

Kyoto energypark

A large flock of white sheep is gathered in a fenced enclosure. The sheep are mostly white with some yellowish tints, and many have curved horns. They are packed closely together, filling the lower two-thirds of the frame. In the background, there are several tall, leafy trees and a wooden fence. A corrugated metal barrel is visible on the left side. The sky is blue with some light clouds. The text "Kyoto energypark" is overlaid in the upper left, with "Kyoto" in blue and "energypark" in green.

7. Existing Environment

7.0 EXISTING ENVIRONMENT

7.1 Topography, Slope & Aspect

Middlebrook Station Site

The Middlebrook Station site is part of the Glen Range, and is a single ridgeline which runs approximately north-south. Middlebrook Station has an elevation between 580m and 620m. Terrain slopes around the Main Ridge can be described as complex in all other directions, as there are steep slopes present, particularly to the east and west. The ground cover is medium tree cover to 6-8m. The valleys surrounding the ridgeline are mainly open grassland, with occasional scattered trees to 8m.

Mountain Station

Mountain Station is in an area of escarpment and ridges, which form part of the western side of the Hunter Valley. The proposed energy park has been located on prominent ridgelines and associated escarpments including the Mount Moobi Plateau. The Mount Moobi ridgeline in the proposed location of the Kyoto Energy Park varies between elevations of 600-640m. Terrain on Mountain Station can be generally described as moderate to the west, steep in the east (as the escarpment moves down toward the Hunter Valley flood plain) and complex in all other directions.

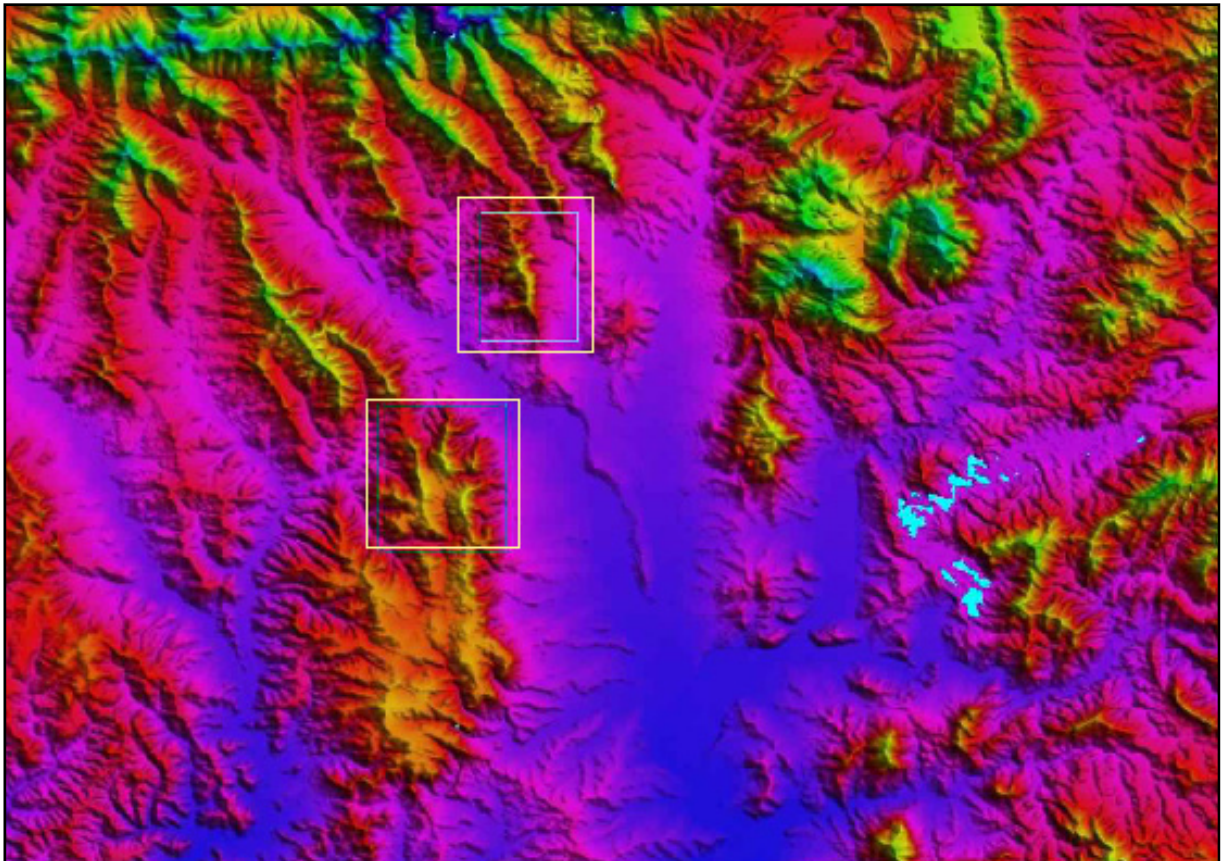


Figure 7.0 Surrounding Topography Mountain Station and Middlebrook Station sites

7.2 Temperature

Climatic conditions have been estimated based on data obtained from the Bureau of Meteorology for nearby weather stations located at Scone Airport, the Scone Soil Conservation Service (SCS) and Scone centre (Philip Street). Temperature data is relatively constant across the three monitoring stations. The mean annual air temperature at Scone varies between 10.0 and 24.1degrees Celsius.

Generally summer periods are hot and dry during the daytime with moderate to mild night time periods. Spring and autumn is pleasant sunny days with cool nights. Winter has very cool periods with morning frosts.

Average annual peak sunlight hours (PSA) for the site have been calculated at 5.58 hours per day.

7.3 Rainfall

Mean average rainfall has been taken from the Scone Airport with a yearly average 600 mm.

7.4 Snow

Snow or ice can be a problem in cold temperatures resulting in blade-fouling and reduced wind turbine efficiency. Snow falls in the area are rare and have not been considered as an impact upon solar modules and wind turbine blades.

7.5 Wind Data

Long term wind data has been logged on site from the two wind monitoring towers located at Mountain Station. Two wind monitoring stations have been installed on Mountain Station and have been used to determine wind data. Data from Wind Mast 1 is representative of long term wind speed and direction based on the 8 year period of collection by the CSIRO. Data from Wind Mast 2 has been used for predicting wind shear coefficients and wind speedups for the site.

Table 7.0 outlines details of Wind Mast 1 and Wind Mast 2.

Table 7.0 Wind Monitoring Mast details Mountain Station

Item	Wind Mast 1	Wind Mast 2
Site	Mountain Station	Mountain Station
Easting (WGS-84)	288790	287866
Northing (WGS-84)	6450231	6452681
Elevation	631	636
Zone	56	56
Anemometer Heights	45m	30,45,65m
Wind Vane Heights	45m	45,65m
Data logging commenced	January 2000	October 2006
Data logging intervals	10 min	10 min
Wind Speed (m/s)	6.5-7.5	6.5-7.5

7.6 Wind Direction

Dominant long term wind directions representative of both sites are predominantly from the south-east and also the west as illustrated in Figure 7.1 below.

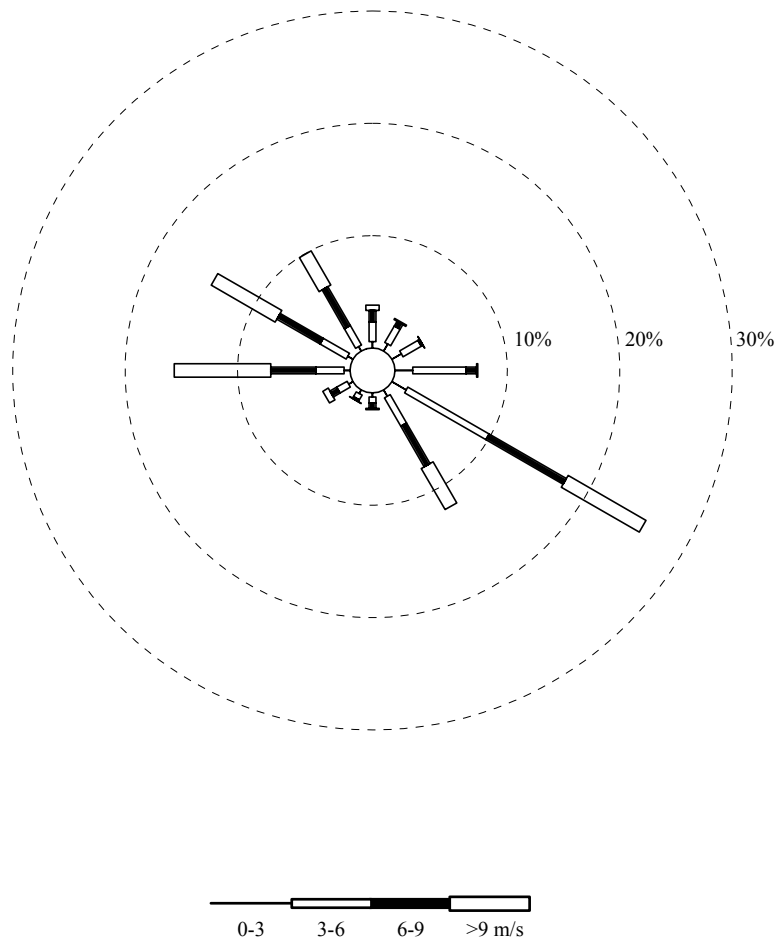


Figure 7.1 Long term wind rose at 45m (Mast 1 Mountain Station)

7.7 Air Quality

The Kyoto Energy Park will utilise renewable energy technologies that do not produce air pollutants as a by-product. Dust generated during operation of the Energy Park will be limited to usage of the internal access roads used by Park staff which would be minimal.

During the construction phase of the project exposed works areas will generally be limited to access roads and hardstand areas. Exposed works areas will generally increase the sites susceptibility to marginally increased dust levels within the vicinity of the Kyoto Energy Park on nearby residencies adjacent to the subject sites. The potential for impacts on local receivers from dust generation is expected to be negligible.

7.8 Existing Services

The surrounding area of Scone is serviced by major bus and train services operating in a northern and southern direction. Scone airport is located west of the Scone township along Bunnan road. Existing

services to the site are limited. Due to the sites isolated location, elevation and lack of previous development there is no connection to reticulated water or sewer.

7.9 Local Context and Tourism

The Hunter Valley, also known as the Hunter region, is an area in New South Wales, just over 200 kilometres north of Sydney and approximately 130 kilometres north-west of Newcastle. It is bordered by mountain ranges, all of which are part of the Hunter River system catchment.

The Upper Hunter (around Scone, Murrurundi and Merriwa) is undulating country transitioning into mountainous terrain to the north and Barrington Tops Mountain Range which is the closest World Heritage Listing to the proposal and the highest point within the greater region. The lower Hunter (Maitland, Cessnock, Singleton) is reasonably flat country which lies on the flood plains of the Hunter, Paterson and Williams Rivers.

The Scone area is distinctly rural with a relatively small urban centre and rural residential density development areas, agricultural production and open space. Agricultural landholdings contribute to about 70% of the former Scone and Murrurundi land area. The Scone area also has a significant equine industry home to Australia's thoroughbred industry and is also labelled as 'horse capital of Australia'.

Coal mining activity is concentrated south of Scone in the Muswellbrook area, however some mines are located within the Upper Hunter area including the Dartbrook and currently planned Bickham Coal mine to the North.

The Hunter Valley is also a world famous wine producing region. The majority of the wine vineyards are located in the Lower Hunter, however some private vineyards are scattered throughout the Upper Hunter region. The Hunter Valley region also supports a tourism base mainly generated from the wine industry and to a lesser extent from the equine industry. The Upper Hunter landscapes, open country areas rural villages remains a popular destination for vacationers and weekenders.

Residents in the area have a rural lifestyle which is a reflection of the rural landuses, clean air, open space and natural environment.

7.10 Existing landuses

The project is situated on two separate landholdings of 2032ha (Middlebrook Station) and 1995ha (Mountain Station). A small fraction of the two landholdings will be used for the Kyoto Energy Park footprint. Existing on-site activities will continue unaffected on the station properties with the exception of the private airstrip on Mt Moobi Plateau which will be replaced by the proposed Mt Moobi solar PV farm. The current dominant landuse is for grazing (sheep) with some tourist accommodation located on Middlebrook Station and rural site tours to both properties.

Existing landuse activities on both the Mountain Station and Middlebrook Station sites are outlined below.

Existing landuses - Mountain Station

The areas of Mountain Station proposed for the Kyoto Energy Park have undergone heavy clearing as a result of the historical and existing agricultural land use activity

Existing activities on site are described as follows:

- **Pastoral/Agricultural** - Grazing paddocks including holding pens, shearing sheds, dams for stock and water supply etc;
- **Shearing sheds** – shearing sheds are located near the entrance to Mountain Station, the sheds do not provide any accommodation.
- **Private Airstrip** – a makeshift grassed airstrip is located on the Mt Moobi Plateau at the location for the proposed solar photovoltaic plant. The landowner has agreed to discontinue the use of the airstrip.
- **Aircraft Hazard lights** – existing aircraft hazard lights are located on the eastern escarpment of Mountain Station. Both hazard lights are supplied by overhead 11kV powerlines located on the eastern escarpment of Mountain Station. No interruption, modification or removal of the hazard lights of power supply to them shall occur as a result of this proposal.
- **4WD Tours** – Existing activities include group bus tours to the shearing sheds and Mt Moobi Plateau

- **Myall Trigonometric (Trig) Station** – The Trig station is located in the southern portion of the Mountain Station site on Mt Moobi Plateau as shown in Figure 7.2. This Trig Station will not be affected by the proposal nor will any lines of sight from or to this Trig Station be affected by the proposal. The NSW Department of Lands have requested that they be consulted during final design stages of the project with to confirm final locations and dimensions of wind turbines and facilities. Further details are outlined in Section 7.11.

Existing landuse activities for the Mountain Station property are shown in Figure 7.2.

Existing landuses - Middlebrook Station

The relevant areas of Middlebrook Station have undergone significant clearing. There are signs of past fires, as much of the bushland is regrowth. No significant clearing will be required for the proposed works in this application. The existing 4WD track follows the existing ridgeline and shall be upgraded to a width of 5m to allow for construction vehicle and crane access.

Existing activities located on the Middlebrook Station property include:

- **Road base Quarries** - existing gravel and road base quarry, involving excavation, dryscreening and stockpiling operation. No washing or crushing facilities occur on site;
- **Pastoral/Agricultural** - Grazing paddocks including holding pens.
- **Various homesteads** – Middlebrook Station and several homesteads are located on the flats along the western side of Middlebrook road. A total of 8 residencies owned by the landowner are located on Middlebrook Station.
- **Private Airstrip** – Aircraft are used for agricultural activities on both sites. A private grassed airstrip is located adjacent to the Middlebrook Station homestead and used by the landowner (for tourism and aerial spraying), other aerial spraying operators and the Scone Aero Club on irregular occasions.
- **Tourist accommodation** – located within 300m of the Middlebrook Station homestead, Middlebrook Station Tourist Accommodation holds accommodation for typically tourists, groups and schools. Tourist activities include shearing demonstrations (Mountain Station), a conference/functions hall (Middlebrook Station), site tours and visits to Mt Moobi Plateau lookout (located on Mountain Station at location of Visitors and Education Centre)
- **Aircraft Hazard light** – existing aircraft hazard lights are located on Robertson's Knob in the south of Middlebrook Station. The hazard light is supplied by overhead 11kV powerline which would remain unaffected as a result of this proposal.
- **Robertson's Knob Trigonometric (Trig) Station** – The Trig station is located on Crown Land in the southern portion of the Middlebrook Station site away from any of the proposed works. This Trig Station will not be affected by the proposal nor will any line of sight from or to this Trig Station be affected by the proposal (see Section 7.11).

Existing landuse activities for the Middlebrook Station property are illustrated in Figure 7.3.

7.11 Trigonometric Stations

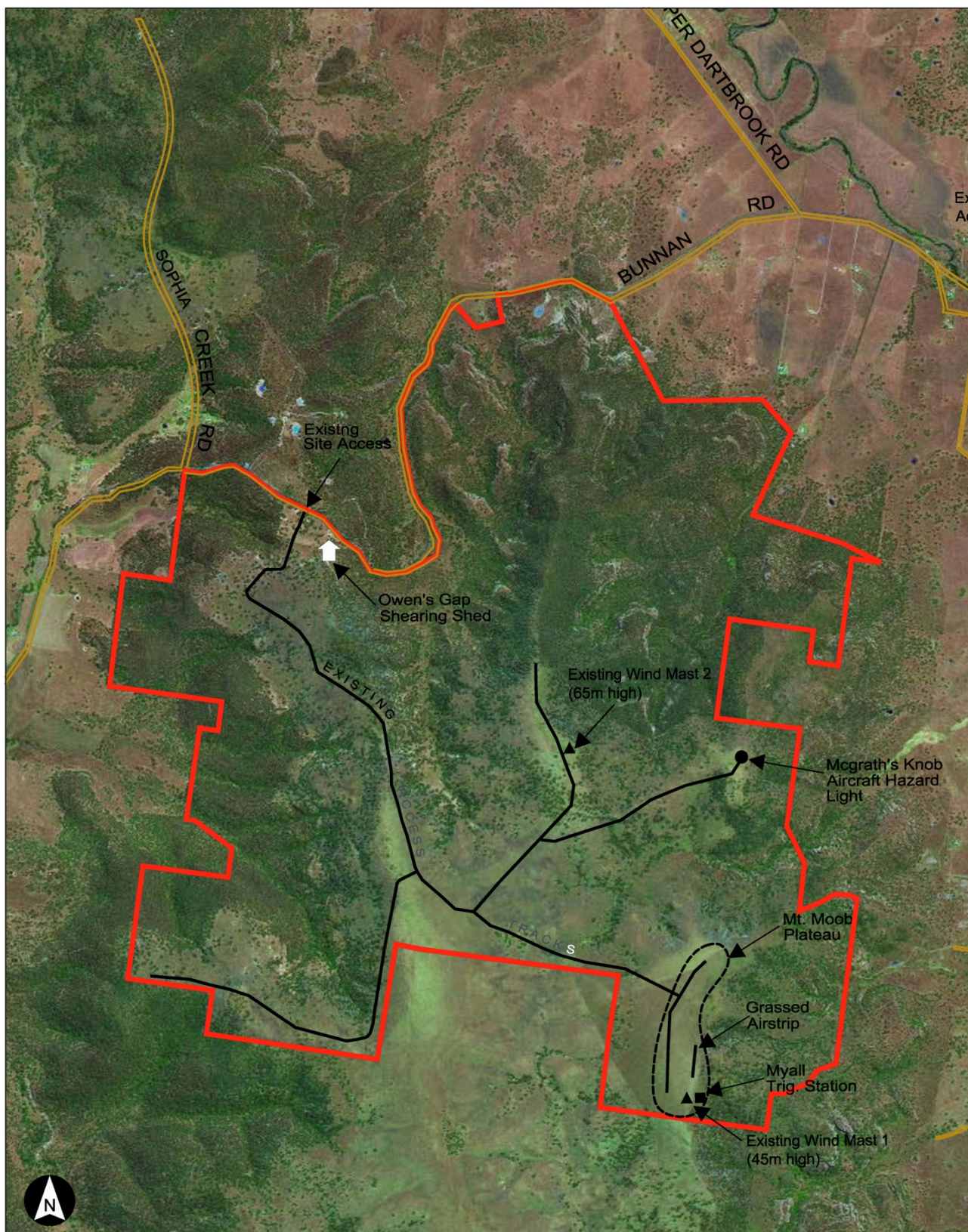
There is one trigonometric (Trig) station located on the Mountain Station (referred to as the 'Myall' trig station) and one on the Middlebrook Station property (referred to as 'Robertson's' trig station). Both 'Trig' stations are located on Crown Land Reserves, which are both accessed from existing separate entrances along Bunnan Road.

The Robertson's Knob 'Trig' located on Middlebrook Station is located at considerable distance from any of the proposed works and is not in the line of site of any proposed structures for both sites.

The 'Myall' Trig Station (MGA 56 Easting: 288,709.216 Northing: 6450018.872) is located at the south-eastern corner of Mountain Station property on the Mt Moobi Plateau. The 'Myall' Trig station is represented by a small reinforced concrete structure with black marker plate fixed on top. The existing 'Myall' trig is situated adjacent to the locations of the proposed wind turbines and solar PV plant on the Mount Moobi Plateau as shown in Figure 7.2.

The NSW Department of Lands were consulted in relation to potential affectation of survey marks from the Kyoto Energy Park proposal. Details of both Trig stations were investigated. The Department

indicated that the Myall trig was a key station in the geodetic network. The Department supplied details of the Myall Trig station and also general requirements as well as guidelines for siting of wind turbines in relation to geodetic survey marks (*General Guidelines for positioning of and construction of Wind Turbines near Trigonometrical Stations*).



Legend:

- Property Boundary
- Minor road
- Existing Quarry/4WD track

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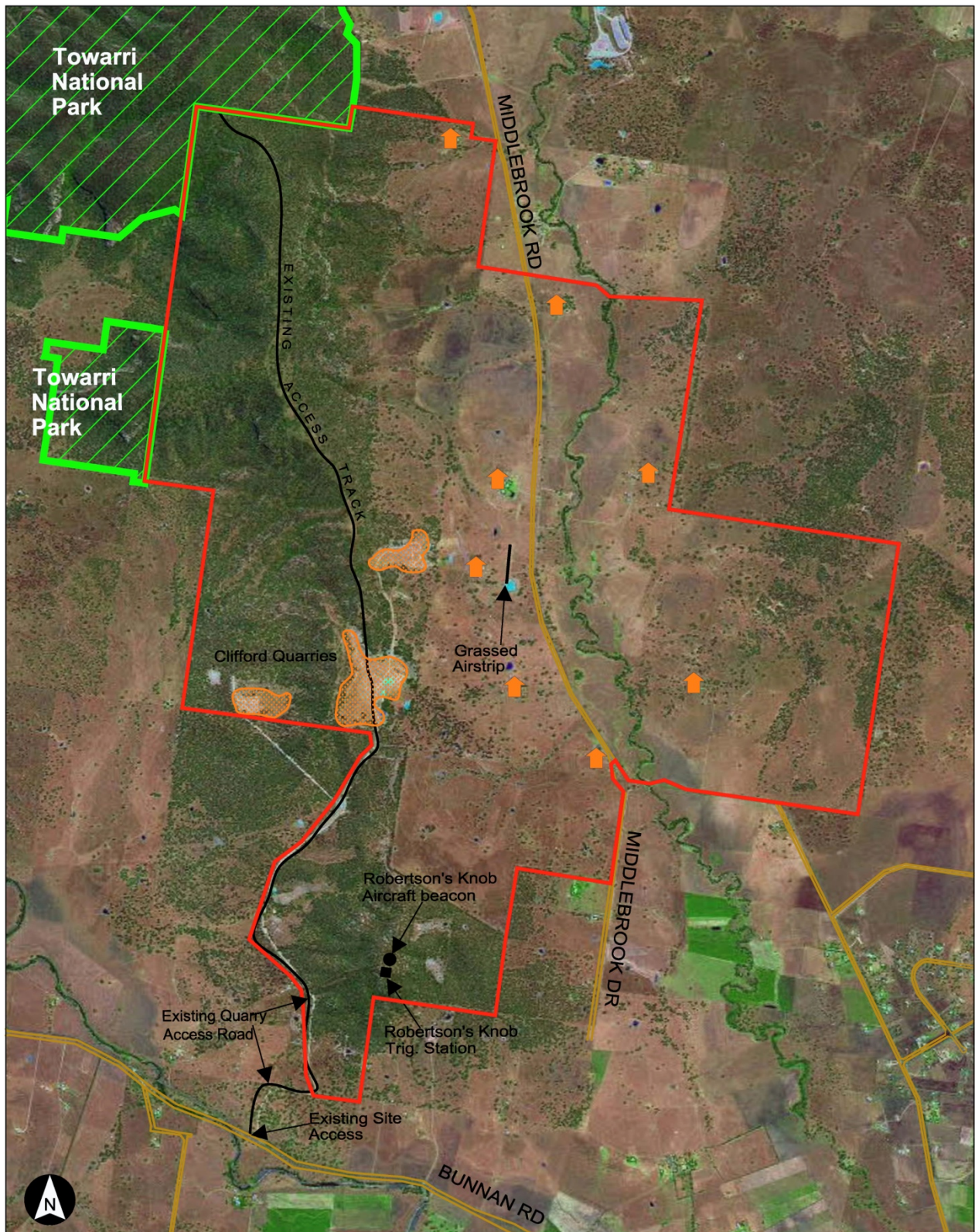


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Figure 7.2 - Existing Landuse (Mountain Station)

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Legend:

- | | |
|--|---|
| Property Boundary | ▲ Landowner residences |
| National Park/Nature Reserve | Existing Quarries (Gravel) |
| Minor road | Existing Quarry/4WD track |

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Figure 7.3 - Existing Landuse (Middlebrook Station)

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The Department of Lands requested the following issues be considered in the placement of facilities in proximity to the Myall trig station summarised as follows:

- **Avoid line of sight to nearby population centres and to neighbouring Trigonometrical Stations, particularly to the close ones.**

Details including coordinates of the Myall Trig, line of sight to nearby Trig stations were supplied to Pamada by the Department of Lands. None of the proposed Kyoto Energy Park structures were found to interfere with any of the line of sights as supplied.

The Trig Station is located on the south eastern escarpment of Mount Moobi Plateau with uninterrupted line of sight to the north and south east.

- **Make every effort to position the structures as far as reasonably possible from the Trigonometrical Station.**

A rotating turbine represents an opaque surface to the GPS satellite receiver technology that is deployed to complete geodetic and control surveys. The surface area of the rotating blades, that is normal to the trigonometrical station, can obscure a proportion of the satellite signal.

The closest turbine to the Myall trig is approximately 230m away. The Department of Lands are satisfied that the rotating blades of the wind turbines at the Kyoto Energy Park will not interfere with GPS satellite. The turbines are not in the line of sight of surrounding survey marks as supplied.

- **Avoid disturbing the Trigonometrical Station and its eccentric marks during construction.**

The Construction Environmental Plan (CEMP) shall address measures for protection of the Myall Trig during construction works on Mt Moobi in accordance with the requirements of the Department of Lands.

- **Avoid sloping roofs of associated buildings towards the Trigonometrical Station.**

The proposed Visitor's and Education Centre is located approximately 80 metres north of the 'Myall' Trig Station. The preliminary layout of the Visitors and Education Centre is illustrated in Figure 2.17. Roof slopes would be in a east to westerly direction. Final design plans for the Visitors and Education Centre will be sent to the Department of Lands for concurrence prior to construction.

- **The Department of Lands has requested that they be consulted on final location of the wind turbine towers.**

The Department were satisfied with the siting of facilities being outside the area of affectation of the Myall Trig Station. However the Department have requested that they be consulted during final design of the wind turbines and facilities. Pamada shall supply to the Department a diagram/plan showing location, dimensions for assessment of the impact of the final structure on survey activities.

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The funding of this proposal and report is 100% Australian.
An Australian Project



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