WHITEHAVEN COAL

Narrabri Coal Operations Pty Ltd

ABN: 15 129 850 139

Annual Environmental Management Report

for the

Narrabri Underground Coal Mine (ML 1609)

01 April 2009 – 31 March 2010

Narrabri Coal Operations PtyLtd

Annual Environmental Management Report for the Narrabri Underground Coal Mine (ML 1609)

MOP Commencement Date 08.02.2008 – MOP Completion 31.12.2011

AEMR Commencement Date 01.04.2009 – AEMR Completion Date 31.03.2010

Narrabri Coal Operations Pty Ltd

Head Office	Site	Gunnedah Office
Level 9	Narrabri Coal Site Office	Whitehaven CHPP
1 York Street	Kurrajong Creek Road	Kamilaroi Highway
SYDNEY NSW 2000	BAAN BAA NSW 2390	GUNNEDAH NSW 2380
Phone: (02) 8507 9700	Phone: (02) 6794 4755	Phone: (02) 6742 4337
Fax: (02) 8507 9701	Fax: (02) 6794 4753	Fax: (02) 6742 3607

Reporting Officer: Danny Young

Title: Environmental Manager

Signature: _____

Date: _____

Distribution: Department of Planning

Department of Industry and Investment - Mineral Resources

Department of Environment, Climate Change and Water- EPA

NSW Office of Water

Narrabri Shire Council

Narrabri Coal Mine Community Consultative Committee

TABLE OF CONTENTS

1 INTRODUCTION AND OBJECTIVES 7
1.1 Scope 7
1.1.1 Introduction and Period of Reporting 7
1.1.2 The Company 9
1.1.3 Background and History of the Narrabri Project 9
1.1.4 Products and Markets 10
1.1.5 Operational and Environmental Management 10
1.1.6 Corporate Environmental Policy 12
1.2 Approval Status 13
1.2.1 Leases, Licences and Approvals 13
1.2.2 Amendments to Leases, Licences and Approvals 15
1.3 Actions Requested at Previous AEMR Review 16
2 SUMMARY OF OPERATIONS 17
2.1 Exploration, Resources / Reserves and Mine Life 17
2.1.1 Exploration 17
2.1.2 Resources and Reserves 17
2.1.3 Estimated Mine Life 18
2.2 Land Preparation 18
2.3 Construction 19
2.4 Mining 21
2.4.1 Mining Method 21
2.4.2 Mining Constraints 21
2.4.3 Mining Equipment 22
2.4.4 Hours of Operations 23
2.5 Processing 23
2.5.1 Outline 23
2.5.2 Changes or Additions to the Process or Facilities 23
2.6 Waste Management 24
2.6.1 Introduction 24
2.6.2 Domestic Type Wastes 24
2.6.3 Oil Containment and Disposal 24
2.6.4 Recycling 25
2.6.5 Sewage Treatment and Disposal 25
2.6.6 Mine Equipment Tyres 25
2.6.7 Overburden and Interburden 25
2.7 Stockpile Capacity 26
2.8 Water Management 26
2.8.1 Objectives 26
2.8.2 Surface Water Management 27
2.8.3 Discharges 28
2.8.4 Water Sources, Demand and Use 29
2.8.5 Stored Water 30
2.8.6 Groundwater Management 31

2.9 Hazardous and Explosive Material Management 32
2.10 Infrastructure Management 32
3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE 33
3.1 Air Pollution 35
3.1.1 Criteria 35
3.1.2 Control Procedures 35
3.1.3 Dust Monitoring 36
3.2 Erosion and Sedimentation 40
3.2.1 Management 40
3.2.2 Performance 41
3.3 Surface Water Pollution 42
3.3.1 Management 42
3.3.2 Performance 42
3.4 Groundwater Pollution 44
3.4.1 Management 44
3.4.2 Performance 44
3.5 Contaminated or Polluted Land 46
3.6 Threatened Flora 47
3.7 Threatened Fauna 47
3.8 Weeds 48
3.8.1 Management 48
3.8.2 Performance 49
3.9 Blasting 49
3.9.1 Blast Criteria and Control Procedures 49
3.9.2 Performance 50
3.10 Operational Noise 51
3.10.1 Criteria 51
3.10.2 Control Procedures 53
3.10.3 Operational Noise Monitoring 54
3.11 Visual, Light 58
3.11.1 Management 58
3.11.2 Performance 58
3.12 Aboriginal Heritage Management 59
3.12.1 Sites Management and Performance 59
3.12.2 Consultation 61
3.13 Natural Heritage 61
3.14 Spontaneous Combustion 61
3.14.1 Management 61
3.14.2 Performance 61
3.15 Bushfire Management 62
3.15.1 Management 62
3.15.2 Performance 62
3.16 Mine Subsidence 62
3.17 Hydrocarbon Contamination 62
3.17.1 Management 62
3.17.2 Performance 63
3.17.3 Greenhouse Gas Emissions 63

3.18 Gas Drainage / Ventilation 65
3.19 Public Safety 65
3.19.1 Management 65
3.19.2 Performance 66
3.20 Feral Animal Control 66
3.21 Land Capability 66
3.22 Meteorological Monitoring 67
3.22.1 Introduction 67
3.22.2 Rainfall 67
3.22.3 Temperature 69
3.22.4 Wind Speed and Direction 70
3.22.5 Inversions 71
4 COMMUNITY RELATIONS 72
4.1 Complaints 72
4.2 Employment Status, Demography and Socio-Economic Contributions 74
4.2.1 Employment Status and Demography 74
4.2.2 Social and Economic Contributions 74
4.3 Community Liaison 75
5 REHABILITATION 76
5.1 Buildings 76
5.2 Rehabilitation of Disturbed Land 76
5.2.1 Objectives 76
5.2.2 Achievements During the Reporting Period 77
5.3 Rehabilitation Monitoring and Performance 80
6 CONTINUOUS IMPROVEMENT AND TARGET INITIATIVES 81
6.1 Objectives 81
6.2 Achievements to Date 81
6.3 Targets and Goals 82

TABLES

Table 1 Tenements, Licences and Approvals 14
Table 2 Production and Waste Summary 19
Table 3 Mining Equipment 22
Table 4 Stored Water 31
Table 5 Deposited Dust Monitoring Data (April 2009 - March 2010) 37
Table 6 Wet Weather Discharge Results - 5th January 2010 43
Table 7 Groundwater Monitoring Schedule 45
Table 8 Greenhouse Gas Emissions 64
Table 9 Rainfall Data (April 2009 - March 2010) 68
Table 10 Average Temperatures (April 2009 - March 2010) 70
Table 11 Complaints Summary 2009/2010 AEMR Reporting Period 72
Table 12 Rehabilitation Summary 79
Table 13 Maintenance Activities on Rehabilitated Land 80

FIGURES

Figure 1 Project Locality 8
Figure 2 Environmental Monitoring Locations 34
Figure 3 HVAS PM10 data – Claremont (April 2009 - March 2010) 39
Figure 4 HVAS PM10 Data – Turrabaa (April 2009 - March 2010) 39
Figure 5 Monthly Rainfall Data 68

PLANS After page

Plan 3 Land Preparation Narrabri Coal Mine 82
Plan 4 Mining and Rehabilitation Narrabri Mine 82

PLATES

Plate 1 Drift and Skyline Conveyor 20
Plate 2 Train Loadout 20
Plate 3 Topsoil Stockpile Adjacent to Site Access Road 41
Plate 4 Visual Amenity Bund - adjacent to Kurrajong Creek Road 59
Plate 5 Established Tubestock - North of the Amenity Bund 78
Plate 6 Established Tubestock – Between Amenity Bund and Kurrajong Creek Road ... 78

APPENDICES

Appendix 1 PA 05_0102 (of 13 November 2007)
Appendix 2 Environment Protection Licence 12789
Appendix 3 Compliance Review
- PA 05_0102 (Table A3-1)
- Environment Protection Licence 12789 (Table A3-2)
- ML 1609 (Table A3-3)

Appendix 4 Dust Monitoring Results
Appendix 5 Wet Weather Discharge and Surface Water Monitoring Data
Appendix 6 Groundwater Monitoring Data
Appendix 7 Noise Monitoring
Appendix 8 Meteorological Data

1 INTRODUCTION AND OBJECTIVES

1.1 Scope

1.1.1 Introduction and Period of Reporting

This Annual Environmental Management Report (AEMR) is the second for the Narrabri Underground Coal Mine, and has been prepared in accordance with Condition 4 of Mining Lease (ML 1609) (Mining Act 1992) and Condition 5 (Schedule 4) of PA 05_0102. The AEMR generally follows the format identified in the Industry and Investment - Mineral Resources (I&I NSW) document entitled "Guidelines to the Mining, Rehabilitation and Environmental Management Process" Version 3, dated January 2006.

Though primarily covering the period from 01 April 2009 to 31st March 2010 (the Reporting Period), where relevant the AEMR provides information on historical aspects of the operations, longer term trends in environmental monitoring results and provides relevant information on activities to be undertaken during the ensuing period, i.e. from 01 April 2010 to 31 March 2011, or beyond.

The Narrabri Underground Coal Mine is located within the Narrabri Shire, approximately 30 km south-southeast of Narrabri, and 10 km north-northwest of Baan Baa.

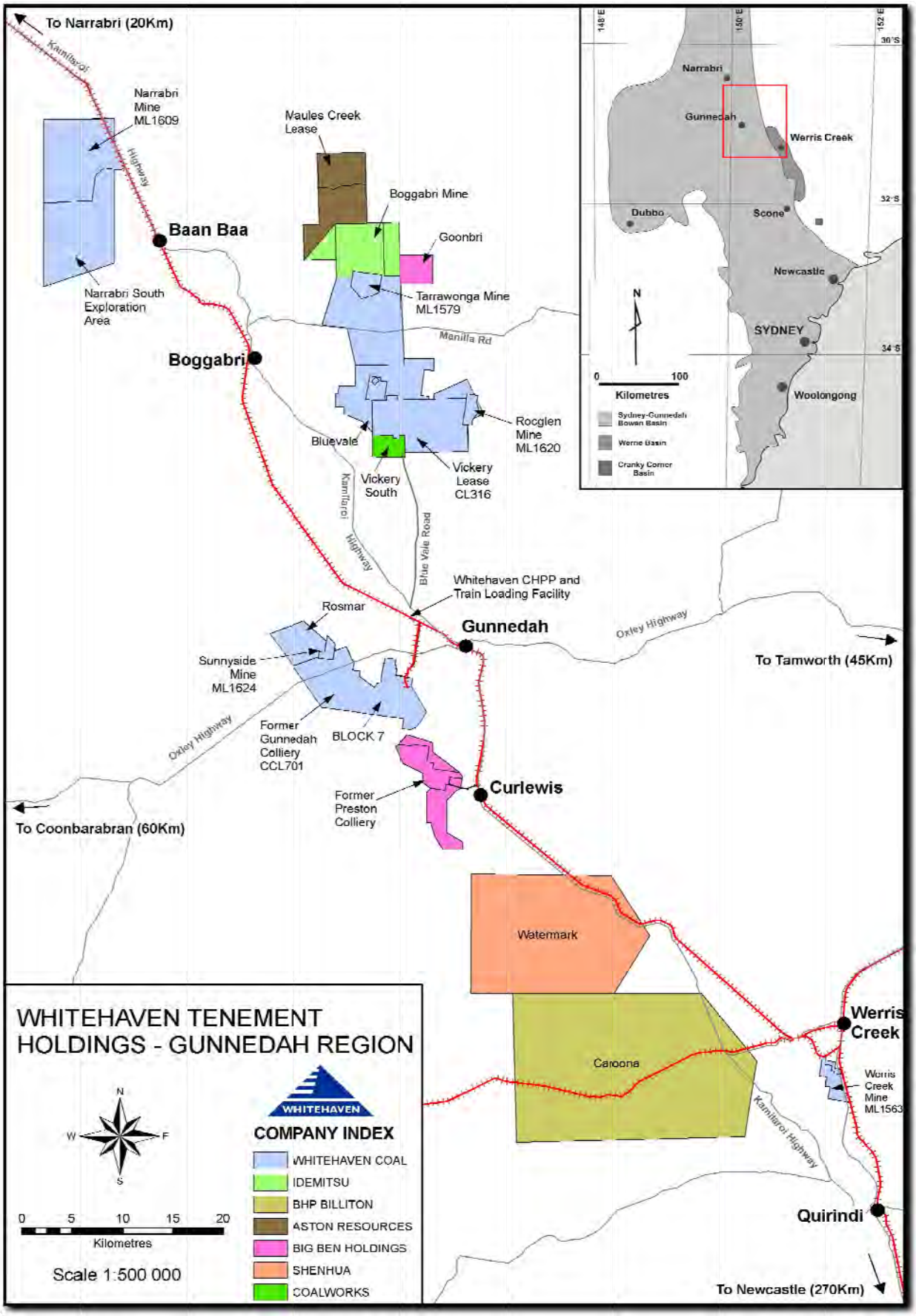


Figure 1
Project Locality

1.1.2 The Company

The operating company for the Narrabri Coal Mine is Narrabri Coal Operations Pty Ltd (NCOPL). NCOPL is a joint venture between Narrabri Coal Pty Ltd (77.5%), Upper Horn Investments (Australia) Pty Ltd (7.5%), J-Power (7.5%), Daewoo (5%) and Kores (2.5%). Narrabri Coal Pty Ltd (NCPL) is a 100% subsidiary company of Whitehaven Coal Limited (WCL), a publicly listed Company with several mining interests in the Gunnedah-Narrabri region of NSW.

WCL owns and operates a number of open cut coal projects in the Gunnedah basin. The Whitehaven operations comprise the Whitehaven Rail Siding and CHPP approximately 6 km west of Gunnedah, the Rocglen Open Cut Coal Mine, the Canyon (formerly Whitehaven) Open Cut Coal Mine (mining ceased mid 2009), the former Gunnedah Colliery and Sunnyside Open Cut Coal Mine (through subsidiary company Namoi Mining Pty Ltd), the Tarrawonga Open Cut Coal Mine (through subsidiary company Tarrawonga Coal Pty Ltd) and Werris Creek Open Cut Coal Mine (through subsidiary company Werris Creek Coal Pty Ltd).

1.1.3 Background and History of the Narrabri Project

The Narrabri Coal Project was developed after substantial investigations were undertaken under Exploration Licence 6243, granted in May 2004. This exploration program comprised an extensive drilling campaign of 160 rotary, fully and partly cored drill holes, totalling in excess of 6000m. Following completion of relevant assessments and feasibility studies, and the determined in-situ coal resource of 229M tonnes, it was determined that the proposal proceed to an application under the Environmental Planning and Assessment Act. An Environmental Assessment was prepared and submitted to the Department of Planning in March 2007. Project Approval 05_0102 was subsequently granted for the Project on 13th November 2007. On approval, Mining Lease 1609 was granted on 18th January 2008 and Environment Protection Licence 12789 was granted on 20th February 2008.

The Project Approval provided for the extraction of no more than 2.5 million tonnes of ROM coal per year. The consent requires all coal to be transported from the site via rail.

Over the life of the approved mine, the total area that may be affected by surface disturbance for construction and operation of mine surface facilities will equate to 457.4ha. ML 1609 covers a total area of 5,298ha.

1.1.4 Products and Markets

Coal within the Narrabri coal deposit can be described as being relatively free of major structural disturbance. The basal 4-4.2m of the seam generally averages 8 to 10 percent raw ash. The product for Stage 1 operations will not require a coal preparation plant but will require general crushing and screening facilities for processing prior to despatch.

Gas desorption testing of coal core samples from exploration drilling throughout ML 1609, indicates gas levels of between 3.87 and 10.6 m^3/tonne, with CO_2 being the dominant gas at approximately 90%. Methane (CH_4) and nitrogen (N_2) are also present in varying amounts.

The coal produced from the Narrabri Mine will be destined for the export market.

1.1.5 Operational and Environmental Management

1.1.5.1 Contacts

The management personnel responsible for operational and environmental performance at the Narrabri Underground Coal Mine and their relevant contacts are as follows:

- Mr Greig Duncan – General Manager, retains overall responsibility for all activities and performance at the mine. Contact: 0458 944 751.

- Mr Matthew Klein – Mine Manager, retains statutory and mine management responsibility for all operational activities and safety performance at the mine.
- Mr Ben Bomford – Project Manager, retains overall responsibility for infrastructure development and project establishment/construction. Contact: 02 6794 4755, 0447 424 338.
- Mr Danny Young -Group Environmental Manager, responsible for the environmental and rehabilitation activities on site. Contact: 02 6742 4337, 0427 497 710.

Mining operations will be undertaken by Narrabri Coal Operations personnel. Construction activities have been undertaken by Narrabri Coal Operations personnel with additional contract operations provided by LDO for drift development and Agcon for surface construction works.

1.1.5.2 Support Personnel

In addition to the personnel identified in Section 1.1.5.1, Narrabri Coal utilise specialist assistance as and when required. Specialist environmentally-based or related companies or consultants involved in activities at the mine during the Reporting Period included:

- ALS Acirl Pty Ltd;
- EA Systems;
- EcoLogical Australia Pty Ltd;
- GSS Environmental Pty Ltd;
- Aquaterra;
- WRM Water and Environment;
- Spectrum Acoustics;
- URS Australia Pty Ltd;

All mining and environmental management activities are undertaken generally in accordance with the MOP, management plans and procedures prepared in

satisfaction of Narrabri Coal's Mining Lease, Environment Protection Licence (EPL 12789), Project Approval and the relevant legislation.

1.1.6 Corporate Environmental Policy

WCL has a documented Health, Safety and Environmental policy which states:

> *Whitehaven is committed to supplying coal in a safe, efficient and environmentally responsible manner. Whitehaven will conduct business in a way that maintains a safe and healthy workplace for our employees, contractors, visitors and the surrounding community and will protect the environment in all stages of mining and processing.*
>
> *<u>Whitehaven's Goals are:</u>*
>
> - *To achieve zero injuries and occupational illnesses.*
> - *To achieve zero equipment damage.*
> - *To achieve zero environmental incidents.*
>
> *Whitehaven will achieve these goals by:*
>
> - *Ensuring health, safety and environment is considered in all planning and work activities.*
> - *Involving our employees through regular communication, consultation and training.*
> - *Identifying and controlling all potential hazards in the workplace through hazard identification and risk analysis.*
> - *Ensuring all incidents are reported, controlled and learning's applied and shared.*
> - *Providing effective injury management and rehabilitation for all employees.*
> - *Seeking continuous improvement in performance by taking into account employee & community concerns and advances in health, safety and environment.*

- *Providing details of legislative and other requirements and necessary training and resources to meet these requirements.*

Responsibilities:

All persons working for Whitehaven have a personal responsibility to comply with this policy and subsidiary Health, Safety & Environment systems. No work is to be undertaken without a clear understanding of a safe method that minimizes the risk of injury, equipment damage and environmental harm.

Whitehaven employees shall share the responsibility to:

- *Work in a healthy, safe and environmentally responsible manner.*
- *Encourage others to work in a healthy, safe and environmentally responsible manner.*
- *Promptly report incidents, unsafe practices or conditions and environmental concerns as they become apparent.*
- *Co-operate with Management in the support of promotion of health and safety and responsible environmental management in the work place.*

This policy applies to all mines operated by Whitehaven Coal Limited and its subsidiaries.

1.2 Approval Status

1.2.1 Leases, Licences and Approvals

Table 1 identifies the leases, licences and approvals in place for the Narrabri Underground Coal Mine at the end of the Reporting Period, the issuing / responsible Authority, dates of issue, duration (where limited) and relevant comments. The list is presented chronologically according to the date of issue.

Reviews of compliance/performance with the conditions identified in PA 05_0102, Environment Protection Licence 12789, and ML 1609, are presented in Appendix 3, Tables A3-1, A3-2 and A3-3 respectively.

Table 1
Tenements, Licences and Approvals

Issuing / Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Industry & Investment NSW (I&I NSW)*[1]	Exploration Licence (EL 6243)	21 May 2004	20 May 2014	Approval for exploration.
Minister for Planning	Project Approval (PA 05_0102)	13 November 2007	18 January 2029	Expiry is 21 years after the commencement of the approval.
Industry & Investment NSW (I&I NSW)*[1]	Mining Lease (ML 1609)	18 January 2008	18 January 2029	Approval for mining.
Department of Environment, Climate Change and Water (DECCW)*[2]	Environment Protection Licence 12789	20 February 2008	Nil Anniversary date: 20 February Next review: 20 Feb 2013	For mining operation to 2.5Mtpa
Narrabri Shire Council	Construction Certificate DP 816020 Inspection Report/Permit to Occupy No 2413	17 October 2008 6 August 2009	N/A	Mine Surface Facilities
WorkCover Authority of NSW	Notification for explosives use and storage			Explosives management currently controlled by LD Operations.
NSW Office of Water*[3]	AL811346 WAL7411 WAL2728 WAL2671 WAL14515 WAL12833 90BL254679 90BL254481 - 90BL254487 90BL254660 - 90BL254663 90BL254658 - 90BL254659 90BL254701 90BL254958 - 90BL254967 90BL255167 - 90BL255173 90BL255216 - 90BL255218	Various	Various	Irrigation River Access Groundwater Access Aquifer Interference Groundwater Monitoring Purposes

*1 – Previously, Department of Primary Industry – Mineral Resources (DPI – MR)
*2 – Previously, Department of Environment and Climate Change (DECC)
*3 – Previously, Department of Water and Energy (DWE)

1.2.2 Amendments to Leases, Licences and Approvals

A variation to EPL 12789 was issued by the then DECC (EPA) which incorporated nominated wet weather discharge monitoring locations (SD2, SD4 and SD5) as well as water quality monitoring locations upstream and downstream of the site (Kurrajong Creek Tributary 1 and Kurrajong Creek Tributary 2). The EPL also included common changes made by the EPA as part of the review of all licences in the coal mining sector. The current EPL is shown in Appendix 2.

An application for Project Approval, accompanied by an Environmental Assessment (EA) for the Narrabri Coal Mine Stage 2 Longwall Project was submitted to the Department of Planning (DoP) for assessment of adequacy in 2009. Following assessment for adequacy and subsequent alterations to the document, the EA was issued for public exhibition on the 17th November 2009. Narrabri Coal has reviewed submissions from various Government departments and the public, and has provided a draft Statement of Commitments to the Department of Planning. A final Statement of Commitments will issue upon finalisation of negotiations with DoP and DECCW in relation to a revised Biodiversity Offset area. Upon determination of the revised Biodiversity Offset area, Narrabri Coal expects to receive formal determination of the application from DoP.

Some of the Stage 2 construction activities involve relatively long construction timeframes and/or are precursors to other construction and development activities. On this basis, NCOPL sought approval to undertake these works via a modification to the Stage 1 Project Approval under Section 75W of the EP&A Act while the Stage 2 EA is being assessed by DoP. The Section 75W Modification Environmental Assessment was submitted to DoP on 14th October 2009 and approved by the Director-General (DG) on 26th March 2010.

Following DG approval of the Section 75W Modification, a draft Mining Operations Plan (MOP) Amendment was submitted to the Department of Industry and Investment NSW (I&I NSW) in March 2010. An electronic version of the MOP

Amendment was reviewed and approved in principle on the 30th March 2010. Hard copies, plans and an updated rehabilitation security estimate will be issued to I&I NSW in May 2010.

1.3 Actions Requested at Previous AEMR Review

A review of the 2008-2009 AEMR and site inspection was not conducted by I&I NSW. As a result, no actions have been requested following submission of the 2008-2009 AEMR.

2 SUMMARY OF OPERATIONS

2.1 Exploration, Resources / Reserves and Mine Life

2.1.1 Exploration

During the Reporting Period approximately 60 drill holes of varying type were established across the Narrabri project site. Over 220 exploratory drill holes totalling approximately 50,000m of drilling have been completed to date. The drilling has included cored, partly cored and openhole drilling.

Exploration during the Reporting Period focused on a number of important disciplines including mine planning, gas modelling, coal quality, structure definition and geotechnical assessments. Overall the exploration activities comprised:

- 14 x geotechnical, gas desorption and coal quality core holes in the western section of the Mining Lease;
- 4 x large diameter (100mm) core holes in the initial longwall panels for further coal quality and washability assessment;
- 3 x geotechnical boreholes to further assess the caving characteristics behind the longwall;
- 50 x open holes to determine structure and potential coal washout areas;
- 15 x gas compliance core holes to assess gas drainage;
- Installation of vibrating wire peizometers to determine gas drainage parameters;
- Coal seam roof touch information from gas drainage lateral wells; and
- A three line seismic survey over the first longwall panels to identify structure not already inferred from drilling

2.1.2 Resources and Reserves

The coal resource of the Narrabri Coal Mine is contained within the Hoskissons Coal Seam. The seam is between 8-10m thick over the western half of ML 1609. The seam strikes generally north-south, and dips gently to the west.

The Hoskissons coal seam has been modelled as two plies, HC1 and HC2. The lower part of the seam contains low ash coal suitable for thermal applications. The lower 4.0-4.2m of the seam (HC2) is the preferred working section for mining. The upper section of the seam (HC1) is the higher ash coal that will remain in the roof where seam thickness exceeds 4.2m.

It has been estimated that approximately 230 million tonnes of coal occurs within the lower HC2 ply, with up to 170 million tonnes recoverable by continuous miner methods.

2.1.3 Estimated Mine Life

Based on an average production rate of 2.5Mtpa using continuous miner methods, mine life would exceed 50 years.

The Stage 2 EA (approval pending) estimates a mine life of approximately 30 years based 170Mt of coal recoverable from 26 longwall panels and associated development roadways, at an annual production rate of up to 8.0Mt

2.2 Land Preparation

Land preparation activities undertaken at the Narrabri Coal Mine during the Reporting Period were conducted in accordance with commitments identified in Section 3 of the MOP and included:

- Limited clearing of grassy areas within the surface infrastructure area. No woodland tree clearing occurred during the Reporting Period.
- Soil stripping comprising 1,600m^3 of topsoil and 2,600m^3 of subsoil. Soil stockpile locations are shown on Plan 3.
- Overburden removal, associated with drift development, totalling approximately 71,000m^3.

Table 2, the "Production and Waste Summary", shows that at the end of the Reporting Period, a total of 352,000 m^3 subsoil and topsoil had been stripped from the Pit Top Area, with 116,000m^3 respread across reprofiled areas. A further 236,000 m^3 of topsoil and subsoil remains stockpiled on site for future rehabilitation purposes.

Table 2
Production and Waste Summary

	Cumulative Production (cubic metres)		
	Start of Reporting Period	**At end of Reporting Period**	**End of next Reporting Period (estimated)**
Soil Stripped (m^3)	348,000	352,000	490,000
Soil Used/spread (m^3)	116,000	116,000	130,000
Waste Rock (m^3)	577,000	648,000	658,000
ROM Coal (t)	0	0	250000
Processing Waste (t)	0	0	0
Product (t)	0	0	250,000

Soil removal activities were undertaken specific to the footprint of required surface infrastructure.

2.3 Construction

All activities undertaken throughout the term of the AEMR Reporting Period related to the construction phase of the Project. Construction included drift tunnel construction, drift and skyline conveyor erection (Plate 1), crushing plant erection, train loadout (Plate 2) and reclaim tunnel construction and erection and building works.

Construction activities during the next Reporting Period will include the CHPP, ventilation shaft and gas drainage infrastructure.

Plate 1
Drift and Skyline Conveyor

Plate 2
Train Loadout

2.4 Mining

2.4.1 Mining Method

No actual coal mining took place during the Reporting Period with all works undertaken to date associated with construction of the mine site. Upon completion of construction and commencement of mining operations, all mining under the current Stage 1 consent will be undertaken by underground continuous miner methods as specified in the MOP.

Drift development continued during the period, with the three drifts still under construction. By the end of the period the drifts had advanced to 1000m inbye the portals, with completion to pit bottom expected in June 2010. Excavation during the period was predominantly by Roadheader, however due to the intersection of hard and very hard material some areas of the drifts were advanced using drill and blast methods.

Upon establishment of pit bottom the drift conveyor will be advanced to its final position and the mine services will be installed to allow for the development of the Mains roadways and the first longwall panel roadways. This development will be carried out using underground continuous miner methods.

2.4.2 Mining Constraints

Mining activities at the Narrabri Coal Mine will be determined, to an extent, by economic considerations which, in turn, are determined to a large extent by factors beyond Narrabri Coal Operations control, i.e. coal price and demand. Economic factors will ultimately determine the continued viability of the operation over the proposed life of mine.

Exploration data obtained to date has identified a number of northwest, northeast and more locally north-northwest trending structural zones in the eastern portion of the mine site however these are not expected to pose any significant operational issues with regard to productivity or mine roof instability.

There have been no igneous intrusions identified as intersecting within the Hoskissons Coal Seam to date.

The occurrence of three massive strata units, being the Garrawilla volcanics, a Basalt Sill, and the Digby Formation have been considered in the mine plan layout. This layout has been optimised for Stage 1 operations as well as the commencement of Stage 2 operations, if approved. The occurrence of this strata is therefore not expected to impact on mine operations.

Groundwater inflow predictions were made for Stage 1 operations, with adequate contingencies in place for the storage and treatment of groundwater on the surface. Actual mining operations will verify if predictions were accurate. Due to the delay in commencement of mining operations, first reporting against these predictions will be made in next year's AEMR.

2.4.3 Mining Equipment

Table 3 presents a list of mining equipment in use at the Narrabri Coal Mine at the end of the Reporting Period, together with its principal function(s) and frequency of use.

Table 3
Mining Equipment

ITEM	NUMBER IN OPERATION	FUNCTION
Personnel Transport Units	4	Transport of personnel underground
Underground Road Header Miner	1	Drift development
Underground loader	8	Drift development (coal)
Underground bogger	2	Drift development (hard rock)
Bolting equipment	1	Drift development
D8	1	Overburden pushing
Water Cart	3	Dust Suppression
CAT 14H Grader	2	Road maintenance
Service Truck	1	Machinery servicing
IT38G Loader	1	Loading

2.4.4 Hours of Operations

Surface construction and site establishment activities occurred between the following hours:

- Surface Infrastructure and Pit Top Area construction – 7am to 10pm (7 days)
- Pit Bottom Area development – 24 hours (7 days)
- Raw materials/supply delivery – 7am to 10pm (7 days)

Underground mining has not yet commenced on site.

The above hours of operation are consistent with, and within those identified in Project Approval PA 05_0102.

2.5 Processing

2.5.1 Outline

There has been no processing of coal undertaken on site during the Reporting Period.

2.5.2 Changes or Additions to the Process or Facilities

All activities onsite have been in accordance with the commitments provided in the Mining Operations Plan and in accordance with the conditions of consent.

Section 1.2.2 provides details on the amendments to mining operations and surface infrastructure related to the Stage 2 Longwall Project and the associated Section 75W modification.

2.6 Waste Management

2.6.1 Introduction

Wastes produced from the Narrabri Coal Mine during the Reporting Period remain unchanged from those identified in the Mine EA and Mining Operations Plan and comprised:

- General domestic-type wastes from on-site buildings and routine maintenance consumables;
- Oils and grease;
- Sewage;
- Overburden from box cut and drift development;

The following sub-sections identify the management procedures adopted for each of these wastes throughout the Reporting Period. Management procedures remain unchanged from those previously identified and will be continued for the ensuing Reporting Period.

2.6.2 Domestic Type Wastes

All general wastes originating from the surface facilities area have been disposed of in mobile garbage bins located adjacent to the various buildings. These bins have been collected and disposed of offsite by Namoi Waste Corp on a regular basis. Approximately 30 tonnes of general waste was transferred offsite during the Reporting Period. This represents a 50% reduction in waste volumes since the last Reporting Period and is a result in the reduction of construction activities occurring at the site.

2.6.3 Oil Containment and Disposal

Waste hydrocarbons from the current temporary maintenance building were collected in drums and stored at the waste oil depot for collection. Potentially hydrocarbon contaminated water (ie. from the washdown pad) passed through an oil water separator and was pumped to waste oil containers. In the last 12 months

approximately 22,000 litres of waste oil was collected by the waste contractor, Northern Lubequip for recycling.

2.6.4 Recycling

Approximately 25 tonnes of scrap metal have been collected for offsite recycling during the Reporting Period.

Narrabri Coal also collects waste paper and cardboard for recycling. Over 40m^3 of paper and cardboard were recycled during the Reporting Period.

2.6.5 Sewage Treatment and Disposal

Effluent from the sewage and ablutions facilities at the Narrabri Coal Mine is managed through a Sewage Treatment Plant (STP) with a Continuous Extended Aeration Process. The plant is made up of a series of industrial plastic tanks. Each tank provides a separate function in order to treat the sewage for the required quality and quantity. The system has a maximum capacity of 30,000L per day.

2.6.6 Mine Equipment Tyres

During the Reporting Period, the predominant activity pertained to surface construction works. Any tyres requiring disposal during this period were transported offsite for disposal at licensed facilities.

2.6.7 Overburden and Interburden

Material obtained during drift development has been stockpiled in the north-western corner of the Pit Top Area for use as road base onsite and for fill in the western section of the amenity bund. Section 2.2 provides details on the quantity of overburden generated during the Reporting Period.

2.7 Stockpile Capacity

The ROM Coal stockpile area has been completed enabling storage of up to 150,000t of coal at a maximum height of 12m. The product coal stockpile has also been completed with a capacity of 250,000t. Both have been developed as per the specifications in the Mining Operations Plan (MOP).

2.8 Water Management

2.8.1 Objectives

The Narrabri Coal Mine lies within the catchment of the Namoi River. Locally, and within proximity of the Project site, Kurrajong Creek and Pine Creek provide flows to the Namoi River during runoff events. The design of sediment detention basins within the disturbed area of the Pit Top Area limits the opportunity of discharge of runoff from mine-disturbed area, i.e. after appropriate detention time to satisfy licensed discharge criteria. Three discharge points (Storage Dams SD-2, SD-4, SD-5) (Plan 4) have been nominated in Environment Protection Licence (EPL) 12789, together with upstream and downstream monitoring locations within the adjacent creek systems.

The management of water at the Narrabri Coal Mine is undertaken with the following objectives:

- The quantity of water exhibiting elevated suspended solids loadings is minimised;
- Erosion is minimised;
- Sediment-laden water is contained for a sufficient period that discharges, if occurring, satisfy the discharge criteria identified in EPL 12789;
- Surface water is harvested onsite to the extent permissible, thereby minimising water extraction from bores or other sources;
- Groundwaters are not contaminated;
- Downstream water users are not adversely affected by the Mine's operations, either in terms of quantity or quality; and

- The water management system is consistent with planned rehabilitation objectives and long-term land use.

2.8.2 Surface Water Management

Water within the DA Area is nominally classified either as “clean”, “sediment-laden” or “dirty”, or “contaminated” and “saline” depending on the source of the flow and its potential for physical or chemical contamination.

“**Clean water**” comprises water which emanates from areas undisturbed by mining activities, flows from sediment basins following its clarification in those structures or is contained within or discharges from storage dams. Within the DA Area, clean surface water flows either pass to natural drainage lines and hence off-site or are collected by diversion banks and directed to the storage dams for use on-site. All water flowing from sediment basins ultimately flows to storage dams.

Five clean water storages are in place within the DA Area (SD1 – SD5), with a combined storage capacity of approximately 112ML. In addition to this surface water storage, Pond D within the Rail Loop complex has a storage capacity of 128ML for transfer of water from the surface storages as required. These storage, of which three are licenced discharge points (SD2, SD4 and SD5), are not expected to receive high sediment laden water due to the successful cover establishment over areas of the Pit Top Area that do not require ongoing disturbance.

“**Dirty water**” comprises water which does or could potentially contain elevated levels of suspended solids originating from areas of mining-related disturbance, including water pumped from the box cut sump within the box cut.

SB1 will collect water from the box cut sump and flows from off the ROM pad and surface facilities area prior to pumping to the Pond A1. This water will be evaporated in the pond complex A1-A3 as a means of managing saline groundwater flows.

All storage dams will be monitored on a regular basis in order to reduce the potential for discharge. Water level markers will be established in the final site storages to provide indicative measures as to when water will need to be pumped from storages into Pond D. Each of the Ponds will also have marker boards to define water level in the ponds for management purposes. Gauge boards had yet to be established in the ponds at the end of the Reporting Period but will be a priority during the next Reporting Period.

The principal components of the water management systems in place at the end of the Reporting Period are shown on Plan 4.

"**Contaminated Water Management**". A single 68,000 L self bunded diesel fuel tank is maintained adjacent to the Narrabri workshop area. The current facility is a temporary arrangement until the industrial pad currently under construction is completed. Once completed, the fuel storage will transfer to the permanent location. An additional concrete bund will be established adjacent to the fuel tank to house other oils and lubricants in a safe and efficient manner. Any associated spills within the bund then report to an oil separating unit for disposal by an appropriately licensed contractor. Waters potentially contaminated with hydrocarbons from the workshop area are also diverted to the oil separator, with clean water reporting to SB1 for later use across the site. Spill kits will be maintained within the workshop area.

The likelihood of localised spills of fuel or oil external to bunded areas is kept to a minimum. In the event that localised spills do occur, immediate action would be undertaken to ensure appropriate clean-up and minimisation of harm.

2.8.3 Discharges

During the initial phases of the construction period, and in consultation with the then DECC, there were no registered discharge locations within the mine site, and no concentration thresholds applied. During this time Narrabri Coal undertook

monitoring of surface water qualities during rainfall events at the upstream and downstream monitoring points for the purposes of obtaining background water quality information.

There has been one wet weather discharge in the period since licenced wet weather discharge points, and associated water quality thresholds, were included in EPL 12789. The discharge occurred on the 5th January 2010 following over 200mm of rainfall over the preceding 11 days.

Wet weather discharges and water quality monitoring are further discussed in Section 3.3.2.

2.8.4 Water Sources, Demand and Use

Within the DA Area and immediate vicinity of Narrabri Coal Mine, surface water resources are limited to a number of ephemeral drainage lines which flow for a short period after substantial rainfall, farm dams, and newly constructed water storage dams and groundwater sources.

Water is required on the mine site primarily for dust suppression purposes, with minor quantities required for potable and toilet ablutions purposes. Where practicable, water collected on-site is retained or reused, with water for dust suppression sourced from a combination of on-site water harvesting, inflows from the overburden during drift development, and groundwater extraction. Water for potable, toilet and ablutions purposes is trucked to the site from Council supplies.

During the Reporting Period, a total of approximately 38 ML was used for mine site dust suppression purposes. Water was generally sourced from on site surface water storages. Following a prolonged dry spell in late 2009, a small quantity of raw water was trucked from offsite. Significant rainfall in late December 2009/early January 2010 subsequently filled a number of storages and removed the requirement for offsite supply. Water use comprised:

- Offsite supply:
    - 2 ML (raw)
    - 5 ML (potable)
- Surface flows to sediment basins and storage dams within the DA Area:
    - 37 ML

During the Reporting Period:

- The 2 ML of raw water from offsite was stored in Pond A1 and pumped to the water truck for dust suppression purposes;
- Potable water, from Council supplies, was stored in tanks onsite for drinking water and ablution purposes; and
- Approximately 180 ML of surface water was also collected in onsite storages during surface water flow events and utilised as required across the site for dust suppression purposes.

The above water use is indicative of dust suppression requirements during the construction phase of the Project and not representative of water use requirements upon commencement of production. Additional water use will be required on commencement of production both underground and on the surface, particularly on machinery, conveyors and stockpile locations. On this basis, a true indication of water requirements as an operational mine will not be gauged until the completion of the first 12 months of production. Commencement of production will enable a more rigorous assessment of water use against predictions.

2.8.5 Stored Water

Table 4 presents an estimate of the volume of stored water at the beginning and end of the Reporting Period.

Table 4
Stored Water

	Volumes Held (m^3)		
	Start of Reporting Period	**At end of Reporting Period**	**Storage Capacity at the end of the Reporting Period (m^3)**
Clean Water (in Storage Dams)*	46,000	5,000	112,000
Dirty Water (in Sediment Basins)	5,600	2,500	10,900
Controlled Discharge Water (salinity trading schemes)	N/A	N/A	N/A
Evaporation Ponds	98,000	123,500	747,000
N/A = Not applicable for the Narrabri Coal Mine			
* = Additional 46ML storage in containment bund of rail loop			

2.8.6 Groundwater Management

Inflows into the box cut and portals are irregular and result from a combination of:

- Direct rainfall over the Box Cut and entrance; and
- Where the box cut and drift workings expose water stored within fractures in the rock mass.

During the Reporting Period, the volume of water pumped from the Box Cut was approximately 15 ML (at an average of 35,000 – 50,000 litres per day). The water was pumped to onsite storages and used generally for dust suppression purposes.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up; and
- Fuels, oil and greases being stored within a bunded area, constructed in accordance with AS 1240-2004 (also see Section 2.8.2) and/or DECCW requirements, whichever are the more stringent.

Groundwater from surrounding bores is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine (see Section 3.4.2).

2.9 Hazardous and Explosive Material Management

Two explosives magazines (within the same compound) are currently located on the mine site to separately store explosives and detonators used for the underground shot firing of the basalt sill and the conglomerate material.

Section 3.9 provides further details about the blasts that have occurred during the Reporting Period.

Materials Safety Data Sheets (MSDS) are retained on-site for all hazardous materials, independent of the quantity. Additionally, all contractors are required to supply MSDS sheets for any hazardous goods they may bring onto the site.

2.10 Infrastructure Management

Management of infrastructure (i.e. buildings, roads, generators, pumps etc) and other facilities not specified elsewhere within this AEMR, is undertaken on an as-needs basis or in accordance with Statutory requirements in order to maintain them in an operationally efficient, safe, neat and tidy condition, and one which does not result in the direct or indirect generation of unacceptable environmental impacts.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the Narrabri Coal Mine, together with monitoring data for the Reporting Period. Existing monitoring locations are shown in Figure 2. A risk identification matrix and the relevant Environmental Management procedures are identified in the Mine's MOP.

768000 770000 772000 774000 776000 778000 780000 782000 784000 786000

6630000 6628000 6626000 6624000 6622000 6620000 6618000 6616000 6614000 6612000 6610000 6608000 6606000

WB4 P5 P6 P4 P7 P17 P16 WB8 P15 P14 WB1 N4 P20 P19 P18 ND-4 ND-3 KC1US ND-6 SD4 ND-5 KC1DS N1 WB7 P9 N2 P13 WB2 ND-9 ND-7 P12 ND-2 KC2US SD2 SD5 KC2DS P3 ND-1 ND-10 N3 N5 P8 WB5a WB5b P10 P11 P2 WB6a WB6b P1

776000 778000 780000

P19 KC1US ND-6 ND-5 SD4 N1 KC1DS P12 P13 SD5 KC2DS WB2 ND-2 ND-9 SD2 KC2US ND-1 ND-10 N3 ND-8

0 250 500 1,000 Meters

776000 778000 780000

Legend

- Pit Top Area
- ML1609
- Noise Monitoring
- Deposited Dust
- PM10 HVAS
- Licenced Discharge Points
- Peizometer
- Water Bore

Narrabri Coal Operations Pty Ltd

NARRABRI COAL MINE

Environmental Monitoring Locations

Author: J. Scealy

Date: April 2010

Coordinate System: Map Grid Australia Zone 56

Scale: **1:80,000**

WHITEHAVEN

2,000 1,000 0 2,000 4,000 6,000 8,000

Meters

3.1 Air Pollution

3.1.1 Criteria

The air quality criteria applicable to the Narrabri Coal Mine are specified in PA 05-0102, Schedule 3, Tables 4, 5 & 6 and summarised below.

- Acceptable mean annual increase in deposited dust of 2g/m^2/month.
- Mean annual dust deposition (all sources) of 4g/m^2/month.
- Mean annual TSP (all sources) concentration – 90 μg/m^3.
- Mean annual PM_{10} particulate level of 30 μg/m^3.
- 24 hour average PM^{10} particulate level of 50 μg/m^3.

Additionally, exhaust gases on earthmoving / mining equipment should not be visible for more than 10 seconds continuously.

Notwithstanding the diversity of the criteria identified above, routine air quality monitoring at the Narrabri Coal Mine is required for deposited dust and PM_{10} particulates. Monitoring of deposited dust is undertaken on a monthly basis whilst PM_{10} levels are monitored every 6 days.

3.1.2 Control Procedures

In order to satisfy the criteria identified above, Narrabri Coal employs a range of air pollution control measures including:

- No burning of materials on site. Any vegetation removed as part of the construction phase retained for subsequent replacement on the rehabilitated landscape;
- Limiting groundcover removal to areas required for immediate operational and construction requirements;
- Groundcover removal as part of the topsoil removal activities;
- Where practicable, limiting soil stripping activities to periods when there is sufficient soil moisture to prevent significant dust lift-off and avoiding periods of high winds;

- Soil stripping using open bowl scrapers, thereby eliminating the dust generated from elevators;
- Application of water to exposed surfaces, with emphasis on those areas subject to frequent vehicle / equipment movements which may cause dust generation and dispersal;
- Use of water injection on the drilling rig;
- Use of imported aggregates for blast hole stemming;
- Progressive shaping and rehabilitation of areas post construction;
- Speed limit restrictions on all vehicles and equipment on the mine site; and
- Equipment exhaust positioning to avoid exhausts impinging on the ground and causing dust lift-off.

3.1.3 Dust Monitoring

Table 5 presents a summary of the deposited dust monitoring data for the Reporting Period while Appendix 4 presents the results of all dust monitoring over the life of the mine to date.

It should be noted that September 2009 results have been excluded from annual average calculations for all monitors. A severe dust storm occurring on the 23rd September 2009 resulted in a significant distortion of the September dust results. The August 2009 result for ND1 (Turrabaa) has also been excluded from the annual average calculation as the deposited dust level has obviously been significantly distorted by contamination issues.

A graphical representation of the total insoluble solids and ash content data for each of the sites monitored during the Reporting Period is also included in Appendix 4. Figure 2 identifies the locations of the various deposited dust gauges maintained during the Reporting Period.

Table 5
Deposited Dust Monitoring Data (April 2009 - March 2010)

Site (see Figure 2)	Property	Total Insoluble Solids g/m^2/month		Ash Content g/m^2/month	
		Mean	Standard Deviation	Mean	Standard Deviation
ND-1	Turrabaa	5.2	5.1	2.3	2.2
ND-2	Claremont	3.4	2.9	2.0	2.4
ND-3	Bow Hills	3.0	2.3	1.8	1.2
ND-4	Matoppo	8.4	11.1	4.6	6.7
ND-5	Claremont	3.1	2.1	2.0	1.0
ND-6	Willarah	2.4	1.3	1.3	0.6
ND-7	Claremont	2.5	1.6	1.8	1.3
ND-8	Claremont	2.2	1.3	1.5	0.9

A review of Table 5 and Appendix 4 shows that:

- As with the 2008/2009 AEMR Reporting Period, the mean annual total insoluble solids (deposited dust) criterion was satisfied at all monitoring locations excluding ND1 and ND4 during the current Reporting Period. These exceedances are believed to be associated with sample contamination (plant material, insects and bird droppings) rather than site operations. No activities were occurring onsite during the monitoring period that could lead to such elevated deposited dust levels. The prevailing wind direction from the south-east and north-west, and the position of the dust gauges, support the concept that elevated dust levels are not directly related to construction activities.
- Deposited dust levels have been relatively inconsistent during the Reporting Period as a result of regional dusty conditions, in particular in September 2009, and sample contamination from farming activities, insects or bird droppings. Monthly deposited dust levels generally began to return to normal in early 2010.

Narrabri Coal Operations Pty Ltd also has High Volume Air Samplers (PM_{10}) located at the properties “Claremont” and “Turrabaa” located to the south-east and south-west

of the mine site. The samplers run for 24 hours every 6 days, with filter papers sent to an accredited laboratory for analysis.

Results during the Reporting Period indicate general compliance with the 24 hour criteria and annual average, with the exception of two monitoring events in December 2009 whereby both HVAS locations exceeded the 24 hour criteria (Figure 3 and Figure 4). The 24hr criterion (50 µg/m^3) was breached at the both monitor locations on the 8th and 14th December, as follows:

Date	Claremont	Turrabaa
8th December 2009	114 µg/m^3	86 µg/m^3
14th December 2009	58 µg/m^3	53 µg/m^3

Review of other PM_{10} units operated by Whitehaven confirmed a general spike in PM_{10} concentrations on these days and coincided with bushfires in the region producing significant smoke haze. It is also noteworthy that the PM_{10} unit in Tamworth operated by DECCW experienced an increase in PM_{10} over the period 8th – 14th December 2009 with PM10 levels ranging from 24 µg/m^3 to 325 µg/m^3, which indicates general regional conditions were responsible for the higher concentrations recorded at the "Claremont" and "Turrabaa" monitors. Advice was issued to both DECCW and DoP pertaining to the elevated PM_{10} levels on these dates.

The annual average at both HVAS locations remained well below the annual average criteria (30 µg/m^3) throughout the Reporting Period. At the end of the Reporting Period the annual average was 16.30 µg/m^3 at "Claremont" and 15.85 µg/m^3 at "Turrabaa".

The full data set for PM10 monitoring is contained within Appendix 4.

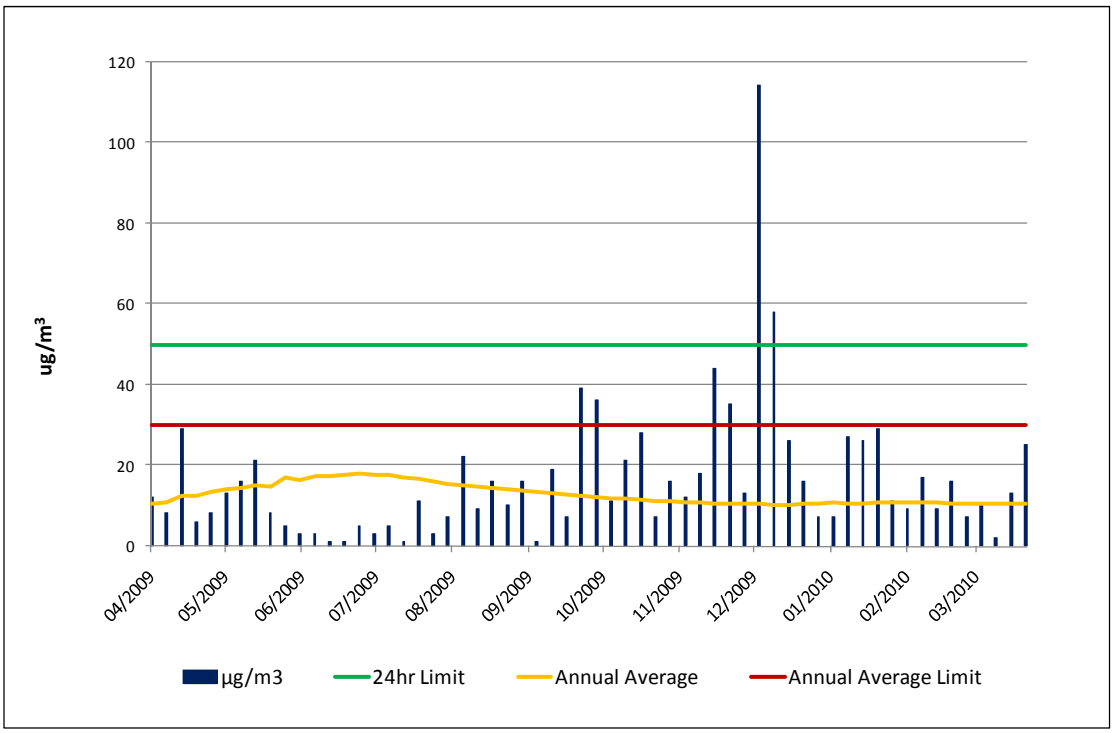


Figure 3
HVAS PM10 data – Claremont (April 2009 - March 2010)

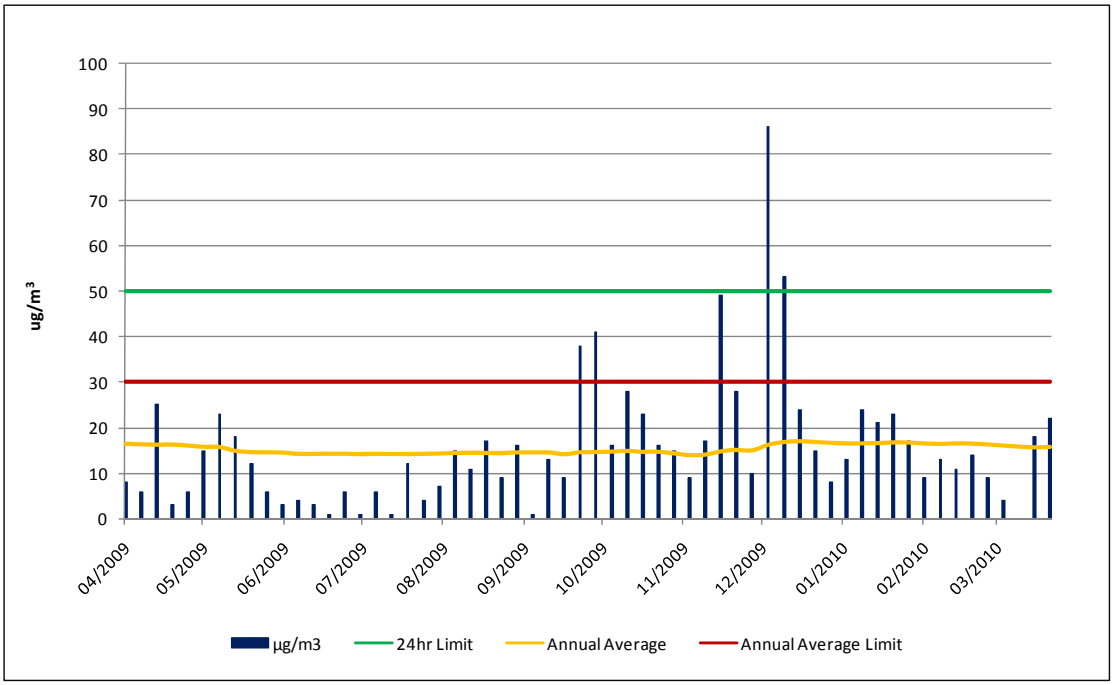


Figure 4
HVAS PM10 Data – Turrabaa (April 2009 - March 2010)

3.2 Erosion and Sedimentation

3.2.1 Management

Methods for the management of erosion and sediment control at the Narrabri Coal Mine are presented in the MOP and the Construction Phase Site Water Management Plan (CPSWMP) prepared in accordance with PA 05_0102. A more comprehensive Site Water Management Plan (SWMP), to incorporate operational requirements, has been submitted to DoP, DECCW and NOW for review.

Control of erosion and sediment generation is achieved on the Narrabri Coal Mine site primarily through the implementation of water management controls identified in Section 2.8.2 and shown on Plan 4, and water usage for dust suppression which ensures adequate storage capacity is available within the various water containment structures to receive inflows. Additional measures which assist in the control of erosion and sedimentation include:

- Minimising the extent of disturbance consistent with operational and construction requirements;
- Revegetation of long-term subsoil and topsoil stockpiles, and establishment of cover crops across areas of disturbance post construction activity;
- Undertaking soil management activities generally in accordance with the recommendations from Geoff Cunningham Natural Resource Consultants.

Soil stockpiles have been placed in gently sloping or near flat areas surrounded by grassland which effectively reduces the runoff velocity, and hence erosive potential, from any run-on waters. However, Narrabri Coal is cognizant of the potential for stockpile erosion and will adopt stockpile protective procedures to minimise impacts as required over the remaining life of the mine. Establishment of cover crops and pasture grasses across rehabilitated areas will be monitored over the life of the mine and additional works undertaken as required to ensure appropriate cover at all times.

3.2.2 Performance

The effectiveness of the procedures for erosion and sedimentation management are assessed visually as part of routine mine operations and supervision undertaken by Narrabri Coal Operations, with any ameliorative works initiated as and when required.

During the Reporting Period, all necessary controls were in place and operating as per design. The well established cover on the Pit Top Area (including along drainage lines, on the banks of water management structures and on soil stockpiles) (Plate 3) has resulted in only isolated, minor occurrences of erosion.

Plate 3
Topsoil Stockpile Adjacent to Site Access Road

3.3 Surface Water Pollution

3.3.1 Management

The prevention of surface water pollution is achieved through the management of surface water as presented in Section 2.8.2.

3.3.2 Performance

Surface water management controls have operated effectively throughout the Reporting Period, with water management controls operating in accordance with the CPSWMP.

Only one wet weather discharge event has occurred during the Reporting Period. Prolonged periods of hot, dry weather were experienced for the majority of 2009. Following a significantly dry period of time in late 2009, whereby the majority of the site's storages were dry, the site received approximately 200 mm of rainfall in the period 25th December 2009 – 4th January 2010. The discharge occurred from SD5 which receives water from a large catchment (Kurrajong Creek Tributary 2) mostly located outside the site boundary.

The discharge satisfied Condition L3.4 of the EPL, whereby the Total Suspended Solids concentration limit could have been exceeded as the discharge occurred solely as a result of rainfall measured at the premises that exceeded 38.4mm over a consecutive five day period prior to the discharge occurring. The EPL notes that 38.4mm equates to the 5 day 90%ile rainfall depth for Gunnedah sourced for *Managing Urban Stormwater: Soils and Construction Volume 1: 4th Edition, March 2004.*

Table 6 provides analysis results for water sampled from the discharge point (SD5) as well as flows upstream and downstream of the site at the time of the discharge. The results indicate compliance with the water quality criteria specified in EPL 12789 and therefore the exceedances permitted in Condition L3.4 did not occur.

Table 6
Wet Weather Discharge Results - 5th January 2010

Sample Location	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (TOC)
EPL 100 %ile concentration limit	-	6.5-8.5	-	50	10	-
KCUS	0930	7.24	804	2	<5	10
KC1US	1000	7.42	126	8	<5	12
KCDS	1030	7.41	456	2	<5	14
SD5	1130	7.23	155	18	<5	8
PC1	1155	7.3	174	7	<5	12
PC	1215	7.38	121	8	<5	15
KC1DS	1235	7.28	419	6	<5	10
KC2DS	1250	7.47	178	22	<5	12

In the event that Kurrajong Creek and/or Pine Creek are flowing, and the mine site is not discharging, Narrabri Coal analyses the water quality in the creek flows to provide baseline data. Appendix 5 includes all wet weather water monitoring conducted over the life of the mine.

Surface water monitoring of site storages commenced in mid 2009. Monitoring of storages had not occurred previously as the storages were being constructed. Water quality results are provided in Appendix 5.

The results indicated that the water is neutral to alkaline with TSS levels generally less than 400 mg/L, which is similar to the water quality of flows in Kurrajong Creek and Pine Creek. EC levels recorded in site storages in June 2009 were similar to the EC levels recorded from flows in Kurrajong Creek and Pine Creek. These levels steadily increased until December 2009 due to the lack of inflows and low storage levels associated with the hot, dry conditions experienced in late 2009. The March 2010 sampling event shows that EC levels have returned to relatively normal levels following high surface flows in December 2009/January 2010.

3.4 Groundwater Pollution

3.4.1 Management

With the exception of fuels and oils, no materials occur or are retained on the mine site which are likely to be a source of groundwater pollution.

The methods for management of potential pollutants are summarised in Section 2.8.6. Ongoing monitoring to assess trends in groundwater chemistry will enable assessment of potential contaminants to groundwater.

3.4.2 Performance

Throughout the construction phase of the development, Narrabri Coal's performance with respect to groundwater management, the prevention of pollution and the assessment of impacts on groundwater availability to other surrounding users has been assessed through groundwater level and chemistry monitoring undertaken at a series of operating and monitoring bores within the mining lease area, on properties adjacent to the mining lease and in the alluvial system adjacent to the Namoi River. The frequency of monitoring and the parameters monitored are all identified in Table 7.

Appendix 6 presents the results of the groundwater monitoring undertaken since the commencement of construction at the Narrabri Coal Mine. Monitoring sites are shown on Figure 2.

Table 7
Groundwater Monitoring Schedule

Location	Parameters	Frequency
All Standpipes P1,P2, P3, P4, P5, P6,P7,P8, P9, P10, P11,P12, P13, P14, P15, P16,P17,P18, P19, P20, WB1, WB2, WB3a, WB3b, WB4, WB5a, WB5b, WB6a, WB6b, WB7 and WB8	Water level EC pH TDS Metals Anions and Cations	Quarterly (water level, pH and EC) Annually (full water quality)
Vibrating Wire Piezometers P21,P22, P25 ,P26 and P27	Water Level	Daily (Data Logger)
Multi Level Vibrating Wire Piezometers P35 and P36	Water Level	Daily (Data Logger)
Mine water pumped into and out of the mine.	EC pH TDS Metals Anion and Cations Discharge Rate	Daily (flow rate) Monthly (EC pH,) Quarterly (Full water quality)

A review of the groundwater monitoring results presented in Appendix 6 shows that standing water levels (SWL) have remained relatively consistent in the monitored bores throughout the Reporting Period with the exception of P7, P10, P18 and P20.

The fluctuations in P7 and P10 are not believed to be mine related given their distance from the operation. P7 is located approximately 9km north-west of the Pit Top Area in the Pilliga East State Forest and is installed in the Pilliga Sandstone strata. The SWL has fluctuated from 60m to over 90m below ground level since monitoring commenced in November 2007. Many of the monitoring piezometers have demonstrated very low water flows and the water levels are slow to recover after purging as required prior to sampling taking place. On several occasions, bore purging has resulted in the sample result being identified as “dry” as the bore has failed to adequately recover over a 48hr period. On this basis, it is considered that the fluctuation in SWL is unrelated to mine development activities.

P10 is located approximately 7km south-west from the Pit Top Area in the Napperby Formation. The SWL has fluctuated between 15m and over 50m since monitoring commenced in March 2008. P11 is in close proximity to P10 and is also in the Napperby Formation. P11 has shown very little variation over time with SWL ranging between 22m and 25m. The most significant drop in SWL was recorded in 2008 (when the SWL dropped from 20m in June 2008 to 53m in September 2008). At this time the mine was in very early stages of development (box cut establishment) and had not encountered any significant groundwater inflows. It is therefore considered the variations in SWL at P10 are related to other non-mine related influences.

P18 and P20 are in close proximity to each other, as well as the gas extraction activities, and are installed in the Hoskissons Coal Seam and Arkarula Formation (below the coal seam) respectively. The SWL at both P18 and P20 dropped approximately 20m between June 2009 and March 2010. The drop in SWL at these two piezometers is believed to be linked to the water extraction occurring in association with gas extraction activities. P18 and P20 are located on mine owned property and not subject to groundwater contingency planning requirements.

A review of the data presented in Appendix 6 indicates that groundwater quality has remained relatively consistent throughout the Reporting Period. In general, the water quality of the monitored bores can be described as moderately saline, with EC levels ranging from 100 µs/cm to >25000 µs/cm.

It is also noteworthy that there has been no suggestion from local landowners that Narrabri Coal's activities are adversely affecting groundwater availability or quality.

3.5 Contaminated or Polluted Land

Prior to mining, the area was a green-fields site, utilised for grazing and agriculture. Discussion with landowners during the preparation of the Environmental Assessment for Stage 1 revealed that no environmentally harmful products had been used on their landholding nor had there been any disposal of potential environmental

contaminants. This situation has remained unchanged throughout surface construction activities. Consequently there is no reason to expect that contaminated lands would be present within the Project Site.

3.6 Threatened Flora

Investigations undertaken by Ecotone Pty Ltd as part of the Environmental Assessment identified that the Project site was of no specific significance in terms of threatened flora as none of the vegetation communities on site constituted an endangered ecological community, with only one threatened flora species having potential to occur on site.

Notwithstanding the findings of the initial flora investigations, all activities during the surface construction program have been undertaken to minimise the impact on flora species. This has been achieved by limiting areas of surface disturbance to those areas specifically required for construction purposes. As the Pit Top Area comprised predominantly open pasture and previously cultivated areas, the only timber removal has been isolated individual trees which were all assessed for habitation by fauna prior to removal.

No flora monitoring within or external to the project site has been undertaken to date. The Landscape Management Plan (LMP), prepared by specialist consultants EcoLogical Australia Pty Ltd and GSS Environmental Pty Ltd, was approved by the Director-General on 24th March 2010. The LMP comprises flora management and monitoring requirements which will be implemented during the next Reporting Period and reported on in subsequent AEMRs.

3.7 Threatened Fauna

Investigations into the occurrence of Threatened fauna within the Project Area were undertaken by Ecotone Pty Ltd as part of the EA preparation phase. Those investigations identified that the proposed development was unlikely to significantly

affect threatened species found or likely to occur in or around the mine site. This was on the basis of no previous recordings of threatened species within 2 kilometres of the mine site.

Notwithstanding the findings of the initial fauna investigations, all activities during the surface construction program have been undertaken to minimise the impact on fauna species. This has been achieved by limiting areas of surface disturbance to those areas specifically required for construction purposes. As the Pit Top Area comprised predominantly open pasture and previously cultivated areas, the only timber removal has been isolated individual trees which were all assessed for habitation by fauna prior to removal.

No fauna monitoring within or external to the project site has been undertaken to date. The Landscape Management Plan identifies specific actions to occur over the life of the mine pertaining to fauna management. Any fauna management conducted on site, either in relation to native fauna or feral animals, will be reported in future AEMRs.

3.8 Weeds

3.8.1 Management

Weed management within the Project Area involves regular inspections by a Narrabri Coal employee who has Chemcert accreditation for weed control via chemical applications.

The Landscape Management Plan, approved by the Director-General in March 2010, specifies weed management measurements. The requirements of this Plan will be implemented during the next Reporting Period.

3.8.2 Performance

During the Reporting Period, weed control measures focussed on the continued control of the noxious weed "Mother of Millions", which was located within the Kurrajong Creek waterway. Whilst this area has not been subject to any surface disturbance activity during the previous or current Reporting Period, it is clear that under previous land ownerships, little had been done to control this weed.

Other weed control comprised spot spraying across the Pit Top Area of Noogoora Burr, Prickly Pear, Bathurst Burr, Coolatai Grass and African Boxthorn, as required.

3.9 Blasting

3.9.1 Blast Criteria and Control Procedures

3.9.1.1 Blast Criteria

Blasting criteria for the Narrabri Coal Mine are nominated in Project Approval 05_0102, and Condition L7 of Environment Protection Licence 12789 (Appendix 2) and specify that:

- Blasting must only be carried out between 10.00 am and 4.00 pm, Monday to Friday and must not take place on Saturday's, Sundays or Public Holidays without the prior approval of the EPA.
- The overpressure level from blasting operations must not:
  (a) exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over each reporting period; and
  (b) exceed 120dB (Lin Peak) at any time.

  At any point within 30 metres of any non-project related residential building or other noise sensitive location.
- Ground vibration peak particle velocity from the blasting operations must not:
  (a) exceed 5mm/s for more than 5% of the total number of blasts during each reporting period; and
  (b) exceed 10mm/s at any time,

at any point within 3.5 metres of any affected non-project related residence or other noise sensitive location.

Licence No. 12789 does, however, note that the hours of blasting operations may be varied with the written consent of the EPA.

Licence No. 12789 also limits the number of blasts to two per day without the written approval of the DECC (EPA).

3.9.1.2 Control Procedures

Flyrock, air vibration, ground vibration and dust from blasting are controlled using a combination of design and operational methods which are detailed in the MOP and/or documented blasting procedures.

3.9.2 Performance

No surface blasting occurred during the Reporting Period. The blasting during the Reporting Period was restricted to development shotfiring in the drift roadways underground.

From June 2009 to October 2009, shotfiring was carried out on a daily basis utilising bulk (ANFO) and packaged (Orica Magnum) explosives. Approximately 200 – 250kg was used per shot to advance the drift roadway approximately 3m. The shotfiring was undertaken due to the intersection of an Igneous Dolerite Sill structure that was well beyond the capabilities of the Roadheader equipment to excavate. Once this structure had been traversed and the drift roadways entered the softer mudstone material, excavation resumed with the Roadheader equipment. During this period the closest shot to the surface was 450m in from the portal mouth. While the shots were audible from the box cut they were not audible from the surrounding surface operations. Due to the potential impact on underground infrastructure and the Main Mine Ventilation Fan, positioned in the box cut in line with one of the drift roadways, the shotfiring design was assessed for windblast and vibration. There was

no vibration or windblast experienced on the surface. The underground workings were evacuated prior to each blast.

Shotfiring to advance the roadways recommenced in late February 2010 when another hard structure was intersected in the drifts. The shotfiring campaign continued up to and beyond the end of the Reporting Period. The same system of work was being used for the shotfiring as used in 2009. In this case the shotfiring was being carried out over 1000m in from the portal mouth. Again no vibration or windblasts have been experienced on the surface.

In comparison to the surface shotfiring conducted during the previous Reporting Period, where up to 40 tonnes of explosives was used in a single shot, the underground shotfiring only required 200-250kg of explosives, thus making monitoring unnecessary.

No complaints have been received from the community in relation to blasting at the mine.

3.10 Operational Noise

3.10.1 Criteria

3.10.1.1 EPA Criteria

The EPA-nominated noise emission criteria, identified in Environment Protection Licence 12789 as applicable to the Narrabri Coal Mine, are as follows.

L6.1 "*Noise from the premises must not exceed:*

(a) 35dB(A)$L_{Aeq(15\ minute)}$ during the day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) for construction activities.

where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L6.2 *Noise from the premises is to be measured at any residence not on the premises to determine compliance with this condition."*
Note: For the purpose of noise measures required for this condition, the L_{Aeq} noise limit must be measured or computed at any point within 30 metres of any residence not on the premises over a period of 15 minutes using "FAST" response on the sound level meter.

L6.3 *The noise emission limits identified in this licence apply under all meteorological conditions except:*
(a) during rain and wind speeds (at 10m height) greater than 3m/s; and
(b) under "non-significant weather conditions".

L6.3.1 *Noise impacts where wind speed exceeds 3 metres per second at 10 metres above the ground must be addressed by:*

a) documenting noise complaints received to identify any higher level of impacts or wind patterns;

Where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts where wind speed exceeds 3 metres per second at 10 metres above the ground should be developed and implemented.

L6.4 *The noise limits set by condition L6.1 of the licence do not apply where a current legally binding agreement exists between the licensee and the occupant of a residential property that:*

a) agrees to an alternative noise limit for that property; or
b) provides an alternative means of compensation to address noise impacts from the premises.

A copy of any agreement must be provided to the EPA before the licensee can take advantage of the agreement.

3.10.1.2 Consent Criteria

Noise emission criteria nominated in Project Approval 05_0102 (Condition Schedule 3(12) is as follows:

3(12) "The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately owned residence.

Day $L_{Aeq(15\ minute)}$	***Evening*** $L_{Aeq(15\ minute)}$	***Night*** $L_{Aeq(15\ minute)}$	***Night*** $L_{A1(1\ minute)}$
35	*35*	*35*	*45*

Table 1: Impact Assessment Criteria dB(A)

3.10.2 Control Procedures

Control of noise generation and propagation on the Narrabri Coal Mine site is by a combination of general source and propagation path methods including:

- Installation and maintenance of appropriate mufflers on plant and equipment;
- Where operationally feasible, scheduling activities to minimize operation of equipment in exposed locations when winds are blowing towards residences;
- Equipment removal or replacement;
- Changing operational procedures;
- Restricting hours of operations;
- Enclosure of fixed items of plant, eg generators;
- Bunding close to noise sources to create obstructions to the propagation path;
- Sealing of mine access road;
- Regular equipment maintenance;
- Demobilising surface plant with bulk of operations underground.

Narrabri Coal also regularly liaises with the majority of surrounding neighbours to seek feedback on the mining activities. It is noted that over the life of the mine to-date, i.e. since March 2008, operational noise has only been raised as an issue of concern by one adjoining landholder.

3.10.3 Operational Noise Monitoring

3.10.3.1 Introduction

The Noise Monitoring Program details the requirements for attended and unattended noise monitoring for construction and operational noise associated with the Narrabri Coal Mine. The noise monitoring sites are identified on Figure 2.

In addition to the scheduled monitoring events, a Barn Owl noise monitor was installed for the period 13th May - 16th June 2009 to determine noise levels associated with complaints from the "Kurrajong" landholder. Due to the landholder not allowing monitoring near the "Kurrajong" residence, all noise monitoring associated with the property was performed at the boundary of the "Claremont" (mine-related) and "Kurrajong" properties.

Sound power level testing of the Titeline drill rig was conducted in March 2010 to compare noise levels with those predicted in the Environmental Assessment.

The following sub-sections present a summary of the outcomes of each monitoring event, conducted by Spectrum Acoustics. Copies of all monitoring reports are presented in Appendix 7.

3.10.3.2 Attended Noise Monitoring

<u>June 2009</u>

Attended noise monitoring was conducted on 23rd June 2009 at "Bow Hills" (N1), "Westhaven" (N2), "Naroo" (N3), "Greylands" (N4) and "Kurrajong" (N5, property boundary). Spectrum Acoustics reported that noise emissions from the mine site were below the criterion of 35 dB(A),$_{Leq(15min)}$ at all receivers.

September 2009

On the 2nd September 2009, Spectrum Acoustics conducted attended noise monitoring at the "Bow Hills" (N1), "Westhaven" (N2), "Naroo" (N3), "Greylands" (N4) and "Kurrajong" (N5, property boundary) properties. Spectrum Acoustics noted a drill rig working to the west was audible at the "Westhaven" property. Despite this, the results indicated that noise emissions from the site were below the criterion of 35 dB(A),$_{Leq(15min)}$ at all receivers.

December 2009

Attended noise monitoring was conducted on the 14th December 2009 at "Bow Hills" (N1), "Westhaven" (N2), "Naroo" (N3), "Greylands" (N4) and "Kurrajong" (N5, property boundary). The gates to "Bow Hills" were locked during the evening so the evening and night measurements were made at the front gates of the property. Spectrum Acoustics noted that noise emissions from the site were below the 35 dB(A),$_{Leq(15min)}$ criteria at all receivers.

In addition to the operational noise, the noise from the site must not exceed 45 dB(A)L1$_{(1\ min)}$ between the hours of 10pm and 7am. This is to minimise the potential for sleep disturbance as a result of individual loud noise from the mine. During the night time measurement circuit the L1$_{(1\ min)}$ noise from the site did not exceed 45 dB(A) at any monitoring location.

March 2010

Attended noise monitoring was conducted on the 26th March 2010 at "Bow Hills" (N1), "Westhaven" (N2), "Naroo" (N3), "Greylands" (N4) and "Kurrajong" (N5, property boundary). Spectrum Acoustics noted that noise emissions from the site were below the 35 dB(A),$_{Leq(15min)}$ criteria at all receivers.

During the night time measurement circuit the L1$_{(1\ min)}$ noise from the site did not exceed 45 dB(A) at any monitoring location.

3.10.3.3 Unattended Noise Monitoring

Unattended noise monitoring was conducted on a quarterly basis during the Reporting Period with monitoring programs being undertaken in June 2009, September 2009, December 2009 and March 2010. Spectrum Acoustics measured noise levels in 15 minute statistical intervals over three day periods using environmental noise loggers. Noise loggers were installed at the entrance gate to "Matoppo" (north of the site) and "Naroo" (south of the site). Since noise loggers record the total acoustic environment, it is not possible to identify or assign noise levels to the various contributing sources. On this basis, Spectrum Acoustics do not interpret the logger results. Unattended noise monitoring reports are provided in Appendix 7.

3.10.3.4 BarnOwl Noise Monitoring

A real-time BarnOwl noise monitor was installed near the southern boundary of the "Claremont" property (which is mine-owned) by the supplier, Wilkinson Murray Pty Limited (WMPL) for the period 13th May 2009 – 16th June 2009. The purpose of the study was to obtain long-term noise levels at the adjoining "Kurrajong" property following ongoing complaints from the resident regarding noise emissions from the site. As the owner of "Kurrajong" would not allow access to the property, advice was sought from DECC Noise Policy Branch, Sydney, as to an acceptable methodology. It was determined that the device would be situated at the nearest available point to "Kurrajong" and a correction determined from noise modelling would then be applied to the BarnOwl data to estimate noise levels at "Kurrajong".

Extensive noise modelling was conducted to determine applicable inversion strength for the Narrabri Stage 2 EA, which is pending approval. The modelling determined that inversion strength of 6^0C/100m was applicable. Based on modelling of actual operational scenarios for May 2008, the worst case predicted noise levels at the BarnOwl location was 8dB higher than predicted levels at the "Kurrajong" residence. Accordingly, 8dB was subtracted from BarnOwl noise levels to estimate levels at "Kurrajong".

The data assessment methodology and results are described in the report in Appendix 7.

The report suggests that noise emissions from Narrabri Mine remained within the criteria at "Kurrajong" during the winter period May-June 2009. Noise criterion exceedances were recorded at the attended monitoring point for "Kurrajong" property on the boundary of the "Claremont" and "Kurrajong" properties during winter 2008 when substantial earthworks were taking place. It is evident that noise emissions were significantly lower during winter 2009 as a consequence of these activities no longer occurring.

3.10.3.5 Drill Rig Sound Power Level Assessment

A noise assessment was conducted on the 11th March 2010 to measure the sound power levels (Lw,dB(A)) of a "Titeline" drill rig that was operating to the north of the Pit Top Area.

The calculated maximum sound power level of 107 dB(A) is 2 dB below the level adopted in the noise modelling conducted for the Section 75W modification and Stage 2 EA. These results confirm that the maximum sound power level for the drill rig, if substituted into the noise model, would result in noise levels below the criterion of 35 dB(A) at the worst affected receiver for day, evening and night-time operation under the modelled adverse meteorological conditions.

Ongoing compliance with the noise criteria throughout the Reporting Period correlates with a reduction in surface construction activities. Over the life of the operation to date, there has only been noise related complaints from the owner of the "Kurrajong" property (see Section 4.1 for further details about complaints received during the Reporting Period). Whitehaven Coal Limited has recently purchased "Kurrajong" and, as a result, it is expected that noise related issues will lessen during the next Reporting Period.

Narrabri Coal is required to submit a revised Noise Management Plan (NMP) to the Director-General for approval by the 31st May 2010 as part of the Section 75W modification. The NMP will include a Noise Monitoring Program that incorporates real-time noise and temperature inversion monitoring as well as reactive noise control measures to manage noise impacts for sensitive receptors.

3.11 Visual, Light

3.11.1 Management

The Narrabri Coal Mine is positioned to the west of the Kamilaroi Highway, upslope of the main road, and is thereby visible to passing motorists and to adjacent property holders to the east. Lights from the mine site are visible during the night, however, is not considered as a significant detrimental impact given the distance from adjacent non-project related residences. Additional lighting has also been established at the intersection of the highway with the mine access road to illuminate the adjacent rail crossing and in this regard this lighting is more prevalent as opposed to lighting on the mine site itself. Over the course of the construction phase, there have been no complaints pertaining to the visual impact of the development. The project site is maintained in a clean and tidy condition at all times, with areas of disturbance reshaped and rehabilitated as soon as practicable.

The constructed amenity bund (Plate 4) on the southern and western boundary of the Project site obscures views of the development site from the south and west, whilst vegetation associated with Kurrajong Creek obscures views to the site from the north. Narrabri Coal has undertaken strategic tree planting across the Project site to further enhance visual screening from adjacent areas.

3.11.2 Performance

The surface construction phase of the development will be the most visual aspect of the entire development. Given the level of construction activity that has occurred since commencement, the site has responded well to reshaping and revegetation

programs which have reduced the overall visual impact of the Project. With the exception of those areas that require ongoing disturbance (ie. site roads), the area in and around the surface infrastructure has excellent groundcover. The visual amenity will further improve as tree establishment progresses.

Plate 4
Visual Amenity Bund - adjacent to Kurrajong Creek Road

3.12 Aboriginal Heritage Management

3.12.1 Sites Management and Performance

An investigation of Aboriginal cultural heritage was undertaken as part of the Environmental Assessment for the Narrabri Coal Mine and identified 7 sites of significance within the project area. Five of these are associated with the adjacent Kurrajong Creek, and not subject to surface disturbance activity, one site within the cleared open area of the pit top, and one site within the heavily vegetated area of

the adjacent Forest, again not subject to surface disturbance activity. The sites are described as follows:

- Site 1 – Wild Orange trees associated with the bank of Kurrajong Creek.
- Site 2 – Low density artefact scatter on creek terrace.
- Site 3 – Dead Tree with scar on standing section of tree.
- Site 4 – Low density artefact scatter on creek terrace.
- Site 5 – Isolated find along gully adjoining Kurrajong Creek.
- Site 6 – 1 Silcrete flake located in cleared paddock.
- Site 7 – Cultural scar on fallen tree.

Following negotiations with the Narrabri Local Aboriginal Land Council and the Gomeroi Narrabri People, it was determined that those sites most likely impacted by operations comprised sites 1, 4, 5 and 6 which all occur within the Pit Top Area. Sites 1, 4 and 5 are associated with Kurrajong Creek, and to ensure avoidance of this area by operations, this section of the creek was fenced and signage placed declaring it to be of Aboriginal significance. Site 6 is located in an area of open paddock not likely to be impacted by surface construction activity. It was intended to fence around the subject site prior to construction works commencing, however a reconnaissance survey by Narrabri Local Aboriginal Land Council, Gomeroi Narrabri People and the Archaeological consultant were unable to locate the artefact. Sites 2 and 3, whilst outside the Pit Top Area, have also been protected via the fencing undertaken for Sites 1, 4 and 5 and in this regard should not be subject to disturbance associated with mining activities. Site 7 is located in dense vegetation and not subject to surface disturbance, in this regard no additional management action was required.

During construction and disturbance activities, representatives of the Narrabri Local Aboriginal Land Council and the Gomeroi Narrabri People were present throughout soil stripping campaigns to ensure appropriate survey for additional items of Aboriginal significance. No additional artefacts were found.

3.12.2 Consultation

Narrabri Coal maintains contact with the representative Aboriginal groups in order to ensure appropriate engagement with the Aboriginal community prior to surface disturbance activity. This will continue throughout the life of the operation. The representative groups have also recently been involved in the additional survey works as undertaken for the ongoing Stage 2 Assessment work for progression to a longwall operation.

To date, the measures in place to protect Aboriginal Cultural Heritage are considered satisfactory, with all measures identified in the Environmental Assessment, the Aboriginal Cultural Heritage Management Plan, and the Project Approval in place.

3.13 Natural Heritage

There are no features of Natural Heritage within the DA Area and hence, no specific management procedures are required.

3.14 Spontaneous Combustion

3.14.1 Management

Coal at the Narrabri Project is from the Hoskissons Coal Seam which has been identified as having a high (Class IV) intrinsic spontaneous combustion propensity. As a consequence, a Spontaneous Combustion Management Plan (SCMP) was developed for the site which details the measures to be taken to reduce the potential for spontaneous combustion incidents to occur, and the personnel responsible for these processes. A more comprehensive SCMP is currently being developed by NCOPL personnel, in consultation with consultants, to coincide with the commencement of mining operations.

3.14.2 Performance

As the site is not yet producing coal there have been no incidents of spontaneous combustion over the reporting period.

3.15 Bushfire Management

3.15.1 Management

Narrabri Coal Operations is equipped to attend to emergency fire situations with appropriate machinery and personnel. Any involvement in such situations would be at the discretion of the local Rural Fire Service (Baan Baa).

3.15.2 Performance

There were no bushfire incidents on or adjacent to the Project Area during the 2009/2010 Reporting Period.

3.16 Mine Subsidence

As active mining has not yet commenced there has been no mine subsidence. Under Stage 1 operations it has been predicted that mine subsidence will not exceed 20mm.

3.17 Hydrocarbon Contamination

3.17.1 Management

It is Narrabri Coal's objective that:

- All bulk hydrocarbons, i.e. fuel, oils, grease etc (both new and waste) retained at the Narrabri Coal Mine be contained within bunded areas within the contained water management system as described in Section 2.8.2;
- All fixed or portable equipment incorporate self-contained bunding;
- Hydrocarbon-contaminated materials be disposed of appropriately; and
- Minor spillages, if occurring, are cleaned up and the contaminated soil either bio-remediated or transferred off-site to an appropriately licensed waste disposal area.

Major spillages, if occurring, would be treated in accordance with a three-phase system of containment, collection and remediation.

3.17.2 Performance

Narrabri Coal's procedures for hydrocarbon management have been effective throughout the Reporting Period with:

- No surface or groundwater contamination evident or reported by landowners; and
- No requirement for off-site disposal of contaminated materials.

3.17.3 Greenhouse Gas Emissions

Narrabri Coal remains committed to minimising emission levels as much as possible throughout the life of the development. To date, greenhouse gas emissions have been predominantly associated with diesel consumption through the surface construction fleet and diesel generators for power supply. Offsite electricity was supplied only for the Kurrajong Creek Road lighting and the Turrabaa homestead. Efficiency of operations has been the only means available to reduce greenhouse gas emissions, with specific attention given to minimising haul distance for overburden and soil materials, and maximising machine operations where possible rather the demobilising plant and remobilising at a later date.

Diesel generators were substituted by mains power for the entire site in late 2009 (main switchyard powered - 29th September 2009). This shift will allow Narrabri Coal to implement more thorough reporting against the Energy Savings Action Plan which was approved by the Director-General in October 2008.

During the Reporting Period, a total of 1,993,591 litres of diesel was used at the site for construction related purposes. Assuming an energy content of Automotive Diesel Oil of 38.6MJ/L and using Table 3 of the National Greenhouse Accounts NGA Factors – January 2008, the estimated direct – Scope 1 Greenhouse Gas emissions including all CO_2 and non CO_2 gasses are shown in Table 8.

Electricity consumption totalled approximately 3,463,000 kWh, with 99% of this consumption occurring in the second half of the Reporting Period (October 2009 –

March 2010). Table 8 shows the estimated CO_2-e emissions which are based on the NGERS NSW and ACT emission factor for consumption of electricity purchased from a grid.

Table 8
Greenhouse Gas Emissions

	Usage	Emission Factor	Equivalent Tonnes
Diesel (kL)	1,994	2.7 t CO_2 –e/KL	5,384
Electricity (kWh)	3,463,173	0.89 kg CO_2-e/kWh	3,082

Diesel consumption has reduced by approximately 300,000 litres since the previous Reporting Period which is linked to the reduction in surface construction activities. It is expected that diesel consumption will continue to decrease during the next Reporting Period whilst electricity consumption will increase significantly.

Due to the limited nature of blasting during the Reporting Period, the estimation of emissions against blasting was considered minimal and not likely to impact on the equivalent tonnes of emissions as presented above.

The Narrabri operation forms part of the wider Whitehaven group which is registered under the Greenhouse Challenge Plus Program and committed to reporting emission levels and improvement initiatives on an annual basis. Whitehaven also reported emissions via the National Greenhouse and Energy Reporting Scheme (NGERS) for the 2008/2009 financial year.

Narrabri Coal is required to develop a Greenhouse Gas Minimisation Plan as required under Condition 40 of Schedule 3 of the Project Approval. The plan was developed by Heggies Pty Ltd, in consultation with Narrabri Coal representatives, and submitted to the Department of Planning (DoP) in November 2009 for Director-General approval. A response from DoP is pending.

3.18 Gas Drainage / Ventilation

Construction of the ventilation drift continued in conjunction with the drivage of the other 2 drifts for vehicle/personnel transport and the conveyor drift for transport of coal from pit bottom. It is expected that drift construction to pit bottom will be completed during June 2010.

Surface to In Seam (SIS) drainage was commenced through the area of the future main headings at pit bottom area as well as the tailgate roadways. A gas vacuum plant has been designed and constructed to provide negative pressure to the SIS production wells. This plant will be upgraded in the next 4 months to include an extra pump that will provide increased capacity for the addition of further SIS drainage wells as well as commissioning of underground inseam drilling. Gas collected and piped from underground as a result of the in seam drilling process will be reticulated to surface by vertical riser pipelines and connected to the vacuum plant to supplement the ongoing SIS network.

Total gas production from the SIS gas drainage system through the AEMR reporting period was 4,319,369 m^3. The gas makeup over this period was 89.5% CO_2 and 10% CH_4.

Preparation has commenced for the main ventilation shaft pad. Construction of the 5.5m diameter vertical shaft is expected to commence in June 2010 using blind boring drilling techniques. Construction, including the installation of 3 main fans, is expected to be completed after the next AEMR Reporting Period.

3.19 Public Safety

3.19.1 Management

The Narrabri Coal Mine surface facilities area is located wholly on WCL owned land and is appropriately signed allowing authorised access only. The site is visible from

the Kamilaroi Highway and accessible via an access road from the Highway across the main northern railway line. The Pit Top Area is fully fenced.

Visitors to the mine are required to report to the mine office and unauthorised personnel are not permitted to move around the mine area unaccompanied.

3.19.2 Performance

The procedures in place have been effective throughout the Reporting Period.

3.20 Feral Animal Control

Feral animals are not a significant land management issue on WCL's landholding and are limited to isolated occurrences of foxes, hares and rabbits. In view of the low frequency of occurrence, and in the absence of an extensive programme by all surrounding landowners, no broad scale feral animal control programme was considered warranted during this Reporting Period.

Narrabri Coal will continue to monitor feral animal occurrences and implement necessary control programmes if and when necessary.

3.21 Land Capability

The majority of land currently disturbed by construction activity is classified as Land Capability Class III.

On completion of all mining activities, the successful rehabilitation of areas of disturbance and the relinquishment of the mining leases, the land affected by mining within the project area will, in the main, be returned to a classification similar to that prior to mining. As a consequence, the area comprised within the Pit Top will be returned to a Class III land capability. Rehabilitation works such as reshaping and seeding of previously disturbed areas has been undertaken ensuring the visual

impact of the development was kept to a minimum and that the soil resources of the area is appropriately managed for future land use requirements.

3.22 Meteorological Monitoring

3.22.1 Introduction

In June 2006, a meteorological station was commissioned on the "Claremont" property. The station has been operating continuously since that time recording 15 minute wind speed, wind direction, temperatures, humidity and rainfall.

Daily meteorological data for the Reporting Period is presented in Appendix 8.

3.22.2 Rainfall

Rainfall data for the Reporting Period is presented in Table 9. Narrabri Coal Mine maintains a standard post mounted rain gauge, adjacent to the mine site access road, in addition to the meteorological station. Rainfall measurements from both the meteorological station and rain gauge were compared with some discrepancies evident.

The meteorological station recorded significantly lower rainfall totals over the period late December 2009/early January 2010 than that recorded from the rain gauge, other Whitehaven sites and the Narrabri and Gunnedah BOM stations. On this basis, the meteorological station data for this period has been substituted with the rain gauge data.

Meteorological data was not recorded during the period 2nd – 4th April 2009 due to flat batteries in the station. Rainfall collected in the rain gauge during this period (19.5mm) has been included in the rainfall summary. All amended rainfall measurements have been highlighted in Appendix 8.

Table 9
Rainfall Data (April 2009 - March 2010)

Month	Monthly Rainfall Reporting Period	Rainfall Long Term Average*[1]	Raindays (>1mm) Reporting Period	Raindays Long Term Average*[1]
April 2009	54.9	39.1	6	2.2
May 2009	49.4	48.1	3	2.6
June 2009	30.0	48.8	7	3.3
July 2009	26.2	46.8	5	3.1
August 2009	7.8	41.1	2	2.9
September 2009	41.6	41.3	5	3.0
October 2009	41.2	53.0	5	3.5
November 2009	10.2	60.2	2	3.8
December 2009	137.0	76.6	10	4.0
January 2010	119.1	82.5	9	3.6
February 2010	67.0	62.3	6	3.1
March 2010	99.2	56.7	4	2.8
TOTAL	**683.6**	**656.5**	**64**	**37.9**

*[1] Narrabri West Post Office averages from 1891-2010

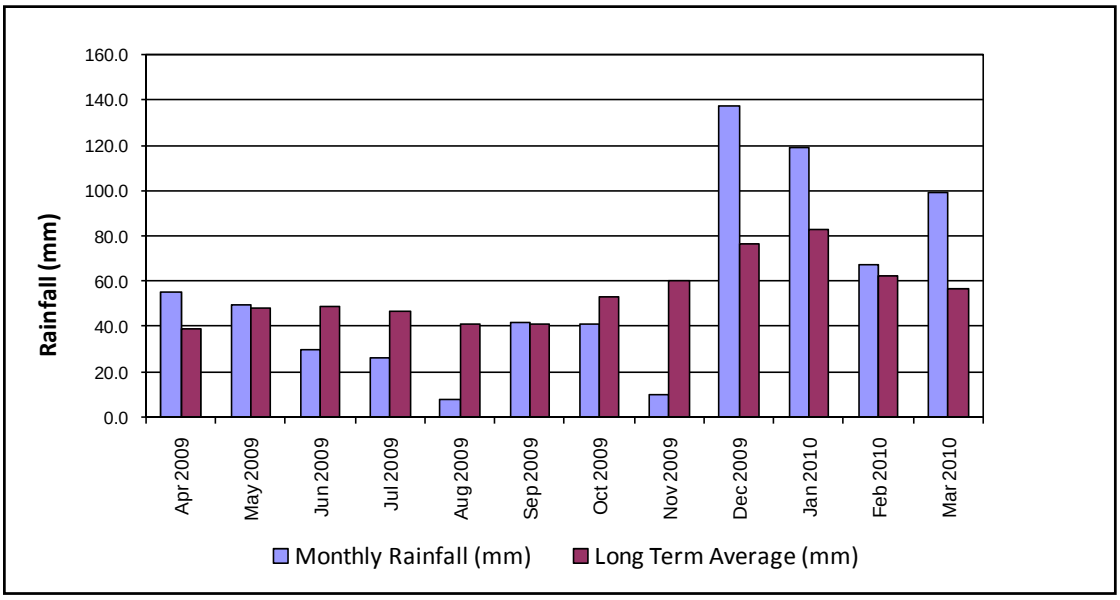


Figure 5
Monthly Rainfall Data

A review of Table 9 and Figure 5 shows that the total rainfall at the mine site during the Reporting Period was 683.6mm, which is 27.1mm above the long term average for Narrabri West Post Office and 67.0mm less than the site total during the previous Reporting Period.

Below average rainfall was experienced over the six month period from June 2009 – November 2009, with the exception of September 2009 which had average rainfall. The majority of the rainfall has been associated with events during the summer months including a sustained period of rainfall in late December 2009/early January 2010.

Total raindays during the Reporting Period was well above average, albeit many of these raindays were associated with measurements less than 5mm. Ongoing monitoring from the meteorological station will provide for comparative analysis of weather information over time, and will be of relevance particularly to success of rehabilitation activity.

3.22.3 Temperature

Average maximum and minimum temperatures for the Reporting Period are presented in Table 10 together with long-term monthly averages for Narrabri West Post Office (Bureau of Meteorology Station 055023).

Table 10
Average Temperatures (April 2009 - March 2010)

Month	Average Daily Temperature			
	Reporting Period (°C)		Station 053030 (°C)	
	Min	Max	Min	Max
April 2009	12.3	24.5	11.9	27.3
May 2009	8.7	21.7	8.3	22.5
June 2009	6.9	17.7	5.2	18.7
July 2009	4.0	17.1	3.7	18.0
August 2009	5.5	22.4	4.6	19.8
September 2009	8.0	24.0	7.6	23.4
October 2009	11.5	26.7	11.7	27.1
November 2009	18.9	34.4	14.8	30.1
December 2009	19.1	32.6	17.7	33.0
January 2010	19.9	33.3	19.3	33.8
February 2010	19.8	31.5	19.1	33.2
March 2010	16.8	29.0	16.4	31.2

Table 10 shows that:

- Average minimum temperatures at the mine site were higher than the long term average minimum temperatures from the Narrabri Post Office Station, with the exception of October 2009 where the average minimum temperature was similar to the long term average; and
- Average maximum temperatures at the mine site were generally cooler than, or similar to, the long term averages. August, September and November 2009 showed higher than average maximum temperatures. These hot conditions coincided with lower than average rainfall and often windy conditions.

3.22.4 Wind Speed and Direction

Fifteen minute average wind speed and direction data is collected from the Narrabri meteorological station as it, together with operational records and environmental monitoring results, can be used to assess the environmental effects or consequences of specific activities undertaken at the mine or in surrounding areas.

Seasonal wind roses, together with an annual wind rose for the period April 2009 to March 2010 are included in Appendix 8. The wind roses show the following trends:

- The predominant wind directions during the Reporting Period were from the south-east and north-west, as expected;
- Wind speeds were generally less than 20m/s however gusts of up to 40m/s were experienced throughout the year; and
- Westerly and north-westerly winds, often at speeds up to 30m/s were prevalent during Spring 2009. These winds were associated with the dusty conditions experienced at times during these months, including the dust storm in September 2009.

The annual wind rose shows south-east winds as the dominant wind direction, with north westerly winds co-dominant.

3.22.5 Inversions

Narrabri Coal established an additional temperature sensor at its meteorological station during May 2008 in order to establish temperature variation over 2m and 10m to assess for incidence of inversion.

No noise exceedances have been measured since June 2008. On the basis of noise criteria compliance on the reduction in surface construction activities, inversion conditions have not been closely monitored during the Reporting Period.

As discussed in Section 3.10.3, Narrabri Coal is required to submit a revised Noise Management Plan (NMP) to the Director-General for approval by the 31st May 2010. The NMP will include a Noise Monitoring Program that incorporates real-time noise and temperature inversion monitoring.

4 COMMUNITY RELATIONS

4.1 Complaints

Narrabri Coal Operations maintains a designated complaints line, with messages checked on a daily basis by site personnel. In the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded on a "Complaints Form".

During the Reporting Period, seven complaints were made directly to either the Project Manager or Environmental Manager. No complaints were received via the designated complaints line. The nature of the complaint, details and response are presented in Table 11.

Table 11
Complaints Summary 2009/2010 AEMR Reporting Period

Method	Complainant	Date/Time of Complaint	Nature of Complaint	Investigation	Action Taken / Follow-up
Phone message to Project Manager	Mark Lennox	22/04/2009 12:00pm	No specific details - complainant's message requested return call by 1:00pm, and if not possible by 1:00pm not to contact him. It was assumed that the complaint related to noise as per previous complaints.	Project Manager advised Environmental Manager of the complaint. As the message was not able to be retrieved until after 1:00pm no subsequent contact made with the complainant as per his request.	At the time, Narrabri Coal was in the process of arranging for a Barn Owl monitor to measure real time noise at the property boundary. This arrangement was endorsed by DECC and DoP. See Section 3.10.3.4 for details.
Complaint to Project Manager	Mark Lennox	2/05/2009 12:00pm	Noise from mine site – different to normal, some kind of additional surface activity.	Project Manager advised Environmental Manager of the complaint. No additional activities being undertaken on site therefore no identification of additional noise source.	Mr Lennox contacted Project Manager later to advise noise was no longer present.
Complaint to Project Manager	Mark Lennox	12/07/2009 8:00am	Noise coming from the mine site described as a roaring noise with reversing alarms at approx 2:30am this morning.	Claim being investigated by Ben Bomford. Initial thoughts are noise may have been related to hard rock boggers from the drifts. Will be confirmed following completion of investigation.	No other noise source identified. Routine noise monitoring indicated compliance with noise criteria.
Complaint to Project Manager	Mark Lennox	7/08/2009 8:00am	Noise coming from the mine site described as a roaring noise first thing of a	Claim being investigated by Ben Bomford. Initial thoughts are noise may have been related to hard rock boggers	No other noise source identified. Routine noise monitoring indicated compliance with noise

Method	Complainant	Date/Time of Complaint	Nature of Complaint	Investigation	Action Taken / Follow-up
			morning as well as reversing beepers.	from the drifts. Will be confirmed following completion of investigation.	criteria.
Complaint to Environmental Manager	Mark Lennox	10/08/2009 9:20am	Noise coming from the mine site described as a roaring noise first thing of a morning as well as reversing beepers.	Advised Mr Lennox that matter would be investigated with site personnel in an effort to reduce noise impacts.	No other noise source identified. Routine noise monitoring indicated compliance with noise criteria.
Complaint to Project Manager	Mark Lennox	25/11/2009 5:00pm	Noise coming from the mine site between 2am and 5am in the morning.	Advised Mr Lennox that matter would be investigated to attempt to identify the noise source. Subsequent discussion between staff identified no additional surface fleet that would impact on noise sources, with only other equipment on site related to gas plant. Determined that best course of action would be to engage Spectrum Acoustics to undertake noise monitoring specifically during that time frame 2am-5am to identify any noise source and if it is outside compliance requirements.	No other noise source identified. Routine noise monitoring indicated compliance with noise criteria.
Complaint to Project Manager	Mark Lennox	9/02/2010 7:15am	Screeching noise coming from mine site between 6am and 7am.	Advised Mr Lennox that matter would be investigated to attempt to identify the noise source. Subsequent discussion between staff identified that no surface activities (including drilling) that could be creating such a noise were operating at that time.	No further action required.

The number of complaints during the Reporting Period (7 in total) has reduced since the last AEMR (9 complaints). This may be attributable to the reduction in surface construction activities being conducted over the last 12 months.

It is noteworthy that all complaints received where from only one complainant and all were related to noise. Noise management and monitoring is discussed in detail in Section 3.10.3.

The number of complaints is expected to decrease significantly during the next Reporting Period as the "Kurrajong" property has recently been purchased by Whitehaven Coal Limited.

Any complaints that are made are reported to the Community Consultative Committee and documented in the AEMR.

4.2 Employment Status, Demography and Socio-Economic Contributions

4.2.1 Employment Status and Demography

During the Reporting Period, an average of 120 personnel were engaged daily in the operations of the Narrabri Project. This comprised both contract personnel for construction operations as well as Narrabri Coal Operations staff.

Narrabri Coal has a preference for sourcing personnel from the local area however certain activities requiring specialist knowledge and experience had to be sourced from other locations.

4.2.2 Social and Economic Contributions

In addition to direct and indirect employment, and the purchase of goods and services from local suppliers, during the Reporting Period Narrabri Coal also contributed over $100,000 to the local community through the provision of funds to various groups, including $20,000 each to the Gunnedah and Narrabri Shire Councils.

As members of the Gunnedah / Narrabri area community, mine-related employees also contribute socially and economically through their involvement in community sporting, educational and social organisations and expenditure of a component of their disposable income.

4.3 Community Liaison

In accordance with Condition 9 of Schedule 4 of PA 05_0102 a Community Consultative Committee (CCC) was formed within 3 months of the Project Approval. The committee comprises representatives of Narrabri Shire Council, Narrabri Coal Operations Pty Ltd and the community. The CCC is chaired by an Independent Chairperson Mr Terry Miller.

Since its inception, the CCC has met on a regular basis, meeting 4 times per year in accordance with the condition of consent. During the Reporting Period meetings were held on 27th May 2009, 26th August 2009, 8th December 2009 and 2nd March 2010.

Narrabri Coal Operations representatives continue to maintain contact with neighbours in the vicinity of the mine site. These contacts not only provide a means of information dissemination, but also enable Narrabri Coal Operations to ascertain and address any potential issues which may arise from time to time.

An open day was held May 2009 to provide the community with an overview of the proposed Stage 2 longwall operation. Mine site tours were also conducted as part of the day, allowing the community to assess the development conducted to date. The open day was highly successful with approximately 100 community members attending.

5 REHABILITATION

5.1 Buildings

No buildings have been removed during the Reporting Period.

5.2 Rehabilitation of Disturbed Land

5.2.1 Objectives

Narrabri Coal's rehabilitation / land use objectives for the Project Area (i.e. the area within the boundary of ML 1609) are as follows:

(a) Areas affected by mining – short term

(i) Stabilise all earthworks, drainage lines and disturbed areas that are required for mine related activities to minimise erosion and sedimentation.

(ii) Reduce the visibility of mining activities from adjacent properties and the local road network.

(b) Areas affected by mining – long term

(i) Decommissioning and removal of all project-related infrastructure not required for the future use of the site;

(ii) The creation of a low maintenance, geotechnically stable, safe and vegetated landform which blends with the surrounding natural landscape;

(iii) Backfilling the Box Cut and blending the final landform with the surrounding topography such that the visual impact of the post-mining landform is minimised;

(iv) remediating any land contaminated by accumulated salts or hydrocarbon spills;

(v) re-establishment of agricultural land of comparable land capability to that of the pre-disturbance environment, ie. Class III.

5.2.2 Achievements During the Reporting Period

Table 12 presents a Rehabilitation Summary while Table 13 presents a listing of maintenance activities undertaken during the Reporting Period. As the majority of cover crop establishment occurred during the previous Reporting Period, rehabilitation during this Reporting Period was limited to minor cover crop maintenance and tubestock planting.

Patches of cover crop on the southern boundary of the amenity bund had failed to establish following initial seeding. Hand seeding of these areas has resulted in successful cover crop establishment.

Approximately 750 seedlings were planted during the Reporting Period in strategic locations across the Pit Top Area to aid in visual amenity of the surface facilities area. Over 1100 seedlings have been planted since the commencement of construction with an estimated success rate of approximately 90% (Plate 5 and Plate 6).

Plate 5
Established Tubestock - North of the Amenity Bund

Plate 6
Established Tubestock – Between Amenity Bund and Kurrajong Creek Road

Table 12
Rehabilitation Summary

		Area Affected (hectares)			
		This Report Period (as of 31.03.10	**Last Report Period (up to 31.03.09)**	**Next Report Period (estimated)**	
A:	**MINE LEASE AREA**				
A1	**Mine Lease(s) Area**				
B:	**DISTURBED AREAS**				
B1	**Infrastructure area** (other disturbed areas to be rehabilitated at closure including facilities, roads)	25.15	24.1	60	
B2:	**Active Mining Area** (excluding items B3 - B5 below)	4.7	4.7	4.7	
B3	**Waste emplacements**, (active/unshaped/in or out-of-pit)	5	5	0	
B4	**Tailings emplacements,** (active/unshaped/uncapped)	N/A	N/A	N/A	
B5	**Shaped waste emplacement** (awaits final vegetation)	15.53	15.53	21	
ALL DISTURBED AREAS		50.38	49.33	85.7	F1
C	**REHABILITATION PROGRESS***				
C1	**Total Rehabilitated area** (except for maintenance)	32.9	10	32.9	F2
D:	**REHABILITATION ON SLOPES**				
D1	**10 to 18 degrees**	14.5	14	14.5	
D2	**Greater than 18 degrees**	18.4	3	18.4	
E:	**SURFACE OF REHABILITATED LAND**				
E1	**Pasture and grasses**	31.4	10	30	
E2	**Native forest/ecosystems**	1.5	0	2.9	
E3	**Plantations and crops**	0	0	0	
E4	**Other** (include non vegetative outcomes)				

* Note – rehabilitation estimates are based on the current acceptable level of rehabilitation for an operating mine (ie. cover crop establishment on amenity bund). Final rehabilitation (ie. infill of box cut, removal of amenity bund etc) will be calculated closer to mine closure.

Table 13
Maintenance Activities on Rehabilitated Land

NATURE OF TREATMENT	Area Treated (ha)		
	Report period	Next period	Comment/control strategies/ treatment detail
Additional erosion control works (drains re-contouring, rock protection**)**	Nil	Nil	
Re-covering (detail - further topsoil, subsoil sealing etc)	Nil	Nil	
Soil treatment (detail - fertilizer, lime, gypsum etc)	Nil	Nil	
Treatment/Management (detail - grazing, cropping, slashing etc)	Nil	Nil	
Re-seeding/Replanting (detail - species density, season etc)	1	Nil	Retreatment of area of amenity bund due to cover crop failure.
Adversely Affected by Weeds (detail - type and treatment)	5	5	Ongoing control of Mother of Millions along Kurrajong Creek Road plus spot spraying of other weeds. See Section 3.8.
Feral animal control (detail - additional fencing, trapping, baiting etc)	*	Nil	* See Section 3.20

5.3 Rehabilitation Monitoring and Performance

Internal rehabilitation / revegetation monitoring undertaken to date has primarily been limited to inspections of water management structures, soil stockpiles and seeded areas for evidence of instability / erosion or poor germination. This process will continue over the life of the mine, with the extent and nature of activities undertaken being consistent with the relevant Mine Operations Plan, Landscape Management Plan and other relevant management plans prepared in satisfaction of Narrabri Coal's Project Approval.

The recently approved Landscape Management Plan formalises ongoing land management activities and ongoing monitoring requirements over the life of the mine and during mine closure. The approval of this plan provides the impetus for more stringent monitoring requirements to be included in the reporting for the next AEMR.

6 CONTINUOUS IMPROVEMENT AND TARGET INITIATIVES

6.1 Objectives

Narrabri Coal Operations Pty Ltd has an ongoing commitment to environmental management and aims to minimise any adverse impacts on the physical, biological, cultural and socio-economic environment in the area of the mine and in surrounding areas.

Improvements in environmental management will be achieved through the effective implementation of the operational and monitoring aspects of the Mining Operations Plan and Landscape Management Plan which, in turn, will incorporate relevant aspects of the various management plans and monitoring programs prepared in accordance with the Mine's relevant Project Approval.

6.2 Achievements to Date

Achievements at the mine in its second year have included:

- The establishment of a working environmental management program and the establishment of culture of environmental awareness / responsibility within all levels of the workforce;
- Routine implementation of all relevant aspects of the approved management plans;
- The ongoing establishment and maintenance of an open and honest relationship with the neighbours, community in general, regulatory authorities, Local Government and other groups such as the local Aboriginal community. Narrabri Coal Operations recognises that it is part of the community and that its activities have the potential to create benefits which extend beyond the life of the mine. The isolated nature of complaints received to date is indicative of the success of this approach;
- Planting of approximately 750 native tubestock (1100 since commencement) with excellent survival rates (~90%). Tubestock have been strategically

planted to allow for future screening of the site from nearby roads and properties.

6.3 Targets and Goals

Targets and goals for the 2010 / 2011 Reporting Period include:

- Maintenance of established groundcover across areas of disturbance on the pit top area and additional tubestock planting to further enhance visual amenity;
- Implementation of the recently approved Landscape Management Plan across the site to define monitoring requirements and ongoing rehabilitation activities;
- Continued improvement in noise management and amenity;
- Continued community liaison, support and involvement / education in the Mine's activities;
- Compliance with all relevant conditions of all leases, licences and consents; and
- Review of all environmental management plans to ensure the management measures and monitoring requirements are up-to-date.

NARRABRI COAL OPERATIONS PTY LTD

WHITEHAVEN

REDUCTION RATIO 1:5000 @ A0

LEGEND

- Soil Stripping Area (to 31/3/09)
- Soil Stripping Area (2009/2010 AEMR)
- Proposed Soil Stripping Area (2010/2011 AEMR)
- Topsoil Stockpile
- Subsoil Stockpile
- Sediment Basin (Dirty) SB1
- Evaporation/Storage Pond
- Storage Dam (Clean)
- 15cm Topsoil Stripping Depth
- 25cm Subsoil Stripping Depth
- Flow (Dirty)
- Flow (Clean)
- Mining Lease Boundary
- Mining Surface Lease & Colliery Holding Boundary
- P2 Soil Test Pit Site
- (2) Soil Mappng Unit
- Soil Mapping Unit Boundary

AEMR PLAN 3
LAND PREPARATION
NARRABRI NORTH MINE

File Ref:	NCAEMR100331
Surveyor:	Todd Shumack
Compiled & Drafted by:	Tim Suter
Date:	31/3/2010

Scale Bar metres 100 0 100 200 300 400 500 600 700 800 900 1000

NARRABRI COAL OPERATIONS PTY LTD

WHITEHAVEN

REDUCTION RATIO 1:5000 @ A0

LEGEND

- Soil Covered Slopes (>18°)
- Soil Covered Slopes (10°-18°)
- Soil Covered Slopes (<10°)
- Infrastructure Areas
- Sediment Basin (Dirty) SB1
- Evaporation/Storage Pond
- Storage Dam (Clean)
- Topsoil Stockpile
- Subsoil Stockpile
- Flow (Dirty)
- Flow (Clean)
- Mining Lease Boundary
- Mining Surface Lease & Colliery Holding Boundary
- Contour banks
- Contour (m AHD) (Interval = 5m)
- Aboriginal Site
- Discharge Monitoring Point

AEMR PLAN 4
MINING & REHABILITATION
NARRABRI NORTH MINE

File Ref:	NCAEMR100331
Surveyor:	Todd Shumack
Compiled & Drafted by:	Tim Suter
Date:	31/3/2010

BOX CUT DETAIL

Scale Bar metres

Scale Bar metres

Appendix 1

PA 05_0102

Notice of Modification

Section 75W of the *Environmental Planning and Assessment Act 1979*

I modify the Project Approval referred to in Schedule 1, subject to the conditions in Schedule 2.

David Kitto
Director
Mining and Industry Projects
(as Delegate for the Minister for Planning)

Sydney 26 MARCH 2010

SCHEDULE 1

The Project Approval (05_0102) for the Narrabri Coal Project, granted by the Minister for Planning on 13 November 2007.

SCHEDULE 2

1. Delete the definitions for "DECC", "DPI", "DWE" and "Land" in "DEFINITIONS" and insert in alphabetical order the following:

DECCW	Department of Environment, Climate Change and Water
Feasible	Feasible relates to engineering considerations and what is practical to build
I&I NSW	Industry and Investment NSW
Land	In general, the definition of land is consistent with the definition in the EP&A Act. However, in relation to the noise and air quality conditions in Schedules 3 and 3A it means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
NOW	DECCW's NSW Office of Water
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements

2. Delete all references to "DECC" and replace with "DECCW".

3. Delete all references to "DPI", and replace with "I&I NSW".

4. Delete all references to "DWE" and replace with "NOW".

5. In condition 2 of schedule 2, delete all words after "statement of commitments (see Appendix 3);" and replace with the following:

   (c) modification application 05_0102_MOD 1, supporting Environmental Assessment titled "*Narrabri Coal Mine – Section 75W Modification*", dated October 2009 and Proponent's Response to Submissions dated 10 February 2010; and
   (d) conditions of this approval.

6. Following condition 8 of schedule 2 insert:

   8A. The Proponent shall prepare revisions of any strategies, plans or programs required under this approval if directed to do so by the Director-General. Such revisions shall be prepared to the satisfaction of, and within a timeframe approved by, the Director-General.

7. Delete the text of the second dot point in the "Notes" below Table 1 and replace with:

- *The noise limit applies to applicable receivers under all meteorological conditions except for any one of the following:*
  - *wind speed greater than 3 metres/second at 10 metres above ground level; or*
  - *temperature inversions of 1.5 - 4°C/100 metres and a source-to-receiver wind speed greater than 2 metres/second at 10 metres above ground level; or*
  - *temperature inversions of greater than 4°C/100 metres.*
- *The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station to be determined in consultation with the DECCW.*

8. Following condition 12 of schedule 3 insert:

Noise Acquisition Criteria

12A. If the noise generated by the project exceeds the criteria in Table 1A at any residence on privately-owned land, or on more than 25% of any privately-owned land, then the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of schedule 3A.

Table 1A: Noise acquisition criteria dB(A)

Location	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
All privately owned residences	40	40	40

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 1. For this condition to apply, the exceedances of the criteria must be systemic.

Additional Noise Mitigation Measures

12B. If the noise generated by the project is equal to or exceeds the criteria in Table 1B at any residence on privately-owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

Table 1B: Additional noise mitigation criteria

Location	Day	Evening	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$
All privately owned residences	38	38	38

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 1. For this condition to apply, the exceedances of the criteria must be systemic.

9. Following condition 13 of schedule 3 insert:

Noise Management

13A. The Proponent shall prepare and implement a Noise Management Plan for the mine's activities to the satisfaction of the Director-General. This Plan shall:

(a) be prepared in consultation with DECCW by a suitably qualified expert whose appointment has been approved by the Director-General;

(b) be submitted to the Director-General for approval by 31 May 2010;

(c) include a Noise Monitoring Program incorporating real-time noise and temperature inversion monitoring; and

(d) include reactive noise control measures to manage noise impacts for sensitive receivers. Prior to 14 May 2010

10. Following condition 32 of schedule 3 insert:

32A. Prior to the commencement of any surface disturbance activities associated with modification application 05_0102_MOD 1, the Proponent shall protect, whether by fencing or appropriate signage, all known Aboriginal sites within 50 metres of these activities.

11. Following condition 41 of schedule 3 insert a new Schedule 3A, as follows:

SCHEDULE 3A
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. If the results of the monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant impact assessment criteria, except where a negotiated agreement has been entered into in relation to that impact, then the Proponent shall, within 2 weeks of obtaining the monitoring results, notify the Director-General, the affected landowners and tenants (including tenants of mine-owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in schedule 3.

2. If the results of monitoring required in schedule 3 identify that impacts generated by the project are greater than the relevant air quality impact assessment criteria in schedule 3, then the Proponent shall send the relevant landowners and tenants (including tenants of mine-owned properties) a copy of the NSW Health fact sheet entitled "Mine Dust and You" (and associated updates) in conjunction with the notification required in condition 1.

INDEPENDENT REVIEW

3. If a landowner considers the project to be exceeding the impact assessment criteria in schedule 3, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 2 months of the Director-General's decision:

(a) consult with the landowner to determine his/her concerns;

(b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to:

- determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
- identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and

(c) give the Director-General and landowner a copy of the independent review.

4. If the independent review determines that the project is complying with the relevant impact assessment criteria in schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the independent review determines that the project is not complying with the relevant impact assessment criteria in schedule 3, and that the project is primarily responsible for this non-compliance, then the Proponent shall:

(a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria and conduct further monitoring to determine whether these measures ensure compliance; or

(b) secure a written agreement with the landowner to allow exceedances of the relevant criteria,

to the satisfaction of the Director-General.

If further monitoring under paragraph (a) determines that the project is complying with the relevant criteria, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the independent review determines that the project is not complying with the relevant land acquisition criteria in schedule 3, then the Proponent shall offer to acquire all or part of the landowner's land in accordance with the procedures in conditions 5-7 below, to the satisfaction of the Director-General.

LAND ACQUISITION

5. Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent 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 project the subject of the project 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 'reasonable and feasible measures' in condition 12B of schedule 3 or condition 4(a) of this schedule;
   (b) the reasonable costs associated with:
      - relocating within the Narrabri or Gunnedah local government areas, 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 to be acquired; and
   (c) reasonable compensation for any disturbance caused by the land acquisition process.

   However, if following this period, the Proponent 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.

   Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute (the API) to appoint a qualified independent valuer to:
   (a) consider submissions from both parties;
   (b) determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
   (c) prepare a detailed report setting out the reasons for any determination; and
   (d) provide a copy of the report to both parties and the Director-General.

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

   However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Director-General for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Director-General shall determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above and the independent valuer's report. Within 14 days of this determination, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the Director-General's determination.

   If the landowner refuses to accept the Proponent's binding written offer under this condition within 6 months of the offer being made, then the Proponent's obligations to acquire the land shall cease, unless the Director-General determines otherwise.

6. The Proponent shall pay all reasonable costs associated with the land acquisition process described in condition 5 above.

7. If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall also 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.

Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project referred to in schedule 1, subject to the conditions in schedules 2 to 4.

These conditions are required to:
- prevent and/or minimise adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Frank Sartor MP
Minister for Planning

Sydney 13 Nov 2007

SCHEDULE 1

Application No:	05_0102
Proponent:	Narrabri Coal Pty Limited
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Narrabri Coal Project

TABLE OF CONTENTS

DEFINITIONS 3

ADMINISTRATIVE CONDITIONS 4

Obligation to Minimise Harm to the Environment 4
Terms of Approval 4
Limits on Approval 4
Management Plans / Monitoring Programs 4
Structural Adequacy 4
Demolition 4
Operation of Plant and Equipment 5
Planning Agreements 5

SPECIFIC ENVIRONMENTAL CONDITIONS 6

Water Management 6
Noise 8
Blasting and Vibration 8
Air Quality 10
Meteorological Monitoring 11
Subsidence 11
Landscape Management 11
Heritage 12
Transport 12
Visual 13
Greenhouse Gases 13
Waste 13

ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING & AUDITING 14

Environmental Management Strategy 14
Environmental Monitoring Program 14
Reporting 14
Independent Environmental Audit 15
Community Consultative Committee 15
Access to Information 15

APPENDIX 1: SCHEDULE OF PROJECT LAND 16

APPENDIX 2: PROJECT MAPS 17

APPENDIX 3: STATEMENT OF COMMITMENTS 21

APPENDIX 4: PLANNING AGREEMENTS 22

DEFINITIONS

AEMR	Annual Environmental Management Report
BCA	Building Code of Australia
CCC	Community Consultative Committee
Day	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 Department of Planning, or delegate
DPI	Department of Primary Industries
DWE	Department of Water and Energy
EA	Environmental Assessment prepared for Narrabri Coal Pty Limited entitled *Narrabri Coal Project Environmental Assessment* and *Specialist Consultant Studies Compendium,* Volumes 1&2 (April 2007), including the *Response to Public and Government Agency Submissions* (June 2007) and *Preferred Project Report* (June 2007)
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the *Protection of the Environment Operations Act 1997*
Evening	The period from 6pm to 10pm
GSC	Gunnedah Shire Council
Kamilaroi Highway Intersection	The intersection of the Kamilaroi Highway and the mine access road and "Bow Hills" quarry access road (see Figure 4 of Appendix 2)
km	Kilometre
Land	The whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Material harm to the environment	Material harm to the environment as defined in *Protection of the Environment Operations Act 1997*
Mining operations	The extraction, processing and transportation of coal on the site, including the formation of mine access drifts
Minister	Minister for Planning, or delegate
NSC	Narrabri Shire Council
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Privately-owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary)
Proponent	Narrabri Coal Pty Limited or any other person or persons who rely on this approval to carry out the project that is subject to this approval
Project	The Narrabri Coal Project described in the EA
RTA	Roads and Traffic Authority
ROM	Run-of-mine
Site	Land to which the project application applies (see Appendix 2)
Statement of Commitments	The Proponent's commitments in Appendix 4
Subsidence	Subsidence of the land surface caused by underground coal mining

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent 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 project.

Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
   (a) EA;
   (b) statement of commitments (see Appendix 3); and
   (c) conditions of this approval.

   Note: The general layout of the project is shown in Figure 1 of Appendix 2.

3. If there is any inconsistency between the above documents, the later document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.

4. The Proponent shall comply with any reasonable and feasible requirements of the Director-General arising from the Department's assessment of:
   (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with the conditions of this approval; and
   (b) the implementation of any actions or measures contained in these reports, plans, programs, strategies or correspondence.

Limits on Approval

5. Mining operations may take place on the site for 21 years from the grant of the mining lease for the project.

   Note: Under this Approval, the Proponent is required to rehabilitate the site to the satisfaction of the Director-General and DPI. Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.

6. The Proponent shall not extract more than 2.5 million tonnes of ROM coal a year from the site.

7. The Proponent shall transport all coal from the site by rail.

Management Plans / Monitoring Programs

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

Structural Adequacy

9. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

   Notes:
   - *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
   - *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

Demolition

10. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

11. The Proponent shall ensure that all plant and equipment used on site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

Planning Agreements

12. Within 12 months of this approval, the Proponent shall enter into a planning agreements with Narrabri Shire Council (NSC), Gunnedah Shire Council (GSC) and the Minister in accordance with:
    (a) Division 6 of Part 4 of the EP&A Act; and
    (b) the terms of the Proponent's offer to the Minister on 7 September 2007, which includes the matters set out in Appendix 4.

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

WATER MANAGEMENT

Note: These conditions should be read in conjunction with sections 6, 7, 8 and 11 of the Statement of Commitments.

Great Artesian Basin

1. Within 5 years of the date of this approval, the Proponent shall ensure that any loss of water flow into the Great Artesian Basin aquifers (equal to the maximum predicted impact, or the measured impact of the project, whichever is the greater), is managed, licensed or offset to the satisfaction of DWE.

   Note: The EA predicts a maximum impact of 100 megalitres a year for Great Artesian Basin aquifers in year 50 of the project.

Groundwater Model

2. Within 12 months of the commencement of mining operations, the Proponent shall undertake a transient calibration of the groundwater model presented in the EA, in consultation with DWE and DECC, and to the satisfaction of the Director-General.

3. Following the completion of the transient calibration of the groundwater model and the first annual review of the water balance, the Proponent shall prepare a Dewatering Contingency Plan. This plan must:
   (a) be prepared in consultation with DWE and DECC and to the satisfaction of the Director-General;
   (b) identify the freeboard required to prevent the evaporation/storage ponds from discharge of water under weather conditions of a 1 in 100 year 72 hour storm event for the site;
   (c) contain measures to ensure minewater is not pumped to the evaporation/storage ponds once this freeboard level is reached;
   (d) identify lead times required for the construction of a water conditioning plant to ensure the capacity of the site's evaporation /storage ponds is not exceeded (see below);
   (e) refine its estimates of quantities of salts that would be accumulated within the evaporation/storage ponds over the life of the project;
   (f) identify how it would manage and/or dispose of these accumulated salts, in consultation with DWE and DECC, and to the satisfaction of the Director-General.

4. The Proponent must commence construction of the water conditioning plant identified in condition 10(d) when daily mine dewatering volumes exceed 0.88 megalitres, or an alternative trigger point based on a review of the water balance and model and established in consultation with DWE and DECC, and approved by the Director-General.

Discharge

5. Except as may be expressly provided for by an EPL, the Proponent shall not discharge any surface waters from the site. However, product water from the water conditioning plant may be transferred to water users in accordance with an approved Water Management Plan (see below).

Evaporation/Storage Ponds

6. The Proponent shall:
   (a) construct evaporation/storage ponds incorporating the use of low permeability layers to manage minewater generated by the project;
   (b) prior to commencement of construction, submit pond designs and a construction QA/QC program to DECC; and
   (c) prior to commissioning the ponds, summit an "as constructed" report, produced by an experienced and qualified engineer, to DECC;
   to the satisfaction of the Director-General.

Water Management Plan

7. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway

intersection) in consultation with DECC and DWE by suitably qualified expert/s whose appointment/s have been approved by the Director-General and include a:

(a) Site Water Balance;
(b) Erosion and Sediment Control Plan;
(c) Surface Water Monitoring Plan;
(d) Groundwater Monitoring Program; and
(e) Surface and Groundwater Response Plan, setting out the procedures for:
    - investigating, and if necessary mitigating, any exceedances of the surface or groundwater assessment criteria (see below); and
    - responding to any unforeseen impacts of the project.

Site Water Balance

8. The Site Water Balance must:
    (a) include details of:
        - sources and security of water supply;
        - water use on site;
        - water management on site;
        - off-site water transfers;
        - reporting procedures;
    (b) describe measures to minimise water use by the project; and
    (c) be reviewed and recalculated each year in the light of the most recent water monitoring data.

Erosion and Sediment Control

9. The Erosion and Sediment Control Plan must:
    (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction* manual (Landcom, 2004), or its latest version;
    (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 to downstream waters;
    (d) describe the location, function, and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to monitor and maintain the structures over time.

Surface Water Monitoring Program

10. The Surface Water Monitoring Plan must include:
    (a) detailed baseline data on surface water flows and quality in creeks and other waterbodies that could be affected by the project;
    (b) surface water impact assessment criteria;
    (c) a program to monitor the impact of the project on surface water flows and quality;
    (d) procedures for reporting the results of this monitoring.

Groundwater Monitoring Program

11. The Groundwater Monitoring Program must include:
    (a) further development of the regional and local groundwater model;
    (b) detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site);
    (c) groundwater impact assessment criteria;
    (d) a program to monitor the impact of the project on groundwater levels, yield and quality;
    (e) a program to monitor, (by the use of shallow piezometers/lysimeters), detect, and quantify any leakage from the site's evaporation/storage ponds; and
    (f) procedures for reporting the results of this monitoring.

NOISE

Note: These conditions should be read in conjunction with section 15 of the Statement of Commitments.

Impact Assessment Criteria

12. The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All privately owned residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $L_{Aeq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Noise Policy.*
- *To determine compliance with the $L_{A1(1\ minute)}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

Continuous Improvement

13. The Proponent shall:
    (a) implement all reasonable and feasible best practice noise mitigation measures;
    (b) investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and
    (c) report on these investigations and the implementation and effectiveness of these measures in the AEMR,

    to the satisfaction of the Director-General.

Monitoring

14. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General for approval prior to the commencement of construction activities;
    (b) be prepared in consultation with the DECC;
    (a) use attended noise monitoring measures to monitor the performance of the project
    (c) include a protocol to establish whether the project is complying with the noise impact assessment criteria in Table 1.

BLASTING AND VIBRATION

Note: These conditions should be read in conjunction with section 2 of the Statement of Commitments.

Airblast Overpressure Limits

15. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 2 at any residence on privately-owned land.

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	5% of the total number of blasts in a 12 month period
120	0%

Table 2: Airblast overpressure impact assessment criteria

Note: The overpressure values in Table 2 apply when the measurements are performed with equipment having a lower cut-off frequency of 2 Hz or less. If the instrumentation has a higher cut-off frequency a correction of 5 dB should be added to the measured value. Equipment with a lower cut-off frequency exceeding 10 Hz should not be used.

Ground Vibration Impact Assessment Criteria

16. The Proponent shall ensure that the ground vibration level from blasting, or any other activity at the project does not exceed the criteria in Table 3 at any residence on privately-owned land.

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts in a 12 month period
10	0%

Table 3: Ground vibration impact assessment criteria

Blasting Hours

17. The Proponent shall only carry out blasting associated with construction activities on site between 10 am and 4pm Monday to Friday.

Blasting Frequency

18. The Proponent may carry out:
    (a) a maximum of 2 blasts a day associated with construction activities; and
    (b) 5 blasts a week associated with construction activities, averaged over a 12 month period;
    on site without the written approval of the Director-General.

Property Inspections

19. Before carrying out any blasting, the Proponent shall advise all landowners within 2 km of proposed blasting activities, and any other landowner nominated by the Director-General, that they are entitled to a property inspection.

20. If the Proponent receives a written request for a property inspection from any landowner within 2 km of proposed blasting activities, or any other landowner nominated by the Director-General, the Proponent shall within 3 months of receiving this request:
    (a) commission a suitably qualified person, whose appointment has been approved by the Director-General, to inspect the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and
    (b) give the landowner a copy of this property inspection report.

Property Investigations

21. If any landowner within a 2 km of proposed blasting activities, or any other landowner nominated by the Director-General, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the project, the Proponent shall within 3 months of receiving this request:
    (a) commission a suitably qualified person whose appointment has been approved by the Director-General to investigate the claim; and

(b) give the landowner a copy of the property investigation report.

If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

Monitoring

22. Prior to the commencement of blasting, the Proponent shall prepare and implement a detailed Blasting Monitoring Program for the project to the satisfaction of the Director-General.

AIR QUALITY

Note: These conditions should be read in conjunction with section 13 of the Statement of Commitments.

Impact Assessment Criteria

23. The Proponent shall ensure that dust emissions generated by the project does not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately owned land, or on more than 25 percent of any privately-owned land.

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

Table 4: Long term impact assessment criteria for particulate matter

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

Table 5: Short term impact assessment criteria for particulate matter

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

Table 6: Long term impact assessment criteria for deposited dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS/NZS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Monitoring

24. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway intersection);
    (b) be prepared in consultation with the DECC; and
    (c) use a combination of high volume samplers and dust deposition gauges to monitor the performance of the project.

METEOROLOGICAL MONITORING

25. During the project, the Proponent shall ensure there is a suitable meteorological station on site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales* (DECC, 2007), or its latest version.

SUBSIDENCE

Subsidence Impact Limits

26. The Proponent shall ensure that the project does not result in subsidence impacts of greater than 20 mm vertical subsidence on any land.

Notification of Landowners

27. Six months prior to mining occurring under each privately owned property, the Proponent shall notify the relevant landowner/s of the extent of planned mining operations under their property.

LANDSCAPE MANAGEMENT

Note: These conditions should be read in conjunction with sections 5, 9 and 11 of the Statement of Commitments.

Rehabilitation

28. The Proponent shall rehabilitate the site to the satisfaction of the Director-General and DPI.

Landscape Management Plan

29. The Proponent shall prepare and implement a detailed Landscape Management Plan for the site to the satisfaction of the Director-General and DPI. This plan must:
    (a) be submitted to the Director-General for approval within 12 months of this approval;
    (b) be prepared by suitably qualified expert/s whose appointment/s have been endorsed by the Director-General;
    (c) be prepared in consultation with DWE, DECC and NSC; and
    (d) include a:
        - Rehabilitation Management Plan; and
        - Mine Closure Plan.

Rehabilitation Management Plan

30. The Rehabilitation Management Plan must include:
    (a) the rehabilitation objectives for the site;
    (b) a strategic description of how the rehabilitation of the site would be integrated with surrounding land use;
    (c) a general description of the short and long term measures that would be implemented to rehabilitate the site;
    (d) a detailed description of the measures that would be implemented to rehabilitate the site, including the measures to be implemented for:
        - managing the remnant vegetation and habitat on site;
        - minimising impacts on fauna;
        - minimising visual impacts;
        - conserving and reusing topsoil;
        - controlling weeds, feral pests, and access;
        - managing bushfires; and
        - managing any potential conflicts between the rehabilitation works and Aboriginal cultural heritage.
    (e) detailed performance and completion criteria for the rehabilitation of the site;
    (f) a detailed description of how the performance of the rehabilitation works would be monitored over time to achieve the stated objectives and against the relevant performance and completion criteria; and
    (g) details of who is responsible for monitoring, reviewing and implementing the plan.

Mine Closure Plan

31. The Mine Closure Plan must:
    (a) define the objectives and criteria for mine closure;
    (b) investigate options for the future use of the site;
    (c) provide a detailed methodology for decommissioning the site's evaporation/storage ponds and the treatment of any accumulated salt within or around those ponds;
    (d) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local and regional employment levels;
    (e) describe the measures that would be implemented to minimise or manage the on-going environmental effects of the project; and
    (f) describe how the performance of these measures would be monitored over time.

HERITAGE

Note: These conditions should be read in conjunction with section 10 of the Statement of Commitments.

Aboriginal Cultural Heritage Management Plan

32. The Proponent shall not destroy any known Aboriginal objects (as defined in the *National Parks and Wildlife Act 1974*) without the written approval of the Director-General.

33. The Proponent shall prepare and implement an Aboriginal Cultural Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be submitted the Director-General prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway intersection);
    (b) be prepared in consultation with the DECC and the Narrabri Local Aboriginal Land Council;
    (c) include a protocol for the ongoing consultation and involvement of Aboriginal communities in the conservation and management of Aboriginal heritage on site;
    (d) describe the measures that would be implemented to protect Aboriginal sites on site, or if any new Aboriginal objects or skeletal remains are discovered during the project.

TRANSPORT

Note: These conditions should be read in conjunction with section 14 of the Statement of Commitments.

Kamilaroi Highway Intersection

34. The Proponent shall construct the Kamilaroi Highway intersection in consultation with NSC and to the satisfaction of RTA. This intersection must:
    (a) be completed, other than for items listed in (c) below, prior to the commencement of construction activities on site (with the exception of construction of the Access Road);
    (b) be constructed in accordance with a Traffic Management Plan approved by NSC and RTA;
    (c) include boom gates, flashing lights and warning bells for the Kurrajong Creek Road level crossing, to the satisfaction of ARTC and NSC;
    (d) include illumination of the Kurrajong Creek Road level crossing during construction of the intersection;
    (e) provide a information sign on Kurrajong Creek Road to inform road users of likely delays due to train traffic; and
    (f) maintain permanent access for the "Bow Hills" quarry.

Kurrajong Creek Road

35. Within 12 months of commencement of mining operations, the Proponent shall bitumen seal Kurrajong Creek Road (Shire Road 188) for a distance of 7 km south of the Kamilaroi Highway intersection (see Figure 2 of Appendix 2), to the satisfaction of NSC.

VISUAL IMPACT

Note: These conditions should be read in conjunction with section 12 of the Statement of Commitments.

Visual Amenity

36. The Proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.

Lighting Emissions

37. The Proponent shall ensure that:
    (a) no outdoor lights shine above the horizontal; and
    (b) all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

GREENHOUSE GAS

Note: These conditions should be read in conjunction with section 13 of the Statement of Commitments.

Energy Savings Action Plan

38. The Proponent shall prepare and implement an Energy Savings Action Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with DECC;
    (b) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS, 2005), or its latest version;
    (c) be submitted to the Director-General for approval within 3 months of this approval; and
    (d) include a program to monitor the effectiveness of measures to reduce energy use on site.

Gas Drainage

39. The Proponent shall implement all reasonable and feasible measures to minimise the greenhouse gas emissions from the underground mining operations to the satisfaction of the Director-General.

40. Prior to carrying out underground coal mining operations, the Proponent shall submit a Greenhouse Gas Minimisation Plan to the Director-General. This plan must:
    (a) identify options for minimising greenhouse gas emissions from underground mining operations, with a particular focus on capturing and/or using these emissions;
    (b) investigate the feasibility of implementing each option;
    (c) propose the measures that would be implemented in the short to medium term on site; and
    (d) include a research program to inform the continuous improvement of the greenhouse gas minimisation measures on site.

WASTE

Note: These conditions should be read in conjunction with section 9 of the Statement of Commitments.

Waste Minimisation

41. The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be submitted to the Director-General for approval prior to commencing of construction;
    (b) identify the various waste streams of the project;
    (c) describe what measures would be implemented to reuse, recycle, or minimise the waste generated by the project;
    (d) ensure irrigation of treated wastewater is undertaken in accordance with *Environmental Guidelines: Use of Effluent by Irrigation* (DEC, 2004), or its latest version; and
    (e) include a program to monitor the effectiveness of these measures.

SCHEDULE 4

ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

Note: This schedule should be read in conjunction with sections 18 and 19 of the Statement of Commitments.

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General prior to the commencement of construction activities, and:
   (a) provide the strategic context for environmental management of the project;
   (b) identify the statutory requirements that apply to the project;
   (c) describe in general how the environmental performance of the project would be monitored and managed;
   (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 project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the course of the project;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   (e) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare and implement an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program must be submitted to the Director-General within 6 months of this approval and consolidate the various monitoring requirements in schedule 3 of this approval into a single document.

REPORTING

Incident Reporting

3. As soon as practicable, and in any event within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) material harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.

4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:
   (a) describes the date, time, and nature of the exceedance/incident;
   (b) identifies the cause (or likely cause) of the exceedance/incident;
   (c) describes what action has been taken to date; and
   (d) describes the proposed measures to address the exceedance/incident.

Annual Reporting

5. Within 12 months of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General and to all relevant agencies. This report must:
   (a) identify the standards and performance measures that apply to the project;
   (b) describe the works carried out in the last 12 months;
   (c) describe the works that would 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 project 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 EA;

(g) identify any trends in the monitoring results over the life of the project;
(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. Within 2 years of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
   (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;
   (b) include consultation with the relevant agencies
   (c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements of this approval and any relevant mining lease or EPL (including any strategy, plan or program required under these approvals);
   (d) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate,
   (e) recommend measures or actions to improve the environmental performance of the project, 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 water and noise management.

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

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

COMMUNITY CONSULTATIVE COMMITTEE

9. Within 3 months of this approval, the Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007)*, or its latest version.

ACCESS TO INFORMATION

10. Within 3 months of the approval of any strategy/plan/ program required under this approval (or any subsequent revision of these strategies/plans/ programs), or the completion of the audits or AEMRs required under this approval, the Proponent shall:
    (a) provide a copy of the relevant document/s to the relevant agencies and CCC; and
    (b) put a copy of the relevant document/s on its website.

11. During the project, the Proponent shall:
    (a) make a summary of monitoring results required under this approval publicly available at the mine and on its website; and
    (b) update these results on a regular basis (at least every three months).

APPENDIX 1
SCHEDULE OF PROJECT LAND

Area	***Land Title Reference***
Pit Top Area	*Part Lot 60 DP 757124* *Part Lots 151 & 152 DP 816020.*
Indicative Mining Area	*Part Lots 57, 58, 63 to 65, 81 to 84 & 115 DP 757124* *Lot 61 DP 757124* *Part Lot 1 DP 811171, Lot 2 DP 811171* *Part Lots 3, 8, 25, 67 & 68 DP 757104* *Lot 7 DP 757104* *Part Lot 152 DP 816020* *Lot 1 DP 659899, Part Lot 3 DP 1005608* *Part Pilliga East State Forest* *Various Crown roads.*
Remainder of Project Site	*Lots 381 & 382 DP 1028753* *Part Lot 1 DP 798487* *Part Lots 57, 58, 60, 63 to 65, 81 to 84, 115 DP 757124* *Part Lot 1 DP 811171* *Part Lots 3, 8, 10, 25, 67 & 68 DP 757104* *Part Lot 3 DP 1005608* *Part Lots 151 & 152 DP 816020* *Part Pilliga East State Forest* *Various Crown roads.*

APPENDIX 2
PROJECT MAPS

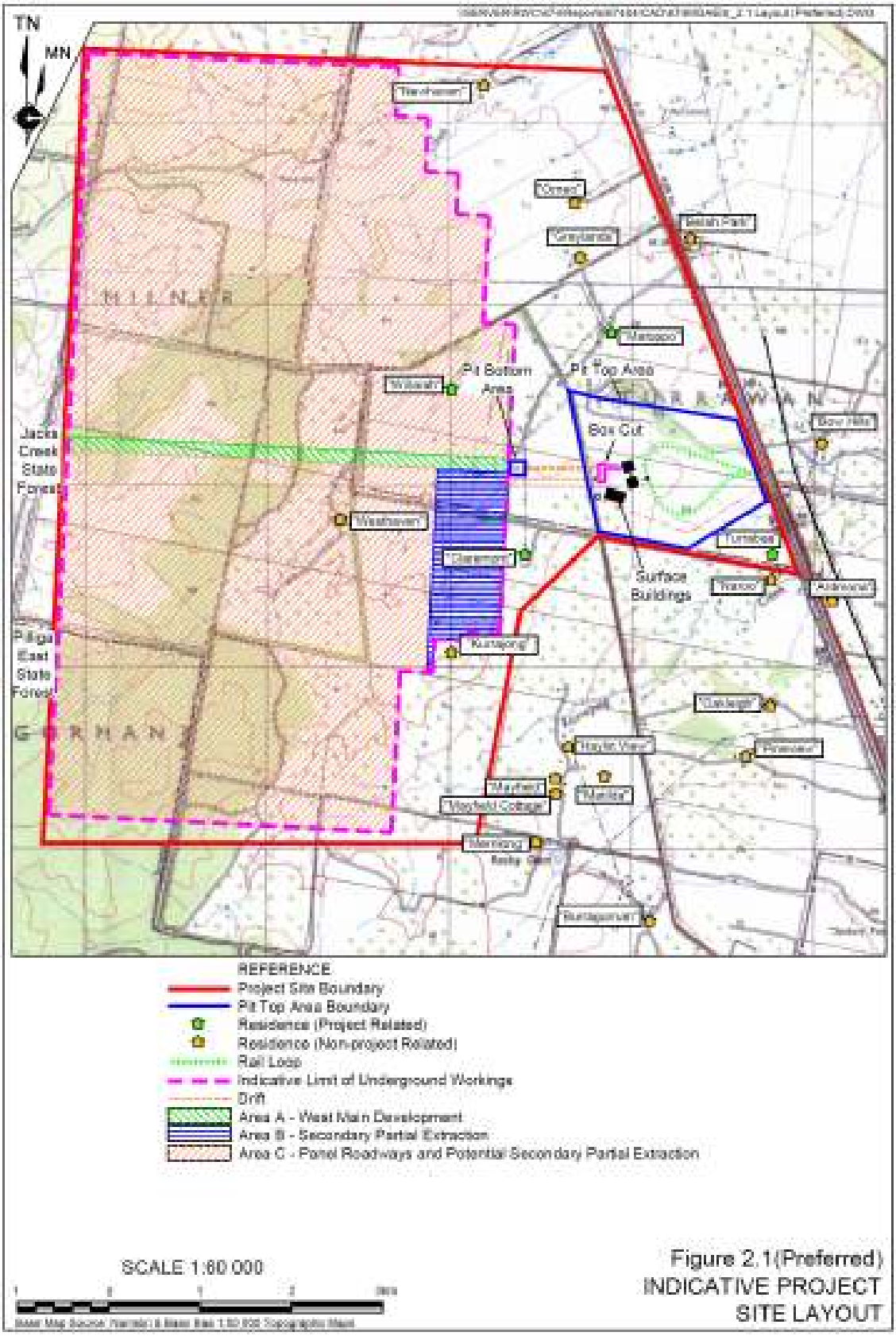


Figure 1: *Project Layout*

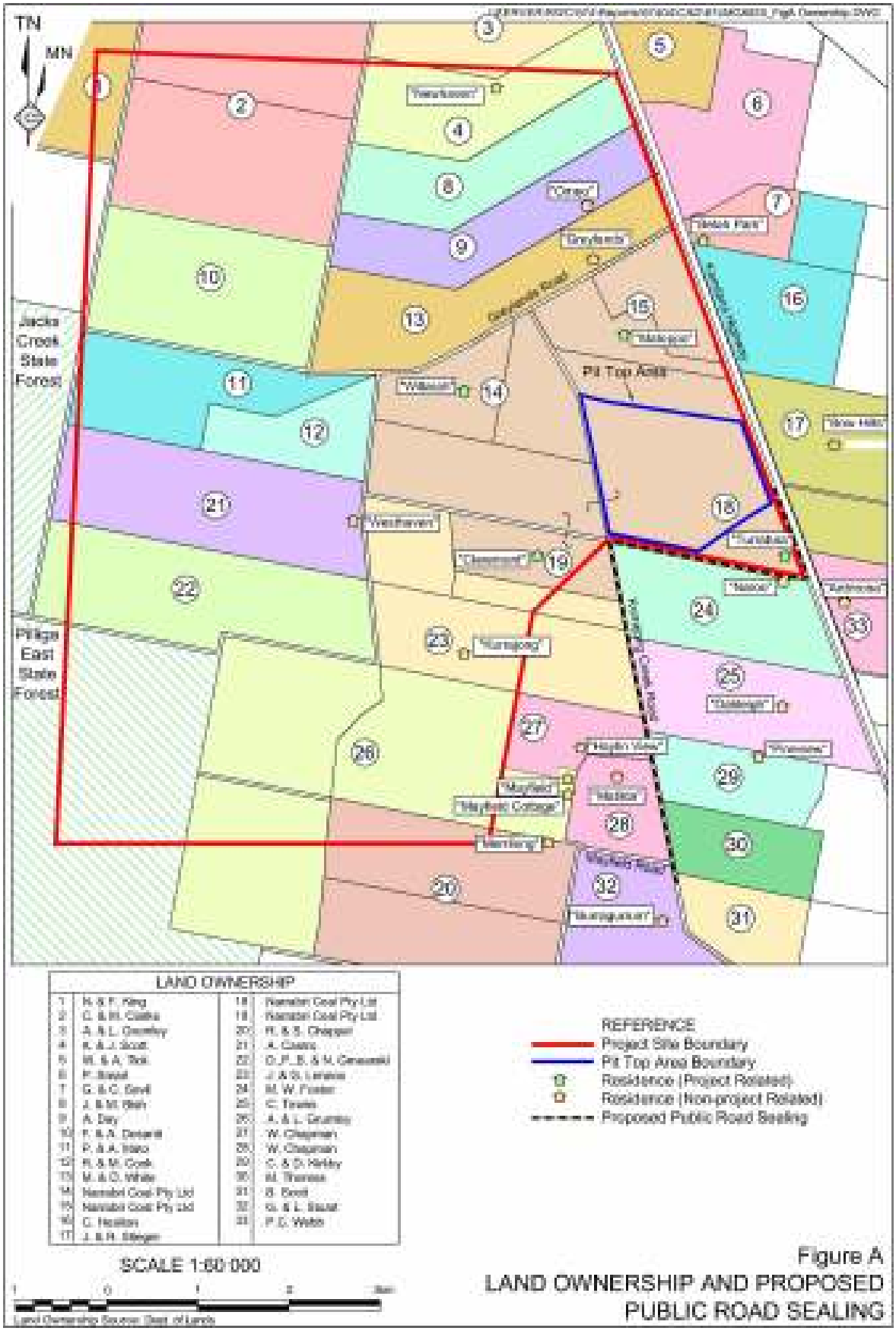


Figure 2: *Section of Kurrajong Creek Road proposed to be sealed*

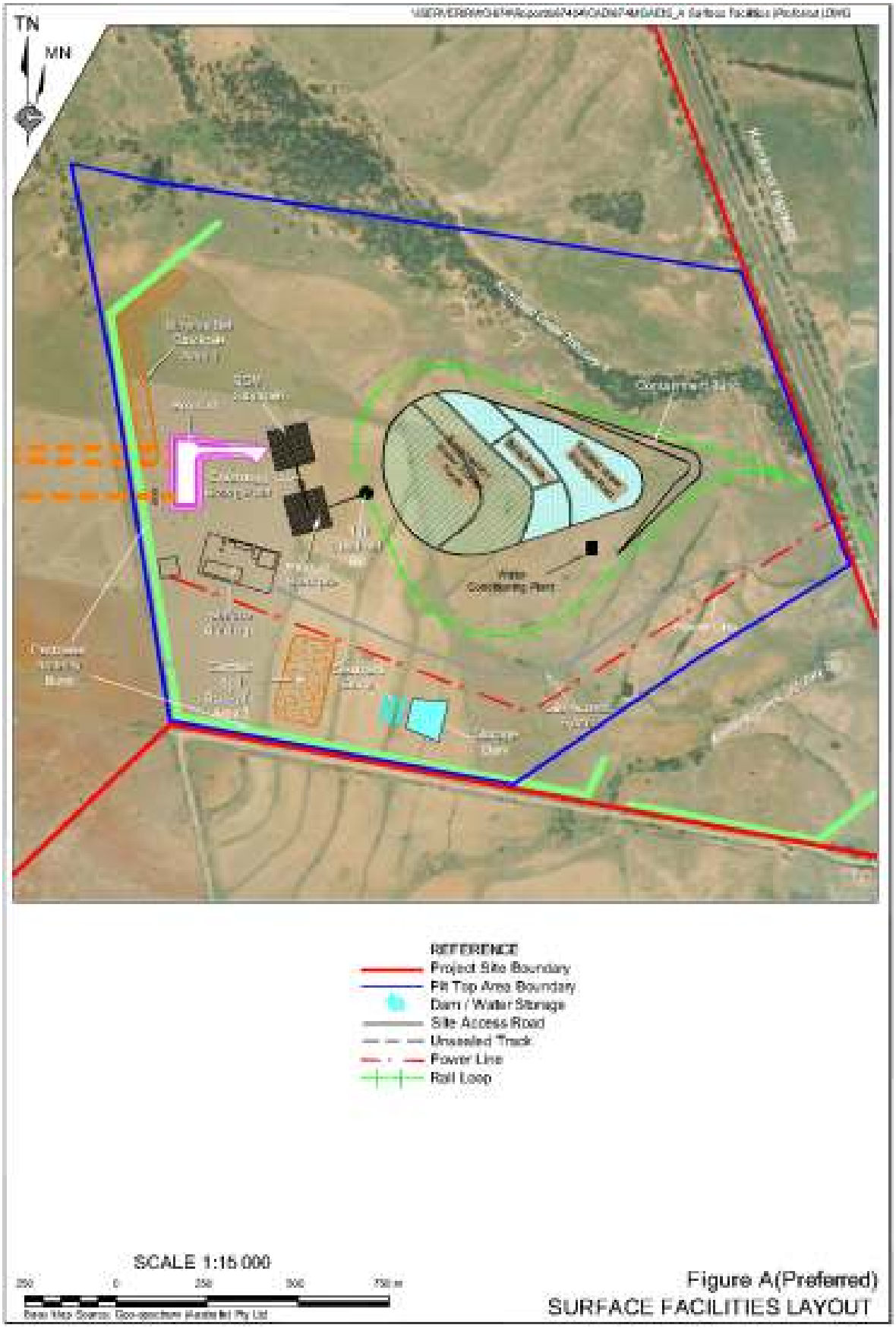


Figure 3: *Surface Facilities Layout*

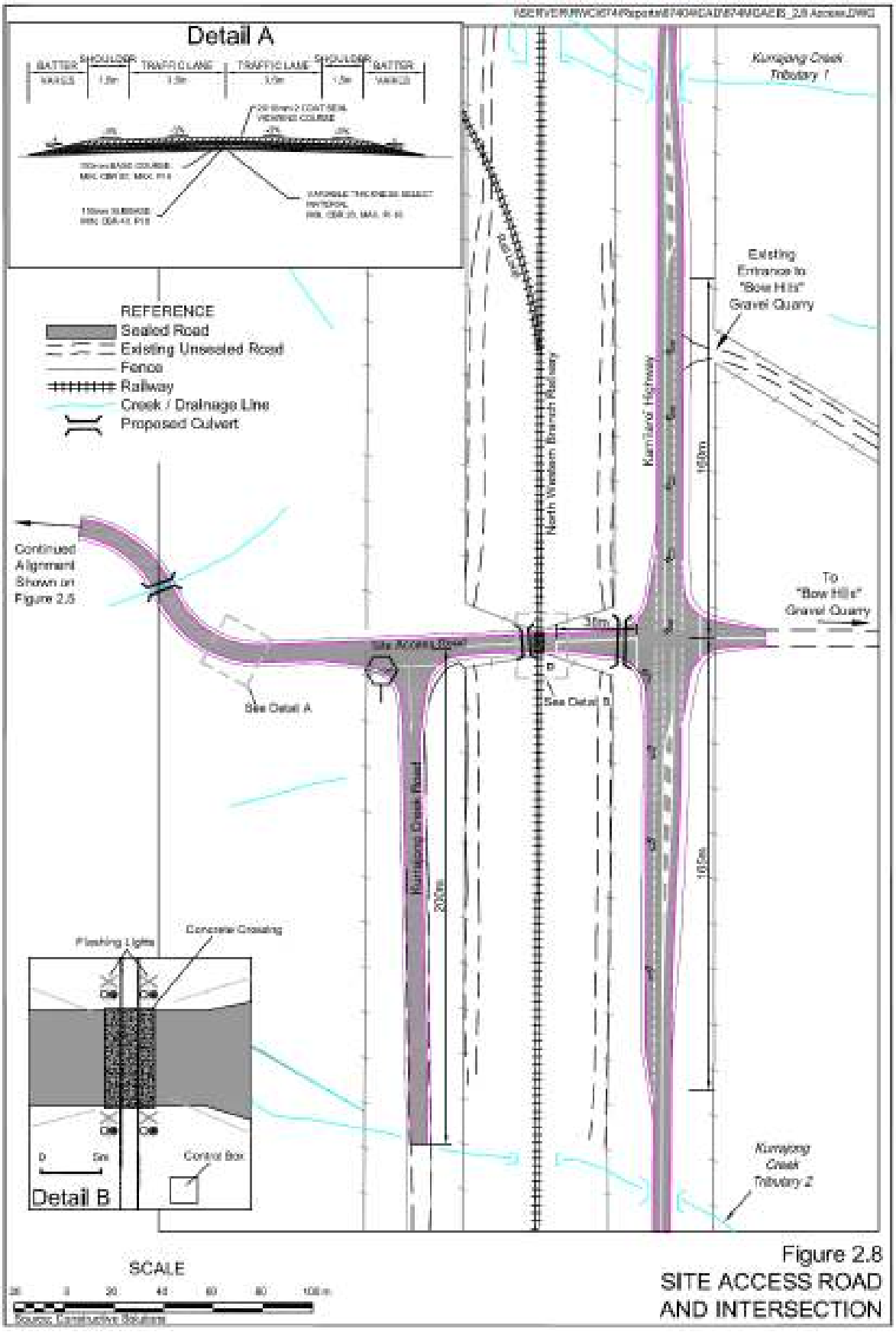


Figure 4: *Proposed Kamilaroi Highway Intersection*

APPENDIX 3
STATEMENT OF COMMITMENTS

APPENDIX 4
GENERAL TERMS OF PLANNING AGREEMENTS

Funding Area	Minimum Proponent Contribution	Funding Time Frame
Narrabri Shire Upgrade and seal Kurrajong Creek Road, adjacent to the Project site	7.0 kilometres length of Kurrajong Creek Road to be upgraded and sealed.	Works to be completed within 12 months of this approval.
Narrabri Shire Monetary Contribution – Provision of bush fire services	$7,000	One instalment to be paid within 12 months of this approval.
Narrabri Shire Community Infrastructure Contribution	$93,000	An initial instalment of $13,000 to be paid within 12 months of this approval with $20,000 to paid for a period of four years on the anniversary of the initial payment.
Gunnedah Shire Monetary Contribution – Gunnedah Urban Riverine Scheme	$100,000	$20,000 each year for a period of 5 years with the first instalment to be paid within 12 months of this approval.

Notes:

- The Gunnedah Urban Riverine Scheme Contributions must be reviewed and adjusted to take into account any increase in the CPI over time, in accordance with the Planning Agreement between the Proponent and Gunnedah Shire Council required under this approval.
- The Community Infrastructure Contribution must be reviewed and adjusted to take into account any increase in the CPI over time, in accordance with the Planning Agreement and Narrabri Shire Council required under this approval.

Appendix 2

ENVIRONMENT PROTECTION LICENCE 12789

Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 12789

Department of **Environment & Climate Change** NSW

Licence Details	
Number:	12789
Anniversary Date:	20-February
Review Due Date:	20-Feb-2013

Licensee

NARRABRI COAL PTY LTD
PO BOX 600
GUNNEDAH NSW 2380

Licence Type

Premises

Premises

Narrabri Coal Project
"Turrabaa" Kurrajong Creek Road
BAAN BAA NSW 2390

Scheduled Activity

Mining for coal
Coal works

Fee Based Activity	**Scale**
Mining for coal	> 2000000 - 3500000 T produced
Coal works	> 2000000 - 5000000 T loaded

Region

North West - Armidale
Level 1, NSW Govt Offices, 85 Faulkner Street
ARMIDALE NSW 2350
Phone: 02 6773 7000
Fax: 02 6772 2336

PO Box 494 ARMIDALE
NSW 2350

Environment Protection Licence

Licence - 12789

Department of Environment & Climate Change NSW

INFORMATION ABOUT THIS LICENCE 4
Dictionary 4
Responsibilities of licensee 4
Variation of licence conditions 4
Duration of licence 4
Licence review 4
Fees and annual return to be sent to the EPA 4
Transfer of licence 5
Public register and access to monitoring data 5
1 ADMINISTRATIVE CONDITIONS 5
A1 What the licence authorises and regulates 5
A2 Premises to which this licence applies 6
A3 Other activities 7
A4 Information supplied to the EPA 7
2 DISCHARGES TO AIR AND WATER AND APPLICATIONS TO LAND 7
P1 Location of monitoring/discharge points and areas 7
P2 Weather monitoring 11
3 LIMIT CONDITIONS 11
L1 Pollution of waters 11
L2 Load limits 11
L3 Concentration limits 12
L4 Volume and mass limits 12
L5 Waste 13
L6 Noise Limits 13
L7 Blasting limits 13
4 OPERATING CONDITIONS 14
O1 Activities must be carried out in a competent manner 14
O2 Maintenance of plant and equipment 15
O3 Dust 15
5 MONITORING AND RECORDING CONDITIONS 15
M1 Monitoring records 15
M2 Requirement to monitor concentration of pollutants discharged 15
M3 Testing methods - concentration limits 16
M4 Recording of pollution complaints 17
M5 Telephone complaints line 17
M6 Requirement to monitor volume or mass 17
M7 Requirement to monitor weather 18
M8 Noise Monitoring 18
6 REPORTING CONDITIONS 19

R1 Annual return documents 19
R2 Notification of environmental harm 20
R3 Written report 21
GENERAL CONDITIONS 21
G1 Copy of licence kept at the premises 21
POLLUTION STUDIES AND REDUCTION PROGRAMS 22
SPECIAL CONDITIONS 22
E1 Quality assurance and verification report 22
E2 Noise Impacts 22
DICTIONARY 22
General Dictionary 22

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:

NARRABRI COAL PTY LTD
PO BOX 600
GUNNEDAH NSW 2380

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
Coal works

Fee Based Activity	Scale
Mining for coal	> 2000000 - 3500000 T produced
Coal works	> 2000000 - 5000000 T loaded

A1.3 Not applicable.

A1.4 The licensee must not commence scheduled activities (i.e. coal mining or coal works) on the premises referred to in condition A1.2 of this licence without prior approval from DECC. The licensee must submit a variation of licence application to DECC's Armidale Office to seek this approval. The application must include copies of all relevant approvals and documentation for the proposed scheduled activities.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
Narrabri Coal Project
"Turrabaa" Kurrajong Creek Road
BAAN BAA
NSW
2390
SEE DETAILS BELOW

Premises Details
Location of premises is shown on figures titled "Figure 1.1 Project Site Location" and "Figure 2.1 (Preferred) Indicative Project Site Layout" submitted by Licensee with licence application dated 21-09-07. Copy on file 25147A1/03

A2.2 The licence applies to the following premises:

Lot 1 DP 816020; Lot 152 DP 816020; Lot 60 DP 757124; Part Lot 60 DP 757124; Part Lots 151 & 152 DP 816020; Part Lot 152 DP 816020; Part Lots 57, 58, 63, 64, 65, 81, 82, 83, 83 &115 DP 757124; Lot 61 DP 757124; Part Lot 1 DP 811171; Lot 2 DP 811171; Part Lots 3, 8, 25, 67 & 68 DP 757104; Lot 7 DP 757104; Part Lot 152 DP 816020; Lot 1 DP 659899; Part Lot 3 DP 1005608; Lots 381 & 382 DP 1028753; Part Lot 1 DP 798487; Part Lots 57,58,60,63,64,65,81,82,83,84 & 115 DP 757124; Part Lots 3, 8, 10, 25, 67 & 68 DP 757104; Part Lots 151 & 152 DP 816020

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 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Environment Protection Licence

Licence - 12789

Air

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Ambient Air Quality Monitoring		Monitoring point located at "Turrabaa" and labelled ND1 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
2	Ambient Air Quality Monitoring		Monitoring point located at "Claremont" and labelled ND2 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
3	Ambient Air Quality Monitoring		Monitoring point located at "Bow Hills" and labelled ND3 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
4	Ambient Air Quality Monitoring		Monitoring point located at "Matoppo" and labelled ND4 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
5	Ambient Air Quality Monitoring		Monitoring point located at "Willarah" and labelled ND5 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
6	Ambient Air Quality Monitoring		Monitoring point located at "Willarah" and labelled ND6 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
7	Ambient Air Quality Monitoring		Monitoring point located at "Claremont" labelled ND7 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
8	Ambient Air Quality Monitoring		Monitoring point located at "Claremont" and labelled ND8 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
9	Ambient Air Quality Monitoring		Monitoring point located at "Claremont" and labelled ND9 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.
10	Ambient Air Quality Monitoring		Monitoring point located at "Turrabaa" and labelled ND10 as shown on map titled "Figure 2- Air Quality Monitoring locations" dated 2 January 2008 and on DECC file LIC07/1074-02.

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.

Environment Protection Licence

Licence - 12789

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
11	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Discharge point on northern side of mine boundary labelled as "SD4" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.
12	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Discharge point on eastern side of mine boundary labelled as "SD5" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.
13	Wet weather discharge Discharge water quality monitoring	Wet weather discharge Discharge water quality monitoring	Discharge point on south eastern side of mine boundary labelled as "SD2" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.
14	Ambient Water Quality Monitoring		Upstream of mine discharge point on Kurrajong Creek Tributary 1 labelled as "KC1US" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.
15	Ambient Water Quality Monitoring		Downstream of mine discharge point on Kurrajong Creek Tributary 1 labelled as "KC1DS" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
16	Ambient Water Quality Monitoring		Upstream of mine discharge point on Kurrajong Creek Tributary 2 labelled as "KC2US" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.
17	Ambient Water Quality Monitoring		Downstream of mine discharge point on Kurrajong Creek Tributary 2 labelled as "KC2DS" on Figure titled "Wet Weather Discharge Monitoring Locations" provided with licence variation application dated 10 February 2009.

P2 Weather monitoring

P2.1 The following point(s) in the table are identified in this licence for the purpose of the monitoring of weather parameters at the point.

EPA identification number	Type of Monitoring Point	Description of Location
W1	Weather analysis	Weather station identified at "Meteorological station" on map titled "Figure B Environmental Monitoring" submitted with the Final Statement of Commitments, dated June 2007.

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.

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

POINTS 11,12,13

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre	-	-	-	10
pH	pH	-	-	-	6.5-8.5
Total suspended solids	milligrams per litre	-	-	-	50

L3.4 The Total Suspended Solids concentration limits specified for Points 11, 12 and 13 may be exceeded for water discharged provided that:

(a) the discharge occurs solely as a result of rainfall measured at the premises that exceeds 38.4 millimetres over any consecutive 5 day period immediately prior to the discharge occurring; and

(b) all practical measures have been implemented to dewater all sediment dams within 5 days of rainfall such that they have sufficient capacity to store run off from a 38.4 millimetre, 5 day rainfall event.

Note: 38.4 mm equates to the 5 day 90%ile rainfall depth for Gunnedah sourced from Table 6.3a Managing Urban Stormwater: Soils and Construction Volume 1: 4th edition, March 2004.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 Not applicable.

L6 Noise Limits

L6.1 Noise from the premises must not exceed:

(a) 35 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) for construction activities.

Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L6.2 Noise from the premises is to be measured at any residence not on the premises to determine compliance with this condition.

Note: For the purpose of noise measures required for this condition, the L_{Aeq} noise limit must be measured or computed at any point within 30 metres of any residence not on the premises over a period of 15 minutes using “FAST” response on the sound level meter.

L6.3 The noise emission limits identified in this licence apply under all meteorological conditions except:
(a) during rain and wind speeds (at 10m height) greater than 3m/s; and
(b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

L6.4 The noise limits set out by condition L6.1 of the licence do not apply where a current legally binding agreement exists between the proponent and the occupant of a residential property that:

a) agrees to an alternative noise limit for that property; or
b) provides an alternative means of compensation to address noise impacts from the premises.

A copy of any agreement must be provided to the EPA before the proponent can take advantage of that agreement.

L7 Blasting limits

L7.1 The overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.2 The overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.3 The airblast overpressure level from blasting operations listed in Conditions L7.1 and L7.2 must not be exceeded at any point within 30 metres of any non-project related residential building or other noise sensitive location.

L7.4 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.5 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.6 The ground vibration peak particle velocity limits listed in Conditions L7.3 and L7.4 must not be exceeded at any point within 3.5 metres of any non-project related residential building or other noise sensitive location.

L7.7 Blasting operations at the premises may only take place between 10:00am-4:00pm Monday to Friday. (Where compelling safety reasons exist, the Authority may permit a blast to occur outside the abovementioned hours. Prior written (or facsimile) notification of any such blast must be made to the Authority).

L7.8 Blasting at the premises is limited to:

a) A maximum of two (2) blasts per day;
b) Five (5) blasts a week, averaged over a twelve month period;

on each day on which blasting is permitted.

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 All operations and activities occurring at the premises must be carried out in a manner that will minimise 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:

POINTS 1,2,3,4,5,6,7,8

Pollutant	Units of measure	Frequency	Sampling Method
Particulates - Deposited Matter	grams per square metre per month	Once a month (min. of 4 weeks)	AM-19

POINTS 9,10

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Every 6 days	AM-18

POINTS 11,12,13

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 1	In situ
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
Total organic carbon	milligrams per litre	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	In situ

POINTS 14,15,16,17

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	In situ
Oil and Grease	milligrams per litre	Special Frequency 2	Grab sample
Total organic carbon	milligrams per litre	Special Frequency 2	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample
pH	pH	Special Frequency 2	In situ

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or

(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or

(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

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.

For the purposes of the table(s) above Special Frequency 1 means the collection of samples as soon as practicable after each discharge commences and in any case not more than 12 hours after each discharge commences.

For the purposes of the table(s) above Special Frequency 2 means the collection of samples quarterly (in the event of flow during the quarter) at a time when there is flow and as soon as practicable after each wet weather discharge from points 11, 12 or 13 commences and in any case not more than 12 hours after each discharge commences.

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 Not applicable.

M7 Requirement to monitor weather

M7.1 For each monitoring point specified in the table below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Point W1

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Rainfall	mm	Continuous	1 hour	AM-4
Wind speed @ 10 metres	m/s	Continuous	15 minute	AM-2 & AM-4
Wind direction @ 10 metres	°	Continuous	15 minute	AM-2 & AM-4
Temperature @ 2 metres	°C	Continuous	15 minute	AM-4
Temperature @ 10 metres	°C	Continuous	15 minute	AM-4
Sigma theta @ 10 metres	°	Continuous	15 minute	AM-2 & AM-4
Solar radiation	W/m²	Continuous	15 minute	AM-4
Additional requirements - Siting - Measurement				 AM-1 & AM-4 AM-2 & AM-4

M8 Noise Monitoring

M8.1 For each monitoring point specified below, the Licensee must monitor the noise parameter 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.

POINTS: N1, N2, N3, N4, N5

Parameter	Units of measure	Frequency	Sampling Method
Ambient Noise	$L_{Aeq\ (15\ minute)}$ L_{Amax} L_{A1} L_{A10} L_{A90} L_{Amin}	Quarterly frequency of monitoring as detailed in the document "Noise Monitoring Program for the Narrabri Coal Mine including a Noise Monitoring Protocol" report No. 674/12d dated 3 December 2007 and prepared for Narrabri Coal Mine Pty Ltd.	Type 1 Noise Meter – Unattended and/or Attended Monitoring as detailed in the document "Noise Monitoring Program for the Narrabri Coal Mine including a Noise Monitoring Protocol" report No. 674/12d dated 3 December 2007 and prepared for Narrabri Coal Mine Pty Ltd.

For the purpose of this condition, the noise monitoring locations are described as:

EPA Identification No.	Description of Location
N1	Within 30m of the residence on property "Bow Hills"
N2	Within 30m of the residence on property "Westhaven"
N3	Within 30m of the residence on property "Naroo"
N4	Within 30m of the residence on property "Greylands"
N5	Within 30m of the residence on property "Kurrajong"

Note: The location, frequency of monitoring and the parameters to be monitored may be varied by the EPA once the variability of the noise impact is established.

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 Environment 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

U1.1 Not applicable.

Special conditions

E1 Quality assurance and verification report

E1.1 Prior to the commissioning of the evaporation and storage ponds, the licensee must provide the DECC Armidale office with an "as constructed" report, produced by an experienced and qualified engineer. The report must include detailed design plans for the ponds and illustrate the use of low permeability layers to manage mine waters generated by the project. The report also must include a detailed Quality Assurance/Quality Control program that was used throughout the construction of the ponds.

E2 Noise Impacts

E2.1 Noise impacts where wind speed exceeds 3 metres per second at 10 metres above the ground must be addressed by:

a) documenting noise complaints received to identify any higher level of impacts or wind patterns;

where levels of noise complaints indicated a higher level of impact then actions to quantify and ameliorate any enhanced impacts where wind speed exceeds 3 metres per second at 10 metres above the ground should be developed and implemented.

Dictionary

General Dictionary

Environment Protection Licence

Licence - 12789

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

Environment Protection Licence

Department of **Environment & Climate Change** NSW

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 type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Robert O'Hern

Environment Protection Authority

(By Delegation)

Date of this edition - 18-Aug-2009

End Notes

1	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
2	Licence varied by notice 1100826, issued on 18-Aug-2009, which came into effect on 18-Aug-2009.

Appendix 3

COMPLIANCE REVIEWS

PA 05_0102 (Table A3-1)

EPL 12789 (Table A3-2)

ML 1609 (Table A3-3)

TABLE A3-1 – PROJECT APPROVAL 05_0102

Condition	Conditional Requirement	Compliance	Comments
Schedule 2: Administrative Conditions			
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 project.	Yes	All measures take to reduce impact of operation.
2.	The Applicant shall carry out the development generally in accordance with the: (a) EA; (b) statement of Commitments (see Appendix 3); and (c) conditions of this approval.	Yes	The activities on site were generally being undertaken in accordance with the nominated documents.
3.	If there is any inconsistency between the above documents, that later document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.	Yes	No determined inconsistency.
4.	The proponent shall comply with any reasonable and feasible requirements of the Director General arising from the Department's assessment of: (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with the conditions of this approval; and (b)the implementation of any actions or measures contained in these reports, plans, programs strategies or correspondence.	Yes	All requests complied with.
5.	Mining Operations may take place on the site for 21 years from the grant of the mining lease for the project.	Yes	Mining Lease granted in January 2008.
6.	The proponent shall not extract more than 2.5 million tonnes of ROM coal a year from the site.	Yes	No coal produced over the Reporting Period.
7.	The proponent shall transport all coal from the site by rail.	N/A	No coal transported from the site over the Reporting Period.
8.	With the approval of the Director General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.	Yes	
9.	The proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures are constructed in accordance with relevant requirements of the BCA.	Yes	All buildings on site constructed in accordance with Council certification.

Condition	Conditional Requirement	Compliance	Comments
10.	The proponent shall ensure that all demolition work is carried out in accordance with *Australian Standards AS 2601-2001: The Demolition of Structures*, or its latest version.	N/A	No demolition works required.
11.	The proponent shall ensure that all plant and equipment used on site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Yes	All equipment used subject to pre-start check.
12.	Within 12 months of this approval, the Proponent shall enter into a planning agreement with Narrabri Shire Council, Gunnedah Shire Council and the Minister in accordance with: (a) Division 6 of Part 4 of the EP&A Act; and (b) the terms of the Proponents offer to the Minister on 7 September 2007, which includes the matters set out in Appendix 4.	Yes	As per condition.
Schedule 3: Specific Environmental Conditions			
1.	Within 5 years of the date of this approval, the proponent shall ensure that any loss of water flow into the Great Artesian Basin aquifers (equal to the maximum predicted impact, or the measured impact of the project, whichever is the greater), is managed, licensed or offset to the satisfaction of the DWE.	N/A	Not yet triggered
2.	Within 12 months of the commencement of mining operations, the Proponent shall undertake a transient calibration of the groundwater model presented in the EA, in consultation with DWE and DECC, and to the satisfaction of the Director-General.	N/A	Mining not yet commenced
3.	Following the completion of the transient calibration of the groundwater model……	N/A	Calibration not yet required.
4.	The proponent must commence construction of the water conditioning plant identified in condition 10(d) when daily mine dewatering volumes exceed 0.88 megalitres, or an alternative trigger point based on review of the water balance and model and established in consultation with DWE and DECC, and approved by the Director General.	N/A	Not yet triggered.

Condition	Conditional Requirement	Compliance	Comments
5.	Except as may be expressly provided for by an EPL, the Proponent shall not discharge any surface waters from the site. However, product water from the water conditioning plant may be transferred to water users in accordance with an approved Water Management Plan.	Yes	Water retained on site and pumped to retention pond in rail loop. No transfer of water to date.
6.	The Proponent shall: (a) construct evaporation/storage ponds incorporating the use of low permeability layers to manage minewater generated by the project. (b)prior to commencement of construction, submit pond designs and a construction QA/QC program to DECC; and (c)prior to commissioning the ponds, submit an "as constructed" report, produced by an experienced and qualified engineer, to DECC; to the satisfaction of the Director General.	Yes Yes No	Ponds constructed to design criteria as approved by DECC.
7.	The proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director General. This plan must be submitted to the Director General for approval prior to the commencement of construction activities (not including the construction of the Kamilaroi Highway intersection) in consultation with DECC and DWE by suitably qualified expert/s whose appointments have been approved by the Director General and include a: (a)site water balance; (b)Erosion and Sediment Control Plan (c)Surface Water Monitoring Program; and (d)Surface and Groundwater Response Plan, setting out procedures for:……	Yes	Director General approved the implementation of a Construction Phase Surface Water Management Plan (CPSWMP) on 20th February 2008 conditional on a full Site Water Management Plan (SWMP) being submitted prior to commencement of mining operations. The SWMP for the operational phase was submitted to DECCW, DoP and NOW on the 17th March 2010 and approval is pending.
8.	The Site Water Balance must….	Yes	As per condition. A site water balance has been included in the SWMP currently awaiting approval.
9.	The Erosion and Sediment Control Plan must….	Yes	As per condition. The CPSWMP included erosion and sediment control that has been further developed in the SWMP.
10.	The Surface Water Monitoring Plan must….	Yes	As per above – included in the CPSWMP and further enhanced through development of SWMP.
11.	The Groundwater monitoring program must……..	Yes	As per above – included in the CPSWMP and further enhanced through development of SWMP.

Condition	Conditional Requirement	Compliance	Comments
12.	The proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately owned residence.	Yes	No noise exceedances recorded during the Reporting Period.
13.	The Proponent shall: (a)implement all reasonable and feasible best practice noise mitigation measures; (b)investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and (c)report on these investigations and the implementation and effectiveness of these measures in the AEMR; to the satisfaction of the Director General.	Yes	Access road sealed. Rail loop and loading point cut below surface level to assist noise reduction. Barn Owl monitor established at boundary of "Claremont" and "Kurrajong" property to assess real time noise levels over monthly period.
14.	The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must: (a)be submitted to the Director-General for approval prior to the commencement of construction activities; (b)be prepared in consultation with the DECC; (c)use attended noise monitoring measures to monitor the performance of the project; (d)include a protocol to establish whether the project is complying with the noise impact assessment criteria in Table 1.	Yes	Noise monitoring program conducted in accordance with the Noise Monitoring Program approved by DG on 15th January 2008.
15.	The proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 2 at any residence on privately owned land.	Yes	See Section 3.9.2.
16.	The proponent shall ensure that the ground vibration level from blasting, or any other activity at the project does not exceed the criteria in Table 3 at any residence on privately owned land.	Yes	See Section 3.9.2.
17.	The proponent shall only carry out blasting associated with construction activities on site between 10am and 4pm Monday to Friday.	Yes	See Section 3.9.2.
18.	The proponent may carry out: (a)a maximum of 2 blasts a day associated with construction activities; and (b)5 blasts a week associated with construction activities, average over a 12 month period; on site without the written approval of the Director General.	Yes	See Section 3.9.2.

Condition	Conditional Requirement	Compliance	Comments
19.	Before carrying out any blasting, the Proponent shall advise all landowners within 2km of proposed blasting activities, and any other landowner nominated by the Director-General, that they are entitled to a property inspection.	Yes	Letters sent to nominated landholders advising of rights to an inspection, with inspections completed by Kelley Covey Pty Ltd.
20.	If the proponent receives a written request for a property inspection from any landowner with 2km of proposed blasting activities, or any other landowner nominated by the Director General, the proponent shall within 3 months of receiving this request: (a)commission a suitably qualified person, whose appointment has been approved by the Director General, to inspect the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and (b)give the landowner a copy of this property inspection report.	Yes	All reports provided to landowners.
21.	If any landowner within 2km of proposed blasting activities or any other landowner as nominated by the Director General claims that his/her property, including vibration sensitive infrastructure……..	N/A	Not triggered.
22.	Prior to the commencement of blasting, the proponent shall prepare and implement a detailed Blasting Monitoring Program for the project to the satisfaction of the Director General.	Yes	Blast Monitoring Program approved by DG 15th January 2008.
23.	The proponent shall ensure that dust emissions generated by the project does not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately owned land, or on more than 25% of privately owned land.	No	Annual average deposited dust criteria exceeded at ND-1 “Turrabaa” and ND-4 “Matoppo”. See AEMR Section 3.1.3 for details.
24.	The proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director General. This program must: (a)be submitted to the Director-General prior to the commencement of construction activities; (b)be prepared in consultation with the DECC; and (c)use a combination of high volume air samplers and dust deposition gauges to monitor the performance of the project.	Yes	Air Quality Monitoring program in place and approved by the DG on 15th January 2008.
25.	During the project, the Proponent shall ensure there is a suitable meteorological station on site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales (DECC, 2007)*, or its latest version.	Yes	Meteorological Station is in place and functioning to required standards specified in the Narrabri EPL.
26.	The proponent shall ensure that the project does not result in subsidence impacts of greater than 20mm vertical subsidence on any land.	Yes	No subsidence impacts to date.

Condition	Conditional Requirement	Compliance	Comments
27.	Six months prior to mining occurring under each privately owned property, the proponent shall notify the relevant landowners of the extent of planned mining operations under their property.	Yes	No mining under privately owned property at this stage.
28.	The Proponent shall rehabilitate the site to the satisfaction of the Director General.	N/A	Only minor works undertaken to date to pit top area.
29.	The proponent shall prepare and implement a detailed Landscape Management Plan for the site to the satisfaction of the Director-General and DPI. This plan must: (a)be submitted to the Director-General for approval within 12 months of this approval; (b)be prepared by suitably qualified expert/s whose appointment have been endorsed by the Director General; (c)be prepared in consultation with DWE, DECC and NSC; and (d)include a Rehabilitation Management Plan and Mine Closure Plan.	Yes	Landscape Management Plan approved in March 2010.
30.	The Rehabilitation Management Plan must……..	No	See response to 29 above.
31.	The mine closure plan must…….	No	See response to 29 above.
32.	The proponent shall not destroy any known Aboriginal objects (as defined in the NPWA 1974) without the written approval of the Director General.	Yes	No known objects destroyed.
33.	The proponent shall prepare and implement an Aboriginal Cultural Heritage Management Plan to the satisfaction of the Director General. This plan must: (a)be submitted to the Director General prior to the commencement of construction activities; (b)be prepared in consultation with DECC and the Narrabri Local Aboriginal Land Council; (c)include a protocol for the ongoing consultation and involvement of Aboriginal communities in the conservation and management of Aboriginal heritage on site; (d)describe the measures that would be implemented to protect Aboriginal sites on site, or if any new Aboriginal objects or skeletal remains are discovered during the project.	Yes	ACHMP prepared and implemented, approved by DG on 4th February 2008.

Condition	Conditional Requirement	Compliance	Comments
34.	The Proponent shall construct the Kamilaroi Highway intersection in consultation with NSC and to the satisfaction of RTA. This intersection must: (a)be completed, other than for items listed in (c) below, prior to the commencement of construction activities on site; (b)be constructed in accordance with a Traffic Management Plan approved by NSC and RTA; (c)include boom gates, flashing lights and warning bells for the Kurrajong Creek Road level crossing, to the satisfaction of ARTC and NSC; (d)include illumination of the Kurrajong Creek Road level crossing during construction of the intersection; (e)provide a information sign on Kurrajong Creek Road to inform road users of likely delays due to train traffic; and (f)maintain permanent access for the "Bow Hills" quarry.	Yes	As per condition.
35.	Within 12 months of commencement of mining operations, the proponent shall bitumen seal Kurrajong Creek Road for a distance of 7km south of the Kamilaroi Highway intersection, to the satisfaction of the NSC.	Yes	Kurrajong Creek Road sealed. Currently seeking final sign-off from NSC (request sent to NSC in February 2010).
36.	The proponent shall minimise the visual impacts of the project to the satisfaction of the Director-General.	Yes	Pit Top Area managed to reduce visual impact with completed areas rehabilitated to extent practicable.
37.	The proponent shall ensure that: (a)no outdoor lights shine above the horizontal; and (b)all external lighting associated with the project complies with *Australian Standard AS4282(INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.*	Yes	Lighting maintained in accordance with these provisions.
38.	The proponent shall prepare and implement an Energy Savings Action Plan for the project to the satisfaction of the Director General. This plan must: (a)be prepared in consultation with DECC; (b)be prepared in accordance with the *Guidelines for Energy Savings Action Plans (DEUS, 2005)*, or its latest version; (c)be submitted to the Director-General for approval within 3 months of this approval; and (d)include a program to monitor the effectiveness of measures to reduce energy on site.	Yes	Energy Savings Action Plan developed and approved by DG on 13th October 2008.
39.	The proponent shall implement all reasonable and feasible measures to minimise the greenhouse gas emissions from the underground mining operations to the satisfaction of the Director General.	Yes	Gas drainage measures being thoroughly investigated to determine most feasible method to reduce impact. Composition of gas significantly minimizes options.

Condition	Conditional Requirement	Compliance	Comments
40.	Prior to carrying out underground coal mining operations, the Proponent shall submit a Greenhouse Gas Minimisation Plan to the Director General. This plan must: (a)identify options for minimizing greenhouse gas emissions from underground mining operations, with a particular focus on capturing and/or using these emissions; (b)investigate the feasibility of implementing each option; (c)propose the measures that would be implemented in the short to medium term on site; and (d)include a research program to inform the continuous improvement of the greenhouse gas minimization measures on site.	Yes	Submitted to DG in November 2009 and currently awaiting approval.
41.	The proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must: (a)be submitted to the Director General for approval prior to commencing construction; (b)identify the various waste streams for the project; (c)describe what measures would be implemented to reuse, recycle or minimize the waste generated by the project; (d)ensure irrigation of treated wastewater is undertaken in accordance with *Environmental Guidelines: Use of Effluent by Irrigation (DEC, 2004)*, or its latest version; and (e)include a program to monitor the effectiveness of these measures,	Yes	Waste Management Plan approved by DG on 15th January 2008.
Schedule 4: Environmental Management, Monitoring, Auditing and Reporting			
1.	The proponent shall prepare and implement and Environmental Management Strategy for the project to the satisfaction of the Director General. This strategy must be submitted to the Director General prior to the commencement of construction activities and: (a)provide the strategic context for environmental management of the project; (b)identify the statutory requirements that apply to the project; (c)describe in general how the environmental performance of the project would be monitored and managed; (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 project; - receive, handle, respond to and record complaints; - resolve any disputes that may arise during the course of the project; - respond to any non compliance; - manage cumulative impacts; and - respond to emergencies; and (e)describe the role, responsibility, authority and accountability of all key personnel in the environmental management of the project.	Yes	Environmental Management Strategy approved by DG on 15th January 2008.

Condition	Conditional Requirement	Compliance	Comments
2.	The proponent shall prepare and implement an Environmental Monitoring Program for the project to the satisfaction of the Director General. This program must be submitted to the Director General within 6 months of this approval and consolidate the various monitoring requirements in Schedule 3 of this approval into a single document.	No	To be submitted during next Reporting Period.
3.	As soon as practicable, and in any event within 24 hours of detecting an exceedance of the limits/performance criteria in the approval, or the occurrence of an incident that causes (or may cause) material harm to the environment, the proponent shall notify the Department and other relevant agencies of the exceedance/incident.	Yes	All occurrences reported, as required.
4.	Within 6 days of notifying the Department and other relevant agencies….	Yes	Advice documented as required.
5.	Within 12 months of this approval, and annually thereafter, the proponent shall submit an AEMR to the Director General and to all relevant agencies. This report must: (a)identify the standards and performance measures that apply to the project; (b)describe works carried out in last 12 months; (c)describe the works that would be carried out in the next 12 months; (d)include a summary of complaints received during the past year, and compare this to complaints from previous years; (e)include a summary of the monitoring results for the project 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 EA; (g)identify any trends in the monitoring results over the life of the project; (h)identify any non-compliance during the previous year; and (i)describe what actions were, or are being taken to ensure compliance.	Yes	As per condition.
6.	Within 2 years of this approval, and every 3 years thereafter, unless the Director General directs otherwise, the proponent shall commission and pay the full cost of an Independent Environmental Audit of the project	No	NCOPL requested in early February 2010 that the Independent Environmental Audit be postponed until 12 months after the commencement of mining (ie. audit due in June 2011). Awaiting advice from DoP.

Condition	Conditional Requirement	Compliance	Comments
7.	Within 6 weeks of completing this audit….	N/A	See Condition 4(6) above.
8.	Within 3 months of submitting the audit….	N/A	Not yet triggered. See Condition 4(6) above.
9.	Within 3 months of this approval, the Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007)* or its latest version.	Yes	CCC established and operating as per guidelines.
10.	Within 3 months of the approval of any strategy/plan/program required under this approval, or the completion of audits or AEMR's required under this approval, the Proponent shall: (a)provide a copy of the relevant documents to the relevant agencies and CCC; and (b)put a copy of the relevant documents on its website.	Yes	As per requirements.
11.	During the project, the proponent shall: (a)make a summary of monitoring results required under this approval publicly available at the mine and on its website; and (b)update these results on a regular basis (at least every three months)	Yes	As per requirements.

TABLE A3-2

Compliance Review – Environment Protection Licence 12789

Condition	Conditional Requirement	Compliance	Comments
A1.1	Construction of surface infrastructure including but not limited to access roads….	Yes	Intersection and access roads completed prior to commencement of mining activity.
A1.2	Carry out Coal Mining not exceeding 3 500 000T	Yes	No coal production within Reporting Period.
A1.4	The licensee must not commence scheduled activities on the premises without prior approval from DECC.	Yes	As per condition.
P1.1	Comply with monitoring/ discharge points and areas. Setting of limits for the emission of pollutants.	Yes	Monitoring of all dust sampling points undertaken throughout term.
P2.1	Comply with weather monitoring.	Yes	Weather station in place and logging data.
L1.1	Comply with Section 120 of the POEO Act 1997 (re water quality)	Yes	Discharge from site compliant with criteria. See Section 2.8.3.
L5.1	Ensure no waste receival or disposal at premises, except as permitted by licence	Yes	No receival or disposal of waste at premises.
L6.1	Ensure noise compliance: (a) 35 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm), evening (6pm to 10pm) and night (10pm to 7am) for construction activities.	Yes	As per condition.
L6.2	To determine compliance, measure noise within 30m of noise sensitive residences or receptors.	Yes	At all monitoring points except “Kurrajong” as there was no access.
L7.1/2	Do not exceed blasting overpressure levels: • 115dBL for more than 5% of total number of blasts over 12 months • 120dB at any time	N/A	No blasting during Reporting Period.
L7.4/5	Do not exceed vibration particle velocity from blasting by: (a) 5mm/s for more than 5% of total blasts during reporting period; and (b) 10mm/s at any time; At any point within 30m of any affected residential boundary or noise sensitive location.	Yes	See Section 3.9.2.
L7.7	Carry out blasting between 10:00am-4:00pm Monday to Friday	Yes	See Section 3.9.2.

Condition	Conditional Requirement	Compliance	Comments
L7.8	Blasting is limited to: a) Maximum two (2) blasts per day b) Five (5)blasts a week	Yes	See Section 3.9.2.
O1.1	Carry out licensed activities in a competent manner, i.e. (a) Processing, handling, movement and storage of materials and substances; & (b) Treatment, storage, processing, reprocessing, transport and disposal of generated waste.	Yes	All measures undertaken in competent manner
O2.1	Maintain and operate all plant and equipment at premises in proper and efficient condition.	Yes	Adequate maintenance scheduling.
O3.1	Minimise or prevent emission of dust	Yes	Dust lift off kept to minimum.
M1.1	Record and retain monitoring results required as per this licence.	Yes	Monitoring results recorded and retained.
M1.2	Keep all monitoring records associated with this licence: (a) In a legible form; (b) For at least 4 years; for production to any EPA authorized officer.	Yes	As above
M1.3	(a) Sampling date; (b) Sampling time (c) Sampling location (d) Sample collectors name	No	Sample time for deposited dust not recorded during March – June 2009 sampling. This issue has been rectified and sample times are now recorded.
M2.1	Monitor each monitoring point for pollutants as specified in licence	Yes	As per condition.
M3.1	Monitor air pollutants in accordance with the Approved Methods publication or as approved by EPA.	Yes	In accordance with guidelines
M4.1	Keep a legible record of all complaints re pollution arising from licenced activity.	Yes	Complaints record held
M4.2	Keep the following records of complaint. (a) Date and time of complaint (b) Method complaint made (c) Any personal details of complaint (d) Nature of complaint (e) Licensee's action in response, any follow up contact; and (f) If no action-reason why	Yes	All details recorded.

Condition	Conditional Requirement	Compliance	Comments
M4.3	Keep records of complaints for 4 years	Yes	Complaints retained on site.
M4.4	Present records to EPA on request	Yes	All records will be provided on request.
M5.1	Operate telephone complaints line for receipt of complaints from the public	Yes	Complaints line operational.
M5.2	Notify the public of the complaints telephone line	Yes	Complaints line advertised.
R1.1	Complete and supply Annual Return to EPA comprising: (a) Statement of Compliance (b) Monitoring & Complaints Summary	Yes	Annual Return completed.
R1.5	Provide EPA with Annual Return no later than 60 days after end o each reporting period.	Yes	Annual Return supplied.
R1.7	Retain copy of Annual Return for 4 years.	Yes	Annual Return retained.
R1.8	Certify the Statement of Compliance within the Annual Return and sign the Monitoring and Complaints Summary by: (a) Licence holder; or (b) Approved person	Yes	Return signed by authorised company representatives.
R2.1	Notify EPA of threatening or harmful incidents as soon as practicable by phoning EPA's Pollution Line Service	Yes	All incidents will be reported
R2.2	Provide written details of the incident to EPA within 7 days of incident	Yes	Written details will be supplied.
R3.1	Upon an EPA officer suspecting that an event is causing or likely to cause environmental harm: (a) At the premises; or (b) In connection with vehicles or plant associated with the licenced activities; A request may be made for a written report of the event.	Yes	Any requests for information will be complied with.
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within the time specified	Yes	Report will be supplied.

Condition	Conditional Requirement	Compliance	Comments
R3.3	The report may be required to include: (a) Event cause, time and duration; (b) Type, volume and concentration of every pollutant discharged; (c) Contact details of employees or agents of licensee who witnessed event; (d) Contact details of any other persons witnessing the event; (e) The action taken and follow-up action with complainants in relation to event; (f) Mitigation measures proposed to prevent recurrence; (g) Ant other relevant matter	Yes	Reporting will supply with required information.
R3.4	EPA may request further details-must be supplied within specified time	Yes	Timeframes will be met.
G1.1	Retain a copy of this licence at premises to which the licence applies	Yes	Licence retained at site office.
G1.2	Produce licence to EPA officer on request	Yes	Licence available at site office on request
G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Yes	As above
E1.1	Prior to the commissioning of the evaporation and storage ponds, the licensee must provide the DECC Armidale with an “as constructed” report	No	As constructed report not yet supplied to DECCW.

TABLE A3-3

Compliance Review – ML 1609

Condition	Conditional Requirement	Compliance	Comments
1	Within a period of three months from the date of grant/renewal of the lease a notice in writing must be served on each landholder.	Yes	As per condition.
2	All practicable measures to prevent and/or minimise any harm to the environment.	Yes	All measures taken to reduce impact.
3	Conduct mining operations in accordance with a MOP.	Yes	MOP approved with all measures in accordance with MOP.
4	EMR to be lodged with the DG annually.	Yes	AEMR supplied annually
7	Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the DG.	Yes	Areas disturbed on pit top have been rehabilitated to the extent practicable.
8(a)	Prepare a Subsidence Management Plan prior to commencing any underground mining operations.	N/A	To be incorporated in Extraction Management Plan as part of Stage 2 Consent.
9(a)	Ensure that at least 212 competent people are efficiently employed on the lease area on each week day except Sunday or Public Holiday; or	Yes	Narrabri Coal satisfies Condition 9(b).
9(b)	Expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than $3,710,000 per annum whilst the lease is in force.	Yes	Annual expenditure to date exceeds required minimum.
11	Exploration Report to be submitted to the DG each year within 28 days of the anniversary.	Yes	Submitted annually
15 (a)	Monitor ground vibration generated by any blasting that it does not exceed 10mm/second in more than 5% of the total blasts over a period of 12 months.	N/A	See Section 3.9.2.
15 (b)	Overpressure noise level generated by any blast is not to exceed 120 dB (linear) and 115 dB (linear) in more than 5% of the total blasts over a period of 12 months.	N/A	See Section 3.9.2.
16	Ensure the safety of persons or stock.	Yes	Safety measures a priority on site.

Condition	Conditional Requirement	Compliance	Comments
17.2	Exploratory drill holes must satisfy the DG: 1.Cored holes surveyed 2.Cored Holes sealed to prevent collapse 3.Drill holes permanently sealed with cement plugs 4.If drill hole meets natural or noxious gases it is plugged or sealed. 5.If drill hole meets an artesian or sub-artesian flow it is effectively sealed. 6.Unused drill holes are to be sealed in accordance with Department guidelines. 7.Once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.	Yes	As per requirements
18	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution or soil contamination or erosion.	Yes	As per requirement.
19	Transmission line, communication line, pipeline or any other utility must not be interfered with.	Yes	As per requirement.
20	Fences must not be damaged or interfered with. Gates must be closed or left open in accordance with the requirements of the landholder.	Yes	As per requirement.
21(a)	Operations must not affect any road.	Yes	No roads affected.
21(b)	The cost incurred in fixing any damage to roads must be paid to the designated authority.	Yes	No costs incurred.
22	Access tracks must be kept to a minimum.	Yes	Access tracks are minimised.
23(a)	The lease holder must not fell trees, strip bark or cut timber on the lease without the consent of the landholder.	Yes	As per requirement.
23(b)	The lease holder must not cut, destroy, ringbark or remove any timber or other vegetative cover on the lease area except such as directly obstructs or prevents the carrying on of operations.	Yes	As per requirement.
23(c)	The lease holder must obtain all necessary approvals or licences before using timber from any Crown land within the lease area.	N/A	No timber removed from Crown land.
27(a)	A security of $100,000 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfillment by the lease holder of obligations under this lease.	Yes	Security paid.

Condition	Conditional Requirement	Compliance	Comments
27(b)	Security: Cash Security Certificate	Yes	Security Certificate in place.
28	A person must not remove, damage, destroy, displace, obliterate or deface any marks in connection with any trigonometrical station, permanent mark or survey mark.	Yes	No damage occurred.

Appendix 4

DUST MONITORING RESULTS

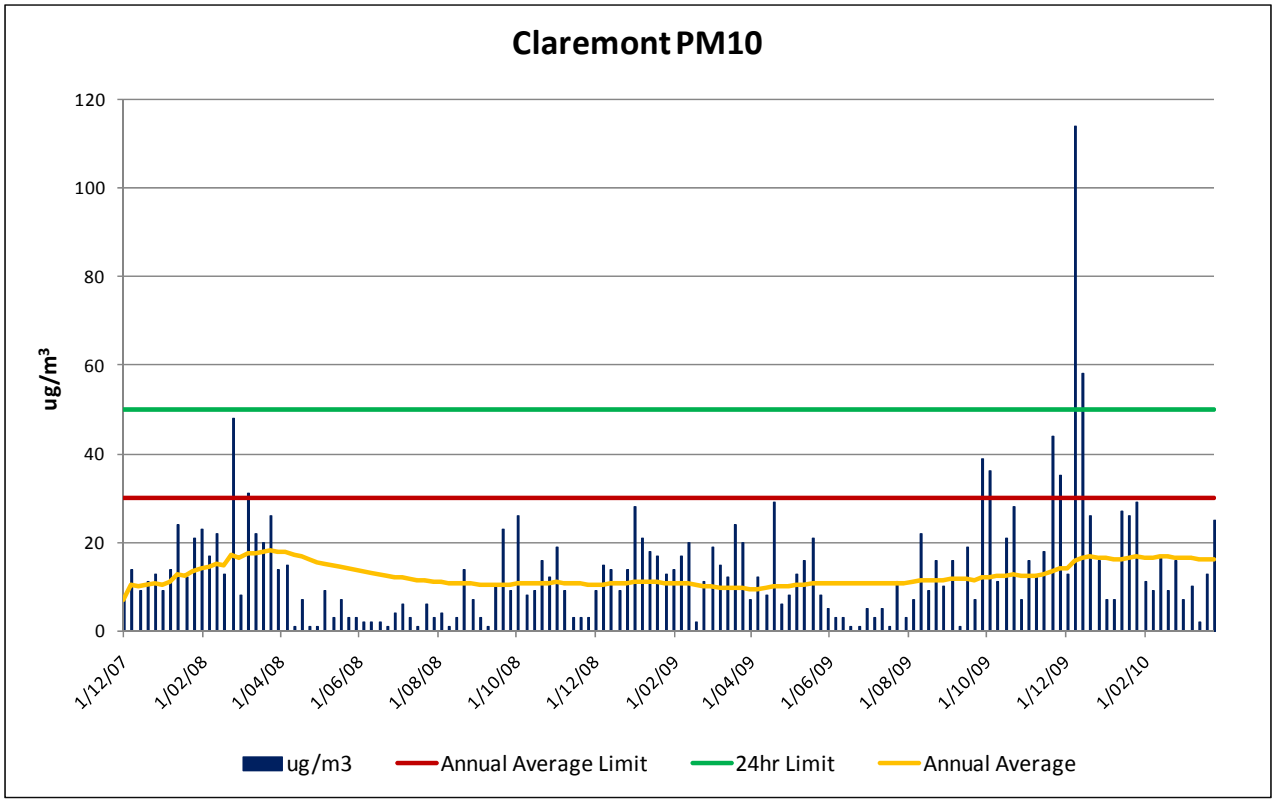
Claremont PM_{10} High Volume Air Sampler

Site	Site Id	Datum	Zone	Easting	Northing
Claremont PM10	ND-9	MGA	55	777047	6619621
Date	**mg/paper**	**µg/m³**	**Annual Average**	**Annual Average Limit**	**24hr Limit**
1/12/2007	11.1	7	7.00	30	50
7/12/2007	20.5	14	10.50	30	50
13/12/2007	14.2	9	10.00	30	50
19/12/2007	16.1	11	10.25	30	50
25/12/2007	20.7	13	10.80	30	50
31/12/2007	14.1	9	10.50	30	50
6/01/2008	20.9	14	11.00	30	50
12/01/2008	37.4	24	12.63	30	50
18/01/2008	19.4	12	12.56	30	50
24/01/2008	33	21	13.40	30	50
30/01/2008	35.6	23	14.27	30	50
5/02/2008	26.6	17	14.50	30	50
11/02/2008	34	22	15.08	30	50
17/02/2008	20.2	13	14.93	30	50
23/02/2008	74.3	48	17.13	30	50
29/02/2008	13.1	8	16.56	30	50
6/03/2008		31	17.41	30	50
12/03/2008		22	17.67	30	50
18/03/2008		20	17.79	30	50
24/03/2008		26	18.20	30	50
30/03/2008		14	18.00	30	50
5/04/2008	24	15	17.86	30	50
11/04/2008	1.7	1	17.13	30	50
17/04/2008	11.4	7	16.71	30	50
23/04/2008	2	1	16.08	30	50
29/04/2008	1.8	1	15.50	30	50
5/05/2008	14	9	15.26	30	50
11/05/2008	5.3	3	14.82	30	50
17/05/2008	10.9	7	14.55	30	50
23/05/2008	5.7	3	14.17	30	50
29/05/2008	4.1	3	13.81	30	50
4/06/2008	2.5	2	13.44	30	50
10/06/2008	2.5	2	13.09	30	50
16/06/2008	2.4	2	12.76	30	50
22/06/2008	1.3	1	12.43	30	50
28/06/2008	6.7	4	12.19	30	50

Date	mg/paper	µg/m^3	Annual Average	Annual Average Limit	24hr Limit
4/07/2008	9.4	6	12.03	30	50
10/07/2008	4.3	3	11.79	30	50
16/07/2008	1.8	1	11.51	30	50
22/07/2008	9.2	6	11.38	30	50
28/07/2008	5.7	3	11.17	30	50
3/08/2008	6.5	4	11.00	30	50
9/08/2008	1.2	1	10.77	30	50
15/08/2008	5.5	3	10.59	30	50
21/08/2008	22.2	14	10.67	30	50
27/08/2008	12	7	10.59	30	50
2/09/2008	5.3	3	10.43	30	50
8/09/2008	2	1	10.23	30	50
14/09/2008	17	10	10.22	30	50
20/09/2008	36.7	23	10.48	30	50
26/09/2008	14.7	9	10.45	30	50
2/10/2008	41	26	10.75	30	50
8/10/2008	12.9	8	10.70	30	50
14/10/2008	14.7	9	10.67	30	50
20/10/2008	24.5	16	10.76	30	50
26/10/2008	19.5	12	10.79	30	50
1/11/2008	29.3	19	10.93	30	50
7/11/2008	13.4	9	10.90	30	50
13/11/2008	5	3	10.76	30	50
19/11/2008	3.9	3	10.63	30	50
25/11/2008	2.6	3	10.51	30	50
1/12/2008	14	9	10.54	30	50
7/12/2008	23.5	15	10.56	30	50
13/12/2008	21.2	14	10.64	30	50
19/12/2008	14.5	9	10.61	30	50
25/12/2008	21.6	14	10.62	30	50
31/12/2008	42.3	28	10.93	30	50
6/01/2009	29.2	21	11.05	30	50
12/01/2009	27.4	18	10.95	30	50
18/01/2009	27.2	17	11.03	30	50
24/01/2009	19	13	10.90	30	50
30/01/2009	21.9	14	10.75	30	50
5/02/2009	25.1	17	10.75	30	50
11/02/2009	31.2	20	10.72	30	50
17/02/2009	3.8	2	10.54	30	50
23/02/2009	16.8	11	9.93	30	50

Date	mg/paper	µg/m^3	Annual Average	Annual Average Limit	24hr Limit
1/03/2009	29.2	19	10.11	30	50
7/03/2009	23.3	15	9.85	30	50
13/03/2009	19.1	12	9.69	30	50
19/03/2009	36.8	24	9.75	30	50
25/03/2009	31	20	9.66	30	50
31/03/2009	11.7	7	9.54	30	50
6/04/2009	19.4	12	9.49	30	50
12/04/2009	12.3	8	9.61	30	50
18/04/2009	46.2	29	9.97	30	50
24/04/2009	9.3	6	10.05	30	50
30/04/2009	12.9	8	10.16	30	50
6/05/2009	20	13	10.23	30	50
12/05/2009	26	16	10.44	30	50
18/05/2009	34.3	21	10.67	30	50
24/05/2009	12.9	8	10.75	30	50
30/05/2009	8.7	5	10.79	30	50
5/06/2009	4.2	3	10.80	30	50
11/06/2009	5	3	10.82	30	50
17/06/2009	1.6	1	10.80	30	50
23/06/2009	2.3	1	10.80	30	50
29/06/2009	4.9	5	10.82	30	50
5/07/2009	5	3	10.77	30	50
11/07/2009	8.5	5	10.80	30	50
17/07/2009	1	1	10.80	30	50
23/07/2009	17	11	10.89	30	50
29/07/2009	5.3	3	10.89	30	50
4/08/2009	10.9	7	10.93	30	50
10/08/2009	35.4	22	11.28	30	50
16/08/2009	14.8	9	11.38	30	50
22/08/2009	25.9	16	11.41	30	50
28/08/2009	16.7	10	11.46	30	50
3/09/2009	25.9	16	11.67	30	50
9/09/2009	1.4	1	11.67	30	50
15/09/2009	29.3	19	11.82	30	50
21/09/2009	10.4	7	11.56	30	50
27/09/2009	61.5	39	12.05	30	50
3/10/2009	57.8	36	12.21	30	50
9/10/2009	17.4	11	12.26	30	50
15/10/2009	32.9	21	12.46	30	50
21/10/2009	44.2	28	12.66	30	50

Date	mg/paper	µg/m^3	Annual Average	Annual Average Limit	24hr Limit
27/10/2009	11.8	7	12.57	30	50
2/11/2009	24.6	16	12.52	30	50
8/11/2009	18.6	12	12.57	30	50
14/11/2009	28	18	12.82	30	50
20/11/2009	66.1	44	13.49	30	50
26/11/2009	53.7	35	14.02	30	50
2/12/2009	20.4	13	14.08	30	50
8/12/2009	170.1	114	15.70	30	50
14/12/2009	89.5	58	16.43	30	50
20/12/2009	39.9	26	16.70	30	50
26/12/2009	26.5	16	16.55	30	50
1/01/2010	10	7	16.39	30	50
7/01/2010	10.5	7	16.13	30	50
13/01/2010	40	27	16.31	30	50
19/01/2010	40.9	26	16.52	30	50
25/01/2010	44.7	29	16.72	30	50
31/01/2010	17	11	16.67	30	50
6/02/2010	13.9	9	16.48	30	50
12/02/2010	25.8	17	16.73	30	50
18/02/2010	14.1	9	16.70	30	50
24/02/2010	25.3	16	16.65	30	50
2/03/2010	11.3	7	16.52	30	50
8/03/2010	15.7	10	16.48	30	50
14/03/2010	3.5	2	16.12	30	50
20/03/2010	20.6	13	16.00	30	50
26/03/2010	39.3	25	16.30	30	50


Claremont PM10
120
100
80
60
40
20
0
ug/m³
1/12/07
1/02/08
1/04/08
1/06/08
1/08/08
1/10/08
1/12/08
1/02/09
1/04/09
1/06/09
1/08/09
1/10/09
1/12/09
1/02/10
ug/m3
Annual Average Limit
24hr Limit
Annual Average

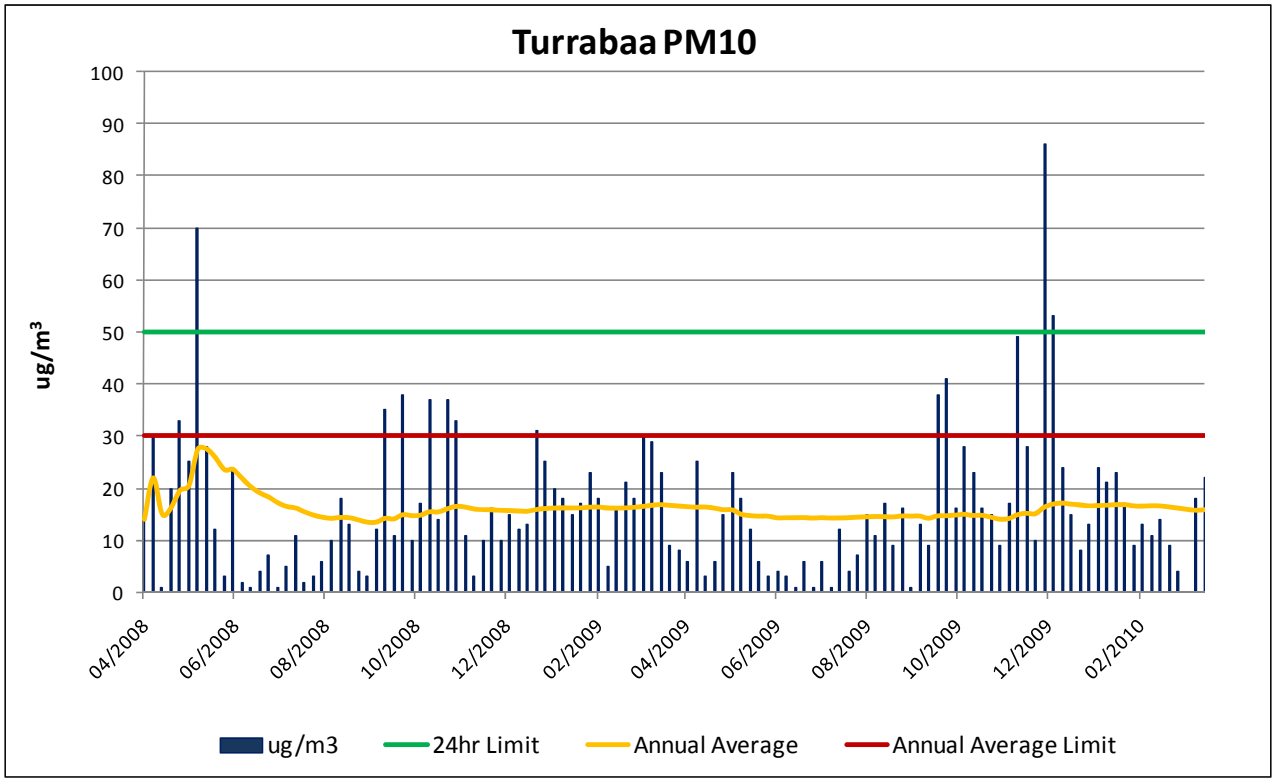
Turrabaa PM10 High Volume Air Sampler

Site	Site Id	Datum	Zone	Easting	Northing
Turrabaa PM10	ND-10	MGA	55	779775	6619367
Date	**mg/paper**	**µg/m3**	**Annual Average**	**Annual Average Limit**	**24hr Limit**
11/04/2008	20.9	14	14.00	30	50
17/04/2008	45.8	30	22.00	30	50
23/04/2008	0.9	1	15.00	30	50
29/04/2008	32.4	20	16.25	30	50
5/05/2008	51.4	33	19.60	30	50
11/05/2008	38.7	25	20.50	30	50
17/05/2008	106.6	70	27.57	30	50
23/05/2008	43.9	28	27.63	30	50
29/05/2008	19.4	12	25.89	30	50
4/06/2008	5	3	23.60	30	50
10/06/2008	38.1	24	23.64	30	50
16/06/2008	3.6	2	21.83	30	50
22/06/2008	1.7	1	20.23	30	50
28/06/2008	6.8	4	19.07	30	50
4/07/2008	11.6	7	18.27	30	50
10/07/2008	2.3	1	17.19	30	50
16/07/2008	8	5	16.47	30	50
22/07/2008	18.4	11	16.17	30	50
28/07/2008	3.6	2	15.42	30	50
3/08/2008	4.9	3	14.80	30	50
9/08/2008	9.8	6	14.38	30	50
15/08/2008	16	10	14.18	30	50
21/08/2008	28	18	14.35	30	50
27/08/2008	20.1	13	14.29	30	50
2/09/2008	5.6	4	13.88	30	50
8/09/2008	5.1	3	13.46	30	50
14/09/2008	18.9	12	13.41	30	50
20/09/2008	52.6	35	14.18	30	50
26/09/2008	17.4	11	14.07	30	50
2/10/2008	58.7	38	14.87	30	50
8/10/2008	16.1	10	14.71	30	50
14/10/2008	25.8	17	14.78	30	50
20/10/2008	55.8	37	15.45	30	50
26/10/2008	21.8	14	15.41	30	50
1/11/2008	55.9	37	16.03	30	50
7/11/2008	49.4	33	16.50	30	50

Date	mg/paper	µg/m3	Annual Average	Annual Average Limit	24hr Limit
13/11/2008	16.6	11	16.35	30	50
19/11/2008	4.6	3	16.00	30	50
25/11/2008	15.3	10	15.85	30	50
1/12/2008	25	16	15.85	30	50
7/12/2008	14.7	10	15.71	30	50
13/12/2008	22.5	15	15.69	30	50
19/12/2008	19.3	12	15.60	30	50
25/12/2008	19.4	13	15.55	30	50
31/12/2008	47.6	31	15.89	30	50
6/01/2009	36.3	25	16.09	30	50
12/01/2009	30.1	20	16.17	30	50
18/01/2009	27.9	18	16.21	30	50
24/01/2009	21.5	15	16.18	30	50
30/01/2009	24.6	17	16.2	30	50
5/02/2009	33.5	23	16.33	30	50
11/02/2009	27.5	18	16.37	30	50
17/02/2009	7.4	5	16.15	30	50
23/02/2009	24.4	16	16.15	30	50
1/03/2009	31.4	21	16.24	30	50
7/03/2009	27.2	18	16.27	30	50
13/03/2009	44.8	30	16.51	30	50
19/03/2009	43.6	29	16.72	30	50
25/03/2009	34.9	23	16.83	30	50
31/03/2009	14.3	9	16.70	30	50
6/04/2009	12.2	8	16.56	30	50
12/04/2009	9.5	6	16.43	30	50
18/04/2009	38.1	25	16.34	30	50
24/04/2009	4.8	3	16.38	30	50
30/04/2009	10.1	6	16.15	30	50
6/05/2009	23.5	15	15.85	30	50
12/05/2009	35.5	23	15.82	30	50
18/05/2009	27.9	18	14.97	30	50
24/05/2009	18	12	14.70	30	50
30/05/2009	9.2	6	14.61	30	50
5/06/2009	4	3	14.61	30	50
11/06/2009	5.4	4	14.28	30	50
17/06/2009	4.3	3	14.30	30	50
23/06/2009	1.5	1	14.30	30	50
29/06/2009	5.9	6	14.33	30	50
5/07/2009	1.6	1	14.23	30	50

Date	mg/paper	µg/m3	Annual Average	Annual Average Limit	24hr Limit
11/07/2009	9	6	14.31	30	50
17/07/2009	2.2	1	14.25	30	50
23/07/2009	18.8	12	14.26	30	50
29/07/2009	6.6	4	14.30	30	50
4/08/2009	10.7	7	14.36	30	50
10/08/2009	24	15	14.51	30	50
16/08/2009	16.5	11	14.52	30	50
22/08/2009	26.4	17	14.51	30	50
28/08/2009	14.5	9	14.44	30	50
3/09/2009	24.4	16	14.64	30	50
9/09/2009	2	1	14.61	30	50
15/09/2009	19.6	13	14.62	30	50
21/09/2009	14.3	9	14.20	30	50
27/09/2009	59.4	38	14.64	30	50
3/10/2009	63.3	41	14.69	30	50
9/10/2009	24.3	16	14.79	30	50
15/10/2009	42.9	28	14.97	30	50
21/10/2009	35.6	23	14.74	30	50
27/10/2009	26.5	16	14.77	30	50
2/11/2009	22.8	15	14.41	30	50
8/11/2009	13.7	9	14.02	30	50
14/11/2009	25.4	17	14.11	30	50
20/11/2009	72.2	49	14.87	30	50
26/11/2009	41.7	28	15.16	30	50
2/12/2009	15.4	10	15.07	30	50
8/12/2009	125.3	86	16.31	30	50
14/12/2009	78.9	53	16.93	30	50
20/12/2009	35.9	24	17.13	30	50
26/12/2009	22.3	15	16.93	30	50
1/01/2010	11.4	8	16.79	30	50
7/01/2010	19.2	13	16.59	30	50
13/01/2010	34.7	24	16.66	30	50
19/01/2010	31.5	21	16.70	30	50
25/01/2010	34	23	16.84	30	50
31/01/2010	25.8	17	16.84	30	50
6/02/2010	12.9	9	16.61	30	50
12/02/2010	19.8	13	16.52	30	50
18/02/2010	16.1	11	16.62	30	50
24/02/2010	21.5	14	16.59	30	50
2/03/2010	14	9	16.39	30	50

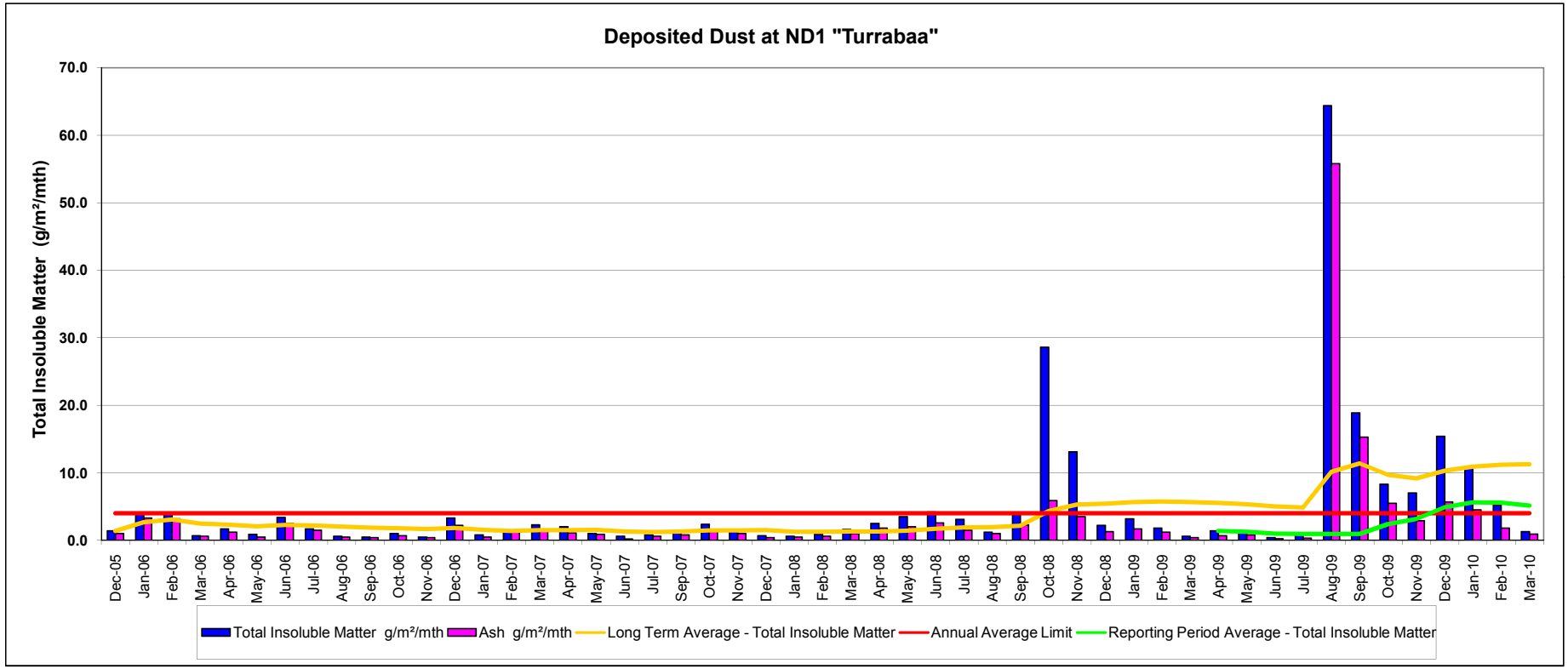
Date	mg/paper	µg/m3	Annual Average	Annual Average Limit	24hr Limit
8/03/2010	6.4	4	16.16	30	50
14/03/2010	0	<1	15.93	30	50
20/03/2010	26.9	18	15.75	30	50
26/03/2010	39.8	22	15.85	30	50



Deposited Dust - ND1 "Turrabaa"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21959.01	ND1	05-Jan-06	Dec-05	Client	1045	2710	1.4		1.4	4.0	1.0	
22569.01	ND1	03-Feb-06	Jan-06	Client	1045	205	4.0		2.7	4.0	3.3	
22720.01	ND1	09-Mar-06	Feb-06	Client	1310	1135	3.9		3.1	4.0	3.2	
23204.01	ND1	03-Apr-06	Mar-06	Client	1035	135	0.7		2.5	4.0	0.6	
23295.01	ND1	02-May-06	Apr-06	Client	0905	650	1.7		2.3	4.0	1.2	
23630.01	ND1	02-Jun-06	May-06	Client	0825	<10	0.9		2.1	4.0	0.5	
23882.01	ND1	28-Jun-06	Jun-06	Client	1641	660	3.4		2.3	4.0	2.5	
24078.01	ND1	31-Jul-06	Jul-06	Client	0920	1600	1.7		2.2	4.0	1.5	
24412.01	ND1	30-Aug-06	Aug-06	Client	1357	40	0.6		2.0	4.0	0.5	
24689.01	ND1	03-Oct-06	Sep-06	Client	1410	550	0.5		1.9	4.0	0.4	
24973.01	ND1	02-Nov-06	Oct-06	Client	1344	375	1.0		1.8	4.0	0.7	
25439.01	ND1	04-Dec-06	Nov-06	Client	1340	375	0.5		1.7	4.0	0.4	
25536.01	ND1	02-Jan-07	Dec-06	Client	1145	510	3.3		1.9	4.0	2.2	
25839.01	ND1	02-Feb-07	Jan-07	Client	1215	380	0.8		1.6	4.0	0.5	
26116.01	ND1	05-Mar-07	Feb-07	Client	1445	940	1.5		1.4	4.0	1.2	
26423.01	ND1	03-Apr-07	Mar-07	Client	1200	<50	2.3		1.5	4.0	1.4	
26626.01	ND1	02-May-07	Apr-07	Client	1200	395	2.0		1.5	4.0	1.1	
26955.01	ND1	05-Jun-07	May-07	Client	1245	1250	1.0		1.6	4.0	0.9	
27229.01	ND1	02-Jul-07	Jun-07	Client	1205	1350	0.6		1.3	4.0	0.2	
27526.01	ND1	03-Aug-07	Jul-07	Client	0815	155	0.8		1.2	4.0	0.6	
28113.01	ND1	04-Oct-07	Sep-07	Client	1245	70	1.4		1.3	4.0	0.8	
28392.01	ND1	05-Nov-07	Oct-07	Client	1445	680	2.4		1.5	4.0	1.3	
28656.01	ND1	04-Dec-07	Nov-07	Client	1120	1380	1.4		1.5	4.0	1.0	
28917.01	ND1	03-Jan-08	Dec-07	Client	1430	1770	0.7		1.5	4.0	0.4	
29219.01	ND1	04-Feb-08	Jan-08	Client	1315	1480	0.6		1.3	4.0	0.5	
29519.01	ND1	03-Mar-08	Feb-08	Client	1035	2485	0.9		1.3	4.0	0.6	
29767.01	ND1	02-Apr-08	Mar-08	Client	1155	140	1.6		1.3	4.0	1.0	
30049.01	ND1	09-May-08	Apr-08	Client	0945	530	2.5		1.3	4.0	1.8	
30380-01	ND1	02-Jun-08	May-08	Client	1342	320	3.5		1.5	4.0	2.0	
30654.01	ND1	01-Jul-08	Jun-08	Client	1330	1115	4.2		1.7	4.0	2.6	
30896.01	ND1	04-Aug-08	Jul-08	Client	1000	640	3.1		1.9	4.0	1.5	
31204.01	ND1	01-Sep-08	Aug-08	Client	1030	890	1.2		2.0	4.0	1.0	
31522.01	ND1	02-Oct-08	Sep-08	Client	0830	1925	3.8		2.2	4.0	2.3	
31769.01	ND1	03-Nov-08	Oct-08	Client	1049	1365	28.6		4.3	4.0	5.9	
32017.01	ND1	03-Dec-08	Nov-08	Client	1115	1525	13.1		5.3	4.0	3.5	
32512.01	ND1	05-Jan-09	Dec-08	Client	0935	2770	2.2		5.4	4.0	1.3	
32240.01	ND1	02-Feb-09	Jan-09	Client	0930	595	3.2		5.7	4.0	1.7	
32857.01	ND1	02-Mar-09	Feb-09	Client	0815	2600	1.8		5.7	4.0	1.2	
2600 1003-00	ND1	01-Apr-09	Mar-09	ALS		15	0.6		5.7	4.0	0.4	Insects, Bird droppings
2600 1021-00	ND1	01-May-09	Apr-09	ALS		1000	1.4	1.4	5.6	4.0	0.7	Bird droppings
2600 1031-01	ND1	01-Jun-09	May-09	ALS		900	1.1	1.3	5.4	4.0	0.8	
2600 1041-01	ND1	06-Jul-09	Jun-09	ALS		350	0.4	1.0	5.0	4.0	0.3	Insects
2600 1053-01	ND1	03-Aug-09	Jul-09	ALS	0915	600	0.9	0.9	4.9	4.0	0.3	Insects, Bird Droppings, Plant Material
2600 1065-00	ND1	31-Aug-09	Aug-09	ALS	0925	100	64.4	0.9	10.1	4.0	55.8	Insects, Bird Droppings, Plant Material
2600 1065-00	ND1	28-Sep-09	Sep-09	ALS	0925	800	18.9	0.9	11.4	4.0	15.3	Insects, Bird Droppings, Plant Material

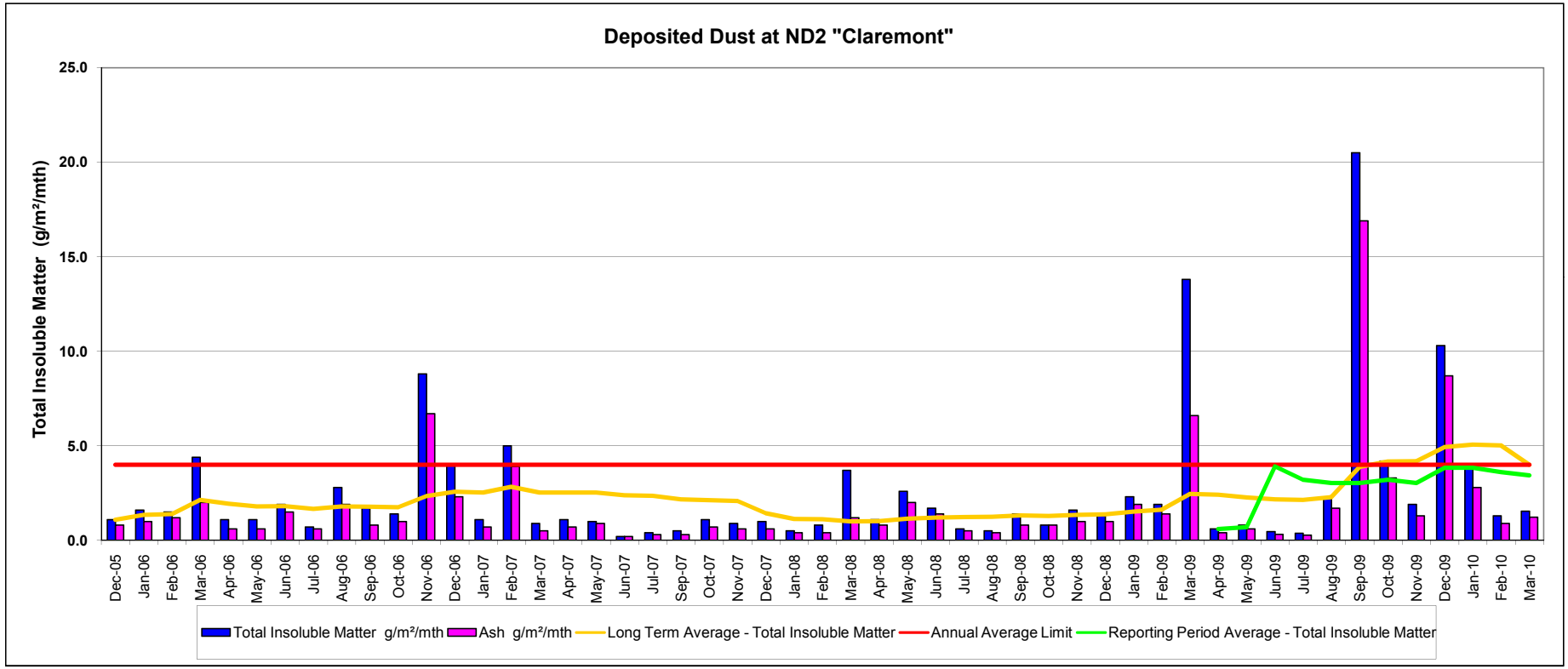
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1125-00	ND1	03-Nov-09	Oct-09	ALS	1007	900	8.3	2.4	9.7	4.0	5.5	Insects, Bird Droppings, Plant Material
2600 1204-115	ND1	01-Dec-09	Nov-09	ALS	0950	100	7.0	3.2	9.2	4.0	2.9	Insects, Bird droppings
2600 1222-00	ND1	31-Dec-09	Dec-09	ALS	0955	2200	15.4	4.9	10.3	4.0	5.7	Insects, Plant Material
2600 1234-00	ND1	01-Feb-10	Jan-10	ALS	1120	2200	10.7	5.6	10.9	4.0	4.5	Insects, Bird Droppings, Plant Material
2600 1247-00	ND1	03-Mar-10	Feb-10	ALS	1030	1100	5.2	5.6	11.2	4.0	1.8	Insects, Bird Droppings, Plant Material
2600 1260	ND1	31-Mar-10	Mar-10	ALS	0945	500	1.3	5.2	11.2	4.0	0.9	Insects, Plant Material



Deposited Dust - ND2 "Claremont"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21959.02	ND2	05-Jan-06	Dec-05	Client	1105	2750	1.1		1.1	4.0	0.8	
22569.02	ND2	03-Feb-06	Jan-06	Client	1355	475	1.6		1.4	4.0	1.0	
22720.02	ND2	09-Mar-06	Feb-06	Client	1245	1175	1.5		1.4	4.0	1.2	
23204.02	ND2	03-Apr-06	Mar-06	Client	1055	225	4.4		2.2	4.0	2.0	
23295.02	ND2	02-May-06	Apr-06	Client	0900	775	1.1		1.9	4.0	0.6	
23630.02	ND2	02-Jun-06	May-06	Client	0840	<10	1.1		1.8	4.0	0.6	
23882.02	ND2	28-Jun-06	Jun-06	Client	1650	800	1.9		1.8	4.0	1.5	
24078.02	ND2	31-Jul-06	Jul-06	Client	0923	1700	0.7		1.7	4.0	0.6	
24412.02	ND2	30-Aug-06	Aug-06	Client	1407	40	2.8		1.8	4.0	1.9	
24689.02	ND2	03-Oct-06	Sep-06	Client	1422	750	1.7		1.8	4.0	0.8	
24973.02	ND2	02-Nov-06	Oct-06	Client	1341	450	1.4		1.8	4.0	1.0	
25439.02	ND2	04-Dec-06	Nov-06	Client	1310	950	8.8		2.3	4.0	6.7	
25536.02	ND2	02-Jan-07	Dec-06	Client	1155	750	4.0		2.6	4.0	2.3	
25839.02	ND2	02-Feb-07	Jan-07	Client	1220	320	1.1		2.5	4.0	0.7	
26116.02	ND2	05-Mar-07	Feb-07	Client	1345	1080	5.0		2.8	4.0	3.9	
26423.02	ND2	03-Apr-07	Mar-07	Client	0955	200	0.9		2.5	4.0	0.5	
26626.02	ND2	02-May-07	Apr-07	Client	1100	400	1.1		2.5	4.0	0.7	
26955.02	ND2	05-Jun-07	May-07	Client	1145	1350	1.0		2.5	4.0	0.9	
27229.02	ND2	02-Jul-07	Jun-07	Client	1215	1565	0.2		2.4	4.0	0.2	
27526.02	ND2	03-Aug-07	Jul-07	Client	0835	210	0.4		2.4	4.0	0.3	
28113.02	ND2	04-Oct-07	Sep-07	Client	1140	50	0.5		2.2	4.0	0.3	
28392.02	ND2	05-Nov-07	Oct-07	Client	1500	635	1.1		2.1	4.0	0.7	
28656.02	ND2	04-Dec-07	Nov-07	Client	1130	1140	0.9		2.1	4.0	0.6	
28917.02	ND2	03-Jan-08	Dec-07	Client	1440	1800	1.0		1.4	4.0	0.6	
29219.02	ND2	04-Feb-08	Jan-08	Client	1325	1410	0.5		1.1	4.0	0.4	
29219.02	ND2	03-Mar-08	Feb-08	Client	1045	2065	0.8		1.1	4.0	0.4	
29767.02	ND2	02-Apr-08	Mar-08	Client	1110	85	3.7		1.0	4.0	1.2	
30049.02	ND2	09-May-08	Apr-08	Client	0855	480	1.1		1.0	4.0	0.8	
30380-02	ND2	02-Jun-08	May-08	Client	1230	175	2.6		1.2	4.0	2.0	
30654.02	ND2	01-Jul-08	Jun-08	Client	1225	1075	1.7		1.2	4.0	1.4	
30896.02	ND2	04-Aug-08	Jul-08	Client	1010	625	0.6		1.2	4.0	0.5	
31204.02	ND2	01-Sep-08	Aug-08	Client	1040	980	0.5		1.3	4.0	0.4	
31522.02	ND2	02-Oct-08	Sep-08	Client	0840	1815	1.4		1.3	4.0	0.8	
31769.02	ND2	03-Nov-08	Oct-08	Client	1106	1080	0.8		1.3	4.0	0.8	
32017.02	ND2	03-Dec-08	Nov-08	Client	1200	1675	1.6		1.4	4.0	1.0	
32512.02	ND2	05-Jan-09	Dec-08	Client	0943	2765	1.3		1.4	4.0	1.0	
32240.02	ND2	02-Feb-09	Jan-09	Client	0950	635	2.3		1.5	4.0	1.9	
32857.02	ND2	02-Mar-09	Feb-09	Client	0845	2580	1.9		1.6	4.0	1.4	
2600 1003-00	ND2	01-Apr-09	Mar-09	ALS		15	13.8		2.5	4.0	6.6	Insects, Bird droppings
2600 1021-00	ND2	01-May-09	Apr-09	ALS		1000	0.6	0.6	2.4	4.0	0.4	Insects, Bird droppings
2600 1031-01	ND2	01-Jun-09	May-09	ALS		900	0.8	0.7	2.3	4.0	0.6	
2601 1041-01	ND2	06-Jul-09	Jun-09	ALS		400	0.5	3.9	2.2	4.0	0.3	Insects
2601 1053-01	ND2	03-Aug-09	Jul-09	ALS	0920	550	0.4	3.2	2.2	4.0	0.3	Insects, Bird Droppings, Plant Material
2600 1065-00	ND2	31-Aug-09	Aug-09	ALS	0935	100	2.2	3.0	2.3	4.0	1.7	Insects, Plant Material
2600 1065-00	ND2	28-Sep-09	Sep-09	ALS	1300	1000	20.5	3.0	3.9	4.0	16.9	Insects, Plant Material

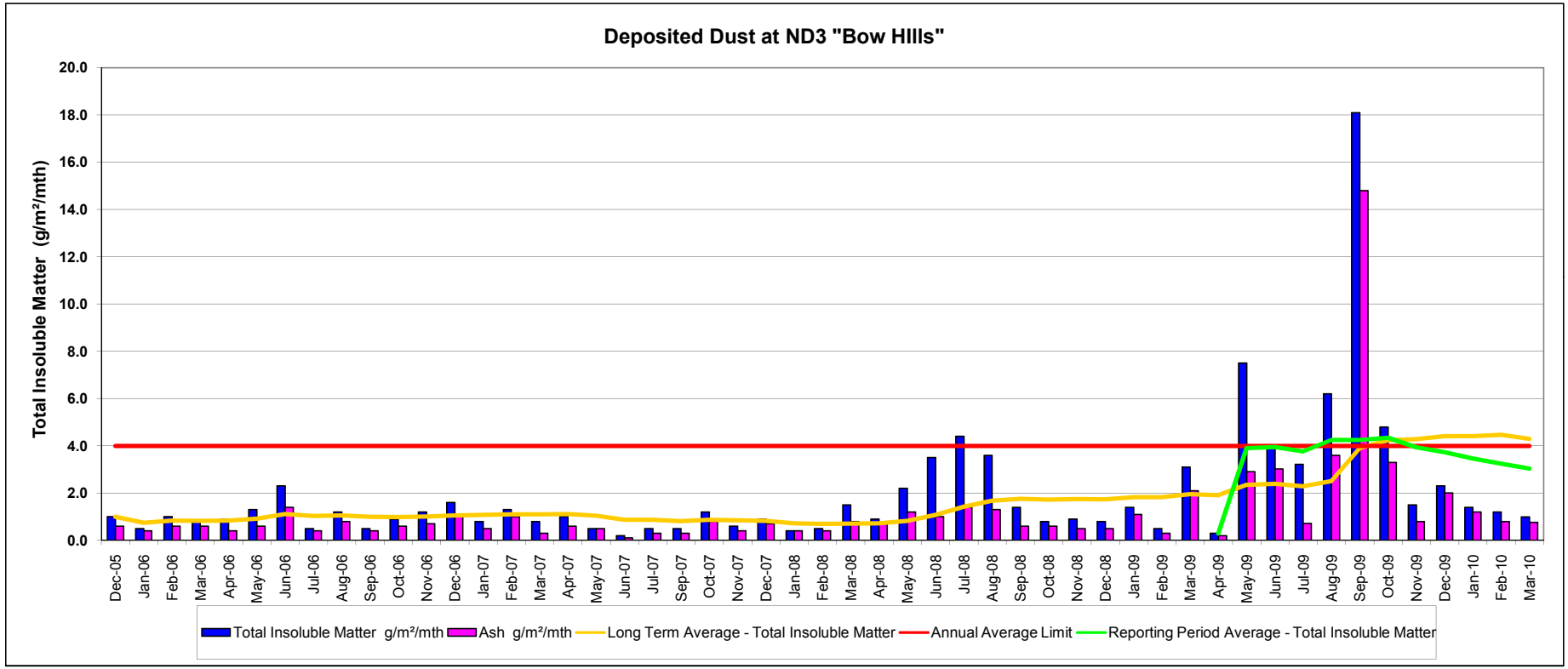
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1125-00	ND2	03-Nov-09	Oct-09	ALS	1012	900	4.2	3.2	4.2	4.0	3.3	Insects, Bird Droppings
2600 1204-115	ND2	01-Dec-09	Nov-09	ALS	0956	100	1.9	3.0	4.2	4.0	1.3	Insects
2600 1222-00	ND2	31-Dec-09	Dec-09	ALS	1030	2400	10.3	3.8	4.9	4.0	8.7	Insects
2600 1234-00	ND2	01-Feb-10	Jan-10	ALS	1125	2200	3.8	3.8	5.1	4.0	2.8	Insects, Plant Material
2600 1247-00	ND2	03-Mar-10	Feb-10	ALS	1035	1100	1.3	3.6	5.0	4.0	0.9	Insects, Plant Material
2600 1260	ND2	31-Mar-10	Mar-10	ALS	0955	600	1.5	3.4	4.0	4.0	1.2	Insects, Plant Material



Deposited Dust - ND3 "Bow Hills"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21959.03	ND3	05-Jan-06	Dec-05	Client	1040	2550	1.0		1.0	4.0	0.6	
22569.03	ND3	03-Feb-06	Jan-06	Client	1340	475	0.5		0.8	4.0	0.4	
22720.03	ND3	09-Mar-06	Feb-06	Client	1235	1285	1.0		0.8	4.0	0.6	
23204.03	ND3	03-Apr-06	Mar-06	Client	1100	350	0.8		0.8	4.0	0.6	
23295.03	ND3	02-May-06	Apr-06	Client	0845	700	0.9		0.8	4.0	0.4	
23630.03	ND3	02-Jun-06	May-06	Client	0815	<10	1.3		0.9	4.0	0.6	
23882.03	ND3	28-Jun-06	Jun-06	Client	1630	660	2.3		1.1	4.0	1.4	
24078.03	ND3	31-Jul-06	Jul-06	Client	0930	1550	0.5		1.0	4.0	0.4	
24412.03	ND3	30-Aug-06	Aug-06	Client	1502	75	1.2		1.1	4.0	0.8	
24689.03	ND3	03-Oct-06	Sep-06	Client	1059	700	0.5		1.0	4.0	0.4	
24973.03	ND3	02-Nov-06	Oct-06	Client	1352	365	0.9		1.0	4.0	0.6	
25439.03	ND3	04-Dec-06	Nov-06	Client	1215	770	1.2		1.0	4.0	0.7	
25536.03	ND3	02-Jan-07	Dec-06	Client	1130	600	1.6		1.1	4.0	1.1	
25839.03	ND3	02-Feb-07	Jan-07	Client	1115	560	0.8		1.1	4.0	0.5	
26116.03	ND3	05-Mar-07	Feb-07	Client	1255	890	1.3		1.1	4.0	1.0	
26423.03	ND3	03-Apr-07	Mar-07	Client	0900	220	0.8		1.1	4.0	0.3	
26626.03	ND3	02-May-07	Apr-07	Client	1050	500	1.0		1.1	4.0	0.6	
26955.03	ND3	05-Jun-07	May-07	Client	1100	1285	0.5		1.1	4.0	0.5	
27229.03	ND3	02-Jul-07	Jun-07	Client	1405	1350	0.2		0.9	4.0	0.1	
27526.03	ND3	03-Aug-07	Jul-07	Client	0950	265	0.5		0.9	4.0	0.3	
28113.03	ND3	04-Oct-07	Sep-07	Client	1250	25	0.5		0.8	4.0	0.3	
28392.03	ND3	05-Nov-07	Oct-07	Client	1545	785	1.2		0.9	4.0	0.8	
28656.03	ND3	04-Dec-07	Nov-07	Client	1255	1370	0.6		0.9	4.0	0.4	
28917.03	ND3	03-Jan-08	Dec-07	Client	1545	1560	0.9		0.8	4.0	0.7	
29219.03	ND3	04-Feb-08	Jan-08	Client	1400	1365	0.4		0.7	4.0	0.4	
29219.03	ND3	03-Mar-08	Feb-08	Client	1630	1885	0.5		0.7	4.0	0.4	
29767.03	ND3	02-Apr-08	Mar-08	Client	1210	130	1.5		0.7	4.0	0.8	
30049.03	ND3	09-May-08	Apr-08	Client	1005	405	0.9		0.7	4.0	0.7	
30380-03	ND3	02-Jun-08	May-08	Client	1400	220	2.2		0.8	4.0	1.2	
30654.03	ND3	01-Jul-08	Jun-08	Client	1350	1060	3.5		1.1	4.0	1.0	
30896.03	ND3	04-Aug-08	Jul-08	Client	1055	685	4.4		1.4	4.0	1.4	
31204.03	ND3	01-Sep-08	Aug-08	Client	1147	945	3.6		1.7	4.0	1.3	
31522.03	ND3	02-Oct-08	Sep-08	Client	1000	1645	1.4		1.8	4.0	0.6	
31769.03	ND3	03-Nov-08	Oct-08	Client	1222	1395	0.8		1.7	4.0	0.6	
32017.03	ND3	03-Dec-08	Nov-08	Client	1106	1710	0.9		1.8	4.0	0.5	
32512.03	ND3	05-Jan-09	Dec-08	Client	1108	2760	0.8		1.7	4.0	0.5	
32240.03	ND3	02-Feb-09	Jan-09	Client	1145	465	1.4		1.8	4.0	1.1	
32857.03	ND3	02-Mar-09	Feb-09	Client	1118	2420	0.5		1.8	4.0	0.3	
2600 1003-00	ND3	01-Apr-09	Mar-09	ALS		100	3.1		2.0	4.0	2.1	Insects
2600 1021-00	ND3	01-May-09	Apr-09	ALS		800	0.3	0.3	1.9	4.0	0.2	
2600 1031-01	ND3	01-Jun-09	May-09	ALS		800	7.5	3.9	2.4	4.0	2.9	Bird droppings, plant material
2602 1041-01	ND3	06-Jul-09	Jun-09	ALS		350	4.0	3.9	2.4	4.0	3.0	Bird Droppings, Insects
2602 1053-01	ND3	03-Aug-09	Jul-09	ALS	1100	450	3.2	3.8	2.3	4.0	0.7	Insects, Bird Droppings, Plant Material
2600 1065-00	ND3	31-Aug-09	Aug-09	ALS	1155	100	6.2	4.2	2.5	4.0	3.6	Insects, Bird Droppings, Plant Material
2600 1065-00	ND3	28-Sep-09	Sep-09	ALS	1451	600	18.1	4.2	3.9	4.0	14.8	Insects, Bird Droppings

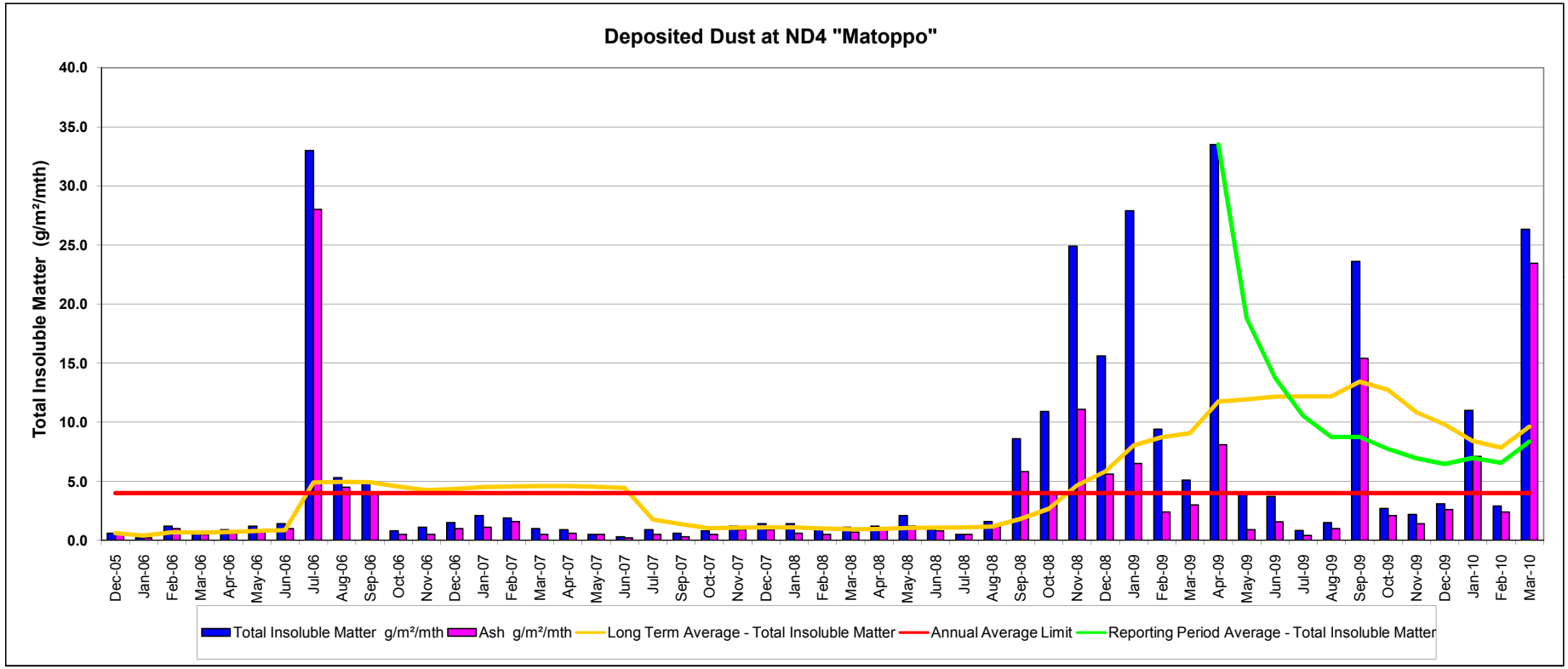
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1125-00	ND3	03-Nov-09	Oct-09	ALS	1111	700	4.8	4.3	4.2	4.0	3.3	Insects, Plant Material
2600 1204-115	ND3	01-Dec-09	Nov-09	ALS	1155	100	1.5	3.9	4.3	4.0	0.8	Bird droppings, Plant Material
2600 1222-00	ND3	31-Dec-09	Dec-09	ALS	1142	2300	2.3	3.7	4.4	4.0	2.0	Insects
2600 1234-00	ND3	01-Feb-10	Jan-10	ALS	1220	2200	1.4	3.5	4.4	4.0	1.2	Insects
2600 1247-00	ND3	03-Mar-10	Feb-10	ALS	1240	1200	1.2	3.2	4.5	4.0	0.8	Insects, Plant Material
2600 1260	ND3	31-Mar-10	Mar-10	ALS	1230	500	1.0	3.0	4.3	4.0	0.8	Insects, Plant Material



Deposited Dust - ND4 "Matoppo"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21959.04	ND4	05-Jan-06	Dec-05	Client	1010	2280	0.6		0.6	4.0	0.5	
22569.04	ND4	03-Feb-06	Jan-06	Client	1430	<10	0.2		0.4	4.0	0.2	
22720.04	ND4	09-Mar-06	Feb-06	Client	1215	980	1.2		0.7	4.0	1.0	
23204.04	ND4	03-Apr-06	Mar-06	Client	1115	250	0.6		0.7	4.0	0.5	
23295.04	ND4	02-May-06	Apr-06	Client	0830	600	0.9		0.7	4.0	0.6	
23630.04	ND4	02-Jun-06	May-06	Client	0755	<10	1.2		0.8	4.0	0.7	
23882.04	ND4	28-Jun-06	Jun-06	Client	1745	575	1.4		0.9	4.0	1.0	
24078.04	ND4	31-Jul-06	Jul-06	Client	0800	1450	33.0		4.9	4.0	28.0	
24412.04	ND4	30-Aug-06	Aug-06	Client	1453	20	5.3		4.9	4.0	4.5	
25689.04	ND4	03-Oct-06	Sep-06	Client	1110	550	4.8		4.9	4.0	4.1	
24973.04	ND4	02-Nov-06	Oct-06	Client	1307	200	0.8		4.5	4.0	0.5	
25439.04	ND4	04-Dec-06	Nov-06	Client	1225	325	1.1		4.3	4.0	0.5	
25536.04	ND4	02-Jan-07	Dec-06	Client	1330	420	1.5		4.3	4.0	1.0	
25839.04	ND4	02-Feb-07	Jan-07	Client	1135	75	2.1		4.5	4.0	1.1	
26116.04	ND4	05-Mar-07	Feb-07	Client	1310	625	1.9		4.6	4.0	1.6	
26423.04	ND4	03-Apr-07	Mar-07	Client	0915	115	1.0		4.6	4.0	0.5	
26626.04	ND4	02-May-07	Apr-07	Client	1015	415	0.9		4.6	4.0	0.6	
26955.04	ND4	05-Jun-07	May-07	Client	1110	975	0.5		4.5	4.0	0.5	
27229.04	ND4	02-Jul-07	Jun-07	Client	1330	1330	0.3		4.4	4.0	0.2	
27526.04	ND4	03-Aug-07	Jul-07	Client	1005	110	0.9		1.8	4.0	0.5	
28113.04	ND4	04-Oct-07	Sep-07	Client	1305	35	0.6		1.4	4.0	0.3	
28392.04	ND4	05-Nov-07	Oct-07	Client	1605	605	0.8		1.0	4.0	0.5	
28656.04	ND4	04-Dec-07	Nov-07	Client	1225	1040	1.2		1.1	4.0	0.9	
28917.04	ND4	03-Jan-08	Dec-07	Client	1555	1540	1.4		1.1	4.0	0.9	
29219.04	ND4	04-Feb-08	Jan-08	Client	1415	1535	1.4		1.1	4.0	0.6	
29219.04	ND4	03-Mar-08	Feb-08	Client	1515	1505	1.0		1.0	4.0	0.5	
29767.04	ND4	02-Apr-08	Mar-08	Client	1220	80	1.1		0.9	4.0	0.7	
30049.04	ND4	09-May-08	Apr-08	Client	1020	455	1.2		0.9	4.0	0.9	
30380-04	ND4	02-Jun-08	May-08	Client	1410	120	2.1		1.0	4.0	1.2	
30654.04	ND4	01-Jul-08	Jun-08	Client	1400	790	0.9		1.1	4.0	0.8	
30896.04	ND4	04-Aug-08	Jul-08	Client	1105	455	0.5		1.1	4.0	0.5	
31204.04	ND4	01-Sep-08	Aug-08	Client	1200	800	1.6		1.2	4.0	1.2	
31522.04	ND4	02-Oct-08	Sep-08	Client	0945	1285	8.6		1.8	4.0	5.8	
31769.04	ND4	03-Nov-08	Oct-08	Client	1236	1350	10.9		2.7	4.0	4.0	
32017.04	ND4	03-Dec-08	Nov-08	Client	1310	1455	24.9		4.6	4.0	11.1	
32512.04	ND4	05-Jan-09	Dec-08	Client	1057	2175	15.6		5.8	4.0	5.6	
32240.04	ND4	02-Feb-09	Jan-09	Client	1130	440	27.9		8.0	4.0	6.5	
32857.04	ND4	02-Mar-09	Feb-09	Client	1045	1970	9.4		8.7	4.0	2.4	
2600 1003-00	ND4	01-Apr-09	Mar-09	ALS		100	5.1		9.1	4.0	3.0	Bird Droppings
2600 1021-00	ND4	01-May-09	Apr-09	ALS		800	33.5	33.5	11.8	4.0	8.1	Insects, Bird droppings
2600 1031-01	ND4	01-Jun-09	May-09	ALS		800	4.1	18.8	11.9	4.0	0.9	Bird droppings, plant material
2603 1041-01	ND4	06-Jul-09	Jun-09	ALS		350	3.7	13.8	12.2	4.0	1.6	Bird Droppings, Insects
2603 1053-01	ND4	03-Aug-09	Jul-09	ALS	1050	450	0.8	10.5	12.2	4.0	0.4	Insects, Plant Material
2600 1065-00	ND4	31-Aug-09	Aug-09	ALS	1140	100	1.5	8.7	12.2	4.0	1.0	Insects, Plant Material
2600 1065-00	ND4	28-Sep-09	Sep-09	ALS	1440	600	23.6	8.7	13.4	4.0	15.4	Insects, Bird Droppings, Plant Material

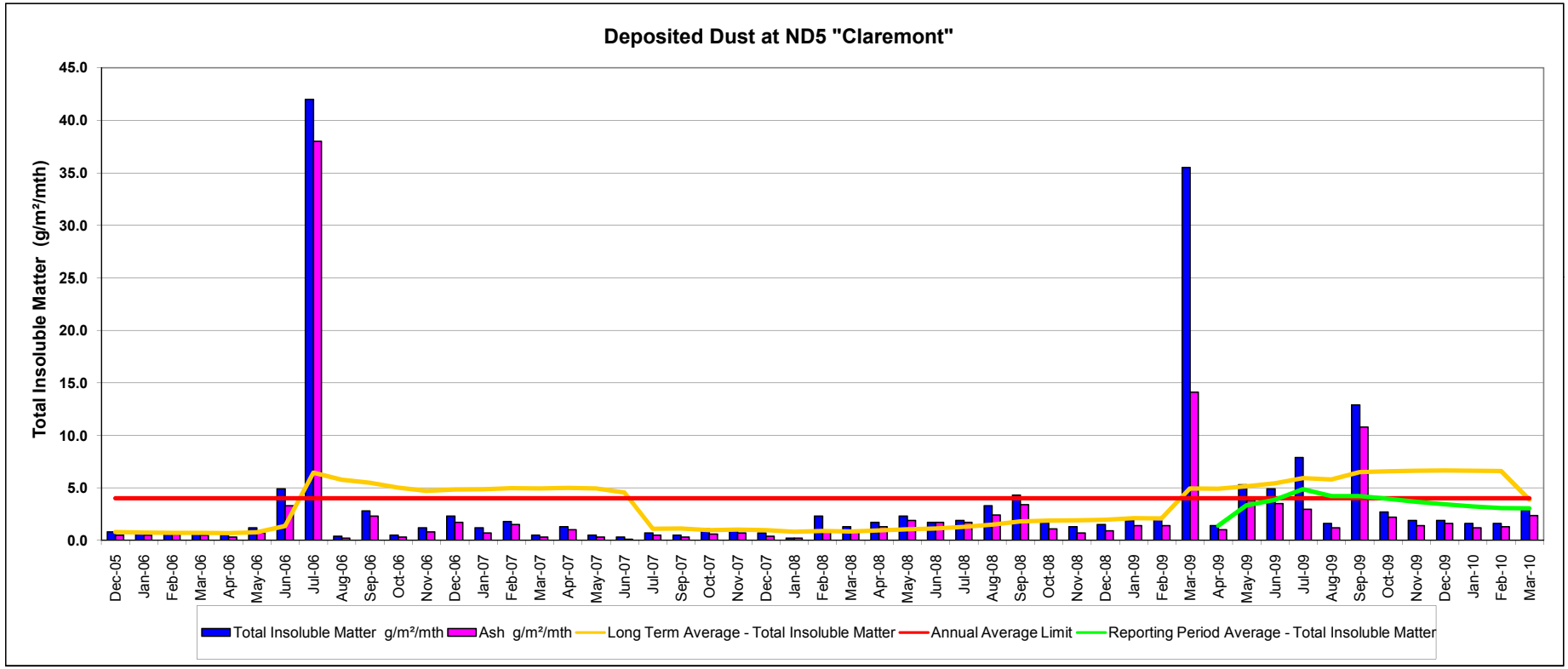
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1125-00	ND4	03-Nov-09	Oct-09	ALS	1100	700	2.7	7.7	12.7	4.0	2.1	Insects, Plant Material
2600 1204-115	ND4	01-Dec-09	Nov-09	ALS	1125	20	2.2	6.9	10.8	4.0	1.4	Insects, Bird Droppings, Plant Material
2600 1222-00	ND4	31-Dec-09	Dec-09	ALS	1100	2400	3.1	6.5	9.8	4.0	2.6	
2600 1234-00	ND4	01-Feb-10	Jan-10	ALS	1210	1600	11.0	7.0	8.4	4.0	7.1	Insects, Bird Droppings, Plant Material
2600 1247-00	ND4	03-Mar-10	Feb-10	ALS	1225	1000	2.9	6.6	7.9	4.0	2.4	Insects
2600 1260	ND4	31-Mar-10	Mar-10	ALS	1215	600	26.3	8.4	9.6	4.0	23.4	Insects, Plant Material



Deposited Dust - ND5 "Claremont"

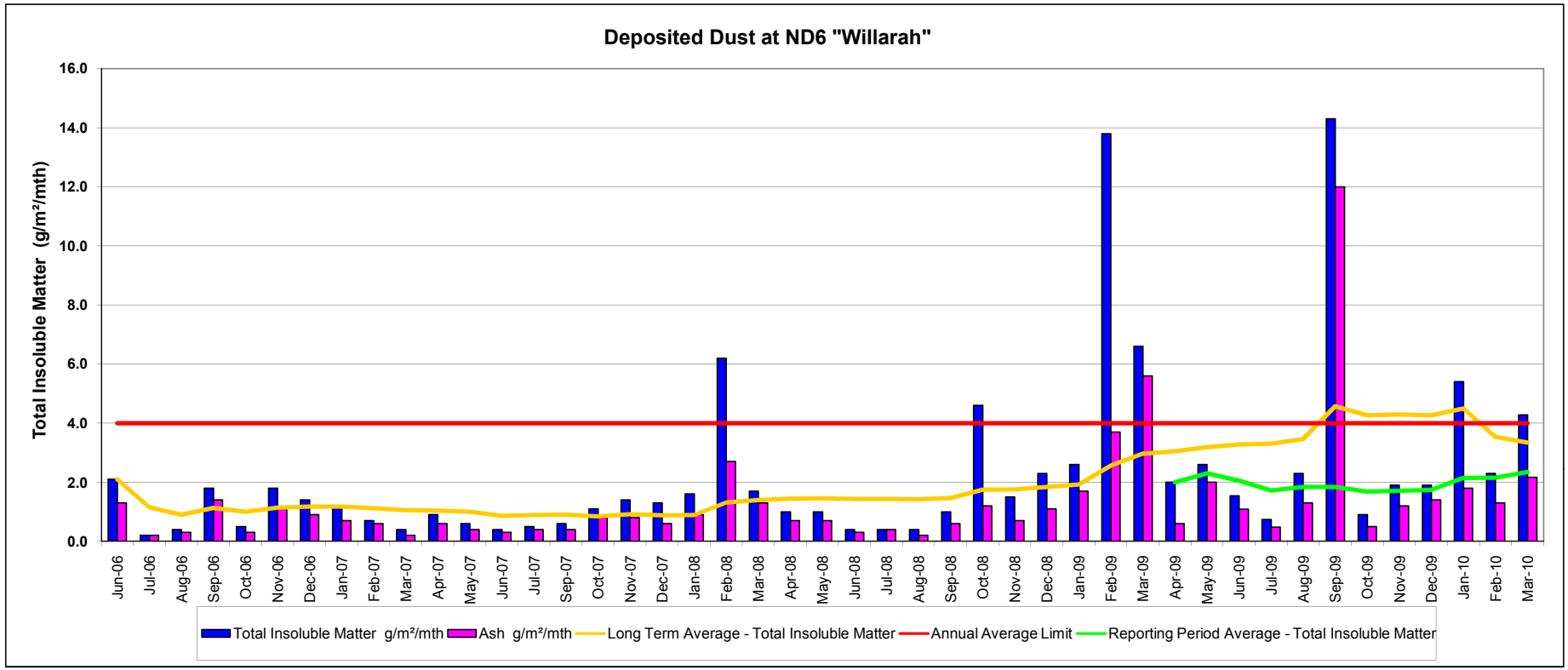
Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
21959.05	ND5	05-Jan-06	Dec-05	Client	1050	1360	0.8		0.8	4.0	0.5	
22569.05	ND5	03-Feb-06	Jan-06	Client	1405	125	0.7		0.8	4.0	0.5	
22720.05	ND5	09-Mar-06	Feb-06	Client	1310	950	0.7		0.7	4.0	0.6	
23204.05	ND5	03-Apr-06	Mar-06	Client	1045	125	0.7		0.7	4.0	0.5	
23295.05	ND5	02-May-06	Apr-06	Client	0910	500	0.6		0.7	4.0	0.3	
23630.05	ND5	02-Jun-06	May-06	Client	0830	<10	1.2		0.8	4.0	0.7	
23882.05	ND5	28-Jun-06	Jun-06	Client	1732	610	4.9		1.4	4.0	3.3	
24078.05	ND5	31-Jul-06	Jul-06	Client	0810	1430	42.0		6.5	4.0	38.0	
24412.05	ND5	30-Aug-06	Aug-06	Client	1446	30	0.4		5.8	4.0	0.2	
25689.05	ND5	03-Oct-06	Sep-06	Client	1120	700	2.8		5.5	4.0	2.3	
24973.05	ND5	02-Nov-06	Oct-06	Client	1313	345	0.5		5.0	4.0	0.3	
25439.05	ND5	04-Dec-06	Nov-06	Client	1235	620	1.2		4.7	4.0	0.8	
25536.05	ND5	02-Jan-07	Dec-06	Client	1340	620	2.3		4.8	4.0	1.7	
25839.05	ND5	02-Feb-07	Jan-07	Client	1155	260	1.2		4.9	4.0	0.7	
26114.05	ND5	05-Mar-07	Feb-07	Client	1320	880	1.8		5.0	4.0	1.5	
26423.05	ND5	03-Apr-07	Mar-07	Client	0925	170	0.5		5.0	4.0	0.3	
26626.05	ND5	02-May-07	Apr-07	Client	1030	380	1.3		5.0	4.0	1.0	
26955.05	ND5	05-Jun-07	May-07	Client	1120	1150	0.5		5.0	4.0	0.3	
27229.05	ND5	02-Jul-07	Jun-07	Client	1345	1310	0.3		4.6	4.0	0.1	
27526.05	ND5	03-Aug-07	Jul-07	Client	1015	185	0.7		1.1	4.0	0.5	
28113.05	ND5	04-Oct-07	Sep-07	Client	1310	45	0.5		1.1	4.0	0.3	
28392.05	ND5	05-Nov-07	Oct-07	Client	1610	625	1.1		1.0	4.0	0.6	
28656.05	ND5	04-Dec-07	Nov-07	Client	1235	1210	1.0		1.0	4.0	0.7	
28917.05	ND5	03-Jan-08	Dec-07	Client	1605	1335	0.7		1.0	4.0	0.4	
29219.05	ND5	04-Feb-08	Jan-08	Client	1425	1235	0.2		0.8	4.0	0.2	
29219.05	ND5	03-Mar-08	Feb-08	Client	1545	1985	2.3		0.9	4.0	0.8	
29767.05	ND5	02-Apr-08	Mar-08	Client	1245	100	1.3		0.9	4.0	0.9	
30049.05	ND5	09-May-08	Apr-08	Client	1050	425	1.7		1.0	4.0	1.3	
30380-05	ND5	02-Jun-08	May-08	Client	1440	190	2.3		1.1	4.0	1.9	
30654.05	ND5	01-Jul-08	Jun-08	Client	1425	870	1.7		1.2	4.0	1.7	
30896.05	ND5	04-Aug-08	Jul-08	Client	1115	510	1.9		1.3	4.0	1.7	
31204.05	ND5	01-Sep-08	Aug-08	Client	1210	840	3.3		1.5	4.0	2.4	
31522.05	ND5	02-Oct-08	Sep-08	Client	0935	1495	4.3		1.8	4.0	3.4	
31769.05	ND5	03-Nov-08	Oct-08	Client	1250	1220	1.9		1.9	4.0	1.1	
32017.05	ND5	03-Dec-08	Nov-08	Client	1250	1440	1.3		1.9	4.0	0.7	
32512.05	ND5	05-Jan-09	Dec-08	Client	1030	2760	1.5		2.0	4.0	0.9	
32240.05	ND5	02-Feb-09	Jan-09	Client	1115	450	1.9		2.1	4.0	1.4	
32857.05	ND5	02-Mar-09	Feb-09	Client	1000	2300	2.0		2.1	4.0	1.4	
2600 1003-00	ND5	01-Apr-09	Mar-09	ALS		100	35.5		4.9	4.0	14.1	Insects, Bird droppings
2600 1021-00	ND5	01-May-09	Apr-09	ALS		800	1.4	1.4	4.9	4.0	1.0	Bird droppings
2600 1031-01	ND5	01-Jun-09	May-09	ALS		750	5.3	3.4	5.2	4.0	3.8	Plant material
2604 1041-01	ND5	06-Jul-09	Jun-09	ALS		400	4.9	3.9	5.4	4.0	3.5	Insects, Plant Material
2604 1053-01	ND5	03-Aug-09	Jul-09	ALS	1035	450	7.9	4.9	5.9	4.0	3.0	Insects, Bird Droppings
2600 1065-00	ND5	31-Aug-09	Aug-09	ALS	1113	100	1.6	4.2	5.8	4.0	1.2	Insects, Plant Material
2600 1065-00	ND5	28-Sep-09	Sep-09	ALS	1428	700	12.9	4.2	6.5	4.0	10.8	Insects, Plant Material

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
2600 1125-00	ND5	03-Nov-09	Oct-09	ALS	1050	800	2.7	4.0	6.6	4.0	2.2	Insects, Bird Droppings
2600 1204-115	ND5	01-Dec-09	Nov-09	ALS	1116	100	1.9	3.7	6.6	4.0	1.4	Insects, Plant Material
2600 1222-00	ND5	31-Dec-09	Dec-09	ALS	1115	2400	1.9	3.4	6.7	4.0	1.6	
2600 1234-00	ND5	01-Feb-10	Jan-10	ALS	1205	1800	1.6	3.2	6.6	4.0	1.2	Insects, Plant Material
2600 1247-00	ND5	03-Mar-10	Feb-10	ALS	1210	1000	1.6	3.1	6.6	4.0	1.3	Insects
2600 1260	ND5	31-Mar-10	Mar-10	ALS	1150	600	2.9	3.1	3.9	4.0	2.3	Insects, Plant Material



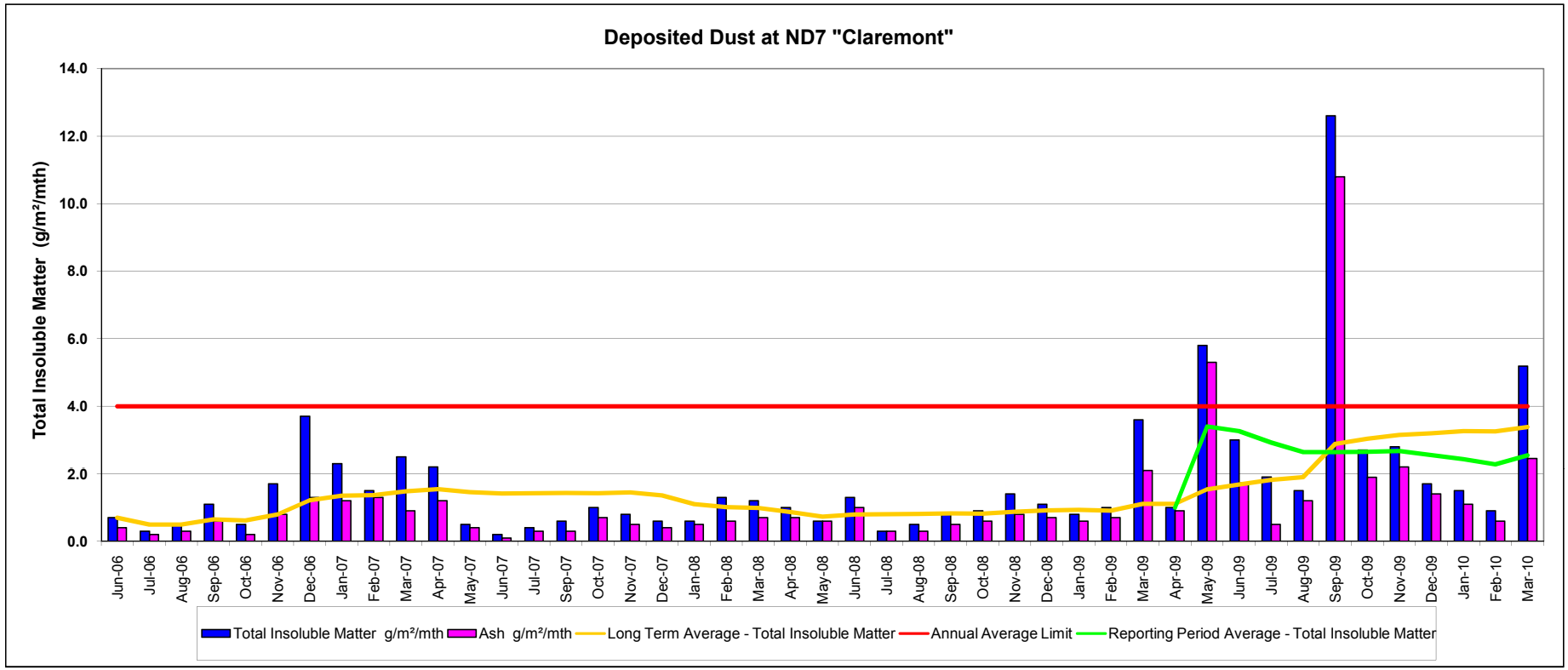
Deposited Dust - ND6 "Willarah"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
23882.06	ND6	28-Jun-06	Jun-06	Client	1720	60	2.1		2.1	4.0	1.3	
24078.06	ND6	31-Jul-06	Jul-06	Client	0830	1280	0.2		1.2	4.0	0.2	
24412.06	ND6	30-Aug-06	Aug-06	Client	1438	30	0.4		0.9	4.0	0.3	
25689.06	ND6	03-Oct-06	Sep-06	Client	1131	400	1.8		1.1	4.0	1.4	
24973.06	ND6	02-Nov-06	Oct-06	Client	1318	255	0.5		1.0	4.0	0.3	
25439.06	ND6	04-Dec-06	Nov-06	Client	1245	560	1.8		1.1	4.0	1.1	
25536.06	ND6	02-Jan-07	Dec-06	Client	1350	280	1.4		1.2	4.0	0.9	
25839.06	ND6	02-Feb-07	Jan-07	Client	1145	60	1.2		1.2	4.0	0.7	
26114.06	ND6	05-Mar-07	Feb-07	Client	1330	890	0.7		1.1	4.0	0.6	
26423.06	ND6	03-Apr-07	Mar-07	Client	0930	<50	0.4		1.1	4.0	0.2	
26626.06	ND6	02-May-07	Apr-07	Client	1035	435	0.9		1.0	4.0	0.6	
26955.06	ND6	05-Jun-07	May-07	Client	1127	1105	0.6		1.0	4.0	0.4	
27229.06	ND6	02-Jul-07	Jun-07	Client	1350	1305	0.4		0.9	4.0	0.3	
27526.06	ND6	03-Aug-07	Jul-07	Client	1025	105	0.5		0.9	4.0	0.4	
28113.06	ND6	04-Oct-07	Sep-07	Client	1325	75	0.6		0.9	4.0	0.4	
28392.06	ND6	05-Nov-07	Oct-07	Client	1620	595	1.1		0.8	4.0	0.8	
28656.06	ND6	04-Dec-07	Nov-07	Client	1245	880	1.4		0.9	4.0	0.8	
28917.06	ND6	03-Jan-08	Dec-07	Client	1615	1445	1.3		0.9	4.0	0.6	
29219.06	ND6	04-Feb-08	Jan-08	Client	1440	925	1.6		0.9	4.0	0.9	
29219.06	ND6	03-Mar-08	Feb-08	Client	1600	1750	6.2		1.3	4.0	2.7	
29767.06	ND6	02-Apr-08	Mar-08	Client	1255	160	1.7		1.4	4.0	1.3	
30049.06	ND6	09-May-08	Apr-08	Client	1055	345	1.0		1.4	4.0	0.7	
30380-06	ND6	02-Jun-08	May-08	Client	1450	190	1.0		1.5	4.0	0.7	
30654.06	ND6	01-Jul-08	Jun-08	Client	1435	885	0.4		1.4	4.0	0.3	
30896.06	ND6	04-Aug-08	Jul-08	Client	1120	595	0.4		1.4	4.0	0.4	
31204.06	ND6	01-Sep-08	Aug-08	Client	1215	695	0.4		1.4	4.0	0.2	
31522.06	ND6	02-Oct-08	Sep-08	Client	0920	1465	1.0		1.5	4.0	0.6	
31769.06	ND6	03-Nov-08	Oct-08	Client	1300	1295	4.6		1.8	4.0	1.2	
32017.06	ND6	03-Dec-08	Nov-08	Client	1300	1505	1.5		1.8	4.0	0.7	
32512.06	ND6	05-Jan-09	Dec-08	Client	1022	2750	2.3		1.8	4.0	1.1	
32240.06	ND6	02-Feb-09	Jan-09	Client	1103	480	2.6		1.9	4.0	1.7	
32857.06	ND6	02-Mar-09	Feb-09	Client	0950	1900	13.8		2.6	4.0	3.7	
2600 1003-00	ND6	01-Apr-09	Mar-09	ALS		100	6.6		3.0	4.0	5.6	Insects, frogs
2600 1021-00	ND6	01-May-09	Apr-09	ALS		600	2.0	2.0	3.1	4.0	0.6	Insects, Bird droppings
2600 1031-01	ND6	01-Jun-09	May-09	ALS		750	2.6	2.3	3.2	4.0	2.0	
2605 1041-01	ND6	06-Jul-09	Jun-09	ALS		400	1.5	2.0	3.3	4.0	1.1	Insects
2605 1053-01	ND6	03-Aug-09	Jul-09	ALS	1030	500	0.7	1.7	3.3	4.0	0.5	Insects, Plant Material
2600 1065-00	ND6	31-Aug-09	Aug-09	ALS	1105	100	2.3	1.8	3.5	4.0	1.3	Insects, Plant Material
2600 1065-00	ND6	28-Sep-09	Sep-09	ALS	1420	700	14.3	1.8	4.6	4.0	12.0	Insects, Plant Material
2600 1125-00	ND6	03-Nov-09	Oct-09	ALS	1045	800	0.9	1.7	4.3	4.0	0.5	Bird Droppings, Plant Material
2600 1204-115	ND6	01-Dec-09	Nov-09	ALS	1110	50	1.9	1.7	4.3	4.0	1.2	Insects, Plant Material
2600 1222-00	ND6	31-Dec-09	Dec-09	ALS	1125	2400	1.9	1.7	4.3	4.0	1.4	Bird Droppings
2600 1234-00	ND6	01-Feb-10	Jan-10	ALS	1200	1800	5.4	2.1	4.5	4.0	1.8	Insects, Plant Material
2600 1247-00	ND6	03-Mar-10	Feb-10	ALS	1215	900	2.3	2.2	3.5	4.0	1.3	Insects, Bird Droppings
2600 1260	ND6	31-Mar-10	Mar-10	ALS	1200	500	4.3	2.4	3.3	4.0	2.2	Insects, Plant Material


Deposited Dust at ND6 "Willarah"
Total Insoluble Matter (g/m²/mth)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Total Insoluble Matter g/m²/mth
Ash g/m²/mth
Long Term Average - Total Insoluble Matter
Annual Average Limit
Reporting Period Average - Total Insoluble Matter

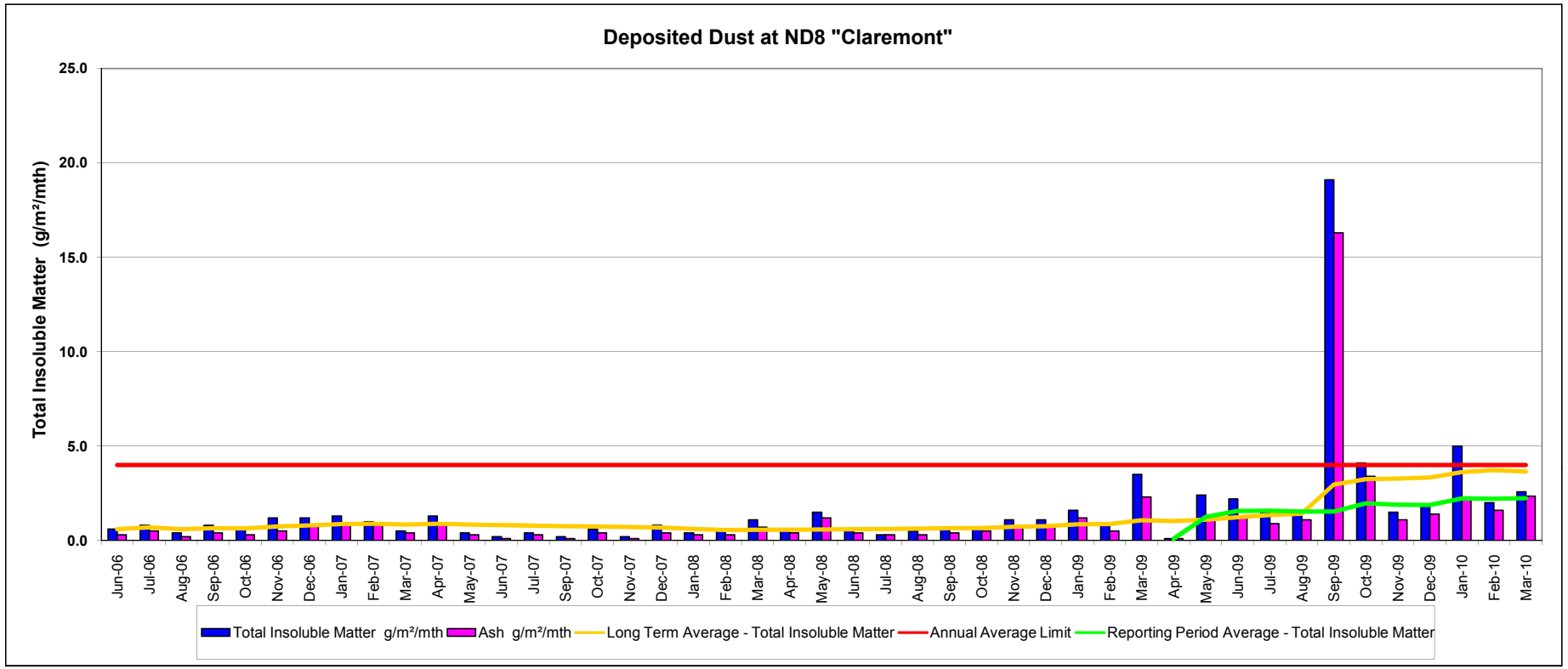
Deposited Dust - ND7 "Claremont"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
23882.07	ND7	28-Jun-06	Jun-06	Client	1709	90	0.7		0.7	4.0	0.4	
24078.07	ND7	31-Jul-06	Jul-06	Client	0845	1375	0.3		0.5	4.0	0.2	
24412.07	ND7	30-Aug-06	Aug-06	Client	1426	35	0.5		0.5	4.0	0.3	
25689.07	ND7	03-Oct-06	Sep-06	Client	1440	600	1.1		0.7	4.0	0.6	
24973.07	ND7	02-Nov-06	Oct-06	Client	1328	340	0.5		0.6	4.0	0.2	
25439.07	ND7	04-Dec-06	Nov-06	Client	1255	780	1.7		0.8	4.0	0.8	
25536.07	ND7	02-Jan-07	Dec-06	Client	1205	700	3.7		1.2	4.0	1.3	
25839.07	ND7	02-Feb-07	Jan-07	Client	1230	140	2.3		1.4	4.0	1.2	
26114.07	ND7	05-Mar-07	Feb-07	Client	1355	925	1.5		1.4	4.0	1.3	
26423.07	ND7	03-Apr-07	Mar-07	Client	1000	205	2.5		1.5	4.0	0.9	
26626.07	ND7	02-May-07	Apr-07	Client	1120	290	2.2		1.5	4.0	1.2	
26955.07	ND7	05-Jun-07	May-07	Client	1150	1025	0.5		1.5	4.0	0.4	
27299.07	ND7	02-Jul-07	Jun-07	Client	1225	1270	0.2		1.4	4.0	0.1	
27526.07	ND7	03-Aug-07	Jul-07	Client	0845	205	0.4		1.4	4.0	0.3	
28113.07	ND7	04-Oct-07	Sep-07	Client	1150	60	0.6		1.4	4.0	0.3	
28392.07	ND7	05-Nov-07	Oct-07	Client	1505	630	1.0		1.4	4.0	0.7	
28656.07	ND7	04-Dec-07	Nov-07	Client	1140	1050	0.8		1.5	4.0	0.5	
28917.07	ND7	03-Jan-08	Dec-07	Client	1510	1610	0.6		1.4	4.0	0.4	
29219.07	ND7	04-Feb-08	Jan-08	Client	1335	1580	0.6		1.1	4.0	0.5	
29219.07	ND7	03-Mar-08	Feb-08	Client	1000	1565	1.3		1.0	4.0	0.6	
29767.07	ND7	02-Apr-08	Mar-08	Client	1130	105	1.2		1.0	4.0	0.7	
30049.07	ND7	09-May-08	Apr-08	Client	0920	355	1.0		0.9	4.0	0.7	
30380-07	ND7	02-Jun-08	May-08	Client	1255	170	0.6		0.7	4.0	0.6	
30654.07	ND7	01-Jul-08	Jun-08	Client	1250	985	1.3		0.8	4.0	1.0	
30896.07	ND7	04-Aug-08	Jul-08	Client	1040	475	0.3		0.8	4.0	0.3	
31204.07	ND7	01-Sep-08	Aug-08	Client	1115	695	0.5		0.8	4.0	0.3	
31522.07	ND7	02-Oct-08	Sep-08	Client	0910	1340	0.8		0.8	4.0	0.5	
31769.07	ND7	03-Nov-08	Oct-08	Client	1140	1290	0.9		0.8	4.0	0.6	
32017.07	ND7	03-Dec-08	Nov-08	Client	1220	1345	1.4		0.9	4.0	0.8	
32512.07	ND7	05-Jan-09	Dec-08	Client	1009	2495	1.1		0.9	4.0	0.7	
32240.07	ND7	02-Feb-09	Jan-09	Client	1027	695	0.8		0.9	4.0	0.6	
32857.07	ND7	02-Mar-09	Feb-09	Client	0926	1950	1.0		0.9	4.0	0.7	
2600 1003-00	ND7	01-Apr-09	Mar-09	ALS		100	3.6		1.1	4.0	2.1	Insects, Bird droppings
2600 1021-00	ND7	01-May-09	Apr-09	ALS		800	1.0	1.0	1.1	4.0	0.9	Insects
2600 1031-01	ND7	01-Jun-09	May-09	ALS		750	5.8	3.4	1.5	4.0	5.3	Plant material
2606 1041-01	ND7	06-Jul-09	Jun-09	ALS		450	3.0	3.3	1.7	4.0	1.7	Insects, Plant Material
2606 1053-01	ND7	03-Aug-09	Jul-09	ALS	1015	400	1.9	2.9	1.8	4.0	0.5	Insects, Bird Droppings, Plant Material
2600 1065-00	ND7	31-Aug-09	Aug-09	ALS	1050	75	1.5	2.6	1.9	4.0	1.2	Insects, Plant Material
2600 1065-00	ND7	28-Sep-09	Sep-09	ALS	1410	600	12.6	2.6	2.9	4.0	10.8	Insects
2600 1125-00	ND7	03-Nov-09	Oct-09	ALS	1034	850	2.7	2.7	3.0	4.0	1.9	Insects, Plant Material
2600 1204-115	ND7	01-Dec-09	Nov-09	ALS	1100	100	2.8	2.7	3.2	4.0	2.2	Insects, Plant Material
2600 1222-00	ND7	04-Jan-10	Dec-09	ALS	1230	2500	1.7	2.6	3.2	4.0	1.4	Insects, Plant Material
2600 1234-00	ND7	01-Feb-10	Jan-10	ALS	1140	400	1.5	2.4	3.3	4.0	1.1	Insects, Plant Material
2600 1247-00	ND7	03-Mar-10	Feb-10	ALS	1150	800	0.9	2.3	3.3	4.0	0.6	Insects
2600 1260	ND7	31-Mar-10	Mar-10	ALS	1130	600	5.2	2.5	3.4	4.0	2.5	Insects, Plant Material


Deposited Dust at ND7 "Claremont"
Total Insoluble Matter (g/m²/mth)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Total Insoluble Matter g/m²/mth
Ash g/m²/mth
Long Term Average - Total Insoluble Matter
Annual Average Limit
Reporting Period Average - Total Insoluble Matter

Deposited Dust - ND8 "Claremont"

Sample Number	Sample Location	Sample Date	Sample Month	Sampler	Time: (d)	Volume Collected (ml)	Total Insoluble Matter g/m²/mth	Reporting Period Average - Total Insoluble Matter	Long Term Average - Total Insoluble Matter	Annual Average Limit	Ash g/m²/mth	Comment
23882.08	ND8	28-Jun-06	Jun-06	Client	1658	75	0.6		0.6	4.0	0.3	
24078.08	ND8	31-Jul-06	Jul-06	Client	0905	1300	0.8		0.7	4.0	0.5	
24412.08	ND8	30-Aug-06	Aug-06	Client	1414	10	0.4		0.6	4.0	0.2	
25689.08	ND8	03-Oct-06	Sep-06	Client	1429	400	0.8		0.7	4.0	0.4	
24973.08	ND8	02-Nov-06	Oct-06	Client	1334	200	0.6		0.6	4.0	0.3	
25439.08	ND8	04-Dec-06	Nov-06	Client	1305	370	1.2		0.7	4.0	0.5	
25536.08	ND8	02-Jan-07	Dec-06	Client	1220	500	1.2		0.8	4.0	0.8	
25839.08	ND8	02-Feb-07	Jan-07	Client	1235	170	1.3		0.9	4.0	0.9	
26114.08	ND8	05-Mar-07	Feb-07	Client	1410	750	1.0		0.9	4.0	0.8	
26423.08	ND8	03-Apr-07	Mar-07	Client	1015	<50	0.5		0.8	4.0	0.4	
26626.08	ND8	02-May-07	Apr-07	Client	1105	285	1.3		0.9	4.0	0.9	
26955.08	ND8	05-Jun-07	May-07	Client	1200	1040	0.4		0.8	4.0	0.3	
27299.08	ND8	02-Jul-07	Jun-07	Client	1235	1265	0.2		0.8	4.0	0.1	
27526.08	ND8	03-Aug-07	Jul-07	Client	0855	100	0.4		0.8	4.0	0.3	
28113.08	ND8	04-Oct-07	Sep-07	Client	1155	20	0.2		0.8	4.0	0.1	
28392.08	ND8	05-Nov-07	Oct-07	Client	1510	570	0.6		0.7	4.0	0.4	
28656.08	ND8	04-Dec-07	Nov-07	Client	1150	755	0.2		0.7	4.0	0.1	
28917.08	ND8	03-Jan-08	Dec-07	Client	1500	1595	0.8		0.7	4.0	0.4	
29219.08	ND8	04-Feb-08	Jan-08	Client	1345	1230	0.4		0.6	4.0	0.3	
29219.08	ND8	03-Mar-08	Feb-08	Client	1125	1585	0.6		0.6	4.0	0.3	
29767.08	ND8	02-Apr-08	Mar-08	Client	1120	70	1.1		0.6	4.0	0.7	
30049.08	ND8	09-May-08	Apr-08	Client	0910	410	0.6		0.6	4.0	0.4	
30380.08	ND8	02-Jun-08	May-08	Client	1245	50	1.5		0.6	4.0	1.2	
30654.08	ND8	01-Jul-08	Jun-08	Client	1235	795	0.6		0.6	4.0	0.4	
30896.08	ND8	04-Aug-08	Jul-08	Client	1030	465	0.3		0.6	4.0	0.3	
31204.08	ND8	01-Sep-08	Aug-08	Client	1050	835	0.5		0.6	4.0	0.3	
31522.08	ND8	02-Oct-08	Sep-08	Client	0850	1510	0.6		0.7	4.0	0.4	
31769.08	ND8	03-Nov-08	Oct-08	Client	1120	1455	0.6		0.7	4.0	0.5	
32017.08	ND8	03-Dec-08	Nov-08	Client	1210	1460	1.1		0.7	4.0	0.7	
32512.08	ND8	05-Jan-09	Dec-08	Client	0955	2740	1.1		0.8	4.0	0.7	
32240.08	ND8	02-Feb-09	Jan-09	Client	1007	725	1.6		0.9	4.0	1.2	
32857.08	ND8	02-Mar-09	Feb-09	Client	0906	2250	0.8		0.9	4.0	0.5	
2600 1003-00	ND8	01-Apr-09	Mar-09	ALS		100	3.5		1.1	4.0	2.3	Insects
2600 1021-00	ND8	01-May-09	Apr-09	ALS		800	0.1	0.1	1.0	4.0	0.1	Insects
2600 1031-01	ND8	01-Jun-09	May-09	ALS		750	2.4	1.3	1.1	4.0	1.2	
2607 1041-01	ND8	06-Jul-09	Jun-09	ALS		350	2.2	1.6	1.2	4.0	1.3	Insects
2607 1053-01	ND8	03-Aug-09	Jul-09	ALS	0925	450	1.6	1.6	1.3	4.0	0.9	Insects, Plant Material
2600 1065-00	ND8	31-Aug-09	Aug-09	ALS	0940	100	1.4	1.5	1.4	4.0	1.1	Insects, Plant Material
2600 1065-00	ND8	28-Sep-09	Sep-09	ALS	1310	800	19.1	1.5	3.0	4.0	16.3	Insects
2600 1125-00	ND8	03-Nov-09	Oct-09	ALS	1018	900	4.1	2.0	3.3	4.0	3.4	Insects
2600 1204-115	ND8	01-Dec-09	Nov-09	ALS	1000	100	1.5	1.9	3.3	4.0	1.1	Insects, Plant Material
2600 1222-00	ND8	31-Dec-09	Dec-09	ALS	1015	2500	1.8	1.9	3.3	4.0	1.4	Insects
2600 1234-00	ND8	01-Feb-10	Jan-10	ALS	1130	2200	5.0	2.2	3.6	4.0	2.3	Insects, Plant Material
2600 1247-00	ND8	03-Mar-10	Feb-10	ALS	1050	1000	2.0	2.2	3.7	4.0	1.6	Insects
2600 1260	ND8	31-Mar-10	Mar-10	ALS	1010	600	2.6	2.2	3.7	4.0	2.3	Insects, Plant Material


Deposited Dust at ND8 "Claremont"
Total Insoluble Matter (g/m²/mth)
25.0
20.0
15.0
10.0
5.0
0.0
Jun-06
Jul-06
Aug-06
Sep-06
Oct-06
Nov-06
Dec-06
Jan-07
Feb-07
Mar-07
Apr-07
May-07
Jun-07
Jul-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Total Insoluble Matter g/m²/mth
Ash g/m²/mth
Long Term Average - Total Insoluble Matter
Annual Average Limit
Reporting Period Average - Total Insoluble Matter

Appendix 5

WET WEATHER DISCHARGE AND SURFACE WATER MONITORING DATA

Kurrajong Creek and Pine Creek Wet Weather Events

Sample No.	Date	Sample Location	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (TOC)	Comments
	31 July 2007	KCUS		7.9	255	22		<10	
	31 July 2007	KCDS		8	205	163		15	
	31 July 2007	KC2US		6.7	75	84		18	
	31 July 2007	KC2DS		6.7	85	21		12	
	31 July 2007	KC1US		8.2	1300	15		<10	
	31 July 2007	KC1DS		6.9	430	39		<10	
31489.01	23 September 2008	KC2US	0950	6.5	65	35	<2	-	
31489.02	23 September 2008	KC1US	1015	8.0	65	320	<2	-	
31489.03	23 September 2008	KCUS	1030	7.7	315	168	<2	-	
31489.04	23 September 2008	KCDS	1040	7.2	230	150	<2	-	
31489.05	23 September 2008	PC	1100	7.2	90	294	<2	-	
31489.06	23 September 2008	PC1	1113	7.0	90	62	<2	-	
31489.07	23 September 2008	KC1DS	1130	7.1	220	1280	<2	-	
31489.08	23 September 2008	KC2DS	1135	7.2	165	444	<2	-	
32276.01	15 December 2008	KCDS	1605	7.1	355	21	<2	-	
32276.02	15 December 2008	KC2DS	1614	6.9	95	8	<2	-	
32276.03	15 December 2008	KCUS	1623	7.5	55	6	<2	-	
32276.04	15 December 2008	PC	1645	7.2	125	12	<2	-	
32276.05	15 December 2008	PC1	1700	6.9	255	23	<2	-	
32276.06	15 December 2008	KC1DS	1713	8.2	315	42	<2	-	
32276.07	15 December 2008	KC2DS	1725	7.4	185	289	<2	-	
32373.01	29 December 2008	KC1US	1535	6.9	95	48	<2	-	
32373.02	29 December 2008	KC2US	1519	6.8	90	17	<2	-	
32373.03	29 December 2008	KCDS	1512	7.1	450	26	<2	-	
32815.01	17 February 2009	KCUS	1611	7.2	280	123	<2	-	
32815.02	17 February 2009	KC2US	1620	6.7	70	14	<2	-	
32815.03	17 February 2009	KCDS	1626	6.9	180	132	<2	-	
32815.04	17 February 2009	PC	1650	7.1	60	57	<2	-	
32815.05	17 February 2009	PC1	1708	7.1	180	38	<2	-	
32815.06	17 February 2009	KC1DS	1720	7.1	145	142	<2	-	
32815.07	17 February 2009	KC2DS	1750	7.1	105	1130	<2	-	
ES0919730-001	29 December 2009	KC2DS	1055	7.15	95	48	-	13	Oil & Grease not reported for any location due to incorrect sample bottle and insufficient sample. No site discharge - only adjacent creek samples
ES0919730-002	29 December 2009	KCDS	1100	6.94	187	33	-	11	
ES0919730-003	29 December 2009	KC2US	1105	6.67	86	4	-	16	
ES0919730-004	29 December 2009	KC1US	1115	6.7	74	47	-	6	
ES0919730-005	29 December 2009	KCUS	1125	7.05	305	52	-	9	
ES0919730-007	29 December 2009	PC	1225	7.23	83	117	-	8	
ES0919730-008	29 December 2009	KC1DS	1215	7.12	171	79	-	10	
ES1000146-001	5 January 2010	KCUS	0930	7.24	804	2	<5	10	
ES1000146-002	5 January 2010	KC1US	1000	7.42	126	8	<5	12	
ES1000146-003	5 January 2010	KCDS	1030	7.41	456	2	<5	14	
ES1000146-004	5 January 2010	SD5	1130	7.23	155	18	<5	8	
ES1000146-005	5 January 2010	PC1	1155	7.3	174	7	<5	12	
ES1000146-006	5 January 2010	PC	1215	7.38	121	8	<5	15	
ES1000146-007	5 January 2010	KC1DS	1235	7.28	419	6	<5	10	
ES1000146-008	5 January 2010	KC2DS	1250	7.47	178	22	<5	12	

Narrabri - Surface Water Monitoring

Sample No.	Date	Sample Location	Time	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)	Grease & Oil (mg/L)	Total Organic Carbon (TOC)	Comments
ES0908566-001	11 June 2009	SD1	0825	8.38	378	74	<5	8	
ES0908566-002	11 June 2009	SD2	0840	8.15	254	89	<5	5	
ES0908566-003	11 June 2009	SD3	0845	7.85	308	328	<5	11	
ES0908566-004	11 June 2009	SD4	0845	8.27	421	262	<5	7	
ES0908566-005	11 June 2009	SD5	0900	8.07	228	26	<5	16	
ES0908566-006	11 June 2009	SB1	0915	8.23	1390	11	<5	3	
ES0912774-001	26 August 2009	SD1	1115	9.54	363	8	<5	8	
ES0912774-002	26 August 2009	SD2	1125	8.33	274	28	<5	4	
ES0912774-003	26 August 2009	SD3	1142	7.97	326	141	<5	12	
ES0912774-004	26 August 2009	SD4	1150	8.37	498	66	<5	6	
ES0912774-005	26 August 2009	SD5	1205	8.25	256	24	<5	5	
ES0912774-006	26 August 2009	SB1	1225	8.37	2020	21	<5	<1	
ES0918374-001	1 December 2009	SD1	1220	8.66	722	68	<10	14	
ES0918374-002	1 December 2009	SD2	1225	8.41	374	1870	<10	5	
ES0918374-003	1 December 2009	SD3	1210	8.37	550	216	<10	7	
ES0918374-004	1 December 2009	SD4	1215	9.3	1150	204	<10	10	
ES0918374-005	1 December 2009	SD5	1230	8.68	417	52	<10	5	
ES0918374-006	1 December 2009	SB1	1200	8.82	5250	26	<10	<1	
ES0919730-006	29 December 2009	SD2	1140	7.3	198	310		7	Sampled to determine sediment load as close to full
ES1004140-001	3 March 2010	SD1	1330	8.29	326	44	<5	5	
ES1004140-002	3 March 2010	SD2	1300	8.74	271	126	<5	6	
ES1004140-003	3 March 2010	SD3	1400	8.14	286	326	<5	15	
ES1004140-004	3 March 2010	SD5	1315	8.2	218	44	<5	6	
ES1004140-005	3 March 2010	SB1	1400	8.2	947	480	<5	<2	

Appendix 6

GROUNDWATER MONITORING DATA

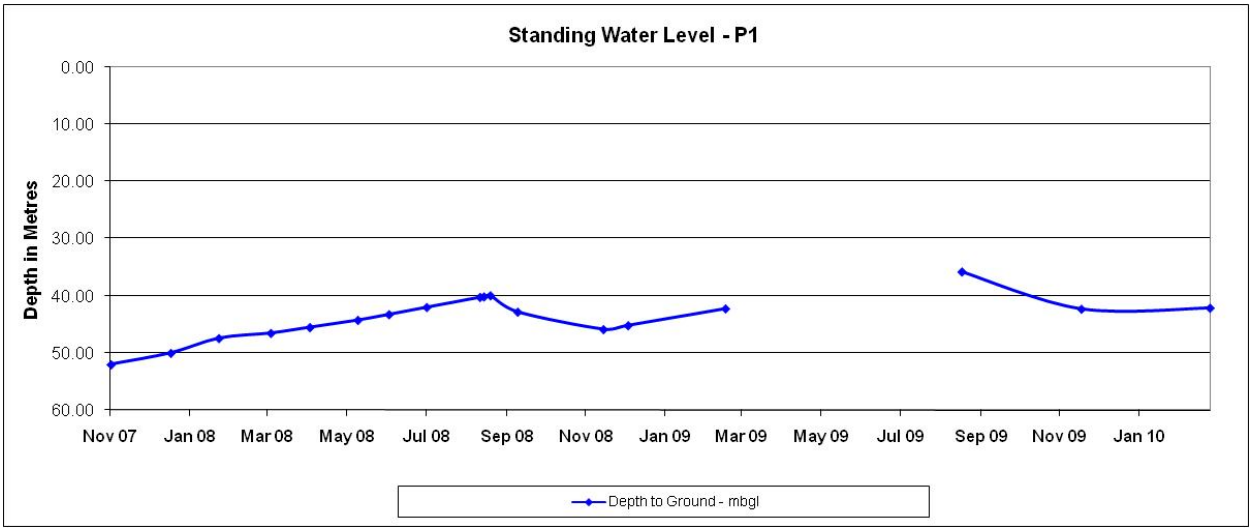
Site ID	Piezometer / Water Bore	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals														Mercury (Hg) - mg/L	pH Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	NOX as N - mg/L	Total Dissolved Solids
						pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L							
P1	NG1	1-Nov-07	1450	52.02	53.00																																				
		17-Dec-07		50.02	51.00																																				
		23-Jan-08	1145	47.43	48.42																																				
		3-Mar-08	1230	46.53	47.51																																				
		2-Apr-08	1040	45.51	46.50																																				
		9-May-08	826	44.25	45.23																																				
		2-Jun-08	1200	43.25	44.24																																				
		1-Jul-08	1150	42.00	42.98																																				
		11-Aug-08	1350	40.24	41.22																																				
		14-Aug-08	1047	40.15	41.13																																				
		19-Aug-08	0925	39.96	40.94																																				
		9-Sep-08	0830	42.82	43.80	7.6	470	20.8		0.008	0.684	0.003	0.0008	0.094	0.041	0.128	56.7	0.516	2.33	0.154	0.11	0.250	0.0001		3710	26	25	933	24	44.6	641	43	<1	<1	1190	1190	42.7	2.06	1.62				2380
		14-Nov-08	0956	45.86	46.84																																				
		3-Dec-08	1505	45.18	46.16																																				
		16-Feb-09	1255	42.24	43.22																																				
		11-Jun-09	1500							<0.001	0.237	<0.001	<0.0001	0.001	0.002	0.096	0.71	0.198	0.266	0.025	<0.1	0.235	<0.0001		3840	25	26	846	23	40.7	693	<10	<1	<1	1000	1000	39.6	1.33	0.24				2300
		17-Aug-09	0930	35.79	36.77	7.3	3920	23.5		0.009	0.954	0.002	0.0005	0.094	0.051	0.236	56.5	0.24	1.38	0.206	0.14	0.347	0.0002		4130	20	27	892	22	42.6	614	48.2	<1	<1	1120	1120	40.6	2.24	0.48				2520
		17-Nov-09	0920	42.30	43.28	7.21	2940	34.4		0.003	0.31	<0.001	0.0002	0.032	0.007	0.121	7.74	0.236	0.403	0.041	0.02	0.091	<0.0001		2370	7	20	471	13	22.8	346	40.4	<1	<1	624	624	23	0.57	0.35				1420
		24-Feb-10	1255	42.13	43.11																																				
P2	NG2	1-Nov-07	1420	30.58	31.50																																				
		17-Dec-07		29.58	30.50																																				
		23-Jan-08	1120	28.97	29.90																																				
		3-Mar-08	1655	29.48	30.40																																				
		2-Apr-08	1100	29.46	30.38																																				
		9-May-08	0846	29.45	30.38																																				
		2-Jun-08	1224	29.46	30.39																																				
		1-Jul-08	1215	29.43	30.35																																				
		11-Aug-08	1435	29.44	30.36																																				
		14-Aug-08	1105	29.45	30.37																																				
		19-Aug-08	1055	29.45	30.37																																				
		9-Sep-08	1030	29.88	30.80	7.2	15700	20.8		0.010	1.40	0.004	0.0006	0.024	0.029	0.057	33.4	0.091	2.96	0.048	0.06	0.093	<0.0001		17100	189	453	4060	126	227	5650	366	<1	<1	2550	2550	218	1.97	4.52				12900
		14-Nov-08	1012	29.64	30.56																																				
		3-Dec-08	1445	29.51	30.43																																				
		16-Feb-09	1329	29.32	30.23																																				
		11-Jun-09	1500							0.004	0.613	<0.001	<0.0001	0.016	0.021	0.025	8.81	0.124	2.44	0.039	0.02	0.108	<0.0001		19300	184	397	3770	90	208	5790	181	<1	<1	2890	2890	225	3.83	3.31				13400
		17-Aug-09	1125	29.33	30.24	6.5	33100	25.3		0.004	0.896	<0.001	0.0001	0.026	0.024	0.057	7.47	0.032	2.37	0.057	0.02	0.064	0.0002		20300	250	585	3650	83	222	5720	247	<1	<1	3000	3000	226	1.12	2.47				12800
		17-Nov-09	1020	29.31	30.22	6.58	20400	32.4		0.041	8.41	0.008	0.0009	0.215	0.103	0.463	167	0.152	4.64	0.284	0.25	0.493	0.0002		18900	6	434	3630	78	196	5300	276	<1	393	2360	2750	210	3.51	2.88				12800
		24-Feb-10	1220	29.29	30.20																																				
P3	NG3	1-Nov-07	1530	9.92	10.85																																				
		17-Dec-07		10.07	11.00																																				
		23-Jan-08	1400	9.32	10.25																																				
		3-Mar-08	1640	9.87	10.80																																				
		2-Apr-08	1200	9.89	10.83																																				
		9-May-08	1002	9.90	10.83																																				
		2-Jun-08	1353	9.90	10.84																																				
		1-Jul-08	1345	9.91	10.84																																				
		11-Aug-08	1610	9.92	10.85																																				
		9-Sep-08	1300	9.77	10.70	7.07	1340	20.2		0.005	0.092	0.002	0.0002	0.004	0.006	0.002	0.76	0.030	0.496	0.014	<0.01	0.014	<0.0001		15800	331	504	3190	60	198	5250	1230	<1	<1	1310	1310	200	0.44	0.94				11700
		14-Nov-08	0930	9.89	10.83																																				
		1-Dec-08	1120	9.86	10.80																																				
		12-Jan-09	1223	9.86	10.80																																				
		9-Dec-09	0945	9.90	10.83	6.64	18620	25.8	0.02	<0.001				<0.005		0.004	<0.05	<0.001	0.348	0.025		0.016	<0.0001	6.82	14500	257	467	3440	51	202	5230	1160	<1	<1	1270	1270	197	1.24		0.02	<0.01	<0.01	
		24-Feb-10	0920	9.90	10.83																																				
P4	NG4	1-Nov-07	1610	18.49	19.40																																				
		11-Dec-07		18.09	19.00																																				
		17-Dec-07		18.09	19.00																																				
		23-Jan-08	1225	17.82	18.73																																				
		3-Mar-08	1505	18.3	19.21																																				
		2-Apr-08	1305	18.29	19.20																																				
		9-May-08	1110	18.26	19.17																																				
		2-Jun-08	1505	18.275	19.19																																				
		1-Jul-08	1448	18.24	19.15																																				
		11-Aug-08	1703	18.19	19.10																																				
		9-Sep-08	1400	17.99	18.9	6.7	1560	21.2		0.008	0.265	0.003	<0.0001	0.005	0.033	0.006	3.93	0.027	6.20	0.024	<0.01	0.013	<0.0001		17700	355	699	4550	124	276	7650	1700	<1	<1	1840	1840	288	2.10	1.70				16800
		14-Nov-08	0920	18.16	19.06																																				
		1-Dec-08	1315	18.12	19.02																																				
		12-Jan-09	1239	18.10	19.00																																				
		23-Feb-09	1045	18.06	18.96																																				
		9-Jun-09	1100	18.55	19.40	6.9	25600	20.8		0.003	0.165	<0.001	<0.0001	0.056	0.026	0.006	14.4	0.047	4.99	0.066	0.02	0.044	<0.0001		25200	288	640	5670	86	316	7850	1470	<1	<1	2220	2220	297	3.1	0.48				16200
		24-Aug-09	1310	18.11	18.99	SWL only																																				
		18-Nov-09	1455	18.12	19.00	6.51	25700	25.1	0.04	0.004				<0.005		0.013	<0.05	0.009	3.61	0.043		0.053	<0.0001	6.73	23700	351	706	6200	115	348	8700	1560	<1	<1	1850	1820	314	5.04		<0.01	0.1	0.1	
		18-Feb-10	1100	17.88	18.76																																				
P5	NG5	1-Nov-07	1620	29.06	30.00																																				
		11-Dec-07		29.06	30.00																																				
		17-Dec-07		29.06	30.00																																				
		23-Jan-08	1240	28.36	29.30																																				
		3-Mar-08	1455	27.97	28.91																																				
		2-Apr-08	1315	27.475	28.42																																				
		9-May-08	1120	26.92	27.86																																				
		2-Jun-08	1516	26.605	27.55																																				
		1-Jul-08	1500	26.26	27.20																																				
		14-Aug-08	1515	25.78	26.72																																				
		12-Sep-08	1015	26.56	27.5	7	1050	20.8		0.007	0.368	0.003	0.0002	0.004	0.019	0.007	2.01	0.081	1.92	0.051	<0.01	0.031	<0.0001		24600	456	494	3960	71	238	7300	719	<1	<1	1860	1860	258	4.16	2.03				12700
		14-Nov-08	0908	27.06	28																																				
		1-Dec-08	1109	26.81	27.75																																				
		12-Jan-09	1249	26.41	27.35																																				
		16-Feb-09	1356	25.79	26.72																																				
		9-Jun-09	1215	25.06	25.99	6.6	25800	20.4		0.014	0.985	0.001	0.0003	0.032	0.022	0.597	19.7	0.336	1.16	0.091	0.04	1.14	0.0002		25100	361	536	5700	63	312	8230	765	<1	<1	1920	1920	286	4.19	0.91				15900
		1-Dec-09	1245	24.68	25.62	6.74	25600	25.8	<0.01	0.001				0.009		0.095	<0.05	0.008	0.659	0.053		0.167	<0.0001	6.76	20800	381	577	5830	73	322	8480	739	<1	<1	1940	1940	294	4.54		0.26	6.42	6.68	
		18-Feb-10	1115	24.99	25.93																																				

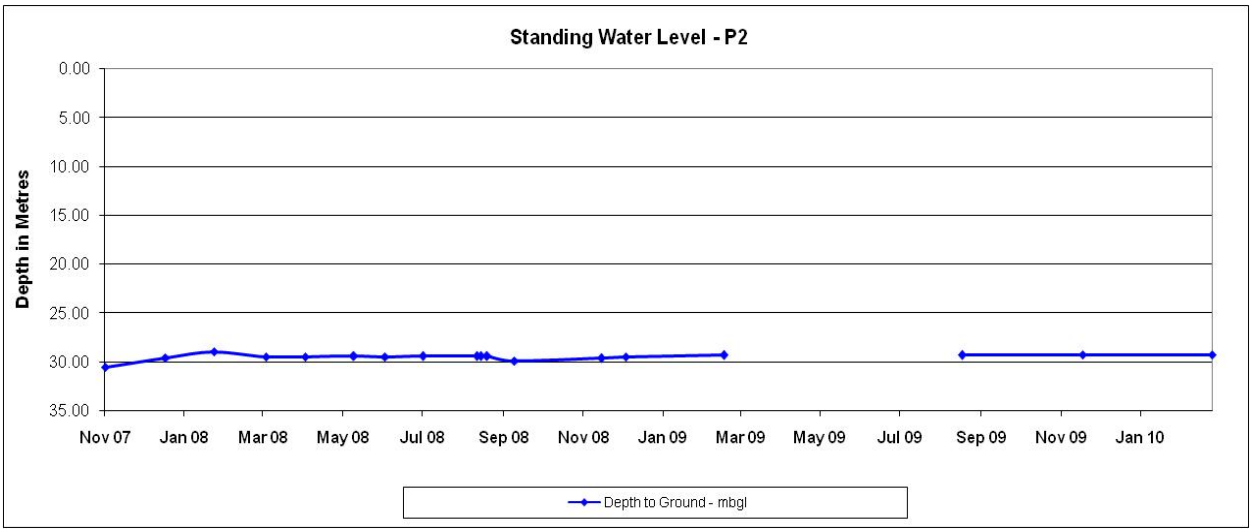
Site ID	Piezometer / Water Bore	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals															Mercury (Hg) - mg/L	pH Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	NOX as N - mg/L	Total Dissolved Solids
						pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L							
P6	NG6	1-Nov-07	1640	90.21	91.10																																						
		11-Dec-07		90.11	91.00																																						
		17-Dec-07		90.11	91.00																																						
		23-Jan-08	1315	89.37	90.26																																						
		3-Mar-08	1440	89.91	90.80																																						
		2-Apr-08	1330	89.93	90.82																																						
		9-May-08	1145	89.91	90.80																																						
		2-Jun-08	1533	89.92	90.81																																						
		1-Jul-08	1519	89.92	90.81																																						
		12-Aug-08	1055	89.86	90.75																																						
		10-Sep-08		89.11	90.00					-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Nov-08	1204	89.04	90.02																																						
		3-Dec-08	1336	89.05	90.03																																						
		23-Feb-09	1214	89.17	90.05																																						
		24-Aug-09	1400			Dry																																						
		17-Nov-09	1140			Dry																																						
		24-Feb-10	1035	89.82	90.71																																						
P7	NG7	1-Nov-07	1700	62.87	63.80																																						
		11-Dec-07		62.07	63.00																																						
		17-Dec-07		62.07	63.00																																						
		23-Jan-08	1335	90.47	91.40																																						
		3-Mar-08	1425	90.00	90.93																																						
		2-Apr-08	1400	91.07	92.00																																						
		9-May-08	1202	89.52	90.45																																						
		2-Jun-08	1553	92.07	93.00																																						
		1-Jul-08	1544	92.07	93.00																																						
		12-Aug-08	1135	91.07	92.00																																						
		10-Sep-08	1115	62.87	63.80	7.95	1170	20.5		<0.001	0.031	<0.001	<0.0001	0.005	0.003	0.006	0.79	0.117	0.095	0.005	<0.01	0.033	<0.0001		149	1	1	25	3	1.33	26	4	<1	<1	19	19	1.20		0.55				101
		14-Nov-08	1213	91.08	92.00																																						
		3-Dec-08	1350	91.08	92.00																																						
		23-Feb-09	1240	89.17	90.10																																						
		9-Jun-09	1425			Dry																																						
		24-Aug-09	1415	86.26	87.20	8.9	170	22.4		<0.001	0.064	<0.001	0.0002	0.007	0.004	0.016	2.72	0.022	0.074	0.012	<0.01	0.066	<0.0001		147	3	1	18	3	1.27	26.2	3.47	<1	<1	24	24	1.27		<0.01				107
		17-Nov-09	1230	62.84	63.78	5.52	212	25		<0.001	0.029	<0.001	0.0001	0.004	0.002	0.053	0.49	0.047	0.023	0.013	<0.01	0.173	<0.0001		160	2	1	19	3	1.11	27	3.09	<1	<1	22	22	1.27	-	<0.01				95
		24-Feb-10	1105	63.04	63.98																																						
P8	NC-110S	3-Mar-08	1345	62.23	63.00																																						
		2-Apr-08	1415	50.52	51.29																																						
		9-May-08	1220	50.59	51.36																																						
		2-Jun-08	1608	62.23	63.00																																						
		1-Jul-08	1558	50.57	51.34																																						
		12-Aug-08	1230	50.62	51.39																																						
		19-Aug-08	1515	50.63	51.40																																						
		12-Sep-08	830	50.53	51.30	7.85	1120	21.2		<0.001	0.057	<0.001	<0.0001	<0.001	<0.001	0.001	0.09	0.004	0.037	<0.001	<0.01	0.007	<0.0001		805	33	10	121	9	7.96	64	20	<1	<1	276	276	7.74	1.35	0.14				455
		14-Nov-08	1247	50.55	51.33																																						
		3-Dec-08	1414	50.44	51.22																																						
		23-Feb-09	1326	50.48	51.30																																						
		09-Jun-09	1445			SWL >50				0.003	0.192	<0.001	0.0002	0.004	0.004	0.382	3.62	0.374	0.364	0.016	<0.01	0.967	<0.0001		490	29	8	59	7	4.85	44	<10	<1	<1	171	171	4.66	1.99	<0.01				360
		24-Aug-09	1500	50.20	51.24	SWL only																																					
		17-Nov-09	1330	50.32	51.36	7.45	414	25.2		<0.001	0.121	<0.001	0.0001	<0.001	<0.001	0.014	0.52	0.019	0.117	0.005	<0.01	0.07	<0.0001		423	12	4	57	6	3.59	27.2	10.3	<1	<1	137	137	3.72	1.81	0.06				240
		24-Feb-10	1130	50.36	51.40																																						
P9	GWB5S	3-Mar-08	1105	19.88	20.52																																						
		2-Apr-08	1135	19.88	20.52																																						
		9-May-08	929	19.87	20.51																																						
		2-Jun-08	1300	19.89	20.53																																						
		1-Jul-08	1255	19.86	20.50																																						
		14-Aug-08	1217	19.90	20.54																																						
		12-Sep-08	1230	19.66	20.30	6.8	1210	22.1		0.002	0.059	<0.001	0.0001	0.004	0.003	0.014	1.32	0.036	0.037	0.012	<0.01	0.042	<0.0001		451	30	12	43	5	4.51	42	24	<1	<1	139	139	4.46	0.52	0.13				295
		14-Nov-08	1103	19.80	20.44																																						
		01-Dec-08	1219	19.77	20.41																																						
		12-Jan-09	0930	19.79	20.43																																						
		23-Feb-09	0938	19.80	20.45																																						
		17-Aug-09	1430	19.70	20.51	6.7	22500	24		<0.001	0.077	<0.001	<0.0001	0.003	0.002	0.01	6.94	0.001	0.122	<0.005	<0.01	0.009	<0.0001		23000	402	635	3560	62	229	7150	1830	<1	<1	641	641	253	4.96	1.6				16000
		18-Nov-09	1120	19.64	20.45	6.61	22870	28.1	0.04	<0.001				<0.005		0.005	0.38	<0.001	0.127	0.004		<0.005	<0.0001	6.63	21200	249	535	3830	74	225	7260	1720	<1	<1	392	392	248	5.02		<0.01	<0.01	<0.01	
		17-Feb-10	1120	19.72	20.53																																						
P10	NC-030D	3-Mar-08	1315	15.56	16.53																																						
		2-Apr-08	1425	15.64	16.61																																						
		9-May-08	1230	15.88	16.85																																						
		2-Jun-08	1623	16.03	17.00																																						
		1-Jul-08	1610	15.13	16.10																																						
		14-Aug-08	1635	16.31	17.28																																						
		9-Sep-08	1700	20.03	21.00	7.92	1130	20.8		0.002	1.59	0.001	<0.0001	0.006	0.002	0.004	0.92	0.024	2.13	0.005	<0.01	0.023	<0.0001		6800	155	80	1490	30	79.9	2410	188	<1	<1	546	546	82.9	1.88	1.73				4170
		14-Nov-08	1301	53.36	54.33																																						
		3-Dec-08	1432	51.73	52.70																																						
		12-Jan-09	1130	47.89	48.86																																						
		23-Feb-09	1355	43.72	44.68																																						
		11-Jun-09	1540	31.95	32.93					<0.001	1.4	<0.001	<0.0001	0.002	0.003	0.034	0.15	0.027	1.57	0.015	<0.01	0.249	<0.0001		7610	134	74	1490	31	78.6	2160	40	<1	<1	774	774	77.1	0.9	<0.01				4370
		24-Aug-09	1530	44.98	45.96	SWL only																																					
		17-Nov-09	1400	41.83	42.81	7.4	8350	25.2		0.001	1.34	<0.001	<0.0001	0.002	<0.001	0.014	0.31	0.035	1.35	0.018	<0.01	0.12	<0.0001		3200	41	78	1550	30	76.8	2250	64.8	<1	<1	760	760	30.9	2.11	1.27				4610
		24-Feb-10	1150	39.10	40.08																																						
P11	NC-030S	3-Mar-08	1320	22.18	23.17																																						
		2-Apr-08	1430	22.14	23.13																																						
		9-May-08	1232	22.26	23.25																																						
		2-Jun-08	1620	22.30	23.29																																						
		1-Jul-08	1612	22.33	23.32																																						
		12-Aug-08	1248	22.39	23.38																																						
		12-Sep-08	0730	22.91	23.90	8.23	980	17.6		0.004	0.162	<0.001	<0.0001	<0.001	0.089	0.004	0.81	0.006	2.98	0.159	<0.01	0.016	<0.0001		2490	89	40	341	4	22.7	581	16	<1	<1	248	248	21.7	2.24	0.04				1330
		14-Nov-08	1258	23.02	24.01																																						
		3-Dec-08	1430	23.01	24.00																																						
		12-Jan-09	1125	23.01	24.00																																						
		23-Feb-09	1400	22.98	23.95																																						
		11-Jun-09	1525	22.88	23.98					0.007	0.303	<0.001	0.0014	0.003	0.082	0.069	3.6	0.092	3.22	0.194	0.02	0.46	<0.0001		3230	122	54	495	6	32.2	878	<1	<1	<1	335	335	31.5	1.15	<0.01				1890
		24-Aug-09	1530	24.19	25.18	SWL only																																					
		17-Nov-09	1420	24.79	25.78	7.34	34900	25		0.005	0.303	<0.001	0.0004	0.001	0.09	0.048	0.57	0.056	2.43	0.215	<0.01	0.294	<0.0001		3200	64	48	493	6	28.7	863	10.2	<1	<1	320	320	30.9	3.68	<0.1				1870
		24-Feb-10	1150	24.30	25.29																																						

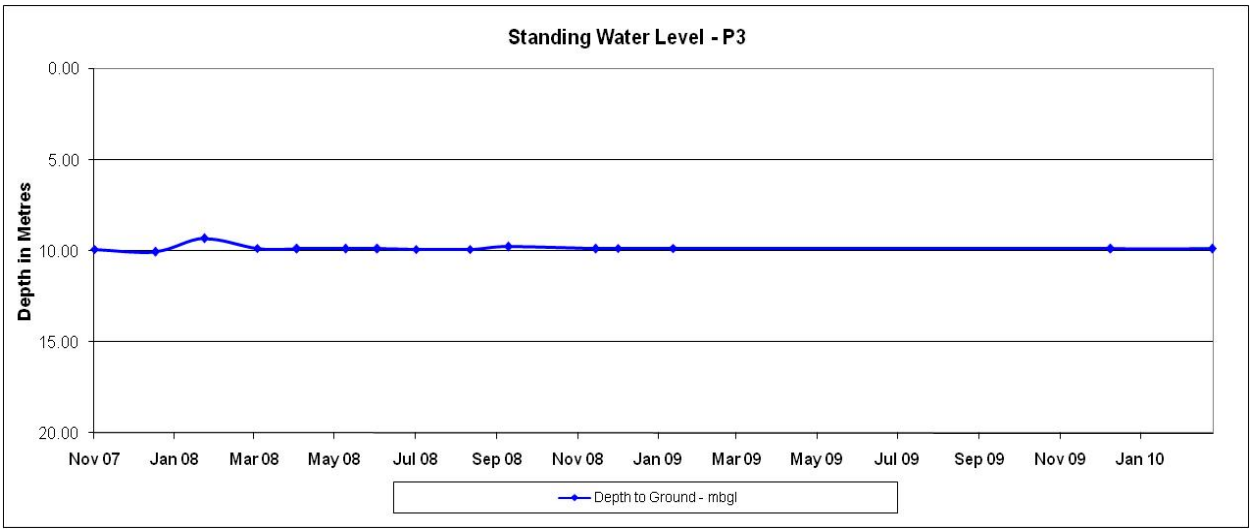
Site ID	Piezometer / Water Bore	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals															Mercury (Hg) - mg/L	pH Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	NOX as N - mg/L	Total Dissolved Solids
						pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L							
P12	NC-098D	3-Mar-08	1135	36.70	37.51																																					
		2-Apr-08	1145	37.72	38.53																																					
		9-May-08	0937	36.75	37.56																																					
		2-Jun-08	1312	36.78	37.59																																					
		1-Jul-08	1300	36.79	37.60																																					
		11-Aug-08		36.54	37.35																																					
		12-Sep-08	1130	36.49	37.30	6.8	1020	21.5		0.007	0.022	<0.001	<0.0001	0.002	0.008	0.002	0.67	0.132	0.053	0.002	<0.01	0.189	<0.0001		367	30	10	28	5	3.62	24	16	<1	<1	131	131	3.63	0.14	0.08				226
		14-Nov-08	1047	36.72	37.61																																					
		01-Dec-08	1200	36.67	37.56																																					
		12-Jan-09	0915	36.66	37.57																																					
		18-Feb-09	1233	36.72	37.52																																					
		17-Aug-09	1245	37.18	37.99	7.3	2540	23.8		0.006	0.163	<0.001	0.0004	0.005	0.211	0.008	3	0.009	3.37	0.218	<0.01	0.04	<0.0001		2530	82	49	453	6	28	370	8.67	<1	<1	864	864	27.9	0.1	0.09				1540
		11-Nov-09	1035	37.13	37.94	7.5	2790	33.8		0.013	0.12	<0.001	<0.0001	0.009	0.051	0.004	1.42	0.014	1.41	0.078	<0.01	0.044	<0.0001		2470	51	28	555	7	29.2	394	4.15	<1	<1	931	931	29.8	0.98	0.3				1660
		17-Feb-10	0945	37.13	37.94																																					
P13	NC-098S	3-Mar-08	1140	8.51	9.38																																					
		2-Apr-08	1147	8.62	9.49																																					
		9-May-08	0939	8.88	9.75																																					
		2-Jun-08	1308	9.00	9.88																																					
		1-Jul-08	1303	9.18	10.05																																					
		11-Aug-08		9.34	10.21																																					
		12-Sep-08	1045	9.43	10.30	7.1	1180	20.1		<0.001	0.153	<0.001	<0.0001	0.001	<0.001	0.001	0.11	0.007	0.134	0.002	<0.01	0.023	<0.0001		2040	50	89	253	7	21.0	279	30	<1	<1	556	556	19.6	3.47	0.24				1040
		14-Nov-08	1045	8.35	9.21																																					
		01-Dec-08	1202	8.48	9.34																																					
		12-Jan-09	0920	7.53	8.39																																					
		18-Feb-09	1241	7.35	8.23																																					
		17-Aug-09	1330	8.03	8.90	7.6	1540	24.3		<0.001	0.103	<0.001	<0.0001	0.003	0.002	0.002	1.51	0.002	0.064	0.004	<0.01	0.009	<0.0001		1760	50	100	204	3	19.6	272	50.7	<1	<1	551	551	19.7	0.34	<0.01				978
		11-Nov-09	1120	8.92	9.79	7.2	1310	27.5		0.001	0.125	<0.001	<0.0001	0.003	0.005	0.006	2.57	0.005	0.625	0.016	<0.01	0.015	<0.0001		1820	54	105	218	3	20.9	362	45.8	<1	<1	520	520	21.6	1.66	14.9				1110
		17-Feb-10	0950	8.06	8.93																																					
P14	NC-100D	3-Mar-08																																								
		2-Apr-08																																								
		9-May-08																																								
		2-Jun-08																																								
		1-Jul-08																																								
		11-Aug-08																																								
		12-Sep-08								-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-
		14-Nov-08																																								
		3-Dec-08																																								
		12-Jan-09	0945	58.42	58.77																																					
		24-Aug-09	1240	57.32	57.68	12.6	9300	23.3		0.002	2.04	<0.001	<0.0001	0.04	0.003	0.06	2.04	0.018	0.051	0.027	<0.01	0.158	<0.0001		5430	656	<1	205	112	44.5	5.71	2.58	<1	<1	<1	<1	0.21	99	3.03				2480
		18-Nov-09	1200	59.48	59.84	12.35	9320	28.5	0.02	0.002				0.018		0.016	<0.5	<0.001	<0.001	0.011		<0.005	<0.0001	9.98	2520	574	<1	202	118	40.5	7.84	31.8	2140	50	<1	2190	44.6	4.88		0.06	0.06	0.13	
		24-Feb-10	0955	60.31	60.67																																					
P15	NC-100S	3-Mar-08																																								
		2-Apr-08																																								
		9-May-08																																								
		2-Jun-08																																								
		1-Jul-08																																								
		11-Aug-08																																								
		12-Sep-08								-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-
		14-Nov-08																																								
		3-Dec-08																																								
		12-Jan-09	0950	16.21	16.56																																					
		24-Aug-09	1215	16.16	16.47	6.8	16000	26.8		0.004	0.522	<0.001	0.0005	0.036	0.024	0.091	12.9	0.011	3.54	0.058	0.04	0.108	<0.0001		15300	193	286	2830	60	158	4340	928	<1	<1	1220	1220	166	2.56	3.34				10400
		18-Nov-09	1230	16.18	16.49	6.68	16320	29.3	<0.01	<0.001				<0.005		0.008	<0.05	<0.001	3.12	0.019		0.02	<0.0001	7.25	15200	87	284	3090	70	164	4490	971	<1	<1	788	788	162	0.39		<0.01	<0.01	<0.01	
		24-Feb-10	0955	16.23	16.54																																					
P16	NC-119D	3-Mar-08	1410	51.25	52.03																																					
		2-Apr-08	1345	51.24	52.02																																					
		9-May-08	1152	51.21	51.99																																					
		2-Jun-08	1542	51.20	51.98																																					
		1-Jul-08	1525	51.12	51.90																																					
		12-Aug-08	1145	51.08	51.86																																					
		12-Sep-08	0930	50.52	51.30	7.45	1085	20.5		0.001	0.029	<0.001	<0.0001	0.002	<0.001	0.002	4.43	0.394	0.070	0.036	<0.01	0.204	<0.0001		132	5	1	14	3	1.05	22	<1	<1	<1	25	25	1.12		2.00				109
		14-Nov-08	1227	56.22	57.00																																					
		3-Dec-08	1400	55.22	56.00																																					
		12-Jan-09	1055	48.67	49.45																																					
		23-Feb-09	1250	48.45	49.24																																					
		9-Jun-09	1330	48.45	49.30	Bore pumped dry																																				
		24-Aug-09	1445	47.53	48.37	SWL only																																				
		17-Nov-09	1300	48.16	49.00	6.84	1605	24.1		<0.001	0.135	<0.001	<0.0001	0.001	<0.001	0.023	4.79	0.119	0.299	0.043	<0.01	1.21	<0.0001		1530	23	13	208	14	13.3	324	1.36	<1	<1	235	235	13.9	2.11	23.4				682
		24-Feb-10	1045	47.00	47.84																																					
P17	NC-119S	3-Mar-08	1405	55.96	56.56																																					
		2-Apr-08	1350	59.40	60.00																																					
		9-May-08	1157	59.05	59.65																																					
		2-Jun-08	1539	59.40	60.00																																					
		1-Jul-08	1527	43.40	44.00																																					
		12-Aug-08	1150	58.40	59.00																																					
		12-Sep-08		57.30	57.90					-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				-
		14-Nov-08	1233	57.39	58.00																																					
		3-Dec-08	1404	57.39	58.00																																					
		12-Jan-09	1100	58.40	59.00																																					
		23-Feb-09	1258	48.88	49.50																																					
		09-Jun-09	1345			Dry																																				
		24-Aug-09	1450			Dry																																				
		17-Nov-09	1320			Dry																																				
		24-Feb-10	1115			Dry																																				
P18	NC-122	3-Mar-08	1530	13.40	14.24																																					
		2-Apr-08	1225	13.40	14.24																																					
		9-May-08	1027	13.45	14.29																																					
		2-Jun-08	1425	13.53	14.37																																					
		1-Jul-08	1414	13.56	14.40																																					
		11-Aug-08	1650	13.66	14.50																																					
		11-Sep-08	1030	13.16	14.00	6.75	1410	22.9		0.003	0.817	<0.001	<0.0001	0.008	0.032	0.007	3.75	0.046	0.137	0.059	0.03	0.022	<0.0001		3650	30	27	824	38	40.6	80	38	<1	<1	1870	1870	40.5	0.04	2.61				2370
		14-Nov-08	1123	12.70	13.49																																					
		01-Dec-08	1251	12.79	13.58																																					
		12-Jan-09	1015	12.88	13.67																																					
		23-Feb-09	1003	13.00	13.80																																					
		09-Jun-09	0900	13.60	14.35	6.1	8750	20.7		0.002	1.98	<0.001	<0.0001	0.009	0.019	0.007	4.6	0.04	0.14	0.038	0.03	0.03	<0.0001		8250	66	70	1960	79	96.4	134	<1	<1	<1	5100	5100	106	4.62	4.74				6720
		24-Aug-09	1320	17.87	18.68	SWL only																																				
		18-Nov-09	1400	23.90	24.71	6.66	6180	27.5	0.2	0.009				0.009		0.03	3.44	0.042	0.306	0.091		0.694	<0.0001	7.03	6100	58	48	1450	63	71.7	110	18	<1	<1	3710	3710	77.6	3.99		0.02	0.06	0.08	
		17-Feb-10	1200	31.91	32.72																																					
		16-Mar-10	1610	33.34	34.15	SWL only																																				

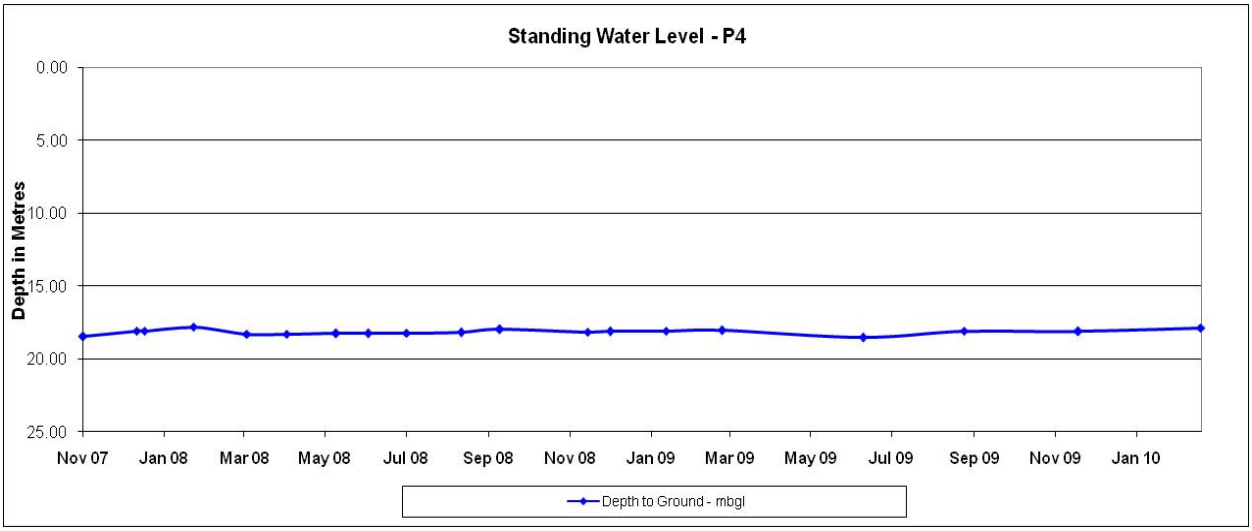
Site ID	Piezometer / Water Bore	Date	Time	Depth to Ground - mbgl	Depth to Stand - mbtoc	Field Parameters			Total Metals																Mercury (Hg) - mg/L	pH Lab	EC - Lab - µs/cm	Major Cations				Total Cations - meq/L	Major Anions						Total Anions - meq/L	Ionic Balance	Ammonia as Nitrogen (N)	Nitrite as N - mg/L	Nitrate as N - mg/L	NOX as N - mg/L	Total Dissolved Solids
						pH - Field	EC - Field - µs/cm	Temp - Field - °C	Aluminium (Al) - mg/L	Arsenic (As) - mg/L	Barium (Ba) - mg/L	Beryllium (Be) - mg/L	Cadmium (Cd) - mg/L	Chromium (Cr) - mg/L	Cobalt (Co) - mg/L	Copper (Cu) - mg/L	Iron (Fe) - mg/L	Lead (Pb) - mg/L	Manganese (Mn) - mg/L	Nickel (Ni) - mg/L	Vanadium (V) - mg/L	Zinc (Zn) - mg/L				Calcium (Ca) - mg/L	Magnesium (Mg) - mg/L	Sodium (Na) - mg/L	Potassium (K) - mg/L		Chloride (Cl) - mg/L	Sulfate (SO4) - mg/L	Hydroxide Alkalinity as CaCO3 - mg/L	Carbonate Alkalinity as CaCO3 - mg/L	Bicarbonate Alkalinity as CaCO3 - mg/L	Alkalinity - mg/L								
P19	NC-123R	3-Mar-08	1535	16.11	17.05																																						
		2-Apr-08	1230	16.10	17.05																																						
		9-May-08	1033	16.11	17.05																																						
		2-Jun-08	1432	16.30	17.24																																						
		1-Jul-08	1421	16.38	17.32																																						
		14-Aug-08	1335	16.34	17.29																																						
		17-Sep-08	1445	16.16	17.10	6.7	1340	23.2		0.001	1.26	<0.001	0.0001	0.018	0.043	0.005	3.19	0.015	0.728	0.320	<0.01	0.066	<0.0001		11000	99	141	1040	1400	97.6	1880	28	<1	<1	1880	1880	91.2	3.40	6.15				6220
		14-Nov-08	1130	19.19	20.18																																						
		01-Dec-08	1244	17.26	18.21																																						
		12-Jan-09	1025	16.87	17.82																																						
		23-Feb-09	1008	24.20	24.60																																						
		09-Jun-09	0930	23.50	23.90	7	5600	21.2		<0.001	0.275	<0.001	<0.0001	0.029	0.003	0.002	3.14	0.003	1.24	0.014	<0.01	0.039	<0.0001		5230	40	82	1030	18	54	1170	<20	<1	<1	1060	1060	54.2	0.16	3.83				2910
		24-Aug-09	1322	24.82	25.30	SWL only																																					
		18-Nov-09	1410	24.11	24.59	7.34	3690	23.8	<0.01	0.003				<0.005		0.002	0.12	<0.001	0.93	0.005		0.011	<0.0001	7.71	3050	28	45	551	19	29.6	624	22.1	<1	<1	663	663	31.3	2.9		<0.01	0.04	0.04	
		17-Feb-10	1210	23.75	24.23																																						
P20	NC-127	3-Mar-08	1610	13.52	14.39																																						
		2-Apr-08	1235	13.52	14.39																																						
		9-May-08	1039	13.62	14.49																																						
		2-Jun-08	1420	13.68	14.55																																						
		1-Jul-08	1408	13.64	14.51																																						
		11-Aug-08	1640	13.70	14.57																																						
		9-Sep-08	1000	13.48	14.35	6.7	1140	19.6		<0.001	4.80	0.002	0.0003	0.003	0.001	0.005	1.57	0.004	0.035	0.014	<0.01	0.009	<0.0001		10500	62	68	2860	118	136	425	<1	<1	<1	5970	5970	131	1.83	10.3				9630
		14-Nov-08	1118	13.79	14.68																																						
		01-Dec-08	1257	13.88	14.77																																						
		12-Jan-09	1010	13.97	14.86																																						
		23-Feb-09	920	14.06	14.95																																						
		09-Jun-09	1000	14.83	15.68	7.1	13600	21		<0.001	4.12	<0.001	0.0002	0.002	<0.001	0.004	0.4	0.001	0.014	0.003	<0.01	0.036	<0.0001		12500	74	80	3290	114	156	174	<10	<1	<1	8420	8420	173	5	9.14				9910
		24-Aug-09	1330	20.77	21.68	SWL only																																					
		18-Nov-09	1430	17.20	18.11	7.26	10210	26.1	<0.01	<0.001				<0.005		0.002	0.13	0.002	0.046	0.016		0.1	<0.0001	7.52	10300	8	120	2510	96	122	599	26.9	<1	<1	5960	5960	136	4.97		<0.01	0.01	0.01	
		17-Feb-10	1215	30.15	31.06																																						
		16-Mar-10	1555	37.69	38.60	SWL only																																					
WB1		14-Aug-08	1445	8.34	9.00																																						
		12-Sep-08	1330	8.34	9.00	7.9	1060	23.5		0.005	3.96	0.002	0.0003	0.001	<0.001	0.002	0.64	0.002	0.015	<0.001	<0.01	0.091	<0.0001		14200	102	209	3740	204	190	53	3	<1	<1	8700	8700	175	4.06	11.9				8510
		14-Nov-08	1139	8.46	9.12																																						
		01-Dec-08	1303	8.46	9.12																																						
WB2		11-Aug-08	1515	9.22	9.41																																						
		11-Sep-08	930	8.81	9.00	7.2	1010	20.7		<0.001	0.033	<0.001	<0.0001	<0.001	<0.001	0.001	<0.05	<0.001	0.003	0.002	<0.01	<0.005	<0.0001		239	12	6	32	1	2.53	16	6	<1	<1	101	101	2.61		0.06				153
		14-Nov-08	1056	6.12	6.31																																						
		01-Dec-08	1212	6.30	6.49																																						
		18-Feb-09	1250	4.41	4.60																																						
		11-Jun-09	1500							<0.001	0.087	<0.001	<0.0001	<0.001	<0.001	0.106	0.3	0.002	0.02	0.001	<0.01	0.067	<0.0001		1130	64	57	83	2	11.6	156	17	<1	<1	340	340	11.5	0.21	<0.01				628
		17-Aug-09	1345	6.34	6.72	7.4	1150	18.5		<0.001	0.093	<0.001	<0.0001	<0.001	<0.001	0.003	0.06	<0.001	0.002	<0.001	<0.01	<0.005	<0.0001		1210	71	60	74	4	11.8	227	34.3	<1	<1	248	248	12.1	1.27	<0.01				744
		11-Nov-09	1200	8.18	8.56	7.3	1200	28.1		0.002	0.202	0.003	0.0007	0.021	0.008	0.064	16.8	0.012	0.203	0.02	0.03	0.058	<0.0001		1130	62	53	63	6	10.4	217	29.5	<1	<1	194	194	10.6	1.11	<0.01				1200
		17-Feb-10	1000	5.72	6.10																																						
WB3a		11-Sep-08	1230	8.09	8.60	7.7	1050	20.1		<0.001	0.179	<0.001	<0.0001	<0.001	<0.001	0.002	0.34	0.002	0.259	0.002	<0.01	0.009	<0.0001		703	39	20	78	4	7.11	54	10	<1	<1	268	268	7.08	0.10	0.26				431
		14-Nov-08	0856	8.14	8.65																																						
		01-Dec-08	1055	8.14	8.65																																						
		12-Jan-09	1301	7.94	8.45																																						
		01-Dec-09	1310	8.21	8.72																																						
		18-Feb-10	1205	8.11	8.62																																						
WB3b		11-Sep-08	1245	7.99	8.50	7.6	1250	19.8		<0.001	0.175	<0.001	<0.0001	<0.001	<0.001	0.002	0.31	0.001	0.255	0.001	<0.01	0.007	<0.0001		706	38	20	77	4	7.01	52	10	<1	<1	268	268	7.02	0.17	0.18				415
		14-Nov-08	0854	8.05	8.56																																						
		01-Dec-08	1057	7.99	8.50																																						
		12-Jan-09	1303	7.84	8.33																																						
		01-Dec-09	1310	8.20	8.71																																						
		18-Feb-10	1210	8.05	8.56																																						
WB4		12-Sep-08	1430	8.35	8.90	7.3	1120	19.8		<0.001	0.042	<0.001	<0.0001	<0.001	<0.001	0.002	<0.05	<0.001	0.003	0.002	<0.01	0.006	<0.0001		1040	61	35	116	1	11.0	93	30	<1	<1	360	360	10.4	2.39	0.06				461
		14-Nov-08	0902	8.30	8.85																																						
		12-Jan-09	1258	8.25	8.80																																						
		01-Dec-09	1305	8.38	8.93																																						
		18-Feb-10	1220	8.41	8.96																																						
WB5a		12-Sep-08	1430	9.98	11.10	7.5	1200	21		<0.001	0.026	<0.001	<0.0001	<0.001	<0.001	0.004	0.1	0.006	0.033	<0.001	<0.01	0.008	<0.0001		510	36	18	32	2	4.66	29	28	<1	<1	160	160	4.59	0.72	0.05				281
		14-Nov-08	832	10.29	11.41																																						
		01-Dec-08	1035	10.15	11.27																																						
		12-Jan-09	1319	9.89	11.01																																						
		01-Dec-09	1345	10.38	11.50																																						
		18-Feb-10	1245	10.35	11.47																																						
WB5b		12-Sep-08	1430	10.08	11.20	7.6	1150	21		<0.001	0.028	<0.001	<0.0001	<0.001	<0.001	0.003	<0.05	0.006	0.031	0.001	<0.01	0.007	<0.0001		505	35	17	31	2	4.56	28	28	<1	<1	166	166	4.68	1.39	0.05				278
		14-Nov-08	0833	10.43	11.55																																						
		01-Dec-08	1037	10.15	11.27																																						
		12-Jan-09	1321	10.21	11.33																																						
		01-Dec-09	1345	10.78	11.90																																						
		18-Feb-10	1250	10.69	11.81																																						
WB6a		12-Sep-08	1530	13.93	14.80	6.8	1120	20.4		<0.001	0.050	<0.001	<0.0001	<0.001	<0.001	0.008	0.22	0.029	0.302	0.002	<0.01	0.022	<0.0001		706	45	22	77	3	7.48	33	21	<1	<1	294	294	7.24	1.55	0.09				389
		12-Sep-08	1530	13.93	14.80	6.8	1120	20.4		<0.001	0.052	<0.001	<0.0001	<0.001	<0.001	0.005	0.29	0.014	0.419	0.004	<0.01	0.017	<0.0001		981	58	36	74	3	9.13	89	53	<1	<1	266	266	8.94	1.04	0.87				525
		14-Nov-08	0823	14.31	15.19																																						
		01-Dec-08	1030	14.29	15.17																																						
		12-Jan-09	1326	14.24	15.12																																						
		01-Dec-09	1400	14.38	15.22																																						
		18-Feb-10	1310	14.31	15.15																																						
WB6b		12-Sep-08	1530	11.33	12.20	7.2	1080	20.7		<0.001	0.052	<0.001	<0.0001	<0.001	<0.001	0.007	0.28	0.028	0.297	0.006	<0.01	0.050	<0.0001		781	45	22	83	3	7.78	35	21	<1	<1	305	305	7.52	1.62	0.09				405
		14-Nov-08	0825	12.21	13.09																																						
		01-Dec-08	1032	11.21	12.09																																						
		12-Jan-09	1328	17.89	18.77																																						
		01-Dec-09	1400	19.70	20.54																																						
		18-Feb-10	1315	13.94	14.78																																						
WB7		11-Sep-08	1330			6.9	1175	20.5		<0.001	0.006	<0.001	<0.0001	<0.001	<0.001	0.013	<0.05	<0.001	<0.001	<0.001	<0.01	0.040	<0.0001		765	33	18	92	2	7.16	60	23	<1	<1	250	250	7.16	0.06	0.04				410
		14-Nov-08	0841	4.11	4.99																																						
		01-Dec-08	1045	2.27	3.15																																						
		12-Jan-09	1315	4.30	5.18																																						
		25-Aug-09	1500							<0.001	0.006	<0.001	<0.0001	<0.001	<0.001	0.049	<0.05	0.006	0.002	<0.001	<0.01	0.044	<0.0001		633	26	14	80	2		47.4	23	<1	<1	224	224			<0.01				348
		01-Dec-09	1330	4.79		8.18	1002	23.3	0.05	0.005				<0.001		0.013	0.32	<0.001	0.038	0.004		<0.005	<0.0001	7.91	848	12	7	164	1	8.35	65.2	32	<1	<1	272	272	8.05	1.82		0.02	1.45	1.48	
		18-Feb-10	1240	4.64																																								
WB8		12-Sep-08								-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		14-Nov-08																																										
WB9	NC-008	1-Dec-08	1235	19.2	19.67					-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

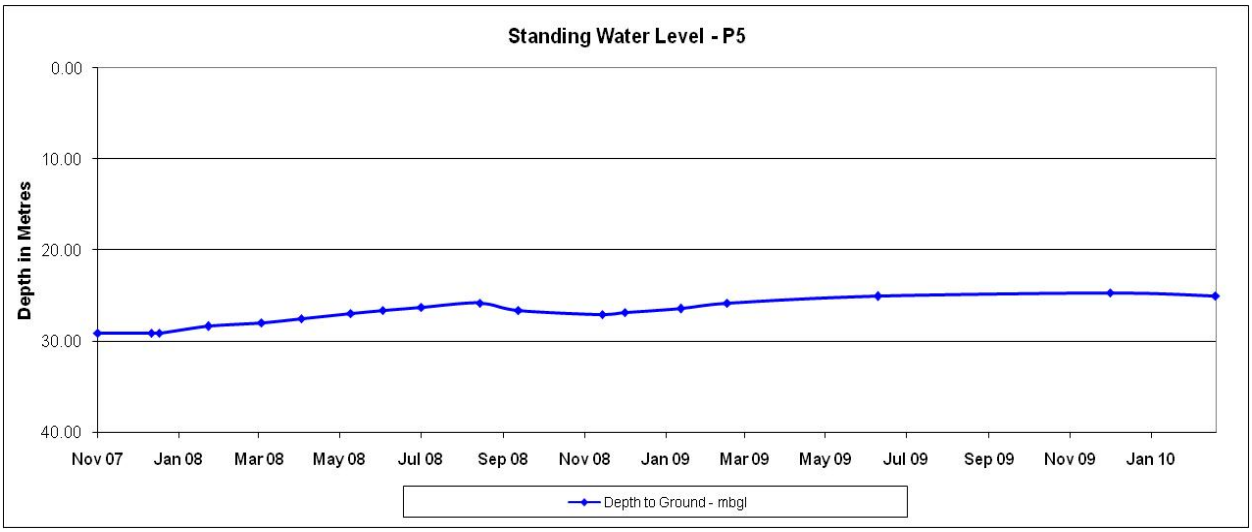
Denotes dissolved metals

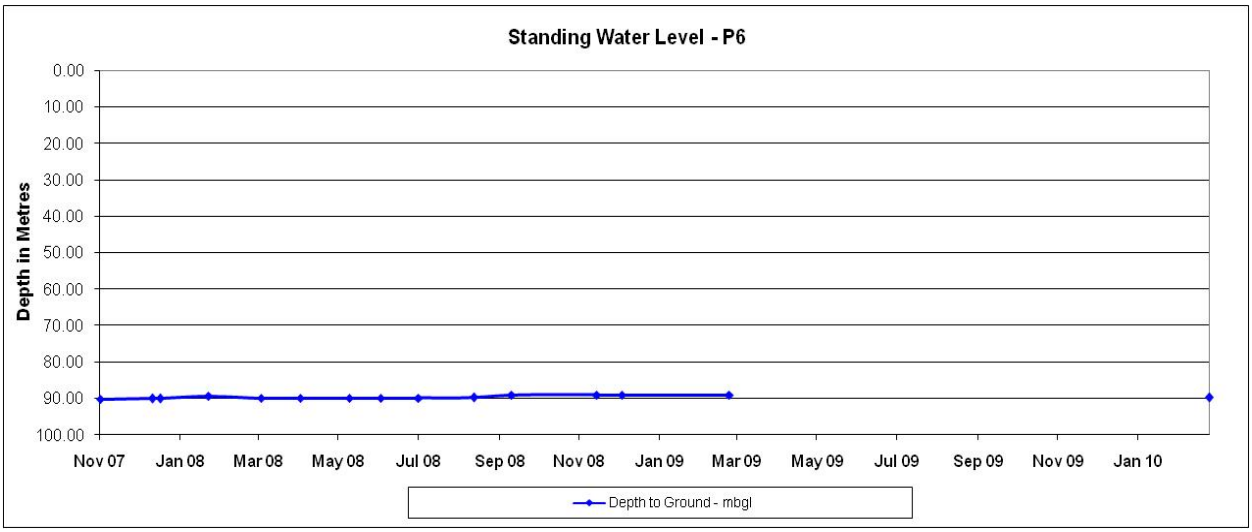

Standing Water Level - P1
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

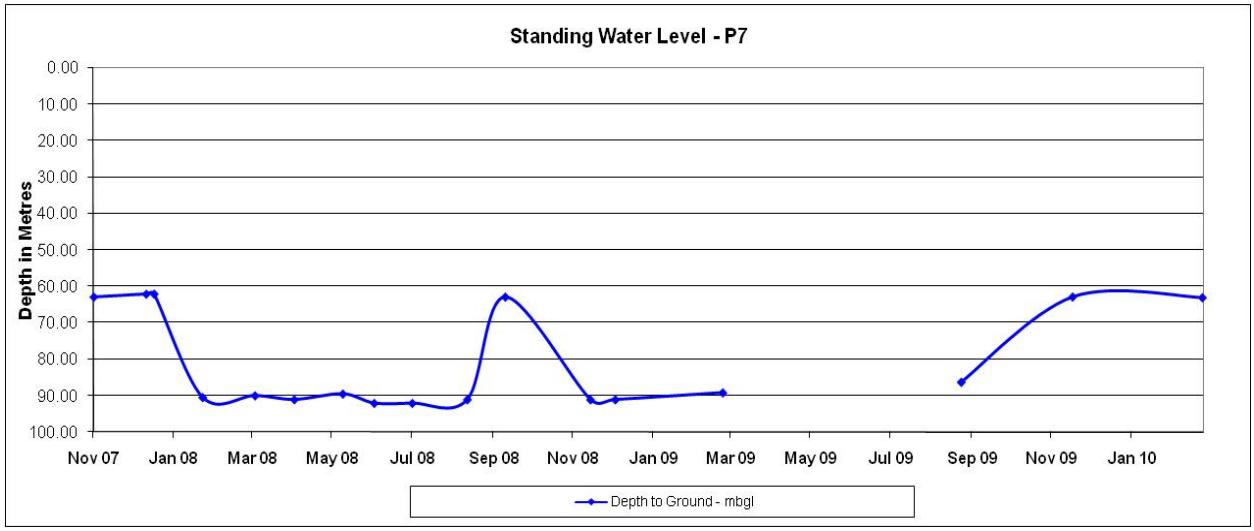

Standing Water Level - P2
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

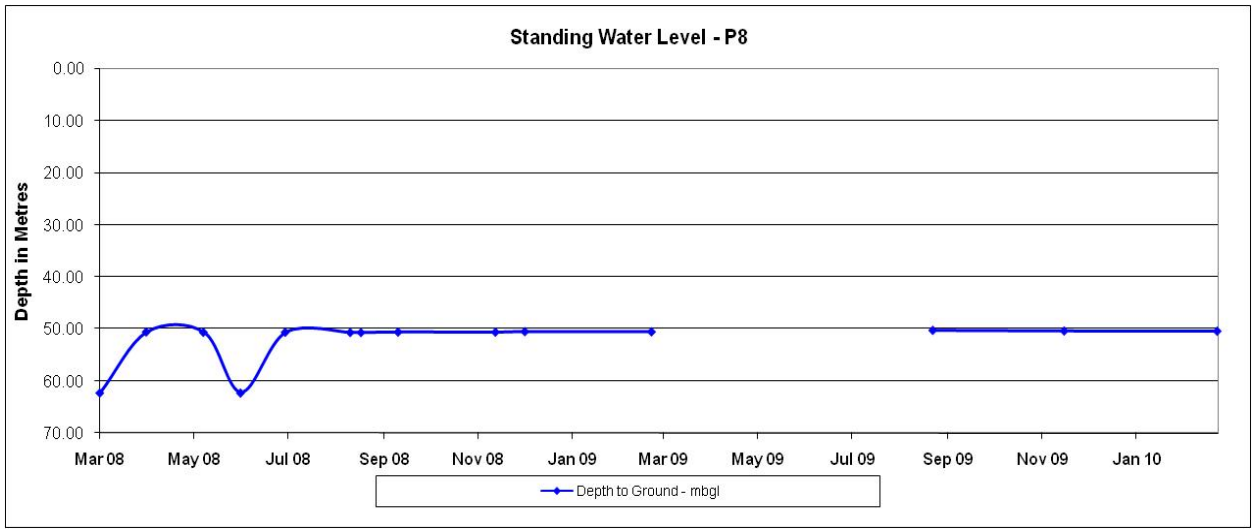

Standing Water Level - P3
Depth in Metres
0.00
5.00
10.00
15.00
20.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

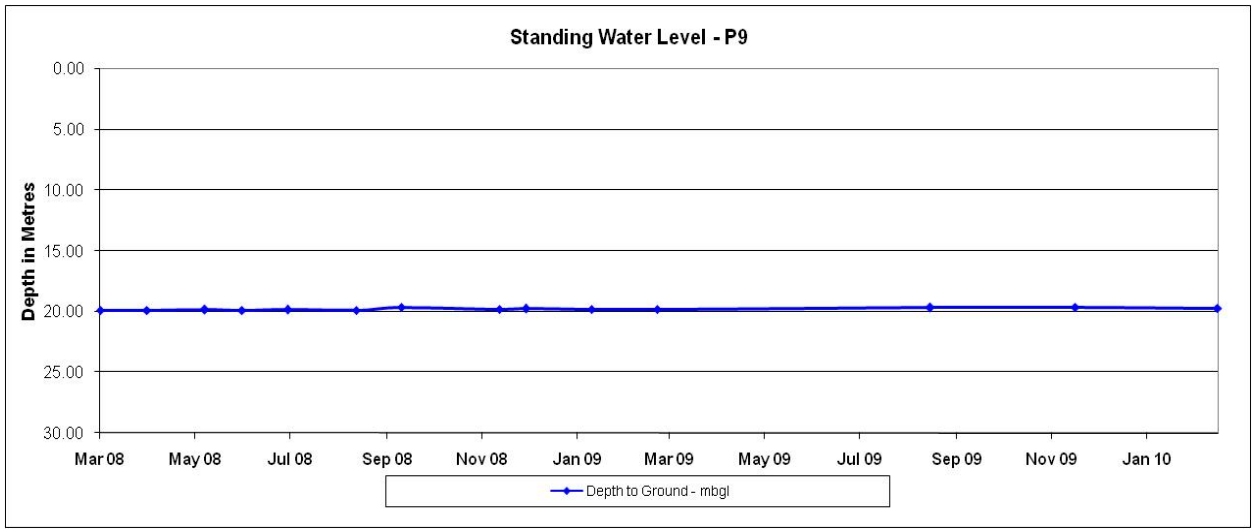

Standing Water Level - P4
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

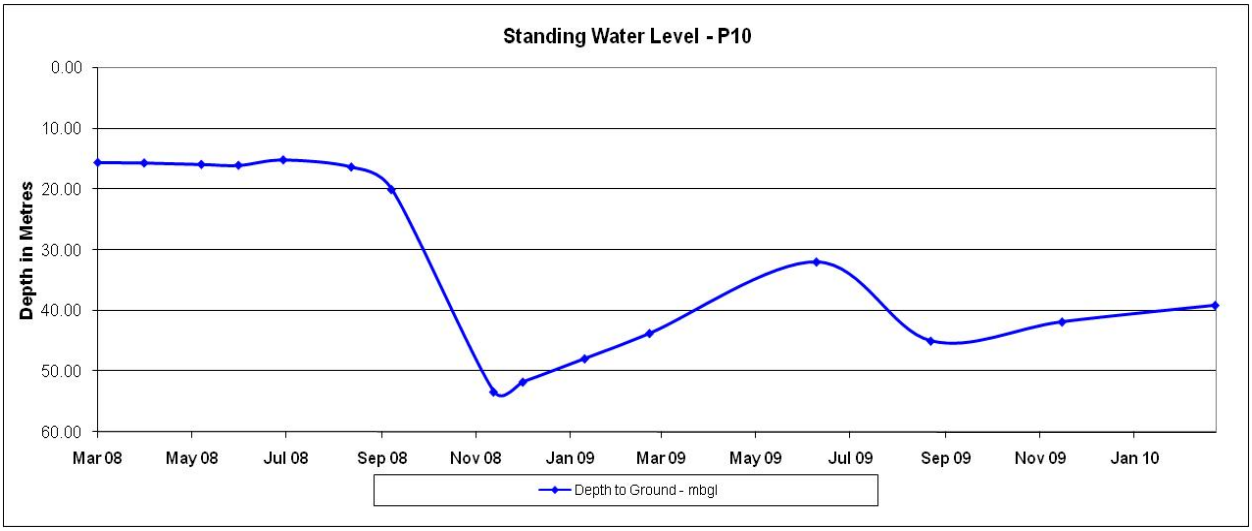

Standing Water Level - P5
Depth in Metres
0.00
10.00
20.00
30.00
40.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

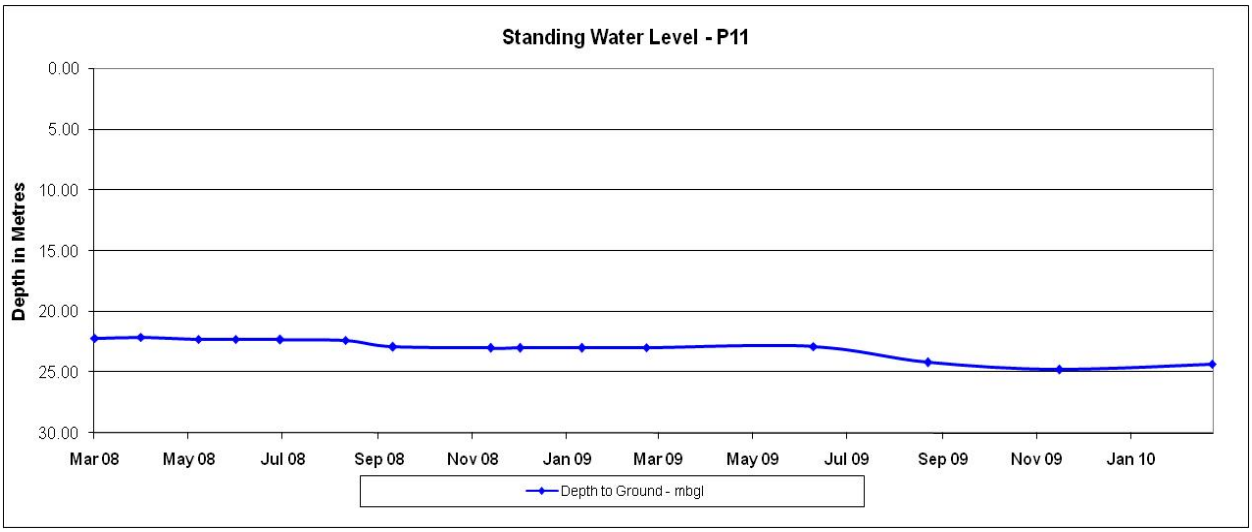

Standing Water Level - P6
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

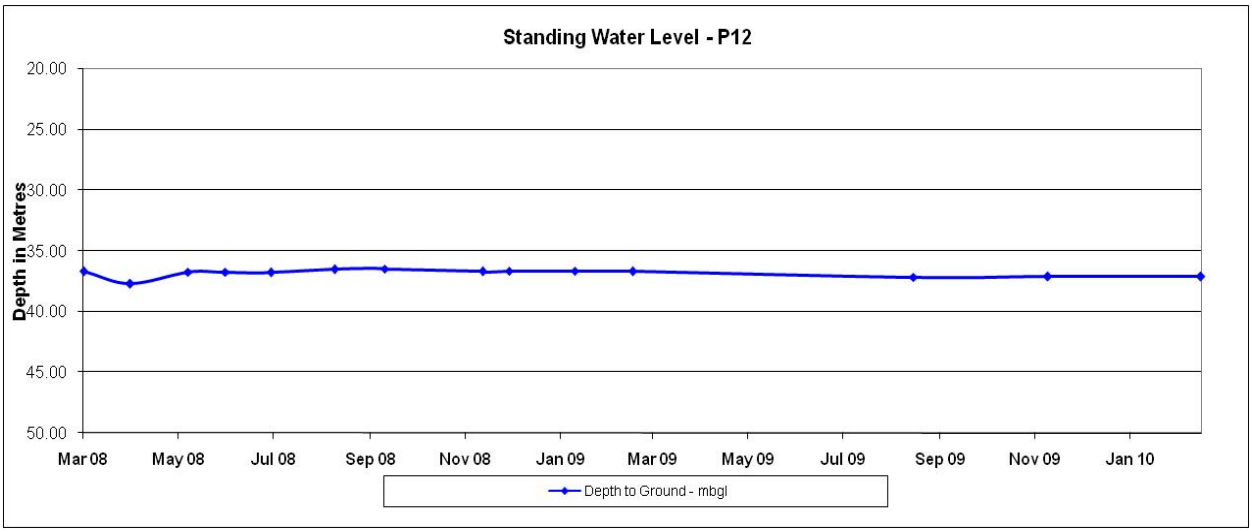

Standing Water Level - P7
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
Nov 07
Jan 08
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

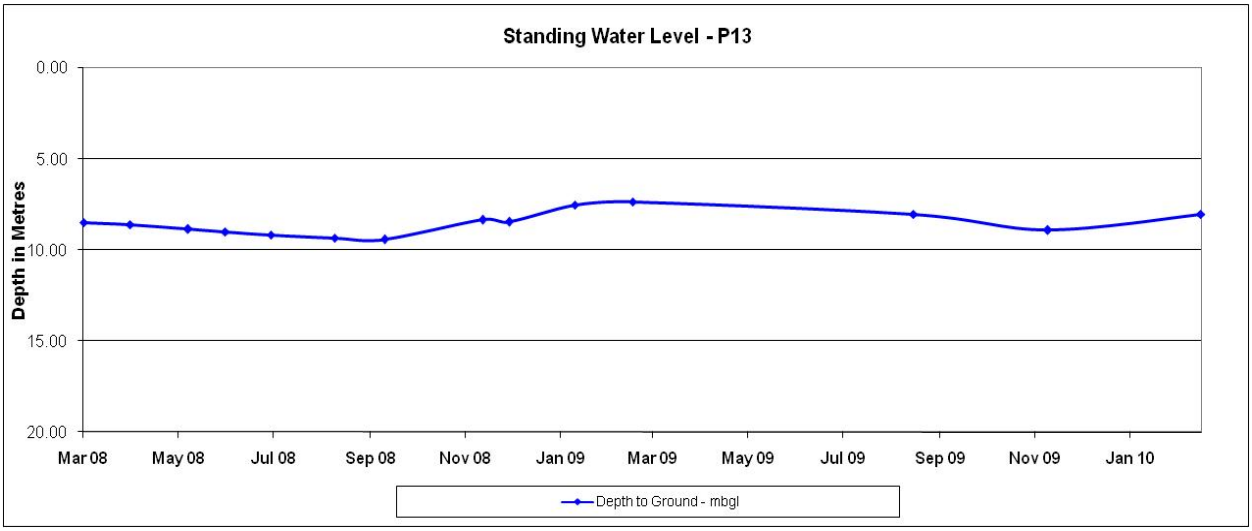

Standing Water Level - P8
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

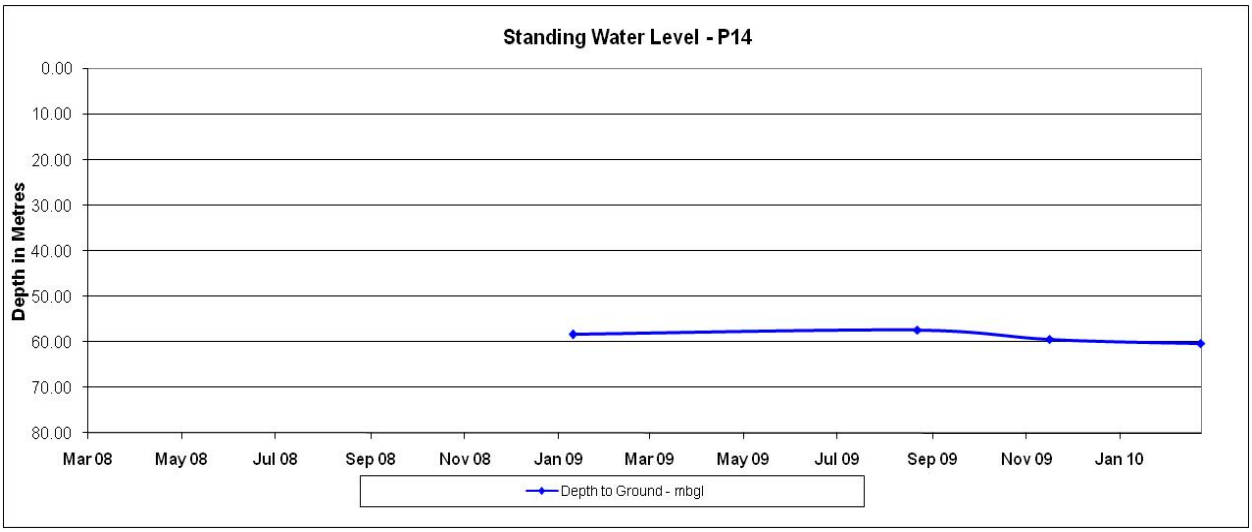

Standing Water Level - P9
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

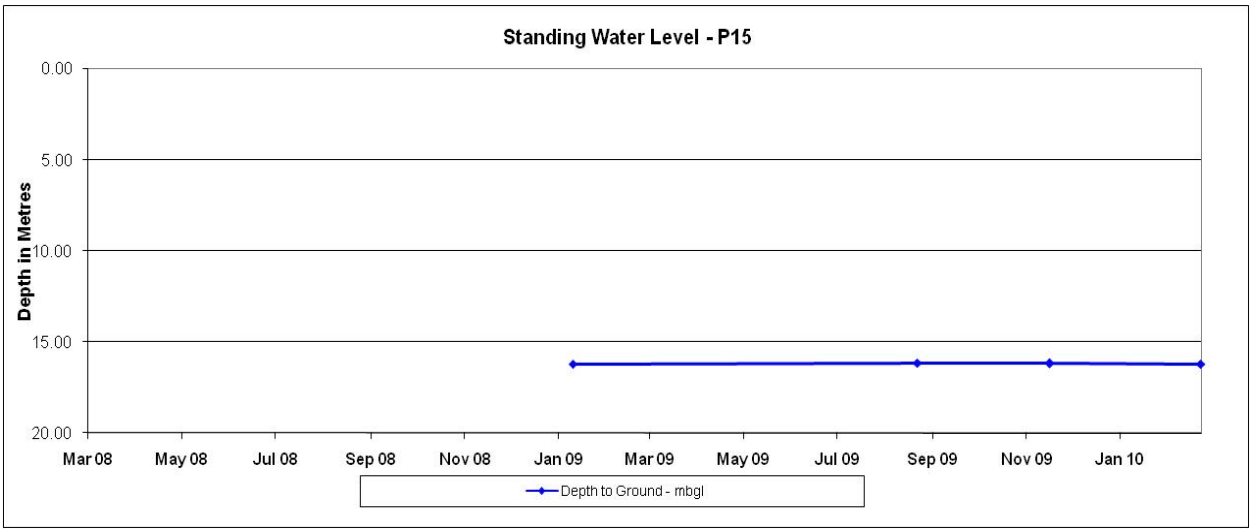

Standing Water Level - P10
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

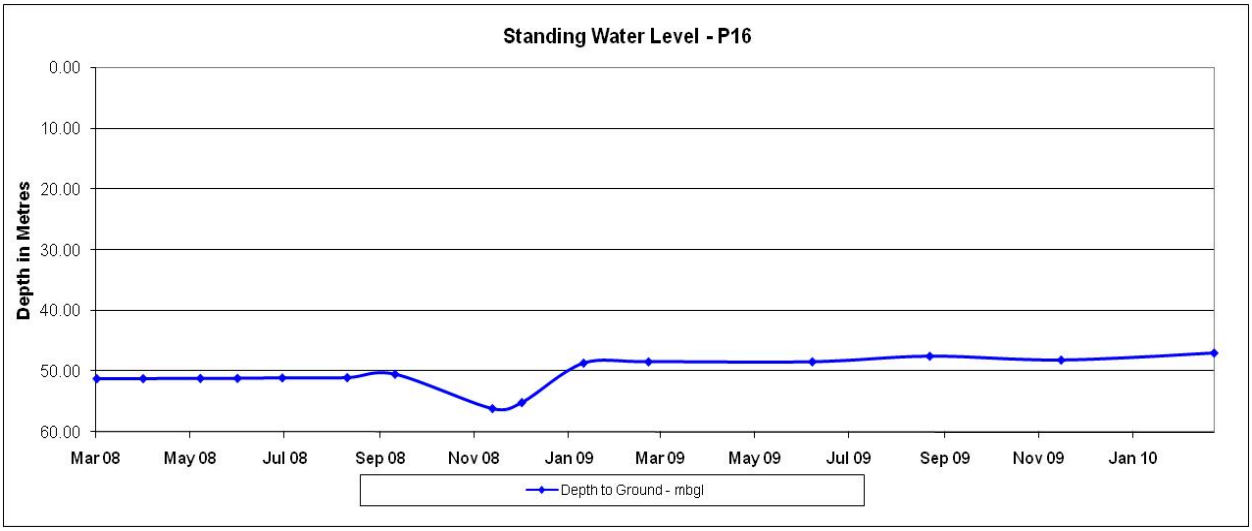

Standing Water Level - P11
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

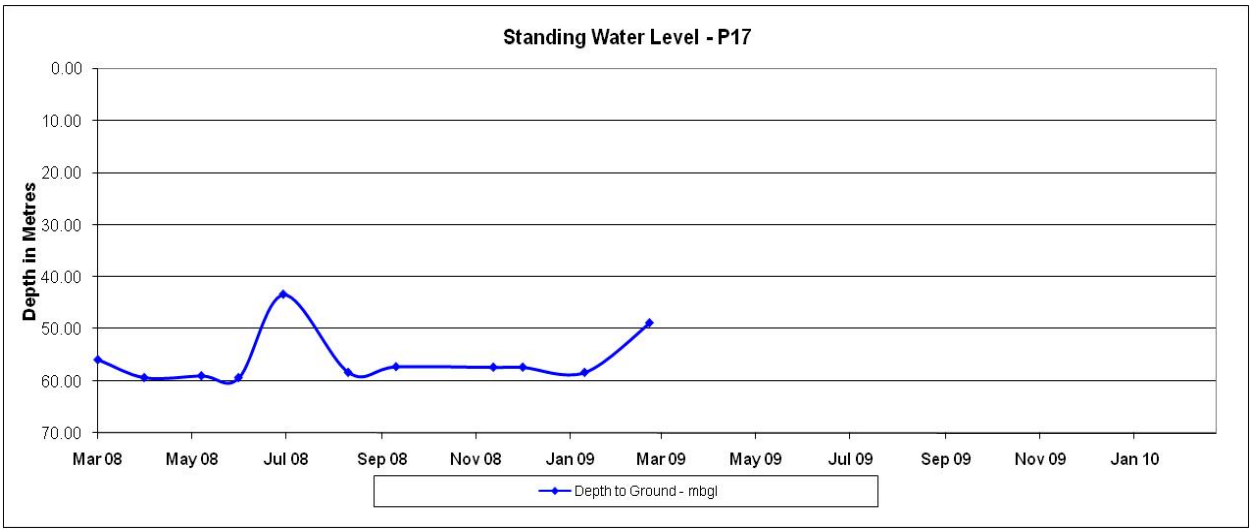

Standing Water Level - P12
Depth in Metres
20.00
25.00
30.00
35.00
40.00
45.00
50.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

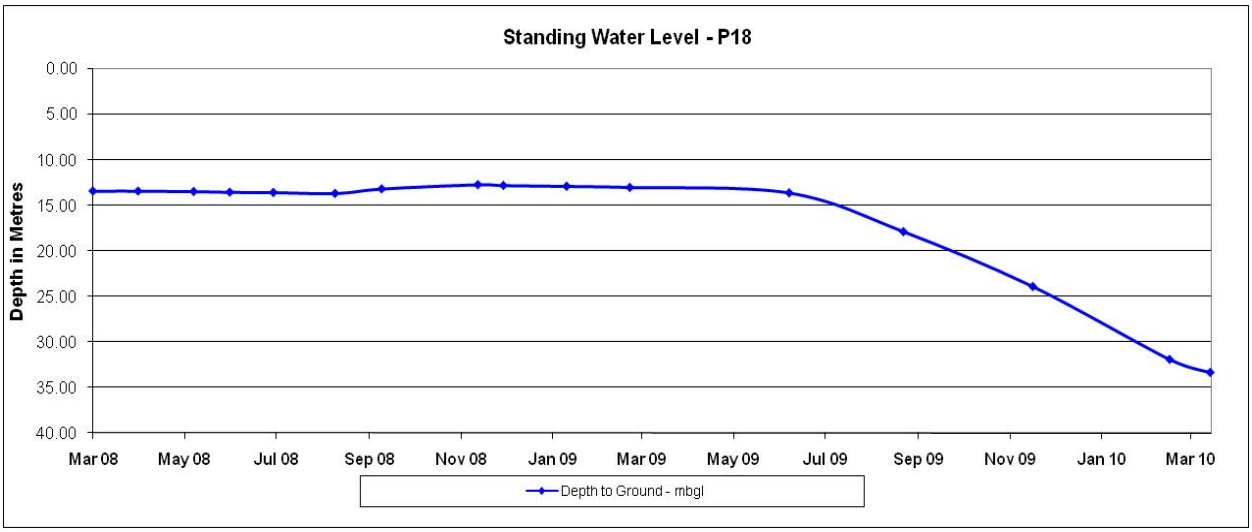

Standing Water Level - P13
Depth in Metres
0.00
5.00
10.00
15.00
20.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

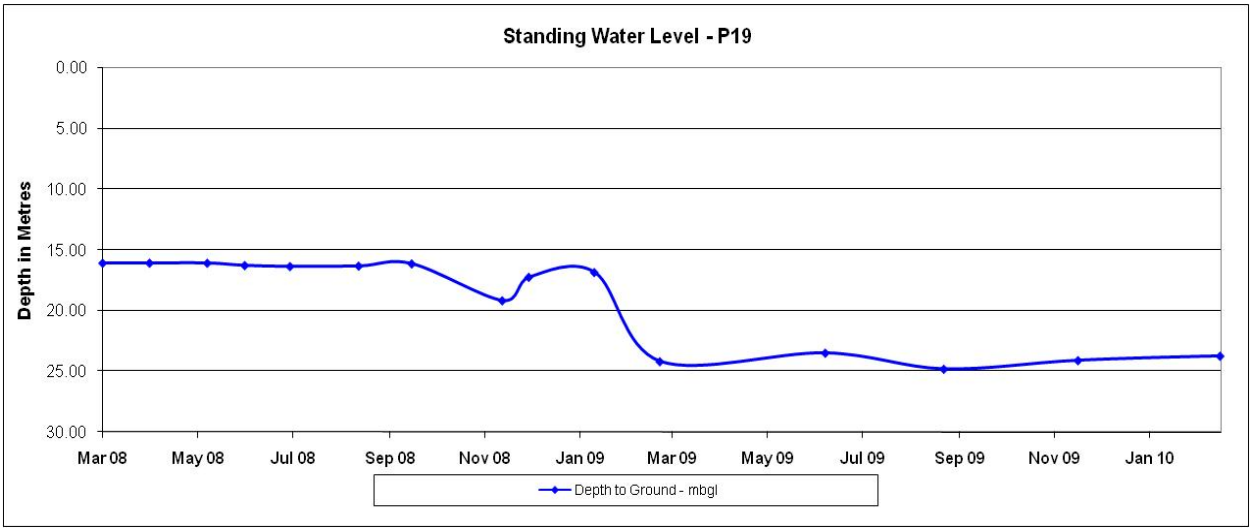

Standing Water Level - P14
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl

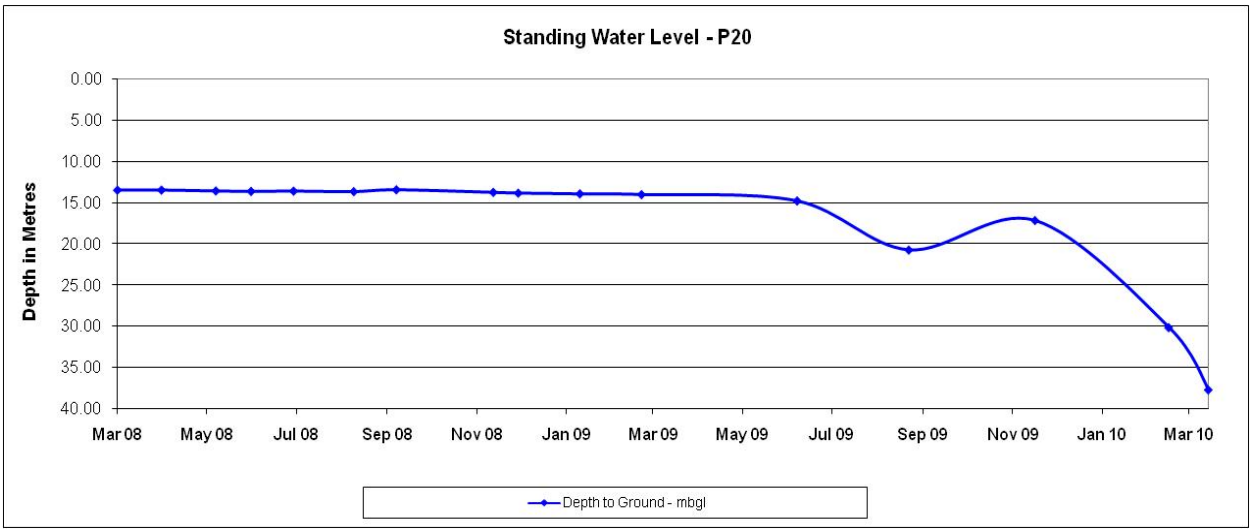

Standing Water Level - P15
Depth in Metres
0.00
5.00
10.00
15.00
20.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl


Standing Water Level - P16
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl


Standing Water Level - P17
Depth in Metres
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl


Standing Water Level - P18
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Mar 10
Depth to Ground - mbgl


Standing Water Level - P19
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Depth to Ground - mbgl


Standing Water Level - P20
Depth in Metres
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
Mar 08
May 08
Jul 08
Sep 08
Nov 08
Jan 09
Mar 09
May 09
Jul 09
Sep 09
Nov 09
Jan 10
Mar 10
Depth to Ground - mbgl

Appendix 7

NOISE MONITORING DATA

Attended Noise Monitoring

June 2009

September 2009

December 2009

March 2010

30 June 2009

Ref: 05168/3159

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: JUNE 2009 ATTENDED NOISE MONITORING RESULTS

This letter report presents the results of attended noise compliance monitoring conducted for the Narrabri Coal Mine (NCM) from Tuesday 23rd to Wednesday 24th June 2009. Noise monitoring was carried out in accordance with the conditions of the NCM Noise Management Plan (NMP) as detailed below.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $L_{A_{eq(15\ minute)}}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $L_{A1(1\ minute)}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below:

Location N1: Bow Hills
Location N2: Westhaven
Location N3: Naroo
Location N4: Greylands
Location N5: Kurrajong*

*It was not possible to conduct monitoring at a point within 30m of the residence, as access to the property was denied by the land owner. An alternative location was chosen at the edge of mine owned land in the direction of "Kurrajong". Measurements were taken near the boundary fence with "Claremont", which is approximately half way between the works for construction of the box cut and the "Kurrajong" residence. An indeterminate correction factor between 4 and 8 dB should be subtracted from these results to estimate the noise level at "Kurrajong".

NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather was generally cool with clear skies, temperatures below 20^0C, 70-80% relative humidity and a faint wind drift from the west.

RESULTS

Measured noise levels are shown in **Tables 1-3**. Where the noise from NCM was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall level.

Noise from NCM is shown in bold type. Where noise from NCM is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
NCM Noise Monitoring Results – 23 June 2009 (Day)

Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Naroo	4:02 pm	44.2	Calm	School bus (43), Traffic (38), **NCM Inaudible**
Claremont*	4:25 pm	36.9	Calm	Birds (36), **NCM (<25)**
Westhaven	4:44 pm	30.2	Calm	Birds (29), **NCM (24)**
Greylands	5:03 pm	38.3	Calm	Train (36), Birds (34), **NCM inaudible**
Bow Hills	4:02 pm	41.4	Calm	Traffic (41), Birds (31), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 2
NCM Noise Monitoring Results – 23 June 2009 (Evening)

Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Bow Hills	8:11 pm	41.4	0-0.3m/s W	Traffic (41), **NCM (31)**
Naroo	8:28 pm	51.9	0-0.3m/s W	Train (49), Traffic (46), **NCM (30)**
Claremont*	8:46 pm	33.3	0-0.3m/s W	Traffic (30), **NCM (29)**
Westhaven	9.11 pm	28.0	0-0.3m/s W	**NCM inaudible**
Greylands	9.28 pm	43.5	0-0.3m/s W	Insects (46), **NCM (23)**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 3
NCM Noise Monitoring Results – 23 June 2009 (Night)

Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Bow Hills	10:41 pm	45.5	0-0.3m/s W	Traffic (45), **NCM inaudible**
Naroo	10:53 pm	41.0	0-0.3m/s W	Traffic (40), Insects (30), **NCM inaudible**
Claremont*	11:10 pm	35.9	0-0.3m/s W	Traffic (32), Sheep (32), **NCM (24)**
Westhaven	11:33 pm	32.1	0-0.3m/s W	Car (31), **NCM inaudible**
Greylands	11:46 pm	40.4	0-0.3m/s W	Traffic (40), Insects (30), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

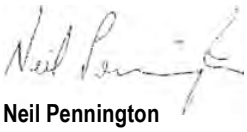
The results shown in Tables 1-3 indicate that noise emissions from the NCM were below the criterion of 35 dB(A),$L_{eq(15min)}$ at all receivers.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

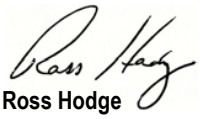
Author:



Neil Pennington

Acoustical Consultant

Review:



Ross Hodge

Acoustical Consultant

16 September 2009

Ref: 05168/3261

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: SEPTEMBER 2009 ATTENDED NOISE MONITORING RESULTS – NARRABRI MINE

This letter report presents the results of attended noise compliance monitoring conducted for the Narrabri Coal Mine (NCM) on Wednesday 2nd September 2009. Noise monitoring was carried out in accordance with the conditions of the NCM Noise Management Plan (NMP) as detailed below.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

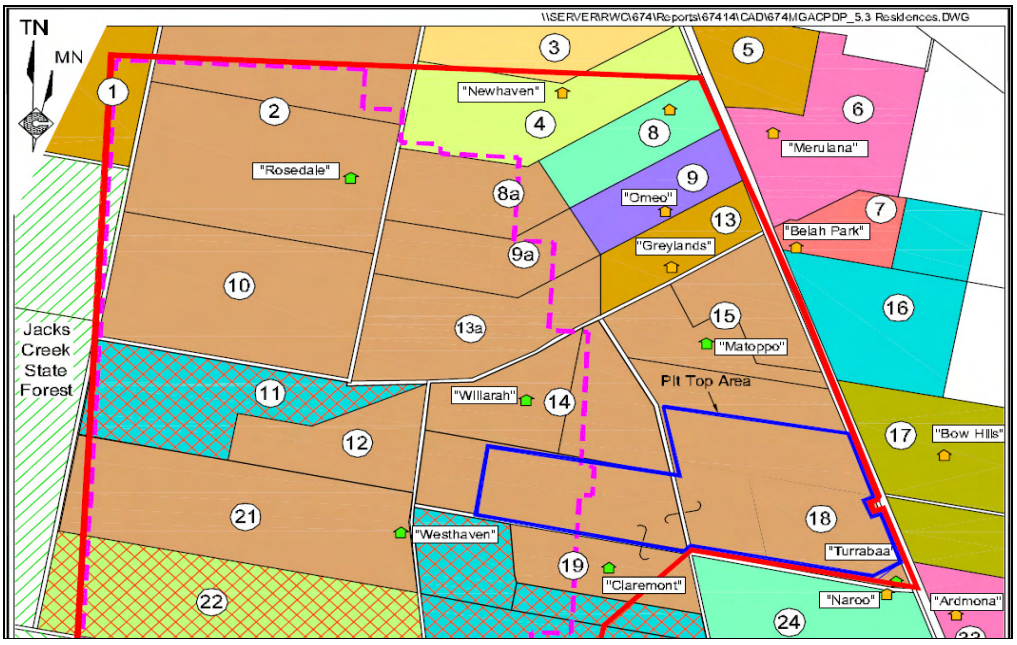
- *To determine compliance with the $LA_{eq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $LA1(1\ minute)$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying figure:

Location N1: Bow Hills
Location N2: Westhaven
Location N3: Naroo
Location N4: Greylands
Location N5: Kurrajong*

*It was not possible to conduct monitoring at a point within 30m of the residence, as access to the property was denied by the land owner. An alternative location was chosen at the edge of mine owned land in the direction of "Kurrajong". Measurements were taken near the boundary fence with "Claremont", which is approximately half way between the works for construction of the box cut and the "Kurrajong" residence. An indeterminate correction factor between 4 and 8 dB should be subtracted from these results to estimate the noise level at "Kurrajong".



NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather throughout the survey was generally mild with clear skies. During the afternoon the wind was gusty from the NNW, dropping in speed during the evening and night time monitoring periods.

RESULTS

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær "*Evaluator*" software. The software enables the contributions of the mine and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for the operational phase of the RCM project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times.

The results shown in **Tables 1**, **2** and **3**, below, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. This is the compliance criterion for the operation of the mine. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Measured noise levels are shown in **Tables 1-3**. Where the noise from NCM was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall level.

Noise from NCM is shown in bold type. Where noise from NCM is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

The gates to Bow Hills were locked during the evening and the measurements for evening and night were made at the front gates to the property.

Table 1 NCM Noise Monitoring Results – 2 September 2009 (Day)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Naroo	4:05 pm	44	3.5m/s NNW	Traffic (43), birds (36), **NCM inaudible**
Claremont*	3:43 pm	35	4.5m/s NNW	Birds (33), farm machinery (30), **NCM inaudible**
Westhaven	3:07 pm	37	4.5m/s NNW	Drill (35), birds (32), **NCM inaudible**
Greylands	4:45 pm	37	3.5m/s NNW	Birds (34), traffic (33), drill (26), **NCM inaudible**
Bow Hills	4: 52 pm	50	3.5m/s NNW	Traffic (50), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 2 NCM Noise Monitoring Results – 2 September 2009 (Evening)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Bow Hills	9:26 pm	61	1.5m/s NW	Traffic (61), **NCM (29)**
Naroo	9:09 pm	52	1.5m/s NW	Traffic (52), **NCM (30)**
Claremont*	8:48 pm	31	1.5m/s NW	**NCM (30)**, insects (25)
Westhaven	8:14 pm	30	1.5m/s NW	Insects (30), **NCM faintly audible**
Greylands	7:50 pm	34	1.5m/s NW	Insects (33), traffic (26), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 3 NCM Noise Monitoring Results – 2 September 2009 (Night)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Bow Hills	11:30 pm	62	<0.5m/s NW	Traffic (62), insects (30), **NCM inaudible**
Naroo	11:10 pm	42	<0.5m/s NW	Traffic (42), **NCM (25)**
Claremont*	10:50 pm	33	<0.5m/s NW	**NCM (33)**
Westhaven	10:00 pm	29	1m/s NW	**NCM (29)**
Greylands	10:23 pm	29	1m/s NW	**NCM (28)**, insects (23)

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

The results shown in Tables 1-3 indicate that noise emissions from the NCM were below the criterion of 35 dB(A),$L_{eq(15min)}$ at all receivers.

During the day time survey a drill rig was audible (and the noise measurable) working to the west of the residence at Westhaven.

Data for the 15 minute Leq noise levels were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from NCM must not exceed 45 dB(A) L1 (1 min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

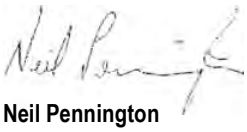
During the night time measurement circuit the L1 (1 min) noise from RCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

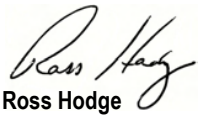
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

Review:



Ross Hodge
Acoustical Consultant

31 December 2009

Ref: 05168/3390

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: DECEMBER 2009 ATTENDED NOISE MONITORING RESULTS – NARRABRI MINE

This letter report presents the results of attended noise compliance monitoring conducted for the Narrabri Coal Mine (NCM) commencing Thursday 14th December 2009. Noise monitoring was carried out in accordance with the conditions of the NCM Noise Management Plan (NMP) as detailed below.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

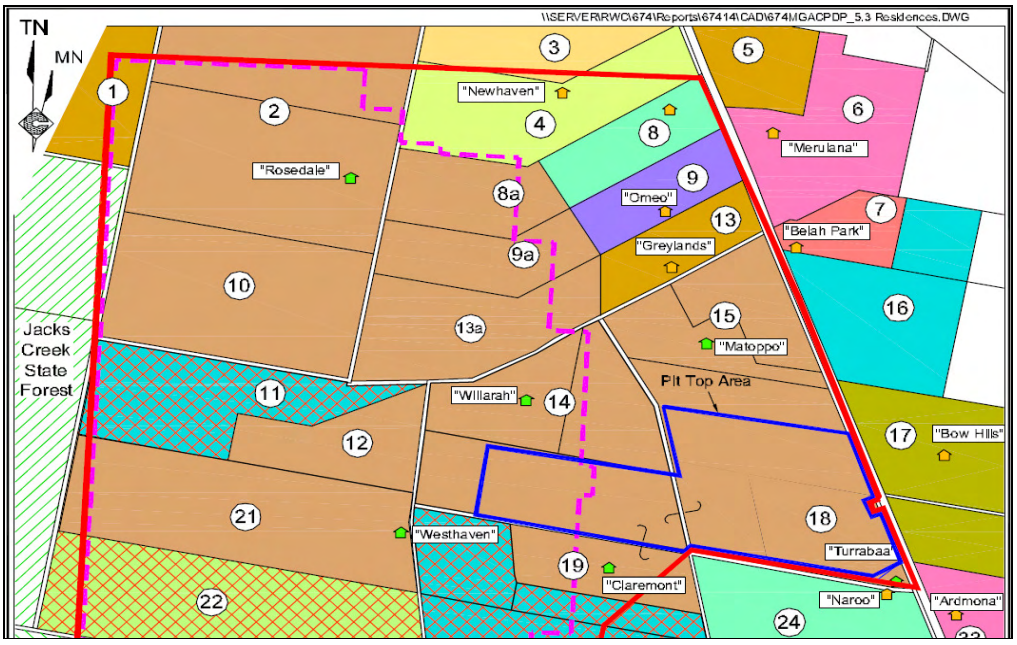
- *To determine compliance with the $LA_{eq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $LA1(1\ minute)$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying figure:

Location N1: Bow Hills
Location N2: Westhaven
Location N3: Naroo
Location N4: Greylands
Location N5: Kurrajong*

*It was not possible to conduct monitoring at a point within 30m of the residence, as access to the property was denied by the land owner. An alternative location was chosen at the edge of mine owned land in the direction of "Kurrajong". Measurements were taken near the boundary fence with "Claremont", which is approximately half way between the works for construction of the box cut and the "Kurrajong" residence. An indeterminate correction factor between 4 and 8 dB should be subtracted from these results to estimate the noise level at "Kurrajong".



NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather throughout the survey was generally mild with clear skies. Winds were generally gusty from the south to southeast at 2-4 m/s during the evening of 14 December, dropping in speed during the night and following morning.

RESULTS

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær "*Evaluator*" software. The software enables the contributions of the mine and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for the operational phase of the NCM project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times.

The results shown in **Tables 1**, **2** and **3**, below, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. This is the compliance criterion for the operation of the mine. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Measured noise levels are shown in **Tables 1-3**. Where the noise from NCM was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall level.

Noise from NCM is shown in bold type. Where noise from NCM is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

The gates to Bow Hills were locked during the evening and the measurements for evening and night were made at the front gates to the property.

Table 1 NCM Noise Monitoring Results – 15 December 2009 (Day)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Bow Hills	8:57 am	53.3	1-2 m/s SE	Traffic (53), Plane (34), **NCM inaudible**
Naroo	8:35 am	42.1	1-2 m/s SE	Traffic (40), birds (37), **NCM inaudible**
Claremont*	8:17 am	38.6	1-2 m/s SE	Birds (37), Traffic (34), **NCM (25)**
Westhaven	7:42 am	36.2	1-2 m/s SE	Birds (35), Traffic (29), **NCM (23)**
Greylands	7:04 am	41.2	1-2 m/s SE	Traffic (38), Birds (34), Wind (32), **NCM (25)**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 2 NCM Noise Monitoring Results – 14 December 2009 (Evening)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Bow Hills	9:36 pm	52.1	2-4 m/s S	Traffic (52), Wind (40), **NCM inaudible**
Naroo	8:12 pm	47.5	2-4 m/s S	Traffic (46), Wind (35), **NCM inaudible**
Claremont*	8:35 pm	37.3	2-4 m/s S	Wind (36), Pump (32), **NCM inaudible**
Westhaven	8:57 pm	38.4	2-4 m/s S	Wind (37), Insects (34), **NCM inaudible**
Greylands	9:14 pm	40.5	2-4 m/s S	Wind (40), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

Table 3 NCM Noise Monitoring Results – 15 December 2009 (Night)				
Location	**Time**	**dB(A),L_{eq}**	**Wind speed/ direction**	**Identified Noise Sources**
Bow Hills	5:27 am	34.4	1-2 m/s SE	Insects (30), Wind (30), **NCM (22)**
Naroo	4:17 am	45.9	1-2 m/s SE	Traffic (44), Wind (33), **NCM inaudible**
Claremont*	4:36 am	40.6	1-2 m/s SE	Car (39), Wind (32), **NCM inaudible**
Westhaven	4:52 am	35.5	1-2 m/s SE	Wind (35), **NCM inaudible**
Greylands	5:09 am	41.8	1-2 m/s SE	Birds (39), Wind (35), **NCM inaudible**

* Correction of 4-8dB to be subtracted from the *mine noise component only* measured at "Claremont" boundary to estimate levels at "Kurrajong".

The results shown in Tables 1-3 indicate that noise emissions from the NCM were below the criterion of 35 dB(A),$L_{eq(15min)}$ at all receivers.

Data for the 15 minute Leq noise levels were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from NCM must not exceed 45 dB(A) L1 (1 min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

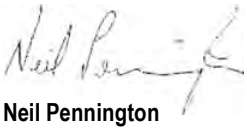
During the night time measurement circuit the L1 (1 min) noise from NCM did not exceed 45 dB(A) at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington

Acoustical Consultant

Review:

Ross Hodge

Acoustical Consultant

22 April 2010

Ref: 05168/3514

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: MARCH 2010 ATTENDED NOISE MONITORING RESULTS – NARRABRI MINE

This letter report presents the results of attended noise compliance monitoring conducted for the Narrabri Coal Mine (NCM) commencing Friday 26th March 2010. Noise monitoring was carried out in accordance with the conditions of the NCM Noise Management Plan (NMP) as detailed below.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

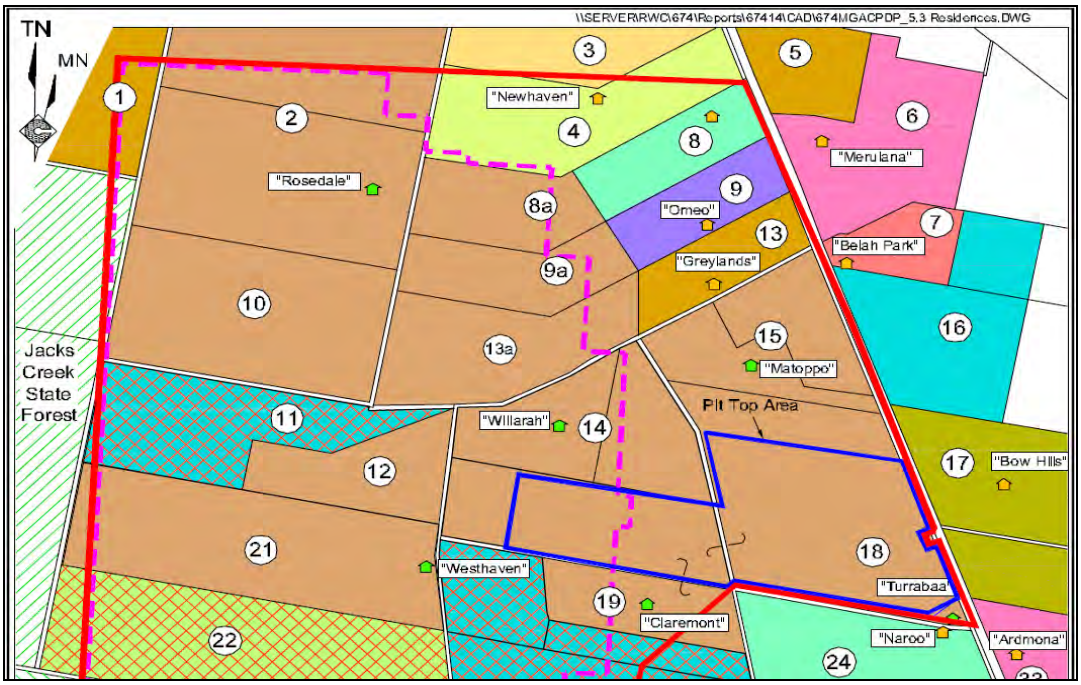
- *To determine compliance with the $LA_{eq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $LA1(1\ minute)$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and shown in the accompanying figure:

Location N1: Bow Hills
Location N2: Westhaven
Location N3: Naroo
Location N4: Greylands
Location N5: Kurrajong*

*It was not possible to conduct monitoring at a point within 30m of the residence, as access to the property was denied by the land owner. An alternative location was chosen at the edge of mine owned land in the direction of "Kurrajong". Measurements were taken near the boundary fence with "Claremont", which is approximately half way between the box cut and the "Kurrajong" residence. An indeterminate correction factor between 4 and 8 dB should be subtracted from these results to estimate the noise level at "Kurrajong".



NOISE MEASUREMENTS

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Meteorological data used in this report was obtained from a hand held weather station with measurements made at approximately 2m above ground level. The weather throughout the survey was generally warm with clear skies. Winds were generally calm with occasional very faint drift from the SE.

RESULTS

The measured noise levels, over 1 second intervals, were analysed using Brüel & Kjær "*Evaluator*" software. The software enables the contributions of the mine and other significant noise sources to the overall to be quantified.

Noise levels were recorded for each of the Leq (15 min), Lmax, L1, L10, L90 and Lmin percentiles. As shown in Table 1, the noise criterion for the operational phase of the NCM project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times.

The results shown in **Tables 1**, **2** and **3**, below, represent the total 15 minute Leq noise level for all noise sources and the relative contributions of each. This is the compliance criterion for the operation of the mine. Levels for the other percentiles are not shown as they have no compliance criteria for comparison but are available on request. The exception is the L1 (1 min) noise level (which is the standard measure of sleep disturbance) which is applicable to noise emissions at night (i.e. between 10 pm and 7 am).

Measured noise levels are shown in **Tables 1-3**. Where the noise from NCM was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall level.

Noise from NCM is shown in bold type. Where noise from NCM is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
NCM Noise Monitoring Results – 26 March 2010 (Day)

Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Bow Hills	4:18 pm	36.6	<1 m/s SE	Traffic (35), Insects (29), NCM inaudible
Naroo	2:48 pm	40.7	Calm	Birds (39), Traffic (35), NCM inaudible
Claremont*	3:07 pm	31.3	Calm	Plane (28), Insects (27), NCM inaudible
Westhaven	3:26 pm	33.5	Calm	Birds (31), Insects (29), NCM inaudible
Greylands	3:46 pm	39.3	Calm	Local car (35), Birds (34), NCM (30)#

* Correction of 4-8dB to be subtracted from the *mine noise component only* to estimate levels at "Kurrajong".
# Distant drill rig.

Table 2 NCM Noise Monitoring Results – 26 March 2010 (Evening)				
Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Bow Hills	8:20 pm	46.9	Calm	Traffic (46), Insects (36), NCM inaudible
Naroo	8:37 pm	44.7	Calm	Traffic (44), Insects (37), NCM inaudible
Claremont*	8:55 pm	51.5	Calm	Insects (51), NCM (22)#
Westhaven	9:18 pm	38.0	Calm	Insects (38), NCM (19)#
Greylands	9:36 pm	38.8	Calm	Insects (35), Dog (35), NCM inaudible

* Correction of 4-8dB to be subtracted from the *mine noise component only* to estimate levels at "Kurrajong".
# Distant drill rig.

Table 3 NCM Noise Monitoring Results – 26 March 2010 (Night)				
Location	Time	dB(A),L_{eq}	Wind speed/ direction	Identified Noise Sources
Bow Hills	11:24 pm	44.1	Calm	Traffic (44), Insects (25), NCM inaudible
Naroo	11:04 pm	46.1	Calm	Traffic (44), Insects (35), NCM (26)#
Claremont*	10:43 pm	44.1	Calm	Insects (44), NCM (27)#
Westhaven	10:21 pm	41.6	Calm	Insects (41), NCM inaudible
Greylands	10:01 pm	36.4	Calm	Insects (34), Traffic (28), NCM (19)#

* Correction of 4-8dB to be subtracted from the *mine noise component only* to estimate levels at "Kurrajong".
# Distant drill rig.

The results shown in Tables 1-3 indicate that noise emissions from the NCM were below the criterion of 35 dB(A),$L_{eq(15min)}$ at all receivers.

Data for the 15 minute Leq noise levels were analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from NCM must not exceed 45 dB(A) L1 (1 min) between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine. During the night time measurement circuit the L1 (1 min) noise from NCM did not exceed 45 dB(A) at any monitoring location.

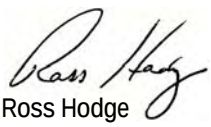
We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington
Acoustical Consultant

Review:



Ross Hodge
Acoustical Consultant

Unattended Noise Monitoring

June 2009

September 2009

December 2009

March 2010

15 July 2009

Ref: 05168/3178

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: JUNE 2009 UNATTENDED NOISE MONITORING RESULTS

This letter report presents the results of unattended operational noise monitoring conducted for the Narrabri Coal Mine (NCM) during June 2009.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $L_{A_{eq(15\ minute)}}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $L_{A1(1\ minute)}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the attended noise survey are listed below and indicated in Figure 1.

Location N4: Entrance gate to Matoppo (north of site)
Location N3: Naroo (south of site)

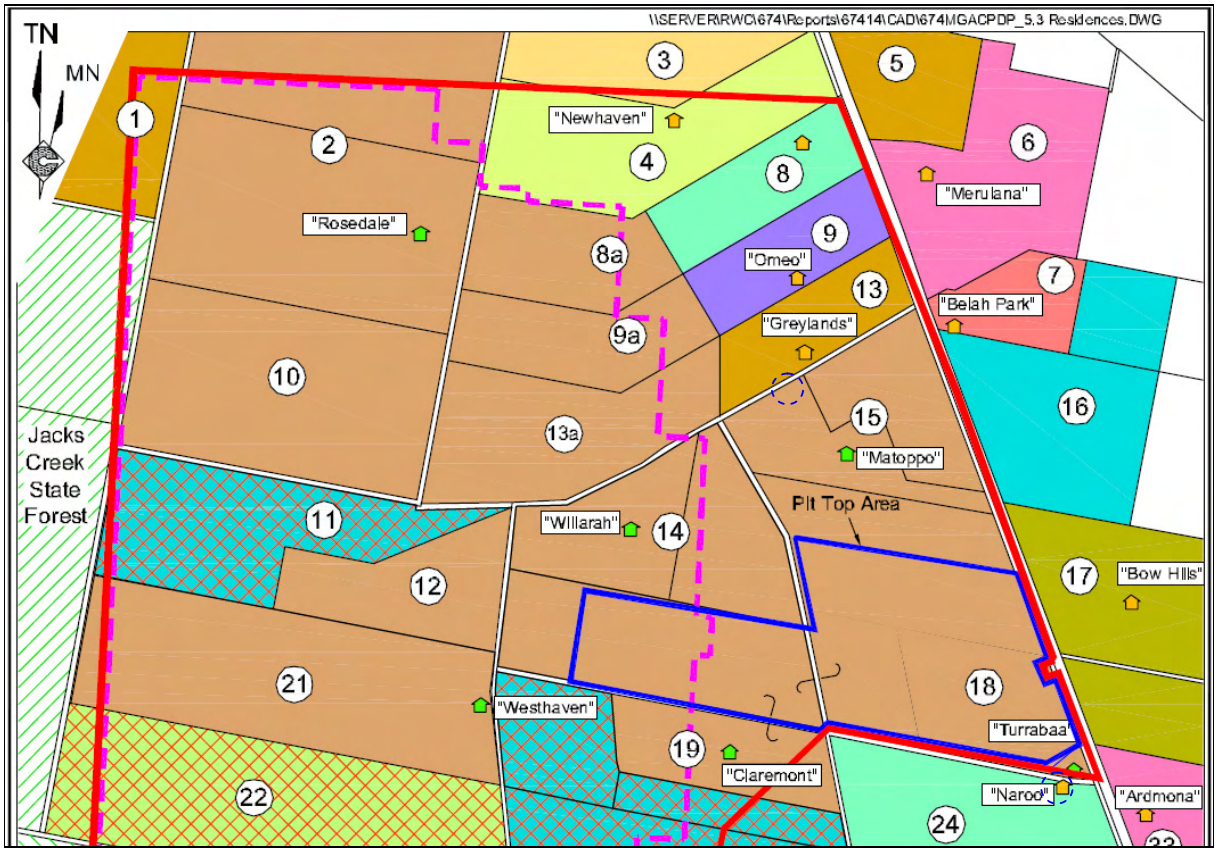


Figure 1. Unattended noise monitoring locations.

NOISE MONITORING PROGRAM

Noise levels were measured at each location for a period of at least seven days. Noise levels were measured at 15 minute statistical intervals using Svan 949 sound and vibration analysers used as environmental noise loggers. The measurements were done in accordance with relevant DECC guidelines and AS 1055-1997 "Acoustics – Description and Measurement of Environmental Noise". The noise loggers used comply with the requirements of AS 1259.2-1990 "Acoustics – Sound Level Meters".

Each logger was programmed to continuously register environmental noise levels over the 15 minute intervals, with internal software calculating and storing Ln percentile noise levels for each sampling period. Calibration of the logger was performed as part of the instrument's initialisation procedures, with calibration results being within the allowable ± 0.5 dB(A) range. Since noise loggers record the total acoustic environment, it is not possible to identify or assign noise levels to the various contributing sources. Accordingly, this report does not attempt to interpret the logger results.

MEASURED NOISE LEVELS

Measured noise levels at each location are summarised below. Tabulated results show overall L_{Aeq} and L_{90} levels for the day, evening and night time periods using procedures specified in the DECC INP. Graphs showing full data sets are shown in **Appendix A**.

Matoppo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
23-Jun-09	61.7	39.2	39.8	20.9	23.3	19.7
24-Jun-09	43.4	31.1	37.2	29.2	20.6	17.3
25-Jun-09	40.6	40.2	37.6	20.4	18.0	17.3
LAeq	**57**	**38**	**38**	**--**	**--**	**--**
L90	**--**	**--**	**--**	**25**	**21**	**17**

Naroo

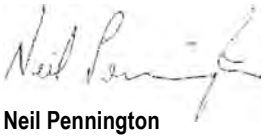
Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
23-Jun-09	61.1	49.6	48.1	21.6	25.0	20.5
24-Jun-09	53.1	44.7	47.4	38.1	27.3	19.9
25-Jun-09	52.5	46.9	43.6	31.2	19.9	18.2
LAeq	**57**	**48**	**47**	**--**	**--**	**--**
L90	**--**	**--**	**--**	**34**	**25**	**20**

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0406 670677.

Yours faithfully,

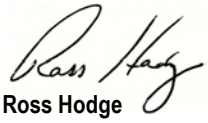
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

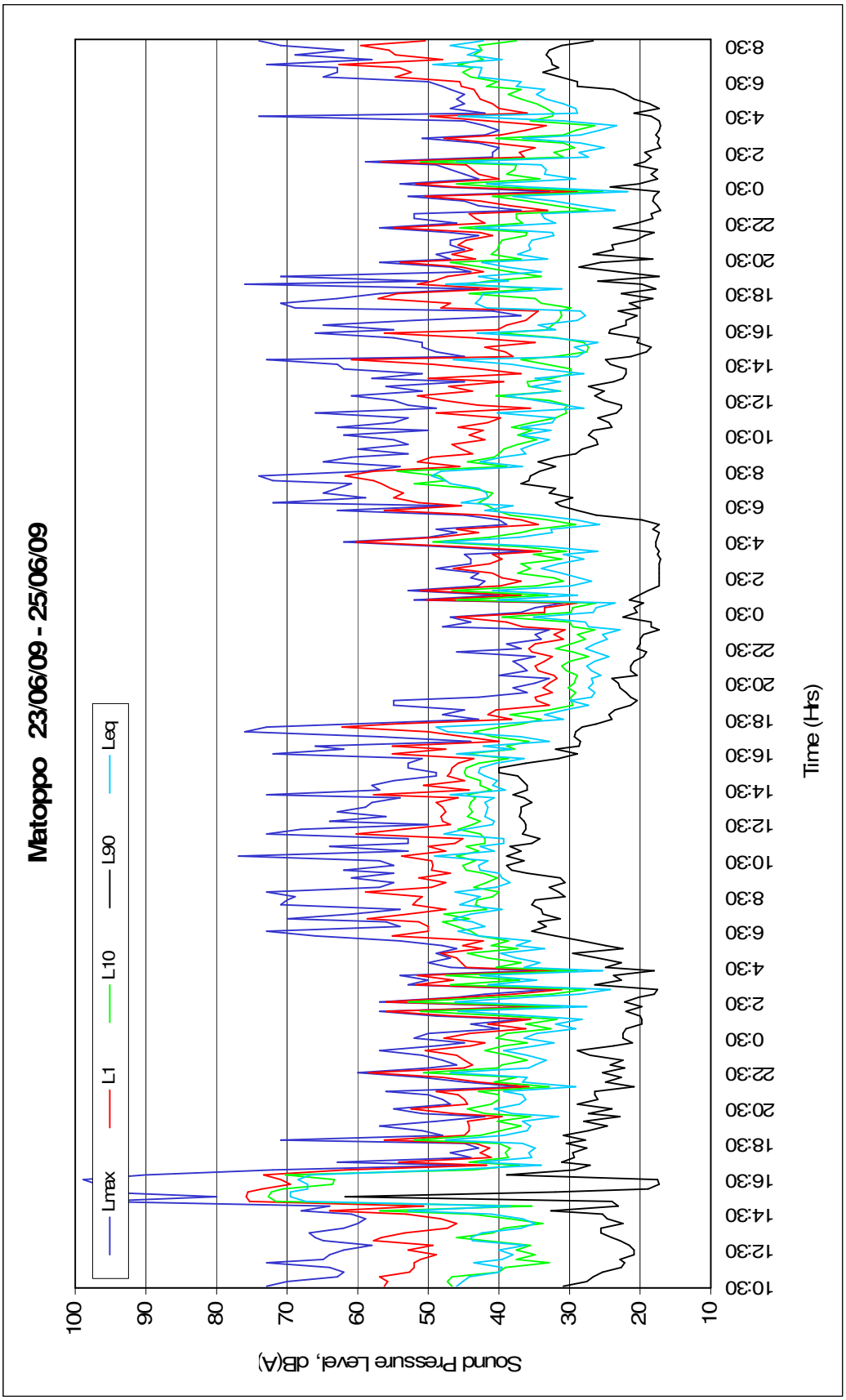
Review:

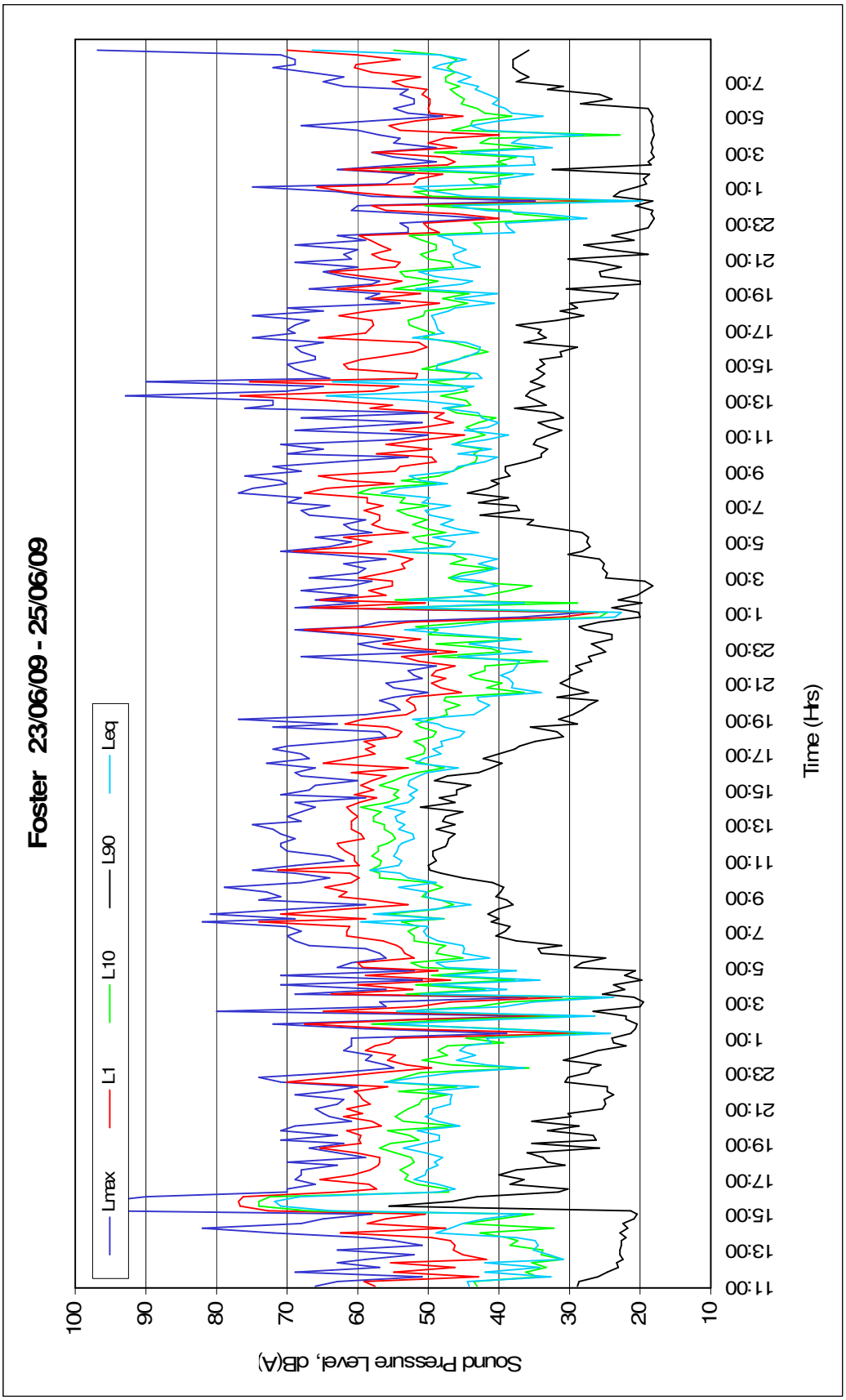


Ross Hodge
Acoustical Consultant

APPENDIX A

NOISE DATA CHARTS


Matoppo 23/06/09 - 25/06/09
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
10:30
12:30
14:30
16:30
18:30
20:30
22:30
0:30
2:30
4:30
6:30
8:30
10:30
12:30
14:30
16:30
18:30
20:30
22:30
0:30
2:30
4:30
6:30
8:30


Foster 23/06/09 - 25/06/09
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
7:00

16 September 2009

Ref: 05168/3260

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: SEPTEMBER 2009 UNATTENDED NOISE MONITORING RESULTS

This letter report presents the results of unattended operational noise monitoring conducted for the Narrabri Coal Mine (NCM) in September 2009.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $L_{A_{eq(15\ minute)}}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $L_{A1(1\ minute)}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the unattended noise survey are listed below and indicated in Figure 1.

Location N4: Entrance gate to Matoppo (north of site)
Location N3: Naroo (south of site)

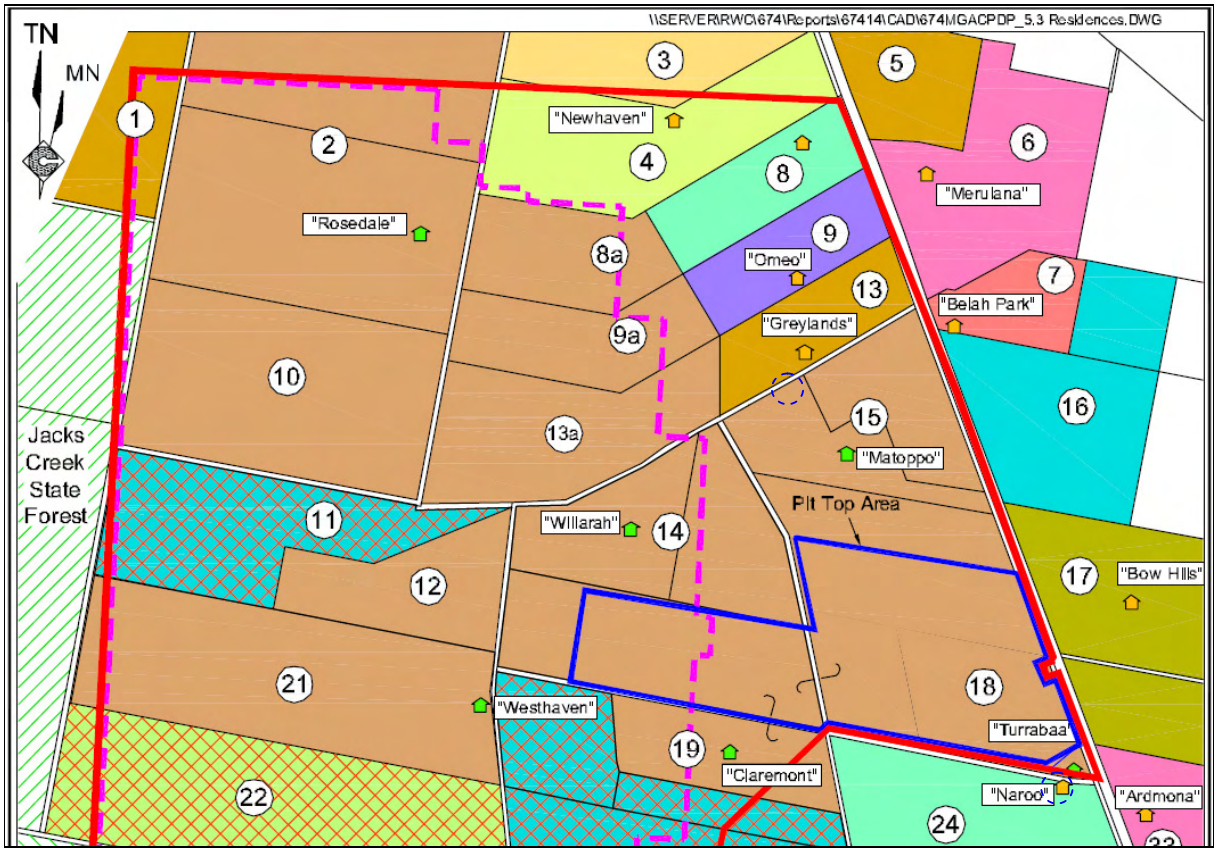


Figure 1. Unattended noise monitoring locations.

NOISE MONITORING PROGRAM

Noise levels were measured at each location for a period of at least three days. Noise levels were measured at 15 minute statistical intervals using Svan 949 sound and vibration analysers used as environmental noise loggers. The measurements were done in accordance with relevant DECCW guidelines and AS 1055-1997 "Acoustics – Description and Measurement of Environmental Noise". The noise loggers used comply with the requirements of AS 1259.2-1990 "Acoustics – Sound Level Meters".

Each logger was programmed to continuously register environmental noise levels over the 15 minute intervals, with internal software calculating and storing Ln percentile noise levels for each sampling period. Calibration of the logger was performed as part of the instrument's initialisation procedures, with calibration results being within the allowable ± 0.5 dB(A) range. Since noise loggers record the total acoustic environment, it is not possible to identify or assign noise levels to the various contributing sources. Accordingly, this report does not attempt to interpret the logger results.

MEASURED NOISE LEVELS

Measured noise levels at each location are summarised below. Tabulated results show overall L_{Aeq} and L_{90} levels for the day, evening and night time periods using procedures specified in the NSW Industrial Noise Policy. Graphs showing full data sets are shown in **Appendix A**.

Matoppo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
2-Sep-09	48.4	45.8	43.9	31.9	20.2	18.2
3-Sep-09	47.6	43.3	48.6	33.3	32.3	27.9
4-Sep-09	45.2	48.3	41.4	32.3	22.3	19.2
LAeq	**47**	**46**	**46**			
L90				**32**	**22**	**19**

Naroo

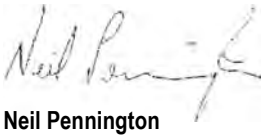
Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
2-Sep-09	47.2	49.3	43.9	32.5	18.4	17.7
3-Sep-09	50.4	41.7	49.6	32.7	19.7	22.5
4-Sep-09	50.3	45.7	41.8	35.6	25.4	17.2
LAeq	**50**	**47**	**46**			
L90				**33**	**20**	**18**

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0406 670677.

Yours faithfully,

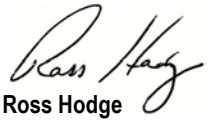
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

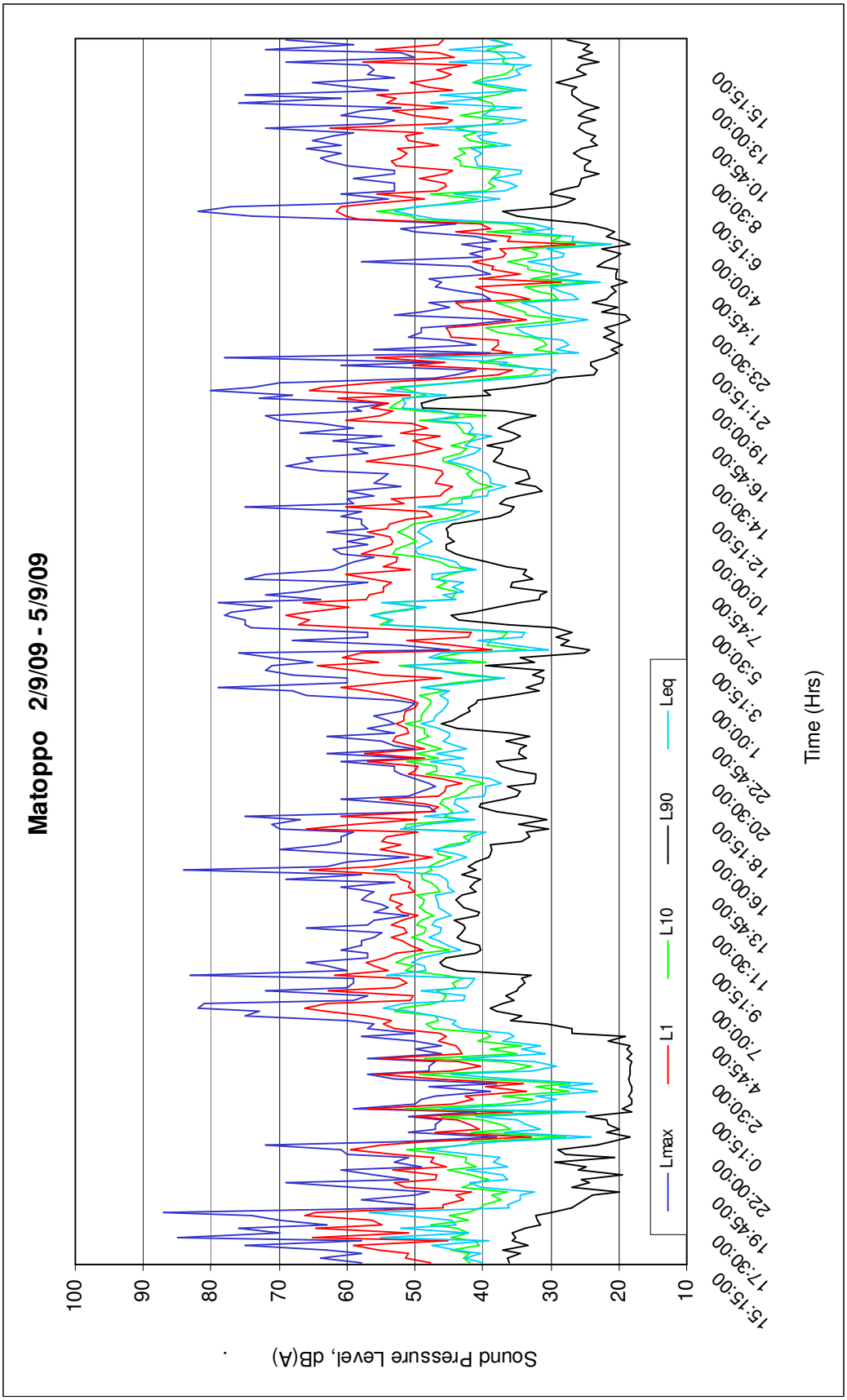
Review:

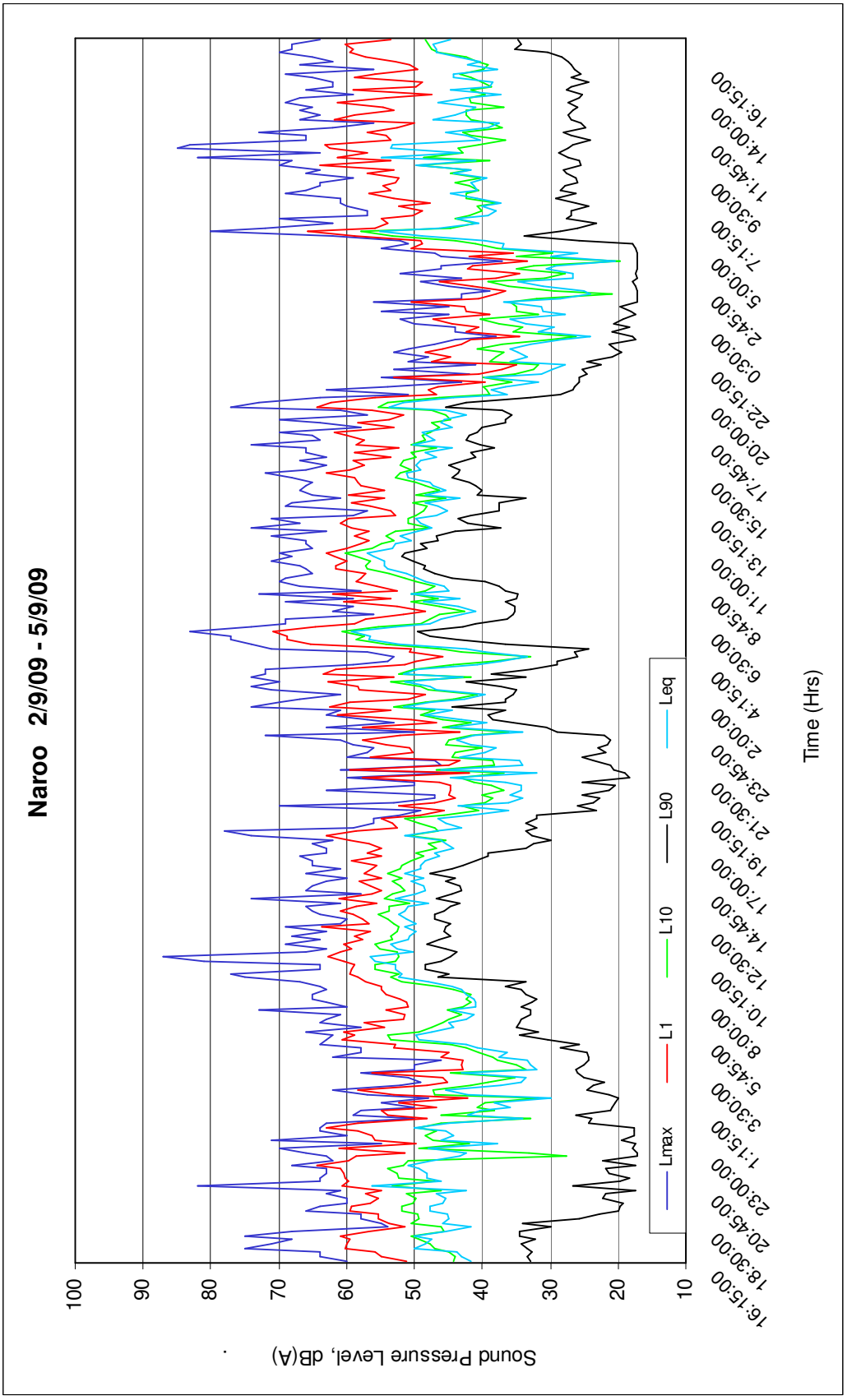


Ross Hodge
Acoustical Consultant

APPENDIX A

NOISE DATA CHARTS


Matoppo 2/9/09 - 5/9/09
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Lmax
L1
L10
L90
Leq
Time (Hrs)
15:15:00
17:30:00
19:45:00
22:00:00
0:15:00
2:30:00
4:45:00
7:00:00
9:15:00
11:30:00
13:45:00
16:00:00
18:15:00
20:30:00
22:45:00
1:00:00
3:15:00
5:30:00
7:45:00
10:00:00
12:15:00
14:30:00
16:45:00
19:00:00
21:15:00
23:30:00
1:45:00
4:00:00
6:15:00
8:30:00
10:45:00
13:00:00
15:15:00


Naroo 2/9/09 - 5/9/09
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Lmax
L1
L10
L90
Leq
Time (Hrs)
16:15:00
18:30:00
20:45:00
23:00:00
1:15:00
3:30:00
5:45:00
8:00:00
10:15:00
12:30:00
14:45:00
17:00:00
19:15:00
21:30:00
23:45:00
2:00:00
4:15:00
6:30:00
8:45:00
11:00:00
13:15:00
15:30:00
17:45:00
20:00:00
22:15:00
0:30:00
2:45:00
5:00:00
7:15:00
9:30:00
11:45:00
14:00:00
16:15:00

15 April 2010

Ref: 05168/3512

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: DECEMBER 2009 UNATTENDED NOISE MONITORING RESULTS

This letter report presents the results of unattended operational noise monitoring conducted for the Narrabri Coal Mine (NCM) in December 2009.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $LA_{eq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $LA1(1\ minute)$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the unattended noise survey are listed below and indicated in Figure 1.

Location N4: Entrance gate to Matoppo (north of site)
Location N3: Naroo (south of site)

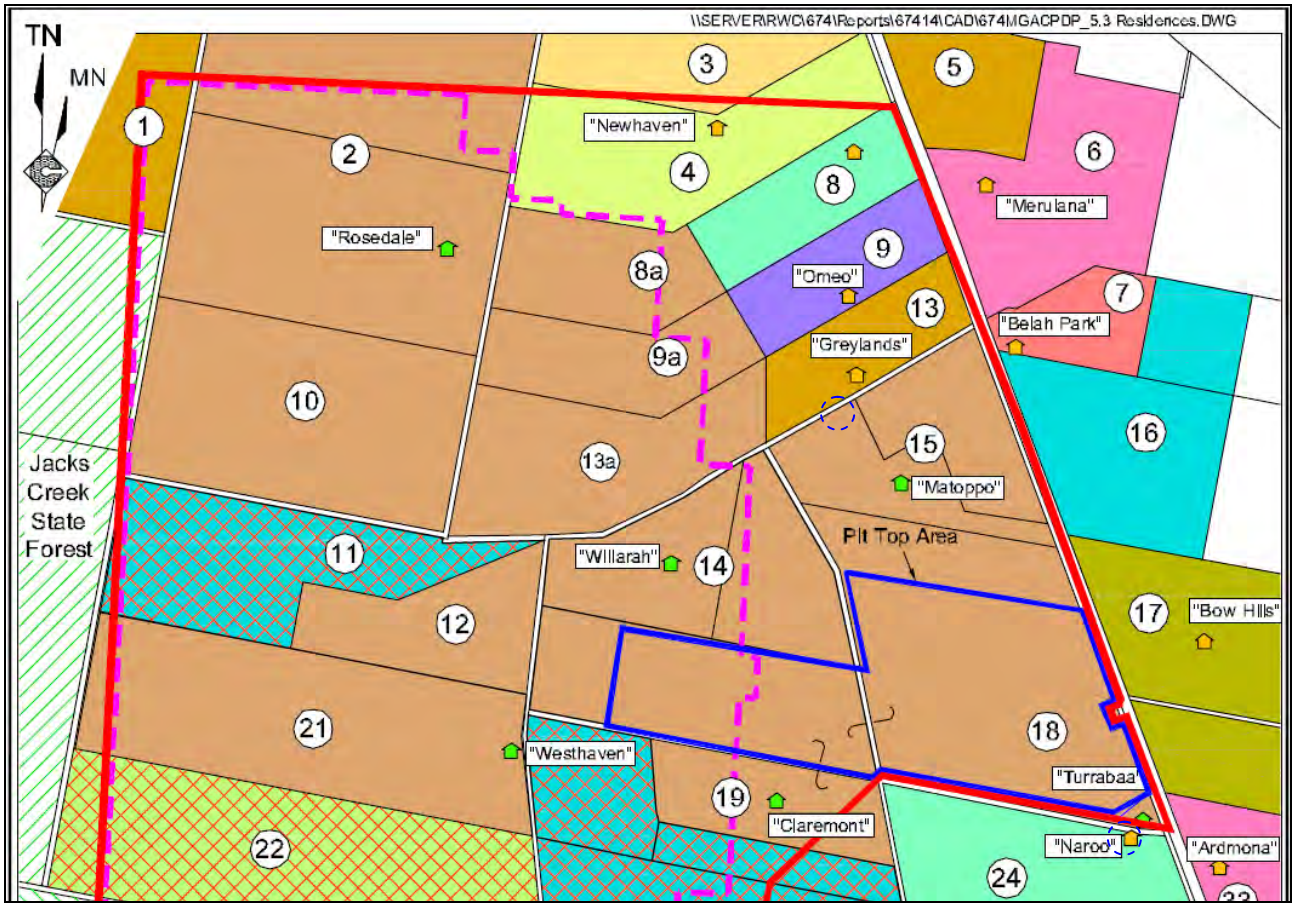


Figure 1. Unattended noise monitoring locations.

NOISE MONITORING PROGRAM

Noise levels were measured at each location for a period of at least three days. Noise levels were measured at 15 minute statistical intervals using Svan 949 sound and vibration analysers used as environmental noise loggers. The measurements were done in accordance with relevant DECCW guidelines and AS 1055-1997 "Acoustics – Description and Measurement of Environmental Noise". The noise loggers used comply with the requirements of AS 1259.2-1990 "Acoustics – Sound Level Meters".

Each logger was programmed to continuously register environmental noise levels over the 15 minute intervals, with internal software calculating and storing Ln percentile noise levels for each sampling period. Calibration of the logger was performed as part of the instrument's initialisation procedures, with calibration results being within the allowable ± 0.5 dB(A) range. Since noise loggers record the total acoustic environment, it is not possible to identify or assign noise levels to the various contributing sources. Accordingly, this report does not attempt to interpret the logger results.

MEASURED NOISE LEVELS

Measured noise levels at each location are summarised below. Tabulated results show overall L_{Aeq} and L_{90} levels for the day, evening and night time periods using procedures specified in the NSW Industrial Noise Policy. Graphs showing full data sets are shown in **Appendix A**.

Matoppo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
15-Dec-09	43.3	42.9	41.1	23.9	20.8	18.8
16-Dec-09	47.9	41.5	44.3	24.5	23.1	26.4
17-Dec-09	52.0	41.5	33.5	31.5	19.3	19.1
LAeq	49	42	41	--	--	--
L90	--	--	--	24	21	19

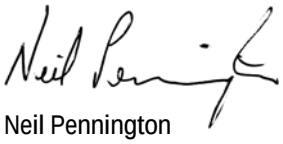
Naroo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
15-Dec-09	45.4	39.5	41.2	30.7	29.3	24.2
16-Dec-09	46.2	43.7	40.1	26.6	28.4	19.8
17-Dec-09	46.9	39.3	40.9	28.2	25.6	19.1
LAeq	46	41	41	--	--	--
L90	--	--	--	27	28	20

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

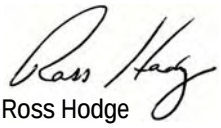
Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

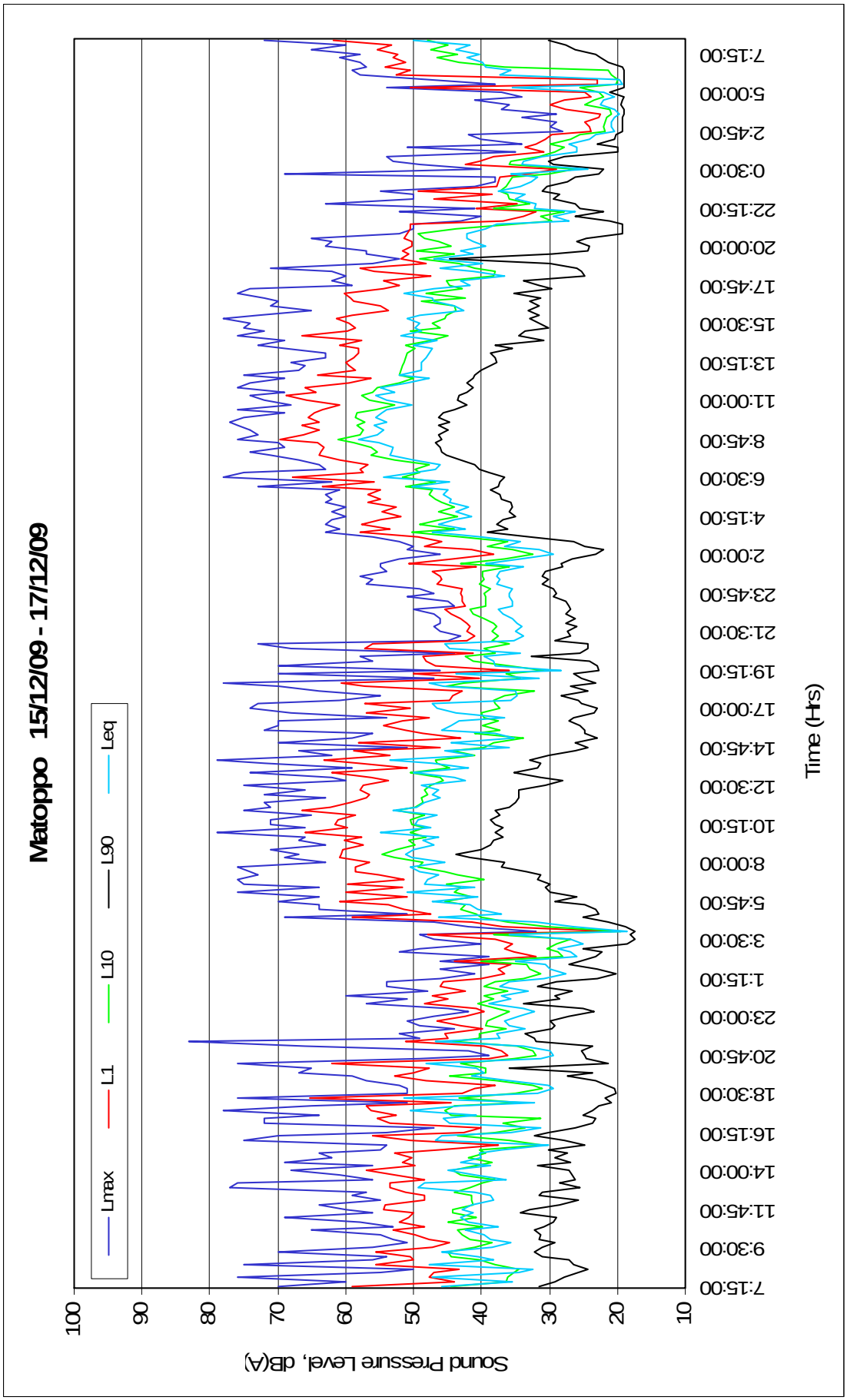
Review:

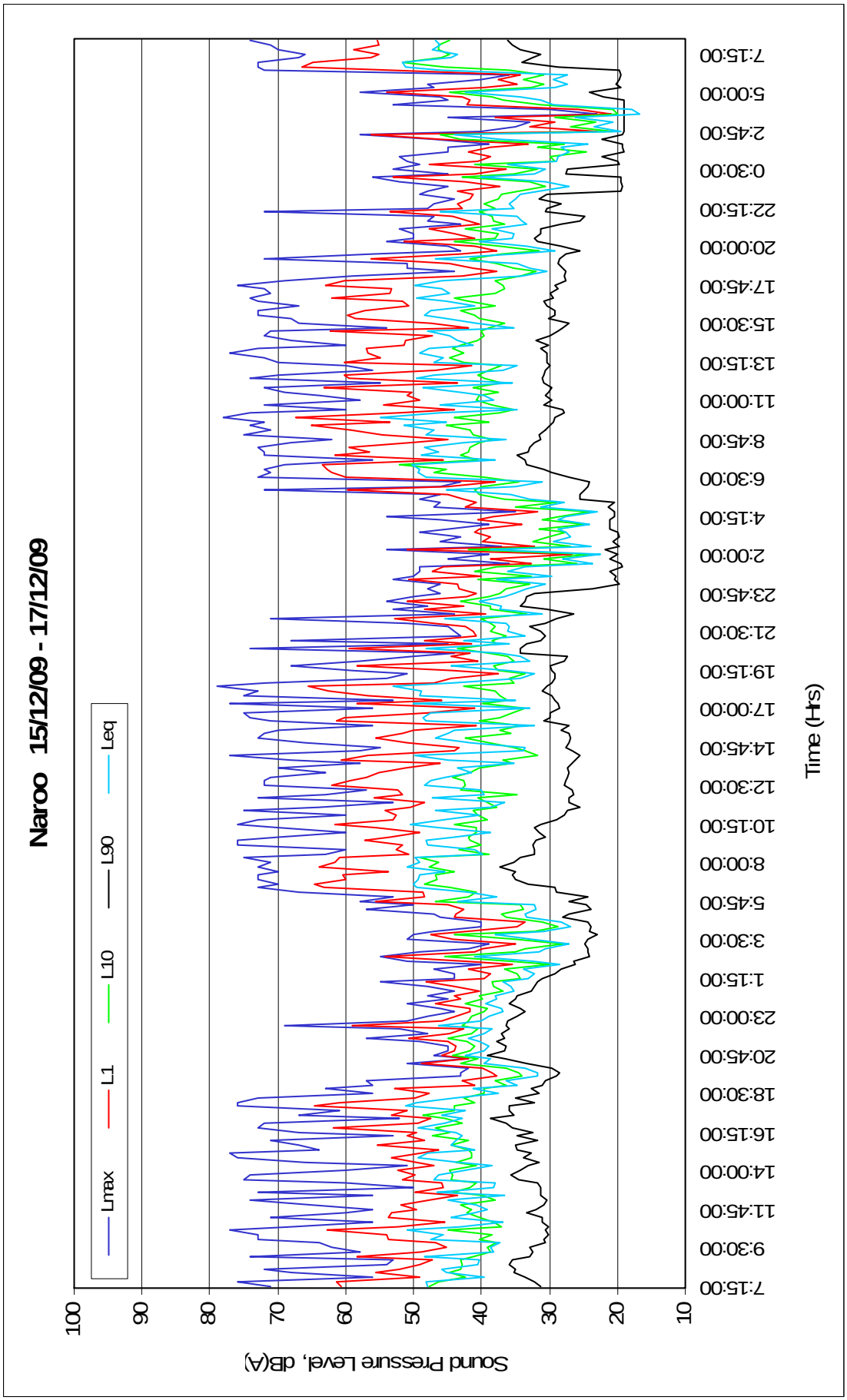


Ross Hodge
Acoustical Consultant

APPENDIX A

NOISE DATA CHARTS


Matoppo 15/12/09 - 17/12/09
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
7:15:00
9:30:00
11:45:00
14:00:00
16:15:00
18:30:00
20:45:00
23:00:00
1:15:00
3:30:00
5:45:00
8:00:00
10:15:00
12:30:00
14:45:00
17:00:00
19:15:00
21:30:00
23:45:00
2:00:00
4:15:00
6:30:00
8:45:00
11:00:00
13:15:00
15:30:00
17:45:00
20:00:00
22:15:00
0:30:00
2:45:00
5:00:00
7:15:00


Naroo 15/12/09 - 17/12/09
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
7:15:00
9:30:00
11:45:00
14:00:00
16:15:00
18:30:00
20:45:00
23:00:00
1:15:00
3:30:00
5:45:00
8:00:00
10:15:00
12:30:00
14:45:00
17:00:00
19:15:00
21:30:00
23:45:00
2:00:00
4:15:00
6:30:00
8:45:00
11:00:00
13:15:00
15:30:00
17:45:00
20:00:00
22:15:00
0:30:00
2:45:00
5:00:00
7:15:00

22 April 2010

Ref: 05168/3513

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: MARCH 2010 UNATTENDED NOISE MONITORING RESULTS

This letter report presents the results of unattended operational noise monitoring conducted for the Narrabri Coal Mine (NCM) in March 2010.

NOISE CRITERIA

The following is an extract from the Narrabri Coal NMP:

Noise impact assessment criteria for the various stages and activities associated with the mine's development were established in the *Environmental Assessment* using relevant DECC guidelines. These criteria have been incorporated in PA 05_0102 *Condition 3(12)* which is reproduced below. Additionally, PA 05_0102 *Condition 3(13)* identifies criteria for ensuring continuous improvement in noise mitigation actions at the mine site.

Noise Limits

3(12) The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1 at any privately-owned residence.

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
All Privately owned Residences	35	35	35	45

Table 1: Impact assessment criteria dB(A)

Notes:

- *To determine compliance with the $LA_{eq(15\ minute)}$ limit, noise from the project is to be measured at the most affected point 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. Where it can be demonstrated that direct measurement of noise from the project is impractical, 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.*
- *These limits apply under the relevant meteorological conditions outlined in the assessment procedures in Chapter 5 of the NSW Industrial Relations Policy.*
- *To determine compliance with the $LA1(1\ minute)$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).*
- *These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.*

NOISE MONITORING LOCATIONS

Noise measurement locations for the unattended noise survey are listed below and indicated in Figure 1.

Location N4: Entrance gate to Matoppo (north of site)
Location N3: Naroo (south of site)

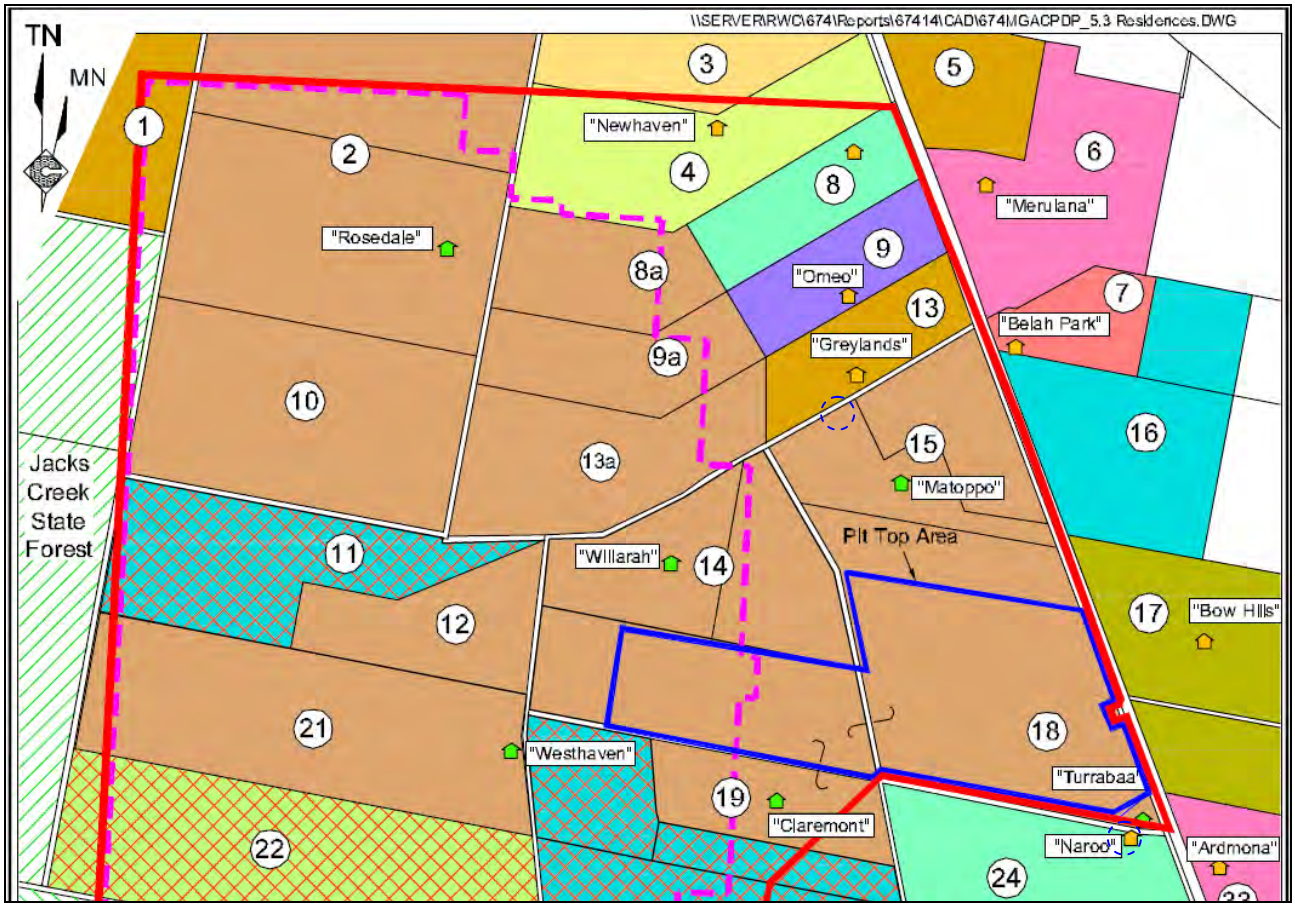


Figure 1. Unattended noise monitoring locations.

NOISE MONITORING PROGRAM

Noise levels were measured at each location for a period of at least three days. Noise levels were measured at 15 minute statistical intervals using Svan 949 sound and vibration analysers used as environmental noise loggers. The measurements were done in accordance with relevant DECCW guidelines and AS 1055-1997 "Acoustics – Description and Measurement of Environmental Noise". The noise loggers used comply with the requirements of AS 1259.2-1990 "Acoustics – Sound Level Meters".

Each logger was programmed to continuously register environmental noise levels over the 15 minute intervals, with internal software calculating and storing Ln percentile noise levels for each sampling period. Calibration of the logger was performed as part of the instrument's initialisation procedures, with calibration results being within the allowable ± 0.5 dB(A) range. Since noise loggers record the total acoustic environment, it is not possible to identify or assign noise levels to the various contributing sources. Accordingly, this report does not attempt to interpret the logger results.

MEASURED NOISE LEVELS

Measured noise levels at each location are summarised below. Tabulated results show overall L_{Aeq} and L_{90} levels for the day, evening and night time periods using procedures specified in the NSW Industrial Noise Policy. Graphs showing full data sets are shown in **Appendix A**.

Matoppo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
12-Mar-10	53.4	45.6	42.4	39.2	35.4	35.0
13-Mar-10	48.1	47.5	41.4	37.3	38.8	32.0
14-Mar-10	46.4	40.5	38.6	28.9	28.5	21.2
LAeq	50	45	41	--	--	--
L90	--	--	--	37	35	32

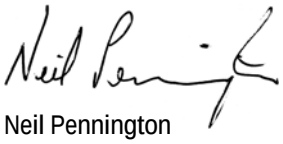
Naroo

Date	Leq(day)	Leq(eve)	Leq(night)	L90(day)	L90(eve)	L90(night)
12-Mar-10	49.5	54.8	38.8	24.3	27.4	20.2
13-Mar-10	45.4	39.5	41.2	30.7	29.3	24.2
14-Mar-10	46.2	43.7	40.1	26.6	28.4	19.8
LAeq	47	50	40	--	--	--
L90	--	--	--	27	28	20

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

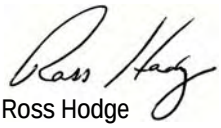
Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Neil Pennington
Acoustical Consultant

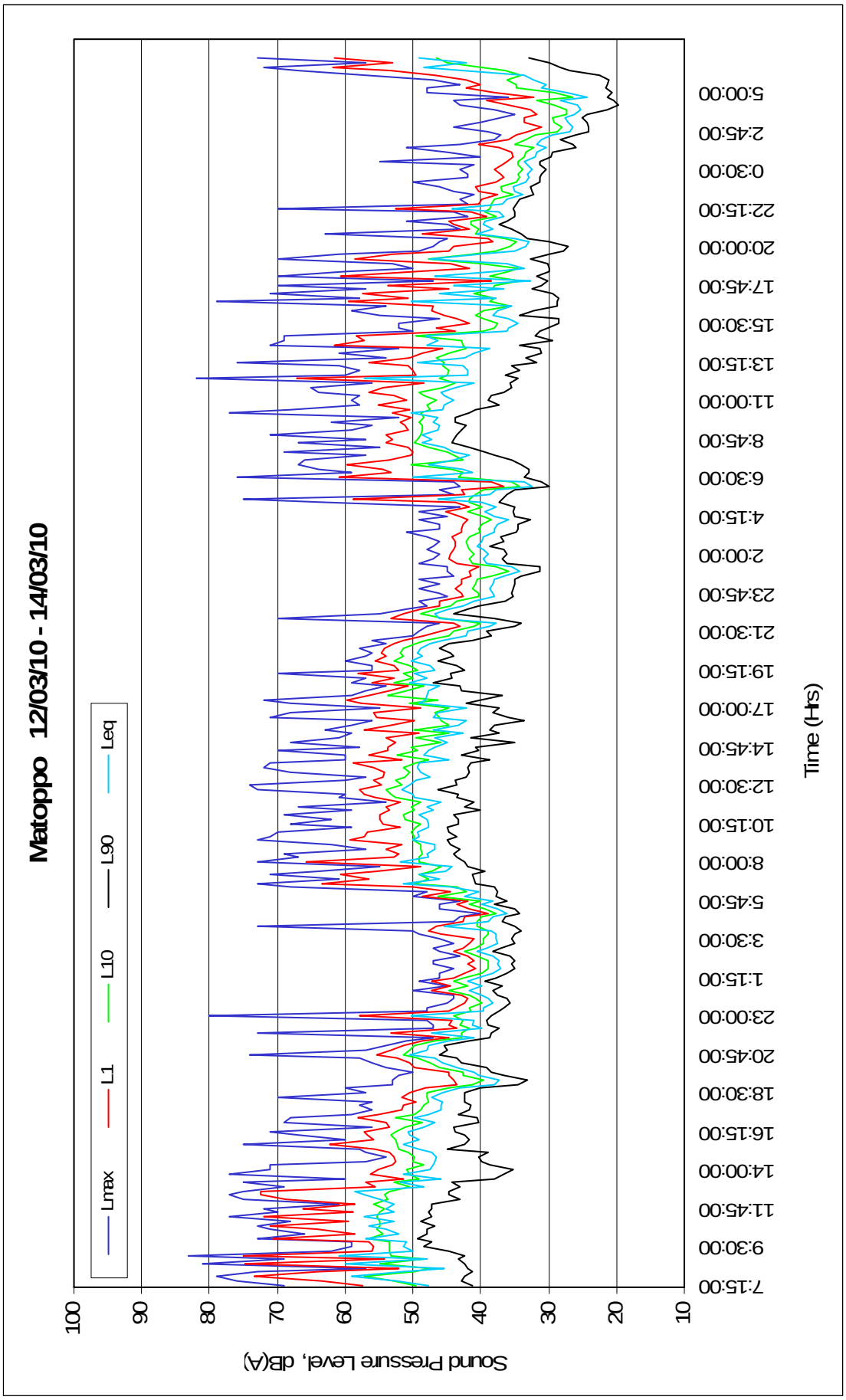
Review:

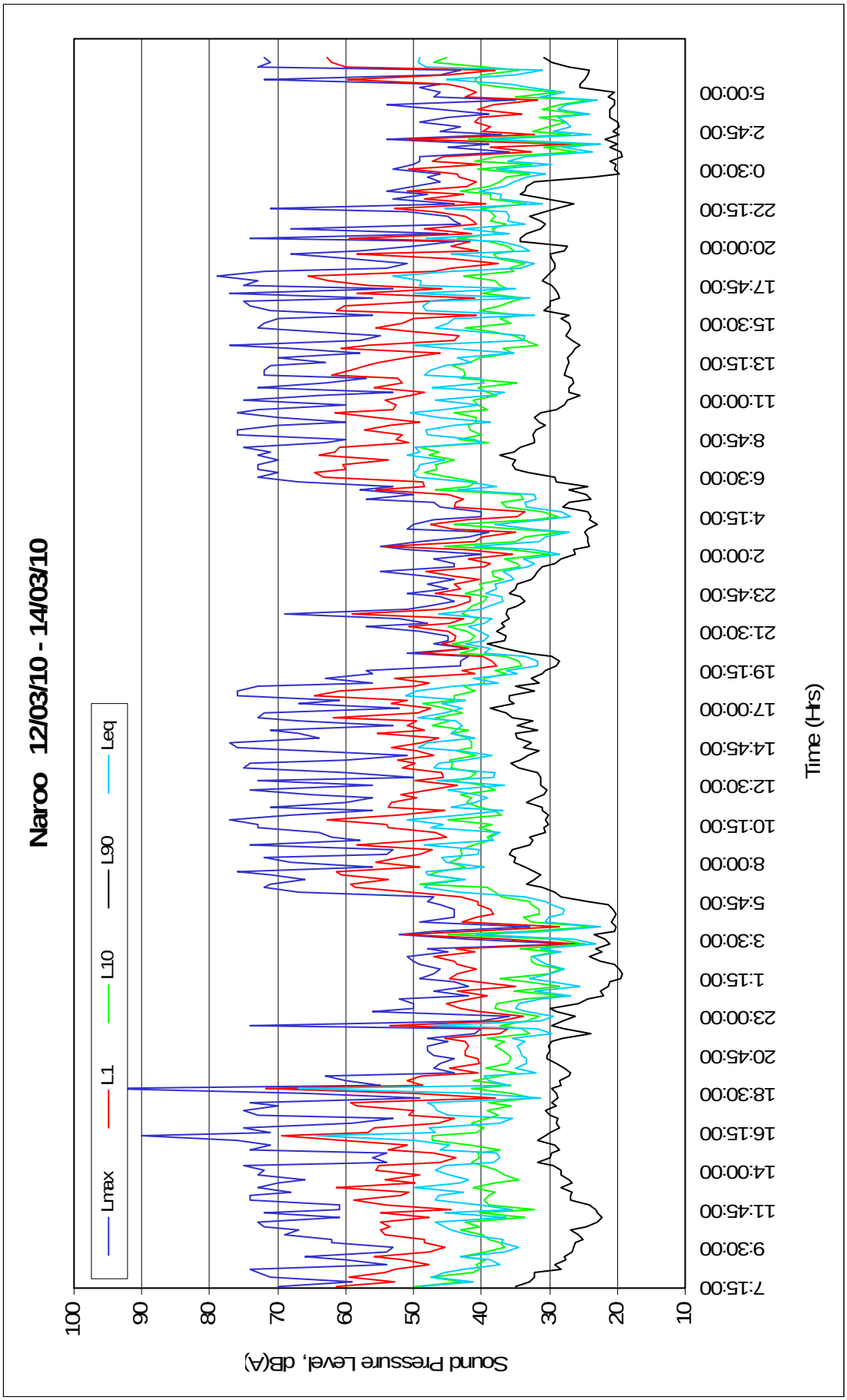


Ross Hodge
Acoustical Consultant

APPENDIX A

NOISE DATA CHARTS


Matoppo 12/03/10 - 14/03/10
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
7:15:00
9:30:00
11:45:00
14:00:00
16:15:00
18:30:00
20:45:00
23:00:00
1:15:00
3:30:00
5:45:00
8:00:00
10:15:00
12:30:00
14:45:00
17:00:00
19:15:00
21:30:00
23:45:00
2:00:00
4:15:00
6:30:00
8:45:00
11:00:00
13:15:00
15:30:00
17:45:00
20:00:00
22:15:00
0:30:00
2:45:00
5:00:00


Narroo 12/03/10 - 14/03/10
Lmax
L1
L10
L90
Leq
Sound Pressure Level, dB(A)
100
90
80
70
60
50
40
30
20
10
Time (Hrs)
7:15:00
9:30:00
11:45:00
14:00:00
16:15:00
18:30:00
20:45:00
23:00:00
1:15:00
3:30:00
5:45:00
8:00:00
10:15:00
12:30:00
14:45:00
17:00:00
19:15:00
21:30:00
23:45:00
2:00:00
4:15:00
6:30:00
8:45:00
11:00:00
13:15:00
15:30:00
17:45:00
20:00:00
22:15:00
0:30:00
2:45:00
5:00:00

BarnOwl Noise Monitoring

May – June 2009

10 August 2009

Ref: 05168/3210

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

BARN OWL NOISE MONITORING SUMMARY

This letter report presents the results of an analysis of data from the real-time BarnOwl ® noise monitor which was installed near the Narrabri Mine from Wednesday 13 May until Tuesday 16 June 2009.

The unit was set-up near the southern boundary of the "Claremont" property (which is mine-owned) by the supplier, Wilkinson Murray Pty Limited (WMPL). The purpose of the study was to obtain long-term noise levels at the adjoining "Kurrajong" property. As the owner of "Kurrajong" would not allow access to the property, advice was sought from DECC Noise Policy Branch, Sydney, as to an acceptable methodology. It was determined that the device would be situated at the nearest available point to "Kurrajong" and a correction determined from noise modelling would then be applied to the BarnOwl data to estimate noise levels at "Kurrajong". Figure 1 shows the location of the BarnOwl and the residence on the "Kurrajong" property.

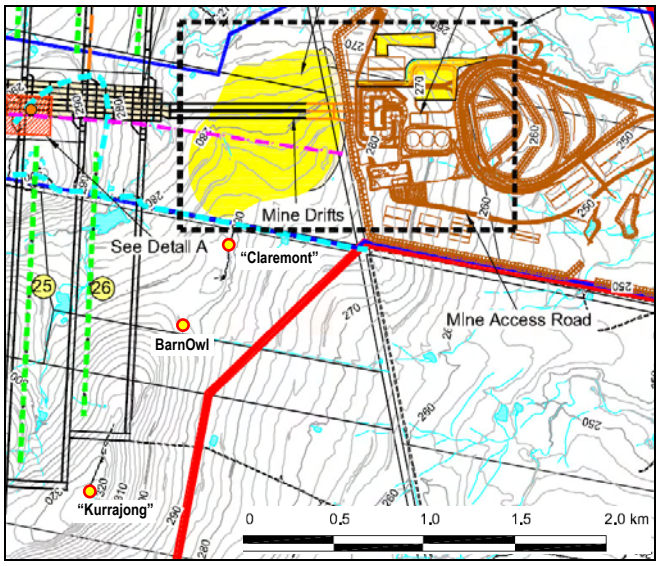


Figure 1. Location of BarnOwl logger and "Kurrajong" residence.

Extensive noise modelling was conducted to determine applicable inversion strength for the Narrabri Stage 2 EA, which is currently nearing completion. The modelling determined that inversion strength of 6^0C/100m was applicable. Based on modelling of actual operation scenarios for May 2008, the worst case predicted noise level as the BarnOwl location was 8dB higher than predicted levels at the "Kurrajong" residence. Accordingly, 8dB has been subtracted from BarnOwl noise levels to estimate levels at "Kurrajong".

The data assessment methodology is described with the aid of Figure 1, which shows BarnOwl data for 9 June 2009.

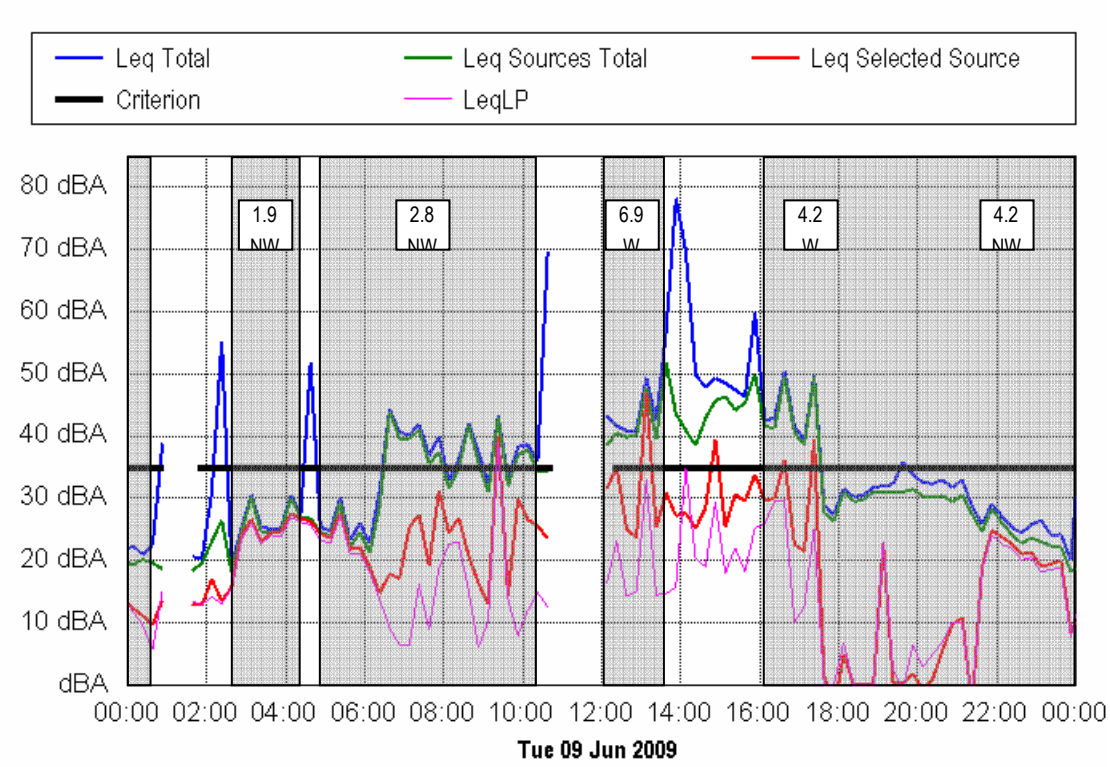


Figure 2. Sample BarnOwl data.

The blue trace in Figure 2 shows the total (non-directional) sound pressure level. The green trace shows all sources identified by the BarnOwl software. Where the blue and green traces are within nominally 2dB of each other, then virtually all noise sources have been identified. Where there is a large difference between the blue and green traces, there are significant unidentified noise sources. These are diffuse sounds such as insects or wind on the microphones. Periods when the blue and green traces are close together are shaded grey in Figure 2. Average wind speeds from the Narrabri weather station are shown within the grey shaded zones.

At around 2:30-4am in Figure 2, the wind is gentle and from the NW. The red trace shows the identified noise level within a wedge covering the Narrabri mine activities. Since virtually all of the noise has been identified (blue and green traces coincide), the red trace shows that it is likely that Narrabri mine contributed up to 28dB(A),$L_{eq(15minite)}$ during this period. Winds were much stronger later in the afternoon on that day, the blue and green traces separate considerably and advice from WMPL is that the red trace is unreliable.

At around 9:30 am in Figure 2, it is evident that all the noise is emanating from the wedge centred on Narrabri Mine. It would not be expected, however, that mine noise would increase by 30dB for a single 15-minute period and than drop again. Residences and machinery sheds associated with the "Claremont" property are directly between the BarnOwl and the mine and it is reasonable to assume that noise from "Claremont" contributed to the noise spike at 9:30 am. All such events have been excluded from the analysis, except where they occur in the middle of the night and activity at "Clarement" is unlikely.

The accompanying file ***NarrabriDirectionalGraphs1.doc*** contains all BarnOwl data from 13 May – 16 June 2009 summarised with grey bands and wind information include for each day as for Figure 2 above. The maximum $L_{Aeq(15\text{-}minute)}$ levels during all periods where it is likely that Narrabri Mine has been identified are summarised in Table 1. Cultivation of a paddock next to the BarnOwl, within the Narrabri Mine wedge, was occurring during the daytime on May 28-29 and these data have been excluded from the assessment.

Day	Date	Time(s)	Measured dB(A),$L_{eq(15minute)}$	"Kurrajong" dB(A),$L_{eq(15minute)}$	Criterion dB(A),$L_{eq(15minute)}$
Friday	15 May	9:30 am	34	26	35
Monday	18 May	1-6 pm	31	23	35
		10 pm – 12 am	31	23	35
Tuesday	19 May	12 am – 2 am	30	22	35
		8 am	35	27	35
Wednesday	20 May	7:30 am	32	24	35
Thursday	21 May	2 am	29	21	35
Friday	22 May	3am	30	22	35
		6pm	33	25	35
Sunday	24 May	6am	32	24	35
		11pm	37	29	35
Monday	25 May	7am	37	29	35
Tuesday	26 May	7am	37	29	35
Wednesday	27 May	5:30am	33	25	35
Thursday	28 May	Cultivation	N/A	N/A	35
Friday	28 May	Cultivation	N/A	N/A	35
Saturday	30 May	1am	35	27	35
Sunday	31 May	7am	36	28	35
Monday	1 June	2:30am	42	34	35
		7am	37	29	35
		11pm	33	25	35
Wednesday	3 June	8am	40	32	35
Thursday	4 June	7:30am	37	29	35
Saturday	6 June	7:30am	36	28	35
Sunday	7 June	2am	34	26	35
Wednesday	10 June	3am	32	28	35
		7:30am	43	35	35
Friday	12 June	5:30am	33	25	35
Saturday	13 June	4am	38	30	35
Sunday	14 June	2am	36	28	35
Monday	15 June	3am	35	27	35
Tuesday	16 June	8am	33	25	35

The results in Table 1 show that noise from Narrabri Mine may have reached levels approaching the 35 dB(A) criterion at “Kurrajong” during some early mornings in June. Notably, the higher winds that prevailed throughout May had abated significantly in June.

The above analysis of BarnOwl results suggest that noise emissions from Narrabri Mine remained within the criteria at “Kurrajong” during the winter period May-June 2009. Noise criterion exceedances were recorded at the BarnOwl location during winter 2008 when substantial earthworks were taking place. It is evident that noise emissions were significantly lower during winter 2009 with these activities no longer occurring.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Author:

Neil Pennington

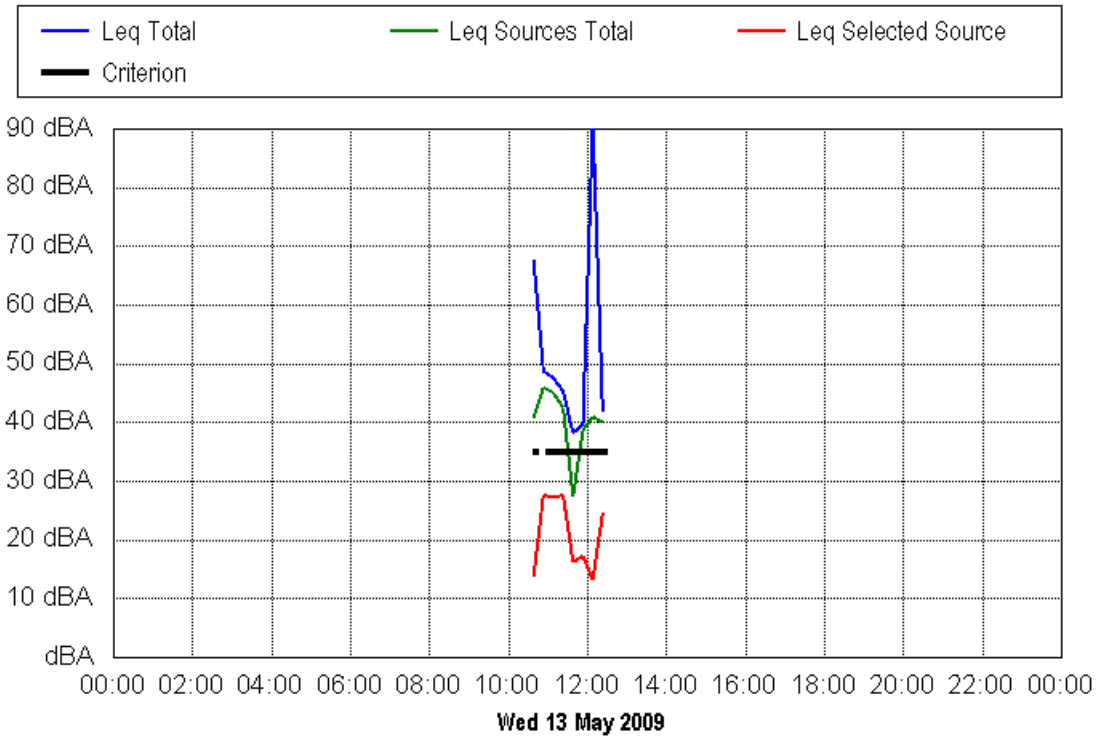
Acoustical Consultant

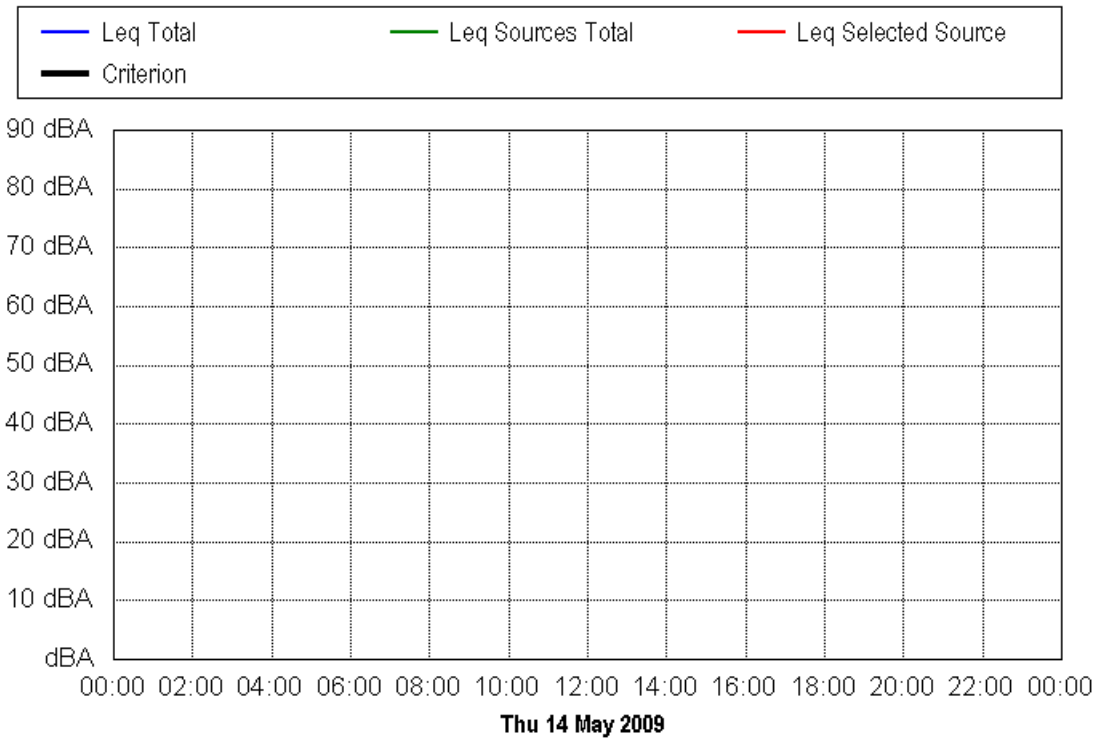
Review:

Ross Hodge

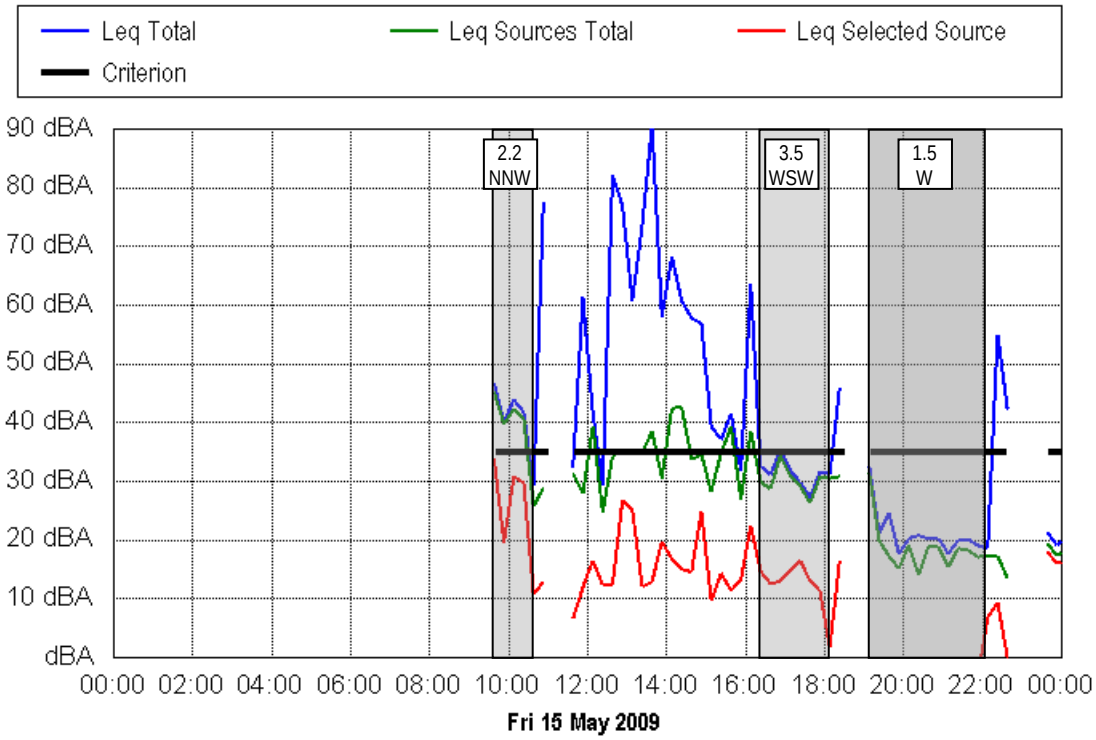
Acoustical Consultant

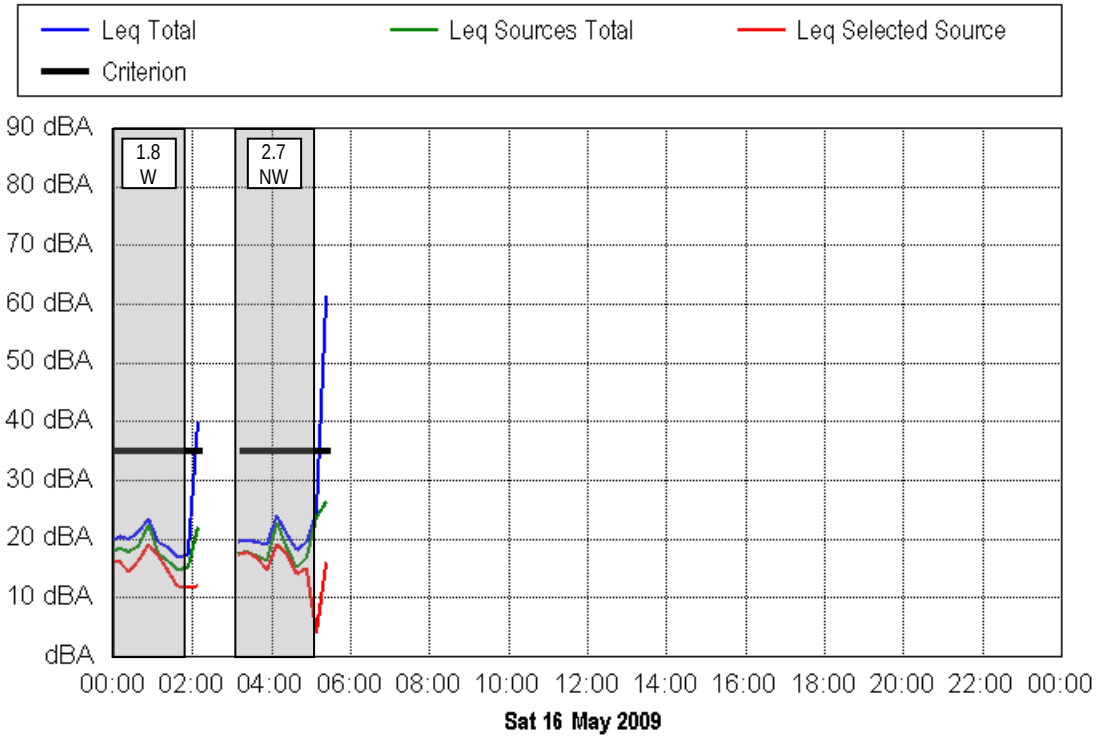
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



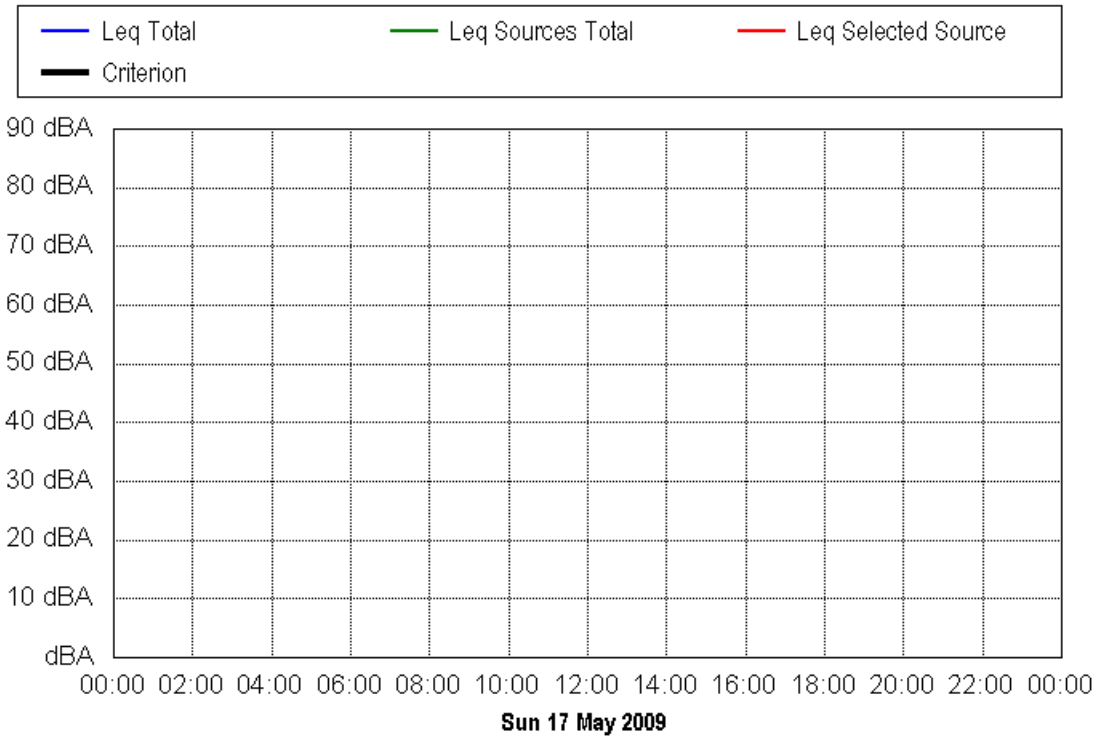


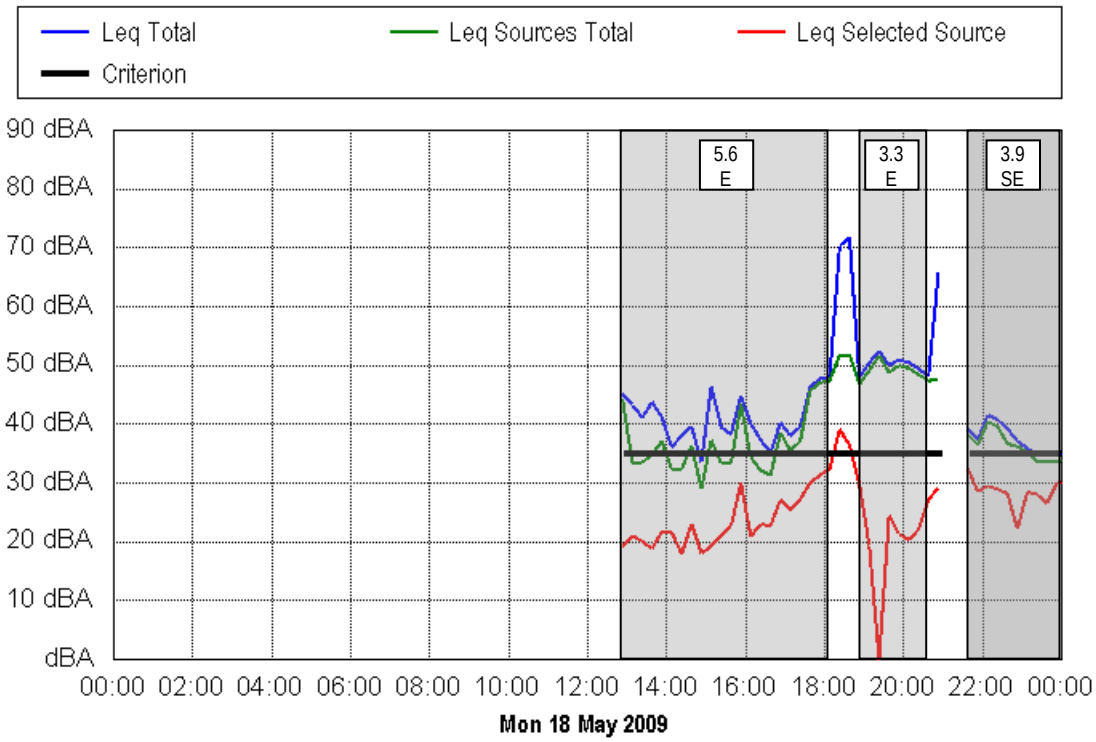
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



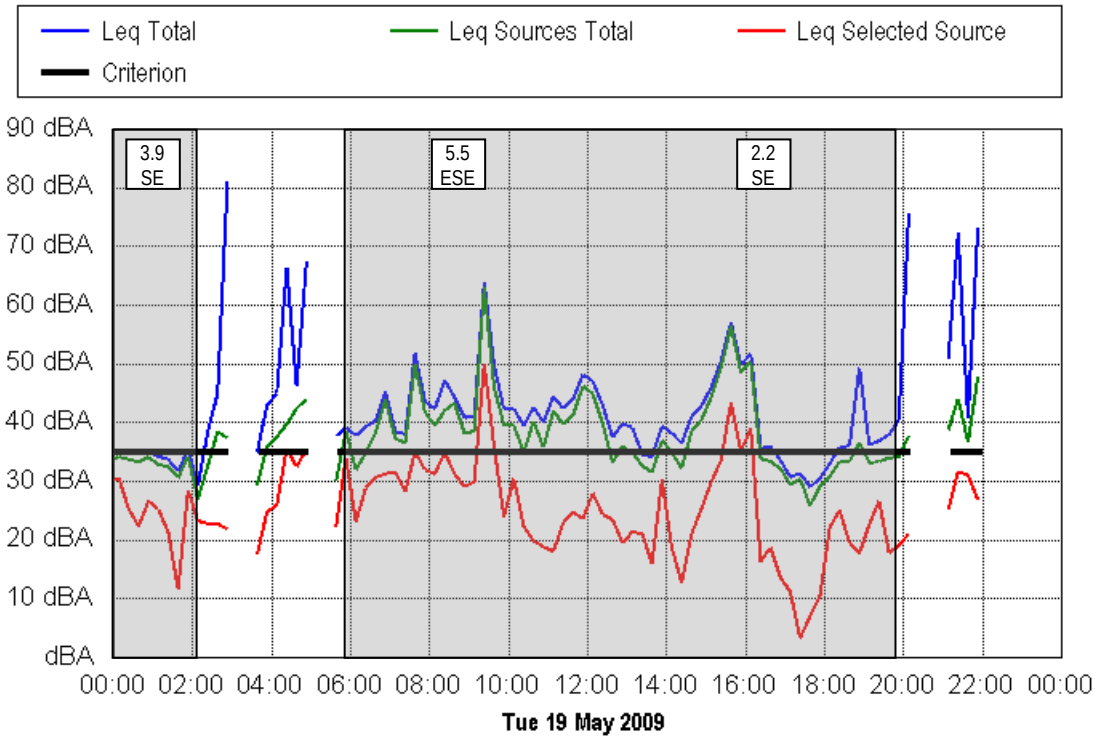


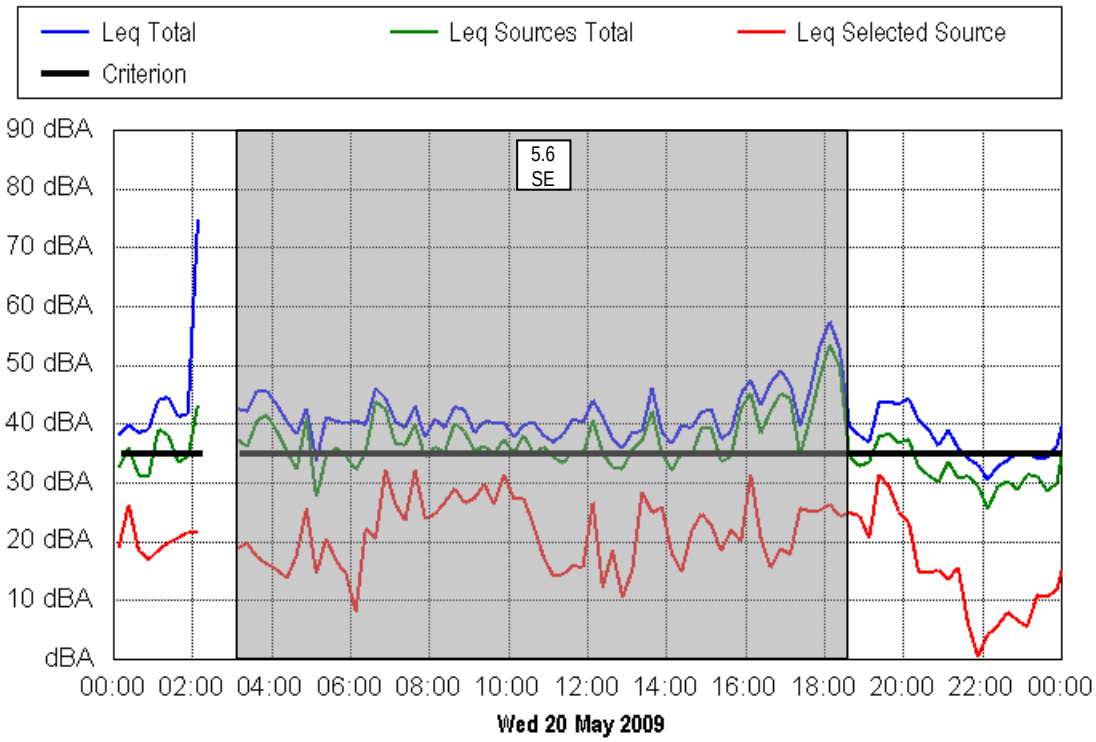
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



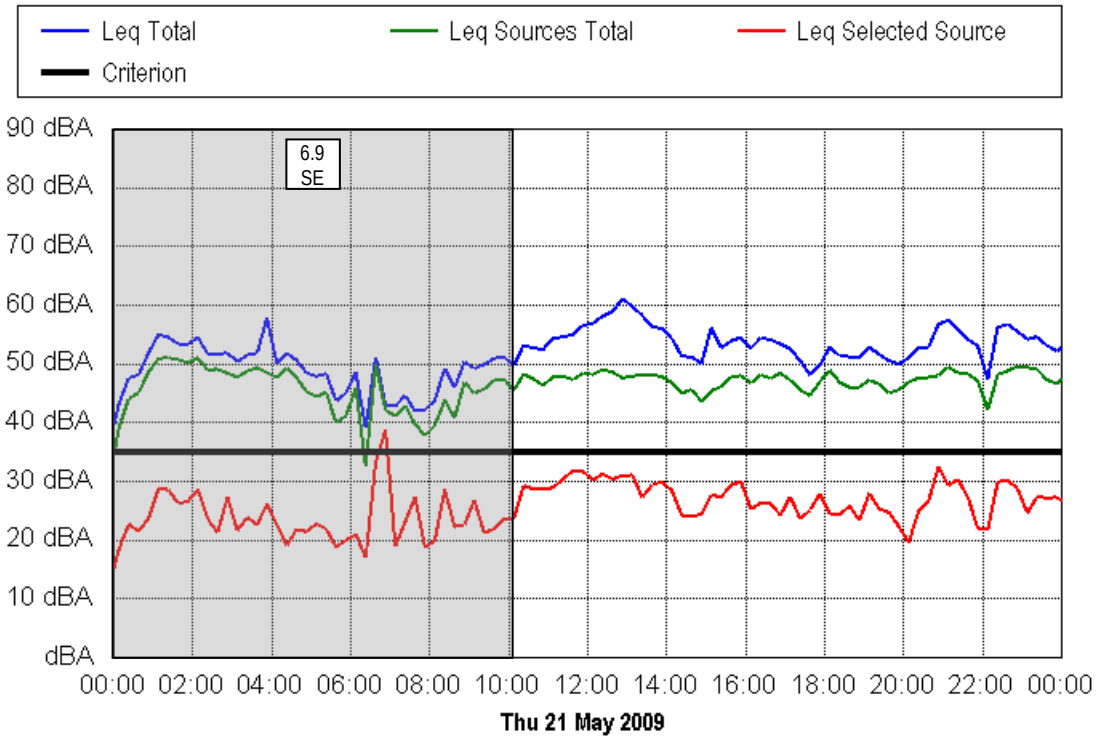


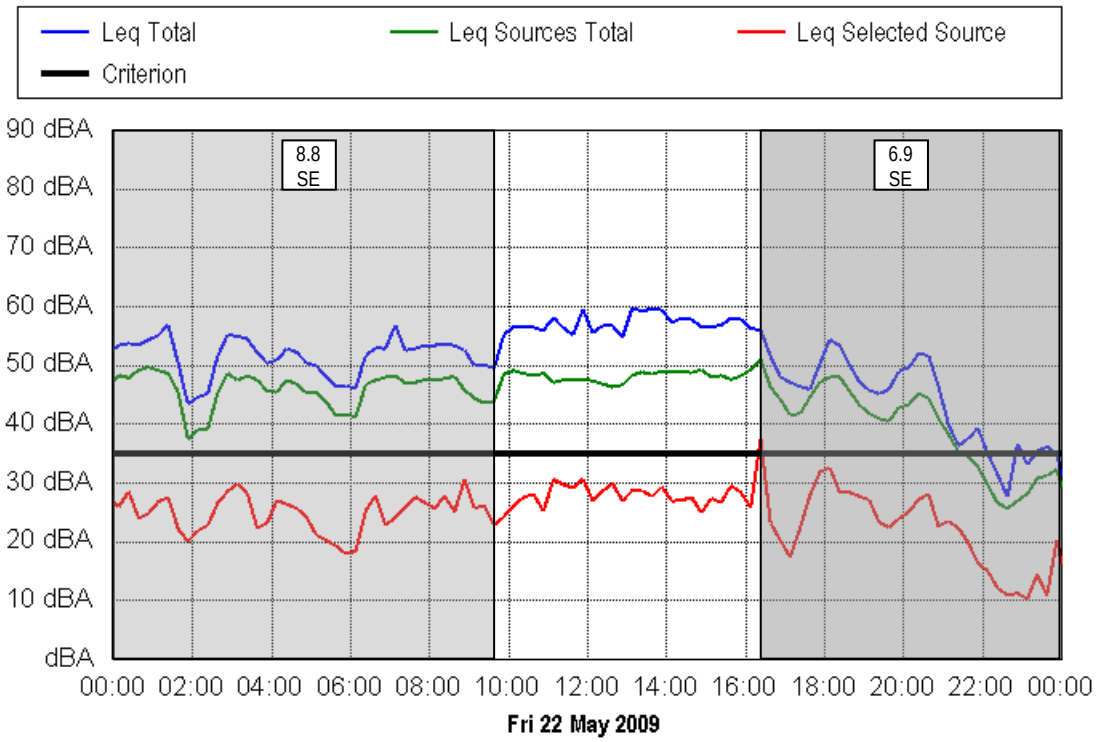
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



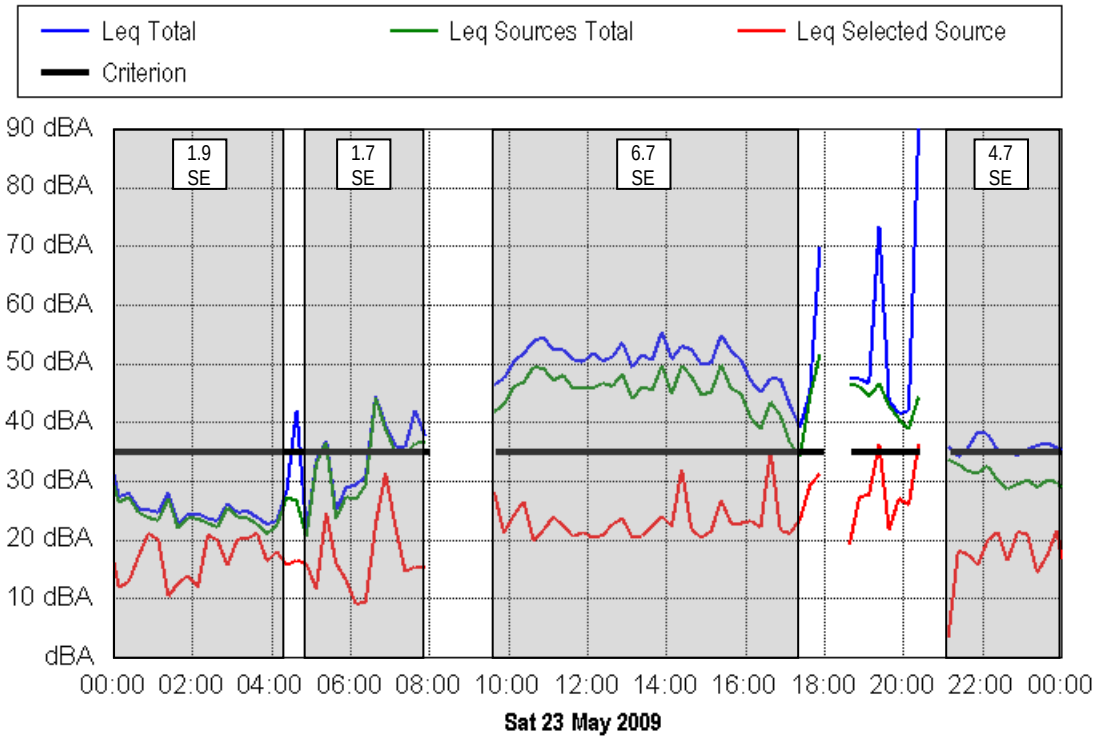


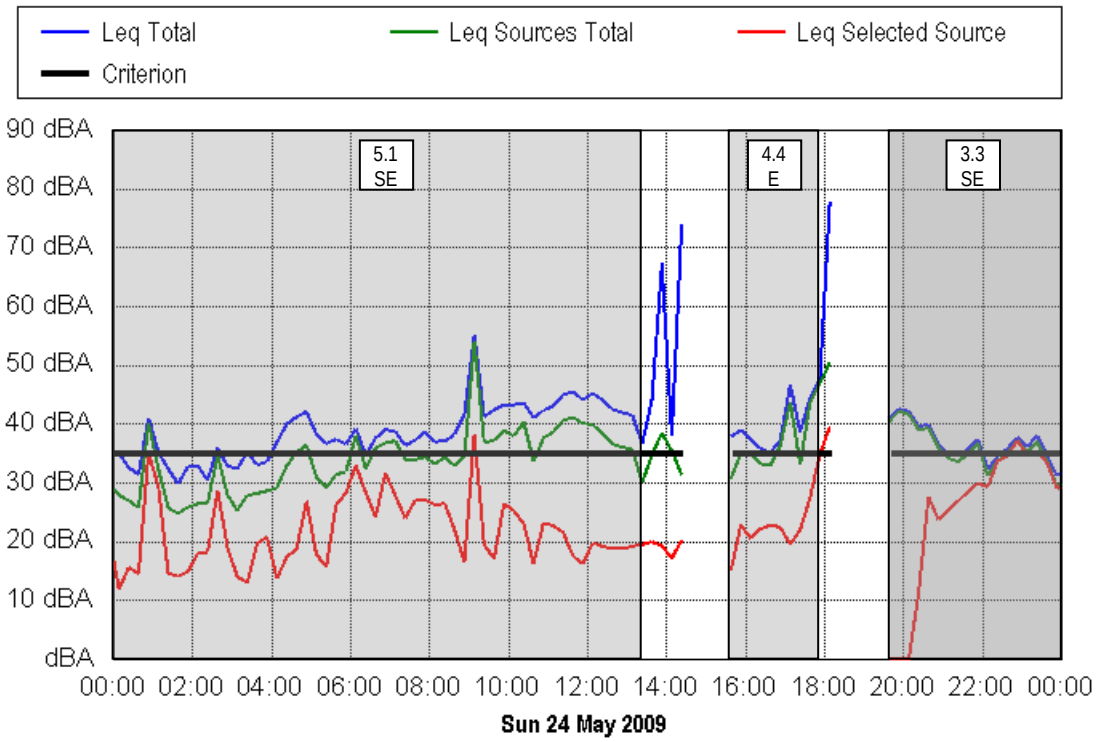
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



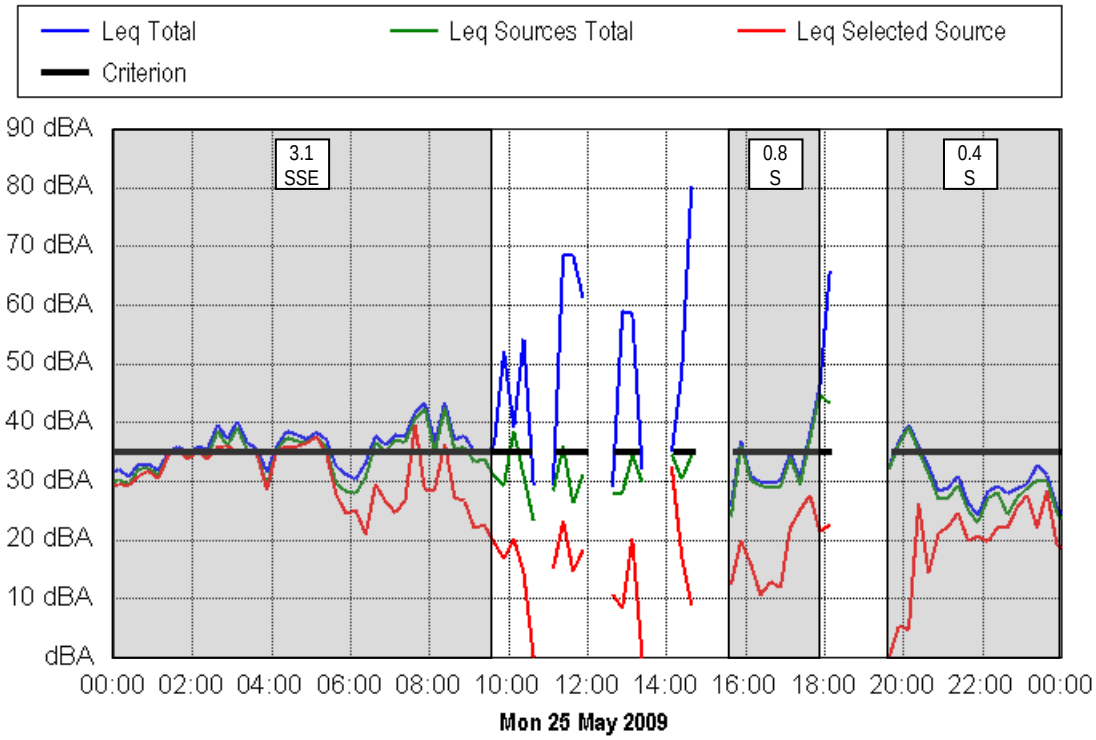


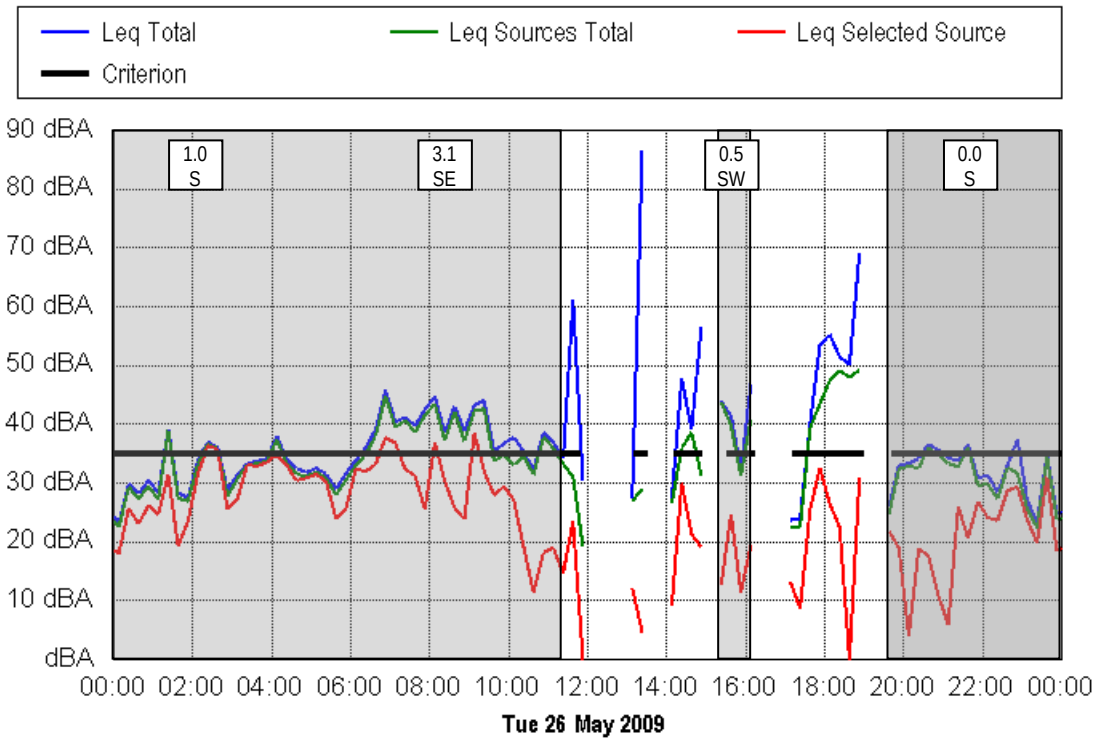
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



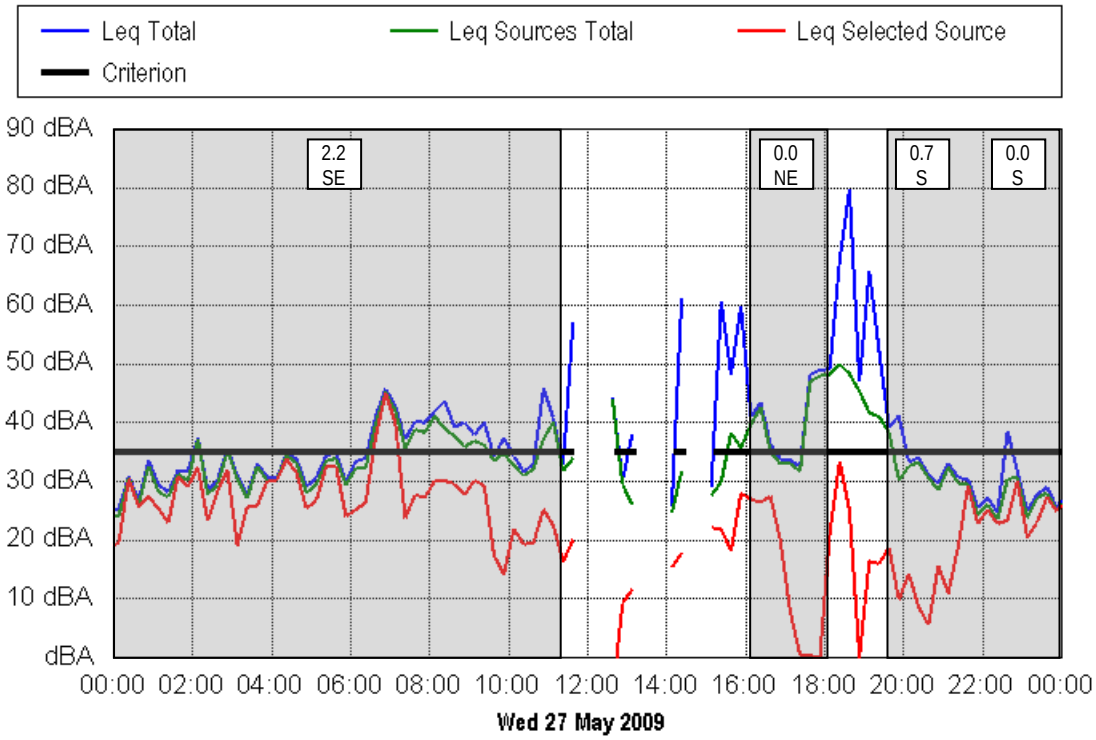


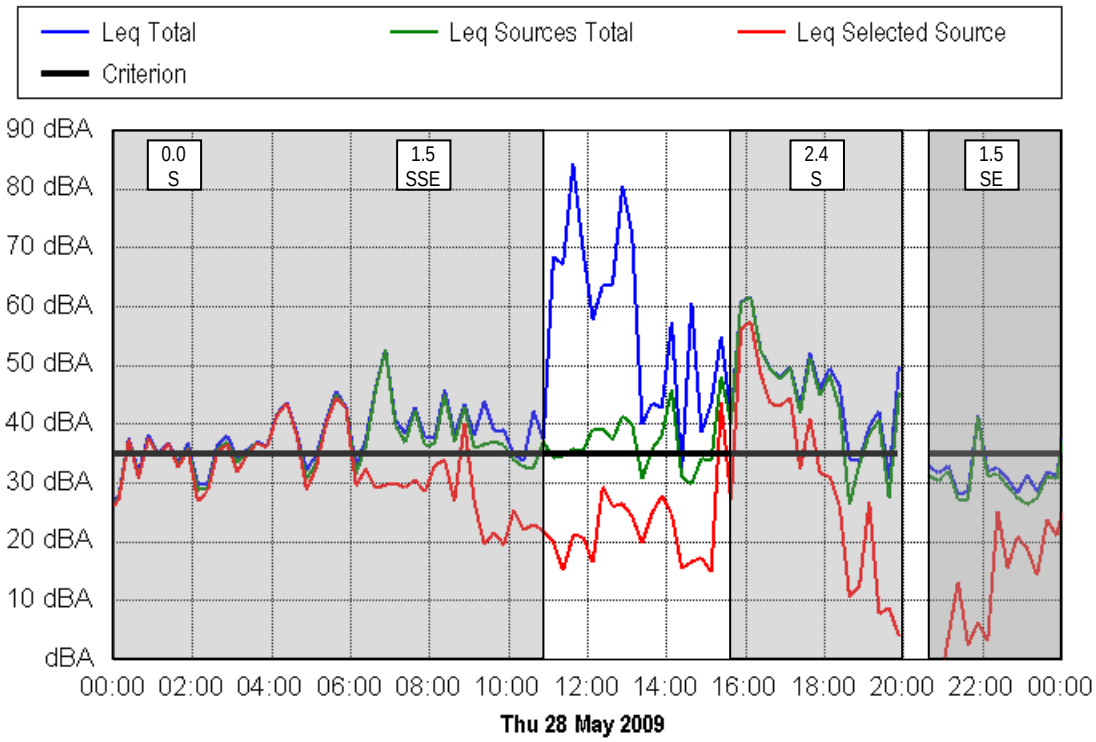
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



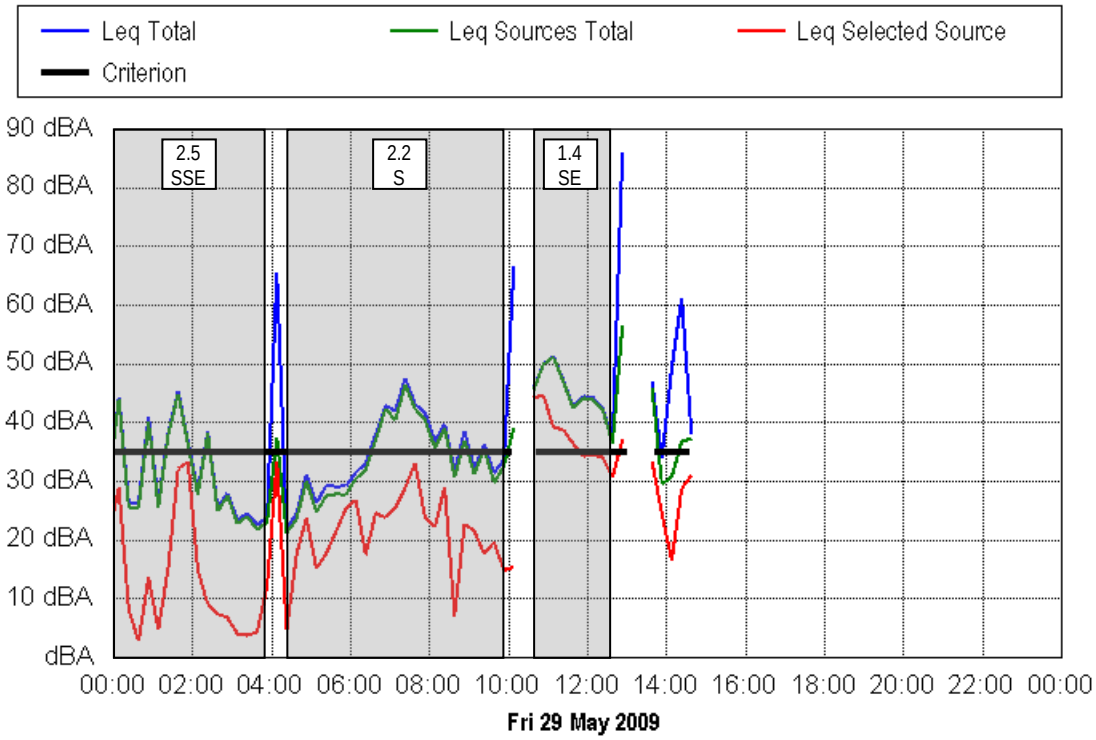


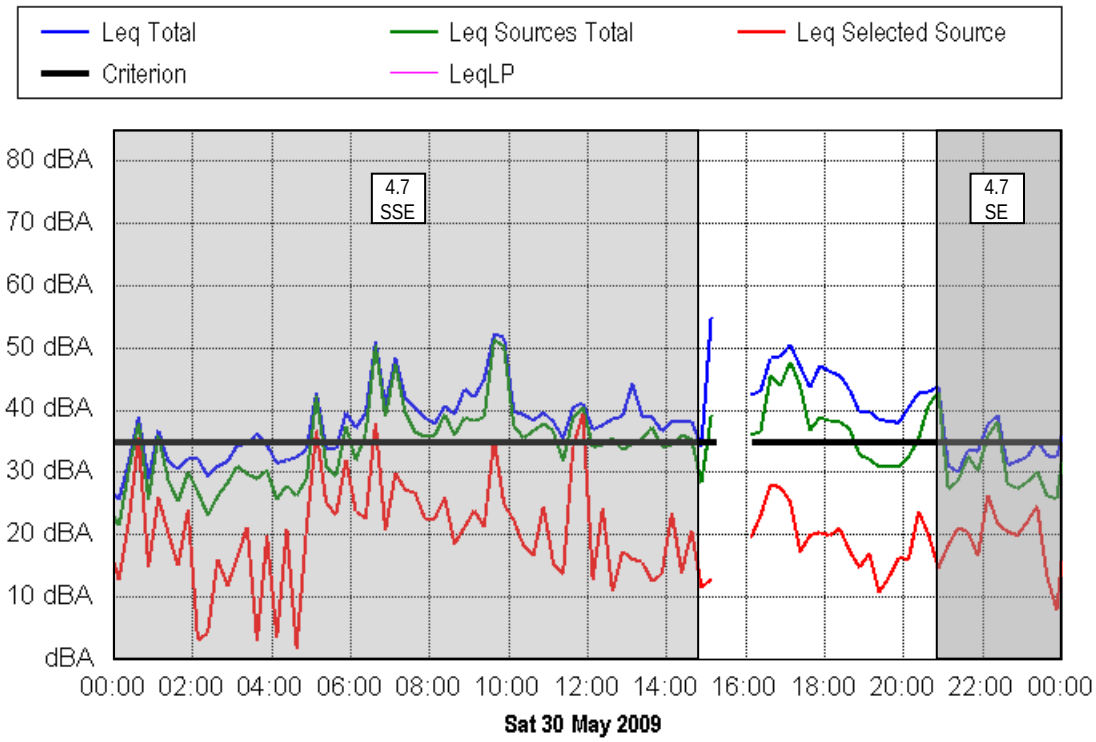
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



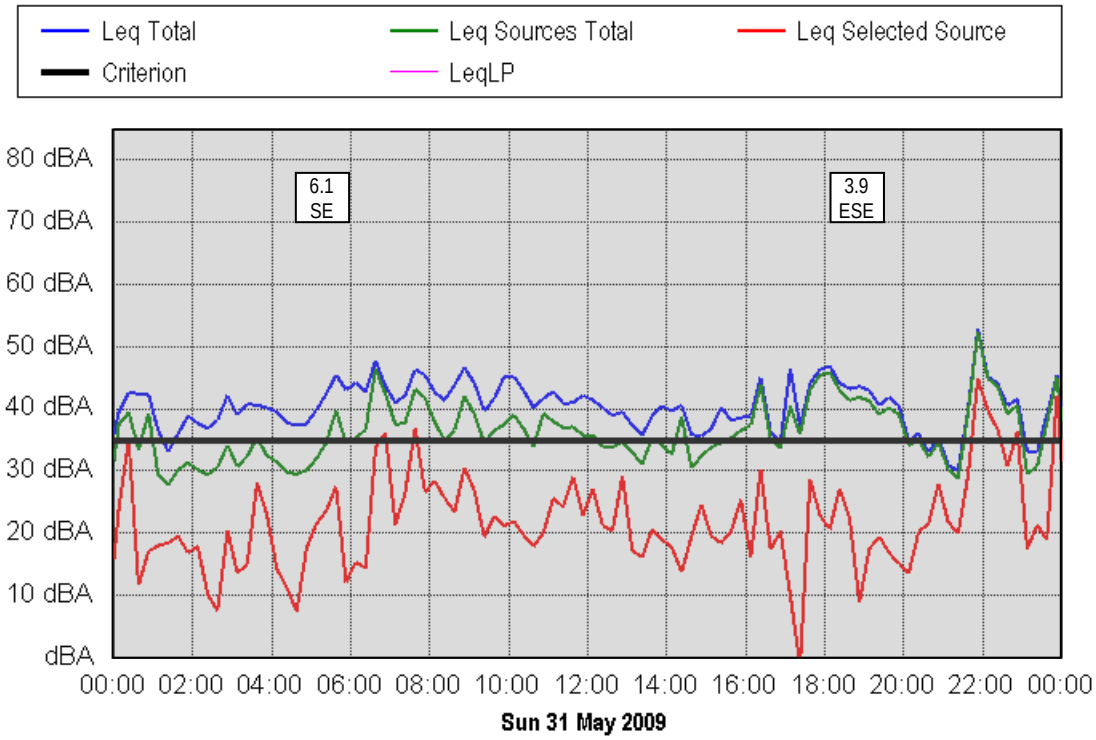


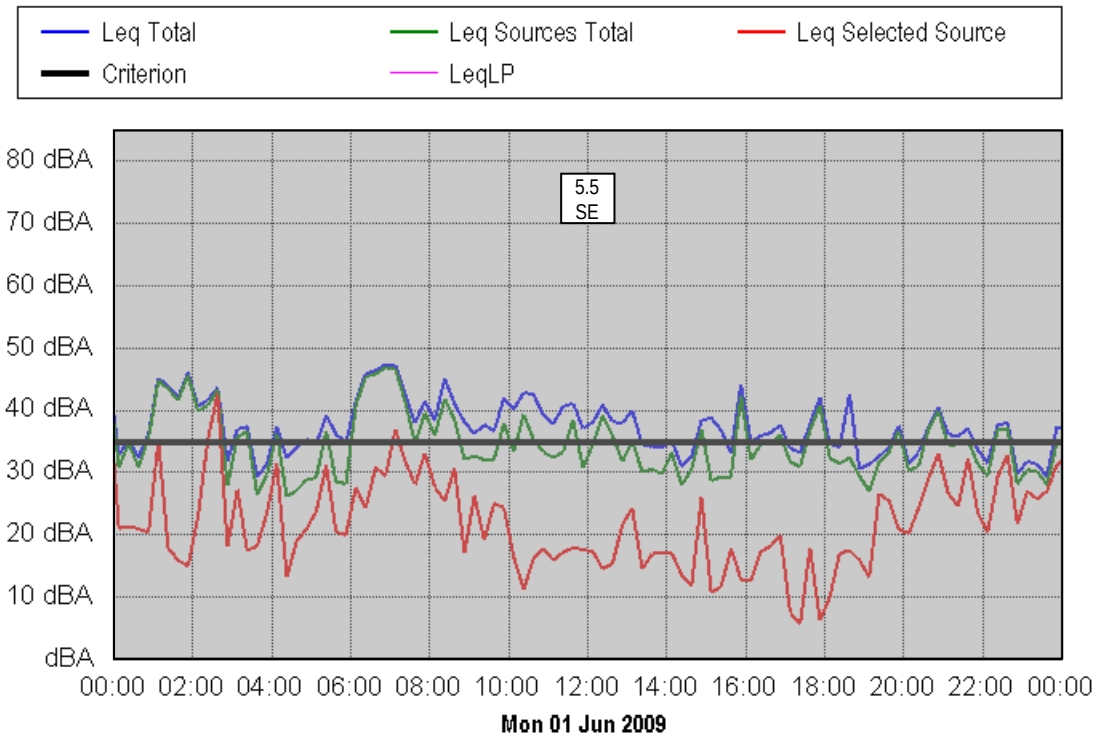
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



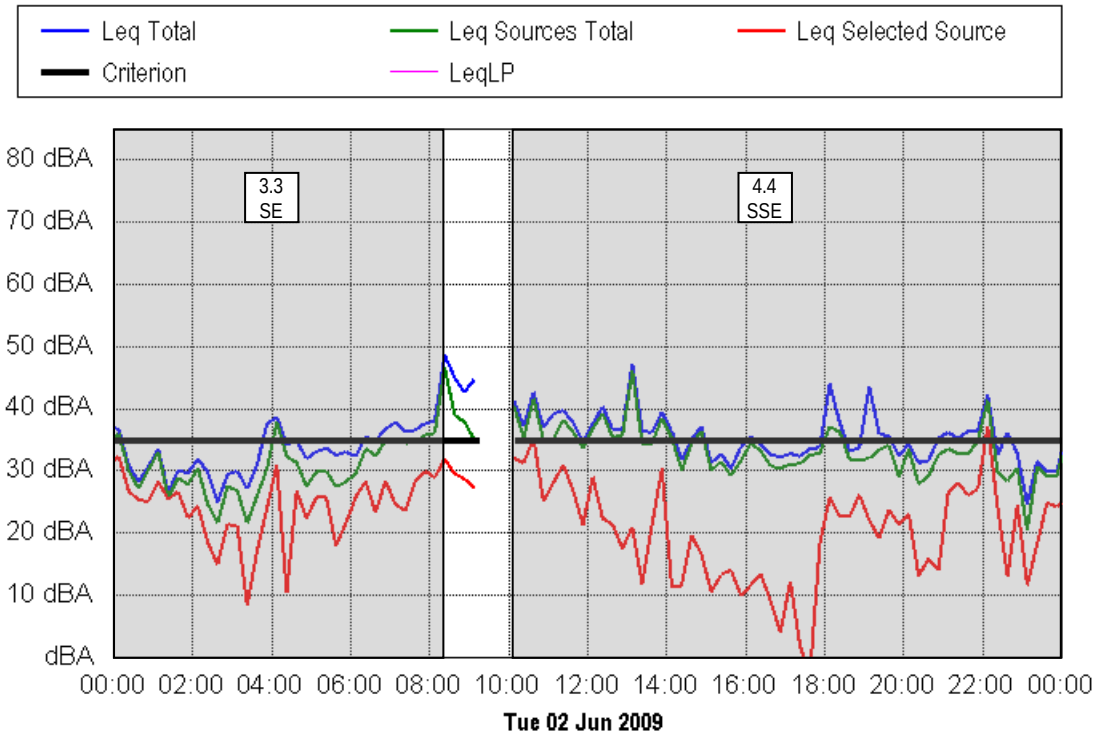


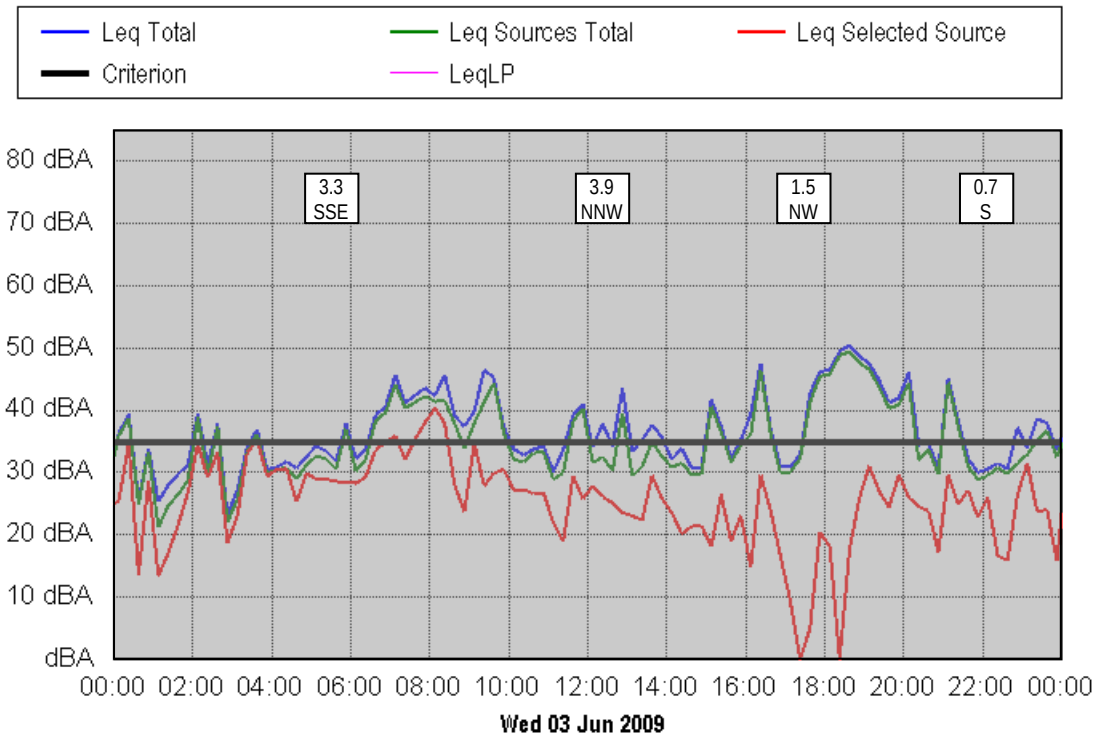
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



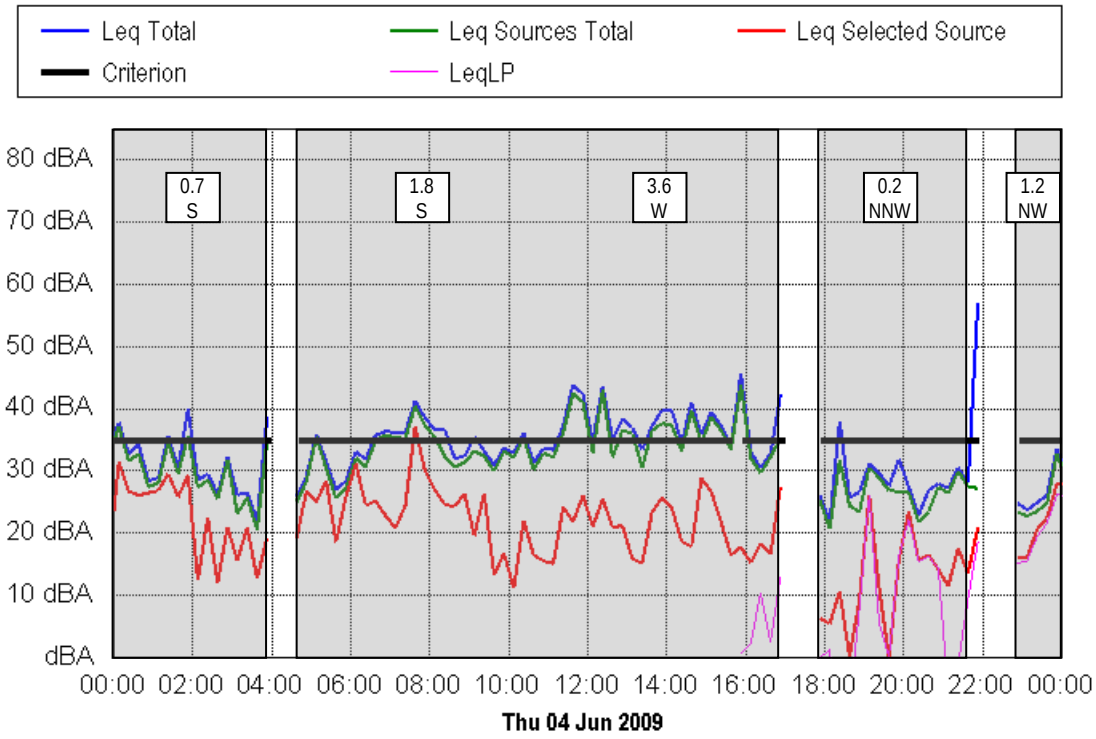


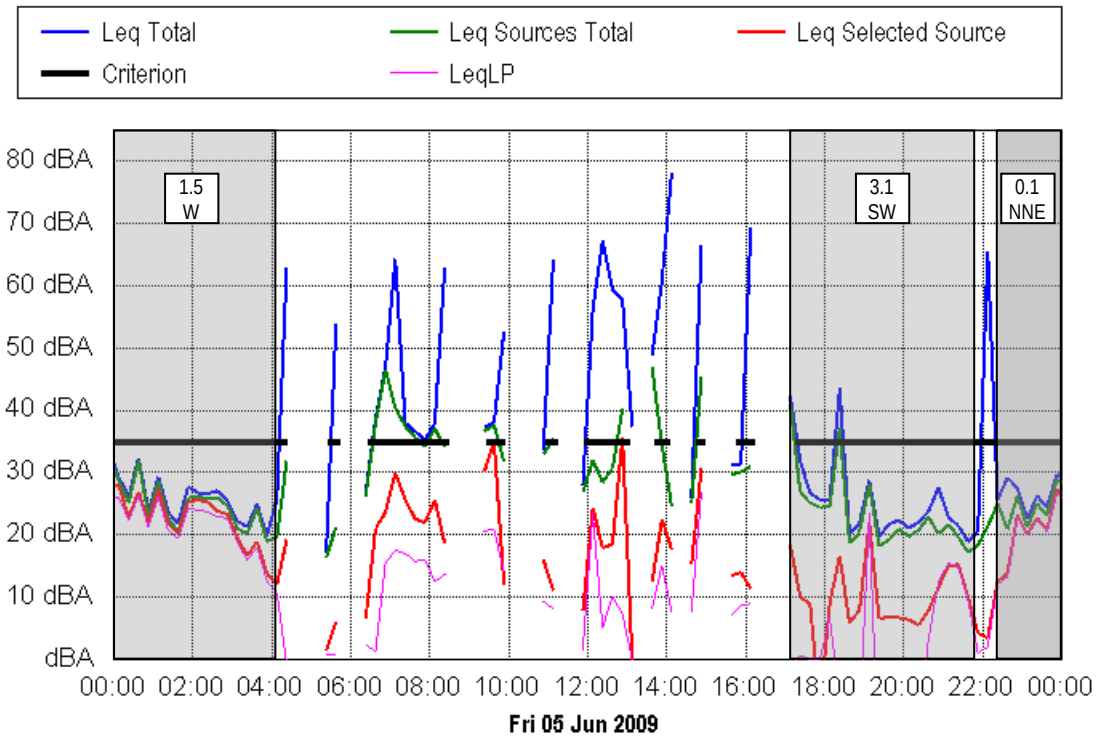
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



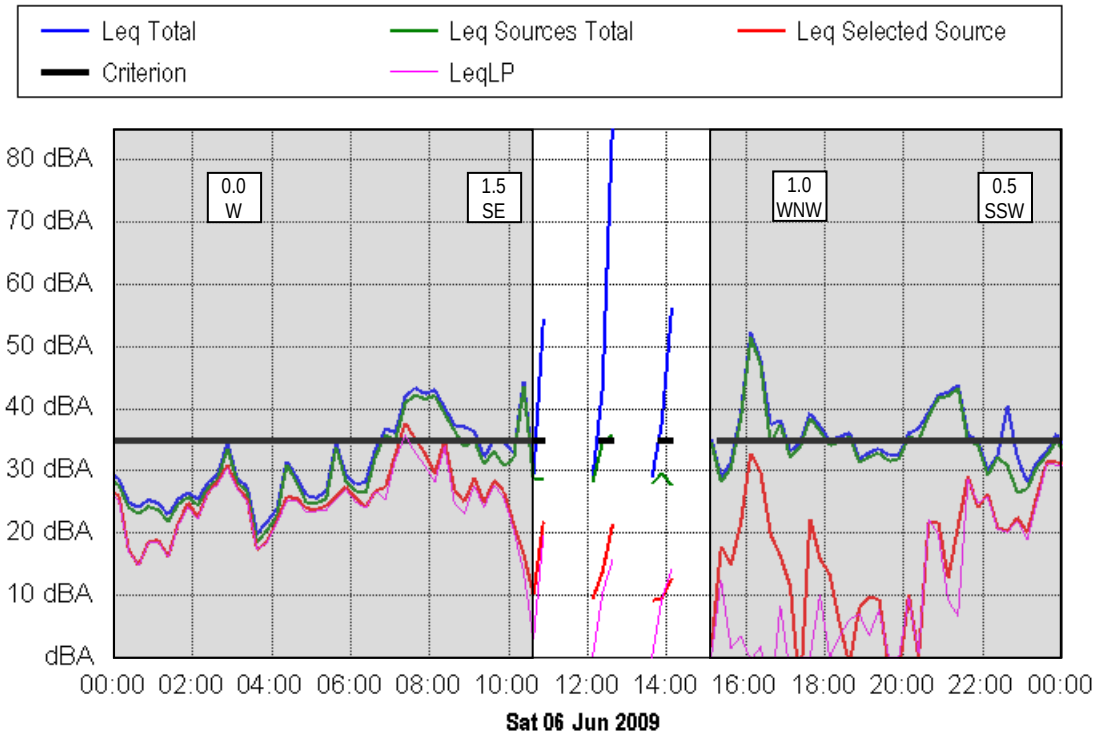


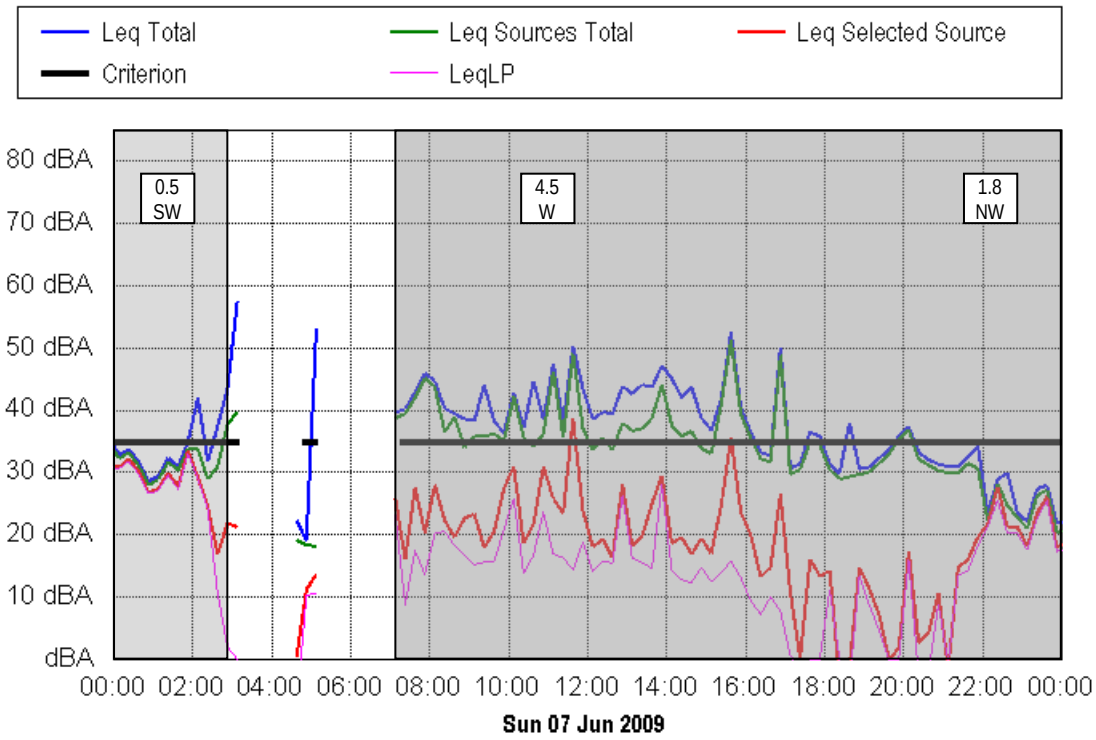
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



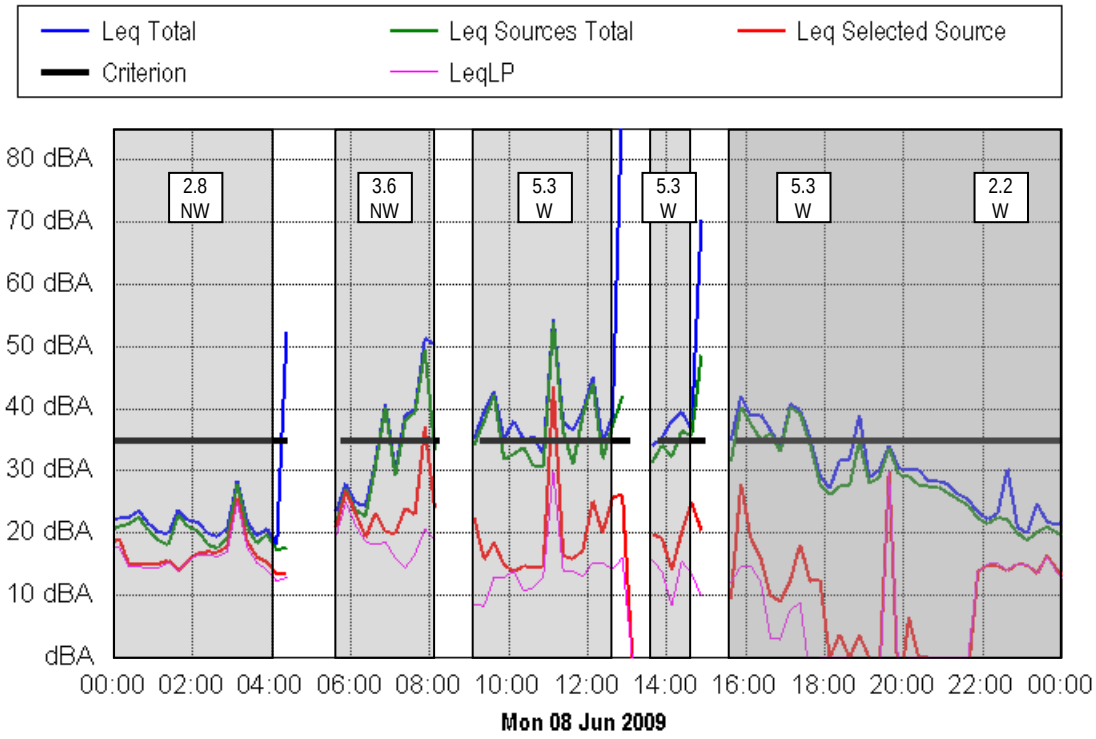


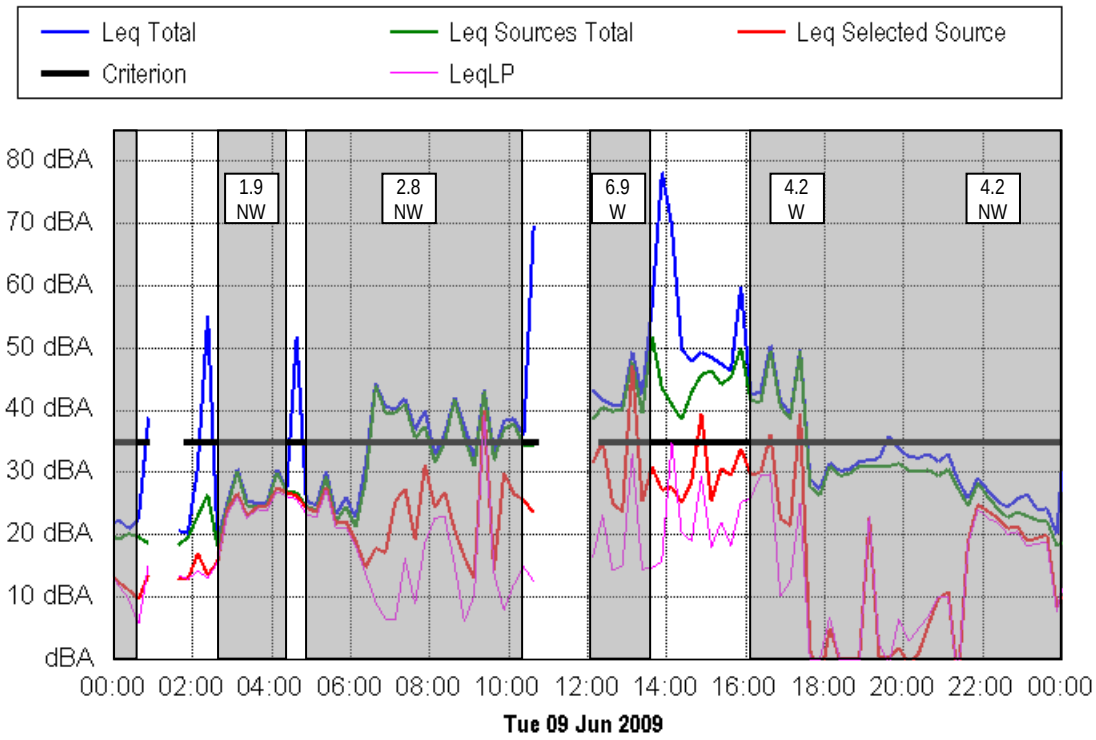
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



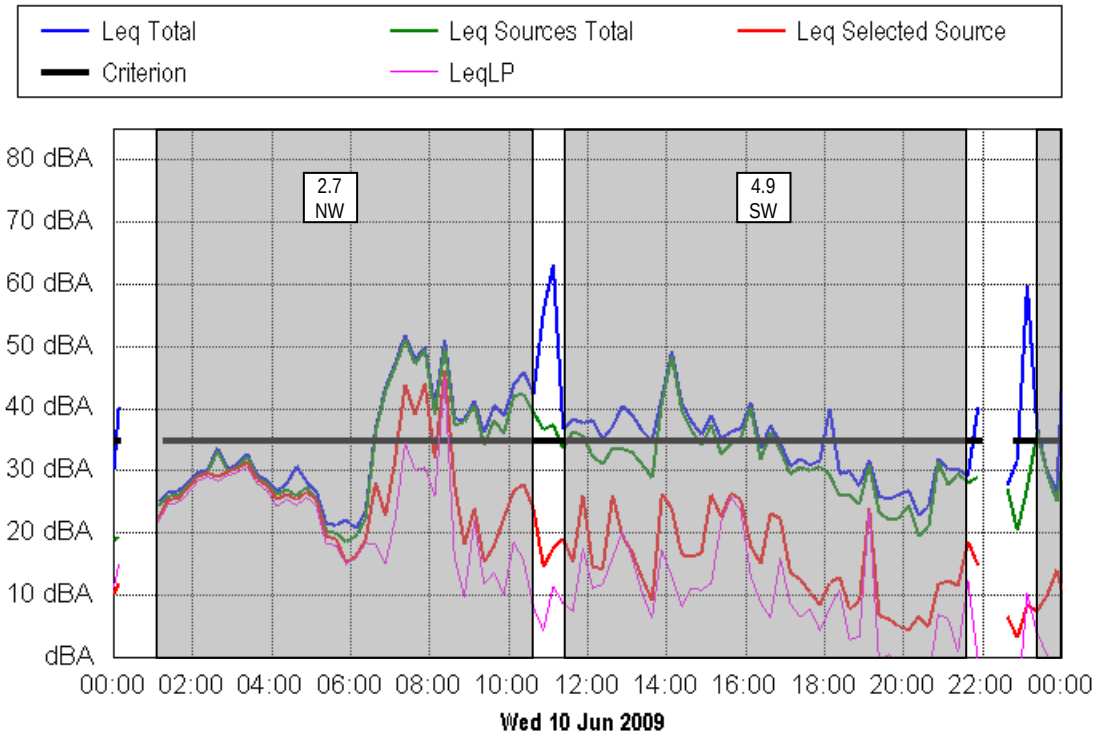


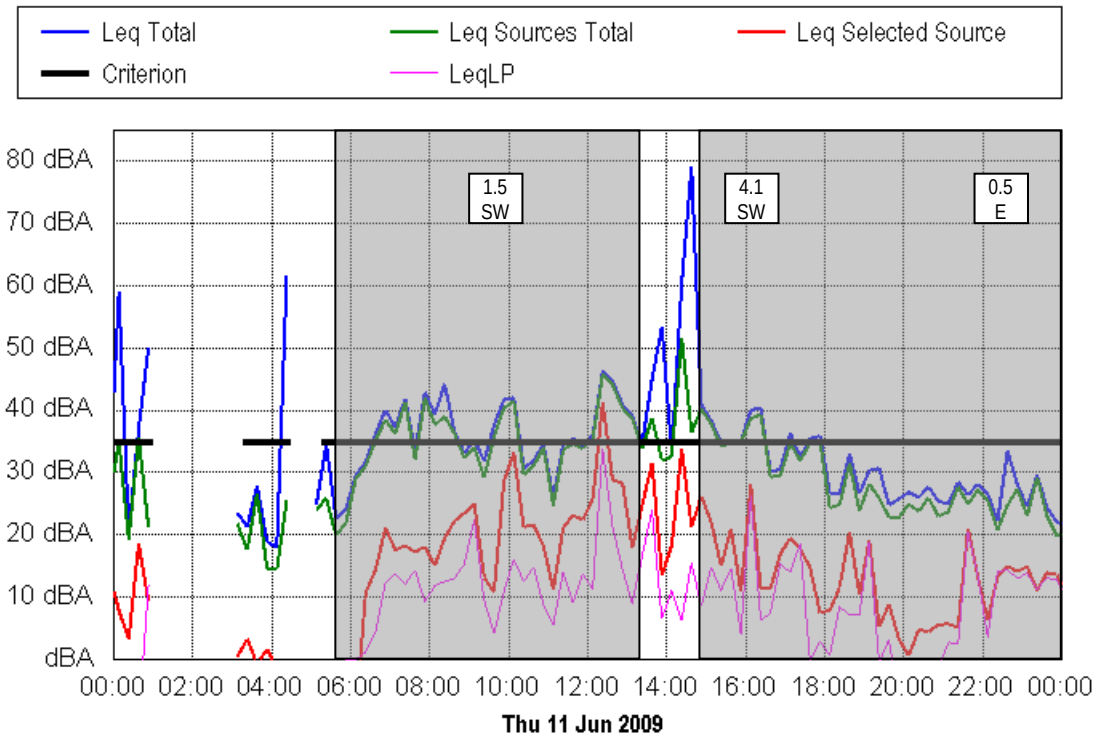
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



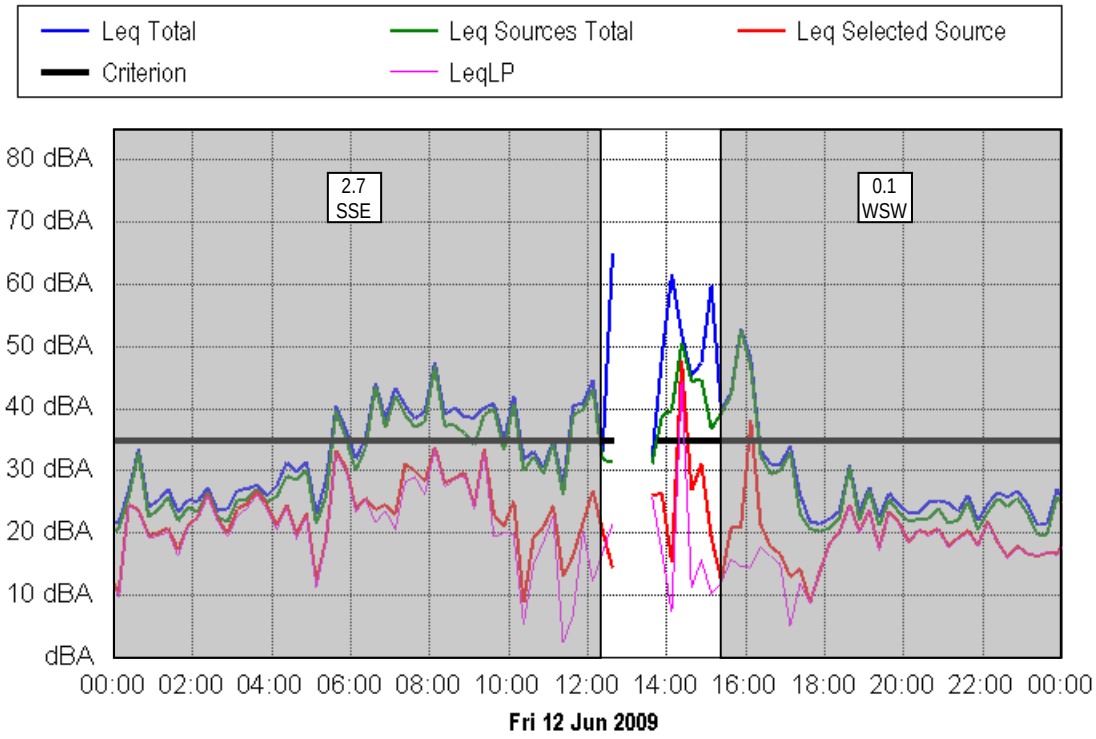


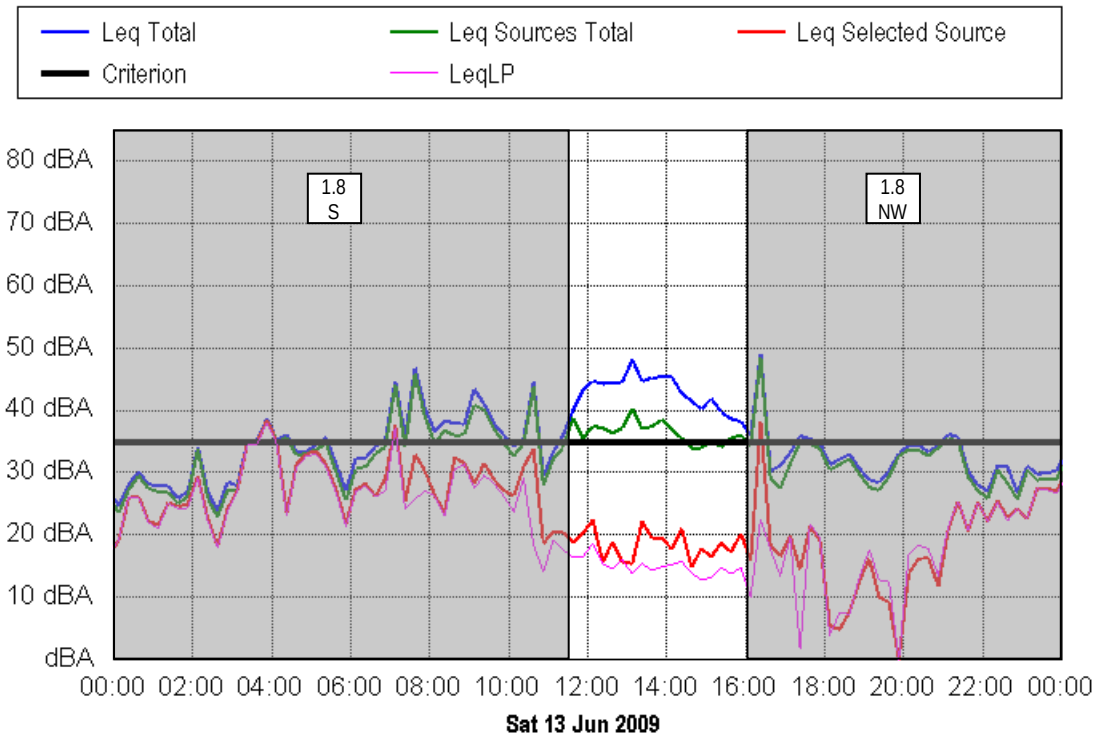
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



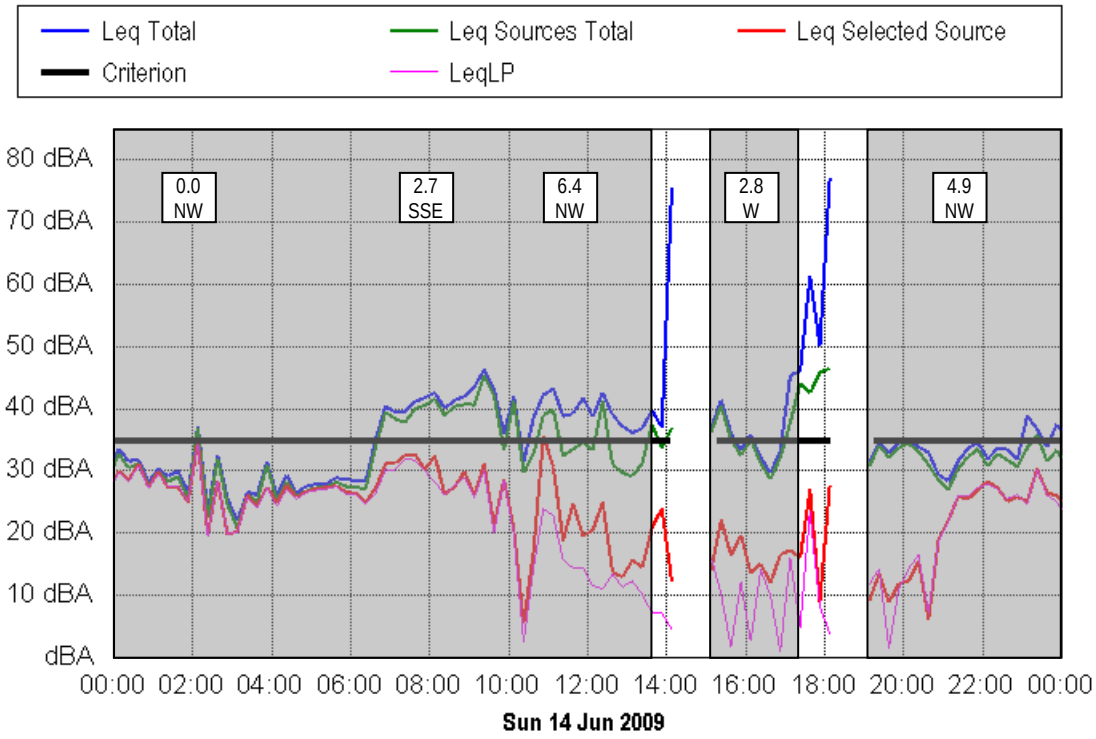


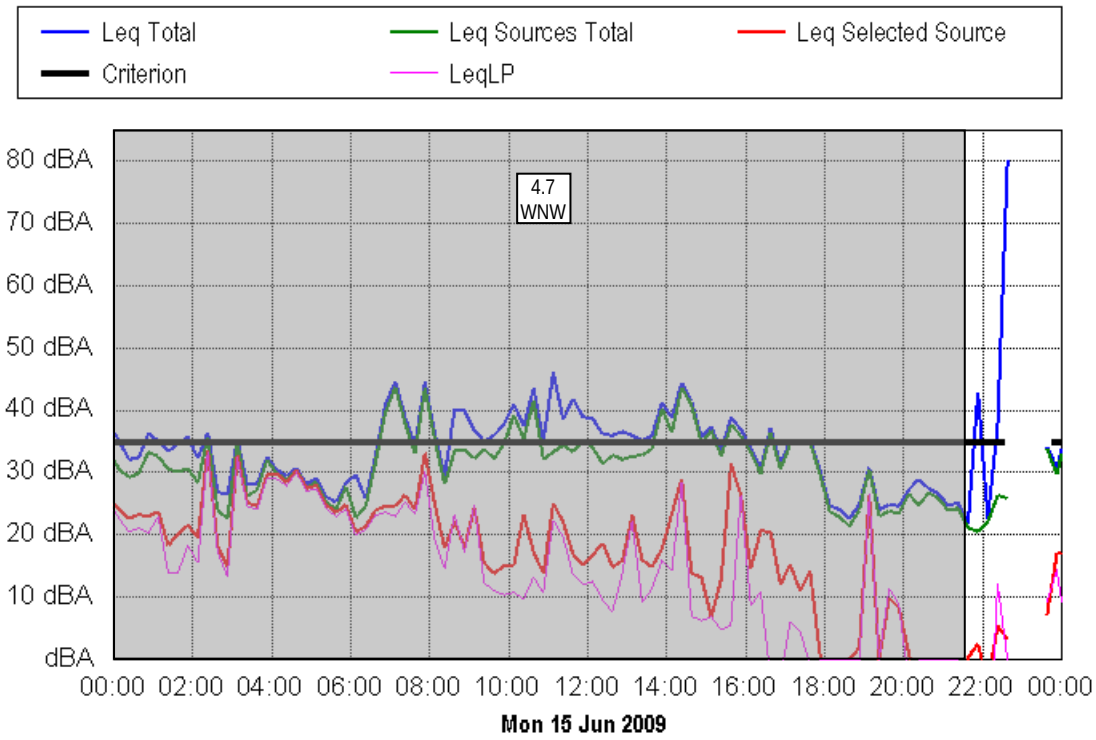
Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



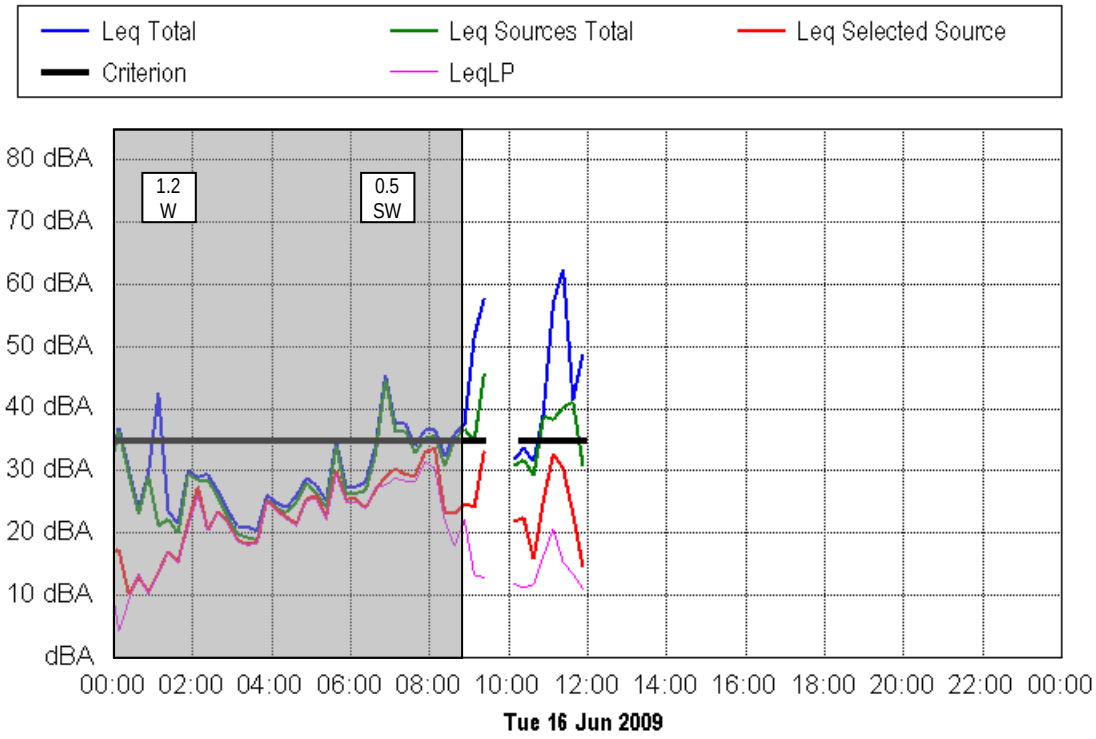


Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum





Project: SoundScience
Location: Kurrajong
Filter: A:Raw
Criterion: DECC Minimum



Drill Rig Noise Assessment

March 2010

17 March 2010

Ref: 05168/3468

Mr Danny Young
Narrabri Coal Pty Ltd
PO Box 600
GUNNEDAH NSW 2380

RE: DRILL NOISE TEST RESULTS – NARRABRI COAL MINE

This letter presents the results of noise testing conducted at the Narrabri coal mine on 11 March 2010. The purpose of the tests was to measure the sound power levels (Lw,dB(A)) of a "Titeline" drill currently operating to the north of Longwall panel 1.

Measurements taken at 40m in accessible directions (north and south of the drill) with the drill in full operation, including air pressure and mud pump, averaged 63 dB(A),Leq with a maximum of 65 dB(A) during air discharge from the vent (which was directed towards the west away from residential receivers). The calculated maximum sound power level of 107 dB(A) is 2 dB below the level adopted in the recent modelling for the Section 75W modification application and the Stage 2 EA. These previous assessments required a sound power level no greater than 109 dB(A) in order for the noise criterion of 35 dB(A),$L_{eq(15minute)}$ to be achieved at all receivers under all modelled atmospheric conditions.

These results confirm that the maximum sound power level for the "Titeline" drill, if substituted into the noise model, would result in noise levels below the criterion of 35 dB(A) at the worst affected receiver for day, evening and night-time operation under the modelled adverse meteorological conditions.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Neil Pennington
Acoustical Consultant

Appendix 8

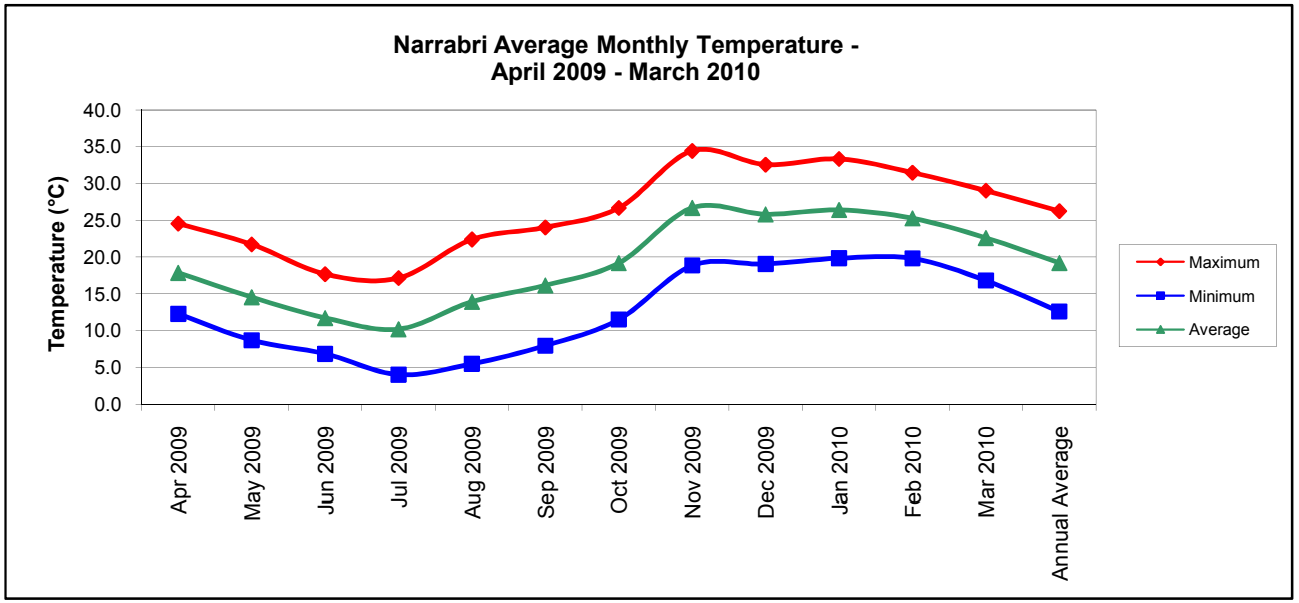
METEOROLOGICAL DATA

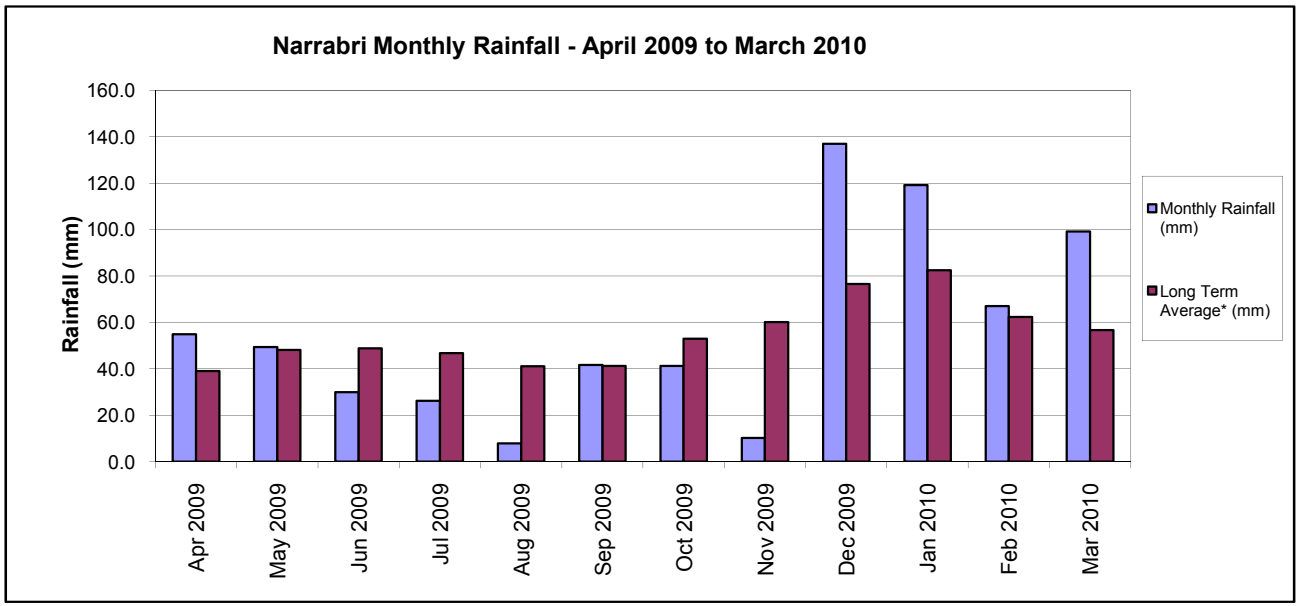
Narrabri Coal Mine Average Monthly Results

Month	Minimum Air Temp (°C)	Average Air Temp(°C)	Maximum Air Temp (°C)	Minimum Relative Humidity (%)	Average Relative Humidity(%)	Maximum Relative Humidity (%)	Minimum Wind Speed (m/s)	Average Wind Speed (m/s)	Maximum Wind Speed (m/s)
Apr 2009	12.3	17.9	24.5	39	64	84	2.8	13.0	24.4
May 2009	8.7	14.6	21.7	35	61	82	3.0	12.3	22.9
Jun 2009	6.9	11.7	17.7	47	72	89	1.9	10.0	21.6
Jul 2009	4.0	10.2	17.1	42	69	88	2.1	11.5	24.0
Aug 2009	5.5	13.9	22.4	25	52	78	0.6	10.6	24.7
Sep 2009	8.0	16.2	24.0	29	52	78	0.8	12.2	27.3
Oct 2009	11.5	19.2	26.7	22	45	70	2.1	13.8	29.2
Nov 2009	18.9	26.7	34.4	20	41	66	2.1	15.0	30.4
Dec 2009	19.1	25.8	32.6	27	45	65	2.0	14.6	29.0
Jan 2010	19.9	26.4	33.3	30	52	76	0.8	11.5	27.5
Feb 2010	19.8	25.3	31.5	34	57	79	3.4	13.7	25.8
Mar 2010	16.8	22.6	29.0	35	57	79	3.3	12.4	22.8
Annual Average	**12.6**	**19.2**	**26.3**	**32**	**56**	**78**	**2.1**	**12.6**	**25.8**
Minimum	**4.0**	**10.2**	**17.1**	**20**	**41**	**65**	**0.6**	**10.0**	**21.6**
Maximum	**19.9**	**26.7**	**34.4**	**47**	**72**	**89**	**3.4**	**15.0**	**30.4**
Total									

Month	Monthly Rainfall (mm)	Long Term Average* (mm)	Cumulative Rainfall (mm)	Number of Rain Days
Apr 2009	54.9	39.1	54.9	6
May 2009	49.4	48.1	104.3	3
Jun 2009	30.0	48.8	134.3	7
Jul 2009	26.2	46.8	160.5	5
Aug 2009	7.8	41.1	168.3	2
Sep 2009	41.6	41.3	209.9	5
Oct 2009	41.2	53	251.1	5
Nov 2009	10.2	60.2	261.3	2
Dec 2009	137.0	76.6	398.3	10
Jan 2010	119.1	82.5	517.4	9
Feb 2010	67.0	62.3	584.4	6
Mar 2010	99.2	56.7	683.6	4
Total	**683.6**	**656.5**	**683.6**	**64**

* Long term average is from Narrabri West Bowling Club (053030) 1891 - 2010


Narrabri Average Monthly Temperature -
April 2009 - March 2010
Temperature (°C)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Apr 2009
May 2009
Jun 2009
Jul 2009
Aug 2009
Sep 2009
Oct 2009
Nov 2009
Dec 2009
Jan 2010
Feb 2010
Mar 2010
Annual Average
Maximum
Minimum
Average


Narrabri Monthly Rainfall - April 2009 to March 2010
Rainfall (mm)
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Apr 2009
May 2009
Jun 2009
Jul 2009
Aug 2009
Sep 2009
Oct 2009
Nov 2009
Dec 2009
Jan 2010
Feb 2010
Mar 2010
Monthly Rainfall (mm)
Long Term Average* (mm)

Daily Summary **April 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Apr/09	17.8	19.2	23.9	66	83	91	3.6	4.8	18.3	32.2
02/Apr/09	-	-	-	-	-	-	-	-	-	-
03/Apr/09	-	-	-	-	-	-	-	-	-	-
04/Apr/09	18.4	18.7	19.1	84	84	84	19.5	14.5	16.5	17.7
05/Apr/09	15.3	21.4	29.7	28	64	90	0.0	0.0	10.9	22.5
06/Apr/09	14.2	21.0	29.4	21	56	85	0.0	0.0	10.2	27.4
07/Apr/09	14.6	20.7	27.8	33	62	86	0.0	3.2	17.1	29.0
08/Apr/09	13.8	19.4	26.6	33	58	82	0.0	4.8	16.0	25.7
09/Apr/09	12.5	18.7	26.0	28	55	81	0.0	0.0	9.8	17.7
10/Apr/09	14.2	19.9	27.1	36	60	78	0.0	1.6	8.9	17.7
11/Apr/09	16.6	21.2	27.4	33	58	76	0.0	0.0	8.5	22.5
12/Apr/09	16.4	18.3	20.7	69	84	93	14.2	0.0	6.3	11.3
13/Apr/09	17.3	18.0	19.3	84	90	93	13.6	0.0	8.8	16.1
14/Apr/09	16.1	19.1	25.1	58	83	93	1.6	0.0	6.6	11.3
15/Apr/09	12.9	18.9	26.8	30	68	93	0.2	0.0	6.2	19.3
16/Apr/09	10.7	18.5	27.9	27	63	89	0.0	0.0	5.3	16.1
17/Apr/09	12.5	19.6	28.6	33	62	86	1.8	0.0	6.9	19.3
18/Apr/09	12.3	17.5	24.5	33	59	84	0.0	3.2	18.2	27.4
19/Apr/09	10.6	16.8	23.3	38	65	89	0.0	1.6	19.9	37.0
20/Apr/09	12.6	17.0	22.8	39	61	80	0.0	11.3	25.3	40.2
21/Apr/09	11.1	17.4	24.5	34	63	88	0.2	8.0	22.4	32.2
22/Apr/09	11.1	17.1	24.3	29	63	86	0.0	11.3	20.2	32.2
23/Apr/09	11.8	17.7	25.7	32	59	83	0.0	0.0	11.7	25.7
24/Apr/09	9.9	18.0	26.8	34	65	85	0.2	0.0	14.5	32.2
25/Apr/09	10.6	17.7	24.2	37	59	87	0.0	4.8	16.9	32.2
26/Apr/09	9.2	16.1	21.6	39	55	72	0.0	3.2	19.8	32.2
27/Apr/09	5.4	11.9	20.1	31	56	77	0.0	0.0	10.1	22.5
28/Apr/09	7.8	14.5	22.1	36	56	74	0.0	4.8	12.4	24.1
29/Apr/09	7.0	15.0	22.9	29	52	75	0.0	0.0	11.4	27.4
30/Apr/09	1.7	11.1	19.1	29	57	85	0.0	0.0	4.8	12.9
Average	**12.3**	**17.9**	**24.5**	**39**	**64**	**84**		**2.8**	**13.0**	**24.4**
Maximum	**18.4**	**21.4**	**29.7**	**84**	**90**	**93**	**19.5**	**14.5**	**25.3**	**40.2**
Minimum	**1.7**	**11.1**	**19.1**	**21**	**52**	**72**	**0.0**	**0.0**	**4.8**	**11.3**
Total							**54.9**			

Denotes data from site rain gauge

Daily Summary **May 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/May/09	7.2	13.8	22.8	26	57	82	0.0	0.0	8.1	20.9
02/May/09	8.0	14.9	23.7	25	50	76	0.0	0.0	6.7	16.1
03/May/09	9.7	15.8	23.7	23	50	71	0.0	3.2	12.1	19.3
04/May/09	10.6	15.9	23.4	27	55	79	0.0	1.6	11.6	20.9
05/May/09	10.6	16.2	23.2	25	54	79	0.0	4.8	14.4	24.1
06/May/09	9.7	15.3	**24.3**	30	62	84	0.0	0.0	7.5	19.3
07/May/09	7.0	15.6	23.8	31	57	86	0.0	0.0	4.5	11.3
08/May/09	8.2	15.4	23.7	24	49	**68**	0.0	1.6	10.5	20.9
09/May/09	8.9	15.1	23.6	27	57	84	0.0	0.0	9.5	19.3
10/May/09	8.7	15.2	22.4	29	56	74	0.0	6.4	18.9	29.0
11/May/09	8.4	14.5	22.1	32	54	74	0.0	1.6	14.7	24.1
12/May/09	8.5	13.6	21.6	31	56	76	0.0	0.0	9.5	19.3
13/May/09	3.8	12.7	22.3	23	**49**	76	0.0	0.0	6.8	19.3
14/May/09	**3.3**	12.1	21.4	**17**	50	80	0.0	0.0	6.3	20.9
15/May/09	**3.3**	**11.8**	21.3	27	56	82	0.0	0.0	6.9	24.1
16/May/09	4.7	13.6	21.4	34	57	81	0.0	0.0	10.6	22.5
17/May/09	5.4	13.2	21.0	31	57	86	0.0	0.0	6.1	17.7
18/May/09	9.7	16.0	23.8	31	54	70	0.0	8.0	17.6	22.5
19/May/09	12.5	13.8	**15.8**	**63**	**86**	**92**	**35.2**	1.6	13.5	27.4
20/May/09	12.4	13.5	16.1	60	85	**92**	12.8	12.9	20.4	35.4
21/May/09	13.2	15.1	18.1	60	73	86	0.0	**19.3**	30.9	45.1
22/May/09	**13.3**	16.7	21.6	44	64	80	0.0	14.5	**31.3**	**46.7**
23/May/09	10.4	**16.9**	24.2	39	68	91	0.0	0.0	18.6	33.8
24/May/09	12.2	16.3	23.2	38	64	85	0.0	8.0	16.6	25.7
25/May/09	9.7	14.4	21.9	35	67	84	0.0	0.0	6.8	17.7
26/May/09	8.4	15.7	20.1	43	57	76	0.0	0.0	5.1	**9.8**
27/May/09	8.2	14.0	21.9	40	72	89	0.0	0.0	**3.9**	12.9
28/May/09	8.2	14.7	21.6	45	74	90	1.0	0.0	5.2	12.9
29/May/09	9.2	13.5	20.8	38	73	**92**	0.4	1.6	8.8	16.1
30/May/09	7.6	12.6	19.4	42	69	88	0.0	2.7	19.3	29.0
31/May/09	8.9	13.3	19.2	48	66	84	0.0	6.4	18.5	25.7
Average	**8.7**	**14.6**	**21.7**	**35**	**61**	**82**		**3.0**	**12.3**	**22.9**
Maximum	**13.3**	**16.9**	**24.3**	**63**	**86**	**92**	**35.2**	**19.3**	**31.3**	**46.7**
Minimum	**3.3**	**11.8**	**15.8**	**17**	**49**	**68**	**0.0**	**0.0**	**3.9**	**9.8**
Total							**49.4**			

Daily Summary June 2009 Narrabri Weather Station

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Jun/09	12.2	13.9	16.4	56	66	83	0.2	6.4	16.5	24.1
02/Jun/09	11.6	12.7	14.2	84	87	91	4.0	8.0	13.5	19.3
03/Jun/09	11.3	14.9	21.0	50	75	90	0.0	0.0	8.0	19.3
04/Jun/09	12.3	14.7	19.2	65	82	92	2.0	0.0	6.2	20.9
05/Jun/09	7.1	13.3	19.5	38	72	94	0.0	0.0	6.9	16.1
06/Jun/09	3.3	10.8	19.4	33	71	91	0.2	0.0	2.9	19.3
07/Jun/09	8.5	12.4	16.6	51	75	92	5.4	0.0	12.5	30.6
08/Jun/09	8.2	12.8	17.3	48	69	85	0.0	6.4	13.1	24.1
09/Jun/09	5.5	10.2	15.8	42	72	90	0.4	4.8	14.3	32.2
10/Jun/09	3.3	7.9	12.6	40	67	86	0.0	6.4	13.3	24.1
11/Jun/09	0.1	6.2	13.7	26	65	89	0.0	0.0	6.3	16.1
12/Jun/09	-0.3	6.3	15.9	37	69	89	0.0	0.0	4.5	12.9
13/Jun/09	3.1	9.4	18.4	24	58	84	0.0	0.0	9.4	30.6
14/Jun/09	3.2	11.7	19.7	27	58	83	0.4	0.0	9.8	25.7
15/Jun/09	7.6	13.1	18.9	43	62	81	0.0	4.8	14.0	24.1
16/Jun/09	4.9	11.7	17.9	36	61	82	0.0	0.0	8.2	22.5
17/Jun/09	5.9	11.9	18.3	51	75	92	0.0	0.0	16.1	25.7
18/Jun/09	7.0	11.9	17.5	47	71	90	0.0	9.7	18.9	27.4
19/Jun/09	7.1	12.7	18.9	49	70	90	0.0	9.7	18.8	27.4
20/Jun/09	8.2	13.8	21.1	43	69	88	0.0	0.0	10.8	20.9
21/Jun/09	12.4	14.8	19.1	62	80	92	7.8	0.0	6.1	12.9
22/Jun/09	9.8	14.0	20.2	49	80	95	0.4	0.0	4.6	11.3
23/Jun/09	7.8	12.5	20.6	47	78	92	0.2	0.0	4.7	11.3
24/Jun/09	5.9	11.9	20.3	28	67	89	0.2	0.0	13.1	32.2
25/Jun/09	2.3	9.3	16.2	39	66	83	0.0	0.0	5.2	16.1
26/Jun/09	6.4	9.8	14.2	54	80	92	2.0	0.0	4.9	19.3
27/Jun/09	9.1	11.1	14.5	79	90	94	5.6	0.0	3.9	11.3
28/Jun/09	10.1	11.4	14.8	64	86	94	1.2	1.6	10.1	24.1
29/Jun/09	3.8	10.6	18.2	47	77	93	0.0	0.0	6.6	12.9
30/Jun/09	8.1	14.2	19.9	40	61	84	0.0	0.0	16.5	32.2
Average	**6.9**	**11.7**	**17.7**	**47**	**72**	**89**		**1.9**	**10.0**	**21.6**
Maximum	**12.4**	**14.9**	**21.1**	**84**	**90**	**95**	**7.8**	**9.7**	**18.9**	**32.2**
Minimum	**-0.3**	**6.2**	**12.6**	**24**	**58**	**81**	**0.0**	**0.0**	**2.9**	**11.3**
Total							**30.0**			

Daily Summary **July 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Jul/09	4.7	15.6	21.4	28	47	75	0.0	3.2	22.4	33.8
02/Jul/09	1.3	9.4	17.2	33	62	87	0.0	0.0	10.0	24.1
03/Jul/09	4.0	9.3	14.9	41	64	84	0.0	4.8	16.1	32.2
04/Jul/09	0.2	7.4	15.4	45	73	91	0.0	1.6	10.4	20.9
05/Jul/09	4.8	9.3	15.8	41	70	89	0.0	0.0	6.1	16.1
06/Jul/09	0.8	8.2	17.0	41	72	90	0.0	0.0	9.0	27.4
07/Jul/09	7.2	10.5	15.5	52	68	79	0.0	6.4	17.6	27.4
08/Jul/09	5.1	10.9	17.9	37	63	88	0.0	8.0	20.0	27.4
09/Jul/09	3.5	10.1	17.5	42	66	87	0.0	9.7	18.8	27.4
10/Jul/09	4.3	10.2	17.8	37	68	92	0.0	6.4	16.9	30.6
11/Jul/09	4.6	10.0	19.1	39	70	88	0.0	0.0	7.9	19.3
12/Jul/09	3.3	11.9	20.8	36	62	88	0.0	0.0	10.3	25.7
13/Jul/09	9.0	11.7	14.9	43	71	89	1.8	1.6	12.3	24.1
14/Jul/09	4.6	9.4	14.4	55	82	95	2.6	0.0	11.4	25.7
15/Jul/09	4.8	8.3	14.3	53	82	94	6.0	0.0	11.7	27.4
16/Jul/09	5.8	8.4	13.0	58	82	93	2.0	1.6	11.3	20.9
17/Jul/09	0.6	7.3	14.6	52	68	79	0.6	0.0	5.2	14.5
18/Jul/09	2.9	8.9	17.5	39	74	93	0.2	0.0	7.4	16.1
19/Jul/09	1.5	8.4	17.6	30	68	92	0.0	0.0	3.2	11.3
20/Jul/09	1.2	8.5	19.3	27	65	88	0.0	0.0	7.2	20.9
21/Jul/09	4.7	14.4	22.7	39	60	84	0.0	0.0	15.0	32.2
22/Jul/09	13.3	16.0	18.1	54	70	90	12.6	17.7	24.8	35.4
23/Jul/09	6.0	12.1	17.3	40	71	93	0.4	1.6	11.3	24.1
24/Jul/09	2.8	8.5	15.4	50	74	88	0.0	1.6	11.5	24.1
25/Jul/09	4.2	10.2	17.9	37	69	87	0.0	0.0	6.7	14.5
26/Jul/09	7.8	13.2	18.2	54	68	84	0.0	0.0	17.0	37.0
27/Jul/09	4.6	10.4	18.1	35	68	91	0.0	0.0	9.6	19.3
28/Jul/09	1.2	8.8	16.2	45	70	91	0.0	0.0	5.6	19.3
29/Jul/09	1.8	9.4	17.3	40	69	91	0.0	0.0	5.4	16.1
30/Jul/09	1.5	9.6	18.4	37	68	92	0.0	0.0	5.7	29.0
31/Jul/09	2.5	10.0	15.8	44	66	87	0.0	0.0	8.9	19.3
Average	**4.0**	**10.2**	**17.1**	**42**	**69**	**88**		**2.1**	**11.5**	**24.0**
Maximum	**13.3**	**16.0**	**22.7**	**58**	**82**	**95**	**12.6**	**17.7**	**24.8**	**37.0**
Minimum	**0.2**	**7.3**	**13.0**	**27**	**47**	**75**	**0.0**	**0.0**	**3.2**	**11.3**
Total							**26.2**			

Daily Summary August 2009 Narrabri Weather Station

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Aug/09	2.0	9.8	17.8	35	67	90	0.0	0.0	5.3	12.9
02/Aug/09	1.9	9.5	20.2	23	63	90	0.0	0.0	7.4	14.5
03/Aug/09	0.2	8.6	18.4	38	67	88	0.0	0.0	3.2	11.3
04/Aug/09	3.4	10.2	19.1	28	62	84	0.0	0.0	7.3	19.3
05/Aug/09	2.6	9.6	18.2	33	63	86	0.0	0.0	7.2	16.1
06/Aug/09	3.8	10.8	20.7	31	61	81	0.0	0.0	8.8	19.3
07/Aug/09	5.1	13.8	22.9	27	57	84	0.0	0.0	16.2	32.2
08/Aug/09	2.3	8.8	16.1	31	57	82	0.0	3.2	11.8	24.1
09/Aug/09	2.6	10.0	19.7	28	58	78	0.0	0.0	10.6	29.0
10/Aug/09	3.6	11.9	21.3	29	57	79	0.2	0.0	11.7	33.8
11/Aug/09	9.9	16.8	23.7	29	48	70	2.4	0.0	19.5	40.2
12/Aug/09	6.8	14.8	23.3	26	52	74	0.0	0.0	9.6	29.0
13/Aug/09	3.5	12.6	21.9	18	51	85	0.0	0.0	6.5	16.1
14/Aug/09	3.1	11.1	19.9	32	59	87	0.0	0.0	5.0	17.7
15/Aug/09	1.6	10.4	21.4	23	58	86	0.0	0.0	4.3	12.9
16/Aug/09	2.2	15.7	26.2	18	45	81	0.0	0.0	14.3	30.6
17/Aug/09	8.6	18.2	24.1	27	57	84	0.8	6.4	18.2	29.0
18/Aug/09	1.8	10.5	19.1	22	45	76	0.0	0.0	9.6	20.9
19/Aug/09	2.7	11.5	21.2	25	48	69	0.0	0.0	9.1	27.4
20/Aug/09	5.7	14.0	23.2	31	52	71	0.0	0.0	9.4	22.5
21/Aug/09	7.2	18.6	26.2	22	46	80	0.0	0.0	15.6	35.4
22/Aug/09	14.2	18.6	22.6	26	49	73	0.2	0.0	10.3	24.1
23/Aug/09	14.2	21.5	30.9	22	49	77	0.0	0.0	10.7	32.2
24/Aug/09	19.4	24.4	29.3	26	33	48	0.0	6.4	17.5	30.6
25/Aug/09	6.4	18.0	22.8	17	33	60	0.0	0.0	16.5	32.2
26/Aug/09	4.7	13.5	22.6	18	40	69	0.0	0.0	7.4	20.9
27/Aug/09	2.7	14.4	25.5	12	40	74	0.0	0.0	8.1	24.1
28/Aug/09	5.5	17.0	25.8	13	35	66	0.0	0.0	6.9	19.3
29/Aug/09	14.8	21.9	29.8	25	43	62	0.8	0.0	17.2	43.5
30/Aug/09	6.8	14.7	21.7	21	51	87	3.4	1.6	15.9	29.0
31/Aug/09	1.2	10.8	18.6	25	49	84	0.0	0.0	8.2	16.1
Average	**5.5**	**13.9**	**22.4**	**25**	**52**	**78**		**0.6**	**10.6**	**24.7**
Maximum	**19.4**	**24.4**	**30.9**	**38**	**67**	**90**	**3.4**	**6.4**	**19.5**	**43.5**
Minimum	**0.2**	**8.6**	**16.1**	**12**	**33**	**48**	**0.0**	**0.0**	**3.2**	**11.3**
Total							**7.8**			

Daily Summary **September 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Sep/09	2.9	12.2	21.3	24	50	79	0.0	0.0	6.1	17.7
02/Sep/09	5.9	14.1	23.7	23	49	71	0.0	0.0	10.8	25.7
03/Sep/09	8.5	15.6	20.4	32	50	68	0.0	0.0	13.0	35.4
04/Sep/09	12.4	16.4	21.8	53	73	91	22.0	1.6	19.7	37.0
05/Sep/09	7.3	15.1	21.6	39	72	93	0.0	0.0	4.8	14.5
06/Sep/09	5.6	13.9	22.4	31	59	84	0.0	0.0	12.0	25.7
07/Sep/09	9.2	13.6	18.9	73	83	90	8.4	0.0	12.7	29.0
08/Sep/09	7.4	13.5	19.9	38	66	91	0.8	0.0	11.8	25.7
09/Sep/09	3.8	11.2	19.1	33	63	89	0.0	0.0	9.1	22.5
10/Sep/09	3.2	12.3	21.0	22	55	88	0.0	0.0	8.1	20.9
11/Sep/09	3.2	12.5	22.9	21	56	85	0.0	0.0	3.2	9.7
12/Sep/09	4.2	15.4	27.3	12	45	79	0.0	0.0	5.6	14.5
13/Sep/09	6.8	17.9	27.4	22	42	69	0.0	0.0	13.6	33.8
14/Sep/09	12.2	20.6	29.1	22	38	67	0.0	0.0	9.8	25.7
15/Sep/09	11.8	20.4	28.7	22	44	71	0.0	0.0	11.5	30.6
16/Sep/09	12.8	21.2	29.6	24	45	69	0.0	0.0	11.8	29.0
17/Sep/09	13.8	23.5	28.6	73	83	90	0.0	0.0	26.9	43.5
18/Sep/09	13.5	21.3	28.7	18	40	77	0.4	0.0	10.9	32.2
19/Sep/09	9.6	18.5	27.8	21	45	72	0.0	0.0	9.8	20.9
20/Sep/09	9.1	20.0	29.2	20	42	75	0.0	0.0	6.6	19.3
21/Sep/09	13.8	18.7	27.4	26	63	89	2.4	0.0	12.0	32.2
22/Sep/09	15.5	20.3	25.0	44	70	86	6.2	0.0	18.6	46.7
23/Sep/09	10.6	15.4	22.6	34	53	75	1.4	6.4	26.6	45.1
24/Sep/09	6.9	14.3	21.7	27	56	85	0.0	0.0	11.0	24.1
25/Sep/09	5.1	17.0	25.8	17	44	86	0.0	0.0	12.5	27.4
26/Sep/09	10.7	17.5	22.9	15	26	50	0.0	11.3	25.8	38.6
27/Sep/09	4.7	11.6	17.4	22	38	63	0.0	1.6	17.3	33.8
28/Sep/09	1.1	10.6	18.8	27	47	74	0.0	1.6	12.4	24.1
29/Sep/09	3.3	14.2	23.7	15	42	80	0.0	0.0	6.3	16.1
30/Sep/09	4.2	16.0	26.6	12	34	65	0.0	0.0	7.3	17.7
Average	**8.0**	**16.2**	**24.0**	**29**	**52**	**78**		**0.8**	**12.2**	**27.3**
Maximum	**15.5**	**23.5**	**29.6**	**73**	**83**	**93**	**22.0**	**11.3**	**26.9**	**46.7**
Minimum	**1.1**	**10.6**	**17.4**	**12**	**26**	**50**	**0.0**	**0.0**	**3.2**	**9.7**
Total							**41.6**			

Daily Summary **October 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Oct/09	7.9	20.4	31.9	10	30	51	0.0	0.0	12.1	27.4
02/Oct/09	18.3	24.8	31.7	22	36	77	1.0	9.7	27.6	43.5
03/Oct/09	12.6	18.7	24.1	30	58	83	0.0	1.6	11.1	22.5
04/Oct/09	9.9	17.3	25.6	21	60	89	0.0	3.2	13.2	20.9
05/Oct/09	10.4	17.2	25.9	23	59	89	0.0	0.0	9.4	24.1
06/Oct/09	8.2	17.1	25.7	16	45	83	0.0	0.0	9.9	19.3
07/Oct/09	5.9	14.0	19.5	15	33	62	0.0	0.0	15.2	30.6
08/Oct/09	2.2	13.8	22.1	13	38	73	0.0	0.0	11.2	25.7
09/Oct/09	7.2	11.0	17.4	36	57	71	0.0	16.1	20.4	27.4
10/Oct/09	15.8	18.2	21	24	36	49	0.0	11.3	15.1	22.5
11/Oct/09	11.6	16.5	21.4	37	57	80	1.6	0.0	14.2	41.8
12/Oct/09	10.2	19.6	29.1	20	53	86	0.0	1.6	15.2	35.4
13/Oct/09	15	20.1	25.6	17	36	68	0.0	0.0	21.7	41.8
14/Oct/09	10.9	18.3	23.1	19	29	46	0.0	4.8	21.6	41.8
15/Oct/09	7.8	17.0	25.5	16	35	60	0.0	4.8	16.7	40.2
16/Oct/09	6.6	15.4	20.9	13	34	73	0.0	0.0	15.2	33.8
17/Oct/09	3.7	15.4	23.8	18	34	62	0.0	0.0	8.8	22.5
18/Oct/09	9.5	16.9	25.3	20	39	68	0.0	0.0	7.5	17.7
19/Oct/09	9.9	19.4	27.7	21	40	70	0.0	0.0	7.3	20.9
20/Oct/09	11.2	21.5	30.6	17	37	59	0.0	0.0	12.4	35.4
21/Oct/09	14.1	24.4	33.2	14	29	52	0.0	0.0	10.5	32.2
22/Oct/09	14.1	25.3	35.1	10	26	48	0.0	0.0	9.7	24.1
23/Oct/09	15.8	26.4	34.7	13	24	48	0.0	0.0	18.8	37
24/Oct/09	14.9	24.9	33.1	7	20	38	0.0	0.0	13.8	27.4
25/Oct/09	12.9	22.3	32.8	11	29	54	0.0	0.0	11.0	48.3
26/Oct/09	14.5	15.6	19.8	52	85	92	34.6	1.6	21.1	37
27/Oct/09	13.3	17.8	25.1	48	74	89	0.2	6.4	22.5	29
28/Oct/09	14.3	20.9	28.7	28	59	85	0.0	1.6	10.0	16.1
29/Oct/09	17.6	21.4	28.4	36	63	87	1.4	0.0	8.6	19.3
30/Oct/09	15.4	20.7	28.1	34	69	92	2.4	0.0	6.6	17.7
31/Oct/09	15.4	22.7	30.1	26	57	89	0.0	1.6	10.3	20.9
Average	**11.5**	**19.2**	**26.7**	**22**	**45**	**70**		**2.1**	**13.8**	**29.2**
Maximum	**18.3**	**26.4**	**35.1**	**52**	**85**	**92**	**34.6**	**16.1**	**27.6**	**48.3**
Minimum	**2.2**	**11.0**	**17.4**	**7**	**20**	**38**	**0.0**	**0.0**	**6.6**	**16.1**
Total							**41.2**			

Daily Summary **November 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Nov/09	15	22.9	31.1	19	48	79	0.0	0	9.2	19.3
02/Nov/09	16.1	25.4	33.7	19	40	72	0.0	0	11.1	29
03/Nov/09	19.9	27.8	35.7	11	27	54	0.0	1.6	17.5	30.6
04/Nov/09	18.1	26.8	35.1	17	29	52	0.0	0.0	11.9	25.7
05/Nov/09	18.2	22.9	29.7	19	37	66	0.0	1.6	12.5	25.7
06/Nov/09	17	19.2	22	64	73	80	1.2	1.6	16.5	30.6
07/Nov/09	16.1	18.7	23.3	58	74	90	4.2	8.0	19.7	25.7
08/Nov/09	14.9	21.5	29.2	25	62	90	0.2	4.8	15.4	33.8
09/Nov/09	16.3	23.5	30.1	20	52	83	0.4	4.8	15.5	25.7
10/Nov/09	13.9	22.4	30.2	11	41	81	0.0	0.0	7.1	16.1
11/Nov/09	15.4	24.5	33.2	14	35	58	0.0	0.0	12.9	25.7
12/Nov/09	17.2	26.7	35.2	16	31	52	0.0	0.0	9.6	20.9
13/Nov/09	20.1	26.3	34.2	20	46	78	0.4	0.0	15.3	38.6
14/Nov/09	15.7	24.3	33.1	16	47	78	0.0	1.6	11.1	25.7
15/Nov/09	17.4	27.6	36.8	15	34	56	0.0	0.0	12.0	27.4
16/Nov/09	26	32.3	40.3	9	20	32	0.2	4.8	17.0	32.2
17/Nov/09	25.8	33.1	41.4	58	74	90	0.0	1.6	18.4	37
18/Nov/09	17.1	28.2	39.3	9	35	68	0.0	3.2	15.6	29.0
19/Nov/09	21.3	31.5	41.9	10	28	54	0.0	0.0	7.2	19.3
20/Nov/09	17.7	33.3	41.4	14	28	51	0.0	0.0	15.2	30.6
21/Nov/09	29.1	34.7	41.4	12	22	31	0.0	6.4	22.2	38.6
22/Nov/09	29.5	34.3	40.1	11	24	40	0.0	11.3	28.2	40.2
23/Nov/09	19.7	28.1	38.4	18	42	67	0.6	0.0	17.7	48.3
24/Nov/09	17.7	25.1	33	27	51	77	0.6	3.2	17.0	37
25/Nov/09	19.4	27.3	35.5	21	44	74	0.0	1.6	8.5	19.3
26/Nov/09	23.2	28.5	35.3	18	38	65	0.0	1.6	22.9	40.2
27/Nov/09	21.4	26.8	33.8	19	53	88	2.2	0.0	13.3	30.6
28/Nov/09	16.8	29.7	38.9	7	31	75	0.2	0.0	16.4	37
29/Nov/09	17.3	25.5	31	13	21	34	0.0	4.8	21.3	43.5
30/Nov/09	13	22.1	28.9	17	32	59	0.0	0.0	13.2	27.4
Average	**18.9**	**26.7**	**34.4**	**20**	**41**	**66**		**2.1**	**15.0**	**30.4**
Maximum	**29.5**	**34.7**	**41.9**	**64**	**74**	**90**	**4.2**	**11.3**	**28.2**	**48.3**
Minimum	**13.0**	**18.7**	**22.0**	**7**	**20**	**31**	**0.0**	**0.0**	**7.1**	**16.1**
Total							**10.2**			

Daily Summary **December 2009** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Dec/09	14.3	19.5	27.2	23	49	69	0.0	3.2	21.4	40.2
02/Dec/09	12.8	20.2	27.4	14	40	68	0.0	9.7	22.1	29.0
03/Dec/09	14.5	23.0	31.6	14	35	62	0.0	0.0	11.0	25.7
04/Dec/09	15.1	26.7	35.3	14	29	46	0.0	0.0	15.2	35.4
05/Dec/09	23.7	29.9	37.1	7	18	32	0.0	6.4	22.9	38.6
06/Dec/09	16.6	27.6	37.2	9	18	50	0.0	0.0	11.7	24.1
07/Dec/09	17.1	29.8	39.8	7	21	49	0.0	0.0	14.6	33.8
08/Dec/09	21.1	32.5	42.2	7	15	26	0.0	0.0	22.9	48.3
09/Dec/09	21.6	30.3	37.6	11	19	35	0.0	1.6	15.3	32.2
10/Dec/09	22.0	27.6	34.8	16	26	42	0.0	3.2	10.7	25.7
11/Dec/09	20.7	26.4	32.6	6	24	48	0.0	3.2	15.2	27.4
12/Dec/09	13.4	23.6	32.9	7	17	28	0.0	0.0	9.2	19.3
13/Dec/09	14.2	27.1	36.8	6	16	32	0.0	0.0	7.6	17.7
14/Dec/09	21.3	28.5	37.1	14	36	64	0.0	1.6	15.8	35.4
15/Dec/09	21.1	29.0	36.8	16	41	69	0.4	0.0	14.3	27.4
16/Dec/09	21.8	29.9	36.7	18	39	70	0.6	1.6	15.5	30.6
17/Dec/09	25.2	30.6	36.8	19	34	52	0.0	11.3	25.7	40.2
18/Dec/09	19.8	25.9	31.2	26	47	80	0.8	1.6	21.4	37.0
19/Dec/09	17.7	25.5	33.6	13	49	89	0.4	0.0	7.7	19.3
20/Dec/09	19.1	24.9	31.6	20	49	74	0.8	0.0	11.6	24.1
21/Dec/09	19.6	26.2	33.7	23	46	69	0.0	0.0	9.3	25.7
22/Dec/09	17.2	21.7	26.9	43	69	91	8.6	0.0	12.8	48.3
23/Dec/09	17.3	26.5	34.6	20	48	86	3.8	0.0	6.3	16.1
24/Dec/09	20.6	28.1	34.9	22	41	69	2.0	0.0	7.1	17.7
25/Dec/09	22.9	27.6	32.6	27	50	77	27.6	3.2	22.5	37.0
26/Dec/09	20.4	22.1	24.1	77	87	92	16.5	0.0	14.2	27.4
27/Dec/09	20.3	23.0	29.8	56	85	92	7.5	1.6	12.3	19.3
28/Dec/09	20.2	21.6	24.2	83	89	92	32.5	0.0	12.2	32.2
29/Dec/09	20.5	22.4	24.2	74	81	86	15.5	6.4	16.7	24.1
30/Dec/09	19.6	21.0	23.9	72	82	91	3.0	8.0	19.1	24.1
31/Dec/09	19.5	21.8	24.5	62	77	88	17.0	0.0	9.3	16.1
Average	**19.1**	**25.8**	**32.6**	**27**	**45**	**65**		**2.0**	**14.6**	**29.0**
Maximum	**25.2**	**32.5**	**42.2**	**83**	**89**	**92**	**32.5**	**11.3**	**25.7**	**48.3**
Minimum	**12.8**	**19.5**	**23.9**	**6**	**15**	**26**	**0.0**	**0.0**	**6.3**	**16.1**
Total							**137.0**			

Denotes data from site rain gauge

Daily Summary **January 2010** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Jan/10	19.1	20.4	22.2	80	89	93	17.0	1.6	6.7	16.1
02/Jan/10	19.3	22.6	27.3	72	88	94	50.0	0.0	15.0	30.6
03/Jan/10	21.6	24.4	29.8	54	77	92	20.0	0.0	8.5	40.2
04/Jan/10	18.8	25.1	31.4	43	66	88	2.5	0.0	11.5	22.5
05/Jan/10	19.7	25.1	31.6	39	66	84	0.0	0.0	7.7	22.5
06/Jan/10	21.9	25.9	32.1	35	62	84	0.0	0.0	10.7	29.0
07/Jan/10	20.6	25.3	32.9	33	63	82	0.4	1.6	10.0	27.4
08/Jan/10	20.1	26.3	32.5	29	56	84	0.0	0.0	10.1	22.5
09/Jan/10	20.6	27.3	33.4	26	51	77	0.0	0.0	5.8	12.9
10/Jan/10	20.6	28.8	36.3	21	46	79	0.0	0.0	10.9	25.7
11/Jan/10	22.3	29.2	36.4	21	48	73	0.0	0.0	9.2	19.3
12/Jan/10	24.5	29.7	36.7	27	47	65	0.0	0.0	12.3	29.0
13/Jan/10	24.6	30.8	37.3	24	42	69	0.0	0.0	14.5	33.8
14/Jan/10	21.3	27.0	35.2	26	58	84	6.8	1.6	12.9	49.9
15/Jan/10	20.4	26.1	32.1	40	64	89	0.0	0.0	10.7	22.5
16/Jan/10	21.6	26.2	32.8	35	60	78	0.0	0.0	13.6	33.8
17/Jan/10	18.9	25.9	33.7	33	57	87	0.0	0.0	14.3	25.7
18/Jan/10	13.1	21.1	25.8	20	32	70	0.0	0.0	15.2	30.6
19/Jan/10	10.1	19.7	26.7	19	32	63	0.0	0.0	11.2	22.5
20/Jan/10	9.7	22.4	33.0	15	36	73	0.0	0.0	5.8	14.5
21/Jan/10	14.7	27.2	37.3	10	31	63	0.0	0.0	3.9	17.7
22/Jan/10	21.1	29.8	37.4	16	29	46	0.0	0.0	11.8	25.7
23/Jan/10	21.0	29.7	36.8	18	30	50	0.0	0.0	11.8	27.4
24/Jan/10	19.9	29.0	37.3	18	40	65	0.0	0.0	11.6	27.4
25/Jan/10	22.9	31.0	37.3	15	29	77	0.0	4.8	19.4	29.0
26/Jan/10	24.9	31.2	37.4	14	30	44	0.0	4.8	20.5	35.4
27/Jan/10	21.9	29.7	36.7	22	35	80	7.4	0.0	9.0	43.5
28/Jan/10	20.1	26.8	36.7	22	57	85	1.2	0.0	13.1	45.1
29/Jan/10	20.9	24.3	32.6	36	70	88	2.0	0.0	5.5	19.3
30/Jan/10	19.4	26.2	33.7	25	52	79	0.2	8.0	19.7	25.7
31/Jan/10	20.1	24.3	31.2	39	64	85	11.6	1.6	14.3	25.7
Average	**19.9**	**26.4**	**33.3**	**30**	**52**	**76**		**0.8**	**11.5**	**27.5**
Maximum	**24.9**	**31.2**	**37.4**	**80**	**89**	**94**	**50.0**	**8.0**	**20.5**	**49.9**
Minimum	**9.7**	**19.7**	**22.2**	**10**	**29**	**44**	**0.0**	**0.0**	**3.9**	**12.9**
Total							**119.1**			

Denotes data from site rain gauge

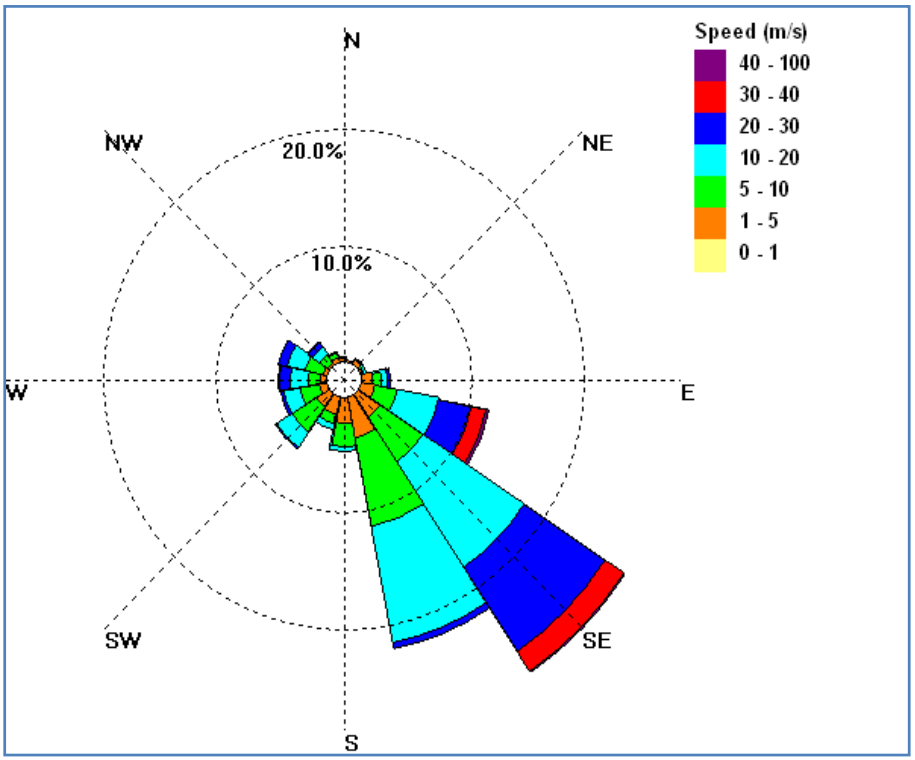
Daily Summary **February 2010** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Feb/10	20.2	24.1	28.9	32	55	80	0.0	9.7	19.9	27.4
02/Feb/10	20.3	25.2	31.2	26	45	65	0.0	16.1	26.1	38.6
03/Feb/10	19.8	26.0	32.5	35	53	76	0.2	4.8	18.8	25.7
04/Feb/10	20.3	26.1	32.2	27	52	69	0.0	0.0	11.4	29.0
05/Feb/10	21.7	25.8	32.4	34	63	90	3.8	0.0	12.5	32.2
06/Feb/10	21.0	24.0	28.2	56	77	92	1.4	0.0	7.4	19.3
07/Feb/10	21.9	24.2	28.0	59	77	90	8.2	0.0	10.6	22.5
08/Feb/10	21.6	26.0	31.6	31	62	92	0.2	1.6	12.1	27.4
09/Feb/10	18.2	26.1	32.6	33	52	79	0.0	1.6	10.1	20.9
10/Feb/10	21.8	26.7	32.8	30	55	75	0.0	0.0	8.2	19.3
11/Feb/10	21.0	26.9	34.4	24	51	71	0.0	0.0	9.1	19.3
12/Feb/10	21.0	28.1	34.4	26	47	70	0.0	0.0	17.3	33.8
13/Feb/10	23.8	29.3	35.7	25	43	69	0.0	0.0	14.9	27.4
14/Feb/10	21.4	26.5	33.2	40	62	92	46.2	0.0	22.2	41.8
15/Feb/10	21.6	24.1	28.9	48	78	92	2.8	0.0	9.6	17.7
16/Feb/10	17.0	24.4	30.6	32	59	90	0.0	0.0	7.8	20.9
17/Feb/10	17.5	24.2	30.7	34	59	81	0.0	11.3	18.6	27.4
18/Feb/10	19.1	23.3	29.2	29	52	72	0.0	20.9	26.2	32.2
19/Feb/10	16.2	23.3	30.2	28	50	69	0.0	6.4	19.1	27.4
20/Feb/10	18.5	24.4	31.1	27	53	78	0.0	0.0	7.1	17.7
21/Feb/10	18.7	25.3	32.5	28	54	79	0.0	0.0	4.5	16.1
22/Feb/10	19.2	26.6	33.2	26	52	76	0.0	0.0	13.2	33.8
23/Feb/10	21.4	25.4	33.6	40	63	90	4.0	0.0	10.2	27.4
24/Feb/10	18.7	25.0	32.2	41	65	88	0.2	4.8	15.6	27.4
25/Feb/10	19.6	24.2	29.9	40	59	75	0.0	14.5	19.5	25.7
26/Feb/10	15.7	22.9	30.1	27	53	75	0.0	3.2	15.6	24.1
27/Feb/10	17.9	24.4	30.9	27	50	75	0.0	0.0	8.5	16.1
28/Feb/10	20.3	25.0	30.4	41	55	72	0.0	0.0	6.8	22.5
Average	**19.8**	**25.3**	**31.5**	**34**	**57**	**79**		**3.4**	**13.7**	**25.8**
Maximum	**23.8**	**29.3**	**35.7**	**59**	**78**	**92**	**46.2**	**20.9**	**26.2**	**41.8**
Minimum	**15.7**	**22.9**	**28.0**	**24**	**43**	**65**	**0.0**	**0.0**	**4.5**	**16.1**
Total							**67.0**			

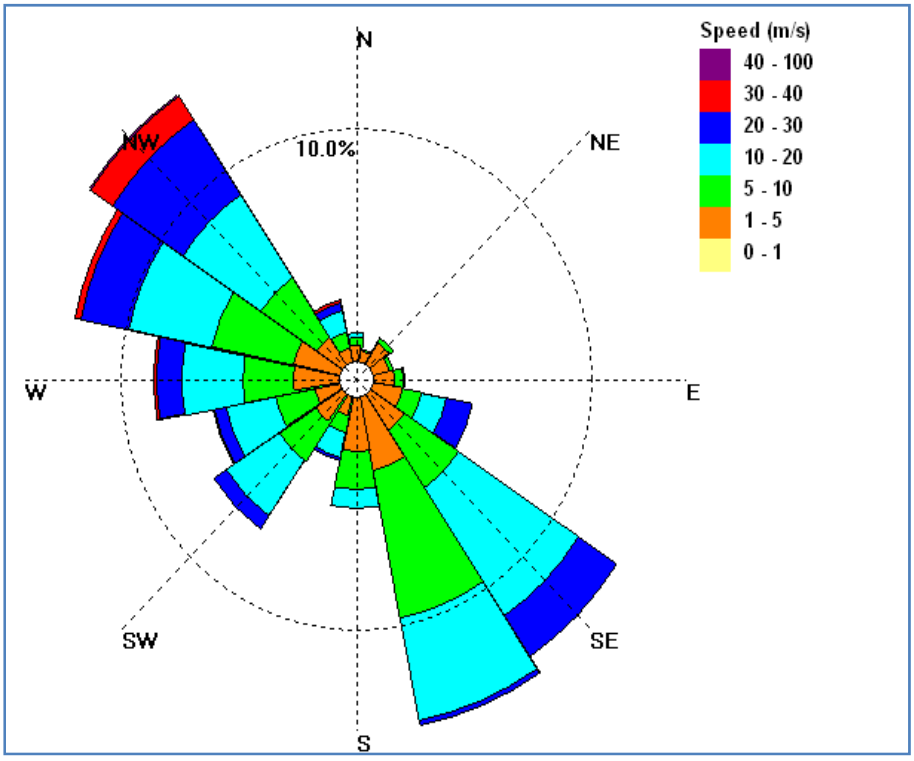
Daily Summary **March 2010** **Narrabri Weather Station**

Date	Min Temp (°C)	Ave Temp (°C)	Max Temp (°C)	Min RH (%)	Ave RH (%)	Max RH (%)	Rain (mm)	Min WS (m/s)	Ave WS (m/s)	Max WS (m/s)
01/Mar/10	18.5	20.7	23.7	63	80	92	15.8	0.0	17.7	33.8
02/Mar/10	16.9	19.2	21.9	50	62	75	0.0	22.5	30.8	38.6
03/Mar/10	16.7	22.3	29.3	38	58	75	0.0	9.7	25.9	35.4
04/Mar/10	17.3	23.9	30.8	36	57	79	0.0	3.2	13.2	22.5
05/Mar/10	18.9	20.9	24.1	60	82	93	13.6	0.0	7.4	14.5
06/Mar/10	19.6	23.3	30.2	50	81	95	0.6	0.0	6.6	20.9
07/Mar/10	20.9	24.1	29.2	50	76	94	19.0	0.0	8.7	22.5
08/Mar/10	19.9	23.2	27.7	63	75	88	0.2	0.0	15.7	33.8
09/Mar/10	13.3	21.6	28.2	27	56	89	0.0	0.0	6.9	14.5
10/Mar/10	14.7	21.4	28.0	31	60	88	0.0	0.0	9.5	30.6
11/Mar/10	16.9	21.6	27.3	34	59	81	0.0	17.7	27.5	35.4
12/Mar/10	14.5	21.0	28.2	31	51	70	0.0	16.1	25.2	33.8
13/Mar/10	14.2	20.4	27.6	31	59	84	0.0	17.7	24.9	33.8
14/Mar/10	14.2	21.0	28.4	33	59	87	0.0	8.0	19.3	27.4
15/Mar/10	16.7	21.8	27.3	34	54	74	0.0	0.0	8.6	16.1
16/Mar/10	15.7	21.8	29.3	20	50	77	0.0	3.2	13.8	22.5
17/Mar/10	14.0	22.2	30.3	21	46	80	0.0	1.6	9.8	17.7
18/Mar/10	16.6	22.6	31.1	13	42	69	0.0	0.0	10.7	19.3
19/Mar/10	14.1	22.2	30.6	27	48	73	0.0	0.0	4.3	12.9
20/Mar/10	14.8	23.8	32.6	21	46	76	0.0	0.0	6.9	17.7
21/Mar/10	15.1	24.6	32.6	23	46	75	0.0	0.0	7.7	22.5
22/Mar/10	16.4	25.4	33.7	22	42	70	0.0	0.0	6.5	16.1
23/Mar/10	17.4	24.5	32.5	23	42	72	0.0	0.0	9.3	17.7
24/Mar/10	15.7	23.7	31.8	22	43	62	0.0	0.0	6.4	12.9
25/Mar/10	18.3	24.6	31.6	25	47	72	0.0	1.6	8.7	16.1
26/Mar/10	19.9	25.1	31.6	27	47	61	0.0	0.0	12.0	24.1
27/Mar/10	17.3	25.4	33.2	21	45	73	0.0	0.0	5.1	14.5
28/Mar/10	19.7	25.5	31.6	30	48	65	0.0	0.0	8.2	19.3
29/Mar/10	19.9	24.5	29.7	37	53	70	0.0	0.0	11.1	22.5
30/Mar/10	17.3	19.2	21.9	63	86	92	50.0	0.0	6.1	16.1
31/Mar/10	16.1	19.2	23.8	59	81	92	0.0	0.0	9.5	20.9
Average	**16.8**	**22.6**	**29.0**	**35**	**57**	**79**		**3.3**	**12.4**	**22.8**
Maximum	**20.9**	**25.5**	**33.7**	**63**	**86**	**95**	**50.0**	**22.5**	**30.8**	**38.6**
Minimum	**13.3**	**19.2**	**21.9**	**13**	**42**	**61**	**0.0**	**0.0**	**4.3**	**12.9**
Total							**99.2**			

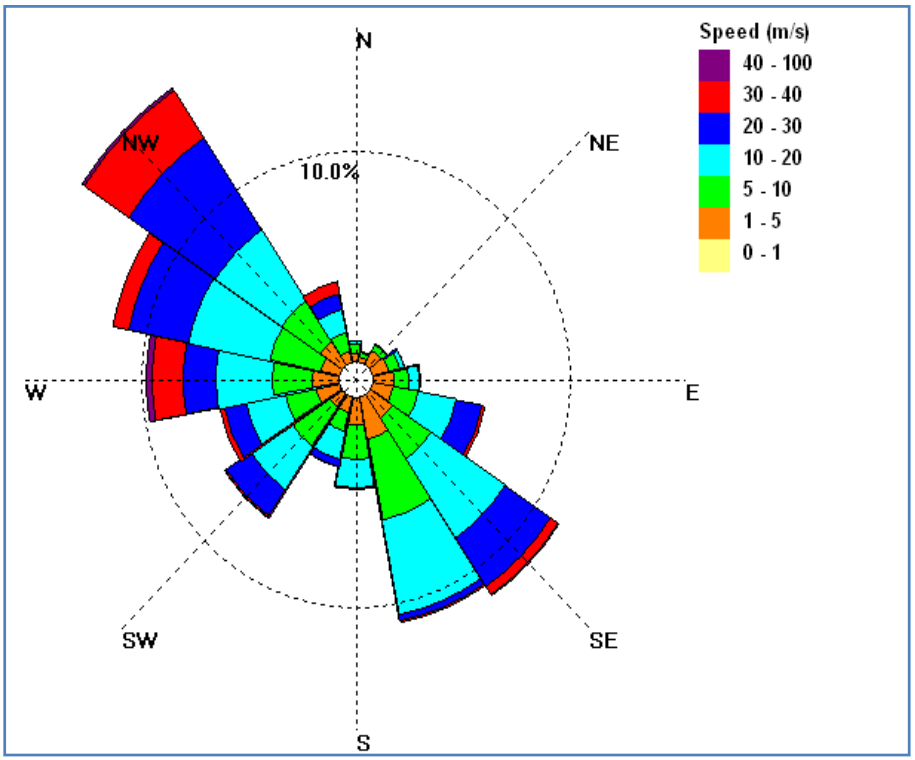
Autumn Wind Rose (March 2009 – May 2009)



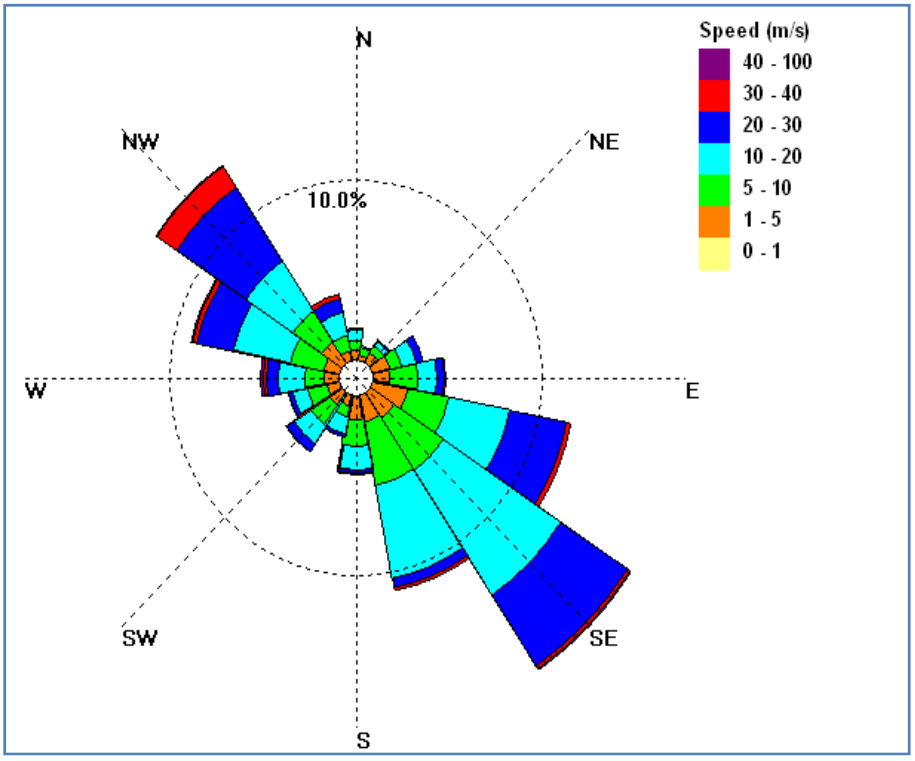
Winter Wind Rose (June 2009 – August 2009)



Spring Wind Rose (September 2009 – November 2009)



Summer Wind Rose (December 2009 – February 2010)



Annual Wind Rose (April 2009 – March 2010)