

WHITEHAVEN COAL MINING PTY LTD

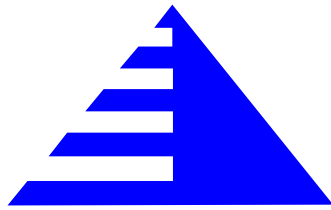
A.B.N. 65 086 426 253

**ENVIRONMENTAL
MONITORING
PROGRAM**

APPROVED
for the

WHITEHAVEN COAL MINE

February 2007



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A.B.N. 65 086 426 253



Environmental Monitoring Program
for the
Whitehaven Coal Mine

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1.0 INTRODUCTION AND OBJECTIVES

The Whitehaven Coal Mine is located within a 417 ha site, approximately 15 kilometres east of Boggabri.

The mine involves the following activities:-

- Open cut coal mining. Over the life of the mine, coal will be extracted from an area of approximately 150 ha.
- Programmed placement of overburden and interburden materials from the open cut to out of pit overburden emplacements and the open cut void itself.
- On-site crushing and temporary stockpiling of the mined coal.
- Transportation of product coal from the mine site to the Whitehaven CHPP for washing and/or dispatch to export markets via rail to the Port of Newcastle.
- Backloading of reject material from the Whitehaven CHPP for placement in the mined out areas of the mine.
- Progressive shaping and rehabilitation of the mine area and other areas of disturbance.

This Environmental Monitoring Program for the Whitehaven Coal Mine has been prepared in accordance with Condition 3 of Schedule 5 of Development Consent DA 8-1-2005 with the objective of consolidating the various monitoring requirements identified in Schedule 3 of the Consent into a single document.

It is recognised that monitoring requirements at the mine may change as the mine proceeds, and as such this document will be reviewed and updated each year in conjunction with the preparation of an Annual Environmental Management Report.

2.0 CONSENT REQUIREMENTS

Schedule 5 of DA 8-1-2005 incorporates two conditions relating to the Environmental Monitoring Program, namely:

ENVIRONMENTAL MONITORING PROGRAM

Condition 3: Within 7 months of the date of this consent, the Applicant shall prepare an Environmental Monitoring Program for the development in consultation with relevant agencies, and to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements in Schedule 3 of the consent into a single document.

Condition 4. Within 3 months of the completion of the Independent Environmental Audit the Applicant shall review, and if necessary revise the Environmental Monitoring Program to the satisfaction of the Director-General.

Consultation with relevant government agencies as required by Condition 3 was undertaken as part of the preparation of the monitoring programs from which the Environmental Monitoring Program provides a consolidated summary.

The majority of these monitoring requirements have been addressed in the following approved management plans or monitoring programs. The numbers following each of the plans / programs correspond to the applicable condition number within Schedule 3 of DA 8-1-2005.

- (i) Noise Monitoring Program (10).
- (ii) Road Noise Management Plan (34).
- (iii) Water Management Plan (24).
- (iv) Air Quality Monitoring Program (5).
- (v) Blasting Monitoring Program (16).
- (vi) Flora and Fauna Management Plan (28).
- (vii) Archaeology and Cultural Heritage Management Plan (32).

However, in addition to the above plans, Schedule 3 also identifies a requirement for meteorological monitoring (Condition 11), greenhouse gas emissions monitoring (Condition 39), and monitoring waste generation (Condition 40).

Sections 3 to 9 presents a summary of monitoring requirements identified in each of (i) to (vii) above, while the additional monitoring requirements are presented in Section 10. Where warranted, comments and/or references to the source documents are also provided. Existing surface water, groundwater, deposited dust, noise and blast monitoring locations are shown on Figure 1. Road noise monitoring locations are shown on Figure 2 and Flora and Fauna monitoring locations are shown on Figure 3. Appendix 1 presents a summary of all monitoring requirements including responsibilities and a monitoring schedule.

Although the formal monitoring programs identified within Schedule 3 are identified within this document, it is also acknowledged that additional programs, primarily with respect to air quality, water, noise and blasting may be required from time to time as a means of investigating complaints, quantifying achievements or verifying performance in particular areas.

3.0 OPERATIONAL NOISE

The operational noise monitoring program is outlined in Table 1. All noise monitoring for statutory compliance will be undertaken on behalf of Whitehaven Coal Mine by a suitably qualified and experienced acoustic consultant.

Table 1: Operational Noise Monitoring

MONITORING TYPE	FREQUENCY	COMMENTS
Operational Phase		
Operator Attended	6-monthly over the remaining operational life of the mine.	At Sites “Gundawarra”, “Merton”, “Will-gai” and “Broadwater” (Figure 1).
Operator Attended and/or Unattended	Quarterly in the event of identified exceedance of nominated criteria	Sound power level validation of dozers, haul trucks, FELs, excavators, drills
		In response to a complaint

For more details on the monitoring methodology, refer to the “Noise Monitoring Program for the Whitehaven Coal Mine (including a Noise Monitoring Protocol)” dated January 2007.

4.0 ROAD NOISE

The road noise monitoring will be undertaken on behalf of Whitehaven Coal Mine by a noise consultant as outlined in table 2. Monitoring locations are shown in Figure 2.

Table 2: Road Noise Monitoring

MONITORING TYPE	FREQUENCY	COMMENTS
Operational Phase		
Attended	3-monthly	<ul style="list-style-type: none"> • at “Brooklyn”. • “Will-gai” measured when undertaking operational noise monitoring.

For more information on how the noise surveys will be undertaken refer to the “Road Noise Management Plan for the Whitehaven Coal Mine” dated December 2005.

5.0 WATER AND WATER MANAGEMENT STRUCTURES

At the Whitehaven Coal Mine, monitoring of groundwater, surface water and the various water management structures is undertaken as described in Sections 5.1, 5.2 and 5.3 respectively. For additional information on all aspects of water and water structure monitoring see the document entitled “Water Management Plan for the Whitehaven Coal Mine” approved 28 January 2007.

5.1 Groundwater

Groundwater Monitoring will be undertaken at the sites, and for the parameters identified in Table 3.

Table 3: Groundwater Monitoring

MONITORING BORE (See Figure 1)	PARAMETER	UNITS	METHOD
QUARTERLY			
GW-1, GW-2, GW-4, GW-5, GW-7, GW-8, GW-9, P1, P2 and P3	Standing water level	m	In-situ
6-MONTHLY			
GW-1, GW-2, GW-4, GW-5, GW-7, GW-8, GW-9, GW-10, GW-13, P1, P2 and P3.	Electrical Conductivity	µS/cm	In-situ
P1, P2 and P3	pH		In-situ
	Sodium	mg/L	Representative Sample
	Calcium	mg/L	Representative Sample
	Potassium	mg/L	Representative Sample
	Magnesium	mg/L	Representative Sample
	Iron	mg/L	Representative Sample
	Manganese	mg/L	Representative Sample
	Aluminium	mg/L	Representative Sample
	Arsenic	mg/L	Representative Sample
	Chloride	mg/L	Representative Sample
	Sulphate	mg/L	Representative Sample
	Alkalinity	mg/L	Representative Sample
	Nitrate	mg/L	Representative Sample
	Nitrogen	mg/L	Representative Sample
	TDS	mg/L	Representative Sample
	TPH	mg/L	Representative Sample
	Copper	mg/L	Representative Sample

	Nickel	mg/L	Representative Sample
	Lead	mg/L	Representative Sample
	Selenium	mg/L	Representative Sample
	Zinc	mg/L	Representative Sample
	Cadmium	mg/L	Representative Sample
ANNUALLY			
GW-11, GW-13	Total Nitrogen	mg/L	Representative Sample
	Nitrate Nitrogen	mg/L	Representative Sample
	Total Phosphorus	mg/L	Representative Sample
	Reactive Phosphorus	mg/L	Representative Sample
	Oil and Grease	mg/L	Representative Sample
	TPH	mg/L	Representative Sample
	Arsenic	mg/L	Representative Sample
	Cadmium	mg/L	Representative Sample
	Chromium	mg/L	Representative Sample
	Nickel	mg/L	Representative Sample
	Lead	mg/L	Representative Sample
	Copper	mg/L	Representative Sample
	Manganese	mg/L	Representative Sample
	Zinc	mg/L	Representative Sample
	Sodium	mg/L	Representative Sample
	Potassium	mg/L	Representative Sample
	Calcium	mg/L	Representative Sample
	Chloride	mg/L	Representative Sample
	Sulphate	mg/L	Representative Sample
	Total Alkalinity	mg/L	Representative Sample
Conductivity	uS/cm	In-situ	
pH		In-situ	
Extraction rate/volume	ML	Calculated	

All laboratory analyses to be undertaken by a NATA registered laboratory in accordance with the methods identified in Environment Protection Licence (EPL) 10094.

5.2 Surface Water

Surface water monitoring at the Whitehaven Coal Mine is a discharge event related program involving the discharge sites themselves, and upstream and downstream sites within the receiving waters. Table 4 and Figure 1 identify the sites and parameters to be monitored.

Table 4: Surface Water Monitoring

LOCATION (see Figure 1)	FREQUENCY	PARAMETERS	METHOD
WW-7, wet weather discharge point from Storage Dam SD-1, WW-8, wet weather discharge point from Storage Dam SD-2, WW-9, wet weather discharge point from Storage Dam SD-3, WW-13, wet weather discharge point from Storage Dam-4, WW-14, wet weather discharge point from Storage Dam-5.	When any water is discharged from site.	pH, Conductivity, Total Suspended Solids, Grease & Oil and Volume	Grab sample
WW-11: Driggle Draggie Creek upstream of any mine related discharges WW-12: Driggle Draggie Creek downstream of any mine related discharges.	Within 12 hours of discharge from SD-1, SD-2, SD-3, SD-4 or SD-5	pH, Conductivity, TSS, Grease & Oil	Grab sample

Note: All analyses to be undertaken by a NATA registered laboratory in accordance with the methodology identified in EPL 10094.

5.2 Water Management, Erosion and Sediment Control Structures

Monitoring of water management, erosion and sediment control structures will be undertaken to verify their integrity and efficiency as described in Table 5.

Table 5: Water Management, Erosion and Sediment Control Monitoring

FEATURES	FREQUENCY	METHOD
Storage dams, sediment basins, diversion banks, catch banks / drains, silt-stop fencing, flumes	Quarterly or after >25 mm in 24 hours	Visual inspection for integrity, storage capacity, erosion etc

6.0 AIR QUALITY

Air quality monitoring at the Whitehaven Coal Mine will be limited to monitoring of deposited dust levels as identified in Table 6. Monitoring Sites are shown in Figure 1.

Table 6: Deposited Dust Monitoring

Site (Figure 1)	Description	Comments
WD-1	“Whitehaven” residence	<ul style="list-style-type: none"> • Monthly • Measured as Total Insoluble Dust (g/m²/month)
WD-2	“Merton” residence	
WD-5	“Wilga” property	
WD-7	“Willgai” residence	
WD-8	“Gundawarra” residence	
WD-10	Former “Merton” property	
WD-11	Former “Merton” property	
WD-12	“Whitehaven” property	
WD-13B	“Wilga” residence	

For details of the methodology, see the “Air Quality Monitoring Program for the Whitehaven Coal Mine” dated December 2005.

7.0 BLASTING

The blast monitoring is undertaken by the blasting contractor. The contractor is responsible for setting up the monitoring equipment, videotaping the blast and generating the results. Blast monitoring is routinely undertaken at three sites as identified in Table 7, with monitoring undertaken at additional sites on an intermittent basis and/or at the request of the landowners.

Table 7: Blast Monitoring

Site (Figure 1)	Parameter	Frequency
“Wilga”, “Merton” and “Gundawarra”	Airblast Overpressure (dB(L)) Ground Vibration (ppv)	Every blast
Surrounding Blast Site	Flyrock Distribution	Each blast

For additional information, see the document entitled “Blasting Monitoring Program for the Whitehaven Coal Mine” dated December 2005.

8.0 FLORA AND FAUNA

Monitoring of the rehabilitated and control areas associated with the sections of Whitehaven Coal Mine approved under DA 72-03-2000 is already occurring. This program which involves the establishment of one permanent photopoint and one 100m * 100m permanent quadrat per 10 hectares will be extended to cover all areas of approved activity under DA 8-1-2005. Figure 3 shows the location of existing monitoring quadrats as at 30/09/2006. Additional monitoring quadrats installed over the remaining life of the mine will be identified in the field, on a plan retained at the mine and in future AEMR's.

Monitoring is and will be undertaken on an annual basis by an ecologist experienced in the establishment and growth of native vegetation in western New South Wales.

Three vegetation communities will be disturbed over the remaining life of the mine being:-

- **Community 1** – Cleared-cultivated / uncultivated pasture lands
- **Community 3** – *Eucalyptus crebra* {Narrow-leaf Ironbark} – *Eucalyptus melanophloia* {Silver-leaf Ironbark} – *Eucalyptus pilligaensis* {Pilliga Grey Box} – *Callitris glaucophylla* {White Cypress Pine} Community
- **Community 4** – *Eucalyptus populnea ssp. Bimbil* {Bimble Box} – *Eucalyptus pilligaensis* {Pilliga Grey Box} Community

8.1 Flora Monitoring of the Control Areas of the Native Woodland Communities to be disturbed

A monitoring quadrat previously established as a control for community 4 is also suitable as a control quadrat for community 1 and will continue to be used as a control for both communities.

In addition, a single control quadrat will also be established on remnant areas of each of communities 3 and 4 to provide a benchmark for comparison with the areas of these communities established on the final post mining landscape. Monitoring of the control

quadrats will provide data on changes in species diversity and community composition in the absence of grazing.

8.2 Monitoring of Enrichment Plantings

Monitoring of enrichment plantings will be undertaken with 3 quadrats established once enrichment planting commences. Two quadrats will be located on the western side of the mine and a third on the eastern side.

8.3 Monitoring Methodology (all quadrats)

Monitoring of all quadrats will be undertaken at the commencement of monitoring, at annual intervals for the subsequent 5 years and then biennially until the monitoring program ceases and will involve:

- Establishment of one permanent photopoint per quadrat, with photographs taken from set directions, and;
- Measurement of foliage cover along two 100 metre step point transects: an assessment of species composition of ground flora in the quadrat using the modified Braun-Blanquet [Poore] scale, and a tree and shrub count to quantify deaths and regeneration.

8.4 Fauna Monitoring Program

Disturbance over the remaining life of the mine will involve three habitats, namely:

- Open woodland
- Cleared paddocks {with scattered trees}; and
- Wetlands {man-made dams}

The existing monitoring program for areas of disturbance approved under DA 72-03-2000 will be extended to incorporate those areas to be disturbed over the remaining life of the mine.

Native fauna diversity monitoring will utilise:

- (i) each of the control quadrats established for flora monitoring purposes

- (ii) each of the re-establishing native vegetation community quadrats
- (iii) each of the re-establishing pasture land monitoring quadrats
- (iv) each of the enrichment planting area quadrats; and
- (iv) involve additional sampling for amphibians, mammals and birds external to the quadrats to gain an appreciation of any significant changes to the native fauna assemblage in the presence of mining but absence of grazing.

Monitoring will be undertaken annually in the spring/early summer period and utilise the sampling methods identified below for the different animal groupings.

Amphibians – 10 minute searches and call recordings at selected sites

Birds – Species observed over a 10 minute period on each quadrat and within each habitat type disturbed by mining activity. Monitoring of the targeted Grey Crowned Babbler will include locating and mapping nests and breeding success and observing and recording family size, composition and activities.

Mammals & Nocturnal Birds – Spotlighting search on fixed 1.0km length drive transects to record number and species of arboreal and terrestrial mammal and nocturnal birds species observed. Spotlighting to occur over 2 nights in each habitat type.

Microbats – Ultrasonic bat call recordings overnight with a CF Anabat system on each habitat type.

Reptiles – Systematic hand search on each 100m * 100m quadrat in each of the sampled habitat types.

9.0 ARCHAEOLOGY AND CULTURAL HERITAGE

Archaeology and Cultural Heritage management and monitoring will be undertaken as part of all surface disturbing (topsoil stripping) activities and involve.

- Routinely consulting with Red Chief Local Aboriginal Land Council (LALC) and inviting representatives to be present for all soil stripping activities;
- LALC monitoring of areas as they are stripped; and
- Inspection of fencing and signage at known and “protected” sites of cultural heritage significance.

10. ADDITIONAL MONITORING REQUIREMENTS

10.1 Meteorological Monitoring

The following parameters are to be monitored using the meteorological station positioned as shown on Figure 1.

PARAMETER	UNITS OF MEASURE	FREQUENCY	AVERAGING PERIOD
Rainfall	mm/h	continuous	1 hour
Wind speed @ 2 metres	m/sec	continuous	15 minute
Wind direction @ 2 metres	°	continuous	15 minute
Temperature @ 2 metres	°C	continuous	15 minute
Sigma theta @ 2 metres	°	continuous	15 minute
Humidity	%	continuous	15 minute

10.2 Greenhouse Gas Emissions

Greenhouse gas emissions will be determined in accordance with the methodology identified by the Australian Greenhouse Office and expressed in terms of tonnes per year of CO₂ equivalents.

10.3 Waste Generation

The Whitehaven Coal Mine undertakes a waste segregation and practical recycling program with steel, batteries, aluminium, used oil and filters and all remaining waste materials collected and disposed of to an approved landfill off-site.

Records of the quantities of each of the above wastes / recyclable materials despatched are retained on site.

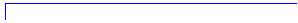
11. REPORTING

The results of all monitoring programs undertaken in accordance with DA 8-1-2005 will be presented in each AEMR, and include an analysis of those results against limits / criteria identified in the consent, previous monitoring results and the predictions in the EIS/SEE's prepared for the Whitehaven Coal Mine.

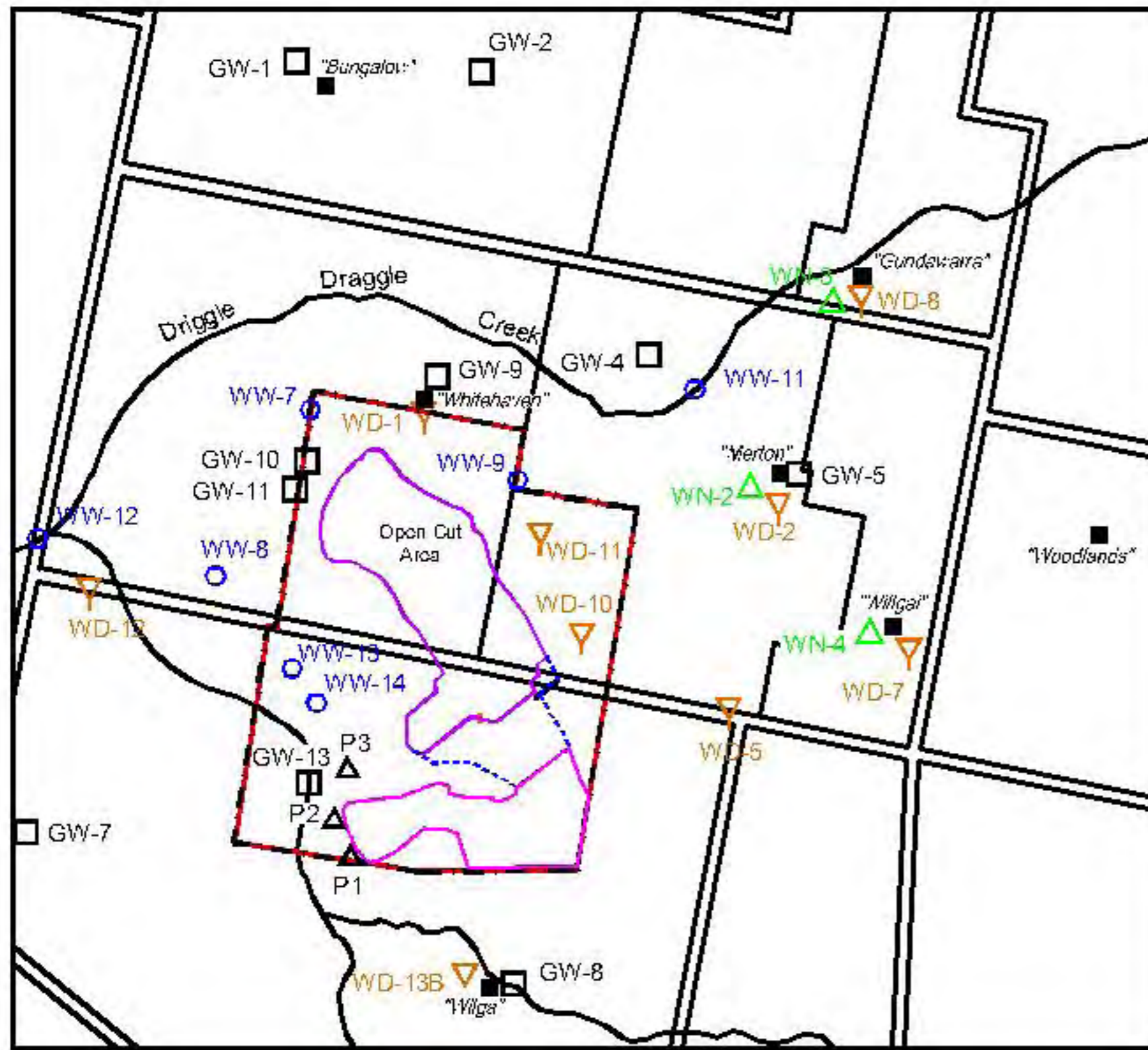
Appendix 1: Environmental Monitoring Summary

Aspect	Parameters	Monitoring Location(s)	Currently Undertaken by:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NOISE	Operational Noise	"Merton", "Gundawarra", "Will-gai" "Broadwater".	Spectrum Acoustics	Bi-Annually											
	Road Noise	"Brooklyn" & "Will-gai"	Spectrum Acoustics			*			*			*			*
	Equipment Noise		Spectrum Acoustics	SPL of mobile equipment monitored on request by Mine Manager											
	Miscellaneous			Following legitimate complaint											
GROUNDWATER	H ₂ O Quality (EC)	GW1, GW2, GW4, GW5, GW7, GW8, GW9, GW10, GW13, P1, P2, P3	Ecowise	Bi-Annually											
	H ₂ O Quality (Rep. Metals & Ions)	GW11, GW13,	Ecowise	Annually											
	SWL	GW1, GW2, GW4, GW5, GW7, GW8, GW9, P1, P2, P3	Ecowise	*			*			*			*		
SURFACE WATER	Wet Weather Discharge (TSS, Grease & Oil, pH, EC)	WW-7(SD-1), WW-8(SD-2), WW-9(SD-3), WW-13(SD-4), WW-14(SD-5)	WCM	As soon as practicable after overflow commences and not more than 12 hours after the commencement of overflow											
	Water Quality (TSS, Grease & Oil, pH, EC)	WW-11(Driggle Draggles-Upstream), WW-12(Driggle Draggles-Downstream)	WCM	As soon as practicable after overflow commences and not more than 12 hours after the commencement of over flow											
BLASTING	Ground Vibration	"Will-gai", "Merton" "Gundawarra"	Orica	Every blast.											
	Air Overpressure	"	Orica	Every blast.											
AIR QUALITY	Deposited Dust	WD-1, WD-2, WD-5, WD-7, WD-8, WD-10, WD-11, WD-12, WD-13B.	WCM & Ecowise	*	*	*	*	*	*	*	*	*	*	*	*
EROSION AND SEDIMENT CONTROL		All Water Management and Erosion and Sediment Control Structures	WCM	*			*			*			*		
FLORA AND FAUNA	Species Diversity	Established Quadrats	GCNRC CES	Pre-Clearing Inspections undertaken Annually in Spring/ Early Summer. Quadrats monitored annually											
CULTURAL HERITAGE	Artefacts	Mine Site	Red Chief LALC	Representatives invited to monitor all soil stripping activities											

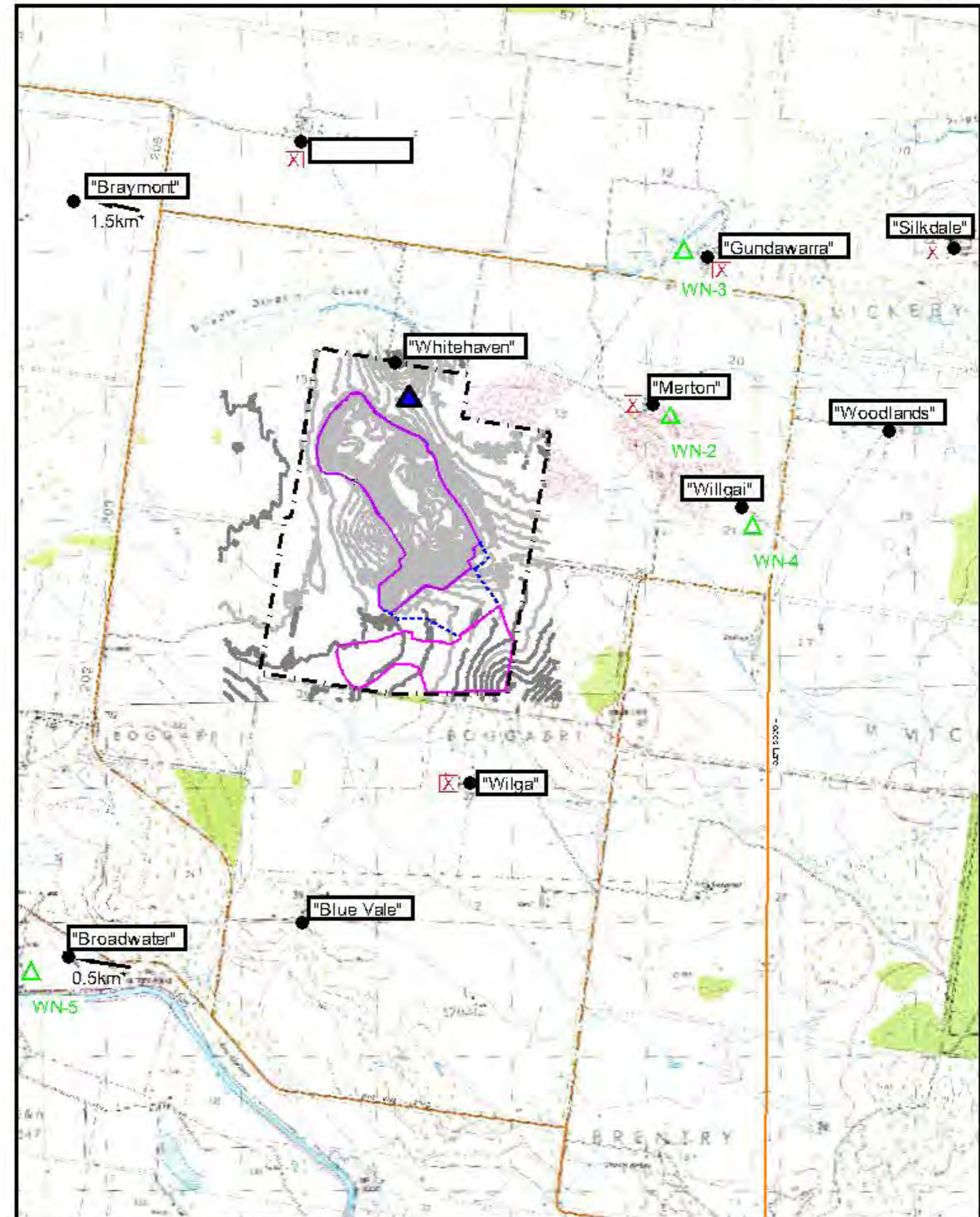
Note: This program is to be updated annually and included in the relevant AEMR. WCM=Whitehaven Coal Mining Pty Ltd GCNRC=Geoff Cunningham Natural Resource Consultants CES = Countrywide Ecological Consultants.



WS 270 2 3 74 0 819 0 0 0 Canyon 0 19 3 Area 1 8 Monitoring DW.G



- REFERENCE**
- - - - - ML 1471 Boundary
 - Limit of Mine Development (1/10/2004)
 - Limit of Approved Open Cut Mining
 - Proposed Canyon Extension
 - WW-1 Surface Water Monitoring Site
 - GW-4 Groundwater Monitoring Site
 - WD-1 Deposited Dust Gauge Site
 - WN-5 Noise Monitoring Site
 - Blast Monitoring Site
 - Meteorological Station



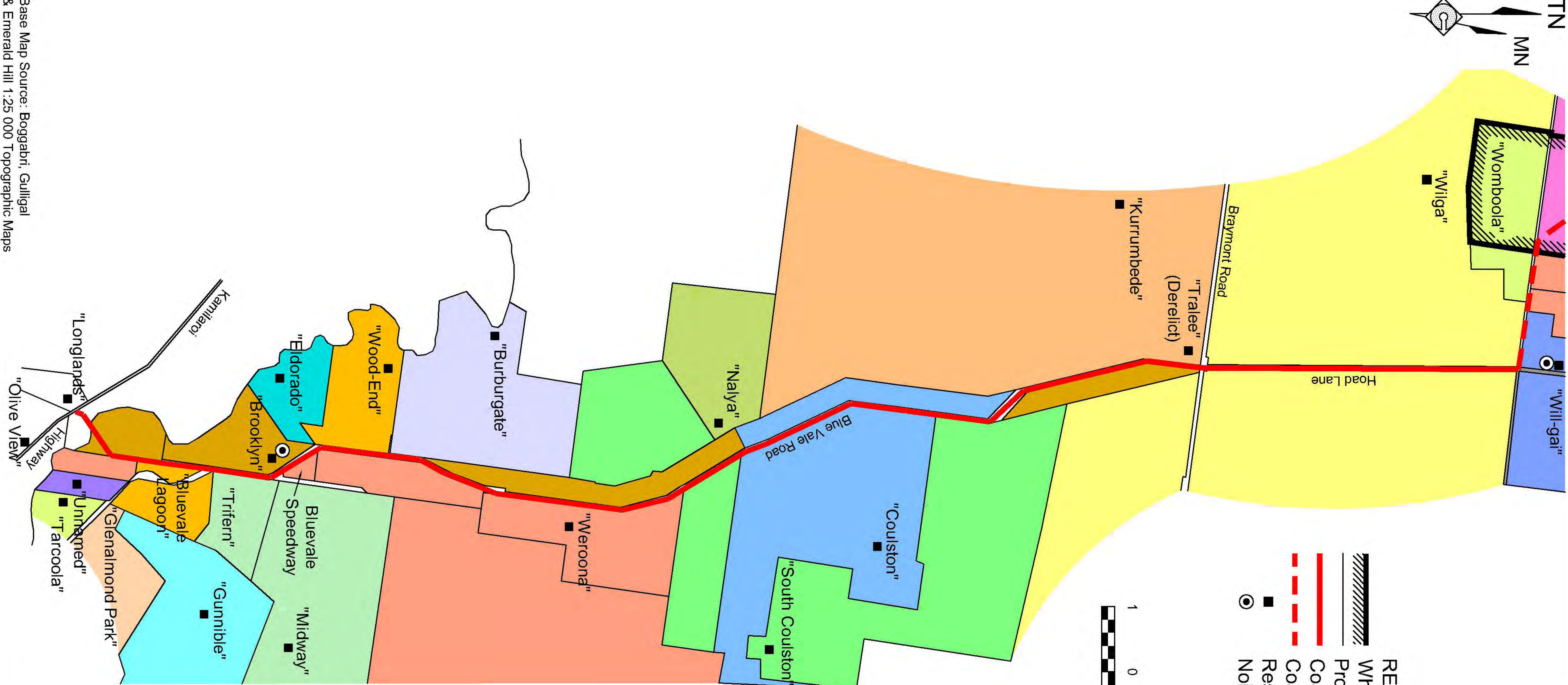
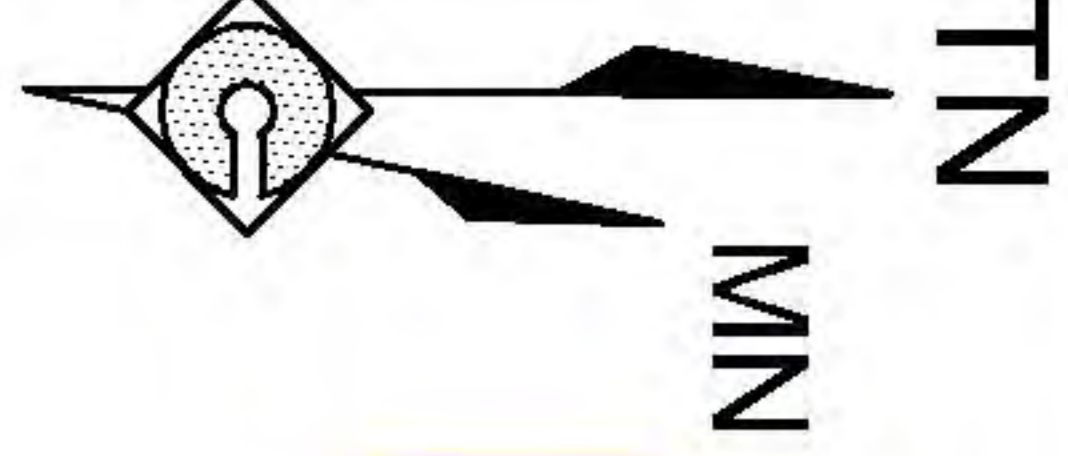
*Note: Distances to Residences Measured from Symbol







SCALE 1:40 000



Figure Compiled by R.P. Cursey & Co.

Figure 1
ENVIRONMENTAL
MONITORING SITES



- REFERENCE**
-  Whitehaven Coal Mine Lease Boundary
 -  Property Boundary
 -  Coal Transport Route (Public)
 -  Coal Transport Route (Private)
 -  Residence
 -  Noise Monitoring Location

SCALE 1:100 000

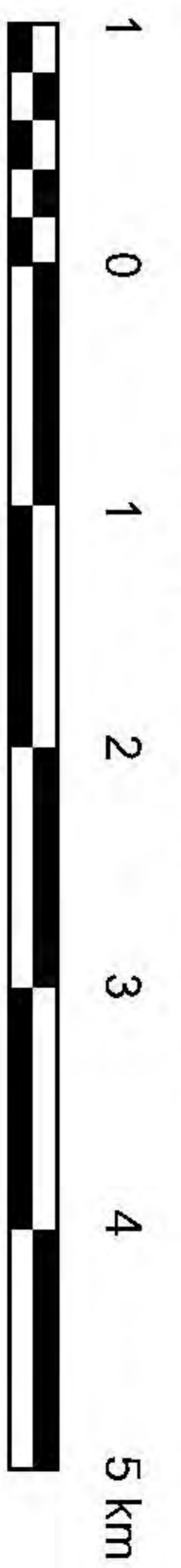


Figure 2
ROAD NOISE
MONITORING LOCATIONS



Figure 3
FLORA AND FAUNA MONITORING QUADRATS