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# Blair Athol Reserve
# QP Report
# October 2013

## Table of Contents

# 1.0 Executive Summary

Xenith Consulting Pty Ltd has prepared this Independent Qualified Persons' Report ("QPR) on behalf of Linc Energy ("Linc") in partial fulfilment of the requirements of Linc's intended listing on the Singapore Exchange ("SGX").

New Emerald Coal Pty Ltd ("NEC") is a wholly owned subsidiary of Linc. NEC is a mineral exploration, development, and production company that will operate in the state of Queensland, Australia.

This QPR has been compiled in accordance with the relevant SGX Mainboard Rules and requirements, in particular *Practice Note 6.3 Disclosure Requirements for Mineral, Oil and Gas Companies*[1].

This QPR describes the Blair Athol Project tenements and tenement applications, inclusive of relevant Coal Reserve Statement.

# 2.0 Introduction

## 2.1 Full name, and if applicable, the partner/director in charge of the report; professional qualifications, years of relevant experience, Professional Society Affiliations and Membership (including details of a recognised professional association) of the qualified person and the address of the qualified person's firm/company

This QPR has been prepared by Mr John Cawte, Manager Mining Solutions of Xenith Consulting Pty Ltd. John holds a Bachelor of Mining Engineering degree from the University of Queensland, and is a member of the Australasian Institute of Mining and Metallurgy (AUSIMM). John has worked in various planning, operational and consulting roles in the coal industry for more than 20 years and as such qualifies as a Competent Person under the JORC Code. Xenith is a professional geological and engineering consultancy that provides specialist services to the resources industry with its main office located at Level 6, 40 Creek St Brisbane, Qld. Xenith has been operating since 2005 and employs a work force of approximately 50 professional and support staff.

Refer to Section 1.0 Statement of JORC Compliance of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 2.2 Statement of independence by the qualified person, if the report is prepared by an independent qualified person who meets the requirements in Rule 210(9)(b)

Refer to Section 1.0 Statement of JORC Compliance of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 2.3 Aim of the report

NEC requested that Xenith prepare an independent Qualified Persons Report (QPR) incorporating an independent Reserve Estimate in accordance with the 2012 JORC code for their Clermont area coal deposit known as 'Blair Athol' in Queensland as at September 2013.

## 2.4 Scope of the report

This QPR, which forms part of the documentation required to list on the SGX Mainboard, has been completed in compliance with the requirements for 'Mineral, Oil and Gas Companies' as stipulated in Practice Note 6.3 in terms of Rule 624 of Chapter 6 of the SGX Mainboard Rules.

## 2.5 Statement of the use of the report

Xenith understands that this independent QPR is to be included as part of a prospectus to be issued by Linc as part of a listing on the mainboard of the Singapore Exchange.

## 2.6 Basis of the report - including data sources, data validation and reliance on other experts

Refer to Section 6 Mining Methods, Section 7 Mining Quantities, and Section 9 Margin Ranking of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

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[1] http://rulebook.sgx.com/

Xenith have relied upon existing unpublished reports prepared by Wood MacKenzie relating to Marketing Assessments of the indicative Blair Athol product specification and future exchange rates. M Resources provided specialist coal quality advice in the field of coal washability and overall product specifications.

## 2.7 Standard Used

Refer to Section 1.0 Statement of JORC Compliance of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 2.8 Whether a site visit has been undertaken (if so, when the site visit was undertaken and by whom and if a site visit has not been undertaken a satisfactory reason as to why not)

Refer to Site visits in Section 4 Estimation and Reporting of Ore Reserves of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 3.0 Property Description, size, location, access, natural and cultural environment

## 3.1 Listing applicant's/issuer's assets and liabilities

The properties detailed in this QPR consist of one (1) coal tenements located within the state of Queensland, Australia. The coal tenements and tenement applications have been issued by the Queensland Government's Departments of Natural Resources and Mines. The tenements are summarised in Table 3.1 and are illustrated in Figure 3.2 – Local Locality Map of ML1804 and ML1881 in the *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

| Asset Name / Country / Lease | Type Of Mineral | Status | Sub-status | Issuer's Interest | Lease Expiry Date | Development Status |
|---|---|---|---|---|---|---|
| Blair Athol Mine / Australia / ML1804 | Coal | Granted | - | 100 | 30-Nov-14 | Production (Care and Maintenance) |

*Table 3.1: Summary of Tenure – Current Leases and Applications (Tenement validity confirmed by NEC)*

## 3.2 Nature and extent of listing applicant's/issuer's rights of exploration or extraction

Refer to Table 3.1 above.

Refer to Section 3.1 Location and Tenure of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 3.3 Description of the economic conditions for the working of the licenses, concessions or similar, with details of the duration & other principal terms & conditions of the concessions including fiscal conditions, environmental & rehabilitation requirements, abandonment costs and any necessary licenses & consents including planning permission[2]

The DNRM administers the right to explore for minerals in the state of Queensland, Australia. There are three (3) types of mineral tenure relevant to coal in Queensland, Australia.

The mineral tenure types are:

- Exploration Permit for Coal (EPC);
- Mineral Development Licence (MDL); and
- Mining Lease (ML).

[2] DNRM website (www.mines.industry.qld.gov.au)

#### 3.3.1 Exploration Permit for Coal

Under Queensland mineral legislation, an EPC:

- Allows the holder to take action to determine the existence, quality and quantity of minerals on, in or under land by methods which include prospecting, geophysical surveys, drilling, and sampling and testing of materials to determine mineral bearing capacity or properties of mineralisation;
- May eventually lead to an application for a mineral development licence or mining lease;
- Can be granted for a period of up to five years; and
- Can be renewed.

#### 3.3.2 Mineral Development Licence

Under Queensland mineral legislation, an MDL:

- Allows the holder to undertake geo-scientific programs (e.g. drilling, seismic surveys), mining feasibility studies, metallurgical testing and marketing, environmental engineering and design studies to evaluate the development potential of the defined resource;
- Can be granted to the holder of an exploration permit for a period of up to five years where there is a significant mineral occurrence of possible economic potential; and
- Can be renewed.

#### 3.3.3 Mining Lease

Under Queensland mineral legislation, an ML is granted for mining operation and:

- Entitles the holder to machine-mine specified minerals and carry out activities associated with mining or promoting the activity of mining;
- Is not restricted to a maximum term - this is determined in accordance with the amount of reserves identified and the projected mine life; and
- Can be granted for those minerals specified in either the prospecting permit, exploration permit or mineral development licence held prior to the grant of the lease.

## 4.0 History of the property, including exploration history and any production history

Refer to Section 4 Exploration and Drilling of *Blair Athol Project, Coal Resource Estimate, August 2013.*

## 5.0 Geological and geophysical setting, type and characteristics of the deposit/accumulation

*Refer to Section 4 Background Geology Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 6.0 Exploration data including drilling and sampling, sampling and analysis methods, sample preparation and security, quality assurance and quality control on the sample analyses

Refer to Section 4 Background Geology *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

Refer to Section 7 Sampling and Coal Quality Results of *Blair Athol Project, Coal Resource Estimate, August 2013.*

## 7.0 Mineral processing and metallurgical testing

Refer to Section 7.3.2 Coal Product Estimation and Section 8 Coal Quality of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 8.0 Resource and reserve estimates and exploration results, as applicable, in accordance with the relevant Standard, including a summary of reserves and resources in the form of Appendix 7.5

| Category | Mineral Type | Gross Attribute to Licence | | Net Attribute to Issuer | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | Tonnes (millions) | Grade | Tonnes (millions) | Grade | Change from Previous Update (%) | |
| **Reserves** | | | | | | | |
| Proved | Coal | 8.7 | Thermal | 8.7 | Thermal | N/A | |
| Probable | Coal | 2.6 | Thermal | 2.6 | Thermal | N/A | |
| Total | Coal | 11.3 | Thermal | 11.3 | Thermal | N/A | |
| ***Coal Reserves are a modified sub-set of the Measured and Indicated Coal Resources** | | | | | | | |

Refer to Section 10.4 Reported Estimate of Coal Reserves of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 9.0 Planned extraction method, processing method, capital costs, operating costs, considerations including social, environmental, health and safety factors that may affect exploration and/or exploitation activities; and production schedule

Refer to Section 6.0 Mining Methods and Section 9 Margin Ranking of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 10.0 Financial analysis of the operations, taxes, liabilities and marketing

Refer to Section 9 Margin Ranking of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 11.0 Interpretation and conclusions

Refer to Section 10 Reserve Estimate Mine of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 12.0 Recommendations

Not applicable.

## 13.0 References

Not applicable.

## 14.0 Date and signature page

Signed by Qualified Person

Xenith

John Cawte BE(Min), MAusIMM (Member number: 108808)

Signed by Managing Director

Ken Hill

Managing Director of Xenith Consulting Pty Ltd

Date : 3rd October 2013

Refer to Section 1.0 Statement of JORC Compliance of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 15.0 Illustrations of sufficient clarity to graphically present the material within the text. Maps must include a geographical reference system and scale bar for clarity. Technical drawings must include a legend to explain features within the diagram

Refer to list of figures in the Table of Contents of *Reserve Estimate, Blair Athol Coal Mine, September 2013.*

## 16.0 Appendices and glossary of terms used

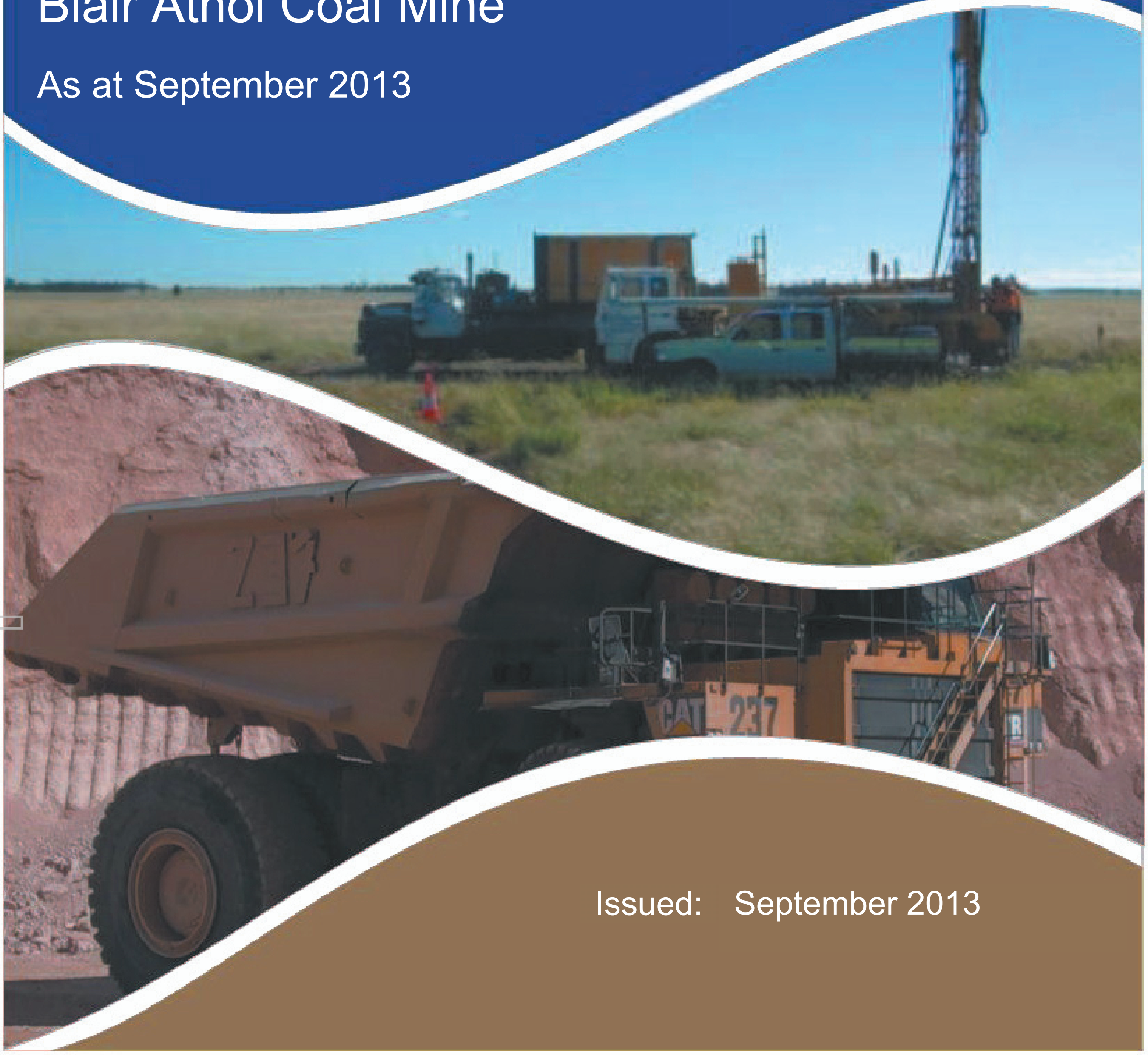
Not applicable.

Xenith

# Reserve Estimate

# Blair Athol Coal Mine

As at September 2013




Issued: September 2013

# TABLE OF CONTENTS

# LIST OF TABLES



# LIST OF FIGURES

# 1 STATEMENT OF JORC COMPLIANCE

This Reserves Estimate has been prepared by Mr John Cawte. The estimates of Open Cut Coal Reserves for the Blair Athol coal mine as at August 2013 presented in this report have been prepared in accordance with the requirements of the 2012 edition of the Australasian Code for Reporting of Mineral Resources and Ore Reserves (JORC Code).

John Cawte is an employee of Xenith Consulting Pty Ltd. He has a Bachelor in Mining Engineering from University of Queensland and a Diploma of Business. He has over 20 years of experience in mining in the open cut coal mining industry that is relevant to the style of mineralisation and type of deposit described in the report, and the type of activity involved in the estimation of the coal reserves. John Cawte is a Member of the Australasian Institute of Mining and Metallurgy and qualifies as a Competent Person under the JORC Code.

Neither John Cawte, nor Xenith Consulting Pty Ltd has any material interest or entitlement, direct or indirect, in the securities of New Emerald Coal Pty Ltd or Linc Energy Ltd or any associated companies. Fees for the preparation of this report are on a time and materials basis only.

John Cawte consents to the release of the report, in the form and context in which it appears.

John Cawte
BE(Mining), Dip Bus
Member AusIMM
108808

# 2 EXECUTIVE SUMMARY

This document forms the supporting documentation for the coal reserve estimate, prepared according to "*The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, December 2012*" (2012 JORC Code), as at August 2013 for the Blair Athol Project.

New Emerald Coal Pty Ltd ("NEC") have commissioned Xenith Consulting Pty Ltd ("Xenith") to prepare a coal reserve estimate in accordance with the requirements of the 2012 JORC Code for the Blair Athol Coal Mine, code named "Project Bill" by NEC. The Blair Athol Coal mine consists of ML1804 and ML1881 currently held by Queensland Coal Pty Ltd, a subsidiary of Rio Tinto Coal Australia ("Rio Tinto").

The coal seams at the Blair Athol mine are found within the isolated Blair Athol Basin on the western flank of the Bowen Basin in Central Queensland. Four main seam groups are found within the basin. The reserve estimate has been focussed on the No.4 seam as the upper three seams have previously been exhausted through open cut mining, along with some historical underground mining.

This reserve estimate is for open cut reserves only. NEC are considering a new and innovative method for underground mining called Partial Block Extraction (PBE). The PBE process incorporates some open cut techniques, including dragline excavated trenches, which is considered to be completely part of the PBE process and is not included, nor is it associated with the open cut reserve estimate.

The No.4 seam exists as one composite seam in the Southwest of the deposit, but is otherwise generally split into the 4 Upper and 4 Lower seams.

The productive coal seams at the Blair Athol Mine produces export quality thermal coal.

A geological model has been developed by Xenith Consulting Pty Ltd. Resource estimation was carried out by Mr Troy Turner, a Competent Person in accordance with the requirements of the 2012 JORC Code.

Resource estimations and category classifications provided for this estimate of reserves were supplied by Xenith Consulting Pty Ltd and were dated August 2013. Mine designs and reserve estimates for Blair Athol Mine have been produced by John Cawte of Xenith Consulting Pty Ltd a Competent Persons in accordance with the requirements of the 2012 JORC Code. These reserves are a sub-set of the underlying resource estimate; therefore the resources are inclusive of the reserves.

**Table 2.1 – Blair Athol Mine Open Cut Reserves Estimate**

| Coal Reserve (Mt ROM)* | 4 Upper | 4 Lower | TOTAL |
|---|---|---|---|
| Proved | 5.1 | 3.6 | 8.7 |
| Probable | 1.5 | 1.2 | 2.6 |
| **Total Coal Reserve** | **6.6** | **4.7** | **11.3** |
| ** At 17% ROM Moisture basis* | | | |

** Tonnages and qualities in the above table are expressed on a "ROM" basis, incorporating the effects of mining losses and dilution, and on a 17.0% ROM moisture basis.*

The marketable coal for Blair Athol Mine is thermal product only. Estimates have been made for the most likely split of the ROM coal to bypass or to the Coal Preparation Plant (CPP) to blend together to produce an export quality thermal coal at 12.5% ash on an air dried basis (adb). This has formed the basis of an estimate of Marketable reserves that correspond to the ROM reserve estimates. Therefore, Marketable Coal Reserves are a sub-set of Coal Reserves.

All Marketable Reserves tonnages have been expressed on a Washed Moisture Basis, which varies depending on the proportion of Bypass coal which ranges from 17.4% to 17.7%.

The total Marketable Coal Reserves for Blair Athol Mine are shown in Table 2.2.

**Table 2.2 – Blair Athol Marketable Open Cut Coal Reserve Estimate**

| Type | Marketable Coal Reserve (Mt Product)** | 4 Upper | 4 Lower | TOTAL |
|---|---|---|---|---|
| **Washed** | Proved | 0.8 | 2.6 | 3.4 |
| | Probable | 0.1 | 0.8 | 0.9 |
| | **Washed Subtotal** | **0.9** | **3.4** | **4.3** |
| **Bypass** | Proved | 4.0 | 0.0 | 4.0 |
| | Probable | 1.3 | 0.0 | 1.3 |
| | **Bypass Subtotal** | **5.2** | **0.0** | **5.2** |
| **Product** | Proved | 4.8 | 2.6 | 7.3 |
| | Probable | 1.4 | 0.8 | 2.2 |
| | **Total Marketable Coal Reserve** | **6.1** | **3.4** | **9.5** |

**Total Marketable Coal is nominally at 12.5% ash.

# 3 INTRODUCTION

## 3.1 Location and Tenure

Blair Athol is located in Central Queensland in the Bowen basin approximately 24 km northwest of Clermont (Figure 3.1and Figure 3.2).

The coal deposit at Blair Athol was originally discovered on the site in 1864 and was first mined in 1890. Between 1920 and 1945 coal was mined with an underground method, which is still visible today. The current open cut operation started in 1984

Historical tenements held over the Blair Athol ML area are outlined in Table 3.1

**Table 3.1 – Historical tenements over ML 1881 and ML 1804 areas**

| Time Active | Tenement ID | Company | Name | Program | Results |
|---|---|---|---|---|---|
| 1979 - 2013 | ML 1804 | Qld Coal Pty Ltd[1] | Blair Athol | Active mine | Currently being rehabilitated |
| 1982 - 2013 | ML 1881 | Qld Coal Pty Ltd [1] | Blair Athol | Active mine | Currently being rehabilitated |
| 2007 - 2013 | EPC 1056 | Waratah Coal Pty Ltd | Blair Athol | None in area | None |
| 1993 - 1999 | EPC 524 | Rio Tinto Exploration Pty Ltd[2] | Clermont District | Gravity Survey Exploration drilling | Did not drill in current ML area |
| 1969 - 1972 | EPC 59 | Blair Athol Coal Pty Ltd | Blair Athol | Exploration drilling | No economic deposits located |

Figure 3.1 shows the regional location of the Blair Athol mine.

[1] *Rio Tinto Coal Australia manages the operation on behalf of the joint venture partners - Queensland Coal Pty Ltd (57.2 per cent), Leichhardt Coal Pty Ltd (31.4 per cent), J-Power Australia Pty Ltd (8 per cent) and J.C.D Australia Pty Ltd (3.4 per cent)*

[2] *EPC 524 was granted to Pacific Coal Pty Ltd in 1993 before being transferred to CRA Exploration Pty Ltd, now Rio Tinto Exploration Pty Ltd*

**Figure 3.1 – Regional Locality Map of Blair Athol Mine**

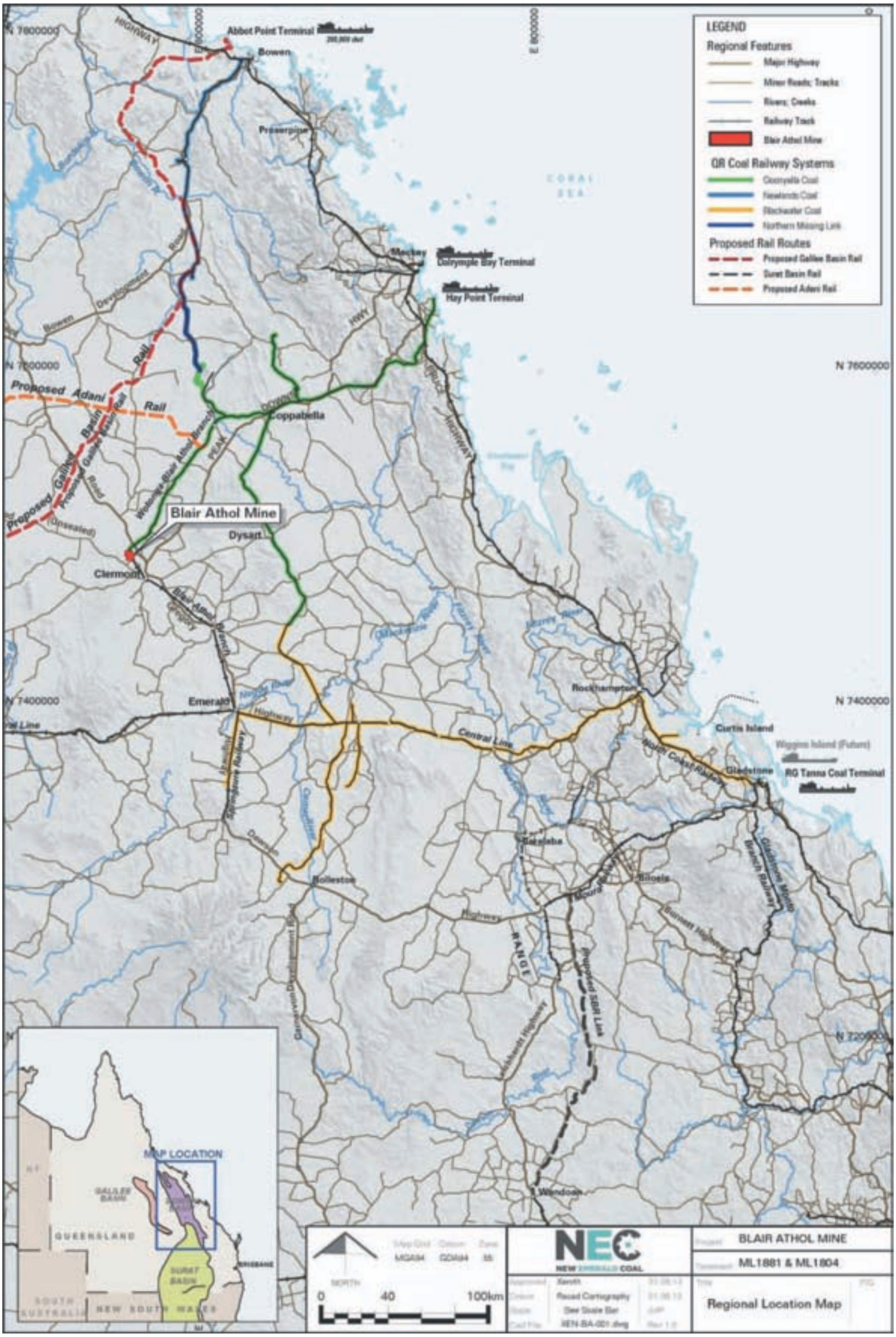
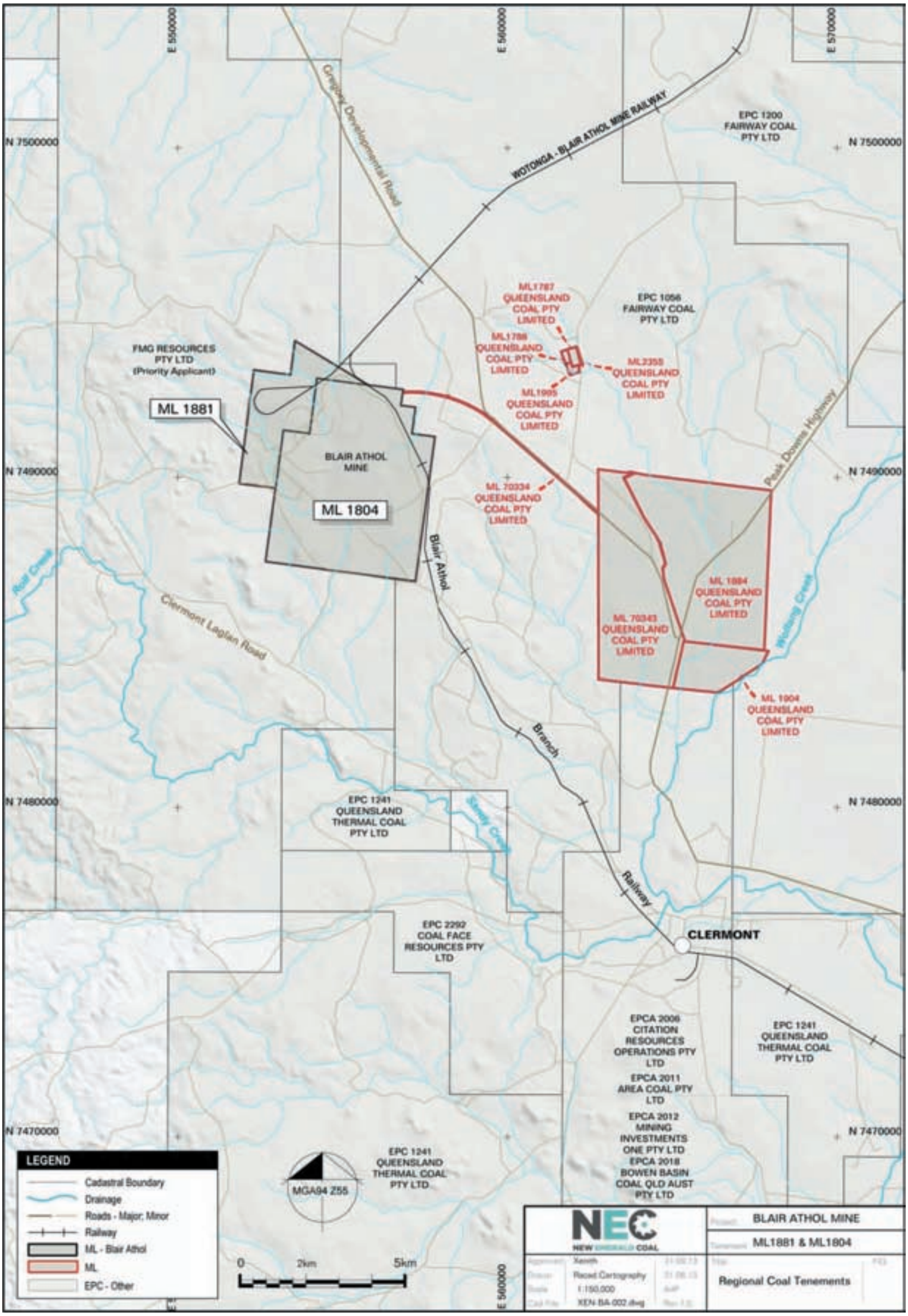


**Figure 3.2 – Local Locality Map of ML1804 and ML1881z**



## 3.2 Infrastructure and Communications

**Figure 3.3 – Aerial View of Blair Athol and Clermont Mines**


The Blair Athol Coal mine can be accessed by road and rail. The Queensland Rail (QR) Wotonga – Blair Athol railway branch is part of the Goonyella Coal railway line that connects areas of central Queensland to Hay Point.

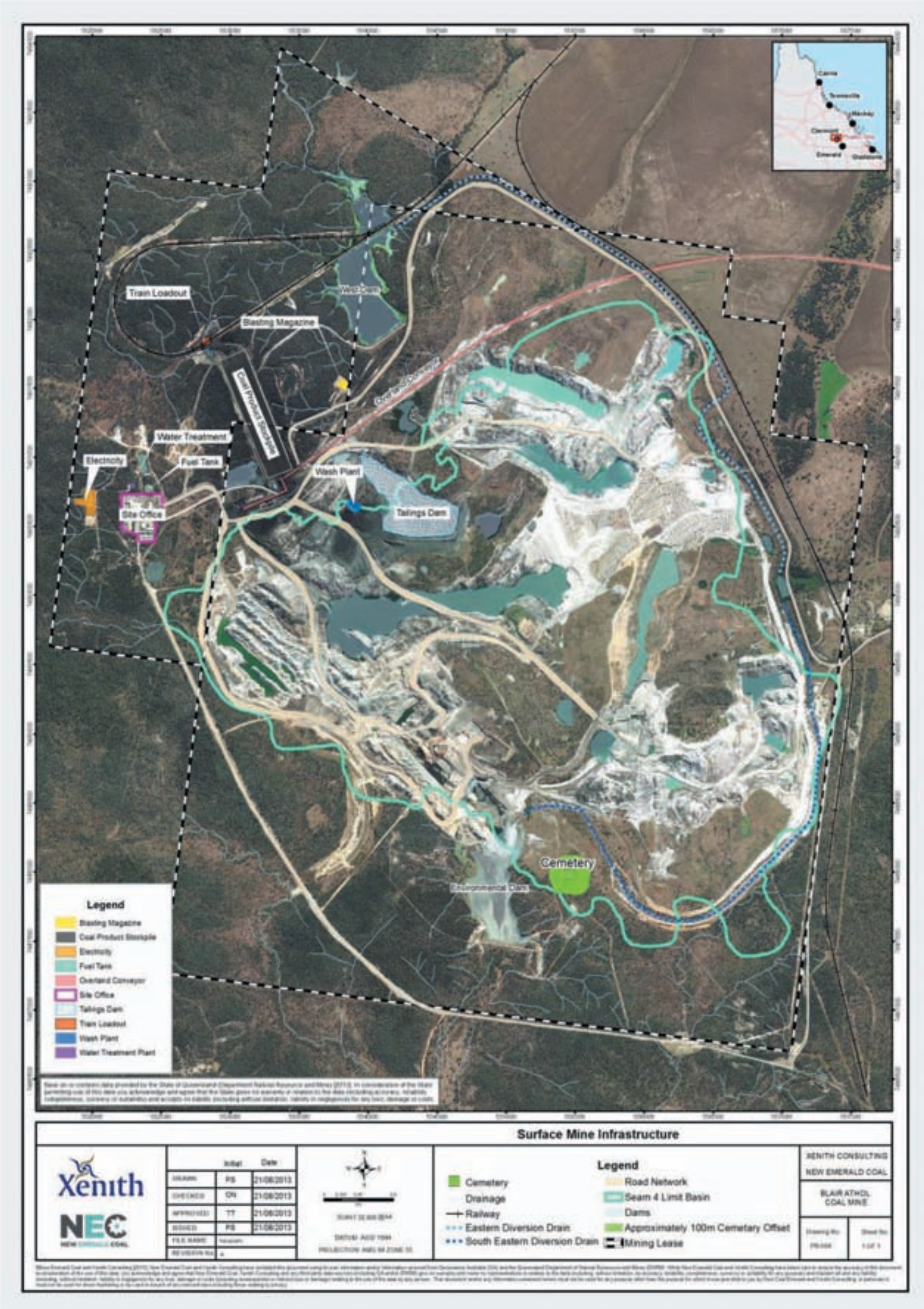
The Peak Downs Highway connects both mines to Clermont in the South, Moranbah (~100 km) to the Northeast and Mackay (~250 km) to the east.

Hay Point consists of two coal export terminals; Dalrymple Bay Coal Terminal and Hay Point Services Coal Terminal. Dalrymple Bay Coal terminal is owned by the Queensland State government and is leased to Dalrymple Bay Coal Terminal Pty Ltd on a 50 year lease with a 49 year renewal option (Dalrymple Bay Coal Terminal Pty Ltd). Hay Point Services Coal Terminal is owned and operated by the BHP Mitsubishi Alliance (BMA).

Blair Athol Coal mine train load out and stockpiles are currently being utilised by Rio Tinto's neighbouring mine, Clermont mine.

An aerial photograph of the Blair Athol Mine (as of August 2012) and associated mine infrastructure can be seen in Figure 3.4. In this figure the mining areas can be clearly seen as exposed ground and some of the  old pits are filled with water. The main infrastructure is found in the Northwest corner where roads and the train loop access the mining lease.

**Figure 3.4 – Blair Athol Coal Mine Layout and Infrastructure**



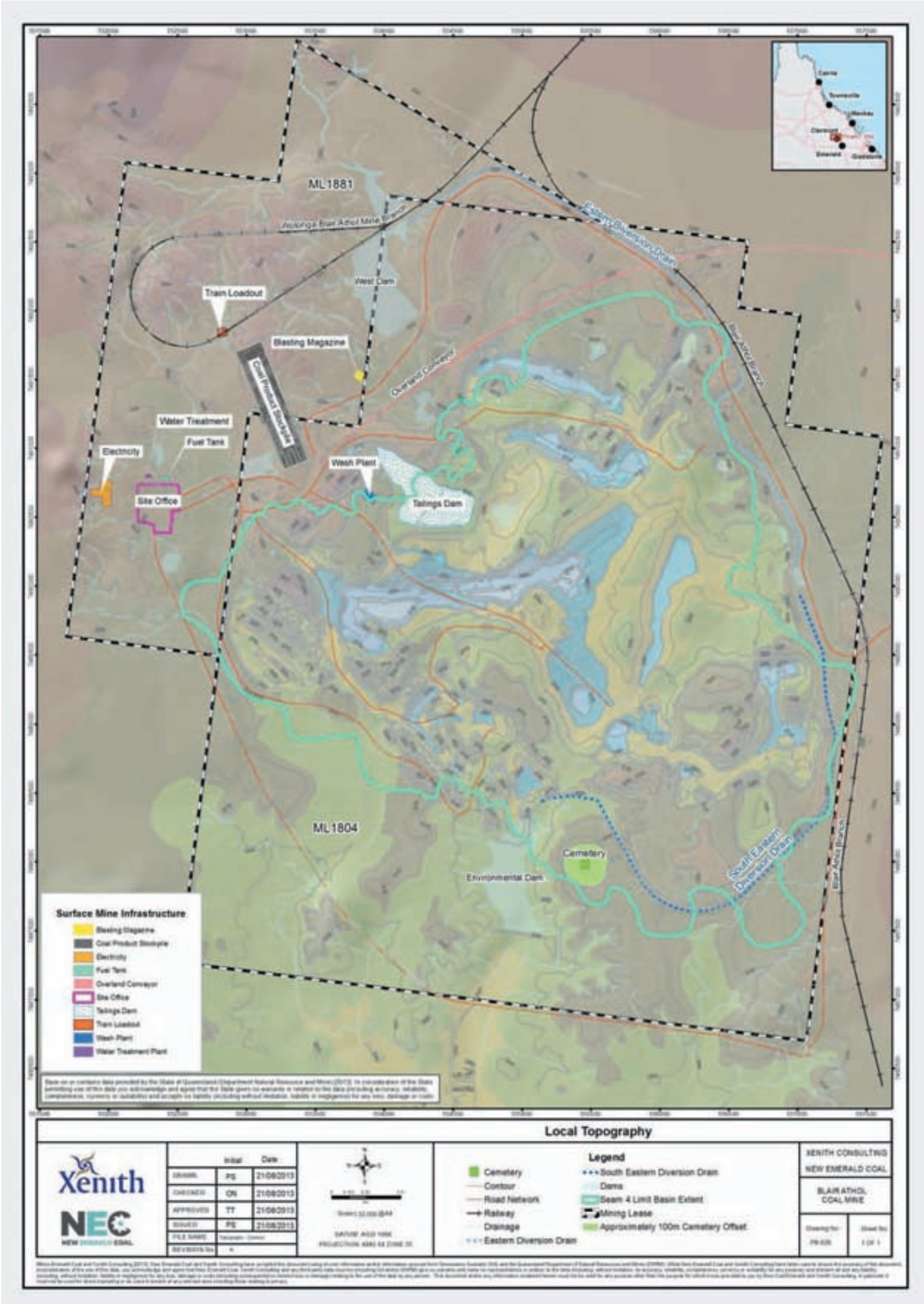
## 3.3 Topography and Land Use

Blair Athol Mine was originally a grazing property, Blair Athol Station, and is located in relatively flat lying terrain. The area lies at an elevation of approximately 317 m above sea level.

The surrounding industries are comprised of coal mining and agriculture. Aspley State Forrest is found to the Southeast of the mine and the Blair Athol State Forest is located directly to the west.

Within the mine area the current topography is one typical of an open-cut coal mine, with spoil dumps creating topography highs and local lows associated with the open pits.

**Figure 3.5 – Current Mine Topography**



# 4 BACKGROUND GEOLOGY

## 4.1 Regional Geology

The Blair Athol Project lies within the Wolfang Basin, on the western margin of the Bowen Basin. The Bowen Basin is exposed in a large, triangular shaped area of central Queensland, 600 km long and up to 250 km wide. Coal seams in the Bowen Basin exhibit major variations in rank and quality, reflecting both the depositional and tectonic history of the basin (Geoscience Australia, 2006).

The coal seams within the Blair Athol deposit are restricted to the Blair Athol Coal Measures. The Early Permian Blair Athol Coal Measures were deposited in a small intracratonic basin near the western margin of the Bowen Basin. Dips are generally between zero and two degrees, with three coal seams of interest present within the area (Menpes, 1999).

## 4.2 Local Geology

Generalised geological stratigraphy for the Blair Athol area can be seen in Table 4.1.

**Table 4.1 – Local Geological Stratigraphy**

| Age | Formation | Lithology |
|---|---|---|
| Quaternary | Undifferentiated | Mud, sand, gravel |
| Quaternary to Tertiary | Undifferentiated | Calcrete, magnesian limestone or dolomite |
| Tertiary | Undifferentiated | Silcrete, olivine basalt, minor agglomerate, tuff, interbedded sediments |
| Permian | Back Creek Group | Quartz sandstone, siltstone, carbonaceous shale, minor coal |
| | Birimgan Formation | sandstone, shale, mudstone, conglomerate, coal |
| | Blair Athol Coal Measures | sandstone, shale, mudstone, conglomerate, coal |
| Middle to Late Devonian | Undifferentiated | granodiorite |
| Neoproterozoic to Early Cambrian | Scurvy Creek Meta-Arenite | meta-arenites, schist, phyllite |
| | Hurleys Metamorphics | Quartzite, schist, phyllite |
| | Rolfe Creek Schist | Schist, phyllite |
| | Bathampton Metamorphics | Phyllite, schist, quartzite greenstone, calc-silicate rocks |

(Menpes, 1999) pg.5

The target Formation within the area is the Blair Athol Coal Measures. The Blair Athol Coal Measures typically comprise coarse grained sandstones, siltstones and coal deposited in an alluvial environment. The thick, clean seam may be the result of a long lived domed peat that grew above the alluvial plain preventing clastic incursion (Menpes, 1999). Fielding (1997) proposed that the Blair Athol Coal Measures were deposited during the latter stages of extensional basin infilling (Phase 1) when clastic sediment supply had decreased but subsidence was still active (Fielding, 1997).

## 4.3 Coal Seam Geology

There are four coal seams within the Blair Athol area. The four coal seams are numbered from top to bottom and are as follows:

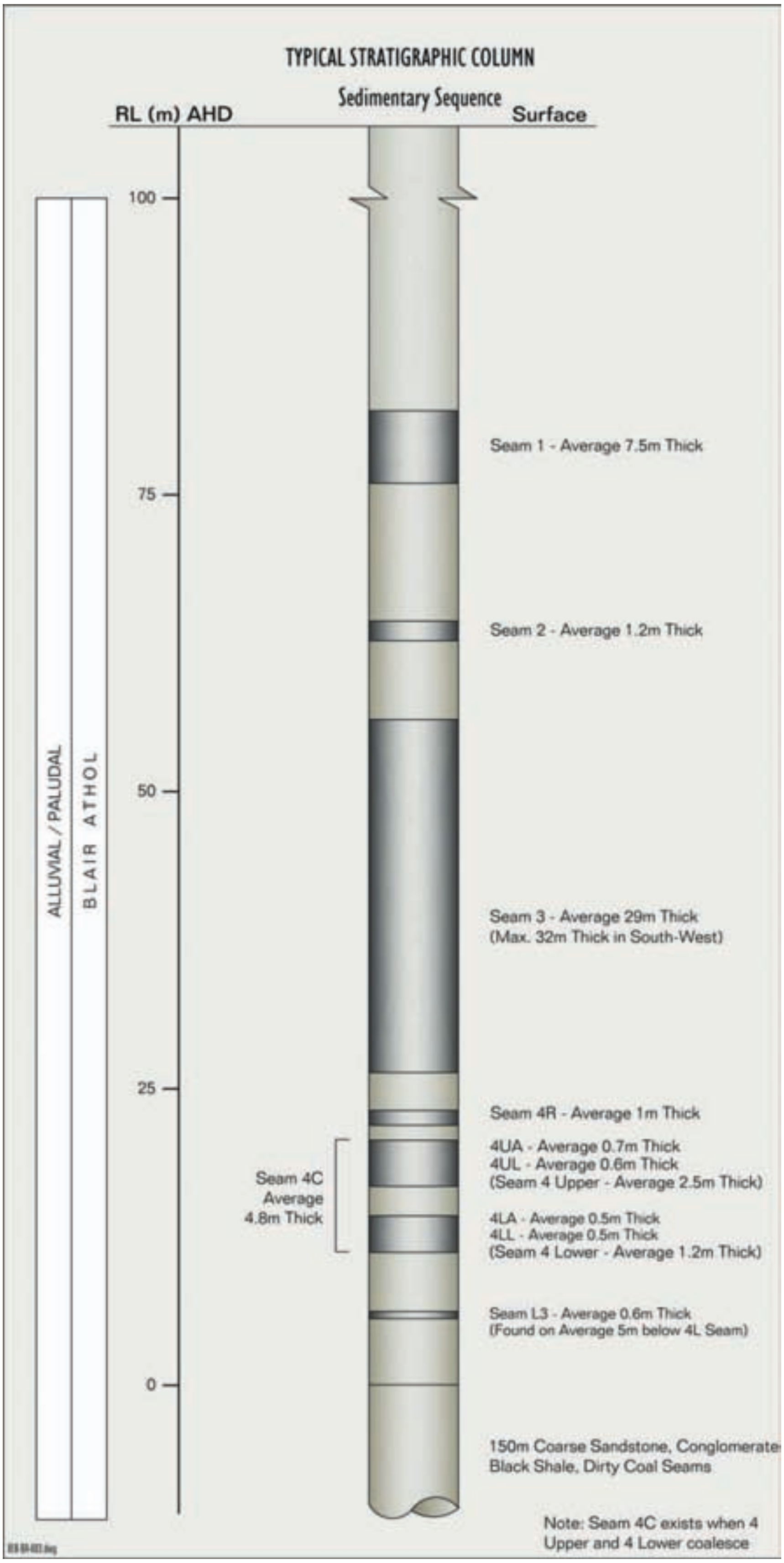
- No. 1 seam which averaged 7.5m thick and has been mined completely.
- No. 2 seam which averaged 1.2m in thickness and has been mined completely.
- No. 3 seam which was the main working seam. The seam averaged 29m in thickness, with a maximum thickness of 32m in the south-west and has been mined completely.
- No. 4 seam which ranges in thickness depending on locality within the lease.

The No. 4 seam comprises (in downhole stratigraphic order) the 4R seam, the 4 Upper seam and the 4 Lower seam.

The 4R seam averages 1m in thickness, whilst the 4 Upper and 4 Lowers seams average 3.5m and 1.5m in thickness respectively. A generalised local stratigraphic column is illustrated as Figure 4.1.

The seams targeted for open cut mining are Seam 4 Upper and Seam 4 Lower.

**Figure 4.1 – Generalised Coal Seam Stratigraphy**



# 5 ENVIRONMENTAL AND OTHER FACTORS

## 5.1 Stored Water

While the Blair Athol site has a significant amount of water already stored on site, there is a relatively low impact on the area targeted for open cut mining. It is believed that the pit water in the open cut area can be managed through normal pit water management practices.

## 5.2 South Eastern Diversion Drain

The South Eastern Diversion Drain requires further diverting to enable the full extraction of the Reserves indicated. The approval of the diversion has been granted and has commenced, however the work had been halted with cessation of mining. Therefore, the fact that the drain is overlying the reserve area has not impacted the quantity nor the classification of the reserve.

## 5.3 Cemetery

It is anticipated that the expectations of the community would be aligned with the expectations of NEC with respect to the non-disturbance of the local cemetery that is located in the south east of the deposit on ML1804. There is no intention to relocate the local cemetery and therefore the proximity of the cemetery impacts the limits of the reserve. To preserve the cemetery from mining a 50m standoff and subsequent batters have been assumed.

# 6 MINING METHODS

## 6.1 General

Coal seams 1, 2 and 3 have been essentially exhausted and the remaining resource is the various splits of the 4 Seam. There is the possibility that some remnant 3 Seam remains but has not been included in the resource estimate and hence has not been considered in the reserves estimate. The mining method mostly requires the removal of old dragline spoil piles to expose the insitu 4 Upper interburden or overburden. The old spoil is removed through a combination of Dozing, Dragline and truck / excavator in a strip mining methodology.

The 4 Upper interburden or overburden requires drilling and blasting. The blasted waste is allocated to a 45m dragline horizon to spoil into the adjacent strip. Waste exceeding the dragline horizon will be excavated by excavator and trucked to the appropriate waste dump.

The 4 Upper has lower ash than the 4 Lower and is targeted for Bypass if the insitu ash is less than 15.5%. To bypass the 4 Upper it must be mined cleanly by adopting a scalping process where the top 0.25m is cleaned up into rills which includes the seam roof loss and dilution. The scalped rills are mined separately and sent to the CPP. The 4 Upper is then mined, standing off the seam floor by 0.25m for clean mining and sent to bypass if the insitu ash is less than 15.5% ash otherwise it is sent to the CPP. The remaining 0.25m in the seam floor is mined separately, absorbing the seam floor loss and dilution, and sent to the CPP.

The 4 Lower parting thickness is taken into account in the loss and dilution and a separate parting excavating activity is undertaken if the parting thickness is greater than 0.3m.

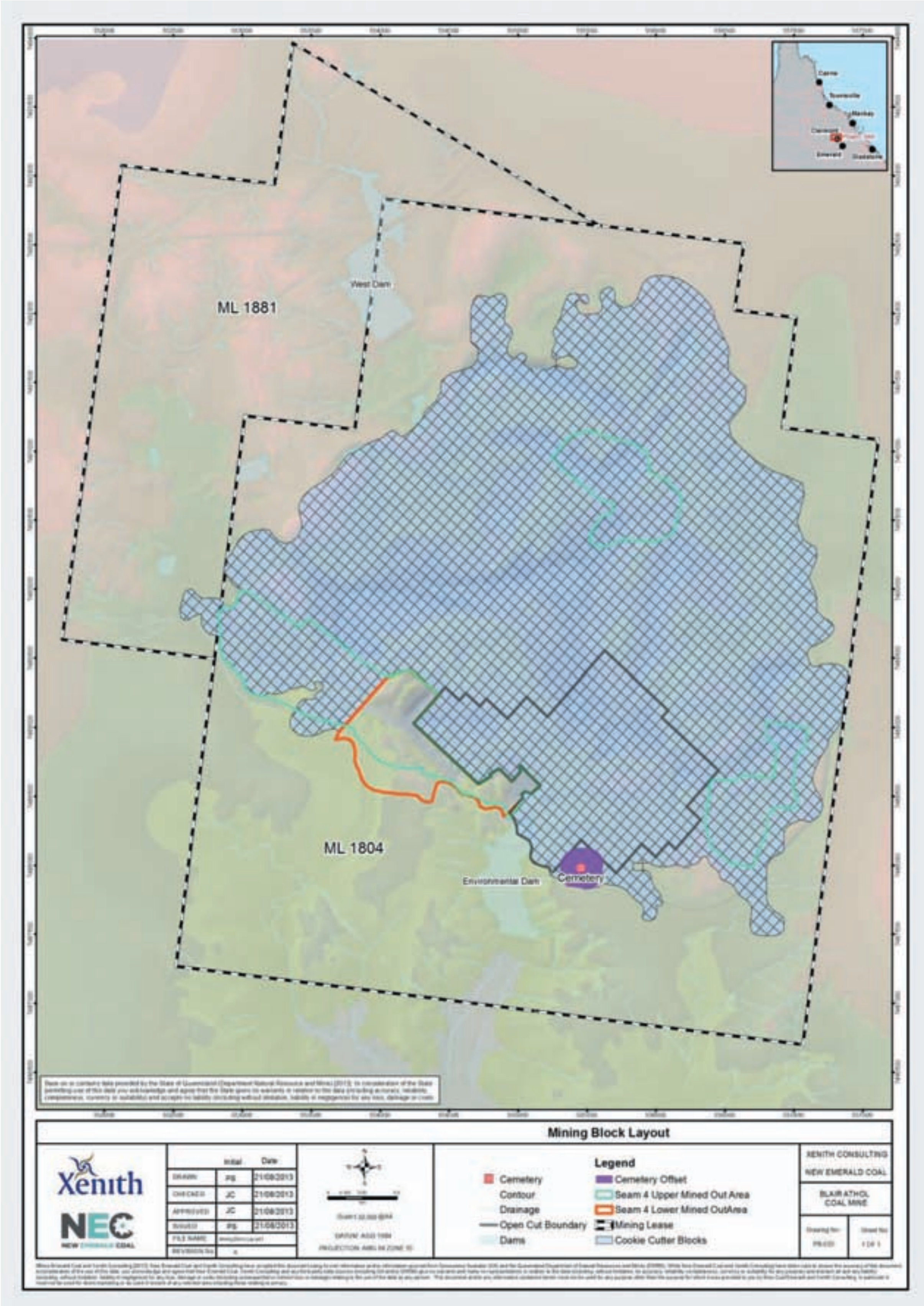
The 4 Lower Seam has seam roof and floor losses and dilution applied, the seam is mined and sent to the CPP.

Bypassing as much 4 Upper ROM coal as possible to meet the product of 12.5% ash, maximises the economics of the open cut area and maximises the reserve estimate.

## 6.2 Mining Block Layout

Figure 6.1 shows the mining block layout is set out along strike and aligns with the existing mining face left when Rio Tinto ceased mining. The block dimensions are set at 70m x 70m. These dimensions and orientation are suitable for strip mining with the inclusion of a dragline.

**Figure 6.1 - Mining Block Layout**



# 7 MINING QUANTITIES

A set of block mining reserves has been generated using the Geological model completed in August 2013 and Minescape for the mining block layout. This information has been transferred into the xTract mining database system in order to estimate mineable reserves.  The construction of the mining model involves applying logic and calculations within the xTract system to the geological data, through several iterations, in order to produce a set of data that can be used to estimate mineable quantities. This section outlines the process that has been followed.

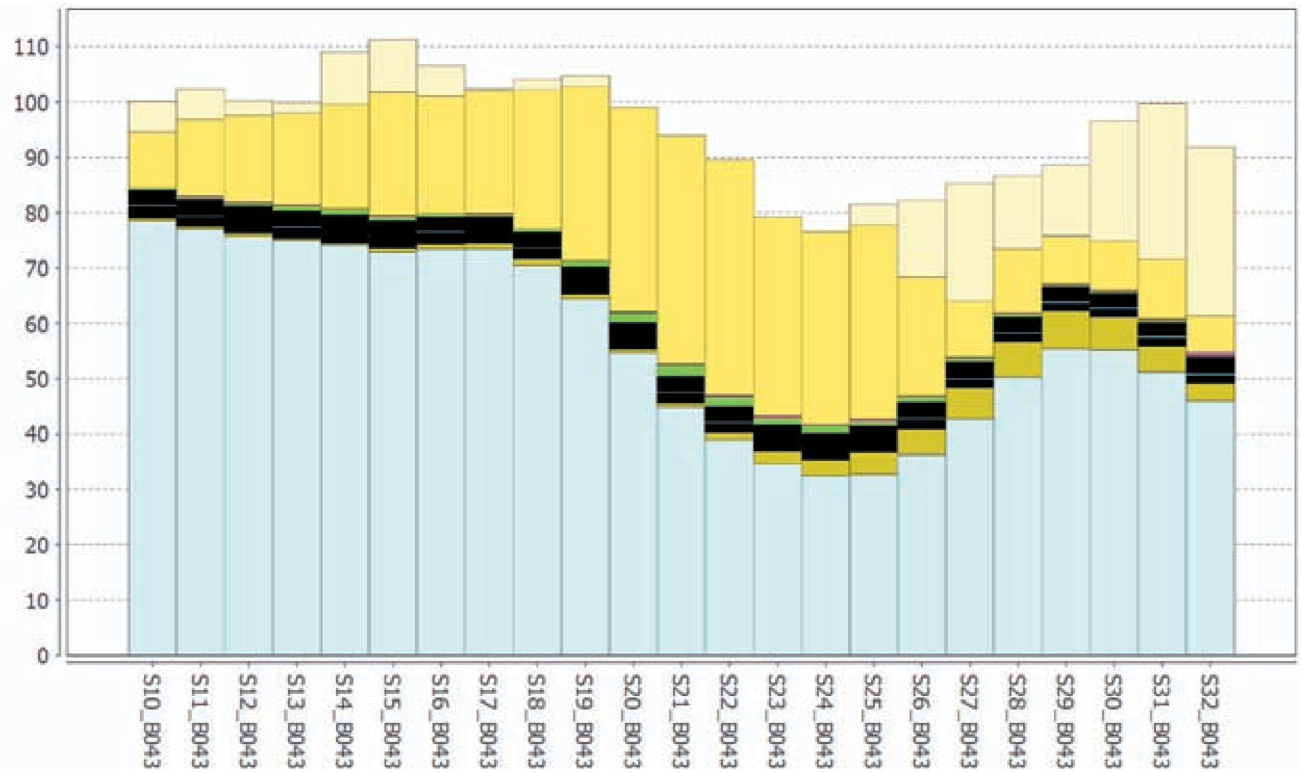
## 7.1 Initial Layers

The following Figure 7.1shows a schematic North to South cross section along mining block line 43 in the middle of the open cut pit.  The section shows the format of the raw information as modelled with separate mining layers for every waste and coal type ply.

The old spoil material overlying the area has been shaded light yellow, while the main insitu waste layers are in shades of yellow. Coal seams are in the section in shades of black. Partings bands in the coal have also been modelled and have been shaded green or blue.

Coal densities have also been adjusted in the geological model from air-dried values in the model to a 17% insitu moisture basis, using the Preston Sanders formula prior to importing into xTract.

**Figure 7.1 – Insitu Waste Allocation**



## 7.2 Derivation of Working Section

The Seams 4 Upper and 4 Lower are the target seams for the open cut area. The 4 Upper has significantly lower insitu ash compared to the 4 Lower. As such it is targeted to be mined and sent to the existing crushing plant bypassing the CPP. The working sections in Figure 7.2 and Figure 7.3 show the approach to mine the 4 Upper cleanly to enable it to be bypassed by scalping the top 0.25m and standing off the seam floor by 0.25m.

**Figure 7.2 – Working Section (Thick Parting)**

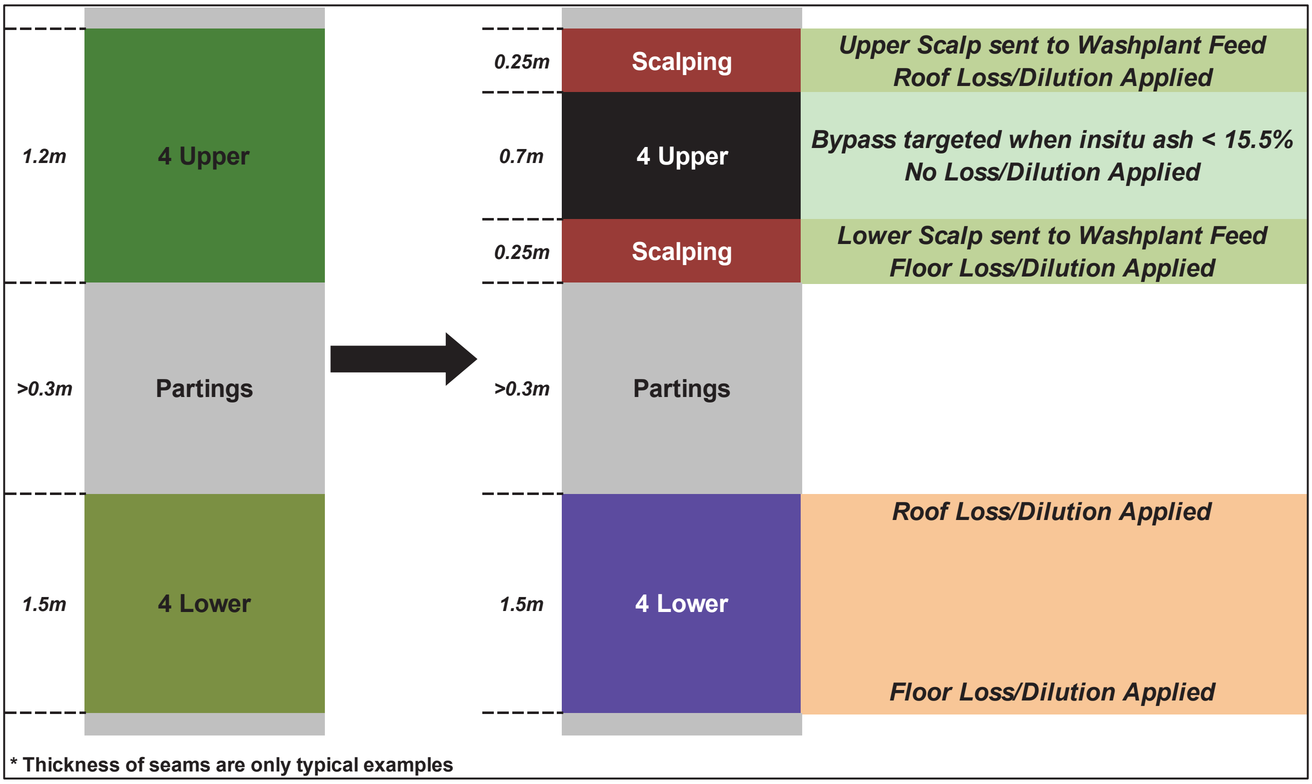
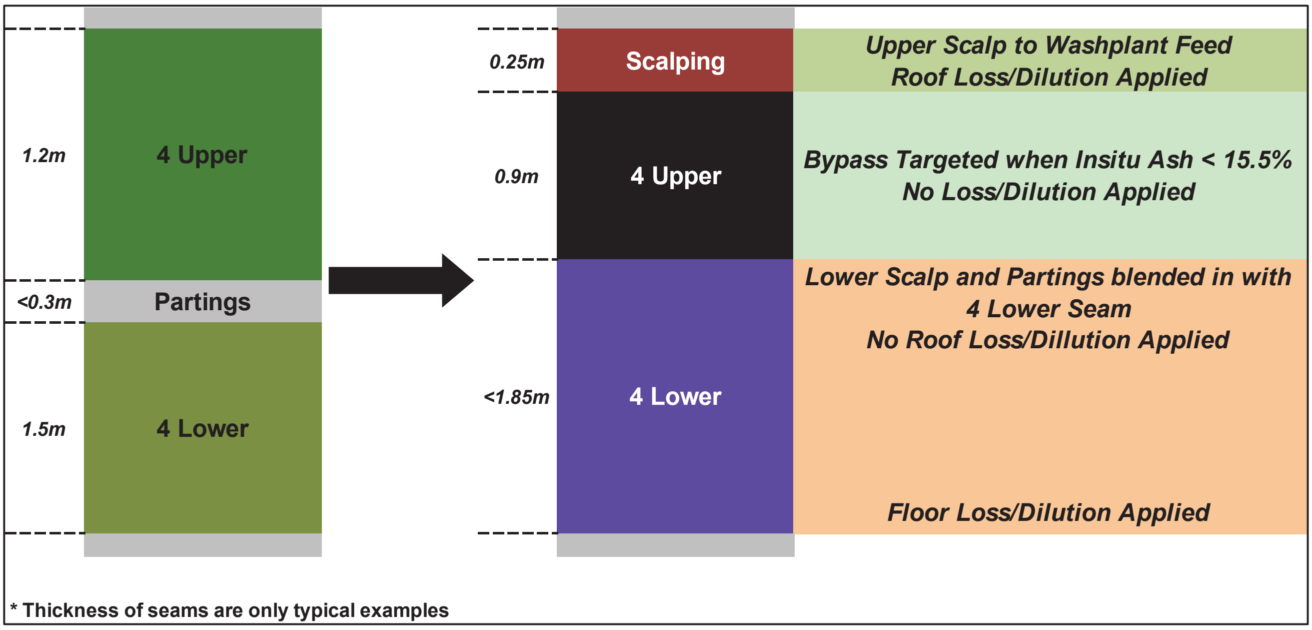


**Figure 7.3 - Working Section (Thin Parting)**




## 7.3 ROM Quantities

### 7.3.1 Coal Losses and Dilution

The insitu coal tonnages have been converted to Run of Mine (ROM) tonnages for each of the working sections by application of roof and floor losses and dilutions. The roof and floor dilution thicknesses have been applied to the appropriate coal layer that form the roof or floor of the working section in that area.

Table 7.1 shows the loss and dilution factors that have been applied in determining ROM coal quantities. These parameters are somewhat aggressive for the medium to large mining equipment intended to be utilised but is achievable when applying and managing clean coal mining practices.

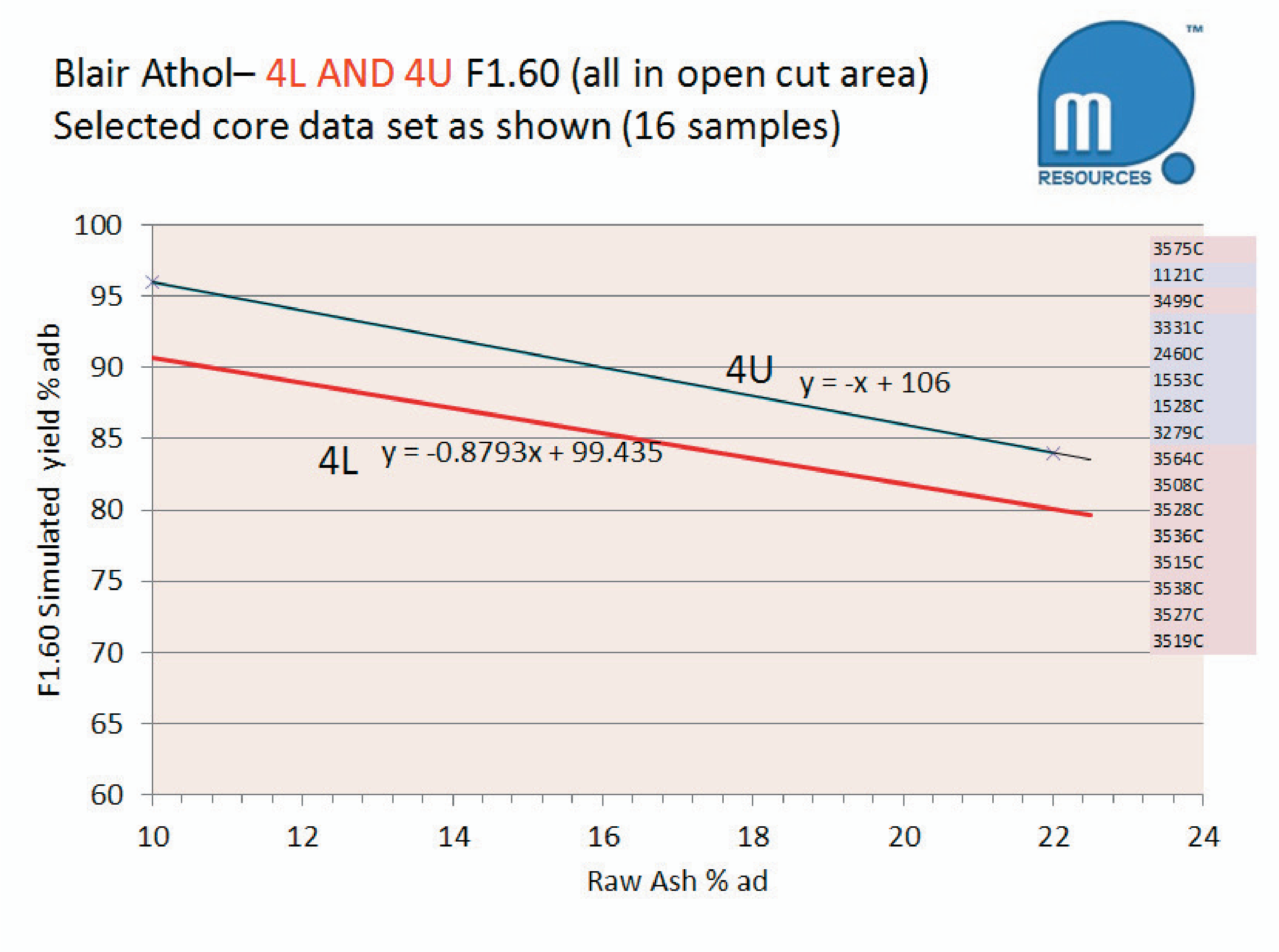
**Table 7.1 – Loss and Dilution Factors**

| Item | Unit | Value |
|---|---|---|
| Roof Loss | m | 0.15 |
| Floor Loss | m | 0.1 |
| Roof Dilution | m | 0.05 |
| Floor Dilution | m | 0.05 |
| Diluent Density | t/bcm | 2.2 |
| Diluent Ash | % | 80 |

### 7.3.2 Coal Product Estimation

The coal product has been estimated using a combination of bypass and washed product. The washed product is based upon the Ash Yield curves shown in Figure 7.4 which produced a 10% ash product for 4 Upper and 11.7% ash product for 4 Lower. These curves were developed by MResources, experts in the field of coal quality. The F1.60 cutpoint was assessed as the most likely cut point to achieve the expected product ash for the nominate product specification. The target product specification is 12.5% ash. An insitu ash cutoff of 15.5% was applied to the 4 Upper Seam as the bypass limit. 4 Upper seam coal that is within this limit is bypassed otherwise the coal is washed. The scalped portion is also sent to the CPP to be washed. The bypass and washed product were weight averaged to achieve 12.5% as total product.

**Figure 7.4 – Ash Yield Curves**




## 7.4 Equipment Waste Allocation

The final stage of the development of the mining model involves the allocation of the various waste layers to the most appropriate removal categories. For the purposes of this study, this is limited to assigning each waste layer to unit cost categories for margin ranking purposes, with allowance for bench and ramp rehandle, doze to final volumes and so on. The general allocation rules that have been applied are:

1. **Spoil Layer** – The top layer of waste has been assigned to spoil and has been allocated to dozing or dragline to remove the waste.

2. **Main Waste Layers** – Provided it exceeds 10 metres in thickness, the main waste layers is assumed to be blasted and all or a 50m horizon proportion is allocated to dragline to spoil across into the old pit area. The remaining waste is removed by trucks

3. **Partings Layers** within coal working sections have been modelled in some areas. If the partings layers are less than 0.3m in thickness, they have either been assumed mined with the coal seams as dilution or added to the adjacent waste layer as appropriate. Remaining partings layers have been handled and costed separately.

# 8 COAL QUALITY

## 8.1 Product Specification

The product coal for Blair Athol Mine is a low energy, high moisture bituminous coal. The indicative product specifications for the 12.5% ash product is displayed in Figure 8.1. The product specifications were developed by MResources.

**Figure 8.1 – 12.5% Ash Product Indicative Specification**

Indicative Product Specification
Project BILL
12.5 % (adb)
Washed / by pass composite

Revised
15/03/2013

| | | | AS RECEIVED | AIR DRIED | DRY | DRY ASH FREE |
|---|---|---|---|---|---|---|
| Moisture (%): | Total | | 18.0 | | | |
| Proximate Analysis (%) : | Inherent Moisture | | | 6.7 | | |
| | Ash | | 11.0 | 12.5 | 13.4 | |
| | Volatile Matter | | 23.1 | 26.3 | 28.2 | 32.6 |
| | Fixed Carbon | | 47.9 | 54.5 | 58.4 | |
| Total Sulphur (%): | | | 0.27 | 0.31 | 0.33 | 0.39 |
| Calorific Value : | Gross | (kcal/kg) | 5556 | 6320 | 6776 | 7828 |
| | | (MJ/kg) | 23.26 | 26.46 | 28.37 | 32.75 |
| | | (Btu/lb) | 10000 | 11380 | 12200 | 14080 |
| | Net | (kcal/kg) | 5291 | 6000 | 6500 | 7500 |
| | | (MJ/kg) | 22.13 | 25.17 | 27 | 31.16 |
| | | (Btu/lb) | 9509 | 10817 | 11597 | 13390 |
| | Gross-Net | (kcal/kg) | 265 | | | |
| Ultimate Analysis (%) : | Carbon | | 58.6 | 66.6 | 71.4 | 82.5 |
| | Hydrogen | | 3.3 | 3.8 | 4.0 | 4.7 |
| | Nitrogen | | 1.4 | 1.6 | 1.7 | 2.0 |
| | Oxygen by difference | | 7.4 | 8.5 | 9.1 | 10.47 |
| | Sulphur | | 0.28 | 0.32 | 0.34 | 0.40 |
| Ash Analysis | $SiO_2$ | 71.0 | | $K_2O$ | 1.5 | |
| (% in dry ash) | $Al_2O_3$ | 23.2 | | $TiO_2$ | 0.09 | |
| | $Fe_2O_3$ | 1.6 | | $Mn_3O_4$ | 0.02 | |
| | CaO | 0.4 | | $SO_3$ | 0.05 | |
| | MgO | 0.29 | | $P_2O_5$ | *0.00* | |
| | $Na_2O$ | 0.96 | | Total | 99 | |
| HGI: | 70 est | | | | | |
| Ash Fusion Temperatures (°C): | | | Reducing | Oxidising | | |
| | Deformation | | 1560 | 1585 | | |
| | Sphere (Softening) | | 1600 | 1600 | | |
| | Hemisphere | | 1600 | 1600 | | |
| | Flow | | 1600 | 1600 | | |
| Trace Elements (mg/kg) db: | Arsenic | 6 - 9 | Molybdenum | 4.00 | | |
| | Boron | 25 | Nickel | 25 | | |
| | Cadmium | 0.03 | Lead | 9.0 | | |
| | Chromium | 12 | Selenium | 0.63 | | |
| | Copper | 16 | Vanadium | 19 | | |
| | Fluorine | 80 | Zinc | 45 | | |
| | Mercury | 0.07 | | | | |
| Topsize (mm) nominal: | 50 | | | | | |
| Other: | | | | | | |

## 8.2 Trace Elements

In general the level of trace elements in Blair Athol coal is at or towards the higher levels for Australian coals particularly for arsenic, fluorine, molybdenum and zinc and on an international comparison. However, a Wood Mackenzie report on the marketability of this coal (March 2013) states, "*Trace elements are not expected to have any impact on marketability and any acceptance issues that may arise would only occur at a plant level.*"

## 8.3 Spontaneous Combustion

Low rank coals are porous and thus display high surface areas relative to higher rank coals. They are also more reactive to oxygen at the surface.

Thus the potential for a higher propensity of spontaneous combustion once the coal is exposed to the atmosphere.

Means to control spontaneous combustion events are now well established and must be incorporate in all facets of mine and stockpile design. Operating practices reflect this aspect of the coals (eg storage time, stockpile size limits, reduction of rilled coal layers, compaction etc).

# 9 MARGIN RANKING

## 9.1 Mining and Processing Costs

The economic pit limits were determined through a margin rank analysis in combination with a schedule where the bypass raw ash was maximised while delivering the 12.5% product ash requirement. Increasing the bypass raw ash cut off enabled the economic limit to be adjusted, due to the CPP operating cost savings.

Table 9.1 lists the proposed costs associated with waste removal, coal mining, processing, shipping, and royalties paid that were used in the margin rank.

**Table 9.1 – Mining, Processing and Royalty Costs.**

| Item | Unit | |
|---|---|---|
| Rehabilitation | AUD / Ha | 51,000 |
| Drill and Blast | AUD / bcm | 1.00 |
| Rip Parting | AUD / bcm | 0.30 |
| Truck and Excavator Waste | AUD / bcm | 3.35 |
| Dragline Waste | AUD / $m^3$ | 1.30 |
| Dozer Push | AUD / $m^3$ | 1.30 |
| ROM Coal Mining (inc. Rehandle) | AUD / ROM t | 4.00 |
| Pit Services | AUD / ROM t | 0.85 |
| Sustaining Capital | AUD / ROM t | 1.90 |
| CHPP Operating Costs | AUD / ROM t | 5.00 |
| Stockpile Management | AUD / ROM t | 0.80 |
| Load out | AUD / Prd t | 2.50 |
| Rail | AUD / Prd t | 15.00 |
| Port/Demurrage | AUD / Prd t | 5.00 |
| Overhead costs | AUD / Prd t | 8.10 |
| Fugitive Emissions | AUD / Prd t | 1.50 |
| **Royalties** | | |
| up to and including $100 per tonne | % | 7 |
| over $100 up to including$150 per tonne | % | 12.5 |
| above $150 per tonne | % | 15 |
| Research Levy | AUD / Prd t | 0.2675 |

## 9.2 Coal Pricing Assumptions

A Wood Mackenzie report on the marketability of this coal (March 2013) referred to the coal as a coal product that could be sold into the rapidly growing Chinese and South East Asian import markets, but could also be sold into the traditional North Asian markets of Japan, South Korea and Taiwan, either as a standalone product or a blend coal. The quality of the coal is such that is would be expected to receive a price related to the Newcastle benchmark, albeit with a cargo tonnage adjustment for moisture being applied. The Cargo adjustment would range from 78% to 85% of the Newcastle Benchmark depending on the market conditions.

The coal price applied for the thermal product is AUD$75/t. This is an average price based upon the lower and upper range of the cargo adjustment factor applied to the Platts Forecast (23/7/2013) over the next few years. These forecast prices are displayed in Table 9.2. The US Exchange rate is assumed as US$0.90/AUD.

**Table 9.2 – Platts Newcastle Thermal Coal Sales Price Forecast (23/7/2013)**

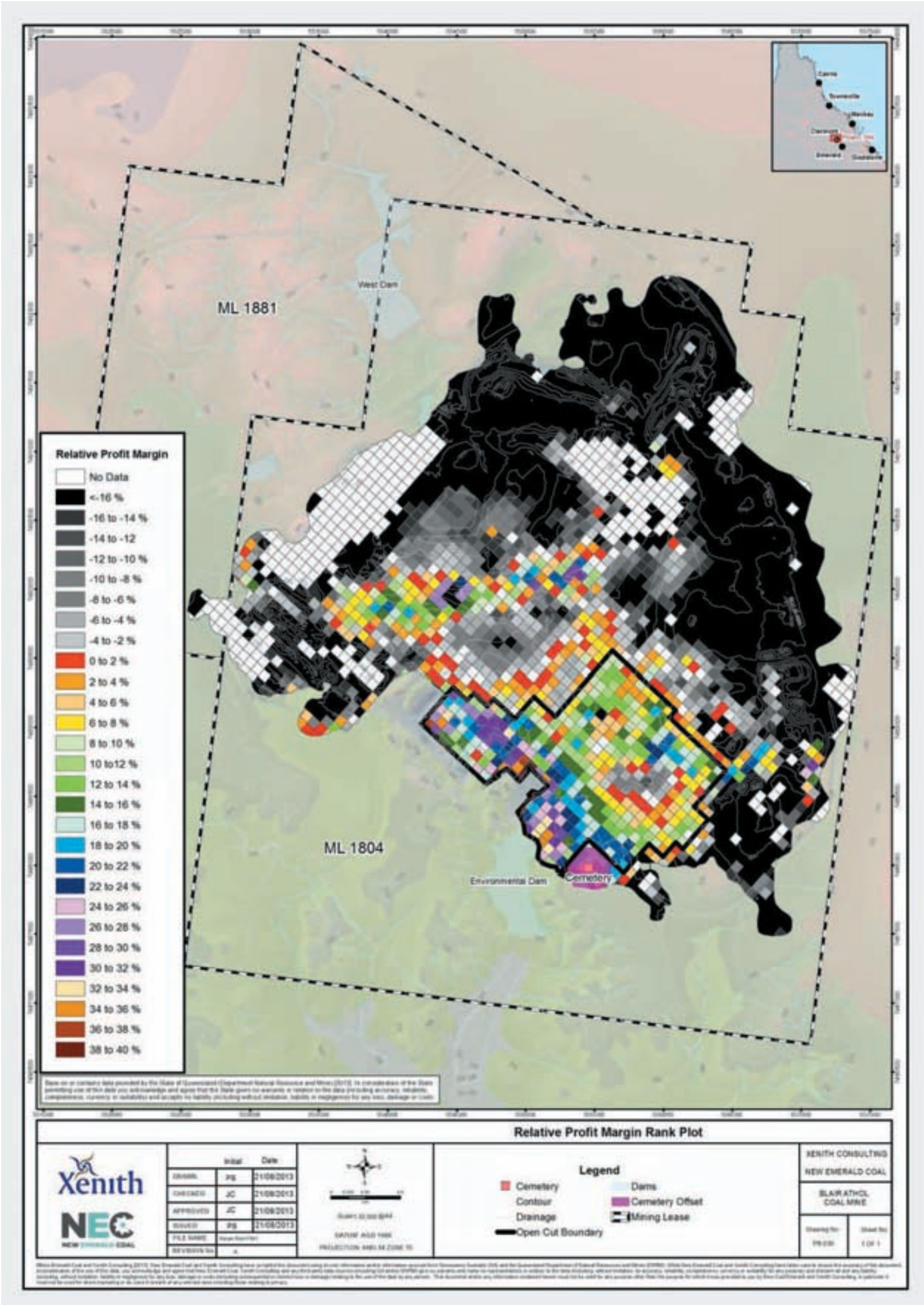
| Product | Unit | 2013 | 2014 | 2015 |
|---|---|---|---|---|
| Thermal Coal | US$/t | 78.90 | 84.40 | 89.00 |

## 9.3 Margin Rank Results

The margin rank displayed in Figure 9.1 shows the margin in terms of the ratio Relative Profit Margin (RPM) which is simply the margin to cost ratio. The south west area of the deposit is the most attractive which is outlined by the thick black boundary representing the economic pit limits. The limit is determined at approximately 6-8% RPM but also establishing a practical pit arrangement. A zone around the middle of the economic pit shows a small group of blocks that indicate that they are uneconomic as individual blocks due to a spoil peak in this location. However, working through this zone provides access to very economic areas and enables good strike length for efficient operations which warrants the inclusion of this zone within the economic pit limits.

An area to the east shows marginally economic blocks which are in the ramp 1 area and have a significant quantity of pit water filling this void. The cost of managing this water is expected to render these blocks uneconomic as a standalone open cut pit. Hence there has been no pit defined in that area.

**Figure 9.1 – Margin Rank Results**



# 10 RESERVE ESTIMATE

## 10.1 Reserve-Resource Clarification

- Proved Reserves are subsets only of areas of Measured Resources category;
- Probable Reserves are subsets of areas of Indicated Resources category. No Measured Resources have been converted to Probable Reserves due to the level of certainty of the modifying factors.

## 10.2 Physical Limits

The open cut pit is bounded to the south by the existing mining faces. The south east is restricted by the proximity of a local cemetery which has incurred a 50m standoff and subsequent batters to the pit floor. The remainder of the open cut pit has been limited through the margin rank analysis. Refer to Section 8.

### 10.2.1 Lease boundaries

The Reserve is wholly contained within ML1804 and are not limited by the proximity of the lease boundaries.

### 10.2.2 Creeks

The South Eastern Diversion Drain requires further diverting to enable the full extraction of the Reserves indicated. The approval of the diversion has been granted and has commenced, however the work had been halted with cessation of mining.

### 10.2.3 Cemetery

The south east is restricted by the proximity of a local cemetery which has incurred a 50m standoff and subsequent batters.

## 10.3 Area Designations

Figure 10.1 and Figure 10.2 display the Proved and Probable areas that define the limits of the Reserve estimate for the seams 4 Upper and 4 Lower.

**Figure 10.1 – Reserve Area for 4 Upper Seam**

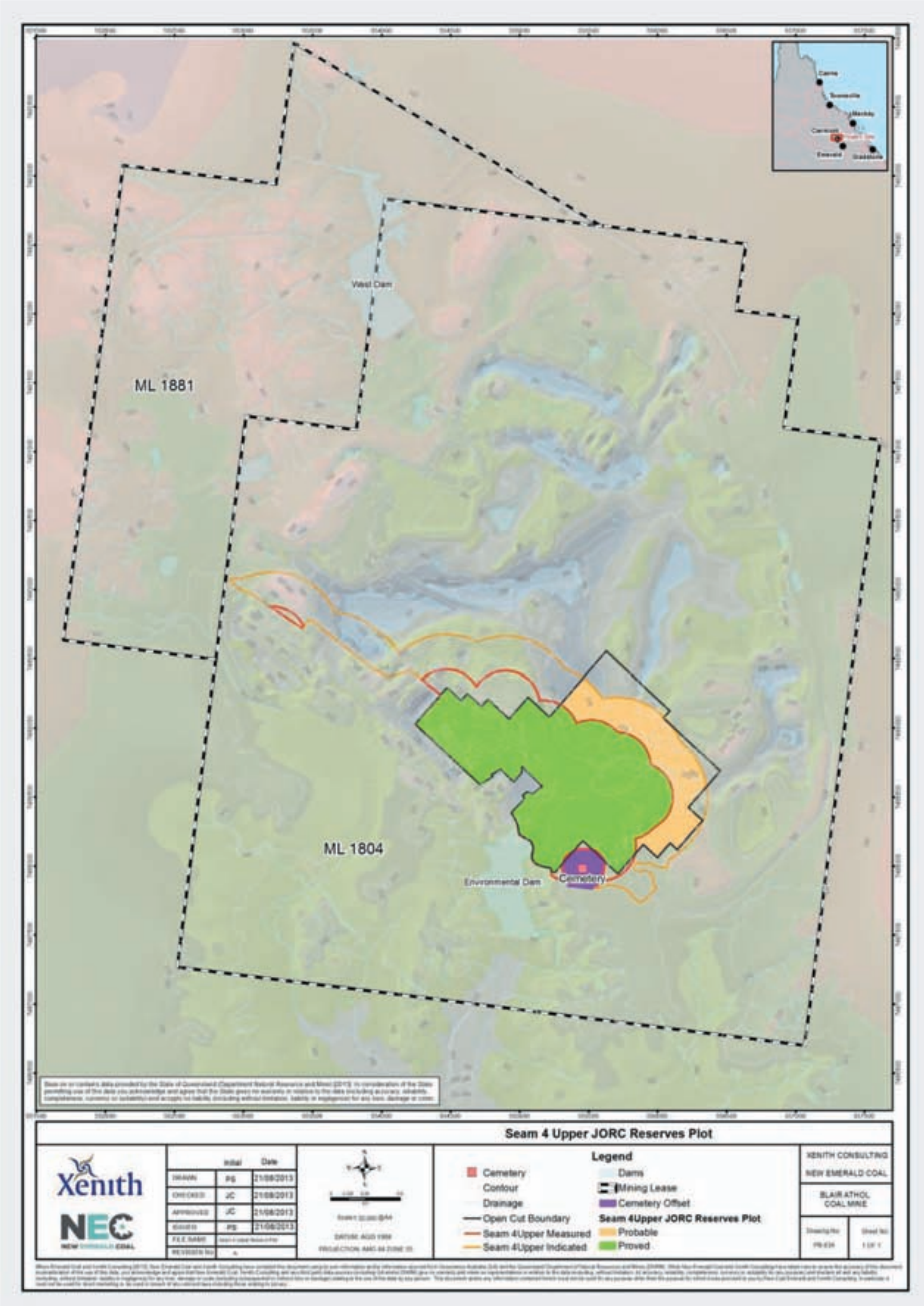
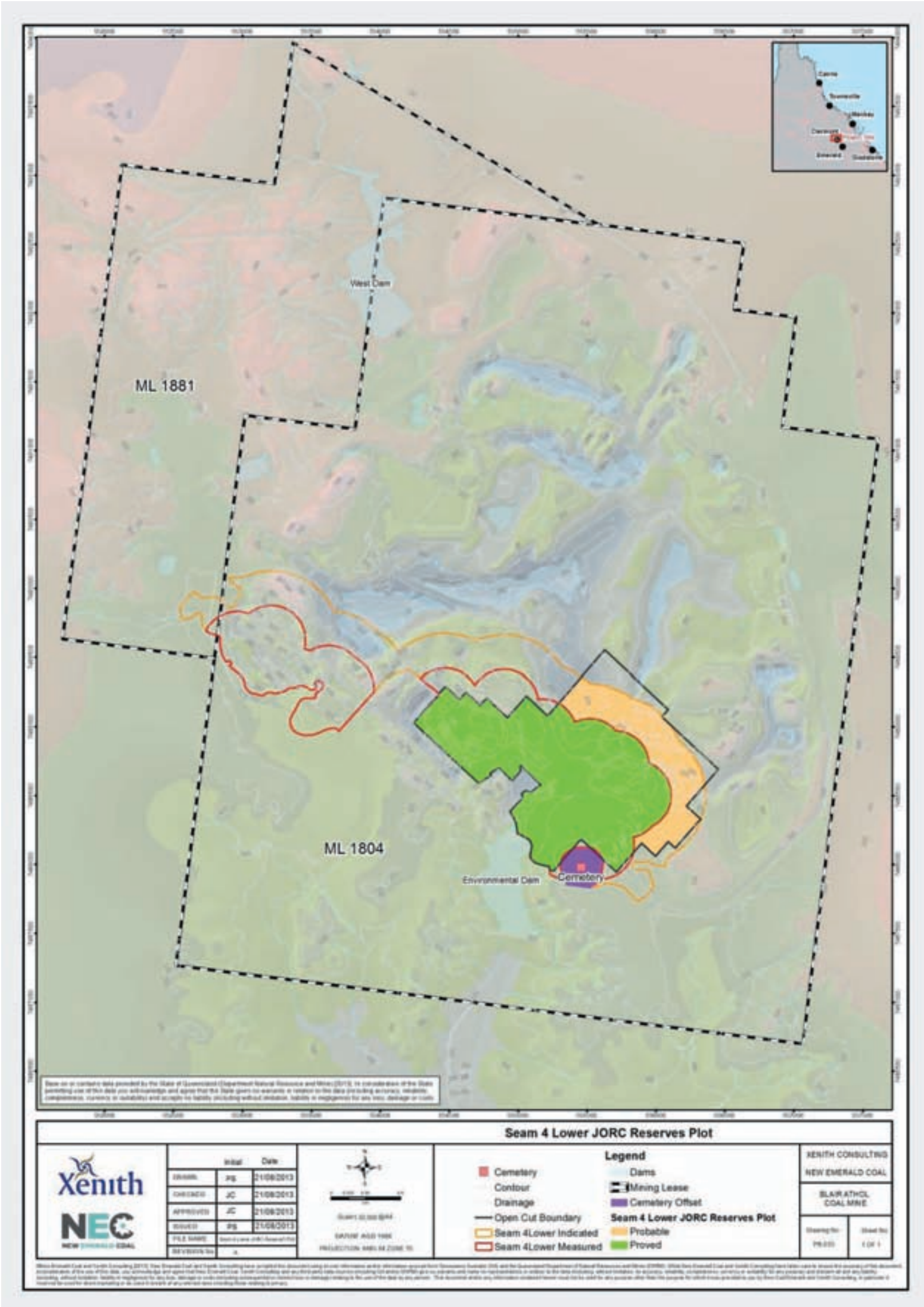


**Figure 10.2 – Reserve Area for 4 Lower Seam**



## 10.4 Reported Estimate

The total open cut coal reserves for Blair Athol Mine are presented in Table 10.1.

### 10.4.1 Blair Athol Mine Open Cut Reserves Estimate

**Table 10.1 – Blair Athol Mine Open Cut Reserves Estimate**

| Coal Reserve (Mt ROM)* | 4 Upper | 4 Lower | TOTAL |
|---|---|---|---|
| Proved | 5.1 | 3.6 | 8.7 |
| Probable | 1.5 | 1.2 | 2.6 |
| **Total Coal Reserve** | **6.6** | **4.7** | **11.3** |
| ** At 17% ROM Moisture basis* | | | |

** Tonnages and qualities in the above table are expressed on a "ROM" basis, incorporating the effects of mining losses and dilution, and on a 17.0% ROM moisture basis.*

## 10.5 Marketable Coal Reserves

### 10.5.1 Open Cut Marketable Reserves for Blair Athol Mine

The total Open Cut Marketable Coal Reserves for Blair Athol Mine are shown in Table 10.2.

**Table 10.2 – Blair Athol open Cut Marketable Coal Reserve Estimate**

| Type | Marketable Coal Reserve (Mt Product)** | 4 Upper | 4 Lower | TOTAL |
|---|---|---|---|---|
| **Washed** | Proved | 0.8 | 2.6 | 3.4 |
| | Probable | 0.1 | 0.8 | 0.9 |
| | **Washed Subtotal** | **0.9** | **3.4** | **4.3** |
| **Bypass** | Proved | 4.0 | 0.0 | 4.0 |
| | Probable | 1.3 | 0.0 | 1.3 |
| | **Bypass Subtotal** | **5.2** | **0.0** | **5.2** |
| **Product** | Proved | 4.8 | 2.6 | 7.3 |
| | Probable | 1.4 | 0.8 | 2.2 |
| | **Total Marketable Coal Reserve** | **6.1** | **3.4** | **9.5** |

## 10.6 Accuracy of Estimate

The depletion limits are adopted from the survey completed at the cessation of mining by Queensland Coal Pty Ltd so no arithmetic adjustments have been made to take into account post-survey as there has been no change.

Small differences may be present in the totals due to tonnes information being rounded so as to reflect the usual uncertainty associated with the estimate.