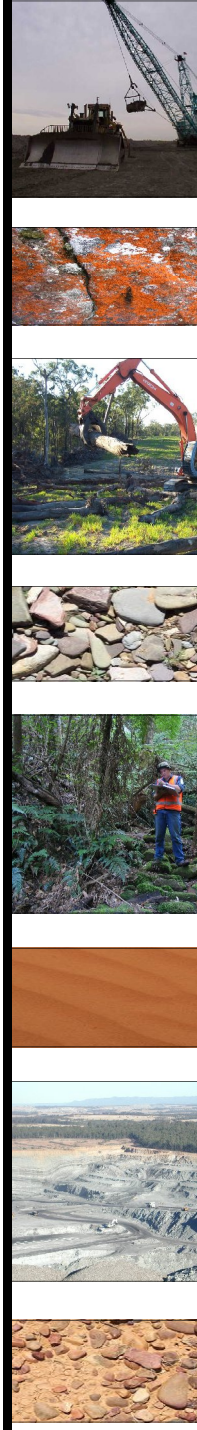
SPECIALIST CONSULTANT REPORTS



APPENDIX 4

Ditton Geotechnical Services Pty Ltd
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DgS
Ditton Geotechnical Services

16 December, 2008

Andrew Hutton
GSS Environmental Pty Limited
51 Hudson Street
Hamilton NSW 2303

Report No. GSS-001/1

Dear Andrew,

Subject: Subsidence Impact Management Compliance Assessment for the First Triennial Independent Environmental Audit of the Austar Coal Mine, Ellalong

1.0 Introduction

This report provides a review by Ditton Geotechnical Services Pty Ltd (DgS) of the performance of the subsidence management plans prepared for Longwalls A1 and A2 at the Austar Coal Mine, Ellalong.

This report forms part of the requirements of Schedule 5, Condition 6 "Independent Environmental Audit" specified in the Section 96(2) Modification to the NSW Department of Planning's Development Consent (DA No. 29/95).

The audit covers the period between December 2005 and December 2008. Mining activities during this period included the development and extraction of longwalls A1 and A2 in the Greta Seam.

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2.0 Scope of Work

The scope of the audit has included the following items of work:

(i) A desktop review of the mine subsidence impact prediction and impact / monitoring reports submitted to the Department of Planning (DoP) and Department of Primary Industries (DPI) during the audit period.

(ii) A brief walk / drive over inspection of the surface above the extracted longwalls to confirm claimed surface impacts and identify possible inconsistencies in the reporting and management of subsidence impacts.

(iii) Provide an assessment of the effectiveness of the subsidence management plans in place and possible avoidance of remediation measures or strategies.

(iv) Provide recommendations on any changes to the overall reporting process such that it may improve the effectiveness of management plans in future mining areas.

3.0 Study Area

The study area for this report is the located within the area of mining influence above longwalls A1 and A2.

The surface is predominately undeveloped woodland of the Werakata State Conservation Area (previously known as the Aberdare State Forest). Details of surface features are defined in **Section 5.0, Document Review**.

4.0 Legislation and Regulations

The legislation and regulations that are applicable to the Austar Coal Mine in regards to mine subsidence impact management include:

- Section 91, Environmental Planning and Assessment Act, 1979.
- Section 239(2), NSW Mining Act, 1982.
- Section 138, Coal Mines Regulations Act, 1982.
- Mine Subsidence Board Compensation Act, 1961

Longwalls A1 and A2 were originally approved under the Section 138 CMRA system in Development Consent DA No.29/95 (14/02/1996). The Section 138 Application Report for LWs A1 and A2 was originally prepared for a mining height of 4.5 m. A modification to the consent to increase the mining height to 6.5 m for the introduction of the Longwall Top Coal Caving (LTCC) method was approved on 26/09/06.

The Section 138 CMRA 1982 was superseded in 2003 by the Section 239(2) NSW Mining Act, 1992 and pertains to the Subsidence Management Plan (SMP) required for new Development Consents for underground coal mining. It was considered that the existing consent conditions were adequate for longwalls A1 and A2. Subsequent longwalls (A3 to A5) however, were assessed under the new SMP system.

The impact of mine subsidence and minimisation of harm to the environment is to be managed in accordance with the conditions of the Development Consent.

4.1 Development Consent Conditions

Before the preparation of a Development Application, an Environmental Impact Statement (EIS) or Statement of Environmental Effects (SEE) which has addressed the Director-Generals Requirements, must be completed. The conditions of development consent are then provided with the DA approval.

The conditions of development consent in regards to subsidence impact management are contained in Clauses 2 to 4, Schedule 3 - Specific Environmental Conditions of the Section 96(2) Modification:

Clause 2 - Subsidence Impact Assessment Criteria;
Clause 3 - Subsidence Management Plan;
Clause 4 - Public Safety Management Plans.

Clause 2 is not applicable to this audit as it concerns the management of damage to any residences affected by mine subsidence. There are no residential dwellings in the area of influence of LWs A1 and A2.

Clause 3 referred to the preparation of a Subsidence Management Plan (SMP) in accordance with the Mining Act 1992 and Department of Primary Industry Guidelines before any mining activities, which could cause mine subsidence. Longwalls A1 and A2 were granted development consent under the now superseded Section 138 of the Coal Mines Regulations Act 1982. The Section 138 report is similar to the new SMP system and provided mine subsidence impact predictions and management requirements.

Clause 4 specified a Public Safety Management Plan was to be prepared for the Werakata State Conservation Area (i.e. includes the area above LWs A1 and A2). The plan defines the public safety issues and risk management methods required during mine subsidence development.

It is considered that the mine has complied with the conditions of consent for Longwalls A1 and A2 in regards to the necessary documentation.

In addition to the Schedule 3 Conditions, the mine must prepare Annual Environmental Management Reports (AEMRs) for submission to the DoP (Clause 5, Schedule 5) and End of Panel Reports (EOPRs) for submission to the DPI. The third party independent audit requirements are provided in Clause 6, Schedule 5.

4.2 Environmental Protection License

Not directly applicable for mine subsidence-impact management, however, an Environmental Impact Statement is required to address the Director Generals Requirements before a DA or Development Consent is issued.

4.3 Mining Lease Conditions

Not applicable for mine subsidence impact management.

4.4 Standards, Codes and Guidelines

Guidelines for the preparation of EIS and SEE Reports were provided by the DoP with references to the appropriate Department of Environment and Climate Change (DECC) and Department of Water and Energy (DWE) Guidelines.

Guidelines for the preparation of Section 138 and SMP Reports were provided by Department of Minerals Resources (now part of DPI, along with Fisheries and Agriculture Departments).

Other documents of relevance used in regards to mine subsidence impact assessment within the study area includes:

Managing Urban Stormwater: Soils and Construction Manual. Landcom's "Blue Book".

5.0 Document Review

5.1 Section 138 Report

The Section 138 Report outlined surface and subsurface monitoring and impact management for the following features within the area of mining influence:

- Werakata State Conversation Area (formerly Aberdare State Forest)
- Schedule 1 and 2 ephemeral creeks (not flowing).
- Unsealed Fire Trails (Pelton Road Fire Trail, Sandpit Road and several un-named roads).
- Terrestrial flora and fauna.
- Old flooded mine workings 150 m to the north of the longwalls A1 and A2.

Subsidence contour predictions and impact management plans have been developed in association with the relevant government agencies and stakeholders for each feature. Baseline studies of pre-mining conditions for each feature have been prepared and used for monitoring outcome and impact assessment purposes.

5.2 Subsidence Impact Management Plans

Four management plans covering various aspects of mine subsidence impact management were prepared and implemented:

- LWA1 and A2 - Subsidence Monitoring Program
- LWA1 and A2 - Public Safety Management Plan
- Environmental Monitoring Program
- LW A1 and A2 - Land and Surface Watercourse Monitoring Plan

Trigger action response type plans have been prepared to (i) assess if subsidence impacts were significantly higher than predicted and (ii) ascertain if corrective management actions are necessary to either remediate damage or review/adjust proposed mine plans.

The performance of the subsidence impact management plans during and after mining of LWs A1 to A2 has been assessed in the AEMRs for 2005, 2006 and 2007 and the End Of Panel Report for LWA1. The outcomes are discussed in **Sections 5.3** and **5.4**.

5.3 Annual Environmental Management Reports (AEMRs)

Three AEMR's have been submitted to the DoP for 2005-06, 2006-07 and 2007-08 periods.

Subsidence predictions and impacts have been reported as all being within expected levels, however, no specific details were provided.

5.4 End of Panel Report (EOPR)

More specific information was presented in the LW A1 End of Panel Report to the DPI.

The EOPR states "there has been no abnormal behaviour that has required a review. The report consisted of the analysis from:

Appendix 1: Surface Subsidence Monitoring Program;
Appendix 2: Public Safety Monitoring and Management Plan;
Appendix 3: Land and Stream Monitoring Plan;
Appendix 4: Vibration Monitoring Plan;
Appendix 5: Evaluation of data from a piezometer located within AQD1077; and
Appendix 6: Evaluation of surface subsidence data and data collected from extensometers in boreholes AQD1076 and AQD1078.

In summary, surface subsidence was of the order of 100 mm as predicted with no perceptible impacts to the environment or increase in public safety risk. Ground and groundwater behaviour indicated by the monitoring is as predicted by the assessment reports."

LW A2 has only recently finished in late November, 2008 and the EOPR for it is not yet available. However, it is understood that the DPI have been provided with updated survey results after the completion of LW A2.

For the purpose of this study it is therefore considered appropriate to present a summary of the predicted v. measured values for LWs A1 and A2 (see **Table 1**). The predicted subsidence parameters were presented in **SCT, 2006a** and **SCT, 2006b**.

The outcomes of the review are summarised below:

- Maximum subsidence, tilt and strain over LWs A1 and A2 are generally equal to or less than the expected values predicted by SCT.

- The angle of draw to the 20 mm subsidence contour appears to be greater than the predicted 30^o on the sides of the panels affected by relatively steep topography (36^o to 57^o).

- The caving height was assessed to range from 37 m to 60 m, based on the surface to seam extensometer data. This is almost 4 to 6 times higher than the predicted caving height of 10 m.

- The measured height of fracturing however, is very close to the predicted range of 158 to 190 m for LW A1, and represents 50% of the cover depth for a sub-critical W/H ratio of 0.38. This indicates that the top 50% or 200 m of overburden is bridging LW A1.

Overall, the results of LW A2 show that the maximum subsidence above the two-panel longwall system is governed by the isolated chain pillar subsidence and not the mining height.

Table 1 - Summary of Predicted v. Measured Subsidence Impact Parameters for LWs A1 and A2

Impact Parameter (Maxima)	Units	LW A1		LWA2	
		Predicted	Measured	Predicted	Measured
Panel Width	m	158	158	227	227
Cover Depth	m	350 - 430	350 - 430	430 - 470	430 - 470
Mining Height	m	6	6	6	6
Subsidence	m	0.1	0.096 - 0.101	1.1 - 1.6*	0.805 - 0.987
Tilt	mm/m	0.8	0.9 - 1.2	11	4.5 - 6.5
Tensile Strain	mm/m	0.1	0.2	2	0.7 - 2.5
Compressive Strain	mm/m	0.2	0.5 - 0.7	4	0.8 - 1.2
Goaf Edge Subsidence	m	<0.1	0.07 - 0.088	0.2 - 0.3	0.154 - 0.329
Angle of Draw	^{o}	30	25 - 44	30	19 - 57
Height of Fracturing	m	157 - 190	211	227 - 272	NM
Height of Caving	m	5 - 10	37 - 60	5 - 10	NM
Surface Crack Width	mm	Nil	Nil	30	Nil
Chain Pillar Subsidence	m	N/A	N/A	1.1 - 1.6	0.9
Chain Pillar Width	m	40	40	40	40
Chain Pillar Height	m	3.5	3.5	3.5	3.5

*- expected values, based on an empirical model of chain pillar and strata compression presented in **Mills, 1998**. Numerical modelling results (Flac-2D) indicate 2 to 3 m is possible, with worst-case value of 65%T or 3.9 m to 4.2 m for impact assessment purposes. Note that worst-case values are 2.6 ~ 4 times the expected values, and roughly coincides with the Section 138 Guidelines.

A review of the surface inspection records prepared by the mine site surveyor, indicate that no perceptible impacts (such as cracking or erosion) have occurred due to further mine subsidence from the extraction of LWA2.

6.0 Site Inspection

An inspection of the surface above LWs A1 and A2 was conducted by a Principal Engineer on the 3/12/08.

The following sites were visited and notes / photographs taken of the observed conditions:

- Pelton Road Fire Trail (see Photo 1)
- Mine subsidence warning sign on Pelton Road Fire Trail (Photo 2)
- Survey Crossline 1B and Feno Mark (Photos 3 and 4)
- Ephemeral drainage gully above LW A2 (Photo 5)
- Surface piezometer (AQD 1077), 400m to south of LW A2 (Photo 6)
- Surface extensometer (AQD 1078) above chain pillar between LWs A1 and A2 (Photo 7)
- Surface extensometer (AQD 1076) above centre of LWA1 (Photo 8)
- Un-named Fire Trail above LW A1 (Photo 9)
- Surface terrain above LW A1 (Photo 10)

As was discussed in the documentation tabled by Austar Mine, there were no perceptible impacts from mine subsidence of up to 1 m observed at the sites visited, except for methane gas odour venting from the A1 Panel extensometer No.1076.

7.0 Strategies, Plans and Programs

7.1 Existing Strategies, Plans and Programs

The existing strategies that are in place to manage mine subsidence impacts and public safety issues at Austar have provided the following:

- Predictions of mine subsidence impacts for a range of scenarios which allow for the uncertainties inherent in the prediction models used and the behaviour of the rock mass (see Section 138 Application Report)

- A Public Safety Management Plan, which addresses issues raised in the DA Consent Conditions and defines the plans required to satisfy those conditions. The PSMP includes for the timely installation of public hazard warning signage, survey lines and visual inspection guidelines before, during and after the development of mine subsidence. Mine subsidence damage repairs and hazard mitigation strategies are also defined in the PSMP.

- Subsidence monitoring plans, which gather data on surface and subsurface movements by 3-D survey, borehole instrumentation, and visual inspection techniques (see LWA1 End of Panel Report for all monitoring plans and results data).

7.2 Compliance with Consent Conditions

Based on the review of the Section 138, AEMR and EOPR documents for 2005 to 2007 it is concluded that the Austar Mine has complied with the relevant DAs Conditions of Consent for mine subsidence impact management for this reporting period.

7.3 Adequacy of the Strategies

Although the above strategies have now been superseded by the Subsidence Management Plan System under the Mining Act, 1992, the information being collected is considered adequate for meeting the objectives of current SMP standards and allows for the assessment / mitigation strategies if any environmental damage occurs.

Actual subsidence and impact predictions at surface features within the area of influence of mining have generally been less than or consistent with the Section 138 Application and EIS predictions. Actual impacts have been assessed as ‘imperceptible’ with no surface cracking or damage observed after subsidence of up to 1 m.

Overall, the current strategies, plans and programs for managing mine subsidence impacts and public safety are considered to be performing adequately.

8.0 Recommended Actions to Improve Subsidence Impact Management System Performance

It is assessed that the subsidence management strategies being implemented at Austar has performed satisfactorily in regards to the Conditions of Consent during the 2005 - 2008 reporting period.

It is considered, however, that the AEMRs and EOPRs could be improved by providing more details or discussion on the predicted subsidence v. measured impacts (eg. As per Table 1 in this document). The current reporting method requires the reader to be familiar with all previous documentation and to be able to understand and interpret the data provided with minimal explanation.

It is therefore recommended that the DPI and DoP liase with the mine and provide more guidance on minimum reporting requirements, if considered necessary.

For and on behalf of
Ditton Geotechnical Services Pty Ltd

Steven Ditton
Principal Engineer and Director
BE(Civil/Hons) C.P.Eng(Civil), M.I.E.(Aust)

NPER 342140

Attachments:

Photos 1 to 10

Photo 1 - Pelton Road Fire Trail Above LW A2

Photo 2 - Mine Subsidence Warning Sign on Pelton Road Fire Trail

Photo 3 - Mine Subsidence Cross Line 1B above LW A2

Photo 4 - Feno Mark

Photo 5 - Ephemeral Drainage Gully above LW A2

Photo 6 - Surface Piezometer (AQD 1077), 400 m to south of LW A2

Photo 7 - Surface Extensometer (AQD 1078) above Chain Pillar between LWs A1 and A2

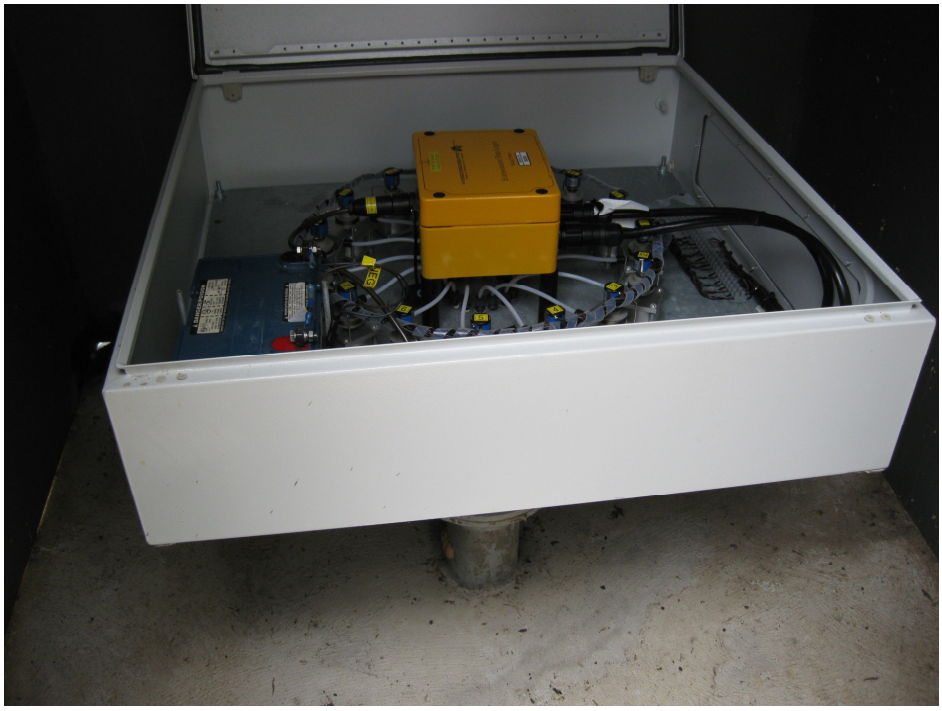

Photo 8 - Surface Extensometer (AQD 1076) Housing above centre of LWA1

Photo 9 - Un-named Fire Trail Above LW A1

Photo 10 - Surface Terrain above LW A1

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REPORT
on
COMPLIANCE AUDIT-GROUNDWATER

AUSTAR COAL MINE
CESSNOCK

Prepared for
GSS ENVIRONMENTAL
on behalf of
AUSTAR COAL MINE

Project 49324
MARCH 2009

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ATTACHMENTS

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Project No: 49324

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11 March 2009

REPORT ON
COMPLIANCE AUDIT - GROUNDWATER
AUSTAR COAL MINE - CESSNOCK

1. INTRODUCTION

This report presents the results of a compliance audit with respect to groundwater issues at the Austar Coal Mine, near Cessnock. The work was carried out for GSS Environmental Pty Ltd on behalf of Austar Coal Mine Pty Ltd.

The purpose of the audit was to assess compliance with the development consent (DA No. 29/95) for the Austar Coal Mine as amended by the Notice of Modification dated 2008, approved by the NSW Minister for Planning.

The development consent (Schedule 5, Item 6) requires that an independent environmental audit is undertaken, the requirements including the following:

- Conducted by a suitably qualified, experienced and independent expert;
- Include consultation with relevant agencies;
- Assess in respect of the requirement of the consent and any relevant mining lease of environmental protection license, the environmental performance of the development and its effects on the surrounding environment;
- Assess whether the development is complying with the relevant standards and performance measures specified in these approvals and with other statutory requirements;

- Review the adequacy of the strategies, plans or programs required under these approvals; and if necessary;
- Recommend measures or actions to improve the environmental performance of the development and/or any strategy, plan or program required under these approvals.

The groundwater component of the audit was undertaken by Will Wright, a geotechnical and groundwater engineer with over 15 years experience. Will's CV is attached for reference.

2. LEGISLATION/ REGULATIONS COMPLIANCE

2.1 Consent Conditions

A summary of the consent conditions relevant to groundwater are presented in Table 1 below, together with comments regarding the evidence of compliance with each condition, whether the conditions is considered to have been met and comments/recommendations.

Table 1 – Assessment of Compliance with Consent Conditions

Condition	Description	Evidence	Compliance	Comments/Recommendations
Schedule 2, Item 2	The applicant shall carry out development generally in accordance with the:			
	a) EIS by HLA Envirosciences P/L August 1995 "water management plan should be altered if investigation indicated changes to expected conditions"	The site water management plan (SWMP) was updated in November 2007 to reflect the results of a Groundwater Impact Assessment carried out by Connell Wagner in 2007 (Ref 1)	Complies	
	b) SEE by ERM, 13 July 2006 – "any adverse effects that require rehabilitation of groundwater levels or groundwater quality will be achieved through producing and implementing a specific post mining rehabilitation plan that addresses attached issue"	No adverse effects have been identified to date	NA	
	c) SEE, September 2007 by Austar – No changes "The surface and groundwater monitoring programs will continue as approved"	NA	NA	
Schedule 2, Item 4	The applicant shall ensure that all plant and equipment used at the site is :			
	a) Maintained in a proper and efficient condition	An inspection of piezometers, extensometers and reverse osmosis treatment system was undertaken – equipment was generally observed to be in good condition	Complies	A number of piezometers at Bore AQD 1077 had failed during 2007. If additional piezometers fail then consideration should be given to their replacement
	b) Operated in a proper and efficient manner	The operation of the reverse osmosis treatment system and associated CITECT continuous monitoring system was viewed	Complies	

Condition	Description	Evidence	Compliance	Comments/Recommendations
	WATER QUALITY			
Schedule 3, Item 5	**Discharge Limits** Except as may be expressly provided by a DECC Environmental Protection Licence, or in accordance with section 120 of the Protection of the Environment Act 1997, the applicant shall not discharge any water from the site.	The site water balance indicates that all ground water extracted from the underground workings is either: 1) re-circulated into the workings 2) Used on site for mining processes 3) Discharged to black creek, for which EPA licence 416 applies	Complies	Compliance of the discharges at Black Creek with the EPA license has not been specifically audited as this is a surface water issue
Schedule 3, Item 6	**Site Water Management Plan** Prior to mining commencing in Panel A3, or any other date agreed by the Director General, the Applicant shall revise its Site Water Management Plan for the mine, in consultation with the DWE and the DECC, and to the satisfaction of the Director General	Mining has not commenced in Panel A3. Nevertheless the SWMP has been submitted to the Department of Planning (DoP) and approved in a letter from Howard Reed received on 19 November 2007. The SWMP was also submitted to DWE and DEC. The DEC responded with no comment and no response has been sighted from the DWE.	Complies	
	This plan shall be implemented to the satisfaction of the Director General and must include:	Mining has not commenced in Panel A3	Complies	The implementation of the SWMP needs to be approved by the DoP prior to mining Panel A3
	a) A Site Water Balance	A site water balance has been developed and the water balance is updated on a monthly basis as evidenced from a spreadsheet database	Complies	
	b) An Erosion and Sediment Control Plan	This has not been assessed as it is not relevant to groundwater	NA – Surface water compliance issue	
	c) A Surface Water Monitoring Program	This has not been assessed as it is not relevant to groundwater	NA – Surface water compliance issue	

Condition	Description	Evidence	Compliance	Comments/Recommendations
	d) A Groundwater Monitoring Program	A groundwater monitoring program is detailed in the SWMP plan	Complies	
	e) A Surface and Ground Water Response Plan	A surface and groundwater response plan is included in the SWMP	Complies	Refer to Item 11 for detailed assessment of the response plan
Schedule 3, Item 10	**Groundwater Monitoring** The groundwater monitoring plan must include:			
	a) Groundwater impact assessment criteria	No specific groundwater impact assessment criteria are nominated in the SWMP	Does not comply	Specific criteria for groundwater compliance may be inappropriate, however regular review of groundwater, surface water and mine subsidence monitoring data, as proposed in Section 7 of the SWMP is considered essential. Refer to Section 2.5 of this report for additional discussion
	b) A program to monitor the volume and quality of groundwater seeping into the underground mine workings	Section 5 of the SWMP includes a programme to monitor groundwater inflows. Results are recorded on monthly basis in spreadsheet database	Complies	
	c) A program to monitor groundwater levels and quality	Section 5 of the SWMP includes a programme to monitor groundwater inflows. Results are recorded on monthly basis in spreadsheet database	Complies	
	d) A protocol for the investigation, notification and mitigation of identified exceedances of the ground water impact assessment criteria	Section 7 of the SWMP is a surface and groundwater response plan. The plan outlines a proposed investigation/verification program, however no procedures are provided for notification, and mitigation	Does not comply	

Condition	Description	Evidence	Compliance	Comments/Recommendations
Section 3, Item 11	**Surface and Ground Water Response Plan** The surface and groundwater response plan must include:			
	a) The procedures that would be followed in the event of any exceedance of the surface or groundwater impact assessment criteria or other identified impact on the surface or groundwater	Section 7 of the SWMP is a surface and groundwater response plan. The plan outlines a proposed verification program to identify the need for remedial measures and modifications to future operations, however no procedures are provided	Does not comply	Although the Connell Wagner Groundwater Impact Assessment (Ref 1) indicates that "The likely impact of the proposed extraction on the alluvial aquifer is assessed to be minimal" potential impact scenarios could be developed as a contingency and appropriate procedures identified for each scenario
	b) Measures to mitigate, remediate and/or compensate any identified impacts (including measures to mitigate and/or compensate potentially affected landowners for any loss of surface water flows in local creeks or farm dams	As above, no measures are included in Section 7 of the SWMP	Does not comply	As above
	c) Disposal/neutralisation contingencies in the event that acid leachate problems emerge after the mine closes	Section 7.3 of the SWMP indicates that a mine closure water plan will be developed however such a plan has not been developed yet as the mine is planned to be operated for a further 23 years	Does not comply	Such disposal / neutralisation contingencies may be required sooner than 23 years in the case of an early mine closure
Section 3, Item 12	**Groundwater Study** The applicant shall, in the event it selects the Cessnock No 1 Shaft at Kalingo as the ventilation shaft site for the mine, submit a report to the Director General and the DPI which includes a groundwater study and mine water disposal plan prepared in accordance with the requirements of the DPI and DECC	NA	NA	The mine is not using the Cessnock No 1 shaft at Kalingo

2.2 Environmental Protection License

An Environment Protection Licence (No 416) has been issued by the Environment Protection Authority. The licence relates to surface water discharges from the site. Although some of the groundwater is ultimately discharged from the site as surface water, following treatment, this discharge is considered a surface water issue and is not specifically addressed in this report.

2.3 Standards, Codes and Guidelines

The development has been assessed for compliance with various NSW policies on groundwater management as considered relevant. The NSW State Groundwater Policy Framework Document and The NSW State Groundwater Dependent Ecosystems Policy have been identified as relevant to the development. It is noted however that both documents provide a series of broad policy 'principles' rather than any specific requirements and therefore assessment of compliance with certain principles is not always relevant and sometimes subjective.

It is also noted that reference has been made to the conclusions of the Connell Wagner Groundwater Impact Assessment (Ref 1) in assessing compliance of some of these policies. Assessment of compliance with the policy documents is presented in Table 2 below.

Table 2 – Assessment of Compliance with Standards / Codes / Guidelines

Condition	Description	Evidence	Compliance	Comments/Recommendations
NSW State Groundwater Policy Framework Document	1) An ethos for the sustainable management of groundwater resources should be encouraged in all agencies, communities and individuals who own, manage or use these resources and its practical application facilitated	A SWMP has been developed to allow management of the groundwater	Complies	
	2) Non sustainable (groundwater) resource uses should be phased out	NA	NA	
	3) Significant environmental and/or social values on groundwater should be accorded special protection	The presence of groundwater dependent ecosystems has been identified and impacts are predicted to be 'minimal'	Complies	
	4) Environmentally degrading processes should be replaced with more efficient and ecologically sustainable alternatives	The mining process being used is designed to minimise impacts on alluvial aquifers	Complies	
	5) Where possible, environmentally degraded areas should be rehabilitated and their ecosystem functions restored	No degradation to the alluvial groundwater has been identified	Complies	The surface and groundwater response plan does not include any procedures for rehabilitation (Refer to Section 2.3)
	6) Where appropriate, the management of surface and groundwater resources should be integrated	The SWMP includes integration of surface water and groundwater	Complies	
	7) Groundwater management should be adaptive, to account for both increasing understanding of resource dynamics and changing community attitudes and needs	The SWMP includes various verification stages to allow identification of unexpected groundwater behaviour	Complies	
	8) Groundwater management should be integrated with the wider environmental and resource management framework	The effects of mining have been considered in the Groundwater Impact Assessment with respect to effects on agriculture and groundwater dependent ecosystems	Complies	

Condition	Description	Evidence	Compliance	Comments/Recommendations
NSW State Groundwater Dependent Ecosystems Policy	Principle 5 ; Planning, approval and management of developments, water use and land use activities should aim to minimise adverse impacts on groundwater dependent ecosystems by:			
	• Maintaining, where possible, natural patterns of groundwater flow and not disrupting groundwater levels which are critical for ecosystems	The proposed mining is predicted to have minimal impact on the alluvial aquifers	Complies	
	• Not polluting or causing adverse changes in groundwater quality	Any groundwater re-circulated into the mine workings is not expected to impact on surface alluvium	Complies	
	• Rehabilitating degraded groundwater systems where practical	No degradation to the alluvial groundwater has not been identified	Complies	The surface and groundwater response plan does not include any procedures for rehabilitation (Refer to Section 2.3)

2.4 Strategies, Plans and Programs

The current SWMP was developed in response to the proposed future Stages 2 and 3 mining, which will include mining below identified alluvial aquifers which contain groundwater dependent ecosystems as well as a number of registered groundwater wells.

The groundwater monitoring plan and groundwater response plan, Sections 5 and 7 of the SWMP, have been developed largely on the basis of the Groundwater Impact Assessment by Connell Wagner for Stages 2 and 3 of the development. The strategy is targeted to monitor groundwater levels in the alluvial aquifer as well as a shallow water bearing zone at 70 m to 100 m depth for any changes.

No groundwater impact criteria have been set, rather it is proposed that data collected from the monitoring be reviewed at the completion of five nominated mining panels ranging from Panel A2 to Panel A17. The data is proposed to be reviewed to assess the occurrence of unexpected behaviour and allow any necessary remedial measures to be carried out.

No specific assessment criteria have been set, presumably because the definition of a sensible/meaningful criteria to compare groundwater levels is very difficult as groundwater levels naturally fluctuate with climatic conditions. The proposed methodology which proposes a holistic overview of the available monitoring data, including rainfall records, groundwater levels, groundwater flows, subsidence data, extensometer data and surface water levels is considered a practical alternative to the adoption of specific, possibly irrelevant, criteria. This proposed strategy however does introduce the process to subjectivity and judgement with interpretation of the data and therefore such a verification process should be subject to third party review. This should include the ongoing adequacy of the monitoring program.

2.5 Recommended Measures or Actions to Improve Environmental Performance

It is considered that the proposed emphasis of the future groundwater monitoring program on measurement of groundwater levels in the alluvium on shallow fractured rock is a sound approach. The SWMP indicates that two additional bores will be installed in the alluvial aquifer and two in the shallow fractured rock aquifer. The alluvial wells are proposed to be installed prior to completion of long wall mining in Stage 2 and the fractured rock wells are proposed to be installed prior to mining in Stage 3.

The installation of the monitoring wells, well in advance of the proposed mining would be advantageous as it would allow collection of background groundwater level data and thereby allow a more definitive assessment of the possible effects of the mining. The background monitoring could also be used to assess whether the proposed additional two well in the alluvial aquifer are sufficient to allow effective monitoring.

3. LIMITATIONS

Conditions on site different to those identified during this assessment may exist. Therefore DP cannot provide unqualified warranties nor does DP assume any liability for site conditions not recorded in the data available for this study.

This report and associated documentation and the information herein have been prepared solely for the use of GSS Environmental and Austar Coal Mine Pty Ltd. The report and the information contained herein may be further relied on by the NSW Department of Planning solely for the purpose of assessing compliance of the development. Any reliance assumed by other parties on this report shall be at such party's own risk. Any ensuing liability resulting from use of the report by other parties cannot be transferred to DP.

DOUGLAS PARTNERS PTY LTD

Will Wright
Principal

Reviewed by:

Stephen Jones
Principal

REFERENCES

1. Connell Wagner Pty Ltd, "Future Mine Development, Groundwater Impact Assessment, Austar Coal Mine", 27 October 2007, Reference 30518-001.

2. Austar Coal Mine, " Site Water Management Plan", October 2007.

Douglas Partners
Geotechnics · Environment · Groundwater

NOTES RELATING TO THIS REPORT

Introduction

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, Geotechnical Site Investigations Code. In general, descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions.

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (eg. sandy clay) on the following bases:

Soil Classification	Particle Size
Clay	less than 0.002 mm
Silt	0.002 to 0.06 mm
Sand	0.06 to 2.00 mm
Gravel	2.00 to 60.00 mm

Cohesive soils are classified on the basis of strength either by laboratory testing or engineering examination. The strength terms are defined as follows.

Classification	Undrained Shear Strength kPa
Very soft	less than 12
Soft	12—25
Firm	25—50
Stiff	50—100
Very stiff	100—200
Hard	Greater than 200

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone penetrometer tests (CPT) as below:

Relative Density	SPT "N" Value (blows/300 mm)	CPT Cone Value (q_c — MPa)
Very loose	less than 5	less than 2
Loose	5—10	2—5
Medium dense	10—30	5—15
Dense	30—50	15—25
Very dense	greater than 50	greater than 25

Rock types are classified by their geological names. Where relevant, further information regarding rock classification is given on the following sheet.

Sampling

Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing with a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling are given in the report.

Drilling Methods.

The following is a brief summary of drilling methods currently adopted by the Company and some comments on their use and application.

Test Pits — these are excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descent into the pit. The depth of penetration is limited to about 3 m for a backhoe and up to 6 m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Large Diameter Auger (eg. Pengo) — the hole is advanced by a rotating plate or short spiral auger, generally 300 mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube sampling.

Continuous Sample Drilling — the hole is advanced by pushing a 100 mm diameter socket into the ground and withdrawing it at intervals to extrude the sample. This is the most reliable method of drilling in soils, since moisture content is unchanged and soil structure, strength, etc. is only marginally affected.

Continuous Spiral Flight Augers — the hole is advanced using 90—115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water

table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be contaminated. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability, due to remoulding, contamination or softening of samples by ground water.

Non-core Rotary Drilling — the hole is advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from 'feel' and rate of penetration.

Rotary Mud Drilling — similar to rotary drilling, but using drilling mud as a circulating fluid. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg. from SPT).

Continuous Core Drilling — a continuous core sample is obtained using a diamond-tipped core barrel, usually 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation.

Standard Penetration Tests

Standard penetration tests (abbreviated as SPT) are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" — Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of say 4, 6 and 7

  as 4, 6, 7
  N = 13

- In the case where the test is discontinued short of full penetration, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm

  as 15, 30/40 mm.

The results of the tests can be related empirically to the engineering properties of the soil.

Occasionally, the test method is used to obtain samples in 50 mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the borelogs in brackets.

Cone Penetrometer Testing and Interpretation

Cone penetrometer testing (sometimes referred to as Dutch cone — abbreviated as CPT) described in this report has been carried out using an electrical friction cone penetrometer. The test is described in Australian Standard 1289, Test 6.4.1.

In the tests, a 35 mm diameter rod with a cone-tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130 mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20 mm per second) the information is plotted on a computer screen and at the end of the test is stored on the computer for later plotting of the results.

The information provided on the plotted results comprises: —

- Cone resistance — the actual end bearing force divided by the cross sectional area of the cone — expressed in MPa.
- Sleeve friction — the frictional force on the sleeve divided by the surface area — expressed in kPa.
- Friction ratio — the ratio of sleeve friction to cone resistance, expressed in percent.

There are two scales available for measurement of cone resistance. The lower scale (0—5 MPa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main scale (0—50 MPa) is less sensitive and is shown as a full line.

The ratios of the sleeve friction to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1%—2% are commonly encountered in sands and very soft clays rising to 4%—10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:—

q_c (MPa) = (0.4 to 0.6) N (blows per 300 mm)

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:—

q_c = (12 to 18) c_u

Interpretation of CPT values can also be made to allow estimation of modulus or compressibility values to allow calculation of foundation settlements.

Inferred stratification as shown on the attached reports is assessed from the cone and friction traces and from experience and information from nearby boreholes, etc. This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties, and where precise information on soil classification is required, direct drilling and sampling may be preferable.

Hand Penetrometers

Hand penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 150 mm increments of penetration. Normally, there is a depth limitation of 1.2 m but this may be extended in certain conditions by the use of extension rods.

Two relatively similar tests are used.

- Perth sand penetrometer — a 16 mm diameter flat-ended rod is driven with a 9 kg hammer, dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.
- Cone penetrometer (sometimes known as the Scala Penetrometer) — a 16 mm rod with a 20 mm diameter cone end is driven with a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). The test was developed initially for pavement subgrade investigations, and published correlations of the test results with California bearing ratio have been published by various Road Authorities.

Laboratory Testing

Laboratory testing is carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedure used are given on the individual report forms.

Bore Logs

The bore logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable, or possible to justify on economic grounds. In any case, the boreholes represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes, the frequency of sampling and the possibility of other than 'straight line' variations between the boreholes.

Ground Water

Where ground water levels are measured in boreholes, there are several potential problems;

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report.
- The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Engineering Reports

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building), the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface condition, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- unexpected variations in ground conditions — the potential for this will depend partly on bore spacing and sampling frequency
- changes in policy or interpretation of policy by statutory authorities
- the actions of contractors responding to commercial pressures.

If these occur, the Company will be pleased to assist with investigation or advice to resolve the matter.

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

Reproduction of Information for Contractual Purposes

Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Tender Documents", published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section

is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

WILL WRIGHT
Senior Geotechnical and Groundwater Engineer
Principal – Newcastle Branch Manager

Bachelor of Engineering (Civil) Hons
University of Newcastle, 1993
Master of Engineering Science
(Groundwater Studies) NSW, 1997

Date of Birth: 14 March 1970

Membership: Member, Institution of Engineers, Australia
Member, Civil College
NPER 3 registration as Civil Engineer

Australian Geomechanics Society
Red R Society

EXPERIENCE:

2003 to present Douglas Partners Pty Ltd
Newcastle Office
Senior Geotechnical and Groundwater Engineer

- Hunter Central, Proposed Shopping Centre, Newcastle: Project manager for concept study including mine subsidence issues, large excavations, groundwater flows and contamination assessment.
- Lower Hunter Lands Development for Coal & Allied, Various Sites. Project manager for integrated mine subsidence, geotechnical and contamination assessments.
- South West Rocks, Proposed Residential Development: assessment of groundwater flow model, assessment of expected affects of proposed development on sensitive habitats, and proposed mitigations
- PWCS Stage 3D Expansion, Kooragang Island. Project Safety Manager and Field Operations Manager for investigation and construction phases. Technical Review of Geotechnical Recommendations. Development of groundwater model and contaminant transport modelling.
- Proposed Coal Fired Power Station. Project manager for site investigation and coal resource evaluation for proposed coal fired power station in Hunter Valley.
- Charlestown square redevelopment, Project manager for extensive mine subsidence, geotechnical and contamination assessments.
- HQO Building, Honeysuckle. Project manager for geotechnical and mine subsidence investigations. Established crush of pillars had already occurred, avoiding otherwise costly grouting of the workings.
- Mine subsidence investigation and numerical modelling for proposed nursing home over multiple worked seams, Elemorevale.
  Mine subsidence investigation for Cessnock Performing Arts centre, confirming existing workings were stowed, avoiding any MSB restrictions.
- Urban capability assessments for numerous developments including: Proposed Nursing Home on former Gretley Colliery land, Wallsend; Sweetwater in Rothbury; Thornton North; Heddon Greta; Housing Estate, Booragul.
- Hunter to Central Coal Water Main – project manager for investigation of water pipeline route from Wangi to Warnervale, including over water drilling of Dora Creek.
- Newcastle East , Design and supervision of grouting of shallow unmapped mine workings.
- Geotechnical design of mine infrastructure built over deep mine spoil at various locations including Cumnock, Ashton Coal, Wambo North.
- Balickera Pump Station, geotechnical investigations for upgrading of pump station.
- Barrier Wall, Former BHP Mayfield. Computer modelling of cut off wall stability.
- Lane Cove Tunnel. Computer modelling of groundwater seepage into tunnel.
- Wallarah Peninsular, assessment of proposed water reservoir at top of quarry wall as well as investigation of proposed water and sewer infrastructure throughout development.
  Carrington Orange Juice Terminal. Geotechnical design of piled raft system to allow location of tanks close to the edge of a sea wall within an area of potential slope instability.
- Maitland DMR Building. Analysis of pile groups to allow founding on gravel layer, reducing piling costs.
- Redhead Subdivision. Extensive groundwater modelling to assess the possible affects of a proposed residential subdivision on groundwater levels, in order to protect endangered frog habitats.

- BHP Emplacement Ponds. Coordination of extensive geotechnical investigation to characterise site and allow assessment of potential site uses.
- Springvale Dam. Design of water storage dam for Springvale Colliery utilising on-site sand soils for embankment construction, with options for GCL lining or a sand-bentonite core.
- George Booth and John Renshaw Drive. Pavement thickness designs for extensive road widenings and intersections to accommodate planned mine haul trucks from Tasman Mine.
- Macquarie Coal. Investigation and reconstruction options for damaged haul road.

WILL WRIGHT
Senior Geotechnical and Groundwater Engineer
Principal

- LNG Terminal, Sakhalin Island. Interpretation of British and Russian field investigations and engineering analysis for footings, including 50 m diameter tanks, dynamic foundation analysis, slope stability and site preparation.

2000 to 2003 URS Corporation - London Office – Senior Engineer (Soil and Groundwater)

- Sangachal Terminal Expansion Geotechnical Investigation in Azerbaijan, 2002.
  Project Manager for an extensive drilling and trial pitting program to allow detailed design of facilities for a major expansion of the existing oil/gas terminal. There was also a significant geophysical component including tracing of existing pipeline and cable locations.
- Sakhalin II Onshore Oil/Gas Processing Facility, Lunskoye, Sakhalin Island, Russia.
  On site technical representative overseeing works by six contractors in remote camp location. The work included CPT testing, geotechnical investigation bores, groundwater exploration bores and geophysical testing. Analysis and reporting including design of large tank foundations. Detailed design of piled foundations.
- Shah Deniz Gas Pipeline, Republic of Georgia, 2001.
  Project manager for Geotechnical Investigation along 340 km pipeline through remote mountainous terrain. Management of local contractor with three field teams, including training of local staff. Advanced Safety Auditing and Environmental Monitoring.
- Construction of Ethylene Plant – Nanjing, China 2002.
  Assessment of pile driving operations during construction. Development of pile completion criteria to meet both Western and Chinese Standards.
- Heathrow Terminal 5 Development – Environmental Risk Assessment.
  Compilation and review of extensive background information on an existing sludge disposal plant. Management of additional subsurface investigations. Quantitative (Tier 3) risk assessment for human health and controlled groundwater using Monte Carlo (probabilistic) methods.
- Redevelopment of Sun Printers Site, Watford. Geotechnical Investigation.
- Chrome plating facility – Bristol. Phase II Contamination Assessment.
- Sakhalin II, LNG Jetty, Sakhalin Island, Russia. Design of piles for 1 km jetty designed for extremely high lateral loadings from icebergs.

1993 to 2000 Douglas Partners Pty Ltd
Newcastle Office
Geotechnical and Groundwater Engineer

<u>Groundwater Investigations/ Assessments</u>

- Existing Paint Factory, Ho Chi Minh City. Vietnam, Field supervision of drilling, well installation and groundwater sampling for contamination assessment. Supervision of contaminated soil remediation.
- Mapping of groundwater vulnerability and beneficial use, as well as recommendation of appropriate management strategies for a coastal city council area.
- Review of the monitoring requirements for the closure of a sand mining operation in a water supply aquifer at Tomago.
- Hydrogeological investigation for a proposed landfill in abandoned open cut pit in the Hunter Valley. Field supervision of drilling, water pressure testing of coal seams, installation of wells and groundwater quality monitoring . Assessment of the existing groundwater quality and the flow regime around pit. Comments on site suitability and possible impacts on nearby Hunter River.
- Proposed effluent disposal site at Heatherbrae. Supervision of drilling, well installation and groundwater sampling. Assessment of groundwater flows, existing groundwater quality and consequences of proposed irrigation of treated effluent, including computer modelling of solute transport.

WILL WRIGHT
Senior Geotechnical and Groundwater Engineer
Principal

- Contamination assessment at coal fired power station. Review of the likely contamination migration paths and locations, supervision of drilling, well installation and sampling. Assessment of the extent of contamination and potential for off-site migration and development of a management strategy including monitoring requirements.
- Proposed effluent disposal site at Anna Bay. Supervision of drilling, well installation and groundwater sampling. Assessment of groundwater flows and existing groundwater quality.
- Field supervision and assessment of pumping tests for the basement dewatering of a proposed multi storey building.
- Hydrogeological study, proposed landfill, Minimbah (Great Lakes). Supervision of drilling and permeability testing and preliminary assessment of the site suitability.

Groundwater/Seepage Modelling

- Proposed sludge lagoon at Castlemaine. Three dimensional modelling was undertaken to estimate leachate leakage from a proposed sludge storage lagoon as well as the corresponding level of groundwater mounding in an underlying aquifer.
- Proposed golf course development, Harrington. Two dimensional plan and cross section modelling was used to assess the interaction between groundwater and surface water of artificial lakes proposed to be used for irrigation of the golf course
- Dewatering of a proposed tunnel through sand, Perth. The modelling was required to estimated required spear locations, pumping rates and the drawdown profile which was needed to estimate likely settlement of nearby buildings.
- Cross section transient modelling of seepage through an elevated mining pond constructed from sand. Assessment of flows around buried structures to determine the potential for piping and development of methods to reduce the risk of piping.
- Application of municipal effluent to a coastal sand dune at Hat Head. The modelling was used to estimate the level of groundwater mounding below the dunes and the component of effluent flow into an inland creek.
- Plan modelling of effluent application near a water supply aquifer at Tomago. The modelling included assessment groundwater mounding as well as transient contaminant transport modelling, considering advection and dispersion mechanisms, to estimate the future migration of the effluent plume.
- Rapid drawdown assessment of the existing Hunter River levee bank around Maitland. The modelling was required to estimate the depth of saturation into the levee bank based on a 50 year flood hydrograph.
- Seepage modelling of a large earth dam at Aldridges Creek. The purpose of the modelling was to estimate pore pressures for stability analyses and flow rates through the clay core to design an adequate drainage filter.
- Research into rainfall recharge and beach face boundary effects at a coastal dune aquifer at Hat Head. The work was carried out for a M.Eng.Sc thesis and involved transient cross section and plan modelling to replicate measured groundwater heads.

Engineering and Construction

- Port Waratah Coal Loader Expansion, Newcastle, Australia.
  Geotechnical Investigation for Expansion of the existing coal terminal. Development of HSE Plan, Task Risk Assessments and Work Procedure. Manager for site works within an operational terminal, including drilling, CPT, plate load testing, trial pitting and installation of piezometer, inclinometer and extensometer instrumentation. Design and monitoring of staged preload mound over very alluvial deposits, including elasto-plastic modelling of vertical settlement and lateral displacement. Design of laterally and axially loaded pile groups for a 4 km conveyor corridor over soft alluvial sediments.
- Woodside 125 km Offshore Pipeline, North-West Shelf, WA – Offshore Investigation
  Offshore survival training including simulated escape from submerged helicopter.
  Supervision of diver operated sea bed drilling operations from support vessel. Co-ordination of sample handling and testing. Characterisation of subsurface conditions for scour stability analysis and dredgability including assessment of rotary core, CPT, vibrocore, and drop core sampling and testing.
- Seed Oil Tank Farm – Kooragang No.3 berth, Newcastle
  Modelling the effect of a new tank farm on the existing wharf which had previously required remediation due to slope instability. Recommendations for safe development of the site.
- Sand Dam – Tomago Sand Beds

WILL WRIGHT
Senior Geotechnical and Groundwater
Principal

Design of a dam made from sand, to allow raising the groundwater and floating sand mining equipment over an existing town water supply pipeline. Development of specialised methods to prevent erosion/piping failure of the sand embankment due to seepage and protection of the pipeline due to embankment loading.

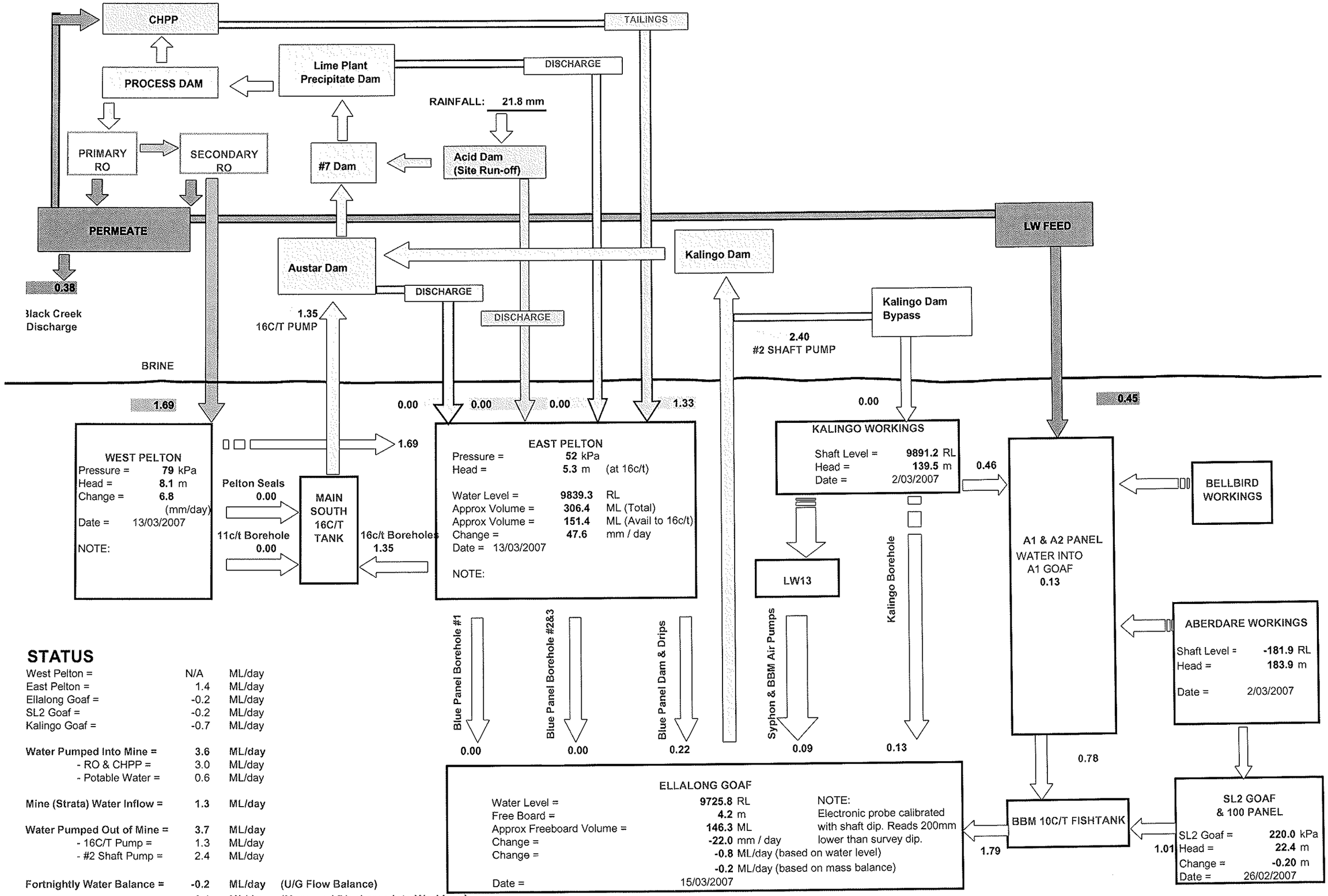
- Water Storage Dam – Aldridges Creek – Construction Supervision
  Supervision of foundation grouting, construction of concrete spillway structure and materials sourcing/verification. Computer modelling of seepage and stability.
- Water Storage Dam – Grahamstown – Construction Supervision
  Subsurface locating of the impermeable cut-off will within existing embankment, supervision of embankment raising and verification of new cut-off wall continuity and quality.
- BHP Steel Works, Newcastle
  Assessment and monitoring of heavily trafficked pavements, and Development of maintenance program to extend pavements life
- Dartbrook Coal Mine, Hunter Valley – Staged Discharge Dam
  Site investigation, design, materials assessment and management of construction supervision for 450 M1 dam with a significant hazard rating.
- Proposed Underground Train Station, Bondi – Dewatering Assessment. Modelling of construction dewatering to determine the optimum well layout to increase system efficiency, and also to reduce groundwater draw-down which could lead to settlement of nearby heritage structures.
- Pavement Assessment Design
  Assessment of existing pavements and design of remediation strategies and the design of new pavements for numerous municipal road, highways and heavily loaded industrial situations.

PUBLICATIONS

" Groundwater Modelling of an Unconfined Coastal Sand Aquifer", Master of Engineering Science Project Report, February 1997.

" Design and Construction of Sand Dam to Float Dredge Over Buried Pipelines", Third Australian and New Zealand Young Geotechnical Professionals Conference, Melbourne, February 1998.

FIGURE 4: DAILY AVERAGE AUSTAR COAL MINE WATER BALANCE SUMMARY (ML / day) From 5/03/2007 to 19/03/2007



STATUS

West Pelton =	N/A	ML/day	
East Pelton =	1.4	ML/day	
Ellalong Goaf =	-0.2	ML/day	
SL2 Goaf =	-0.2	ML/day	
Kalingo Goaf =	-0.7	ML/day	
Water Pumped Into Mine =	**3.6**	**ML/day**	
- RO & CHPP =	3.0	ML/day	
- Potable Water =	0.6	ML/day	
Mine (Strata) Water Inflow =	**1.3**	**ML/day**	
Water Pumped Out of Mine =	**3.7**	**ML/day**	
- 16C/T Pump =	1.3	ML/day	
- #2 Shaft Pump =	2.4	ML/day	
Fortnightly Water Balance =	**-0.2**	**ML/day**	**(U/G Flow Balance)**
	-0.1	**ML/day**	**(Measured Discharge Into Workings)**

Austar Coal Mine Pty Ltd
A.B.N. 67 111 910 822

Mine Office
Middle Road,
Paxton, NSW.
Locked Bag 806,
Cessnock, NSW 2325,
Australia.
PHONE: +61 2 4993 7200
FAX: +61 2 4993 7302

1 November 2007

Mr Fergus Hancock
Department of Water and Energy
PO Box 2213
DANGAR NSW 2309

Dear Fergus

RE: SITE WATER MANAGEMENT PLAN – AUSTAR COAL MINE

Please find enclosed a copy of Austar Coal Mine's Site Water Management Plan for your records. Copies of the plan have also been forwarded to the Department of Planning, Department of Primary Industries and Department of Environment and conservation.

Thank you for your assistance during the preparation of this document. Please do not hesitate to call me on (02) 4993 7334 if you require any further information.

Yours faithfully,

Keren Halliday
Environmental Coordinator
Austar Coal Mine Pty Ltd

NSW GOVERNMENT
Department of Planning

Contact: Colin Phillips
Phone: (02) 9228 6483
Fax: (02) 9228 6466
Email: colin.phillips@planning.nsw.gov.au

Ms Keren Halliday
Environmental Coordinator
Austar Coal Mine Pty Ltd
Locked Bag 806
CESSNOCK NSW 2325

Our ref:

Dear Keren

Austar Coal Mine
Environmental Monitoring Program and Site Water Management Plan

I refer to your letters, dated 31 October and 1November 2007, seeking approval of the accompanying Environmental Monitoring Program (EMP) and Site Water Management Plan (SWMP) required by conditions 33 and 11 respectively of the Minister's consent for the Austar Coal Mine.

The Department considers both the EMP and SWMP satisfy the requirements of the mine's consent. Accordingly, the Director-General had approved Austar Coal Mine's Environmental Monitoring Program and Site Water Management Plan.

If you have any queries on this matter, please contact Colin Phillips at the details listed above.

Yours sincerely,

Howard Reed 15-11-07
A/Manager
Mining and Extractive Industries
as Delegate for the Director-General

RECEIVED
19 NOV 2007
BY:.....

Our reference : DOC07/15964 LIC07/689
Contact : Mitchell Bennett, 02 4908 6806

RECEIVED
3 MAY 2007
BY: SK

Austar Coal Mine Pty Ltd
Locked Bag 806
CESSNOCK NSW 2325

Attention: Ms Keren Halliday

2 - MAY 2007

Dear Ms Halliday

WATER MANAGEMENT PLAN

I refer to your letter dated 27 April 2007 and the attached copy of your site Water Management Plan.

The Department of Environment and Climate Change (DECC) encourages the preparation of strategies, programs and plans as useful tools for industry to ensure that it meets the environmental objectives specified in conditions of Environment Protection Licences. As a regulatory authority DECC does not review or comment on these plans.

Please contact Mitchell Bennett on 04 4908 6906 if you wish to discuss this matter.

Yours sincerely

MITCHELL BENNETT
Head Regional Operations Unit – North East Branch
Climate Change and Environment Protection

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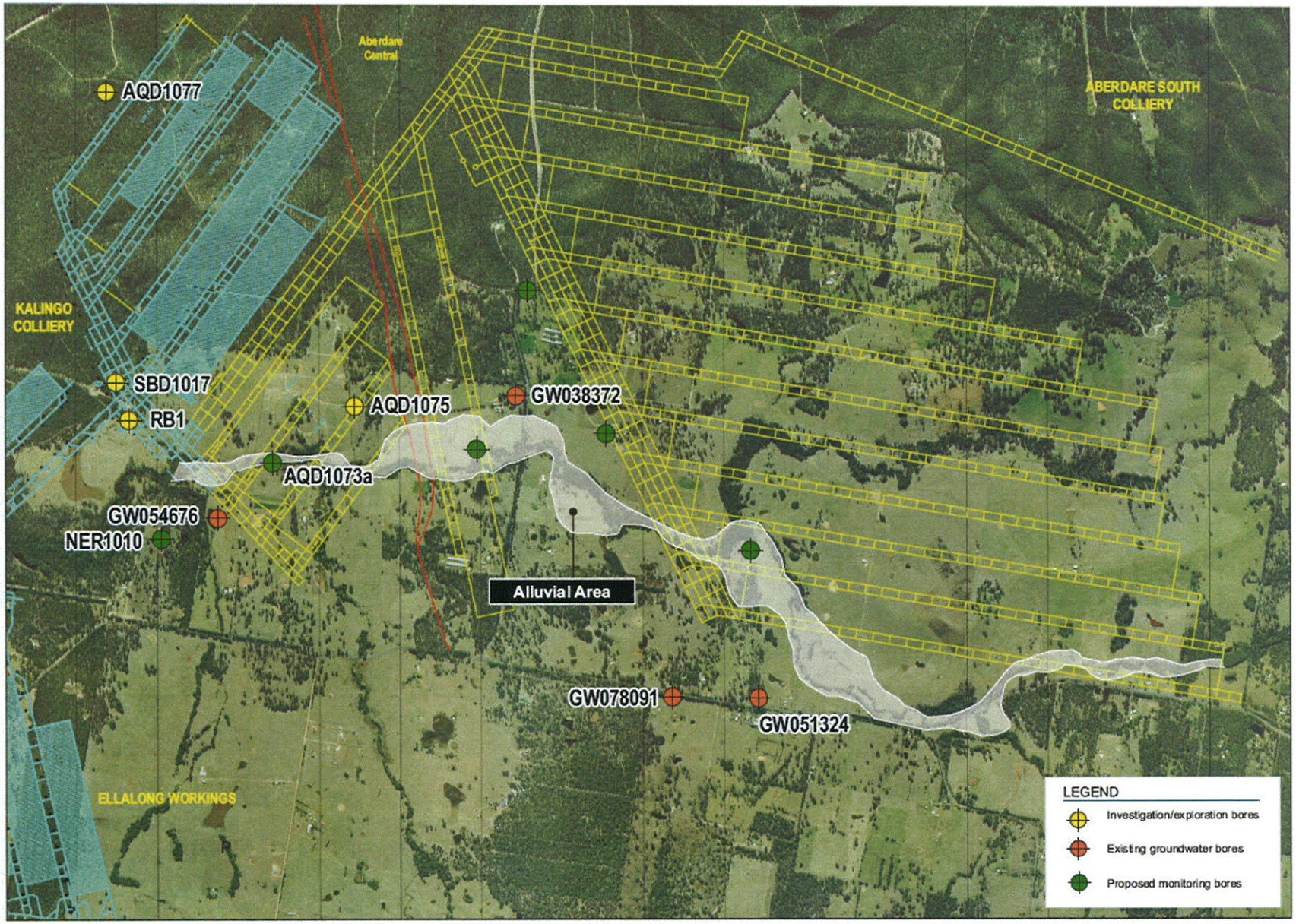
117 Bull Street, Newcastle West, NSW 2302
Tel: (02) 4908 6800 Fax: (02) 4908 6810
ABN 30 841 387 271
www.environment.nsw.gov.au



AUSTAR COAL MINE\30518\00\08.10.07\RC

Figure 5

Extent of Alluvial Area

HEGGIES

REPORT 30-2169-R2

Revision 0

Independent Environmental Audit
December 2008
Austar Coal Mine
Air Quality

PREPARED FOR

GSS Environmental
PO Box 907
Hamilton NSW 2303

5 MARCH 2009

HEGGIES PTY LTD
ABN 29 001 584 612

Independent Environmental Audit

December 2008

Austar Coal Mine

Air Quality

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
30-2169-R2	Revision 0	5 March 2009	Jason Watson	Martin Doyle	Jason Watson

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1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been engaged by GSS Environmental, on behalf of Austar Coal Mine, to conduct an environmental audit with regard to air quality, in accordance with Schedule 5 Item 6 *Independent Environmental Audit* of the Notice of Modification dated 5 June 2008 applicable to Development Consent (DA No. 29/95) granted by the Minister for Urban Affairs and Planning on 14 February 2008.

The author, Jason Watson, has 11 years experience in the field of air quality and is Group Manager (Environmental Management) at the Heggies Newcastle office. Please find his curriculum vitae attached as **Appendix A**.

2 REGULATIONS AND LEGISLATION

2.1 Consent Conditions

The relevant consent conditions applicable to the areas of Air Quality are provided in Schedule 3, Items 17 - 20 of the Notice of Modification (provided in **Appendix B**). The key Consent Conditions and determination of compliance have been summarised and are provided in **Table 1**.

Table 1 Air Quality Consent Conditions - Schedule 3 Items 17-20

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
17	The Applicant shall ensure that the dust emissions generated by the Infrastructure Upgrade Area identified in Figure 1.3 of the April 2006 SEE do not cause additional exceedance of the air quality impact assessment criteria listed Tables 3, 4 and 5 at any residence on, or on more than 25 percent of any privately owned land.	Austar Dust and HVAS monitoring reports 2007 Austar Dust and HVAS monitoring 2008 database Sept 08 AEMR July 2007 – June 2008	Yes	Air quality monitoring did not commence until April 2007. This was 6 months after re-commencement of mining activities. There was one exceedance (55 $\mu g/m^3$) of the 24-hr average PM_{10} criterion (50 $\mu g/m^3$) at Bimbadeen Road on 31/12/2007. As described within the 2007 AEMR, high wind speeds predominantly from the east occurred on this day indicating the mine may not have been the main source of particulate. All other air monitoring results including deposited dust and annual average PM_{10} are well below the assessment criteria.

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
18(a)	The applicant shall ensure any visible air pollution generated by the development is assessed regularly, and measures taken to minimise air quality impacts on privately owned land to the satisfaction of the Director-General.	Air Quality Management and Monitoring Plan 2007 Letter to NSW Dept of Planning dated 14 December 2006 concerning the AQMP.	No	There is no evidence to indicate that any visible air pollution generated by the development is being assessed regularly. It is recommended that a visual dust inspection be conducted regularly at (but not limited to) the Coal Handing and Processing Plant and in the vicinity of any underground ventilation exhaust. Measures for air quality impact mitigation are described within the AQMP and are considered adequate.
18 (b)	The applicant shall implement all practical measures to minimise the off-site odour and fume emissions generated by the mines ventilation system or any spontaneous combustion at the development to the satisfaction of the Director-General	Air Quality Management and Monitoring Plan 2007 DoP letter dated 15/2/07 approving the air quality monitoring program. Complaints Register 2006 – 2008. NATA certificates of examination for underground monitoring equipment dated: 18/3/08 and 1/5/2008. Statutory 6 monthly test and calibration certificate dated 2 April 2008 for underground gas detection equipment. Real time monitoring data of underground gases viewed during audit site visit.	Yes	The AQMP notes that "odour issues have not been a historical problem at the site and therefore no definitive monitoring or evaluation of odour is recommended in this AQMP". The AQMP was approved by the director general and therefore this condition is considered to be met. No complaints have been made regarding this source. All underground monitoring systems for detection of combustion gases are adequate.
19	The applicant shall implement the approved Air Monitoring Program for the development to the satisfaction of the Director-General. This program must include an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this consent.	Air Quality Management and Monitoring Plan 2007 DoP letter dated 15/2/07 approving the air quality monitoring program.	Yes	None

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
20	The applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in Approved Methods for Sampling of Air Pollutants in New South Wales and to the satisfaction of the Director-General.	Site inspection Weather data – 2007 and 2008	Yes	None

AEMR: Annual Environmental Management Report
HVAS: High Volume Air Sampler
D-G: Director-General

2.2 Environment Protection Licence (EPL)

Conditions relevant to air quality provided in Licence No. 416 (the most recent version dated 28 August 2008) have been summarised and are provided in **Table 2**. The relevant Licence is provided in **Appendix B**.

Table 2 EPL Conditions – Air Quality

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Air Quality Management and Monitoring Plan 2007	Yes	None
M4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which the license applies.	Community Contact Register	Yes	None

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
M4.2	The record must include details of the following: a) the date and time of the complaint; b) The method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow up contact with the complainant: and f) if no action was taken by the licensee, the reasons why no action was taken.	Community Contact Register	Yes	None
M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Community Contact Register	Yes	Data is available since operations recommenced in 2006.
M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Viewed on Austar coal mine website	Yes	None
M5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the license.	Air Quality Management and Monitoring Plan 2007	Yes	None
M7.1	The licensee is required to install and maintain a rainfall depth measuring device	Weather data – 2007 and 2008	Yes	None
M7.2	Rainfall at the premises must be measured and recorded in millimetres per 24 hours, at the same time each day.	Weather data – 2007 and 2008	Yes	None

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
R.1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: a) a statement of compliance; and b) a monitoring and complaints summary	Austar Annual Environmental Monitoring Report 2007/2008	Yes	None

RM: Regional Manager

3 OTHER ENVIRONMENTAL PERFORMANCE MEASURES

3.1 Complaints

One complaint regarding odour was received on 11 January 2008 regarding a gas smell coming from the washery.

The requirement for a record of all complaints is specified in Item M4 of the EPL (416). Item M4.2 provides the following requirements for the subject record:

The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

It is acknowledged that the Austar Coal Mine complaints register contains the following information:

- Date and time of the complaint.
- Method by which the complaint was made.
- Contact number (where provided) of the complainant.
- Brief description of the nature of the complaint.
- Description of the actions taken in relation to the complaints.

From the information provided in the complaints register it is apparent that complaint (with regard to the smell) was addressed in a timely manner by the relevant personnel at Austar Coal Mine.

3.2 Incidents

There was one exceedance (55 $\mu g/m^3$) of the 24-hr average PM_{10} criterion (50 $\mu g/m^3$) at Bimbadeen Road on 31 December 2007. As described within the 2007 AEMR, high wind speeds predominantly from the east occurred on this day indicate that the mine may not have been the main source of this exceedance.

3.3 Effects on Surrounding Environment

Excluding the exceedance on 31 December 2007 described above, which is considered a spurious results, the monitoring results for the years 2007 and 2008 indicate that Austar coal mining operations do not cause additional exceedance of the air quality impact assessment criteria .

4 STRATEGIES, PLANS AND PROGRAMS

4.1 Existing Strategies, Plans and Programs

The following Strategies, Plans and Programs are currently relevant to operations at Austar Coal Mine with regard to operational air pollutant emissions:

1. Austar Coal Mine Environmental Management Strategy (EMS); prepared by Austar Coal Mine dated October 2007.
2. Austar Coal Mine Environmental Monitoring Program (EMP); prepared by Austar Coal Mine dated October 2007 (Section 7).
3. Austar Coal Mine Air Quality Management and Monitoring Plan prepared by Carbon Based Environmental Solutions Pty Ltd dated January 2007.

4.2 Adequacy / Compliance of the Strategies, Plans and Programs

The adequacy of each of the relevant Strategies, Plans and/or Programs has been determined and discussion on each is provided as follows:

1. The Austar Coal Mine EMS has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP.
2. The Austar Coal Mine EMP has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP.
3. Austar Coal Mine Air Quality Management and Monitoring Plan has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP.

Jason Watson Curriculum Vitae

JASON WATSON

Manager, Environmental Services

QUALIFICATIONS

Bachelor of Applied Science, specialising in Resource and Environmental Science, University of Canberra.

Masters in Environmental Science at Macquarie University.
Member of the Environment Institute of Australia
Member of the Clean Air Society of Australia and New Zealand

BACKGROUND

Jason Watson has nearly nine years experience in the field of environmental science, specialising in air quality modelling/monitoring, occupational health investigations and contaminated site assessments. He is an active member of the Clean Air Society of Australia and New Zealand (CASANZ) and the Environment Institute of Australia.

Jason has experience in atmospheric dispersion modelling using TAPM, Ausplume v6.0 and Caline4.

Jason recently finished his Masters in Environmental Science at Macquarie University. He completed a research project in conjunction with the NSW DEC, modelling the concentration of air toxics within the Greater Metropolitan Region of NSW (Wollongong, Sydney and Newcastle). Using TAPM as the predictive modelling tool, the research is anticipated to identify air toxic "hot spots" to guide future air toxics policy.

SPECIAL EXPERTISE

- Air quality/odour modelling using TAPM, Ausplume v6.0, Caline4
- Extensive experience in monitoring of water quality, volatile gases, groundwater, meteorology
- Contaminated site assessments and clearance (soil testing for acid sulphate soils and contamination)
- Investigations of ambient air quality / odour on behalf of both the public and the private sectors
- Occupational air quality monitoring (respirable / inspirable dusts; crystalline silica)
- Project management and contractor supervision during site remediation works

SPECIFIC PROJECT EXPERIENCE

HUB Regional Waste Reprocessing Facility

- Odour / Air Quality Impact Assessment in support of an EIS for a Waste Reprocessing Facility. Impact Assessment included a comprehensive literature review of odour emission rates from waste reprocessing / landfilling activities.

Hidden Valley Gold Mine (Papua New Guinea)

- Air Quality Impact Assessment undertaken in support of an Environmental Impact Statement. The assessment included an impact assessment of the proposed mine upon nearby villages in the highland areas of Papua New Guinea.

Whitehaven Coal Mine, NSW

- Air Quality Impact Assessment in support of an Environmental Impact Statement for an Open Cut Coal Mine operation. The assessment included the quantification of particulate emissions and their impact upon the adjacent residential receivers.

Zeehan Nickel Mine, TAS

- Air Quality Impact Assessment in support of an Environmental Impact Statement for an underground nickel mine operation. The assessment included the quantification of particulate emissions and their impact upon the adjacent residential receivers.

Primo Scone Abattoir, NSW

- Odour Impact Assessment in support of a proposed expansion. The assessment included the quantification of odour emissions and their impact upon the adjacent residential receivers.

TAPM and Ausplume Modelling

- East Boggabri Coal Mine, Enfield Asphalt Plant, Ingleburn Concrete Batch Plant, Karuah Hard Rock Quarry, Kulnura Sand Mine, Mars Road Spray Booth Assessment, Woden Valley Bus Interchange.

REFEREE

Professor Peter Nelson
Macquarie University
Head – Graduate School for the Environment
(02) 9850 6958

Conditions of Consent and Environmental Protection Licence

Notice of Modification

Section 96(2) of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Planning, modify the development consent referred to in Schedule 1, as set out in Schedule 2.

Frank Sartor
Minister for Planning

Sydney 2008

SCHEDULE 1

The development consent (DA No. 29/95) for the Austar Coal Mine, which was granted by the Minister for Urban Affairs and Planning on 14 February 1996.

SCHEDULE 2

1. Delete the first paragraph of the preamble in Schedule 1 to the Minister's 1996 development consent and replace with the following:

   I, the Minister for Urban Affairs and Planning, pursuant to Section 91 of the Environmental Planning and Assessment Act 1979 ("the Act") and clause 8 of the State Environmental Planning Policy No.34 – Major Employment Generating Development, determine the development application ("the application") referred to in Schedule 1 by granting consent to the application subject to the conditions set out in Schedules 2 to 5.

2. Delete Schedule 2 and replace with:

DEFINITIONS

AEMR	Annual Environmental Management Report
Applicant	Austar Coal Mine Pty Ltd, or its successors
CCC	Community Consultative Committee
Council	Cessnock City Council
DA	Development Application
Day	Day is defined as the period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
DECC	Department of Environment and Climate Change
Department	Department of Planning
Director-General	Director-General of the Department of Planning, or delegate
DWE	Department of Water and Energy
DPI	Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
Evening	Evening is defined as the period from 6pm to 10pm
Land	Land means the whole of a lot in a current plan registered at the Land Titles Office at the date of this consent
MOP	Mining Operations Plan
MSB	Mine Subsidence Board
Night	Night is defined as the period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays

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Privately-owned land	Land excluding land owned by a mining company, where: • a private agreement does not exist between the Applicant and the land owner; and • there are no land acquisition provisions requiring the Applicant to purchase the land upon request from the land owner
RTA	Roads and Traffic Authority
Safe, Serviceable and Repairable	Safe – no danger to uses; Serviceable – available for its intended use Repairable – damaged components repaired economically
SEE	Statement of Environmental Effects
Site	Land to which the DA applies

SCHEDULE 2

ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

Terms of Consent

2. The Applicant shall carry out the development generally in accordance with the:
   (a) DA 29/95 and accompanying Environmental Impact Statement prepared by HLA Envirosciences Pty Limited, dated August 1995 (August 1995 EIS);
   (b) modification application MOD-49-4-2006 and accompanying Statement of Environmental Effects, titled *Austar Coal Mine Section 96 Modification*, prepared by Environmental Resources Management Australia Pty Ltd (ERM) and dated April 2006 (April 2006 SEE), and information from ERM clarifying the modification application MOD-49-4-2006, dated 13 July 2006;
   (c) modification application DA29/95 – Mod 2 and accompanying Statement of Environmental Effects, titled *Austar Coal Mine Statement of Environmental Effects Section 96 Modification Stage 2 Longwall Panels A3-A5*, prepared by Austar Coal Mine and dated September 2007 (September 2007 SEE); and
   (d) conditions of this consent.

   If there is any inconsistency between the above documents, the latter document shall prevail over the former to the extent of the inconsistency. However, the conditions of this consent shall prevail over all other documents to the extent of any inconsistency.

3. The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any reports, plans, strategies, programs or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these reports, plans, strategies, programs or correspondence.

Operation of Plant and Equipment

4. The Applicant shall ensure that all plant and equipment used at the site is:
   (a) maintained in a proper and efficient condition; and
   (b) operated in a proper and efficient manner.

Limits on Approval

5. This consent lapses on 14 February 2017.

   Note: this condition does not affect the operation of section 95 of the EP&A Act.

Management Plans/Monitoring Programs

6. With the approval of the Director-General, the Applicant may submit any management plan or monitoring program required by this approval on a progressive basis.

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the landowner of land listed in Table 1, the Applicant shall acquire the land in accordance with the procedures in conditions 3 to 5 of Schedule 4:

Table 1: Land subject to acquisition upon request

Property A03a - Duff	Property A04a – Bukanmain Pty Limited

However, the Applicant is not required to acquire the land listed in Table 1 if:
(a) the Applicant has a current written negotiated agreement with the landowner in regard to the management of subsidence-related impacts, and a copy of this agreement has been forwarded to the Department by the Applicant; or
(b) the landowner has agreed to the MSB purchasing the land under the *Mine Subsidence Compensation Act 1961*; or
(c) a request for acquisition has not been made following completion of mining in longwalls A3 to A5, and the MSB determines that the residence/s on the land listed in Table 1 remains safe, serviceable and repairable.

Notes:
- *To avoid any uncertainty in regard to condition 1(c), the Applicant is required to act on any request for acquisition by a landowner listed in Table 1 unless the residence/s on the land has been declared to be safe, serviceable and repairable by the MSB after mining has been completed in longwalls A3 to A5.*
- *For more information on the references to land used in this condition see Figure 9 of Appendix C to the September 2007 SEE prepared for longwalls A3 to A5.*

SUBSIDENCE

Subsidence Impact Assessment Criteria

2. If the subsidence generated by the development results in damage to any residence on privately-owned land (excluding the land listed in Table 1) that in the opinion of the MSB exceeds safe, serviceable and repairable criteria, the Applicant shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 3 to 5 of Schedule 4.

However, the Applicant does not have to act on any such request if:
(a) the Applicant has a current written negotiated agreement with the landowner in regard to the management of subsidence-related impacts, and a copy of this agreement has been forwarded to the Department by the Applicant; or
(b) the landowner has agreed to the MSB purchasing the land under the *Mine Subsidence Compensation Act 1961*.

Subsidence Management Plan

3. Prior to carrying out any underground mining operations (except for longwall panels A1 and A2) that will potentially lead to subsidence of the land surface, the Applicant shall prepare a Subsidence Management Plan (SMP) for those operations in accordance with the following DPI documents (or their latest versions or replacements):
(a) *New Approval Process for Management of Coal Mining Subsidence - Policy*; and
(b) *Guideline for Applications for Subsidence Management Approvals*,
to the satisfaction of the DPI.

Note: The Applicant has an existing approval from the DPI under section 138 of the Coal Mines Regulation Act 1982 for longwall panels A1 and A2. An application has been made to modify this approval to allow an increase in the height of coal extraction from 4.5 to 6.5 metres. All future longwall panels will be regulated under the SMP approval process for managing the impacts of coal mining subsidence under the Mining Act 1992.

Public Safety Management Plans

4. The Applicant shall:
(a) before carrying out any underground mining that will potentially lead to subsidence within the Werakata State Conservation Area, the Applicant shall prepare (and following approval implement) a Public Safety Management Plan for the Werakata State Conservation Area; and

(b) before carrying out any underground mining that will potentially lead to subsidence at Nash Lane, the Applicant shall prepare (and following approval implement) a Public Safety Management Plan for Nash Lane,

to the satisfaction of the DPI.

WATER QUALITY

Discharge Limits

5. Except as may be expressly provided by a DECC Environmental Protection Licence, or in accordance with section 120 of the Protection *of the Environment Operations Act 1997*, the Applicant shall not discharge any water from the site.

Site Water Management Plan

6. Prior to mining commencing in panel A3, or other date agreed by the Director-General, the Applicant shall revise its Site Water Management Plan for the mine, in consultation with the DWE and the DECC, and to the satisfaction of the Director-General. This plan shall be implemented to the satisfaction of the Director-General, and must include:
   (a) a Site Water Balance;
   (b) an Erosion and Sediment Control Plan;
   (c) a Surface Water Monitoring Program;
   (d) a Ground Water Monitoring Program; and
   (e) a Surface and Ground Water Response Plan.

Site Water Balance

7. The Site Water Balance must:
   (a) include details of:
      - sources of water;
      - water use on site;
      - water management on site;
      - off-site water transfers or discharges;
      - reporting procedures; and
   (b) describe measures to minimise water use by the development.

Erosion and Sediment Control

8. The Erosion and Sediment Control Plan must:
   (a) be consistent with the requirements of Landcom's *Managing Urban Stormwater: Soils and Construction* manual;
   (b) identify activities that could cause soil erosion and generate sediment;
   (c) describe measures to minimise soil erosion and the potential for transport of sediment downstream;
   (d) describe the location, function and capacity of erosion and sediment control structures; and
   (e) describe what measures would be implemented to maintain the structures over time.

Surface Water Monitoring

9. The Surface Water Monitoring Program must include:
   (a) surface water assessment criteria;
   (b) a program to monitor surface water flows and quality (particularly in Black, Cony and Quorrobolong Creeks);
   (c) a program to monitor water levels in farm dams within the subsidence zone;
   (d) a program to monitor channel stability in Quorrobolong and Cony Creeks;
   (e) reporting procedures; and
   (f) a protocol for the investigation, notification and mitigation of identified exceedances of the surface water criteria that are related to the development (particularly in respect of acid mine drainage and acid leachate).

Groundwater Monitoring

10. The Groundwater Monitoring Program must include:
   (a) ground water impact assessment criteria;
   (b) a program to monitor the volume and quality of ground water seeping into the underground mine workings;
   (c) a program to monitor ground water levels and quality; and

(d) a protocol for the investigation, notification and mitigation of identified exceedances of the ground water impact assessment criteria.

Surface and Ground Water Response Plan

11. The Surface and Ground Water Response Plan must include:
    (a) the procedures that would be followed in the event of any exceedance of the surface or groundwater impact assessment criteria, or other identified impact on surface or groundwater;
    (b) measures to mitigate, remediate and/or compensate any identified impacts (including measures to mitigate and/or compensate potentially affected landowners for any loss of surface water flows in local creeks or farm dams); and
    (c) disposal/neutralisation contingencies in the event that acid leachate problems emerge after the mine closes.

Groundwater Study

12. The Applicant shall, in the event it selects the Cessnock No. 1 Shaft at Kalingo as the ventilation shaft site for the mine, submit a report to the Director-General and the DPI which includes a groundwater study and mine water disposal plan prepared in accordance with the requirements of the DPI and DECC.

NOISE AND VIBRATION

Impact Assessment Criteria

13. The Applicant shall ensure that the noise generated by the Infrastructure Upgrade Area identified in Figure 1.3 of the April 2006 SEE does not exceed the noise impact assessment criteria in Table 2.

Table 2: Noise impact assessment criteria dB(A)

Day/Evening/Night $L_{Aeq(15\ minute)}$	***Land***
35	*All privately owned land*

Notes:
a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary, to determine compliance with the $L_{Aeq(15\ minute)}$ noise limits in the above table. Where it can be demonstrated that direct measurement of noise from the development is impractical, the Department and the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
b) The noise emission limits identified in the above table apply under meteorological conditions of:
- *wind speeds of up to 3 m/s at 10 metres above ground level; or*
- *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

However, if the Applicant has a written negotiated noise agreement with any landowner of the land listed in Table 2, and a copy of this agreement has been forwarded to the Department and the DECC, then the Applicant may exceed the noise limits in Table 2 in accordance with the negotiated noise agreement.

Continuous Improvement

14. The Applicant shall:
    (a) implement all reasonable and feasible noise mitigation measures;
    (b) investigate ways to reduce the noise generated by the development; and
    (c) report on these investigations and the implementation and effectiveness of these measures in the AEMR,
    to the satisfaction of the Director-General.

Noise Monitoring

15. The Applicant shall implement the approved Noise Monitoring Program for the development to the satisfaction of the Director-General. This program must include quarterly attended noise monitoring and a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this consent.

Vibration Monitoring

16. The Applicant shall implement the approved Vibration Monitoring Program for the development to the satisfaction of the Director-General. This program must be capable of recording ground vibrations on the surface emanating from underground mining activities.

AIR QUALITY

Impact Assessment Criteria

17. The Applicant shall ensure that the dust emissions generated by the Infrastructure Upgrade Area identified in Figure 1.3 of the April 2006 SEE do not cause additional exceedances of the air quality impact assessment criteria listed in Tables 3, 4 and 5 at any residence on, or on more than 25 percent of, any privately-owned land.

Table 3: Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 $\mu g/m^3$
Particulate matter < 10 µm (PM_{10})	Annual	30 $\mu g/m^3$

Table 4: Short term impact assessment criterion for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	50 $\mu g/m^3$

Table 5: Long term impact assessment criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	4 g/m^2/month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Operating Conditions

18. The Applicant shall:
    (a) ensure any visible air pollution generated by the development is assessed regularly, and measures taken to minimise air quality impacts on privately-owned land; and
    (b) implement all practicable measures to minimise the off-site odour and fume emissions generated by the mine's ventilation system or any spontaneous combustion at the development,

    to the satisfaction of the Director-General.

Monitoring

19. The Applicant shall implement the approved Air Quality Monitoring Program for the development to the satisfaction of the Director-General. This program must include an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this consent.

METEOROLOGICAL MONITORING

20. The Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in Approved Methods for Sampling of Air Pollutants in New South Wales and to the satisfaction of the Director-General.

REJECT EMPLACEMENT

21. The Applicant shall undertake reject emplacement in accordance with the current Mining Operations Plan as updated and approved by the Department of Primary Industries from time to time. If reject emplacement in Areas 1, 3 and 4 as described in the August 1995 EIS is proposed, the Applicant shall:
    (a) investigate and report to the DPI on the possibility of disposing all reject into one emplacement area, at least 12 months before reject emplacement into the disturbed mining areas is complete;
    (b) provide a report on the geotechnical investigations and engineering specifications for emplacement areas 1, 3 and 4 to the DPI, and the Director-General at least 6 months prior to commencement of reject emplacement in these areas; and
    (c) commence use of emplacement areas 1, 3 and 4 only after consultation with the Council and approval by the DPI.

FLORA AND FAUNA

22. The Applicant shall:
    (a) take all reasonable measures to protect native vegetation from damage during construction except where trees, shrubs and other vegetation are removed for approved works; and
    (b) salvage all useable trees and shrubs for reuse in controlling erosion and/or site rehabilitation.

23. The Applicant shall:
    (a) undertake fauna surveys for bat species at undisturbed sites proposed for reject emplacement as required by the DECC;
    (b) report results of any fauna surveys to the DECC;
    (c) undertake a monitoring program of riparian vegetation along Quorrobolong and Cony Creeks in the area of longwalls A3 to A5 with particular reference to River Flat Eucalypt Forest EEC; and
    (d) carry out any necessary ameliorative measures requested by the DECC in relation to the findings of the fauna surveys and riparian vegetation monitoring program,

    to the satisfaction of the DECC.

HERITAGE

Aboriginal Heritage

24. Six months prior to commencing activities in undisturbed reject emplacement areas to use Cessnock No. 1 Colliery surface facilities, the Applicant shall undertake additional Aboriginal heritage surveys to the satisfaction of the DECC.

European Heritage

25. The Applicant shall:
    (a) undertake a Heritage Impact Assessment of the site and prepare a Heritage Management Plan, in consultation with the Council, for the approval of the Heritage Council of NSW prior to re-commencing any mining activities at the Cessnock No 1 Colliery surface facilities at Kalingo;
    (b) make application under section 132 of the *Heritage Act 1977* for any works proposed to be undertaken on or under Lot 1, DP 87087 and Part Lot 1, DP 69968 County Northumberland, Parish Heddon; and
    (c) take all reasonable measures to protect the ring-barked tree referenced in the April 2006 SEE,

    to the satisfaction of the Director-General.

    Note: The land referred to in condition 25(b) is currently subject to a section 130 order under the Heritage Act 1977 to prevent harm to buildings, works, relics etc of the South Maitland Railway, gazetted 16 September, 1983.

TRAFFIC AND TRANSPORT

26. The Applicant shall:
    (a) prior to the commencement of operations in reject emplacement areas 3 and 4 (as described in the August 1995 EIS), provide to the satisfaction of the Council and the RTA and at its own cost, a crossing over Wollombi Road (Main Road 218) in the vicinity of these coal waste emplacement areas with respect to type and sight distance in accordance with AS2890-1. Such crossing shall consist of pavement and bitumen seal extending at least 30 metres either side of Main Road 218; and

(b) provide a Type BA intersection at the nominated entry to the Cessnock No 1 Colliery site. The intersection type and location shall be determined in conjunction with Council and constructed prior to commencement of operations at the Cessnock No 1 Colliery site.

27. The Applicant shall:

(a) prior to 31 December 2008, or as otherwise agreed with the Director-General, undertake upgrade works to the road level crossing at Vincent Street, Kitchener, as recommended in *Austar Coal Mine Pty Limited Report on Four Rail Level Crossings in Cessnock LGA Stage 5 Road Safety Audit* (GHD March 2007); and

(b) prior to 30 June 2009, use its best endeavours to undertake upgrade works at the following road level crossings as recommended in *Austar Coal Mine Pty Limited Report on Four Rail Level Crossings in Cessnock LGA Stage 5 Road Safety Audit* (GHD March 2007):

- Cessnock Road, Kearsley;
- Neath Road, Neath; and
- Mitchell Avenue, Weston,

in consultation with the South Maitland Railway, and to the satisfaction of the Council and the RTA.

SCHEDULE 4
ADDITIONAL PROCEDURES FOR SUBSIDENCE MANAGEMENT

NOTIFICATION OF LANDOWNERS

1. Prior to 31 June 2008, the Applicant shall notify the landowners of land listed in Table 1 in writing that they have the right to require the Applicant to acquire their land in accordance with condition 1 of Schedule 3 and conditions 3 to 5 below.

2. Prior to 31 June 2008, the Applicant shall notify all landowners whose land may be subject to subsidence as a result of the development about the procedures for rectification and compensation for subsidence effects on residences, farm buildings, agricultural land and other infrastructure under the *Mining Act 1992* and the *Mine Subsidence Compensation Act 1961*.

LAND ACQUISITION

3. Within 3 months of receiving a written request from a landowner with acquisition rights as specified in Condition 1 or Condition 2 of Schedule 3, the Applicant shall make a binding written offer to the landowner based on:
   (a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the development the subject of the development application, having regard to the:
      - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
      - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of measures implemented by the MSB;

   (b) the reasonable costs associated with:
      - relocating within the Cessnock local government area, or to any other local government area determined by the Director-General;
      - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and

   (c) reasonable compensation for any disturbance caused by the land acquisition process.

   However, if at the end of this period, the Applicant and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution (see Appendix 1).

   Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

   Within 14 days of receiving the independent valuer's determination, the Applicant shall make a written offer to purchase the land at a price not less than the independent valuer's determination.

   If the landowner refuses to accept this offer within 6 months of the date of the Applicant's offer, the Applicant's obligations to acquire the land shall cease, unless otherwise agreed by the Director-General.

4. The Applicant shall bear the costs of any valuation or survey assessment requested by the independent valuer, or the Director-General and the costs of determination referred above.

5. If the Applicant and landowner agree that only part of the land shall be acquired, then the Applicant shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

Environmental Management Strategy

1. The Applicant shall implement the approved Environmental Management Strategy for the development to the satisfaction of the Director-General. This Strategy must:
   (a) provide the strategic context for environmental management of the development;
   (b) identify the statutory requirements that apply to the development;
   (c) describe in general how the environmental performance of the development would be monitored and managed during the development;
   (d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the development;
      - respond to any non-compliance;
      - manage any cumulative impacts;
      - respond to emergencies; and
   (e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development.

Environmental Monitoring Program

2. The Applicant shall undertake monitoring in accordance with the approved Environmental Monitoring Program for the development, to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements of this consent into a single document.

Environmental Manager

3. Prior to carrying out any development, the Applicant shall employ a suitably qualified and experienced Environmental Manager, whose appointment has been endorsed by the Director-General, for the duration of the development to oversee the environmental performance of the development and compliance with the conditions of this approval.

Incident Reporting

4. Within 7 days of detecting an exceedance of the limits/performance criteria in this consent, the Applicant shall report the exceedance/incident to the Department (and any relevant agency). The report must:
   (a) describe the date, time, and nature of the exceedance/incident;
   (b) identify the cause (or likely cause) of the exceedance/incident;
   (c) describe what action has been taken to date; and
   (d) describe the proposed measures to address the exceedance/incident.

Annual Reporting

5. Each year, the Applicant shall submit an Annual Environmental Management Report (AEMR) to the Director-General and the relevant agencies. This report must:
   (a) identify the standards and performance measures that apply to the development;
   (b) describe the works carried out in the last 12 months;
   (c) describe the works that will be carried out in the next 12 months;
   (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
   (e) include a summary of the monitoring results for the development during the past year;
   (f) include an analysis of these monitoring results against the relevant:
      - impact assessment criteria/limits;
      - monitoring results from previous years; and
      - predictions in the EIS and/or SEE;
   (g) identify any trends in the monitoring results over the life of the development;
   (h) identify any non-compliance during the previous year; and
   (i) describe what actions were, or are being, taken to ensure compliance.

Independent Environmental Audit

6. Prior to 31 December 2008, and every 3 years thereafter, unless the Director-General directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by suitably qualified, experienced, and independent expert/s whose appointment has been endorsed by the Director-General;
   (b) include consultation with the relevant agencies;
   (c) assess, in respect of the requirements of this consent and any relevant mining lease or environment protection licence, the environmental performance of the development and its effects on the surrounding environment;
   (d) assess whether the development is complying with relevant standards and performance measures specified in these approvals (including under any strategy, plan or program required under these approvals) and with other statutory requirements;
   (e) review the adequacy of strategies, plans or programs required under these approvals; and, if necessary,
   (f) recommend measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals.

   Note: This audit team must be led by a suitably qualified auditor and include experts in the fields of subsidence, surface water, groundwater, noise and air quality.

7. Within 6 weeks of completing this audit, or as otherwise agreed by the Director-General, the Applicant shall submit a copy of the audit report to the Director-General with a response to any recommendations contained in the audit report.

8. Within 3 months of submitting the audit report to the Director-General, the Applicant shall review and if necessary revise the strategies/plans/programs required under this consent, to the satisfaction of the Director-General.

Community Consultative Committee

9. The Applicant shall establish and maintain a Community Consultative Committee (CCC) to oversee the ongoing environmental performance of the development. The CCC shall:
   (a) be comprised of:
      - 2 representatives from the Applicant, including the person responsible for environmental management at the mine;
      - at least 1 representative from Council; and
      - at least 3 representatives from the local community,

   whose appointment has been approved by the Director-General in consultation with the Council. The local community representative positions will be re-appointed every two years unless otherwise agreed by the Director-General;
   (b) be chaired by an independent chairperson, or council representative, whose appointment has been approved by the Director-General;
   (c) meet at least 4 times a year, or as otherwise approved by the Director-General;
   (d) review the Applicant's performance with respect to environmental management and community relations;
   (e) undertake regular inspections of the mine operations;
   (f) review community concerns or complaints about the mine operations, and the Applicant's complaints handling procedures; and
   (g) provide advice to:
      - the Applicant on improved environmental management and community relations, including the provision of information to the community and the identification of community initiatives to which the Applicant could contribute;
      - the Department regarding the conditions of this consent; and
      - the general community on the performance of the mine with respect to environmental management and community relations; and
   (h) be operated generally in accordance with any guidelines the Department may publish in regard to the operation of Community Consultative Committees for mining developments.

   Note: The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent.

10. The Applicant shall fulfil all responsibilities set out for companies in the CCC guidelines, including at its own expense:
    (a) ensuring that 2 of its representatives attend CCC meetings;
    (b) regularly providing the CCC with reports and other information on the environmental performance and management of the development;
    (c) providing meeting facilities for the CCC, if the CCC requests;
    (d) arranging site inspections for the CCC, if the CCC requests;
    (e) taking minutes of the CCC meetings, if the CCC requests;
    (f) making these minutes available to the public; and
    (g) responding to any advice or recommendations the CCC may have in relation to the environmental management or community relations.

11. The Applicant shall fund the payment of invoices received to facilitate the general purposes and functioning of the CCC up to $2,000 each year until the cessation of operations under the consent.

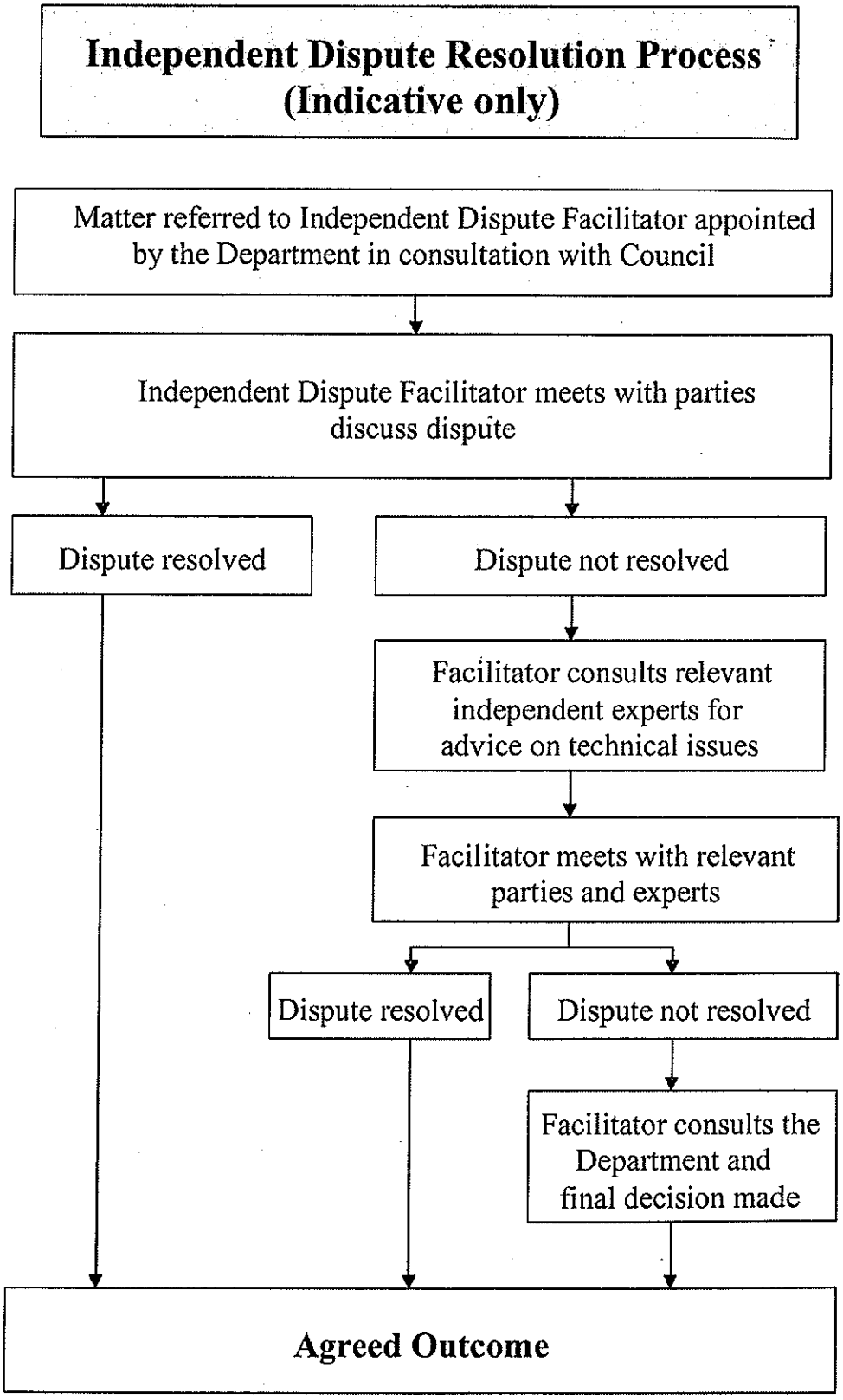
    Note. The contribution is to be indexed according to the CPI at the time of each payment. The first payment shall be made by the date of the first CCC meeting.

Access to Information

12. By 30 April 2008, and thereafter within 3 months of the approval of any strategy/plan/program required under this consent (or any subsequent revision of these strategies/plans/programs), or the completion of the audits or AEMRs required under this consent, the Applicant shall:
    (a) provide a copy of the relevant document/s to the relevant agencies and CCC; and
    (b) put a copy of the document/s on its website.

13. By 30 April 2008, and thereafter during the life of the development, the Applicant shall:
    (a) include a copy of this consent, as may be modified from time to time, on its website;
    (b) provide a full summary of monitoring results required under this consent on its website; and
    (c) update this summary on a regular basis (at least every 3 months).

APPENDIX 1
INDEPENDENT DISPUTE RESOLUTION PROCESS



Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 416

Department of **Environment & Climate Change** NSW

Licence Details	
Number:	416
Anniversary Date:	31-December
Review Due Date:	05-Jan-2010

Licensee

AUSTAR COAL MINE PTY LIMITED
Locked Bag 806
CESSNOCK NSW 2325

Licence Type

Premises

Premises

AUSTAR COAL MINE
WOLLOMBI ROAD
PELTON NSW 2325

Scheduled Activity

Mining for coal

Fee Based Activity	**Scale**
Mining for coal	> 500000 - 2000000 T produced

Region

North East - Hunter
Ground Floor, NSW Govt Offices, 117 Bull Street
NEWCASTLE WEST NSW 2302
Phone: 02 49086800
Fax: 02 49086810

PO Box 488G NEWCASTLE
NSW 2300

Environment Protection Licence

Licence - 416

Department of Environment & Climate Change NSW

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

AUSTAR COAL MINE PTY LIMITED
Locked Bag 806
CESSNOCK NSW 2325

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 Not applicable.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity
Mining for coal

Fee Based Activity	Scale
Mining for coal	> 500000 - 2000000 T produced

A1.3 Not applicable.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
AUSTAR COAL MINE
WOLLOMBI ROAD
PELTON
NSW
2325
SOUTHLAND COLLIERY HOLDING, REFER TO LOCALITY PLAN FIGURE 1.1 FORWARDED TO THE EPA ON 21/8/01.

A3 Other activities

A3.1 Not applicable.

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 Not applicable.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
1	Wet weather discharge; Discharge quality monitoring; Volume monitoring	Wet weather discharge; Discharge quality monitoring; Volume monitoring	Spillway of the emergency dam at the Pelton Coal Preparation Plant site, labelled as 1 on amended Figure 5 entitled Water Management System, submitted to the EPA on 21/11/01.
2	Ambient water quality monitoring		Bellbird Creek labelled as 2 on amended Figure 5 entitled Water Management System, submitted to the EPA on 21/11/01.
3	Ambient water quality monitoring		Bellbird Creek labelled as 3 on amended Figure 5 entitled Water Management System, submitted to the EPA on 21/11/01.
4	Ambient water quality monitoring		Bellbird Creek labelled as 4 on amended Figure 5 entitled Water Management System, submitted to the EPA on 21/11/01.
5	Ambient water quality monitoring		The unnamed creek labelled as 5 on amended Figure 5 entitled Water Management System, submitted to the EPA on 21/11/01.at the Western Boundary of the Pelton Mine landholding.
6	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge to waters Discharge quality monitoring Volume monitoring	Discharge from 1ML permeate tank as shown on Figure 1 "Austar Washery Area Water Management System" dated 7/2/2008 included with Licence Variation Application recevied by DECC on 13/2/08.

3 Limit conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L1.2 Discharge from Point 1 is permitted only when the discharge occurs solely as a result of rainfall at the premises exceeding:

a) a total of 168 millimetres over any consecutive five day period; or
b) 48 millimetres in less than any consecutive 12 hour period.

L2 Load limits

L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

L3.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

Water and Land

POINT 1

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Iron	milligrams per litre				1
pH	pH				6.5-8.5
Total dissolved solids	milligrams per litre				6000
Total suspended solids	milligrams per litre				50

POINT 6

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Conductivity	microsiemens per centimetre				600
Iron	milligrams per litre				1
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

L4 Volume and mass limits

L4.1 For each discharge point or utilisation area specified below (by a point number), the volume/mass of:

(a) liquids discharged to water; or;

(b) solids or liquids applied to the area;

must not exceed the volume/mass limit specified for that discharge point or area.

Point	Unit of measure	Volume/Mass Limit
1	kilolitres per day	2000
6	Measure 1	2000

For the purpose of this condition 'Measure 1' means KL/day measured as an annual average.

L5 Waste

L5.1 Not applicable.

L6 Noise Limits

L6.1 The licensee must ensure that every practical effort is undertaken to control noise from the premises to meet the following environmental noise goals:

Pelton Village 43dB(A) L_{90};
The Pyne residence 40dB(A) L_{90}; and
The O'Hearn residence 37dB(A) L_{90}.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

Environment Protection Licence

Water and Land

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 1	Representative sample
Iron	milligrams per litre	Once a month (min. of 4 weeks)	Representative sample
Total dissolved solids	milligrams per litre	Once a month (min. of 4 weeks)	Representative sample
Total suspended solids	milligrams per litre	Special Frequency 1	Representative sample
pH	pH	Special Frequency 1	Representative sample

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Iron	milligrams per litre	Special Frequency 2	Representative sample
Total suspended solids	milligrams per litre	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	Representative sample

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Iron	milligrams per litre	Special Frequency 2	Representative sample
Total suspended solids	milligrams per litre	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	Representative sample

POINT 4

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Iron	milligrams per litre	Special Frequency 2	Representative sample
Total suspended solids	milligrams per litre	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	Representative sample

POINT 5

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Iron	milligrams per litre	Special Frequency 2	Representative sample
Total suspended solids	milligrams per litre	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	Representative sample

POINT 6

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Monthly	A probe designed to measure the range 0 to 5,000 uS/cm
Iron	milligrams per litre	Monthly	Representative sample
Total suspended solids	milligrams per litre	Monthly	Representative sample
pH	pH	Monthly	Representative sample

Special Frequency 1 means daily collected at a minimum of twelve hourly intervals when a discharge is occurring.

Special Frequency 2 means three times per week during any period of discharge from Point 1 at a minimum of 48 hour intervals commencing as soon as practical after discharge has commenced. Once per month during any period of discharge from Point 6 at a minimum of 4 weekly intervals.

M3 Testing methods - concentration limits

M3.1 Not applicable.

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:

(a) the volume of liquids discharged to water or applied to the area;
(b) the mass of solids applied to the area;
(c) the mass of pollutants emitted to the air;

at the frequency and using the method and units of measure, specified below.

POINT 1

Frequency	Unit Of Measure	Sampling Method
Special Frequency 1	kilolitres per day	In line instrumentation

POINT 6

Frequency	Unit Of Measure	Sampling Method
Monthly	kilolitres per day	In line instrumentation

M7 Environmental Monitoring

M7.1 The licensee is required to install and maintain a rainfall depth measuring device.

M7.2 Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.

Note: The <rainfall> monitoring data collected in compliance with Condition <M7.1> can be used to determine compliance with <L1.2>.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
(a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
(a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
(b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
(a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
(b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
(a) the cause, time and duration of the event;

(b) the type, volume and concentration of every pollutant discharged as a result of the event;
(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Pollution studies and reduction programs

U1 Assessment of Noise Impacts

U1.1 The licensee must undertake an assessment of the noise impacts associated with the existing Pelton Coal Handling and Preparation Plant (CHPP) and associated activities in accordance with Section 10 of the *NSW Industrial Noise Policy*. The assessment must:

a) measure and determine existing background and ambient noise levels and document historical information relating to the noise impacts associated with the CHPP and associated activities;

b) Determine project specific noise levels from intrusive and amenity noise criteria;

c) Measure the noise levels produced by the Pelton CHPP and associated activities, having regard to meteorological effects such as wind and temperature inversion;

d) Compare the measured noise levels with the project specific noise levels derived at b) above;

e) Where the project specific noise levels are exceeded, identify which components of the CHPP and associated activities are contributing to the exceedance and provide an assessment of all reasonable and feasible noise mitigation strategies for each contributing source; and

f) Provide a report to the Regional Manager, Hunter which documents the findings of the noise impact assessment as described in a) to e) above.

Note: Where the noise impact assessment identifies operational noise mitigation measures that can be completed easily and effectively, the licensee should implement these actions as soon as they are identified and include in the report required at (f) discussion regarding the effectiveness of these measures in reducing noise emission from the CHPP and associated activities. It is the EPA's intention to require implementation of any reasonable and feasible noise mitigation measures identified in the Report through subsequent Pollution Reduction Program Conditions on this licence. The timing of the implementation of any such measures will be negotiated subsequently.

Date for Completion: 30 September 2008

Special conditions

E1 Advice to Black Creek Water Users

E1.1 The licensee must maintain a system acceptable to water users on Black Creek for advising those water users registered with the company of the discharge of waters from discharge point 1.

Where possible, water users will be advised within the 24 hour period immediately prior to the commencement of any discharge. Where prior advice is not possible, advice will be given as soon as practicable after discharge commences.

The licensee will advise water users of the conductivity of water being discharged. The conductivity of the waters of Bellbird Creek at the intersection of Black Creek with Lomas Lane will be advised to water users on request.

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.

flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste code	Means the waste codes listed in Appendix 5 of the EPA document A Guide to Licensing Part B
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Bernie Weir

Environment Protection Authority

(By Delegation)

Date of this edition - 28-Aug-2008

End Notes

1	Licence varied by notice V/M upgrade, issued on 08-Jul-2000, which came into effect on 08-Jul-2000.
2	Licence varied by notice 1010102, issued on 21-Jan-2002, which came into effect on 21-Jan-2002.
3	Licence varied by notice 1016072, issued on 27-Mar-2002, which came into effect on 21-Apr-2002.
4	Licence varied by notice 1019333, issued on 26-Jul-2002, which came into effect on 20-Aug-2002.
5	Licence varied by notice 1027360, issued on 19-May-2003, which came into effect on 13-Jun-2003.

End Notes

6	Licence varied by notice 1043397, issued on 05-Jan-2005, which came into effect on 30-Jan-2005.
7	Licence transferred through application 143246, approved on 16-Feb-2005, which came into effect on 24-Dec-2004.
8	Licence varied by notice 1050000, issued on 07-Nov-2005, which came into effect on 02-Dec-2005.
9	Licence varied by notice 1064795, issued on 01-Sep-2006, which came into effect on 01-Sep-2006.
10	Licence varied by notice 1069811, issued on 23-Feb-2007, which came into effect on 23-Feb-2007.
11	Licence varied by notice 1075717, issued on 11-Jul-2007, which came into effect on 11-Jul-2007.
12	Licence varied by repair to Annual Return Archive, issued on 17-Jul-2007, which came into effect on 17-Jul-2007.
13	Licence varied by notice 1083253, issued on 29-Feb-2008, which came into effect on 29-Feb-2008.
14	Licence varied by notice 1083659, issued on 23-May-2008, which came into effect on 23-May-2008.
15	Licence varied by notice 1091659, issued on 28-Aug-2008, which came into effect on 28-Aug-2008.

HEGGIES

REPORT 30-2169-R1

Revision 0

Independent Environmental Audit
December 2008
Austar Coal Mine
Noise and Vibration

PREPARED FOR

GSS Environmental
PO Box 907
Hamilton NSW 2303

5 MARCH 2009

HEGGIES PTY LTD
ABN 29 001 584 612

Independent Environmental Audit
December 2008
Austar Coal Mine
Noise and Vibration

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
30-2169-R1	Revision 0	5 March 2009	Katie Teyhan	John Cotterill	Katie Teyhan

TABLE OF CONTENTS

1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been engaged by GSS Environmental, on behalf of Austar Coal Mine, to conduct an environmental audit with regard to noise and vibration, in accordance with Schedule 5 Item 6 *Independent Environmental Audit* of the Notice of Modification dated 5 June 2008 applicable to Development Consent (DA No. 29/95) granted by the Minister for Urban Affairs and Planning on 14 February 2008.

The author, Katie Teyhan, has six (6) years experience in the field of acoustics and vibration and is Group Manager (Acoustics & Vibration) in Heggies Newcastle office. Please find relevant curriculum vitae attached as **Appendix A**.

2 REGULATIONS AND LEGISLATION

2.1 Consent Conditions

The relevant consent conditions applicable to the areas of noise and vibration are provided in Schedule 3, Items 13 - 16 of the Notice of Modification (DA No. 29/25). The key consent conditions and determination of compliance have been summarised and are provided in **Table 1**.

Table 1 Noise and Vibration Consent Conditions - Schedule 3 Items 13-16

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
13.	Impact Assessment Criteria - Noise: Day/Evening/Night $L_{Aeq(15minute)}$ 35 dBA within 30m of any dwelling on privately owned land.	Quarterly Noise Monitoring Reports from Q1 2007 to Q3 2008.	Yes	Monitoring has been conducted for Q4 2008 and reporting is currently underway.
	Criteria allowed to be exceeded if written negotiated noise agreement exists.			It is noted that negotiated noise agreements currently do not exist.
14.(a)	Implement all reasonable and feasible noise mitigation measures.	Letter to Environment Protection and Regulation RE: Environmental Protection Licence 416 - Noise Pollution Reduction Program U1.1 - Austar Coal Mine dated 11 December 2008 *Austar Coal CHPP Assessment of Noise Impacts* dated September 2008 prepared by Global Acoustics. First stage of the voluntary Pollution Reduction Program (PRP)	Yes	None

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
14.(b)	Investigate noise reduction techniques.	*Austar Coal CHPP Assessment of Noise Impacts* dated September 2008 prepared by Global Acoustics. First stage of the voluntary Pollution Reduction Program (PRP)	Yes	None
14.(c)	Report on these investigations and the implementation and effectiveness in the AEMR to the satisfaction of the D-G.	None	TBC	Given that the investigation was completed in September 2008 the findings should be reported in the 2008 AEMR.
15.	Implement a NMP to the satisfaction of the D-G including: -quarterly noise monitoring -protocol for evaluating compliance with Item 13.	Austar Coal Mine Noise Monitoring Program prepared by Heggies Pty Ltd dated 22 January 2008. Quarterly Noise Monitoring Reports from Q1 2007 to Q3 2008.	Yes	A more detailed description of on-site activities or an operational log should be included with the noise monitoring reports.
16.	Implement a VMP to the satisfaction of the D-G capable of recording ground vibrations on the surface.	Austar Coal Mine Vibration Monitoring Plan Issue 1: January 2007 Austar Coal Mine Vibration Monitoring Plan Longwall Panel A2 dated October 2007 Communication from DoP Re: Austar Coal Mine - Revised Vibration Monitoring Plan dated 17/10/07	No	The revised VMP has been approved by the D-G. It is noted that there are no acceptable limits for vibration specified in the relevant approval / licence documentation or the VMP. It is recommended that the methodology for download and calibration of the vibration monitors be more clearly defined and implemented. Vibration data has not been downloaded since May 2008. Monthly review of the data and vibration monitors has not been conducted in accordance with the VMP.

AEMR: Annual Environmental Management Report
D-G: Director-General
NMP: Noise Monitoring Program
VMP: Vibration Monitoring Program

2.2 Environment Protection Licence (EPL)

Conditions relevant to noise and vibration provided in EPL 416 (the most recent version dated 28 August 2008) have been summarised and are provided in **Table 2**.

Table 2 EPL Conditions - Noise and Vibration

Condition	Description	Evidence	Compliance (Yes/No)	Comments / Recommendations
L6.	Ensure that every practical effort is undertaken to control noise to meet the following noise goals: Pelton Village 43db(A) L_{A90} The Pyne residence 40db(A) L_{A90} The O'Hearn residence 37db(A) L_{A90}	Quarterly Noise Monitoring Reports from Q1 2007 to Q3 2008.	Yes	None
U1.	The licensee must undertake an assessment of the noise impacts associated with the CHPP in accordance with the INP. The assessment must: (a) Measure and determine existing background and ambient noise levels and document historical information relating to noise impacts associated with the CHPP. (b) Determine PSNL from intrusive and amenity noise criteria. (c) Measure noise levels produced by the CHPP, having regard to wind and temperature inversion. (d) Compare measured noise levels to PSNL derived at (b). (e) Where PSNL are exceeded, identify which components of the CHPP are contributing to the exceedance and provide an assessment of all reasonable and feasible noise mitigation strategies for each contributing source. (f) Provide a report to the RM(Hunter) which documents the findings of items (a) to (e).	*Austar Coal CHPP Assessment of Noise Impacts* dated September 2008 prepared by Global Acoustics. First stage of the voluntary Pollution Reduction Program (PRP)	Yes	The noise reduction program will be an ongoing process. It appears to be progressing in a timely manner. The findings of the report suggest that significant consultation will be required with neighbouring residences and the relevant governing authorities.

CHPP: Pelton Coal Handling and Preparation Plant and associated activities
INP: New South Wales Industrial Noise Policy
PSNL: Project Specific Noise Levels
RM: Regional Manager

3 OTHER ENVIRONMENTAL PERFORMANCE MEASURES

3.1 Complaints

The majority of environmental complaints received by Austar Coal Mine are related to noise and/or vibration emissions from the CHPP and associated activities; a total of 45 complaints in Calendar Year 2008 up to 13 November 2008. It is noted that 34 of the 45 noise complaints came from two residences.

The requirement for a record of all complaints is specified in Item M4 of the EPL (416). Item M4.2 provides the following requirements for the subject record:

The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

It is acknowledged that the Austar Coal Mine complaints register contains the following information:

- Date and time of the complaint.
- Method by which the complaint was made.
- Contact number (where provided) of the complainant.
- Brief description of the nature of the complaint.
- Description of the actions taken in relation to the complaints.

From the information provided in the complaints register it is apparent that complaints (with regard to noise and/or vibration) are addressed in a timely manner by the relevant personnel at Austar Coal Mine.

3.2 Incidents

Quarterly noise monitoring has been conducted in relation to operation of the Austar Coal Mine since the implementation of the Noise Monitoring Program (Heggies, dated 22 January 2007).

Since the commencement of quarterly operational noise monitoring Austar Coal Mine noise emission levels have been in compliance with the relevant conditions specified in the Notice of Modification and EPL. Therefore, there are no incidents to report with regard to non-compliance of noise emission levels.

3.3 Effects on Surrounding Environment

Although compliance with all Consent and EPL Conditions relevant to noise emissions is being achieved there are still significant numbers of complaints with regard to noise emissions from the CHPP and associated activities.

Austar Coal Mine has entered into a voluntary Noise Pollution Reduction Program. In accordance with EPL 416 Condition U1.1 an investigation has been conducted with regard to noise emissions from the CHPP and associated activities in accordance with the NSW Industrial Noise Policy. The investigation found that with the recommended noise mitigation measures in place that the project specific noise levels (determined in accordance with the INP) would still be exceeded at neighbouring residences.

Further recommendations were provided as part of the investigation with regard to noise mitigation options. Austar Coal Mine has demonstrated a commitment to ongoing monitoring of noise emission levels and noise reduction investigations over the Calendar Year 2009.

4 STRATEGIES, PLANS AND PROGRAMS

4.1 Existing Strategies, Plans and Programs

The following Strategies, Plans and Programs are currently relevant to operations at Austar Coal Mine with regard to operational noise and vibration emissions:

1. Austar Coal Mine Environmental Management Strategy (EMS); prepare by Austar Coal Mine dated October 2007.
2. Austar Coal Mine Environmental Monitoring Program (EMP); prepared by Austar Coal Mine dated October 2007 (Section 5 Noise, Section 6 Vibration).
3. Austar Coal Mine Noise Monitoring Program (NMP); prepared by Heggies Pty Ltd dated 22 January 2007.
4. Austar Coal CHPP Assessment of Noise Impacts; prepared by Global Acoustics dated September 2008.
5. Austar Coal Mine Vibration Monitoring Plan Longwall Panel A2 (VMP); prepared by Austar Coal Mine dated October 2007.

4.2 Adequacy/Compliance of the Strategies, Plans and Programs

The adequacy of each of the relevant Strategies, Plans and/or Programs has been determined and discussion on each is provided as follows:

1. The Austar Coal Mine EMS has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP.
2. The Austar Coal Mine EMP has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP.
3. The Austar Coal Mine NMP is in compliance with the Mine's Consent (Schedule 3 Item 15 of the Notice of Modification DA No. 29/25). The NMP is considered an effective program for monitoring noise emission levels associated with Austar Coal Mine operations and determining compliance with the relevant noise limits provided in the Mine's Consent and Licence Conditions.
4. It is noted that the Assessment of Noise Impacts report prepared by Global Acoustics is the first stage of the Austar Coal Mine voluntary Noise Pollution Reduction Program. It is considered adequate for this purpose however, it is also noted that the PRP will be a long-term ongoing process. Austar Coal Mine has demonstrated a commitment to ongoing monitoring of noise emission levels and noise reduction investigations over the Calendar Year 2009.
5. The Austar Coal Mine VMP has been deemed to satisfy the Mine's Consent (Notice of Modification DA No. 29/25) and has been approved by the DoP. Nonetheless, the purpose of the VMP is unclear as there are no acceptable limits for vibration specified in the relevant approval / licence documentation. Vibration data has not been downloaded since May 2008 and hence monthly review of the data and vibration monitoring equipment has not been conducted in accordance with the VMP. It is recommended that the methodology for download and calibration of the vibration monitors be more clearly defined and implemented.

CURRICULUM VITAE - KATIE TEYHAN

Group Manager (Acoustics and Vibration) Heggies Pty Ltd

QUALIFICATIONS

Combined Bachelor of Engineering (Mech.)/Bachelor of Mathematics (University of Newcastle)

BACKGROUND

Katie completed her double degree program at the University of Newcastle in 2002 with Honours Class 1. As part of her Mechanical Engineering degree program Katie completed two major research projects. The first was a Student Fellowship with the Anglo-Australian Observatory involving the research and testing of an innovative astronomical instrument; and secondly, as her final year project at University, the measurement and analysis of bending strains produced in a 600 Watt wind turbine blade.

Since September 2002, she has been working for Heggies as a Project Consultant in their Newcastle office. Katie has gained experience in a broad range of projects including the measurement, prediction and assessment of noise and vibration from a range of commercial and industrial developments. She is experienced in the assessment of noise and vibration associated with road and railway transportation systems as well as in the acoustical planning of land uses near such systems. She is familiar with noise modelling software such as ENM and SoundPLAN, which are used in the prediction of industrial/commercial noise and road and railway traffic noise. Other projects have involved occupational noise and personal dust assessments, construction noise and vibration management plans and the preparation of expert evidence.

Katie has also been a lecturer at the University of Newcastle in the faculty of Engineering and the Built Environment. She was co-lecturer of the third year subject in the four year Mechanical Engineering degree program: “Acoustics, Vibration and Condition Monitoring” in 2003 and 2004. Katie also conducts Heggies internal training for new employees and has also conducted general introductory acoustics and vibration training to employees from other industries.

SPECIAL EXPERTISE

- Preparation and delivery of an introductory acoustics course.
- Noise and vibration measurement, prediction and assessment for industrial and commercial developments and design of mitigation measures.
- Road and rail noise and vibration impact assessments and design of mitigation measures.
- Blast emission monitoring, analysis and prediction.
- Investigations of occupational noise exposure and respirable dust assessments.
- Preparation of construction noise and vibration management plans.

PROFESSIONAL MEMBERSHIPS

- Engineers Australia (Member)
- Australian Acoustical Society

SELECTED PROJECT EXPERIENCE

Mining and Quarries

- Karuah Quarry
- Tweed Quarry
- Drayton Coal Mine
- Mount Arthur North Coal Mine
- Prospect Quarry

Commercial/Industrial

- Rooty Hill Regional Distribution Centre
- Electricity Substation - Beresfield
- Eastern Creek Industrial Area Precinct Plan
- Wallsend Aged Care Facility

Occupational Noise

- Karuah Quarry
- Seaham Quarry

Road/Rail

- Pacific Highway Upgrade - Possums Brush to Bundacree Creek
- Cardiff Rail Noise Assessment
- F3 Freeway, Cooranbong
- Sovereign Hills Residential/Commercial Development

Training Services

- General Acoustics Theory and Sound Level Meter Use - DEPHA Tasmania
- OH&S Noise Monitoring and Assessment - Hydro Aluminium Kurri Kurri
- Internal Introductory Acoustics and Vibration Training - Heggies Pty Ltd