

ASTON RESOURCES

MAULES CREEK COAL PROJECT

PRELIMINARY ENVIRONMENTAL ASSESSMENT

AUGUST 2010







Hansen Bailey
ENVIRONMENTAL CONSULTANTS

ASTON RESOURCES

MAULES CREEK COAL PROJECT

PRELIMINARY ENVIRONMENTAL ASSESSMENT

Prepared by:

HANSEN BAILEY
PO Box 473
SINGLETON NSW 2330

August 2010

for:

ASTON COAL 2 PTY LIMITED
Level 10, 10 Eagle Street
BRISBANE QLD 4000

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 PROPONENT 4
1.3 PROJECT OVERVIEW 4
1.4 DOCUMENT PURPOSE AND STRUCTURE 4

2 BACKGROUND 6
2.1 APPROVED OPERATIONS 6
2.2 ENVIRONMENTAL MANAGEMENT 8
2.3 EXISTING ENVIRONMENT 8
2.4 LAND USE 11
2.6 LAND OWNERSHIP 13

3 PROJECT DESCRIPTION 15
3.1 MINING OPERATIONS 15
3.2 MINE INFRASTRUCTURE 22
3.3 MOBILE EQUIPMENT 26
3.4 REJECT AND TAILINGS DISPOSAL 27
3.5 WORKFORCE AND HOURS OF OPERATION 27
3.6 PROJECT ALTERNATIVES 27

4 REGULATORY FRAMEWORK 29
4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 29
4.2 MINING ACT 1992 31
4.3 COAL MINE HEALTH AND SAFETY ACT 2002 32
4.4 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997 32
4.5 THREATENED SPECIES CONSERVATION ACT 1995 32
4.6 WATER ACT 1912 AND WATER MANAGEMENT ACT 2000 33
4.7 DAMS SAFETY ACT 1978 33
4.8 ROADS ACT 1993 33
4.9 FORESTRY ACT 1916 33
4.10 BRIGALOW AND NANDEWAR COMMUNITY CONSERVATION ACT 2005 34
4.11 COMMONWEALTH LEGISLATION 36
4.12 LICENCES AND APPROVALS REQUIRED 37

5 STAKEHOLDER ENGAGEMENT 38
5.1 INTRODUCTION 38
5.2 EXISTING COMPANY ENGAGEMENT 38
5.3 PROJECT ENGAGEMENT 39

6 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT 42

7 KEY ENVIRONMENTAL AND COMMUNITY ISSUES 43
7.1 ECOLOGY 43
7.2 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE 45
7.3 NON-ABORIGINAL HERITAGE 46
7.4 SURFACE WATER 47
7.5 GROUNDWATER 50
7.6 NOISE AND BLASTING 51
7.7 AIR QUALITY AND GREENHOUSE GAS 53
7.8 TRAFFIC AND TRANSPORT 54
7.9 VISUAL 55
7.10 SOCIAL IMPACT ASSESSMENT 57
7.11 ECONOMICS 58
7.12 SOILS AND LAND CAPABILITY 59
7.13 REHABILITATION, LAND USE AND FINAL LANDFORM 60

8 PRELIMINARY PROJECT JUSTIFICATION 63

9 REFERENCES 65

LIST OF TABLES

Table 1 Aston Mining Tenements 7
Table 2 Consents and Licences 7
Table 3 Average Climatic Conditions Measured by BoM from 1948 to 2010 10
Table 4 Indicative Project Equipment List 26
Table 5 Expected Leases, Licences and Approvals for the Project 37
Table 6 Stakeholder Communication Methods 38
Table 7 Summary of Preliminary Environment Risk Assessment 42

LIST OF FIGURES

Figure 1 Location Plan 2
Figure 2 Regional Locality 3
Figure 3 Environmental Monitoring Program 9
Figure 4 Indicative Stratigraphic Column 12
Figure 5 Land Ownership 14
Figure 6 Project Layout 16
Figure 7 Conceptual Year 1 Mine Plan 17
Figure 8 Conceptual Year 5 Mine Plan 18
Figure 9 Conceptual Year 10 Mine Plan 19
Figure 10 Conceptual Year 15 Mine Plan 20
Figure 11 Conceptual Year 21 Mine Plan 21
Figure 12 Conceptual Project Infrastructure 24
Figure 13 Planning Approvals and Consultation 41
Figure 14 Preliminary Vegetation Mapping 44
Figure 15 Conceptual Final Landform 62

LIST OF APPENDICES

Appendix A Preliminary Environmental Risk Assessment

MAULES CREEK COAL PROJECT
PRELIMINARY ENVIRONMENTAL ASSESSMENT

for
Aston Coal 2 Pty Limited

1 INTRODUCTION

1.1 BACKGROUND

The Maules Creek Coal Project (the Project) is located approximately 18 km to the north-east of the township of Boggabri in the north-west region of NSW within the Narrabri Local Government Area (LGA) (**Figure 1**). The Project largely falls within Coal Lease 375 (CL 375) and Authorisation 346 (A 346) (**Figure 2**).

The Project is owned by Aston Coal 2 Pty Limited (Aston), a wholly owned subsidiary of Aston Resources Limited (Aston Resources). It is considered to be one of only a few remaining Tier 1 undeveloped semi soft coking and thermal coal assets in NSW. Located in the Gunnedah Coal Basin, it is a large delineated coal project with a Joint Ore Reserves Committee (JORC) Coal Reserves of 610 Million tonnes (Mt) of semi-soft coking and thermal coal, capable of supporting a large open cut operation for more than 21 years.

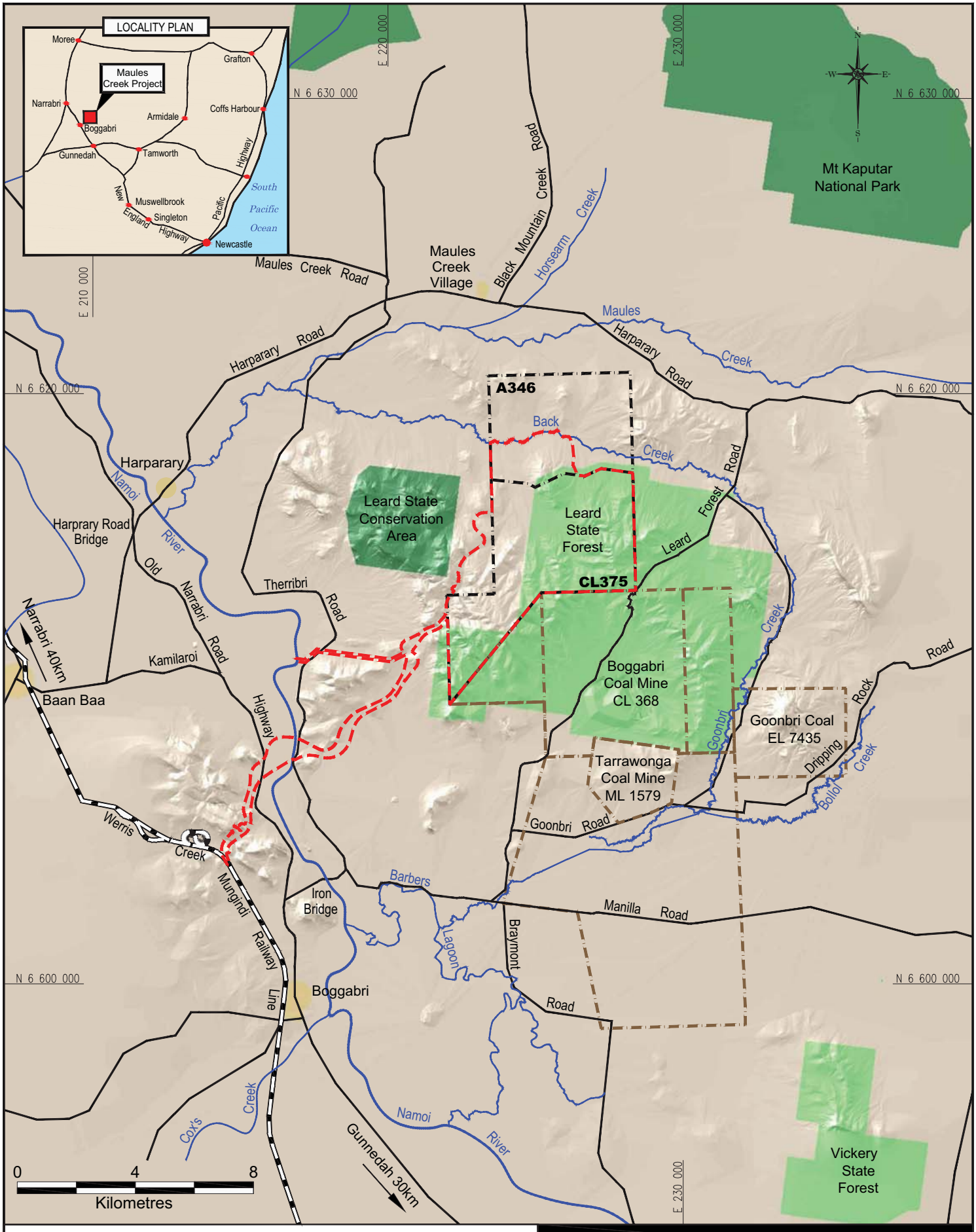
Mining tenements across the Project were originally granted in the 1970s. Following this, extensive exploration activities were undertaken with the ultimate aim of defining the local geology and developing a viable open cut mine plan. To this end, the document entitled *Maules Creek Coal Project Environmental Impact Statement* (Maules Creek EIS) (KCC 1989) was prepared and submitted to the Narrabri Shire Council (NSC) in October 1989.

Development Consent approval (DA 85/1819) was granted on 12 June 1990 for the Maules Creek Coal Mine pursuant to the Maules Creek EIS. DA 85/1819 was physically commenced in 1995 with the construction of the Development Dam; however no open cut mining has been undertaken at the site to date. DA 85/1819 has no sunset clause and remains valid.

Aston seeks a contemporary Project Approval under Part 3A of the *Environmental Planning & Assessment Act 1979* (EP&A Act) to facilitate the development of surface infrastructure and open cut mining activities for the Project generally within its current mining tenements for a period of 21 years. The Project is also generally consistent with activities approved in DA 85/1819. The Project Application Boundary (Project Boundary) is shown on **Figure 2**.

This Preliminary Environmental Assessment (PEA) has been prepared by Hansen Bailey Environmental Consultants (Hansen Bailey) on behalf of Aston. The PEA supports a Project Application under Section 75E of the EP&A Act.


E 200 000
E 300 000
N 6 600 000
N 6 500 000
N 6 400 000
Mt Kaputar National Park
Narrabri
Barraba
Maules Creek Project
Baan Baa
Boggabri
Lake Keepit
Gunnedah
Werris Creek
Mungindi Railway
Tamworth
Main North Railway
Woolbrook
Binnaway
Werris Creek Railway
Main
Willow Tree
Coolah
North
Scone
Merriwa
Gloucester
Stratford
Railway
Muswellbrook
Sandy Hollow
Gulgong
Railway
Railway
Denman
Coast
North
Singleton
Mudgee
Maitland
Cessnock
Ilford
NEWCASTLE
0
25
50 km
Kilometres
Glen Davis
DARWIN
AUSTRALIA
BRISBANE
PERTH
Newcastle
SYDNEY
ADELAIDE
CANBERRA
MELBOURNE
HOBART
Export Port
Road
Railway
HansenBailey
ASTON RESOURCES
MAULES CREEK PROJECT
Location Plan
Filename: 0986 Maules Creek - Location Plan - Fig 1.ai
Date: 26.05.10
Drawn: BD
Figure
1



Project Boundary
Maules Creek Mining Tenements
Other Mining Tenements
Roads
Railway
Watercourses
National Park
State Forest
Urban Areas

Hansen Bailey

ASTON RESOURCES

Coordinate System: MGA Zone 56
Source: Boggabri Coal 2009/2010, LPI 2009/2010, Aston 2010

MAULES CREEK PROJECT

Regional Locality

Cad File: 05514H.dwg	Date: 30.06.10	Drawn: CP	Figure 2

1.2 PROPONENT

The contact details for Aston are:

Aston Resources
Level 10, AMP Place,
10 Eagle Street,
BRISBANE QLD 4000
Phone: (07) 3235 6600
Fax: (07) 3235 6699
www.astonresources.com

1.3 PROJECT OVERVIEW

Aston is seeking a contemporary Project Approval under Part 3A of the EP&A Act to facilitate the development of surface infrastructure and open cut mining activities for the Project generally within its current mining tenements for a period of 21 years. The Project generally comprises:

- The construction and operation of an open cut mining operation extracting up to 13 Million tonnes per annum (Mtpa) Run of Mine (ROM) coal to the Templemore Seam;
- Open cut mining fleet including excavator / shovels and fleet of haul trucks, dozers, graders and water carts utilising approximately 400 permanent employees;
- The construction and operation of a Coal Handling and Preparation Plant (CHPP) with a throughput of 13 Mtpa ROM coal;
- The construction and operation of Tailings Drying Areas to facilitate the drying of tailings prior to co-disposal within the mining area or reprocessing in the CHPP;
- The construction and operation of a rail spur, rail loop, associated load out facility and connection to the Werris Creek to Mungindi Railway Line;
- The construction and operation of a Mine Access Road;
- The construction and operation of administration, workshop and related facilities;
- The construction and operation of a water pipeline, pumping station and associated infrastructure for access to water from the Namoi River;
- A power transmission line and related infrastructure; and
- Installation of communications, water management and reticulation infrastructure.

The Project as proposed is generally consistent with that approved in DA 85/1819. The Project description is discussed further in **Section 3**.

1.4 DOCUMENT PURPOSE AND STRUCTURE

This PEA describes the key social and environmental issues associated with the Project and its proposed assessment methodology for consideration by Department of Planning (DoP) and other relevant Government Authorities at the Planning Focus Meeting (PFM) which was held on 21 July 2010.

The Environmental Assessment Requirements (EARs) for the Project will be sought from DoP following the PFM, stakeholder consultation and discussions with key Government Regulators.

This PEA is structured as follows:

- **Section 2** provides an overview of the history of the Maules Creek Coal Project and the surrounding environment;
- **Section 3** provides a detailed description of the Project;
- **Section 4** summarises the planning legislation relevant to the Project;
- **Section 5** describes the stakeholder engagement program to be undertaken to ensure all interested parties are consulted regarding the Project;
- **Section 6** provides an overview of the preliminary environmental risk assessment conducted for the Project which is provided in full in **Appendix A**;
- **Section 7** describes the potential impacts and proposed assessment methodology for all key environmental issues identified in the preliminary environmental risk assessment for the Project;
- **Section 8** provides a preliminary justification for the Project; and
- **Section 9** lists the relevant references.

2 BACKGROUND

This section provides a brief discussion on the history on the Project, a description of the current monitoring program and a discussion on Aston's environmental management plans. It also discusses relevant components of the existing environment including climate, topography, geology and land ownership.

2.1 APPROVED OPERATIONS

2.1.1 History

The original Exploration Permit No 4 over the area was held by Pacific Coal Pty Limited, a subsidiary of CRA Limited. When CRA acquired the Maules Creek mining tenements, a comprehensive program of exploration drilling and feasibility assessments were undertaken to define the coal resource and develop a viable open cut mine plan.

In October 1989, the document entitled Maules Creek EIS (KCC 1989) was prepared and submitted to the NSC. Development Consent approval (DA 85/1819) was then granted by the Minister for Planning on 12 June 1990 for the Maules Creek Coal Mine which provided approval for:

- The development of a coal mine within the Leard State Forest utilising open cut mining and underground mining methods at an average production rate of 9 Mtpa product coal during the operation of both the open cut and underground operations;
- The extraction of coal down to the Braymont coal seam via open cut mining methods and the extraction of coal commencing in the Braymont coal seam down to the Lower Northam coal seam via underground mining methods;
- Construction of mining infrastructure, including a rail loop and associated rail spur, CHPP, mine administration and bathhouse facilities, workshop, communications and powerlines and water reticulation; and
- Employment of up to 683 employees during peak production periods.

On 4 June 1991, CL 375 was granted to Namoi Valley Coal Pty Limited (NVCPL) for a period of 21 years until 4 June 2012 and simultaneously, A 354 was cancelled. During this time, A 346 was also modified by NVCPL to retain surface rights over the northern portion of CL 375 that was approved for underground mining development. NVCPL became a wholly owned subsidiary of Coal and Allied Pty Limited (CNA) in 1991.

DA 85/1819 was physically commenced in 1995 with the construction of the Development Dam; however no open cut mining has been commenced at the site to date. DA 85/1819 has no sunset clause and remains as a valid planning approval.

2.1.2 Existing Licences and Approvals

Table 1 outlines the status of Aston's mining tenements, whilst **Table 2** outlines Aston's key licences, leases and other mining approvals.

Table 1
Aston Mining Tenements

Tenement	Holder	Comment	Term
Coal Lease 375 (CL 375)	Aston	Covers an area of approximately 4200 ha. The southern part of the tenement covers rights to mine from the surface to unlimited depth (~2500 ha). The northern part of the tenement covers rights to mine from 20 m depths to unlimited depth (~1700 ha)	4 June 1991 – 4 June 2012
Authorisation 346 (A 346)	Aston	Covers the rights of the northern part of CL 375 from the surface to 20 m depth (~1700 ha)	Expires 27 February 2011

Table 2
Consents and Licences

Approval	Tenement / Licence	Comment	Dates
Development Consent DA 85/1819	CL 375	Pursuant to the EIS submitted in October 1989, for the construction and operation of a surface and underground coal mine, associated transport and coal preparation and loading facilities and rail spur	Granted 19 June 1990. This approval has no sunset clause
Environmental Protection Licence 5112 (EPL)	EPL5112	Surrendered in March 2003 but was related to the discharge of waters from the Development Dam	Surrendered by CNA in 2003
Surface Water Licence	90SL051655	30 ML water licence for irrigation use	Granted 28 June 2010 for a period of 5 years (i.e. 28 June 2015)
Bore Water Licence	90BL121059	6 ML bore license held for MAC 018 LD Drill hole	Surrendered
Bore Water Licence	90BL255704	6 ML bore licence	Granted 7 June 2010
Bore Water Licence	90BL001144	Bore will be used for Stock and domestic services	Granted 28 February 1939 for perpetuity
Water Access Licence (WAL)	WAL 13050	3000 units of water entitlements for site supply	Transferred to Aston 11May 2010
Bore Licence	90WA809078	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	Commencement 1 November 2006
Bore Licence	90WA809079	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	Commencement 1 November 2006
Bore Licence	90WA809300	Bore constructed in the Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source	Commencement 1 November 2006

Approval	Tenement / Licence	Comment	Dates
Bore Licence	90WA809127	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	Commencement 1 November 2006
Forests NSW Occupation Agreement	N/A	Agreement applies to that part of Leard State Forest No. 420 that falls within the boundaries of Aston's mining tenement CL 375	Granted 31 March 2010 for a period of one year
Mining Operations Plan	N/A	Mining Operations Plan for exploration activities	Granted 1 April 2010 to 1 April 2012

2.2 ENVIRONMENTAL MANAGEMENT

Aston has developed and implemented environmental management initiatives to ensure impacts from its activities are minimised. Proactive environmental management programs include rehabilitation initiatives, water management works and noise control measures as appropriate.

Aston encourages continual improvement in performance and will develop a number of management plans and procedures for key activities during the operational phase. These plans and procedures will be regularly reviewed, communicated to the workforce and audited for compliance and performance.

2.2.1 Environmental Monitoring Program

Aston is committed to minimising its social and environmental impacts and recognises that the implementation of a comprehensive Environmental Monitoring Program (EMP) is a key requirement in achieving this. To this end, Aston will continually review its EMP and implementing additional monitoring locations. The existing monitoring network is illustrated on **Figure 3**.

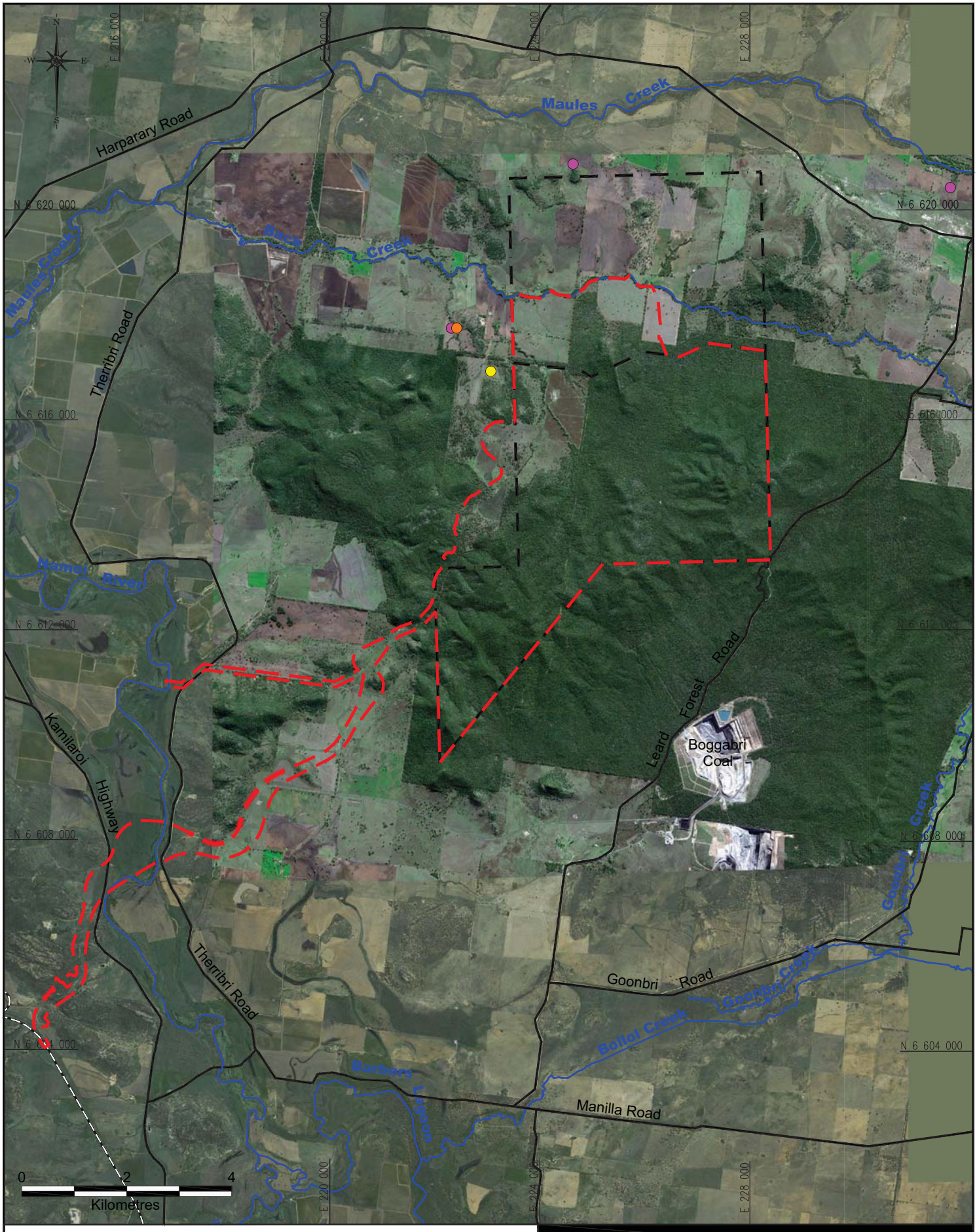
The EMP will continue to be enhanced and revised as required for the Project to ensure proactive and ongoing environmental monitoring and management.

2.3 EXISTING ENVIRONMENT

2.3.1 Regional Setting

The closest urban centre to the Project is the township of Boggabri 18 km to the south-west of the mine site. Boggabri is itself situated approximately 40 km and 60 km from the larger centres of Gunnedah and Narrabri respectively. The city of Tamworth is the main regional centre located 120 km to the south-east of the Project. The Kamilaroi Highway and other minor rural roads link these regional centres and form an important road network that provides access throughout the region.

The Nandewar Range which includes the Mt Kaputar National Park is located approximately 18 km to the north-east of the Project. There are several state forests located within the regional setting of the Project Boundary including Jacks Creek, Bibblewindi, Kelvin and Vickery State Forests. The Willow Tree Range forms part of the Leard State Forest and dissects the Project Boundary.



- Project Boundary
- Mining Tenement Boundary
- Roads
- Existing Rail
- Watercourses
- HVAS PM10 Monitoring Site
- Depositional Dust Monitoring Site
- Meteorological Station

Hansen Bailey

ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2005, 2010

MAULES CREEK PROJECT

Environmental Monitoring Program

Cad File: 06279G.dwg	Date: 29.06.10	Drawn: CP	Figure 3

The Namoi River is the most significant water body in the Namoi Valley (see **Figure 2**). The Namoi River and adjoining alluvial floodplain areas form some of the most productive and fertile land within the district. The Namoi River flows in a north-westerly direction passing Boggabri, Narrabri, Wee Waa and Burren Junction and eventually joins the Barwon River near the town of Walgett.

2.3.2 Topography

The southern to central portion of the Project Boundary generally consists of a series of ridges and narrow gullies above RL 350 m with slopes ranging up to 30%. The northern portion of the Project Boundary is generally more undulating with slopes ranging from 0 to 15% (**Figure 2**). In this area there are a series of lower hills and ridges that separate Back Creek from Maules Creek. Small areas of flat land exist in the northern portion of the Project Boundary near Back Creek.

2.3.3 Climate

As shown in **Table 3**, temperatures range from an average maximum of 34^{o}C in summer down to an average minimum of 3^{o}C in the winter months. Meteorological monitoring has confirmed that temperature inversions are common in winter months, forming in the late afternoon and reaching maximum resistance at dawn. This is particularly the case in the valleys on the edge of the Nandewar Ranges and along the Namoi River. The predominant wind direction is from the north-east followed by winds from the south-east and west north-west directions.

Table 3
Average Climatic Conditions Measured by BoM from 1948 to 2010

Month	Mean Daily Temperature (°C)				Mean Monthly Rainfall (mm)		Mean Monthly Rain Days	
	Gunnedah Pool		Gunnedah Resource Centre		Gunnedah Pool	Gunnedah Resource Centre	Gunnedah Pool	Gunnedah Resource Centre
	Min	Max	Min	Max				
January	18.3	34.0	18.8	31.9	71.3	85.5	5.6	6.0
February	18.1	32.9	18.7	31.1	66.5	73.0	5.1	5.3
March	15.8	30.7	16.6	29.1	48.1	41.6	3.9	3.9
April	11.4	26.4	12.8	25.1	37.7	39.6	3.5	3.5
May	7.1	21.3	8.7	20.3	42.5	44.8	4.1	4.2
June	4.3	17.6	6.1	16.8	43.9	39.5	4.8	4.5
July	3.0	16.9	4.7	16.1	42.2	42.4	4.8	4.9
August	4.1	18.9	5.8	17.9	41.3	35.3	4.7	4.6
September	6.9	22.8	8.5	21.4	39.8	39.6	4.5	4.6
October	10.7	26.7	12.1	25.1	55.2	59.3	5.4	6.0
November	14.1	30.3	15.0	28.3	60.9	68.0	5.7	6.2
December	16.8	33.0	17.5	31.1	68.6	68.5	5.9	6.4
TOTAL	**10.9**	**26.0**	**12.1**	**24.5**	**618.0**	**637.1**	**58.0**	**60.1**

Source: BoM April 2010

The long term average annual rainfall for the area is approximately 640 mm and is influenced by a number of phenomena including:

- Passage of moist upper atmospheric low pressure cells from the north which often cause high intensity rainfall events;
- Passage of inland tropical cyclones and low pressure systems which often cause long duration high intensity rainfall periods during summer;
- Passage of cold fronts across NSW; and
- Localised convection storms that can cause a certain amount of the high intensity summer rainfalls.

2.3.4 Geology

The Project Boundary is located within a major regional geological feature known as the Gunnedah Basin. The Gunnedah Basin is one of the main coal basins within NSW. The target coal resources for the Project occur within the early Permian Maules Creek Formation (see **Figure 4**). The basement of the Maules Creek Formation is formed by the Boggabri Volcanics. The rhyolitic volcanics are overlain by the Leard Formation, a thin unit comprised by black claystone and thin coal seams. The Maules Creek Formation is up to 800 m thick within the Project Boundary and sits conformably on the Leard Formation (Sides, 2009).

All seam groups situated stratigraphically below the Braymont Seam lap onto the basement volcanics. The depth of weathering across the modelled area varies from 6 m to 113 m with the average depth being 25 m. No significant faults have been identified.

2.3.5 Coal Resource

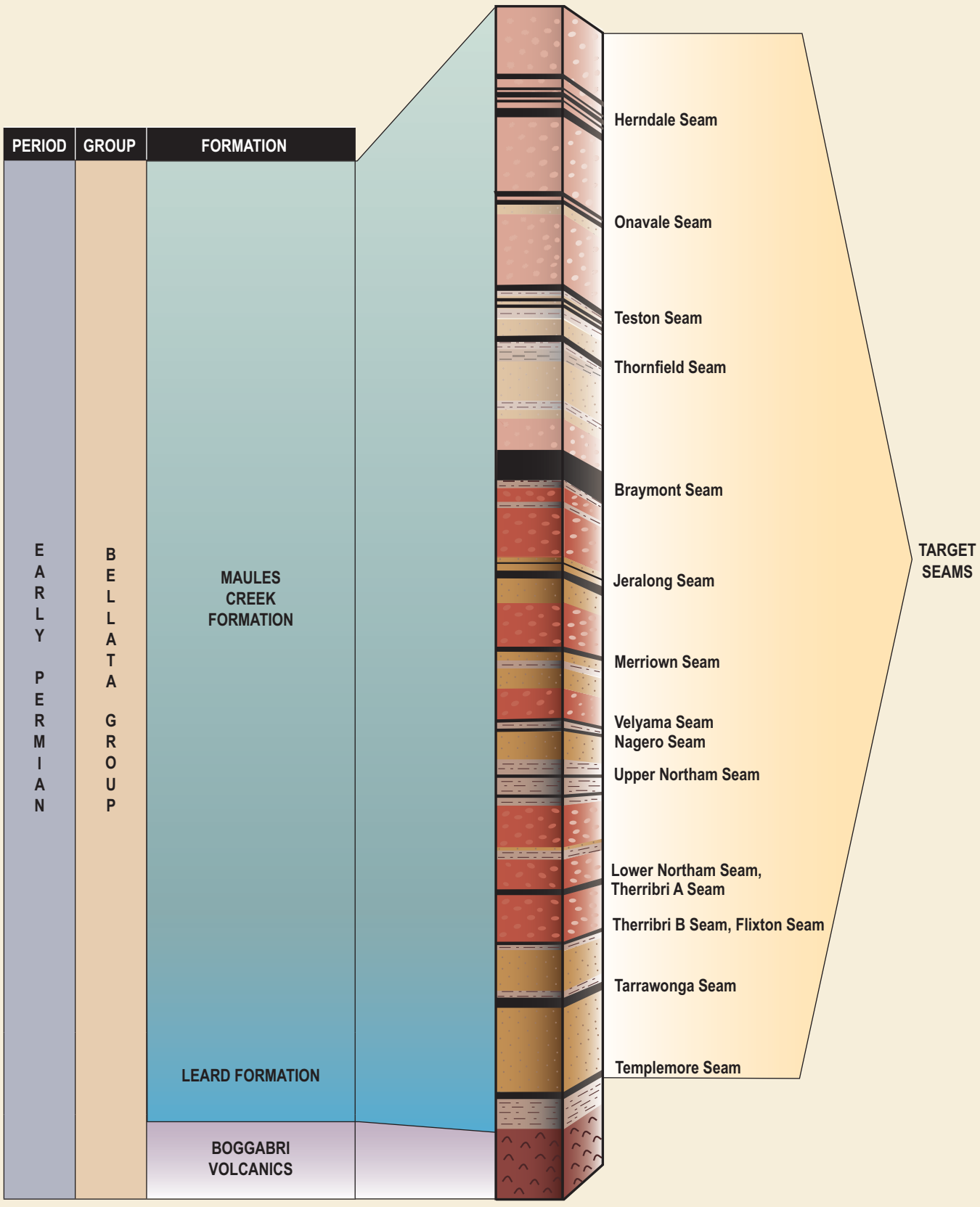
The Maules Creek Formation contains 15 named seam groups within the Project Boundary which exhibit splitting towards the north-east. This seam splitting has resulted in the recognition of up to 39 individual seam plys. The coal measures dip towards the south-east with a flattening of dip occurring in the far south-east corner of the Project Boundary (Sides, 2009). Dips range from 1 to 7 degrees but are within the range of comfortable open cut mining operations. Dip direction is not consistent across the deposit, with dips into, out from and parallel to the proposed highwall.

2.4 LAND USE

The Project Boundary is predominately located within the Leard State Forest. The Leard State Forest is situated within an 8134 ha remnant patch of native vegetation.

The bulk of the land within the Project Boundary has been affected by disturbances commonly associated with forestry operations. These disturbances include vegetation clearing, weed invasion, altered natural drainage and edge effects.

The active open cut mining operations of Boggabri Coal Mine and Tarrawonga Coal Mine are located within to the south-east of the Project Boundary. Recent planning approval applications have been made for both Boggabri Coal Mine and Tarrawonga Coal Mine to facilitate ongoing operations, additional production rates and other mining flexibilities.



Coal
Sandstone
Shale
Volcanics
Conglomerate
Siltstone

Hansen Bailey

ASTON RESOURCES

Sources: Maules Creek Project EIS 1989
Aston Resources 2010

MAULES CREEK PROJECT

Indicative Stratigraphic Column

Filename: 914_boggabrigeology1.indd	Date: 12.04.10	Drawn: MB	Figure 4

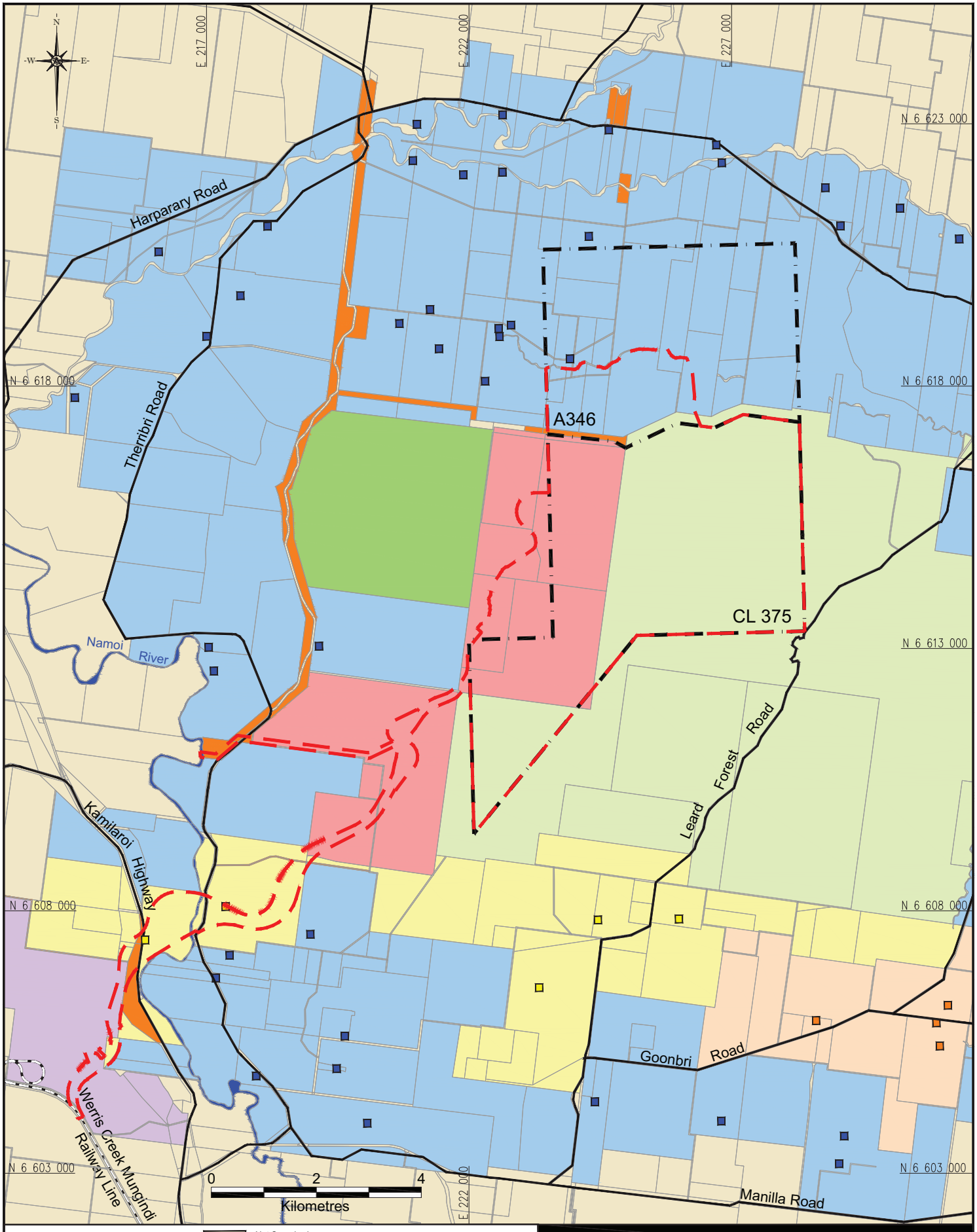
The Project considers as an option the flexibility for joint use of part of Boggabri Coal's rail infrastructure as proposed in their recent application upon reaching a suitable agreement with Boggabri Coal.

The land surrounding the Project Boundary is largely an agricultural landscape, comprising primarily grazing and cropping activities dominating the area to the north, south, east and west of Leard State Forest. The regional climate allows summer and winter crops to be cultivated in the lower lying areas of the Namoi River floodplain. Many local properties also have the advantage of surface and underground water access for irrigation and hence many crops have thrived including wheat, sorghum, oil seeds and livestock fodder.

2.6 LAND OWNERSHIP

Land ownership within and surrounding the Project Boundary is shown on **Figure 5**. The land within the Project Boundary is covered by four key landownership categories, namely: private freehold land, Aston owned land, land owned by other mining companies and land held by NSW State Forests. Land owned by Forests NSW within the Project Boundary where mining is proposed will be undertaken in accordance with a Compensation Agreement or equivalent measure.

The majority of the proposed infrastructure will be located on land owned by Aston, Boggabri Coal or Crown land. A small area of land where the current Boggabri Coal rail loadout facility is located is owned as tenants in common under a perpetual lease between Aston and Boggabri Coal. Private freehold landowners occupy land to the north and south-east of the Project Boundary. Other private landholders are located to the south and south-west of the Project Boundary at least 2 km from the proposed active mining areas.



Project Boundary
Mining Tenement Boundary
Private Freehold
Aston Coal 2 Pty Ltd
Boggabri Coal Pty Limited
Whitehaven Coal Mining Limited
Aston Coal 2 Pty Ltd & Idemitsu Boggabri Coal Pty Ltd
Crown
NSW State Forest
Leard State Conservation Area

Not Searched
Private Freehold Receiver
Boggabri Coal Receiver
Whitehaven Coal Receiver

Hansen Bailey

ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: LPI 2010

MAULES CREEK PROJECT

Land Ownership

Cad File: 06075K.dwg	Date: 02.08.10	Drawn: CP	Figure 5

3 PROJECT DESCRIPTION

This section provides a detailed description of the Project and a discussion of the key alternatives that were considered during the formulation of the Project description.

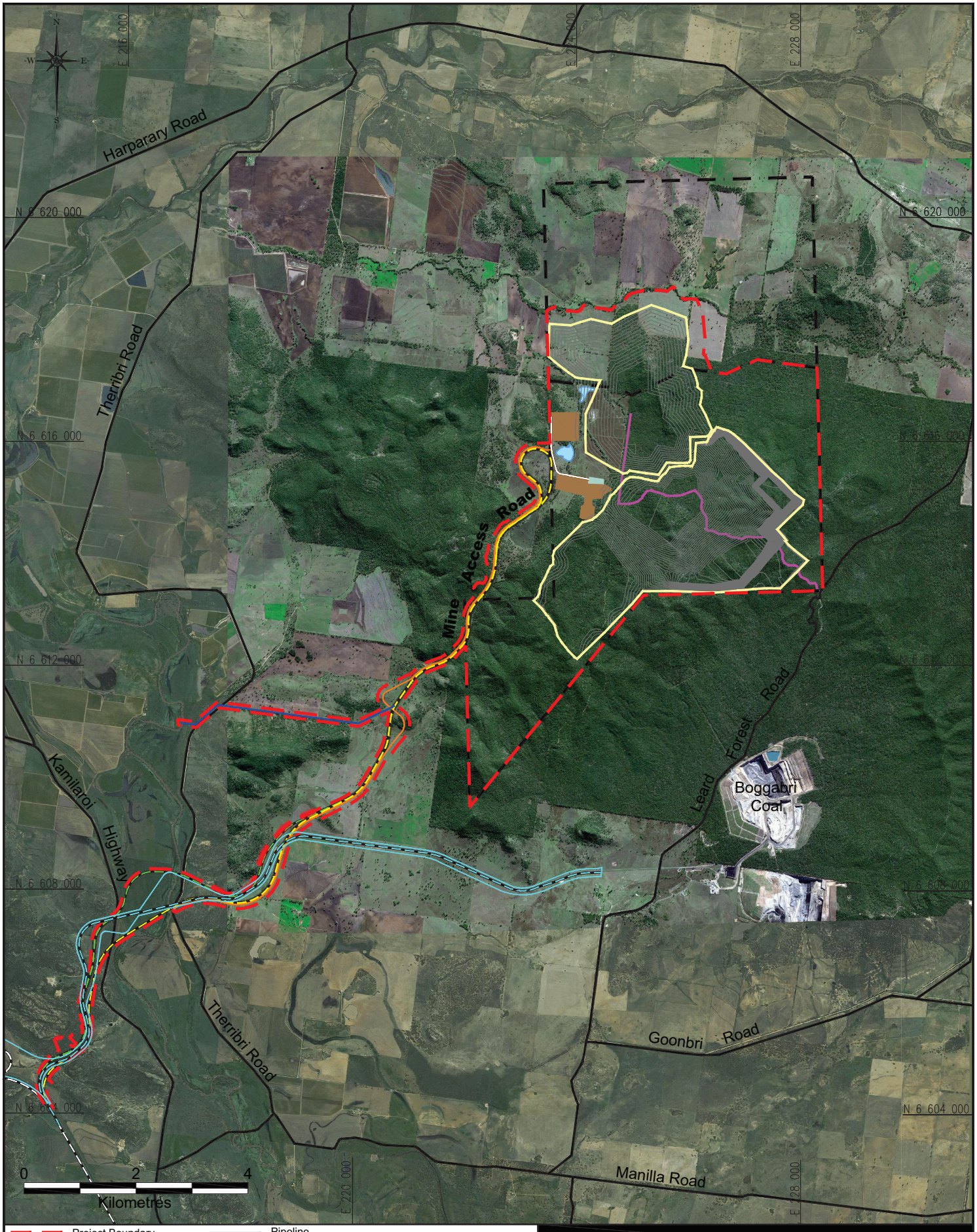
3.1 MINING OPERATIONS

The Projects seeks to gain a contemporary project approval under Part 3A of the EP&A Act for the development of the required site infrastructure and the mining of a 21 year open cut coal reserve. The estimated open cut coal reserve within the 21 Year Mine Disturbance is approximately 240 Mt of ROM coal from the Maules Creek Formation.

The Project will be generally consistent with the development as approved in the original Development Consent with contemporary mining methods and practices to be implemented enabling the maximum and efficient extraction of coal reserves within the Project Boundary. The Project seeks approval for open cut mining with a production rate of up to 13 Mtpa ROM coal to be achieved by:

- Utilising standard mining equipment fleet for truck and shovel / excavator mining operations to extract the coal reserve down to the Templemore Seam;
- The capability to process the ROM coal through a single stage CHPP and / or bypass coal directly to export market;
- Transport of product coal by rail via the Werris Creek to Mungindi Railway and the Main Northern Railway to the Port of Newcastle for export;
- The development and utilisation of various site infrastructure and associated facilities, including:
    - CHPP and associated facilities;
    - Rail load out facility;
    - A rail spur and loop connecting to the Werris Creek to Mungindi Railway;
    - Upgrade of local road access;
    - Communications and power access;
    - Explosives storage facilities;
    - Water management structures and systems; and
    - Other administrative offices and support facilities;
- A total workforce of approximately 400 permanent employees at peak production, with some potential increase beyond this during the construction period.

The overall Project Layout is shown below on **Figure 6**. The conceptual mine plan layout for the Project is shown on **Figure 7** to **Figure 11** for Years 1, 5, 10, 15 and 21, respectively.



- Project Boundary
- Mining Tenement Boundary
- Roads
- Temporary Access Road
- Mine Access Road
- Indicative Haul Routes
- Existing Rail
- Indicative Rail Spur and Loop
- Alternative Rail Alignment
- Mine Disturbance Boundary
- Pipeline
- Proposed Infrastructure Area
- Tailings Drying Area
- Water Strorage
- Boggabri EA Boundary
- Proposed Boggabri Coal Rail Spur

Hansen Bailey

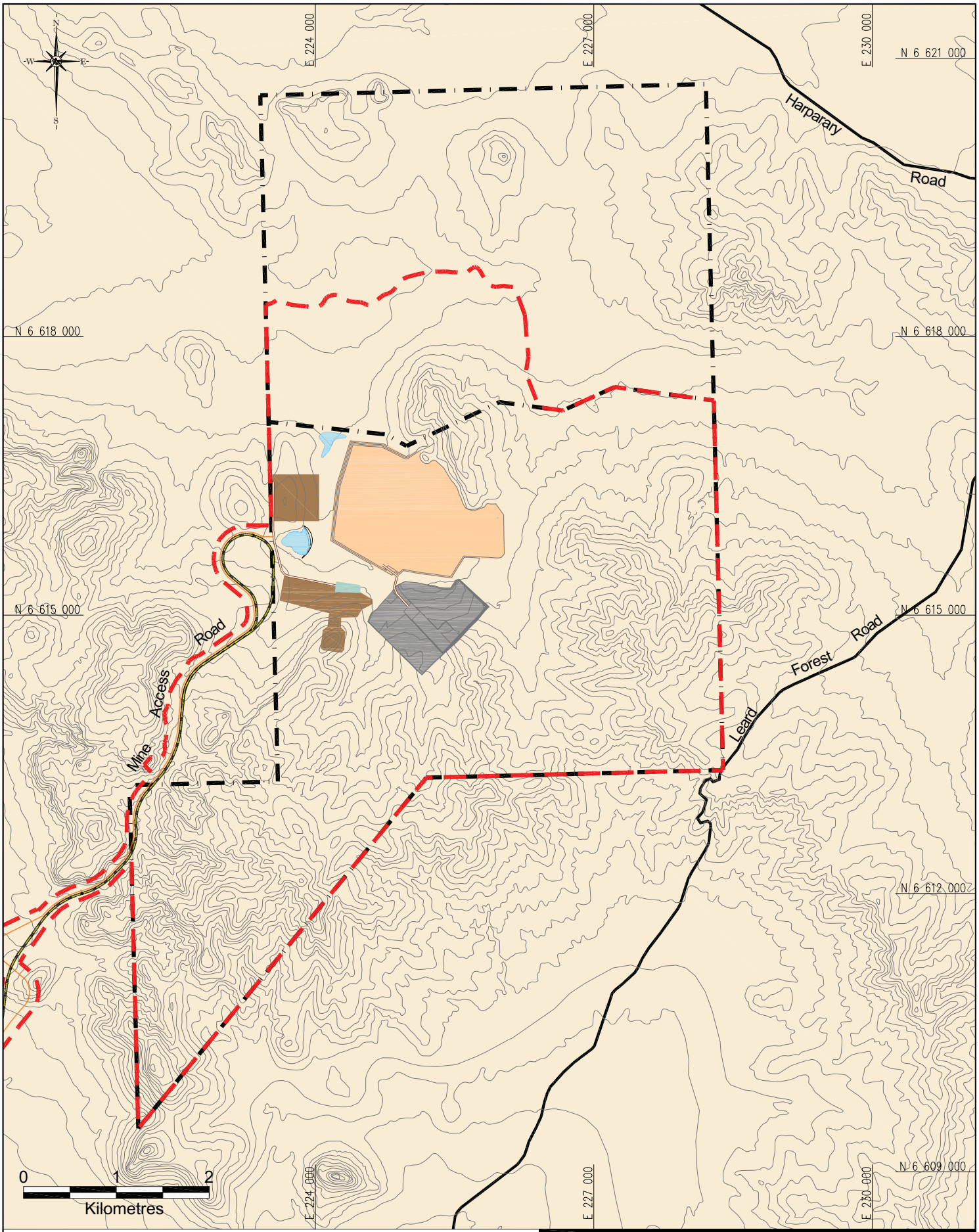
ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2005, 2010

MAULES CREEK PROJECT

Project Layout

Cad File: 06259J.dwg	Date: 03.08.10	Drawn: CP	Figure 6



Project Boundary
Mining Tenement Boundary
Roads
Mine Access Road
Indicative Haul Routes
Indicative Rail Spur and Loop
Proposed Infrastructure Area
Tailings Drying Area
Water Strorage
Overburden Emplacement
Active Mining

Hansen Bailey

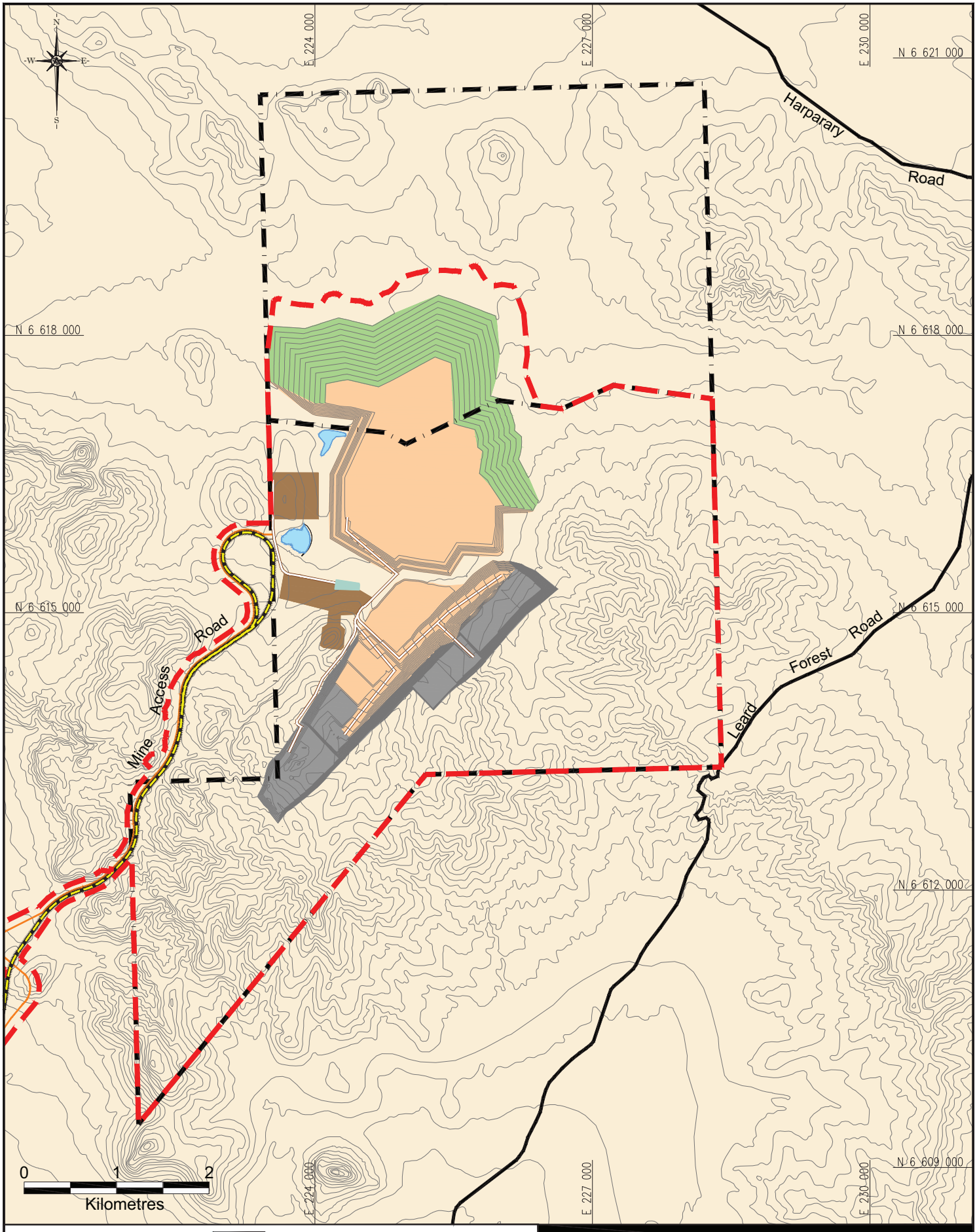
ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2010

MAULES CREEK PROJECT

Conceptual Year 1 Mine Plan

Cad File: 06228l.dwg	Date: 29.06.10	Drawn: CP	Figure 7



- Project Boundary
- Mining Tenement Boundary
- Roads
- Mine Access Road
- Indicative Haul Routes
- Indicative Rail Spur and Loop
- Proposed Infrastructure Area
- Tailings Drying Area
- Active Rehabilitation
- Water Strorage
- Overburden Emplacement
- Active Mining

Hansen Bailey

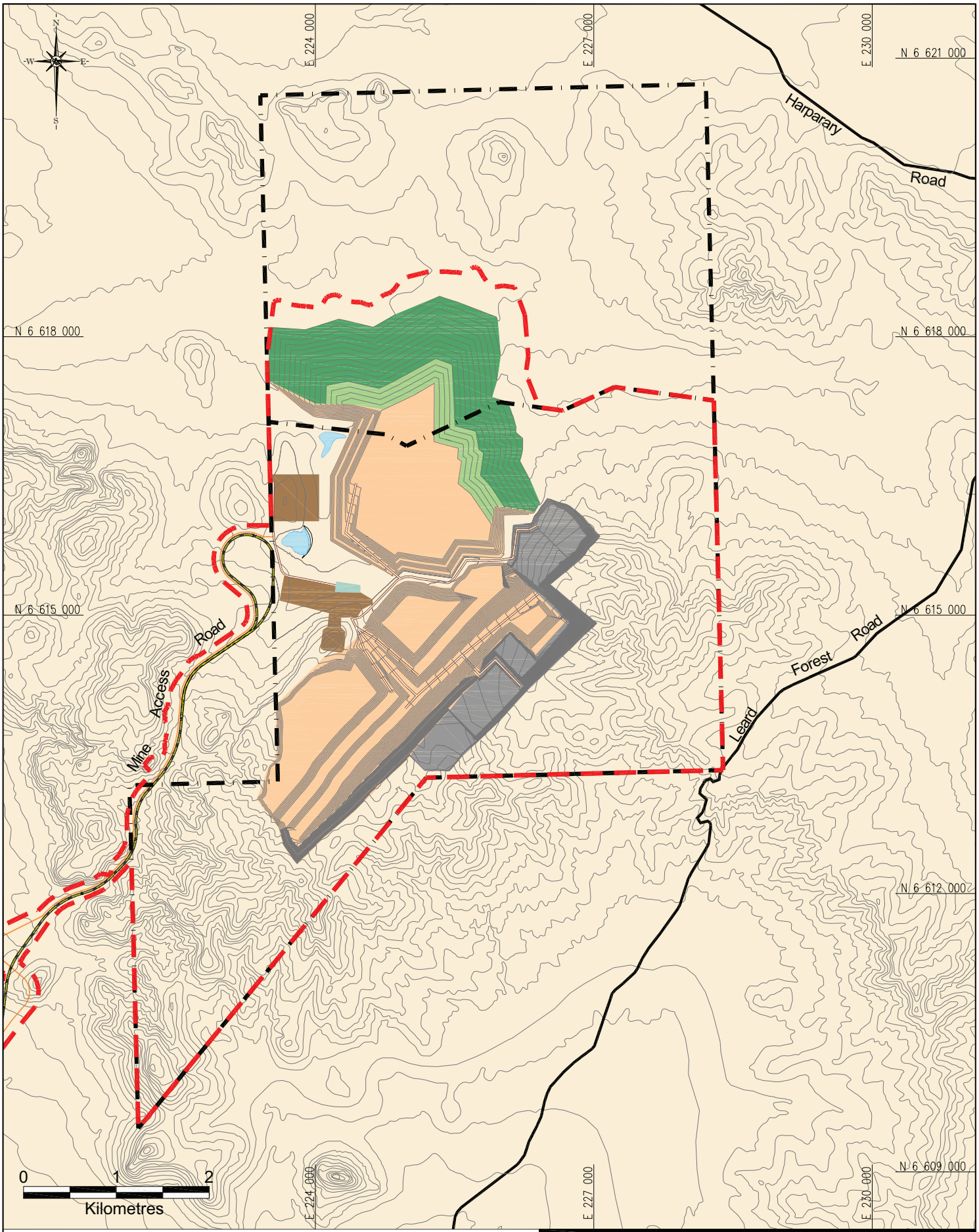
ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2010

MAULES CREEK PROJECT

Conceptual Year 5 Mine Plan

Cad File: 06229K.dwg	Date: 03.08.10	Drawn: CP	Figure 8



Project Boundary
Mining Tenement Boundary
Roads
Mine Access Road
Indicative Haul Routes
Indicative Rail Spur and Loop
Proposed Infrastructure Area
Tailings Drying Area
Active Rehabilitation

Rehabilitation
Water Strorage
Overburden Emplacement
Active Mining

Hansen Bailey

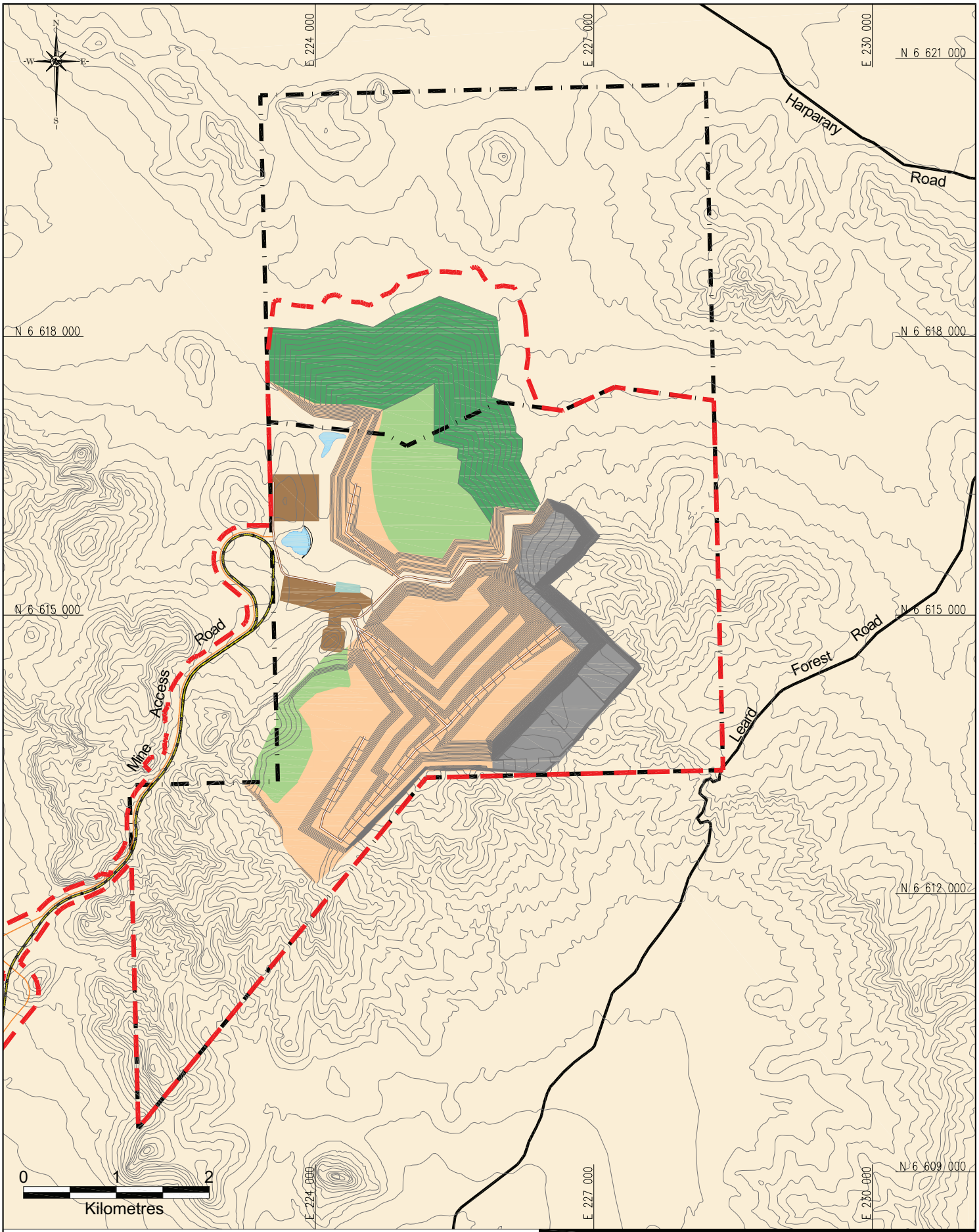
ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2010

MAULES CREEK PROJECT

Conceptual Year 10 Mine Plan

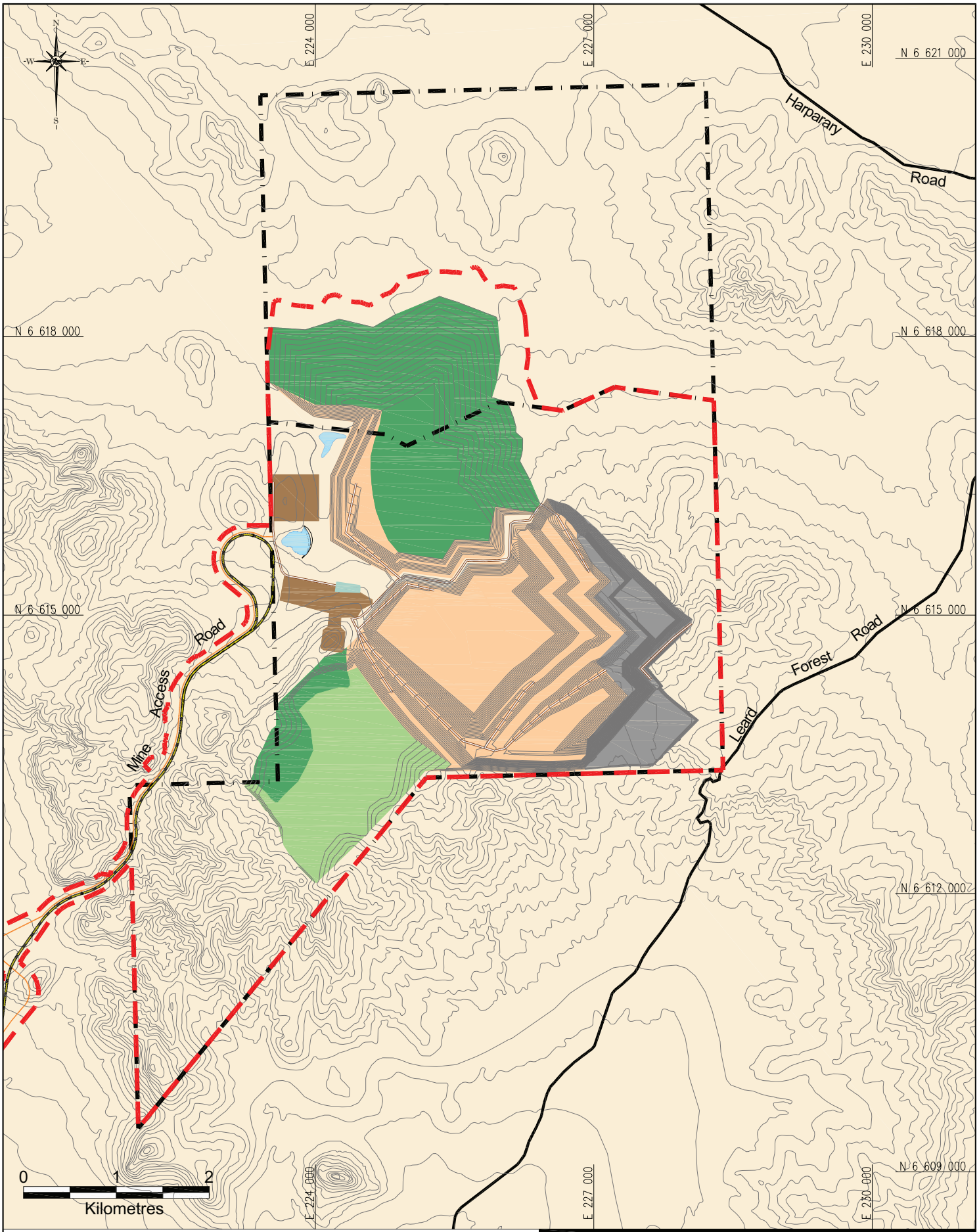
Cad File: 06230J.dwg	Date: 03.08.10	Drawn: CP	Figure 9



MAULES CREEK PROJECT

Conceptual Year 15 Mine Plan

Cad File: 06231J.dwg	Date: 03.08.10	Drawn: CP	Figure 10



MAULES CREEK PROJECT

Conceptual Year 21 Mine Plan

Cad File: 06232K.dwg	Date: 03.08.10	Drawn: CP	Figure 11

As illustrated in **Figure 7** to **Figure 11**, mining operations commence in the central west of the mining area, progressing to the south-west along the limit of oxidisation of the coal reserve, before turning toward the south-east in around Year 5. The mine plan, whilst progressing towards the eastern boundary of the Project Boundary also advances to the north to Year 21. As noted previously, there are considerable resources present beyond the 21 Year mining limit and in the future, Aston may, depending upon market factors, seek relevant approval for the extraction of further coal resources.

During the early years of operation, the Northern Overburden Emplacement Area (OEA) is proposed to be developed in the northern part of the Project Boundary to the east of and north of the proposed infrastructure area, as discussed in **Section 3.2**. The Northern OEA is proposed to be fully developed by the end of Year 10 and largely rehabilitated by Year 15.

The western and southern faces of the Northern OEA are not proposed to be shaped and rehabilitated until mining activities cease. Final rehabilitation of these faces would cover the required mine water infrastructure areas and internal haulage roads that are expected to be required during and beyond the 21 Year mine plan. **Section 7.13** describes a conceptual final landform should the approval for the continuation of mining beyond the 21 Year mine plan not be sought and subsequently granted. The final landform for the Project will be developed in consideration of neighbouring mining operations approved operations as far as practical to ensure favourable outcomes for the community.

Due to the shallow nature of the coal reserves during the early years of mining, the Project will commence production at approximately 4 Mtpa ROM coal from Year 1. Production rates are then scheduled to increase to full production by Year 5.

3.2 MINE INFRASTRUCTURE

3.2.1 Coal Handling and Preparation Plant

The Project will include the construction of a CHPP and associated facilities to enable the handling and processing of up to 13 Mtpa ROM coal. The facilities will be setup with two coal circuits, including: a Processing Circuit where the CHPP will be designed to process up to 1750 tonnes per hour (tph) of ROM coal, and a Bypass Circuit designed to handle up to 1600 tph of ROM coal.

ROM coal will be unloaded from haul trucks into two 450 tonne (t) ROM coal hoppers where it will be fed into double rolling sizers. ROM coal will also be stockpiled and fed into the ROM coal hoppers by front end loaders as required. Coal will then be analysed and directed to either the Processing or Bypass Circuit depending on the quality of coal. Bypass Coal will be directly diverted to the product coal stockpiles for loading onto trains at the relevant time.

ROM coal that is diverted into the Processing Circuit will be fed into the CHPP. The CHPP will involve a simple Dense Medium Cyclone (DMC) / Reflux Classifier Process, whereby coarse reject and fine tailings will be generated.

A conveyor system will be constructed to direct course rejects to a 600 t rejects bin, where this material is proposed to be loaded onto haul trucks for co-disposal with overburden. It is proposed the fine tailings will be pumped via pipeline to Tailings Drying Areas.

Water will be decanted from the tailings and reused in the mine water management system. The tailings material, depending upon the coal quality will be dried and either recovered for reprocessing or hauled inpit for co-disposal with overburden. This will facilitate an increase in resource recovery, and reduce water demands and waste production.

Aston is currently considering two options for product coal stockpiles with capacities of approximately 600000 t, including:

- Linear coal stockpiles and reclamation system; and
- Central coal stockpiles utilising dozers to push coal towards an underground conveyor reclamation system.

Figure 12 illustrates the footprint for the linear coal stockpiles which represents the maximum footprint of both options. The Environmental Assessment (EA) will assess the potential impacts resulting from both options as required.

3.2.2 Product Transport

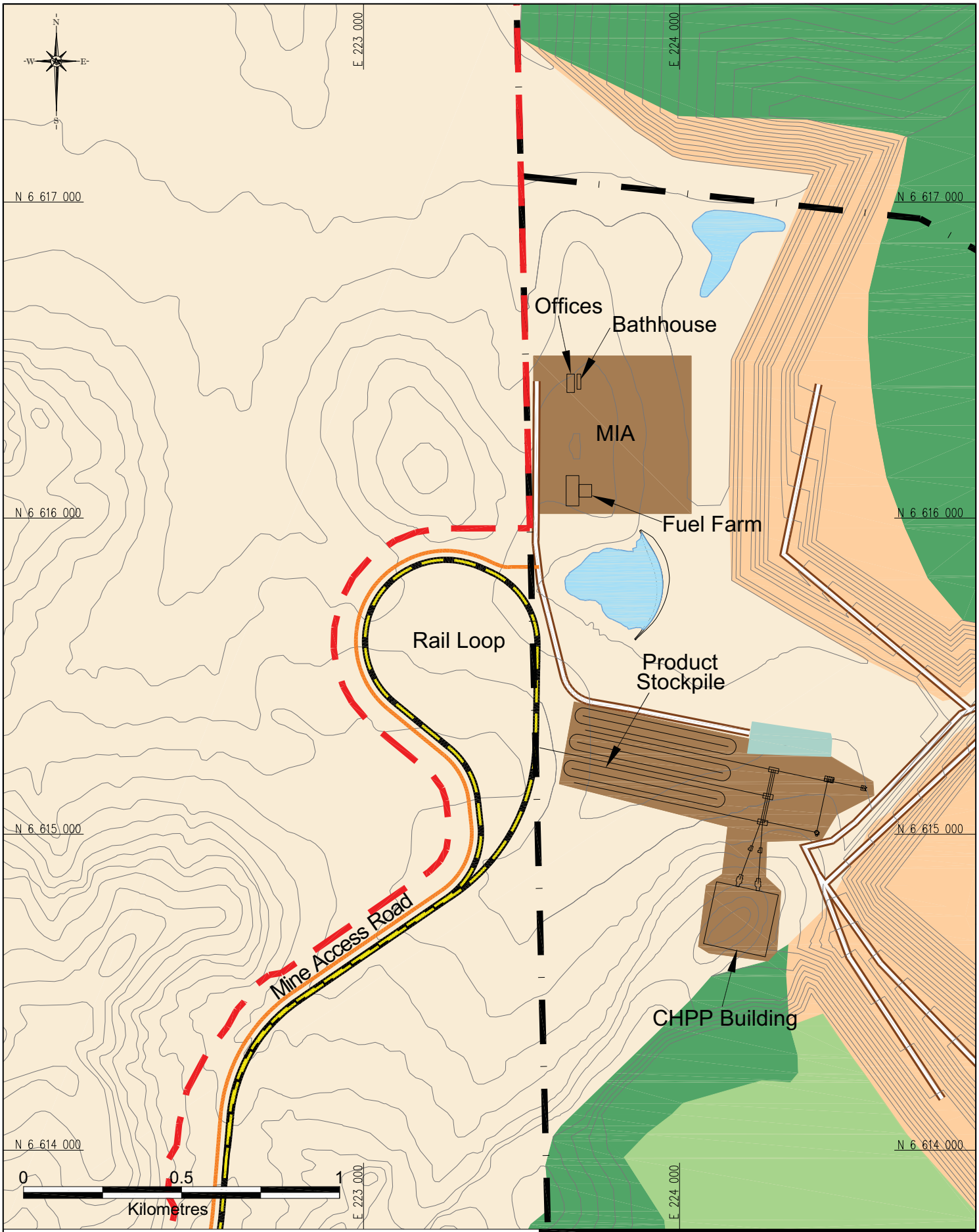
The Project will involve the transport of product coal by rail to the Port of Newcastle for sale to the export market. The Project seeks approval for the construction of a rail spur from the Project to either the Werris Creek to Mungindi Railway Line or the proposed Boggabri Coal rail spur. A rail loop with train loading facilities with a capacity of approximately 5000 tph will be constructed to facilitate the loading of product coal.

A number of alignments for the rail spur and associated facilities are currently being considered by Aston, including:

1. The yellow alignment as illustrated in **Figure 6**, continuing approximately 18 km from the rail loop towards the south-west to its junction with the Werris Creek to Mungindi Railway Line;
2. A rail spur approximately 20 km in length following the yellow alignment for around 10 km and then branching off onto an alignment to the west of Option 1 (green alignment in **Figure 6**), which will continue to the Werris Creek to Mungindi Railway Line; and
3. Construction of a rail spur on the yellow alignment down to its intersection with Boggabri Coal's proposed rail spur which will be utilised for the remaining 10 km to the Werris Creek to Mungindi Railway Line upon the relevant agreement with Boggabri Coal (**Figure 6**).

The final rail spur alignment(s) will be determined and subsequently included and assessed in the EA to support the Project Application. The EA will not include an assessment of the construction impacts associated with utilising Option 3 (the proposed Boggabri Coal rail spur) as this will have previously been considered in Boggabri Coal's relevant Project Approval application. However, the potential impacts upon noise and air quality from the transport of the Project's coal will be considered within the EA.

The construction of the rail spur would involve the alignment across the floodplain and the Namoi River. The rail spur would intersect the Therribri Road and the Kamilaroi Highway which will involve the construction of infrastructure to facilitate crossing these roads.



Project Boundary
Mining Tenement Boundary
Mine Access Road
Indicative Haul Routes
Indicative Rail Spur and Loop
Proposed Infrastructure Area
Tailings Drying Area
Year 21 Active Rehabilitation
Year 21 Rehabilitation
Water Storage
Overburden Emplacement

Hansen Bailey

ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2010

MAULES CREEK PROJECT

Conceptual Project Infrastructure

Cad File: 06280F.dwg	Date: 29.06.10	Drawn: CP	Figure 12

It is noted that the Project Boundary in the vicinity of the southern portion of the rail spur partly overlies some non-mine owned land. It is Aston's intention that this non-mine owned land will not be disturbed as a result of the Project.

3.2.3 Mine Infrastructure Area

The Project will require the construction of various items of surface infrastructure to enable the operation of the mine. The Mine Infrastructure Area (MIA) illustrated on **Figure 12** is anticipated to contain the following items:

- Administration, office, and bathhouse buildings for mine employees;
- Heavy and Light Vehicle Parking;
- Waste Water Treatment Plant;
- Electrical Sub-Station;
- Helicopter Pad;
- Heavy and Light Vehicle Workshops and Hardstand areas;
- Tyre Change Bay and Storage Areas;
- Stores Building and Laydown areas;
- Vehicle Wash down Facilities;
- Bulk Oil and Fuel Storage Tanks and Refuelling Facilities;
- Associated Water Management Infrastructure; and
- Site Security.

3.2.4 Mine Access and Service Infrastructure

Current access to the site is via existing public and State Forest roads. These include: Kamilaroi Highway, Old Manilla Road, Leard Forest Road and a State Forest access road (Temporary Access Road, see **Figure 6**) near the south-eastern corner of CL 375. This Temporary Access Road will be required for the initial year of the Project to enable access and transport of equipment and materials to the site, whilst the Mine Access Road is under construction.

The proposed Mine Access Road is to continue from Therribri Road in a north-easterly direction adjacent to the rail spur towards the MIA. The Mine Access Road will be approximately 15 km in length and designed with a bitumen seal capable of withstanding heavy vehicles required during the development of the Project. Utilising this access may also require the sealing and upgrade of approximately 3 km of Therribri Road which will be undertaken in close consultation with NSC.

Upon the initial commencement of mining operations, it is possible that the rail spur will still be under construction and product coal from the Project may need to be transported from the Project Boundary utilising a Temporary Coal Haulage Route. Aston seeks approval for the temporary haulage of product coal during this initial year of mining operations utilising existing road infrastructure subject to reaching suitable arrangements with Boggabri Coal.

Further to this, Aston seeks approval for an Emergency Coal Haulage Route via the same arrangements utilised for Temporary Coal Haulage should access to the rail facilities be temporarily unavailable during the operation of the Project. This Emergency Coal Haulage Route would be subject to reaching suitable arrangements with Boggabri Coal.

Access to electricity for the Project and the location of any associated infrastructure are still to be negotiated and agreed with TransGrid and / or Country Energy. The ultimate location for this infrastructure will be included as part of the EA and the Project Approval Application.

Communications lines will be fed from the existing infrastructure which is expected to be located along Therribri Road. Any communications line will be located within the corridor required for the Mine Access Road and Rail Spur.

3.2.5 Mine Water Management System

The Project will require an ongoing and reliable water source, mainly for the processing of coal within the CHPP and for dust suppression.

As listed in **Table 2**, Aston currently holds Water Access Licence (WAL) 13050 which provides a water allocation from the Namoi River for up to 3000 units for irrigation purposes. This water allocation will be required for use in the construction and operation of the Project, and an application to alter its purpose to mining and industrial use will be necessary.

A pump and associated water pipeline (see **Figure 6**) will be required to transfer water from the Namoi River for use in the water management system.

The Development Dam, which was constructed in 1995 to physically commence the DA 85/1819, is proposed to be utilised for the Project, mainly as a sediment structure for the Northern OEA. A preliminary design for the CHPP dam is illustrated in **Figure 12**, between the CHPP and the MIA. Preliminary locations and requirements for various other mine water structures and erosion and sediment control devices will be developed throughout the assessment of the Project in the EA.

3.3 MOBILE EQUIPMENT

An indicative equipment fleet for the Project is shown in **Table 4**.

Table 4
Indicative Project Equipment List

Equipment	Number
Hydraulic Excavators	7
Overburden Trucks	32
Coal Trucks	6
Graders	3
Bulldozers	9
Watercarts	3
Coal Stockpile Dozers	5
Drills	4
Front End Loaders	2

The above equipment will be mobilised onsite on a progressive basis consistent with the scheduled mining production levels. Various other infrastructure will be required during the construction process.

3.4 REJECT AND TAILINGS DISPOSAL

The Project involves the co-disposal of coarse reject in the active overburden emplacement area. Fine reject material is to be pumped into the Tailings Drying Areas where the fines will either be recovered and reprocessed or transported and co-disposed with overburden.

The Tailings Drying Areas will have a capacity designed to cater for worst case scenarios such as winter drying based on a tailings depth of approximately 2-3 m. The Tailings Drying Areas will be constructed of impervious material.

3.5 WORKFORCE AND HOURS OF OPERATION

The Project will require approximately 400 permanent employees, including contractors. Maintenance activities, deliveries, coal processing, coal transport and mining operations will occur 24 hours a day, seven days a week.

The Project will require up to three blast events per week from Monday to Saturday in daylight hours once mining rates meet steady state. It is anticipated that some blasting activities may be required for the earthworks associated with the construction of the mine access road and rail spur. No blasting is proposed to occur on Sundays without prior approval from Department of Environment, Climate Change & Water (DECCW).

3.6 PROJECT ALTERNATIVES

Since the acquisition of the Project in February 2010, Aston has conducted detailed investigative studies in order to formulate the most efficient and viable mining operation possible to extract the coal reserves. These investigations have involved review and analysis of the historical information compiled by the previous owner of the Project and completion of additional work where needed.

This process included the consideration of numerous mine plans and operational alternatives. The primary objective of the studies was to develop a mine plan that minimised potential environmental and social impacts whilst maximising coal recovery and retaining flexibilities required going forward.

The various Project alternatives that were considered during this process, included:

1. The do nothing and leave approach would result in the expiration of the mining lease in 2012 which would then be relinquished to the NSW Government. This would result locally in a loss of employment opportunities and socioeconomic benefits in addition to a loss of benefits and royalties or other payments to both the Federal and NSW State government;
2. The potential to mine the open cut mineable resource by underground mining methods has been investigated and deemed unviable as there are only a limited number of coal seams within the sequence that have any potential for underground mining. This approach would result in the sterilisation of significant viable coal reserves;

3. Develop the mining operation under the current planning approval. Utilising this alternative would not allow the mine to be developed utilising current best-practice environmental and social standards, nor would the proposed infrastructure provide the operation with the flexibility it requires into the future. Progressing with the operation of the coal mine under this alternative would limit the amount of coal extracted from the CL 375, and would not be consistent with current industry standards. This alternative may result in reduced production rates, increased social and environmental impacts and diminished recovery of the coal resource;

4. Development of the mine for a period of 21 years with a maximum ROM coal production rate of 8 Mtpa. This alternative was investigated and considered feasible. However, the coal reserve is viable for extraction at greater rates with minimum additional environmental and social impacts. Mining this resource utilising a low production rate would diminish the employment and revenues that can be achieved safely and efficiently with the higher production rates; and

5. The fourth alternative is the Project as it is proposed. By combining contemporary best-practice technologies and processes to enable the efficient extraction of the coal reserve for 21 years, this is considered the most economic and efficient alternative for all stakeholders. It will maximise the number of social and economic benefits associated with the Project. In addition it would fully utilise a coal resource which is reserved for mining under the *Brigalow and Nandewar Community Conservation Area Act 2005* (BNC Act) in which the NSW State Government has set aside areas with economic potential due to the presence of viable minerals for development.

4 REGULATORY FRAMEWORK

This Section provides a discussion on the major relevant State and Commonwealth planning and environmental legislation applicable to the Project. In addition to gaining Project Approval, the Project may also require ancillary approvals under a number of additional Acts and / or applicable State Environmental Planning Policies (SEPP) as discussed below.

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Aston will seek Project Approval under Part 3A of the EP&A Act from the Minister for Planning. DoP has indicated that the Project is likely to be a project to which Part 3A applies and as such will be determined by the Minister for Planning.

Section 75J(3) of the EP&A Act provides that in deciding whether or not to approve the carrying out of a project, the Minister for Planning may (but is not required to) take into account the provisions of any environmental planning instrument that would not (because of Section 75R of the EP&A Act) apply to the Project if approved.

4.1.1 NSW State Environmental Planning Policies

SEPP (Major Development) 2005

SEPP (Major Development) 2005 defines certain developments which are classified as Major Projects under Part 3A of the EP&A Act for determination by the Minister for Planning.

In accordance with Schedule 1 of the *SEPP (Major Development) 2005* the Project is required to be assessed under Part 3A of the EP&A Act.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007

(a) Permissibility

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (SEPP (Mining)) was gazetted on 16 February 2007. Under SEPP (Mining) open cut mining is permissible with development consent:

- On land where development for the purposes of agriculture or industry may be carried out (with or without development consent), or
- On land that is, immediately before the commencement of this clause, the subject of a mining lease under the *Mining Act 1992* (Mining Act).

Facilities for the processing or transportation of minerals are permissible with development consent on land on which mining may be carried out, if the minerals were mined from that land or adjoining land.

All land within the Project Boundary is zoned 1(a) General Rural under the *Narrabri Local Environmental Plan 1992* (Narrabri LEP), within which *Agriculture* is a permissible land use (see **Section 4.1.2**). Aston holds CL 375 over the majority of the Project Boundary, which was granted prior to the commencement of SEPP (Mining) (see **Table 1**).

(b) Compatibility

Clause 12 of SEPP (Mining) provides

"Before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must:

(a) consider:

(i) the existing uses and approved uses of land in the vicinity of the development, and

(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and

(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and

(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and

(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii)."

Land uses in the vicinity of the Project Boundary are described in **Section 2.4**. The respective public benefits of the Project and whether the Project is likely to have any significant impact on the adjoining lands preferred land uses and any potential incompatibility therewith will be examined and analysed in the EA. Further, measures proposed by Aston to avoid or minimise any incompatibility will be described and evaluated in the EA.

SEPP No 33 - Hazardous and Offensive Development

SEPP 33 requires the consent authority to consider whether an industrial project is a potentially hazardous industry or a potentially offensive industry.

A Preliminary Hazardous Analysis will be carried out for inclusion in the EA.

SEPP No 44 - Koala Habitat Protection

SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for koalas to ensure there is ongoing protection of koalas and their habitat. An assessment of koala populations and habitat will be conducted as part of the EA ecological assessment.

4.1.2 Narrabri Local Environment Plan 1992

The Project Boundary is located within the Narrabri Shire LGA, in which the relevant Environmental Planning Instrument (EPI) is the Narrabri LEP.

All components of the Project (the entire Project Boundary) fall within the 1(a) – General Rural Zone of the Narrabri LEP. Agriculture is permissible on land which is within this zone without development consent and therefore under SEPP (Mining), open cut coal mining and facilities for the transportation and processing of minerals extracted from that land or adjoining land is permissible with development consent under the Narrabri LEP.

Mining is a permissible land use in 1(a) with development consent. The objectives of the 1(a) zoning are the proper management and utilisation of resources by:

"(a) protecting, enhancing and conserving:

(i) agricultural land in a manner which sustains its efficient and effective agricultural production potential,

(ii) soil stability by controlling and locating development in accordance with soil capability,

(iii) forests of existing and potential commercial value for timber production,

(iv) valuable deposits of minerals, coal, petroleum and extractive materials by controlling the location of development for other purposes in order to ensure the efficient extraction of those deposits,

(v) trees and other vegetation in environmentally sensitive areas where the conservation of the vegetation is significant to scenic amenity or natural wildlife habitat or is likely to control land degradation,

(vi) water resources for use in the public interest,

(vii) areas of significance for nature conservation, including areas with rare plants, wetlands and significant habitats, and

(viii) places and buildings of archaeological or heritage significance, including the protection of Aboriginal relics and places,

(b) preventing the unjustified development of agricultural land for purposes other than agriculture,

(c) preventing residential development of prime crop and pasture land, except where it is ancillary to agriculture or another use permissible in the zone,

(d) facilitating farm adjustments,

(e) ensuring that any allotment created for an intensive agricultural pursuit is potentially capable of sustaining a range of such purposes or other agricultural purposes,

(f) minimising the cost to the community of:

(i) fragmented and isolated development of rural land, and

(ii) providing, extending and maintaining public amenities and services."

The EA will examine whether the Project achieves the objectives of the zone which will be relevant in the event that the Minister exercises his discretion to take into account the provisions of the Narrabri LEP.

4.2 MINING ACT 1992

Under Section 5 of the Mining Act a person must not mine any publicly owned mineral otherwise than in accordance with an authority. Under Section 73 of the Mining Act the holder of a mining lease may carry out any mining purpose on the land, the subject of the lease in accordance with the conditions of the lease.

Under Section 265(4) of the Mining Act before the holder of a mining lease can commence mining operations or mining purposes on the surface of land it must have in place a compensation arrangement or determination in respect of that mining or mining purpose.

Aston holds mining lease CL 375 and exploration licence A 346. The mining activities relating to the Project will occur largely within CL 375. A renewal of this coal lease will be sought to allow ongoing access to the coal resource for mining purposes and mine rehabilitation processes.

An application will be made in respect of an approximate eight hectare parcel of land immediately adjacent to the south-western corner of CL 375 for a new mining lease. Further, an application for a new mining lease will be made for the northern portion of the Project Boundary that lies entirely within A 346 for the Northern OEA.

Under Section 163 of the Mining Act, there is also an obligation on the holder of a mining lease to register the area as a colliery holding. Within the colliery holding there are obligations to nominate an operator, establish health and safety management plans and hazard management systems and establish other operational plans and systems. These matters all need to be attended to prior any mining being undertaken within the colliery holding.

4.3 COAL MINE HEALTH AND SAFETY ACT 2002

The establishment of any emplacement areas or tailings disposal areas for the Project will require an approval under Section 100 of the *Coal Mine Health and Safety Act 2002* (CMHS Act).

4.4 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

As part of the Project, a new Environment Protection Licence will be sought for the Project under the *Protection of the Environment Operations Act 1997* (POEO Act).

4.5 THREATENED SPECIES CONSERVATION ACT 1995

The *Threatened Species Conservation Act 1995* (TSC Act) defines and lists endangered species, populations, communities and critical habitat within NSW and key threatening processes. It also provides a framework for their protection and a methodology for the assessment of the effects of development on threatened species. This methodology will be partly relied upon in the preparation of the EA.

Under Part 8A of the *National Parks and Wildlife Act 1974 NSW* (NPW Act) it is an offence to harm a member of a threatened species, population or ecological community or to damage critical habitat.

Under Sections 118A and 118C of the NPW Act it is a defence to the above offence if the harm or damage resulted from activity which was essential to the carrying out of a project approved under Part 3A EP&A Act.

4.6 WATER ACT 1912 AND WATER MANAGEMENT ACT 2000

The Project Boundary lies within the Namoi River Catchment of NSW. The *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2003* (Namoi River WSP) and the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* (Groundwater WSP) as established under the *Water Management Act 2000* (WM Act) apply to the Project. The water contained within the Permian coal seam aquifers at this stage remains subject to the *Water Act 1912.*

To the extent that the Project is located in an area that is affected by a WSP it is subject to the approvals and licensing provisions of the WM Act. To the extent that it is located outside of a WSP the Project is subject to the *Water Act 1912*.

Accordingly, the Project will require the following water related licences and approvals:

- Water Use Approval (under Section 89 of the WM Act);
- Water Management Work Approval (under Section 90 of the WM Act);
- Activity Approval (under Section 91 of the WM Act);
- Access Licence (under Section 56 of the WM Act);
- Bore licences within the Namoi River or Maules Creek alluvials (under Section 63 of the WM Act); and
- Bore licences within the Permian strata (Part 5 of the *Water Act 1912*).

4.7 DAMS SAFETY ACT 1978

The *Dams Safety Act 1978* (Dams Safety Act) requires the NSW Dams Safety Committee (DSC) to "*formulate measures to ensure the safety of dams*" and to "*maintain a surveillance of prescribed dams*". A "*prescribed dam*" is one listed in Schedule 1 of the Dams Safety Act. An approval under the Dams Safety Act will be sought for the major water and waste management structures if and as required.

4.8 ROADS ACT 1993

The *Roads Act 1993* (Roads Act) provides for the dedication of classified and unclassified roads and confers certain functions to NSC in relation to the management of roads. Under Section 138 of the Roads Act, consent from NSC is required to erect a structure or carry out work in, on or over a public road. Approvals under Section 138 of the Roads Act will be sought from NSC and Roads & Traffic Authority (RTA) as required.

4.9 FORESTRY ACT 1916

The *Forestry Act 1916* (Forestry Act) encourages the sustainable and responsible use of State Forests in NSW. This includes the extraction of timber and the management of the environment. The Project is located partially within the Leard State Forest. Forests New South Wales (Forests NSW) has granted Aston an Occupation Permit to allow it to operate and maintain the facilities within the Occupation Permit Area. The Occupation Permit applies to that part of Leard State Forest No. 420 that falls within the boundaries of Aston's mining tenements CL 375 and A 346. The Agreement was granted on the 31 March 2010 for a period of one year.

Further agreements will be sought from Forests NSW for the allowance of mining and related activities.

4.10 BRIGALOW AND NANDEWAR COMMUNITY CONSERVATION ACT 2005

4.10.1 Introduction

The BNC Act is also relevant to the Project. The objectives of the BNC Act are to:

> *"Reserve forested land in the Brigalow and Nandewar area to create a Community Conservation Area that provides for permanent conservation of land, protection of areas of natural and cultural heritage significance to Aboriginal people and sustainable forestry, mining and other appropriate uses; and*
>
> *Give local communities a strong involvement in the management of that land. "*

The BNC Act provides for the establishment of the Brigalow and Nandewar Community Conservation Council (Council). The Council is subject to the control and direction of the Premier. Members of the Council consist of the Director-General of the Premier's Department (Chairperson), the Director General of DECCW, the Director General of Industry & Investment NSW (I&I NSW) and the Director General of DoP.

The function of the Council is to implement the BNC Act. In particular, the Council is to develop a Community Conservation Area Agreement (BNC Agreement) and to co-ordinate and monitor the achievements of government policy in respect of the Community Conservation Area. The BNC Act provides for the establishment of a Community Conservation Advisory Committee (Advisory Committee) to develop the BNC Agreement and report to the Council.

The Advisory Committee consists of 15 members appointed by the relevant ministers and the chairperson. Members of the Advisory Committee include identified stakeholders and interest groups within the Community Conservation Area. Members include representatives from the Catchment Management Authority, local government, industry representatives such as forestry, mining, apiary, farmers, recreational users, Aboriginal people, environmental groups, National Parks and Wildlife Regional Advisory Committee and scientific experts. The Advisory Committee has the function of advising the Council on the provisions of the BNC Agreement applicable to the relevant area for which the Committee is constituted.

Three Advisory Committee's have been established that form part of the BNC Act. These include the Border Rivers / Gwydir Advisory Committee, the Central West Advisory Committee and the Namoi Advisory Committee.

Land included in the BNC Agreement has been identified and zoned according to its conservation value as identified by the Advisory Committee. The purpose of a BNC Agreement is to provide a co-ordinated framework for the management of all the land in Zones 1, 2, 3 and 4 as identified in the BNC Act in consultation with the community of the Brigalow and Nandewar area. The BNC Agreement developed by the Namoi Advisory Committee was signed by the Minister in July 2009. It describes the function of the land management zones within the conservation area and how each zone of land is to be managed.

4.10.2 The Project

The Leard State Forest (and hence the Project) is located within the land management area designated to the Namoi Advisory Committee and is identified as being Zone 4. Land dedicated as Zone 4 is State Forest under the Forestry Act for the purposes of forestry, recreation and mineral extraction.

The strategic aim of Zone 4 land provides for commercial activities (in particular forestry and mining activities). The strategic aim relevant to mining included in the BNC Agreement includes:

> *'Provide for exploration, mining, petroleum production and extractive industry in accordance with the Mining Act 1992 and the Petroleum (Onshore) Act 1991 and associated Regulations and guidelines.'*

Forests NSW is the land management agency identified in the BNC Agreement responsible for the management of land in Zone 4. The land management agencies are to encourage and facilitate economic development consistent with the purposes and permitted uses of the Zones. In particular the land management agencies will work with:

> *"Mineral, petroleum and extractive industries to facilitate development of resources (Zones 3 and 4 only). Note that extractive industry is only permissible within Zone 4.*
>
> *The Land Management Agencies will manage exploration, mining, petroleum production and extractive industry in their respective Zones in accordance with legislation, Policies and operating practices. Extractive industry may be permitted only in Zone 4."*

Further to the above, the second reading speech which was made by the Minister for Primary Industries (now I&I NSW) when the BNC Act was put before the Parliament provides further clarification as to the purpose, intent and perspective of the BNC Act and subsequent agreements made pursuant to it. Relevant extracts relating to the zoning of lands and mineral exploration include:

> *"The bill introduces entirely new land management tenure. To be known as a community conservation area, this tenure was developed specifically for this part of western New South Wales. Most importantly, the Government's new community conservation area will provide an appropriate balance – between conservation and sustainable industries that will provide jobs in the timber, gas, minerals and apiary sectors…*
>
> *Parts of the Brigalow and Nandewar regions have high minerals and gas potential…*
>
> *The Government's decision will preserve the full economic potential of the regions by ensuring the local coal and gas reserves can be accessed by the mining industry – including in Zone 3 which is the same as State Conservation Areas in the National Parks and Wildlife Act which permits exploration and extractive activities for gas and mining."*

> *This is an internationally recognised reserve concept new to Australia… by creating a framework for the coordinated management of all public lands…*
>
> *it will achieve both permanent conservation outcomes and provide certainty to the various industries operating in the region…"*

A review of the second reading speech makes it clear that the principal purpose of the BNC Act is the reservation of land for forestry. The recognition of areas to be used for mining and other commercial activities were also incorporated within the context of the BNC Act. The fundamental basis and purpose of the legislation is for the management of public lands.

The implementation of the BNC Act and the BNC Agreement adopts the principles of intergenerational equity and Ecologically Sustainable Development (ESD) and take into account that open cut mining will occur in the Leard State Forest.

The BNC Act and BNC Agreement are existing instruments in place and provide for the conservation of ecological values and biodiversity within the vicinity of the Project. The BNC Act and BNC Agreement are based on internationally recognised principles of sustainability. The recognition of land use potential on public land in this area and the classification of land management Zones 1, 2, 3 and 4 is based on the principle of identifying offsets (Zone 1 and 2 land) for conservation while other land is utilised for industrial development (Zone 3 and 4).

The EP&A Act and the principles implicit in conditions of Project Approvals requiring offsets address ecological and other planning issues pertaining to all land within NSW. The BNC Act could therefore be considered as the implementation of an offset strategy for mining within the Leard State Forest.

Further expectations for offset areas beyond those already provided for in the BNC Act and BNC Agreement for the Project would be providing additional areas of conservation for the Leard State Forest that has already had land identified and set aside for conservation. Any offset requirements for the Project will need to carefully consider the provisions of land already set aside in the BNC Act and the BNC Agreement.

4.11 COMMONWEALTH LEGISLATION

4.11.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Environmental Protection & Biodiversity Conservation Act 1999* (EPBC Act) prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas of national significance. It also provides a mechanism for national environment protection and biodiversity conservation. The EPBC Act is administered by Department of Environment, Water, Heritage and the Arts (DEWHA) and provides protection for listed Matters of National Environmental Significance (MNES) including:

- Listed species and communities (e.g. listed threatened species and ecological communities and migratory species);
- Protected areas (e.g. World heritage properties, Ramsar wetlands of international significance, conservation zones); and
- National, Commonwealth and Indigenous Heritage.

Species and communities listed under the EPBC Act that are present or are likely to be present in the vicinity of the Project must be identified. A Referral including a supporting assessment of significance for each species must be made to DEWHA to obtain confirmation of whether or not a Project constitutes a *"Controlled Action"*. The Project will be referred to DEWHA for a decision under Section 68. The Minister for DEWHA has the power to accredit the NSW EP&A Act to meet the requirements of the EPBC Act.

4.12 LICENCES AND APPROVALS REQUIRED

A list of the key leases, licences and approvals that are required for this Project and where they are derived from are set out in **Table 5** below.

Table 5
Expected Leases, Licences and Approvals for the Project

	APPROVAL REQUIRED	LEGISLATIVE ORIGIN	SEPARATE or PART 3A
1	Mining Lease(s), Renewal of CL 375	Mining Act	Section 75V EP&A Act
2	Section 87 - Permit to disturb, move or take possession of an Aboriginal object	Section 87 of the NPW Act	Section 75U EP&A Act
3	Section 90 Consent to Destroy an Aboriginal object	Section 90 of the NPW Act	Section 75U EP&A Act
4	Environment Protection Licence	Chapter 3 of the POEO Act	Section 75V EP&A Act
5	Development consent to clear Native Vegetation	Section 12 of the *Native Vegetation Act 2003 NSW*	Section 75U EP&A Act
6	Water Use Approval	Section 89 of the WM Act	Section 75U EP&A Act
7	Water Management Work Approval	Section 90 of the WM Act	Section 75U EP&A Act
8	Activity Approval	Section 91 of the WM Act	Section 75U EP&A Act
9	Bore Licence	Part 5 of the *Water Act 1912*	Licence to be separately acquired
10	Licence Under Threatened Species Act	NPW Act	Exemption under Section 118A and 118C NPW Act
11	Consent to carry out a work in on or over a public road	Section 138 of the Roads Act	Section 75V EP&A Act
12	Approval for the carrying out of a "Controlled Action"	EPBC Act	Separate approval, adopting Part 3A assessment process if so decided under Section 87 of the EPBC Act
13	Construction Permits	EP&A Act	Part 3A
14	Approval for works over Crown Land	*Crown Lands Act 1989*	Separate Approval
15	Notification of Dangerous Goods	*Occupational Health and Safety Regulation 2001*	Separate Approval
16	Approval for Emplacement Area	*Coal Mine Health and Safety Act 2002*	Separate Approval
17	Radiation Licences	*Radiation Control Act 1990*	Separate Approval
18	Mine Operations Plan	Mining Lease	Separate Approval
19	Environment Management Plans	Project Approval	Separate Approval

5 STAKEHOLDER ENGAGEMENT

This section includes a description of Aston's stakeholder engagement undertaken for the Project to date and a summary of the key consultation activities proposed for the EA.

5.1 INTRODUCTION

Aston is strongly committed to undertaking best-practice social assessment and ongoing stakeholder engagement activities with communities in which they operate. Further, Aston has identified key community, regulatory and industry stakeholders relevant to the Project to achieve these goals and will constantly endeavour to build strong and effective relationships, consistent with their policies and values.

5.2 EXISTING COMPANY ENGAGEMENT

Given the long lead time since the original granting of development consent and with only minor site activities occurring since this date, consultation regarding the Project with stakeholders has been limited. Throughout Astons' process of acquiring the Project, consultation with stakeholders has primarily been via media releases and the Aston Resources website (www.astonresources.com.au).

Preliminary consultation has begun with some of the relevant regulators in relation to the proposed Exploration Program activities and their specific requirements in relation to gaining the relevant planning approvals for the Project.

Different communication methods have been developed to ensure that a comprehensive list of issues raised by relevant stakeholders for the Project is formulated. The methods used for stakeholder engagement and communication are detailed below in **Table 6**. It is anticipated that these methods will continue to be used during the development of the Project EA.

Table 6
Stakeholder Communication Methods

Stakeholders	Method
DoP	Briefing, Newsletters
I&I NSW	Briefing, Newsletters
NSW Office of Water (NOW)	Briefing, Newsletters
DECCW	Briefing, Newsletters
NSC Mayor, Councillors & Officers	Briefing, Newsletters
GSC Mayor, Councillors & Officers	Briefing, Newsletters
DEWHA	Briefing, Newsletters
RTA	Briefing, Newsletters
Relevant State & Federal MPs	Briefing, Newsletters
Maules Creek Employees & Contractors	Toolbox Talks, Newsletters
Non-Government Organisations	Newsletters (as required)
Individual Neighbours	Newsletters and Individual briefings as required for specific Project impacts

Stakeholders	Method
Aboriginal Community	Newspaper notices, Personal briefings
Land and Property (LPI)	Briefing, Newsletters
Local Service Providers	Personal meetings
Local business and industry associations	Personal meetings
Community	Personal meetings (as required)
Special interest groups	Briefings
Media	Briefings, Press Releases
Relevant Neighbouring mines and industry	Newsletters

5.3 PROJECT ENGAGEMENT

The objectives of the stakeholder engagement program for the Project include:

- To provide stakeholders with information on the Project to facilitate meaningful participation in addressing issues raised;
- To identify potential impacts associated with the Project to inform the Social Impact Assessment and broader EA program; and
- To identify potential strategies for impact management, mitigation and community enhancement.

Relationships will be established and developed with key stakeholders during preparation of the EA. Aston will facilitate stakeholder feedback on the Project in order to ensure that stakeholder issues are adequately addressed through the Social Impact Assessment and EA.

Communication materials in the form of Project Information sheets will also be utilised to complement the engagement program and provide stakeholders with information on the project and the assessment program.

5.3.1 Regulatory Engagement

Face-to-face briefings and group presentations to State and Local Government agencies will take place throughout the development of the Project. These presentations will be designed to provide Government stakeholders with an initial overview of the Project, and to identify issues that will require assessment in the EA.

5.3.2 Community Engagement

Engagement with the local community will be undertaken for the Project during preparation of the EA, with all relevant issues raised to be addressed, as required. Information gathered during community engagement regarding the Project will assist in informing Project planning and developing appropriate management and mitigation strategies to address issues of concern and relevance to the local community.

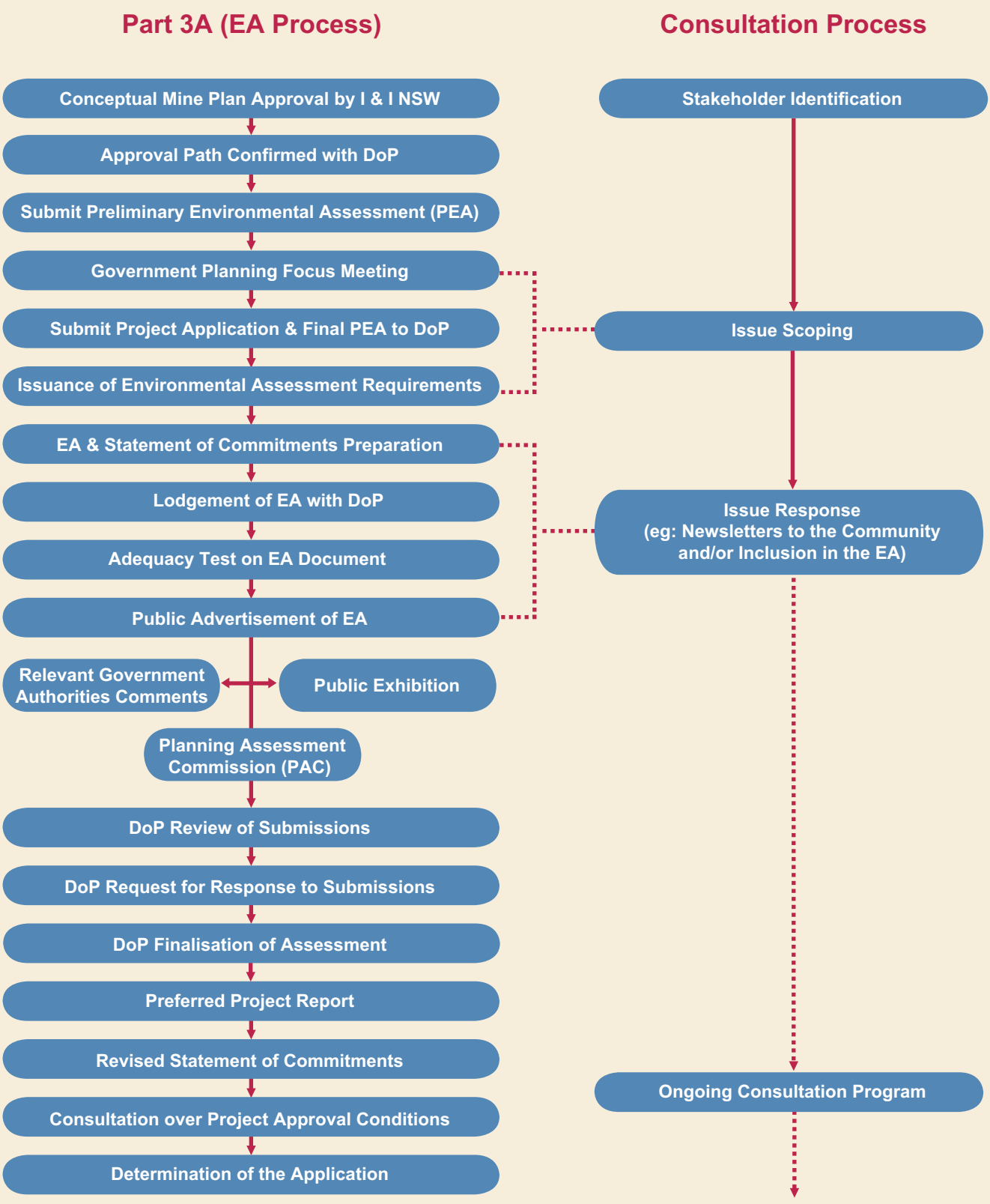
Initial briefings will be offered to near neighbours to discuss the Project, where information will be provided to assess issues of concern to the community. Where required, further consultation meetings will be offered to provide feedback on the EA and to obtain additional community input. Community engagement has commenced with an offer of personal meetings to near neighbours.

The analysis of community issues and responses through the EA process is essential in ensuring that relevant issues are identified and evaluated in the assessment program. During this process appropriate strategies are developed to minimise negative impacts and / or enhance the positive impacts associated with the Project.

Project newsletters will be regularly distributed to key community stakeholders to complement the engagement program and provide regular updates on key Project and EA milestones.

Aston has established a Project office in the township of Boggabri where community members can drop in at any time to make inquiries or receive an update on the Project. Beyond this, local interest will also be gauged through the conduct of a two day open forum community information session in the township of Boggabri.

A flowchart showing the planning approvals and consultation process relevant to the Project is shown in **Figure 13**.



* Avenue available to the Minister

HansenBailey

ASTON RESOURCES

MAULES CREEK PROJECT

Planning Approvals & Consultation

Filename: 0986 Maules Creek - Planning Approvals and Consult - Fig 13.ai | Date: 13.05.10 | Drawn: BD

Figure 13

6 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

To assist in identifying the key environmental and social issues for the Project, a preliminary environmental risk assessment was completed utilising the Maules Creek Risk Assessment Tools. This risk assessment is presented in **Appendix A**.

Each of the potential environmental issues were ranked in accordance with the Maules Creek Risk Matrix as either being of low, medium or high risk. The initial findings of the risk assessment were used to prioritise and focus the required environmental assessments for the Project to ensure that each of the environmental issues was addressed to the extent relevant and that appropriate management and mitigation options are developed. The resulting scope of assessment to be included in the EA is discussed in further detail in **Section 7**.

As shown in **Appendix A** and **Table 7**, the majority of activities are rated as low or moderate level risks, with several high risks and no extreme risks. It is anticipated that with the completion of detailed assessment as outlined in **Section 7**, any high risks will be reduced to medium or low, due to the identification and implementation of appropriate controls and mitigation measures.

Table 7
Summary of Preliminary Environment Risk Assessment

Category	Issues
Extreme	None
High	Ecology, Aboriginal Archaeology and Cultural Heritage, Air Quality and Greenhouse, Surface Water, Flooding and Groundwater
Moderate	Noise and Blasting, Traffic and Transport, Visual, Social and Economics
Low	Soils and Land Capability, Rehabilitation, Final Land use, Final Landform and Non-Aboriginal Heritage

7 KEY ENVIRONMENTAL AND COMMUNITY ISSUES

7.1 ECOLOGY

7.1.1 Background

Historically, the land within the Project Boundary includes land that has been impacted by agricultural activities such as cropping, grazing, selective logging and associated roads. The Leard State Forest covers a large portion of the land within the Project Boundary and the biodiversity present is representative of similar forested woodlands and disturbed grasslands occurring extensively across the Namoi River Valley.

The Maules Creek EIS addressed the impact on vegetation and faunal species of an open cut coal mine. It was determined that no rare or threatened flora or fauna species or communities would be impacted by the Project. Due to the time lapsed and changes to policy, legislation and species listings, this is no longer considered contemporary.

A recent Preliminary Flora and Fauna Assessment compiled by Cumberland Ecology (2009) provides a background to the existing ecological environment. It was found that heavy vegetation of forest and woodland communities exist. Although these vegetation types were not considered pristine, they have been identified to include areas of the *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, which is listed as a Critically Endangered Ecological Community (CEEC) under the EPBC Act and Endangered Ecological Community under the TSC Act. **Figure 14** illustrates preliminary vegetation mapping of the Project Boundary.

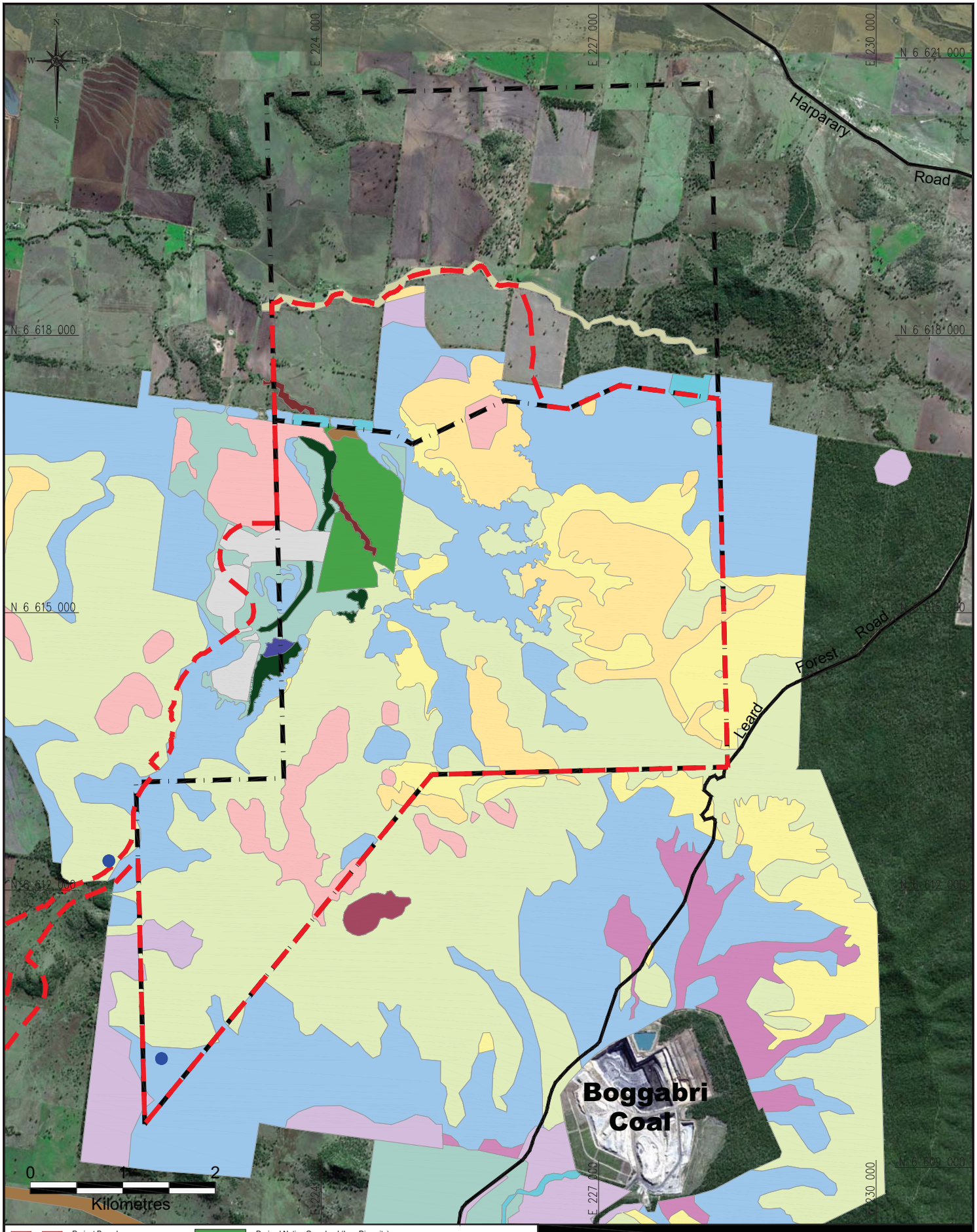
The Forest and Woodland communities within the Project Boundary have the potential to be habitat for a range of threatened faunal species. A number of threatened woodland birds, including the Brown Treecreeper, Speckled Warbler and the Turquoise Parrot have been observed within the Project Boundary. The Greater Long-eared Bat was also recorded and is listed as *"vulnerable"* under the TSC Act and EPBC Act (Cumberland Ecology, 2009).

Further assessment will be completed for inclusion in the EA to determine the impacts of the Project upon ecological communities, threatened flora and threatened fauna. The assessment will include discussion of the ecological impacts along the proposed rail spur and loop and mine access road corridors as well as where mining disturbance will occur.

7.1.2 Potential Impacts

The Project is mainly located within the Leard State Forest which is largely covered by woodland vegetation. Specific flora and fauna impacts identified in the preliminary environmental risk assessment (see **Appendix A**) include:

- Clearance of vegetation within the proposed mining areas; and
- The displacement of faunal communities and therefore increased competition for habitat in the surrounding environment.



Project Boundary
Mining Tenement Boundary
Roads
Belah woodland
Crop land on basalt soil
White Box-Wilga-Belah woodland
Silver-leaved Ironbark heathy woodland
Yellow Box - Blakely's Red Gum grassy woodland
White Box - Blakely's Red Gum - Melaleuca riparian forest
White Box - White Cypress Pine grassy woodland
Narrow-leaved Ironbark - White Cypress Pine shrubby open forest
Pilliga Box - Poplar Box - White Cypress Pine grassy open woodland
White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest
White Box - Narrow-leaved Ironbark - White Cypress Pine shrubby open forest
Narrow-leaved Ironbark - Brown Bloodwood - White Cypress Pine shrubby open forest
Derived Native Grassland (Low Diversity)
Derived Native Grassland
Exotic grassland
Dwyer's Red Gum woodland
Melaleuca riparian forest
Cliff and Scree Thickets (Rainforest Species)

Hansen Bailey

ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Cumberland Ecology 2010, Aston 2010

MAULES CREEK PROJECT

Preliminary Vegetation Mapping

Cad File: 06454A.dwg	Date: 29.06.10	Drawn: CP	Figure 14

7.1.3 Assessment Methodology

A Flora and Fauna Impact Assessment will be completed for the Project by Cumberland Ecology in accordance the *DECC Draft Guidelines for Threatened Species Assessment* (DEC, 2005b).

A preliminary indication of the flora and fauna values of land within CL 375 was prepared by Cumberland Ecology in 2009. Further detailed flora and fauna surveys will be completed within the Project Boundary.

The scope of the Flora and Fauna Impact Assessment will include:

- A desktop review of relevant databases and extensive available relevant literature to identify flora and fauna species and communities potentially found within the study area;
- Seasonal surveys to comply with DECCWs recommendations for survey;
- Mapping the distribution of vegetation communities in the Project Boundary by ground survey and air photo interpretation;
- Listing of flora species and descriptions of vegetation communities within the Project Boundary;
- Targeted searches for threatened flora species, threatened ecological communities and critical habitat (as listed under the schedules to the TSC Act and EPBC Act) that may potentially occur in the Project Boundary;
- Habitat assessment of the Project Boundary;
- Assessment of impacts on listed vegetation communities and threatened flora and fauna species, including Koalas;
- Preparation of a BioBanking Assessment for the Project; and
- Identification of any impact mitigation measures necessary for the Project.

As noted in **Section 4.11.1**, an EPBC Referral has been submitted to DEWHA for determination.

7.2 ABORIGINAL ARCHAEOLOGY AND CULTURAL HERITAGE

7.2.1 Background

An Aboriginal archaeology and Cultural Heritage assessment was completed for the Maules Creek EIS. The Maules Creek EIS recorded a total of 25 archaeological sites within the Project Boundary, which consisted largely of scattered stone artefact sites. These sites varied in extent, with most described as being the result of small groups travelling through the area. Three camping sites were identified in the north of the Project Boundary, on the banks of Maules Creek. One shelter and three open camp sites were identified along the proposed haulage route in the vicinity of the Werris Creek to Mungindi Railway Line.

7.2.2 Potential Impacts

Potential impacts on Aboriginal archaeology and cultural heritage identified in the preliminary environmental risk assessment include the removal of archaeological sites and items within the proposed disturbance areas (see **Appendix A**). This will include any archaeological sites previously identified in the Maules Creek EIS and any sites which may be identified during further proposed surveys for the Project.

7.2.3 Assessment Methodology

The Aboriginal archaeology and Cultural Heritage Impact Assessment for the Project will be conducted by AECOM Australia Pty Ltd (AECOM) in accordance with the *National Parks & Wildlife Act 1974: Part 6 Approvals Interim Community Consultation Requirements for Applicants (ICCRs)* and DECCWs *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

The proposed scope of the Aboriginal archaeological and Cultural Heritage Impact Assessment includes:

- Desktop review, including Aboriginal Heritage Information Management System (AHIMS) database search, Native Title Search, and a review of previously completed studies conducted in the area to assist in the development of a predictive model;
- A field-based Archaeological and Aboriginal Cultural Heritage impact assessment with members of the local Aboriginal community. The fieldwork will focus on identifying any additional sites of Aboriginal cultural heritage within the disturbance area and revisiting existing sites that were previously classified as being of high significance with members of the Aboriginal community;
- Preparation of an Aboriginal archaeology and Cultural Heritage Impact Assessment to meet the DECCW guidelines and the expectations of the local Aboriginal community. This will include an assessment of any additional Aboriginal cultural heritage issues or places identified during the site visit;
- Aboriginal stakeholder consultation in accordance with the DECCW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*; and
- Development of an appropriate management and mitigation strategies for any Aboriginal heritage sites that are identified to be disturbed.

7.3 NON-ABORIGINAL HERITAGE

7.3.1 Background

The first European explorer to cross the Liverpool Plains was Oxley who crossed the region in 1817. The first settler in the area was George Clarke who was better known as the 'Barber'. George was an escaped convict who took up residence in 1825 on the Liverpool plains and described the "Nammoy".

Major Thomas Mitchell, a Surveyor General, then explored the Namoi Region in 1831 and named the stream which fed the valley 'Maule's River'. Edward Cox who took up the 'Namoi Hut' in 1835 was the first known squatter in the study area. This site was later to become the township of Boggabri.

In 1860, the town of Boggabri was gazetted and expanded thereafter. There are several historically significant features located surrounding the Project including the township of Boggabri and the Namoi River Road Bridge built at Manilla in 1886. There have been no significant European heritage sites identified within the Project Boundary to date.

7.3.2 Potential Impacts

As the Project is predominantly located within the Leard State Forest and no heritage sites have been previously identified in the area, it is not anticipated that the Project will disturb any sites of heritage significance. However detailed surveys are proposed to be undertaken in this regard.

7.3.3 Assessment Methodology

A Non-Aboriginal Heritage Impact Assessment will be completed for the Project by Archaeology Australia in accordance with relevant guidelines and legislation. The scope of assessment will include:

- A review of any relevant existing heritage assessment reports and other sources of information containing information on heritage items in the region;
- A field survey;
- Assessment of the heritage significance of identified items within the proposed disturbance areas;
- Identification of potential impacts to sites of heritage significance; and
- Identification of any necessary impact mitigation measures.

7.4 SURFACE WATER

7.4.1 Background

The Namoi River begins in the Great Dividing Range and extends for over 350 km west where it discharges into the Barwon River near Walgett. It has a total catchment area of approximately 42000 km^2. The major tributaries of the Namoi River include the Peel River, Mooki River, Manilla River, Cox's Creek, Baradine Creek and Pain Creek.

There are a number of water storages including Lake Keepit, Chaffey and Split Rock Dams located upstream of the Project Boundary on the Namoi River, Peel River and Manilla River. Keepit Dam is the main water storage in the catchment and is located approximately 70 km up stream of the Project Boundary. The Namoi River water levels at Boggabri are heavily regulated by the up stream dams.

Most releases are made from Lake Keepit Dam during the summer months for irrigation purposes, the majority of which is used downstream of the Project and west of Narrabri. Lake Keepit Dam releases significantly less water during the winter months when there is less demand for irrigation.

The largest recorded flood event at Boggabri occurred in February 1955. This flood had a peak discharge of 4300 m^3/s and caused widespread inundation and damage. Other large floods have occurred in February 1956, January 1971, January 1976 and February 1984. The Namoi River flood flows take approximately two days to travel from Gunnedah to Boggabri, a distance of some 40 km.

Within the Project Boundary, natural surface water flows along several unnamed drainage lines from the steeper slopes towards Back Creek which is located in the north of the Project Boundary. Back Creek flows through paddocks and farmland which have been largely modified by previous agricultural activities. The Willow Tree Range is located in the southern portion of the Project Boundary and directs surface water through natural drainage lines within the Leard State Forest toward the north which eventually flow into Back Creek. Back Creek flows to the west and is a tributary to Maules Creek which eventually flows into the Namoi River to the west of the Project Boundary. To the south-west of the Project Boundary surface water flows through several unnamed drainage lines and onto the Namoi River floodplain before making its way to the Namoi River.

Surface water quality has been monitored previously as part of the original Maules Creek EIS from a network of several surface water sampling points, which included creeks and dams within the Maules Creek Coal Lease. Surface water was analysed for pH, Electrical Conductivity (EC), Total Suspended Solids (TSS) and Total Dissolved Salts (TDS). Additional testing of sulphates, nitrates and oil and grease will be conducted as required during the operational phase of the Project. Key objectives of the site water management plan which will be developed for the Project will include:

- Diverting runoff from undisturbed areas around areas disturbed by mining activities and allow them to drain from the site, where possible;
- Provide water storages to ensure sufficient capacity for mine site usage;
- Collect runoff from all active mining areas, overburden emplacement areas and establishing rehabilitation areas in catch drains and direct it to sediment traps and settling dams to remove suspended sediment, prior to utilisation or drainage from site; and
- Provide an adequate level of flood protection for mining operations.

7.4.2 Potential Impacts

Potential impacts in relation to surface water from the Project have been identified through the risk assessment and relate to surface water management and sediment and erosion control; and potential for flooding associated with the proposed rail alignment. Construction of the rail spur across the floodplain and Namoi River has the potential to impact upon natural flooding characteristics including drain flows, afflux, erosion and upstream impacts such as on the township of Boggabri.

Flood levels will vary depending on a number of factors including rainfall intensity, soil moisture content, river bank heights and diversion obstacles. Flood waters can reach high velocity and the water is typically loaded with high levels of suspended solids. Erosion to the main river channel and natural landscapes is common. Flooding can also cause substantial damage to man made structures including houses, bridges, roads, fencing and other infrastructure.

Potential surface water impacts as a result of the Project as identified in the preliminary environmental risk assessment, include:

- Potential for increased turbidity and sedimentation impacting on downstream water quality;
- Potential for discharge of surplus water and / or additional demands on existing water sources;
- Changes to the catchment area, with consequent impacts on catchment yields and drainage downstream of the site;
- Any discharge, with consequent potential impacts on downstream water quality and drainage; and
- Post-mining surface water impacts on catchment yields water quality and drainage.

7.4.3 Assessment Methodology

A relevant Flood Assessment will be completed for the Project by WRM Water and Environment, the scope of which will include:

- A review of any assessment reports and other sources of information;
- A field visit to determine the local drainage and flooding characteristics in the vicinity of the proposed rail spur and bridge crossing on the Namoi River and to define the survey requirements for the impact assessment;
- Estimation of the Namoi River design flood discharges through the development of a flood frequency analysis of recorded flows at Boggabri and other stream gauges in the vicinity of the mine;
- Development of a two dimensional hydraulic model (TUFLOW) of the Namoi River floodplain in the area of interest to define the characteristics of the floodplain flows for existing conditions and with the proposed bridge in place;
- Estimation of the impacts of the proposed bridge on flood flows, flood velocities and changes in erosion potential; and
- Identification of any mitigation measures necessary.

A surface water impact assessment (including mine water management and sediment and erosion control) will be conducted for the Project by WRM Water and Environment, the scope of which will include:

- Assessment of the existing surface water environment including major flow paths, drainage, water storage locations, water quality and downstream water usage;

- Preparation of a water balance and identification of water demands and management requirements;
- Development of a mine water management system model including the consideration of a range of water management scenarios;
- Assessment of impacts on downstream catchment yields and drainage systems;
- Assessment of post-mining surface water impacts; and
- Identification of any necessary impact mitigation measures.

7.5 GROUNDWATER

7.5.1 Background

High level groundwater assessments to date suggest that three aquifer systems exist in the region including, the alluvial aquifer system associated with the Namoi River floodplain and tributaries; weathered bedrock near the ground surface; and the coal seams of the Permian Maules Creek Formation. The alluvium aquifer system is largely associated with the Namoi River Valley, however is known to extend through some minor tributary creek systems. Depth to groundwater in the Permian Maules Creek Formation ranges from approximately 18 to 60 m below ground surface.

Regional groundwater flow in the alluvium aquifer is to the north north-west along the axis of the Namoi River Valley and towards the Namoi River in the weathered bedrock and Permian Maules Creek Formation aquifers. Locally within the Project Boundary the direction of groundwater flow is in a generally north-west direction towards the Maules Creek and Namoi River floodplains.

Previous groundwater quality monitoring results presented in the Maules Creek EIS and recent studies indicate that the local groundwater is generally fresh in the alluvial aquifer system. Groundwater quality is typically brackish in the Permian Maules Creek Formation aquifer and is suitable for livestock use.

7.5.2 Potential Impacts

Potential groundwater impacts identified in the preliminary environmental risk assessment include:

- Groundwater drawdown effects, changes to groundwater flow directions and changes to groundwater quality;
- Potential for depressurisation of aquifer systems' in the area through mine void dewatering;
- Increased groundwater inflows to the pits;
- Loss of groundwater yield at existing bore locations; and
- Long term changes (post mine closure) to groundwater levels, groundwater quality and flow direction.

7.5.3 Assessment Methodology

A groundwater impact assessment will be conducted for the Project by Australasian Groundwater and Environmental Consultants (AGE). The scope of assessment will include:

- An assessment of the potential for mine groundwater impacts (including impacts on alluvial systems in the vicinity of Project and neighbouring landowners boreholes) via predictive numerical modelling in the finite-difference simulation package MODFLOW SURFACT.
- Estimation of mine groundwater inflow rates suitable for input into the water balance for the Project;
- An assessment of any groundwater impacts from infrastructure;
- An assessment of cumulative groundwater impacts incorporating surrounding mining and other activities;
- An assessment of post-mine groundwater impacts; and
- Identification of any groundwater impact mitigation measures necessary for the Project.

Results from previous geological and resource assessment studies will be utilised to determine seam and interburden permeabilities. Exploration and survey data will be used to assign geographic and geological parameters like seam depths, special geological anomalies and river bed heights, etc. Coal seam geometry, other smaller drainages, alluvial lands and adjacent mining operations will also be considered in the model.

7.6 NOISE AND BLASTING

7.6.1 Background

The Project is located in a quiet rural area at some distance from major sources of background noise such as arterial roads or other industrial developments. However there are two existing mining operations in close proximity to the Project.

A key component of the Project will be the implementation of practical noise operational controls to assist in the management of noise impacts where practical, including:

- The overburden fleet would be directed to higher, exposed emplacement areas during favourable weather conditions (generally during the day) and to lower, more shielded emplacement areas where possible during noise enhancing weather conditions (generally during the evening and night);
- Vehicle reverse alarms, horns, start alarms and other audible warning devices would be selected, installed and adjusted to produce the lowest possible noise levels consistent with relevant safety standards;
- Mobile and coal handling equipment would be maintained in good condition to minimise unnecessary noise;
- The proposed rail spur would include noise control measures to minimise noise impacts where practical; and
- Monitoring of blasts to ensure vibration and overpressure amenity levels are achieved.

Further to the above, Aston will continue to review, enhance and modify the Noise and Blasting Monitoring for the Project. These operational and monitoring strategies will be applied throughout the life of the Project to manage noise and blasting quality impacts.

7.6.2 Potential Impacts

Potential noise and blasting impacts as a result of the Project (as identified in the preliminary environmental risk assessment (**Appendix A**)) include:

- Noise generation from construction and operational activities associated open cut mining (land preparation, drilling, blasting, loading and movement of haul trucks, shovel operation, overburden emplacement, CHPP and ancillary activities);
- Noise associated with the transport of coal along the proposed rail spur and rail loop;
- Traffic noise associated with the transport of construction materials, personnel, consumables, and waste materials to and from the site;
- Noise generation associated with short term construction activities;
- Cumulative noise impacts with surrounding industry; and
- Blasting vibration and overpressure impacts at near neighbours.

7.6.3 Assessment Methodology

A Noise and Blasting Impact Assessment will be conducted for the Project by Bridges Acoustics. The scope of assessment will include:

- A review of noise monitoring data and previous assessments undertaken;
- Background noise surveys at sensitive receptors in the vicinity;
- Predictive noise modelling of the Project and infrastructure at Years 1, 5, 10 and 21 in accordance with the *Industrial Noise Policy* (INP) for both construction and operational activities;
- Potential for sleep disturbance impacts;
- Traffic noise in accordance with the *Environmental Criteria for Road Traffic Noise 1999*;
- Rail traffic noise;
- Vibration and overpressure blasting impacts at near neighbours;
- Cumulative noise and blasting impacts; and
- The identification of noise and blasting mitigation and management measures.

7.7 AIR QUALITY AND GREENHOUSE GAS

7.7.1 Background

The Project is located in a rural environment, where the predominant land uses include the existing Mining Operations to the south-east of the Project Boundary, forestry and recreational use of the Leard State Forest and agriculture. To the south-west and north-west of the Project Boundary is the fertile Namoi River alluvial floodplain which supports an array of intensive agricultural enterprises including cotton, wheat and cattle grazing.

Land use activities surrounding the Project influence the background air quality environment upon which to base further assessments of the Project.

A key component of the Project will be the implementation of operational controls to assist in the management of dust impacts where practical, including:

- Minimising disturbance ahead of active mining;
- Deploying water carts across the mine site;
- Using dust suppressant on haul roads;
- Fitting drills with dust suppressant measures;
- Ensuring progressive rehabilitation of mining areas occurs and accelerating rehabilitation where possible;
- Establishing cover crops on topsoil and subsoil stockpiles that are not going to be used in less than six months;
- Modifying work practices in extreme unfavourable weather conditions;
- Dumping in less exposed areas during strong winds;
- Avoiding tipping into strong headwinds where possible;
- Maintaining auto-start for stockpile sprays in windy conditions;
- Maintaining enclosed coal loading and transfer areas and associated sprays; and
- Training all mine personnel in dust mitigation practices.

Further to the above, Aston will continue to review, enhance and modify the Air Quality Monitoring Program for the Project. These operational and monitoring strategies will be applied throughout the life of the Project to manage air quality impacts.

7.7.2 Potential Impacts

Potential air quality, spontaneous combustion and greenhouse gas impacts as a result of the Project (as identified in the preliminary environmental risk assessment (**Appendix A**)) include:

- Dust generation from land disturbance (vegetation clearing and topsoil stripping);
- Dust generation from open cut mining activities (blasting, loading and movement of haul trucks, overburden emplacement and in-pit activities);
- Short term dust impacts associated with construction activities;

- Greenhouse gas emissions (Scope 1 and 2) as result of the actual mining operations and the associated use of energy by mining equipment and coal processing infrastructure;
- Greenhouse gas emissions (Scope 3) as a result of non-mining activities at the site and in the combustion of product coal in the energy generation process; and
- Emissions of odorous gasses from spontaneous combustion.

7.7.3 Assessment Methodology

An air quality, spontaneous combustion and greenhouse gas impact assessment will be conducted for the Project by PAE Holmes in accordance with DECCWs *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2001) and the Australian Greenhouse Office's (AGO) *Factors and Methods Workbook* (AGO, 2005).

The scope of assessment will include:

- A review of local meteorological data, including wind speed and direction, temperature, humidity, rainfall and evaporation;
- A review of background ambient air quality monitoring data to identify representative values for existing background dust deposition, Particulate Matter less than 10 microns in diameter (PM_{10}), and Total Suspended Particulate (TSP) concentrations for relevant averaging periods;
- Development of a predictive air quality model to assess air quality impacts associated with the Project (and cumulatively with other approved and proposed developments) at Years 1, 5, 10, 15 and 21 against regulatory criteria;
- An assessment of the potential for dust generation associated with construction activities;
- An assessment of cumulative air quality impacts with surrounding mining operations and industry;
- Review and recommendations to enhance on the existing monitoring network;
- An assessment of spontaneous combustion impacts and emissions;
- An assessment of potential Scope 1, 2 and 3 greenhouse gas emissions; and
- The identification of appropriate management and mitigation measures in relation to dust, greenhouse and spontaneous combustion as required.

7.8 TRAFFIC AND TRANSPORT

7.8.1 Background

The principal road network adjacent to the Project Boundary is shown on **Figure 2** and includes:

- Leard Forest Road (to the east of the Project Boundary);
- Harparary Road (to the north of the Project Boundary);
- Therribri Road (to the west of the Project Boundary);
- Goonbri Road (to the south of the Project Boundary adjoining Leard Forest Road);

- Kamilaroi Highway (to the south-west of the Project Boundary);
- Dripping Rock Road (to the south-east of the Project Boundary); and
- Manilla Road (to the south of the Project Boundary).

All public roads are under the control of the RTA or NSC. The Kamilaroi Highway is the only significant transport corridor and the northern portion of Goonbri Road has not yet been constructed.

Upon commencement of mining operations, product coal from Maules Creek will be transported via the proposed rail spur and loop which will connect with the Werris Creek Mungindi Railway.

7.8.2 Potential Impacts

Specific traffic and transport impacts identified in the preliminary environmental risk assessment include a potential to establish light vehicle movements associated with employees and contractors and heavy vehicle movements associated with delivery of materials to the site in relation to current road movements. An increase in local traffic flows will occur during the construction and ongoing operational phases of the Project and during the upgrade of local roads. Increased traffic flows immediately before and after shift changes is common.

7.8.3 Assessment Methodology

A Traffic and Transport Impact Assessment will be completed for the Project by Hyder Consulting in accordance with the *Guide to Traffic Generating Developments* (RTA, 2002). The scope of assessment will include:

- Review of traffic impact assessments and other available reports for the surrounding area;
- Assessment of the likely traffic impacts during the construction and operational phases of the mine, as well as the cumulative impacts due to future changes in the region;
- Assessment of the increase in demand for rail movements due to increased coal production in this area;
- Identification of impacts of the Project relating to works on the public road network;
- Quantification of predicted increases in traffic during the construction and operational phases (considering potential future traffic flows); and
- Identification of any impact mitigation measures necessary.

7.9 VISUAL

7.9.1 Background

The Project Boundary lies within Leard State Forest, an 8134 ha area of disturbed remnant native vegetation covering most of CL 375. The Project Boundary is surrounded by agricultural areas used for grazing along with cropping. A small area of heavy timber is located adjacent to the Project Boundary. Additionally, small proportions of timber are scattered throughout both A 346 and CL 375.

The Leard State Conservation Area lies approximately 800 m to the west of the Project Boundary and covers an area of approximately 1176 ha (KCC 1989). The southern half of the mine area consists of steeper slopes (15 to 30%) with a series of ridges and narrow gullies above RL 350 m. The northern half of the mine area is more undulating with slopes ranging from zero to 15%.

The proposed rail spur will sit on fairly flat land until it reaches the edge of the lease boundary (KCC 1989).

Private freehold residences are present surrounding the mining tenements although the closest of these is located approximately 2.2 km away. Some other coal mining related activities are present to the south-east.

The key viewing locations within the Projects Primary Visual Catchment will be identified as part of the Visual Impact Assessment to be conducted for the Project. Preliminary identification of key viewing locations includes:

- Harparary Road;
- Rural Residences to the north of the site;
- Kamilaroi Highway rail crossing;
- Therribri Road rail crossing; and
- Rail loop visual corridor.

7.9.2 Potential Impacts

The visual setting of the Project will be consistent with the surrounding landscape and will be barely visible from the area in the south, east and west due to Forest and Conservation areas acting as visual buffers. There is potential, however, for visual effects to take place from the northern area, in particular from Harparary Road. This would largely be due to elevated OEAs to heights of RL 420 m. Possible visual impacts may also occur from areas surrounding the rail alignment which will cross the Kamilaroi Highway and Therribri Road. Additionally if a visual corridor along the proposed rail spur and loop is made, the mine and associated infrastructure may also be visible from this angle. However, mitigation techniques and mine design will assist in ameliorating these issues.

7.9.3 Assessment Methodology

A Visual Impact Assessment will be completed for the Project by Integral Visual Planning and Design. The scope of assessment will include:

- Characterisation of the existing visual environment and landforms taking into consideration existing approvals;
- Identification of sensitive view sheds (including nearby residences);
- Assessment of the visual sensitivity of these view sheds;
- Review of the mine plan to recommend any suggested additional ‘engineering required’ mitigation measures in mine plan finalisation;
- Assessment of potential impacts due to night lighting;

- Development of a 3-D digital terrain model incorporating visual simulations and photomontages at relevant locations;
- Assessment of the degree of visual landscape alteration that the Project would have on sensitive view sheds, including the use of visual simulations, where appropriate; and
- Identification of any impact mitigation measures necessary for the Project.

7.10 SOCIAL IMPACT ASSESSMENT

7.10.1 Background

The Project is in a relatively isolated location situated approximately 18 km north-east of the township of Boggabri. The Maules Creek village is located approximately 5 km north of the Project Boundary and has a population of less than 10 (NSC 2010). Boggabri is approximately halfway between Gunnedah and Narrabri on the Kamilaroi Highway which connects to the Newell Highway. Boggabri is a relatively small town with a population of just under 1000 people. Boggabri is located on the Werris Creek to Mungindi Railway Line which forms the main rail link between Sydney and Moree with regular services.

The Gunnedah Basin is developing as one of the primary coal fields in NSW. Of the 60 coal mines and 30 development projects making up the mining industry, 10 are registered in the Gunnedah Basin. The Assessment of opportunities for the NSC from Coal Mining and Gas Extraction in the Gunnedah Basin report estimates 270 to 290 people were employed directly in the mines in the Gunnedah Basin in 2007 with a further 230 to 250 people likely to be employed within the next 5 - 7 years.

In the Narrabri LGA, there has also been a reduction in employment in the agriculture and forestry industries, with significant reductions in the manufacturing and wholesale trades. There has been a corresponding significant increase in employment in the mining industry, with minor increases in employment in the education, health care and administrative services industries.

7.10.2 Potential Impacts

The Project has a potential to contribute to an increase in the population base of the local and regional area, as well as contribute to the improvement of infrastructure and services. The Project will have a significant positive impact on the local and regional economy through the capital costs of the Project, contractor and employee salaries, associated local spending and contributions to community enhancement programs. The commencement of operations and the construction of associated components as proposed by the Project will also result in an increase in government revenue.

The Project will require a workforce of approximately 400 permanent employees at full production. The assessment of the social impacts of this population change and development of appropriate mitigation and management strategies will be a key component of the Social Impact Assessment.

7.10.3 Assessment Methodology

Hansen Bailey will complete a comprehensive Social Impact Assessment which will identify the potential impacts of the Project on the local and regional community, paying particular attention to the demand it may generate for the provision of additional infrastructure and services.

The assessment will also identify the beneficial and potential adverse impacts of the Project from a social perspective. The assessment of impacts will take account of relevant demographic, social, cultural and economic profiles and will include an estimation and analysis of the project economic parameters.

The social amenity and use of the Project Boundary and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, education or residential purposes would be described.

7.11 ECONOMICS

7.11.1 Background

The Narrabri Shire covers an area of approximately 13065 km^2 in the Upper Namoi Valley. The area is supported by agriculture and is known for its high value cotton as well as wheat, beef cattle, lamb and wool. The Shire has a population of approximately 13100 people, the majority of whom reside in the township of Narrabri with smaller numbers in rural areas and the townships of Boggabri and Wee Waa.

The commencement of mining within the Project Boundary will involve significant capital investment, ongoing operational expenditure and the direct employment of approximately 400 permanent employees. The Project will contribute to flow-on economic effects such as the creation of indirect employment opportunities and significant expenditure at a local and State level.

7.11.2 Potential Impacts

As noted above, the Project will require approximately 400 permanent employees. The Project will also create employment, further strengthen the local economy and create significant revenue at State and Federal levels. The Project will provide revenue to the State government through the payment of royalties and taxes contributing to the NSW economy. The Project will also result in additional and ongoing demands on community infrastructure and services (such as skill levels, trade, health and educational opportunities and population demographics) and impacts to the immediate environment.

Preliminary investigations have confirmed that the Project will provide a net production benefit to society of up to $8.8 billion.

7.11.3 Assessment Methodology

The Economics Impact Assessment will be completed for the Project by Gillespie Economics in accordance with DoPs '*Guideline for economic effects and evaluation in EIA*' (2002).

The scope of assessment will include:

- A benefit cost analysis (threshold value analysis) of the Project;
- A regional economic impact assessment of construction and operation of the Project;

- Quantification of the economic cost, benefits and impacts of the Project; and
- Any necessary mitigation measures, as required.

The economic analysis will assess the potential incremental economic costs and benefits of the Project to the community (i.e. consideration of economic efficiency). This will not only include a consideration of the regional economic impact or economic activity generated by the Project but also any incremental costs and benefits to the environment.

7.12 SOILS AND LAND CAPABILITY

7.12.1 Background

The Maules Creek EIS detailed an analysis of Land capabilities and Soil characteristics for the Maules Creek area. Possible impacts upon these environmental aspects were also listed and amelioration techniques followed. It was concluded that the depth and type of soil and the availability of suitable overburden for rehabilitation would ensure that proper handling and rehabilitation could be achieved. It was also predicted in the Maules Creek EIS that the proposed mine development will lead to a minor change in the balance of land capability within the area affected.

Soil surveys completed for the Maules Creek EIS mentioned above confirmed that Lithosols occurred on stony ridges and forested slopes within the Mining Tenements. Soloth soils occur generally on lower slopes while Black Earth and Prairie soils occur in the south-western corner of the Project Boundary. Brown Clay, Structured Loam and Solodics are associated with the Namoi River and Maules Creek floodplains (KCC 1989).

The original soil surveys done for inclusion in the Maules Creek EIS (KCC 1989) also noted that Lithosols, Soloths, black earth and Prairie soils are suitable for native forest regeneration and that there is no acid generating potential in the soils or overburden apart from the Onavale roof and some weathered areas.

7.12.2 Potential Environmental Impacts

According to the Maules Creek EIS the Onavale roof material and some weathered overburden has the potential for acid generation and therefore the Onavale roof and weathered materials should be buried at least 2 m below the final surface of the emplacement area.

Sodic hazards exist in weathered overburden also and to avoid dispersion and soil erosion problems associated with elevated SAR values, this material needs to be covered with stable topsoil.

Impacts on soil structure, integrity and fertility may occur as a consequence of extended periods of topsoil storage. This would potentially affect rehabilitation success and the long term sustainability of rehabilitated areas.

The post mining land capability of the Project will be developed and addressed as part of the assessment. The land capability will be largely influenced by the mine plan and post mining land use plans and the final landform design. The presence of final voids will also influence the final land use potential and capability.

7.12.3 Assessment Methodology

A Soils and Land Capability Impact Assessment will be completed for the Project by GSS Environmental. The scope of assessment includes:

- A review of any relevant assessment reports and other sources of information;
- A field survey with test pits undertaken;
- Soils assessment of areas to be disturbed to satisfy the requirements of I&I NSW;
- Mapping of soil types within the proposed mining areas and a description of their physical and chemical characteristics;
- Identification of any soil materials with potentially adverse quality (e.g. acid sulphate generating);
- Identification of the suitability of topsoils for use as topdressing material and potential soil amelioration measures for stabilising soils;
- Pre and post mining land capability and class assessment in accordance with NOW guidelines;
- Assessment of topsoil resources for mining and infrastructure area rehabilitation, management and mitigation measures;
- Pre and post mining agricultural suitability assessment in accordance with I&I NSW guidelines; and
- Identification of any impact mitigation measures necessary.

7.13 REHABILITATION, LAND USE AND FINAL LANDFORM

7.13.1 Background

The land within the Project Boundary has been significantly altered from previous land use including forestry and agriculture. The Leard State Forest has been logged intermittently over the past century for its valuable timber resource. The Leard State Forest is a heavily impacted ecosystem which has maintained some high biodiversity values.

Rehabilitation planning for the Project will be undertaken progressively to ensure the total area of disturbance at any one time is minimised to reduce the potential for wind-blown dust, visual impacts and increased sediment-laden runoff.

Rehabilitation will be designed to be compatible with the surrounding landform (with a consideration of the progression of neighbouring mining operations), stable and able to support final land use(s). To ensure a stable final landform, the majority of the overburden emplacement slopes will be shaped to 10 degrees or less.

Aston will aim to restore land disturbed by mining to a condition similar to that which existed prior to mining. It is anticipated that with good land management practices, final rehabilitation of the Project will restore the native vegetation communities to a similar area to its original coverage. The close proximity of the rehabilitated lands to adjacent stands of remnant native vegetation will provide for colonisation of native species into the future.

Rehabilitated land from the Project will be predominantly topsoiled and comprised of a mixture of native trees and shrubs representing habitat of the existing forestry values. Reafforestation will be undertaken consistent with the surrounding landscape aiming to link remnant native vegetation communities with re-established habitat areas. The rehabilitation strategy for the Project will focus on biodiversity and the establishment of habitat for Threatened species.

7.13.2 Potential Impacts

Throughout its operation, the Project will require the disturbance of the Leard State Forest and thus, an increased requirement for additional and expedient rehabilitation across the Project Boundary. In this regard and as discussed in **Section 3.1**, the mine plan has been specifically designed to obtain the maximum area of rehabilitation available throughout the life of the Project.

A long term rehabilitation strategy will be developed to ensure that the disturbed land is returned to its original state once mining operations have ceased. The development of a strong conservation ethic focused on biodiversity for the long term rehabilitation of the Project Boundary will be developed throughout the Project.

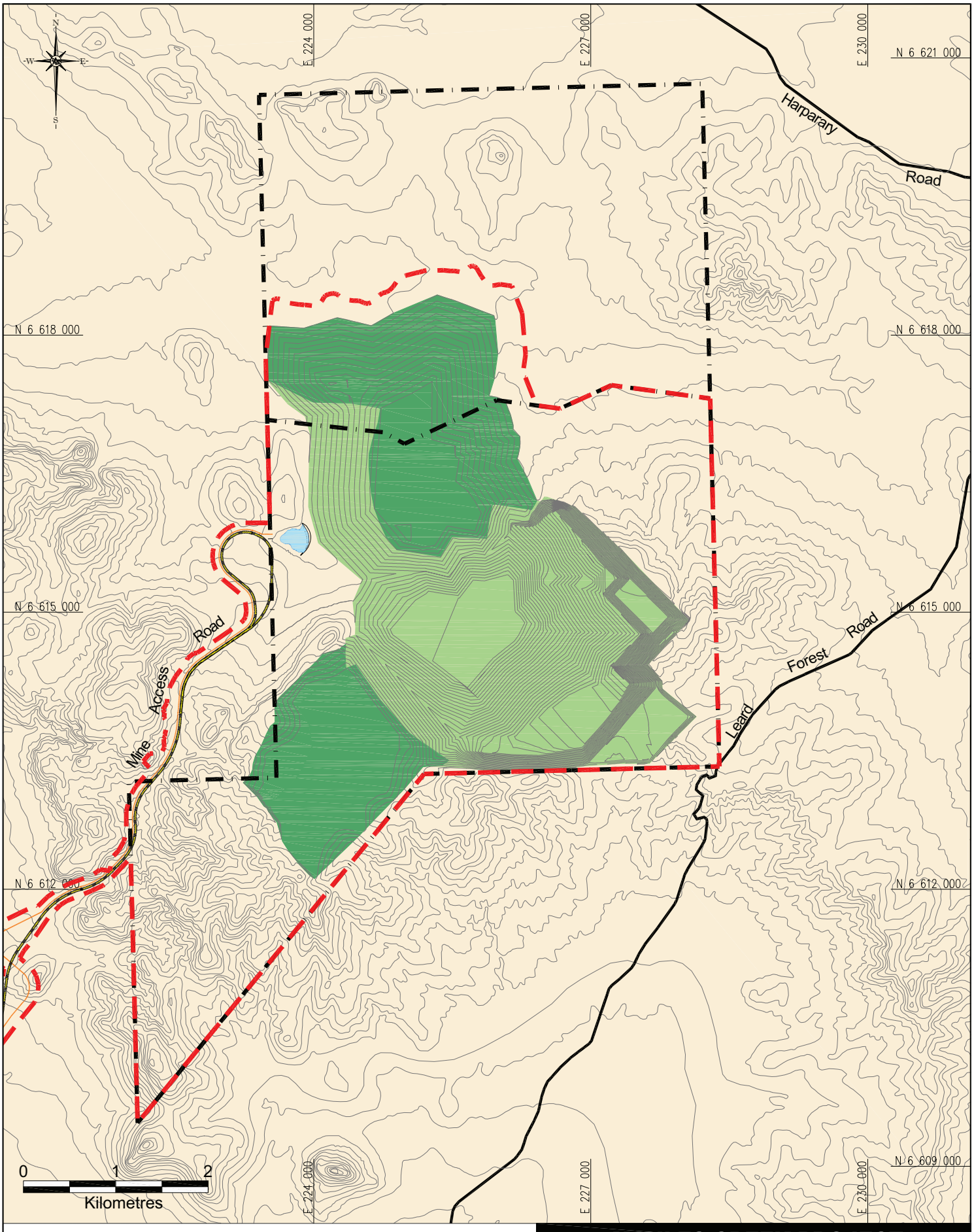
7.13.3 Assessment Methodology

The proposed mine plan and ultimate final landform for the Project maintains the development of an undulating, free-draining and stable landform consistent with the surrounding environment. Further planning and detail will be provided in the EA with regard to the establishment of existing vegetation communities and final landform.

A conceptual final landform for the Project is illustrated in **Figure 15**, which will be further refined for inclusion in the EA. The final landform will be developed via progressive rehabilitation with a focus of developing a stable and undulating, free-draining landform utilising native trees and shrubs representative of the surrounding landscape habitat as far as practical. It should be noted that additional coal resources exist beyond the proposed 21 year mining limit for the Project.

The EA will include a detailed description of the proposed rehabilitation strategy for the Project Boundary, having regard to the key principles in the *'Strategic Framework for Mine Closure'* (ANZMEC-MCA). Detailed descriptions of the following will be included in the EA:

- Rehabilitation objectives, methodology and proposed completion criteria;
- Nominated final land use, having regard to any strategic land use planning or resource management plans or policies; and
- The potential for integrating this strategy with any other offset strategies in the region.



Project Boundary
Mining Tenement Boundary
Roads
Mine Access Road
Indicative Rail Spur and Loop
Active Rehabilitation
Rehabilitation
Water Strorage

Hansen Bailey

ASTON RESOURCES

Co-ordinate System: MGA 94 Zone 56
Source: Aston 2010

MAULES CREEK PROJECT

Conceptual Final Landform

Cad File: 06448C.dwg	Date: 03.08.10	Drawn: CP	Figure 15

8 PRELIMINARY PROJECT JUSTIFICATION

The Maules Creek Coal Project is located within the Narrabri LGA which forms part of the Gunnedah Basin. Coal mining within this area has occurred for more than 120 years and the basin contains a well known coal deposit. Recent demand for coal in the international market has stimulated new investment in the Basin's coal resources which are estimated to contain approximately 12% of total coal resources in NSW (NSGMS, 2008).

Coal mining has been an emerging industry in the Narrabri LGA and has the potential to be a major contributor to the local economy, particularly for employment as well as for ancillary industry and the multiplier effect this has on the local economy.

Mining within the Narrabri LGA is not a new industry with two mines operating and a further two with planning approvals, which are yet to commence coal production. Maules Creek Coal Mine and the Narrabri Mine are the two mining operations that are approved but have not yet commenced production. The operational mines include the Tarrawonga Coal Mine and Boggabri Coal Mine. Other mines exist or are proposed within the neighbouring Gunnedah LGA.

The importance of the future of coal mining in the Narrabri LGA is recognised in the draft Narrabri Shires' Growth Management Strategy (GMS). The GMS offers strategic direction and advice for the LGA and is the first stage in the revision of their LEP. The GMS has recognised the opportunities and importance of this emerging industry within the LGA and as such has recommended that provision within the LEP encourage the development of coal projects within the LGA. The Narrabri LEP is currently being revised and it is understood that changes to Zones 2(a), 2(b) and 2(c) surrounding the township of Boggabri will provide for unit development to support accommodation needs anticipated from proposed mining projects.

The BNC Act was enacted in December 2005. The BNC Act was introduced by the NSW Government as a new concept in environmental management that is based on international standards for biodiversity conservation and to take into account the principles of ESD. The Leard State Forest is recognised as 'Zone 4' in accordance with the BNC Act which encourages the use of this land for forestry, mining and extractive industries. Other higher conservation value State Forest areas have been dedicated as National Parks under the BNC Act (such as the Plagyan State Forest which has been incorporated into the Mt Kaputar National Park) thus offsetting the intended timber harvesting and mining of areas such as the Leard State Forest.

Exploration rights for the coal resources which are now proposed to be extracted by the Project were originally granted to CRA Limited in 1979. Since this time, ongoing exploration and mine planning has been undertaken to define the mineable reserves within this area.

Development Consent approval was originally granted to NVCPL by the then DoP in 1990 for the development of a mining operation and associated facilities involving the use of both open cut and underground mining methods to extract these resources.

This Development Consent was physically commenced in 1995 with the construction of the Development Dam required for the management of surface water runoff. However, no other infrastructure or development has been undertaken.

Aston purchased the Maules Creek Coal Mine from CNA in February 2010 with the intention of rapidly developing the mine into one of the world's leading coking and thermal coal producers.

The Maules Creek coal deposit is known to be one of the few remaining Tier 1 undeveloped coal assets within Australia. With over 640 Mt of coal resources, it ranks as a globally significant deposit of high quality, low ash, high-energy thermal coal and premium quality semi-soft coking coal. This world class coal resource will support a low cost, low risk and high productivity open cut mine.

The Project will continue to provide substantial economic benefits to the local community, State and Federal government utilising a workforce approximately 400 permanent employees. With a reserve of 240 Mt to be mined over the 21 years and the additional coal reserves beyond this, the Project will also result in a significant increase in royalty payments to the State of NSW and export earnings for Australia. Preliminary investigations have confirmed that the Project will provide a net production benefit to society of up to $8.8 billion.

The Project is a unique opportunity to maximise the recovery of coal reserves within one of the last greenfield sites in NSW, whilst minimising environmental and social impacts. This will be achieved in operations by adherence to current standards of best-practice and through using the latest, most suitable technologies.

Early consultation with near neighbours has been positive in developing constructive relationships. Best industry standards and practices will be engaged to develop community consultation programs throughout the life of the Project to promote effective communication. Plans will be given to the community to provide comment and the local Aboriginal community will be given the opportunity to assist with field assessments and to review assessment reports.

Discussions have commenced with Boggabri Coal regarding the appropriate sharing of infrastructure and land in an attempt to minimise any adverse environmental and social impacts.

A full EA conducted in accordance with the Director-General's EARs will investigate and report on the social, environmental and economic impacts from the Project in accordance with the objectives of the EP&A Act.

9 REFERENCES

- ANZMEC/MCA (2000) Strategic Framework for Mine Closure.
- Australian Greenhouse Office (2005). *AGO Factors and Methods Workbook*.
- *Brigalow and Nandewar Community Conservation Area Act 2005.*
- Department of Environment and Conservation (2005). Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.
- Department of Environment and Conservation (2005). *Draft Guidelines for Threatened Species Assessment*.
- Department of Environment and Climate Change (2005a). Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation.
- Department of Environment (2008). Brigalow and Nandewar Community Conservation Area Agreement.
- Department of Natural Resources (2003). Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources.
- Department of Natural Resources (2003). Water Sharing Plan for the Upper Namoi, Lower Namoi Regulated River Water Sources.
- Department of Planning (2002). Guideline for Economic Effects and Evaluation in EIA.
- Environment Protection Authority (1985). *Environmental Noise Control Manual*.
- Environment Protection Authority (2000). *NSW Industrial Noise Policy.*
- Environment Protection Authority (1999). Environmental Criteria for Road Traffic Noise.
- Kembla Coal & Coke Pty. Limited (1989), *Maules Creek Coal Project EIS September 1989.* Report prepared for Coal Cliff Collieries Pty Limited.
- Malitz (2008), *Rio Tinto Coal Australia Maules Creek Project 2007-2008 Modelling Report*.
- Narrabri Shire (1992). Narrabri Local Environmental Plan.
- Narrabri Shire (2010). Growth Management Strategy.
- Roads and Traffic Authority (2002). Guide to Traffic Generating Developments.
- Sides (2009), *Coal Resources at Maules Creek, A Statement of the Insitu JORC Raw Coal Resources within CL 375 at Maules Creek, Near Gunnedah, NSW*, prepared by JB Mining Services Pty Limited, prepared for Aston Resources Pty Limited.



Appendix A

Preliminary Environmental Risk Assessment

MAULES CREEK COAL PROJECT

PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

for

Aston Coal 2 Pty Limited

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
Ecology	Vegetation clearing, drilling, blasting and topsoil stripping	Loss of biodiversity and disruption to threatened flora and fauna or habitats	3	A	High	A Flora and Fauna Impact Assessment will be completed for the Project by Cumberland Ecology in accordance the *DECC Draft Guidelines for Threatened Species Assessment* (DEC, 2005b). The assessment will identify the impacts of the Project on flora and fauna (including listed threatened species and vegetation communities). Mitigation measures will include progressive revegetation, protection and enhancement of existing vegetation, regeneration of conservation areas, establishment of internal and external ecological corridors, augmentation of existing habitat and direct impact minimisation strategies. A comprehensive ecological offset strategy will also be developed and implemented for the Project, which may include the consideration of the BNC Act for mining within the Leard State Forest.
		Disturbance to Federally listed species	3	A	High	
Archaeology and Cultural	Vegetation clearing, drilling, blasting	Disturbance of Aboriginal artefacts,	3	B	High	An Aboriginal Archaeological and Cultural Heritage Impact Assessment for the Project will be undertaken by AECOM Australia Pty Ltd in

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
Heritage	and topsoil stripping	sites or places of cultural heritage significance				accordance with the *National Parks & Wildlife Act 1974: Part 6 Approvals Interim Community Consultation Requirements for Applicants* and DECCWs *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. Mitigation strategies for sites identified to be impacted includes surface collection, grader scrapes and excavation of the sites within the disturbance area as well as conservation of sites in proposed offset areas.
		Disturbance of non-Indigenous heritage sites	2	C	Medium	Archaeology Australia will complete a Non-Indigenous Heritage Assessment in accordance with the standards required by the Heritage Office of NSW. Non-Indigenous heritage management commitments will include an assessment of all items of heritage significance within the disturbance area, the recording and salvage of heritage items where practical, the ongoing monitoring of blast impacts on surrounding heritage sites and the inspection of nearby non-Indigenous heritage sites.
Water Management	Topsoil stripping, haul roads, un-rehabilitated spoil	Dirty water runoff entering local waterways	3	B	High	A Groundwater Impact Assessment will be conducted for the Project by Australasian Groundwater and Environmental Consultants (AGE). A finite 3D, numerical simulation package (SURFACT MODFLOW) will be utilised to identify the impacts of the Project on groundwater (including alluvial aquifers and any surrounding private boreholes). Groundwater management commitments will include the maintenance
	Coal extraction and overburden removal	Groundwater inflow into pit	2	C	Medium	

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
		Drawdown of aquifers on surrounding water users	2	C	Medium	of existing and new groundwater monitoring bore locations, the protection of existing bores from impacts, minimising the groundwater affectation zone of the Project as far as practical, effective final void design and ongoing analysis of monitoring data. A surface water impact assessment will be conducted for the Project by WRM Water & Environment. The assessment will include the preparation of a water balance and identification of water demands and management requirements for the Project. Aston will develop and implement a Surface water management program for the Project which will source, capture, divert, store, monitor, utilise and reticulate water onsite. Surface water management commitments will also include controls which ensure clean runoff is separated from runoff within disturbed areas; drainage lines are constructed to be stable and natural in appearance and the maintenance improvement of water quality in the local area. A relevant flood water impact assessment will be conducted by WRM. The assessment will investigate the influence of infrastructure works including the rail bridge, on flood levels and aflux above and below the Project area.
		Cumulative impacts with surrounding users	4	D	Medium	
	Coal processing and production	Water demand for dust suppression and coal washing	1	B	Medium	
	Water discharges into local waterways	Surface water contamination	3	C	High	
		Contaminated water from wash down bays, etc	3	C	High	
	Flooding	Increased flood levels and erosion of Namoi River Channel	3	D	Medium	
Acoustics	Coal, rejects and overburden haulage	Excessive Noise generation	2	C	Medium	A noise and blasting impact assessment will be conducted for the Project by Bridges Acoustics in accordance with the *Industrial Noise Policy 2000* (INP).

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
	Plant and equipment working in-pit and on overburden dumps		2	C	Medium	The assessment will identify the potential noise impacts of the Project, infrastructure, traffic noise and rail noise. The EA will also consider the cumulative noise impacts of the Project with surrounding mining operations and industry. The EA will identify and recommend the implementation of all reasonable and feasible mitigation measures including those mentioned hereunder. Aston will develop a comprehensive noise management plan for the Project which will provide a framework to manage monitoring, assessment and mitigation of noise impacts on the local community. Management controls will include the assessment of mine planning, operational and engineering methods to be utilised, real-time monitoring, and alarming systems. Additional management controls to be considered will also include the installation of noise mitigation structures around the key infrastructure areas, restricted operation of trucks to day time hours, the potential acquisition of surrounding land and measures for the minimisation of Project traffic noise.
	Train movements on rail loop and spur		2	C	Medium	
	CHPP operation and stockpiles		2	C	Medium	
	Coal loading at rail loop		2	C	Medium	
	Product Coal Transport		2	B	Medium	
	Increased traffic movements		1	B	Medium	
	Blasting	Overpressure and ground vibration impacts at near neighbours and heritage properties	2	C	Medium	A blasting impact assessment will be conducted for the Project by Bridges Acoustics as a component of the noise impact assessment. Mitigation measures will be developed for blasting adjacent to sensitive receivers and heritage properties, as required. These include monitoring of nearby residences to ensure compliance with all vibration and overpressure criteria, minimisation of blast impacts, blasting during day time hours only, mitigation of fly-rock impacts, consultation with

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
						surrounding residents, appropriate personnel training, documentation of blasts, review of blast procedures and reporting of blast monitoring results.
Visual	Overburden stockpile dumps	Visual impact to surrounding receivers	1	D	Low	A Visual Impact Assessment will be completed for the Project by JVP Visual Planning and Design to assess the visual impacts of the Project and identify mitigation and management measures, as appropriate. Management commitments will include the establishment of vegetation screens in key areas, evaluation of earthworks and final landform design, the construction and placement of Project infrastructure and effective operational measures.
	Exposed earthworks		1	D	Low	
	Lighting from mobile and fixed equipment		1	D	Low	
Air Quality	Vegetation clearing, drilling and topsoil stripping	Wind blown dust and machinery exhaust fumes contributing to elevated dust levels	2	C	Medium	An air quality and greenhouse gas impact assessment will be conducted for the Project by PAE Holmes in accordance with the '*Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales*' (DEC, 2001). Aston will develop a comprehensive air quality management plan for the Project which will provide a framework to manage monitoring, assessment and mitigation of air quality impacts on the local community. Management techniques for managing air quality impacts of the Project will include minimising disturbance areas, water cart deployment, enforced speed limits, drills fitted with dust suppressant, accelerated rehabilitation establishment and maintenance, alarm
	Overburden emplacement		2	B	Medium	
	Uncovering of coal		2	B	Medium	
	Coal, rejects and overburden haulage		2	B	Medium	
	Coal processing and transport		2	B	Medium	

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
	CHPP operation and stockpiles		2	C	Medium	systems, efficient dumping and tipping operations.
	Combustion of diesel fuel	Greenhouse gas emissions	2	C	Medium	The air quality impact assessment will assess greenhouse gas Scope 1, 2 and 3 emissions in accordance with the Australian Greenhouse Office's (AGO) '*Factors and Methods Workbook*' (AGO, 2005). Greenhouse Gas emissions from the Project will be managed and minimised, where possible. Aston will achieve this through the use of energy management systems, targeting continuous improvement in energy efficiency, investigating the use of biodiesel and electric solar hot water and small scale vegetation plantings for the purposes of carbon sequestration.
	Electricity use		2	C	Medium	
	Downstream Impacts from the Burning of Coal		2	C	Medium	
	Blasting	Greenhouse gas emissions, fume and dust Generation	3	D	Medium	Blasting effects will be mitigated by restricting blasting to suitable weather conditions and ensuring optimal material breakage and movement as well as minimising the amount of explosives used.
Mine Rehabilitation	Topsoil Stripping and land preparation	Loss of productive topsoil	2	C	Medium	A Soils and Land Capability Impact Assessment will be completed for the Project by GSS Environmental. The assessment will include the mapping of the soil types within the proposed disturbance areas, identification of any soil materials with potentially adverse quality (e.g., acid sulphate generating) and identification of the suitability of topsoils for use as topdressing material. Where necessary, the soils and land capability assessment will also identify mitigation and management measures for the Project.
		Deterioration of land capability	2	C	Medium	

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
	Rehabilitation	Erosion	2	C	Medium	Rehabilitation planning for the Project will be undertaken progressively to ensure the total area of disturbance at any one time is minimised to reduce the potential for wind-blown dust, visual impacts and increased sediment-laden runoff. Rehabilitation will be designed to be compatible with the surrounding landform, stable and able to support final land use(s). To ensure a stable final landform, the majority of the final overburden emplacement slopes will be shaped to 10 degrees or less. Aston will aim to restore land disturbed by mining to a condition equivalent to or better than that which existed prior to mining. It is anticipated that with good land management practices, final rehabilitation of the Project will restore the native vegetation communities to a similar area to its original coverage. The close proximity of the rehabilitated lands to adjacent stands of remnant native vegetation will provide for colonisation of native species into the future. Rehabilitated land from the Project will be predominantly topsoiled and comprised of a mixture of native trees and shrubs representing habitat of the existing forestry values. Reafforestation will be undertaken consistent with the surrounding landscape aiming to link remnant native vegetation communities with re-established habitat areas. The rehabilitation strategy for the Project will focus on biodiversity and the establishment of habitat for Threatened species.
		Invasion of weed species	1	C	Low	
		Invasion of feral animals	1	C	Low	
	Final Landform	Acid Rock Drainage	4	D	Medium	
		Unstable landform	3	D	Medium	
		Poor drainage	3	D	Medium	
		Erosion	2	C	Medium	

Issue	Aspect	Impact	Initial Risk Assessment			Proposed Control Measures
			C	L	R	
Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading	Increased traffic movements	4	D	Medium	A Traffic and Transport Impact Assessment will be completed for the Project by Hyder Consulting in accordance with the *'Guide to Traffic Generating Developments'* (RTA, 2002). The assessment will review the capacity of the affected road network to cater for differing traffic volumes due to the proposed change in traffic flows. Road network enhancements and mitigation measures will be identified for the Project, as required. Noise impacts from traffic will be assessed in the noise and blasting impact assessment. Approval for any road maintenance or enhancement works will be sought under the *Roads Act 1993.*
	Road Upgrades	Public Perception	1	C	Low	
Waste	General waste management	Land contamination	1	D	Low	A Waste Management System will be developed for the Project which shall provide detailed management procedures to ensure the environmentally responsible disposal, tracking and reporting of all waste generated on site. The Waste Management System will continue to be applied to the Project and will be enhanced as required.
	Rejects management	Water contamination	2	C	Medium	
	Sewage management	Water contamination	2	D	Low	
Hazardous materials	Storage and Handling	Soil and water contamination	2	D	Low	All hazardous materials will continue to be managed in accordance with the relevant hazardous materials management procedures. It is not anticipated that large quantities of hazardous materials will be required for the Project.

MAULES CREEK COAL PROJECT

Risk Assessment Tools

Matrix for Determining Level of Risk

Likelihood Label	Consequence Label				
	I	**II**	**III**	**IV**	**V**
A	Medium	High	High	Very high	Very high
B	Medium	Medium	High	High	Very high
C	Low	Medium	High	High	High
D	Low	Low	Medium	Medium	High
E	Low	Low	Medium	Medium	High

Likelihood Scale

Level	Descriptor	Description	Indicative Frequency (expected to occur)
A	**Almost certain**	The event will occur on an annual basis	Once a year or more frequently
B	**Likely**	The event has occurred several times or more in your career	Once every three years
C	**Possible**	The event might occur once in your career	Once every ten years
D	**Unlikely**	The event does occur somewhere from time to time	Once every thirty years
E	**Rare**	Heard of something like the occurring elsewhere	Once every 100 years

Consequences Scale

Severity Level	Consequences Types				
	Health & Safety	**Natural Environment**	**Social/ Cultural Heritage**	**Community/Govt/ Reputation/Media**	**Legal & Regulatory**
V	Multiple fatalities, or significant irreversible effects to >50 persons	Very serious, long-term environmental impact that is widespread and unconfined, leaves major damage			Significant prosecution and fines. Very serious litigation including class actions. Suspended or reduced operation
IV	Single fatality and/or severe irreversible disability (>30%) to one or more persons		On-going serious social issues. Significant damage to structures/items of cultural significance	Serious public or media outcry (international coverage)	Major breach of regulation. Major litigation. High potential for prosecution
III	Moderate irreversible disability or impairment (>30%) to one or more persons	Serious but confined medium term environmental effects near the source		Significant adverse national media/public/NGO attention	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate find possible
II	Objective but reversible disability requiring hospitalisation	Moderate, short-term effects on environment (near the source, reversible and confined)	On-going social issues. Permanent damage to items of cultural significance	Attention from media and/or heightened concern by local community. Criticism by NGOs	Minor legal issues, non-compliances and breaches or regulation. Low potential for impact
I	No medical treatment required or requiring first aid treatment at the most	Minor environmental effects (near the source, confined and quick to reverse)	Minor medium-term social impacts on local population. Mostly repairable	Minor, adverse local public or media attention or complaints	

Prepared by:

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

Phone: (02) 6575 2000
Fax: (02) 6575 2001
Address: 6 / 127 – 129 John Street Singleton NSW 2330
Postal: PO Box 473 Singleton NSW 2330