

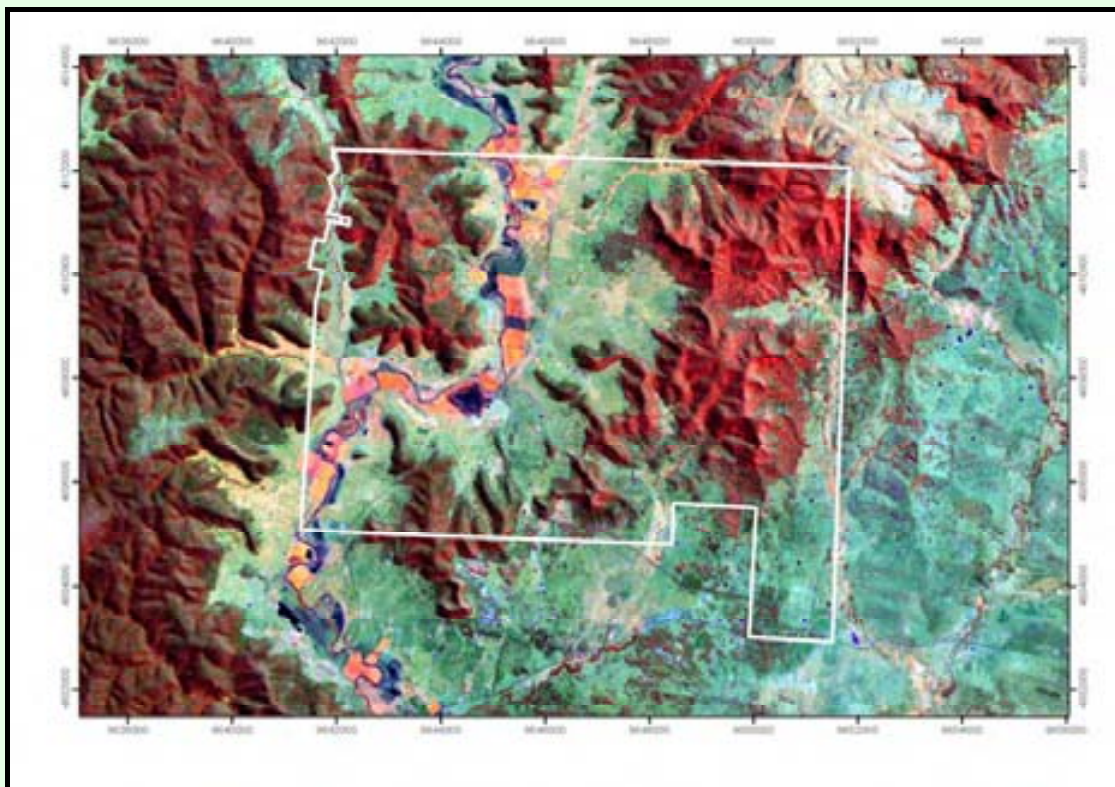


NSW DEPARTMENT OF  
PRIMARY INDUSTRIES

# RIDGELANDS EXPRESSION OF INTEREST INFORMATION

HUNTER VALLEY  
NEW SOUTH WALES

June 2009



# **RIDGELANDS EXPRESSION OF INTEREST INFORMATION**

**HUNTER VALLEY  
NEW SOUTH WALES**

June 2009



#### Disclaimer

The information contained in this information package is as complete and accurate as possible at the time of writing. However, users are reminded that they should verify all information provided by making and relying upon their own separate inquiries prior to making any important decisions or taking any action on the basis of the information in this document.

## 1. INTRODUCTION

The Minister for Mineral Resources in New South Wales, Australia, invites Expressions of Interest for the awarding of an exploration licence in respect of the Ridgелands coal exploration area, pursuant to the Mining Act 1992. The Ridgелands coal exploration area is located approximately 20 km west-north-west of the town of Muswellbrook in the Hunter Coalfield (Figures 1, 2 and 3). The area is approximately 150 km from the port of Newcastle. The Expression of Interest is for an area of approximately 80 sq km which is expected to contain underground coal resources of domestic and export quality thermal coal.

The area comprises part of Authorisation 286 and Exploration Licence 6047, which are currently held by the Director General of the NSW Department of Primary Industries on behalf of the Crown. The successful applicant will be awarded a coal exploration licence over the area for an initial period of up to 5 years, pursuant to the Mining Act 1992.

A number of companies have recently approached the Government, seeking access to coal resources in the area. The Minister for Mineral Resources has decided to call for Expressions of Interest for the awarding of an exploration licence over the area.

Interested parties are required to submit an Expression of Interest to the Department of Primary Industries with details of an exploration and development program. Closing time and date for Expressions of Interest is **12 noon on Thursday 15 October 2009**.

The Expression of Interest (EOI) is open to an individual company or companies or a consortium. Any proposed foreign investment in Australian resource projects is subject to the Australian Government's Foreign Investment Review Board guidelines and approvals.

The Department of Primary Industries will establish an evaluation team from experts on its staff and elsewhere in government. The team will evaluate the Expressions of Interest using a consistent process approved by an independent probity auditor.

The Minister will select a company/companies or consortium to which exploration rights over the area will be awarded by part transfer of the existing titles or the grant of a new title. The continued tenure of the exploration licence during the initial period and any subsequent renewal period will be subject to compliance with agreed commitments and title conditions. The Minister is not bound to accept any of the proposals.

Within the Ridgелands coal exploration area the Great Northern and Fassifern seams contain more than 500 million tonnes of in situ coal resources from about 100 metres to about 400 metres depth of cover. The resources which underlie the Wybong Creek and associated water aquifers require further studies to determine their potential mineability.

Any company/companies or consortium considering submitting an Expression of Interest for this area should verify all information provided by making and relying upon their own separate inquiries prior to making any important decisions or taking any action on the basis of the information in this document.

Figure 1: Coalfields in NSW

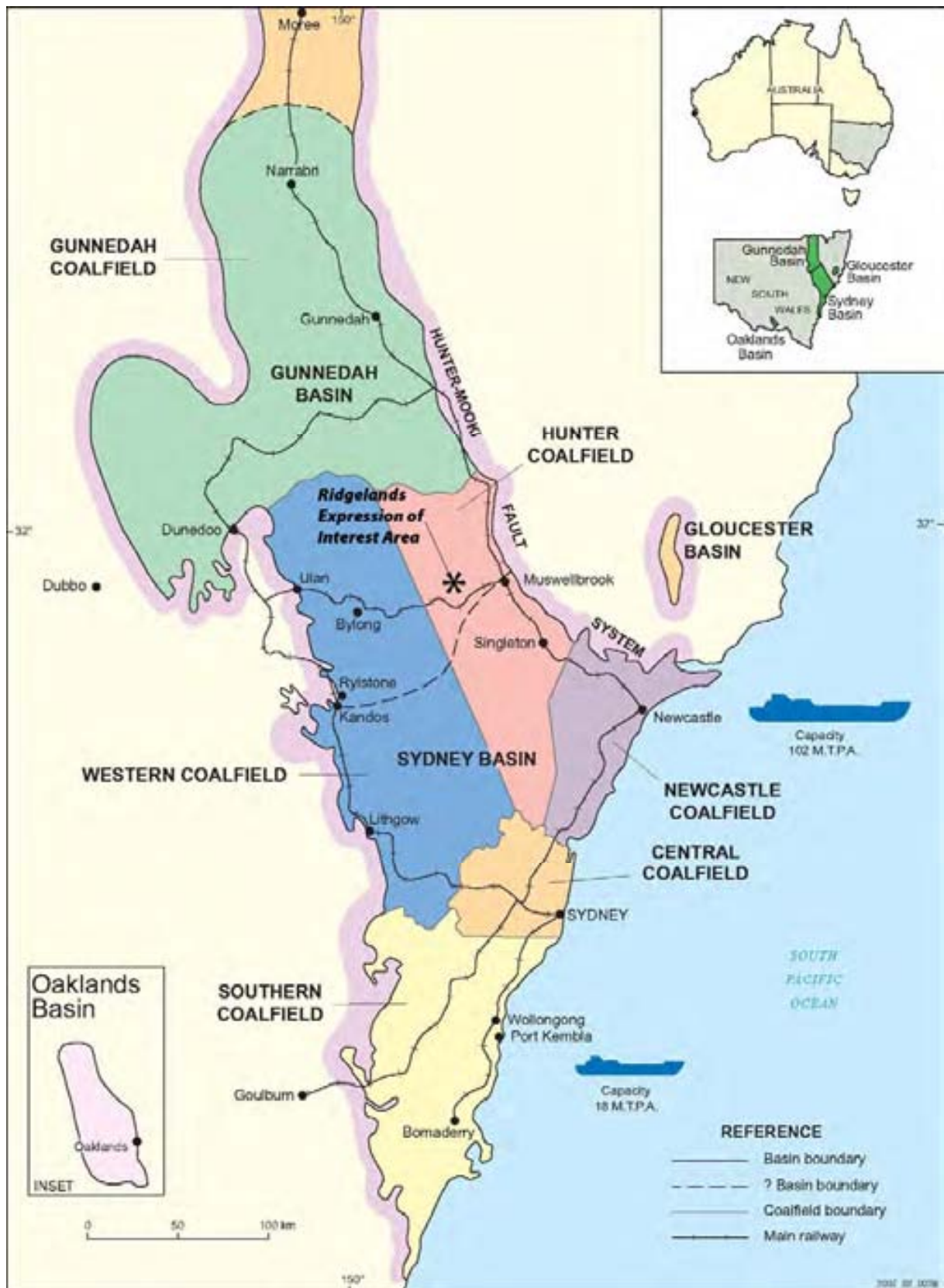


Figure 2: Location of the Ridglands Expression of Interest Area

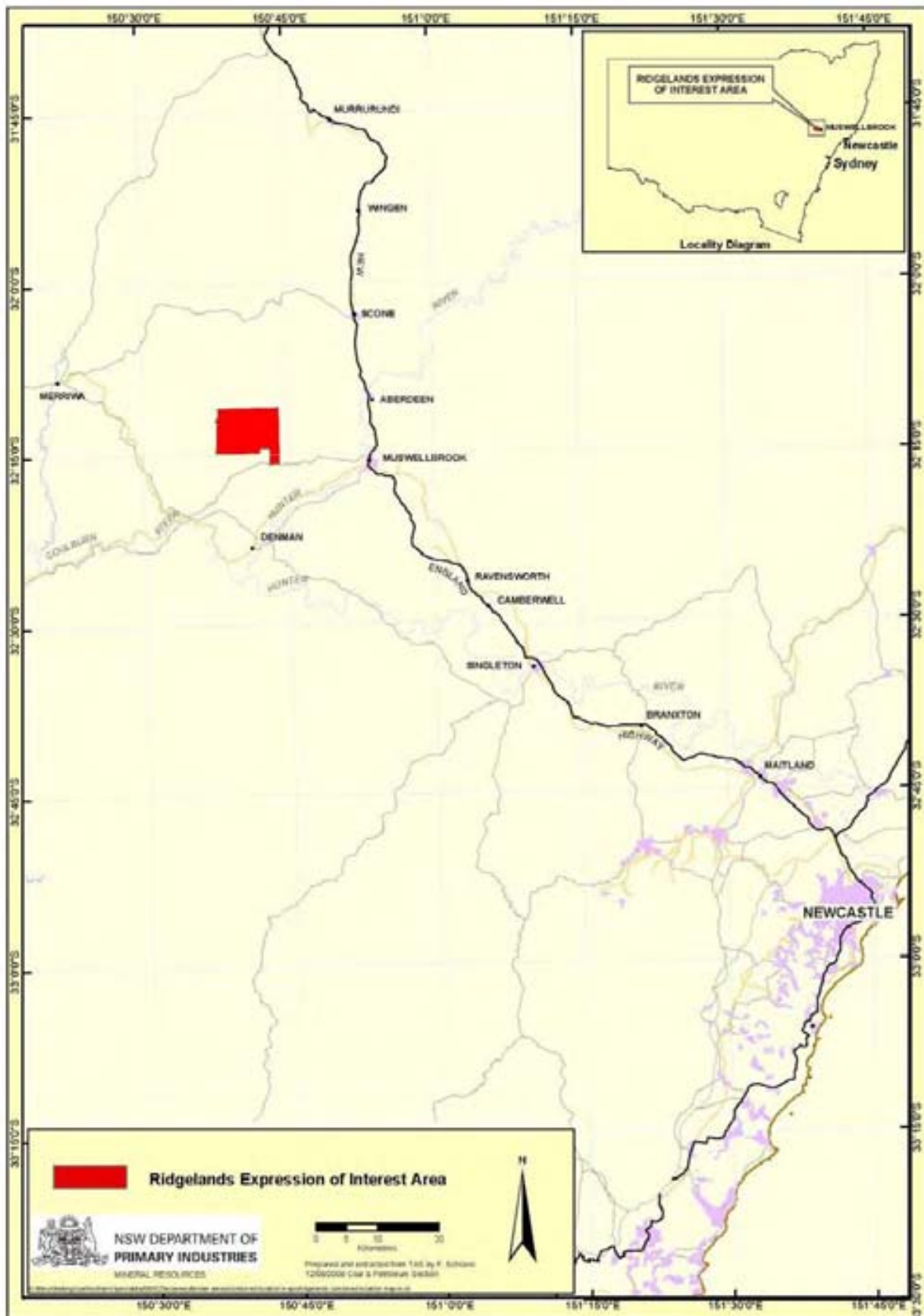
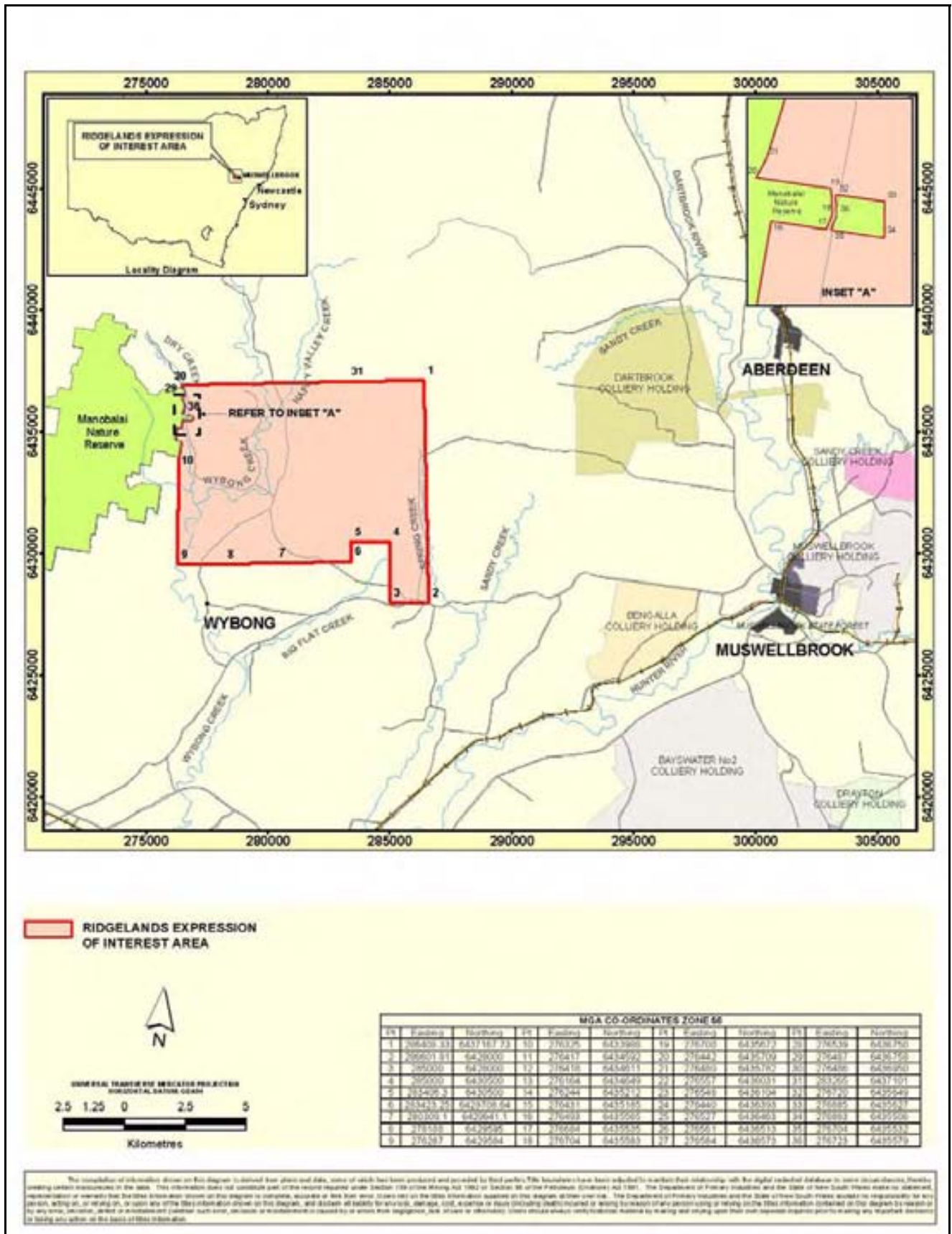


Figure 3: Detailed Locality Map



## **2. LOCATION, LAND USE AND INFRASTRUCTURE**

### **2.1 Location**

The Ridgелands coal exploration area is located approximately 20 km west-north-west of the town of Muswellbrook in the Hunter Coalfield (Figures 2 and 3). The area is approximately 150 km from the port of Newcastle.

Access to the Ridgелands area from Muswellbrook is across the Hunter River via the Kayuga Road bridge, then about 15 kilometres along the Wybong Road, and then along the sealed Ridgелands Road which traverses the area generally from south to north.

### **2.2 Topography**

Wybong Creek flows from north to south through the Ridgелands area (Figure 4). The Wybong Creek alluvial floodplain is typically one to two kilometres wide. To the east of the creek in the northern and central parts of the area, undulating ground generally slopes westward from the base of the escarpment to the edge of the floodplain. To the south several prominent spurs jut out from the adjacent escarpment. The eastern parts of the area are dominated by rugged, heavily vegetated hills and escarpments. In the west the narrow north-south trending Dry Creek valley bisects two rugged hilly areas.

### **2.2 Land Use**

In the northern and central parts of the Ridgелands exploration area, the lower ground is largely cleared and is mainly used for cattle grazing. Some crops are grown on the Wybong Creek alluvial floodplain. This area was also used for dairy farming in the recent past.

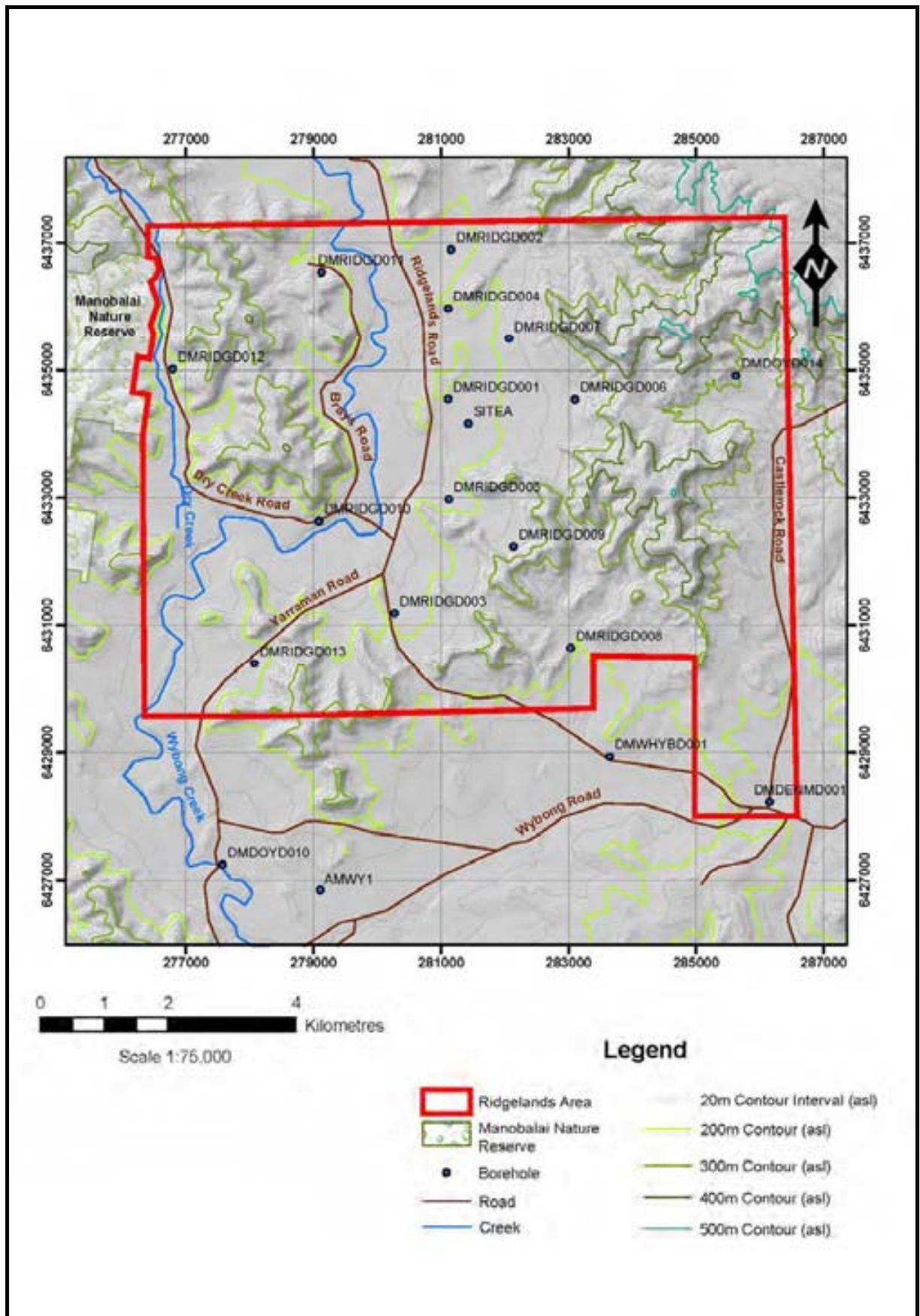
Smaller farm lots of about 40 hectares in size occur in the southern part of the area. There are several vineyards along the Wybong Creek floodplain in the south-western part of the Ridgелands area. A thoroughbred racehorse spelling facility has been established at the junction of Wybong and Dry Creeks.

The rugged, elevated land flanking the Wybong Creek valley is heavily vegetated and is mainly Crown Land. The Manobalai Nature Reserve is located immediately to the west of the Ridgелands area.

### **2.3 Infrastructure**

The Main Northern railway is approximately 30 km east of the Ridgелands exploration area and the Ulan railway is approximately 25 km southeast of the area. In any

Figure 4: Topography and Borehole Location Map



potential mine development, all long term transport of coal is expected to be off public roads.

Infrastructure constraints to coal exports from the area may include the existing capacity of the rail line and network and the capacity of the coal terminals at the Port of Newcastle.

### **3. TIMEFRAME FOR RESOURCE EVALUATION AND DEVELOPMENT APPROVALS**

Although broad-scale exploration by the Department has been carried out in the Ridgeland area, it is recognised that there is a need for more detailed exploration to determine geological constraints and potential mineable reserves prior to any proposed mine feasibility studies. An indicative timeframe for future exploration and development is:

- Exploration 3 years
- Feasibility and preliminary environmental studies 1.5 years
- Approval 1.5 years
- Commencement of Development 1 year

Total 7 years

### **1. PREREQUISITES TO MINE DEVELOPMENT**

The exploration licence will be subject to renewal in the normal manner, based on satisfactory performance during the initial period and an agreed program of work for the renewal period. The continued tenure of the exploration licence during the initial period and any subsequent renewal periods will be subject to compliance with EOI commitments and title conditions.

While the Government intends that the successful applicant would proceed to apply for a mining lease and mine development, progress beyond exploration licence tenure will be subject to all normal processes of obtaining development approval and a mining lease. The development assessment and approval process under the *Environmental Planning and Assessment Act 1979* would involve the preparation and public display of a comprehensive Environmental Assessment report. Any application for development approval and a mining lease would not be progressed until the Department of Primary Industries - Mineral Resources Division approved a "conceptual project development plan" in accordance with current guidelines ([www.dpi.nsw.gov.au/minerals/titles/policies/development\\_plans](http://www.dpi.nsw.gov.au/minerals/titles/policies/development_plans) ).

## **5. INFORMATION**

### **5.1 General Information**

This Ridgeland Expression of Interest Information booklet is available on the Department of Primary Industries' website [www.dpi.nsw.gov.au/minerals](http://www.dpi.nsw.gov.au/minerals). Any updated information which may become available relating to this Expression of Interest process will also be posted on this website. Interested parties should regularly check the website for any updates.

### **5.2 General Enquiries**

Requests for further information should be addressed to:  
Julie Moloney, Principal Adviser, Development Coordination  
Phone: (02) 4931 6549  
Email: [julie.moloney@dpi.nsw.gov.au](mailto:julie.moloney@dpi.nsw.gov.au)  
Department of Primary Industries  
PO Box 344, Hunter Region Mail Centre NSW 2310

Any formal questions/enquiries should be made in writing after discussion with the nominated contact officer above.

### **5.3 Available Data**

The Ridgeland Data Package has been compiled from previous geological and geophysical exploration and coal quality investigations.

The data are divided into two (2) parts:

#### **5.3.1 Geological Data**

Lithological, analytical and geophysical logs of 19 core boreholes in the area. Figure 4 shows the location of bores presented in the package.

#### **5.3.2 Reports**

- The Ridgeland Coal Drilling Programmes, 2001 and 2003 Hunter Coalfield, New South Wales – J.S. Brunton and A.M. Moore June 2004
- The Hunter Coalfield – Notes to accompany the 1:100,000 Hunter Coalfield Geological Map – Beckett J 1988
- Hunter Coalfield Regional Geology 1:100 000, 2nd edition – Glen R.A. and Beckett J 1993

A variety of other broader geological reports which include the Ridgeland area can be found on the Department's website, [www.dpi.nsw.gov.au/minerals](http://www.dpi.nsw.gov.au/minerals) using the DIGS reporting system.

For more information on available geological data contact:

Dr Kevin Ruming, A/Manager Coal Advice  
Phone: (02) 4931 6701  
Email: [coal.geology@dpi.nsw.gov.au](mailto:coal.geology@dpi.nsw.gov.au)  
Department Of Primary Industries  
PO Box 344, Hunter Region Mail Centre NSW 2310

### 5.3 Purchase of Geological Data Package

**Cost of Ridgелands Geological Data Package (available on DVD): \$5,000, including GST (plus Postage and Handling)**

An overview of the geological information available on the Ridgелands area is included in the geological data package. In addition, the Department will make the geological data package available for viewing, by appointment, prior to purchase.

Appointments to view the geological data package should be made by telephoning Dr Kevin Ruming on (02) 4931 6701.

The geological data package can be purchased from:

Lee Main, Geological Administrator, Coal Advice  
Phone: (02) 4931 6689  
Email: [coal.geology@dpi.nsw.gov.au](mailto:coal.geology@dpi.nsw.gov.au)  
Department of Primary Industries  
PO Box 344, Hunter Region Mail Centre NSW 2310

### 5.4 Site Inspections

To assist potential applicants in evaluation of the Ridgелands Expression of Interest area, a site and core inspection will be undertaken with interested parties on the **Tuesday 18 August 2009**. The inspection will be from public roads within the Ridgелands area. A Department geologist will be on hand to answer technical questions. Anyone interested in attending the site inspection day should contact:

Dr Kevin Ruming, A/Manager Coal Advice  
Phone: (02) 4931 6701  
Email: [coal.geology@dpi.nsw.gov.au](mailto:coal.geology@dpi.nsw.gov.au)  
Department of Primary Industries  
PO Box 344, Hunter Region Mail Centre NSW 2310

## **6. SUBMISSION OF EXPRESSIONS OF INTEREST**

### **6.1 Closing Date**

Closing time and date for Expressions of Interest is **12 noon on Thursday 15 October 2009**.

### **6.2 Expression of Interest submission documentation**

Any submitted Expression of Interest documentation should include an Executive Summary addressing the Evaluation Criteria outline in Section 7.

The Executive Summary should also clearly demonstrate the applicant's commitment to pay the Financial Obligations of the Successful Applicant outlined in Section 8.

### **6.3 Lodgement**

Each Expression of Interest must be enclosed in a sealed envelope or parcel and be clearly marked "Expression of Interest – Ridgелands Coal Exploration Area". In addition, a cover letter should be included in a separate standard size envelope and be attached to the outside of the main envelope or parcel containing the Expression of Interest. *The covering letter should state the name of the company/companies or consortium involved in submitting the Expression of Interest and any company equity involved.*

Applications should be delivered to **Development Coordination, Department of Primary Industries, 516 High Street, Maitland NSW 2320, prior to 12 noon on Thursday 15 October 2009**. Three copies of the main Expression of Interest document(s) are required. One copy of any detailed appendix material is sufficient.

Each application is to be accompanied by a non-refundable EOI lodgement fee of \$10,000. A receipt will be issued for this fee.

### **6.4 Declaration of Expressions of Interest Received**

Expressions of Interest will be opened at **1:00pm on Thursday 15 October 2009** in the Conference Room, Level 1, 516 High Street, Maitland NSW 2320. Declaration of Expressions of Interest will be open to the public. Only the name of the company/companies or consortium and any company equity involved will be made public.

## **7. EVALUATION OF EXPRESSIONS OF INTEREST**

### **7.1 Evaluation Process**

The Minister for Mineral Resources will be the final determinant for the awarding of the exploration licence for the Ridglands area. The Director General of the Department of Primary Industries will make recommendations to the Minister following completion of the evaluation process by the Department.

The Department of Primary Industries will establish an evaluation team from experts on its staff and elsewhere in government. The team will evaluate the Expressions of Interest using a consistent process approved by an independent probity auditor. The auditor will review compliance of the evaluation process by the evaluation team prior to the submission of recommendations to the Director General and the Minister for Mineral Resources. This process will ensure the highest levels of consistency, fairness and probity are achieved.

The evaluation team's assessment will be based on the Evaluation Criteria outlined in Section 7.2.

### **7.2 Evaluation Criteria**

#### **7.2.1 Exploration, Mine Development, Resource Recovery and Coal Utilisation, Infrastructure and Financial Contribution**

##### **(a) Exploration**

The exploration program must involve a commitment to test the resource potential of the whole area to a sufficient level to allow mine planning. Method, cost and timing of exploration should be included.

##### **(b) Mine Development**

A mine development proposal should include a commitment to the development of a modern coal mine. Conceptual mine planning should be based on current knowledge and address technical issues associated with developing the Ridglands resource.

The mine development plan should include the timeframe for evaluation and development, the scale of proposed development, likely employment and capital cost of the project.

### **(c) Resource Recovery and Coal Utilisation**

The proponent should provide concept mine development plans to maximise resource recovery and coal utilisation.

### **(d) Infrastructure**

The proponent should provide details of any proposed infrastructure development and identify any constraints with existing rail and port infrastructure. Cost and timing of any proposal should be included.

### **(e) Financial Contributions**

The successful EOI applicant will be required to meet the financial obligations listed below in Section 8.

Addition financial contributions as outline in Section 8(d) will be considered as part of the evaluation process.

## **7.2.2 Overall Benefits**

A summary of the overall benefits of the proposal to the region and the State of New South Wales should be provided. These should include:

- Employment
- Benefits to local and regional communities
- Capital expenditure
- Infrastructure benefits
- Any other benefits

## **7.2.3 Programs of Work**

A commitment to implementing sound work programs should include:

- The exploration program to bring the resources to measured reserves status
- Conceptual mine feasibility studies
- Utilisation studies
- Coal marketing
- Infrastructure studies including coal transport and export facilities
- Environmental studies
- Community liaison program, which includes individual landholders, local, regional and indigenous communities.

The above programs should include indicative schedules and costing for major phases and be set out in clear terms with positive, realistic objectives.

#### **7.2.4 Indicative Timeframe**

A timetable for the implementation of the above work programs and any proposed subsequent mine/coal utilisation developments. The timeframe outlined in Section 3 of this document is considered reasonable for the assessment and development of the Ridgeland deposit.

#### **7.2.5 Technical Competence**

Demonstrated technical ability to implement the nominated programs, subsequent infrastructure and project development, ongoing mining, coal marketing and utilisation, and environmental management.

#### **7.2.6 Financial Qualifications**

Demonstrated financial ability to fund work programs and subsequent mine and infrastructure development.

#### **7.2.7 Other**

Any other matters which the company/companies or consortium believes would assist the Government in assessing its proposal.

## **8. FINANCIAL OBLIGATIONS OF SUCCESSFUL APPLICANT**

As part of the Expression of Interest commitments, the successful applicant, will within 30 days from the date of a registration of part transfer of the current exploration licence or within 30 days of the Minister granting consent to apply for a new exploration licence, be required to pay:

(Note: the figures below include GST where applicable)

- (a) an assessment fee of \$100,000 to cover Department of Primary Industries' Expression of Interest administration, advertising and evaluation costs
- (b) a payment of \$7,000,000 as contribution towards the Department's Coal Development Fund for continued coal exploration. This amount includes all required refund of public expenditure previously incurred by the Department of Primary Industries for exploration and evaluation of the area
- (c) a one-off, non-refundable payment of \$20,000,000
- (d) financial contributions in excess of the minimum \$20 million requirement, may be included as part of an applicant's Expression of Interest.

An environmental security deposit of \$100,000 is payable at the time of awarding the exploration licence.

## **9. CONSIDERATION OF EXPRESSIONS OF INTEREST**

The Government is not bound to accept any Expression of Interest. The Minister's decision in relation to the selection of the successful EOI applicant to be awarded the exploration licence will be final.

## **10. FAILURE TO COMPLY WITH COMMITMENTS**

- (a) If the successful applicant, who was subsequently awarded the exploration licence, does not substantially meet its commitments as per its Expression of Interest or fails to comply with the title conditions, then the Minister may cancel any title in place at that time.
- (b) If the successful applicant fails to commence substantial development of a mine within 8 years of the awarding of the original exploration licence, subject to all necessary approvals, the Minister may cancel any title in place at that time.
- (c) If coal exploration rights in the area are reallocated to another party within 3 years of such cancellation, then the incoming party may be required to refund reasonable exploration costs (as determined by the Minister) to the original party plus any monies paid to the Government by the original party subsequent to the grant of any Mining Lease.
- (d) Money paid under parts a, b, c and d of Section 8 Financial Obligations of Successful Applicant will not be refunded.

## **11. GEOLOGY**

The Ridgeland exploration area is situated on the north-western fringe of the Hunter Coalfield. The Hunter Coalfield is part of the Sydney Basin, which forms the southern section of the Sydney-Gunnedah-Bowen Basin, a composite structural basin extending for 1700 kilometres from southern New South Wales to central Queensland.

The surface geology of the Ridgeland exploration area is predominantly Narrabeen Group with Quaternary alluvial sediments along the Wybong Creek valley and its major tributaries. To the north, extensive Tertiary basalt overlies the Narrabeen Group strata. This represents the southern limit of the basalts covering the Liverpool Range. Newcastle Coal Measures (formerly Wollombi Coal Measures) outcrop in the east of the exploration area.

The main target seams in the Ridgeland exploration area are the Great Northern and Fassifern seams. The depth of cover ranges from less than 100 m in the central part of the area, to over 400 m in the west. Secondary target seams occur below the Fassifern seam.

### **11.1 Coal Quality**

The Great Northern and Fassifern seams are well developed in the western half of the Ridgeland exploration area, however both seams split in the east.

The Great Northern seam ranges in thickness from 1.1 - 4.9 metres, and has a raw ash content of 16 - 28% (ad) (Table 2).

The fully developed Fassifern seam ranges from 5.5 - 7.0 metres in thickness. A potential underground working section has been identified comprising the middle and lower parts of the seam. This section is 2 - 5 metres thick, with raw ash content generally ranging from 18 - 28% (ad) (Table 3).

The coal in both seams is slightly lower in rank than other Hunter Valley coals, however it is considered that both seams could produce coal suitable for the domestic and export thermal markets.

### **11.2 Structure**

In the Ridgeland exploration area the strata generally strike north-south, and dips to the west at a low angle. The dip steepens through the central part of the area. This may be due to draping of the target sequence over thick channel deposits which are developed in the eastern part of the area.

A major thrust fault, the Mt Ogilvie Fault, which is well defined to the south of the Hunter River, is inferred to exist trending north-north-west through the Ridgeland exploration area terminating near its northern boundary.

Several of the Ridgeland boreholes intersected fractured/faulted zones. However, based on structure contour plans drawn on several horizons and various cross sections through the Ridgeland area, no obvious large scale faults have been

recognised (Brunton & Moore 2004). It is possible however that smaller scale faults may exist in the area.

### **11.3 Igneous Activity**

Igneous activity in the Ridgeland exploration area includes:

- Basalt to the north-east of the area, equivalent to the Tertiary Liverpool Range basalts to the north.
- Intrusive sills in the north-eastern, southern and western parts of the area. DM Doyles Creek DDH 14, intersected numerous intrusive sills throughout the borehole, which had destroyed many of the coal seams.
- North-east trending dykes intersecting the southern boundary of the area.
- Several small igneous plugs.

### **11.4 Alluvium and Aquifers**

Quaternary alluvial sediments occur along the Wybong Creek valley and its major tributaries.

There are aquifers associated with the alluvial sediment throughout the area which contain water of variable quality.

### **11.5 Gas**

The gas content of the potentially mineable seams or surrounding strata in the Ridgeland exploration area has not been evaluated.

A current Petroleum Exploration Licence overlies the area.

### **11.6 Geological Considerations**

Issues considered in Section 11.1 – 11.5 should not be interpreted as a definitive list of what could impact upon the potential development of the resource within the Ridgeland Expression of Interest area.

The successful Expression of Interest applicant will need to design and implement an exploration program to assess all of the geological risks factors of the deposit.

**Table 1: Simplified Stratigraphic Column for the Ridglands Area**  
(Modified from Brunton & Moore 2004)

| AGE        |                     | STRATIGRAPHY          |                          | TARGART SEAMS                   | LITHOLOGY  |
|------------|---------------------|-----------------------|--------------------------|---------------------------------|--|
| Quaternary |                     |                       |                          |                                 | silt, sand, gravel                                 |
| Tertiary   |                     |                       |                          |                                 | basalt   |
| Jurassic   |                     |                       |                          |                                 | basalt   |
| Triassic   | Middle              | Hawkesbury Sandstone  |                          |                                 | massive quartz sandstone with minor siltstone      |
|            | Early               | Narrabeen Group       |                          |                                 | interbedded conglomerate, sandstone and siltstone  |
| Permian    | Late                | Singleton Super Group | Newcastle Coal Measures  | Great Northern Fassifern        | coal, conglomerate, tuff, sandstone, siltstone     |
|            |                     |                       | Watts Sandstone          |                                 | medium-coarse grained sandstone                    |
|            |                     |                       | Denman Formation         |                                 | sandstone-siltstone laminite                       |
|            |                     |                       | Wittingham Coal Measures |                                 | coal, sandstone, siltstone, conglomerate, tuff     |
|            | Middle              | Maitland Group        | Mulbring Siltstone       |                                 | siltstone, claystone, minor fine grained sandstone |
|            |                     |                       | Muree Sandstone          |                                 | fine to coarse grained sandstone conglomerate      |
|            |                     |                       | Branxton Formation       |                                 | siltstone, sandstone, conglomerate                 |
|            | Early               | Greta Coal Measures   |                          |                                 | coal, conglomerate, sandstone, siltstone           |
|            |                     | Dalwood Group         | Farley Formation         |                                 | silty sandstone                                    |
|            |                     |                       | Rutherford Formation     |                                 | siltstone, minor sandstone                         |
|            |                     |                       | Allandale Formation      |                                 | conglomerate, lithic sandstone                     |
|            | Lochinvar Formation |                       |                          | volcanics, siltstone, sandstone |  |
|            | Carboniferous       |                       |                          |                                 |  |

**Table 2: Summary of Analytical Data Great Northern Seam**  
**Potential Working Section** (Modified from Brunton & Moore 2004)

| Hole No | Depth Base (m) | Thick. (m) | Composite Type | Yield (%) | Moisture (%ad) | Ash (%ad) | Vol. Mat. (%ad) | Total Sulphur (%ad) | Calorific Values (ad) |           |
|---------|----------------|------------|----------------|-----------|----------------|-----------|-----------------|---------------------|-----------------------|-----------|
|         |                |            |                |           |                |           |                 |                     | (MJ/kg)               | (kcal/kg) |
| DDH 1   | 137.065        | 4.125      | Raw            | 100.0     | 4.5            | 16.0      | 26.6            | 0.26                | 24.82                 | 5927      |
|         |                |            | CF1.50         | 87.0      | 4.0            | 11.2      | 28.2            | 0.31                | 26.67                 | 6370      |
| DDH 2   | 126.820        | 1.105      | Raw            | 100.0     |                | 27.8*     |                 |                     |                       |           |
| DDH 3   | 161.970        | 4.510      | Raw            | 100.0     | 3.0            | 17.5      | 27.4            | 0.31                | 24.35                 | 5817      |
|         |                |            | CF1.56         | 85.0      | 3.0            | 11.1      | 28.6            | 0.31                | 26.78                 | 6396      |
| DDH 4   | 131.500        | 4.200      | Raw            | 100.0     | 5.6            | 20.2      | 24.5            | 0.23                | 22.83                 | 5453      |
|         |                |            | CF1.60         | 84.6      | 6.0            | 12.9      | 25.8            | 0.24                | 25.71                 | 6142      |
| DDH 5   | 136.430        | 4.355      | Raw            | 100.0     | 4.3            | 16.3      | 27.4            | 0.24                | 24.55                 | 5864      |
|         |                |            | CF1.60         | 88.5      | 4.7            | 10.9      | 27.9            | 0.23                | 26.57                 | 6347      |
| DDH 7   | 92.550         | 1.050      | Raw            | 100.0     |                | 25.5*     |                 |                     |                       |           |
| DDH 9   | 114.540        | 3.610      | Raw            | 100.0     | 6.2            | 17.0      | 24.3            | 0.27                | 24.64                 | 5886      |
|         |                |            | CF1.60         | 89.3      | 6.0            | 10.8      | 27.1            | 0.25                | 26.14                 | 6244      |
| DDH 10  | 175.505        | 4.925      | Raw            | 100.0     | 5.5            | 15.6      | 26.0            | 0.27                | 25.56                 | 6104      |
|         |                |            | CF1.60         | 91.3      | 5.1            | 11.3      | 27.4            | 0.27                | 26.99                 | 6446      |
| DDH 11  | 241.325        | 2.395      | Raw            | 100.0     | 4.7            | 22.0      | 23.2            | 0.25                | 23.21                 | 5544      |
|         |                |            | CF1.60         | 82.2      | 4.6            | 14.5      | 25.0            | 0.27                | 25.92                 | 6190      |
| DDH 12  | 276.050        | 3.660      | Raw            | 100.0     | 4.0            | 18.6      | 26.1            | 0.25                | 24.94                 | 5956      |
|         |                |            | CF1.60         | 88.8      | 4.6            | 12.2      | 27.6            | 0.26                | 27.08                 | 6468      |
| DDH 13  | 181.580        | 3.660      | Raw            | 100.0     | 5.4            | 17.8      | 24.6            | 0.25                | 24.65                 | 5888      |
|         |                |            | CF1.60         | 88.2      | 5.0            | 12.8      | 26.0            | 0.25                | 26.56                 | 6344      |

\* Calculated      nd - not determined

**Table 3: Summary of Analytical Data Fassifern Seam**  
**Potential Working Section (Modified from Brunton & Moore 2004)**

| Hole No | Depth Base (m) | Thick. (m) | Composite Type | Yield (%) | Moisture (%ad) | Ash (%ad) | Vol. Mat. (%ad) | Total Sulphur (%ad) | Calorific Values (ad) |           |
|---------|----------------|------------|----------------|-----------|----------------|-----------|-----------------|---------------------|-----------------------|-----------|
|         |                |            |                |           |                |           |                 |                     | (MJ/kg)               | (kcal/kg) |
| DDH 1   | 158.380        | 4.485      | Raw            | 100.0     | 6.5            | 27.2      | 23.7            | 0.32                | 20.57                 | 4913      |
|         |                |            | CF1.60         | 78.0      | 6.0            | 16.3      | 26.2            | 0.39                | 24.84                 | 5932      |
| DDH 3   | 172.495        | 2.115      | Raw            | 100.0     |                | 31.2*     |                 |                     |                       |           |
| DDH 4   | 149.945        | 4.490      | Raw            | 100.0     | 3.9            | 29.6      | 24.2            | 0.29                | 20.50                 | 4896      |
|         |                |            | CF1.60         | 72.1*     | 4.0            | 16.6      | 26.7            | 0.30                | 25.23                 | 6026      |
| DDH 5   | 147.035        | 3.980      | Raw            | 100.0     | 3.9            | 26.5      | 25.7            | 0.34                | 21.30                 | 5088      |
|         |                |            | CF1.60         | 78.0*     | 4.3            | 15.5      | 27.3            | 0.36                | 25.46                 | 6082      |
| DDH 7   | 108.490        | 2.050      | Raw            | 100.0     |                | 40.0*     |                 |                     |                       |           |
| DDH 8   | 89.040         | 2.800      | Raw            | 100.0     | 4.3            | 27.8      | 25.2            | 0.36                | 21.30                 | 5088      |
|         |                |            | CF1.60         | 65.2      | 5.0            | 13.3      | 29.3            | 0.44                | 26.23                 | 6264      |
| DDH 9   | 140.020        | 2.190      | Raw            | 100.0     | 5.0            | 31.1      | 24.1            | 0.33                | 20.07                 | 4794      |
|         |                |            | CF1.60         | 67.6      | 5.2            | 15.8      | 27.2            | 0.35                | 25.15                 | 6006      |
| DDH 10  | 184.455        | 5.015      | Raw            | 100.0     | 5.0            | 18.4      | 28.2            | 0.36                | 24.79                 | 5920      |
|         |                |            | CF1.60         | 87.4      | 5.0            | 11.6      | 30.3            | 0.36                | 27.15                 | 6484      |
| DDH 11  | 250.345        | 4.030      | Raw            | 100.0     | 4.4            | 21.0      | 26.7            | 0.36                | 23.80                 | 5684      |
|         |                |            | CF1.60         | 84.8      | 4.5            | 12.8      | 28.4            | 0.37                | 26.78                 | 6396      |
| DDH 12  | 286.100        | 4.485      | Raw            | 100.0     | 3.8            | 18.0      | 28.8            | 0.36                | 25.51                 | 6092      |
|         |                |            | CF1.60         | 89.1      | 4.5            | 11.0      | 30.0            | 0.38                | 27.92                 | 6668      |
| DDH 13  | 190.980        | 4.265      | Raw            | 100.0     | 5.0            | 18.3      | 27.2            | 0.34                | 24.81                 | 5926      |
|         |                |            | CF1.60         | 85.8      | 5.0            | 10.8      | 29.0            | 0.41                | 27.34                 | 6530      |

\* Calculated    nd – not determine