JACOBS

Memorandum

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Subject	**Preliminary Traffic Impact Assessment Memo**	**Project Name**	Delburn Wind Farm
Attention	Peter Marriott	**Project No.**	IS279700
From	Renukha Nadarajah		
Date	7 August 2019		

1. Introduction

This preliminary traffic impact assessment has been prepared by Jacobs to support Delburn Wind Farm Pty Ltd Pty Ltd (DELBURN WIND FARM PTY LTD) in preparing a referral to the Minister of Planning, to determine if and Environment Effects Statement is required for the proposed Delburn Wind Farm (the Project).

The memo covers:

- Project description and key assumptions
- Identification of key potential access routes and intersections to/from the site
- Project traffic generation estimation and distribution for construction and operation phases

2. Project description

The Project will involve the construction of approximately 35 wind turbines on existing timber plantations, Darlimurla, Silver Creek and Thorpdale, in the Latrobe Valley (see Attachment A). The Project is being developed by Delburn Wind Farm Pty Ltd, which will lease the area from the timber plantation owner. It is anticipated that the wind farm will generate approximately 620,000 MWh hours of electricity per annum. The start of construction is assumed to be 2022, with wind generation commencing 12 months into construction.

The proposed development site is over the plantation land centred in the Delburn area, covering the Darlimurla, Silver Creek and Thorpdale plantations. The site is generally bounded by Coalville and Hernes Oak to the north, Thorpdale to the west, Darlimurla to the south, and Boolarra and Yinnar to the east. The township of Morwell is approximately 5km to the north-east of the development site (as measured from the outer boundaries of both the township and the project land) and the township of Moe is approximately 5km to the north.

The Strzelecki Highway (B460) is the main B-class, sealed two-lane, two-way arterial road that runs through the heart of the site boundary, and provides access to/from the site.

2.1 Source of key traffic assumptions

Unless it is stated (see Section 2.2), all other traffic assumptions have been provided by DELBURN WIND FARM PTY LTD to Jacobs.

All Jacobs derived assumptions for the Project have been based on previous trip generation estimates Jacobs have undertaken for other Victorian wind farm projects.

2.2 Key traffic assumptions

The following key overarching traffic assumptions have been used to undertake this high-level preliminary traffic assessment:

Source of construction materials

- All key component delivery items (during the construction phase) will be sourced from the Port of Hastings and transported to site
- The Project will utilise the existing on-site quarry. Jacobs have also assumed that the Project will have on-site concrete batching. The quarry will provide aggregate for construction tasks such as: public/private road upgrades, site access track and hardstand construction, turbine foundation construction and electrical infrastructure. Water, sand and cement would still need to be delivered to the site

Construction phase

- The proposed construction phase is 18-24 months. For this preliminary traffic assessment, Jacobs have used *18 months* as to reflect a worst-case scenario, i.e. a more compressed timeline and more intense construction activity. Construction is expected to commence in January 2022 and end in mid-2023
- The construction phase is expected to have a direct employment of 150-200 full-time staff. Jacobs have used 200 staff to reflect a worst-case scenario and assumed that construction staff will be sourced from the outer metropolitan south-eastern suburbs e.g. Pakenham and nearby Gippsland towns e.g. Traralgon, Warragul and Leongatha
- Jacobs have assumed that there are 20 working days per month
- Jacobs have assumed that the types of trucks that will be used for delivery purposes include: concrete mixer trucks, B-Doubles, semi-trailers, over-dimensioned (OD) trailers, truck and trailers, and rigid trucks. The OD trailers[1] will be the vehicles delivering the underground and overhead cables, power poles, temporary buildings, the main sub-station transformer, wind turbine tower sections, nacelles and blades. The assumed loading capacity in tonnes (t) for different types of heavy vehicles assumed to be used for this project are shown in Table 2.1

[1] OD vehicles fall under Class 3 of heavy vehicles, under the National Heavy Vehicle Regulator's (NHVR) Restricted Access Vehicle (RAV) category, of which covers vehicles operating under a notice or permit and vehicles operating under higher mass limits (HML) that can normally only access certain parts of the public road network. Class 3 of heavy vehicles with their loads combined generally do not comply with prescribed dimensions or mass requirements. OD vehicles required to transport the turbine components listed will need to obtain permits through NHVR to travel on the designed site routes using the public road network.

Table 2.1: Assumed heavy vehicle loading capacity by truck type

Truck type		Assumption (t) per GML vehicle		
		GVM/GCM*	Tare Weight**	Loading capacity***
Rigid Truck	**3 Axle**	22.5	9	**13.5**
Semi-trailer	**6 Axle**	42.5	26	**16.5**
Truck & dog trailer	**3 Axle Rigid Truck & 4 Axle Dog Trailer**	42.5	12	**30.5**
B-Double	**7 Axle**	50	23.2	**26.8**
Concrete agitator	**-**	30	7.6	**22.4**
OD vehicle	**-**	-	-	**-**
Other HV	**-**	-	-	**-**

*** Gross Vehicle Mass (GVM) / Gross Combination Mass (GCM) –** is the total weight a vehicle can carry and/or tow including its own weight

** **Tare Weight** – is the weight of an empty or unloaded vehicle

*** **Loading capacity** – is the weight of the load a vehicle can carry (loading capacity = GVM/GCM - tare weight)

Operation phase

- The proposed operation and maintenance phase is 25-30 years. For this preliminary traffic assessment, Jacobs have used 30 years
- The operation phase is expected to have a direct employment of 10-15 staff. Jacobs have used 15 staff to reflect a worst-case scenario and assumed that construction staff will be sourced from nearby e.g. Traralgon, Moe, Morwell, Warragul and Leongatha
- Jacobs have assumed that there are 20 working days per month

3. Key potential access routes and intersections identification

3.1 Nominated access route(s)

The key access routes to/from the Delburn Wind Farm are illustrated in Figure 3.1. All routes are required to access the site using the Strzelecki Highway (from either the westbound or eastbound direction). The distribution of the estimated number trips generated by construction activities will be based on the road network of interest identified in this section. The roads forming the key access routes are listed below:

Route 1 (preferred): To/from the Port of Hastings:

- Stony Point Road (C786) – at Port of Hastings
- Frankston-Flinders Road (C777)
- Western Port Highway (A780)
- Princes Highway (M1)
- Marretts Road
- Strzelecki Highway (B460) – Moe/Morwell to the Project

Route 1 (alternate): To/from the Port of Hastings:

- *Stony Point Road (C786) – at Port of Hastings*
- *Frankston-Flinders Road (C777)*
- *Western Port Highway (A780)*
- *Baxter-Tooradin Road (C781)*
- *South Gippsland Highway (M420/A440)*
- *Strzelecki Highway (B460) – Leongatha to the Project*

Route 2a/b/c: To/from construction workforce home locations:

- Princes Highway (M1) – from outer south-east Melbourne/Warragul and Traralgon (Route 2a & 2b)
- Mirboo North-Trafalgar Road (C469) – from Warragul (Route 2a)
- Strzelecki Highway (B460) – Leongatha/Traralgon to the Project (Route 2b & 2c)

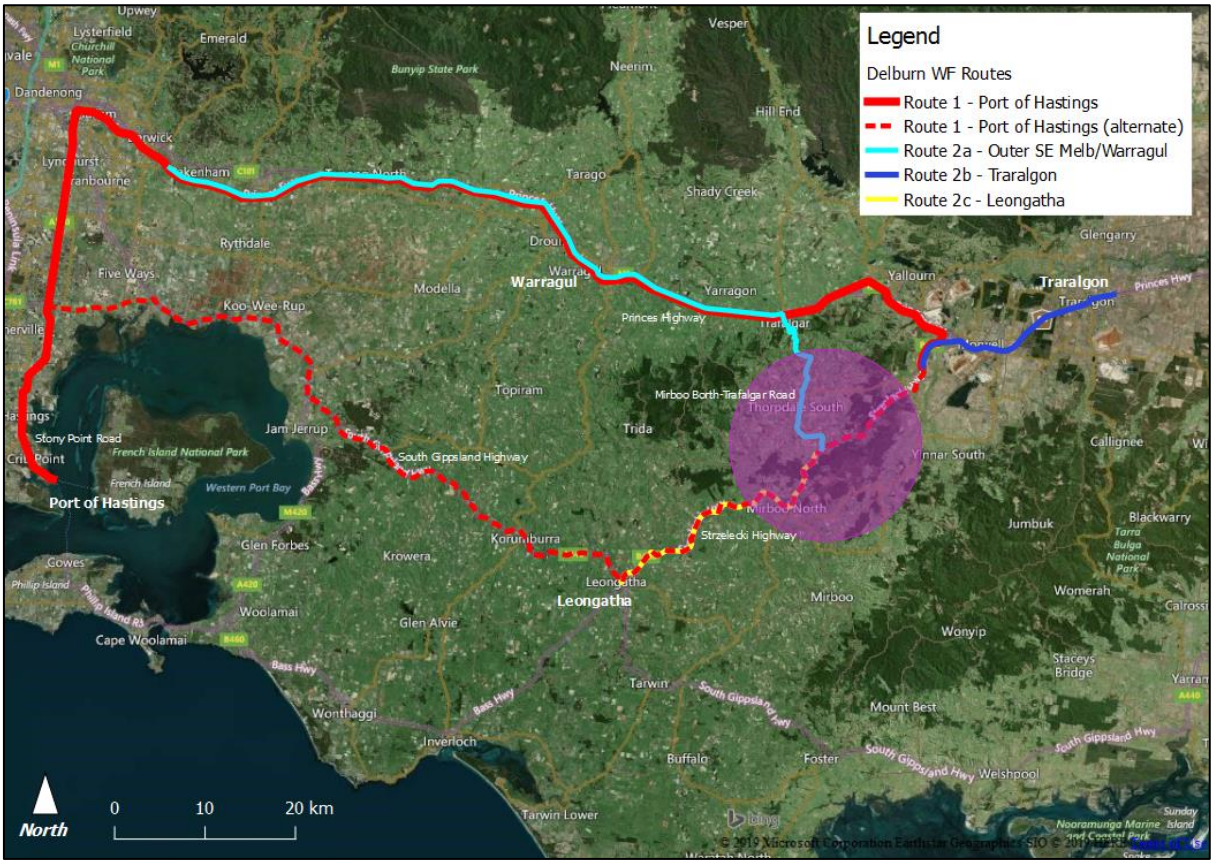


Figure 3.1: Key nominated access routes

3.2 Key intersections

Based on the key nominated access routes, potential traffic (capacity and performance) and/or civil engineering (swept path) assessment will need to be undertaken (see Table 3.1).

Table 3.1: Potential traffic and civil assessments required at intersections along nominated routes

Intersection	Potential assessments required	
	Traffic	Civil
Key access points		
Strzelecki Highway / Creamery Road	✓	✓
Strzelecki Highway / Golden Gully Road	✓	✓
Strzelecki Highway / Smiths Road	✓	✓
Strzelecki Highway / new access road approximately 1km east of Ten Mile Creek Road	✓	✓
Strzelecki Highway / Deans Road	✓	✓
Princes Highway / Mirboo North-Trafalgar Road	✓	
Strzelecki Highway / Princes Freeway (at Morwell)	✓	
Other intersections where construction traffic is required to turn left/right (based on the preferred Route 1 only)		
Stony Point Road / Frankston-Flinders Road	✓	✓
Frankston-Flinders Road / Graydens Road	✓	✓
Graydens Road / Frankston-Flinders Road	✓	✓
Frankston-Flinders Road / Western Port Highway	✓	✓
Western Port Highway / Princes Highway	✓	✓
Princes Highway / Marretts Road	✓	✓
Marretts Road / Strzelecki Highway	✓	✓

A mid-block traffic (capacity) and civil engineering (bridge assessment, overhead clearance and pavement condition), i.e. road sections between intersections, may also be required.

Jacobs recommend that these assessments be undertaken as part of preparing a Traffic Management Plan (TMP) for the project. A TMP is likely to be required under an approved planning permit and should be completed prior to the construction phase commencing, in collaboration with the appointed contractor for the project.

4. Project traffic generation estimation and distribution

4.1 Construction traffic volumes

4.1.1 Construction traffic generation estimation

A large amount of traffic will be generated by the construction of the Project. Traffic generated by the Project will mainly be construction vehicles delivering materials and construction workers. The construction process will bring larger volumes of vehicles of varied types with heavier and/or oversize

loads. This amount and type of traffic will vary in the construction period. Table 4.1 lists the main construction activities involved and key trip generation assumptions.

Table 4.1: Break down of Delburn Wind Farm construction activities

Construction task	Task duration (months)	Start and end dates	Vehicle transport type(s)	Other assumptions
Site establishment	1	1 Jan 2022 To 1 Feb 2022	Various	
Public/private road upgrades	3	1 Feb 2022 to 1 May 2022	Truck & dog trailer Rigid truck	• Materials will be largely sourced from the on-site quarry, otherwise they will be delivered from the Port of Hastings • Water will be sourced from local standpipes • It is assumed that only 6.2km of road upgrades are required over a three-month period for the Project
Site access track and hardstand construction	6	1 Feb 2022 to 1 Aug 2022	Truck & dog trailer	• Materials will be largely sourced from the on-site quarry, otherwise they will be delivered from the Port of Hastings
Turbine foundation excavation and construction	6	1 Feb 2022 to 1 Aug 2022	B-Double Rigid truck Truck & dog trailer Concrete agitator Semi-trailer	• Some materials will be sourced from the on-site quarry, otherwise they will be delivered from the Port of Hastings • Water will be sourced from local standpipes
Electrical infrastructure construction (including a substation)	10	1 Feb 2022 to 1 Dec 2022	OD trailer Semi-trailer B-Double Rigid truck	• Some materials will be sourced from the on-site quarry, otherwise they will be delivered from the Port of Hastings • Water will be sourced from local standpipes
Wind turbine component delivery	6	1 Feb 2022 to 1 Aug 2022	OD trailer Various heavy vehicles	• 12 OD vehicles and 48 other heavy vehicles (e.g. support vehicles) are required to transport one turbine
Wind turbine erection	10	1 Jul 2022 to 1 May 2023	Various	• 50 heavy vehicles are required to erect one turbine
Dust suppression	17	1 Feb 2022 to 1 May 2023	Rigid truck	• Water will be sourced from local standpipes • Four water trucks will be used and deliver water five times daily each
Site clean-up	2	1 May 2023 to 30 Jun 2023	Various	• 100 one-way trips assumed for site clean-up tasks
Construction workforce commute	18	1 Jan 2022 to 30 Jun 2023	Light weight service van Ute Private car	• Vehicle occupancy is one staff per vehicle • Only 50% of the total workforce is required during the first and last month of construction

Figure 4.1 plots the estimated traffic generated by the construction of the Project on a month-to-month basis. These figures have been calculated based on the predicted work timetable and number of movements needed for each job. Over a period of 18 months, it is expected that approximately

152,500 one-way trips will be required to be made by construction vehicles (16,500 trips – this includes 640 OD vehicle trips and on-site quarry trips) and workforce vehicles (136,000 trips).

It is expected that the second to fourth months (February 2022 to April 2022) will experience the highest levels of construction-related traffic. During these peak construction months, a maximum of 519 one-way daily trips are expected to be made (119 construction vehicles and 400 worker vehicles respectively).

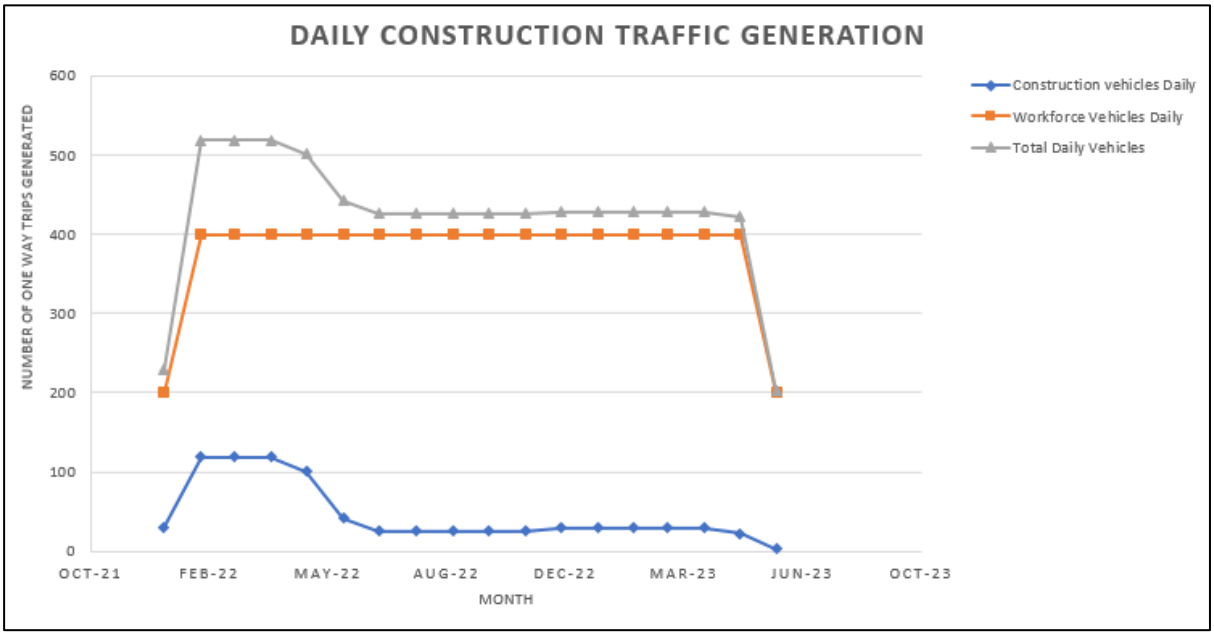


Figure 4.1: Delburn Wind Farm estimated daily, one-way vehicle movements during the construction phase

4.1.2 Construction traffic estimated distribution

The following traffic distribution assumptions, developed by Jacobs, were applied to the Project traffic generation estimates:

- 200 one-way staff vehicle trips are assumed in an AM peak one-hour period. One-third of construction staff will commute to/from outer south-east Melbourne/Warragul, one-third to/from Traralgon and one-third to/from Leongatha/South Gippsland/Bass Coast
- 94 one-way construction vehicle trips are assumed in an AM peak one-hour period. All construction staff arrive/depart the site from Strzelecki Highway / Smiths Road intersection (this intersection represents an assumed future site office location and staff carpark). All construction staff will arrive on-site during the AM peak period and depart the site during the PM peak period
- All construction vehicle traffic will travel to/from site via the preferred route nominated from the Port of Hastings
- 29% of all construction vehicle traffic will access the site from Strzelecki Highway / Creamery Road. 10 turbines are located on an access track network off Creamery Road
- 30% of all construction vehicle traffic will access the site from Strzelecki Highway / Smiths Road. 11 turbines are located on an access track network off Smiths Road
- 21% of all construction vehicle traffic will access the site from Strzelecki Highway / new access road approximately 1km east of Ten Mile Creek Road. 7 turbines are located on an access track network off this new access road

- 20% of all construction vehicle traffic will access the site from Strzelecki Highway / Golden Gully Road. Seven turbines are located on an access track network off Golden Gully Road
- As a worst-case scenario, all construction vehicles will enter the site (to unload any deliveries) and exit the site (as empty vehicles) during the AM peak period
- The on-site quarry and on-site concrete batching trips have been assumed to access Smiths Road along the Strzelecki Highway

Figure 4.2 summarises the AM peak hour trip distribution across the road network of interest that is expected during the peak construction months. Note that this distribution does not include or take into account any background/existing traffic volumes.

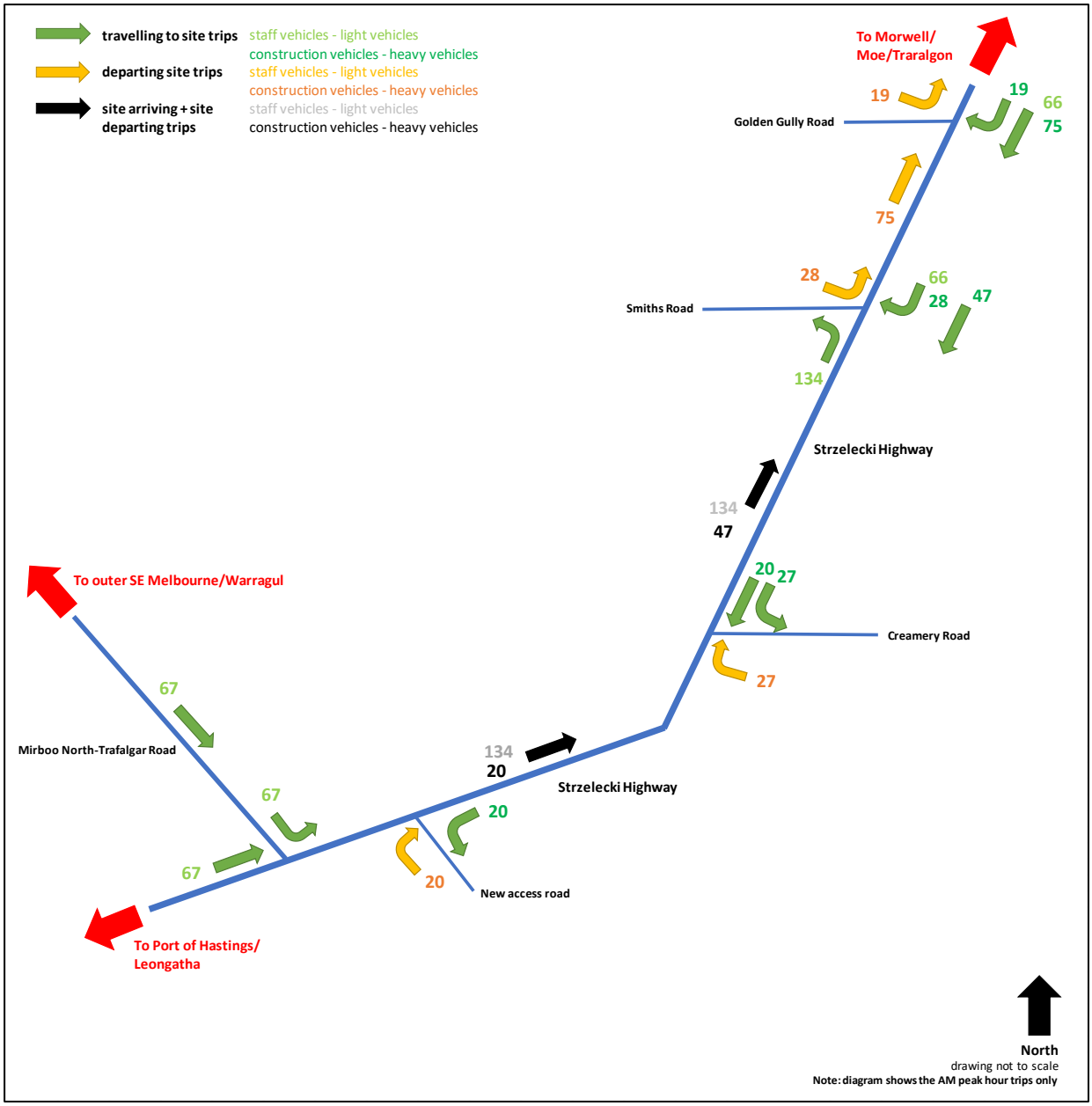


Figure 4.2: Delburn Wind Farm estimated AM peak one-hour distribution vehicle movements during the peak construction months

In terms of the estimated traffic distribution across the road network of interest, there is expected to be a maximum of 160 additional vehicles traversing westbound along the Strzelecki Highway and 181 additional vehicles traversing eastbound in the AM peak one-hour period. The Creamery Road, Smiths Road and Golden Gully Road intersections off the Strzelecki Highway are key access points and will see both additional heavy and light vehicles turning in and out from these intersections. Smiths Road intersection is expected to carry the highest amount of turning construction related traffic (256 vehicles in total).

4.2 Operation traffic volumes

Once the project is fully operational, traffic to and from the site is anticipated to be minimal. The wind farm will have permanent maintenance staff, in addition to being monitored remotely. 15 full-time employees will be required for the operation and maintenance of the turbines. This is equivalent to up to 30 vehicle trips per day on the wider highway network, which will have a negligible effect.

5. Summary

Based on the key project, traffic generation and distribution assumptions provided by DELBURN WIND FARM PTY LTD and/or developed by Jacobs for the Project, it is expected that a total of approximately 152,500 one-way trips (i.e. over 18 months) will be required to be made by construction vehicles (16,500 trips) and workforce vehicles (136,000 trips).

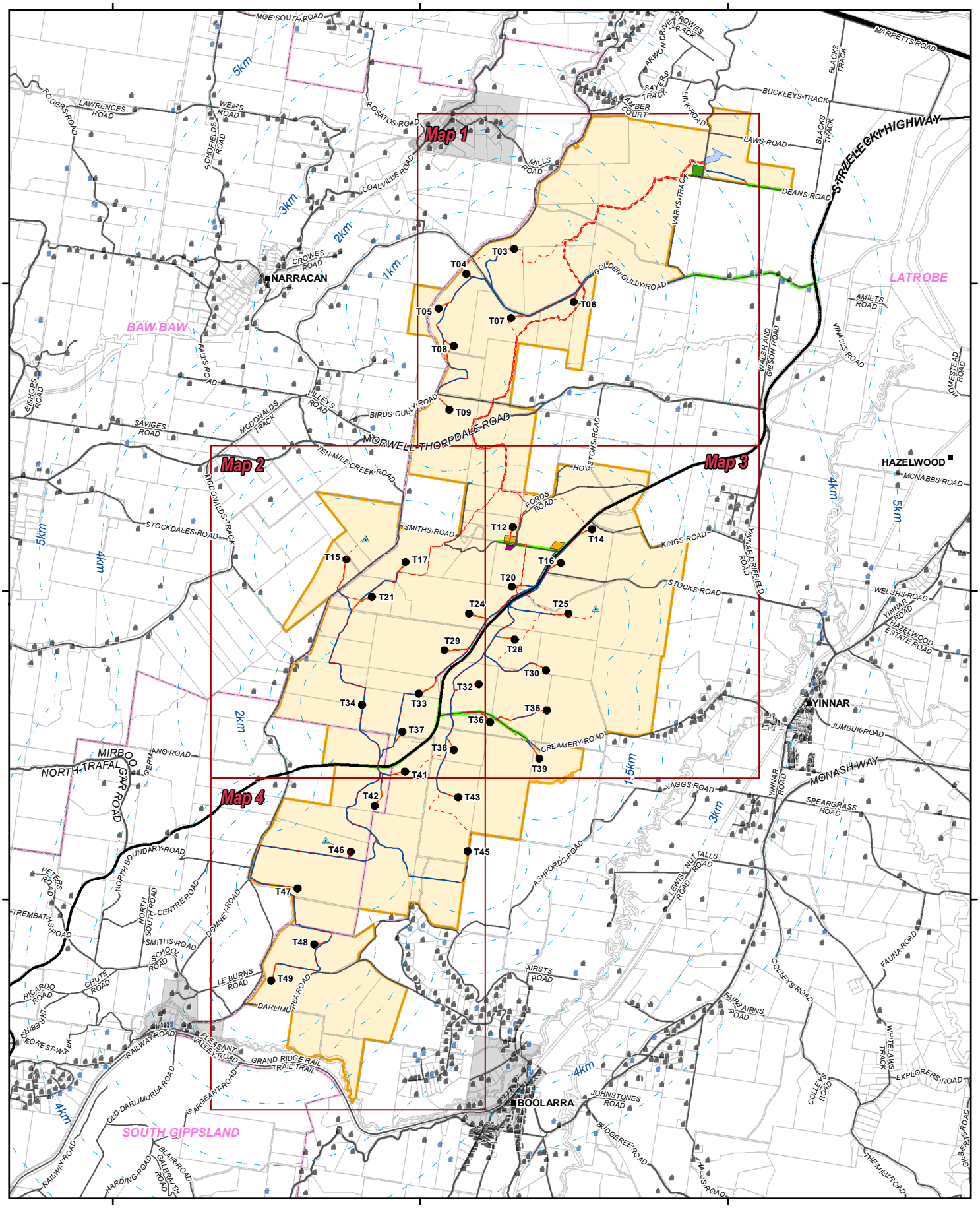
During the expected peak construction months (February 2022 to April 2022), a maximum of 519 one-way daily trips are expected to be made (119 construction vehicles and 400 worker vehicles). In terms of the estimated traffic distribution across the road network of interest, there is expected to be a maximum of 160 additional vehicles traversing westbound along the Strzelecki Highway and 181 additional vehicles traversing eastbound in the AM peak one-hour period. The Creamery Road, Smiths Road and Golden Gully Road intersections off the Strzelecki Highway are key access points and will see both additional heavy and light vehicles turning in and out from these intersections. Smiths Road intersection is expected to carry the highest amount of turning construction traffic.

Once the project is fully operational, traffic to and from the site is anticipated to be minimal.

A traffic (capacity and intersection performance) and transport (swept path) assessment will potentially be required at these three nominated key intersections. Other intersections where left or right turns are required by construction related traffic (OD vehicles in particular) along the Port of Hastings route may also require a traffic and transport assessment. A mid-block traffic (capacity) and transport (bridge assessment, overhead clearance and pavement condition), i.e. road sections between intersections, may also be required. Jacobs recommend that these assessments be undertaken as part of preparing a Traffic Management Plan (TMP) for the project. A TMP for the Project is likely to be required under an approved planning permit and should be completed prior to the construction phase commencing, in collaboration with appointed contractor for the project.

Yours sincerely

Renukha Nadarajah
Senior Traffic Engineer



LEGEND

- Project Boundary
- Wind Turbine
- Met Mast
- Dwelling
- Possible Dwelling
- Wind Turbine Buffer
- Electrical Reticulation
- Battery Facility
- Construction Compound / Batch Plant
- O&M Facility
- Proposed Terminal Station
- New Access Track
- Existing Access Track
- Major Road
- Minor Road
- Public Roads for Access Upgrade
- Cadastral Boundary
- Built-Up Area
- LGA Boundary

Delburn Wind Farm

Revised Plan Overview

DATE: 11/07/2019	PRODUCED: C.McArlein
SCALE: 1:55,000 @ A3	CHECKED: I.Mackey
STATUS: Draft	APPROVED: P.Marriott

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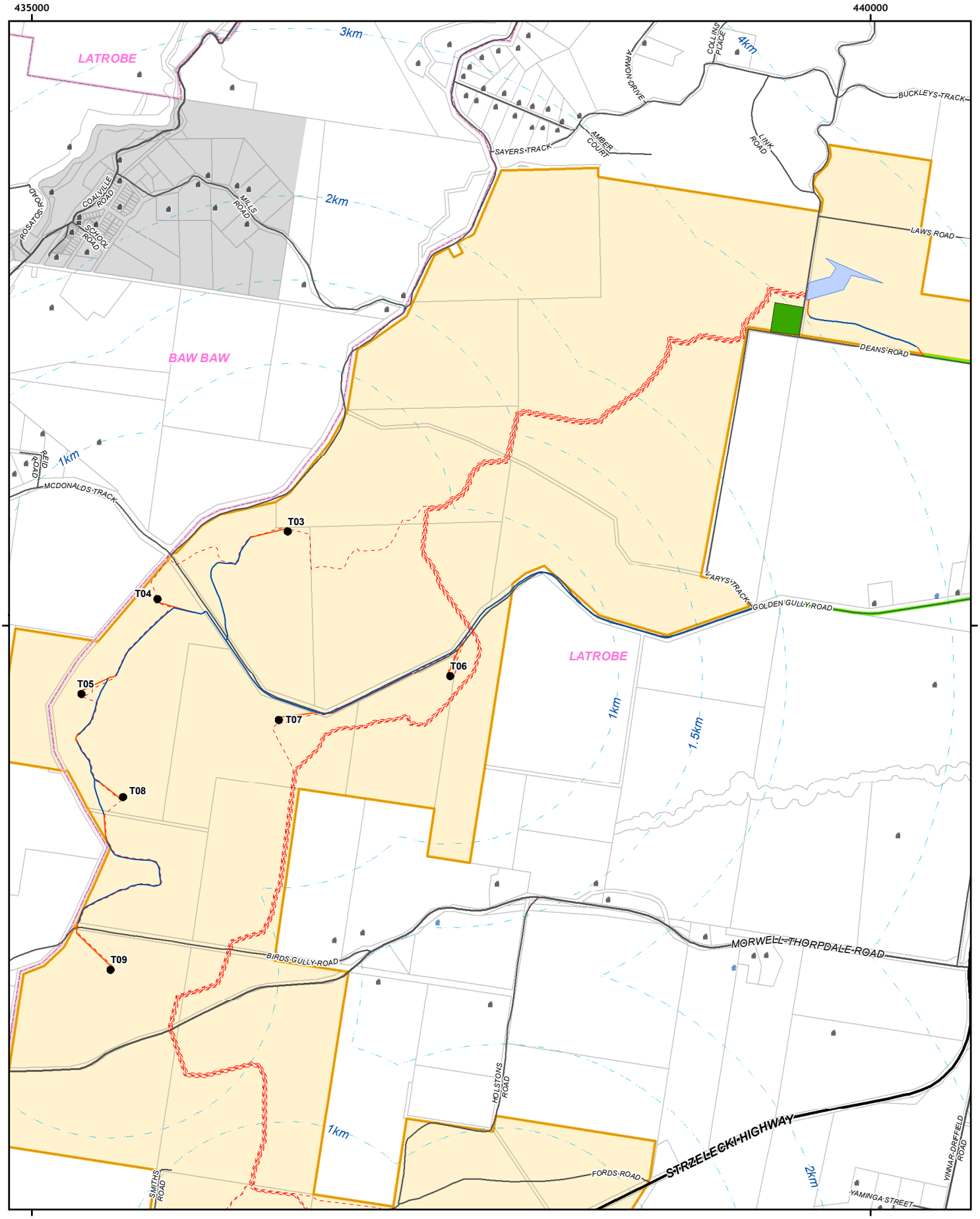
DRAWING No.: DWF_OVR_014_01H Overview

REV: v2.1



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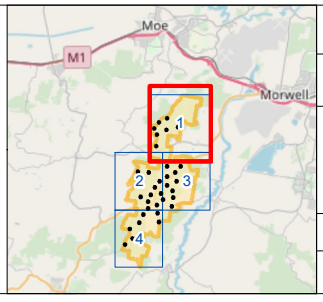

Delburn Wind Farm

Revised Plan - Map 1 of 4

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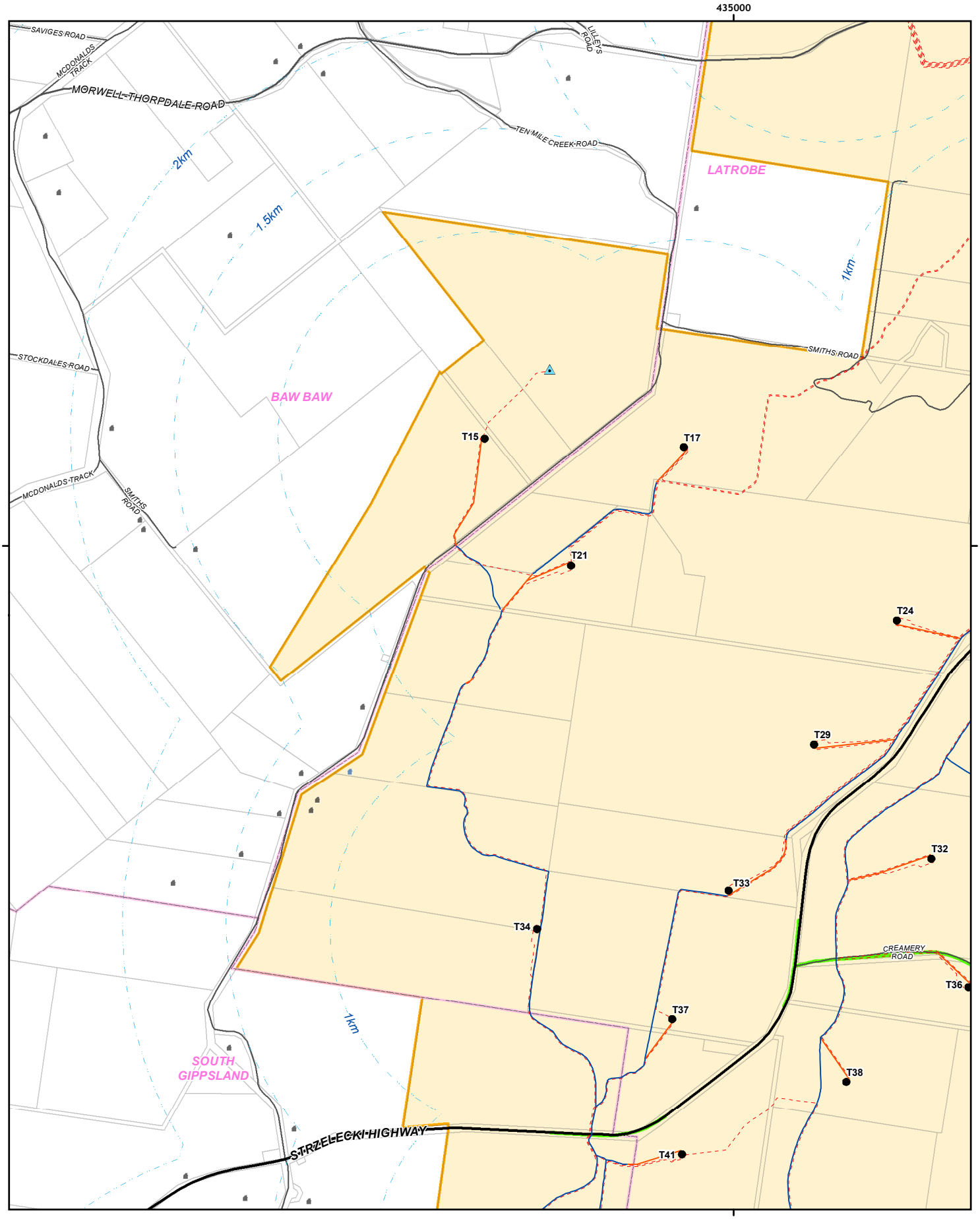
REV v2.1



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LEGEND

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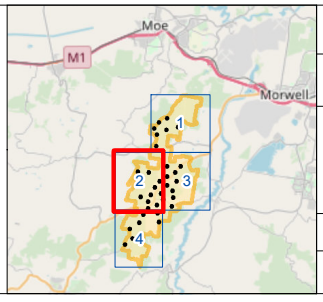

PROJECT: **Delburn Wind Farm**

TITLE: **Revised Plan - Map 2 of 4**

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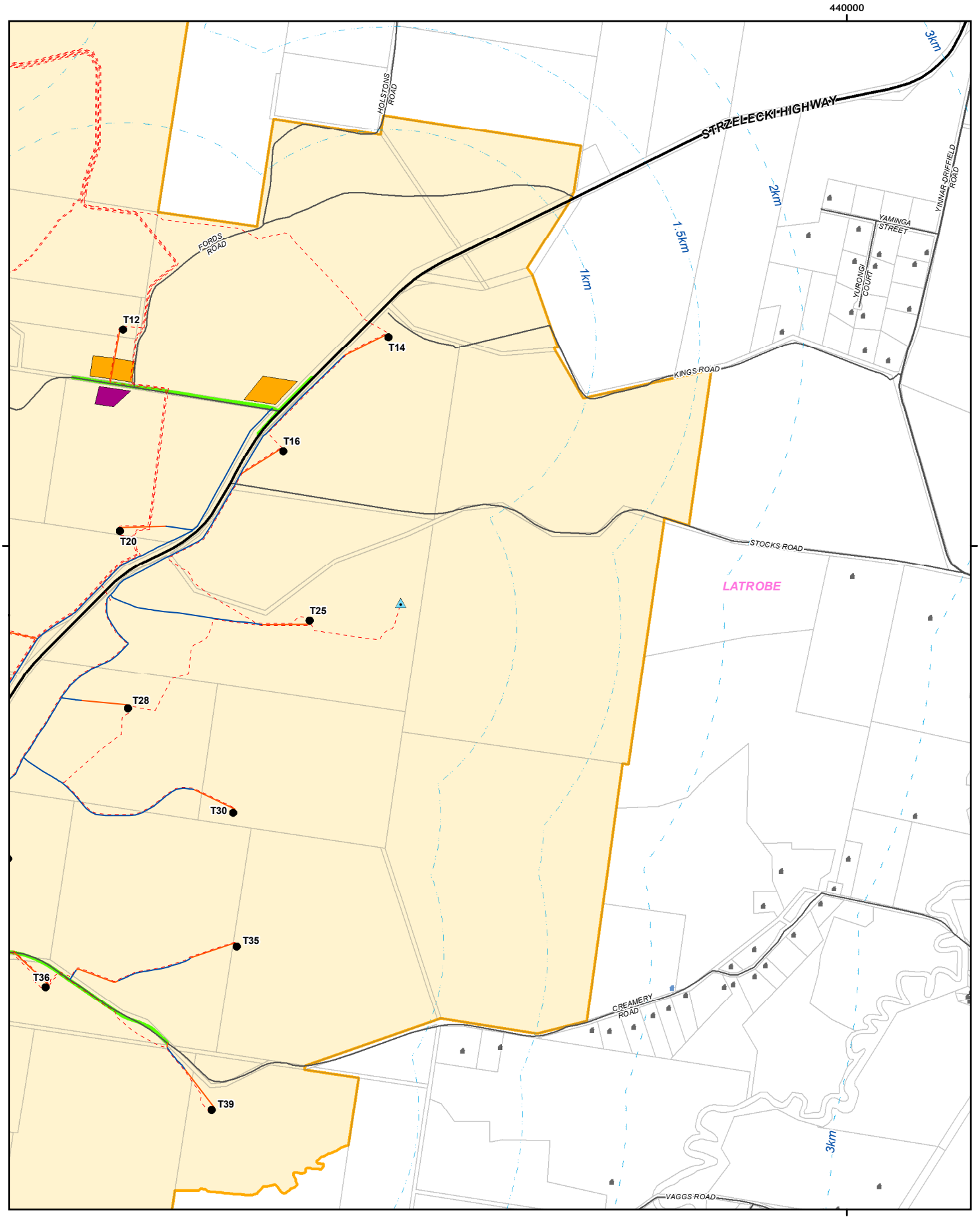
DRAWING No.: DWF_OVR_014_01H DD Map 2

REV: v2.1



LEGEND

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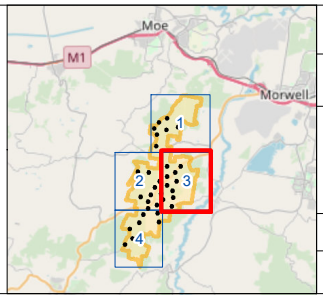

PROJECT: **Delburn Wind Farm**

TITLE: **Revised Plan - Map 3 of 4**

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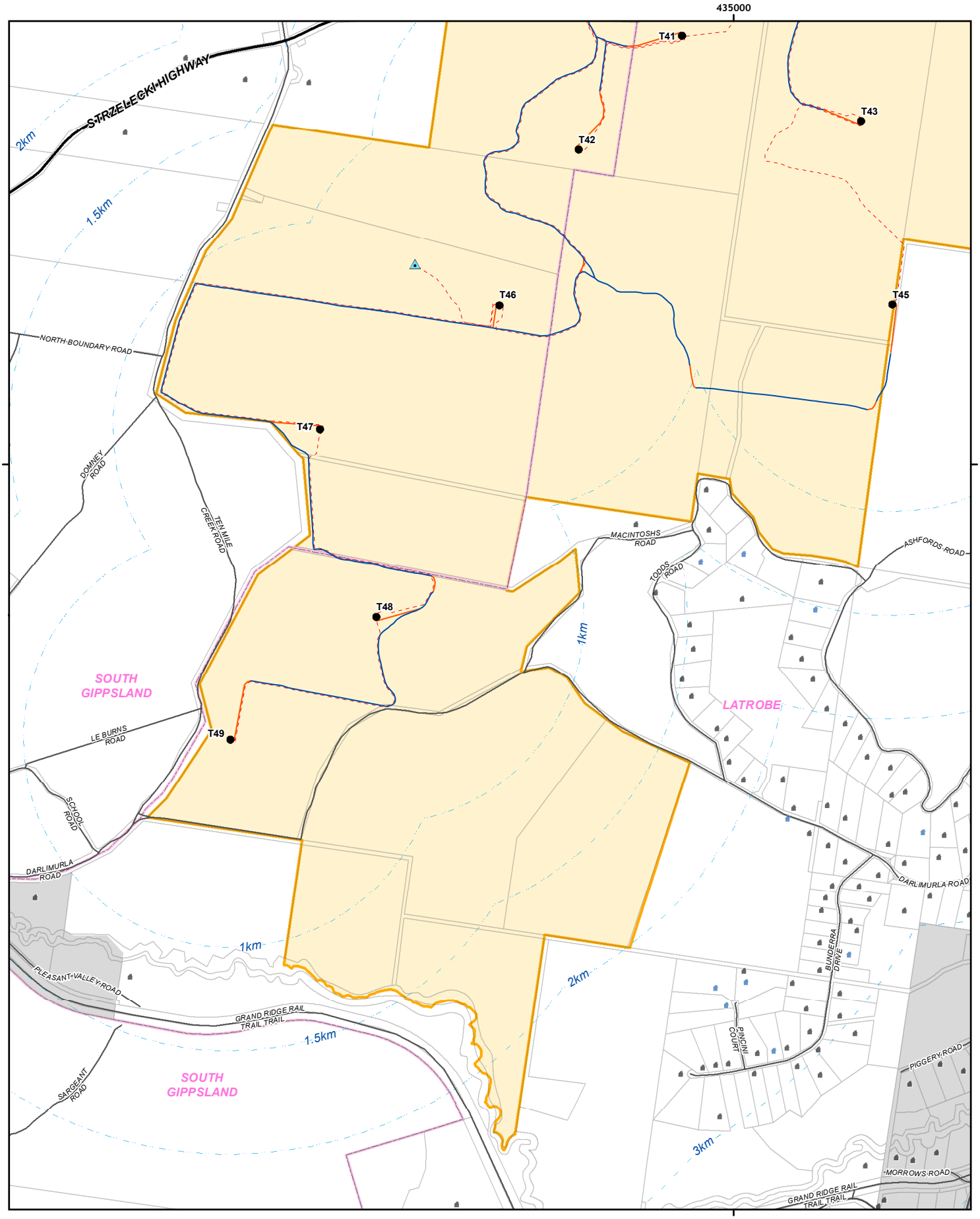
DRAWING No.: DWF_OVR_014_01H DD Map 3

REV: v2.1



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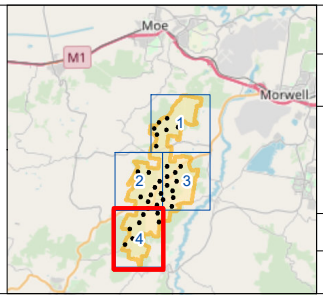

Delburn Wind Farm

Revised Plan - Map 4 of 4

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