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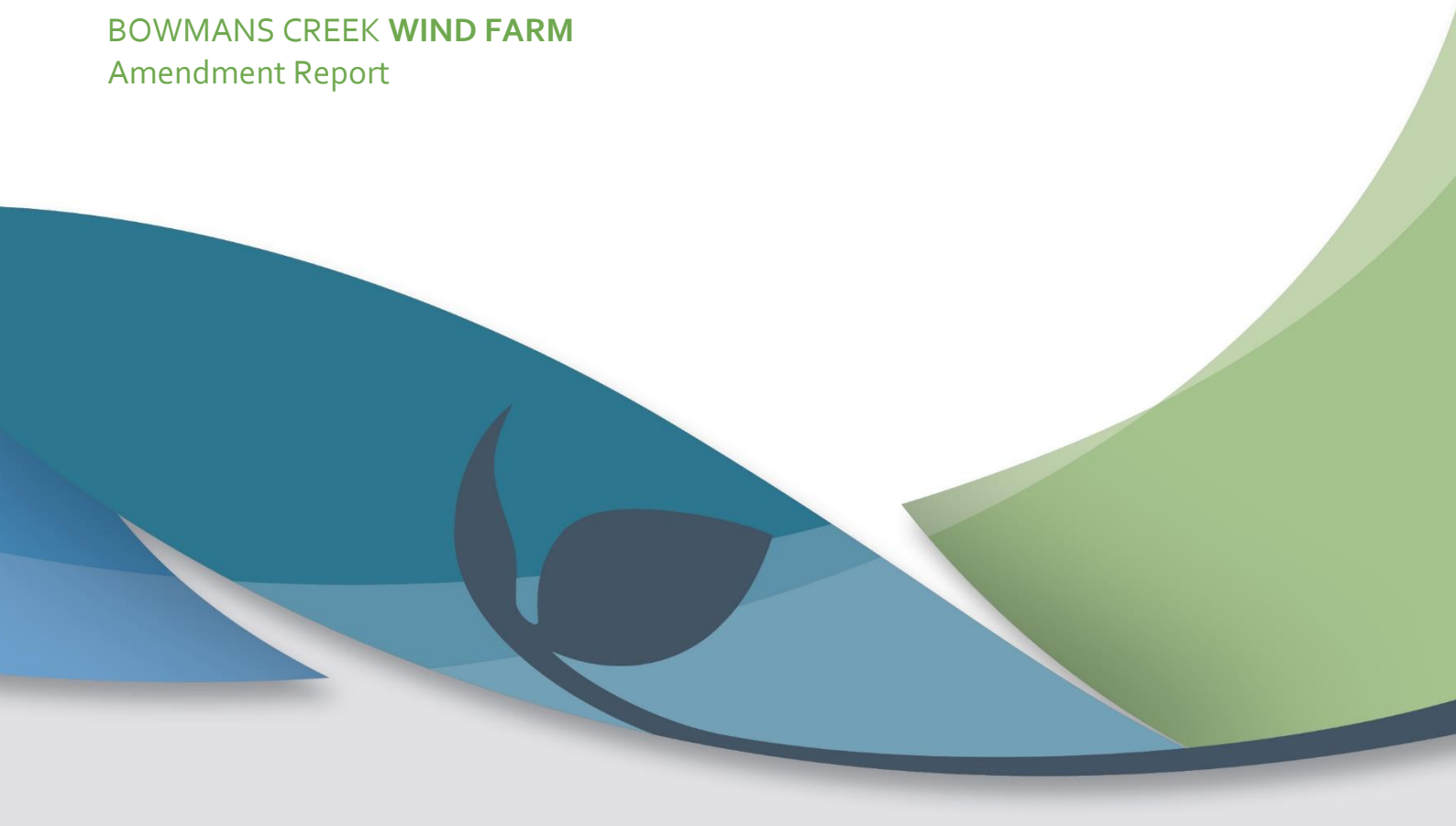
APPENDIX A

UPDATED PROJECT DESCRIPTION

BOWMANS CREEK **WIND FARM**
Amendment Report



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01	Draft updated Project Description	James Bailey	Julian Kasby	27/07/2021
02	Updated Project Description	James Bailey	Andrew Wilson	24/09/2021
03	Final Project Description	James Bailey	Julian Kasby	08/10/2021

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Our Reference	211008 APP A - Updated Project Description Bowmans Creek Amendment Report

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1. THE DEVELOPMENT

This section provides a detailed description of the conceptual construction, operation, maintenance and decommissioning activities associated with the Amended Project. It also outlines the alternatives that were considered during the development of the Project.

1.1 DESCRIPTION

1.1.1 Overview

The Project will generally involve the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm as generally illustrated on **Figure 1** including:

- Up to 56 wind turbine generators (WTGs) consisting of:
  - A three-blade rotor and nacelle mounted onto a tubular tower;
  - Crane hardstand area; and
  - Laydown area;
- Electrical infrastructure:
  - Up to two collector substations and associated transmission line to transmit the generated electricity into the existing high voltage network; and
  - Connections between the WTGs and the collector substation/s, which will include a combination of underground cables and overhead powerlines;
- Ancillary infrastructure;
  - Operations and Maintenance Facility (O&M Facility);
  - Storage facilities and laydown areas;
  - Unsealed access tracks;
  - Ongoing use of two temporary wind monitoring masts and the installation of up to four permanent monitoring masts; and
  - Temporary construction facilities (including concrete batching plant and rock crushing facilities);
- Minor upgrades to the road network to facilitate delivery of oversize or overmass (OSOM) loads (such as WTG components) to the site and to facilitate the construction of the transmission line; and
- Administrative activities (including boundary adjustments and subdivisions).

Extensive engagement has occurred with stakeholders in relation to the Project description. A detailed discussion over the outcome of this process is included in Section 5 of the EIS.

A Voluntary Planning Agreement (VPA) will be entered into with each of Muswellbrook Shire Council (MSC), Upper Hunter Shire Council (UHSC) and Singleton Council (SC) generally in accordance with Division 7.1(a) of Part 7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). An offer of $3,000 per WTG per annum, constructed within each Local Government Area (LGA) boundary has been made to each of UHSC, SC and MSC and is proposed to be distributed via a 'Community Fund' mechanism.

There are no relevant related developments to the Project to be incorporated into the Project.

There are no components of the Project that are subject to a separate approval process under the EP&A Act to facilitate the operation of the Project.

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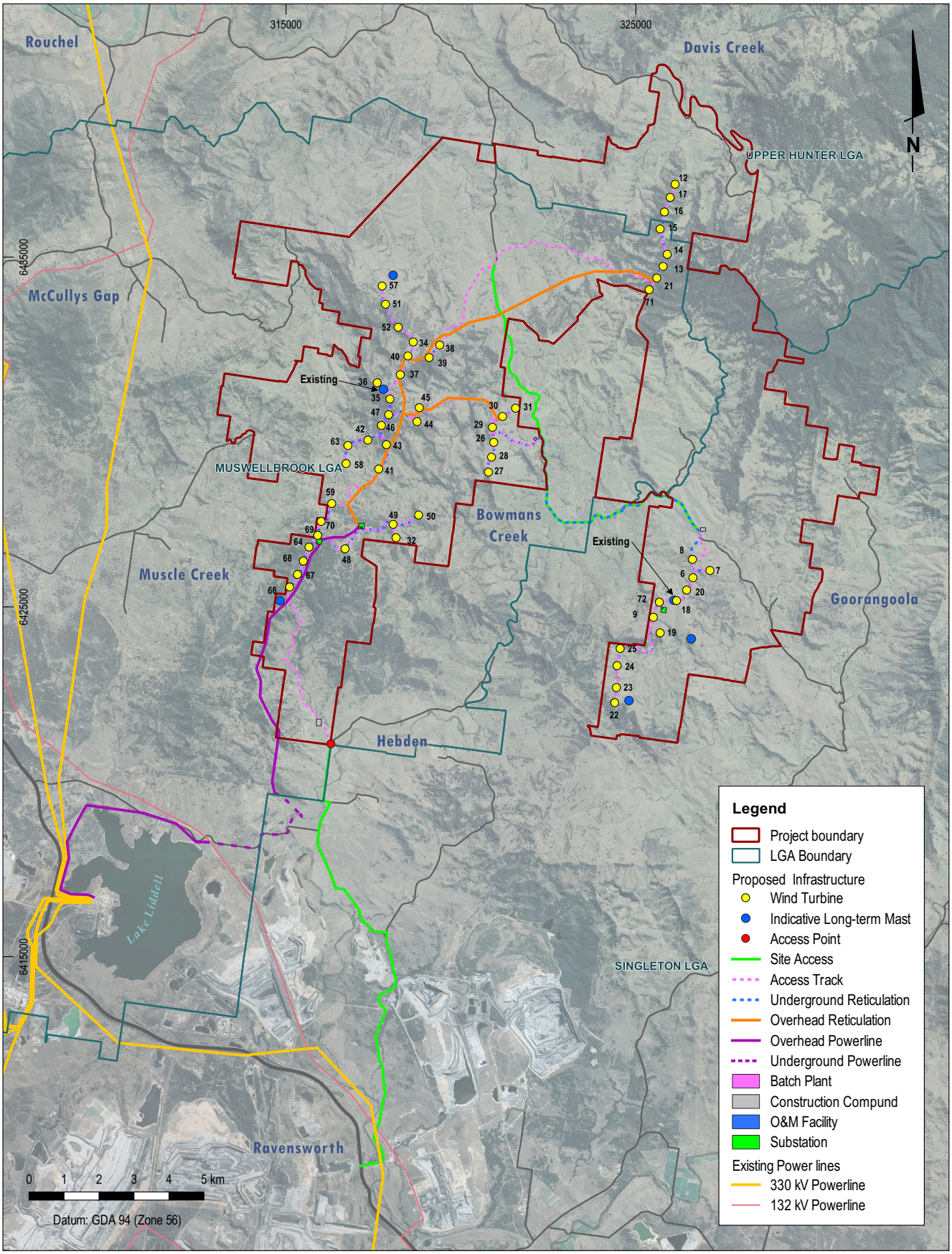

Bowmans Creek Wind Farm | Fig01 Conceptual Project Layout | 07.10.2021

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Conceptual Project Layout

FIGURE 1

1.1.2 Project Boundary

The Project Boundary includes the majority of the key components of the Project as shown on **Figure 1**.

Additional Project components which are external to the Project Boundary include road upgrades (see **Section 1.6**) and the transmission line (see **Figure 1**).

1.1.3 Project Disturbance

The Survey Area is shown on **Figure 2** and is approximately 1,193 ha. It incorporates buffers around Project components to facilitate future detailed design and "micro-siting" (outlined in **Section 1.3.2**). Therefore, the Survey Area encompasses the vast majority of the area that may be disturbed by the Project. It excludes minor road works from the NEH / Hebden Road turnoff to Newcastle Port as described in Section 7.4 of the EIS.

For the purposes of determining the maximum disturbance area and direct impacts in Section 7 of the EIS, the indicative disturbance areas as shown in **Table 1** have been applied to Project components. Actual disturbance may vary on a case-by-case basis, however, the total Project disturbance will remain within 417 ha.

Table 1 Indicative Disturbance Parameters

Components	Indicative Disturbance
Project Boundary	
WTG footing and pad	30 m x 70 m
Access tracks	Variable (7 m – 50 m)
Underground reticulation	2 m (1 m from centre)
Overhead reticulation	29 m (14.5 m from centre)
O&M Facility / Substation / Batching plant / Construction compound	Polygon + 2 m
External to Project Boundary	
Road upgrades	Polygon + 2 m
Transmission line (overhead)	60 m (30 m from centre)
Transmission line (underground)	12 m (6 m from centre)

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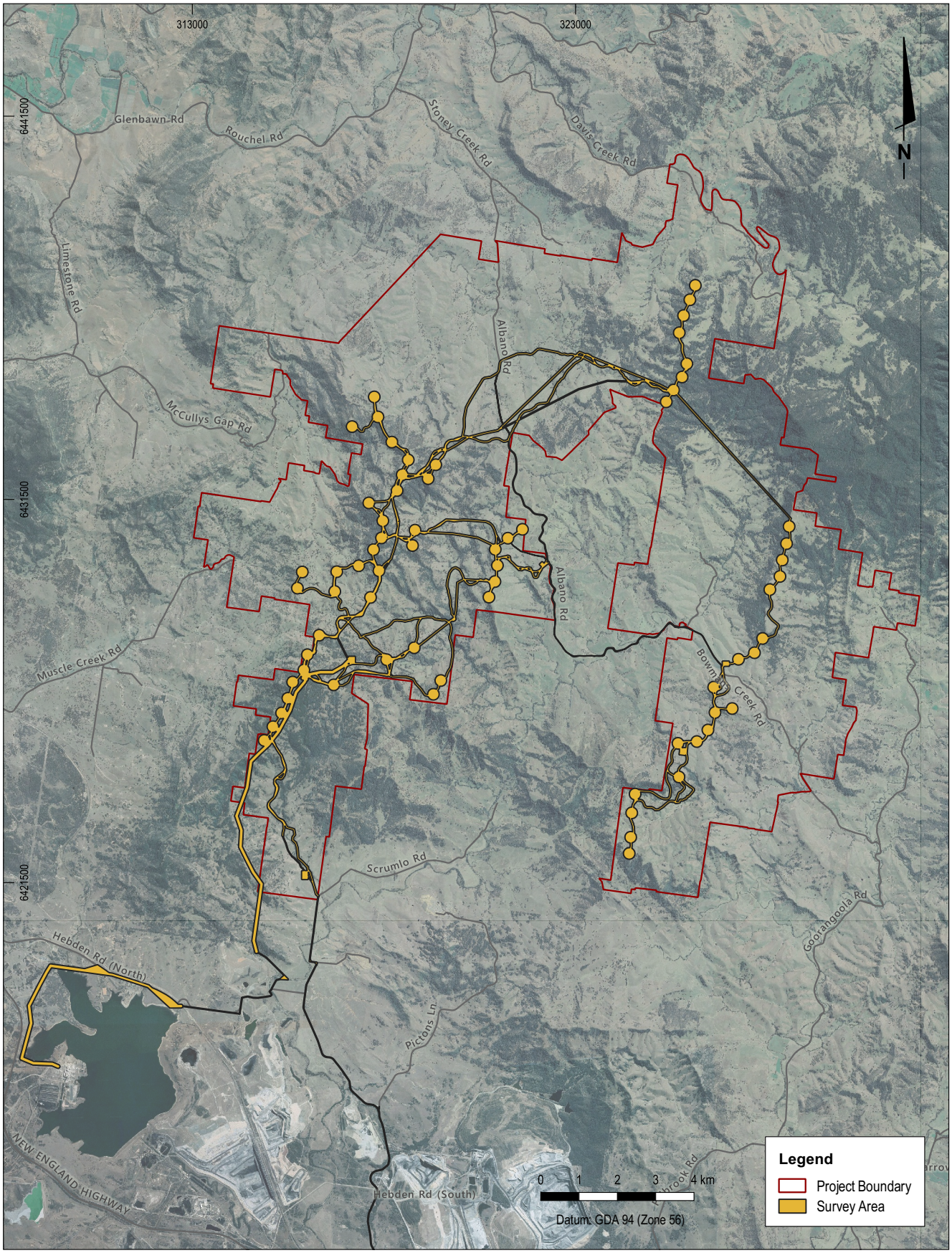

Bowmans Creek Wind Farm | Fig02_Survey Area | 02 09 2021

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Survey Area

FIGURE 2

1.1.4 Project Summary

The key aspects of the Project are summarised in **Table 2** and shown conceptually on **Figure 1.**

Table 2 Indicative Key Project Parameters

Aspect	Description
Project Boundary	Shown on Figure 1 and encompasses an area of 16,720 ha Some minor components are external to the Project Boundary as described in this section
Project Term	In perpetuity. The life cycle of an individual WTG is approximately 25 years
Survey Area	Shown on **Figure 2** and encompasses an area of 1,193 ha and indicates the Survey Area utilised for field assessments
Disturbance Area	Maximum disturbance of up to 417 ha
WTGs	• Up to 56 WTGs generators • Hardstand areas • Transformers enclosed within the nacelle or separate enclosure, depending on final turbine model adopted • Communications equipment connecting to the O&M Facility
Output	Approximately 347 MW
Electrical reticulation infrastructure	• Transmission Line to Liddell Substation (up to 330 kV voltage) • Up to two substations (1a and 1b options, 2) • Underground and overhead 22kV or 33kV electrical reticulation cabling from WTG sites to substations
Ancillary infrastructure	• O&M Facility and associated communications equipment • Unsealed access tracks • Laydown areas • Two wind monitoring masts (temporary) • Up to four permanent monitoring masts
Temporary construction facilities	• Construction compounds / offices • Rock crushing plant/s • Concrete batching plant
Public infrastructure works	• Upgrades to Hebden, Albano and Scrumlo Road • Temporary road and infrastructure works from Newcastle Port to site entry • Connection to the electrical transmission network at Liddell substation • Associated communications or other public infrastructure relocations
Construction timeframe and hours	• Approximately 18 months • Generally, 7 am to 6 pm (weekdays) and 8 am to 1 pm (Saturday) for standard construction work (additional activities may be subject to an 'Out of Hours Protocol') • Blasting only between 9 am and 5 pm (weekdays) and 9 am to 1 pm (Saturdays). No blasting will occur on Sundays or public holidays.
Operational hours	24 hours per day, 7 days a week
Workforce (full time equivalent personnel)	• Up to 156 construction personnel • Up to 15 operational personnel
Capital Investment	$569 million

1.2 OPERATING HOURS, PERSONNEL AND SCHEDULE

Approval is being sought in perpetuity for the Project. The life cycle of a WTG is approximately 25 years and changing out of componentry will occur infrequently.

The Interim Construction Noise Guideline (DECC, 2009) (ICNG) recommends standard hours for construction work which will be utilised for the Project as outlined in **Table 3**, except where an exemption is granted by the relevant authority.

Table 3 Standard Construction and Operational Hours

Work Type	Recommended Standard Hours
Normal construction	7 am to 6 pm on weekdays 8 am to 1pm on Saturdays No work on Sundays or public holidays Additional activities may be subject to an 'Out of Hours Protocol'
Blasting	9 am to 5 pm on weekdays 9 am to 1pm on Saturdays No blasting on Sundays or public holidays
Operation	24 hours a day, seven days a week

Construction hours will generally be 7 am to 6 pm on weekdays, 8 am to 1 pm on Saturdays with no audible work conducted on Sundays or public holidays. Additional activities may be subject to an "Out of Hours Protocol" approved by the relevant regulator. Operational hours will be up to 24 hours a day, up to seven days a week.

The Project will utilise up to 156 Full Time Equivalent (FTE) construction employees and approximately 15 FTE operational personnel. Additional contractors may be required.

The construction phase for the Project is expected to have a duration of approximately 18 months. Indicative durations of the key tasks are provided in **Table 4**. Multiple construction tasks may be undertaken simultaneously.

Table 4 Indicative Construction Schedule

Task	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Establish temporary construction infrastructure																		
Establish site access (i.e. upgrades to public roads)																		
Initial civil works (access tracks and laydown areas)																		
Earthworks for WTG foundations																		
Install electrical reticulation infrastructure (powerlines and cables)																		
Install communications cables for WTG sites																		
WTG component delivery and erection																		
Construct electrical substations																		
Construct transmission line																		
Commission operational infrastructure																		
Decommission temporary structures																		

1.3 WIND TURBINE GENERATORS

1.3.1 Wind Turbine Generator Design

The components of a typical WTG are indicatively shown in **Figure 3**. The WTG will have a maximum height of 220 m from above ground level to blade tip. **Figure 4** provides an indication of the maximum height of the WTG against other relevant local features.

Individual wind turbine capacity is likely to be in the range of 5 to 7 MW. For example, with a turbine capacity of 6.2 MW the Project will have an output of 347 MW.

Figure 5 conceptually illustrates the relationship between the WTG tower and nacelle (including internal components) for a typical WTG (Office of Energy Efficiency and Renewable Energy, ND). For assessment purposes an appropriate combination for hub height (140 - 150 m) and blade length (80 m blade length with a maximum tip height of 220 m) has been selected to consider the greatest impact. The hub height dimensions selected are specified within each relevant individual report.

The WTG will feature three blades in an 'up-wind' configuration. This configuration has the blades in front of the tower and nacelle which face into the wind.

Each tower is a tubular steel structure that supports the nacelle, the hub and the three blades. The exact dimensions for each tower will depend on the WTG model that is selected. The diameter of the tower typically tapers from approximately 5 m at the base to 3 m at the top. The interior of the tower contains the power and control cables and an access ladder or lift (with safety controls).

The nacelle is the structure at the top of the tower. It encloses the generator, gearbox (if used) and control gear including motors, pumps, brakes and electrical components. This control gear ensures that the WTG always faces into the wind and adjusts blade angles to maximise power output and minimise blade noise. The nacelle also houses winches to assist in lifting maintenance equipment or smaller replacement parts to the nacelle. The nacelle includes noise suppression devices to minimise the noise generated by the mechanical components.

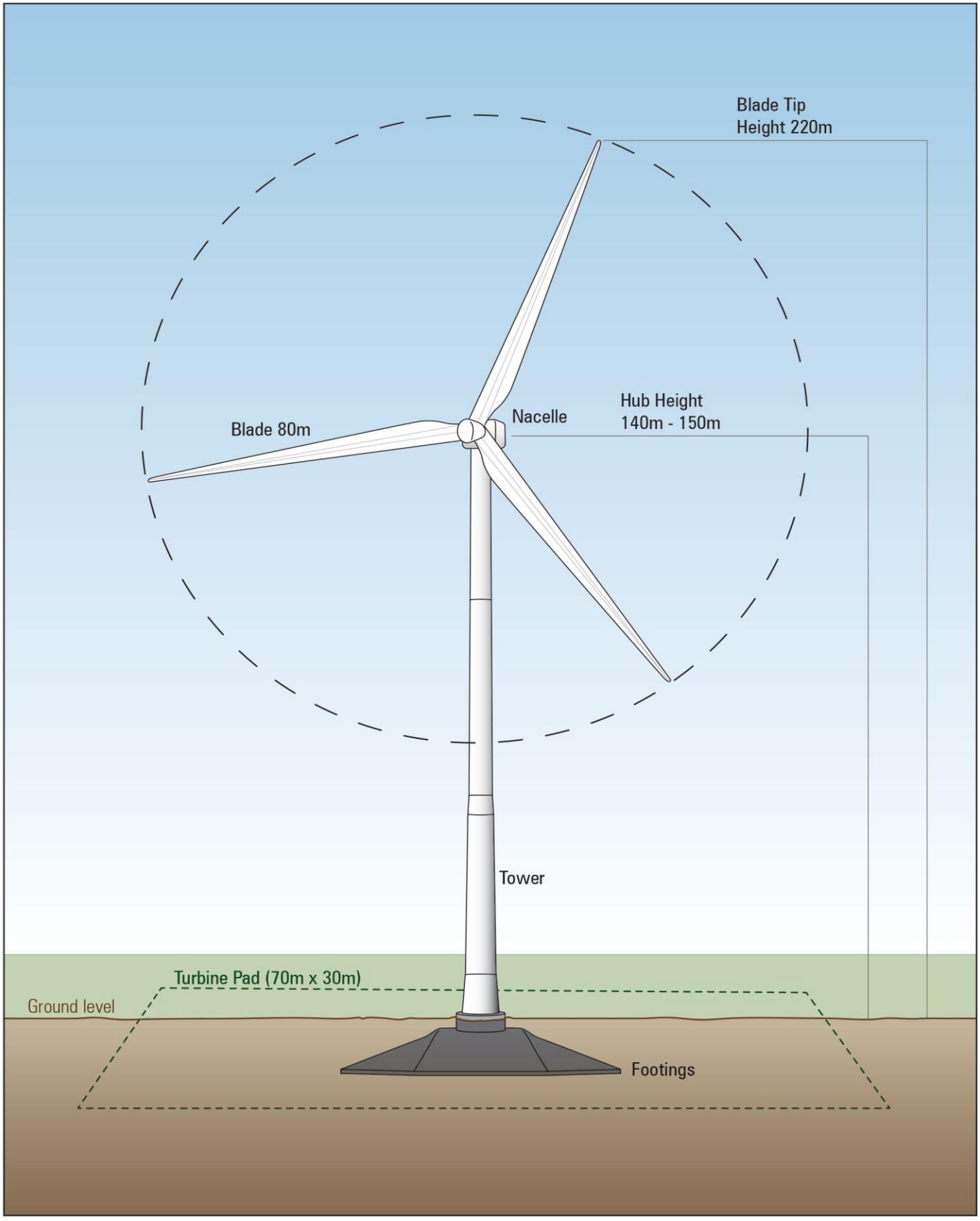
WTGs are fitted with lightning conductors, which direct lightning strikes into the ground. Lightning conductors reduce the risk of damage to the WTG and fire by providing a safe path to earth for lightning strikes. Operation of the WTG can be managed remotely (see **Section 1.5.4**) including the ability to shut down the WTG as a safety precaution.

Each WTG is mounted on a reinforced concrete footing. Concrete footing design is dependent on the WTG model and geotechnical conditions at each site (e.g. a footing design could be a gravity foundation or a rock-bolted foundation). A hardstand area will be established at each WTG site to facilitate assembly of the WTG. The hardstand provides a base for the installation crane and a storage area for WTG components. The shape and exact size of the hardstand area is subject to final WTG selection and crane lifting requirements.

CASA has recommended that the wind farm is obstacle lit in accordance with the National Airports Safeguarding Framework Guideline D and section 9.31 of the CASA Part 139 (Aerodromes) Manual of Standards. As such limited obstacle lighting that is designed to avoid visual lighting impacts to private receivers to the maximum extent practicable will be installed consistent with an Obstacle Lighting Management Plan to be developed for the Project.

WTGs are proposed to be painted off white/grey and finished with a surface treatment that minimises the potential for glare and reflection. WTGs will not display any advertising signs or logos.

Approximately 52 km of internal access tracks will be established during the initial construction phase generally to connect WTGs and other internal infrastructure.



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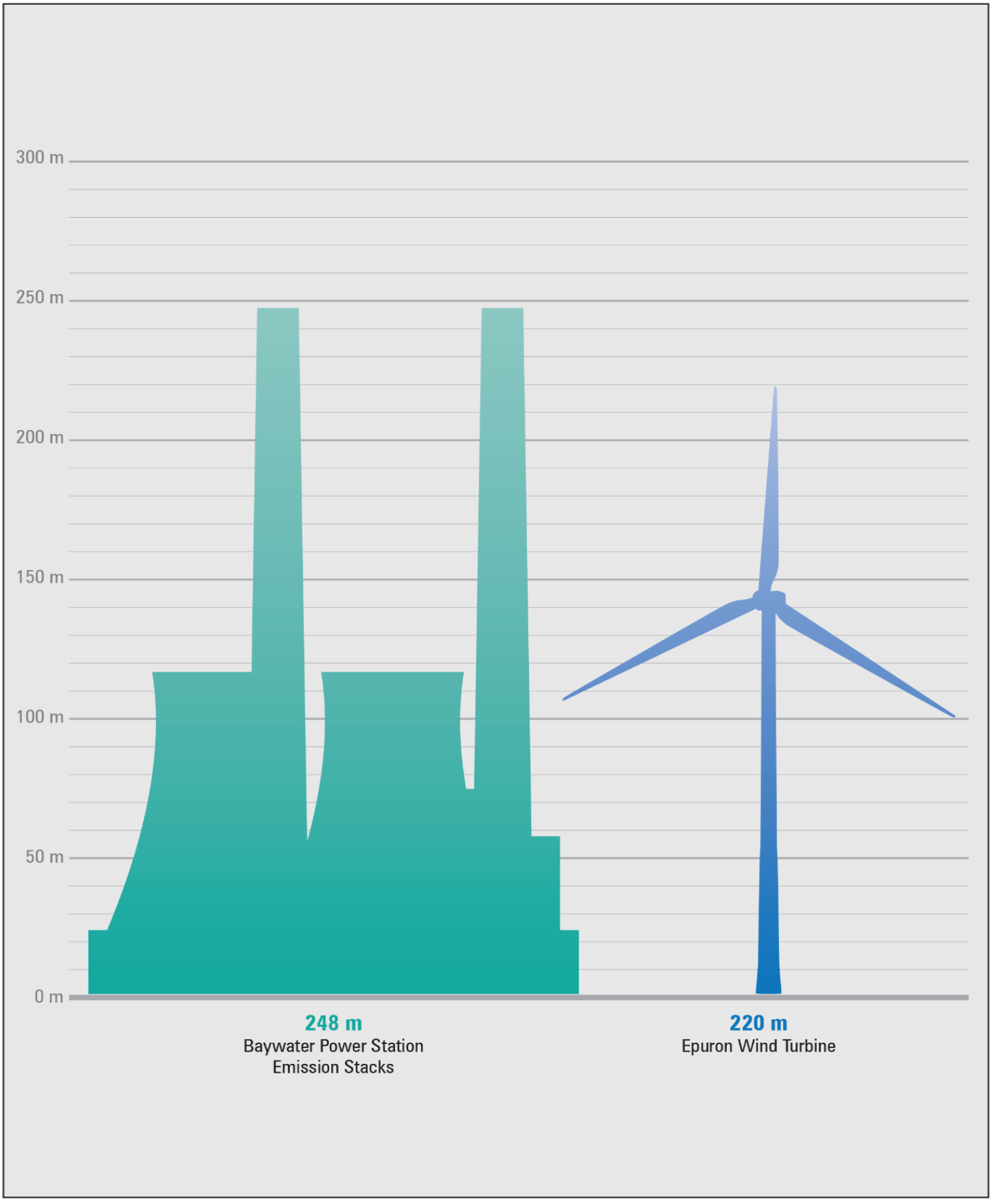
Conceptual Wind Turbine Components

FIGURE 3



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Turbine Height Comparison to Bayswater Stacks

FIGURE 4

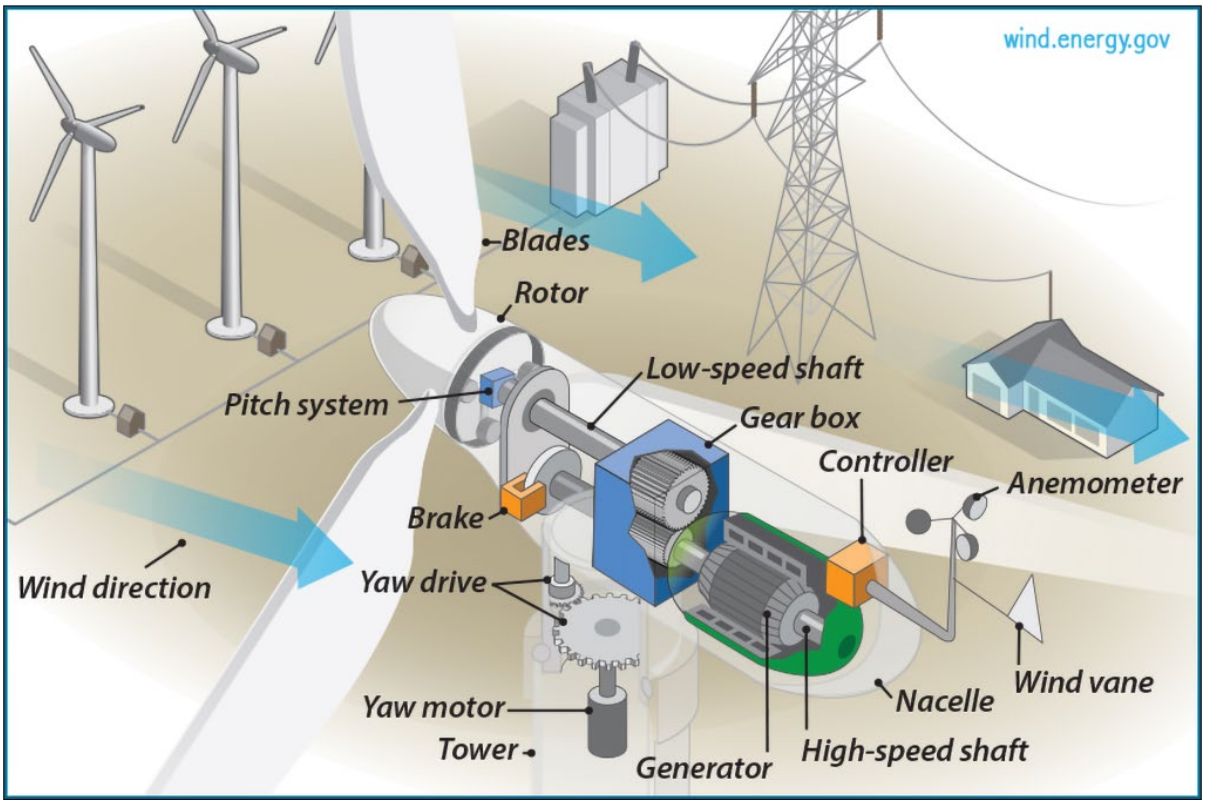


Figure 5 **Typical Wind Turbine Generator Components – Nacelle Internals**

1.3.2 WTG Locations

Indicative locations of the proposed WTGs are shown in **Figure 1**. The indicative layout reflects the spacing required for the WTG models that are being considered. WTG towers will be located at least 100 m from the Project Boundary. The design of the Project followed the principles of:

- Avoiding and minimising adverse environmental impacts;
- Maximising production of renewable energy; and
- Practical limitations affecting the construction and operation of the wind farm.

The coordinates of the locations and maximum heights of the WTGs, as amended, are presented in **Appendix A**.

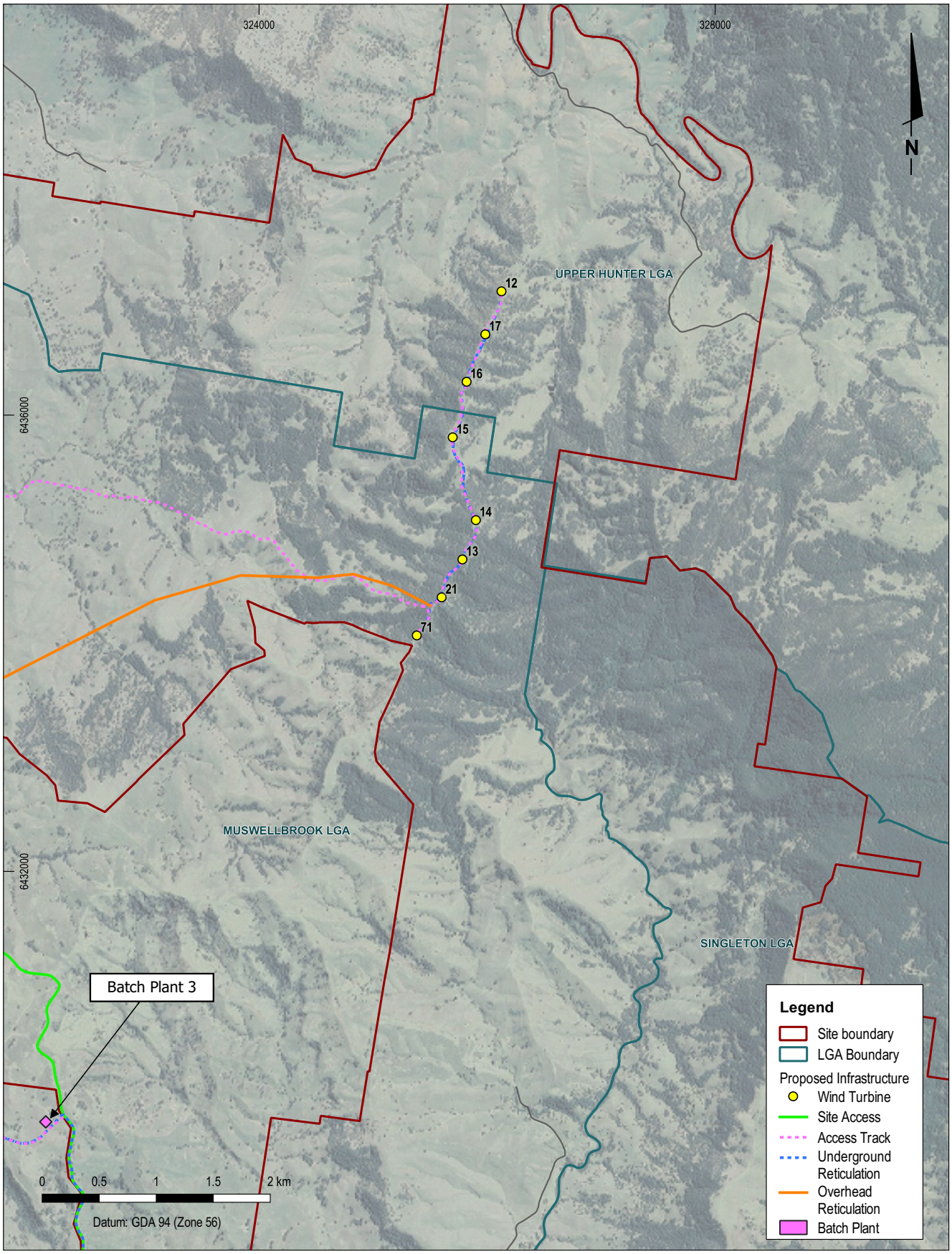
The indicative WTG locations have accounted for known constraints as described in Section 7 of the EIS. However, WTGs may need to be relocated during the detailed design or construction phase due to geotechnical, environmental and other technical requirements, up to 100 m from the specified GPS co-ordinates in **Appendix A** (except where noted in Section 7.9.4 of the EIS). This practice is referred to in the Wind Assessment Guideline as "micro-siting".

In accordance with the Wind Assessment Guideline:

- Micro-siting will not materially increase the environmental impacts of the Project; and
- Potential variability has been addressed in this EIS.

Figure 6 to **Figure 9** provides an amplified aerial view of the northern, eastern, western, and southern aspects of the Project.

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig06_Conceptual Project Layout - Northern | 01 09 2021

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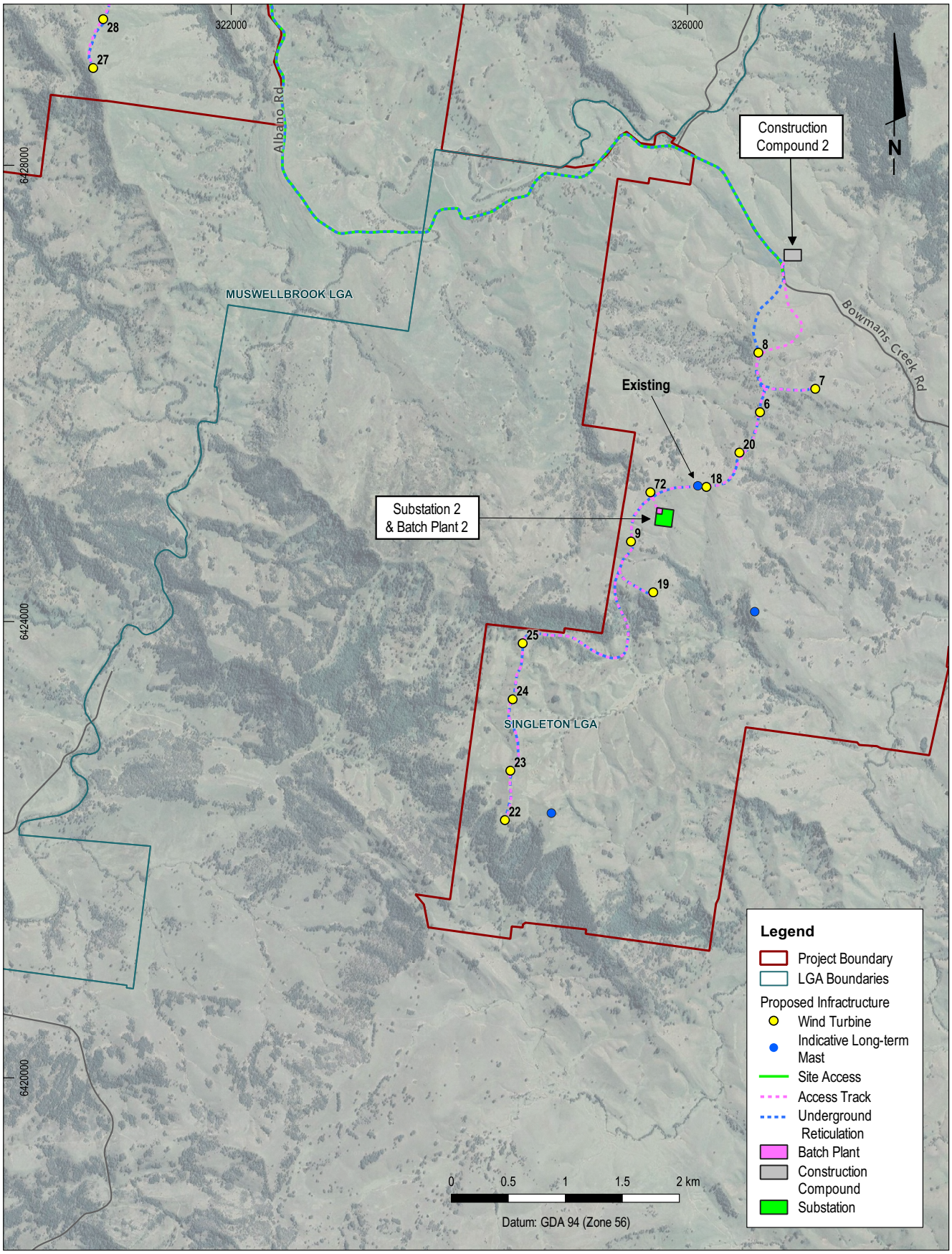
Conceptual Project Layout - Northern

FIGURE 6

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig07_Conceptual Project Layout - Eastern | 08 09 2021

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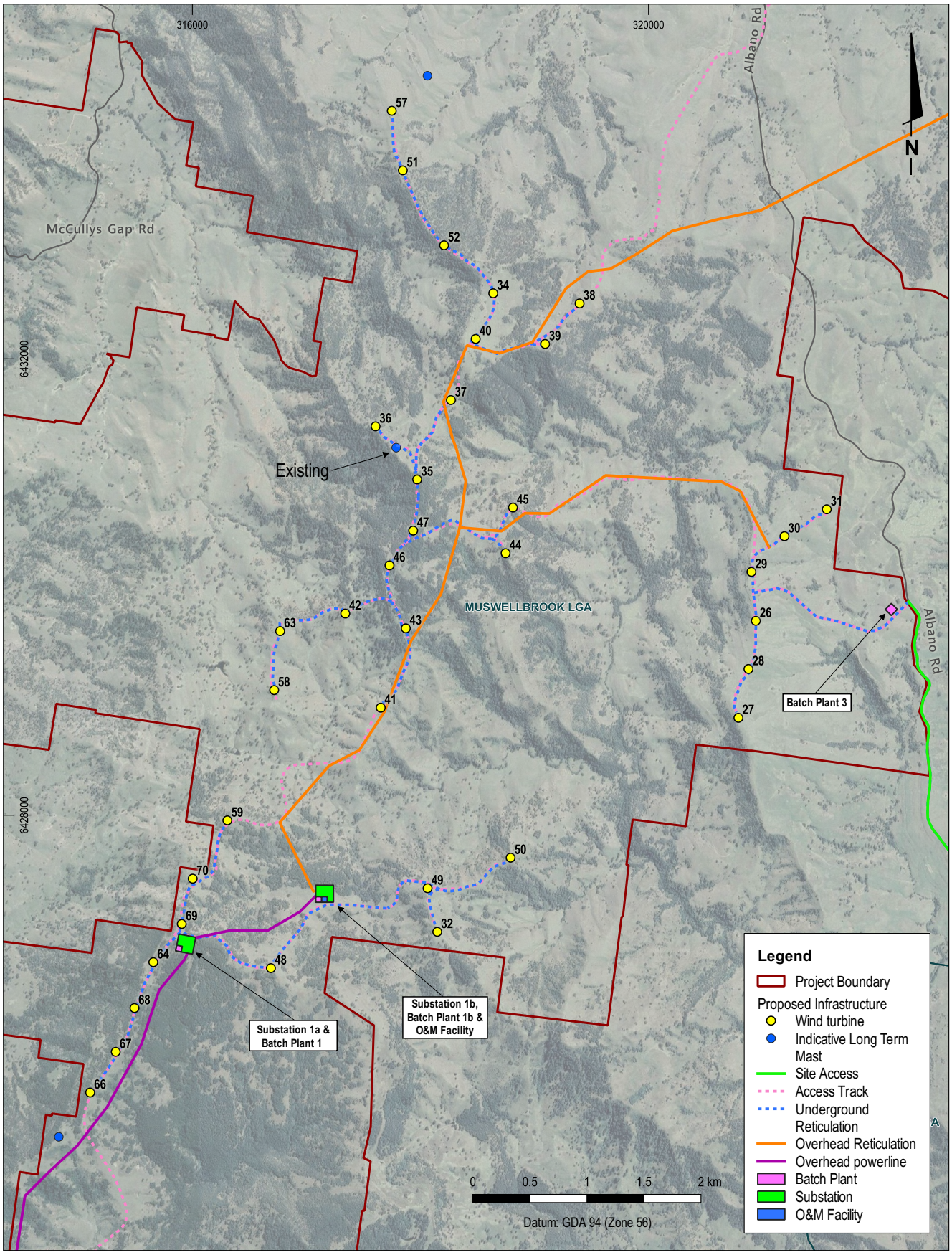
Conceptual Project Layout - Eastern

FIGURE 7

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig08_Conceptual Project Layout - Western | 07.10.2021

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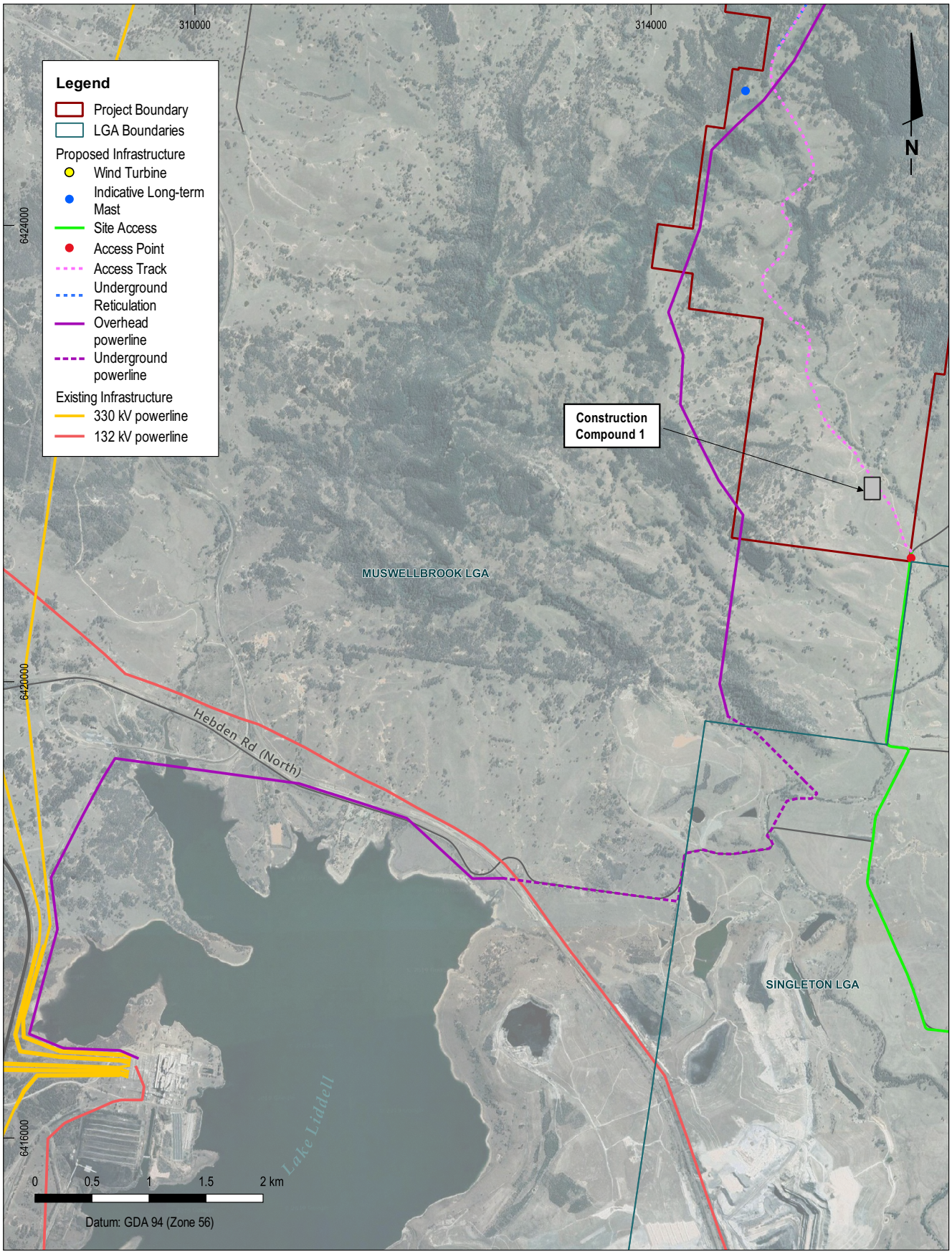
Conceptual Project Layout - Western

FIGURE 8

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig09_Conceptual Project Layout - Southern | 07 10 2021

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Conceptual Project Layout - Southern

FIGURE 9

1.3.3 Hardstand Areas

The establishment of hardstand areas at each WTG site will generally involve clearing of vegetation, earthworks and compaction of soil.

The tower will be mounted on a reinforced concrete foundation that will require removal of rock and subsoil at the base of each WTG. The material excavated during the construction of the WTG footings may be crushed, and reused as road base for the access tracks, used in hardstand areas; or other in earthworks for other Project components.

In some circumstances, blasting may be required to loosen the bedrock at the WTG site. If required, blasting will be undertaken and monitored in accordance with the Development Consent and Environment Protection Licence (EPL) for the Project. Blasting would be undertaken between 9 am and 5 pm Monday to Saturday only (excluding public holidays).

Once the footings have been established, a mobile crane and other ancillary equipment will be introduced to assemble the WTG components. Hardstands and towers will generally be retained in situ after construction to allow for any required maintenance and repairs over the life of the Project.

1.3.4 Operation and Maintenance

Although the operation of WTG is largely automated, operational staff will conduct routine inspections and maintenance. WTGs typically require up to 6 days of maintenance per year. In addition to scheduled maintenance, WTG components will be repaired or replaced as required.

1.3.5 Refurbishment

Individual WTG have an operating lifespan of approximately 25 years. Depending on the WTG, some or all of the major components will be replaced to ensure its ongoing operation. Wherever possible, the concrete foundations and towers will be reused for the refurbished WTGs.

The access tracks established during the initial construction phase will continue to be utilised for refurbishment works. The refurbishment process will be similar to the original construction of the WTGs.

WTGs that are not refurbished will be decommissioned as generally described in **Section 1.8**.

1.4 ELECTRICAL INFRASTRUCTURE

1.4.1 On-site Electrical Reticulation

Each WTG will be accompanied by a transformer, which will be either housed within the nacelle or separate enclosure. WTGs typically produce electricity at a voltage of around 690 V. The transformer within the WTG will step up the voltage to 33 kV for more efficient reticulation within the site. The transformer will be either a dry-type transformer, or will be suitably bunded / contained.

Electricity will be reticulated from the WTG to the on-site substation/s using either overhead powerlines or underground cables. Underground cables are generally preferred for connecting WTGs along ridgelines, whereas overhead powerlines are preferred for transporting power between adjacent ridges and for connecting groups of WTGs to the substation.

Adjustment of electrical connections may be required to enable micro-siting of WTGs or other constraints identified during detailed design to facilitate construction. Any amendments to powerline routes external to the Survey Area will be undertaken in accordance with the 'Land Disturbance Procedure' as described in Section 7.25 of the EIS.

Approximately 40 km of underground cables will be required and the installation of which will require the excavation of trenches approximately 2 m wide and 1 m deep. Where possible, trenches will be located within or adjacent to access tracks to reduce ground disturbance.

Approximately 17 km of overhead powerlines will be required and will include a combination of single-circuit and double-circuit powerlines. The overhead powerlines will use single pole type structures. Compared to underground cables, overhead powerlines have the advantage of requiring less disturbance and being able to span across creeks. At creek crossings, powerlines will be designed such that the poles avoid the stream bed. Powerlines will generally follow the on-site access tracks, and where retained these will be maintained for the life of the Project.

1.4.2 Substations

The reticulation cables and powerlines will transport the generated electricity to one or two substations (at locations 1a or 1b; and 2 shown on **Figure 1**). Each substation facility will occupy an area of 150 m x 150 m A typical substation is shown in **Figure 10** (TransGrid, 2014).

Each substation will include a transformer to step up the reticulation voltage (33 kV) to (up to 330kV). Should the transformer be oil-cooled units, appropriate bunding to the relevant Australian Standards will be implemented to manage potential spills or leakages. The substation will also be equipped with circuit breakers, control and protection systems, smaller voltage and current transformers, communications equipment and fire protection.

Connections to the required telecommunications services will be facilitated through cables, optical fibres and/or electromagnetic transmissions. The substations' backup power supplies will include a connection to the local electricity network.

The substations will be contained within fenced enclosures to prevent unauthorised access. To reduce the risk of fires, an appropriate Asset Protection Zone (APZ) will be established around each substation in accordance with 'Planning for Bushfire Protection' (RFS, 2019) as described in Section 7.10 of the EIS.

Night lighting will be installed at the substations and O&M Facility to enable critical maintenance work to be undertaken safely at night. These lights will be of low intensity and directed downwards in accordance with relevant Australian Standards.

Figure 10 Typical Wind Farm Substation Layout

1.4.3 Transmission Line

A new single or double circuit transmission line(s) will be constructed to export electricity generated by the Project to the existing TransGrid network via the Liddell substation as shown on **Figure 1**. The voltage of the proposed transmission line will be up to 330 kV.

The overhead portion of the transmission line is approximately 17 km in length and will be supported by single pole steel or concrete structures. The towers will be approximately 45 m tall and spaced at intervals of 200 - 300 m depending on topography. The transmission lines will be constructed within a 60 m wide easement. Although the easement does not need to be entirely cleared, vegetation will be removed where required to maintain a safe setback from the conductors.

The underground portion of the transmission line is approximately 5 km in length and will either be trenched at a depth of approximately 1.2 m below the ground surface with a work's area of approximately 5 - 6 m wide either side of the trench to accommodate the excavator and stockpiling of soil, or underbored. The trenches for the cables will be backfilled with excavated material and covered with topsoil post-installation. The surface above the transmission line will be rehabilitated on completion of construction activities in consultation with landholders. The underground transmission line will cross some waterways as discussed in Section 7.15 of the EIS.

An unsealed access track of up to 3 m will be constructed where necessary within the overhead transmission line easement to provide access for maintenance activities. The transmission line will be equipped with an earth wire to protect the current carrying wires from lightning strikes. The towers will be fitted with insulators to prevent current from being transferred to the supporting structure. The final design of the transmission line will be developed in consultation with TransGrid.

1.5 ANCILLIARY INFRASTRUTURE AND EQUIPMENT

The Project will involve the following ancillary infrastructure which will generally be retained throughout the operational life of the Project:

- O&M Facility;
- Communications;
- Access tracks; and
- Wind monitoring masts and monitoring equipment.

Temporary infrastructure and equipment that will only be required for the construction phase are described in **Section 1.5.1** and **Section 1.5.2**, respectively. All infrastructure components will be designed to ensure the visual appearance (including paint colours) blends in as far as possible with the surrounding landscape.

1.5.1 Temporary Construction Infrastructure

Construction compounds will be established at various locations within the Survey Area to facilitate the construction of the WTGs and other operational infrastructure described in **Section 1.3** and **Section 1.4**. These compounds will include power supply, roads, communications, temporary offices, amenities and car parking spaces for construction personnel, as well as laydown and storage areas for construction materials and equipment. Construction compounds will be fenced to prevent unauthorised access by trespassers and livestock.

Bedrock excavated during the construction of the WTG sites will be crushed to produce gravel for other construction activities (such as road base for access tracks). Mobile rock crushers will be established at various locations within the site for this purpose. A typical rock crusher would occupy an area of approximately 50 m by 100 m and consist of a tracked or wheel mounted mobile crushing unit, conveyor belts, feeder and power unit. They are easily movable on and between sites, which reduces the need for hauling materials over large distances.

Up to three temporary concrete batching plants will be commissioned during the construction phase to produce the concrete required for construction activities. The batching plants will occupy an area of approximately 100 m by 100 m include loading bays, hoppers, cement and silos, truck loading hardstand, water tank and aggregate stockpiles. Coarse aggregate required for concrete production may be sourced from the on-site rock crushers or an external source. Concrete will be transported throughout the site using concrete mixer trucks.

The concrete batching plant and rock crushers will be decommissioned at the completion of the construction phase.

Only with the permission of the landholders, water in existing farm dams may be used to assist in dust suppression (under the conditions described in Section 4.4.7 of the EIS).

1.5.2 Construction Equipment

The equipment fleet required for the construction of the Project will include at least:

- OSOM and semi-trailers to deliver components to site;
- Excavators, loaders, dozers and other earthmoving machinery;
- Graders and rollers for road construction;
- Trenching machine;
- Underboring machine for directional drilling for transmission line installation;
- Trucks (including road registered trucks for transportation of materials, concrete mixer trucks and water trucks);
- Mobile cranes and elevated work platforms; and
- Hand operated tools.

1.5.3 Operation and Maintenance Facility

The O&M Facility acts as the main administration building during the operational phase of the Project. The O&M Facility will include (at least): the main control room, offices, amenities, storage areas (for equipment and materials), water tank(s), laydown/storage areas, septic system(s) and car park.

The O&M Facility will accommodate approximately 15 personnel. The indicative location of the O&M Facility is shown on **Figure 1**.

An indicative fleet of operational and maintenance vehicles includes: 4WD vehicles, watercart, trucks and light trucks. During refurbishment of WTGs, OSOM vehicles will also be required.

1.5.4 Communications

The operation of the WTG will be controlled remotely from the O&M Facility. To enable this to occur, control and communication cables will be installed from each WTG to the O&M Facility. These connections are generally in the form of optical fibre cables.

In order to minimise ground disturbance, the optical fibre cables will accompany the electrical reticulation infrastructure associated with that WTG (wherever practicable). That is, the optical fibre cables will either be attached to the powerline or laid in the same trench as the underground cable.

A communications network for personnel will also be established. This network will utilise radio (UHF or VHF) or microwave transmissions. The installation of equipment on masts to improve phone performance and fix any impact to radio or other links as described in Section 7.9 of the EIS will also be undertaken in the vicinity of the Project Boundary.

1.5.5 Wind Monitoring Masts and Monitoring Equipment

There are two existing wind monitoring masts at the site used for wind speed verification, weather and general monitoring purposes. The masts are steel lattice structures (approximately 110 m high) that are mounted on a concrete footing and supported by guy-wires. These may be relocated over the life of the Project.

The masts are fitted with instruments for measuring wind speed and direction, pressure and temperature at various levels. The mast is also equipped with a solar panel, lightning rod, data loggers and anti-climb barrier. Security fences have been established around the masts and each of the guy-wire anchor points.

In accordance with the Infrastructure SEPP, a Designated Development planning approval is currently being sought for the continued use of both monitoring masts.

Up to four additional, permanent monitoring masts and associated equipment (including performance monitoring masts and associated communications) may also be constructed and utilised for the Project.

1.6 ACCESS AND ROAD NETORK UPGRADES

1.6.1 Public Road Access

The WTG components, other materials and construction equipment required for the Project will be transported to the site via the public road network.

WTG components will be to be delivered to the Project from the Port of Newcastle via the Hunter Expressway. Once at the intersection of Hebden Road (south) / NEH, OSOM vehicles will access the site via the identified Site Access location (see **Figure 1**) utilising Hebden Road (south), Scrumlo Road and Bowmans Creek Road/ Albano Road as follows:

- Hebden Road (south) between NEH and the intersection with Pictons Lane;
- Hebden Road (south) and Scrumlo Road from the intersection with Pictons Lane to the Site Access location; and
- Bowmans Creek Road/Albano Road connecting the north-western to the south-eastern areas of the Project Boundary.

Muscle Creek Road, Sandy Creek Road, Goorangoola Road and Rouchel Road will not be used by Project related traffic.

It is anticipated that the construction workforce will predominantly be located in the nearby townships of Muswellbrook and Singleton (including south of Singleton). Operational personnel originating in Singleton and Muswellbrook will generally access the site from the NEH via Hebden Road and Scrumlo Road.

Glencore proposes to realign a 5 km section of Hebden Road south which is conceptually shown in *Glendell Continued Operations Project EIS* (Umwelt, 2019). It is likely that this work will be completed prior to the commencement of the construction of the Project.

Access protocols will be described in the Traffic Management Plan (TMP) (Section 7.4.4 of the EIS) and will minimise disruption to the local community and consider (at least): local school bus routes, time of delivery, designing and implementing modifications to intersections, providing a 24-hour contact during construction as well as public notifications of upcoming traffic patterns and/or road changes.

1.6.2 Public Infrastructure Upgrades

NEH / Hebden Road Intersection to Local Roads

Due to the size of the WTG components, some of the deliveries to the Project will be OSOM loads. Upgrades to the local road network will be required to facilitate the safe transportation of these loads.

A detailed description of road upgrades and modifications to associated infrastructure are included in Appendix K of the EIS. Temporary and permanent works will be required to Hebden Road, Scrumlo Road, Albano Road / Bowmans Creek Road and along the transport route from the Port of Newcastle at Selwyn Street, George Street, Industrial Drive, Pacific Highway and the Hunter Expressway.

The required upgrades to the existing local road network to facilitate the OSOM haulage of wind turbine components for the Project are discussed in Section 7.4 of the EIS. The impacts and mitigation measures proposed during these upgrades are also discussed in Section 7.4 of the EIS.

Road works will also be required to facilitate installation of the underground transmission line (discussed in **Section 1.4.3**). These works will be undertaken in consultation with the relevant council and in accordance with the *Roads Act 1993* (see Section 4.4.6 of the EIS).

During detailed design, where it is identified that the physical road does not follow the road easement, consultation will occur with the relevant council to undertake realignment of the cadastral boundary prior to any works commencing.

Port of Newcastle to NEH / Hebden Road Intersection

A detailed description of road upgrades and modifications to associated infrastructure are included in Appendix K of the EIS, however temporary and permanent minor works will be required to Selwyn Street upon exit from the Port of Newcastle. The Pacific Highway and Hunter Expressway will require traffic management measures.

The required upgrades to the existing road network south of the NEH / Hebden Road Intersection to facilitate the OSOM haulage of windfarm componentry to the Project are indicatively shown in Appendix K of the EIS.

Associated Infrastructure

Associated communications or other public infrastructure relocations associated with the upgrades described above will be undertaken as required by the relevant road's authority.

1.6.3 Externally Supplied Resources

Gravel for construction purposes will be produced in situ wherever practicable. However, supplementary supplies of gravel will be obtained from local quarries or material suppliers if required. Fine aggregate (sand) for concrete production will also be sourced from local quarries, or other material's suppliers.

During the construction phase, water will be required for dust suppression, concrete production and human consumption. Potable water will be sourced from the municipal water supply (i.e. Hunter Water network) and transported to the site using road registered water trucks. The total water demand for the Project is discussed in Section 7.15 of the EIS.

Water that does not need to be of potable quality may be sourced from host landholders' farm dams (as described in Section 4.4.7 of the EIS) in consultation with the landholder or from water storages in the region where pumping stations are available (e.g. Glenbawn Dam, Glennies Creek Dam, Liddell Dam, etc.) and transported to the site using road registered water trucks.

Raw water from landholders may be used in accordance with the *Water Management Act 2000* (WM Act) as discussed in Section 4.4.7 of the EIS.

The Proponent does not own the land within the Project Boundary and as such, is not entitled to any harvestable rights. However, there are farm dams located within the Project Boundary that may be consistent with the relevant harvestable rights order. The Proponent will enter into agreements with these landowners if it is necessary to use water captured in these farm dams.

The water demands for the Project will significantly reduce at the completion of construction. The operational phase of the Project will only require a small volume of water (approximately 1 ML/year). Section 7.15 of the EIS provides further detail on water use.

1.7 LAND SUBDIVISION

Subdivisions will be required for the two parcels of land that the substations will be located on, including:

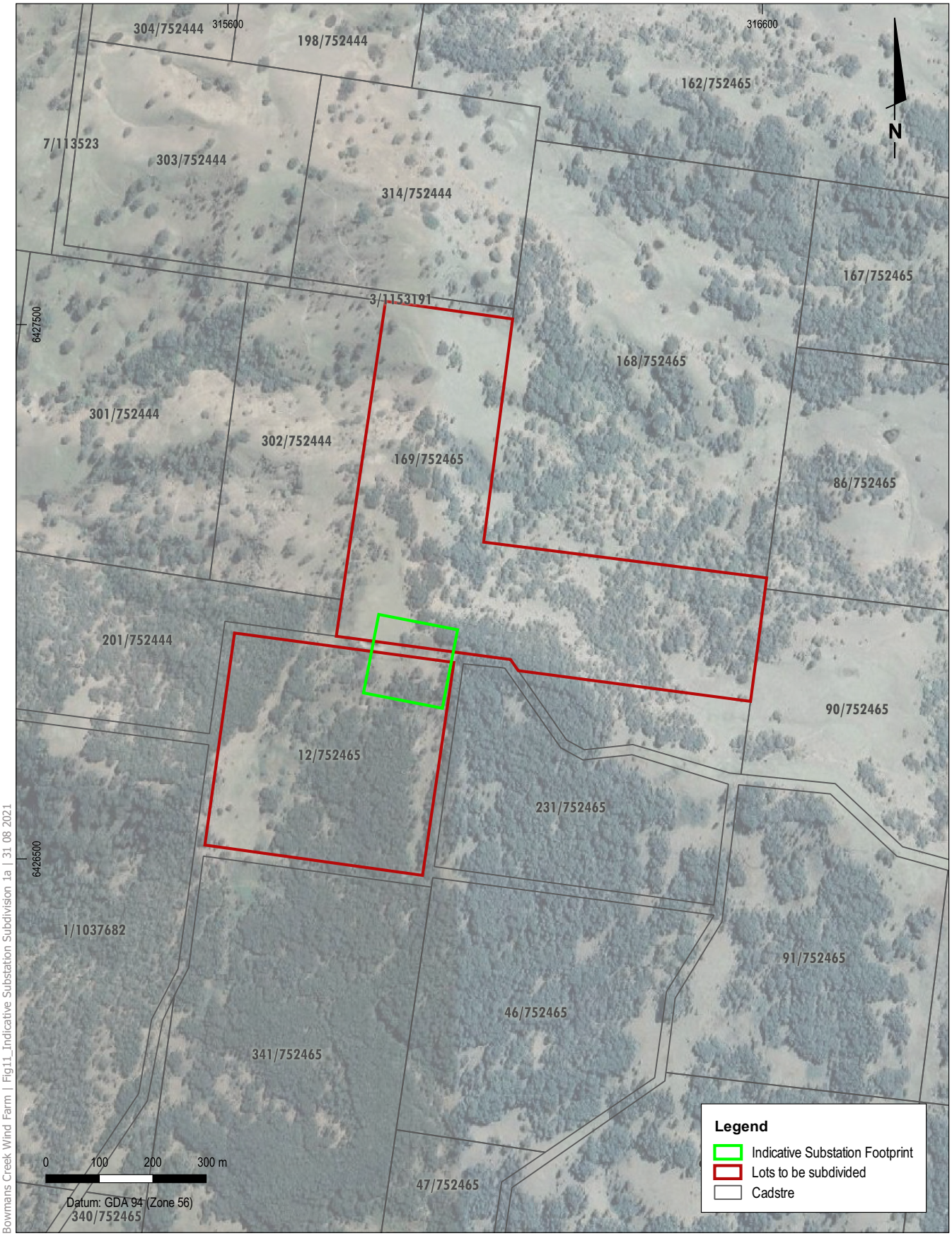
- Substation 1, either of:
  - Substation 1a (Part of each of Lot 169 DP 752465 and Lot 12 DP 752465); or
  - Substation 1b (Lot 86 DP 752465); and
- Substation 2 – (Part of each of Lot 131 DP 752460 and Lot 198 DP 752460.

The new lots created by the subdivisions will be occupied by the proposed substations and transferred to TransGrid (or other operator) at their request. The subdivisions are administrative activities that do not involve any physical works. Long term leases or land sales will also be required over the subject land (see Section 4.4.8 of EIS).

Figure 11 to **Figure 13** provide indicative substation subdivision layouts on Associated landholders properties. Detailed plans will be prepared to accompany applications for subdivision works' certificates (refer to Section 4.2.2 of the EIS).

Subdivisions may also be required following detailed design where it is identified that the physical road does not follow the road easement as discussed in **Section 1.6.2**.

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig11_Indicative Substation Subdivision 1a | 31 08 2021

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BOWMANS CREEK WIND FARM

Indicative Substation Subdivision 1a

FIGURE 11

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Aerial ©2019 Google

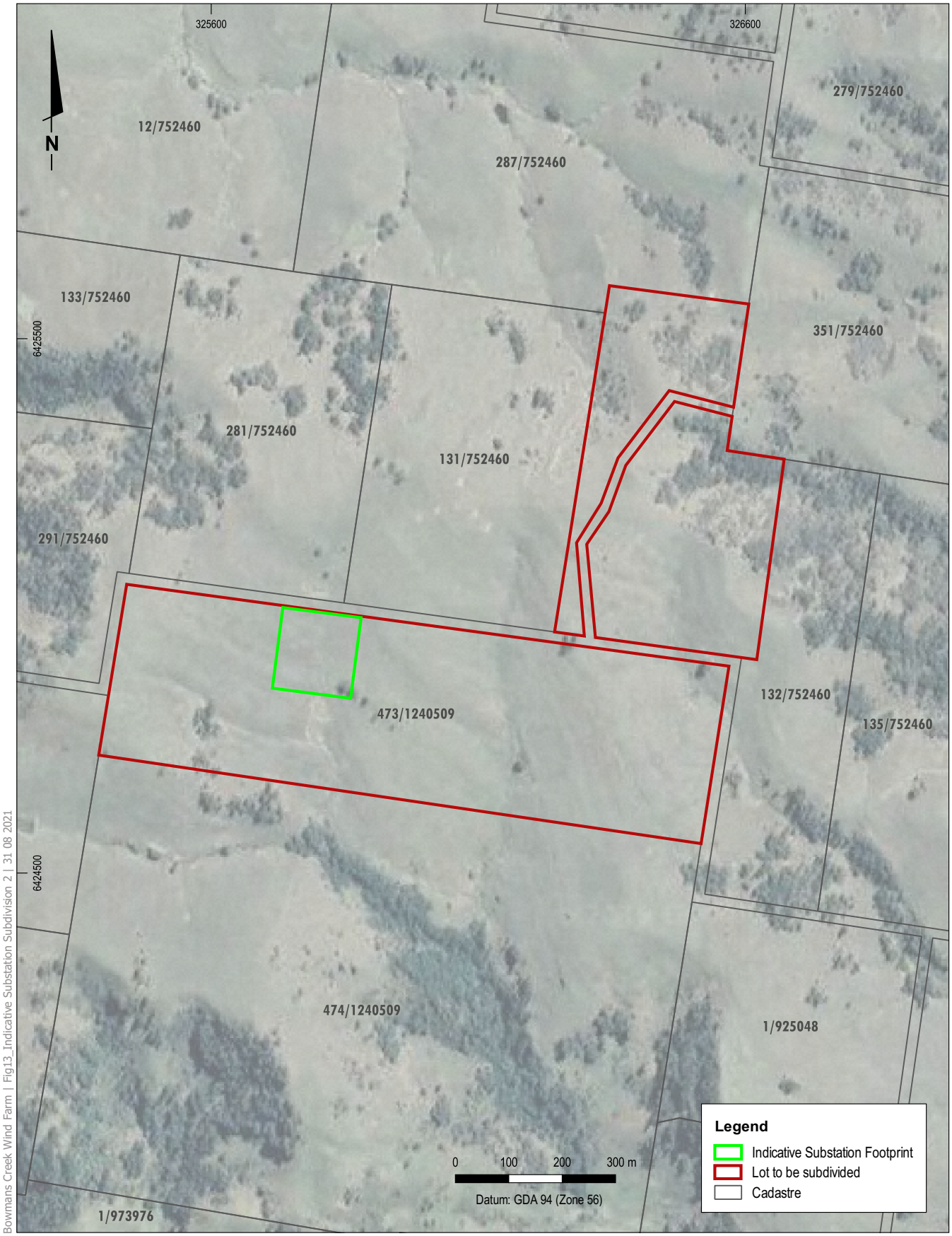
Bowmans Creek Wind Farm | Fig12_Indicative Substation Subdivision 1b | 31 08 2021

BOWMANS CREEK WIND FARM

Indicative Substation Subdivision 1b

FIGURE 12

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig13_Indicative Substation Subdivision 2 | 31 08 2021

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Indicative Substation Subdivision 2

FIGURE 13

1.8 OTHER ANCILLIARY ACTIVITIES

Other ancillary activities generally required during the construction, maintenance, operation and decommissioning of a wind farm including: sub surface geotechnical investigations, firebreaks, portable structures, signage, minor water diversion structures, pipelines, fencing, sediment and erosion control structures.

Some of these activities may occur within the Project Boundary but external to the Survey Area and will only occur following implementation of the 'Land Disturbance Protocol' (see Section 7.16.3 of the EIS) and within other limits within this Project Description.

1.9 DECOMMISSIONING

The proposed WTGs are expected to have an operational life of approximately 25 years. At the end of this term, the operator may decide to refurbish the facility, thereby extending its operational life by an additional 25 years. If the operator decides not to refurbish the facility, WTGs will be decommissioned within 18 months of ceasing operation. The decommissioning process will generally involve the removal of above ground infrastructure, including WTGs, electrical infrastructure and maintenance buildings.

Substations, transmission lines and powerlines may be of use by TransGrid or other industrial stakeholders. If a future use is identified for any above ground infrastructure associated with the Project, that infrastructure may be retained in agreement with the interested stakeholders. Otherwise, all above ground electrical infrastructure will be removed during the decommissioning phase.

Buried infrastructure such as underground cables and footings will generally remain in situ to avoid further disturbance, unless these are within 500mm below the surface on arable land. Some infrastructure, such as access tracks and laydown areas, may be of benefit to the landowner. Such infrastructure may be retained in situ with the agreement of the landowner. The indicative decommissioning process is summarised in **Table 5**.

Table 5 Indicative Decommissioning Activities

Component	Tasks
WTG	• Disconnect from the electricity network • Drain and dispose of liquids (e.g. oils, lubricants, coolants, etc.) • Disassemble into its components using a crane • Transportation of components off-site • Concrete foundations will be retained in situ unless within 500mm depth immediately below the surface of arable land
Wind Farm Substation	• Deactivate the transformer and allow components to cool • Drain and dispose of liquids (e.g. oils, lubricants, coolants, etc.) • Disassemble and dispose of parts off-site • Concrete foundations will be retained in situ
Powerlines / transmission line and cables	• Overhead powerlines / transmission line will be dismantled and removed from the site (unless it is to be retained for future use by third parties) • Underground cables will generally be retained in situ
Access tracks	• Access tracks will generally be retained for the landowner's use • If required to be decommissioned, the gravel and sub-layers will be removed and either reused as fill or transported off-site • If the road is to be decommissioned, associated culverts, crossings and drainage structures will also be removed

Component	Tasks
O&M Facility and other buildings	• Buildings may be retained for the landowner's use • If not required for other uses, buildings will be demolished in accordance with relevant standards

During decommissioning, existing access tracks will generally be used for equipment access and removal of materials from site. The dismantled infrastructure components will generally be sold as parts or scrap materials. All waste will be recycled where practical, or where necessary disposed of in a relevantly licensed facility as described in Section 7.17 of the EIS.

Disturbed areas will be rehabilitated to meet the intended final land use and be comparable with pre-construction conditions in consultation with landholders.

1.10 ALTERNATIVES CONSIDERED

This section describes the alternatives considered during the development of the Project. This included the do-nothing option, consideration of WTGs and associated infrastructure locations, transmission line access, and site access via the public road network.

Various amendments were made in response to the stakeholder engagement (Section 5 of the EIS), environmental impact assessment findings (Section 7 of the EIS) and field ground-truthing during ongoing project planning.

1.10.1 "Do Nothing"

The "Do Nothing" approach would lead to a missed opportunity for the state of NSW, Federal Government of Australia and its people in relation to:

- Provision of additional generation capacity into the NSW grid to assist in meeting load demand as a result of retiring thermal generators;
- Reducing greenhouse gas emissions and contributing to cleaner electricity generation under the Paris Agreement;
- Supply of renewable energy to assist in meeting State targets under the 'Net Zero Plan Stage 1 2020-2030'; and
- Providing an opportunity for regional investment as the renewable energy sector grows in NSW and the Hunter Valley.

Additionally, the "Do Nothing" approach will create missed opportunities for the environment and local community including:

- Reducing a significant amount of GHG emissions through the avoidance of carbon dioxide from coal fired power stations;
- Direct injection of funds into the local economy through the provision of jobs, use of local services, ongoing landowner payments and contributions under the VPA;
- The production of 347 MW of clean, renewable energy, equivalent to the consumption of around 145,000 homes (greater than the total existing houses in the three LGAs); and
- Improvements to the local road network.

1.10.2 Alternative Powerline Route

As discussed in **Section 1.4.3** a new transmission line will be constructed to export electricity generated by the Project to the existing TransGrid network via the Liddell substation. The Proponent considered and investigated three potential options for the transmission line alignment: two running east-west towards the TransGrid Muswellbrook substation, and one running north-south towards Liddell substation. Options are shown on **Figure 14**. The two Muswellbrook options were discounted as a suitable transmission line corridor could not be secured.

An alternative alignment for the Liddell option was investigated as shown in **Figure 14.** This option was discounted due to current land access constraints and does not form part of the proposed route.

A detailed discussion on environmental impacts and benefits for the proposed alignment are described in Section 7 of the EIS. This option provides significant environmental, technical and social benefits (by way of less impacts on private landholders) to the alternate options considered.

1.10.3 Alternative Site Access

Site Access is described in Section 7.4 of the EIS.

An alternative Site Access route for light and heavy vehicles was investigated along Muscle Creek Road and Stoney Creek Road. Following consultation with nearby landowners and transportation assessment, it was determined that these access routes were not preferred due to community concerns relating to interactions between heavy vehicles, school buses and local area traffic as well as challenging road conditions and the requirement to upgrade a number water crossing structures.

OSOM and heavy vehicles travelling along Pictons Lane was also considered but not pursued as part of the Project due to current land access constraints.

Site access options investigated as part of the proposal are shown on **Figure 14**.

1.10.4 Alternative WTG and Associated Infrastructure

Figure 14 illustrates the "preliminary layout" considered immediately following the Scoping Report.

Figure 15 shows the Conceptual EIS Project Layout for which development consent was sought during the exhibition of the EIS.

Figure 16 shows the Conceptual Amended Project Layout for which development consent is sought, as described in this Amendment Report.

Table 6 provides a detailed summary of the changes made between the "preliminary layout", "Conceptual EIS Project" and the "Conceptual Amended Project" for which approval is sought. It also summarises environmental benefits resulting from the changes.

In summary, the following changes were made between the preliminary layout and the development for which approval is sought and as assessed in this EIS (and subsequent assessments):

- 72 WTGs reduced to 60 WTG in the EIS with a further 4 removed for the Amended Project (total of 56 WTG proposed);
  - Four WTGs were removed and three WTGs were re-sited following stakeholder submissions received during the EIS Exhibition period. This will assist in minimising noise and visual impacts at receivers;
- Two proposed batch plants were relocated to reduce noise impacts at receivers;
- Two northern transmission line options were discounted in response to stakeholder engagement;

- The preferred southern transmission line includes several design changes due to stakeholder engagement; and
- Site access transport options were reduced to access via the NEH only (i.e. no OSOM vehicles on Pictons Lane, Muscle Creek Road) due to stakeholder engagement.
- Further reductions were made to site access tracks as well as underground and overhead reticulation routes, in response to issues raised by stakeholders and to minimise the overall project disturbance footprint by approximately 97 ha.

The following requirements and constraints were considered when determining the Project including (but not limited to):

- Topography and local wind conditions;
- Locations of non-associated dwellings in the vicinity;
- Results of noise monitoring and modelling;
- Identified ecological features (e.g. vegetation);
- Identified heritage items;
- Potential visual impacts on dwellings;
- Locations of communications links in the vicinity;
- Aviation assessments and landing grounds in the vicinity; and
- Accessibility for delivery of WTG components.

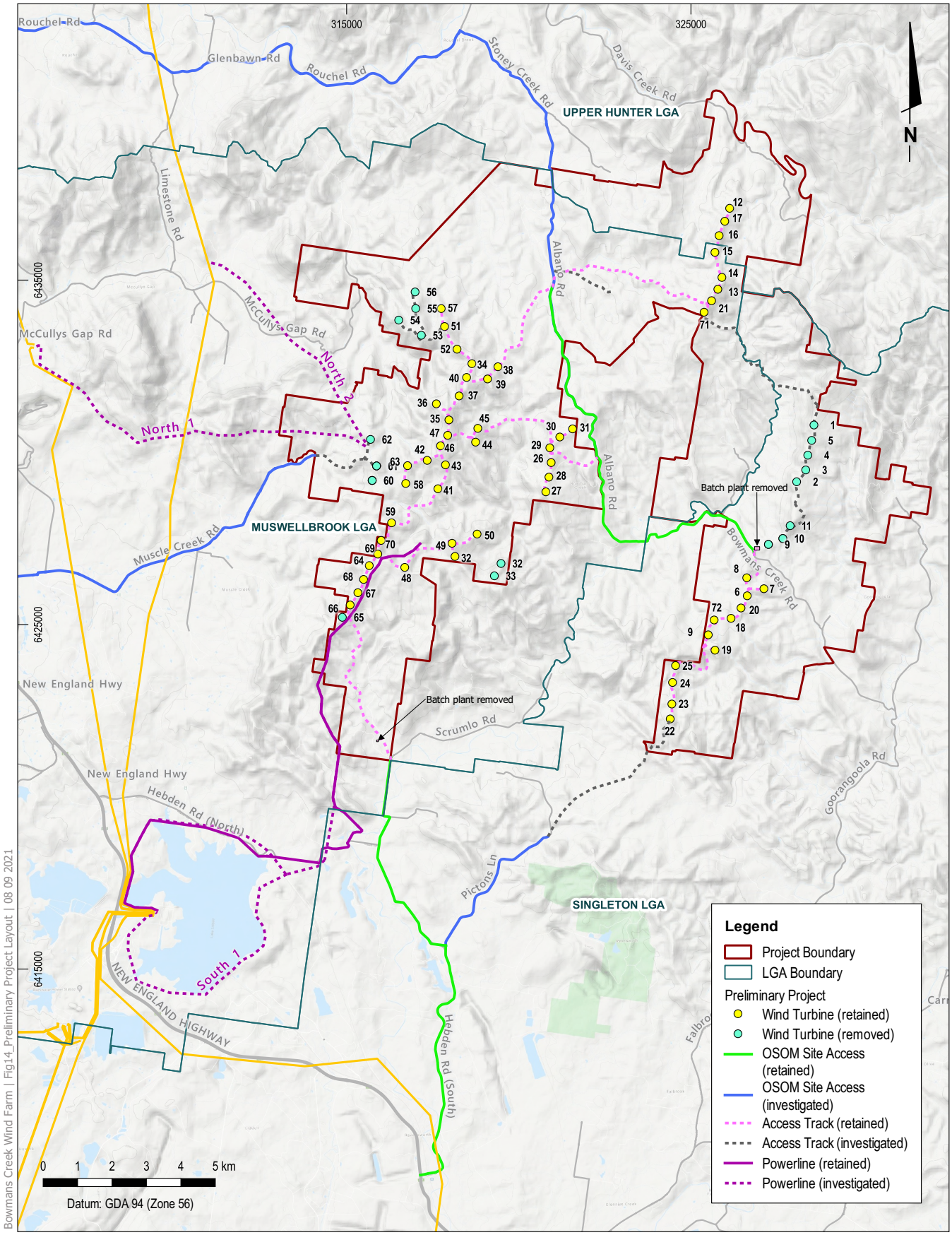
Table 6 Project Alternatives Considered, Benefits and Outcomes

Infrastructure	Environmental Benefits Achieved from Outcome	Outcome
Project Boundary		
WTG (T) 1	• Noise – exceeds noise level (LAeq,10 minute) of 35dBA at W14-1 • Shadow flicker – exceeds Visual Bulletin criteria of 30 hours per year at W14-1 • Visual – high impact on W14-1 • Water – located 250 m south-west of Jolly Springs • Ecology – reduced impacts to Plant Community Types (PCTs) 1583, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG removed • Access track connecting T1 to T71 removed
T2	• Visual – high impact on W14-1 • Ecology – reduced impacts to PCTs 1583, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG removed
T3	• Isolated WTG due to constraints on T1, T2, T4 and T5 • Ecology – reduced impacts to PCTs 1583, 618 (defined in Section 7.5 of the EIS)	• WTG removed
T4	• Visual – high impact on W14-1 • Located near dry rainforest identified by community member • Ecology – reduced impacts to PCTs 1583, 1606, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG removed
T5	• Visual – impact on W14-1 unacceptable • Ecology – reduced impacts to PCTs 1583, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG removed
T8	• Visual – reduce visual impact of WTG to Q17-3, Q17-1, Q 17-2, S17-2 • Noise – reduce noise at R17-1, S17-1, S17-2	• WTG relocated
T9	• Visual – reduce visual impact of one WTG to S17-2, S15-1 • Noise – reduce noise at R17-1, S17-1, S17-2	• WTG relocated • Access track to WTG 10 removed
T10	• Noise – reduce noise at T15-1, T15-2, W14-1, X17-1, X17-2, X17-3, Y15-1, Y17-1, Y17-2, Y17-3, Y15-1, Y17-1, Y17-2, Y18-1, Y19-1, Y19-2, Y19-3, Y19-4, Y19-5, Y20-1 • Visual – removes 1 visible WTG from T15-1, W14-1, S17-2	• WTG removed • Access track to WTG 9 & 10 removed

Infrastructure	Environmental Benefits Achieved from Outcome	Outcome
T11	• Unacceptable gradient for construction • Ecology – reduced impacts to PCTs 1543, 1583, 1607, 618 (defined in Section 7.5 of the EIS)	• WTG removed
T32	• Reduce ecological impacts	• WTG relocated
T33	• Reduce ecological impacts • Reduce noise – K23-2, L23-1, L23-2, M23-2, N21-1, N22-1 • Visual – removes 1 visible WTG from L23-1, M23-2, N21-1, N21-2, N22-1,	• WTG removed • Access track to WTG 32 and 33 removed
T53	• Visual – high impact on H12-3, H11-1, and H12-2 • Ecology – reduced impacts to PCTs 1683, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
T54	• Visual – high impact on H12-3, H11-1, and H12-2 • Ecology – reduced impacts to PCTs 1606 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
T55	• Visual – high impact on H12-3, H11-1, and H12-2 • Ecology – reduced impacts to PCTs 1606, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
T56	• Visual – high impact on H12-3, H11-1 and H12-2 • Ecology – reduced impacts to PCTs 1608, 618 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
T60	• Noise – reduce noise at D16-1, E17-6, F16-1, F16-2, F17-1 • Visual – removes 1 visible WTG from E17-6, F16-1, F16-2, F17-1, G15-3 • Reduce ecological impacts	• WTG removed • Access track and underground reticulation to WTG 60 and 61 removed
T61	• Noise – reduce noise at D13-1, E12-2, E12-5, F11-1, F11-2, F12-2 • Visual – removes 1 visible WTG from F16-1 • Reduce ecological impacts	• WTG removed • Access track and underground reticulation to WTG 60 and 61 removed
T62	• Visual – moderate impact to dwellings • Ecology – reduced impacts to PCTs 1606, 1608, 618 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
T64	• Visual – moderate impact to dwellings	• WTG moved

Infrastructure	Environmental Benefits Achieved from Outcome	Outcome
T65	• Visual – high impacts to dwellings • Ecology – reduced impacts to PCTs 1584, 1604, 1607, 618 (defined in Section 7.5 of the EIS)	• WTG and associated infrastructure removed
Batch Plant (BP)	• BP 1 – preliminary modelling exceeded noise level (LAeq,10 minute) of 35dBA at private dwelling • BP 2 – preliminary modelling exceeded noise level (LAeq,10 minute) of 35dBA at S17-2 and Q17-2	• Batch Plant 1 – moved to Substation 1a location • Batch Plant 2 – moved to Substation 2 location
Transmission Line		
Muswellbrook 1	• Landholder agreement not granted for access	• Southern option to Liddell substation adopted
Muswellbrook 2	• Landholder agreement not granted for access	• Southern option to Liddell substation adopted
Liddell	• Discounted due to current land access constraints	• Southern option to Liddell substation adopted
Transport Route		
Muscle Creek Road, Stoney Creek Road, Pictons Lane	• Following consultation with near landowners, it was determined that these potential access routes would not be used by the Project due to current land access constraints and concerns relating to interactions between Project OSOM traffic, school buses and proximate landowner traffic as well as unsuitable road conditions.	• Hebden Road (north) used for heavy and light vehicle; Hebden Road (south) used for all vehicles
Hebden Road (south)	• Disturbance area included two trees adjacent to the road which landowner requested to retain	• Move disturbance area to avoid the trees and widening opposite side of the road

Source: Terrain ©2019 Google



Bowmans Creek Wind Farm | Fig14_Preliminary Project Layout | 08 09 2021

BOWMANS CREEK WIND FARM

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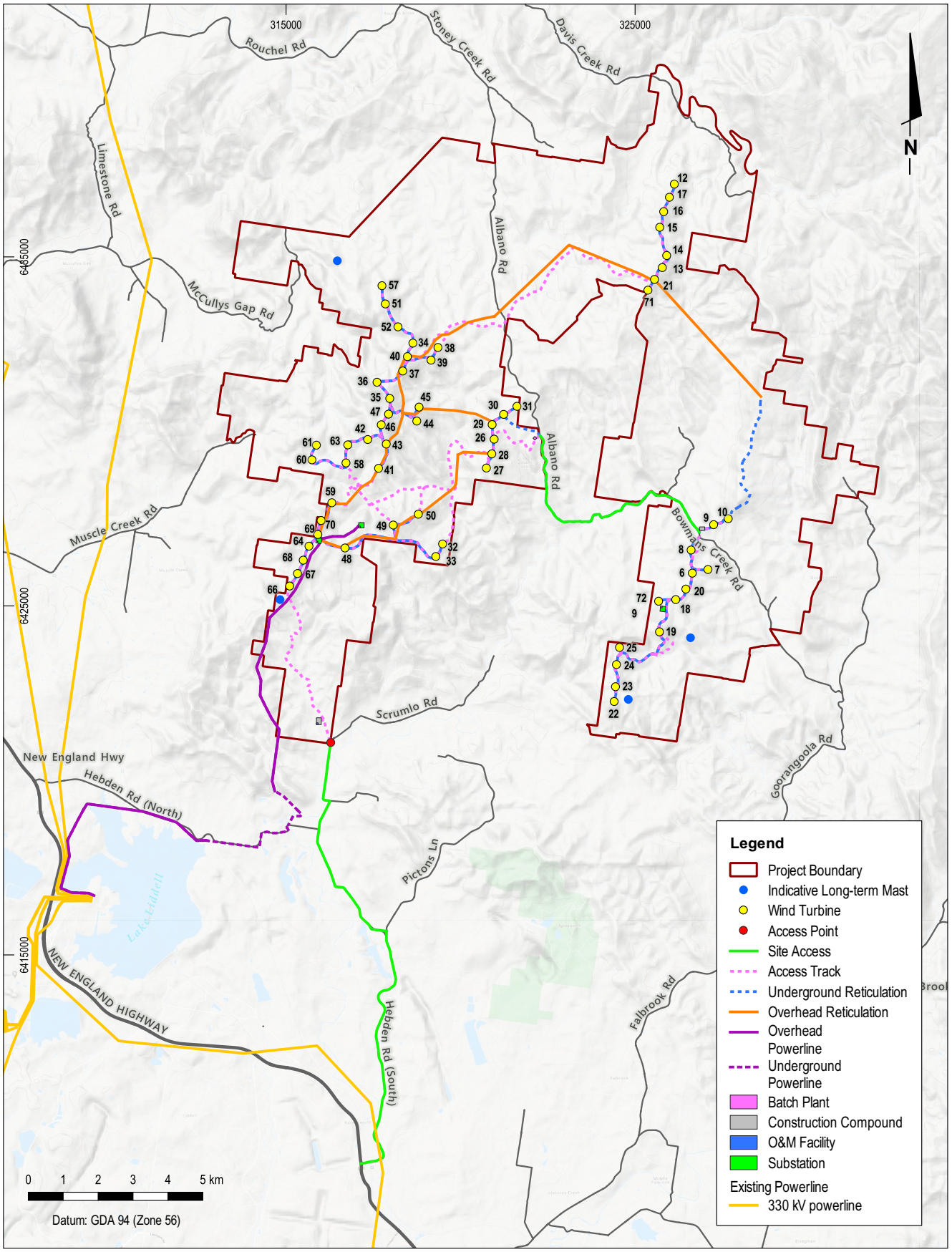
Preliminary Project Layout

FIGURE 14

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig23_Conceptual Project Layout | 09 09 2021

BOWMANS CREEK WIND FARM

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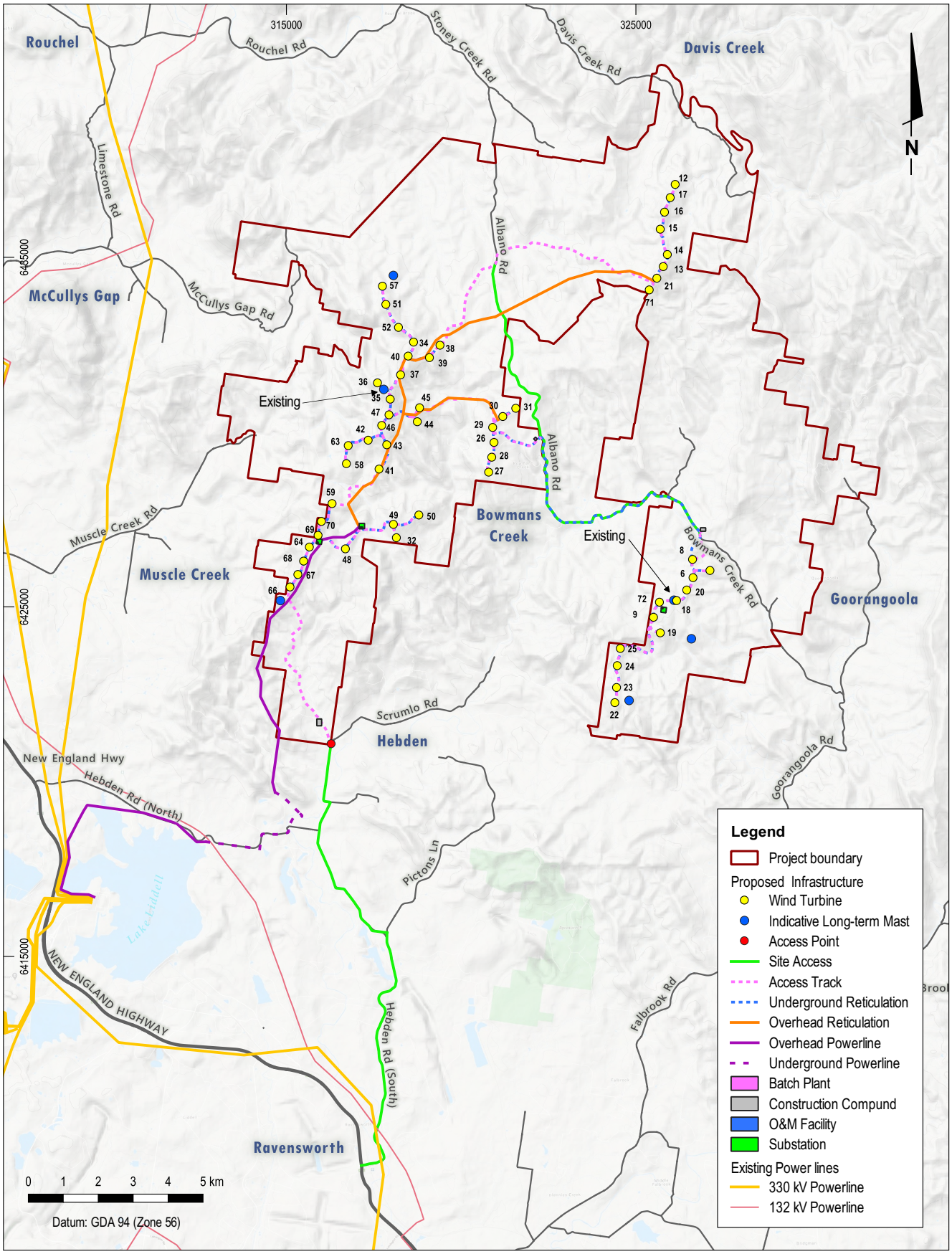
EIS Conceptual Project Layout

FIGURE 15

Source: Aerial ©2019 Google



Bowmans Creek Wind Farm | Fig16 Conceptual Project Layout | 08 10 2021

BOWMANS CREEK WIND FARM

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Amended Conceptual Project

FIGURE 16

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3. ABBREVIATIONS

Abbreviation	Meaning
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHIA	Aboriginal and Cultural Heritage Impact Assessment
AHD	Australian Height Datum
AHIP	Aboriginal Heritage Impact Permit
AIP	The NSW Aquifer Interference Policy
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016
BCD	Environment, Energy and Science – Biodiversity and Conservation Division
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
CCC	Community Consultative Committee
CIV	Capital Investment Value
DA	Development Application
DAWE	Department of Agriculture, Water and the Environment
dB(A)	A-weighted decibels
DPIE	NSW Department of Planning, Industry and Environment
DRG	Department of Planning, Industry and Environment – Division of Resources and Geoscience
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning & Assessment Act 1979
EPA Savings Regulation	Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017
EPBC Act	Environment Protection & Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
GHG	Greenhouse Gas Emissions
ha	hectare
Heritage Act	Heritage Act 1977
ICNG	Interim Construction Noise Guideline
IPCN	Independent Planning Commission NSW
LEP	Local Environmental Plan
LGA	Local Government Area
M	metres
NPW Act	National Parks and Wildlife Act 1974
NT Act	Native Title Act 1993
PCT	Plant Community Type

Abbreviation	Meaning
RAPs	Registered Aboriginal Parties
RBL	Rating Background Level
RL	Reduced Level
RMS	Roads and Maritime Services
SEE	Statement of Environmental Effects
SEPPs	State Environmental Planning Policies
SPLs	Sound Power Levels
SSD	State Significant Development
WM Act	Water Management Act 2000

APPENDIX A

WIND TURBINE GENERATOR TOWERS, COORDINATES AND MAXIMUM HEIGHTS

ID	Easting	Northing	Latitude	Longitude	Base Elevation (AHD m)	Tip Elevation (AHD m)
6	326637	6425835	-32.2909	151.159	388	608
7	327122	6426040	-32.2891	151.164	411	631
8	326623	6426357	-32.2861	151.159	420	640
9	325506	6424701	-32.3009	151.147	441	661
12	326127	6437085	-32.1893	151.156	526	746
13	325784	6434734	-32.2105	151.151	636	856
14	325902	6435079	-32.2074	151.153	615	835
15	325699	6435805	-32.2008	151.151	578	798
16	325821	6436292	-32.1964	151.152	591	811
17	325985	6436708	-32.1927	151.154	566	786
18	326167	6425180	-32.2967	151.154	435	655
19	325701	6424256	-32.3049	151.149	436	656
20	326457	6425481	-32.2940	151.157	405	625
21	325602	6434402	-32.2134	151.149	626	846
22	324400	6422259	-32.3227	151.135	435	655
23	324448	6422692	-32.3189	151.135	458	678
24	324468	6423318	-32.3132	151.135	413	633
25	324556	6423809	-32.3088	151.136	467	687
26	320942	6429703	-32.2551	151.099	546	766
27	320789	6428853	-32.2627	151.097	555	775
28	320877	6429281	-32.2589	151.098	524	744
29	320903	6430132	-32.2512	151.099	550	770
30	321193	6430445	-32.2484	151.102	517	737
31	321564	6430681	-32.2464	151.106	508	728
32	318148	6426977	-32.2792	151.069	534	754
34	318639	6432574	-32.2288	151.075	618	838
35	317972	6430942	-32.2434	151.068	684	904
36	317607	6431408	-32.2392	151.064	674	894
37	318268	6431638	-32.2372	151.071	637	857
38	319396	6432485	-32.2298	151.083	519	739
39	319094	6432130	-32.2329	151.080	615	835
40	318485	6432174	-32.2324	151.074	666	886
41	317652	6428942	-32.2614	151.064	495	715
42	317341	6429767	-32.2539	151.061	589	809

ID	Easting	Northing	Latitude	Longitude	Base Elevation (AHD m)	Tip Elevation (AHD m)
43	317872	6429637	-32.2552	151.067	599	819
44	318747	6430296	-32.2494	151.076	604	824
46	317729	6430189	-32.2502	151.065	691	911
47	317937	6430494	-32.2475	151.067	688	908
48	316689	6426659	-32.2818	151.053	593	813
49	318063	6427359	-32.2758	151.068	558	778
50	318791	6427627	-32.2735	151.076	498	718
51	317846	6433652	-32.2190	151.067	606	826
52	318208	6432995	-32.2250	151.071	617	837
57	317749	6434174	-32.2143	151.066	548	768
58	316718	6429096	-32.2599	151.054	526	746
59	316307	6427954	-32.2701	151.050	531	751
63	316770	6429613	-32.2552	151.055	539	759
64	315658	6426711	-32.2812	151.043	560	780
66	315104	6425568	-32.2914	151.036	497	717
67	315328	6425925	-32.2882	151.039	520	740
68	315493	6426309	-32.2848	151.041	555	775
69	315907	6427046	-32.2782	151.045	573	793
70	316003	6427443	-32.2747	151.046	553	773
71	325384	6434068	-32.2164	151.147	546	766
72	325676	6425133	-32.2970	151.149	425	645