

Kyoto energypark

A photograph of a large, dark, rocky hillside, likely a coal or mineral deposit. A winding dirt road leads up the slope. A small yellow building is visible on the right side of the road. The sky is blue with some clouds.

14. Mineral Resource
Sterilisation

14.0 MINERAL RESOURCE STERILISATION

A strategic assessment on the coal and gas mining potential in the Hunter Valley was undertaken by the Department of Planning in 2005. This Environmental Assessment uses information gained in the report as a background as well as information obtained from the Department of Mineral Resources.

In addition three exploration licenses were identified over the Kyoto Energy Park sites including Macquarie Energy, Sydney Gas and the NSW Department of Primary Industries (DPI). Details of the Kyoto Energy Park project were made to each party. No conflicts of interest with license holders were identified and no objections to the development were made. A summary of the outcomes of current exploration licenses over the subject sites is provided in Section 14.5.

14.1 Coal Resources

The Kyoto Energy Park proposal lies within an area that has potential for coal and gas (primarily coal seam gas) mining. The DGRs requirements identified the need to identify the presence of coal, gas and gravel resources and the impact upon mining potential and land sterilisation.

Coal resource potential refers to the actual coal located in layers beneath the surface of the ground, as opposed to coal mining potential which refers to the efficient and economical extraction of the resource.

The main factors which affect the coal resource potential of an area are:

- Depth of coal. The greater the depth of coal the more difficult and costly to extract.
- Thickness and continuity of the seams
- Quality of coal (eg presence of intrusions and non combustible material such as ash)

Other factors relate to coal mining potential and include:

- Resource of at least 15 years
- Transport infrastructure (eg heavy rail lines)
- Overlying topography of the area
- Suitable nearby port facilities
- Mine economics
- Environmental and Social considerations

Middlebrook Station was an area identified as having a limited potential for long term underground coal reserves. No areas have been yet identified as suitable for extraction. Future exploration activities would be required to fully assess potential. Exploration to date in the area were reported as 'not been encouraging', with developable underground coal resource unlikely based on the geological complexity of the strata in the area, overlying topography and considerable depth to coal seams.

Mountain Station was identified as having low foreseeable coal resource exploration potential based on high depth of coal seams, likely intrusions and limitations from the overlying topography.

14.2 Existing Coal mining in the area

At present there is only one underground coal mine in the vicinity of the Kyoto Energy Park. This is the Dartbrook mine located south-east of Mountain Station and approximately 5 km west of the Aberdeen township. The Dartbrook mine has recently closed due to finite resources but has potential for open cut mining in the future. Bickham mine is currently operating a test pit at South Bickham approximately 17 km north-east of the Middlebrook Station site. Bickham mine is currently proposing an open cut mine for extraction of coal. Further open cut mines are located south of Aberdeen and concentrated around the Muswellbrook and Singleton districts.

14.3 Coal Mining Potential

Coal reserves underlying the Mountain and Middlebrook Station sites are considered to have low coal mining potential as the seam is deep and potentially complex to extract. Assuming a suitable resource was encountered issues needed to be considered in extraction of the resource would include mine

development economics, social and environmental considerations (noise, dust, traffic, groundwater impacts, mine subsidence) which would further restrict development. It is unlikely that the Kyoto Energy Park will have an impact on the development of this resource should it be considered in the long term.

The Upper Hunter Shire Council has generally resisted the inclusion of mines in the area however the demand for the resource has sent the inclusion of new areas for extraction. The Department of Planning 2005 study did not identify any new minable areas in the area for possible extraction in the Scone area for the next 15 years. This is an indication of the degree of difficulty in mining or extraction of the coal resource economically, as compared to other reserves at Bickham to the north and Dartbrook west of Aberdeen. The study indicated that coal seams in these areas were deep, complex and overlaid by landuse and topographical constraints. Any underground mining operation would require further extensive resource exploration prior to consideration of mining economics and development.

Based on these findings it is highly unlikely that underground coal mining would be considered on Mountain and Middlebrook Station in the short to medium term (i.e. <15 years) based on depth and complexity of suitable strata for mining. Both sites are outside existing mine subsidence areas as illustrated in Figure 14.0.

In consideration of the above factors the design of wind turbine foundations to consider future mine subsidence measures would not be warranted considering the limitations to the resource under the sites (especially Mountain Station), depths and complexity of strata, timeframes for future extraction should it be considered and economically feasibility of designing foundations for unforeseeable events.

14.4 Gas Resources

Methane gas produced during the formation of black coal can become trapped within the coal seam and is referred to as coal seam gas. Shallow black coal seams (generally less than 250 metre depth) have little or no potential gas resource capacity. As the coal seam is deep under the Mountain and Middlebrook sites there is a potential for deep coal seam gas reserves.

The **Middlebrook Station** site has a potential for long term gas reserves, however gas exploration activities to date have not recorded any intersections to date (DOP 2005).

The **Mountain Station** area contains coal seams which may include long term gas potential.

The Department of Mineral Resources were contacted in March 2007 to determine if there were any:

- current or future mining leases;
- mineral claims;
- current and a future exploration licenses

within the vicinity of the Kyoto Energy Park. The results of the search, followed up by verbal confirmation with representatives from NSW Department of Primary Industry (DPI) indicated that there were no existing or future mining leases, mineral leases and mineral claims applied to the site and immediate vicinity.

A total of three exploration licenses given by the DPI were found to exist over the two sites. The licence, term and its holder are presented below in Table 14.0.

Table 14.0 Existing Exploration Licenses over Middlebrook and Mountain Stations

Application/ Title No.	Term	Applicant/Holder and Address
Coal Exploration Licence Authorisation AUTH-286-1973	2/04/2006 – 2/04/2011	Director General NSW Dept of Primary Industry on behalf The Crown PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310
Petroleum Exploration Licence PEL-4-1991	RENEWAL PENDING	Sydney Gas Operations Pty Ltd Level 11 1 O'Connell Street SYDNEY NSW 2000
Petroleum Exploration Licence Petroleum Special Prosp Auth Appn (91 Act) 15 Petroleum (Onshore) ACT 1991	PENDING	Macquarie Energy Pty Ltd Level 7, Suite 708 33 Bligh Street SYDNEY NSW 2000

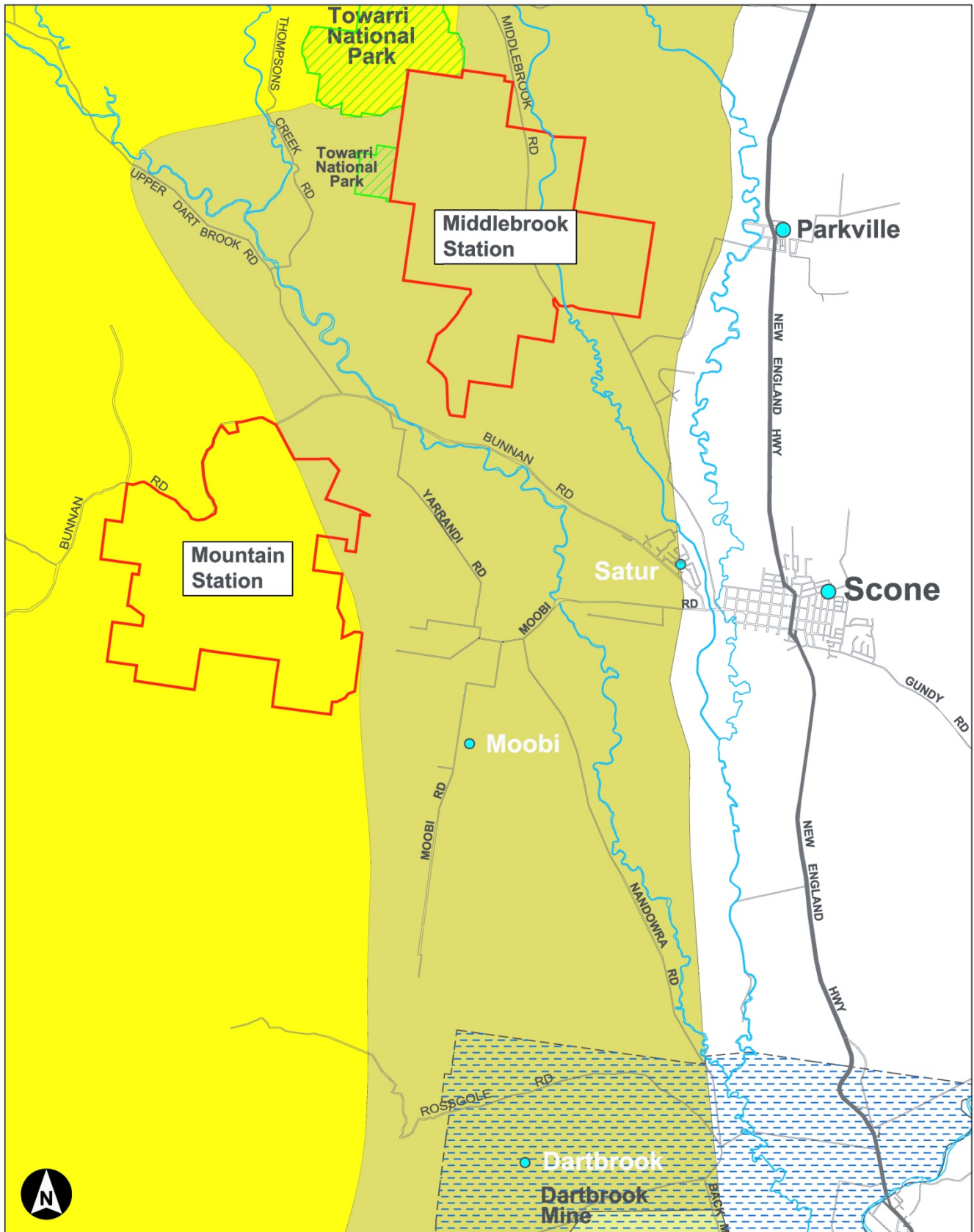
The Department of Primary Industry currently has a Coal Exploration license over the sites until 2011. Verbal confirmation was received from a representative of the DPI that no impacts to this license were identifiable.

Sydney Gas Operations Pty Ltd currently has a Petroleum Exploration Licence (No. PEL-4-1991) over the subject properties with a renewal pending.

Macquarie Energy Pty Ltd currently has a Petroleum Exploration Licence (PEL 456) over the subject sites with a renewal pending.

Both Sydney Gas and Macquarie Energy were contacted regarding there existing exploration licenses over the two properties. Both companies were provided with specific details of the project, location of components and physical dimensions of components and facilities. Both companies were asked to advise as to whether the Kyoto Energy Park proposal would have any foreseeable impact upon their existing and future exploration activities under their separate licenses .

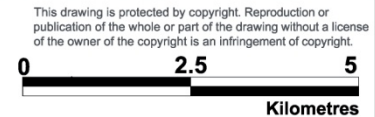
Both companies advised that exploration activities mainly consisted of the use of a drill rig for core sampling and drilling operations at lower elevations closer to resource depth. Both Sydney Gas Operations Pty Ltd and Macquarie Energy Pty Ltd advised in writing that they had no objection to the Kyoto Energy Park proposal.



Legend:

- | | | | |
|--|----------------------------------|--|--------------------------------|
| | Major & Minor Rural Town Centres | | Low Coal Mining Potential |
| | Highway/main road | | Potential Deep Gas Resources |
| | Minor road | | Limited Coal Mining Potential |
| | Natural Drainage | | Potential Gas Resources |
| | | | Extent of Mine Subsidence Area |

Source: Coal Mining Potential in the Upper Hunter Valley Department of Planning 2005



Kyoto **energypark**

Figure 14.0 - Mineral Resource Sterilisation

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14.6 Gravel and Rock Resources

An existing ridge gravel and road base quarry is located on the Middlebrook Station site which supplies RTA spec road base and gravel to the local and regional areas. The quarry is owned by Clifford Quarries who own and operate a lease over Portion 126/127 on Middlebrook Station for extraction and dry screening until 2012. A dry screening plant is also located on the site. Extracting activities are currently occurring on Portion 127 while rehabilitation activities are currently being undertaken on Portion 126.

The quarry is a dry screening operation on an alluvial clayey gravel deposit located west of the main ridgeline. This is an open cut operation, with no underground consents. Consent was granted for the quarry by the Scone Shire Council. There is an option to source gravel material from the quarry for use in the construction, concrete batching and upgrading of the access tracks.

Clifford Quarries also operate the Braeside Quarry which is 26 km north of Scone. This quarry supplies blended products including washed sands and concrete aggregates which may be used for the concrete construction activities on site.

14.7 Conclusion

Mountain Station was identified as having no foreseeable coal mining potential based on high depth of coal seams, likely intrusions and limitations from the overlying topography. The Mountain Station site does contain coal seams which may include coal seam gas potential. There are no identifiable gravel resources present within the Mountain Station site.

Middlebrook Station was identified as having reserves that potentially could be considered for the long term underground coal reserves, however resource is unlikely based on the geological complexity of the strata in the area. Exploration activities have not recorded any gas intersections to date.

The Department of Planning 2005 study did not identify any minable areas in the area for possible coal extraction in the next 15 years. This is an indication of the degree of difficulty in mining or extraction of the coal resource economically, as compared to other locations at Bickham and Dartbrook in the Upper Hunter LGA.

Other issues needed to be considered in extraction of the resource would include mine development economics, social and environmental considerations (noise, dust, traffic, groundwater impacts, mine subsidence) which would likely restrict development of this resource in close proximity to Scone.

Existing extraction licenses were researched over the subject sites. The results of the search, followed up by verbal confirmation with representatives from NSW Department of Primary Industry (DPI) indicated that there are no mineral leases and mineral claims applied to the proposed area.

Three (3) exploration licenses given by NSW Department of Primary Industry (DPI), were identified.

The Department of Primary Industry currently has a Coal Exploration license over the sites until 2011. Verbal confirmation was received from a representative of the DPI that no impacts to this license were identifiable. The DPI requested that Pamada consult with other license holders.

Sydney Gas Operations Pty Ltd currently has a Petroleum Exploration Licence (No. PEL-4-1991) over the subject properties with a renewal pending, but has advised there is no objection to the Kyoto Energy Park proposal.

Macquarie Energy Pty Ltd currently has a Petroleum Exploration Licence (PEL 456) over the subject sites with a renewal pending, but has advised they do not foresee any conflicts with any future exploration works.

There is currently a gravel quarry operating on Middlebrook Station. The quarry is a dry screening operation on an alluvial clayey gravel deposit located west of the main ridgeline. It is an open cut operation, with no underground consents.

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

An Australian Project