HUNTER ENVIRO-MINING (OPERATIONS) PTY LIMITED

PRELIMINARY ASSESSMENT

CHITTER AND TAILINGS RECLAMATION

CESSNOCK LOCAL GOVERNMENT AREA

August 2006

PRELIMINARY ASSESSMENT

Contents

List of Tables

List of Photographs

Abbreviations and definitions

ABE	Aberdare East
AHD	Australian Height Datum
Chitter	Course carbonaceous coal reject
ECRTN	Environmental Criteria for Road Traffic Noise
EMP	Environmental Management Plan
HEM	Hunter Enviro-Mining Pty (Operations) Pty Limited
INP	Industrial Noise Policy
L90	Background Noise Level (noise exceeded 90% of time)
Leq	Equivalent Noise Level (average noise level)
OH & S	Occupation Health and Safety
RME	Richmond Main East
Tailings	Fine carbonaceous coal reject

1 PROJECT BACKGROUND

The Hebburn No 3 Project involves the clean-up and rehabilitation of the former Hebburn No. 2 Colliery site near Cessnock and several other coal chitter and tailings emplacements in the area. A coal washery was constructed at the Hebburn No.2 chitter and tailings emplacement and has been in operation since 5th December 2005. The washery processes material collected from the chitter and tailings emplacements to extract coal suitable for export which is then used to finance the rehabilitation project. The project is being conducted by Hunter Enviro Mining (Operations) Pty Ltd (HEM), a NSW based mine rehabilitation company, which employs a number of local employees and contractors.

The Hebburn No.3 processing plant obtained development consent in 2001 to extract and process approximately 0.7 million tonnes (Mt) of carbonaceous material from the derelict Hebburn No.2 mine site. Since that time the project was modified to incorporate the processing of smaller carbonaceous emplacements (satellites) in the local area to supplement resources at the Hebburn No.2 site, making a total resource of approximately 2.2Mt.

A significant proportion of the estimated coal in the emplacement at Hebburn No 2 and at several of the other emplacements in the area has burnt since investigations began in 1998. This has reduced the overall coal resource available to support the projects operations and has also shortened the planned project life.

HEM has identified additional coal chitter and tailings emplacements that would benefit from an environmental clean up and rehabilitation which would also assist in extending the projects life and the jobs of employees.

The areas identified are (refer **Figure 1**):

1. An estimated 1.7MT of chitter and tailings south of the Aberdare East Rail Siding emplacement;

2. An estimated 1 MT of chitter and tailings adjacent to the former Neath washery site; and

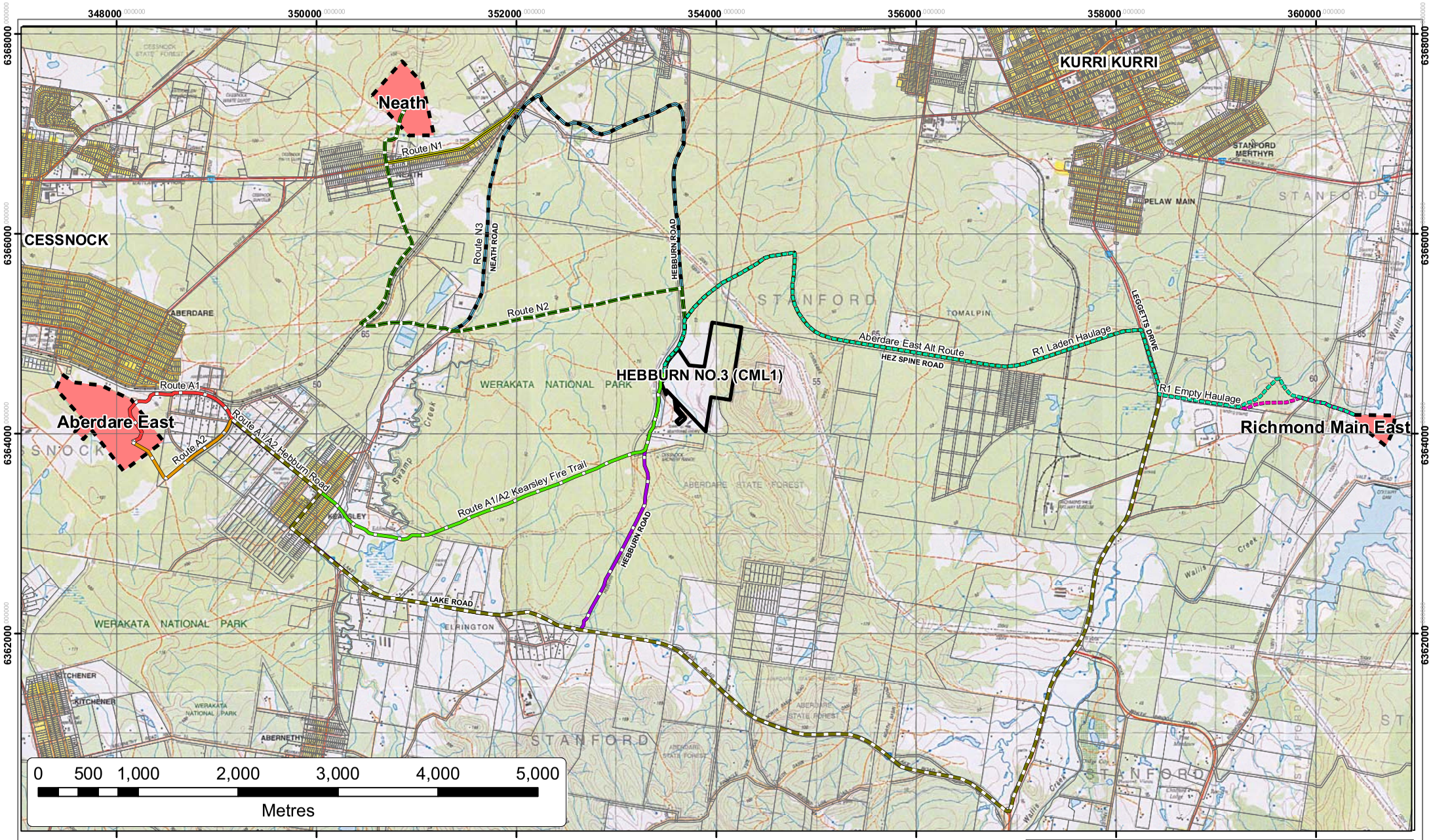
3. An estimated 160,000 tonnes of chitter at Richmond Main East.

HEM is seeking to clean up and rehabilitate these three areas by collecting and transporting the material from emplacements to the Hebburn No 3 washery and processing this material to extract saleable coal.

HEM has identified several potential haulage routes utilising both public roads and tracks. Sections of these haulage routes could significantly reduce environmental and community impacts from the movement of trucks for haulage of the emplaced material to the washery at Hebburn. These sections of haulage routes are existing fire trails through the Werakata National Park. The fire trails would be upgraded by HEM with access only required for the duration of the project. If the fire trails are used, significant benefits could be attained by the local community, in the management of the Werakata National Park and the community and emergency services, particularly the Rural Fire Service.

The environment and local community will benefit from:

1. Remove of a potential ignition source for bushfires from spontaneous combustion (see **Photograph 1**);



HUNTER ENVIRO-MINING (OPERATIONS) PTY LIMITED

PART 3A - CHITTER AND TAILINGS REHABILITATION

LOCATION AND HAULAGE

Drawn: JPB	12 July 2006	Checked: AW	24 July 2006
File Name: FIGURE 1_LOCATION AND HAULAGE 240706			**FIGURE 1**

2. The removal of the emplacements which leach acid and salt (see **Photograph 2** attached); and

3. The removal of exotic plant life and the removal of the visual impact.

If the fire trails are used, all of these benefits could be achieved with the use of a haul route with minimal impact. Allowing these existing trails to be used would provide improved and safer access for the community and emergency services, particularly the Rural Fire Service.

2 PROJECT DESCRIPTION

2.1 Introduction

The proposed project will involve the remediation of three coal chitter and tailings emplacement areas in the Cessnock local government area. The remediation will be facilitated by the removal of chitter and tailings by front-end loader or excavator and haulage by road registered trucks to the Hebburn No.3 washery for processing to produce a saleable product coal and construction fill.

The removal and direct haulage of some chitter and tailings to local Power Stations will also be investigated.

2.2 Project Approval

The three sites proposed for remediation are:

- Aberdare East;
- Neath; and
- Richmond Main East.

A summary of these coal chitter and tailings emplacements is described below.

2.2.1 Coal Chitter and Tailings Emplacements

2.2.1.1 Aberdare East

Name	**Aberdare East (ABE)** The Aberdare East Resource has been sub-divided into two areas, these being: • Tailings Dams; and • Chitter Resource. A separate resource called the Aberdare East Rail Siding has been removed under S11A of the Mining Act 1992 and State Environmental Planning Policy No 55 – Remediation of Contaminated Lands, and is not covered by this application.
Location	South of the South Maitland Railway and Cessnock Street, Aberdare (**Figure 1**). Former Aberdare Colliery and Aberdare East Washery Approximate centre of the site is 347710E 6364550N (MGA Zone 56)
Property Description	Lot 566 DP 821172, Adjacent to the South Maitland Railway and Cessnock Street, Aberdare
Estimated Chitter and Tailings Emplacement Quantity	• Tailings Dams – 1.5Mt • Chitter Resource – 0.2Mt

General Chitter and tailings Emplacement Characterisation	• The Chitter Resource is a flat chitter emplacement with a good topsoil and clay cover, predominantly grassed with some small woody vegetation. • The Tailings Dams are a 'turkeys nest' emplacement, with dam walls constructed of chitter. The site is a capped with clay and is predominantly grassed with some woody vegetation. There is a significant acid drainage problem emanating from this emplacement.
Land Owner / Leases applicable to land	State of New South Wales Currently leased to Hunter Plant Operation and Training School (HPOTS), (Lease No.10224)
Cessnock City Council LEP Zoning	Rural 1(a)
Potential Haulage Routes	There are several potential haulage routes that have been identified as shown in Figure 1 and described below: A1. Entry/exit through Government Circuit adjacent to South Maitland Railway, onto Caledonia Street, Allandale Street, Lake Road and Hebburn Road to the processing plant; A2. Entry/exit through southern entry of Government Circuit opposite Ellalong Street, Caledonia Street, Allandale Street, Lake Road and Hebburn Road to the processing plant; The above haulage routes could also be coupled with access through the Werakata National Park immediately south west of the processing plant. Combinations of two of the above haulage routes may also prove beneficial from an operational and environmental perspective. The preferred haulage route will be subject to land owners consent and traffic, noise, flora, fauna and dust impact assessments. Haulage of some material directly to local Power Stations will also be investigated, the transport route selection for this haulage would be subject to the traffic impact assessment.

2.2.1.2 Neath

Name	**Neath** The Neath Resource has been sub-divided into four areas: • Washery – Chitter and tailings emplacements east of former coal washery; • Southern Tailings Dam Toe – Chitter emplacement

	north west of former coal washery area and east of the southern tailings dam wall; • Southern Tailings Dam – Tailings dam west of washery chitter and tailings; and • Northern Tailings Dam – Tailings dam at northern extent of site, to the north of the southern tailings dam.
Location	North of Maitland Road, Neath, off David Street. Site of the former Neath Colliery and coal washery (**Figure 1**). Approximate centre of the site is 350847E 6367300N (MGA Zone 56).
Property Description	Crown land (Pt 755259), under reserve R101448 for future public requirements adjoining Lot 102 DP755259, Carrs Road, Neath Crown land (Pt 755215) under reserve R101448 for future public requirements adjoining Lot 393 DP755215, David Street, Neath.
Estimated Chitter and tailings Emplacement Quantity	• Washery - 111,905t • Southern Tailings Dam Toe - 82,117t • Southern Tailings Dam - 457,763t • Northern Tailings Dam – 283,814t
General Chitter and tailings Emplacement Characterisation	• Washery – Chitter dumps and tailings dams built with chitter walls, capped with topsoil, light woody vegetation and grass cover. • Southern Tailings Dam Toe – Chitter emplacement at toe of southern tailings dam, probable co-contributor to significant acid water emanating from site, has a sporadic grass cover and occasional woody vegetation. • Southern Tailings Dam – Tailings dam, capped with layer of chitter and topsoil, dam wall also chitter, grass cover, probable co-contributor to significant acid water emanating from site. • Northern Tailings Dam – Tailings dam, capped with layer of chitter and topsoil, dam wall also chitter, grass cover.
Land Owner / Leases applicable to land	Crown HEM hold Exploration Licence 5410 issued by Department of Primary Industries- Minerals HEM hold Investigation Licence 324246 issued by the Department of Lands.

Cessnock City Council LEP Zoning	Rural 1(a)
Potential Haulage Routes	There are several potential haulage routes that have been identified as shown in Figure 1 and described below: N1. Entry/exit David Street, east on Maitland Road, cross South Maitland Railway north on Neath Road, south east on power easement (Energy Australia) to Hebburn Road, south on Hebburn Road to processing plant and return via same route. N2. Entry/exit through David Street, across Maitland Road continue on David Street to South Maitland Railway in south east direction, go south along western edge of railway line to Energy Australia easement, then east along Energy Australia easement across Neath Road and follow fire trail through Werakata National Park to Hebburn Road then south on Hebburn Road to processing plant and return via same route. N3. Entry/exit through David Street, across Maitland Road continue on David Street to South Maitland Railway in south east direction, go south along western edge of railway line to Energy Australia easement, then east along Energy Australia easement to Neath Road, north on Neath Road, south east on power easement (Energy Australia) to Hebburn Road, south on Hebburn Road to processing plant and return via same route. Combinations of two or more of the above haulage routes (or portions of haulage route) may also prove beneficial from an operational and environmental perspective. The preferred haulage route will be subject to land owners consent and traffic, noise, flora, fauna and dust impact assessments. Haulage of some material directly to local Power Stations will also be investigated, the transport route selection for this haulage would be subject to the traffic impact assessment.

2.2.1.3 Richmond Main East

Name	Richmond Main East (RME)
Location	North of Richmond Vale Road and East of the Kurri-Mulbring Road, Richmond Vale. (**Figure 1**). Approximate centre of the site is 360642mE 6364097mN (MGA Zone 56)
Property Description	Lot 2 DP 986081, Avery's Lane, Richmond Vale, Parish of

	Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland Lot 20 DP 755260, Avery's Lane, Richmond Vale, Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland. Lot 19 DP 1061633, Richmond Vale Road, Richmond Vale, Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland.
Estimated Chitter and tailings Emplacement Quantity	• RME - 160,000t
General Chitter and tailings Emplacement Characterisation	RME - The chitter appears to have been capped with topsoil and grassed, but dump edges up to 10 metres high were not battered and the steep slopes are poorly vegetated and inconsistent with the surrounding landscape.
Land Owner / Leases applicable to land	Freehold
Cessnock City Council LEP Zoning	Rural 1(a)
Potential Haulage Routes	There are several potential haulage routes that have been identified as shown in Figure 1, and described below, all haulage routes utilise existing bush tracks: R1. Exit west along graded abandoned railway easement through Lot 19 DP1061633 into ALC 4242, south into Lot 14 DP716009 running along northern side of airstrip to the Kurri Kurri-Mulbring Road approximately 600m south of the HEZ Spine Road. North on Kurri-Mulbring Road, west on the HEZ Spine Road, south west on Hospital Road, south on Hebburn Road to Processing Plant. Return via same route. The preferred haulage route will be subject to land owners consent and traffic, noise, flora, fauna and dust impact assessments. Haulage of some material directly to local Power Stations will also be investigated, the transport route selection for this haulage would be subject to the traffic impact assessment.

2.2.2 Removal Methodology

The removal of the coal chitter and tailings from each of the three emplacements areas would be undertaken using front end loaders or excavators loading into trucks. Trucks would then haul material along one or a combination of possible haulage routes to the Hebburn No.3 processing plant.

Given the Hebburn No.3 Processing Plant hauls product coal to Port Waratah there is a potential opportunity to minimise traffic impacts and utilise a back haul arrangement where trucks returning empty from Port Waratah will go directly to one of the sites (RME or Neath predominantly) and collect a load of carbonaceous chitter and tailings before returning to the processing plant.

2.2.3 Final Landform

The final landform at each site will be stable and were possible mirror the original topography. Some areas of the site will not be possible to return to the original landform. Where this is not possible a stable self draining landscape will be created. The final landuse and hence revegetation of the sites are subject to negotiations with the respective land holder.

All sites will be at a minimum made to a stable landform with good vegetative cover.

2.2.4 Chitter and Tailings Haulage

The Hebburn No.3 Processing Plant generally requires 70-100,000 tonnes of chitter and tailings per month at current processing rates to meet product coal demand at the Port. To maintain these rates assuming a 5 day week, 10 hour day, up to 17 laden trucks per hour are required across the three nominated sites, assuming standard 27 tonne semi trailers. This rate could be reduced considerably if larger trucks were adopted on appropriate haulage routes.

The ultimate haulage rates will aim to maintain the existing intersection level of serviceability and be dependant upon discussions with Council, Roads and Traffic Authority and other relevant stakeholders. Rates may also be reduced following an assessment of noise impacts associated with the haulage.

2.2.5 Hebburn No.3 Processing and Haulage

The Hebburn No.3 Processing Plant obtained development consent in 2001 (DA 8/2001/740/1) to extract and process approximately 0.7 million tonnes (Mt) of carbonaceous material from the derelict Hebburn No.2 mine site. Since that time the project was modified to incorporate the processing of smaller carbonaceous emplacements (satellites) in the local area to supplement resources at the Hebburn No.2 site, making a total resource of approximately 2.2Mt (8/2001/740/2). From this resource it was envisaged that approximately 1.1Mt of product would be produced and transported to Port Waratah Services Ltd.

The processing of the chitter and tailings produce the following:

- Product coal for haulage to Port Waratah and subsequent export;
- Construction fill material;
- Coal and chitter and tailings slimes that are pumped back into Hebburn No.2 Underground workings.

2.2.5.1 Product Coal Haulage

Product coal haulage from the Hebburn No.3 Processing Plant is undertaken by road registered trucks to Port Waratah. The development consent was modified in 2003 to increase coal haulage from eight (8) laden trucks of coal per hour to ten (10) laden trucks per hour. The life of the project in 2003 was also approved for 21-24 months.

Given current yield and resource complications experienced at Hebburn No.3 it is difficult to estimate what impact the processing of the additional tonnages proposed in this application will have on the total product coal generated by the plant. It is however expected that there will be an increase in product coal and construction fill generated at the Hebburn No.3 Processing Plant.

HEM will not seek to increase the rate of haulage from the plant, but rather increase the duration of the modified development consent (DA 8/2001/740/2) beyond the 21-24 months originally planned.

3 APPROVAL AUTHORITY AND RELEVANT LEGISLATION

The approval authority for the project will be the Minister for Planning pursuant to the provisions of Part 3A (Major Projects) of the Environmental Planning and Assessment (EP&A) Act 1979 (as amended) and State Environmental Planning Policy (Major Project) 2005, (as amended).

Coal mining is listed as a Part 3A project within Schedule 1 of State Environmental Planning Policy (Major Project) 2005. While the remediation of the site through the removal of the chitter and tailings is not strictly mining, HEM has been informed by the Department of Primary Industries – Minerals that the proposed removal of chitter and tailings from the sites identified in *Section 2* of this document is considered a mining activity due to the size of the chitter and tailings emplacements. As such HEM's reclamation of chitter and tailings will need to comply with the newly proclaimed provisions of Part 3A of the EP&A Act 1979 and Environmental Planning and Assessment Regulations 2000. The new Part 3A will integrate the approvals under eight separate acts and the consideration of conservation threatened species obligations.

Lands identified as being impacted by coal mining associated with HEM's reclamation of chitter and tailings are zoned 1(a) Rural 'A' Zone pursuant to the provisions of Cessnock City Council Local Environmental Plan 1989. Mining in this zone is a permissible form of development subject to consent.

Lands identified as being impacted by the proposed haulage routes are permissible within the Cessnock City Council Local Environmental Plan 1989 subject to authorisation by or under the National Parks and Wildlife Act 1974. Correspondence with the Department of Environment and Conservation - National Parks and Wildlife Service has indicated that haulage along the proposed routes through National Park may be permissible subject to ministerial consent and completion of relevant studies and applications.

HEM's reclamation of chitter and tailings is not prohibited by an environmental planning instrument applying to the lands.

3.1 Full Approval Sought

HEM will be seeking a project approval from the Minister under Part 3A of the EP&A Act, 1979 for the reclamation of chitter and tailings from the three sites specified.

3.2 Title Details

Property descriptions for all lands impacted by chitter and tailings emplacement removal or potential haulage routes is shown within **Table 3.1** and illustrated in **Figure 1**.

Table 3.1: Property descriptions for all potentially impacted lands.

Site Name	Chitter and Tailings Emplacement Title Details	Potential Haulage Routes Property Details
Aberdare East	Lot 566 DP 821172	Lot 567 DP 821172

		Werakata National Park (Pt 755259) adjoining the northern side of Lake Road, including Hebburn Road, Kearsley Werakata National Park (Pt 755259) surrounding Lot 260 DP 257594, Kearsley.
Neath	Crown land (Pt 755259), under reserve R101448 for future public requirements adjoining Lot 102 DP755259, Carrs Road, Neath Crown land (Pt 755215) under reserve R101448 for future public requirements adjoining Lot 393 DP755215, David Street, Neath.	Crown land (Pt 755259), under reserve R101448 for future public requirements located between Maitland Road and Neath Road, Neath Lot 129, DP 755259, west of South Maitland Railway, Neath Lot 328, DP 821117, east of South Maitland Railway Neath Lot 1 DP 791531, Neath Road, Neath Werakata National Park (Pt DP 755259) located between Neath Road and Hebburn Road, Abermain Lot 58 DP 755259, east of Neath Road, Neath
Richmond Main East	Lot 2 DP 986081, Avery's Lane, Richmond Vale, Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland Lot 20 DP 755260, Avery's Lane, Richmond Vale, Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland. Lot 19 DP 1061633, Richmond Vale Road, Richmond Vale, Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland.	Crown Land described as ALC 4242, Kurri Kurri-Mulbring Road, Richmond Vale, Parish of Stanford, County of Northumberland. *(Haulage Route R1)* Lot 14 DP 716009, Kurri Kurri-Mulbring Road, Parish of Stanford, County of Northumberland *(Haulage Route R1 & R2)* Lot 25 DP 1033424, Richmond Vale Road, Richmond Vale Parish of Stanford, County of Northumberland and Parish of Stockrington, County of Northumberland. *(Haulage*

		Route R2) Lot 2 DP 533820, Kurri Kurri-Mulbring Road, Parish of Stanford, County of Northumberland. *(Haulage Route R2)* Lot 7 DP1037092, Cessnock Road, Weston, *(Haulage Route R1 & R2)* Crown Land described as ALC 4250, Hebburn Road, Abermain *(Haulage Route R1 & R2)*

4 ENVIRONMENTAL ASSESSMENT AND IDENTIFICATION OF CRITICAL ISSUES

The following provides a summary of environmental aspects associated with the local area and coal chitter and tailings emplacements. We have sought to identify critical issues associated with the development to assist the agencies involved in the Planning Focus Meeting, so that the Director-General can issue a comprehensive set of requirements for the project under Section 75F of the EP&A Act, 1979.

4.1 Site Background

The following sections briefly described the historical context of each of the sites proposed for removal of carbonaceous chitter and tailings.

4.1.1 Aberdare East

This area is adjacent to the former Aberdare Shaft Colliery Pit Top. The Aberdare Shaft Colliery commenced in 1904. A washery was built on site in 1957 and processed coal from mines such as Aberdare North Tunnel, Aberdare West Colliery, Aberdare Extended Colliery, Aberdare Seven Colliery and later the Aberdare East Colliery. In 1985 all pit-top structures, rail sidings, at the Aberdare Shaft Colliery were demolished and removed after all suitable materials were recovered for scrap. Colliery officials' houses constructed in 1905 were demolished and removed. The washery plant was dismantled in late 1982 after the Aberdare East Colliery and the Aberdare Shaft pit-top washery had ceased operations, and was transferred to Liddell Colliery.

Not all buildings were bulldozed on mine closure and most of the Aberdare East buildings remain today, used by the Hunter Plant Operator Training School (HPOTS). The coal laboratory at the Aberdare Washery site also remains and has been modified for use as a residence. There was a large washery at this site operating for a number of years, resulting in a large quantity of both coarse and fine rejects in various emplacements on the site.

Aberdare East has been the subject of numerous management plans and grants, to facilitate feasible strategies for remediation. While considerable derelict mine funds have been well directed in rehabilitation works in some areas of the site, there is still a significant acid mine drainage problem at the site. The removal of the source of the acid, through the removal of the carbonaceous chitter and tailings from the site would in the long term be the best solution to this problem.

4.1.2 Neath

The first train of coal was despatched from Neath on Tuesday 26th February 1907 by Wickham and Bullock Island Coal Company. Five shafts worked the coal in the area through the bord and pillar system of mining. In 1927 Cessnock Collieries Limited acquired the Neath Colliery. Open cut mining of the sub-crop coal began in 1949. Underground operations in the Neath lease holding stopped in 1957 In 1957 Cessnock Collieries Limited installed a simple washing plant at Neath Colliery pit-top. In 1959, open cut operations ceased and Caledonian Collieries Limited acquired the Neath holdings. Subsequently in 1960, Coal and Allied were formed through the

merger of J. & A. Brown Abermain - Seaham Collieries, J.A.B.A.S., and Caledonian Collieries Limited.

The washery was upgraded in 1964 and then processed 1250 tons per day up till 30th April 1988. Coal production from Aberdare North Tunnel was washed at Neath Colliery washery, then if necessary transported to Coal and allied Hexham Plant for blending, or alternatively despatched direct to Port Waratah for shipment. When Aberdare North Tunnel closed at the end of April 1988, so also did Neath Colliery washery.

Neath, like Aberdare East, has also been subject to numerous rehabilitation strategies and had significant funding injected to rehabilitate the site, however a significant acid mine drainage problem is still evident. The site has also been the subject of recent land care group efforts to attempt to neutralise acid using lime dosing, unfortunately the scale of resources available have not been an effective long term solution to the sites problems. The removal of the source of the acid, through the removal of the carbonaceous chitter and tailings from the site would in the long term be the best solution to this problem.

4.1.3 Richmond Main East

The emplacement is located in an area remote from any known mine site and was possibly a dump for chitter backhauled from J & A Brown's Hexham washing plant. The only evidence of European artifacts is a couple of rotted railway sleepers where it appears that a railway line was probably used to transport the chitter.

4.2 Climate

Over the year, the prevailing winds are aligned along northwest-southeast and southwest axes. This is common for most areas within the Hunter Valley. Summer winds are generally from the southeast, and in winter, northwest winds are more common. Long term meteorological parameters have been collected by the Bureau of Meteorology weather station at Nulkaba, approximately 9.5 km to the west of the proposed reprocessing operation. Table 4.2 provides a summary of local climatology.

Table 4.2: Climate Summary, Nulkaba Weather Station 1966-2001.

Parameter	Summer	Autumn	Winter	Spring
Mean Daily Min Temp (deg C)	17.0	12.0	5.0	10.7
Mean Daily Max Temp (deg C)	29.5	24.3	18.4	24.8
Mean Rainfall (mm)	257.7	204.1	126.7	172
Mean 9am Wind Speed (m/s)	2.9	2.8	3.3	3.7
Mean 3pm Wind Speed (m/s)	4.5	3.8	4.1	4.7

4.3 Soils

The sites are covered by emplaced material, however, beneath these emplacements natural soils possibly remain that have been covered for over 50 years. The characteristics of these soils are expected to vary. However, the majority of these soils are likely to be Solodics and Podzolics belonging to the Neath and Aberdare Soil Landscapes respectively. These soil landscapes are typically characterised by soils of low fertility, are acidic and subject to erosion (Kovac and Lawrie, 1991).

4.4 Air Quality

4.4.1 Existing Air Quality

Air quality monitoring in the area typically focuses on aspects associated with the heavy industrial activities such as aluminium smelting. As such, there is limited air quality monitoring sites monitoring dust concentration. Dust monitoring has been performed in the past to the south of the former Hebburn No. 2 colliery at the former Ellalong (now Southland) colliery (HLA, 1995). Dust deposition and concentration was measured over a number of years in the 1990's.

4.4.2 Critical Issues

- Identification and location of all surrounding residences and other sensitive receptors near resource and haulage routes;
- Determination of trigger values for changing weather conditions;
- Estimates of dust emissions from chitter removal operations and haulage are known;
- Development of TAPM Model to accurately model dust impacts; and
- Given the proximity of sensitive receptors develop intelligent and adaptable mitigation measures.

4.4.3 Potential Mitigation Measures

- Undertake preliminary assessment of several haulage routes to determine most appropriate route;
- Trafficked areas to be watered;
- Working areas to be watered to minimise dust during removal of chitter and tailings;
- Schedule removal of chitter and tailings to ensure exposed earth or chitter and tailings is minimal;
- Ensure rehabilitation and revegetation occurs as soon as practical following the removal of the chitter and tailings; and
- Undertake community liaison where residential sites exist in close proximity to these sites.

4.5 Acoustics

4.5.1 Existing Noise Levels

The existing acoustic environment of the area has been studied as part of this assessment. The loggers were in place between 27 March and 3 April 2003. Noise levels were recorded for 15 minute statistical intervals over the entire measurement period using an Acoustic Research Laboratories EL-215 Environmental Noise Logger in accordance with the relevant EPA guidelines and AS 1055-1997 “Acoustic Description and Measurements of environmental noise”. Periods of adverse weather conditions were excluded from the data as per the procedures outlined in Appendix B of the Industrial Noise Policy (INP).

Background noise levels were calculated from the measured data using the tenth percentile method (L_{90} of the L_{90}’s) as specified in the INP. Results are summarised in Table 4.3.

Table 4.3: Measured ambient noise levels 23/2/01 to 2/3/01 and 23/2/03 TO 2/3/03

Location	Day i.e. hours of operation between 7am-6pm	
	Background L90 dB(A)	Leq dB(A)
Neath Road, Neath (2001)	31	50
48 Pokolbin Street, Kearsley (2003)	34	54
3 Rawson Street, Kurri Kurri (2003)	37	59

The acoustic environment of each of the localities is characterised by domestic and natural sounds such as insects (as evidenced by a marked decrease in L_{eq} during the night time measurement period), birds etc. Receiver types in the vicinity of each of the deposits are residential or rural residential, there are few existing industrial noise sources in any of the areas. During installation and retrieval of the loggers no industrial noise could be heard.

4.5.2 Critical Issues

- Identification and location of all surrounding residences and other sensitive receptors near resource and haulage routes;
- Estimates of noise emissions from chitter removal operations and haulage are known;
- Determination of trigger values for changing weather conditions;
- Modelling will be via ENM and consideration given to cumulative impacts of other industrial/mining operation; and
- Given the proximity of sensitive receptors develop intelligent and adaptable mitigation measures.

4.5.3 Potential Mitigation Measures

- Undertake preliminary assessment of several haulage routes to determine most appropriate route;
- Ensure vehicles are shutdown or on low throttle when not in use and high noise emitting operations are restricted to times that minimise community disturbance
- Selection of appropriate equipment to minimise noise emissions;
- Ensure all haulage roads are maintained in good condition.
- Scheduling and planning of operations creating excessive noise to minimise impact on community (i.e during daylight hours only);
- Monitoring of wind direction and speed to identify times when noise emissions may have increased impacts;
- Monitoring of emitted noise levels will be undertaken to verify initial modelling and to assess the need for additional noise attenuation measures; and
- Undertake community liaison where residential sites exist in close proximity to these sites.

4.6 Traffic

Haulage from the sites to Hebburn No.3 Processing Plant needs to be undertaken using road registered trucks. The preferred haulage route has not been selected; however there are a number of potential haulage routes as detailed in *Section 2*. The selection of the preferred haulage route will be made after the analysis of traffic, noise, air quality, and flora and fauna impacts.

The Hebburn No.3 Processing Plant generally requires 70-100,000 tonnes of chitter and tailings per month at current processing rates to meet product coal demand at the Port. To maintain these rates assuming a 5 day week, 10 hour day, up to 17 laden trucks per hour are required across the three nominated sites, assuming standard 27 tonne semi trailers. This rate could be reduced considerably if larger trucks were adopted on appropriate haulage routes.

Increased processing of coal and chitter will also result in increased product coal that will require haulage to Port Waratah or to local power stations. While an increase above the haulage rate of ten (10) laden trucks per hour is not proposed an increase in the haulage timeframe of 21-24 months will be required.

4.6.1 Critical Issues

- Examine several haulage routes from each of the sites to identify safest route with least overall impact to road users and residents;
- Haulage to be minimised on heavily used roads during the peak school children times;
- Haulage trip rate to be commensurate with potential acceptable and safe gap acceptance;
- Haulage rate to be adequate to meet processing rates at Hebburn No.3;

- Haulage trip rate should not impact upon current road network levels of service; and
- Review resource estimates and yields to determine potential haulage timeframe for project.

4.6.2 Potential Mitigation Measures

- Identify haulage routes that minimise use of the public road network and built up areas;
- Investigate use of Werakata National Park fire trails to improve public safety and amenity impacts from haulage and improve quality of fire trails through the Werakata National Park;
- Install advance warning signs at each access point to the main road / track network for period of operation;
- Cleaning of sealed roads in the event of foreign material entering the carriageway;
- Investigate the removal of chitter and tailings from several sites at once or alternating routes depending on traffic levels; and
- Undertake community liaison where residential sites exist in close proximity to these sites.

4.7 Water Management

4.7.1 Hebburn No.3 Ground Water Impacts

The EIS and subsequent modifications addressed impacts to ground waters as a result of the processing operations. While existing approved reserves have reduced due to undetected burnt out areas of the emplacements the processing of more chitter and tailings will result in an increase in disposal of slimes to underground workings. Consequently the EA report will need to assess the potential impacts to ground waters.

Critical Issues

- Review existing disposal techniques;
- Calculate estimated increase in slimes disposal;
- Determine potential impacts;
- Description of ground waters;
- Depths to workings for disposal on other sites; and
- Benefits of deep groundwater disposal.

4.7.2 Surface Water

Clean water will be diverted around the working area within the sites during operations. Natural drainage patterns will be re-established where appropriate after completion of works and rehabilitation of the underlying ground. Some consideration will be given to the creation of wetland weir structures to reduce salt discharges to periods of high rainfall. This is because the

remediation process will remove the source of the acid and salt, but whereas any remnant acid can be neutralised during the remediation process, progressive removal of the salt can only be achieved by natural processes over a longer period of time.

Critical Issues

- Water balances at each site;
- Priority of water use on site; and
- Leachate treatment and storage.

4.7.3 Acid Mine Drainage

Acid mine drainage is a significant issue at the Aberdare East (see **Photograph 2** attached) and Neath sites. The source of the acid mine drainage is the oxidation of pyrite within the carbonaceous chitter and tailings emplacements. The removal of these emplacements will ultimately result in the removal of the source of the acid problems.

4.7.3.1 Critical Issues

- Investigation of residual pyrite (and therefore potential acidity) in construction fill generated from processing;
- Investigation of impacts associated with disposal of potentially acidic slimes;
- Techniques for amelioration of acid issues during processing; and
- Removal of capping material will potentially increase acidic discharge following rain events.

4.7.3.2 Potential Mitigation Measures

- Analysis potential plant feed material and resulting construction fill and slimes, chitter and tailings to be undertaken;
- Aberdare East and Neath have both been subject to thesis on the characterization of the chitter and tailings and potential remedial options, these studies will be reviewed. The use of a lime dosing plant may be the most economical option in this relatively short term situation;
- Effective drainage of water currently flowing through material will reduce subsequent acid impacts;
- Implement surface water diversion structures to limit runoff entering exposed chitter and tailings emplacements; and
- Use of Underground workings at site for acidic discharge disposal (this technique was used at Neath until recently, where blockages in shaft were caused from iron hydroxide precipitation).

4.8 Heritage

4.8.1 Aberdare East

4.8.1.1 European

The Cessnock City Council Local Environment Plan lists a heritage order to lands within a 50m corridor of the South Maitland Railway Line. No works as part of this application have been specified within this corridor, however, HEM have commissioned a heritage assessment of the corridor in the area for the adjoining rail siding resource.

There are no items of European Heritage constructed on the emplacements.

4.8.1.2 Indigenous

The emplacements are above the natural ground surface so no interference with Aboriginal artefacts is possible.

Where haulage of material will require the widening of existing bush tracks or fire trails an assessment of indigenous heritage will be required to ensure minimal impacts to items of indigenous heritage.

4.8.2 Neath

4.8.2.1 European

There are no items of European Heritage constructed on the emplacements.

4.8.2.2 Indigenous

The emplacements near the former washery site are above the natural ground surface so no interference with Aboriginal artefacts is possible.

The emplacements in the old open cuts have been placed in areas where the natural ground surface has been disturbed and removed to horizons below solid rock. Removal of these emplacements will not therefore disturb items of Aboriginal heritage. As with the surface emplacements, there are no items of European Heritage constructed on the emplacements.

Where haulage of material will require the widening of existing bush tracks or fire trails an assessment of indigenous heritage will be required to ensure minimal impacts to items of indigenous heritage.

4.8.3 Richmond Main East

4.8.3.1 European

There are no items of European Heritage constructed on the emplacements.

4.8.3.2 Indigenous

The emplacements are above the natural ground surface so no interference with Aboriginal artefacts is possible.

Where haulage of material will require the widening of existing bush tracks or fire trails an assessment of indigenous heritage will be required to ensure minimal impacts to items of indigenous heritage.

4.9 Flora and Fauna

Given the relatively recent closure (i.e. less then 20 years) of the Aberdare East and Neath processing plants and the highly acidic seepage and subsequent soils, the vegetation is relatively sparse. Vegetation on Neath and Aberdare East where present consists of a grass cover, wattles, melaleuca with occasional eucalypts. Richmond Main East has been used for grazing and contains a reasonable grass cover in most areas.

Haulage Routes from the sites will require a flora and fauna assessment to identify the most appropriate path.

4.9.1 Critical Issues

- Undertake a flora and fauna assessment of all areas impacted by both chitter and tailings removal activities and haulage;
- Undertake assessments in accordance with Department of Conservation guidelines; and
- Where native vegetation removal is required ensure best practice is used and habitat reintroduced into landscape where practical.

4.10 Final Landform and Rehabilitation

As a component of the environmental management system to accompany the Mining Lease over the sites the proponent will be required to develop a rehabilitation plan. The aim of the rehabilitation plan will be to create a safe and stable landform requiring little or no ongoing maintenance. The final land use is to be determined in consultation with key stakeholders with possible outcomes including combination of wooded native vegetation and open grassed areas.

The land beneath the emplacements will where possible be rehabilitated to the underlying natural surface contours and in other areas to a land form of softly terraced flats covered with salt tolerant native grasses and woody native vegetation, leading down to an artificial permanent wetland. This will allow slow desalination reduction of residual acidity of the subsoil clays. Ripping will be used to aerate the material beneath the emplacements prior to topsoil placement. Topsoil quantities appear adequate for all needs.

The wetland will assist in managing the release of salt into the waterways downstream by retaining salty water during light rainfall and only discharging when flows are sufficient to dilute the salt to acceptable levels.

4.10.1 Critical Issues

- Consultation with Catchment Management Authorities as a stake holder;
- Strategy for long term post operation of the site and its ecological relationship with the surrounding lands;

- Wetland concepts and interaction; and
- Investigation of riparian vegetation links where practical.

4.11 Community Liaison and Consultation

An important element of the proposed HEM reclamation operations will be the attention given to by HEM to nearby sensitive receptors of both haulage routes and operations, vested interest groups and statutory authority undertakings.

4.11.1 Critical Issues

Hunter Enviro-Mining (Operations) Pty Limited consultative strategy is based upon:-

- Personal regular contact between project staff and residents;
- Door to door canvassing about the project;
- Regular briefings of the project to Cessnock City Council;
- Briefings of State Members of Parliament; and
- Briefing and regular information distribution to vested interest groups.

PHOTOGRAPHS

Photograph 1: Unfenced tailings on fire within Werakata National Park taken in January 2006

Photograph 2: Example of acid mine drainage at Aberdare East.