

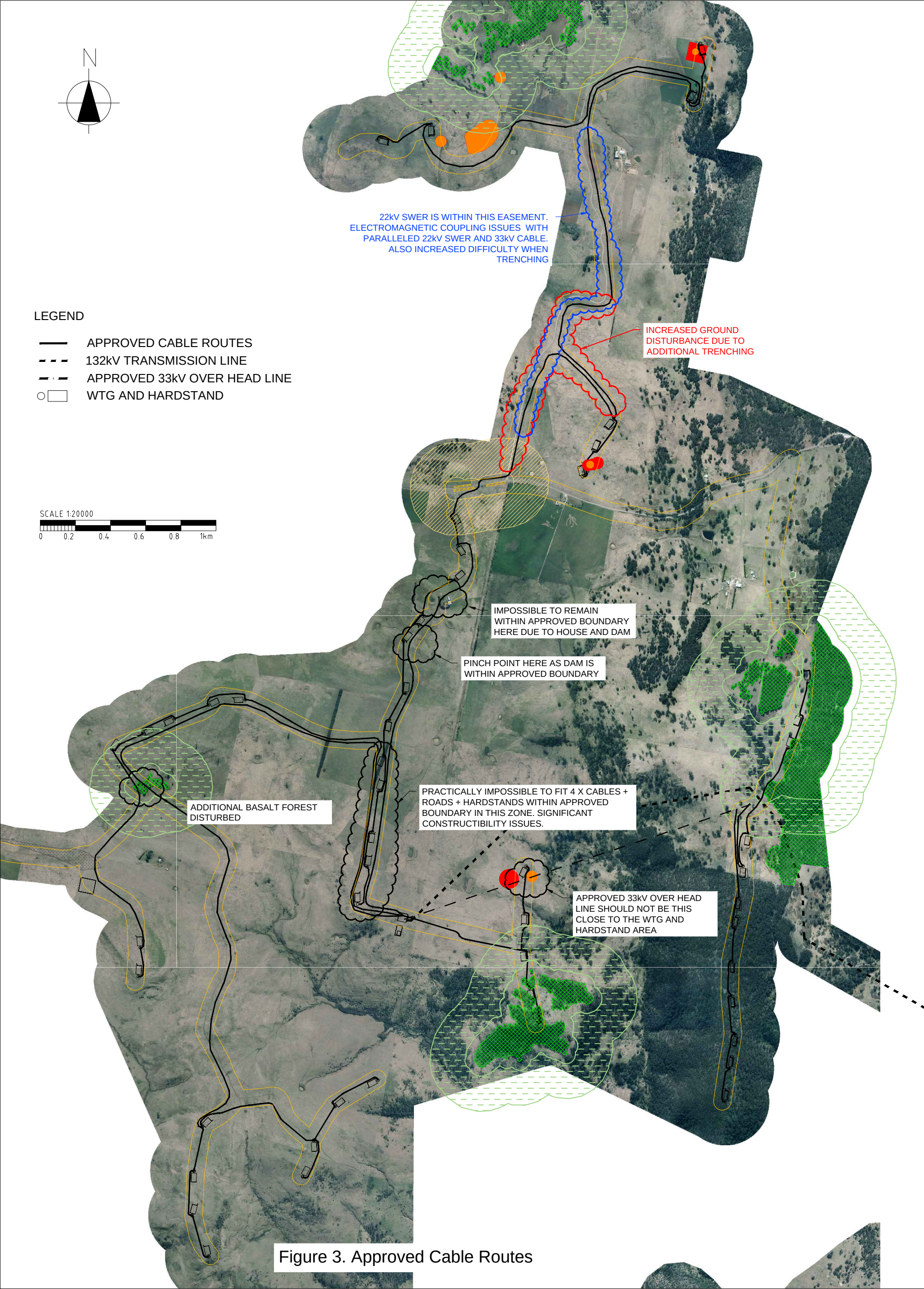


Figure 3. Approved Cable Routes

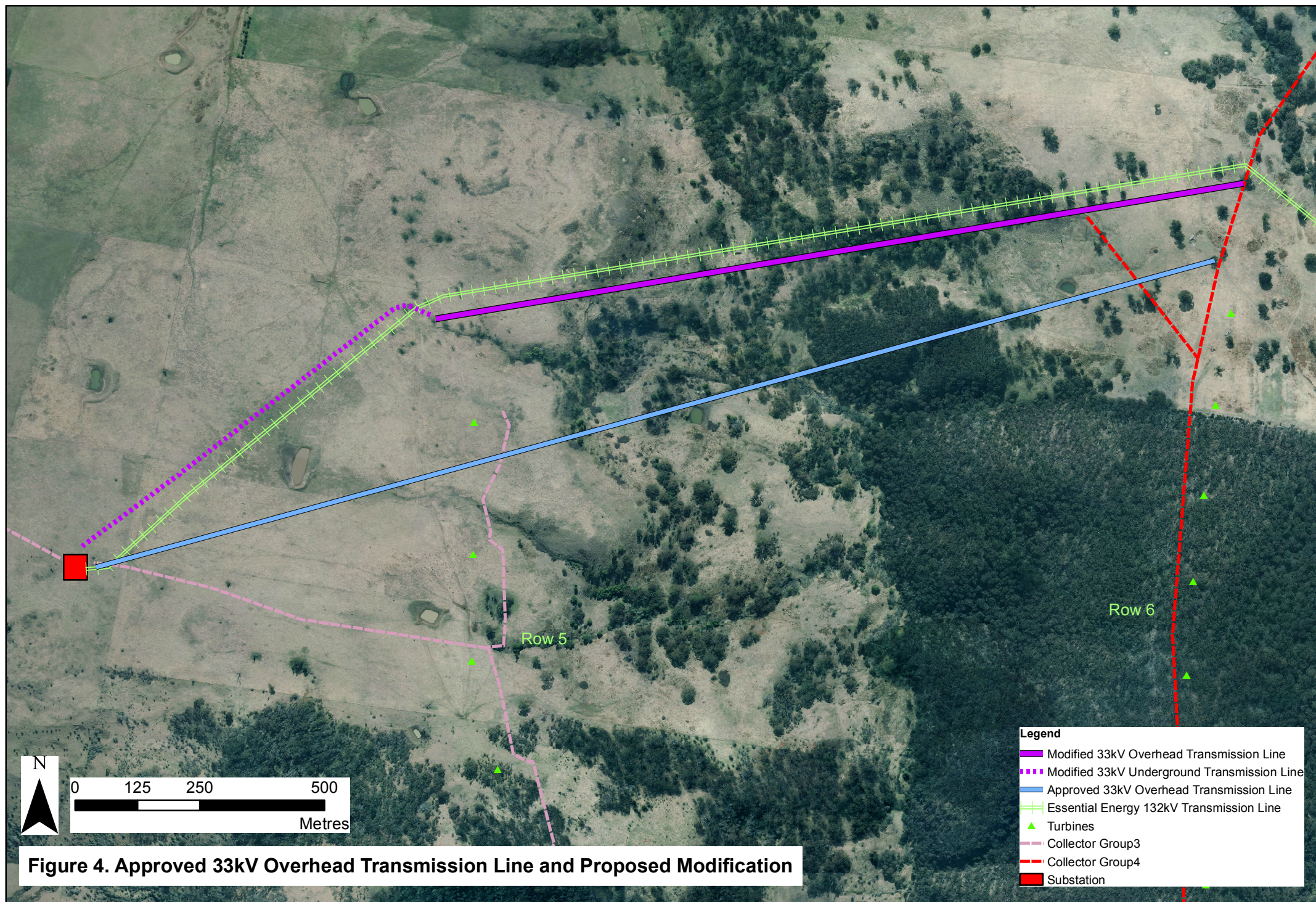


Figure 4. Approved 33kV Overhead Transmission Line and Proposed Modification

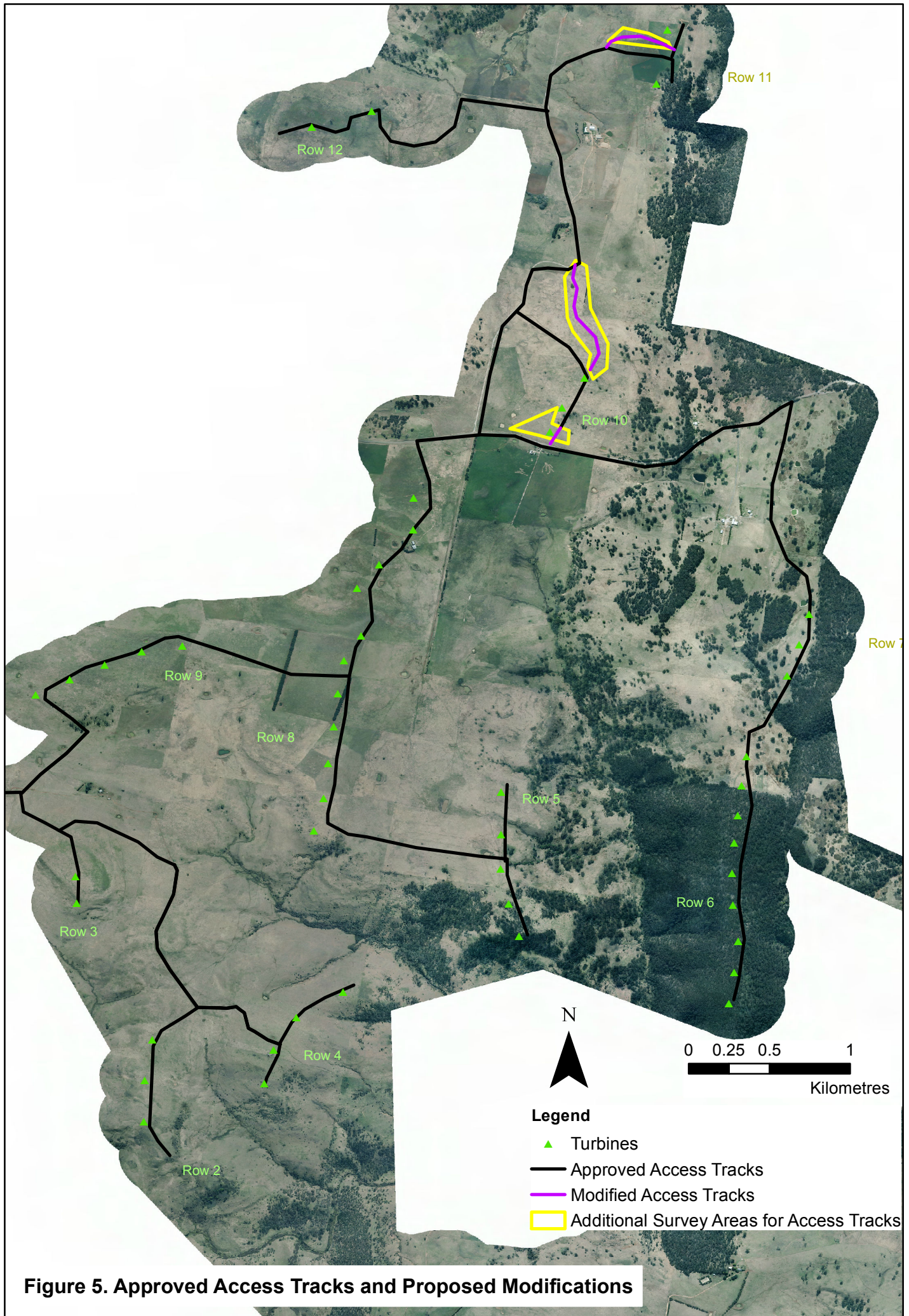


Figure 5. Approved Access Tracks and Proposed Modifications

2.3.1. Underground Cabling Alignment

The current consent conditions for the Project specify underground cabling to connect the wind turbines to the substation with the exception of two locations where overhead power lines will be used. Section 2.5.7 of the EIS states that the cables are to be laid in a trench approximately 0.5m wide by 1m deep adjacent to the access tracks. In instances where double circuits are required, trenches would be slightly wider or undertaken on both sides of the access track. The approved Project will result in disturbance of 7.84 hectares associated with underground cabling. The specific issues related to the approved cable routes are shown in Figure 3.

It is proposed to modify the alignment of the cabling route in the vicinity of turbine rows 2, 3, 6, 7, 8, 9, 10, 11 and 12 as shown in Figure 1. As access is required to the base of each turbine it is not proposed to alter the access track alignment. The identified cabling route modification would result in the separation of the access track and the cables within a portion of the wind farm resulting in a slightly greater area of disturbance associated with cabling of 8.16 hectares. The modified cabling alignments are all within cleared farm paddocks and would have minimal environmental impacts as discussed in Section 4.

The cable trenching footprint would comprise 450 mm width by 1000 mm depth with additional disturbance width of 1500 mm either side of the trench for temporary stockpiling of topsoil and subsoil. This material would be reinstated and disturbed areas revegetated with the preferred seed mix nominated in the CEMP.

The proposed modifications would have the following Project benefits:

- Resource savings through reduction in high voltage cable distances by 10 km with associated monetary savings;
- Increased operational reliability and efficiency through a reduction in the number of cable joints in the network;
- Increased efficiency and materials resource saving through reduction in required cable diameters;
- Greater certainty in managing electrical failures due to a reduction in overlapping cables; and
- Reduced construction timeframe with associated reduction in construction related impacts.

2.3.2. 33kV Overhead Transmission Line

The Development Consent identifies an overhead 33kV transmission line to connect turbine rows 6 and 7 to the substation. Section 2.4.7 of the EIS states that this option avoids impacts in vegetated gullies and that the lines can be installed with minimal off-site visual impact. Furthermore, the EIS identifies that the transmission line is to consist of single poles of a height and size substantially smaller than the steel towers associated with the 330kV transmission line that currently traverses the southern end of the Project site. It is specified that the line would be designed and built to avoid the need for any works to be undertaken within the gully and to provide adequate clearance so that no vegetation within this gully requires disturbance.

However, since the EIS was produced, further consideration of the overhead transmission line has indicated that the size and height of poles required to achieve the span across the gully, without disturbing vegetation, would be prohibitive. It has been estimated that heights of approximately 80 m would be required in the form of towers to provide the necessary strength. The height of towers required would be greater than those of the 330kV transmission line, in direct contradiction of the EIS.

It is therefore proposed to modify the alignment of the overhead 33kV transmission line to eliminate these engineering constraints. The current approved alignment is a straight line from turbine rows 6 and 7 to the substation resulting in the transmission running between turbines 18 and 19. The proposed new alignment for the 33kV transmission line to connect turbine rows 6 and 7 to the

substation is immediately adjacent to the approved, but not yet built, Essential Energy 132kV transmission line alignment as shown in Figure 4. This proposed alignment is to the north of turbines 18 and 19. The two transmission lines would be adjacent to each other with the 33kV line on the southern side of the 132 kV line. A 40m wide easement would be established for the 33kV line, side by side with the 132kV easement.

The proposed modified alignment would only require 18.5m high poles with an associated reduction in visual impact. Furthermore, as the topography is suitable, an approximately 800m section of the proposed 33kV line that connects into the substation could be placed underground, similar to the majority of turbine connections within the Project, which would further reduce the visual impact. The section of overhead line would be carried by single poles and the route would include an access track for construction and maintenance to the final pole on both the eastern and western sides of the gully. The steepest part of the gully would be spanned (Figure 6) with no access track required across the drainage line.

The proposed modifications would have the following Project benefits:

- Reduced visual impact through reduction in height of required poles for the overhead section of 33kV transmission line; and
- Increased efficiency of Turbine 18 (eliminates need to shut down part of wind farm for maintenance to this turbine or the 33kv transmission line) and ease of access for maintenance as the modified transmission alignment would be to the north and a greater distance from this turbine compared to the original alignment.

2.3.3. Access Tracks

The EIS (Figure 2.4) identifies both new access tracks and existing tracks to be upgraded. Following further detailed design for the Project, two modifications to the alignment of access tracks are proposed (Figure 5). The location and details of the two modifications proposed are as follows:

- Access to turbine row 10 would be modified by changing the alignment of the new track from Turbine 51 to Alders and Crees Road and establishing an additional small section of new track to connect Turbine 49 to Bannaby Road. This would allow vehicles to effectively enter and exit this turbine group in the one direction eliminating the need for vehicles to perform a turn around manoeuvre on a hilltop and side slope; and
- Minor alignment change to new access track off Alders and Crees Road to turbine row 11. The alignment would be changed over a length of approximately 200 m to avoid the recently approved met mast site at this location.

These relatively minor changes to alignment would not increase the area of disturbance associated with access tracks compared to the approved Project. The proposed modifications would facilitate the delivery of oversize turbine components.

2.3.4. Operation and Maintenance Facility

The term 'Operation and Maintenance Facility' is used in this report to identify the structure referred to as the 'Control Building' in the EIS. This is not strictly a modification to the approved Project but rather a clarification as to the location of this structure. The EIS describes the approved Project but does not show the location of the Operation and Maintenance Facility on the wind farm layout figures. From the EIS text it is inferred that the Operation and Maintenance Facility is adjacent to the substation. The purpose of addressing this issue in this report is to both confirm the location of the building and to ensure that this location has been assessed. The Operation and Maintenance Facility will be approximately 55m by 30m.

The building would be used by seven permanent staff with up to five additional temporary staff who would undertake ongoing maintenance of the turbines. Other staff may utilise the facility on an as needs basis.

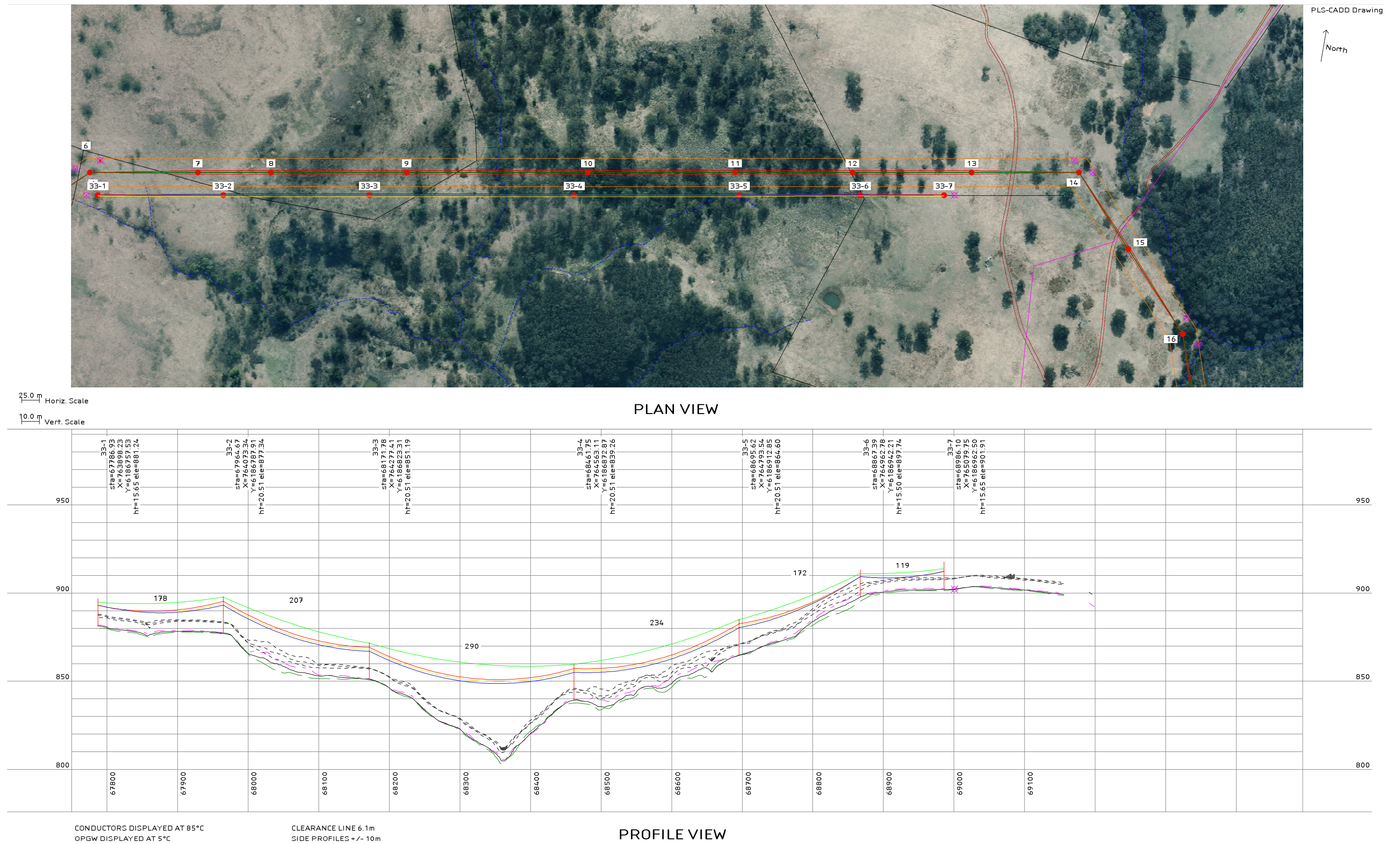


Figure 6. Proposed 33kV Overhead transmission line

2.3.5. Additional Hardstand Area

The EIS identifies typical hardstand areas required to erect each turbine. These consist of a turbine and rotor construction area, main crane pad and tail crane pad. After the turbine is erected the majority of the hardstand area is restored to its pre-construction state with only half of the main crane pad remaining permanently. At Turbine 54 the construction contractor has identified the need to rotate and/or enlarge the hardstand area. This may encompass land outside of the original assessment area and therefore it has been assessed in this report.

3. Statutory Planning Framework

3.1. State Legislation

Environmental Planning and Assessment Act, 1979

Taralga Wind Farm received development consent from the Land and Environment Court of NSW in February 2007 under Part 4 of the *Environmental Planning & Assessment Act, 1979* (EP&A Act). The development application had earlier been declared as State Significant Development by the Minister, thereby making the Minister for Infrastructure and Planning the Consent Authority for the project.

By virtue of various savings provisions, the modification application is made under s 75W of the EP&A Act. Although s 75W is part of the repealed Part 3A of the EP&A Act, the project remains a Part 4 approval.

State Environmental Planning Policy (Infrastructure) 2007

The aim of the State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) is to facilitate the effective delivery of infrastructure across NSW.

As per Clause 34 in Division 4 of the Infrastructure SEPP, *development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone*. Taralga Wind Farm is defined as electricity generating works, whereby *electricity generating works means a building or place used for the purpose of making or generating electricity*. Based on Clause 33 of the Infrastructure SEPP, the RU1 and RU2 zones, which contain Taralga Wind Farm and the proposed modifications, are prescribed zones.

Given that the proposed modifications form a critical part of Taralga Wind Farm; these would also be considered development permitted with consent within the prescribed zones.

3.2. Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act, 1999

The *Environment Protection and Biodiversity Conservation Act, 1999* (the EPBC Act) is the principal legislation for assessing any development or activity with regards to significant impact on “matters of National Environmental Significance” (NES matters). The NES matters are defined as:

- World Heritage properties;
- National Heritage places;
- Wetlands of international importance (listed under the Ramsar Convention);
- Listed threatened species and ecological communities;
- Migratory species protected under international agreements;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mines); and
- A water resource, in relation to coal seam gas development and large coal mining development.

A previous environmental assessment of the Taralga Wind Farm confirmed that the original proposed development will not significantly impact on any NES matters. As a result, the development was not defined as a controlled action by the Minister.

Given that the nature and location of proposed modifications would be similar to the project elements featured in the original approval, it is anticipated that the potential impacts on NES matters would be comparable to previous findings, and likely to be negligible or minimal. To confirm the potential impacts, an additional heritage assessment and ecological assessment was undertaken specifically

with regards to the proposed modifications (Appendix A and Appendix B respectively). A summary of findings from these assessments are contained in Section 4.5 (Heritage) and Section 4.7 (Ecology).

It was concluded that the proposed modifications would not likely have a significant impact on NES matters, and would therefore, not require a referral to the Department of Sustainability, Environment, Water, Population and Communities.

3.3. Local Planning Policies and Instruments

In determining Part 3A project applications, the Minister is not bound by the provisions of any local environmental plans (LEPs). However, the Minister can choose to take them into account during this process and the Director-General must identify them in the Director-General's report to the Minister. The following local planning policies and instruments may be considered by the Minister:

- Upper Lachlan Local Environmental Plan 2010 (ULLEP); and
- Upper Lachlan Development Control Plan 2010 (ULDCP).

Upper Lachlan Local Environmental Plan 2010

Table 4 provides a summary of the relevant controls and provisions set by the ULLEP and the relevance of these to the proposed modifications.

Table 4 Relevant provisions of ULLEP

Clause	Key requirements	Application of the clause to the proposed modifications
Land Use Table	Permissibility of development within land use zones	The proposed modifications are permissible with consent within the relevant land use zones (RU1 and RU2).
Part 4 – Principal Development Standards	Key objectives relating to: • Minimum subdivision lot size • Height of buildings • Floor space ratio • Calculation of floor space ratio and site area	Not relevant to proposed modifications.
5.9 Preservation of trees or vegetation	The objective of this clause is to preserve the amenity of the area, including biodiversity values, through the preservation of trees and other vegetation.	The proposed modifications would involve removal of some groundcover vegetation to facilitate underground cabling and other ancillary infrastructure. Disturbed areas that would not be used for operational purposes (e.g. access tracks, hard stand areas) would be rehabilitated and revegetated following construction. The proposed modifications would not involve the removal of any trees.
5.10 Heritage conservation	The objectives of this clause are as follows: (a) to conserve the environmental heritage of Upper Lachlan, (b) to conserve the heritage significance of heritage items and heritage conservation areas,	The proposed modifications are not within land containing listed heritage items or places. A heritage assessment has identified the existing environmental heritage located in the vicinity of the proposed modifications. The assessment has determined that the proposed modifications would not have any

Clause	Key requirements	Application of the clause to the proposed modifications
	including associated fabric, settings and views, (c) to conserve archaeological sites, (d) to conserve Aboriginal objects and Aboriginal places of heritage significance.	significant impact on environmental heritage.
6.2 Biodiversity	The objective of this clause is to maintain terrestrial and aquatic biodiversity including: (a) protecting native fauna and flora, and (b) protecting the ecological processes necessary for their continued existence, and (c) encouraging the recovery of native fauna and flora, and their habitats.	The proposed modifications are situated on land identified as “sensitive land” on the Natural Resources Sensitivity—Biodiversity Map. An ecological assessment has identified the existing ecological constraints (endangered ecological communities, vegetation communities, threatened species, etc) in the vicinity of the proposed modifications. The assessment has determined that the proposed modifications would not have any significant impact on biodiversity and would result in a reduction in impact to an area of endangered ecological community compared to the approved Project.
6.3 Land	The objective of this clause is to maintain soil resources and the diversity and stability of landscapes, including: (a) protecting land with steep slopes and shallow soils, and (b) protecting land subject to soil salinity, and (c) protecting land with high erosion potential soils, and (d) protecting land susceptible to other forms of land degradation, and (e) protecting landforms.	Some of the proposed modifications are situated on land identified as “sensitive land” on the Natural Resources Sensitivity – Land Map. Given the nature of the proposed changes and their close proximity to the approved project area, impacts to local land form and soils are anticipated to be similar to the potential impacts identified for the approved project. Details of the potential impacts to land from the proposed changes are provided in Section 4.3.
6.4 Water	The objective of this clause is to maintain the hydrological functions of riparian land waterways and aquifers, including protecting: (a) water quality, and (b) natural water flows, and (c) the stability of the bed and banks of waterways, and	The proposed modifications are not located on land identified as “sensitive land” on the Natural Resources Sensitivity – Water Map.

Clause	Key requirements	Application of the clause to the proposed modifications
	(d) groundwater systems.	
6.5 Earthworks	The objectives of this clause are as follows: (a) to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land, (b) to allow earthworks of a minor nature without separate development consent.	Majority of the earthworks relating to Taralga Wind Farm has been approved. The proposed modifications would require earthworks of a similar nature but of a lesser scale, and would comply with the objectives of this clause.
6.11 Development in proximity of waste disposal facilities and sewerage treatment works	The objective of this clause is to protect the operational environment of sewage treatment plants and waste disposal facilities.	The proposed modifications are not located on land identified as being within a sewage treatment plant or tip buffers.

Upper Lachlan Development Control Plan 2010

Table 5 provides a detailed assessment of the proposed modifications with respect to all relevant controls in the ULDCP.

Table 5 Relevant provisions of ULDCP

Section	Summary of Controls and Application to the Proposal
2.2 Rural development objectives	The proposed modifications would only involve ancillary infrastructure and access tracks that are directly related to the approved Taralga Wind Farm. The proposed modifications would be near the approved areas for the wind farm development. Therefore, the proposed modifications would support the objectives of this section.
3.10 Erosion and sediment control	Appropriate erosion and sediment controls would be implemented to ensure the objectives of this clause are met.
4.2.1 Tree and vegetation preservation	Vegetation removal for the proposed modifications would be minimal and for the most part, temporary and restricted to groundcover vegetation (a mixture of exotic and native grass and herbaceous species). The proposed modifications would not require any tree removal.
4.2.6 Biodiversity management	The proposed modifications would have negligible or minimal impact to biodiversity, as indicated in Section 4.7.
4.4 Heritage	The proposed modifications would have negligible or minimal impact to local heritage, as indicated in Section 4.5.
9.5 Wind farms	The following objectives are within this section: • To provide development controls and guidelines that assist in achieving the

Section	Summary of Controls and Application to the Proposal
	objectives of the LEP, • To ensure sufficient information is included with each development application to enable proper assessment, • To minimise potential land use conflicts, • To ensure road access and other issues are identified and sufficient information is included with each development application to enable proper assessment, and • To ensure that adequate provisions are made to restore developed land at the end of the life of the development. The proposed modifications are consistent with the above objectives.

4. Environmental Assessment

4.1. Context

This Environmental Assessment (EA) has taken into consideration all of the environmental issues identified in the original Taralga Wind Farm EIS (Geolyse 2004). Based on the existing knowledge of the Project site, specialist input was sought to assess potential ecological and heritage impacts.

The EA is structured to address the following aspects for each environmental issue:

- Brief description of the existing environment relative to the particular issue;
- Identification of impacts during construction and operation with regard to any increase or decrease compared to the approved Project; and
- Identification of any mitigation measures that may be required in addition to those that already apply to the Project.

The environmental issues discussed below are presented in the same order as in the EIS (Geolyse 2004) with the exception of cumulative impacts which is considered last.

4.2. Visual Impact

The landscape sensitivity of the Project site is identified in the EIS (Geolyse 2004) as being low. The visual impact associated with the proposed modifications is considered to reduce the visual impact compared to the impacts associated with the approved Project.

The construction and operational impacts associated with the access tracks and Operation and Maintenance Building are considered to be no different to the approved Project. For the underground cabling and additional hardstand area there would be some minor additional visual impact during the construction phase due to machinery and disturbance, however this would be temporary in nature. There would be no visual impact associated with the underground cabling in operation and the additional hardstand area is unobtrusive and such a small area so as to be negligible additional impact.

The modification to the 33kV overhead transmission line would reduce the visual impact associated with this element of the wind farm. A section of this transmission line, approximately 850m from the substation heading in a north east direction (identified in Figure 4) would be placed underground resulting in no visual impact. The remaining above ground section would be realigned to be adjacent to the approved 132kV Essential Energy transmission line alignment. The modification would result in two transmission lines adjacent to each other rather than two separate transmission lines within the same section of the Project. Furthermore, it is estimated that the currently approved Project will require poles (possibly even towers) of approximately 80m in height, while the proposed modification would only require poles of 18.5m in height. This represents a substantial reduction in the visual impact associated with this element of the wind farm.

The visual landscape in the area of the approved and proposed modified 33kV overhead transmission line is shown in Photos 1 to 4 below.

No additional management or mitigation measures are considered necessary for the proposed modifications.



Photo 1: Looking west along approved 33kV overhead transmission line towards the substation site



Photo 2: Looking west along proposed modified 33kV underground section of transmission line towards the substation site

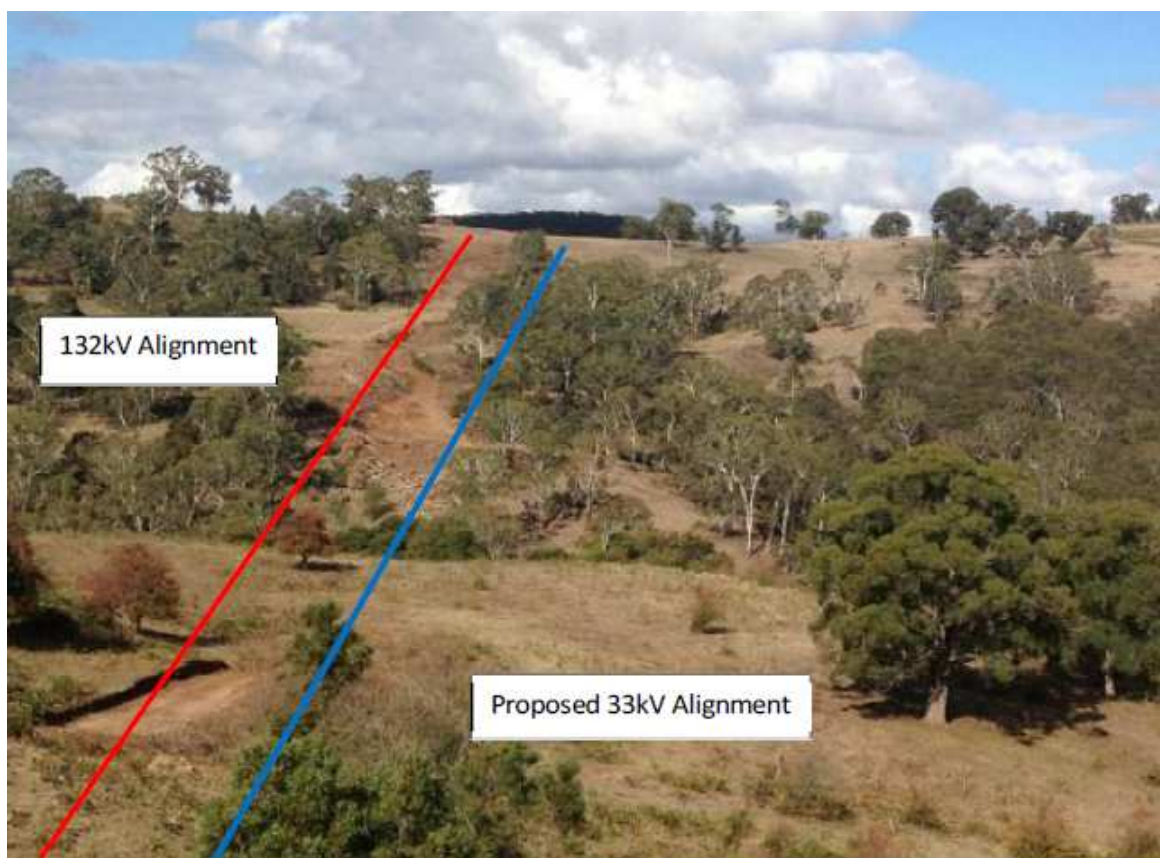


Photo 3: Looking east across the Charteris Creek gully along the Existing 132kV Essential Energy alignment and proposed 33kV alignment



Photo 4: eastern side of gully in vicinity of modified 33kV overhead transmission line route

4.3. Land Use

The land use within which the five proposed modifications are located is very similar. It consists of agricultural land which is predominantly used for grazing livestock. The proposed modifications are within land zoned RU1 (Primary Production) and RU2 (Rural Landscape) under ULLEP. The proposed modifications would be permissible with development consent under the provisions of ULLEP.

The land use impacts associated with the proposed modifications are very minor and consistent with those identified for the approved Project. During construction there would be a slightly larger area of land disturbance where the underground cabling is not adjacent to the access tracks, however given the temporary nature of this impact and the extensive agricultural land in the vicinity of the Project this impact is considered negligible. There are no land use impacts additional to the approved Project anticipated during operation.

There would be no additional landowners affected by the proposed modifications and no land use impacts to non-involved landowners. The proposed modifications are located on 10 properties of landowners involved in the wind farm.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.4. Noise and Vibration

There are several potential residential noise and vibration receivers within and surrounding the Project area. These include residences involved with the wind farm (landowners with turbines on their property) and those that are not. There is only one location where the proposed modifications would result in infrastructure being closer to a receiver than the approved Project. This location is in the western section of the wind farm near turbine row 3 (Figure 2B). The proposed change to the cabling route between turbine row 3 and the substation would result in a section of the buried cable being 25 m closer to the residence compared to the approved Project. The approved cable alignment is approximately 270 m from the residence while the modified alignment would be approximately 245 m from the residence. The residence is that of an involved landowner.

To determine the likely construction noise impacts as a result of the cabling route being closer to this residence, an assessment was undertaken to identify the predicted construction noise levels at 270 m (approved Project) and 245 m (proposed modification). Using the sound power levels of construction equipment likely to be used for underground cabling activities and applying the formula identified in the *Noise Guide for Local Government* (Environment Protection Authority 2013) the predicted construction noise at 270 m was 42 dBA and at 245 m it was 43 dBA. The Project's Construction Noise and Vibration Management Sub-Plan identifies noise level goals for non-involved receivers where monitoring was undertaken of between 41 and 45 dBA. As the predicted construction noise level for the modified cable route is within the range of noise goals identified for the monitored receivers it is recommended that feasible and practical noise mitigation measures as identified in the Construction Noise and Vibration Management Sub-Plan be implemented during the construction of this section of underground cabling.

Buried cables do not emit noise in operation and therefore there would be no change to operational noise as a result of this modification.

In the northern section of the wind farm it is proposed to modify the connection point of the access track from turbine row 10 to Alders and Crees Road, which will be upgraded. At this location the modified access track would join Alders and Crees Road approximately 220 m to the south of a non-involved landowner residence compared to the approved access track which joins Alders and Crees Road approximately 500 m south of the residence. It should be noted that the approved upgraded access track alignment is Alders and Crees Road itself which passes within approximately 25 m of this residence. While the connection point of the modified access track would be closer to the non-involved

residence compared to the approved Project, the approved alignment at its closest point to this residence (25 m) will not change. As there is no infrastructure that would be closer to the residence no noise assessment is required.

No further management or mitigation measures are considered necessary for the proposed modifications.

4.5. Heritage Values

4.5.1. Indigenous Heritage

The EIS (Geolyse 2004) stated that there is evidence of occupation, use and association with the landscape by indigenous peoples within the local area. Eight open archaeological sites, one potential archaeological deposit and one scarred tree were recorded in the Project area. The findings of the archaeological survey were taken into consideration when determining the wind farm layout. The approved wind farm layout avoided the need to disturb the recorded Aboriginal sites.

An indigenous heritage survey and assessment was undertaken by OzArk to assess the potential impacts associated with the current proposed modifications. The survey methodology and detailed results are presented in Appendix A. A summary of the results of the assessment is presented below.

The proposed modification areas are within a landscape that has previously been assessed for Aboriginal heritage values although the precise locations of the proposed infrastructure have not previously been specifically assessed. The modification areas represent relatively small areas of land in an area that has been intensively farmed for over 150 years and located in elevated landforms which would not have been suitable for occupation for a certain amount of the year. The size of the modification areas and their location in elevated landforms distant to reliable water sources, indicate that it is unlikely that Aboriginal sites would be recorded within these areas. This was borne out by the visual inspection which did not record any Aboriginal cultural material within any of the modification areas. Further, due to the nature of the landforms and the level of past disturbances, it is assessed that there is a low likelihood of encountering further subsurface archaeological deposits within any of the modification areas. The assessment confirmed that there is a low likelihood that the proposed works within the modification areas would harm Aboriginal cultural heritage items.

Should any ground disturbing works be required outside of the approved Project and these modification areas, then further consideration and possibly site inspection would be required to ensure Aboriginal cultural material is not harmed. No other additional management or mitigation measures are considered necessary for the proposed modifications.

4.5.2. Non-Indigenous Heritage

The EIS identified numerous heritage items within the village of Taralga from local, state and national heritage lists. There were no listed items within the Project area. The surveys undertaken for the EIS (Geolyse 2004) identified two ruins within the wind farm area however it was concluded that these items did not have heritage significance. The current surveys undertaken for the proposed modifications did not identify any non-indigenous heritage items.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.6. Soil and Water

The soil types within the Project area are largely influenced by the underlying geology with the vast majority of the Project located within the Taralga soil landscape unit. Some relatively small portions of the Project are within the Lickinghole soil landscape unit. The erosion hazard of the basalt derived

Taralga soil landscape is identified as low, while the looser, more coarse grained soils of the Lickinghole soil landscape present a higher erosion hazard if not carefully managed.

The proposed modifications are all within the existing Project area and would not affect any additional soil types. The majority of the proposed modifications are within the Taralga soil landscape unit with only the eastern section of the overhead portion of the 33kV transmission line being located within the Lickinghole soil landscape unit.

The Project is within the Warragamba catchment which forms part of the Sydney drinking water catchment. As part of the EIS (Geolyse 2004) a Water Cycle Management Study was prepared in accordance with the requirements of the now repealed *State Environmental Planning Policy No.58 – Protecting Sydney's Water Supply*. This study concluded that with the implementation of appropriate best practice mitigation measures the construction and operation of the Project would have a neutral or beneficial effect on water quality and no off site impacts would be likely to occur.

During construction the proposed modifications would result in disturbance to areas of the wind farm not previously identified as having any wind farm infrastructure. There would also be a requirement for three additional drainage line/creek crossings. These potential impacts are mainly associated with the underground cabling alignment changes. The access track alignment changes would result in a slight reduction in the length of access road required for the Project, while the additional hardstand area and the underground portion of the 33kV transmission line would result in a minor increase in the soil disturbance area during construction. There would be no changes associated with the Operation and Maintenance Building.

The proposed underground cabling alignment modifications would result in the separation of the cabling from the access tracks. While this would lead to disturbance in additional areas of the wind farm compared to the approved Project, overall there would be a reduction in the length of cabling required by up to 10 km. The separation of the cabling from the access track would result in slightly larger disturbance footprint from plant and machinery during the actual trenching process, however this would be offset by the substantial reduction in the length of cabling required.

At three locations the modified underground cabling alignment would require additional creek/drainage line crossings. The cabling south of Turbine Row 9 would be separated from the access road effectively requiring an additional crossing of an unnamed drainage line that flows to Meadow Creek to the north. The cabling connecting Turbine Rows 2, 3 and 4 to the substation would cross an unnamed drainage line that flows to Kerraway Creek to the south. The cabling connecting Turbine Row 11 to Turbine Row 12 would cross the uppermost part of Snooks Creek. In each case, the impact associated with creek/drainage line crossings would be minimised through undertaking the works in accordance with the Soil and Water Management Plan.

In operation the proposed modifications would not change any soil and water impacts associated with the approved Project. There would be no change to flood risk or wastewater management associated with the Project.

It is considered that the management and mitigation measures for the approved project and the Soil and Water Management Plan provide measures suitable to manage the additional impacts identified above as a result of the proposed modifications.

It is considered that the proposed modifications would not change the conclusion in the EIS (Geolyse 2004) from the Water Cycle Management study that the construction and operation of the proposed windfarm would have a neutral or beneficial effect on water quality and no off site impacts are likely to occur.

4.7. Flora and Fauna

The EIS (Geolyse 2004) identified the Project site and surrounding area as a predominantly agricultural landscape with a long history of agricultural use. The pockets of remnant timber which have been retained across the landscape are generally of low quality with timbered and native communities located on less arable land. Native grassland components are present on less accessible slopes and more lightly grazed country, and much of the native ground component diversity has been lost from pasturelands.

Two endangered ecological communities (EEC) listed under the *Threatened Species Conservation Act 1995* (TSC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been recorded within the Project site (Figure 1). Four areas of Tableland Basalt Forest (TSC Act) are present on ridges and side slopes with Natural Temperate Grassland (EPBC Act) present at two locations immediately adjacent to Old Showground Road and Bannaby Road.

A flora survey and habitat assessment was undertaken by Kevin Mills and Associates to assess the potential impacts associated with the proposed modifications. The survey methodology and detailed results are presented in Appendix B. A summary of the results of the assessment is presented below.

The vegetation within and adjacent to the proposed modifications is identified as being exotic grassland, most of which has been pasture improved. Improved pastures are those that have been fertilised and sown with fodder crops such as Subterranean Clover and Rye Grass as was evident in the survey plots undertaken for this assessment. None of the grassland at the site of the proposed modifications is of a condition that makes it derived native grassland of a quality that reaches the minimum set for an EEC.

As the underlying geology across the majority of the Project site is basalt, the original vegetation would have consisted of Tablelands Basalt Forest, however none of the vegetation within the proposed modification areas consists of this EEC. With regards to fauna habitat, the character of the grassland areas within the proposed modification areas is such that its habitat value for native fauna is negligible and is of no importance to any species, including threatened species.

It was concluded by Kevin Mills and Associates that given the very poor quality of the grasslands and the absence of any listed species, populations or communities, assessments of significance as provided for under the TSC Act or the EPBC Act are not required.

The portion of the modified overhead 33kV transmission line crossing the gully (Charteris Creek) would be spanned using a helicopter. Whilst the EIS (Geolyse 2004) stated that no clearing would be required to cross this gully, trees that impede on clearance or have the potential to do so in the future would need to be cleared, lopped or trimmed. The gully is steep and there are few trees on the flatter land on both sides of the gully and the requirement for vegetation removal for the modified route would be limited. While the 25m easement required for the 33kV overhead transmission line would require large trees to be removed, shrubs can remain. The trees in the vicinity of the overhead line are *Eucalyptus viminalis* with a mostly exotic understorey. The proposed 33kv line easement abuts the existing 132kV Essential Energy easement that links the wind farm substation to the Marulan substation. Access tracks for the 132kV transmission line have already been constructed in lieu of foundations, pole erection and stringing activities. The proposed modified 33kv transmission line would use the existing 132kV line access tracks to conduct foundation, erection and stringing activities. There would be limited additional disturbance required to gain access to proposed pole locations. It is estimated that 200m x 25m of sporadic open eucalypt woodland vegetation would require removal adjacent to the 132kv line easement to accommodate the proposed modified 33kV alignment. Photo 5 shows the approved 132kV alignment and the proposed modified 33kV alignment.

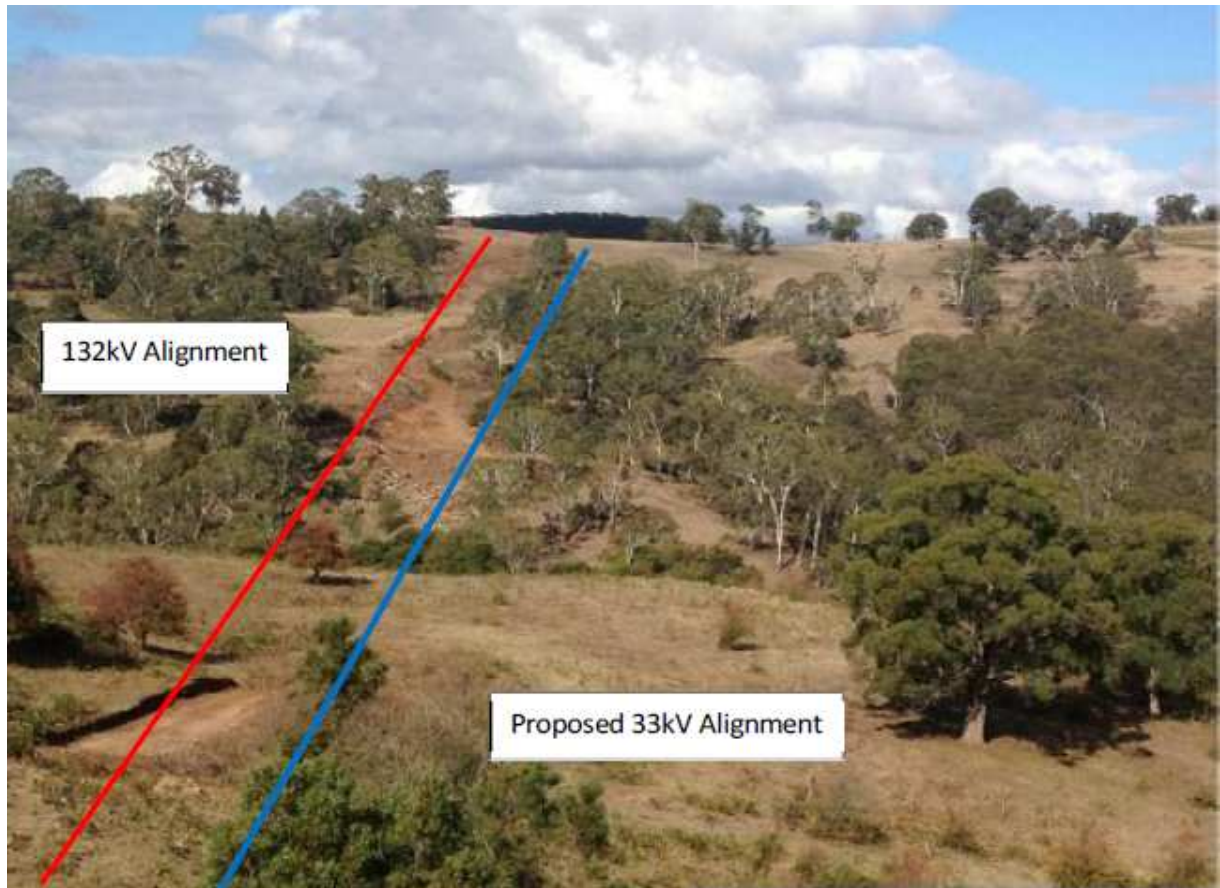


Photo 5: Existing 132kV Essential Energy alignment and proposed 33kV alignment looking east across the Charteris Creek gully

Photo 6 below shows the approved 33kV transmission line alignment. The approved 33kV line requires a new set of access tracks for construction, erection and stringing on both eastern and western sides of the Charteris Creek gully. Access along the approved line from the western side of the gully requires descending a 30-40% grade to reach the Charteris creek flats. Extensive civil works will be required to provide access to the line for construction and erections crews. Similarly, extensive access and civil works will be required on the eastern side of the gully to provide access to the line for construction and erections crews. It is estimated that 290m x 25m of dense eucalyptus vegetation would require removal for construction and conductor clearance requirements. Photos 7 and 8 show the vegetation along the approved 33kV transmission line alignment that would require removal.



Photo 6: the approved 33kV alignment looking east across the Charteris Creek gully



Photo 7: vegetation along approved 33kV alignment



Photo 8: vegetation along approved 33kV alignment

The EIS (Geolyse 2004) does not identify the extent of clearing for each vegetation community it identifies. However, the increase in the disturbance area associated with the proposed modifications for the underground cabling routes has been estimated at 0.32 hectares of exotic grassland. Changes as a result of the access tracks and hardstand area being negligible. As stated above there would be the need to lop or clear individual trees to ensure adequate clearance beneath the 33kV transmission line. For the proposed modified 33kV alignment this would be 200m x 25m of sporadic open eucalypt woodland vegetation. For the approved 33kV alignment this would be 290m x 25m of dense eucalyptus vegetation.

On the western side of the gully to be crossed by the overhead portion of the 33kV transmission line there are small rocky knolls that support comparatively diverse native grassland. Although these areas do not form part of any EEC, it is recommended that these areas be avoided if possible when positioning the poles. The potential disturbance area to the small rocky knolls supporting a more diverse native grassland is very difficult to determine as final positioning on-site will aim to avoid these areas.

No other additional management or mitigation measures are considered necessary for the proposed modifications.

4.8. Traffic and Transport

Access to the Project site is from the local road network off Old Showground Road and Bannaby Road. Access to the site off Bannaby Road is restricted to the section from Taralga to the access point to Turbine Row 7.

The proposed modifications would involve a relatively minor change to the existing Project access arrangements (Figure 5). Access to turbine row 10 would be modified by changing the alignment of the

new track from Turbine 51 to Alders and Crees Road and establishing an additional small section of new track to connect Turbine 49 to Bannaby Road. This would allow vehicles to effectively enter and exit this turbine group in the one direction eliminating the need for vehicles to perform a turnaround manoeuvre on a hilltop and side slope. The modifications would not result in any increase in the construction or operational traffic volumes. The proposed modifications would facilitate a reduction in the construction timeframe associated with the particular wind farm element being modified.

A minor modification to the access track alignment in the vicinity of turbine row 11 is also proposed to avoid an approved met mast location.

Neither of the proposed modifications would result in access roads being located closer to involved or non-involved landowners compared to the approved project. As such no impacts are expected as a result of the modifications.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.9. Greenhouse and Energy Issues

Once operational the Project will provide significant greenhouse gas and energy savings in terms of NSW electricity production. The proposed modifications would make a small contribution to the efficient production of renewable energy. The more direct underground cabling routes would increase the reliability and efficiency of the wind farm and the altered route of the 33kV overhead transmission line would remove the potential for interference to Turbine 18.

It is anticipated that the proposed modifications would allow for a reduction in the construction timeframe associated with the particular element of the wind farm being modified. This would result in a corresponding reduction in the duration of use for machinery and vehicles constructing that element of the wind farm which would result in a saving in fuel with associated reduction in greenhouse gas production.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.10. Socio-economic Issues

The construction and operation of the Project will contribute to the local and regional economies. The proposed modifications represent a relatively minor change compared to size and scale of the Approved Project. There are no additional socio-economic impacts anticipated as a result of the proposed modifications. The slightly reduced construction timeframe may have some flow on effects in terms of reduction use of local resources for accommodation and other businesses.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.11. Infrastructure and Services

The EIS (Geolyse 2004) identified that there are no constraints posed by utilities such as gas, water and telecommunications within the wind farm site. The potential for interference to other services such as television reception, radio reception and microwave communications is largely related to the positioning of turbines. As the proposed modifications would not alter the approved layout of turbines within the wind farm there is no potential for impact to infrastructure and services during the construction or operation phase.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.12. Hazards and Risks

The hazards and risks investigated in the EIS (Geolyse 2004) included air safety, bushfire risk, public and employee safety. The proposed modifications all relate to existing elements of the wind farm and would not introduce any new hazards or risks during the construction and operation that have not already been taken into consideration as part of the approved Project.

No additional management or mitigation measures are considered necessary for the proposed modifications.

4.13. Air Quality

The local air quality was described as clean and good with no significant point source emission in the EIS (Geolyse 2004). The potential for impact as a result of the proposed modifications is restricted to the construction phase with no impacts expected during the operation phase as all disturbance areas would be stabilised as part of construction process.

During construction the potential air quality impacts associated with the proposed modifications relate to dust generation and vehicle emissions. The proposed access track modifications would result in a minor reduction in the length of tracks required. The underground cabling alignment modifications would result in a reduction in the required trenching distance of approximately 10 km. While the modified cabling routes would be separate from the access tracks, essentially requiring two work areas, the substantial reduction in the distance of cabling required would reduce the area of ground disturbance and the potential for dust generation. The reduced distance of access tracks and cabling would also reduce the construction timeframe with an associated reduction in vehicle emissions.

The additional hardstand area and underground portion of the 33kV transmission line would result in a very minor increase in the area of disturbance compared to the approved Project. There would be no changes from the approved Project in relation to the Operation and Maintenance Building.

It is not expected that there would be any significant change in air quality impacts as a result of the proposed modifications. No additional management or mitigation measures are considered necessary for the proposed modifications.

4.14. Cumulative Impacts

The potential cumulative effects with other existing and likely future activities were taken into consideration as part of the approved Project. As the proposed modifications represent a very minor alternation to the approved Project it is considered that there are no additional cumulative impacts that would arise as a result of the proposed modifications.

5. Justification and Conclusion

5.1. Justification

Taralga Wind Farm Pty Ltd has identified a number of modifications to the Approved Project that would allow several efficiencies to be achieved during both the construction and operational phases of the Project. If implemented the modifications would result in a shorter construction phase, reduction in materials required (electrical cabling) and increased operational reliability of the wind farm.

An assessment has been undertaken of the potential impacts associated with the proposed modifications. It has been assessed that the proposed modifications would result in minor changes to the impacts associated with the Approved Project. It is considered that these changes to environmental impacts are consistent with the approved Project and manageable through the existing management and mitigation measures.

5.2. Conclusion

The potential impacts associated with the proposed modifications are relatively minor and considered consistent with the approved Project. Benefits include decreased visual impact of the 33kV overhead transmission line, a reduction in the length of underground cabling required and a reduction in the construction timeframe associated with the particular elements being modified. The negative impacts include a greater area of temporary ground disturbance associated with the underground cabling. The existing management and mitigation measures for the approved Project would be sufficient for potential impacts associated with the proposed modifications.

Based on this environmental assessment and the implementation of the existing management and mitigation measures it is recommended that the proposed modifications can be approved without significant impact to the environment.

References

Environment Protection Authority, 2013. *Noise Guide for Local Government*

Geolyse, 2004. *Environmental Impact Statement, Taralga Windfarm*