animals are observed within the Project, control works should be undertaken as required to provide for the suppression of feral animals.	• Minimise potential for pest animals in the final Development Footprint and the locality. • Minimise potential impacts to native fauna species from out-competition and/or preying of pest or feral animal species.	• Project Manager

Measure	Timing	Proposed Techniques	Outcome	Responsibility
Fencing and access control	Construction and operation	• Where possible, fencing will not include barbed wire on the top line of the fence.	• Provides for access control to avoid unwanted human interference and disturbance to non-operational areas. • Minimisation of impacts to native fauna species from the use of barbed-wire fences.	• Project Manager • Site Supervisor
Bushfire management	Construction and operation	• Bushfire management will consider asset protections and the consideration of the sensitivities of threatened species and threatened ecological communities.	• Protect life and property, while supporting appropriate conditions for the existing ecological features.	• Project Manager • Site Environmental Officer

It is not considered likely that any of these measures have a risk of failure if implemented correctly during the periods specified, or that significant residual impacts are likely to occur. The consequences of potential residual impacts (i.e. minor changes to habitat quality in surrounding areas) are considered to be low, due to the existing disturbed nature of the Development Corridors through historic and current land management practices.

Further detail on the management strategies which are proposed for the BMP and BBAMP is provided in **Table 4.3.** Umwelt note that these methods and measures are preliminary in nature, and the final BMP and BBAMP will be subject to potential changes in the information provided below.

Table 4.3 Preliminary Methods and Actions for BMP and BBAMP

Feature	BMP	BBAMP
Baseline data	The BMP will utilise the following data: • Key findings of initial Biodiversity Assessment (NGH Environmental 2014) • Baseline flora and fauna surveys conducted by Umwelt between 2017 -2019.	The BBAMP will utilise the following data: • Key findings of the pre-approval (NGH Environmental 2013) • Baseline bird and bat surveys conducted by Umwelt during 2018/19.
Seasonal changes	The timing of monitoring and management components will be defined in the BMP based on known appropriate seasonal conditions specified by the BAM for the flora and fauna entities being addressed.	The timing of monitoring and management components will be defined in the BBAMP, with increased occurrence of some components to coincide with known seasonal peaks in numbers of key species covered by the BBAMP.
Monitoring methods	Ecological monitoring program to be developed which identifies at a minimum: • site vegetation condition • presence of threatened species • evidence of erosion • occurrences of weeds and feral fauna • human disturbance. Monitoring will inform further requirements for corrective actions to be undertaken.	• Post-construction bird and bat survey programs must match the timing, location and effort of the baseline conducted by Umwelt during 2018/19 (**Section 2.3.3**). These will allow before and after analysis of data. • Carcass searches will be undertaken in a manner which accounts for variables which affect detectability of carcasses. They will be conducted regularly, with increase in searches to coincide with peak numbers of key species known to occur in the area. The design of these searches will consider: o Frequency of searches o Number of turbines to be searched o Radius around turbines to be searched o Influence of vegetation structure within searched areas on carcass detectability o Effectiveness of human observers and dogs o Carcass removal rates by scavengers.
Trigger values	Trigger values will be defined in the BMP, and will be generated for the threatened (and significant) ecological communities, populations and species identified in **Sections 3.2** and **3.3**.	Trigger values will be defined in the BBAMP, and will be generated for the following species: • large-eared pied bat (*Chalinolobus dwyeri*)

Feature	BMP	BBAMP
		• large bent-winged bat (*Miniopterus orianae oceanensis*) • southern myotis (*Myotis macropus*) • white-striped free-tailed bat (*Tadarida australis*) • wedge-tailed eagle (*Aquila audax*) • little eagle (*Hieraaetus morphnoides*) • black falcon (*Falco subniger*) • white-throated needletail (*Hirundapus caudacutus*) • brown treecreeper (*Climacteris picumnus victoriae*) • varied sittella (*Daphoenositta chrysoptera*) • painted honeyeater (*Grantiella picta*).
Management actions	The BMP will provide detailed management actions incorporating those in **Table 4.2** and including actions specifically addressing: • disruption to connections between suitable habitat for fauna foraging • installing predator-proof fencing around remnant squirrel glider habitat • implementing an integrated feral animal monitoring and control program targeting cats and foxes. These management actions will be prepared in consultation with BCD.	Management actions will include: • carcass removal program to reduce the likelihood of raptors accessing carrion on the ground below • pest animal control • raptor perch management. These management actions will be prepared in consultation with BCD.
Measurement of impacts	The information collected during monitoring events conducted under the BMP will be used to analyse condition trends over time, to assess initial and ongoing impacts of the Project. These may be used to inform further action to be undertaken during ongoing operations to reduce the extent of indirect impacts.	The information collected during monitoring events conducted under the BBAMP will be used to analyse condition trends over time, to assess initial and ongoing impacts of the Project. These may be used to inform further action to be talking during ongoing operations to reduce the extent of indirect impacts.