SAFETY & SUSTAINABLE DEVELOPMENT

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT - 2015

DRAYTON MINE

AngloAmerican

Real Mining. Real People. Real Difference.

Annual Environmental Management Report - 2015

Name of Mine:	ANGLO COAL (DRAYTON MANAGEMENT) PTY LTD
Titles / Mining Leases:	CL229, CL395, ML153, A173
Current MOP	Mine Operations Plan
MOP Commencement Date:	1st JULY 2015
MOP Completion Date:	30th JUNE 2020
AEMR Commencement Date:	1st JANUARY 2015
AEMR Completion Date:	31st DECEMBER 2015
Name of Leaseholder:	ANGLO COAL (DRAYTON MANAGEMENT) PTY LTD
Name of mine operator (if different):	
Reporting Officer:	JAMES BENSON
Title:	ENVIRONMENT COORDINATOR
Signature:	(*JBENSON*)
Date:	31/03/2016

CONTENTS

1 INTRODUCTION 1

1.1 Consents, Leases and Licences 2
1.2 Mine Contacts 3
1.3 Actions required at Previous AEMR Review 3

2 OPERATIONS DURING THE REPORTING PERIOD 5

2.1 Exploration 5
2.2 Land Preparation 5
2.3 Construction 5
2.4 Mining 5
2.5 Mineral Processing 8
2.6 Waste Management 8
2.7 Ore and Product Stockpiles 11
2.8 Water Management 11
2.9 Hazardous Material Management 15
2.10 Other Infrastructure Management 16

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE 17

3.1 Air Quality 17
3.2 Erosion and Sediment 32
3.3 Surface Water 33
3.4 Ground Water 37
3.5 Water Accounting Framework 41
3.6 Contaminated Land 42
3.7 Threatened Flora 43
3.8 Threatened Fauna 44
3.9 Weeds 46
3.10 Blasting 49
3.11 Operational Noise 53
3.12 Visual Aesthetics and Lighting 60
3.13 Aboriginal Heritage 61
3.14 Natural Heritage 61
3.15 Spontaneous Combustion 62
3.16 Bushfire 63
3.17 Mine Subsidence 64
3.18 Hydrocarbon Contamination 64
3.19 Methane Drainage / Ventilation 65
3.20 Public Safety 65
3.21 Meteorological Monitoring 66
3.22 Other Issues and Risks 70

4 COMMUNITY RELATIONS 72

4.1 ENVIRONMENTAL COMPLAINTS 72
4.2 COMMUNITY LIAISON 74

5 REHABILITATION 76

5.1 BUILDINGS 76
5.2 REHABILITATION OF DISTURBED LAND 76
5.3 OTHER INFRASTRUCTURE 95
5.4 REHABILITATION TRIALS AND RESEARCH 95
5.5 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN 96

6 ACTIVITIES PROPOSED FOR THE NEXT AEMR PERIOD 98

6.1 ENVIRONMENTAL PERFORMANCE 98

7 ADDITIONAL INFORMATION 99

7.1 ANTIENE JOINT RAIL USER FACILITY 99
7.2 MONITORING 100

APPENDICES 103

Figures

FIGURE 1: WATER MANAGEMENT FLOW DIAGRAM 12
FIGURE 2: DEPOSITIONAL DUST MONITORING SITES 20
FIGURE 3: REAL-TIME DUST MONITORING EQUIPMENT 21
FIGURE 4: PREDICTED ANNUAL AVERAGE DEPOSITED DUST - YEAR 10 23
FIGURE 5: AVERAGE DEPOSITIONAL DUST GAUGE RESULTS 2015 24
FIGURE 6: PREDICTED ANNUAL TSP CONCENTRATIONS - YEAR 10 26
FIGURE 7: LONG TERM ANNUAL AVERAGE TSP FROM LOT 22 HVAS 27
FIGURE 8: TSP FROM LOT 22 HVAS 2015 27
FIGURE 9: PREDICTED ANNUAL PM10 CONCENTRATIONS - YEAR 10 29
FIGURE 10: PM10 DATA 2015 30
FIGURE 11: PM10 HISTORICAL DATA 31
FIGURE 12: SURFACE WATER MONITORING SITES 34
FIGURE 13: GROUNDWATER MONITORING SITES 40
FIGURE 14: PINE DONKEY ORCHID 43
FIGURE 15: SPOTTED-TAIL QUOLL IDENTIFIED DURING ANNUAL FLORA AND FAUNA MONITORING 44
FIGURE 16: WEED INFESTATIONS TARGETED DURING 2015 48
FIGURE 17: BLAST MONITORING SITES 51
FIGURE 18: NUMBER OF BLASTS BY TYPE 53
FIGURE 19: NOISE MONITORING LOCATIONS 57
FIGURE 20: AREA AFFECTED BY SPONTANEOUS COMBUSTION BY YEAR 63
FIGURE 21: RAINFALL HISTORY 1981 TO 2015 67
FIGURE 22: ANNUAL WINDROSES 2014 AND 2015 69
FIGURE 23: COMMUNITY COMPLAINTS/ENQUIRIES ASSOCIATED WITH DRAYTON (2006 – 2015) 73
FIGURE 24: COMMUNITY COMPLAINTS/ENQUIRIES BY TYPE FOR THE 2015 REPORTING PERIOD 73

FIGURE 25: RECIPIENT ORGANISATION TYPE 74
FIGURE 26: REHABILITATION AREAS TO END 2015 84
FIGURE 27: REHABILITATION AREA CONTOURS - NORTH 85
FIGURE 28: REHABILITATION AREA CONTOURS - EAST 86
FIGURE 29: REHABILITATION AREA CONTOURS - SOUTH 87
FIGURE 30: REHABILITATION AREA TARGET VEGETATION COMMUNITIES 88
FIGURE 31: PROPOSED REHABILITATION AREAS 2016 89
FIGURE 32: CROSS SECTION OF EN01 REHABILITATION AREA 90
FIGURE 33: CROSS SECTION OF EN02 REHABILITATION AREA 90
FIGURE 34: CROSS SECTION OF NN01 REHABILITATION AREA 91
FIGURE 35: CROSS SECTION OF NN02 REHABILITATION AREA 91
FIGURE 36: CROSS SECTION OF SE5-7 REHABILITATION AREA 92
FIGURE 37: CROSS SECTION OF SE9-10 REHABILITATION AREA 92
FIGURE 38: CROSS SECTION OF SW1, 2, 4 AND 5 REHABILITATION AREAS 93
FIGURE 39: CROSS SECTION OF SW2 AND 5 REHABILITATION AREAS 93
FIGURE 40: CROSS SECTION OF SW3, 6 AND 7 REHABILITATION AREAS 94
FIGURE 41: HORSE GRAZING TRIAL 96

Tables

TABLE 1: MINE CONTACTS 3
TABLE 2: ACTIONS FROM THE PREVIOUS AEMR 3
TABLE 3: PRODUCTION AND WASTE SCHEDULE 7
TABLE 4: HISTORY OF ROM COAL PRODUCTION AND TARGET 7
TABLE 5: 2014 PRODUCTION FIGURES COMPARED TO EA PREDICTIONS 8
TABLE 6: WASTE STREAM VOLUMES GENERATED IN 2015 9
TABLE 7: STORED WATER – DECEMBER 2015 13
TABLE 8: MINE WATER STORAGE DAMS – WATER SOURCE AND USAGE 14
TABLE 9: HAZARDOUS MATERIALS - LICENCE AND REGISTRATION DETAILS 15
TABLE 10: LONG TERM IMPACT ASSESSMENT CRITERIA FOR DEPOSITED DUST 18
TABLE 11: LONG TERM IMPACT ASSESSMENT CRITERIA FOR TSP 18
TABLE 12: SHORT AND LONG TERM IMPACT ASSESSMENT CRITERIA FOR PM10 18
TABLE 13: DUST DEPOSITION RESULTS COMPARED WITH EA 22
TABLE 14: 2015 AVERAGE DUST DEPOSITION GAUGE RESULTS 24
TABLE 15: TOTAL SUSPENDED PARTICULATES 2015 25
TABLE 16: WATER QUALITY – FAR EAST TIP (1895) DAM 35
TABLE 17: WATER QUALITY – DAM 2081 36
TABLE 18: AVERAGE RESULTS OF WATER QUALITY SAMPLING FOR REMAINING SURFACE WATER MONITORING POINTS 37
TABLE 19: SUMMARY OF GROUNDWATER LEVELS 38
TABLE 20: DRAYTON GROUNDWATER LICENCES (EXTRACTION) 39
TABLE 21: WATER BALANCE INPUTS AND OUTPUTS 39
TABLE 22: DRAYTON WATER ACCOUNTING FRAMEWORK INPUT-OUTPUT STATMENT 42
TABLE 23: WEEDS TREATED 2015 46
TABLE 24: BLASTING AND VIBRATION CRITERIA 49
TABLE 25: BLAST MONITORING SUMMARY 52
TABLE 26: NOISE IMPACT ASSESSMENT CRITERIA 54
TABLE 27: NOISE RESULTS DAY LAEQ (15 MIN)* 58
TABLE 28: NOISE RESULTS EVENING LAEQ (15 MIN) 59
TABLE 29: NOISE RESULTS NIGHT LAEQ (15 MIN) 59

TABLE 30: NOISE RESULTS NIGHT LA1 (1 MIN) 59
TABLE 31: BARNOWL® MONTHLY AVERAGE NOISE LEVELS 60
TABLE 32: AREA AFFECTED BY SPONTANEOUS COMBUSTION BY YEAR 62
TABLE 33: HYDROCARBON CONTAMINATED MATERIAL REMOVED FROM SITE IN 2015 65
TABLE 34: TOTAL MONTHLY RAINFALL FOR 2015 67
TABLE 35: 2015 MONTHLY TEMPERATURE RANGE AND AVERAGE DAILY TEMPERATURE 68
TABLE 36: MONTHLY WIND DIRECTION AND DURATION (HOURS) 69
TABLE 37: MONTHLY WIND VELOCITY AND DURATION (HOURS) 70
TABLE 38: ENVIRONMENTAL RISK REVIEW 71
TABLE 39: 2015 WORKFORCE SHIRE OF ORIGIN 72
TABLE 40: PASTURE SPECIES MIX 77
TABLE 41: NATIVE SPECIES SEED MIX WOODLAND REHAB 2015 78
TABLE 42: TUBESTOCK SPECIES PLANTED 80
TABLE 43: REHABILITATION SUMMARY 82
TABLE 44: MAINTENANCE ACTIVITIES ON REHABILITATED LAND 83
TABLE 45: REHABILITATION PLAN TARGET AND ACTUAL COMPLETED 97
TABLE 46: RAIL RELATED NOISE COMPLAINTS RECEIVED IN 2015 99
TABLE 47: DRAYTON'S CONSENTS, LEASES AND LICENSES 103
TABLE 48: 2015 SURFACE WATER RESULTS 105
TABLE 49: 2015 PIEZOMETER RESULTS 116
TABLE 50: DEPOSITIONAL DUST GAUGE RESULTS 119
TABLE 51: TEOM REAL TIME PM10 MONITORING RESULTS 125
TABLE 52: HIGH VOLUME AIR SAMPLER RESULTS 131
TABLE 53: REAL TIME NOISE MONITORING – *LEQ SELECTED SOURCE: LEQ PERIOD* (ALL SOURCES FROM 180º - 225º) 220
TABLE 54: BLAST MONITORING RESULTS 226
TABLE 55: LIST OF ENQUIRIES, CONCERNS AND COMPLAINTS RECEIVED THROUGHOUT 2015 231
TABLE 56: ANGLO AMERICAN RISK MATRIX 235

Abbreviations

Abbreviation	Meaning
ACARP	Australia Coal Association Research Program
ADL	Ash Dam Levee
AEMR	Annual Environmental Management Report
AHMP	Aboriginal Heritage Management Plan
ANE	Ammonium Nitrate Emulsion
CCC	Community Consultative Committee
CHP	Coal Handling Plant
CL	Coal Lease
CTU	Coal Treatment Unit
dBA	Noise decibels (A-weighted)
dBL	Noise decibels (linear)
Drayton	Anglo Coal (Drayton Management) Pty Limited
DRE	Division of Resource and Energy
DP&E	Department of Planning and Environment
DSC	Dam Safety Committee
EA	Environmental Assessment
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EIP	Environmental Improvement Plan
EMC	Environmental Management Committee
EMP **EPA**	Environmental Management Plan Environmental Protection Authority
EPL	Environmental Protection License
g/m2/mth	Grams per square metre per month
Ha	Hectare
HLRF	Hunter Lowland Redgum Forest
HVAS	High Volume Air Sampler
LAeq(15 min)	Average noise energy over a 15 minute period
LGA	Local Government Area
M	Metres
Mbcm	Million bank cubic meters
MOP	Mining Operations Plan
mg/L	Milligrams per litre

Abbreviation	Meaning
ML	Megalitre
ML	Mining Lease
mm	Millimetres
mm/s	Millimetres per second
MSC	Muswellbrook Shire Council
MSDS	Material Safety Data Sheet
Mtpa	Million tonnes per annum
m2	Square metres
m3	Cubic metres
NATA	National Association of Testing Authorities
NFR	Non-Filterable Residue
NSW	New South Wales
pH	Potential of hydrogen
PM_{10}	Particulate matter with a diameter of less than 10 microns
PPR	Preferred Project Report
PRP	Pollution Reduction Program
OEH	Office of Environment and Heritage
ROM	Run-of-Mine Coal
SHE	Safety, Health and Environment
SHE MS	Safety, Health and Environment Management System
SS	Suspended Solids
T	Tonne
TEOM	Tapered Element Oscillating Microbalance
TDS	Total Dissolved Solids
TSP	Total Suspended Particulates
µS/cm	Microsiemens per centimetre
µg/m3	Micrograms per cubic metre
°C	Degrees Celsius

1 INTRODUCTION

This Annual Environmental Management Report (AEMR) details production, environmental management and community relations for the operation during the 2015 calendar year period, and outlines any changes from the current Mine Operation Plan (MOP).

In doing so, the AEMR consolidates Government reporting requirements relating to environmental management and rehabilitation of mines by addressing the current status of approvals, leases, licences, environmental risk management and control strategies for the reporting period in respect of mining, mine development, and rehabilitation in relation to the MOP as well as environmental performance in relation to the collective conditions of approvals, leases and licences and community relations and liaison.

It also looks to the next 12 months by proposing improvements in environmental performance and management systems and specifying environmental and rehabilitation targets to be achieved.

Environmental performance reported in this AEMR is evaluated for mining operations with regard to the disturbance of land as proposed in the accepted MOP, progressive rehabilitation of land according to the MOP rehabilitation schedule, conduct of operations using methods proposed in the MOP, and compliance with environmental conditions of all consents leases and licences, including reporting requirements.

Drayton mine is located near the township of Muswellbrook in the Upper Hunter Valley of New South Wales. It is an open cut mine using both dragline and truck and shovel to produce thermal coal for export markets. Currently production is approximately five Mtpa, employing approximately 310 permanent employees with contractors to support operations.

Drayton commenced operation in 1983 and has approval to mine until 2017. Due to continued uncertainty in approvals, operations have continued on a reduced 24 hours a day, 5 days a week rate (which commenced in mid-2014) throughout 2015. Drayton prepared and submitted another application for development consent of the Drayton South Project, however, this application was recommended not to proceed by the Planning Assessment Commission late in the year. A decision by the Department of Planning and Environment is still yet to formally be made.

Anglo American owns an 88.2 per cent share of the Drayton joint venture and other joint venture partners include: Mitsui Drayton Investment Pty Limited; NCE Australia Pty Limited; Hyundai Australia Pty Limited; and Daesung Australia Limited.

This Annual Environmental Management Report (AEMR) is required by Development Application 106-04-00 for the Antiene Rail Spur, Project Approval 06_0202 for the Drayton Mine, and Coal Lease's 229 and 395 and Mining Lease (ML) 1531.

The report is provided in accordance with the Director General's guidelines, and outlines any changes from the current MOP. The current MOP covers a five year period from the 1st July 2015 to the 30th June 2020. This report will be distributed to:

- NSW Trade and Investment – Division of Resource and Energy (DRE);
- Muswellbrook Shire Council (MSC);

- Office of Environment and Heritage (OEH) and Environment Protection Authority (EPA);
- Department of Planning and Environment (DP&E);
- NSW Dam Safety Committee (DSC); and
- The Drayton Community Consultative Committee (CCC).

A copy of the AEMR is publicly available on the Drayton website:

http://australia.angloamerican.com/our-operations/operating-sites-subpage/drayton-environment.

1.1 Consents, Leases and Licences

Appendix A lists Drayton's consents, approvals, leases and licenses (Approvals), with the principle approvals being:

- Project approval No.06_0202 issued on the 1st February 2008, under Section 75J of the (now repealed) Part 3A of the *Environmental Planning and Assessment Act 1979*, (EP&A Act), and modified under Section 75W in 2009 to add a further 8 hectares to the existing approval area and in 2012 for the construction of an explosive storage facility and placing tailings in the east pit.
- Development Consent No. DA 106-04-00 issued in 2000 under Section 76 (A), 9 and 80 of Part 4 of the EP&A Act authorising the Drayton mine use of the Antiene Joint Rail User Facility in conjunction with the adjoining Mt Arthur coal mine.
- Coal Lease (CL) 395 granted on the 24th June 1992 by the Minister for Mineral Resources under the *Mining Act 1973*, which was renewed in 2003 to 2nd February 2024.
- Section 100 and Section 101 applications, relating to an emplacement area for washery reject material, were granted in 2007 and 2011. This approval remained in place for 2015.
- Drayton's Mining Operations Plan was renewed in 2015 and covers the period of 1st July 2015 to 30th June 2020. It was approved on the 29th October 2015. As agreed with the DRE and the DP&E, the current Drayton MOP includes an approved Mine Closure Plan and Final Void Management Plan.

1.1.1 Mt Arthur Sublease

In 2006 Drayton Mine granted a sublease over part of CL229 to Mt Arthur Coal for the deposition of overburden and tailings. The sublease was registered by the Division of Resources and Energy (DRE) on 17th December 2008 and the Mt Arthur sublease area was moved from the Drayton Mine colliery holding to the HVEC colliery holding. During the 2015 reporting period, Mt Arthur Coal had full management obligations over the Sublease. Mt Arthur Coal is responsible for holding a MOP and associated rehabilitation security deposit for the Sublease area.

1.2 Mine Contacts

Contact details of the current Mine Manager and the Safety Health and Environment (SHE) Manager are given in Table 1 below.

Table 1: Mine Contacts

Position	Name	Contact Numbers
Mine Manager	Darren Pisters	Ph (02) 6542 0203 M 0417 618 876
Safety, Health & Environment Manager	Peter Forbes	Ph (02) 6542 0256 M 0427 752 397

1.2.1 Site Personnel Responsible For Mining, Rehabilitation and the Environment

The SHE Manager at Drayton is supported by the:

- Environment Coordinator
- Environment Officer
- Environment Graduate

Other departments within the company are responsible for specific aspects of environmental management within their respective work areas under the advice of the SHE Department. Individual employees and contractors are accountable for their own environmental performance and have environmental requirements set within their position descriptions.

Drayton's Safety, Health and Environment Management System (SHE MS) is certified to both ISO 14001 for its environmental management practices and ASOHS 18001, AS/NZ4801 for health and safety.

1.3 Actions required at Previous AEMR Review

The DP&E provided comment on the 2014 AEMR in correspondence dated 7th July 2015, and DRE provided comment on 3 August 2015. These comments and associated actions are presented in Table 2.

Table 2: Actions from the previous AEMR

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
	7th July 2015		
DP&E / 1	On page 23, Figure 3 includes the location of dust monitors. This plan does not indicate the general location of the E-Samplers. These should be shown. The text does not include the use and success of the E-Samplers. In next year's report the location and use of the E-Samplers needs to be included.	Next AEMR	This AEMR **Section 3.1**

Department / Action Number	Action Required from previous AEMR	Due Date specified in correspondence.	Response from Drayton
DP&E / 2	It was noticed that the dust deposition gauges showed an increased trend and provided readings in excess of the EA predictions Yr 5. This trend was not consistent with the TEOM and HVAS readings. Should this trend continue, next year's report will need to explain why this is occurring.	Next AEMR	This AEMR **Section 3.1**
DP&E / 3	On page 57, Figure 18 shows the noise monitor locations. It was missing one BarnOwl monitor location and did not include the locations of some of the independent noise monitoring locations. These should be added to next year's report.	Next AEMR	This AEMR **Section 3.11**
DP&E / 4	On page 59, there is an error in Table 30 for the noise criterion in brackets.	Next AEMR	This AEMR **Section 3.11**
DP&E / 5	It is noted that the next Drayton Independent Environmental Audit is due shortly. Once you have a preferred independent consultant chosen, could you please advise the Department so the Audit review and approval process can begin.	Prior to Independent Environmental Audit being undertaken	Refer to email correspondence dated Friday 25th September 2015 and approval response from DP&E also dated Friday 25th September 2015.
DP&E / 6	It is noted that the coal transported on the Antiene rail spur continues to exceed Drayton consent requirement, due to Mt Arthur coal transport. As has occurred in the past, could you please provide the Singleton Officer regular reports on this, so this exceedance can be monitored and accepted.	Six monthly reports provided to DP&E Office	This AEMR **Section 7.1**, Latest report submitted to DP&E on 6th October 2015
DRE / 1	Treated sewage effluent irrigated on rehabilitation Provide information / analytical results which demonstrates that effluent irrigation is occurring in an acceptable manner.	Next AEMR	This AEMR **Section 2.6.3**
DRE / 2	Tailings line surveillance Provide additional information on pipeline monitoring in order to fully demonstrate the level of surveillance undertaken.	Next AEMR	This AEMR **Section 2.6.4**
DRE / 3	Proposed rehabilitation not shown pictorially The location of proposed rehabilitation for the year immediately following the reporting year should be shown on a plan included in the AEMR.	Next AEMR	This AEMR **Figure 31**

2 OPERATIONS DURING THE REPORTING PERIOD

2.1 Exploration

In 2015, exploration within the Drayton Mine leases has focussed on validating out-of-mine-plan resources (to ensure the continuity of Drayton Mine in light of the significant delays encountered with the approval of the Drayton South Mining Lease application (MLA 461)). In order to minimise the impacts on the Drayton mine workforce and ensuring the continued benefit of its operations to the New South Wales economy and local communities the criticality of this work has meant that significant resources (financial, human and technical) have been diverted accordingly, which has resulted in a delay to planned exploration programs.

Structural data obtained from logging in pit blast holes has been incorporated into the Minex geological models to ensure short term variations in the current mining areas are known. Quality data obtained from the A 173 drilling that occurred in 2013 were loaded into Minex software. Updated quality grids were generated and significant differences were observed for several of the gridded quality variables due to the integration of this data. Fugitive emissions' reporting was completed to satisfy internal business requirements. Previous testing has shown Drayton's emissions are significantly lower than the standard value used.

2.2 Land Preparation

Throughout the 2015 reporting period Drayton increased the area of land cleared for mineral extraction activities by 10.9 ha in the SPW area. Of this area, 2.5 ha was disturbance of previously rehabilitated land.

2.3 Construction

No major construction works occurred during the 2015 reporting period.

2.4 Mining

The Drayton mining operation advances north and south, the remaining reserves exist in the South Pit area, the NN Pit area and the ROM Pit area. Areas remaining to be mined at Drayton may still contain complex geology including multiple faults, steeply dipping coal seams and silling.

As at 31st December 2015, the remaining total mine plan and additional resources are 2.774 million tonnes (Mt). All of these tonnes are within the mine plan. No additional resources currently exist per the 2015 Resources and Reserves statement. Resources within the mine plan can be mined within the term of the existing MOP.

During 2014, Drayton made the decision to alter operational rates in an attempt to maintain the workforce while securing project approval for the Drayton South extension. Drayton made the decision to move from operating 24 hours, 7 days per week, to 24 hours, 5 days per week and the operation has continued with this work pattern during the reporting period.

2.4.1 Changes in Mining Equipment and Method

During 2015, there were minimal changes to the Drayton owned fleet, however Drayton did continue to use a variety of contract equipment ranging from drills to dozers.

Current major equipment consists of:

- BE 1370 Electric Dragline
- Two Hitachi EX 5500 Excavators
- Hitachi EX 3600 Excavator
- Hitachi EX 3500 Excavator
- One Le Tourneau L1100 Loader
- One Le Tourneau L1400 Loader
- One Cat 992 Front End Loader
- 26 Caterpillar 789B / 789C Trucks
- One Svendala SKF50 Drill (parked up in October 2014)
- One Sandvik DK45S
- One Sandvik DR460
- One Altas Copco PV235 Drill (in working order but parked up)
- Three to four Hire Drills
- Two Cat 777D water carts
- One Cat 777F Water Cart
- 7 D11R track dozers
- Three D10T track dozers
- Contract hire dozer fleet (mainly D11 track dozers)
- One 834 rubber tyre dozer
- One Tiger 690/Cat 854 rubber tyre dozer (parked up in March 2014)
- 3 Cat 16H graders

2.4.2 Overburden Handling

Overburden and interburden is predominantly removed by the dragline and the excavators, with assistance where required from front-end loaders. Overburden, parting and coal thicker than two metres is blasted. All overburden and parting material is moved to tips located within the previously mined areas. Placement of this material follows the guidelines in Drayton's Spontaneous Combustion Management Plan. Detailed mining statistics for 2015 are shown in Table 3.

Table 3: Production and waste schedule

	Cumulative Production		
	Start of Reporting Period (1 Jan 2015)	End of reporting Period (31 Dec 2015)	End of Next Reporting Period (Estimated)
Topsoil stripped (m^3)	957,350	957,350	1,015,350
Topsoil used/spread (m^3)	506,640	506,640	506,640
Waste Rock (Mbcm) (approximate only)	715	742	751
Ore - ROM Coal (Mt)*	127.5	130.6	132.4
Processing Waste (t)**	2,418,728	3,055,358	3,376,358
Product (saleable) (Mt) (approximate only)***	89.1	91.5	93.0

** ROM coal is assumed to be the equivalent of Ore*

*** Total of rejects and dry tailings cumulative from 2013*

**** Excludes any Drayton South production*

2.4.3 ROM Production History and Forecast

Run-of-Mine (ROM) product for the reporting period was 3,061,574 t with a total prime waste and rehandle of 27.036 Mbcm. A comparison showing the ROM production at Drayton for the past reporting periods is provided in Table 4.

Table 4: History of ROM Coal production and target

Year	Production (Mt)	Year	Production (Mt)
1985	1	2001	5.23
1986	2	2002	4.84
1987	3	2003	5.04
1988	3	2004	4.98
1989	3.55	2005	4.73
1990	3.48	2006	5.021
1991	3.96	2007	4.691
1992	3.85	2008	4.171
1993	3.97	2009	4.821
1994	3.77	2010	5.425
1995	3.85	2011	5.312
1996	3.5	2012	5.456
1997	4.2	2013	5.488
1998	4.5	2014	4.758
1999	4.8	2015	3.5
2000	5.07	2016	1.8*, **

** 2016 ROM target smaller as operations move to mine closure.*

*** excludes any Drayton South tonnage*

2.4.4 Comparison with Environmental Assessment Predictions

Table 5 shows a comparison of 2015 production figures compared to EA predictions.

Table 5: 2014 production figures compared to EA predictions

	Total Prime (Mbcm)	ROM Coal (Mtpa)	Product Coal (Mtpa)
2015	15.887	3.061	2.423
EA Prediction (Yr 8)	11.73	2.33	2.06

Product Coal figures for 2015 were above those predicted in the EA for year 8 of the operation.

2.5 Mineral Processing

Mineral processing at Drayton is undertaken through the Drayton CHP. This facility comprises of a washery, fines plant, crushers, two stackers, two bucket-wheel reclaimers and a series of overland conveyor belts. In 2011 a coal fines plant within the existing coal handling plant was commissioned.

Rear dump coal trucks deliver ROM coal into a 400 tonne capacity ROM hopper. ROM coal is crushed and then washed in the coal preparation plant or bypassed straight to product. This decision is based on the expected quality of the feed coal reconciled with online ash analyser trends. The washed product is then sampled before reporting to the export coal stockpiles.

In 2015, 2.423 Mt of saleable coal was produced, all of which was exported. Export coal from Drayton is loaded onto trains at the Drayton Rail Loop, transported via the Antiene Rail Spur to the Main Northern Railway line and then to the Port of Newcastle. Tailings disposal in 2015 totalled 204,609 tonnes

During the reporting period all tailings was placed in the ES void as discussed in Section 2.6.4.

2.6 Waste Management

Drayton has existing waste management systems which, where appropriate, incorporate waste reuse and recycling and address issues relevant to the management of waste.

The volumes of different waste streams generated during 2015 are outlined in Table 6.

Table 6: Waste stream volumes generated in 2015

Waste Stream	Treatment and Disposal	Volume	Unit
Metal	Recycled off-site	192.04	tonne
General Waste	Off-site landfill	182.71	tonne
Confidential document bins	Off-site document destruction	1.403	tonne
Batteries	Recycled off-site	8.83	tonne
Empty 205L gallon drums	Recycled off-site	25	each
Empty 20L drums	Recycled off-site	186	each
Oil Filters	Recycled / disposed of off-site	6,926	each
Oil	Recycled / disposed of off-site	265,750	litres
Mixed Regulated Waste	Off-site disposal at licensed regulated waste facility	7.64	tonne
Sewage	On-site treatment and disposal	559,100	litres
Sewage	Off-site treatment and disposal at licensed sewerage treatment facility	67,600	litres

2.6.1 General Waste

To assist in the separation of waste at source, designated waste storage areas, such as labelled bins or bunded areas, are in place across the site. Hazardous wastes are contained within bunds which drain into Drayton's pollution control system.

Remondis is currently contracted to dispose of all waste materials generated on site. Domestic rubbish generated on site is deposited in the Muswellbrook Waste Management Facility. Monthly inventories and reports ensure all waste movements are documented. Management strategies are in place for each of the major waste streams relevant to key work areas.

2.6.2 Recycling Initiatives

Drayton recycles or reuses specific waste streams to minimise the environmental effects of the product. Where possible, waste items are recycled by original equipment manufacturers or certified contractors. Machine batteries; mobile phone and radio batteries; waste oil; grease; empty drums; aluminium cans; and scrap metal are removed from site and recycled by Remondis. Used printer cartridges are returned to the manufacturer for recycling.

2.6.3 Sewerage Treatment / Disposal

There has been no significant change in demand for waste services as the number of employees did not significantly changed.

All on-site effluent is treated in Drayton's sewage treatment plant, which is licenced under the EPL. The treated effluent is then distributed into two settlement ponds, and overflow from these ponds is pumped to an area of rehabilitation on the East Tip.

There are several septic tanks on site (e.g. at the CHP and crib huts) which are not connected to the on-site sewerage treatment plant. During the 2015 reporting period, Drayton's waste provider transported 626.7 kL of effluent from these tanks and pumped it into the on-site STP for treatment. The total volume of effluent treated on site during 2015 was 3,864.24 kL which equates to 10.6 kL/day. The EPL allows 140 kL/day to be discharged to the utilisation area. Visual inspections of the area have not identified any ponding or run-off. During January and February of 2015, a total of 67.6 kL of effluent was transported off site to a licensed sewerage treatment facility while maintenance was carried out on Drayton's on-site treatment station.

2.6.4 Mineral Waste

As described in the 2015-2020 MOP, the primary areas for placement of mineral waste materials are the mined out areas in the South and East Pits. The Great North Tip is also used for mineral waste material and extends over the ES, EN and NN strips as one active emplacement, with several dumping faces at different levels. A similar arrangement exists in the South Pit areas as mining progressed.

In 2012, Drayton received planning approval to deposit tailings from the Drayton CHP into the ES void. The tailings were approved to be deposited into water, and cumulated volumes were predicted using a conservatively low tailings density of 0.6 t/m3. This was coupled with a forecast tailings production of 200,000 t/year to produce a facility life of 10 years for 3.35 million m3 (3,350 ML) capacity.

During the reporting period all tailings were deposited into the ES void, which is also the primary water storage location on site. The tailings discharge point has formed a tailings beach against the northern endwall of the ES void. Tailings disposal in 2015 totalled 240,609 tonnes, which was lower than previous reporting periods. The decrease in tailings production was a result of changes to production rates associated with aiming to achieve workforce continuity for the Drayton South Project. The volumes of deposition will continue to be assessed to understand the implication of varied tailings deposition rates on the tailings storage facility lifetime.

Coarse reject from the CHP is transported by truck to the ES void area or has been used in other areas of the mine to sheet haul roads. The total amount of rejects produced in 2015 was 432,021 tonnes.

A return water pump in the southern end of the ES void pumps water to the Access Road Dam which is then transferred to the CHP for reuse.

The tailings line from the CHP to the ES void is inspected by vehicle on a weekly basis by a CHP operator. The pipeline is also monitored in real time for any leakage using electronic flow meters, one at the discharge of the CHP thickener and one at the discharge point into the TSF, which trigger an alarm if there is a differential in instantaneous flow rate between the two meters. The ES void is inspected daily by the Open Cut Examiner with any tailings issues conveyed to the CHP supervisor.

In mid-2015, a bathymetric survey was undertaken in the ES Void to reassess the tailings deposition rate. The survey demonstrated that Drayton had been overestimating the volume of tailings that were being deposited in the void. This survey was used to re-assess the storage capacity within the void and calibrate water storage models in order to be able to calculate the tailings and water split contained in the void on a monthly basis.

2.7 Ore and Product Stockpiles

Drayton has four product coal stockpiles each with a nominal capacity of 80,000 tonnes. Coal from different areas of the pit is blended on the stockpiles to meet customer specifications.

Export coal is stacked in piles of up to 40,000 tonnes. The reclaimer is transferred between stockpiles using a rail-mounted transfer car, which is located at the northern end of the stockpiles. Coal is typically not stored for longer than twelve weeks due to the risk of self-heating.

Drayton operates a ROM stockpile pad adjacent to the feed hopper to the CHP. This stockpile is used to temporarily store coal hauled from the pit during times when the CHP is not available. It is also used to store coal that must be mined due to sequencing issues but is inappropriate for the product stocks being assembled. The ROM stockpile pad is generally divided into five different areas to accommodate five different qualities of coal. It has a capacity of some 200,500 tonnes in total. This level of inventory allows some coal to be available for processing during periods of rain and poor weather conditions which may shut down coal hauling from the pit. It also facilitates the final blending of export cargoes by providing a ready source of different quality coals.

There were no changes to the management of stockpiles during the reporting period.

2.8 Water Management

2.8.1 Water Management System

No changes were made to the mine water management system in the reporting period. The Drayton water management system is a closed system which sources all of its process water internally from within the existing mining operational area with no extraction from the Hunter River. Potable water is supplied by pipeline from Muswellbrook. The Drayton water management system consists of a series of on-site dams and in-pit water storage areas (see Figure 1).

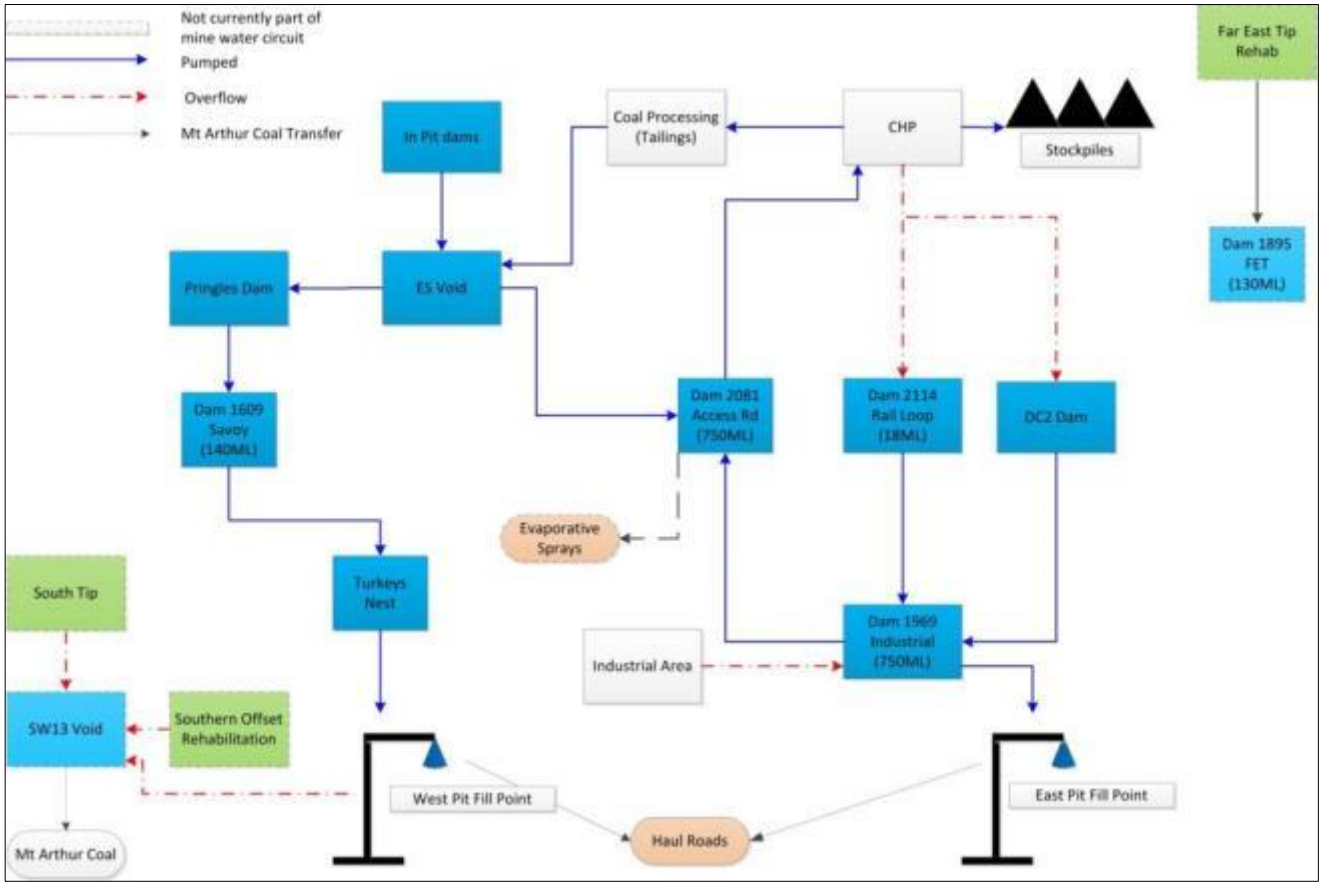


Figure 1: Water Management Flow Diagram

The total storage capacity of the water management system was 16,270 ML at the end of the 2015 reporting period. This consisted of 1,553 ML capacity in major mine water storage dams and 14,717 ML in the voids. Water volumes in major storages are given in Table 7 below.

The Far East Tip Dam (Dam 1895) has a capacity of approximately 130 ML however it has no connection with mining activities. This dam exists principally to control runoff (clean water) from the Far East Tip, a rehabilitated out of pit overburden dump.

The Rail Loop Dam (Dam 2114) controls runoff from the CHP area. Water from the Rail Loop Dam is recycled back to the mine water system via the Industrial Dam. The 18 ML capacity of the Rail Loop Dam is maintained as close to zero as possible to prevent potential for offsite discharge of mine water.

Clean water is imported to site for drinking and bathing. Clean water is stored in a holding tank of 0.05 ML capacity. The tank is maintained at capacity for use as needed.

Table 7: Stored Water – December 2015

		Volumes held (ML)		
		Start of Reporting Period	End of Reporting Period	Storage Capacity
Clean Water		0.05	0.05	0.05
Mine Water:	Savoy (1609) Dam	70	75	145
	Industrial (1969) Dam	405	416.5	750
	Access Road (2081) Dam	435	470	615
	Rail Loop (2114) Dam	5	5	18
	Other Surface Dams (transfer dams)	25	25	25
SW13 Void		590	590	1,000
NN Pit		31	31	40
ES Void		2,665*	2,878	5,537
SPE Void		Nil	1,223	8,140[#]
Controlled discharge water (salinity trading scheme)		Nil	Nil	Nil
Contaminated Water		Nil	Nil	Nil

** ES Void volume dropped by ~1,250ML in the 2015 reporting period as a result of increased accuracy due to bathymetric surveys of tailings deposition within the void.*

[#] After completion of mining in SPE water is in the process of being pumped into SPE final void.

Historically, Drayton's water balance has remained in surplus. Throughout drought periods, water storage levels have dropped however water storage supplies remained sufficient for normal mining operations to occur without adverse impacts on operations. At the end of each month, water storage levels in dams and voids are surveyed. At the end of 2015, approximately 992 ML was being stored in established dams and 4722 ML in pit voids. This equates to approximately 63% of available dam storage capacity and approximately 32% of available void storage capacity. The increase in void storage capacity is a result of the completion of mining in the SPE void which will provide an additional 8,140 ML of storage capacity to the site water system.

Drayton has a water sharing arrangement with Mt Arthur Coal Mine which allows both companies to store water in SW13 Void, located near a shared boundary. Drayton has sprays which allow evaporation of water.

2.8.2 Water Sources

Drayton is situated in the headwaters of three creek catchments, namely Ramrod Creek, Bayswater Creek and Saddlers Creek. There is no major stream flowing through the mine that requires diversion.

All runoff from disturbed areas is intercepted by dams or by the respective pits. All final tips have associated catchment dams that allow runoff to be collected and suspended solids to settle. Water that enters the pit areas is pumped to mine water storage dams allowing this water then to be used for mining activities. During the 2015 reporting period approximately 1,766 ML of runoff from rainfall was captured on site. Any potentially contaminated rainfall runoff from the workshop area is diverted to the Oil Pollution Control Dam. The Oil Pollution Control Dam has an oil / water separator in place which removes oil residue from the water runoff prior to it being transferred into the Industrial Dam.

Drayton currently has several Water Licences issued by the NSW Office of Water, mostly relating to monitoring piezometers. Two of the Licenses allow the extraction of up to 985 ML per annum, and 402 ML per annum (1,387 ML combined).

Pit water extracted from Drayton's operation is a combination of both ground water and surface runoff from the areas within the pit during periods of rainfall.

Table 8 below outlines the main water storages, the source of their water supply and where the water is consumed.

Table 8: Mine water storage dams – Water source and usage

Reference No.	Dam Names	Supply Source	Water Use
1969	Industrial Dam	Runoff from rehabilitated area, industrial areas and East Pit	Haul road dust suppression, industrial wash down water and supply to Access Road Dam
2081	Access Road Dam	Runoff from undisturbed and rehabilitated land and pumping in from Industrial Dam and ES Void	Industrial areas, CHP and fire system
2114	Rail Loop Dam	Runoff from CHP, coal stockpile area and fine rejects settling ponds, and direct pumping from Access Road Dam	Transfer to Industrial Dam
1609	Savoy Dam	Runoff from undisturbed and rehabilitated land, SW Void and ES Void transfer point	Mine water storage or transfer to tanker fill stations
ES Void	East Pit South Void	Tailings and water storage	Water extracted and transferred to Access Road Dam or Savoy Dam
SW13 Void	West Pit Void	Runoff from Southern Offset and excess water during wet weather.	Key storage for Drayton and Mt Arthur Coal. This location will be available for both Drayton and Mt Arthur Coal to extract water from during the life of the mine.
SPE Void	South Pit East Void	Final void water storage, water pumped from ES Void.	Mine water storage

2.8.3 Water Consumption

During 2015, total mine water consumption was approximately 1,563.3 ML. Of this, 416.3 ML consisted of industrial usage mainly through washdown in the workshop and truck wash bays and approximately 345 ML was sprayed onto haul roads for dust suppression purposes. Approximately 802 ML was used by the CHP to process coal through the Coal Treatment Unit (CTU), for washdown and in the CHP dust suppression systems. Some of the CHP water consumed was pumped to the ES void in tailings slurry from the CTU. As the tailings settles, a

proportion of this water is recovered from the ES void and recycled back into the mine water system via the Access Road Dam.

During the 2015 reporting period Drayton used 8.92 ML of potable water for drinking, showering and toilets within the mining operation areas.

2.9 Hazardous Material Management

All dangerous and hazardous goods are stored in accordance with the appropriate legislation and standards. Regular inspections of the storage sites are undertaken to ensure compliance.

All chemicals that are used, or are proposed to be used on site, are checked and approved for their safety and environmental effects by the SHE Department. For each chemical a safety data sheet (SDS) is maintained in a central register, the ChemAlert Database.

All contractors working with chemicals must carry the relevant SDS when using the chemical, and must follow any instructions given by the SHE Department with regard to personal protective equipment and handling requirements.

The ChemAlert Database is also used to log environmental hazards associated with the use of each chemical, and the necessary measures to control these hazards.

The applicable licences and registrations for the management of hazardous materials are listed in Table 9 below.

Table 9: Hazardous materials - Licence and registration details

Licence / Registration Description	Issuing Authority	Expiry Date
Licence to Store Explosives – XSTR100017 **(For the storage of detonators, boosters, detonating cord, primers)**	Work Cover	08/05/2016
Radiation Management Licence – 5061259 **(For radioactive devices using in Coal Scan and the dense medium feed within the CHP)**	EPA	18/06/2016
Acknowledgement of Notification of Dangerous Goods on Premises – NDG019387 **(For the storage of liquid fuels and gases)**	Work Cover	Perpetuity
Acknowledgement of Notification of Dangerous Goods on Premises – 35/038167 **(Orica)**	Work Cover	10/06/2016

The Drayton Radiation Management License was renewed during the reporting period.

At the beginning of 2015, WorkCover changed the duration of licences, with the Acknowledgement of Notification of Dangerous Goods on Premises not requiring renewal until changes in dangerous goods are made. This Acknowledgement covers fuel and gas storage. Fuel containment consists of a series of above ground storage tanks. The major containment for diesel is in a Class C1 above ground tank with a capacity of 860,000 litres. There are also two above ground tanks located at the Western Fuel Farm, each being Class C1, with 110,000 litre capacities. In addition, the acknowledgement covers cylinder stores of acetylene and liquid petroleum gas up to a volume of 500 litres each.

Orica Explosives operate an ammonium nitrate emulsion (ANE) storage facility on the mine site. They hold a Dangerous Goods licence issued by Work Cover for 80 tonnes of ANE and are authorised to store canola oil at the explosives reload area.

2.10 Other Infrastructure Management

The Antiene Joint Rail User facility has specific conditions of consent. These conditions are detailed in Section 7.1 of this report.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Environmental monitoring is a key component of Drayton's operation. Monitoring undertaken includes air quality, surface and ground water quality, blasting, noise and meteorology. All monitoring follows the appropriate Australian Standard, with collection of samples by site personnel and the analysis of water and dust samples performed by an independent laboratory that is NATA accredited.

3.1 Air Quality

3.1.1 Management System

Drayton runs a dust management system where upwind and downwind real time monitors provide feedback to a software package that assesses Drayton's dust contribution. This system provides alerts when Drayton's dust emissions are elevated which triggers actions for employees. This has been outlined in Drayton's Air Quality Management and Monitoring Plan.

Predictive weather modelling was used throughout 2015 to provide a forecast for dust enhancing weather and to trigger preparatory actions prior to dusty conditions.

3.1.2 Monitoring System

Specific requirements relating to air quality monitoring are detailed in EPL 1323 and Development Approval 06_0202. As required by Section M2.1 of the EPL, the Drayton air quality monitoring program monitored Depositional Dust, Total Suspended Particulates (TSP) and particulate matter less than 10 µm in diameter (PM_{10}). Figure 22 shows that the prevailing winds throughout 2015 were predominantly from the South-East and the North-West which influences the potential impacts that operations at Drayton Mine have on air quality results.

Using the results from the monitoring program, Drayton is able to determine compliance with licence conditions. Drayton monitors regional air quality including $PM_{2.5}$ using the Upper Hunter Air Quality Monitoring Network (UHAQMN). The results from the air quality monitoring program are published monthly via the Anglo American website and reported annually in the AEMR.

Deposited Dust

Dust depositional gauges have been in operation for the life of the mine. The eight depositional gauges used for compliance are situated to the north of the lease boundary, and in the vicinity of the residential areas around the mine (see Figure 2).

The dust gauges and measurement conform to *AS3580.10.1 - 2003 - Methods 10.1 - Determination of Particulates - Deposited matter - Gravimetric Method*. Samples are collected, in accordance with AS 2724.5(1987) each calendar month. The samples are analysed by a NATA certified laboratory for total solids, insoluble solids, ash residue and combustible matter. A field observation is made during collection as to possible contamination of samples. To determine compliance the depositional dust results are compared to the licence conditions outlined in Table 10.

Table 10: Long term impact assessment criteria for deposited dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Levels	Maximum Total Deposited Dust Level
Deposited Dust	Annual	2 g/m²/month	4 g/m²/month

Total Suspended Particulates

Drayton operates two high volume air samplers (HVAS) at locations indicated in Figure 3 below. The Met Station monitor is located on site in the CHP area and used to indicate TSP levels on site. The Lot 22 monitor is located offsite, within the Antiene rural sub division close to residential premises, and is used for compliance purposes. Both monitors were calibrated every two months throughout the 2015 reporting period.

Drayton's TSP sampling program follows the OEH guidelines of a six-day rotational cycle. The HVAS and measurement also conform to '*AS 2724.3 – 1984: Particulate Matter – Determination of Total Suspended Particulates (TSP), High Volume Sampler Gravimetric Method*'. Compliance is determined by comparing the results from the HVAS sampling to the licence conditions outlined in Table 11.

Table 11: Long term impact assessment criteria for TSP

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m³

PM10

Drayton's Tapered Element Oscillating Microbalance (TEOM) continuously monitors PM10 at a location between Drayton's mining operations and the near neighbours' boundaries (refer to Figure 3). It is used to indicate real time dust levels between the operation and nearby residents. The TEOM was calibrated in March, June, September and December 2015, in accordance with AS3580.9.8-2008 and the TEOM Service Manual. It is required that dust levels at neighbouring residences fall below the criteria outlined in Table 12 in order to be compliant with licence conditions.

Table 12: Short and long term impact assessment criteria for PM10

Pollutant	Averaging period	Criterion
Particulate matter <10µm (PM_{10})	24 hour	50 µg/m³
Particulate matter <10µm (PM_{10})	Annual	30 µg/m³

E-Sampler Network

Throughout the reporting period, Drayton operated 4 E-Samplers monitoring PM10 levels. These units are positioned to capture particulate matter concentrations both upwind and downwind of operations.

The dominant wind directions at Drayton are South Easterlies in the summer months and North Westerlies in the winter months. This trend is shown in Figure 22. E-Samplers 1 and 2 are located north and south of the operation respectively whilst E-Samplers 3 and 4 are located to the east and west respectively.

The E-Samplers have been used as a tool to monitor real time trends in PM10 concentrations as well as for investigating elevated PM10 levels or air quality complaints. Operational personnel have the ability to access E-Sampler levels in real time to identify potential sources of PM10.

One of the challenges with the E-Samplers has been that monitors regularly indicated that upwind PM10 concentrations were higher than downwind concentrations. In these situations visual inspections by shift supervisors were demonstrated to be the most consistently successful method for monitoring dust emissions, especially during calm wind conditions.

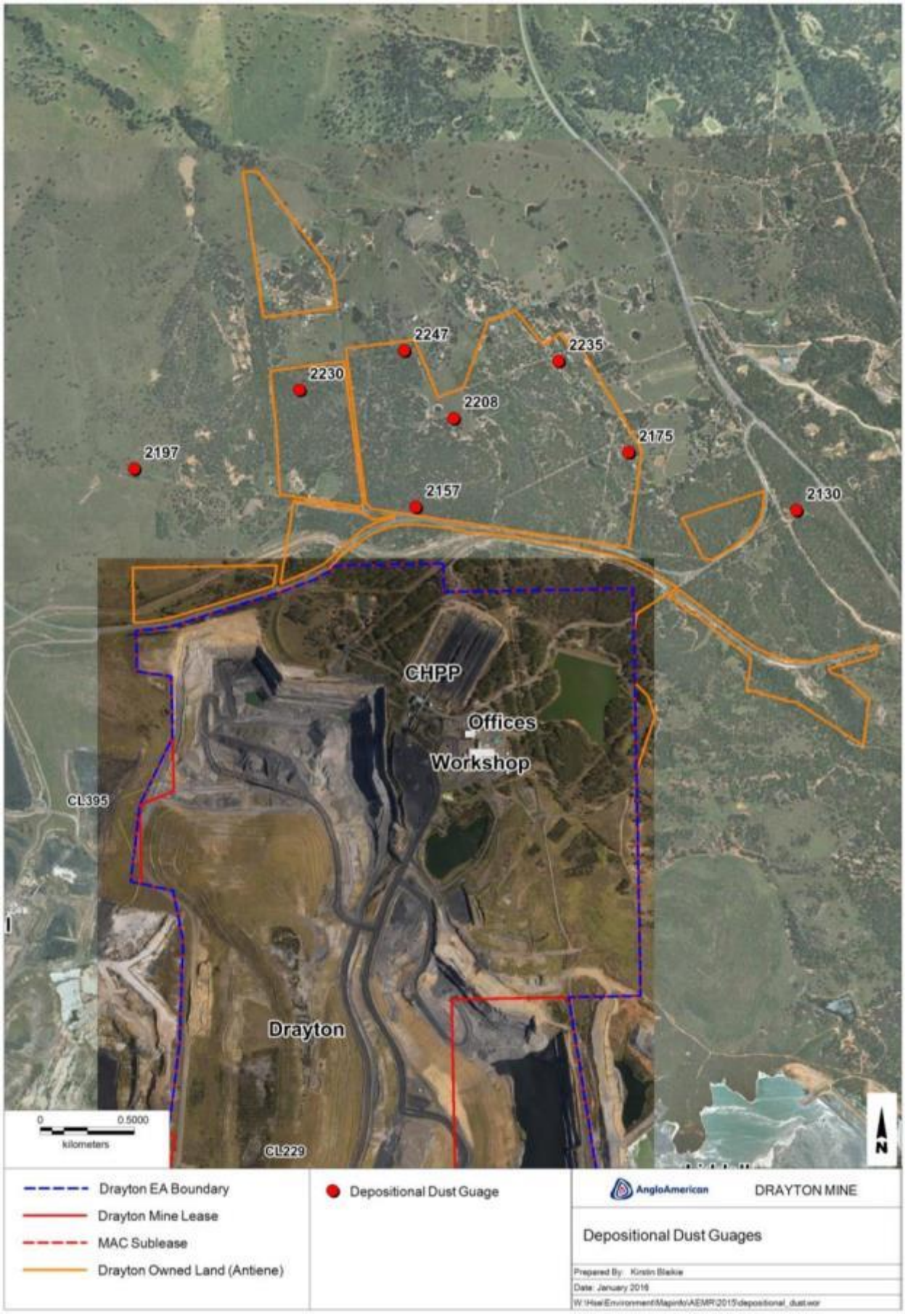


Figure 2: Depositional Dust Monitoring Sites

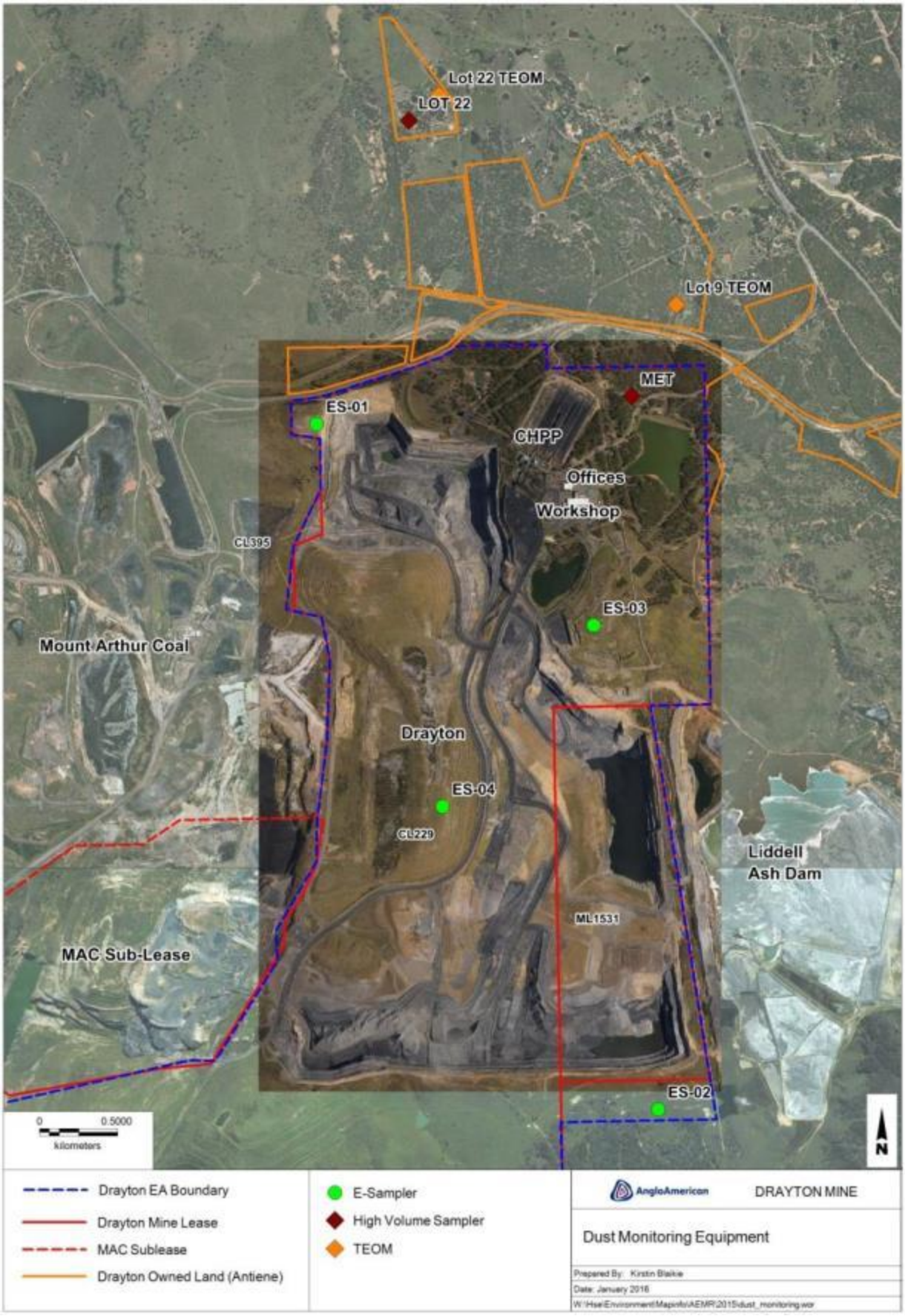


Figure 3: Real-time Dust Monitoring Equipment

3.1.3 Results

Deposited Dust

The Drayton Mine Extension Environmental Assessment 2007 estimated emissions to air for years one, five and ten, and modelled the dispersion and deposition of emissions in these years. The 2015 reporting period coincides with year eight of the EA therefore the 2015 results have been compared to the closest year's prediction (Year 10).

The 2007 EA predicted that no privately owned residences would experience dust deposition levels above the assessment criteria during year 10. The 2015 dust deposition levels displayed acceptable levels which generally fell below the maximum criteria outlined in Table 10 above.

Figure 4 displays a prediction of the average annual dust (insoluble solids) deposition rate due to emissions from all sources for year 10 for the 2007 EA.

The 2007 EA predicted the average dust (insoluble solids) deposition due to Drayton and other sources at specific residences would be within acceptable limits. The actual monitoring results compared to those predicted in the EA can be found in Table 13.

Table 13: Dust Deposition results compared with EA

Residence ID	Representative Dust Gauge	2015 Average Insoluble Solids (g/m^2/month)	EA Prediction Year 10 Average Insoluble Solids (g/m^2/month)
16	2235	2.1	1.5
61	2247	2.1	1.4
27	2230	2.5	1.3
71	2175	2.3	1.3

All results remain well below the 4 g/m^2/month set as the EPL annual limit.

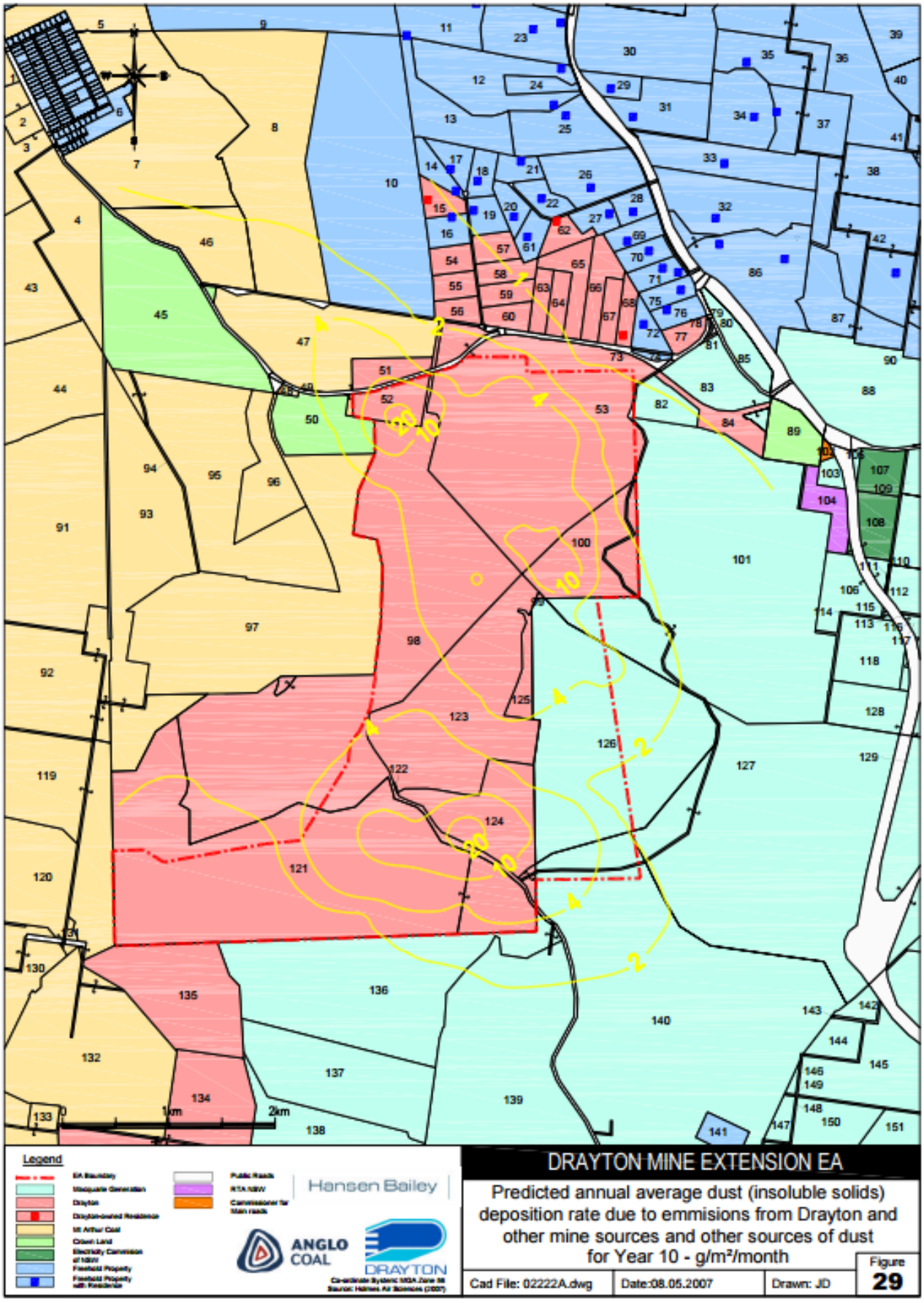


Figure 4: Predicted Annual Average Deposited Dust - Year 10

Table 14 and Figure 5 summarise the year's results of insoluble solids, ash and combustible matter in the eight compliance gauges.

Table 14: 2015 Average Dust Deposition Gauge Results

Site Number	Ash (g/m².month)	Combustible Matter (g/m²/month)	Insoluble Solids (g/m²/month)	No of Samples 2015	EPL Limit	Long Term Average (Insoluble Solids)	
					g/m²/month	g/m²/month	Period
2130	1.3	0.6	2.5	12	4.0	2.0	May99 – Dec15
2157	1.2	0.5	2.3	12	4.0	2.1	Oct82 – Dec15
2175	1.2	0.6	2.3	12	4.0	1.8	Dec86 – Dec15
2197	2.2	0.9	3.8	11[1]	4.0	2.8	Dec86 – Dec15
2208	1.1	0.4	1.5	12	4.0	2.3	Dec86 – Dec15
2230	1.5	0.7	2.2	12	4.0	2.4	Dec87 – Dec15
2235	1.2	0.4	1.6	12	4.0	2.0	Jan85 – Dec15
2247	1.2	0.6	2.8	12	4.0	1.8	Oct82 – Dec15

Note: Deposited dust is assessed as insoluble solids as defined by 'AS/NZS 3580.10.1.2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method'.

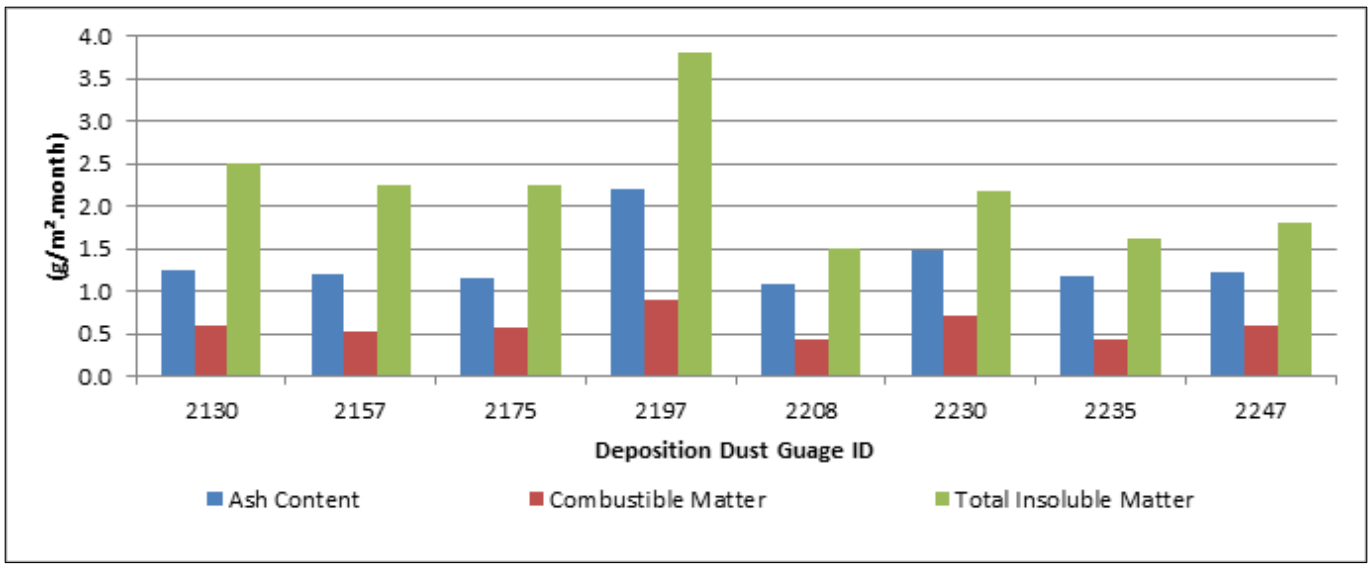


Figure 5: Average Depositional Dust Gauge Results 2015[2]

[1] *Note that February results for 2197 were excluded due to high contamination of sample*

Dust gauges 2208, 2230 and 2235 fell below the long term averages and gauges 2130; 2157; 2175; 2197; and 2247 were above the long term averages (see Table 14). In 2015 the overall average level of insoluble solids across all eight gauges from all sources was 2.4 g/m²/month. This was a decrease of 0.1 g/m²/month compared to the 2014 average insoluble solids level of 2.5 g/m²/month.

When compared to the previous reporting period, on average, dust gauges 2130; 2157; 2175; 2197; and 2247 displayed an increase in insoluble solids, and dust gauges, 2208, 2230 and 2235 displayed decreases in insoluble solids.

Gauge 2197 had the highest average result levels. It experienced an increase from an average of 3.1 g/m^2/month in 2014 to an average of 3.8 g/m^2/month in 2015 with high readings in January, March and October. While January and October were excessively dry months, March recorded above average rainfall. This dust gauge is in an exposed location, being adjacent to pastures that overlook Mt Arthur Mine.

The Depositional Dust gauges have shown variability compared to 2014 results, and therefore show no discernible trends.

Due to the nature of deposition dust gauges, contamination of samples by bird droppings, insects and vegetation occurs. Contamination may cause dust results to appear higher than they actually are.

Details relating to each individual gauge on a monthly basis are outlined in Appendix C.

Total Suspended Particulates

The 2007 EA prediction for the annual TSP concentrations due to emissions from Drayton and other sources for year 10 is presented in Figure 6. The EA predicted that annual average TSP concentrations due to Drayton and other sources for residence 14 in year 10 would be 70.2 µg/m³. The 2015 annual concentration of 47.6 µg/m³ and the long-term average of 52.4 µg/m³ (see Table 15) are below the EA prediction.

Table 15: Total Suspended Particulates 2015

Location	Yearly Average (µg/m^3)	Range (µg/m^3)	No. Samples	Long Term Average µg/m³	*EA Prediction Residence 14 Year 10*
Lot 22 Antiene	47.6	30.8 - 156.6	61	52.4 (2001 – 2015)	70.4

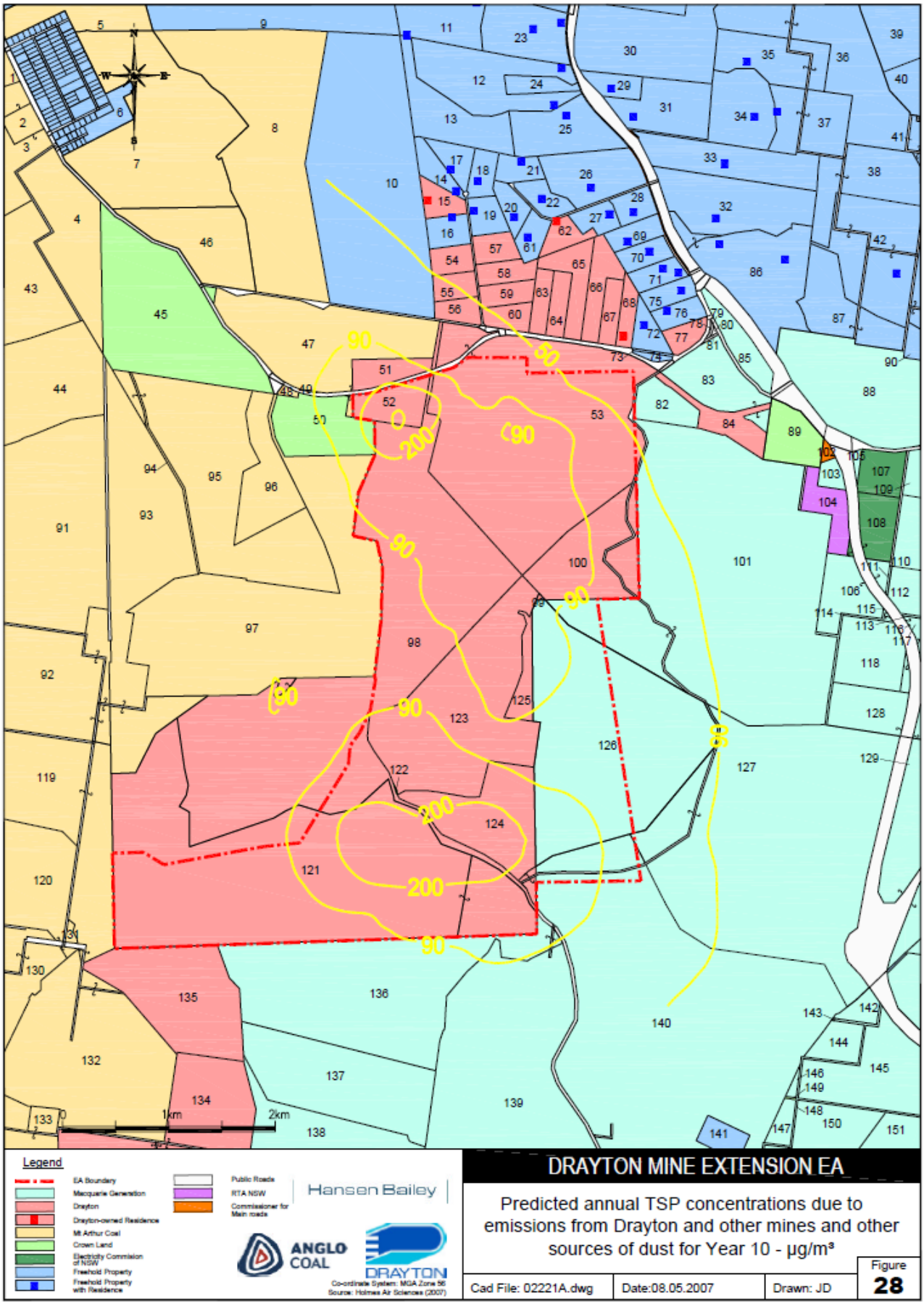


Figure 6: Predicted Annual TSP Concentrations - Year 10

The 2015 annual mean TSP for the Antiene station at Lot 22 was below the annual mean limit of 90 µg/m³ (see Figure 7). The 2015 annual mean displayed a decrease of 13.3 µg/m³ in comparison to the 2014 figure. The annual mean results are summarised in Table 15 and the complete results for the 2015 reporting period are in Appendix C. Annual rainfall was above the long term average.

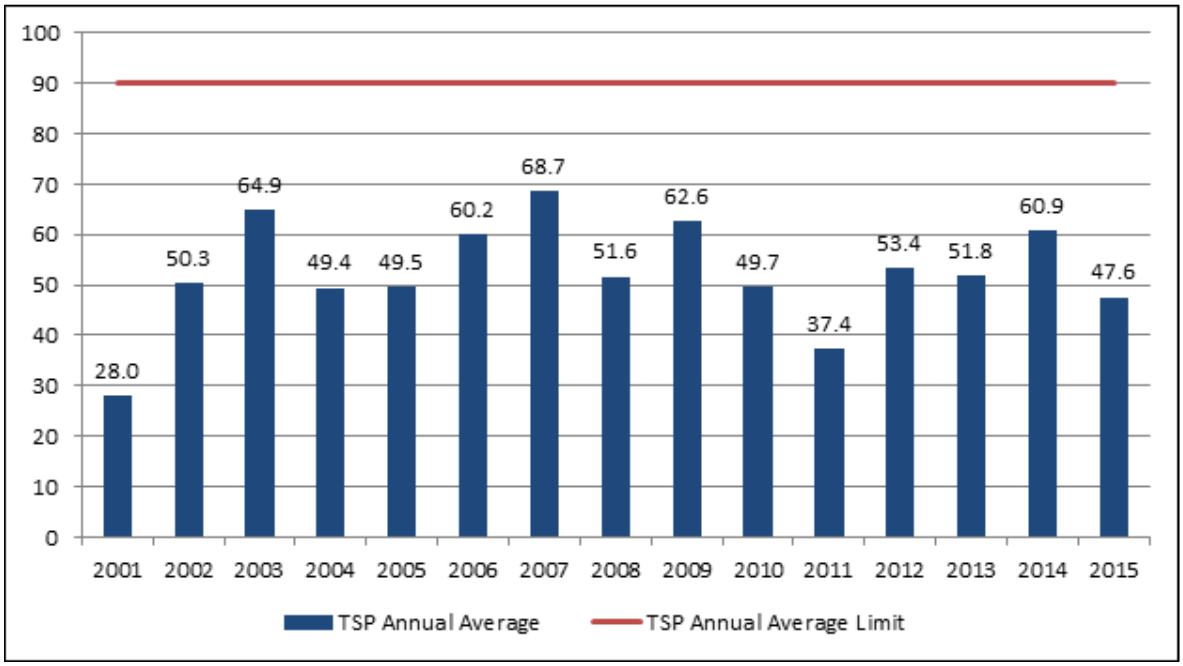


Figure 7: Long Term Annual Average TSP from Lot 22 HVAS

Figure 8 shows the TSP results for the period. A fuse on the Lot 22 HVAS failed in late May and the fuse casing was damaged. Replacement parts were installed at the start of July, and make up runs were conducted through July and August.

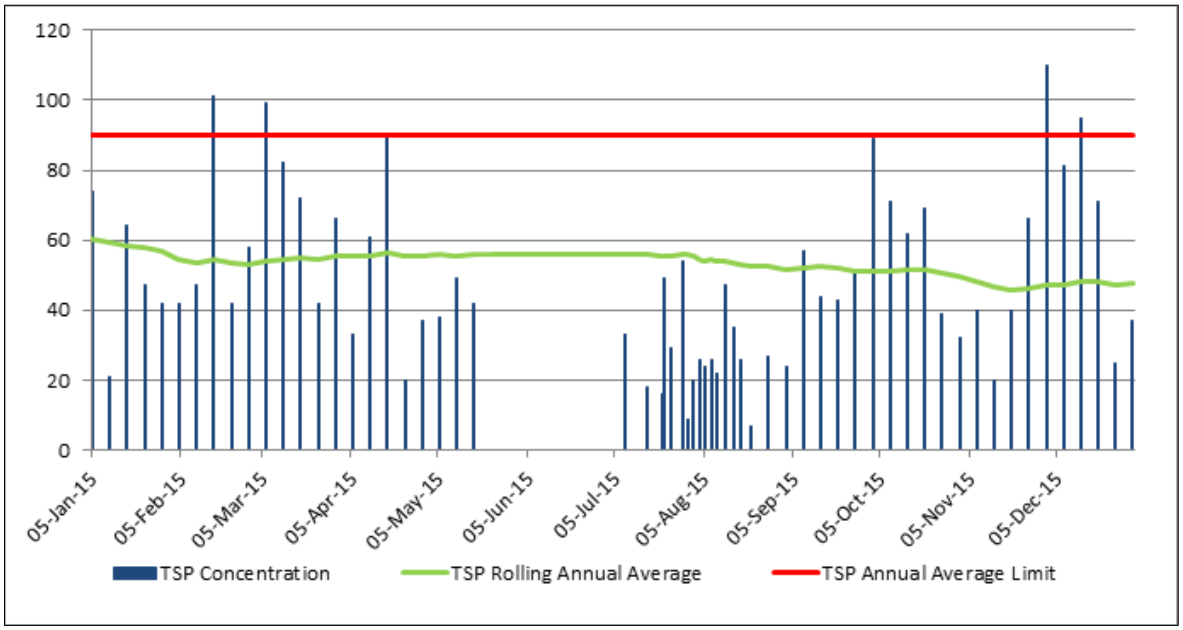


Figure 8: TSP from Lot 22 HVAS 2015

PM_{10}

The 2007 EA prediction of the annual PM_{10} concentrations due to emissions from Drayton and other sources for year 10 is presented in Figure 9. The EA predicted that the annual average PM_{10} concentrations from all sources for residence 72 (Lot 9 Antiene) would be 21.4 µg/m³. The 2015 annual average concentration of PM_{10} at the Lot 9 TEOM was 13.84 µg/m³ and is below the EA's predicted level.

The real time dust monitoring results show that the annual average criterion of 30 µg/m^3 was not exceeded in 2015 (see Figure 10). Throughout the 2015 reporting period there were two instances where the 24-hour average PM_{10} results exceeded the 50 µg/m^3 criterion. These exceedances were reported to the regulators. Each exceedance was investigated as discussed below.

Saturday 7th March

On Saturday the 7th of March, the Lot 9 TEOM recorded a rolling 24hr average of 50.58 µg/m^3 for PM_{10}. The investigation identified that the prevailing wind conditions were not conducive to the elevated dust levels being caused by Drayton Mine as the prevailing wind was from SE and the TEOM is located to the NE of the site. In addition, due to the changes in operations discussed in Section 2.4.4, Drayton Mine was not operating any truck or excavator fleets and the dragline was located in the southern pits.

Wednesday 6th May

On Wednesday the 6th of May, the Lot 9 TEOM recorded a rolling 24hr average of 56.94 µg/m^3 for PM_{10}. Correspondence from the Environmental Protection Agency confirmed the elevated dust levels were due to a regional dust event, however the process was followed to notify and investigate.

The prevailing wind conditions were from the NW on the day and the TEOM is located to the NE of Drayton Mine. Environmental personnel communicated with the production supervisors throughout the day and proactive measures were undertaken to prioritise in-pit dumps, apply extra water carts and park up equipment where required.

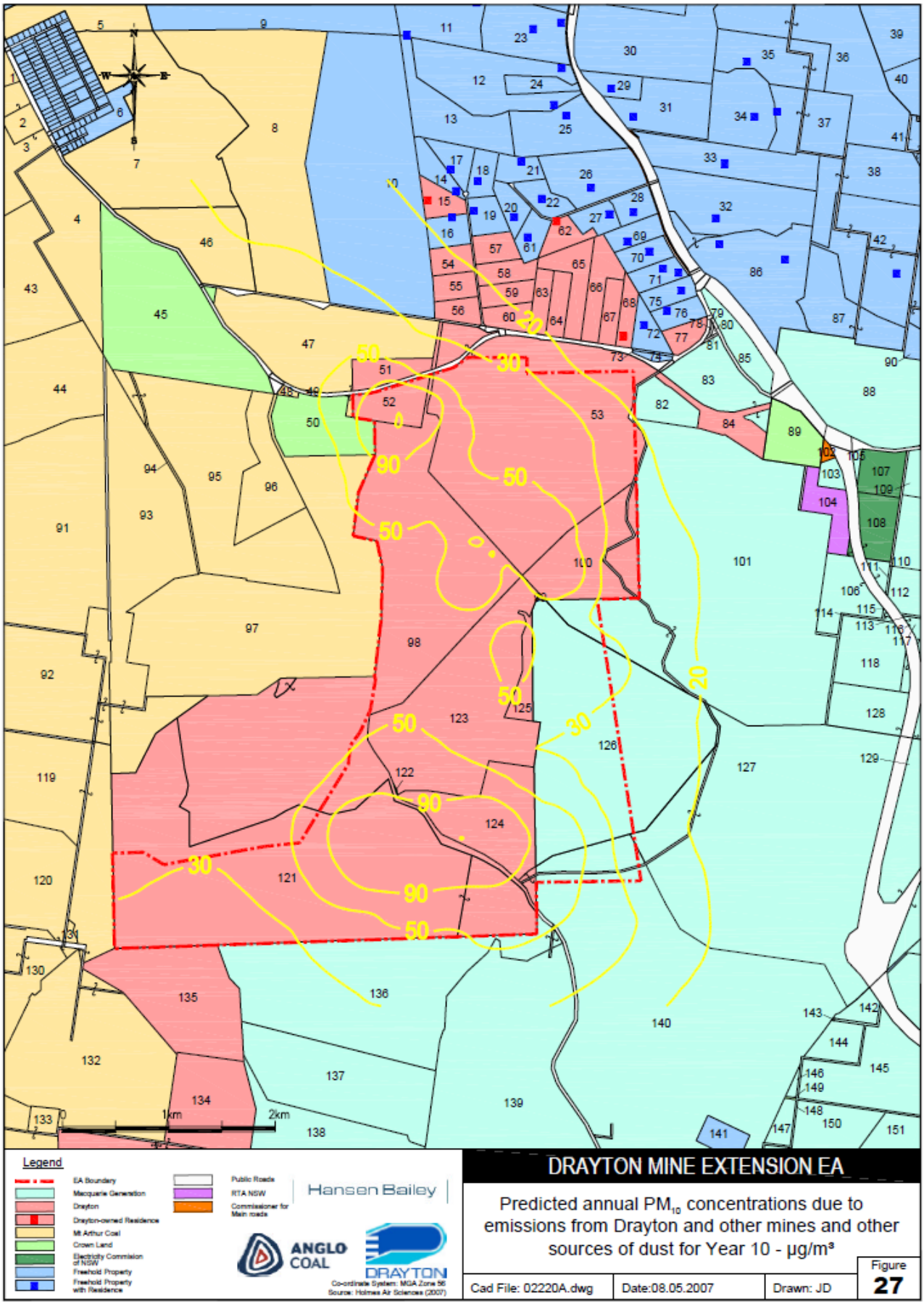


Figure 9: Predicted Annual PM10 Concentrations - Year 10

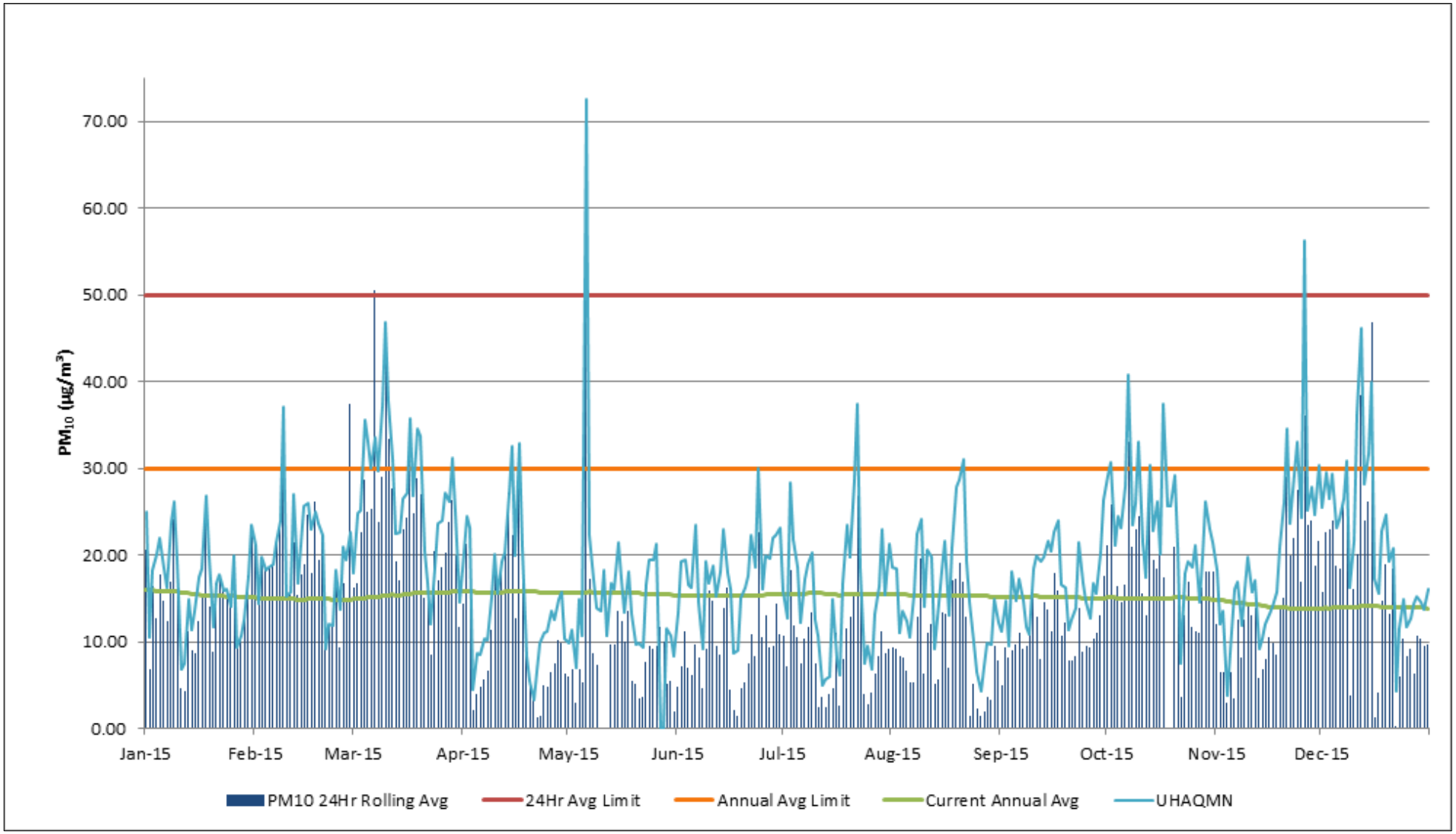


Figure 10: PM10 Data 2015

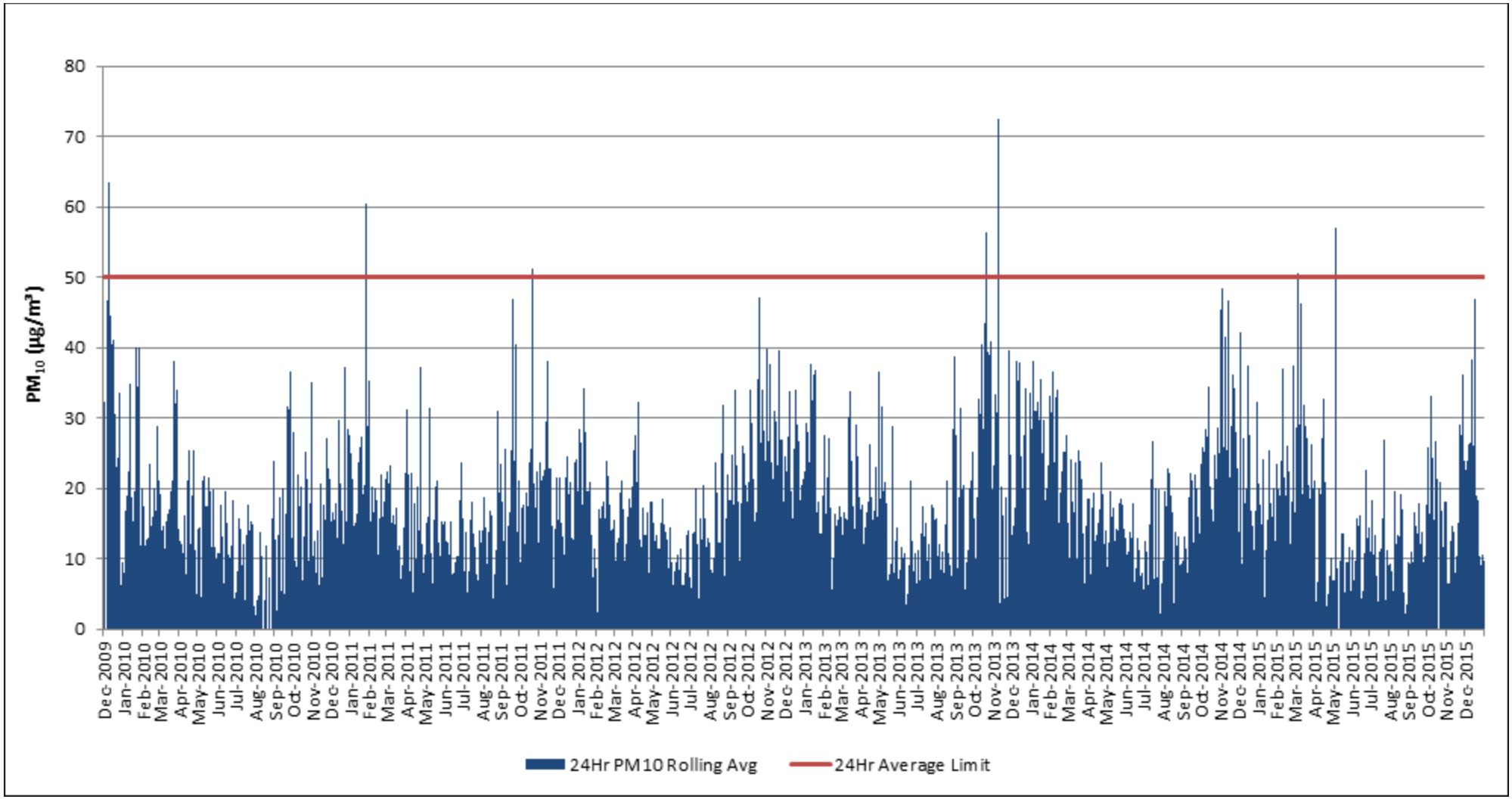


Figure 11: PM10 Historical Data

3.1.4 Greenhouse Gas and Energy Efficiencies

Drayton continued to focus on reducing greenhouse gases and improving energy efficiencies. During the 2014/2015 financial year Drayton reported to the Clean Energy Regulator a total of 98,027 t CO2-e in scope 1 emissions and 34,712 t CO2-e in scope 2 emissions. Also during this financial year, Drayton consumed 1,427,359 gigajoules of energy and produced 119,152,091 gigajoules of energy in the form of coal mined. These results represented a slight increase in scope 1 and scope 2 emissions and an increase in the amount of energy consumed and produced.

Drayton mine had an energy optimisation assessment report compiled by SMEC Australia Pty Ltd in 2014 and opportunities identified through that assessment have continued to be implemented on site through the 2015 reporting period. BanLaw, a fuel management system, tracks the diesel issued from fuel farms and service trucks to end use equipment such as heavy mine equipment, stationary equipment (e.g. pumps, lighting plants) and light and medium vehicles. This system has improved fuel security and accounting rigour (e.g. data accuracy, completeness and transparency) relating to diesel management and consumption on site.

3.2 Erosion and Sediment

During the 2015 reporting period, erosion and sediment control at Drayton was managed in accordance with the site Water Management Plan and the *Managing Urban Stormwater: Soils and Construction* guidelines. The control measures in place throughout the year included:

- Sediment traps and catch drains in the runoff zones from industrial areas;
- Collection of surface runoff in established dams downstream of disturbed areas;
- Progressive rehabilitation of disturbed areas as soon as practicable; and
- Contour banks on rehabilitated land designed at 0.5% - 1% grade and spaced to minimise down slope flows.

Water from washdown bays is collected in a series of sumps that are desilted on a regular basis. Any overflow from these sumps goes into the oil pollution control dam.

The rail loop dam, which collects runoff from the CHP area, has been designed so runoff water travels through a series of sediment ponds prior to entering the dam. Drayton does not possess a licence to discharge water off site so water and sediment is retained on site.

Periodic checks of rehabilitated areas are conducted to identify any erosion concerns and implement remediation measures.

3.3 Surface Water

3.3.1 Management System

Drayton maintains a Water Management Plan, which addresses surface water management and monitoring. As part of water management on site the site water balance is calculated each month using the surveyed storage levels, meter readings and rainfall volumes recorded by the on-site meteorological station.

Since all mine water is contained within the internal mine water management system and is not discharged off site, downstream management is negligible.

3.3.2 Monitoring System

As part of the surface water monitoring plan, monthly surface water monitoring is undertaken at eleven locations. These monitoring locations are illustrated in Figure 12. Most of these dams are mine water dams except for dam 2221, which is located in the Antiene Rural Estate area.

Analysis undertaken on the samples collected from the main drainage basins and on-site dams include:

- pH
- Electrical Conductivity (EC)
- Total Dissolved Solids (TDS)
- Suspended Solids (SS)
- Bicarbonates
- Soluble Ions (Sodium, Magnesium, Chloride, Sulphate, Calcium and Potassium)

Figure 12: Surface water monitoring sites

3.3.3 Results

During the reporting period Drayton received 781.2 mm of rain, the majority of which fell during January, April and November. Water levels in the main dams remained stable throughout 2015 and water quality monitoring continued as in previous years. The Drayton Mine Extension EA 2007 notes that site water quality is typical of other mines in the area and is moderately saline. The results for each surface water monitoring point are discussed below.

Far East Tip Dam (1895)

Dam 1895 collects runoff from rehabilitated land and undisturbed areas. Ongoing monitoring of the Far East Tip Dam (1895) has revealed that the water quality in this dam is alkaline. The pH levels have remained reasonably consistent fluctuating between 8.28 and 9.01 throughout the year.

The results of water quality sampling from the Dam 1895 are provided in Table 16.

Table 16: Water Quality – Far East Tip (1895) Dam

Date	EC µS/cm	pH	TDS mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L
Jan 14	5720	8.55	3780	307	730	1610	866
Feb 14	5530	8.45	3890	319	538	1470	832
Mar 14	5820	8.35	2770	326	528	1770	891
Apr 14	5780	8.28	4010	358	627	1630	977
May 14	5570	8.36	3480	336	689	1600	849
Jun 14	5340	8.48	3310	283	651	1630	848
Jul 14	6720	8.56	4510	412	776	2170	1150
Aug 14	6410	8.78	4470	356	750	1960	1030
Sep 14	6010	9.01	4510	347	827	1730	1000
Oct 14	5990	8.69	4500	338	711	1630	873
Nov 14	5980	8.80	4270	341	716	1800	902
Dec 14	5800	8.75	4250	334	751	1680	938
Average	5889	8.59	3979	338	691	1723	930

Access Road Dam (2081)

The Access Road Dam (2081) receives water from the ES Void tailings storage and the Industrial Dam. The Access Road Dam has a high turnover of water which is pumped to the CHP. During the reporting period the EC and TDS in the Access Road Dam remained stable. The results of water quality sampling from the Access Road Dam are provided in Table 17.

Table 17: Water Quality – Dam 2081

Date	EC µS/cm	pH	TDS mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L
Jan 14	6840	8.17	6450	490	739	3350	608
Feb 14	6840	8.18	6040	482	646	3690	610
Mar 14	6870	8.25	4840	522	664	3540	634
Apr 14	6040	8.18	5160	421	600	3200	564
May 14	5880	8.34	4900	422	600	2780	535
Jun 14	5960	8.33	4340	445	565	2800	593
Jul 14	6060	8.14	3780	433	458	3020	574
Aug 14	5740	8.08	4780	400	466	2420	542
Sep 14	5820	8.17	5360	394	632	2550	547
Oct 14	6270	8.17	4790	466	630	2700	630
Nov 14	6280	8.18	5540	418	638	2930	556
Dec 14	6130	8.20	5310	440	694	2890	662
Average	6228	8.20	5108	444	611	2989	588

During the reporting period, Drayton increased monitoring downstream of the Access Road Dam. An electric pump and real time flow monitor were installed at a downstream weir to pump any water into the Access Road Dam as well as monitor flow, if any, at the weir. Results to date have indicated that water flow data collected at the weir corresponds to rainfall intensity and volume.

Antiene Dam

The Antiene Dam (2221) is located off site in the Antiene rural sub division area. This dam has no connection to mining activities and is monitored for background purposes only. The Antiene dam (2221) was originally a small farm dam and its purpose now is to supply water to native animals. During the reporting period the Antiene Dam (2221) had lower EC, pH, TDS and metal concentrations in comparison to the mine water dams.

Other Dams

Dam 2114, located within the Drayton rail loop, collects surface runoff from the CHP and returns water to the internal water management system. Water quality in this dam fluctuated throughout 2014 in response to rainfall events.

The heavy rainfall which occurred during December resulted in a decrease in concentration levels of EC, TDS and metals in the smaller dams. A summary of the results of the water quality sampling for the remaining water storages on site is presented in Table 18. The complete data is provided in Appendix B.

Table 18: Average Results of Water Quality Sampling for Remaining Surface Water Monitoring Points

Dam	EC µS/cm	pH	TDS mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Sodium mg/L	No. Samples
1609	7414	8.25	6435	588	695	3768	628	12
1969	5914	8.20	4624	391	589	2660	570	12
2109	3180	7.26	2089	121	450	892	461	12
2114	6008	8.01	4597	396	589	2668	582	12
2221	1393	7.71	742	47	199	266	201	12
SW13	6940	8.05	5517	526	585	3522	627	11
ES Void	7173	7.92	5953	572	690	3553	627	3
OPC Dam	5388	7.57	4106	365	526	2458	514	12
V Notch Weir	9964	8.00	7423	407	1229	3731	1602	12

3.4 Ground Water

3.4.1 Management System

Drayton maintains a Water Management Plan, which addresses groundwater management and monitoring. Groundwater at Drayton is extracted only through infiltration to mine voids. As part of water management on site the volume of inflow groundwater is calculated as part of the site water balance. The 2007 EA predicted that the Permian coal seam aquifer would be impacted by Drayton's operations. As a result piezometers were established during the exploration drilling program, and subsequently throughout the mining process as further exploration drilling was carried out.

Of the original 33 piezometers used in the EA predictions, two remained at the end of 2015. These two piezometers (F1167 and F1168) have continued to be monitored on a monthly basis. The Groundwater Impact Statement undertaken as part of the 2007 EA predicted a drop of 25 – 50 m for piezometer F1168 and 10 – 25 m for F1167, from their original levels of approximately 194.40 RL and 190.54 RL respectively. The predicted depth for F1168 by year 10 was between 169 RL and 144 RL, and the average RL during 2015 was 159.29. The predicted depth for F1167 by year 10 was between 180 RL and 169 RL, and the average RL during 2015 was 164.45.

3.4.2 Monitoring System

Drayton monitors a network of 8 piezometers on and off site. Standing water levels and water quality are monitored on a monthly basis, with full water quality analysis being completed six monthly for selected bores. Some piezometers cannot be sampled due to insufficient water.

The locations of the piezometers are shown in Figure 13.

3.4.3 Results

A summary of the 2015 and long-term piezometer groundwater levels is presented in Table 19. The complete results from the 2015 groundwater monitoring program are shown in Table 49.

Table 19: Summary of Groundwater Levels

Location	Average Depth 2015 (RL)	No. of water levels monitored	No. Samples in 2015	Long Term Average Depth (RL)	Years of Data Available
F1024^	178.67	12	0	200.06	1982 – 2015
F1162*	-	12	0	151.89	1982 – 2015
F1163	177.46	12	12	177.60	1982 – 2015
F1164*	-	12	0	160.63	1982 – 2015
F1167	164.45	12	9	182.96	1982 – 2015
F1168	159.29	12	10	186.62	1982 – 2015
W1102	178.51	12	12	178.19	1982 – 2015
R4241	173.03	12	12	181.90	2005 – 2014

Note: All measurements adjusted with Relative Levels.

*^ Bore dry, no water to sample, *Water levels checked every month (>100m, too deep for equipment to get a standing water level)*

Piezometer levels from monitoring locations to the south of the mine were generally steady throughout the reporting period. Piezometer R4241 remains in close proximity to the limit of mining in the south. With the completion of mining in the South Pit East during the reporting period, the adjusted relative level of this piezometer has remained steady.

Piezometer W1102 and F1163 are located to the south-west of the mining lease but are not in close proximity to current operations. W1102 is located near Saddlers Creek and was closest to mining in the south west pit (now SW13 Void), while F1163 is located further to the south of Saddlers Creek. Both of these piezometers have exhibited little change in groundwater levels since monitoring at these locations began in the early 1980s.

Piezometers located in the northern areas of the mining lease generally display a gradual decline in level. Piezometer F1024 was dry throughout 2015, only collecting minor amounts of rainwater runoff and not providing a suitable volume to sample. The water levels in F1162 and F1164, located close to the NN Pit, were too deep to sample during the reporting period. Piezometer F1168, located to the north of the coal stockpiles, displayed a decline in level during the reporting period of approximately 5m compared to the previous reporting period. This has been a steady trend of decrease over the past several years.

Piezometer F1167, located in the Antiene area further to the north of the mine, also gradually declined dropping approximately 2.5-3.0m throughout the reporting period.

Drayton currently holds two groundwater licences for extraction purposes. These are shown in Table 20 below.

Table 20: Drayton Groundwater Licences (Extraction)

Licence Number	Extraction Limit (ML)
20BL111869	402
20BL171958	985
Total	1,387

During the reporting period, it was calculated that a total of 274ML of groundwater was intercepted by the north, south and east pits. The majority of groundwater is pumped out of the mine workings for safe mining operations to take place, and stored in the ES Void. The calculated groundwater interception falls well below the groundwater extraction limit authorised by the 20BL111869 and 20BL171958 water licenses held by Drayton.

The groundwater inflow for the reporting period has been calculated using the site water balance (see Table 21). The water balance uses the difference in measured volumes in the dams at the beginning and end of each period (site inventory) and compares it against the difference between the known inputs and outputs for the site (net changes). Inputs and outputs include measured pump meter numbers, simulated rainfall and runoff volumes from mine water storage catchments, evaporation from the water storages, and measured moisture contents for raw and product coal, rejects and tailings transfers. As Drayton mine does not possess a release license, it is considered a closed system and therefore the difference in inventory should equal the net changes. If the numbers are not equal, the difference is considered to be due to groundwater.

Table 21: Water Balance Inputs and Outputs

Site Inventory			**ML**
V Start	(1 Jan 2015)		3,608
V End	(31 Dec 2015)		5,092
V End – V Start			**1,484**
Measured inputs (ML)		**Measured outputs (ML)**	
High quality third-party	8.9	Evaporation (passive from store, dust suppression, industrial use)	986.9
R&R	2344.1	Entrainment – rejects, tailings, product	294.6
Entrainment	147.3	High quality third party (human consumption)	8.9
Total input	**2,500.4**	**Total output**	**1290.4**
Net water gain/loss	(inputs - outputs)		1210
Difference between inventory and net change		**Aquifer interception**	**274.0**

Note: Volumes have been rounded to one decimal place.

Figure 13: Groundwater Monitoring Sites

The 2007 EA predicted rate of groundwater inflow at Year 10 (2018) is 2.7 ML/day (~981 ML/yr) across the operation. As the aquifer interception outlined in Table 21 above indicates, the volume of groundwater inflow to the mining operation is lower than predicted.

As Drayton is a non-discharge site no groundwater is pumped offsite. The majority of groundwater intercepted on site is stored in the ES void for usages including dust suppression and washing of coal.

3.5 Water Accounting Framework

The Minerals Council of Australia (MCA) has recognised the vital role of water in mining both as an asset that produces value and as a shared natural resource that requires responsible stewardship. To assist its members in managing both of these roles the MCA has, in conjunction with the Sustainable Minerals Institute of the University of Queensland, developed a water accounting framework. Drayton has used this framework.

For the 2015 reporting period, Drayton mine has committed to reporting the *Input-Output Statement* listing flows for all input and output categories for the reporting period, along with the change in the total storage from start-end of the reporting period. Table 22 details the *Input-Output Statement* for Drayton mine for the reporting period spanning 1st January 2015 to 31st December 2015.

Table 22: Drayton Water Accounting Framework Input-Output Statment

INPUT - OUTPUT STATEMENT

Site Details:	Drayton

Reporting Period Details	Date (dd/mm/yyyy)	Storage (ML)
Start	1/01/2015	3,608
Finish	31/12/2015	5,092

INPUTS-OUTPUTS

Input-Output	Element (Source/Destination)	Sub-element (Inputs/Outputs)	Water Quality			Sub-element Total (ML)	Measured, Estimated, Simulated	Accuracy (high, medium, low)	Notes (1,2...)
			Category 1 (ML)	Category 2 (ML)	Category 3 (ML)				
Inputs	Surface Water	*Precipitation and Runoff*		2,344.1		2,344.1	Simulated	Medium	
		Rivers and Creeks							
		External Surface Water Storage							
	Groundwater	*Aquifer Interception*			274.0	274.0	Estimated	Medium	1
		Bore Fields							
		Entrainment			147.3	147.3	Measured	Medium	
	Seawater	*Estuary*							
		Sea/Ocean							
	Third Party Water	*Contract*							
		Waste Water							
		Other (potable, misc)	8.9			8.9	Measured	High	
	TOTAL INPUTS		**8.9**	**2,344.1**	**421.3**	**2,774.3**			
Outputs	Surface Water	*Discharge*							
		Environmental Flows							
	Groundwater	*Seepage*							
		Reinjection							
	Seawater	*Discharge to Estuary*							
		Discharge to Sea/Ocean							
	Supply to Third Party								
	Other	*Evaporation*	986.9			986.9	Simulated	Medium	
		Entrainment			294.6	294.6	Simulated	Medium	
		Other (potable, misc)	8.9			8.9	Measured	High	
	TOTAL OUTPUTS		**995.8**	**0.0**	**294.6**	**1,290.4**			
DIVERSIONS									
Inputs	Surface Water	*Precipitation and Runoff*							
		Rivers & Creeks							
	Groundwater	*Aquifer Interception*							
	TOTAL DIVERSION INPUTS								
Outputs	Surface Water	*Discharge*							
	Groundwater	*Reinjection*							
	TOTAL DIVERSION OUTPUTS								

Notes (user defined):	
1	*Groundwater input is estimated by reconciling the water balance over the whole year.*
2	
3	
4	
5	

3.6 Contaminated Land

Drayton maintains a register of locations on site that are known or potential locations of land contamination. Throughout the reporting period there were no new areas of contaminated land added to the land contamination register.

The areas that Drayton classifies as contaminated did not change from 2014 AEMR and includes all areas around the workshop, stores areas, west fuel bay, main diesel facility, East Pit, Industrial Dam, Savoy Dam, Oil Pollution Control Dam, Access Road Dam and its upstream catchment.

Refer to Section 3.18 for further information on Hydrocarbon Contamination.

3.7 Threatened Flora

EA surveys undertaken on Drayton land in previous years have not identified any threatened flora species as being present on site, although the EEC, Hunter Lowland Redgum Forest (HLRF) as listed under the *Threatened Species Conservation Act 1995* (TSC Act), was identified. Drayton has established offset areas to conserve plant communities in agreement with DP&E. The offsets are described in Drayton's Offset Strategy and management of these areas is detailed in the Rehabilitation and Offset Management Plan (ROMP).

Drayton Environmental Management Plans relating to threatened flora include:

- Offset Strategy;
- Rehabilitation and Offset Management Plan; and
- Flora and Fauna Management Plan.

Flora monitoring was undertaken during the reporting period in rehabilitation and offset areas. During a focussed investigation programme a population of Pine Donkey Orchid (*Diuris tricolor*) was identified in the Drayton Wildlife Refuge and confirmed by specialist botanical ecologists. The species is listed as vulnerable under the TSC Act.

Figure 14: Pine Donkey Orchid

3.8 Threatened Fauna

A total of seventeen threatened fauna species and three migratory species have been recorded at Drayton during EA and subsequent fauna monitoring surveys. Threatened species occurring at Drayton are listed in the Flora and Fauna Management Plan. Management and preservation of existing habitat forms the basis of protection of these threatened species. Known habitat occurs mainly in remnant and regenerating areas of woodland in the Drayton Wildlife Refuge, Northern Offset and Southern Offset.

Drayton Environmental Management Plans relating to threatened fauna include:

- Offset Strategy;
- Rehabilitation and Offset Management Plan; and
- Flora and Fauna Management Plan.

Fauna monitoring undertaken during 2015 recorded two new threatened species for the Drayton site. The Spotted-tail Quoll (*Dasyurus maculatus*) is listed as vulnerable under the *Threatened Species Conservation Act 1995* (TSC Act) and endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (see Figure 15). At least two individuals were recorded by remote camera at the Southern Offset reference site in remnant Yellow Box Woodland.

Figure 15: Spotted-tail Quoll identified during annual Flora and Fauna monitoring

The Squirrel Glider (*Petaurus norfolcensis*), listed as vulnerable under the TSC Act, was also recorded in the Southern Offset during the 2015 monitoring. This species has previously been recorded in the Southern Offset and the Drayton Wildlife Refuge. It was also recorded in the Northern Offset during the 2015 monitoring.

The threatened bird species recorded during the 2015 monitoring were the Speckled Warbler (*Chthonicola sagittata*) (recorded in Drayton Wildlife Refuge) and the Little Lorikeet (*Glossopsitta pusilla*) (recorded in Northern Offset and Drayton Wildlife Refuge), both are listed as vulnerable under the TSC Act. The Little Lorikeet has not been previously recorded at Drayton.

Five threatened microbat species were recorded during the 2015 monitoring. The Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), Little Bentwing-bat (*Miniopterus australis*) (both recorded in Drayton Wildlife Refuge and Northern Offset), Eastern Freetail-bat (*Mormopterus norfolkensi*) (recorded in Drayton Wildlife Refuge and Southern Offset), Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*) and Greater Broad-nosed Bat (*Scoteanax rueppellii*) (both recorded in Drayton Wildlife Refuge, Northern Offset and Southern Offset) are all listed as vulnerable under the TSC Act. All five species have been previously recorded at Drayton.

The two migratory bird species (listed under the EPBC Act) recorded during the 2015 monitoring were the White-throated Needletail (*Hirundapus caudacutus*) (recorded in Drayton Wildlife Refuge) and the Rainbow Bee-eater (*Merops ornatus*) (recorded in Northern Offset). Both have been previously recorded at Drayton.

3.8.1 Drayton Wildlife Refuge

In 1987 the Drayton Wildlife Refuge was gazetted. It allows for planned land use of all areas of the Drayton land holding, whilst still respecting wildlife values. In the Drayton EA it was predicted that the 'Natural Zone' of the Drayton Wildlife Refuge would not be impacted by the Project and that the management of this area will compensate for the impacts of the project on flora and fauna. Besides providing a buffer zone between residents and the mine, the Drayton Wildlife Refuge continues to provide remnant woodland for natural ecosystems.

3.8.2 Feral Animal Control

Feral animals, such as cats, dogs, rabbits and foxes, have been identified at Drayton. Control strategies undertaken include the use of poison baits to control these animal populations. Drayton implements a coordinated feral animal control program with neighbouring property holders. This integrated approach is designed to maximise effectiveness of control for target species across a broad area.

Drayton planned a 1080 Wild Dog baiting program in May 2015 but the baits were not laid due to inclement weather. In September 2015, 1080 Wild Dog baits were laid in coordination with local land owners within the Mt Arthur Wild Dog Association area. The baiting was a success with a high percentage of baits being taken. Baits were laid across operational and non-operational areas of the site with a focus on areas where dogs have been sighted previously. Approximately one third of the baits were laid in the Southern Offset where dogs were recorded in 2013 and 2014 monitoring. The 2015 fauna monitoring, conducted in November 2015, did not record dogs at any of the monitoring locations.

Rabbit baiting with Pindone was undertaken in September 2015 targeting rehabilitation areas where tree planting was planned. Fauna monitoring showed a decline in rabbit abundance in the Southern Offset. This decline is likely to be due to a combination of the baiting program and rehabilitation work being undertaken in the area.

Cats and foxes were recorded during the 2015 fauna monitoring. Numbers recorded were generally consistent with those recorded in previous years monitoring apart from an increase in the number of cats recorded in the Southern Offset. It is thought that this may be due to a corresponding decrease in dog numbers in the area but it may also be due to variations in conditions between subsequent monitoring events.

All feral animal control needs to be carefully planned and relevant guidelines adhered to, however the Southern Offset is particularly sensitive due to the presence of Spotted-tail Quoll which was recorded in the area for the first time in 2015.

3.8.3 Pest Animal Control

Kangaroo species, especially the Eastern Grey Kangaroo (*Micropus giganteus*), have reached high numbers in the areas to the south and south west of the mine. In May and June 2015, a licenced commercial harvester was used to remove 67 male kangaroos. Excessive kangaroo numbers have resulted on impacts to rehabilitated areas, especially on the survival rate of young trees.

3.9 Weeds

During 2015, an experienced weed control contractor was engaged to conduct a weed survey and undertake weed control. Weeds are targeted for control based on priority. High priority weeds include noxious weeds, weeds establishing on new rehabilitation areas and environmental weeds spreading to previously unaffected areas. Weed control is ongoing with control scheduled opportunistically throughout the year depending on weather conditions and life stage of the species being targeted. Treatment occurs during flowering, where possible, to assist with identification and ensure weeds are treated prior to seeding. Weeds are mapped and data collected regarding extent and density of infestations. A full list of weeds targeted during 2015 is provided in Table 23 below. The weed control program is ongoing and focuses on rehabilitation and offset areas where weeds threaten targets for long-term outcomes.

Table 23: Weeds treated 2015

Common Name	Scientific Name	Status	Control Method	Dates
Prickly Pear	*Opuntia spp.*	Noxious - C4	Manual removal	May, July
Castor Oil	*Ricinus communis*	Environmental	Foliar spray	January-March, June
St John's Wort	*Hypericum perforatum*	Noxious - C4	Foliar spray	November

Weed spraying occurred in the Southern Offset during 2015, prior to seeding taking place. This concentrated on Castor Oil, but included a range of other weeds such as Nagoora Burr and Bathurst Burr.

Prickly Pear was manually removed in the Drayton Wildlife Refuge during 2015. As Prickly Pear continues to be the dominant weed in and around Drayton, further removal work will occur in 2016.

In December 2013, Drayton received a Property Inspection Report from the Upper Hunter Weeds Authority regarding an infestation of St John's Wort on land north of Thomas Mitchell Drive. The infestation was mapped by Drayton staff in December 2013 and was treated in January 2014. Follow-up inspections in 2015 identified an infestation in the same location, smaller in area than the one mapped in 2013. The infestation was treated in November 2015 along with a new infestation of St John's Wort located on the Far East Tip rehabilitation area.

Figure 16 shows the weeds treated in 2015.

Figure 16: Weed infestations targeted during 2015

3.10 Blasting

3.10.1 Management System

Blasting is permitted under Drayton's Project Approval between the hours of 0900 and 1700 Monday to Saturday (EST) and between 0900 and 1800 Monday to Saturday (DST). Drayton's Mining Lease, the Approval and the EPL include requirements for the monitoring and control of blasting impacts (see Table 24) at any residence on privately-owned land. A maximum of two blasts per day can be carried out with a limit of eight blasts per week averaged over a 12 month period.

Table 24: Blasting and vibration criteria

Airblast Overpressure Level	
(dB(L)in Peak)	**Allowable Exceedance**
115	5% of the total number of blasts over a period of 12 months
120	0%

Peak Particle Velocity (Ground Vibration)	
mm/sec	**Allowable Exceedance**
5	5% of the total number of blasts over a period of 12 months
10	0%

Procedures have been implemented to ensure Drayton minimises the impact of blasting on near neighbours and operates within licence and project approval conditions. They include the following:

- Loading blasts according to Drill and Blast Engineer's design with attention given to factors such as:
    - charge weight per delay;
    - loading pattern of holes;
    - stemming used;
    - firing sequence and direction;
    - maximum instantaneous charge; and
    - type of blast.
- Accountability for blasting compliance lies primarily with the Mining Operations Department;
- Meteorological conditions are considered when firing shots;
- Waveforms of both air blast and vibration are available for all blasts;
- Implementing an NN Strategy for blasting in the north pit;
- Implementing a road closure process for closing Thomas Mitchell Drive during blasting in the north pit (within 500m of the road);
- Implementing electronic detonation on most blasts in the NN area; and

- Designing blasts to remain below internal limits and well below regulatory limits.

Drayton is also involved in a continuing research project, funded by the Australian Coal Association Research Program (ACARP), to identify the specific weather conditions relating to blasting activity. This is a joint research project involving a number of Upper Hunter mining companies. This project is referred to as the SODAR project.

During 2015, a new weather forecasting tool (implemented through 2014) was used at Drayton. The weather forecasting tool allows modelling of conditions at the proposed time of each blast and prediction of the blast dust or potential fume pathway. Inputs to this modelling system also allow prediction of actual fume levels expected for each blast. Multiple blast times can be modelled to ensure minimal impact to personnel and neighbouring residences. This system allows more accurate forecasting and prediction of potential impacts from blasting to assist in planning for optimal results.

3.10.2 Monitoring System

Drayton uses an internet based blast monitoring system which gives access to immediate blasting information for all blasts. The blast monitoring units also allow additional monitoring to be undertaken in specific locations as required. The units operate between approved blasting hours and automatically trigger once a vibration or overpressure event is recorded. During the 2015 reporting period, all blast monitors were calibrated on an annual basis. There are three community based blast monitors at locations in the Antiene area and two monitors at the Ash Dam, one on the toe, and one on the crest of the wall. The locations of the five blast monitoring units are shown in Figure 17.

Figure 17: Blast Monitoring Sites

3.10.3 Results

A total of 95 blasts were fired at Drayton during the 2015 reporting period. The monitoring results of these blasts are summarised in Table 25 and displayed in Appendix E.

Table 25: Blast Monitoring Summary

Location	Antiene	DeBoer	Sharman
EN Area (18 blasts)			
Avg Air blast dB(L)	90.1	93.6	94.7
Range dB(L)	70.1 - 111.3	84.7 - 110.7	87.9 - 110.1
Avg Vibration mm/sec	0.14	0.24	0.19
Range mm/sec	0.02 - 0.34	0.03 - 0.55	0.02 - 0.51
NN Area (26 blasts)			
Avg Air blast dB(L)	96.8	97.1	95.5
Range dB(L)	75.7 - 109.4	82.5 - 108.5	83.9 - 108.8
Avg Vibration mm/sec	0.73	0.49	0.33
Range mm/sec	0.09 - 1.76	0.08 - 1.65	0.04 - 1.14
SPE Area (8 blasts)			
Avg Air blast dB(L)	87.9	92.1	92.6
Range dB(L)	73.4 - 99.4	80.0 - 99.1	82.4 - 104.0
Avg Vibration mm/sec	0.04	0.14	0.09
Range mm/sec	0.02 - 0.07	0.06 - 0.19	0.04 - 0.19
SPW Area* (43 blasts)			
Avg Air blast dB(L)	88.8	93.9	93.0
Range dB(L)	77.3 - 102.7	82.5 - 106.1	79.9 - 108.0
Avg Vibration mm/sec	0.05	0.11	0.06
Range mm/sec	0.01 - 0.15	0.01 - 0.41	0.01 - 0.16

** It should be noted that the Antiene blast monitor failed to trigger for one SPW shot in May 2015. The SPW summary results have been calculated excluding the null result.*

Figure 18 shows the number of blasts by type. Overburden shots were the most frequent, accounting for just under 35% of all blasts, with parting shots (~29%) and pre-split shots (~23%) closely behind. The remaining shots were made up of trim (4.21%) and through seam (8.42%) shots.

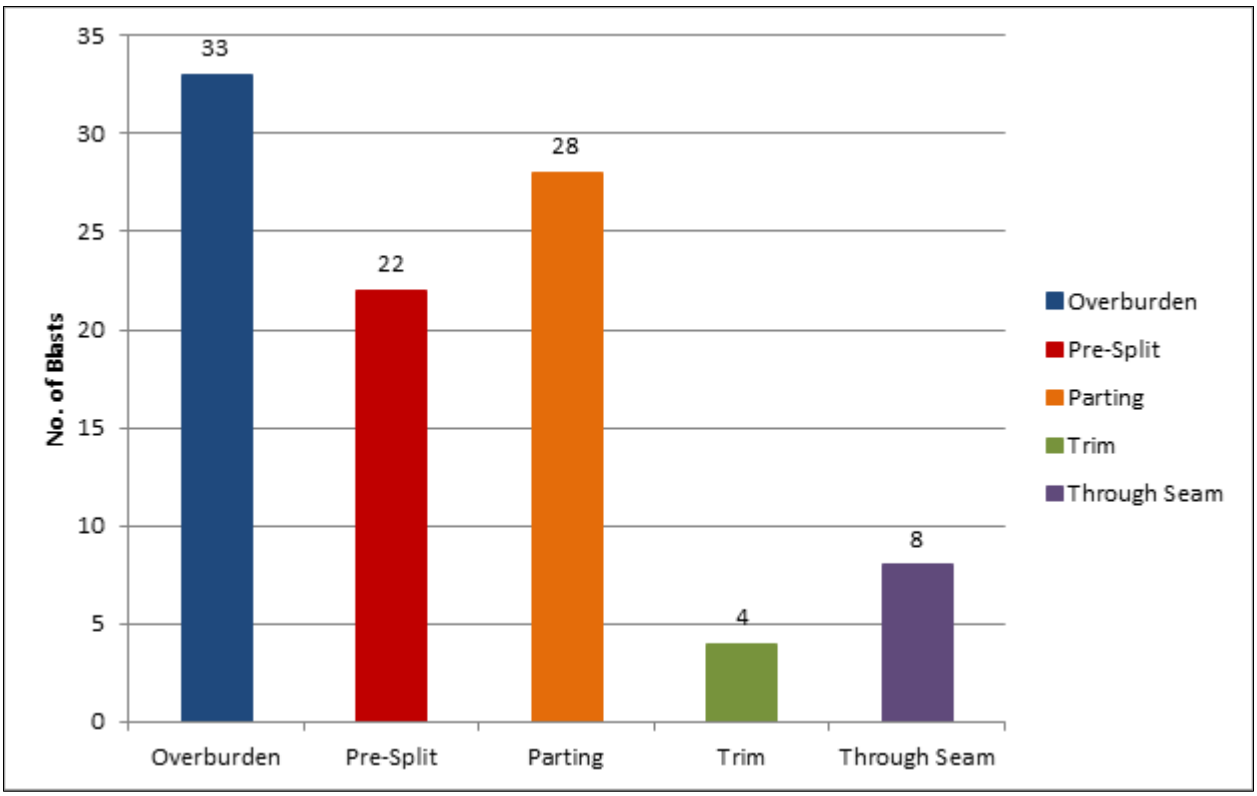


Figure 18: Number of blasts by type

During 2015, all monitoring results were below the maximum limit for ground vibration (10 mm/s) and the airblast/overpressure criteria (120 decibels (linear)).

Throughout 2015 a total of 12 blasting related enquiries or complaints were received. Eleven of these were in regards to blast vibration felt at the complainants' residences, and one was related to blast noise heard at the complainant's residence. All enquiries were investigated and responded to with complainants given details of monitoring data recorded for the relevant Drayton blast where applicable. Details of the complaints or enquiries received during 2015 are contained in Section 4.1 of this report.

3.11 Operational Noise

3.11.1 Management System

Drayton has implemented a number of noise management controls including mine planning, operational and engineering measures, and a real-time monitoring system. The mitigation measures outlined below were applied during the 2015 reporting period and revised as appropriate:

- North and East pit trucks dump in shielded locations during evening and night;
- North pit pre-strip haul roads are shielded by pit walls or a berm in the direction of residences, during evening and night;
- Loading units within the North Pit are located in a shielded area below natural ground surface during the evening and night;

- The haul road from the South Pit has been realigned to the lowest possible elevation, with minimal long straight sections of road directly in line with a residence and effective shielding with earth berms along the sides of the road where possible;
- Mine planning schedules are developed to ensure no active dumping occurs at exposed locations during adverse weather conditions;
- Training of relevant personnel has being undertaken to ensure they are familiar with the complaints response process;
- All trucks and the L1400 loader are fitted with noise attenuation mufflers to further reduce noise emissions for these units;
- Alternative reversing beepers including Broadband (Quacker) Reverse Alarms have been implemented on trucks, to further reduce noise emissions from these units across site; and
- Drayton has a second real-time noise monitor, which is located at the end of Balmoral Road.

3.11.2 Monitoring System

The EPL and approval criteria (Table 26) for Drayton's noise monitoring sites is measured in LAeq (15 min), which is the average noise energy over a 15 minute period. Drayton undertakes a combination of independent monitoring and real-time monitoring in order to assess mine noise levels against these criteria.

Table 26: Noise Impact Assessment Criteria

Land Number	Day	Evening	Night	
	L_{Aeq}(15min)	L_{Aeq}(15min)	L_{Aeq}(15min)	L_{A1}(1min)
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47

Land Number	Day	Evening	Night	
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

Independent Monitoring

Independent noise monitoring is undertaken to quantify the overall noise levels at the nearby residences and determine compliance with noise criteria by Drayton's operations. The monitoring is carried out on a monthly basis by an acoustic engineer who incorporates attended monitoring data into a site model to provide a compliance report. This monitoring also fulfils the requirement of Condition M8.1 that noise must be monitored every six months from the premises to determine compliance with the noise limits. Drayton has continued to undertake independent attended noise monitoring on a monthly basis throughout 2015 to determine compliance against noise criteria.

Drayton's Project Approval details noise impact assessment criteria for 28 specific residential locations (see Table 26 above). For logistical reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken is to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below and depicted in Figure 19:

- Doherty
- Kerr
- Wilson*
- Smith*
- Skinner
- Robertson

- Sharman
- Horder

** Additional locations contained in EPL 1323 but not in the Project Approval.*

Three sets of measurements are made over the “circuit”, one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm).

Real Time Monitoring

Real-time noise monitoring involves the use of two BarnOwl® noise monitoring systems. Multiple microphones allow the BarnOwl® to distinguish the direction of noise sources. This is particularly important when assessing and managing cumulative noise impacts.

The BarnOwl® system facilitates production of graphical and numerical data as well as recording and maintaining noise emission files on a five minute basis. One BarnOwl® has been installed at Lot 9 Antiene, approximately 150 m from the Drayton rail spur, and in close proximity to the mine’s near neighbours (see Figure 19). This station enables proactive management to minimise noise emissions from the site.

A second BarnOwl® was installed at the end of Balmoral Road in the Antiene area. This monitor is operated in conjunction with Mt Arthur Coal and monitors noise levels representative of Balmoral Road residences. This monitor will send alerts to Drayton personnel in the event of elevated noise levels.

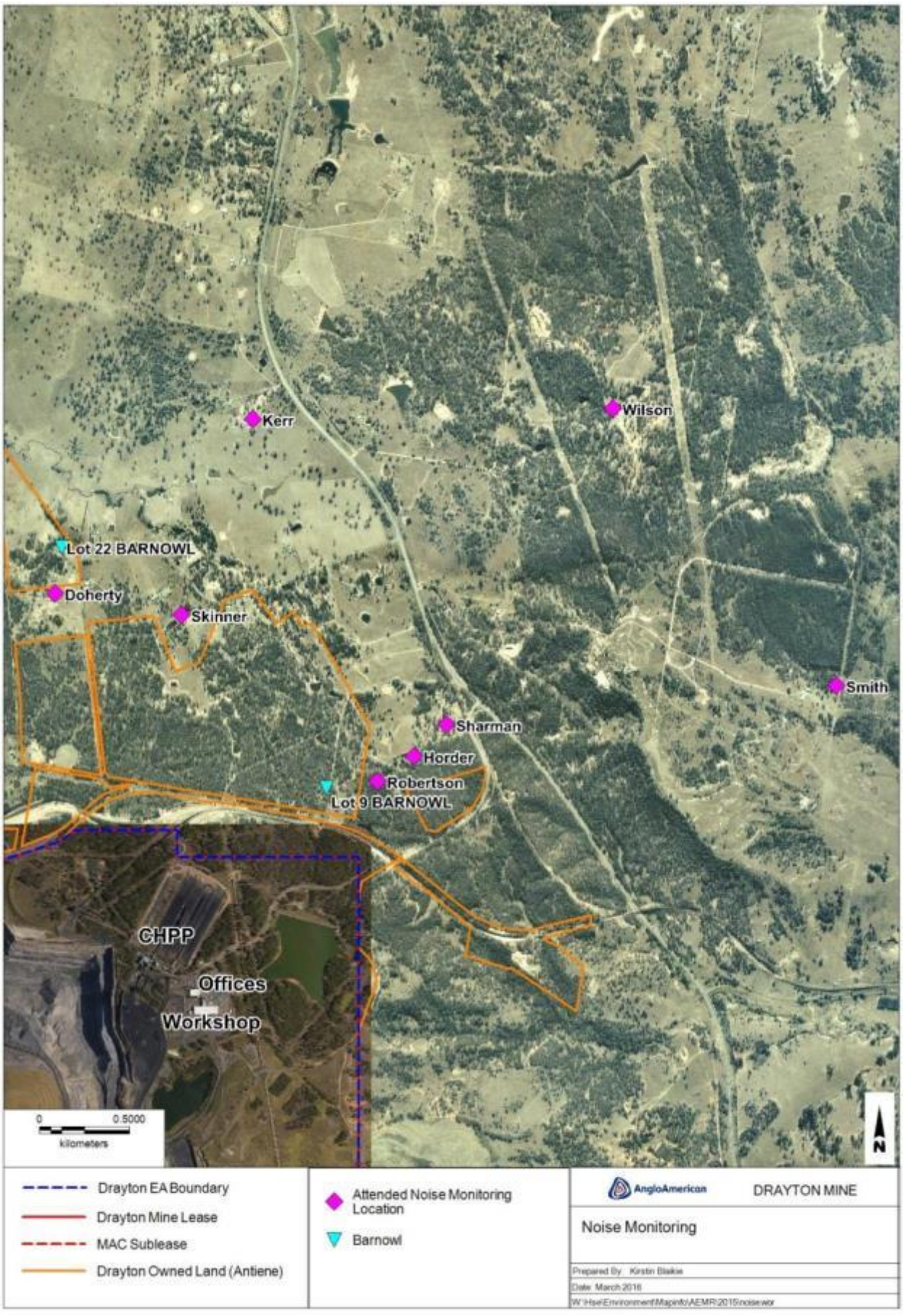


Figure 19: Noise Monitoring Locations

3.11.3 Results

Independent Attended Monitoring

In 2015 a noise compliance assessment report was submitted to the EPA with the Annual Return as set out in Condition R1 of the EPL. No exceedance of operational noise criteria was detected during monitoring with full reports in Appendix D.

Predicted noise levels in the 2007 Environmental Assessment were reported for years 1, 5 and 10 of the project. 2015 was year 8 for the project. As a result year 10 predictions have been used below to compare actual monitoring results to predicted noise levels. All of the results of the attended noise monitoring were below that of predicted noise levels in the Environmental Assessment for year 10 of the project with the exception of the January results at the Smith residence for the Night LAeq (15 min) results. The result of 32 dBL was 1 dBL greater than the EA prediction for year 10 (31 dBL) for the night period, but it has to be noted that 2015 was year 8 of the project. Furthermore, every other monthly monitoring result at this location identified Drayton Mine noise contribution to be either <20 dBL or inaudible suggesting that the elevated result was an isolated incidence, and that other external factors such as weather conditions may have been at play. The EA prediction for year 5 of the project at the Smith residence for the night period was 32 dBL. As mining activities decrease with the approach of mine closure, it is expected that by year 10 (2017), the night time results at the Smith residence would be in line with the EA predictions.

The tables below present the results for day, evening and night monitoring together with the EA prediction for comparison.

Table 27: Noise Results Day LAeq (15 min)*

Daytime Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15\ min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 10)
Doherty (41)			IA			IA			<20			<20	40
Kerr (36)			IA			IA			<20			<20	34
Skinner (39)			IA			IA			<20			<20	37
Robertson (36)			IA			IA			30			<20	34
Sharman (35)			IA			IA			<20			<20	32
Horder (35)			IA			IA			33			<20	33
Wilson (35)			IA			IA			<20			<20	<30
Smith (35)			IA			IA			<20			<20	<30

** Day period results only collected on a quarterly basis, IA= Inaudible, FA= Faintly audible*

Table 28: Noise Results Evening LAeq (15 min)

Evening Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15\ min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 10)
Doherty (41)	IA	25	30	26	IA	IA	29	<20	27	<20	<20	<20	41
Kerr (37)	IA	25	IA	IA	28	IA	<20	<20	32	28	<20	<20	35
Skinner (40)	26	31	FA	30	26	IA	27	<20	27	26	<20	<20	39
Robertson (37)	IA	IA	FA	IA	IA	29	30	27	26	<20	26	<20	36
Sharman (35)	IA	IA	IA	IA	IA	FA	28	<20	<20	<20	<20	<20	34
Horder (36)	IA	IA	27	26	FA	27	31	25	<20	<20	25	<20	35
Wilson (35)	IA	IA	IA	IA	IA	IA	<20	<20	<20	<20	<20	<20	30
Smith (35)	IA	IA	IA	IA	IA	IA	<20	<20	<20	<20	<20	<20	<30

IA = Inaudible, FA= Faintly audible

Table 29: Noise Results Night LAeq (15 min)

Night Measured Noise Results – Drayton Contribution dB(A) $L_{eq\ (15\ min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 10)
Doherty (39)	30	30	29	32	IA	IA	39	<20	37	<20	<20	<20	39
Kerr (37)	30	29	IA	32	26	IA	26	<20	32	<20	<20	<20	35
Skinner (39)	29	35	29	32	26	FA	35	<20	38	<20	<20	<20	39
Robertson (42)	28	26	FA	24	FA	39	33	27	29	28	26	<20	42
Sharman (41)	27	IA	26	FA	FA	34	2	<20	31	24	<20	<20	40
Horder (42)	28	25	27	FA	FA	40	33	25	36	26	26	<20	42
Wilson (35)	32	IA	IA	IA	IA	IA	<20	<20	<20	<20	<20	<20	34
Smith (35)	32	IA	IA	IA	IA	IA	27	<20	<20	<20	<20	<20	31

IA = Inaudible, FA= Faintly audible

Table 30: Noise Results Night LA1 (1 min)

Night Measured Noise Results – Drayton Contribution dB(A) $L_{1\ (1\ min)}$													
Location (Criterion)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	EA Prediction (Yr 10)
Doherty (47)	32	33	34	36	NA	NA	45	<20	41	<20	<20	NA	n/a
Kerr (47)	33	32	NA	35	30	NA	30	<20	36	<20	<20	NA	n/a
Skinner (45)	33	38	33	36	30	22	40	<20	2	<20	<20	NA	n/a
Robertson (47)	31	28	20	27	22	45	38	31	33	33	29	NA	n/a
Sharman (47)	29	NA	28	20	21	38	30	<20	36	28	<20	NA	n/a
Horder (47)	32	27	29	20	22	45	37	28	40	28	28	NA	n/a
Wilson (45)	36	NA	NA	NA	NA	NA	<20	<20	NA	<20	<20	NA	n/a
Smith (45)	36	NA	NA	NA	NA	NA	31	<20	NA	<20	<20	NA	n/a

NA = not audible

Real Time Monitoring

A total of 2 noise related complaints were made during the 2015 reporting period. Noise compliance monitoring is conducted by attended noise monitoring whereas the audio recordings from the Barnowl® are used to investigate the source of the noise when elevated levels occur as well as recording noise for later assessment. For a summary of the 2015 BarnOwl® data that demonstrates monthly trends see Table 31, for the complete dataset see Appendix D.

Table 31: BarnOwl® Monthly Average Noise Levels

Month	Day dB(A)	Evening dB(A)	Night dB(A)
January	33.7	34.2	34.8
February	32.5	33.1	35.4
March	34.6	33.9	34.8
April	34.4	34.8	34.2
May	34.8	35.0	33.8
June	35.9	37.3	36.5
July	36.6	36.5	36.0
August	36.1	36.6	36.4
September	34.6	35.9	36.4
October	33.3	33.2	34.1
November	33.2	32.7	33.1
December	33.5	32.3	31.4
Annual	34.5	34.8	34.8

The average monthly noise levels recorded at the Barnowl are outlined in Table 31 (above). It should be noted that the results include data under all conditions and do not exclude any data during meteorological conditions such as temperature inversions or high winds (>3m.s^{-1}).

3.12 Visual Aesthetics and Lighting

As predicted in the EA assessments, Drayton's operations have a low visual impact as a result of judicious clearing during initial construction. Remnants of the initial woodland have been retained around and throughout the site by careful layout of infrastructure and clearing of the minimum area required. Mature trees provide effective screening of areas such as the CHP, Rail Loadout facilities and general administration area.

Tree planting continues to be a component of rehabilitation programmes. These plantings will provide additional screening of mining activities as well as a corridor for wildlife movement between refuge and offset areas. During 2007, some 2,060 native tree seedlings were planted along Thomas Mitchell Drive to act as visual barrier for future mining developments. The seedlings were successfully established and now provide a screened barrier for travellers along

Thomas Mitchell Drive. Further tree plantings occurred throughout 2012, 2014 and 2015. Trees were planted in areas that are visible to both the New England Highway and Thomas Mitchell Drive to provide future relief from linear rehabilitated contours.

Mobile lighting was actively managed during 2015 to prevent impacts on both Thomas Mitchell Drive and the New England Highway. These lights, essential for night-time operations, are carefully positioned to prevent glare from impacting drivers.

3.13 Aboriginal Heritage

Drayton maintains an Aboriginal Cultural Heritage Management Plan (ACHMP) in accordance with the development consent. The ACHMP provides a set of operational procedures that guides Drayton in the management of Aboriginal cultural heritage issues within the mine development context.

The EA predicted that 29 of the 39 Aboriginal sites identified would likely be impacted by the project. The Aboriginal heritage sites consisted of isolated artefacts and areas where transient communities may have travelled. Of the 39 sites located within the Open Cut and Services Corridor development zone, 13 sites were conserved as part of the Drayton Mine Extension area development. In 2009 the remaining 26 sites were subject to various mitigation salvage procedures prior to impact from mining development. The majority of these sites are considered to be of low scientific significance, however Ramrod Creek R3 was considered to be of medium-high scientific significance following salvage works on a local level.

The 13 conservation sites identified in the Environmental Assessment were inspected during the reporting period. All sites are in situ, although one site could not be directly viewed due to a thicket of shrubs that has grown around it. While the original fencing is still in place to demarcate the heritage sites, it will require upgrading and new signage installed, which is scheduled to be completed in 2016. The artefacts salvaged in 2009 have continued to be stored by the Safety, Health and Environment department for safe keeping.

Throughout the 2015 reporting period, there was no trigger for consultation with cultural heritage groups relating to the mining activities at Drayton.

3.14 Natural Heritage

No natural heritage sites have been identified on the mine site or on land under the control of Drayton.

3.14.1 Non-Aboriginal Heritage

The EA field survey identified five non-Aboriginal heritage sites within the EA boundary, none of which were statutory listed. One of these sites was determined to be of high local significance. It was predicted in the EA that this site would not be impacted by mining activities however a physical barrier was installed around the site to prevent accidental damage and maintain its heritage value.

3.15 Spontaneous Combustion

Drayton, along with other open cut coal mines mining the Greta Coal Measures, experiences spontaneous combustion within spoil, coal stockpiles and coal seams. As a result, a Spontaneous Combustion Management Plan is followed on site in order to meet both statutory and company requirements. This plan indicates the causes of spontaneous combustion, determines accountabilities for its management, lists remediation work to prevent recurrences, and specifies monitoring and reporting requirements. Drayton also completes six monthly reports to the EPA regarding spontaneous combustion management.

Throughout the 2015 reporting period, mining activities were concentrated within South Pit East, South Pit West, North Pit and East Pit North. The spontaneous combustion activity during this period has occurred in both the northern and southern pits. Carbonaceous material from the South Pit was selectively dumped on the lower faces of the expanding Great North Tip area and then buried with inert material to reduce exposure time. This work has been occurring for several years and is controlling spontaneous combustion.

Table 32: Area affected by spontaneous combustion by year

Year	Area Affected (m^2)	Year	Area Affected (m^2)
1998	82,837	**2007**	3,720
1999	57,854	**2008**	1,870
2000	26,251	**2009**	1,020
2001	6,745	**2010**	1,170
2002	1,870	**2011**	1,070
2003	3,140	**2012**	1,160
2004	3,940	**2013**	1,180
2005	3,370	**2014**	810
2006	3,480	**2015**	870*

** As at Apr-Sep 6-monthly report to EPA on 30th Nov 2015*

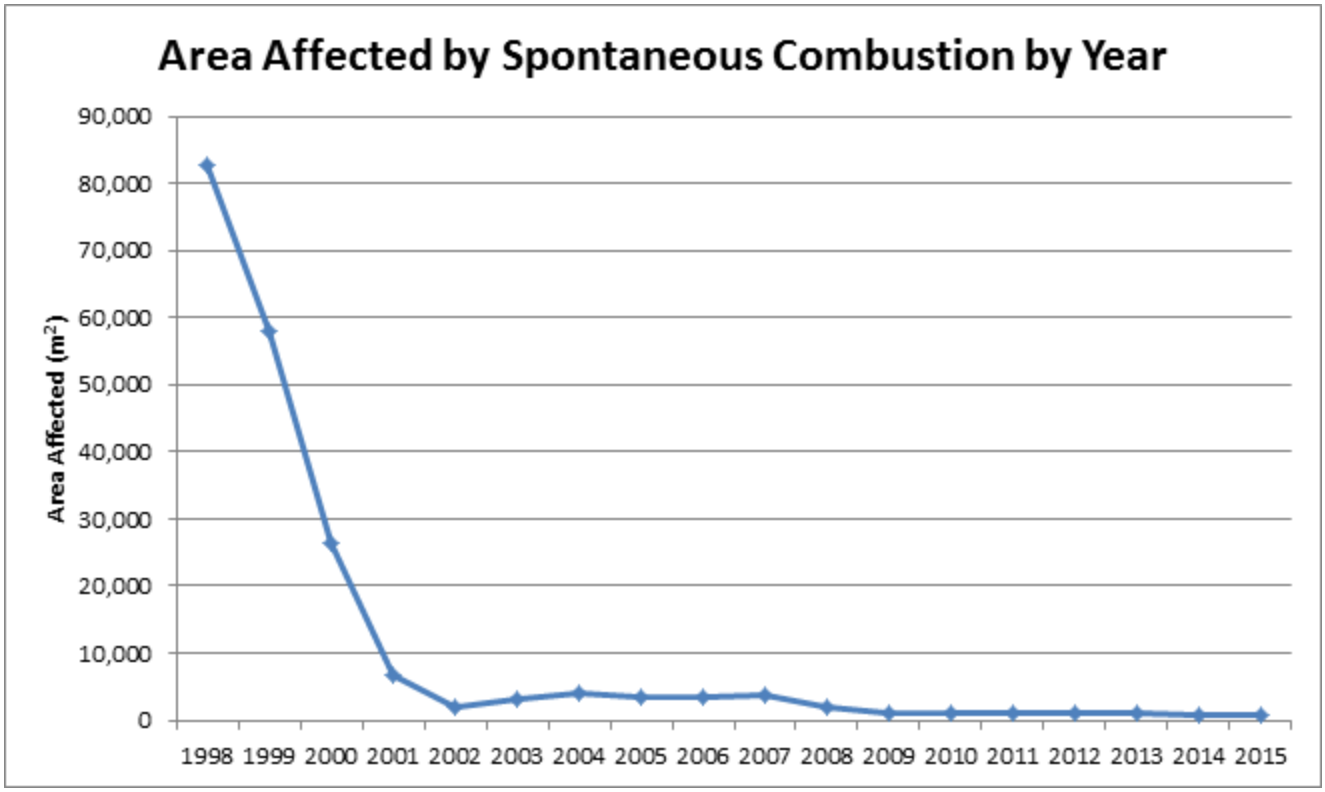


Figure 20: Area affected by spontaneous combustion by year

Table 32 and Figure 20 outline the areas that have been affected by spontaneous combustion since 1998. This demonstrates that spontaneous combustion reduced substantially from the late 1990's. At the end of the reporting period, it was assessed that approximately 870 m^2 of surface area was visibly affected by spontaneous combustion. The areas are being managed through a process of active dumping with inert material and/or clay capping.

As reported in the 2014 AEMR, spontaneous combustion was identified as an issue on the South West Tip rehabilitation. Remediation activities were undertaken in these areas during 2014 and initial monitoring results indicate that spontaneous combustion activity has been suppressed in this area. Throughout 2015, thermal imaging over the South West Tip rehabilitation did not identify the presence of spontaneous combustion.

3.16 Bushfire

During the 2015 reporting period, bushfire mitigation works were carried out in accordance with the Bushfire Management Plan. As part of the management plan, mine equipment such as water carts, graders and dozers were available for on-site fires. The risk of on-site bushfires was managed through a system of peripheral roads that act as firebreaks. Additionally, weeds and grasses growing around electrical substations, explosives magazine and fuel storages were kept to a minimum. An inspection was carried out to assess the status of the Drayton property boundary and neighbouring properties regarding the potential for bushfires. The southern boundary fence line was slashed in August and clearing under power lines occurred across the site prior to bushfire season.

3.17 Mine Subsidence

Subsidence is not an issue at Drayton as it is an open cut coal mine with no underground workings or highwall mining.

3.18 Hydrocarbon Contamination

Drayton has various hydrocarbon storage locations. The primary diesel tank, with a capacity of 860,000 litres, is located near the workshop. Additionally, there is an in pit fuel facility, consisting of above ground diesel storage tanks with a total 220,000 litre capacity.

All bulk storage tanks and containers of hydrocarbons are stored within appropriate bunding and kept in a neat and tidy condition. Contamination is kept at a minimum, with any moderate spillages (20 L or greater) being reported internally through Drayton's incident reporting system. Tanks and storage areas are located such that any incidents will not lead to offsite discharge and impacts. Concrete and earthen bunds were inspected throughout the reporting period for structural integrity and cleanliness. After rainfall events, rainwater is removed from bunds to ensure sufficient storage capacity in the bund in the event of a spill.

Audits on hydrocarbon management were conducted during 2015 by Bureau Veritas (07-10/07/2015). Audits found general compliance with hydrocarbon management with further focus on hydrocarbon management awareness and training required.

In addition to the permanent bunded areas, portable bunds are used for temporary storage or transportation of oils and fuels around the site. Various spill kits and/or bins containing oil absorbent material are located around the site in areas where there is highest potential for a spill to occur. Site personnel are made aware of the locations of these spills kits and absorbent material bins in their work area. The contents of the spill kits and the oil absorbent material bins are checked on a weekly basis by the site's waste contractor. Materials contaminated by hydrocarbons are put into oily rag bins that are located next to all spill kits and throughout the workshop areas.

Drayton has an area dedicated to bioremediating hydrocarbon contaminated soil which is located to the south of the workshop area. In 2015 approximately 1,149 m^3 was put into the bioremediation cells with 1,792 m^3 of remediated material being removed from the cells and disposed of in pit per the approved Bioremediation Management Plan. Inspections of the facility are conducted by the environmental officer or environmental graduate on a weekly to fortnightly basis with sediment samples being taken and analysed on a monthly basis. The facility is the responsibility of the Maintenance Supervisor and the Environmental Graduate who have varying responsibilities within this area.

Small hydrocarbon spills that occur on site are cleaned up using materials from emergency spill kits. These materials are then placed in 'Oily Rag' bins that are located near spill kits. In addition, a specific hydraulic hose bin was brought to site during 2015 in order to further segregate hydrocarbon contaminated materials. During 2015 a total of 7,637 kg of contaminated materials was removed from site by Remondis. A breakdown of weight by month can be seen in Table 33.

Drayton continued the operation of its oil pollution control dam throughout 2015. This dam is located below the main workshop, vehicle wash down bays and lube facilities. Any runoff from

the industrial area reports to this dam via an oil separator that removes hydrocarbons from the water. From the Oil Pollution Control Dam, water passes through a second oil separator before flowing into the Industrial Dam for reuse on site. Hydrocarbons are collected in storage tanks which are serviced by a waste contractor on a regular basis and removed from site. This system is inspected on a weekly basis.

Table 33: Hydrocarbon contaminated material removed from site in 2015

Month	Contaminated material removed in bins (kg)	Contaminated material removed by vacuum truck/skips (t)
January	304	0
February	271	0
March	326	0
April	275	0
May	1,177	0
June	125	0
July	359	0
August	1,247	0
September	388	0
October	1,443	0
November	389	0
December	1,333	0
2014 Total	**7,367**	**0**

3.19 Methane Drainage / Ventilation

Methane drainage and ventilation is not an issue at Drayton as it is an open cut coal mine with no underground workings.

In June 2014, Drayton reported fugitive emissions from the operation in accordance with the National Greenhouse and Energy Reporting (NGER) guidelines. In order to determine fugitive emissions from Drayton, seven boreholes were selected for gas testing according to Australian Standard 3980/1999 and International Standards ASTM D1945-03 and ISO6976-1995. Investigations revealed the existence of a single gas domain at Drayton which is a carbon dioxide 'depleted' zone where the ramp up of gas content starts to occur at a depth greater than 240 m.

It was determined that Drayton has lower gas emissions than the government default of 0.045 CO2-e (t/t) for NSW coal mines. The scope 1 fugitive emissions figure that Drayton reported for the 2014/2015 financial year was 5,322 t CO2-e.

3.20 Public Safety

Public and workplace safety is a major consideration in achieving the Anglo American corporate goal of zero harm. Drayton offers no public access to any mine working areas. Signage around the mining lease boundary fences has been erected notifying the public not to enter the mine site. This signage was updated and increased during 2012. Boundary gates are kept locked

except for the main entrance. A boom gate system on key access routes restricts on-site access to employees and inducted contractors. Contract security is in place during weekends and public holidays. Thomas Mitchell Drive is closed with licenced traffic controllers stationed at appropriate locations for all blasts within 500m of the road. There were no incidents of public safety concerns during 2015.

3.21 Meteorological Monitoring

Real-time meteorological monitoring is a component of Drayton's environmental monitoring system. Meteorological data including wind speed, wind direction, temperature, rainfall, solar radiation and humidity are monitored using an on-site automatic weather station located at the CHP.

The data is collected at five minute intervals and transferred directly into a log file located on Drayton's electronic database. The data allows Drayton employees to assess the prevailing weather conditions and modify the operation where necessary to suit the current conditions. It also plays a vital role in planning blasting events for appropriate weather conditions.

3.21.1 Results

Rainfall

Total annual rainfall for 2015 was 781.6 mm, an increase from the previous reporting period and above the long term average of 675.2 mm. The wettest April since 1989 was recorded as a result of a couple of East Coast low pressure systems during the month. Figure 21 contains the monthly averages.

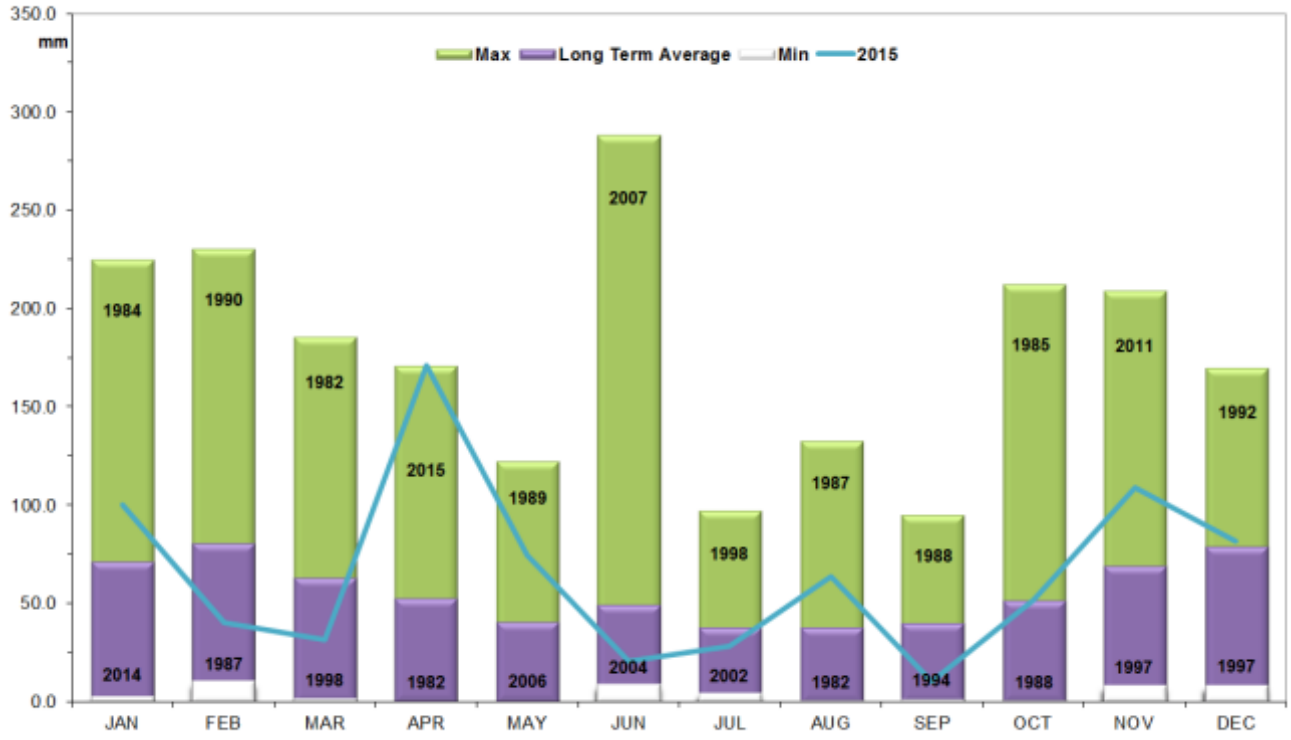


Figure 21: Rainfall history 1981 to 2015

The total monthly rainfall and the total number of rain days during the 2015 reporting period are shown in Table 34. There was an increase in the total volume of rainfall from the previous reporting period (781.6 mm vs 768.6 mm), and there were eight more rain days experienced in 2015 for a total of 96.

Table 34: Total Monthly Rainfall for 2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rainfall (mm)	100	40.2	31.2	171	74.6	20.4	28.2	63.6	10.2	51.6	109	81.6	**781.6**
No. of rain days	11	6	6	12	11	6	7	3	6	10	10	8	**96**

Note: A rain day is a day in which more than 0.2 mm of water is recorded by the on-site meteorological station

Temperature

Ambient temperature was monitored at the CHP meteorological station. The maximum temperature recorded during the year was 40.3°C on the 20th of March 2015 and the minimum was 0.8°C on 29th of July 2015. Temperatures in 2015 followed a similar trend to 2014 however 2015 experienced cooler temperatures than 2014 in 9 of the 12 months. The temperature range per month throughout 2015 and a comparison of the 2014 and 2015 average temperatures is shown in Table 35 below.

Table 35: 2015 Monthly temperature range and average daily temperature

Month	Monthly Temp Range 2015 (°C)	Average Daily Temp 2015 (°C)	Average Daily Temp 2014 (°C)
January	11.6 - 36.1	23.6	24.6
February	12.2 - 35.4	22.7	23.0
March	9.5 - 40.3	21.7	20.8
April	7.3 - 32.0	17.3	18.2
May	3.4 - 26.1	14.1	14.6
June	1.0 - 25.1	10.9	12.0
July	0.8 - 19.3	9.8	10.6
August	1.4 - 26.0	11.9	11.7
September	4.4 - 28.1	14.2	14.9
October	9.1 - 35.7	20.1	19.6
November	10.3 - 39.5	21.6	22.5
December	11.3 - 37.3	22.6	22.7

Wind Speed and Direction

Similar to previous years, the prominent wind directions at Drayton during 2015 were north westerly and south easterly (see Figure 22 and Table 36). The 2015 summer season (January, February and December) was dominated by south easterly (SE) winds from the Lake Liddell direction. The late autumn and early winter months (May to July) were dominated by north westerly (NW) winds from the direction of between Muswellbrook and Denman. Autumn (March to May) and spring months (September to November) experienced a change in dominant wind direction from SE to NW during autumn, while the dominant winds fluctuated between NW and SE during spring. Monthly windroses for 2015 can be found in Appendix I.

In 2015 the maximum wind speed recorded at Drayton was 37.05 km/h on the 15th of December. As was the case for the previous reporting period in 2014, the average wind speeds were highest throughout the summer months with December recording the highest average monthly wind speed. For the majority of the year, wind speeds generally remained between 2 and 15 km/h (see

Table 37).

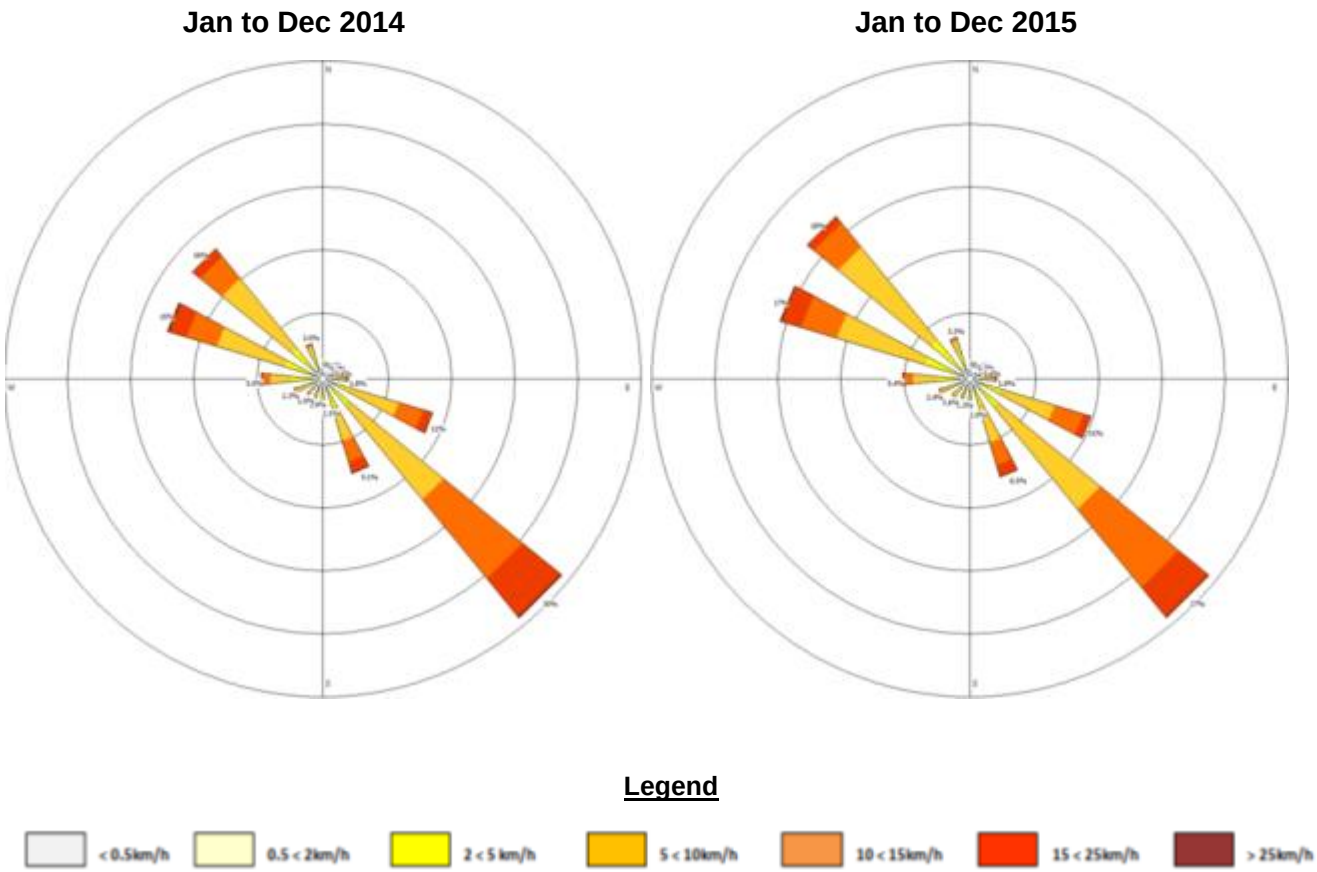


Figure 22: Annual Windroses 2014 and 2015

Table 36: Monthly wind direction and duration (hours)

Month	N	NE	E	SE	S	SW	W	NW
January	4.1	6.3	55.3	412.7	44.4	26.9	76.9	96.0
February	2.0	2.4	64.2	514.8	31.4	9.3	13.3	17.3
March	6.5	6.5	46.5	378.2	41.0	31.7	80.9	140.6
April	7.2	6.3	43.6	280.3	42.3	20.9	87.3	219.3
May	8.8	3.3	18.0	174.2	33.7	16.2	99.3	358.3
June	9.2	4.3	20.6	166.2	29.3	23.8	134.8	330.6
July	10.7	4.1	18.3	103.3	30.5	23.1	139.0	414.0
August	7.9	4.0	9.8	69.5	20.5	22.7	170.3	436.8
September	6.8	5.0	36.7	244.7	59.3	31.5	109.8	225.6
October	5.3	5.3	36.7	337.1	45.6	34.1	104.4	174.2
November	3.1	4.9	32.2	372.5	27.5	22.0	82.1	174.5
December	3.0	3.9	58.1	456.7	34.1	25.3	65.1	96.8

Table 37: Monthly wind velocity and duration (hours)

Month	< 0.5 km/h	0.5 < 2 km/h	2 < 5 km/h	5 < 10 km/h	10 < 15 km/h	15 < 25 km/h	> 25 km/h
January	2.9	30.0	119.2	316.4	174.2	77.6	2.4
February	2.8	23.4	72.6	271.7	221.6	61.7	1.0
March	5.0	38.9	151.8	291.3	175.1	68.5	1.3
April	5.3	30.3	149.4	352.4	121.6	46.2	2.1
May	5.3	30.8	167.3	372.8	98.0	36.5	1.0
June	14.3	55.7	220.8	360.0	61.0	6.8	0.0
July	11.5	53.3	171.7	319.8	110.8	74.3	1.5
August	6.6	23.5	163.6	359.0	138.3	50.0	0.5
September	7.9	46.3	161.0	353.8	118.7	31.3	0.5
October	5.8	39.8	154.5	333.8	157.9	49.7	1.0
November	2.2	27.8	90.2	304.7	206.5	82.8	4.6
December	2.4	25.4	88.5	292.6	233.4	94.5	6.1

3.22 Other Issues and Risks

3.22.1 Environmental Risk

Environmental risks associated with the Drayton Operations are recorded in an Environmental Aspects and Impacts Register. The Environmental Aspects and Impacts Register is reviewed on an annual basis and is the basis of the Environmental Improvement Plan (EIP). The current version of the Aspects and Impacts Register and the EIP are available to all site personnel through the document control system, Drayton SHEC MS Explorer. Table 38 shows the primary aspects of mining rated against the Anglo American Risk Matrix (Appendix G).

The most recent independent environmental compliance audit occurred in late 2015 and assessed environmental compliance of the operation against the requirements of the Development Consent. This audit was conducted by AECOM and included specialists in the fields of air quality, spontaneous combustion, noise and rehabilitation.

Table 38: Environmental Risk Review

Aspect	Normal Operations		Abnormal Operations		Shut Down		Emergency	
	Env	Rep	Env	Rep	Env	Rep	Env	Rep
Spontaneous Combustion	18S	8M			18S	13S	8M	
Decommissioning of Mine					18S	9M		
Water Management	8M	8M	8M	8M			9M	9M
Availability of Inert Material	9M		9M		9M		9M	
Management of Topsoil	12M		5L				5L	
Final Void	8M	13S			8M	13S		
Waste Management	4L	2L	2L	2L			2L	
Equipment Noise	8M	4L	8M	5L			3L	
Vibration/Noise from Blasting	12M	12M		8M				
Air Quality - Dust	12M	17S	13S					
Groundwater	12M	5L	5L		5L		9M	9M
Sewerage Treatment Plant	5L	5L						
Erosion and Sediment Control	12M	8M			13S	13S	9M	13S
Rehabilitation	12M	8M			17S	13S		
Contaminated Land	4L		7M		7M		4L	
Hydrocarbon Spills	14S	9M	5L		17S	5L	6M	6M
Cultural Heritage	9M	9M	9M	14S	9M	9M	10M	
Light emissions	4L	4L	4L	5L			4L	5L
Greenhouse Gases	11M	5L						
Fauna management	8M	5L	5L	5L			6M	
Flora management	9M	14S					6M	
Uncapped exploration holes	4L				4L			
Coal transport – rail		7M		4L			2L	
Radiation devices	1L							
Weed Infestation	12M	8M			12M	13S		
Feral Animals	8M	8M			8M	8M		

4 COMMUNITY RELATIONS

Drayton is bounded to the north by Thomas Mitchell Drive, to the south-east by the Liddell and Bayswater power stations and to the west by Mt Arthur Coal. The privately owned, rural-residential land holdings to the north-east of Thomas Mitchell Drive (Antiene Estate) represent Drayton's immediate local community.

Drayton falls entirely within the Muswellbrook Local Government Area (LGA), which represents Drayton's wider local community. The Singleton LGA adjoins the Muswellbrook LGA immediately to the south of Drayton mine.

At the end of the reporting period, Drayton employed approximately 307 permanent employees and engaged contractors to assist in some areas of the operation. Approximately 52% of the permanent workforce lives in Muswellbrook and the Upper Hunter with the remaining 48% from Singleton and the Lower Hunter towns of Maitland and Cessnock (see Table 39).

Table 39: 2015 Workforce Shire of Origin

Shire	Number of Employees
Muswellbrook/ Upper Hunter	160
Singleton/Cessnock/ Maitland/Other	147
TOTAL	307

4.1 Environmental Complaints

At any time, the community and other stakeholders can find information on Drayton's environmental management and performance by visiting the Anglo Coal website. The Drayton Environment web page features details of Drayton's approvals, proposed blasting times and environmental management plans. Drayton publishes a monthly update of environmental monitoring data to the web page and the AEMR can also be found there for download.

Drayton maintains a 24 hour hotline (1800 814 195) for complaints and enquiries as well as a complaints form on its web page (http://www.angloamerican.com.au/~/media/Files/A/Anglo-American-Australia-V2/Attachments/content/Community%20complaints%20form%20-%20Drayton.pdf). The hotline allows the community to request and provide feedback about operational activities and lodge complaints on any aspect of the Drayton operations. The hotline number has been advertised in the local newspapers throughout the reporting period and is available on the Drayton Website (http://australia.angloamerican.com/our-operations/operating-sites-subpage/drayton-environment).

An initial call back is provided for all calls to the hotline within 24 hours of the call being received. All complaints are investigated and the details, including any follow-up actions required, are recorded in Enablon, Anglo's internal reporting system. The community member is

notified of the response and/or outcome of the complaint once the investigation has been completed. Complaint information is also discussed at Drayton's Community Consultative Committee meetings (see section 4.2).

Over the past several years, the number of complaints receive has decreased (Figure 23). A total of 15 complaints were received during the 2015 reporting period. Of these, the majority were blast vibration related complaints (Figure 24).

There were two odour related complaints that are not believed to be related to Drayton operations, but are logged as complaints due to the source of the odour being unknown. All of odour related complaints were received from the same complainant, a resident of Scone, located approximately 30km from Drayton.

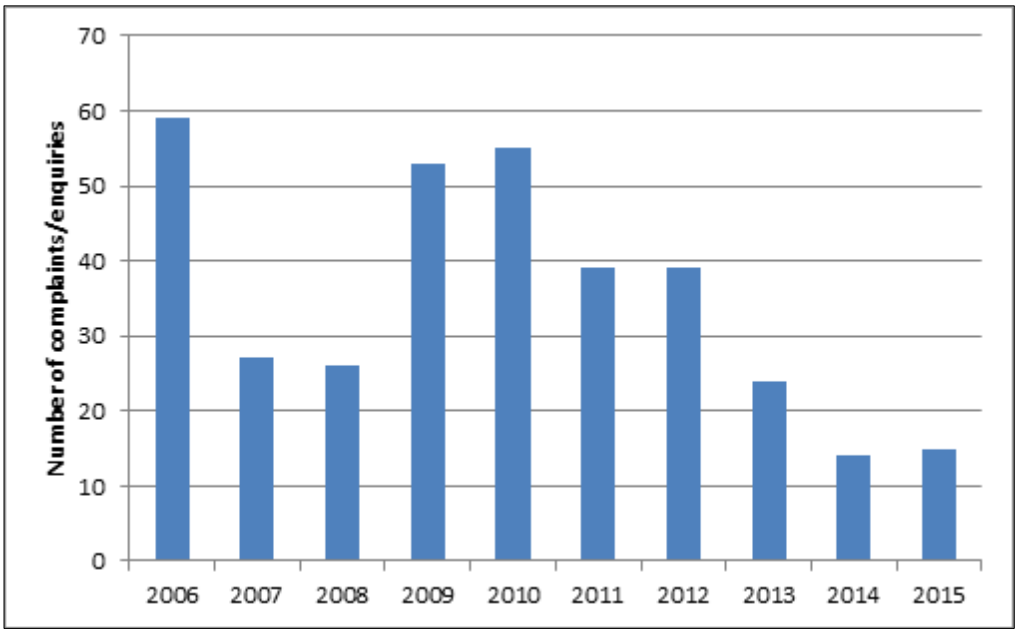


Figure 23: Community Complaints/Enquiries associated with Drayton (2006 – 2015)

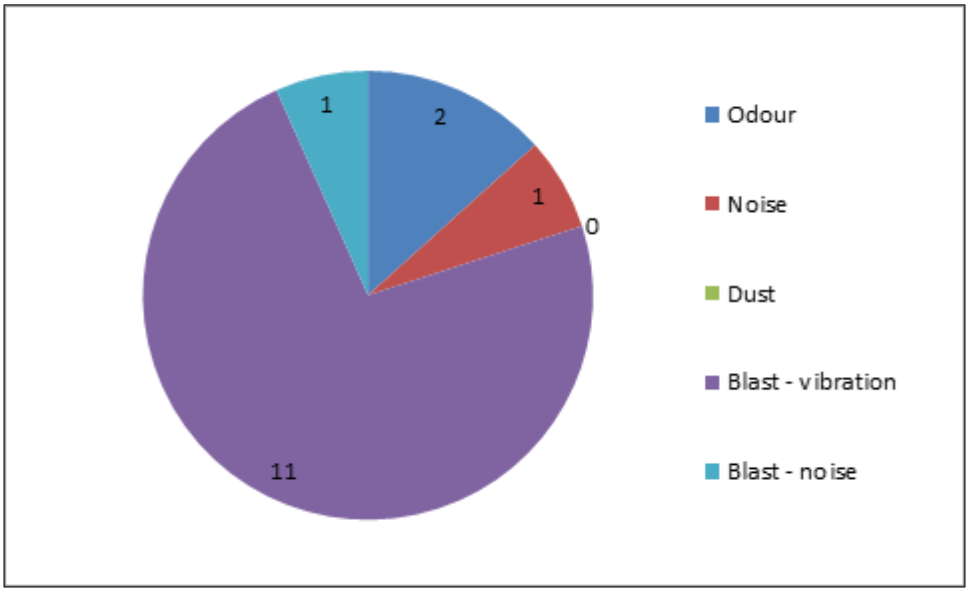


Figure 24: Community Complaints/Enquiries by Type for the 2015 Reporting Period

Further information on community complaints can be found in Table 55 of Appendix F.

4.2 Community Liaison

Drayton's CCC meets quarterly to discuss environmental performance and community issues. Members of this committee consist of local council representatives and near neighbours in addition to the General Manager, SHE Manager and the Environmental Coordinator. Drayton also operates, in conjunction with Mt Arthur Coal, a joint CCC where discussions are held regarding the shared Antiene Rail Spur. Members of the joint CCC meet on a six monthly basis. The joint CCC consists of the members of both operations' individual CCCs.

Key aspects discussed at the CCC meetings include environmental complaints and enquiries, air quality, blasting and vibration, waste management, rehabilitation and new developments. Throughout the 2015 reporting period, four Drayton CCC meetings were held in February, May, September and December, while two joint CCC meetings were held in conjunction with the Mt Arthur Coal in June and September.

The minutes from CCC meetings are published on the Drayton web page.

4.2.1 Social / Economic Contributions and Achievements

Drayton supports a diverse range of projects benefiting the communities of Muswellbrook, Singleton and Upper Hunter LGAs. Contributions are made regularly through application rounds which are advertised in the local papers. Community members belonging to schools and organisations requiring funding for projects, equipment or events are encouraged to complete the application form (available on the Anglo American website) for consideration.

Drayton supports projects relating to education and training, health and welfare, sport, arts, culture and heritage, and environment.

In 2015, Drayton made donations of $234,000 to 74 organisations within the local community. Figure 25 shows the breakdown of recipient organisation type.

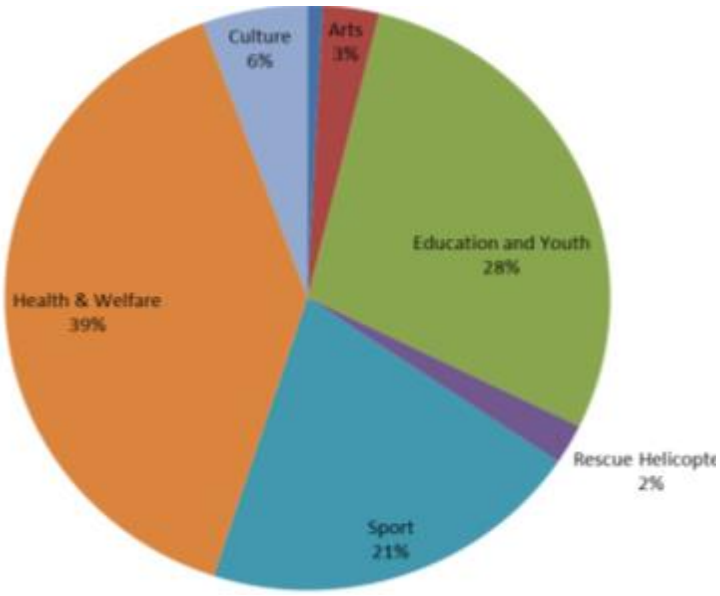


Figure 25: Recipient Organisation Type

The biggest sponsorships for 2015 were:

- Construction of a covered outdoor learning area for Muswellbrook South Public School ($37k)
- Upgrade of facilities for Riding for the Disabled ($30k)
- Sponsorship of the Muswellbrook Christmas Spectacular event ($16k)
- Upgrade of kitchen facilities for a community hall at Rouchel ($10k)
- Sponsorship of the Aberdeen Highland Games ($10k)
- Sponsorship of the Cancer Council ($10k)
- Enclosure for a gym facility at Muswellbrook High School ($9k)
- Installation of a pool hoist for disabled swimmers at the Muswellbrook Pool ($7k)

All the projects Drayton participates in through sponsorship and donations demonstrate Anglo American's commitment to improving social infrastructure for the ongoing benefit of our local communities. 'Giving back' to the local community in which we live and operate is our commitment.

5 REHABILITATION

Drayton has conducted rehabilitation activities since 1983 with a focus on achieving a safe, sustainable and non-polluting landform. The foremost objective of mine rehabilitation at Drayton is to create a landform which is compatible with the surrounding land use practices, is stable in the long term and is capable of a productive post mining land use. Rehabilitation is designed to align with the conservation objectives of the Drayton offset areas as well as those of neighbouring land holders. The objectives of local strategies including the Muswellbrook Shire Council Mining Rehabilitation Policy have been incorporated where possible and the general principles of the NSW Department of Resources and Energy - Mineral Resources 'Synoptic Plan of Integrated Landscapes' have been accounted for in the plan with respect to the creation of wildlife habitat corridors.

The Drayton area was traditionally used for beef cattle grazing, so maintaining grazing capacity in pasture areas is a key objective. Another key objective is to maintain ecosystems and biodiversity through the establishment of trees native to the region. Attainment of both goals will result in land that has good grazing potential and high wildlife amenity.

5.1 Buildings

No buildings are scheduled for removal during the 2015 - 2020 MOP period however some buildings may require removal if Drayton mine is closed at the end of the MOP term. All buildings undergo routine inspections and maintenance. No buildings were renovated or removed at Drayton during the 2015 reporting period.

5.2 Rehabilitation of Disturbed Land

Drayton achieved the area proposed in the MOP of 108 ha of rehabilitation in 2015, however wet weather towards the end of 2015 resulted in some areas requiring minor drainage work and seeding in January 2016. The areas that were rehabilitated in 2015 were in North Pit (NN), South Pit East (SPE), South Pit West (SPW) and the East Pit (ES and EN). These areas are shown in Figure 26.

The areas that were rehabilitated in 2015 varied slightly compared to Plan 3A in the Drayton MOP. According to the plan, part of the area completed in the South Pit West was due for completion in 2016. The area scheduled for completion in 2016 was brought forward to ensure target hectares were achieved despite a delay in the South Pit East rehab area targeted for rehabilitation in 2015. The majority of the area scheduled for rehabilitation which was not completed in 2015 was highwall rehabilitation with only a small area of highwall rehabilitated as planned due to blasting delays. The remaining area was rehabilitated as planned.

Areas rehabilitated during the reporting period were bulk shaped and, where necessary, capped with inert material at a minimum depth of two metres to minimise the risk of spontaneous combustion. Contour banks designed with a 0.5% gradient were constructed as required across all rehabilitated areas, with all runoff being collected in the mine water system. Contour drains were constructed using a D6 dozer and an excavator. Areas were spread with Organic Growth Medium (OGM), using a tractor drawn spreader. The OGM came from a green waste recycling plant in Sydney and provides additional organic material to the soil to promote plant growth.

Post mining land use for the site is low intensity grazing with biodiversity values being protected via the establishment of a habitat corridor. Of the 108 ha completed in 2015, approximately 68 ha were seeded to pasture. The pasture seed mix used is detailed in Table 40**,** and the mix was applied with fertiliser at a rate of 100-250 kg/ha, which also acted as a bulking agent to ensure even spread of the seed. The mix used was varied between winter and summer sown areas.

Table 40: Pasture Species Mix

Species	Kg/Ha	Species	Kg/Ha
Millet (summer)	**40**	**Oats (winter)**	**40**
Ryegrass	**4-5**	**White Clover**	**2-5**
Lucerne	**5-10**	**Vetch**	**2-5**
Couch	**5**	**Medic**	**2-5**
Panic	**2**	**Croplift 15 (fertilizer)**	**100-250**
Kikuyu	**0-3**		

The proposed land capability classifications for the pasture areas ranges from Class IV to Class VI. Class IV and V lands are suitable for well managed grazing, and Class VI and VII lands are not suitable for grazing, but can be used for native woodlands. Post mining rural land capability classification has not yet been assessed for these areas. Pasture areas continue to exhibit high groundcover establishment levels. Completion criteria based on palatable species establishment, diversity of grazing species and soil characteristics have been developed. Future monitoring will include assessment of these parameters against the completion criteria. Rural land capability classification assessment will be completed for areas where grazing has been identified as the final land use, prior to completion. Section 5.4 discusses a trial currently underway grazing horses on rehabilitated pasture.

Approximately 38ha of the rehabilitation completed during the reporting period was seeded to native (Spotted Gum Grey Box) woodland to expand and enhance the habitat corridor being established across site. This corridor is designed to link the Southern Offset area to the Northern Offset area and is consistent with the MOP. These areas will in turn link to other offsite conservation areas. The native woodland species used are outlined in Table 41. All seeding mixtures included millet (summer) or oats (winter) as a cover crop to aid soil stabilisation. All native seed was sourced from within NSW with seed sourced within the Hunter Valley where possible. Some species seeding rates were varied depending on availability and price of local provenance seed at the time of seeding.

An additional 37.6 ha of the Southern Offset area was re-seeded to native woodland during the reporting period. This seeding was undertaken as part of the Southern Offset restoration. Of the 37.6 ha: 19.2 ha was seeded to Narrow-leaved Ironbark Woodland community; 7.4 ha was seeded to Spotted Gum Grey Box Woodland community; 7.8 ha was seeded to Yellow Box Grey Box Woodland community; and 3.2 ha was seeded to Forest Red Gum Woodland community in accordance with the Offset Strategy and the vegetation community plan set out in

the Rehabilitation and Offset Management Plan. The species seed mix used for each community is given in Table 41.

Table 41: Native species seed mix Woodland rehab 2015

Species	Vegetation Community	Kg/Ha
Acacia decora	Narrow-leaved Ironbark Woodland	0.3
	Spotted Gum Grey Box Woodland	0.4
	Yellow Box Grey Box Woodland	0.5
	Forest Red Gum Woodland	0.8
Acacia falcata	Narrow-leaved Ironbark Woodland	0.6
	Spotted Gum Grey Box Woodland	0.6
Acacia implexa	Spotted Gum Grey Box Woodland	0.3-0.4
	Yellow Box Grey Box Woodland	0.4
Acacia paradoxa	Narrow-leaved Ironbark Woodland	0.4
	Yellow Box Grey Box Woodland	0.4
Acacia parvipinnula	Spotted Gum Grey Box Woodland	0.2-0.3
Acacia salicina	Narrow-leaved Ironbark Woodland	0.3
Angophora floribunda	Narrow-leaved Ironbark Woodland	0.1
Brachychiton populneus	Narrow-leaved Ironbark Woodland	0.1
	Yellow Box Grey Box Woodland	0.1
Breynia oblongifolia	Narrow-leaved Ironbark Woodland	0.3
	Spotted Gum Grey Box Woodland	0.2
	Forest Red Gum Woodland	0.6
Bursaria spinosa	Spotted Gum Grey Box Woodland	0.4
	Yellow Box Grey Box Woodland	0.4
	Forest Red Gum Woodland	0.4
Corymbia maculata	Narrow-leaved Ironbark Woodland	0.1
	Spotted Gum Grey Box Woodland	0.4-0.5
	Yellow Box Grey Box Woodland	0.1
	Forest Red Gum Woodland	0.2
Daviesia ulicifolia	Spotted Gum Grey Box Woodland	0.2
	Yellow Box Grey Box Woodland	0.1
	Forest Red Gum Woodland	0.3
Dodonaea viscosa	Narrow-leaved Ironbark Woodland	0.4
	Spotted Gum Grey Box Woodland	0.3
	Yellow Box Grey Box Woodland	0.4
Eucalyptus albens	Narrow-leaved Ironbark Woodland	0.05
	Yellow Box Grey Box Woodland	0.1

Species	Vegetation Community	Kg/Ha
Eucalyptus blakelyi	Narrow-leaved Ironbark Woodland	0.05
	Yellow Box Grey Box Woodland	0.1
Eucalyptus crebra	Narrow-leaved Ironbark Woodland	0.6
	Spotted Gum Grey Box Woodland	0.2
	Forest Red Gum Woodland	0.2
Eucalyptus melliodora	Yellow Box Grey Box Woodland	0.4
Eucalyptus moluccana	Narrow-leaved Ironbark Woodland	0.1
	Spotted Gum Grey Box Woodland	0.3
	Yellow Box Grey Box Woodland	0.3
	Forest Red Gum Woodland	0.2
Eucalyptus tereticornis	Spotted Gum Grey Box Woodland	0.1-0.2
	Yellow Box Grey Box Woodland	0.1
	Forest Red Gum Woodland	0.5
Indigofera australis	Narrow-leaved Ironbark Woodland	0.3
	Spotted Gum Grey Box Woodland	0.4
Myoporum montanum	Yellow Box Grey Box Woodland	0.3
	Forest Red Gum Woodland	0.7
Notelaea microcarpa	Spotted Gum Grey Box Woodland	0.2
	Yellow Box Grey Box Woodland	0.4
	Forest Red Gum Woodland	0.4
Ozothamnus diosmifolius	Narrow-leaved Ironbark Woodland	0.3
Senna artemesioides	Narrow-leaved Ironbark Woodland	0.4
Solanum cinereum	Narrow-leaved Ironbark Woodland	0.2
	Spotted Gum Grey Box Woodland	0.3
	Forest Red Gum Woodland	0.5
Aptriplex semibaccata	All Woodland Mixes	0.3
Aristida mix	All Woodland Mixes	0.6
Austrodanthonia mix	All Woodland Mixes	0.4
Bothriochla macra	All Woodland Mixes	0.6-0.8
Calotis lappulacea	All Woodland Mixes	0.1
Chloris truncata	All Woodland Mixes	0.6-0.7
Chrysocephalum apiculatum	All Woodland Mixes	0.1
Cymbopogon refractus	All Woodland Mixes	0.3
Dicanthium sericeum	All Woodland Mixes	0.6-0.8
Einadia mix	All Woodland Mixes	0.04
Eremophila debilis	Spotted Gum Grey Box Woodland	0.1

Species	Vegetation Community	Kg/Ha
Gahnia aspera	All Woodland Mixes	0.2
Hardenbergia violacea	All Woodland Mixes	0.1
Lomandra longifolia	All Woodland Mixes	0.2
Microlaena stipoides	All Woodland Mixes	0.3
Swainsona galegifolia	All Woodland Mixes	0.1
Themeda australis	All Woodland Mixes	0.6-0.8
Vittadinia mix	All Woodland Mixes	0.03
Wahlenbergia communis	All Woodland Mixes	0.03-0.05
Millet/Oats	Cover crop	2-5
Single Super	Bulking agent	26-30

Approximately 135,000 native plants were planted in rehabilitation areas targeted for native woodland during 2015. Of these, approximately 1600 were planted in the Southern Offset area. Planting in the Southern Offset will continue in 2016 with approximately 100,000 native plants planned to be planted in the area as part of the restoration work being undertaken. The majority of the planting was in areas of the Great North Tip rehabilitation. The planting will increase connectivity of woodland areas in the wildlife corridor thereby enhancing habitat value of rehabilitated areas for fauna. As the trees grow, they will provide an important link between remnant woodland areas in the Southern Offset and intact woodland areas of the Northern Offset and Wildlife Refuge. Planting occurred in August and between October and December 2015. During this period, rainfall was above average and plants were also watered to aid establishment. The species planted are provided in Table 42.

Table 42: Tubestock Species Planted

Species	Approx. Number	Location Planted
Acacia decora	4,960	Great North Tip
Acacia falcata	13,040	Great North Tip
Acacia filicifolia	1,160	Great North Tip
Acacia paradoxa	3,640	Great North Tip
Acacia salicina	2,000	Great North Tip
Angophora floribunda	2,000	Great North Tip
Aristida ramosa	5,670	Great North Tip
Bothriochloa macra	6,950	Great North Tip
Brachychiton populneus	4,240	Great North Tip
Brachyscome	750	Great North Tip

Species	Approx. Number	Location Planted
Breynia oblongifolia	1,150	Great North Tip
Dodonaea boronifolia	1,240	Great North Tip
Chloris ventricosa	750	Great North Tip
Corymbia maculata	16,820	Great North Tip
Cymbopogon refractus	9,880	Great North Tip / Southern Offset
Dodonaea viscosa	8,850	Great North Tip / Southern Offset
Eucalyptus albens	3,060	Great North Tip
Eucalyptus blakelyi	2,280	Great North Tip
Eucalyptus crebra	19,520	Great North Tip
Eucalyptus moluccana	10,160	Great North Tip
Eucalyptus tereticornis	5,040	Great North Tip
Hardenbergia violacea	2,640	Great North Tip
Lomandra longifolia	800	Great North Tip
Lomandra multiflora	250	Great North Tip
Microlaena stipoides	750	Great North Tip
Myoporum montanum	2,000	Great North Tip
Ozothamnus diosmifolius	3,040	Great North Tip
Themeda australis	4,440	Great North Tip

The 2015 annual flora and fauna monitoring addressed vegetation establishment, presence of weeds, habitat for native fauna, and any further works required to meet completion criteria.

Table 43 gives an estimate of mining and rehabilitation areas located at Drayton for 2015 (note annual figures are based on Minex v6.4).

Maintenance activities conducted on rehabilitated land during the reporting period are estimated in Table 44.

Table 43: Rehabilitation Summary

		Area Affected / Rehabilitated (hectares)		
		To Date	**Last Report**	**Next Report (Estimated)**
A:	**MINE LEASE AREA**			
A1	Mine Lease(s) Area	1767.5		
B:	**DISTURBED AREAS**			
B1	Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	100.7	101.1	101
B2	Active Mining Area (excluding items B3 – B5 below)	431.3	554.5	365
B3	Waste emplacements (active/unshaped/in or out-of-pit)	74.7	77.8	47
B4	Tailing emplacements (active/unshaped/in or out-of-pit)	22.8	16.2	30
B5	Shaped waste emplacement (awaits final vegetation)	9.6	25.1	10
ALL DISTURBED AREAS		639.1	774.7	553
C:	**REHABILITATION PROGRESS**			
C1	Total Rehabilitated area (except for maintenance)	619.7	514.2	705.7
D:	**REHABILITATION ON SLOPES**			
D1	14 to 18 degrees	59	200.8	140
D2	Greater than 18 degrees	4	27	7
E:	**SURFACE OF REHABILITATED LAND**			
E1	Pasture and grasses	417.8	347.1	487
E2	Native forest/ecosystems	197.4	162.6	214
E3	Plantations and crops	4.5	4.5	4.5
E4	Other (include no vegetative outcomes)	0	0	0

Table 44: Maintenance Activities on Rehabilitated Land

	Area Treated (ha)		
NATURE OF TREATMENT	**Report period**	**Next period**	**Comment/control strategies/ treatment detail**
Additional erosion control works (drains re-contouring, rock protection**)**	**50**	**40**	**Contour banks and drainage installed on newly rehabilitated areas.**
Re-covering (detail - further topsoil, subsoil sealing etc)	**108**	**86**	**Topsoil and clay spread on newly rehabilitated areas.**
Soil treatment (detail - fertiliser, lime, gypsum etc)	**146**	**86**	**Fertiliser used with pasture seed mix – OGM used with woodland seed mix on new rehab.**
Treatment/Management (detail - grazing, cropping, slashing etc)	**15**	**15**	**A paddock was fenced in 2014 for the purposes of a horse grazing trial. The paddock was grazed throughout 2015.**
Re-seeding/Replanting (detail - species density, season etc)	**40**	**40**	**Re-seeding/replanting on Southern Offset.**
Adversely Affected by Weeds (detail - type and treatment)	**5**	**50**	**Ongoing weed control conducted – target species on rehabilitated areas during 2015 were Prickly Pear and environmental weeds.**
Feral animal control (detail - additional fencing, trapping, baiting etc)	**200**	**200**	**Wild dog baiting and kangaroo culling. South Tip and Southern Offset areas targeted 2015.**

The current extent of rehabilitated areas at Drayton including those completed during the 2015 reporting period are shown below in Figure 26. Figure 27 toFigure 29 indicate the contours and drainage of rehabilitated areas completed in 2015, and Figure 30 outlines target vegetation communities on the 2015 rehabilitation areas. Figure 31 identifies the areas proposed for rehabilitation in 2016.

Figure 32 to Figure 40 show cross sections of rehabilitated areas with all areas generally less than 18 degrees.

Figure 26: Rehabilitation Areas to end 2015

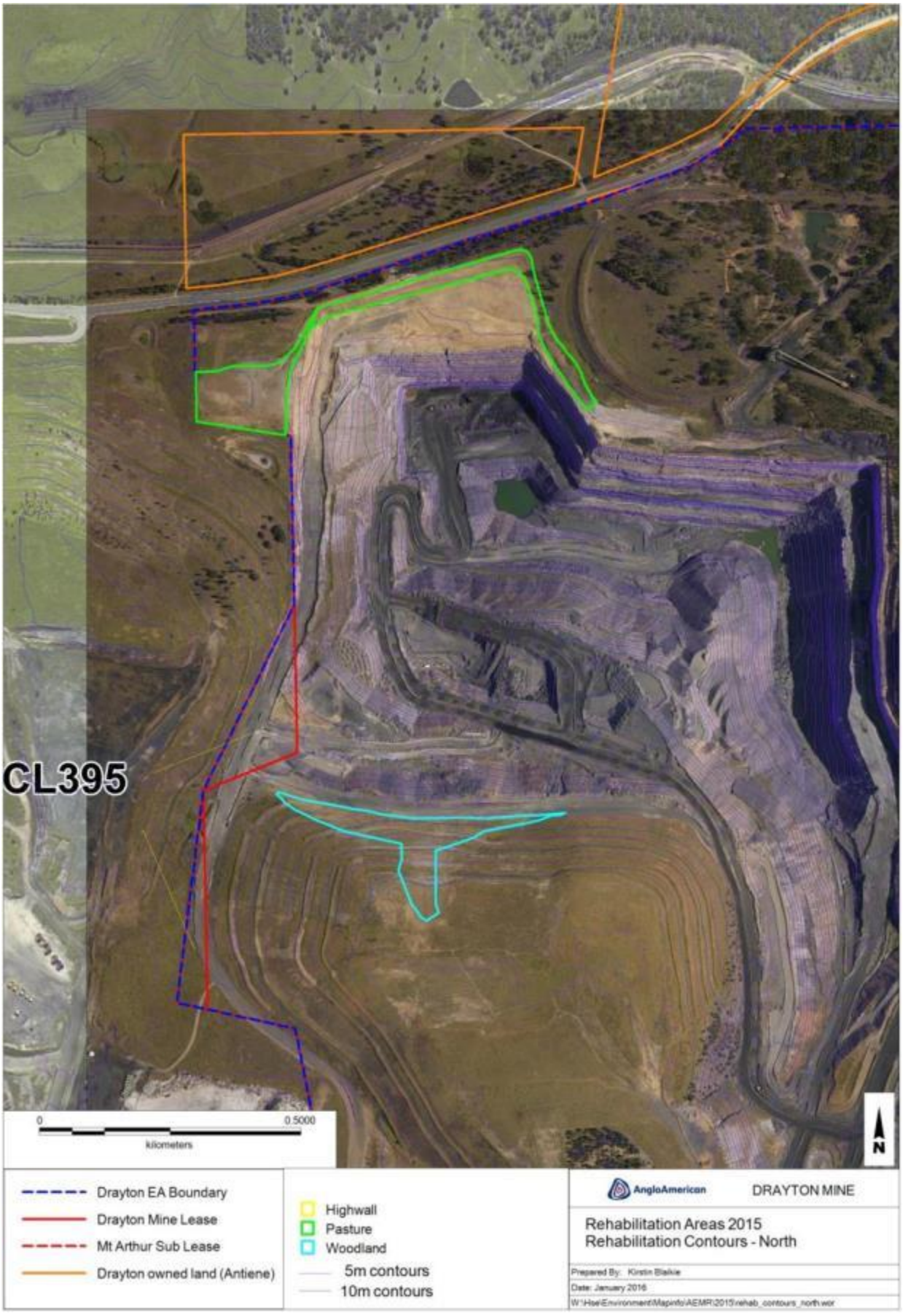


Figure 27: Rehabilitation Area Contours – North

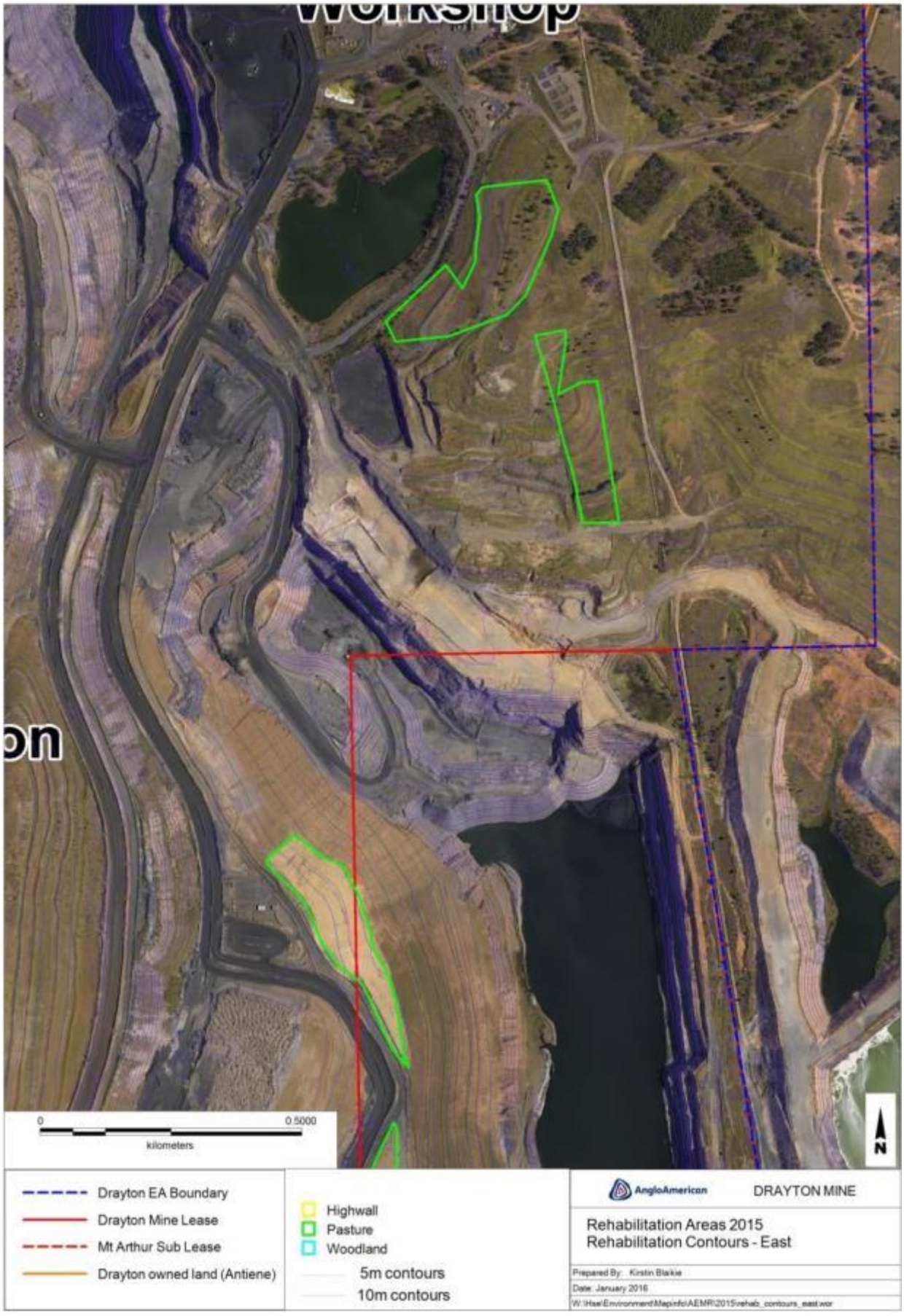


Figure 28: Rehabilitation Area Contours - East

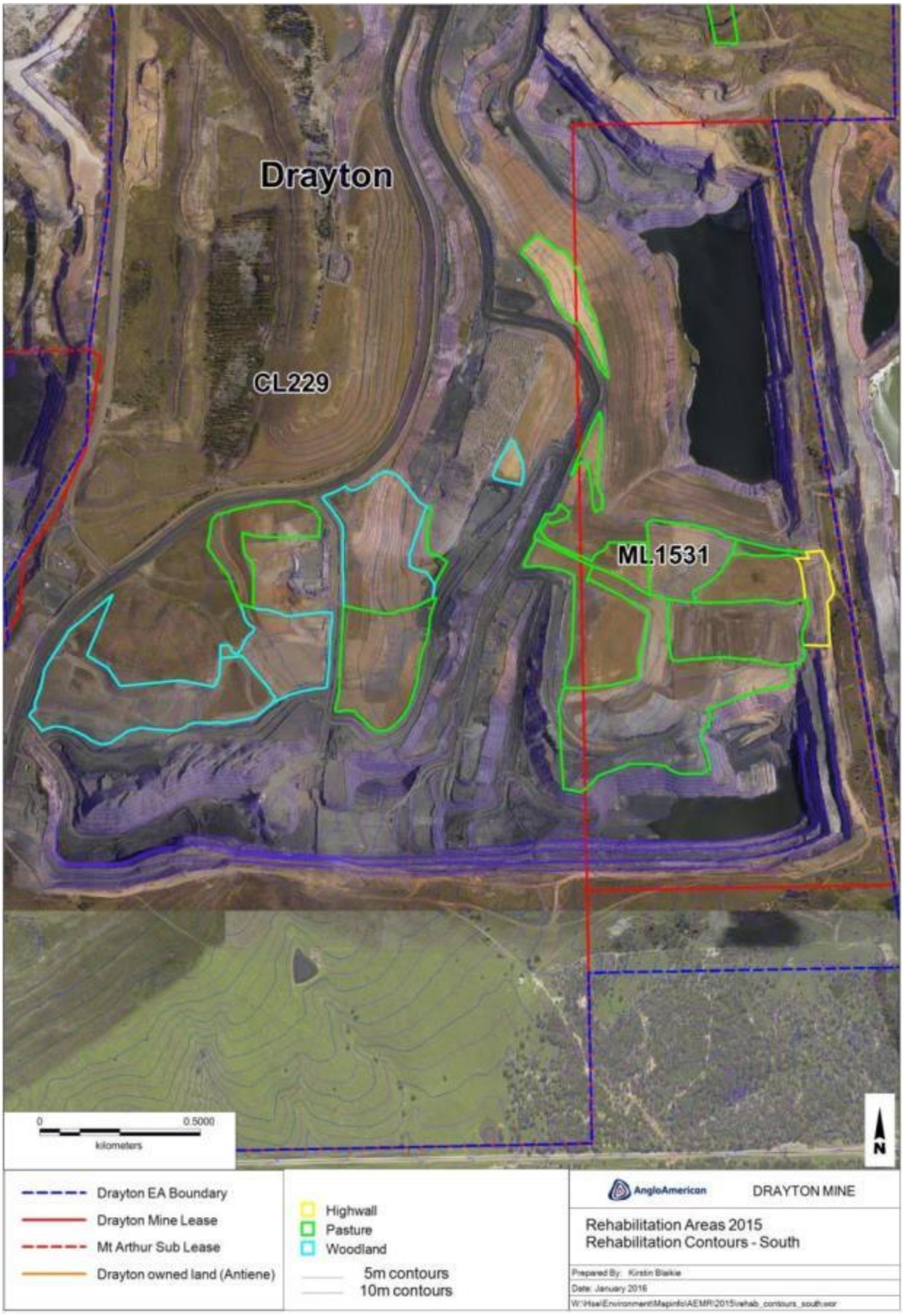


Figure 29: Rehabilitation Area Contours – South

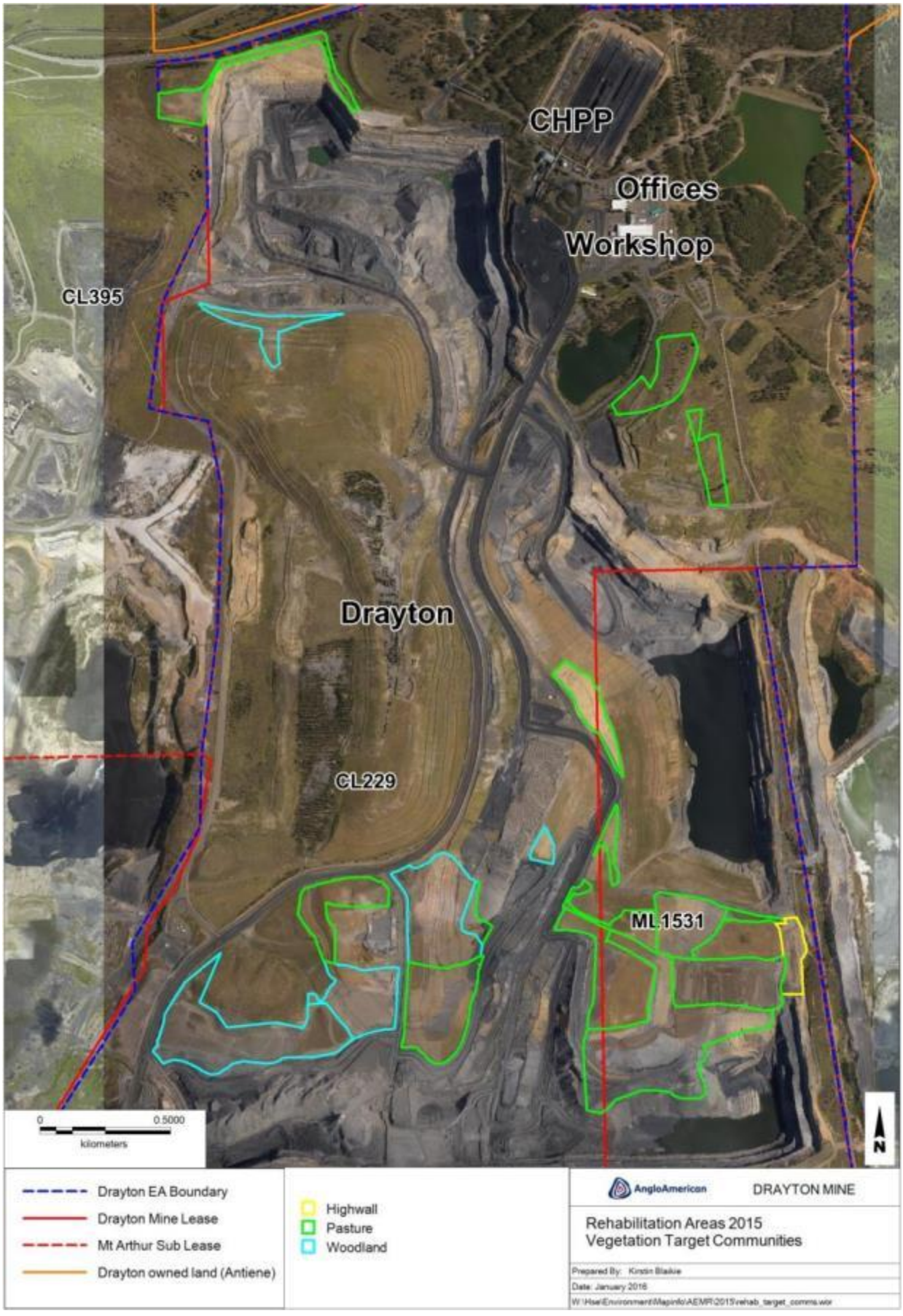


Figure 30: Rehabilitation Area Target Vegetation Communities

Figure 31: Proposed Rehabilitation Areas 2016

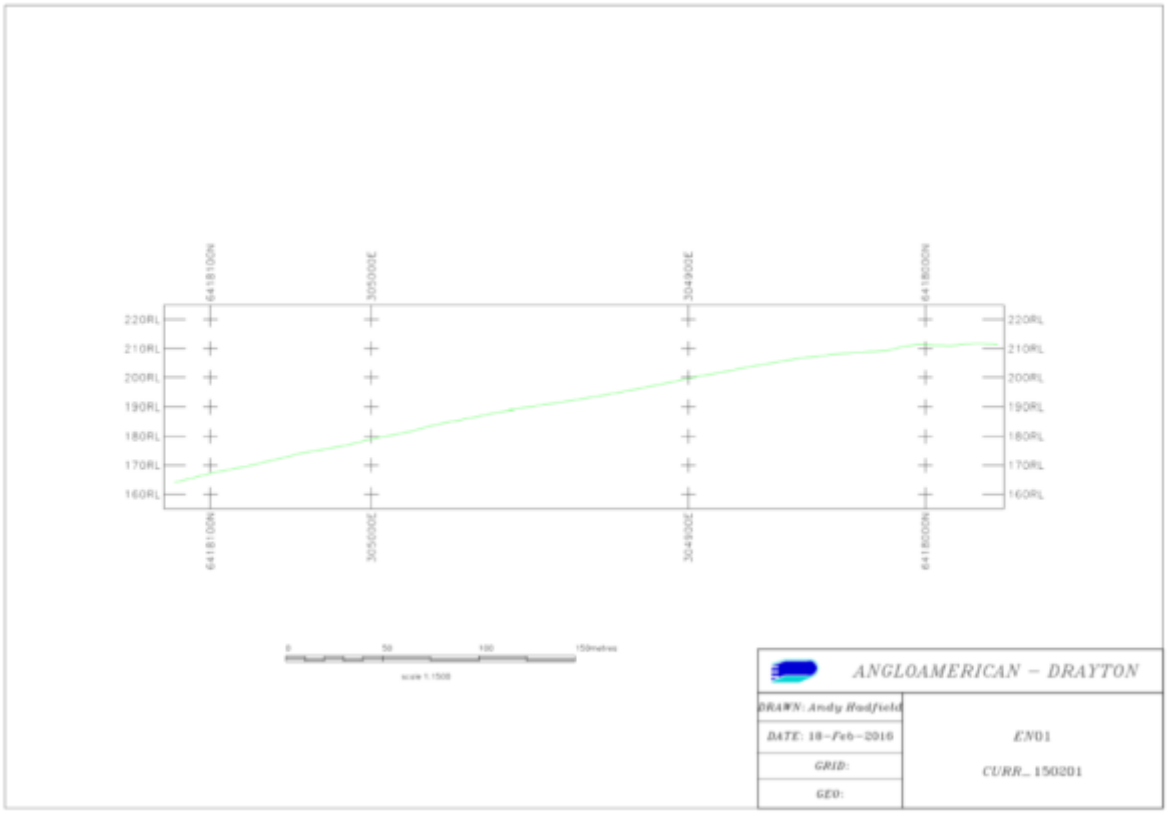


Figure 32: Cross Section of EN01 rehabilitation area

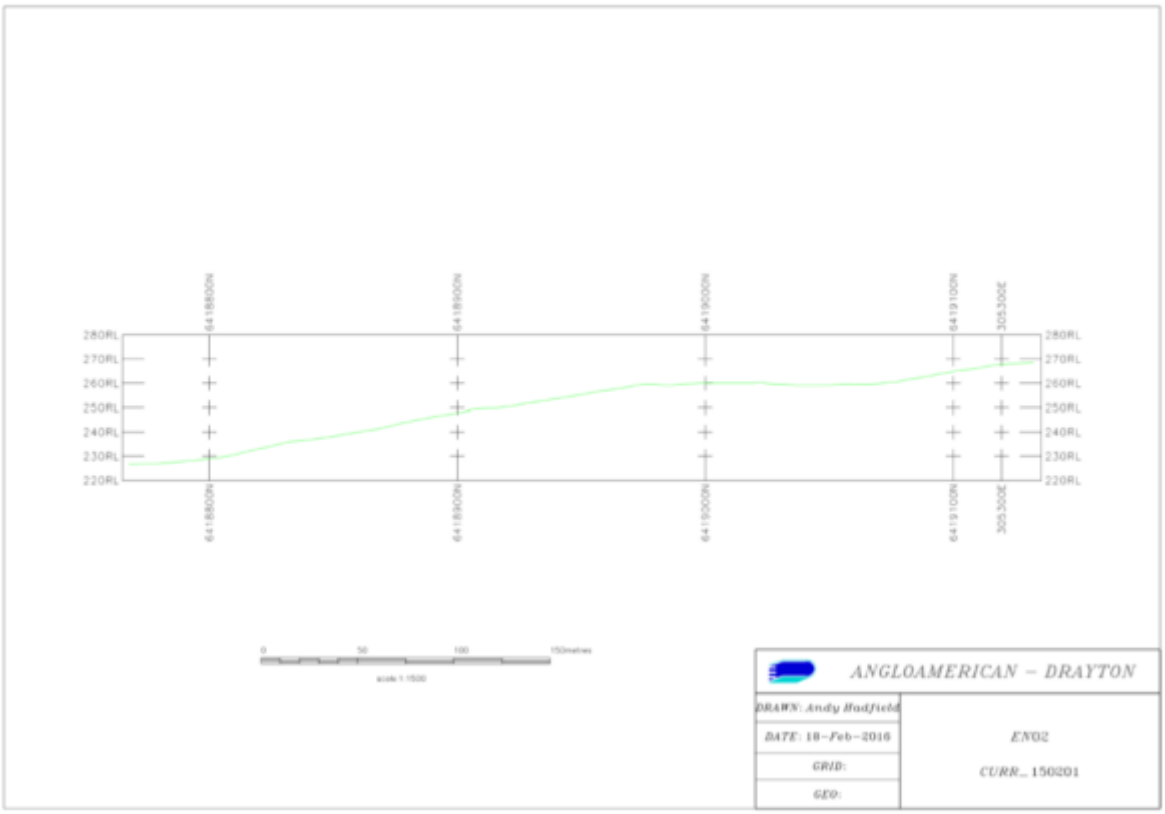


Figure 33: Cross Section of EN02 rehabilitation area

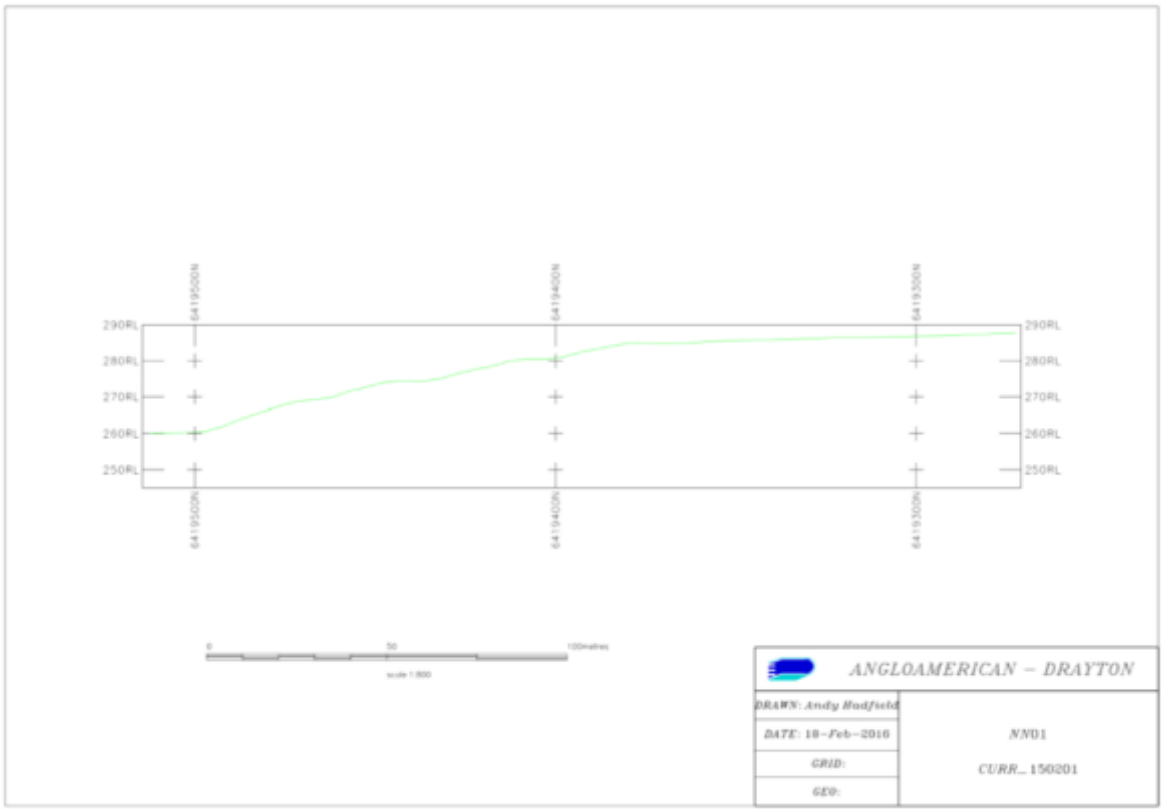


Figure 34: Cross Section of NN01 rehabilitation area

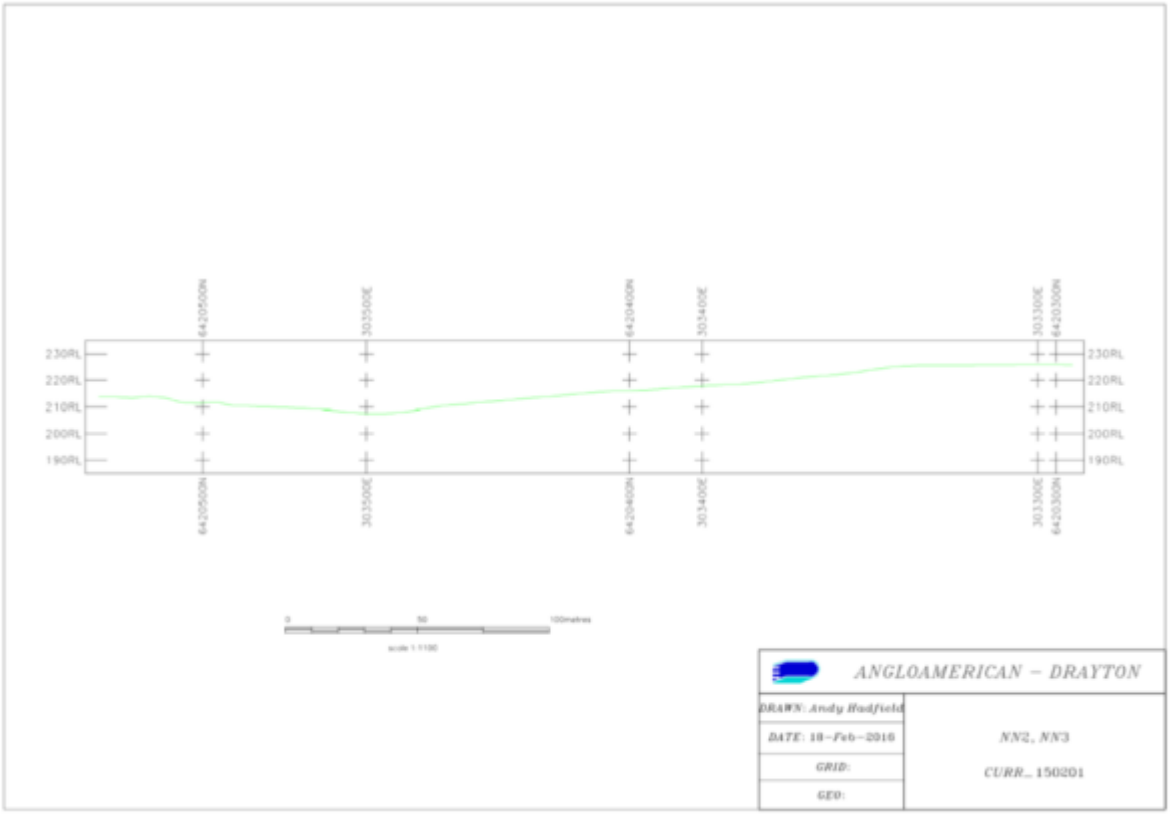


Figure 35: Cross Section of NN02 rehabilitation area

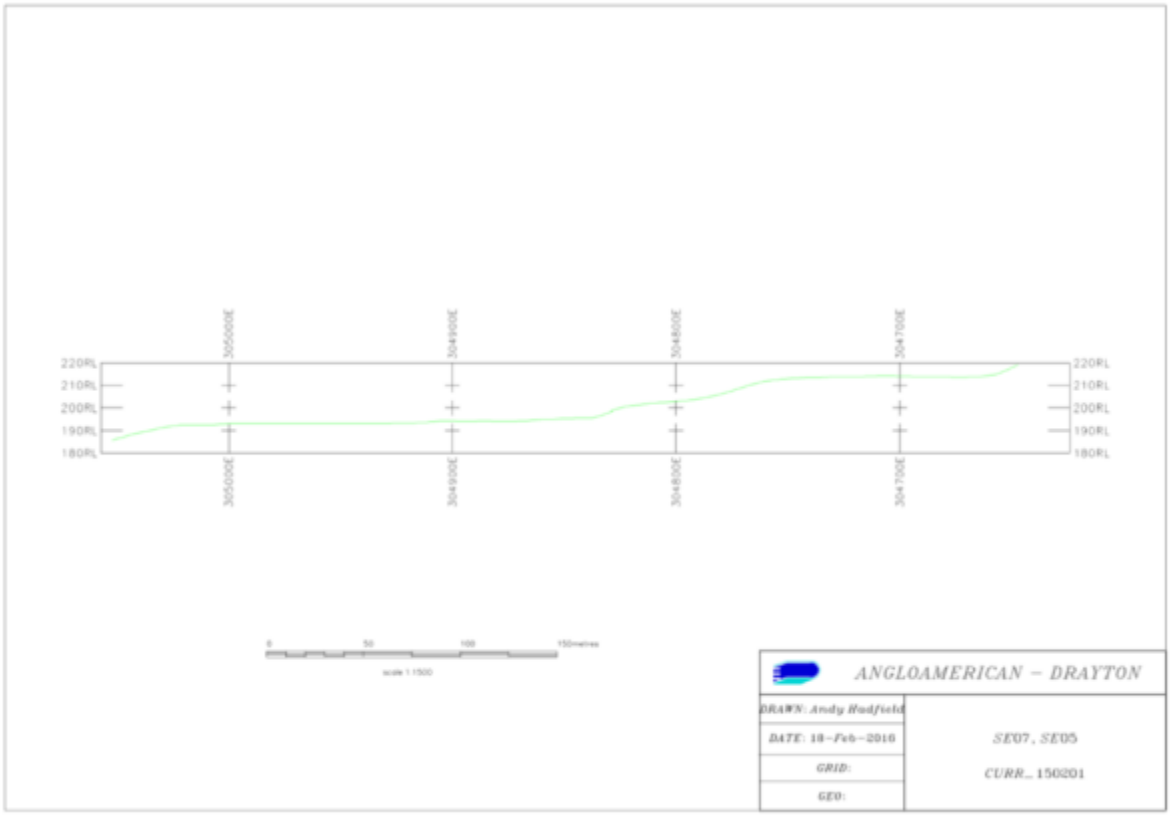


Figure 36: Cross Section of SE5-7 rehabilitation area

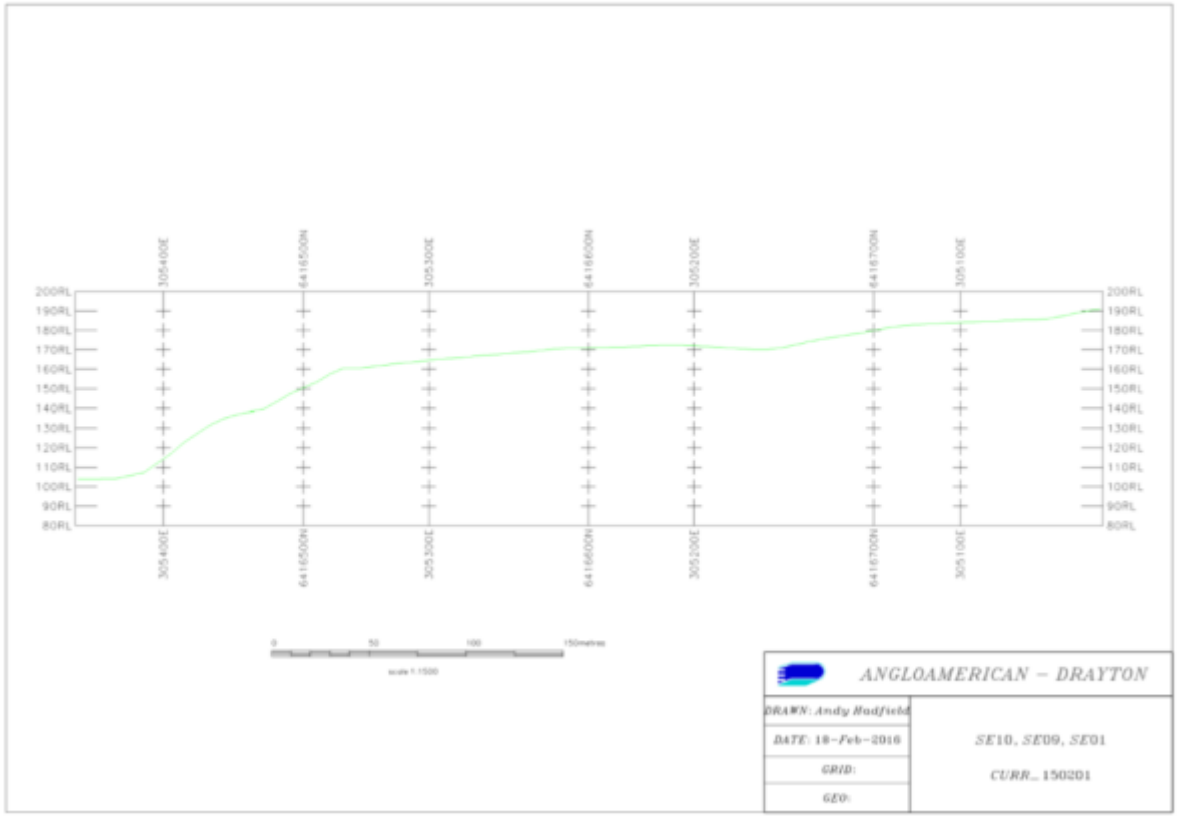


Figure 37: Cross Section of SE9-10 rehabilitation area

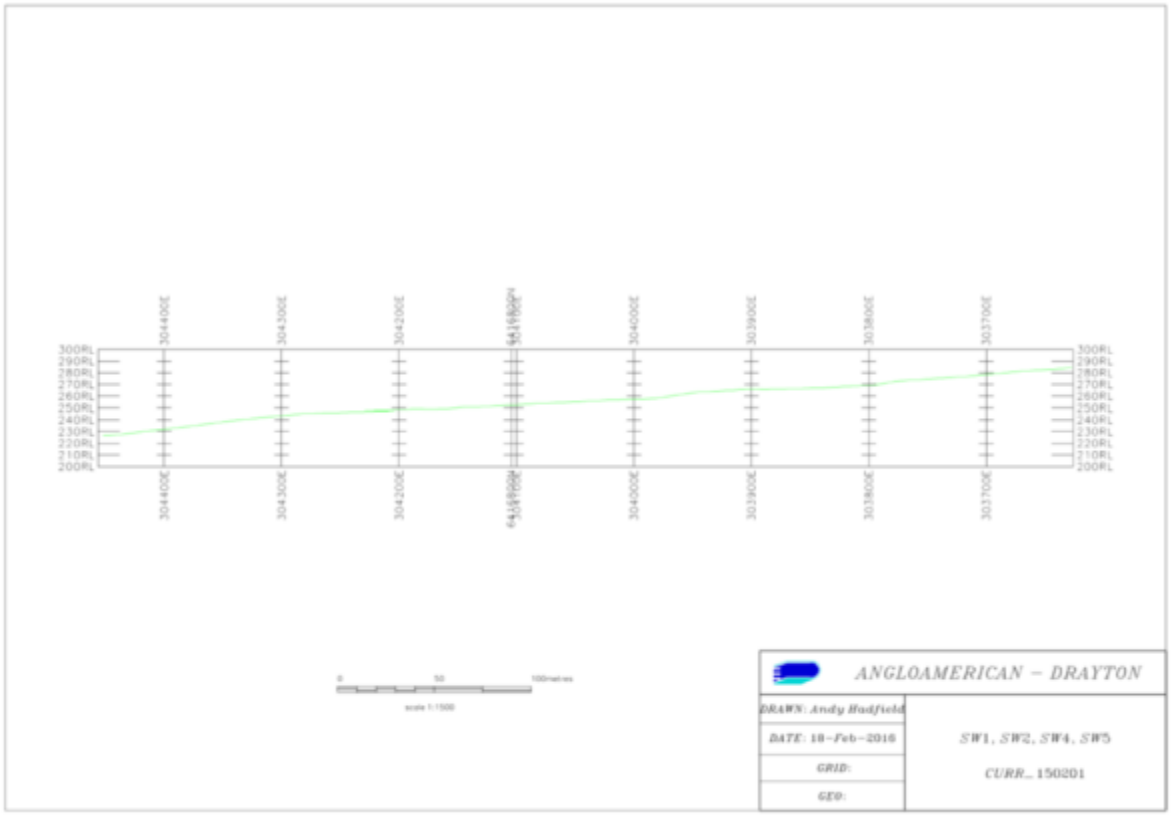


Figure 38: Cross Section of SW1, 2, 4 and 5 rehabilitation areas

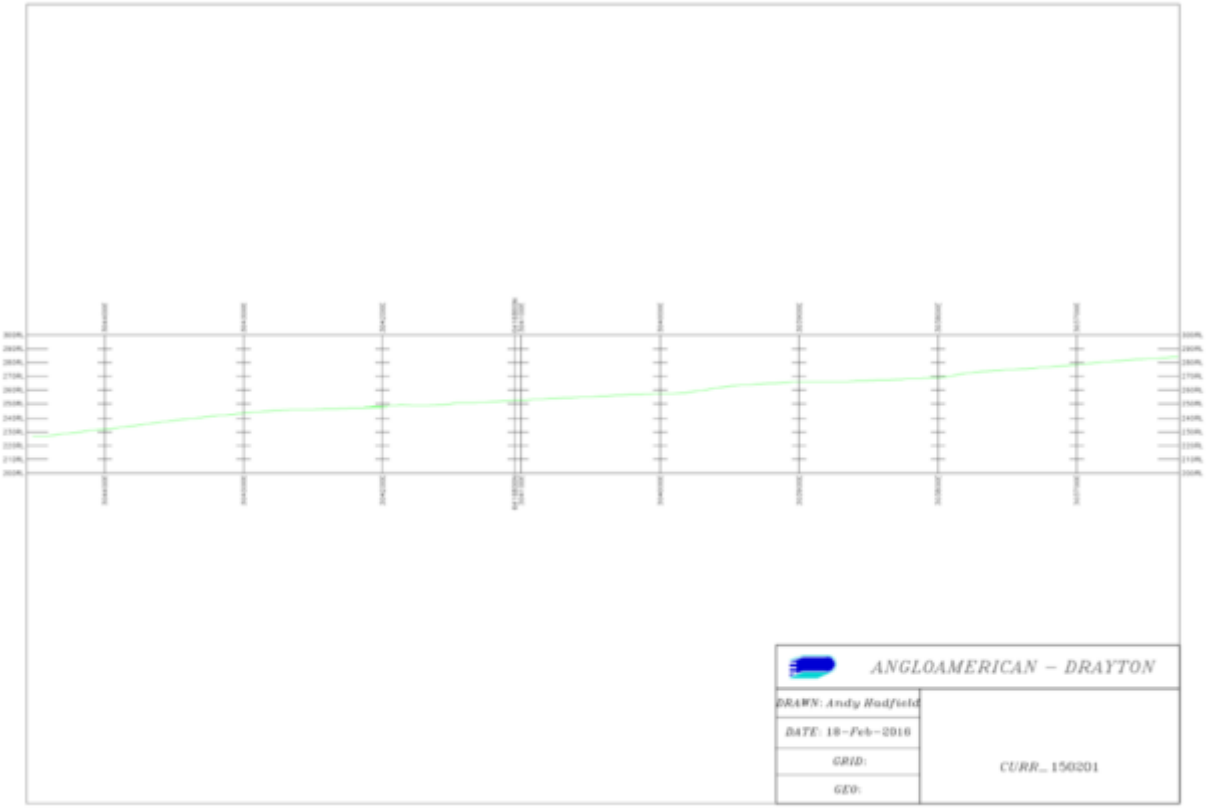


Figure 39: Cross Section of SW2 and 5 rehabilitation areas

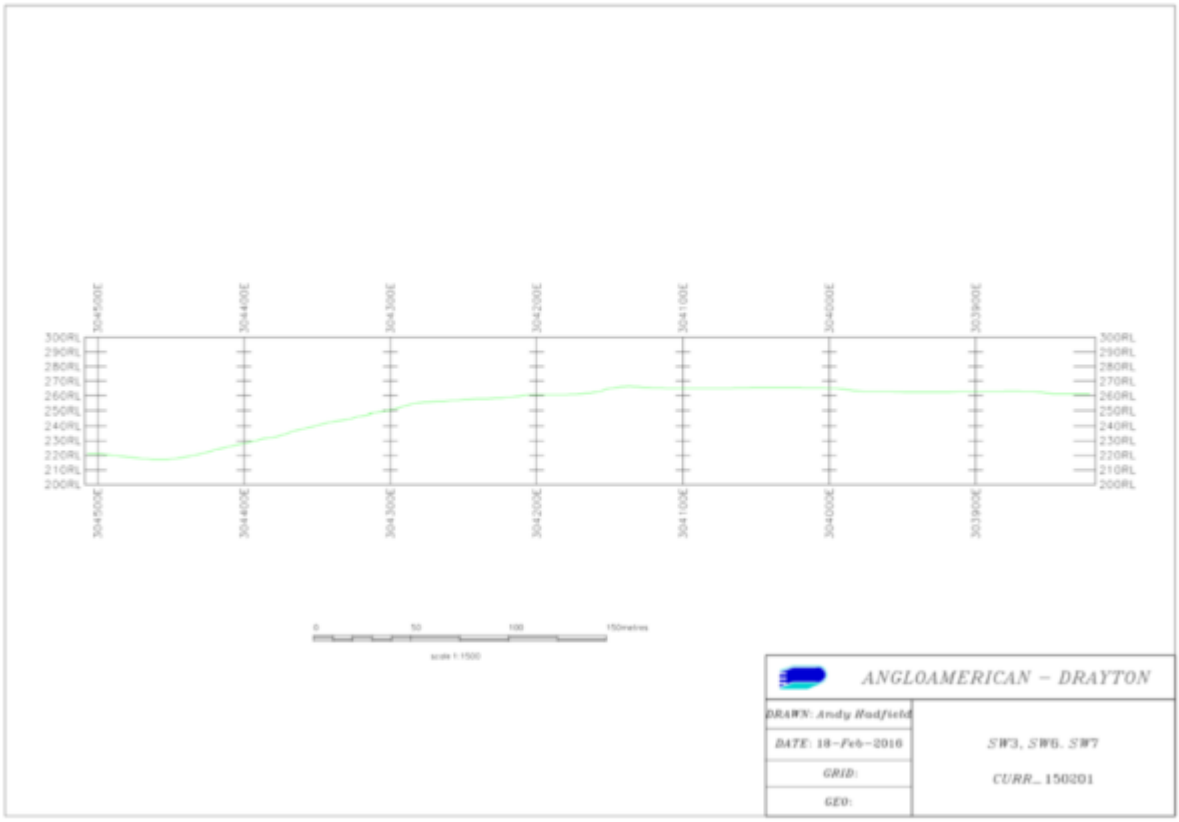


Figure 40: Cross Section of SW3, 6 and 7 rehabilitation areas

In 2008, 88 ha of land within the Drayton lease was dedicated as an offset area. This land, named the Southern Offset, is located in the Saddlers Creek catchment and includes both remnant woodland within the creek and an area of post mining rehabilitation. The rehabilitation area is being progressively replanted to establish target vegetation communities outlined in the Offset Strategy. Monitoring of the Southern Offset area during 2013 identified areas where previously existing vegetation was no longer present. Areas of poor vegetation growth were also observed. Further investigation identified the presence of steam in localised areas and a thermography survey of the Southern Offset was conducted in June 2013. The Thermography Survey Report revealed an area of approximately 11 ha exhibiting active surface heating.

A proposed restoration strategy was developed and presented in the Southern Offset Area Restoration Report. The report outlined proposed restoration of the 11 ha area with active surface heating and a further 14 ha not exhibiting active surface heating but with poor vegetation establishment. The restoration work commenced in 2014 and involved capping of the surface heating areas with at least 2 m of clay, spreading topsoil in all areas, reconstructing the contour banks, and seeding.

Further seeding of 37.6 ha and planting of approximately 1600 tubestock occurred in 2015. A further 100,000 tubestock are scheduled to be planted in 2016 in order to establish target vegetation communities according to the Offset Strategy. Annual flora and fauna monitoring of the areas and thermal surveys are ongoing to monitor progress towards target vegetation establishment. Areas found to have surface heating will be subject to further restoration works.

Flora and fauna monitoring undertaken in 2015 discovered the Spotted-tail Quoll (*Dasyurus maculatus*) using habitat in the remnant woodland section of the Southern Offset. The species is listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and vulnerable under the *Threatened Species Conservation Act 1995* (TSC Act). The species has not been previously recorded on site. This remnant woodland area in the Southern Offset provides habitat for many native species including other threatened species of bat and the Squirrel Glider (*Petaurus norfolcensis*) recorded over successive monitoring events.

As expected, flora in the rehabilitated areas of the Southern Offset was not considered to be meeting criteria due to being subject to restoration over the past two years. The performance of the restored areas is expected to improve in future years as planted native species start to develop. Monitoring in all areas will continue to track progress against criteria.

5.3 Other Infrastructure

No other infrastructure was subject to rehabilitation during the period.

5.4 Rehabilitation Trials and Research

Drayton has conducted various trials on site over the life of the mine, and been involved in a number of in-house and industry sponsored research projects.

In August 2014, Drayton introduced horses into a 40 acre area on the Far East Tip of primarily pasture rehabilitation with a small area of virgin land. At the end of the reporting period there were six horses in this area. The area has been fenced to safely contain the horses and a watering point installed for their wellbeing. There are a number of treed areas to provide shade and cover. During the 2015 flora monitoring, two sites were monitored in this area to track pasture response to grazing. During the 2016 reporting period, Drayton will continue to monitor the pasture response to grazing and adjust stocking rates as required.

Figure 41: Horse grazing trial

5.5 Further Development of the Final Rehabilitation Plan

Rehabilitation inspections during 2015 assessed risk to rehabilitation areas including competition from weeds, erosion, spontaneous combustion and predation by animals.

Rehabilitation areas were assessed for weed infestations in 2015 and treated for Prickly Pear, St John's Wort and various environmental weed species as detailed in Section 3.9.

Rainfall during late 2015 caused erosion in the newly rehabilitated areas in South Pit. To combat this, contour banks were extended or re-installed where necessary. The erosion was addressed using ripping and seeding or left to stabilise with newly germinated vegetation, depending on the extent and severity of the erosion in the area.

The 2015 rehabilitation areas were assessed for spontaneous combustion using thermal imaging techniques. This monitoring will continue during 2016 to ensure any outbreaks in rehabilitation areas are identified and managed.

Assessments of tree growth in woodland rehab areas from seed or tubestock will be conducted during 2016 with replacement tubestock to be planted as required to achieve the target woodland communities at densities approaching that of the reference sites.

Flora and fauna on rehabilitation areas were monitored during 2015 by Eco Logical Australia (ELA). The report is yet to be finalised.

Organic waste compost product was used as growth medium establishment on several areas in 2015 rehabilitation and restoration, being SW2 rehab, SE9 rehab and the Southern Offset area. Monitoring will continue in 2016 to determine the success of plant establishment using this product.

Drayton's Mine Closure Plan was approved 30 October 2015. This plan was drafted in consultation with:

- Muswellbrook Shire Council
- NSW Department of Planning and Infrastructure
- Office of Environment and Heritage
- Division of Resources and Energy

The plan was developed assuming that the Drayton South Project is not successful and mining at Drayton finishes in 2017. The Mine Closure Plan identifies areas of rehabilitation through to 2018. The rehabilitation targets for the following years are detailed below and include the completed rehab areas for each reporting period (see Table 45).

Table 45: Rehabilitation Plan Target and Actual Completed

Year	Rehabilitation Target (ha)	Rehabilitation Completed (ha)
2014	40	41.2
2015	108	108
2016	86	
2017	106	
2018	241	
2019	143	

The rehabilitation targets outlined in the Mine Closure Plan show target annual hectares beyond 2017 when Drayton's development approval expires. To achieve the objectives of the Mine Closure Plan, rehabilitation activities are expected to continue for several years beyond the cessation of mining at Drayton.

6 ACTIVITIES PROPOSED FOR THE NEXT AEMR PERIOD

6.1 Environmental Performance

Drayton's environmental targets for the 2016 reporting period include:

- Maintaining full compliance with environmental legislation;
- Comply with an 80% dust control efficiency on all haul roads;
- Nil discharge of mine water;
- All blasts to be less than 5 mm/sec ground vibration and 115 dB(L) at the nearest residence;
- Dust emissions to be below the statutory limits of 4g/m^2/month and 50 μg/m^3 TSP at nearby residences;
- Noise emissions to be below statutory requirements;
- Reduction in spontaneous combustion emissions by continued improvement in application of the spontaneous combustion management plan;
- Continuation of the CCC meetings;
- Continuation of the waste management plan and continued improvement in the application of the waste management practices;
- Continuous improvement of the documentation associated with the Environmental Management System;
- Conduct 86 ha of rehabilitation;
- Implementation of approved Mine Closure Plan

7 ADDITIONAL INFORMATION

7.1 Antiene Joint Rail User Facility

The Antiene Rail Spur is wholly owned and operated by Drayton Mine. Development Consent DA 106-04-00 was obtained in November 2000 to increase the authorised tonnage of the Drayton Loop to 7 Mtpa and the Antiene Spur to 20 Mtpa.

There were no variations to Drayton approvals relating to the rail facility during the 2015 reporting period.

Additionally, condition 8.1 of the DA requires that the following additional information is supplied in relation to environmental management of the Drayton Rail Loop and Antiene Rail Spur development.

7.1.1 Management

Dust mitigation measures were proposed in the EA for both the construction and operation of the Bayswater Rail Loading Facility and operation of the Antiene Joint User Rail Facility. Mitigation measures have included enclosing conveyors, loading trains using a telescopic chute, train carriages designed with small aperture and equipping transfer points with dust suppression structures.

In addition to the dust mitigation measures, which can assist with noise abatement, noise barricades have been constructed at the northern face at the base of the rail loadout bins. In the 2015 reporting period, one noise related complaint was made in regards to rail activity. The complaint is indicated in Table 46 below and is listed in Appendix F.

Table 46: Rail Related Noise Complaints Received in 2015

Date	Enquiry, Concern OR Complaint	Nature	Outcome
3/07/2015	Complaint	Noise	Complaint received from the Environmental Complaint Hotline (forwarded to Environmental Coordinator). Complaint regarding ongoing noise at the complainant's residence from 5 am on the morning of 3/7/15. Environmental Coordinator attended complainant's residence at ~8:35 am by which time the complainant stated that the noise had reduced significantly. Environmental Coordinator and the complainant discussed possibly sources of the noise. The complainant stated the noise sounded like the washery. The CHP supervisor was contacted and noted that there was a train being loaded between ~2 am and 5:30 am and that the CHP was not operating between 5:30 and 8:00 am. Environmental Coordinator asked the complainant to write down the times that he hears elevated noise levels. The complainant mentioned the noise is usually worse from Fridays to Sundays.

Offsite lighting is restricted to certain parts of the rail loader and rail loop. The lighting is similar to street lighting and was predicted to have minimal impacts. A dense surrounding of native

trees is in place to mitigate the impacts on the surrounding residents. In 2015 no complaints were made in regards to lighting.

The joint Drayton and Mt Arthur Coal CCC held two scheduled meetings during 2015 where the environmental performance of the rail spur was discussed and reviewed, together with any environmental enquiries and other issues.

Environmental targets and strategies are detailed in Drayton's Environment Management Plans (EMP) and include:

- Adhere to all conditions as set out in development consent;
- Ensure all monitoring is undertaken per EMP and consent conditions;
- Ensure all enquiries are dealt with promptly and efficiently;
- Ensure all reporting requirements are met within the required timeframe;
- Ensure, if required, that any requirements outside of this consent, as directed by the Director General are undertaken; and
- Ensure active community consultation continues on a regular basis.

7.2 Monitoring

Under the DA 106-04-00 consent condition 6.1 (e) coal haulage reports are required on a six monthly basis. These reports were provided to the DP&E. A summary report is contained in Appendix H. Condition 6.1(b) states that Coal transported along the Antiene Rail Spur is limited to twenty (20) million tonnes per annum of which Drayton is approved to rail seven (7) million tonnes per annum. In the 2015 reporting period, 21,511,795 tonnes of coal was transported on the Antiene Rail Spur. This comprised of 2,557,203 tonnes from Drayton and 18,954,592 tonnes from Mt Arthur Coal. It should be noted that while the limit set for total railed tonnes on the Antiene Rail Spur was exceeded in 2015, Drayton did not exceed the 7 million tonne limit set for its share of the total tonnages. Mt Arthur Coal has a more recent development approval allowing up to 27 million tonnes of coal to be transported along the Antiene Rail Spur.

General environmental monitoring also continued throughout 2015 with regards to both Drayton's mining operation and the use of the Drayton Rail Loop Facility. Impacts to water quality within the Rail Loading Facility and the Rail Spur have been minimal.

The EA predicted only low level air quality impacts as a result of the construction of the Bayswater Rail Loading Facility and operation of the Antiene Joint User Rail Facility. As predicted, no significant amounts of dust have been observed from the rail loop or spur.

Noise assessments indicated that there would not be a significant noise impact from these areas provided that appropriate noise abatement measures were adopted. Noise monitoring in 2015 has supported these assessments.

7.3 Dams Safety Committee Requirements

7.3.1 Liddell Ash Dam

The Liddell Ash Dam Levee (ADL) was constructed to retain ash produced by the Liddell Power Station. The DSC issued Drayton with requirements for monitoring and reporting regarding the ADL.

In 2015 Drayton complied with the DSC requirements by:

- Carrying out an annual independent Type 2 engineering assessment;
- Having tri-weekly inspections conducted by a competent person;
- Completing an annual review of the Ash Dam Management Plan;
- Having an appointed a DSC Liaison Officer;
- Inspecting the ADL after each blast in the notification area;
- Reporting significant changes in seepage to DSC immediately;
- Reporting blast vibrations in excess of 50 mm/s to DSC immediately; and
- Providing monthly reports on:
    - Seepage and pumping rates
    - ash deposition status
    - blast monitoring results within the notification area
    - mining face positions
    - compliance statement

Deposition of ash against the levee in the southern most section of the ADL commenced in mid-March 2015. As predicted, seepage increased significantly when the ash was first deposited. Seepage remained above average in the southern section of the wall until late September 2015 when the ash beach forming against the wall was sufficient to prevent further ash laden water passing through the wall. The seepage rate then returned to normal. This confirmed that the ADL was performing according to design. An ash beach is maintained against the wall to seal it and contain the ash but the wall allows seepage of water to assist consolidation of the contained ash. An increased inspection regime was put in place to monitor seepage changes during this period and monthly reports to the DSC continued to inform them of the status of the ADL during 2015.

In late July 2015, it was noted that the seepage in the southern section adjacent to the area of ash deposition had turned from clear to cloudy. This was reported to the DSC and in early August 2015, the DSC requested that a geotechnical engineer be commissioned to inspect the dam. The inspection was conducted on 11th August 2015 and the results reported to the DSC in the August monthly report. Visual inspections of the dam were increased from tri-weekly to daily until the seepage and turbidity decreased, which occurred during September 2015.

The vibration limit at the ADL for blasting, set by the DSC, is 50 mm/s with all blast results over the limit to be reported immediately to the DSC. Vibration is monitored using two fixed blast

monitors located at the crest and toe of the ADL in accordance with DSC requirements. During 2015, no blasts exceeded the 50 mm/s limit. Vibration results from all blasts within the notification area were reported to the DSC in the monthly reports.

An updated Dam Safety Emergency Plan for the ADL was approved by the DSC 16th November 2015.

A Type 2 surveillance inspection is conducted annually and results are reported to the DSC. A geotechnical engineer inspected the dam on 11th August 2015. A Type 2 surveillance report for this dam was prepared and has since been submitted to the DSC. Several technical recommendations were made regarding the partially completed augmentation of the ADL. Actions associated with these recommendations are tracked in the monthly reports to the DSC.

7.3.2 Access Road Dam

Drayton's main process water storage facility is called the Access Road Dam (2081). This dam is a 13 metre high, significant consequence category, DSC prescribed dam. A Type 3 surveillance inspection is conducted every five years and results are reported to the DSC. A geotechnical engineer inspected the dam on 11th August 2015. A Type 3 surveillance report for this dam was prepared and has since been submitted to the DSC. The report concluded that "the dam and storage together appears to perform as intended. No obvious concerns for the safety of the dam or major operational requirements were noted during this inspection." The report recommended removal of saplings from the bank and spillway which was undertaken during the reporting period. The next report is due in August 2020.

The Access Road Dam is inspected weekly and no stability issues were found during the reporting period. The dam is operated and maintained with adequate freeboard to prevent discharge via the spillway.

APPENDICES

Appendix A: Consents, Leases and Licenses

Table 47: Drayton's Consents, Leases and Licenses

Consents, Leases and Licences	Date of Issue	Date of Expiry	Approval Authority
Licence / Approval Title			
DUAP Conditions re Antiene Rail Spur Development	02/11/2000	02/11/2025	Minister for Planning
PA – Drayton Mine Extension (06_0202)	01/02/2008		Minister for Planning
Modification to Drayton Mine Extension	16/10/2009		Minister for Planning
Modification 2 to Drayton Mine Extension	17/02/2012		Minister for Planning
Lease Conditions			
Exchange of Parts of Coal Lease 229 & Coal Lease 744	25/06/1992		Minister for Mineral Resources and Energy
Coal Lease 395	08/03/2007	Jan 2029	Minister for Mineral Resources and Energy
Renewal of Authorisation 173	12/05/2014		Minister for Mineral Resources and Energy
Mining Operation Plan	01/08/2012	31/12/2017	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment A	15/04/2013	30/04/2015	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment B	11/10/2013	2017	Division of Resources and Energy (DRE)
Mining Operation Plan - Amendment C	9/10/2014	30/10/2015	Division of Resources and Energy (DRE)
Mining Operation Plan	01/07/2015	30/06/2020	Division of Resources and Energy (DRE)
Coal Lease 229	28/05/2003	May 2024	Minister for Mineral Resources and Energy
Mining Lease ML 1531	26/02/2003	Feb 2024	Minister for Mineral Resources and Energy
Ministerial Approval of an Emplacement Area	22/09/2004		Minister for Mineral Resources and Energy
Anglo Sub Lease	29/01/2008		Minister for Mineral Resources and Energy
Ministerial Approval of an Emplacement Area	28/10/2011		Minister for Mineral Resources and Energy
Current Licence Conditions			
Environmental Protection Licence 1323	28/08/2015		NSW Environmental Protection Authority
Bore Licence 20BL111869	24/04/2010	23/04/2015*	NSW Office of Water
Bore Licence 20BL171958	23/02/2015	22/02/2020	NSW Office of Water

Consents, Leases and Licences	Date of Issue	Date of Expiry	Approval Authority
Bore Licence 20BL171956	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171957	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171958	22/02/2015	(pending)	NSW Office of Water
Bore Licence 20BL171955	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171954	27/08/2008	Perpetuity	NSW Office of Water
Bore Licence 20BL171953	27/08/2008	Perpetuity	NSW Office of Water
Licence to Store Explosives (XSTR100017)	22/11/2011	08/05/2016	Work Cover NSW
Radiation Management License (5061259)	18/06/2015	18/06/2016	EPA
Acknowledgement of Notification of Dangerous Goods on Premesis (NDG019387)	04/03/2014	Perpetuity	Work Cover NSW
Hunter River Salinity Trading Scheme (Credit purchase arrangement)	Nov 1998	No current credits	Department Environment & Climate Change (EPA)
Other Agreements			
NPWS Wildlife Refuge	1987		National Parks and Wildlife
Bayswater/Drayton Boundary Licence No 5	02/02/1999		
Licence Agreement for Liddell – Macquarie Generation Water Bores	14/10/1986		Electricity Commission NSW
Agreement to Access & Occupy Property (Water Bores)	04/06/2001		AGL - Macquarie
Agreement to Access & Occupy Property (Far East Tip)	04/06/2001		AGL - Macquarie
Licence Agreement with Muswellbrook Pistol Club	Aug 2001		Drayton Coal Pty Ltd

** Groundwater license renewal submitted to NSW Office of Water 21/04/2015, license renewal pending.*

Appendix B: 2015 Water Sampling Results

Table 48: 2015 Surface Water Results

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
1609	Jan	7540	8.12	7270	< 5	537	592	817	3980	107	658	82
	Feb	7740	8.48	7240	< 5	416	529	728	3230	73	572	81
	Mar	7720	8.28	5560	5	604	654	702	4200	119	678	86
	Apr	7160	8.26	6290	< 5	484	560	689	4200	119	631	100
	May	7340	8.18	6870	< 5	553	586	720	3930	108	569	84
	Jun	7340	8.14	5720	< 5	394	632	650	3760	146	676	83
	Jul	7360	8.14	4520	9	509	599	532	3900	132	640	104
	Aug	7010	8.25	5280	< 5	496	560	555	3210	173	602	78
	Sep	7210	8.41	7240	17	500	541	741	3440	125	601	79
	Oct	7480	8.22	7260	< 5	541	617	706	3670	157	638	87
	Nov	7640	8.27	6880	< 5	526	561	732	3930	154	590	77
	Dec	7430	8.29	7090	8	533	622	768	3760	151	678	82
	Average	**7414**	**8.25**	**6435**	**7**	**508**	**588**	**695**	**3768**	**130**	**628**	**85**

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
1969	Jan	5910	8.53	4530	< 5	425	421	646	2770	161	590	48
	Feb	6320	8.32	5000	< 5	379	385	617	3030	248	580	55
	Mar	6380	7.99	4630	< 5	468	453	632	3140	249	640	50
	Apr	5360	8.06	3750	< 5	346	342	546	2500	230	530	52
	May	5580	8.03	4750	< 5	382	349	562	2610	251	454	40
	Jun	5720	8.13	3490	< 5	297	424	530	2560	304	596	46
	Jul	6030	8.18	4660	< 5	420	397	468	2670	324	581	54
	Aug	5590	8.23	4220	< 5	390	359	458	2120	349	546	42
	Sep	5960	8.3	4340	< 5	403	375	661	2490	331	565	44
	Oct	6220	8.28	5050	< 5	415	406	644	2720	321	610	48
	Nov	5990	8.09	5950	< 5	360	386	637	2550	220	555	43
	Dec	5910	8.24	5120	10	312	398	662	2760	245	598	41
	Average	**5914**	**8.20**	**4624**	**5**	**383**	**391**	**589**	**2660**	**269**	**570**	**47**

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
2109	Jan	2200	7.23	1260	< 5	73	78	331	563	40	306	6
	Feb	3080	7.41	1660	11	81	105	419	910	63	434	8
	Mar	4010	7.36	2510	6	127	151	554	1270	81	579	9
	Apr	1980	6.91	1200	53	52	71	300	547	40	264	5
	May	1380	7.1	867	< 5	40	48	224	337	33	161	5
	Jun	3910	7.23	2590	< 5	111	172	557	1030	68	603	11
	Jul	4920	7.39	3520	< 5	118	192	561	1480	70	754	10
	Aug	1590	6.87	1040	12	46	57	196	351	34	214	5
	Sep	3960	7.42	2700	< 5	104	146	617	1120	66	597	8
	Oct	4920	7.52	3300	< 5	127	206	698	1370	78	755	9
	Nov	2690	7.44	1820	8	77	94	395	702	62	341	6
	Dec	3520	7.29	2600	25	91	132	549	1020	66	525	6
	Average	**3180**	**7.26**	**2089**	**12**	**87**	**121**	**450**	**892**	**58**	**461**	**7**

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
2114	Jan	6470	7.99	4570	11	446	411	721	2540	403	623	47
	Feb	5620	7.97	3100	10	400	360	464	2190	440	535	45
	Mar	6520	7.91	4120	12	482	409	508	2830	459	638	57
	Apr	5820	8.16	4260	< 5	309	412	576	2690	206	595	41
	May	5960	7.87	4890	11	484	424	585	2650	376	589	44
	Jun	3830	8.22	2620	< 5	234	240	371	1790	130	359	31
	Jul	6560	7.78	4700	11	522	446	663	2990	427	686	52
	Aug	6570	7.88	5080	29	442	404	634	3190	380	639	58
	Sep	5590	8.2	4720	< 5	399	385	590	2670	131	496	48
	Oct	6240	8.15	5730	8	430	391	650	2490	349	578	45
	Nov	6870	7.95	6100	10	453	450	686	3100	359	646	50
	Dec	6040	8.07	5270	11	329	422	623	2880	344	604	40
	Average	**6008**	**8.01**	**4597**	**13**	**411**	**396**	**589**	**2668**	**334**	**582**	**47**
2221	Jan	1480	8.09	798	< 5	31	49	223	223	159	219	8

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Feb	1590	8.32	776	< 5	22	45	228	267	156	217	7
	Mar	1700	8.99	888	< 5	28	59	262	268	142	257	7
	Apr	1150	7.16	578	< 5	29	67	162	277	70	280	6
	May	1200	7.18	668	< 5	31	38	176	261	81	148	8
	Jun	1230	7.12	702	102	39	40	162	269	97	174	9
	Jul	1240	7.54	755	< 5	34	38	147	278	92	167	8
	Aug	1290	7.46	642	< 5	38	43	149	252	106	170	8
	Sep	1390	7.63	834	54	37	42	210	291	106	185	9
	Oct	1450	7.62	807	< 5	40	50	208	288	127	190	9
	Nov	1510	7.82	874	< 5	41	45	223	273	135	190	8
	Dec	1490	7.62	580	< 5	40	48	239	240	163	210	8
	Average	**1393**	**7.71**	**742**	**78**	**34**	**47**	**199**	**266**	**120**	**201**	**8**
1895	Jan	5720	8.55	3780	< 5	73	307	730	1610	528	866	22

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Feb	5530	8.45	3890	< 5	67	319	538	1470	627	832	23
	Mar	5820	8.35	2770	< 5	66	326	528	1770	599	891	28
	Apr	5780	8.28	4010	< 5	68	358	627	1630	659	977	25
	May	5570	8.36	3480	< 5	57	336	689	1600	535	849	28
	Jun	5340	8.48	3310	< 5	44	283	651	1630	577	848	26
	Jul	6720	8.56	4510	< 5	55	412	776	2170	649	1150	28
	Aug	6410	8.78	4470	< 5	36	356	750	1960	517	1030	30
	Sep	6010	9.01	4510	< 5	33	347	827	1730	366	1000	23
	Oct	5990	8.69	4500	< 5	72	338	711	1630	477	873	22
	Nov	5980	8.80	4270	< 5	62	341	716	1800	404	902	22
	Dec	5800	8.75	4250	< 5	43	334	751	1680	470	938	21
	Average	**5889**	**8.59**	**3979**	**< 5**	**56**	**338**	**691**	**1723**	**534**	**930**	**25**
2081	Jan	6840	8.17	6450	< 5	465	490	739	3350	159	608	67

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Feb	6840	8.18	6040	< 5	412	482	646	3690	140	610	75
	Mar	6870	8.25	4840	< 5	495	522	664	3540	154	634	64
	Apr	6040	8.18	5160	< 5	388	421	600	3200	166	564	69
	May	5880	8.34	4900	< 5	394	422	600	2780	140	535	50
	Jun	5960	8.33	4340	7	317	445	565	2800	183	593	55
	Jul	6060	8.14	3780	11	392	433	458	3020	185	574	62
	Aug	5740	8.08	4780	28	362	400	466	2420	175	542	50
	Sep	5820	8.17	5360	6	352	394	632	2550	159	547	47
	Oct	6270	8.17	4790	< 5	415	466	630	2700	193	630	55
	Nov	6280	8.18	5540	< 5	390	418	638	2930	154	556	51
	Dec	6130	8.20	5310	8	349	440	694	2890	141	662	50
	Average	**6228**	**8.20**	**5108**	**8**	**394**	**444**	**611**	**2989**	**162**	**588**	**58**
SW 13	Jan	6760	8.24	6580	< 5	510	504	645	3570	238	636	55

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
	Feb	6940	8.17	6250	< 5	426	451	596	3020	231	565	58
	Mar	7070	8.1	5030	< 5	584	570	594	3940	264	684	58
	Apr	6520	8.03	5830	< 5	476	471	575	3760	253	612	66
	May	6800	7.84	6280	< 5	554	522	608	3560	228	579	60
	Jun	6970	7.88	4200	< 5	406	585	554	3460	263	685	61
	Jul	6920	8	3740	< 5	512	528	464	3760	241	638	67
	Aug	7070	7.84	5920	< 5	513	554	501	3360	294	635	55
	Sep	6970	8.09	4830	< 5	515	517	640	3450	245	606	55
	Oct	7120	8.22	6060	< 5	548	561	631	3160	257	653	58
	Nov	7200	8.09	5970	< 5	527	520	629	3700	231	608	52
	Dec	*Unable to gain access, no sample taken*										
	Average	**6940**	**8.05**	**5517**	**< 5**	**506**	**526**	**585**	**3522**	**250**	**627**	**59**
Oil Pollution	Jan	6040	7.67	5590	35	432	430	659	2880	203	574	57

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
Control Dam												
	Feb	5080	7.3	3670	37	306	313	493	2140	191	458	48
	Mar	6850	7.44	5210	56	490	511	656	3480	229	684	66
	Apr	3750	7.16	2430	34	240	229	358	1700	168	342	35
	May	4830	7.23	3990	11	326	310	505	2310	146	400	37
	Jun	6100	7.42	4860	50	327	464	566	2850	220	623	53
	Jul	5870	7.34	4610	53	374	398	454	2900	229	565	56
	Aug	4360	7.63	3580	11	291	285	348	1760	173	422	32
	Sep	6110	7.59	5140	64	372	390	654	2630	233	611	50
	Oct	4880	7.61	1560	31	313	338	486	2070	186	470	39
	Nov	7040	8.82	5420	70	428	464	720	3320	60	662	53
	Dec	3750	7.66	3210	14	212	242	413	1450	134	355	25
	Average	**5388**	**7.57**	**4106**	**39**	**343**	**365**	**526**	**2458**	**181**	**514**	**46**

Site	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFR mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
ES Void	Jan						*Samples required quarterly*					
	Feb						*Samples required quarterly*					
	Mar											
	Apr						*Samples required quarterly*					
	May						*Samples required quarterly*					
	Jun	7120	7.87	4990	< 5	439	586	616	3540	234	691	80
	Jul						*Samples required quarterly*					
	Aug						*Samples required quarterly*					
	Sep	7260	8.1	6100	< 5	543	552	725	3540	235	576	81
	Oct						*Samples required quarterly*					
	Nov						*Samples required quarterly*					
	Dec	7140	7.78	6770	< 5	497	577	728	3580	217	613	78
	Average	**7173**	**7.92**	**5953**	**< 5**	**493**	**572**	**690**	**3553**	**229**	**627**	**80**

	Date	Electrical Conductivity µS/cm	pH	TDS mg/L	NFS mg/L	Calcium mg/L	Magnesium mg/L	Chloride mg/L	Sulphate mg/L	Bicarbonate mg/L	Sodium mg/L	Potassium mg/L
V Notch	Jan	10900	8.11	9250	< 5	481	436	1640	4170	421	1820	19
	Feb	12200	7.97	10100	< 5	528	490	1450	4970	404	1990	30
	Mar	12900	8.03	8920	< 5	678	554	1490	5230	423	2220	22
	Apr	8480	7.85	6330	< 5	351	334	1080	3160	374	1340	18
	May	8630	7.9	6730	< 5	416	354	1120	3190	314	1280	15
	Jun	9930	7.92	7770	< 5	360	459	1140	3740	395	1670	20
	Jul	9870	8.06	6430	< 5	444	411	898	3850	351	1560	23
	Aug	7070	7.99	5220	< 5	300	278	747	2110	317	1060	14
	Sep	10200	8.12	6660	< 5	516	405	1420	3940	358	1650	19
	Oct	8970	8.12	7280	< 5	413	369	1110	3010	302	1430	21
	Nov	11700	7.95	8560	< 5	467	455	1490	4220	449	1780	20
	Dec	8720	7.92	5820	< 5	330	343	1160	3180	334	1420	18
	Average	**9964**	**8.00**	**7423**	**< 5**	**440**	**407**	**1229**	**3731**	**370**	**1602**	**20**

Table 49: 2015 Piezometer Results

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity (µS/cm)	Salinity (ppm)	Total Dissolved Solids (mg/L)
F1024	January	178.70	*Bore dry – unable to sample*			
	February	178.69	*Bore dry – unable to sample*			
	March	178.65	*Bore dry – unable to sample*			
	April	178.75	*Bore dry – unable to sample*			
	May	178.74	*Bore dry – unable to sample*			
	June	178.70	*Bore dry – unable to sample*			
	July	178.65	*Bore dry – unable to sample*			
	August	178.60	*Bore dry – unable to sample*			
	September	178.63	*Bore dry – unable to sample*			
	October	178.63	*Bore dry – unable to sample*			
	November	178.62	*Bore dry – unable to sample*			
	December	178.63	*Bore dry – unable to sample*			
	Average	178.67	*Bore dry – unable to sample*			
F1162	January – December	*Too deep – unable to sample*				
	Average	>100.00				
F1163	January	177.49	7.12	1345	662	938
	February	177.47	7.20	1348	666	938
	March	177.50	7.22	1142	588	812
	April	177.59	6.89	892	448	630
	May	177.56	7.10	702	352	485
	June	177.40	6.95	618	435	444
	July	177.43	6.73	698	343	486
	August	177.43	6.76	827	413	574
	September	177.32	6.67	725	355	502
	October	177.38	7.16	1106	561	786
	November	177.39	7.02	1029	516	735
	December	177.51	7.11	1234	604	863
	Average	177.46	6.99	972	495	683

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity (µS/cm)	Salinity (ppm)	Total Dissolved Solids (mg/L)
F1164	January – December	*Too deep – unable to sample*				
	Average	>100.00				
F1167	January	165.25	6.07	226	99	161
	February	165.27	6.35	905	442	612
	March	165.25	6.71	890	427	611
	April	164.63	5.75	876	435	612
	May	164.64	6.2	457	224	318
	June	164.40	6.5	819	400	564
	July	164.18	6.56	616	314	428
	August	164.05	5.91	174	59	121
	September	164.20	6.23	284	145	193
	October	163.80	-	-	-	-
	November	163.85	-	-	-	-
	December	163.86	-	-	-	-
	Average	164.45	6.25	583	283	402
F1168	January	160.05	7.09	5190	2780	3610
	February	160.84	7315	5640	3000	3920
	March	159.65	7.15	4660	2290	3260
	April	159.42	-	-	-	-
	May	160.3	7.22	4680	2340	3300
	June	159.13	7301	4310	2080	2910
	July	159.03	-	-	-	-
	August	158.85	7.14	4330	2120	3040
	September	158.75	7.05	4050	2010	2820
	October	158.41	7.04	3910	1940	2750
	November	158.52	6.75	3940	1910	2770
	December	158.55	6.77	3950	1900	2750
	Average	159.29	7.04	4466	2237	3113

Drill Number	Date	Water Level (m)	pH	Electrical Conductivity (µS/cm)	Salinity (ppm)	Total Dissolved Solids (mg/L)
R4241	January	171.88	6.99	4960	2640	3450
	February	172.25	6.92	5130	2640	3570
	March	171.93	7.03	4390	2210	3090
	April	172.58	6.69	4360	2180	3040
	May	173.17	6.97	5010	2420	3500
	June	173.37	6.91	4690	2380	3370
	July	173.44	7.14	5070	2480	3490
	August	173.27	7.13	4930	2420	3430
	September	173.56	6.90	4710	2420	3400
	October	173.51	6.91	4860	2430	3290
	November	173.68	6.86	5240	2630	3610
	December	173.73	6.91	5120	2560	3470
	Average	173.03	6.95	4873	2451	3393

W1102	January	178.30	6.99	7810	4230	5450
	February	178.24	7.00	8050	4540	5590
	March	178.20	7.05	7190	3580	5060
	April	178.46	6.72	7410	3670	5180
	May	178.64	7.09	7100	3560	5040
	June	178.60	7.02	7200	3610	5040
	July	178.66	7.35	7140	3540	4990
	August	178.68	7.17	7080	3520	4950
	September	178.68	7.02	7150	3430	4840
	October	178.44	6.98	7460	3600	5120
	November	178.70	7.01	7550	3660	5230
	December	178.53	7.07	7480	3690	5200
	Average	178.51	7.04	7385	3719	5141

Appendix C: 2015 Dust Sampling Results

Table 50: Depositional Dust Gauge Results

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
2130	January	0.9	0.2	3.4	1.1	Few insects
	February	1.8	1.1	4.3	2.9	Insects, algae, leaves in funnel
	March	1.8	0.8	2.7	2.6	Some insects
	April	1.4	0.6	3.0	2.0	Insects, dust
	May	0.8	0.6	1.9	1.4	Algae, dust
	June	0.6	0.1	0.9	0.7	Insects, dust
	July	0.9	0.2	1.4	1.1	Nil comment
	August	0.8	0.2	2.3	1.0	Insects, dust
	September	1.1	0.5	1.9	1.6	Insects, dust, leaves in funnel
	October	1.6	0.6	2.7	2.2	Insects, algae, dust, leaves/spider web in funnel
	November	1.4	0.7	2.1	3.7	Insects, dust, leaves in funnel
	December	2.0	1.5	3.5	5.2	Insects, dust, leaves in funnel
	Average	**1.3**	**0.6**	**2.5**	**2.1**	
2157	January	1.4	0.2	2.4	1.6	Insects, dust
	February	1.7	0.7	2.9	2.4	Insects, algae, dust
	March	1.4	0.5	2.9	1.9	Funnel blocked by bird poo
	April	1.5	0.6	2.7	2.1	Insects, dust
	May	0.8	0.4	1.3	1.2	Dust, bird poo/spiders web in funnel

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
	June	0.5	0.1	0.7	0.6	Insects, dust
	July	0.8	0.6	1.5	1.4	Insects, dust, bird poo in funnel
	August	1.0	0.4	2.6	1.4	Insects, leaves, dust
	September	1.3	0.4	2.1	1.7	Insects, dust, leaves in funnel
	October	1.5	0.7	3.5	2.2	Insects, leaves, spider and web in funnel
	November	1.0	0.4	1.4	3.3	Insects, dust, leaves in funnel
	December	1.6	1.4	3.0	3.1	Insects, dust
	Average	**1.2**	**0.5**	**2.3**	**1.9**	

2175	January	1.1	0.3	3.7	1.4	Insects
	February	1.5	0.7	3.1	2.2	Insects, algae
	March	2.2	0.8	4	3	Nil comment
	April	1.2	0.5	2.2	1.7	Insects, dust
	May	0.8	0.7	2	1.5	Insects, dust
	June	0.6	< 0.1	0.7	0.6	Insects, dust
	July	1	0.4	1.5	1.4	Rubber stopper from broken lid (lid replaced)
	August	0.8	< 0.1	1.4	0.8	Insects, dust
	September	1	0.5	2.1	1.5	Insects, dust, bird poo in funnel
	October	1.4	0.5	2.7	1.9	Insects, pollen (fine flower particulates)
	November	0.8	0.2	1.0	3.0	Flower pollen, vegetation in funnel
	December	1.5	1.1	2.6	5.1	Insects, dust, leaves in funnel
	Average	**1.2**	**0.6**	**2.3**	**2.0**	

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
2197	January	3.7	0.9	6.4	4.6	Insects
	February	10.8	2.6	15.5	13.4	Insects, live spider (removed), appears to be highly contaminated
	March	3.0	1.7	5.7	4.7	Insects, pieces of lid (broken), lid replaced
	April	2.3	1.0	4.4	3.3	Twigs, dust
	May	0.7	0.3	2.0	1.0	Insects, dust
	June	1.5	0.4	2.1	1.9	Dead spider, dust
	July	1.5	0.8	2.8	2.3	Dead spider, dust
	August	1.3	0.3	2.9	1.6	Insects, dust
	September	1.5	0.6	2.4	2.1	Insects, dust, leaves in funnel
	October	4.6	1.3	7.1	5.9	Insects, dust
	November	1.4	0.5	1.9	3.1	Insects, dust, leaves in funnel
	December	2.5	1.7	4.2	5.7	Insects, leaves, dust
	Average	**2.9**	**1.0**	**3.8**	**4.1**	**February results excluded due to high contamination of sample**
2208	January	1.5	0.1	2.0	1.6	Insects, dust
	February	1.4	0.9	3.1	2.3	Insects, algae, leaves in funnel
	March	2	0.7	3.7	2.7	Insects
	April	1.1	0.5	1.8	1.6	Insects, dust
	May	0.7	0.5	2.5	1.2	Insects, bird poo in funnel
	June	0.5	< 0.1	0.7	0.5	Dust
	July	0.8	0.5	1.5	1.3	Nil comment
	August	0.7	0.2	1.8	0.9	Dust

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
	September	0.9	0.3	1.3	1.2	Insects, dust
	October	1.2	0.4	2.7	1.6	Insects, dust, spider web in funnel
	November	0.9	0.4	1.3	3.0	Insects
	December	1.4	0.6	2.0	3.6	Insects, dust
	Average	**1.1**	**0.5**	**2.0**	**1.8**	
2230	January	1.4	0.6	2.0	2.0	Insects
	February	2.2	1.1	4.4	3.3	Insects, algae, dust
	March	2.1	1.5	4.6	3.6	Dead grasshopper
	April	1.6	0.8	3.4	2.4	Insects, dust
	May	1.0	0.5	2.2	1.5	Dust, lid cracked (replaced following month)
	June	0.6	< 0.1	0.7	0.6	Insects, dust
	July	1.2	0.8	2.5	2.0	Dust, dead spider
	August	1.2	0.3	2.6	1.5	Dust
	September	1.5	0.5	2.3	2.0	Insects, dust
	October	2.3	0.9	4.4	3.2	Insects, dust, spider web in funnel
	November	0.8	0.2	1.0	2.9	Insects, dust, leaves and spider web in funnel
	December	1.8	1.2	3.0	4.0	Leaves in funnel, dust, insects
	Average	**1.5**	**0.8**	**2.8**	**2.4**	
2235	January	1.0	0.1	3.9	1.1	Dust
	February	1.3	0.7	2.8	2.0	Insects, algae
	March	2.2	0.8	3.7	3.0	Grime

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
	April	1.2	0.4	4.3	1.6	Insects, dust
	May	1.0	0.5	1.9	1.5	Insects, dust
	June	0.6	0.2	1.1	0.8	Insects, dust
	July	1.0	0.3	1.4	1.3	Nil comment
	August	0.8	0.2	2.4	1.0	Insects, dust, spider web in funnel
	September	1.2	0.5	2.0	1.7	Insects, dust
	October	0.9	0.2	2.0	1.1	Insects, leaves
	November	1.2	0.4	1.6	3.7	Insects, dust, funnel blocked with insect larvae
	December	1.8	0.9	2.7	3.3	Insects, dust
	Average	**1.2**	**0.4**	**2.5**	**1.8**	

2247	January	1.2	0.3	2.6	1.5	Insects
	February	1.4	1.2	4.1	2.6	Insects, algae, leaves in funnel
	March	2	1.3	4.3	3.3	Nil comment
	April	1.2	0.7	2.7	1.9	Insects, dust, leaves in funnel
	May	0.8	0.7	2.5	1.5	Dust
	June	0.6	< 0.1	0.8	0.6	Insects, dust
	July	1	0.3	1.5	1.3	Dust
	August	1.3	0.1	1.4	1.4	Dust
	September	1.2	0.5	2.0	1.7	Insects, dust
	October	1.7	0.6	3.5	2.3	Insects, spider web in funnel, cracked lid (replace following month)
	November	0.7	0.2	0.9	3.4	Insects, dust, lid broken (replaced)

Site Number	Period	Ash Content (g/m²/month)	Combustible Matter (g/m²/month)	Total Insoluble Matter (g/m²/month)	Total Solids (g/m²/month)	Comments
	December	1.5	1.2	2.7	5.0	Insects, dust, leaves
	Average	**1.2**	**0.6**	**2.4**	**2.2**	

Table 51: TEOM Real Time PM10 Monitoring Results

January	PM10 24Hr Av µg/m³
1/01/2015	20.65
2/01/2015	6.87
3/01/2015	16.39
e	12.64
5/01/2015	17.68
6/01/2015	14.79
7/01/2015	12.29
8/01/2015	16.82
9/01/2015	24.06
10/01/2015	19.60
11/01/2015	4.57
12/01/2015	4.35
13/01/2015	11.18
14/01/2015	9.05
15/01/2015	8.64
16/01/2015	12.28
17/01/2015	15.56
18/01/2015	25.39
19/01/2015	14.06
20/01/2015	8.76
21/01/2015*	-
22/01/2015*	-
23/01/2015*	-
24/01/2015*	-
25/01/2015*	-
26/01/2015*	-
27/01/2015*	-
28/01/2015*	-
29/01/2015*	-
30/01/2015*	-
31/01/2015*	-

February	PM10 24Hr Av µg/m³
1/02/2015*	-
2/02/2015*	-
3/02/2015*	-
4/02/2015*	-
5/02/2015*	-
6/02/2015*	-
7/02/2015*	-
8/02/2015*	-
9/02/2015*	-
10/02/2015*	-
11/02/2015*	-
12/02/2015	21.45
13/02/2015	15.37
14/02/2015	17.78
15/02/2015	19.00
16/02/2015	24.59
17/02/2015	17.97
18/02/2015	26.16
19/02/2015	19.40
20/02/2015*	-
21/02/2015*	-
22/02/2015*	-
23/02/2015*	-
24/02/2015*	-
25/02/2015	9.39
26/02/2015	16.80
27/02/2015	15.03
28/02/2015	37.48

*Intermittent power issues between 21/01/15 - 11/02/15, unreliable data

March	PM10 24Hr Av µg/m³
1/03/2015*	16.18
2/03/2015	16.66
3/03/2015	22.62
4/03/2015	28.62
5/03/2015	25.01
6/03/2015	25.34
7/03/2015	50.58
8/03/2015	23.78
9/03/2015	29.00
10/03/2015	46.36
11/03/2015	33.43
12/03/2015	27.68
13/03/2015	19.17
14/03/2015	17.03
15/03/2015	23.01
16/03/2015	24.28
17/03/2015	31.93
18/03/2015	24.72
19/03/2015	28.81
20/03/2015	27.07
21/03/2015	15.13
22/03/2015	15.65
23/03/2015	8.47
24/03/2015	20.50
25/03/2015	16.99
26/03/2015	18.54
27/03/2015	20.18
28/03/2015	23.81
29/03/2015	26.33
30/03/2015	19.97
31/03/2015	11.71

April	PM10 24Hr Av µg/m³
1/04/2015	14.38
2/04/2015	21.19
3/04/2015	20.97
4/04/2015	2.11
5/04/2015	4.02
6/04/2015	4.86
7/04/2015	5.60
8/04/2015	6.65
9/04/2015	11.28
10/04/2015#	-
11/04/2015#	-
12/04/2015#	-
13/04/2015#	-
14/04/2015#	-
15/04/2015	22.29
16/04/2015	12.69
17/04/2015#	-
18/04/2015#	-
19/04/2015#	-
20/04/2015#	-
21/04/2015#	-
22/04/2015	1.30
23/04/2015	1.36
24/04/2015	4.90
25/04/2015	4.72
26/04/2015	6.45
27/04/2015	7.50
28/04/2015	10.21
29/04/2015	9.89
30/04/2015	6.32

**Calculated using 1hr averages following power outage and reboot.*

#Intermittent power outages between 10/04/2015-14/04/2015 and 17/04/2015-21/04/2015, data unreliable.

May	PM10 24Hr Av µg/m³	June	PM10 24Hr Av µg/m³
1/05/2015	5.98	1/06/2015	4.87
2/05/2015	6.84	2/06/2015	7.11
3/05/2015	2.91	3/06/2015	11.20
4/05/2015	6.82	4/06/2015	6.94
5/05/2015	5.22	5/06/2015	6.06
6/05/2015	56.94	6/06/2015	9.73
7/05/2015	17.21	7/06/2015	8.07
8/05/2015	8.61	8/06/2015	4.65
9/05/2015	7.27	9/06/2015	9.08
10/05/2015*	-	10/06/2015	15.84
11/05/2015*	-	11/06/2015	14.64
12/05/2015*	-	12/06/2015	9.42
13/05/2015	9.65	13/06/2015	8.52
14/05/2015	9.59	14/06/2015	13.88
15/05/2015	13.58	15/06/2015	16.24
16/05/2015	12.36	16/06/2015	4.38
17/05/2015	9.99	17/06/2015	2.04
18/05/2015	13.56	18/06/2015	1.40
19/05/2015	5.47	19/06/2015	4.56
20/05/2015	5.17	20/06/2015	5.35
21/05/2015	3.51	21/06/2015	7.56
22/05/2015	3.55	22/06/2015[#]	10.77
23/05/2015	7.71	23/06/2015	8.39
24/05/2015	9.45	24/06/2015	22.70
25/05/2015	9.10	25/06/2015	10.53
26/05/2015	9.53	26/06/2015	12.98
27/05/2015	11.60	27/06/2015	9.38
28/05/2015	10.06	28/06/2015	9.48
29/05/2015	5.08	29/06/2015	14.37
30/05/2015	5.48	30/06/2015	10.92
31/05/2015	1.98		

**Power outage and server failure, no data recorded.*

[#]Calculated using 1hr averages following TEOM maintenance and change out of filter

July	PM10 24Hr Av µg/m³	August	PM10 24Hr Av µg/m³
1/07/2015	10.74	1/08/2015	9.25
2/07/2015	7.08	2/08/2015	9.24
3/07/2015	18.32	3/08/2015	8.26
4/07/2015	11.84	4/08/2015	8.16
5/07/2015	10.58	5/08/2015	6.60
6/07/2015	7.55	6/08/2015	5.32
7/07/2015	10.33	7/08/2015	5.31
8/07/2015	11.63	8/08/2015	12.79
9/07/2015	13.35	9/08/2015	19.66
10/07/2015	7.48	10/08/2015	6.36
11/07/2015	2.44	11/08/2015	11.08
12/07/2015	3.63	12/08/2015	12.03
13/07/2015	2.37	13/08/2015	5.07
14/07/2015	3.87	14/08/2015	5.61
15/07/2015	4.54	15/08/2015	13.32
16/07/2015	11.09	16/08/2015	13.18
17/07/2015	2.54	17/08/2015	6.94
18/07/2015	7.98	18/08/2015	17.11
19/07/2015	11.53	19/08/2015	17.23
20/07/2015	12.88	20/08/2015	19.14
21/07/2015	15.79	21/08/2015	16.94
22/07/2015	26.84	22/08/2015	12.89
23/07/2015	18.80	23/08/2015	1.42
24/07/2015	3.89	24/08/2015	5.18
25/07/2015	2.85	25/08/2015	2.24
26/07/2015	4.06	26/08/2015	1.38
27/07/2015	6.36	27/08/2015	2.00
28/07/2015	8.28	28/08/2015	3.58
29/07/2015	11.25	29/08/2015	3.23
30/07/2015	8.63	30/08/2015	9.54
31/07/2015	9.18	31/08/2015	7.76

September	PM10 24Hr Av µg/m³
1/09/2015	5.03
2/09/2015	9.32
3/09/2015	8.16
4/09/2015	8.96
5/09/2015	9.66
6/09/2015	10.97
7/09/2015	9.17
8/09/2015	9.46
9/09/2015#	12.95
10/09/2015#	16.70
11/09/2015	12.81
12/09/2015	8.01
13/09/2015	14.58
14/09/2015	13.63
15/09/2015	11.18
16/09/2015	17.85
17/09/2015	15.84
18/09/2015	10.63
19/09/2015	12.19
20/09/2015	7.79
21/09/2015	7.78
22/09/2015	8.39
23/09/2015	13.79
24/09/2015	8.76
25/09/2015	9.54
26/09/2015	9.39
27/09/2015	10.32
28/09/2015	11.08
29/09/2015	12.97
30/09/2015	17.64

October	PM10 24Hr Av µg/m³
1/10/2015	21.07
2/10/2015	25.79
3/10/2015	15.13
4/10/2015	16.41
5/10/2015	14.52
6/10/2015	16.55
7/10/2015	33.10
8/10/2015	20.89
9/10/2015	22.97
10/10/2015	24.43
11/10/2015	15.58
12/10/2015	13.05
13/10/2015	26.71
14/10/2015	19.43
15/10/2015	18.36
16/10/2015	21.32
17/10/2015#	17.35
18/10/2015*	-
19/10/2015*	-
20/10/2015#	20.96
21/10/2015#	16.79
22/10/2015	3.53
23/10/2015	13.03
24/10/2015	16.90
25/10/2015	11.73
26/10/2015	11.11
27/10/2015	11.06
28/10/2015	16.18
29/10/2015	18.08
30/10/2015	18.11
31/10/2015	18.10

*****Power failure, set Tuesday 20th Oct, no data recorded.*
#Calculated using 1hr averages following intermittent power outages

November	PM10 24Hr Av µg/m³
1/11/2015	12.10
2/11/2015#	6.54
3/11/2015#	6.55
4/11/2015	2.87
5/11/2015	6.44
6/11/2015	3.52
7/11/2015	12.50
8/11/2015	8.09
9/11/2015	12.53
10/11/2015	14.59
11/11/2015	12.99
12/11/2015	13.85
13/11/2015	5.84
14/11/2015	6.73
15/11/2015	8.02
16/11/2015	10.43
17/11/2015	9.88
18/11/2015	8.53
19/11/2015	13.63
20/11/2015	15.07
21/11/2015	29.07
22/11/2015	19.88
23/11/2015	21.95
24/11/2015	27.46
25/11/2015	16.93
26/11/2015	36.07
27/11/2015	23.45
28/11/2015	23.99
29/11/2015	18.76
30/11/2015	21.54

December	PM10 24Hr Av µg/m³
1/12/2015	15.72
2/12/2015	22.69
3/12/2015	22.96
4/12/2015	23.96
5/12/2015	18.67
6/12/2015	18.39
7/12/2015	26.30
8/12/2015	26.43
9/12/2015	3.84
10/12/2015	16.08
11/12/2015	20.11
12/12/2015	38.41
13/12/2015	24.03
14/12/2015	26.16
15/12/2015	46.91
16/12/2015	1.33
17/12/2015	4.12
18/12/2015	14.72
19/12/2015	18.91
20/12/2015	13.25
21/12/2015	18.34
22/12/2015	0.05
23/12/2015	6.04
24/12/2015	10.41
25/12/2015	8.38
26/12/2015	9.10
27/12/2015	6.30
28/12/2015	10.62
29/12/2015	10.39
30/12/2015	9.46
31/12/2015#	9.64

#Calculated using 1hr averages following intermittent outages resulting from severe thunderstorms.
#Calculated using 1hr averages following TEOM maintenance and change out of filter.

Table 52: High Volume Air Sampler Results

Lot 22	
Start Date	Particulate Matter µg/m³
05-Jan-15	112.40
11-Jan-15	32.10
17-Jan-15	98.10
23-Jan-15	72.30
29-Jan-15	65.30
04-Feb-15	65.90
10-Feb-15	73.90
16-Feb-15	156.60
22-Feb-15	64.80
28-Feb-15	90.10
06-Mar-15	153.10
12-Mar-15	126.60
18-Mar-15	110.00
24-Mar-15	64.90
30-Mar-15	103.50
05-Apr-15	51.00
11-Apr-15	95.10
17-Apr-15	136.20
23-Apr-15	30.80
29-Apr-15	59.40
05-May-15	59.70
11-May-15	76.90
17-May-15	68.90
08-Jul-15*	55.00
16-Jul-15*	28.60
21-Jul-15*	26.50
22-Jul-15*	80.50
24-Jul-15*	46.70
28-Jul-15*	88.80
30-Jul-15*	14.60
01-Aug-15*	32.10

Lot 22	
Start Date	Particulate Matter µg/m³
03-Aug-15	41.80
05-Aug-15*	38.30
07-Aug-15*	43.00
09-Aug-15*	35.60
12-Aug-15*	77.30
15-Aug-15*	57.20
17-Aug-15*	42.50
21-Aug-15	21.40
27-Aug-15	43.70
02-Sep-15	39.20
08-Sep-15	91.50
14-Sep-15	71.00
20-Sep-15	69.00
26-Sep-15	82.80
02-Oct-15	142.50
08-Oct-15	114.80
14-Oct-15	98.90
20-Oct-15	107.80
26-Oct-15	60.00
01-Nov-15	49.50
07-Nov-15	63.00
13-Nov-15	31.40
19-Nov-15	61.30
25-Nov-15	101.50
01-Dec-15	168.30
07-Dec-15	127.00
13-Dec-15	148.20
19-Dec-15	108.6
25-Dec-15	38.40
31-Dec-15	57.90

**Blown fuse on HVAS sampler occurred on 23rd May, delays in replacement parts meant HVAS only repaired by 8th July. Make up runs conducted between 8th July - 17th August.*

Appendix D: 2015 Noise Monitoring Results

Independent Noise Monitoring Report January 2015

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

18 February 2015

Ref: 03012/5613

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: JANUARY 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 29th January, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

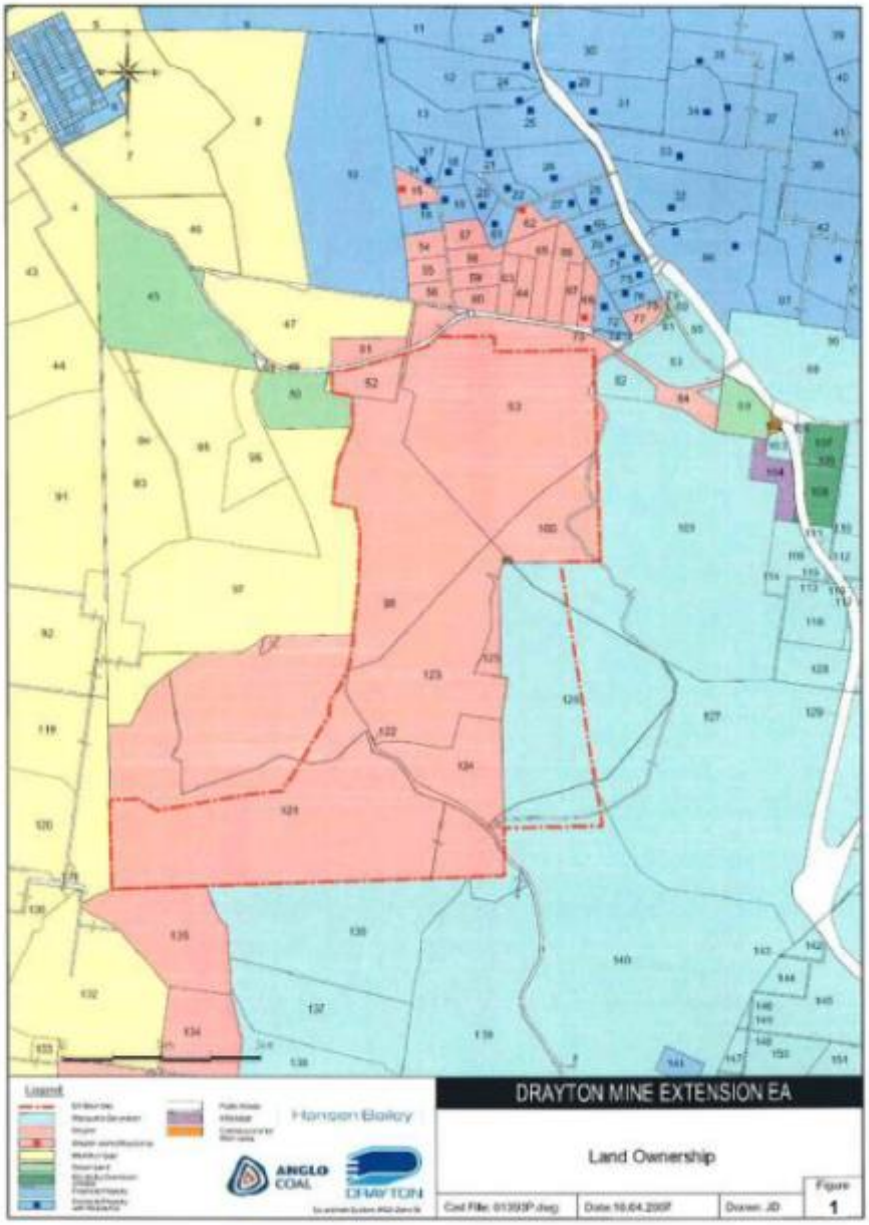
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the night time period.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
Hansen Bailey
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 29 January 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:40 pm	43	2.6/113	Traffic (40), birds & insects (39), wind (32), **DCM inaudible**
Kerr (37)	8:29 pm	49	2.4/115	Traffic (49), frogs & insects (38), **DCM inaudible**
Skinner (40)	8:05 pm	45	2.2/119	Birds & insects (44), traffic (37), **DCM (26)**, train (25)
Robertson (37)	7:03 pm	47	1.8/106	Birds & insects (46), traffic (40), **DCM inaudible**
Sharman (35)	7:43 pm	48	1.5/135	Traffic (47), birds & insects (40), **DCM inaudible**
Horder (36)	7:24 pm	52	1.3/103	Birds & insects (52), traffic (40), **DCM inaudible**
Wilson (35)	8:55 pm	44	2.5/118	Frogs & insects (44), traffic (34), **DCM inaudible**
Smith (35)	9:22 pm	38	3.1/116	Frogs & insects (37), traffic (31), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 29/30 January 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	52	2.6/121	Frogs & insects (52), traffic (32), **DCM (30)**, wind (29)
Kerr (37)	11:47 pm	44	2.1/130	Traffic (43), frogs & insects (37), **DCM (30)**
Skinner (39)	11:25 pm	40	2.1/116	Frogs & insects (37), traffic (36), **DCM (29)**
Robertson (42)	10:21 pm	40	2.3/124	Traffic (39), frogs & insects (33), **DCM (28)**
Sharman (41)	11:04 pm	49	1.9/116	Traffic (49), frogs & insects (31), **DCM (27)**
Horder (42)	10:44 pm	41	2.3/119	Frogs & insects (37), traffic (37), train (30), **DCM (28)**
Wilson (36)	12:10 am	45	1.6/120	Frogs & insects (45), **DCM (32)**, traffic (28)
Smith (36)	12:34 am	38	1.5/121	Frogs & insects (36), **DCM (32)**, traffic (29)

Table 3 DCM Noise Monitoring Results – 29/30 January 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\,(1min)}$	Wind speed/ direction	$L_{1\,(1\,min)}$ source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	53	2.6/121	Frogs	Hum (32)
Kerr (47)	11:47 pm	52	2.1/130	Highway	Hum (33)
Skinner (47)	11:25 pm	43	2.1/116	Highway	Hum (33)
Robertson (47)	10:21 pm	48	2.3/124	Highway	Truck revs (31)
Sharman (47)	11:04 pm	55	1.9/116	Highway	Hum (29)
Horder (47)	10:44 pm	47	2.3/119	Highway	Truck revs (32)
Wilson (47)	12:10 am	47	1.6/120	Frogs	Hum (36)
Smith (47)	12:34 am	40	1.5/121	Frogs	Hum (36)

The results in Tables 1 and 2 show that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\,(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\,(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\,(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 88	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(11hour)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ 50 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 45 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 40 dB(A) – Night.

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ 53 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 48 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 43 dB(A) – Night.

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	<30	39
61*	<30	40	<30	39
14	<30	39	<30	39
19	<30	40	<30	39
16*	<30	41	30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	32	35
37	<30	35	32	35

* Measurement location

27 February 2015

Ref: 03012/5654

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: FEBRUARY 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 24th February, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

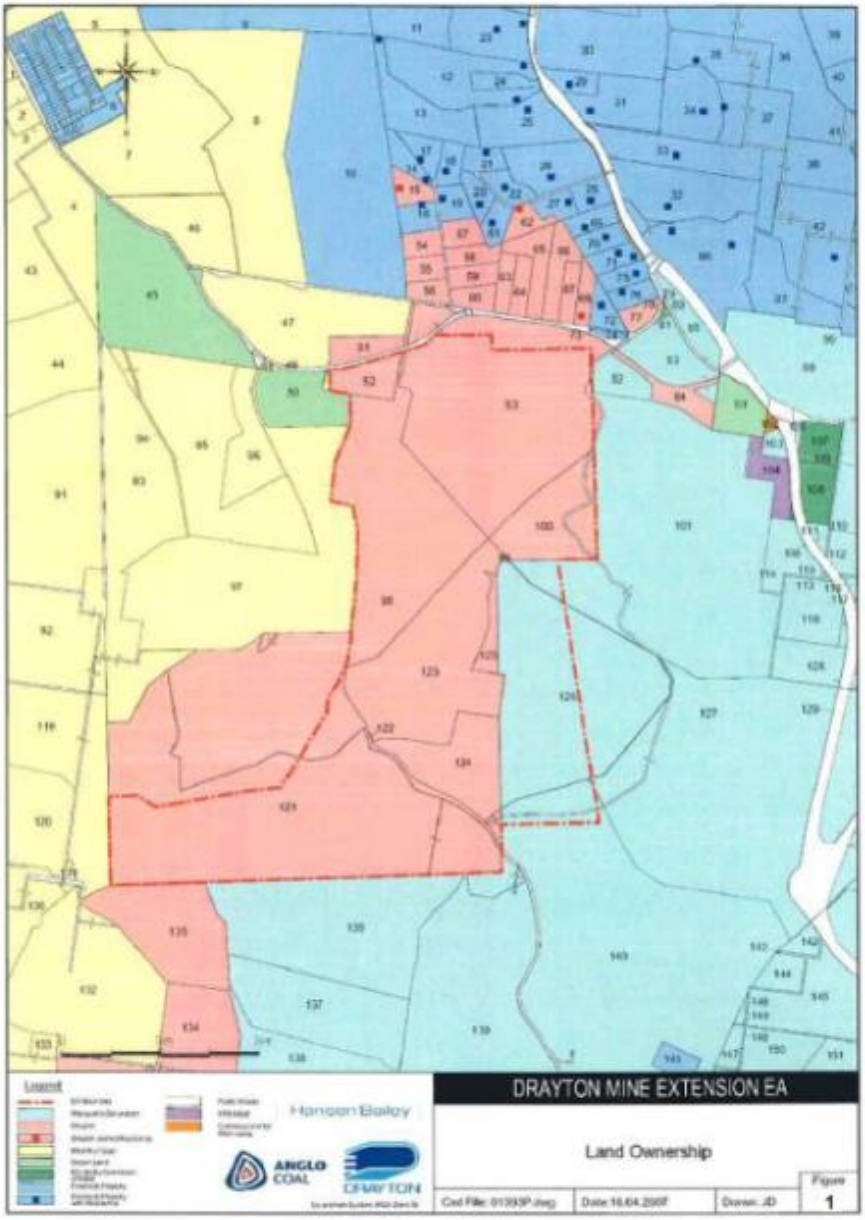
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 24 February 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:45 pm	49	4.8/120	Wind (49), birds & insects (31), traffic (27), **DCM (25)**
Kerr (37)	8:34 pm	48	3.3/125	Traffic (47), frogs & insects (37), wind (37), **DCM (25)**
Skinner (40)	8:10 pm	44	3.6/122	Wind (43), insects (32), **DCM (31)**, traffic (27)
Robertson (37)	7:07 pm	49	4.2/126	Birds & insects (47), traffic (45), **DCM inaudible**
Sharman (35)	7:48 pm	49	2.9/122	Traffic (48), birds & insects (42), **DCM inaudible**
Horder (36)	7:29 pm	51	3.3/123	Birds & insects (51), traffic (40), **DCM inaudible**
Wilson (35)	9:00 pm	42	3.4/125	Traffic (38), wind (38), frogs & insects (34), **DCM inaudible**
Smith (35)	9:27 pm	46	3.7/145	Frogs & insects (43), wind (43), power station (26), traffic (24), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 24/25 February 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	44	3.5/127	Wind (43), frogs & insects (34), **DCM (30)**, traffic (29)
Kerr (37)	11:46 pm	43	1.6/117	Traffic (42), frogs & insects (35), **DCM (29)**
Skinner (39)	11:24 pm	39	2.0/135	Traffic (36), **DCM (35)**, frogs & insects (27)
Robertson (42)	10:22 pm	41	2.5/118	Traffic (39), wind (35), **DCM (26)**, frogs & insects (25)
Sharman (41)	11:03 pm	48	1.8/120	Traffic (48), frogs & insects (28), power plant (26), **DCM inaudible**
Horder (42)	10:43 pm	44	2.2/136	Traffic (43), train (36), frogs & insects (26), **DCM (25)**
Wilson (36)	12:11 am	38	2.1/147	Traffic (36), power plant (31), frogs & insects (29), **DCM inaudible**
Smith (36)	12:35 am	41	1.8/126	Frogs & insects (40), power plant (32), traffic (25), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 24/25 February 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:00 pm	47	3.5/127	Wind	Truck revs (33)
Kerr (47)	11:46 pm	52	1.6/117	Highway	Hum (32)
Skinner (47)	11:24 pm	45	2.0/135	Highway	Truck revs (38)
Robertson (47)	10:22 pm	42	2.5/118	Highway	Hum (28)
Sharman (47)	11:03 pm	58	1.8/120	Highway	n/a
Horder (47)	10:43 pm	45	2.2/136	Highway	Hum (27)
Wilson (47)	12:11 am	43	2.1/147	Highway	n/a
Smith (47)	12:35 am	42	1.8/126	Frogs	n/a

The results in Tables 1 and 2 show that the noise criterion was not exceeded at any location. A coal train was scheduled to arrive at DCM at 0:10 on 25 February. Monitoring was being conducted at the Wilson residence at this time but train noise was inaudible.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$	Night $L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	30	36
21	<30	38	<30	38
22	<30	38	30	38
18	<30	39	<30	38
20	<30	40	32	39
61*	31	40	35	39
14	<30	39	30	39
19	<30	40	30	39
16*	<30	41	30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report March 2015

30 April 2015

Ref: 03012/5731

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: MARCH 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Monday 30th March 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

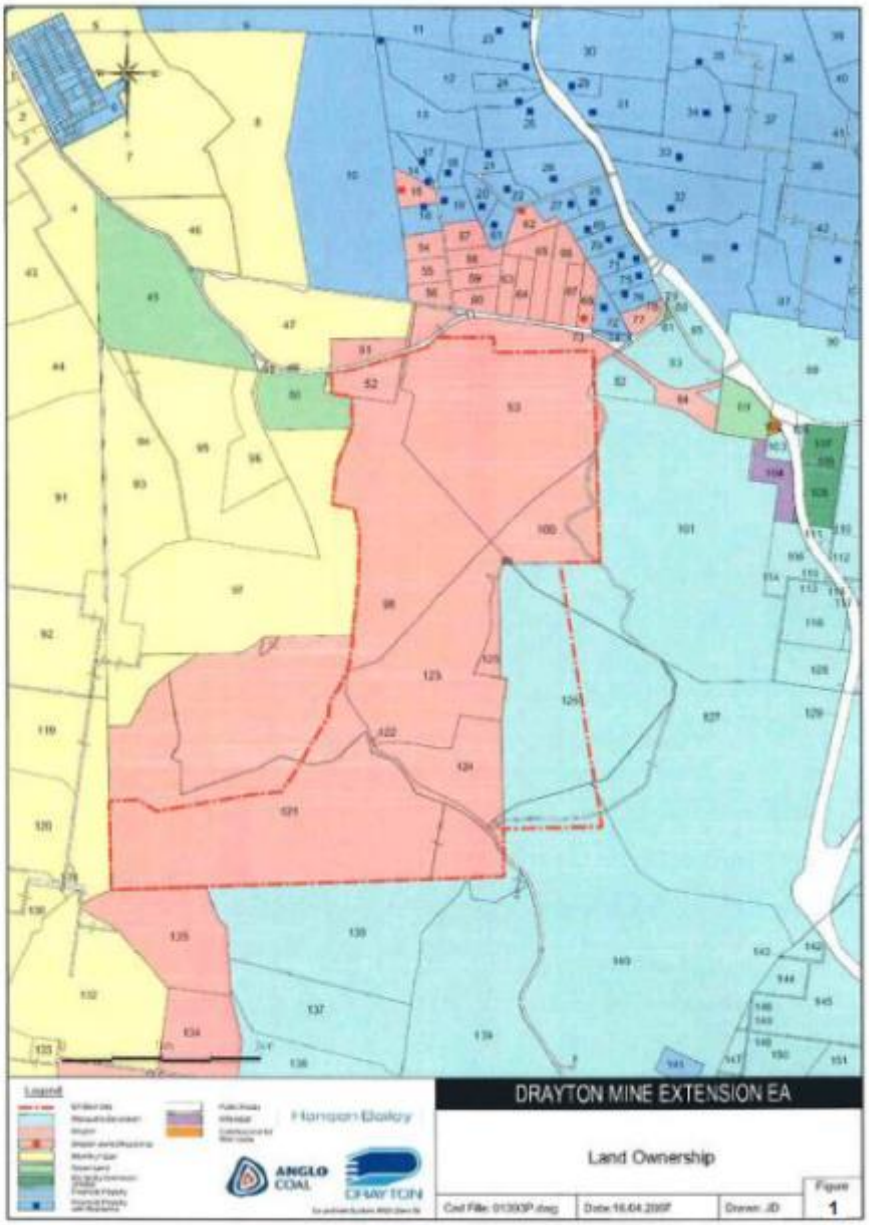
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited | 1 Roath Street, Cardiff NSW 2285 | Phone: (02) 4954 2276
ABN: 40 106 435 554 | Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2250 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.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-3** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 30 March 2015 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	2:46 pm	42	3.3/132	Birds (40), traffic (35), wind (34), **DCM inaudible**
Kerr (36)	4:34 pm	49	4.1/140	Traffic (49), wind (31), birds (26), **DCM inaudible**
Skinner (39)	4:12 pm	41	3.6/140	Traffic (39), birds (34), wind (32), **DCM inaudible**
Robertson (36)	3:09 pm	43	3.0/121	Traffic (42), birds (34), wind (30), **DCM inaudible**
Sharman (35)	3:52 pm	52	2.4/130	Traffic (52), birds (26), **DCM inaudible**
Horder (35)	3:29 pm	41	2.6/124	Traffic (41), birds (28), **DCM inaudible**
Wilson (35)	5:00 pm	43	3.1/132	Wind (42), traffic (37), birds (27), **DCM inaudible**
Smith (35)	5:22 pm	38	3.4/136	Wind (37), traffic (30), birds (26), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 30 March 2015 (Evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:48 pm	41	3.3/131	Wind (38), traffic (36), **DCM (30)**, birds & insects (29)
Kerr (37)	8:37 pm	48	2.0/115	Traffic (48), frogs & insects (24), **DCM inaudible**
Skinner (40)	8:14 pm	38	2.5/110	Traffic (37), frogs & insects (28), wind (27), **DCM faintly audible**
Robertson (37)	7:10 pm	47	3.5/133	Birds & insects (45), wind (40), traffic (40), **DCM faintly audible**
Sharman (35)	7:50 pm	46	2.7/123	Traffic (46), frogs & insects (34), **DCM inaudible**
Horder (36)	7:30 pm	41	3.7/138	Traffic (39), wind (34), frogs & insects (30), **DCM (27)**
Wilson (35)	9:02 pm	31	2.3/91	Traffic (29), frogs & insects (26), **DCM inaudible**
Smith (35)	9:25 pm	33	1.5/115	Train (30), frogs & insects (30), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 30/31 March 2015 (Night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	37	1.6/126	Traffic (36), **DCM (29)**, frogs & insects (26)
Kerr (37)	11:47 pm	40	2.9/139	Traffic (40), frogs & insects (27), **DCM inaudible**
Skinner (39)	11:26 pm	38	2.7/140	Traffic (37), **DCM (29)**, frogs & insects (25)
Robertson (42)	10:23 pm	37	3.5/141	Traffic (37), frogs & insects (24), **DCM faintly audible**
Sharman (41)	11:04 pm	44	3.2/144	Traffic (44), frogs & insects (29), **DCM (26)**
Horder (42)	10:44 pm	38	3.8/137	Traffic (37), frogs & insects (28), **DCM (27)**
Wilson (36)	12:12 am	36	1.9/144	Traffic (36), frogs & insects (23), **DCM inaudible**
Smith (36)	12:36 am	30	1.8/150	Frogs & insects (27), power plant (27), **DCM inaudible**

Table 4 DCM Noise Monitoring Results – 30/31 March 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	43	1.6/126	Highway	Trucks (34)
Kerr (47)	11:47 pm	47	2.9/139	Highway	n/a
Skinner (47)	11:26 pm	44	2.7/140	Highway	Trucks (33)
Robertson (47)	10:23 pm	45	3.5/141	Highway	Hum (20)
Sharman (47)	11:04 pm	53	3.2/144	Highway	Hum (28)
Horder (47)	10:44 pm	42	3.8/137	Highway	Hum (29)
Wilson (47)	12:12 am	40	1.9/144	Highway	n/a
Smith (47)	12:36 am	31	1.8/150	Frogs	n/a

The results in Tables 1 to 3 show that the applicable operational noise criteria were not exceeded at any location or at any time throughout the monitoring survey.

Data from those times where DCM operations were audible 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.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)						
Location	Day		Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	35	<30	39
29	<30	35	<30	35	<30	36
31	<30	35	<30	35	<30	37
33	<30	35	<30	35	<30	38
86	<30	35	<30	35	<30	38
32	<30	35	<30	35	<30	40
71	<30	35	<30	35	<30	41
75*	<30	35	<30	35	<30	41
70	<30	35	<30	36	<30	41
76*	<30	35	<30	36	<30	42
28	<30	35	<30	37	<30	40
69	<30	35	<30	37	<30	41
13	<30	36	<30	36	<30	35
12	<30	36	<30	36	<30	36
25*	<30	36	<30	37	<30	37
26	<30	36	<30	37	<30	38
27	<30	36	<30	37	<30	39
72*	<30	36	<30	37	<30	42
17	<30	37	<30	38	<30	36
21	<30	38	<30	38	<30	38
22	<30	38	<30	38	<30	38
18	<30	38	<30	39	<30	38
20	<30	39	<30	40	<30	39
61*	<30	39	<30	40	<30	39
14	<30	40	<30	39	<30	39
19	<30	40	<30	40	<30	39
16*	<30	41	30	41	<30	39
23	<30	35	<30	35	<30	35
35*	<30	35	<30	35	<30	35
42*	<30	35	<30	35	<30	35
37	<30	35	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report April 2015

30 April 2015

Ref: 03012/5744

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: APRIL 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 9th April, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

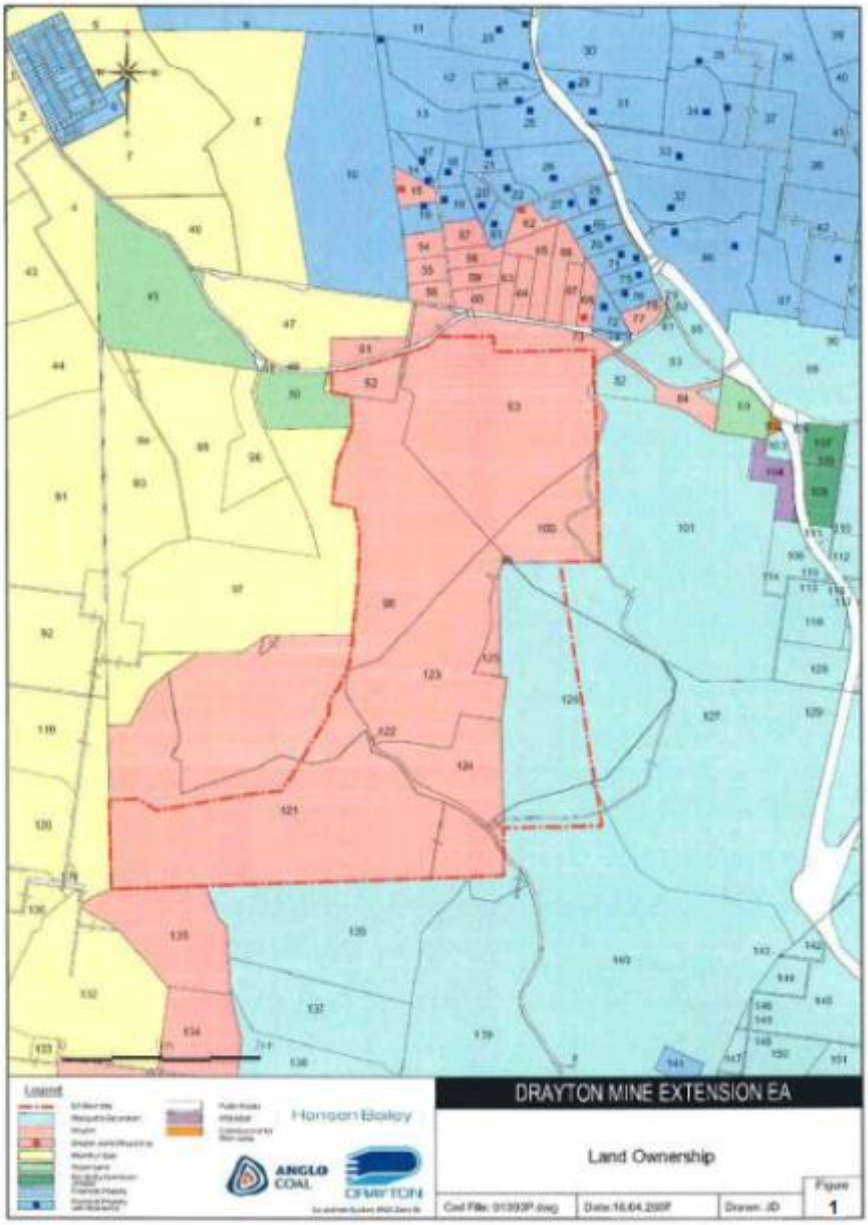
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


Legend
Hansen Bailey
ANGLO COAL
DRAYTON
DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 9 April 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:43 pm	45	3.0/125	Frogs & insects (44), traffic (37), wind (30), **DCM (26)**
Kerr (37)	8:33 pm	46	2.2/110	Traffic (46), wind (29), insects (27), **DCM inaudible**
Skinner (40)	8:09 pm	40	2.2/115	Traffic (38), wind (32), **DCM (30)**, frogs & insects (26)
Robertson (37)	7:05 pm	42	2.8/117	Traffic (42), wind (27), insects (24), **DCM inaudible**
Sharman (35)	7:46 pm	48	2.1/103	Traffic (48), insects (26), **DCM inaudible**
Horder (36)	7:27 pm	43	2.2/97	Traffic (43), **DCM (26)**, insects (25)
Wilson (35)	8:59 pm	38	2.0/116	Traffic (36), power station (29), wind (29), frogs & insects (26), **DCM inaudible**
Smith (35)	9:28 pm	38	2.1/127	Power station (35), wind (33), frogs & insects (28), traffic (25), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 9/10 April 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	45	1.6/122	Frogs & insects (42), traffic (41), **DCM (32)**
Kerr (37)	11:47 pm	45	0.4/112	Traffic (45), **DCM (32)**, frogs & insects (30)
Skinner (39)	11:25 pm	38	0.5/95	Traffic (36), **DCM (32)**, frogs & insects (26)
Robertson (42)	10:23 pm	40	1.2/100	Traffic (40), **DCM (24)**, insects (24)
Sharman (41)	11:04 pm	42	0.8/105	Traffic (41), power station (35), frogs & insects (25), **DCM faintly audible**
Horder (42)	10:43 pm	39	0.9/109	Traffic (39), frogs & insects (26), **DCM faintly audible**
Wilson (36)	12:12 am	37	1.1/136	Power station (36), traffic (29), frogs & insects (23), **DCM inaudible**
Smith (36)	12:38 am	35	1.4/134	Power station (34), traffic (25), insects (24), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 24/25 February 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:00 pm	50	1.6/122	Highway	Truck revs (36)
Kerr (47)	11:47 pm	49	0.4/112	Highway	Truck revs (35)
Skinner (47)	11:25 pm	41	0.5/95	Highway	Truck revs (36)
Robertson (47)	10:23 pm	44	1.2/100	Highway	Truck revs (27)
Sharman (47)	11:04 pm	51	0.8/105	Highway	Hum (20)
Horder (47)	10:43 pm	48	0.9/109	Highway	Hum (20)
Wilson (47)	12:12 am	41	1.1/136	Highway	n/a
Smith (47)	12:38 am	35	1.4/134	Highway	n/a

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 5.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	30	39
61*	30	40	32	39
14	<30	39	31	39
19	<30	40	31	39
16*	<30	41	32	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

4 June 2015

Ref: 03012/5827

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: MAY 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Monday 25th May, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

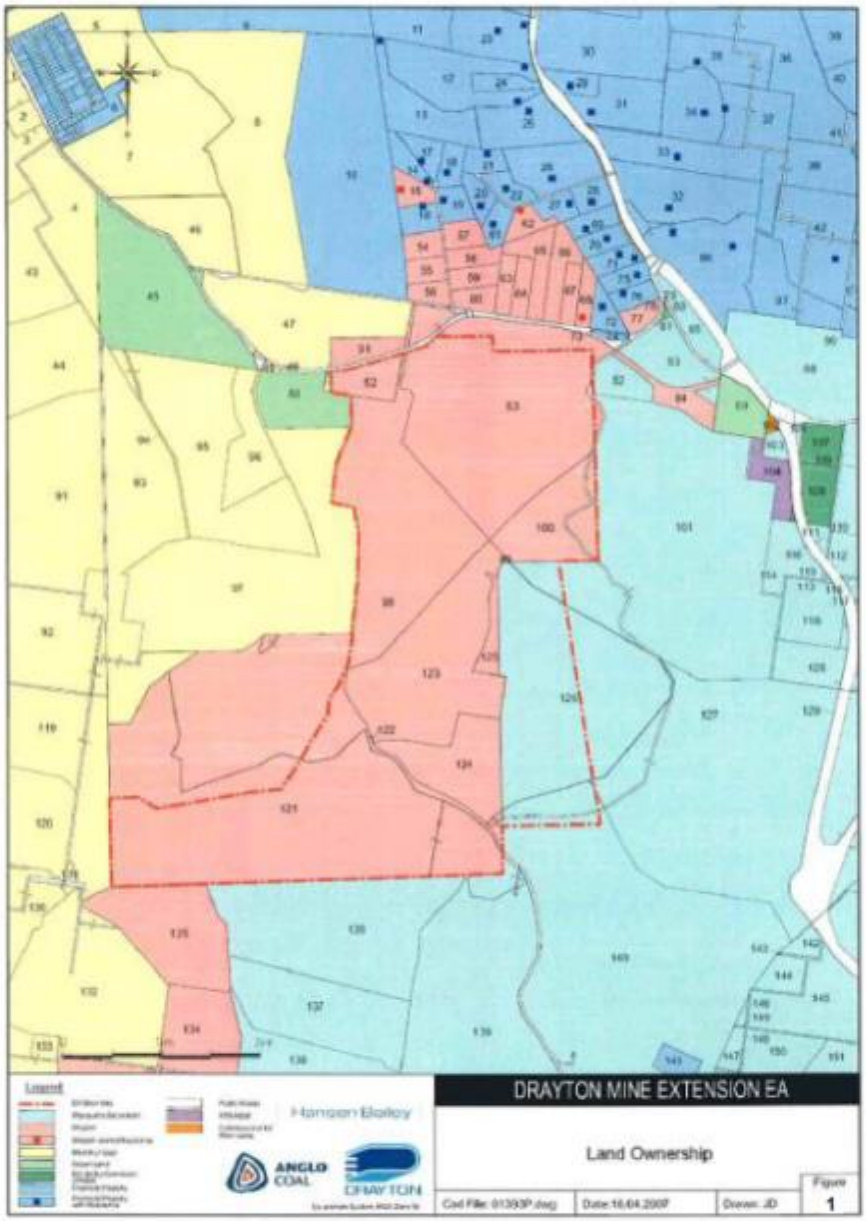
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
Hansen Bailey
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 25 May 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:48 pm	43	1.3/315	Traffic (41), frogs (38), other mine (33), **DCM inaudible**
Kerr (37)	8:37 pm	50	1.3/315	Traffic (50), other mine (35), frogs (34), **DCM (28)**
Skinner (40)	8:14 pm	44	1.1/312	Frogs (41), traffic (39), other mine (36), **DCM (26)**
Robertson (37)	7:10 pm	45	1.7/307	Traffic (45), frogs (27), **DCM inaudible**
Sharman (35)	7:51 pm	49	1.4/322	Traffic (49), other mine (34), frogs (26), **DCM inaudible**
Horder (36)	7:32 pm	46	1.6/324	Traffic (45), frogs (40), other mine (30), **DCM faintly audible**
Wilson (35)	9:04 pm	41	1.1/305	Traffic (40), other mine (32), frogs (25), **DCM inaudible**
Smith (35)	9:32 pm	39	1.4/313	Traffic (38), other mine (30), frogs (26), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 25/26 May 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	42	1.6/298	Traffic (40), frogs (36), other mine (33), **DCM inaudible**
Kerr (37)	11:46 pm	49	1.3/303	Traffic (48), other mine (37), frogs (35), **DCM (26)**
Skinner (39)	11:24 pm	43	1.7/317	Frogs (40), traffic (37), other mine (37), **DCM (26)**
Robertson (42)	10:22 pm	44	1.3/290	Traffic (43), frogs (34), other mine (29), **DCM faintly audible**
Sharman (41)	11:03 pm	46	1.4/307	Traffic (46), other mine (32), frogs (28), **DCM faintly audible**
Horder (42)	10:42 pm	46	1.3/292	Frogs (43), traffic (41), other mine (37), **DCM faintly audible**
Wilson (36)	12:11 am	40	1.5/304	Traffic (37), frogs (34), other mine (34), **DCM inaudible**
Smith (36)	12:38 am	38	1.8/292	Train (37), traffic (28), other mine (28), frogs (24), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 25/26 May 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:00 pm	49	1.6/298	Highway	n/a
Kerr (47)	11:46 pm	56	1.3/303	Highway	Dozer tracks (30)
Skinner (47)	11:24 pm	45	1.7/317	Highway	Dozer tracks (30)
Robertson (47)	10:22 pm	51	1.3/290	Highway	Hum (22)
Sharman (47)	11:03 pm	56	1.4/307	Highway	Hum (21)
Horder (47)	10:42 pm	51	1.3/292	Highway	Hum (22)
Wilson (47)	12:11 am	45	1.5/304	Highway	n/a
Smith (47)	12:38 am	40	1.8/292	Highway	n/a

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 79	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	Day/Evening/Night $L_{Aeq(1hour)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ 50 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 45 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 40 dB(A) – Night.

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ 53 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 48 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 43 dB(A) – Night.

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	<30	39
61*	<30	40	<30	39
14	<30	39	<30	39
19	<30	40	<30	39
16*	<30	41	<30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report June 2015

17 June 2015

Ref: 03012/5867

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: JUNE 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 4th June 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

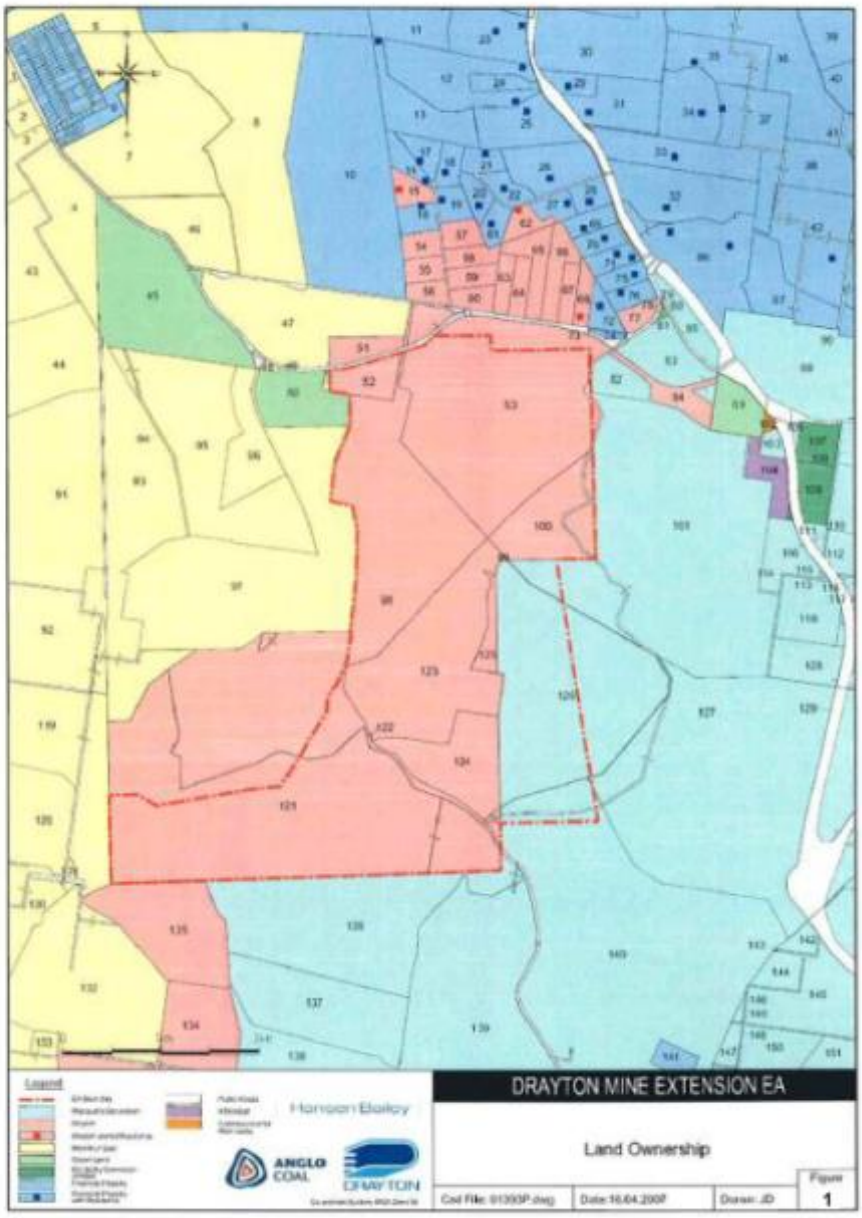
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited | 1 Roath Street, Cardiff NSW 2285 | Phone: (02) 4954 2276
ABN: 40 106 435 554 | Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with a Brüel & Kjær Type 2250 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.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-3** and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ From DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 4 June 2015 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	3:03 pm	35	3.1/290	Traffic (34), birds (28), **DCM inaudible**
Kerr (36)	4:57 pm	50	1.4/315	Traffic (50), birds (38), **DCM inaudible**
Skinner (39)	4:32 pm	39	1.5/308	Traffic (39), birds (25), **DCM inaudible**
Robertson (36)	3:26 pm	44	1.6/312	Traffic (44), birds (32), **DCM inaudible**
Sharman (35)	4:08 pm	54	1.6/307	Traffic (54), birds (29), **DCM inaudible**
Horder (35)	3:47 pm	44	1.4/290	Traffic (43), train (36), birds (28), **DCM inaudible**
Wilson (35)	5:20 pm	44	1.0/311	Traffic (44), birds (24), **DCM inaudible**
Smith (35)	5:42 pm	43	1.1/230	Traffic (43), **DCM inaudible**

Table 2
DCM Noise Monitoring Results – 4 June 2015 (Evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:54 pm	41	1.1/293	Traffic (40), frogs (30), other mine (30), **DCM inaudible**
Kerr (37)	8:43 pm	48	2.3/311	Traffic (48), other mine (36), frogs (29), **DCM inaudible**
Skinner (40)	8:20 pm	42	2.3/303	Traffic (41), other mine (34), frogs (26), **DCM inaudible**
Robertson (37)	7:16 pm	46	1.3/312	Traffic (46), **DCM (29)**, other mine (29), frogs (26)
Sharman (35)	7:56 pm	49	2.2/302	Traffic (49), other mine (35), frogs (25), **DCM faintly audible**
Horder (36)	7:37 pm	44	1.6/308	Traffic (43), other mine (34), frogs (30), **DCM (27)**
Wilson (35)	9:09 pm	43	1.7/280	Traffic (43), other mine (28), frogs (25), **DCM inaudible**
Smith (35)	9:32 pm	42	1.4/288	Traffic (41), other mine (34), frogs (24), **DCM inaudible**

Table 3 DCM Noise Monitoring Results – 4/5 June 2015 (Night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	42	1.9/319	Other mine (40), traffic (38), frogs (25), **DCM inaudible**
Kerr (37)	11:46 pm	46	2.2/318	Traffic (46), other mine (34), frogs (25), **DCM inaudible**
Skinner (39)	11:26 pm	38	2.6/312	Traffic (36), other mine (33), frogs (27), **DCM faintly audible**
Robertson (42)	10:24 pm	46	2.6/305	Traffic (45), **DCM (39)**, other mine (27), frogs (26)
Sharman (41)	11:05 pm	48	3.0/314	Traffic (48), **DCM (34)**, other mine (24), frogs (24)
Horder (42)	10:45 pm	46	3.1/307	Traffic (45), **DCM (40)**, frogs (31), other mine (25)
Wilson (36)	12:12 am	40	2.3/309	Traffic (39), other mine (32), frogs (24), **DCM inaudible**
Smith (36)	12:36 am	40	2.3/316	Traffic (37), wind (36), other mine (29), **DCM inaudible**

Table 4 DCM Noise Monitoring Results – 4/5 June 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	46	1.9/319	Highway	n/a
Kerr (47)	11:46 pm	53	2.2/318	Highway	n/a
Skinner (47)	11:26 pm	43	2.6/312	Highway	Hum (22)
Robertson (47)	10:24 pm	54	2.6/305	Highway	Train loading (45)
Sharman (47)	11:05 pm	63	3.0/314	Highway	Train loading (38)
Horder (47)	10:45 pm	53	3.1/307	Highway	Train loading (45)
Wilson (47)	12:12 am	49	2.3/309	Highway	n/a
Smith (47)	12:36 am	43	2.3/316	Highway	n/a

The results in Tables 1 to 3 show that the applicable operational noise criteria were not exceeded at any location or at any time throughout the monitoring survey.

Data from those times where DCM operations were audible 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.

The results in Table 4 show that the noise sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)						
Location	Day		Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	35	<30	39
29	<30	35	<30	35	<30	36
31	<30	35	<30	35	<30	37
33	<30	35	<30	35	<30	38
86	<30	35	<30	35	<30	38
32	<30	35	<30	35	<30	40
71	<30	35	<30	35	34	41
75*	<30	35	<30	35	34	41
70	<30	35	<30	36	33	41
76*	<30	35	<30	36	40	42
28	<30	35	<30	37	32	40
69	<30	35	<30	37	33	41
13	<30	36	<30	36	<30	35
12	<30	36	<30	36	<30	36
25*	<30	36	<30	37	<30	37
26	<30	36	<30	37	<30	38
27	<30	36	<30	37	<30	39
72*	<30	36	<30	37	39	42
17	<30	37	<30	38	<30	36
21	<30	38	<30	38	<30	38
22	<30	38	<30	38	<30	38
18	<30	38	<30	39	<30	38
20	<30	39	<30	40	<30	39
61*	<30	39	<30	40	<30	39
14	<30	40	<30	39	<30	39
19	<30	40	<30	40	<30	39
16*	<30	41	<30	41	<30	39
23	<30	35	<30	35	<30	35
35*	<30	35	<30	35	<30	35
42*	<30	35	<30	35	<30	35
37	<30	35	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report July 2015

3 August 2015

Ref: 03012/5942

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: JULY 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Wednesday 29th July, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

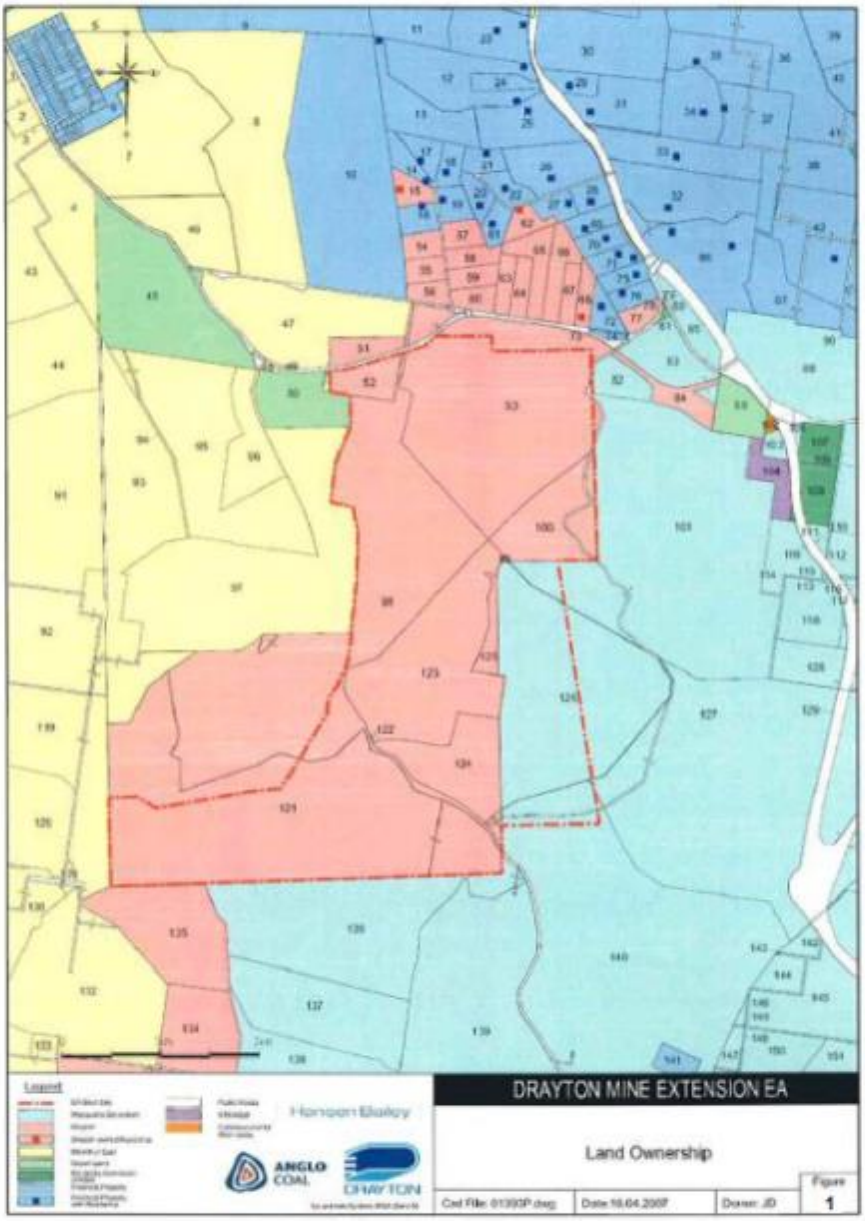
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 29 July 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	8:30 pm	43	1.6/133	Traffic (42), frogs (34), **DCM (29)**
Kerr (37)	8:53 pm	51	1.2/153	Traffic (51), frogs (26), **DCM (<20)**
Skinner (40)	8:26 pm	41	1.5/129	Traffic (40), dogs (30), **DCM (27)**
Robertson (37)	8:53 pm	42	1.2/153	Traffic (42), **DCM (30)**, frogs (24)
Sharman (35)	9:36 pm	48	0.4/222	Traffic (48), **DCM (28)**
Horder (36)	9:15 pm	43	0.4/220	Traffic (42), frogs (33), **DCM (31)**
Wilson (35)	9:18 pm	40	0.4/220	Traffic (40), frogs (25), **DCM (<20)**
Smith (35)	9:41 pm	35	0.4/265	Traffic (33), train (31), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 29 July 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	44	0.3/150	Traffic (42), **DCM (39)**, frogs (32)
Kerr (37)	10:29 pm	44	0.2/260	Traffic (44), frogs (26), **DCM (26)**
Skinner (39)	10:05 pm	41	0.2/259	Traffic (39), **DCM (35)**, domestic pump (29), frogs (26)
Robertson (42)	10:22 pm	45	0.4/288	Traffic (45), **DCM (33)**, frogs (26)
Sharman (41)	11:04 pm	49	0.4/293	Traffic (49), **DCM (27)**
Horder (42)	10:43 pm	45	0.3/205	Traffic (44), frogs (34), **DCM (33)**
Wilson (36)	10:56 pm	44	0.3/226	Traffic (44), birds (30), **DCM (<20)**
Smith (36)	11:21 pm	35	0.2/313	Traffic (32), power plant (29), **DCM (27)**, frogs (24)

Table 3 DCM Noise Monitoring Results – 29 July 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:00 pm	48	0.3/150	Highway	Dozer tracks (45)
Kerr (47)	10:29 pm	49	0.2/260	Highway	Dozer tracks (30)
Skinner (47)	10:05 pm	45	0.2/259	Highway	Dozer tracks (40)
Robertson (47)	10:22 pm	54	0.4/288	Highway	Hum (38)
Sharman (47)	11:04 pm	58	0.4/293	Highway	Hum (30)
Horder (47)	10:43 pm	53	0.3/205	Highway	Hum (37)
Wilson (47)	10:56 pm	49	0.3/226	Highway	(<20)
Smith (47)	11:21 pm	39	0.2/313	Highway	Dozer tracks (31)

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ min)}$ noise limits, 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.*
- *To determine compliance with the $L_{A1(1\ min)}$ 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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	31	36	33	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	30	37	33	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	31	38
18	<30	39	<30	38
20	<30	40	33	39
61*	<30	40	35	39
14	<30	39	32	39
19	<30	40	36	39
16*	<30	41	39	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report August 2015

15 September 2015

Ref: 03012/5991

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: AUGUST 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 27th August, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

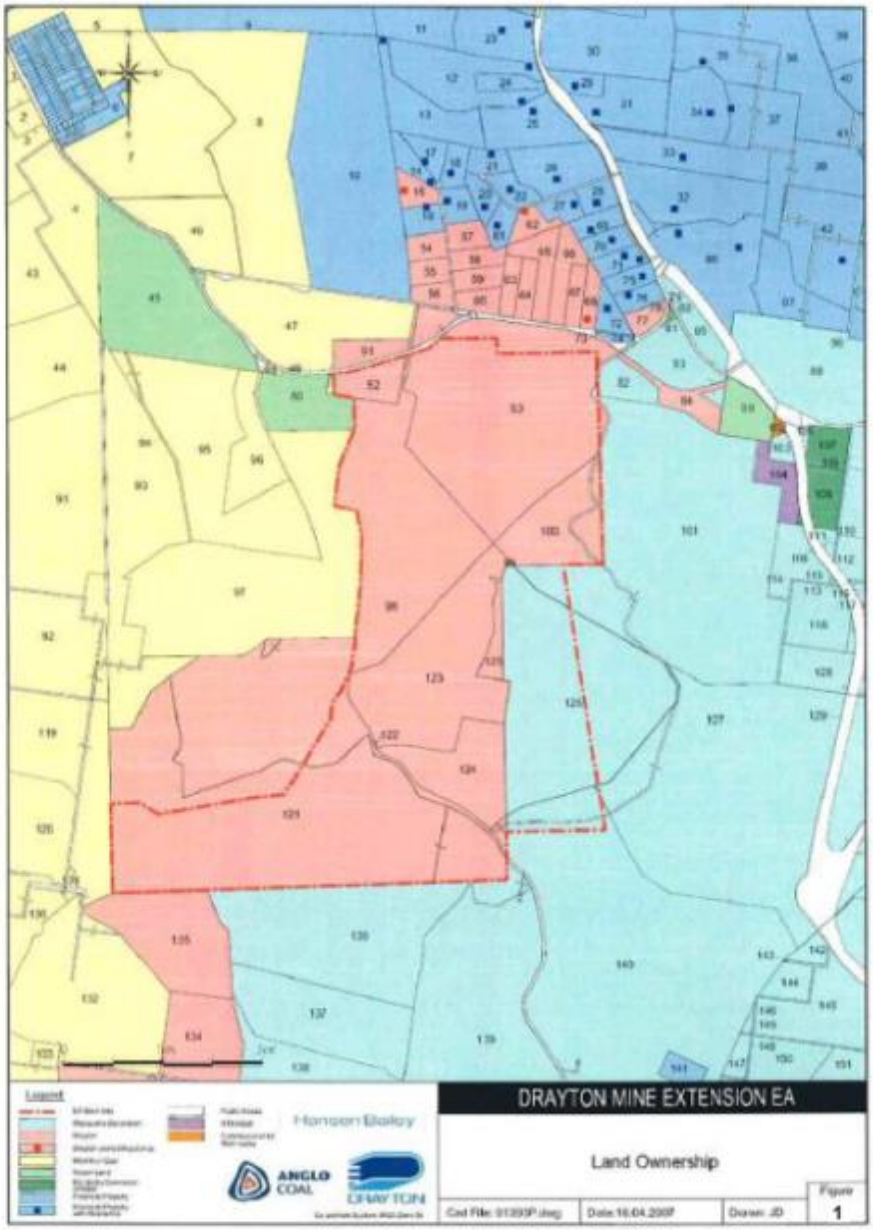
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from the existing automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and have current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 27 August 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:36 pm	50	2.6/310	Frogs (49), traffic (43), other mine (28), wind (27), **DCM (<20)**
Kerr (37)	8:25 pm	49	2.3/300	Traffic (49), frogs (31), other mine (29), **DCM (<20)**
Skinner (40)	8:02 pm	45	2.3/316	Frogs (44),traffic (36), other mine (35), **DCM (<20)**
Robertson (37)	6:59 pm	49	2.2/213	Traffic (49), frogs (31), wind (29), **DCM (27)**
Sharman (35)	7:40 pm	50	2.3/316	Traffic (50), frogs (38), other mine (26), **DCM (<20)**
Horder (36)	7:20 pm	49	2.3/307	Traffic (47), frogs (44), **DCM (25)**
Wilson (35)	8:55 pm	45	1.9/318	Traffic (44), frogs (39), **DCM (<20)**
Smith (35)	9:24 pm	43	1.8/310	Traffic (43), frogs (28), other mine (25), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 27/28 August 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	54	1.8/302	Frogs (54), traffic (39), other mine (33), **DCM (<20)**
Kerr (37)	11:46 pm	46	2.5/299	Traffic (46), frogs (29), other mine (28), **DCM (<20)**
Skinner (39)	11:24 pm	45	2.5/305	Frogs (44), traffic (38), other mine (30), **DCM (<20)**
Robertson (42)	10:22 pm	45	2.3/313	Traffic (44), frogs (38), **DCM (27)**
Sharman (41)	11:03 pm	49	2.9/295	Traffic (49), frogs (35), other mine (24), **DCM (<20)**
Horder (42)	10:42 pm	45	2.6/310	Traffic (42), frogs (42), **DCM (25)**
Wilson (36)	12:10 pm	42	2.2/311	Traffic (41), frogs (35), **DCM (<20)**
Smith (36)	12:36 pm	38	2.8/304	Traffic (37), frogs (30), other mine (24), **DCM (<20)**

Table 3 DCM Noise Monitoring Results – 27/28 August 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\,(1min)}$	Wind speed/ direction	$L_{1\,(1\,min)}$ source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	56	1.8/302	Frogs	(<20)
Kerr (47)	11:46 pm	53	2.5/299	Highway	(<20)
Skinner (47)	11:24 pm	48	2.5/305	Highway	(<20)
Robertson (47)	10:22 pm	48	2.3/313	Highway	Hum (31)
Sharman (47)	11:03 pm	60	2.9/295	Highway	(<20)
Horder (47)	10:42 pm	51	2.6/310	Highway	Hum (28)
Wilson (47)	12:10 pm	47	2.2/311	Highway	(<20)
Smith (47)	12:36 pm	44	2.8/304	Highway	(<20)

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\,(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\,(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\,(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	<30	39
61*	<30	40	<30	39
14	<30	39	<30	39
19	<30	40	<30	39
16*	<30	41	<30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report September 2015

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

6 October 2015

Ref: 03012/6082

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: SEPTEMBER 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 22nd September 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

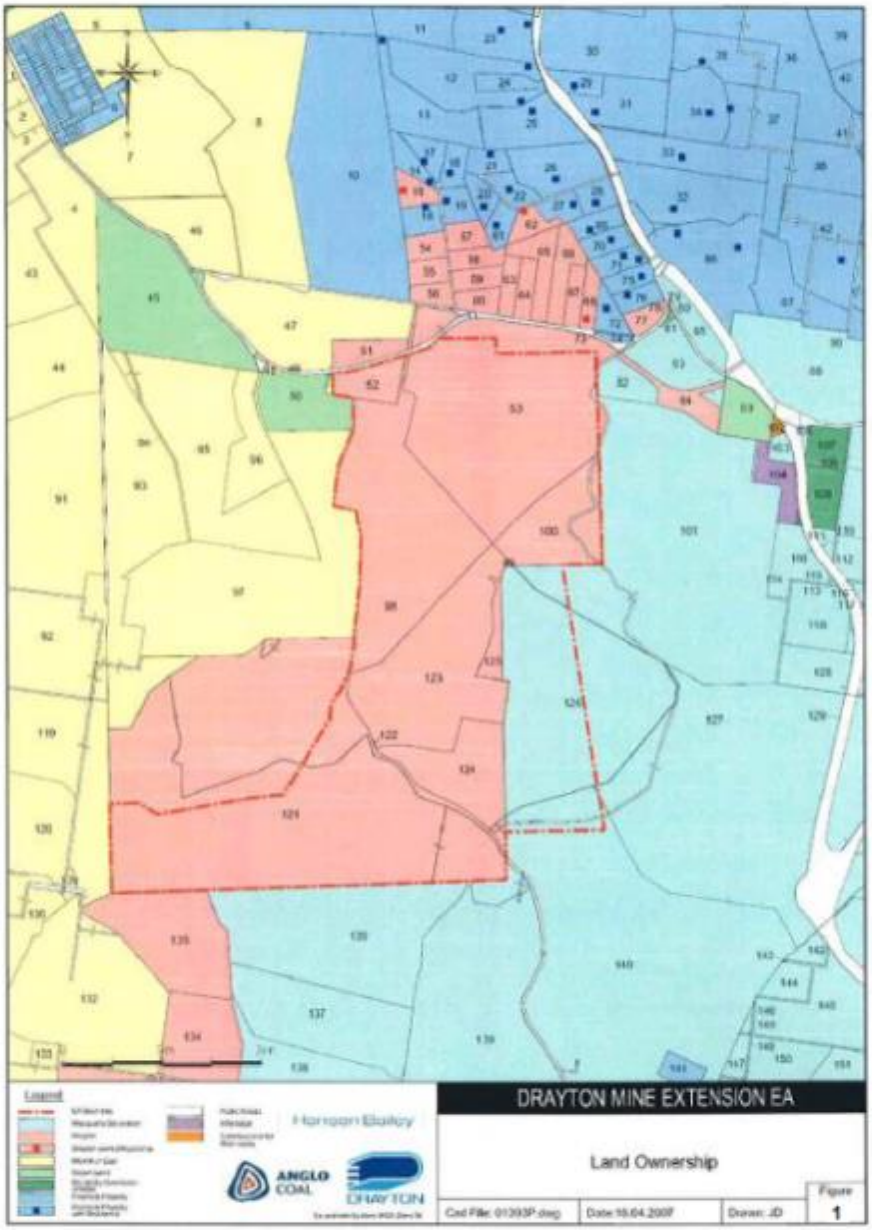
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments haves 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.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1**-3 and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal (criterion) for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The relevant criterion is shown in brackets in the "Location" column in the tables. The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 22 September 2015 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	9:16 am	40	2.8/301	Birds (39), wind (29), other mine (26), traffic (24), **DCM (<20)**
Kerr (36)	9:39 am	42	3.0/287	Traffic (41), birds (34), **DCM (<20)**
Skinner (39)	9:14 am	41	2.8/301	Birds (39), traffic (34), wind (30), other mine (25), **DCM (<20)**
Robertson (36)	9:46 am	47	3.4/293	Traffic (46), birds (39), **DCM (30)**
Sharman (35)	10:29 am	54	3.4/302	Traffic (54), birds (32), wind (27), **DCM (<20)**
Horder (35)	10:09 am	47	3.3/292	Traffic (46), birds (37), **DCM (33)**, wind (30)
Wilson (35)	10:08 am	44	3.3/292	Traffic (40), wind (40), birds (36), **DCM (<20)**
Smith (35)	8:50 am	42	3.4/292	Wind (39), traffic (37), birds (34), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 22 September 2015 (Evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:17 pm	42	2.9/143	Traffic (40), frogs (37), **DCM (27)**
Kerr (37)	9:08 pm	46	2.3/146	Traffic (46), **DCM (32)**, frogs (27)
Skinner (40)	8:43 pm	39	2.1/136	Frogs (35), train (35), traffic (33), **DCM (27)**
Robertson (37)	7:40 pm	39	3.4/131	Traffic (38), frogs (28), **DCM (26)**
Sharman (35)	8:20 pm	48	2.8/134	Traffic (47), frogs (39), train (33), **DCM (<20)**
Horder (36)	8:00 pm	43	2.8/141	Traffic (40), frogs (40), **DCM (<20)**
Wilson (35)	9:33 pm	40	3.1/156	Traffic (39), frogs (33), **DCM (<20)**
Smith (35)	9:27 pm	36	3.0/155	Frogs (34), traffic (31), **DCM (<20)**

Table 3 DCM Noise Monitoring Results – 22 September 2015 (Night)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	41	1.9/152	Traffic (38), **DCM (37)**, frogs (31)
Kerr (37)	10:29 pm	44	2.6/165	Traffic (44), **DCM (32)**, frogs (26)
Skinner (39)	10:00 pm	41	1.9/152	**DCM (38)**, traffic (35), frogs (34)
Robertson (42)	10:24 pm	40	2.2/169	Traffic (39), **DCM (29)**, frogs (28)
Sharman (41)	11:05 pm	50	2.3/171	Traffic (50), frogs (37), **DCM (31)**
Horder (42)	10:44 pm	46	2.4/164	Frogs (45), **DCM (36)**, traffic (33)
Wilson (36)	10:57 pm	39	2.2/170	Traffic (39), frogs (24), **DCM (<20)**
Smith (36)	11:26 pm	36	2.6/167	Traffic (35), power plant (28), frogs (25), **DCM (<20)**

Table 4 DCM Noise Monitoring Results – 22 September 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	10:00 pm	46	1.9/152	Highway	Engine revs (41)
Kerr (47)	10:29 pm	57	2.6/165	Highway	Engine revs (36)
Skinner (47)	10:00 pm	42	1.9/152	Mine	Engine revs (42)
Robertson (47)	10:24 pm	46	2.2/169	Highway	Engine revs (33)
Sharman (47)	11:05 pm	62	2.3/171	Highway	Engine revs (36)
Horder (47)	10:44 pm	53	2.4/164	Frogs	Engine revs (40)
Wilson (47)	10:57 pm	45	2.2/170	Highway	n/a
Smith (47)	11:26 pm	41	2.6/167	Highway	n/a

The results in Tables 1 to 3 show that the applicable operational noise criteria were not exceeded at any location or at any time throughout the monitoring survey.

Data from those times where DCM operations were audible 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.

The results in Table 4 show that the sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on an equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)						
Location	Day		Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	35	<30	39
29	<30	35	<30	35	<30	36
31	<30	35	<30	35	<30	37
33	<30	35	<30	35	<30	38
86	<30	35	<30	35	<30	38
32	<30	35	<30	35	<30	40
71	<30	35	<30	35	34	41
75*	<30	35	<30	35	34	41
70	<30	35	<30	36	33	41
76*	<30	35	<30	36	40	42
28	<30	35	<30	37	32	40
69	<30	35	<30	37	33	41
13	<30	36	<30	36	<30	35
12	<30	36	<30	36	<30	36
25*	<30	36	<30	37	<30	37
26	<30	36	<30	37	<30	38
27	<30	36	<30	37	<30	39
72*	<30	36	<30	37	39	42
17	<30	37	<30	38	<30	36
21	<30	38	<30	38	<30	38
22	<30	38	<30	38	<30	38
18	<30	38	<30	39	<30	38
20	<30	39	<30	40	<30	39
61*	<30	39	<30	40	<30	39
14	<30	40	<30	39	<30	39
19	<30	40	<30	40	<30	39
16*	<30	41	<30	41	<30	39
23	<30	35	<30	35	<30	35
35*	<30	35	<30	35	<30	35
42*	<30	35	<30	35	<30	35
37	<30	35	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report October 2015

19 October 2015

Ref: 03012/6102

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: OCTOBER 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 15th October, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

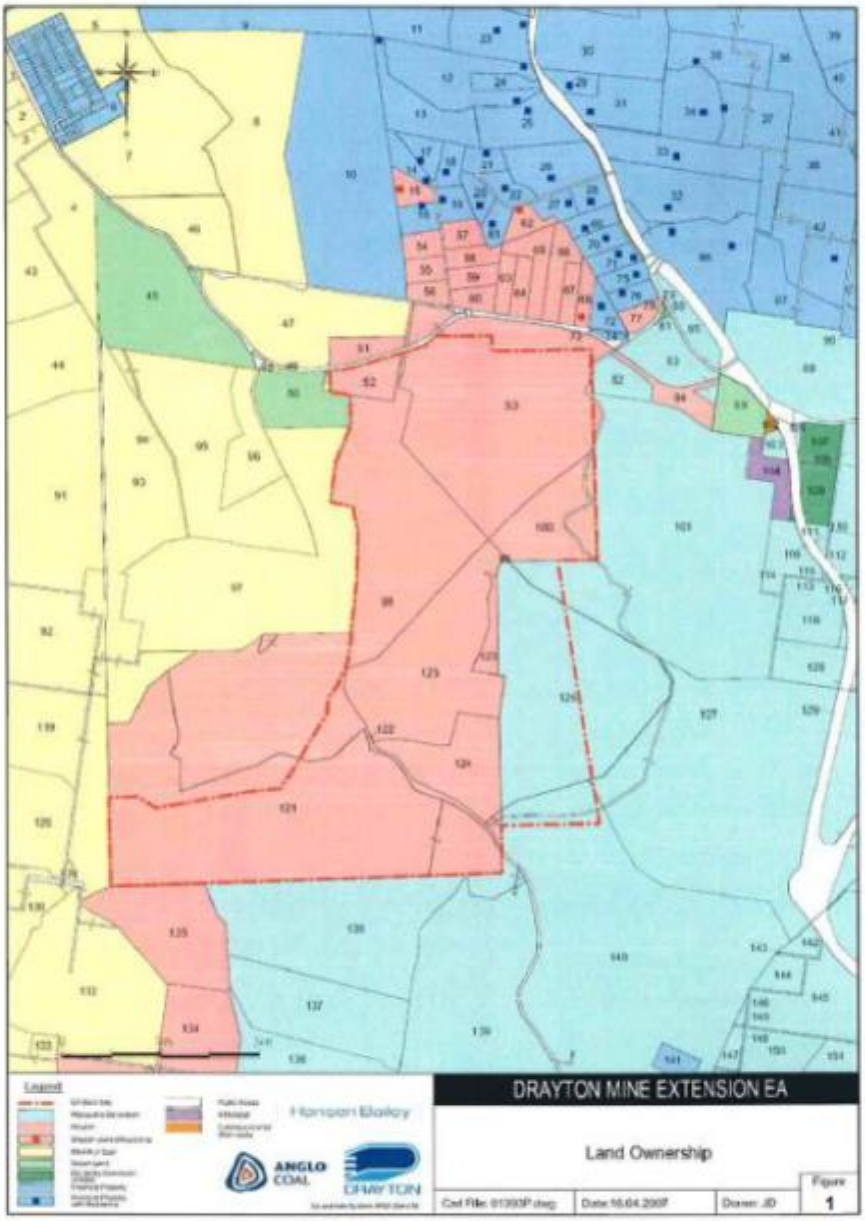
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and has current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 15 October 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:53 pm	44	1.1/90	Birds (43), traffic (37), **DCM (<20)**
Kerr (37)	8:42 pm	48	0.4/169	Traffic (47), frogs & insects (40), **DCM (28)**
Skinner (40)	8:19 pm	44	0.9/132	Frogs & insects (43), traffic (36), **DCM (26)**
Robertson (37)	7:15 pm	49	1.1/89	Birds & insects (48), traffic (42), **DCM (<20)**
Sharman (35)	7:56 pm	49	0.9/126	Traffic (49), frogs & insects (34), **DCM (<20)**
Horder (36)	7:37 pm	46	0.8/121	Frogs & Insects (44), traffic (42), **DCM (<20)**
Wilson (35)	9:09 pm	44	0.3/217	Frogs & insects (44), traffic (31), **DCM (<20)**
Smith (35)	9:36 pm	41	0.2/236	Frogs & insects (40), traffic (33), power plant (26), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 15/16 October 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:00 pm	42	0.6/794	Traffic (41), frogs & insects (36), **DCM (<20)**
Kerr (37)	11:47 pm	49	0.6/264	Traffic (49), frogs & insects (34), **DCM (<20)**
Skinner (39)	11:25 pm	46	0.4/257	Frogs & insects (46), traffic (33), **DCM (<20)**
Robertson (42)	10:23 pm	42	1.1/295	Traffic (41), frogs & insects (33), **DCM (28)**
Sharman (41)	11:03 pm	45	0.9/276	Traffic (45), frogs & insects (32), **DCM (24)**
Horder (42)	10:42 pm	47	0.4/258	Frogs & insects (44), traffic (44), **DCM (26)**
Wilson (36)	12:12 am	47	0.7/256	Frogs & insects (47), traffic (30), train (28), **DCM (<20)**
Smith (36)	12:38 am	41	1.0/264	Frogs & insects (40), traffic (33), power plant (25), **DCM (<20)**

Table 3 DCM Noise Monitoring Results – 15/16 October 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:00 pm	47	0.6/794	Highway	(<20)
Kerr (47)	11:47 pm	56	0.6/264	Highway	(<20)
Skinner (47)	11:25 pm	49	0.4/257	Highway	(<20)
Robertson (47)	10:23 pm	48	1.1/295	Highway	Hum (33)
Sharman (47)	11:03 pm	54	0.9/276	Highway	Hum (28)
Horder (47)	10:42 pm	55	0.4/258	Frogs	Hum (28)
Wilson (47)	12:12 am	51	0.7/256	Frogs	(<20)
Smith (47)	12:38 am	45	1.0/264	Frogs	(<20)

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day $L_{Aeq(15\ min)}$	Evening $L_{Aeq(15\ min)}$	Night $L_{Aeq(15\ min)}$	Night $L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 81	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 6.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	Day/Evening/Night $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ 50 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 43 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 40 dB(A) – Night.

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ 53 dB(A) – Day;
   - $L_{Aeq(4\ hour)}$ 48 dB(A) – Evening;
   - $L_{Aeq(9\ hour)}$ 43 dB(A) – Night.

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	<30	39
61*	<30	40	<30	39
14	<30	39	<30	39
19	<30	40	<30	39
16*	<30	41	<30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report November 2015

SPECTRUM ACOUSTICS
NOISE AND VIBRATION CONSULTANTS

26 November 2015

Ref: 03012/6167

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: NOVEMBER 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Thursday 19th November, 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

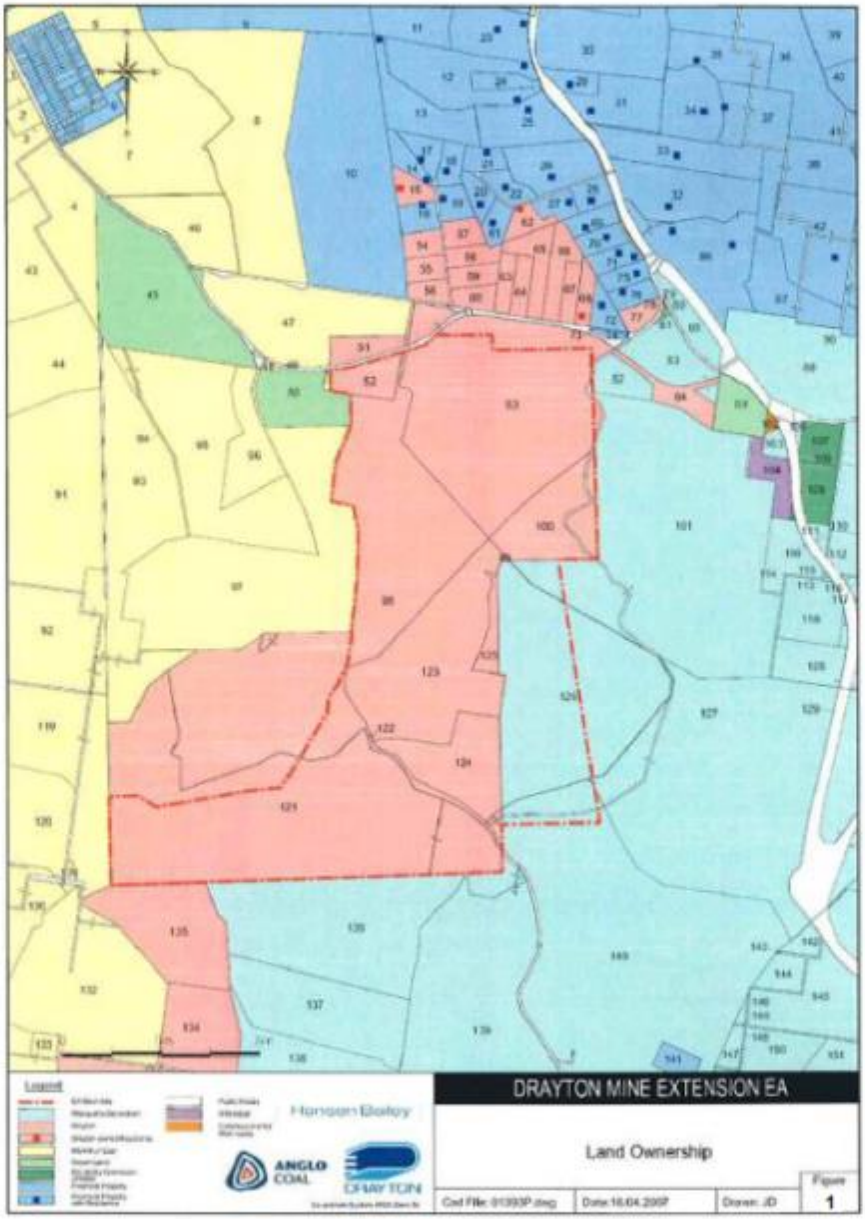
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Two sets of measurements were made over the "circuit", one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at certain monitoring locations throughout the evening and night time periods.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited | 1 Roath Street, Cardiff NSW 2285 | Phone: (02) 4954 2276
ABN: 40 106 435 554 | Fax: (02) 4954 2257


DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1
ANGLO COAL
DRAYTON

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Attended noise monitoring was conducted with a Brüel & Kjær Type 2250 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters" and has current NATA calibration. Field calibration is carried out at the start and end of each monitoring period.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1-2** and night time $L_{1\ (1minute)}$ – approximated as measured L_{max} – in **Table 3**. Table 3 shows the overall $L_{1\ (1minute)}$ and the contributing source as well as the $L_{1\ (1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 19 November 2015 (evening)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	6:58 pm	43	1.4/270	Birds & insects (42), traffic (36), other mine (25), **DCM (<20)**
Kerr (37)	8:47 pm	53	2.1/316	Frogs & insects (51), traffic (49), **DCM (<20)**
Skinner (40)	8:24 pm	45	1.5/309	Frogs & insects (44), traffic (37), **DCM (<20)**
Robertson (37)	7:20 pm	56	1.3/330	Birds & insects (56), traffic (42), **DCM (26)**
Sharman (35)	8:01 pm	49	1.2/315	Traffic (49), birds & insects (37), **DCM (<20)**
Horder (36)	7:41 pm	57	1.0/321	Birds & Insects (57), traffic (40), **DCM (25)**
Wilson (35)	9:15 pm	43	1.7/314	Frogs & insects (42), traffic (36), **DCM (<20)**
Smith (35)	9:41 pm	42	1.9/303	Frogs & insects (41), traffic (35), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 19/20 November 2015 (night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	10:02 pm	46	2.0/319	Frogs & insects (45), traffic (39), other mine (27), **DCM (<20)**
Kerr (37)	11:48 pm	50	1.8/300	Frogs & insects (48), traffic (46), other mine (31), **DCM (<20)**
Skinner (39)	11:27 pm	47	2.0/300	Frogs & insects (47), traffic (33), other mine (27), **DCM (<20)**
Robertson (42)	10:24 pm	50	1.8/310	Frogs & insects (49), traffic (42), **DCM (26)**
Sharman (41)	11:04 pm	48	2.1/298	Traffic (46), frogs & insects (44), **DCM (<20)**
Horder (42)	10:43 pm	49	1.8/304	Frogs & insects (48), traffic (43), **DCM (26)**
Wilson (36)	12:13 am	48	2.4/304	Frogs & insects (48), traffic (29), other mine (26), **DCM (<20)**
Smith (36)	12:39 am	40	2.3/310	Frogs & insects (39), traffic (31), other mine (27), **DCM (<20)**

Table 3 DCM Noise Monitoring Results – 19/20 November 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1\ (1min)}$	Wind speed/ direction	$L_{1\ (1\ min)}$ source	Identified Mine Sources ($L_{1\ (1\ min)}$)
Doherty (47)	10:02 pm	49	2.0/319	Highway	(<20)
Kerr (47)	11:48 pm	55	1.8/300	Highway	(<20)
Skinner (47)	11:27 pm	52	2.0/300	Frogs	(<20)
Robertson (47)	10:24 pm	53	1.8/310	Highway	Hum (29)
Sharman (47)	11:04 pm	55	2.1/298	Highway	(<20)
Horder (47)	10:43 pm	54	1.8/304	Frogs	Hum (28)
Wilson (47)	12:13 am	51	2.4/304	Frogs	(<20)
Smith (47)	12:39 am	45	2.3/310	Frogs	(<20)

The results in Tables 1 and 2 shows that the noise criterion was not exceeded at any location.

Data from those times where DCM operations were audible 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.

The results in Table 3 show that the noise sleep disturbance criterion ($L_{1\ (1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1\ (1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1\ (1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 5.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)				
Location	Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	39
29	<30	35	<30	36
31	<30	35	<30	37
33	<30	35	<30	38
86	<30	35	<30	38
32	<30	35	<30	40
71	<30	35	<30	41
75*	<30	35	<30	41
70	<30	36	<30	41
76*	<30	36	<30	42
28	<30	37	<30	40
69	<30	37	<30	41
13	<30	36	<30	35
12	<30	36	<30	36
25*	<30	37	<30	37
26	<30	37	<30	38
27	<30	37	<30	39
72*	<30	37	<30	42
17	<30	38	<30	36
21	<30	38	<30	38
22	<30	38	<30	38
18	<30	39	<30	38
20	<30	40	<30	39
61*	<30	40	<30	39
14	<30	39	<30	39
19	<30	40	<30	39
16*	<30	41	<30	39
23	<30	35	<30	35
35*	<30	35	<30	35
42*	<30	35	<30	35
37	<30	35	<30	35

* Measurement location

Independent Noise Monitoring Report December 2015

22 December 2015

Ref: 03012/6239

James Benson
Anglo Coal (Drayton Management) Pty Limited
PMB 9
Muswellbrook NSW 2333

RE: DECEMBER 2015 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Drayton Coal Mine (DCM) on Tuesday 21st December 2015. The purpose of the measurements was to quantify the overall noise levels at the nearby residences and determine the contribution from DCM operations.

Schedule 3 of the DCM Project Approval details noise impact assessment criteria for 28 specific residential locations. For logistic reasons it is not reasonable to carry out attended noise monitoring at all of the listed locations during the one monitoring survey. As such, the approach taken was to monitor the noise at eight representative residential locations and determine, by noise modelling, the noise level at all of the other locations required in the Project Approval. Noise measurement locations for the attended noise survey are listed below (as shown in **Figure 1**):

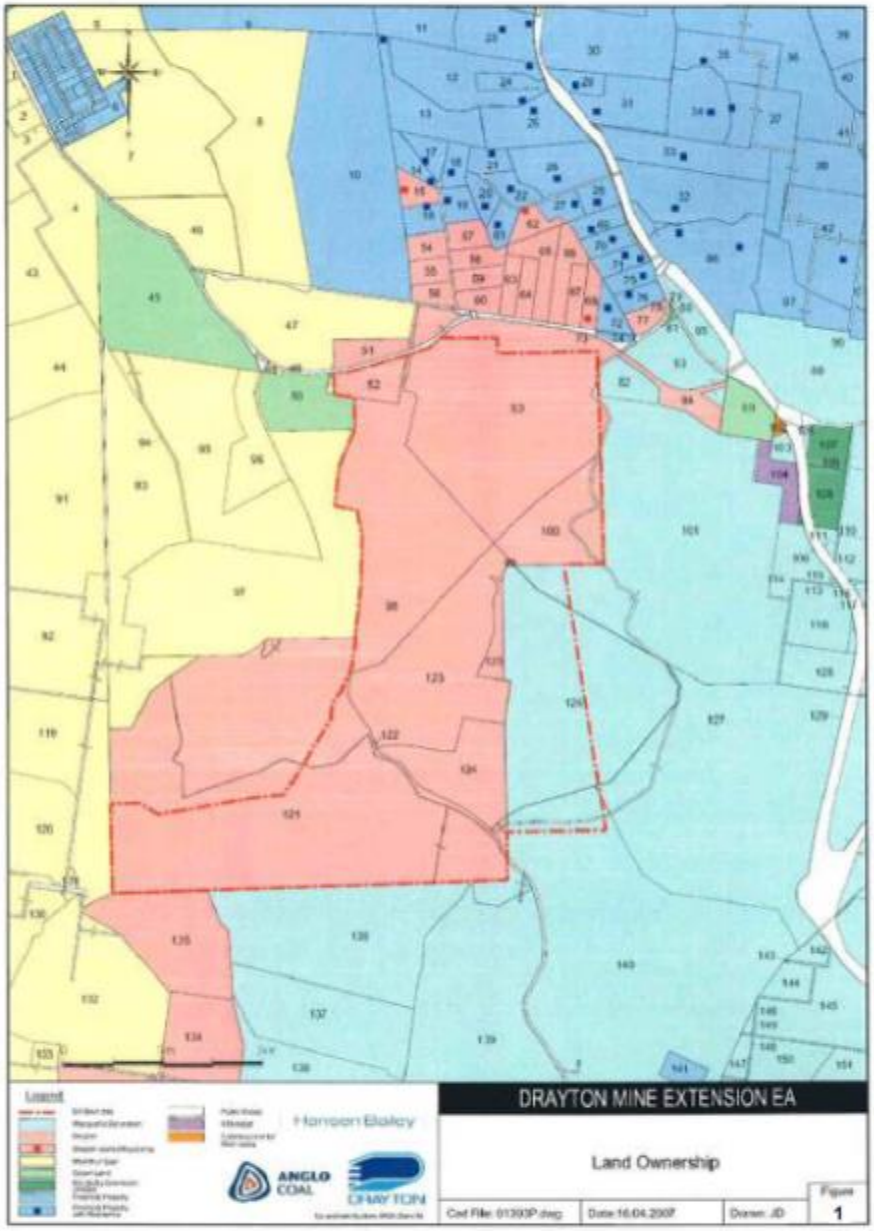
Location R16: Doherty
Location R25: Kerr
Location R35: Wilson*
Location R42: Smith*
Location R61: Skinner
Location R72: Robertson
Location R75: Sharman
Location R76: Horder

* Additional locations contained in EPL 1323 but not in the Project Approval.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). DCM activities were audible at many monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds (in m/s) and direction have been determined as the arithmetic average of the measurements over the monitoring period. The mine operated weather station does not record temperature inversion data.

Spectrum Acoustics Pty Limited
ABN: 40 106 435 554
1 Roath Street, Cardiff NSW 2285
Phone: (02) 4954 2276
Fax: (02) 4954 2257


Legend
Horsnen Bailey
ANGLO COAL
DRAYTON
DRAYTON MINE EXTENSION EA
Land Ownership
Figure
1

Details of the DCM Project Approval with respect to noise emissions are shown as **Appendix A** to this report.

Noise emission levels were measured with Brüel & Kjær Type 2250 Precision Sound Analysers. These instruments have Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instruments was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator prior to and at the completion of measurements.

Measured noise levels for each monitoring circuit are summarised in the following tables. The total measured L_{eq} is shown in **Tables 1**-3 and night time $L_{1(1minute)}$ – approximated as measured L_{max} – in **Table 4**. Table 3 shows the overall $L_{1(1minute)}$ and the contributing source as well as the $L_{1(1minute)}$ from DCM, where this was measurable.

Data were analysed with the Bruel & Kjaer "*Evaluator*" software to quantify the contributions of the various noise source(s) to the overall. The noise sources are listed in the comments column with the contribution of each shown in brackets. The noise goal (criterion) for mining operations at DCM is variable depending upon the location (as per the table from Schedule 3 shown in Appendix A). The relevant criterion is shown in brackets in the "Location" column in the tables. The contribution of mine noise from DCM is shown in bold. Any exceedances of the EPL and project approval noise criteria are shaded grey.

Table 1
DCM Noise Monitoring Results – 21 December 2015 (Night)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	5:32 am	44	2.3/288	Birds & insects (44), traffic (31), other mine (29), **DCM (<20)**
Kerr (36)	5:49 am	50	2.1/312	Traffic (49), birds & insects (42), **DCM (<20)**
Skinner (39)	5:27 am	45	2.8/305	Birds & insects (44), traffic (38), other mine (27), **DCM (<20)**
Robertson (36)	5:55 am	54	2.1/311	Birds & insects (52), traffic (50), **DCM (<20)**
Sharman (35)	6:35 am	57	2.1/296	Traffic (57), birds & insects (39), **DCM (<20)**
Horder (35)	6:15 am	51	2.4/306	Birds & insects (49), traffic (47), **DCM (<20)**
Wilson (35)	6:11 am	43	2.3/303	Traffic (43), birds & insects (26), **DCM (<20)**
Smith (35)	6:34 am	47	2.1/296	Birds & insects (46), traffic (40), **DCM (<20)**

Table 2
DCM Noise Monitoring Results – 21 December 2015 (Day)

Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (41)	7:26 am	47	3.8/314	Birds& insects (46), wind (36), traffic (33), other mine (27), **DCM (<20)**
Kerr (37)	7:21 am	48	3.3/316	Traffic (48), birds & insects (34), wind (30), **DCM (<20)**
Skinner (40)	8:06 am	48	3.3/299	Birds & insects (47), traffic (37), wind (35), **DCM (<20)**
Robertson (37)	7:49 am	48	3.3/307	Traffic (46), birds & insects (44), wind (32), **DCM (<20)**
Sharman (35)	8:29 am	55	4.6/319	Traffic (55), wind (38), birds & insects (32), **DCM (<20)**
Horder (36)	8:09 am	53	2.9/300	Birds & insects (51), traffic (48), wind (38), **DCM (<20)**
Wilson (35)	7:45 am	42	3.8/309	Traffic (40), birds & insects (36), wind (30), **DCM (<20)**
Smith (35)	8:28 am	48	4.6/319	Birds & insects (47), wind (40), traffic (31), **DCM (<20)**

Table 3 DCM Noise Monitoring Results – 21 December 2015 (Evening)				
Location (Criterion)	Time	dB(A), $L_{eq(15min)}$	Wind speed/ direction	Identified Noise Sources
Doherty (39)	6:41 pm	53	5.5/133	Wind (53), traffic (37), birds & insects (31), DCM (<20)
Kerr (37)	6:41 pm	54	5.5/133	Wind (53), traffic (48), birds (29), DCM (<20)
Skinner (39)	6:21 pm	54	7.0/145	Wind (54), traffic (32), birds (30), DCM (<20)
Robertson (42)	6:19 pm	59	7.0/145	Wind (59), traffic (44), birds & insects (32), DCM (<20)
Sharman (41)	6:00 pm	58	8.8/142	Wind (56), traffic (53), birds (33), DCM (<20)
Horder (42)	7:06 pm	52	5.1/149	Wind (52), traffic (40), birds (34), DCM (<20)
Wilson (36)	7:05 pm	50	5.1/149	Wind (50), traffic (31), birds (27), DCM (<20)
Smith (36)	6:00 pm	56	8.8/142	Wind (56), traffic (28), DCM (<20)

Table 4 DCM Noise Monitoring Results – 21 December 2015 (night)					
Location (Criterion)	Time	dB(A), $L_{1(1minute)}$	Wind speed/ direction	L_{A1} source	Identified Mine Sources ($L_{1\,(1\,min)}$)
Doherty (47)	5:32 am	49	2.3/288	Birds	n/a
Kerr (47)	5:49 am	59	2.1/312	Highway	n/a
Skinner (47)	5:27 am	51	2.8/305	Birds	n/a
Robertson (47)	5:55 am	58	2.1/311	Birds	n/a
Sharman (47)	6:35 am	67	2.1/296	Highway	n/a
Horder (47)	6:15 am	60	2.4/306	Birds	n/a
Wilson (47)	6:11 am	48	2.3/303	Highway	n/a
Smith (47)	6:34 am	53	2.1/296	Birds	n/a

The results in Tables 1 to 3 show that the applicable operational noise criteria were not exceeded at any location or at any time throughout the monitoring survey.

Data from those times where DCM operations were audible 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.

The results in Table 4 show that the sleep disturbance criteria ($L_{1(1minute)}$) was not exceeded at any monitoring location during the night time period.

The operational noise levels at other receivers listed in the DCM Project Approval were determined using the ENM noise model in point calculation mode. The noise model was set up with a series of point noise sources representing the DCM operations and then calibrated to be consistent with the measured noise levels from the attended survey under similar atmospheric conditions to those at the time of the monitoring. Point calculations were then performed for each of the listed residential locations with results shown in **Appendix B**.

As the $L_{1(1minute)}$ levels were well below the sleep disturbance criterion at the attended monitoring locations, no modelling of $L_{1(1minute)}$ levels was conducted for other receiver locations, as these are all at greater distance from the DCM.

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

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.

Table 1: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
34	35	35	36	45
29	35	35	36	47
31	35	35	37	47
33, 86	35	35	38	45
32	35	35	40	47
71, 75	35	35	41	47
70	35	36	41	47
76	35	36	42	47
28	35	37	40	47
69	35	37	41	47
13	36	36	35	45
12	36	36	36	47
25	36	37	37	47
26	36	37	38	47
27	36	37	39	47
72	36	37	42	47
17	37	38	36	47
21, 22	38	38	38	45
18	38	39	38	47
20, 61	39	40	39	45
14	40	39	38	47
19	40	40	39	47
16	41	41	39	47
23	35	35	35	47
All other privately-owned land	35	35	35	45

However, if the Proponent has a written negotiated noise agreement with any landowner of the land listed in Table 1, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 in accordance with the negotiated noise agreement.

Notes:

- *For information on the numbering and identification of properties used in this approval, see Appendix 5.*
- *To determine compliance with the $L_{Aeq(15\ minute)}$ noise limits, 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.*
- *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).*

- *The noise emission limits identified in the above table apply under meteorological conditions of:*
  - *wind speeds of up to 3 m/s at 10 metres above ground level; or*
  - *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

Land Acquisition Criteria

2. If the noise generated by the project exceeds the criteria in Table 2 at any residence on privately-owned land or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8-10 of Schedule 4.

Table 2: Land acquisition criteria dB(A)

Land Number	*Day/Evening/Night* $L_{Aeq(15min)}$
12, 14, 16, 17, 18, 19, 23, 25, 26, 27, 28, 29, 31, 32, 69, 70, 71, 72, 75, 76	42
All other private land owners not listed in Table 1, or on more than 25 percent of, any privately owned land.	40

Note: Noise generated by the project is to be measured in accordance with the notes to Table 1.

Cumulative Noise Criteria

3. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately-owned land or on more than 25 percent of any privately owned land:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

4. If the noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned-land or on more than 25 percent of any privately owned land, then upon receiving a written request from the landowner, the Proponent shall acquire the land on as equitable basis as possible with the relevant mines in accordance with the procedures in conditions 8-10 of Schedule 4:
   - $L_{Aeq(11\ hour)}$ *53 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *48 dB(A) – Evening;*
   - $L_{Aeq(9\ hour)}$ *43 dB(A) – Night.*

Notes: The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

APPENDIX B MODELLED NOISE LEVELS as Leq (15 min)						
Location	Day		Evening		Night	
	Noise Level	Noise Goal	Noise Level	Noise Goal	Noise Level	Noise Goal
34	<30	35	<30	35	<30	39
29	<30	35	<30	35	<30	36
31	<30	35	<30	35	<30	37
33	<30	35	<30	35	<30	38
86	<30	35	<30	35	<30	38
32	<30	35	<30	35	<30	40
71	<30	35	<30	35	<30	41
75*	<30	35	<30	35	<30	41
70	<30	35	<30	36	<30	41
76*	<30	35	<30	36	<30	42
28	<30	35	<30	37	<30	40
69	<30	35	<30	37	<30	41
13	<30	36	<30	36	<30	35
12	<30	36	<30	36	<30	36
25*	<30	36	<30	37	<30	37
26	<30	36	<30	37	<30	38
27	<30	36	<30	37	<30	39
72*	<30	36	<30	37	<30	42
17	<30	37	<30	38	<30	36
21	<30	38	<30	38	<30	38
22	<30	38	<30	38	<30	38
18	<30	38	<30	39	<30	38
20	<30	39	<30	40	<30	39
61*	<30	39	<30	40	<30	39
14	<30	40	<30	39	<30	39
19	<30	40	<30	40	<30	39
16*	<30	41	<30	41	<30	39
23	<30	35	<30	35	<30	35
35*	<30	35	<30	35	<30	35
42*	<30	35	<30	35	<30	35
37	<30	35	<30	35	<30	35

* Measurement location

Table 53: Real Time Noise Monitoring – *Leq Selected Source: Leq Period* (All sources from 180º - 225º)

January	Day dB(A)	Evening dB(A)	Night dB(A)
1-Jan-15	34.3	31.6	36.3
2-Jan-15	32.1	34.6	36.2
3-Jan-15	32.0	34.6	36.2
4-Jan-15	28.6	33.8	36.2
5-Jan-15	33.9	32.5	34.9
6-Jan-15	31.7	32.3	35.7
7-Jan-15	33.7	34.5	35.6
8-Jan-15	30.8	33.3	36.3
9-Jan-15*	34.9	*BarnOwl down*	
10-Jan-15*	*BarnOwl down*		
11-Jan-15*	*BarnOwl down*		
12-Jan-15*	*BarnOwl down*		
13-Jan-15	31.7	32.0	32.9
14-Jan-15	41.1	40.3	37.7
15-Jan-15	34.6	35.3	36.2
16-Jan-15	35.7	38.7	35.1
17-Jan-15	30.8	37	42.5
18-Jan-15	35.2	31	32.9
19-Jan-15	37.3	35.9	35.8
20-Jan-15	35.7	34.2	39.3
21-Jan-15	34.5	34.5	38
22-Jan-15	33.4	35.3	33.5
23-Jan-15	32.6	33.8	35.1
24-Jan-15	29.8	37.9	30.9
25-Jan-15	35.8	34.3	30.5
26-Jan-15	31.6	30.3	34.6
27-Jan-15	40.7	35.2	33.0
28-Jan-15	34	34.6	33.0
29-Jan-15	33.8	31.5	32.5
30-Jan-15	35.1	36.8	32.9
31-Jan-15	28.5	28.6	25.2

February	Day dB(A)	Evening dB(A)	Night dB(A)
01-Feb-15	27.9	43.2	32.6
02-Feb-15	32.8	31.6	37.3
03-Feb-15	32.9	30.2	40.1
04-Feb-15	32.7	29.9	33.8
05-Feb-15	32.4	30.6	37.9
06-Feb-15	32.6	33.4	39.5
07-Feb-15	32.7	38.4	34.8
08-Feb-15	33.3	33.3	37.4
09-Feb-15	*BarnOwl down*	31.9	31.8
10-Feb-15	*BarnOwl down*		31.9
11-Feb-15	*BarnOwl down*		32.2
12-Feb-15	*BarnOwl down*		33.6
13-Feb-15	32.1	*BarnOwl down*	
14-Feb-15	*BarnOwl down*		
15-Feb-15	*BarnOwl down*		
16-Feb-15	32.6	34.5	36.3
17-Feb-15	32.5	32.7	36.9
18-Feb-15	32.4	28.8	35.3
19-Feb-15	33.9	30.5	
20-Feb-15	32.6	*BarnOwl down*	
21-Feb-15	*BarnOwl down*		
22-Feb-15	*BarnOwl down*		
23-Feb-15	*BarnOwl down*		
24-Feb-15	33.6	35.7	36.8
25-Feb-15	33.8	35.4	34.9
26-Feb-15			
27-Feb-15	32.1	31.8	33.7
28-Feb-15	32	35.6	32.5

** Power outage, cause unknown, rebooted 13/01/2015*

March	Day dB(A)	Evening dB(A)	Night dB(A)
01-Mar-15	45.3	45.9	*BarnOwl down*
02-Mar-15	33.6	32.2	33.7
03-Mar-15^		*BarnOwl down*	
04-Mar-15	36.4	38.6	35.4
05-Mar-15	38.5	32.9	30.2
06-Mar-15^	39.0	*BarnOwl down*	
07-Mar-15^		*BarnOwl down*	
08-Mar-15^		*BarnOwl down*	
09-Mar-15	31.8	33.5	35.1
10-Mar-15	31.7	30.9	33.7
11-Mar-15	31.6	34.9	34.0
12-Mar-15	34.3	32.5	*BarnOwl down*
13-Mar-15*		*BarnOwl down*	
14-Mar-15*		*BarnOwl down*	
15-Mar-15*		*BarnOwl down*	
16-Mar-15*		*BarnOwl down*	
17-Mar-15	33.4	34.5	36.2
18-Mar-15	35.6	33.6	37.9
19-Mar-15	35.5	34.3	40.9
20-Mar-15	37.6	36.8	35.9
21-Mar-15	31.5	31.3	31.8
22-Mar-15	30.0	33.1	32.9
23-Mar-15	32.8	32.3	39.1
24-Mar-15	38.3	33.5	38.6
25-Mar-15	34.7	31.1	34.5
26-Mar-15	36.6	36.0	39.1
27-Mar-15	34.3	37.5	35.3
28-Mar-15	33.3	28.5	28.4
29-Mar-15	30.9	32.4	32.5
30-Mar-15	31.9	29.6	31.0
31-Mar-15	32.9	32.5	31.7

April	Day dB(A)	Evening dB(A)	Night dB(A)
01-Apr-15	33.2	35.2	39.2
02-Apr-15	34.7	32.7	33.6
03-Apr-15	36.3	34.2	34.6
04-Apr-15	33.1	38.5	28.9
05-Apr-15	28.8	32.6	31.0
06-Apr-15	34.6	31.5	39.6
07-Apr-15	40.8	45.9	39.4
08-Apr-15	40.5	36.4	36.4
09-Apr-15	35.1	33.4	38.3
10-Apr-15~	34.5	*BarnOwl down*	
11-Apr-15~		*BarnOwl down*	
12-Apr-15~		*BarnOwl down*	
13-Apr-15	32.0	32.9	39.2
14-Apr-15~	34.0	*BarnOwl down*	
15-Apr-15~		*BarnOwl down*	
16-Apr-15~		*BarnOwl down*	
17-Apr-15~		*BarnOwl down*	
18-Apr-15~		*BarnOwl down*	
19-Apr-15~		*BarnOwl down*	
20-Apr-15	36.1	35.8	38.5
21-Apr-15	37.8	39.6	37.6
22-Apr-15	35.9	28.3	29.6
23-Apr-15	33.2	32.9	31.2
24-Apr-15	32.8	36.3	31.2
25-Apr-15	30.6	32.8	27.2
26-Apr-15	32.3	33.0	30.0
27-Apr-15	33.6	33.7	32.1
28-Apr-15	33.0	32.0	31.5
29-Apr-15	33.5	37.0	34.1
30-Apr-15	34.2	35.0	35.6

** Power outage resulting from electrical storm.*

^IT/comms issues.

~Intermittent power outages.

May	Day dB(A)	Evening dB(A)	Night dB(A)
01-May-15	34.7	31.9	35.0
02-May-15	31.7	36.9	28.7
03-May-15	30.0	29.5	33.0
04-May-15	33.8	30	30.3
05-May-15	34.4	34.3	38.1
06-May-15	38.1	35.2	35.9
07-May-15	41.5	40.2	36.7
08-May-15	35.8	36.6	33.0
09-May-15	38.7	38.3	33.7
10-May-15	39.3	30.5	37.7
11-May-15	39.0	38.5	34.8
12-May-15	37.7	35.6	34.2
13-May-15	38.9	41.4	39.2
14-May-15	35.2	40.8	37.3
15-May-15	35.3	34.7	33.7
16-May-15	32.1	28.2	34.4
17-May-15	29.8	33.2	31.5
18-May-15	33.6	31.1	30.1
19-May-15	32.4	36.2	32.4
20-May-15	32.8	30.7	28.1
21-May-15	32.9	49.9	34.3
22-May-15	35.3	35.4	32.2
23-May-15	31.6	30.6	32.1
24-May-15	31.3	34	35.0
25-May-15	34.7	35.9	35.0
26-May-15	35.2	34.0	33.8
27-May-15	36.0	34.1	34.0
28-May-15	36.4	34.6	35.8
29-May-15	34.7	33.6	30.8
30-May-15	33.4	32.6	30.2
31-May-15	31.2	36.1	36.1

June	Day dB(A)	Evening dB(A)	Night dB(A)
01-Jun-15	37.0	41.8	37.0
02-Jun-15	35.3	36.5	35.2
03-Jun-15	37.4	41.7	40.3
04-Jun-15	37.6	37.4	38.9
05-Jun-15	35.5	44.2	38.8
06-Jun-15	34.4	38.2	37.0
07-Jun-15	33.2	35.5	35.4
08-Jun-15	31.4	32.1	34.2
09-Jun-15	39.7	41.2	43.5
10-Jun-15	35.4	36.6	35.6
11-Jun-15	35.3	34.5	34.9
12-Jun-15	34.9	34.4	30.9
13-Jun-15	38.5	40.0	39.6
14-Jun-15	37.0	36.5	38.1
15-Jun-15	35.6	34.1	32.6
16-Jun-15	34.5	34.1	34.0
17-Jun-15	35.3	34.3	35.2
18-Jun-15	36.5	39.0	39.8
19-Jun-15	38.6	39.7	33.8
20-Jun-15	34.1	35.8	35.4
21-Jun-15	35.0	35.1	39.4
22-Jun-15	35.7	38.2	38.2
23-Jun-15	35.8	36.9	35.2
24-Jun-15	37.4	35.3	33.7
25-Jun-15	36.0	32.5	32.5
26-Jun-15	36.8	37.1	35.2
27-Jun-15	35.9	37.4	38.5
28-Jun-15	36.7	40.8	40.7
29-Jun-15	36.0	40.1	38.5
30-Jun-15	34.6	39.2	33.4

July	Day dB(A)	Evening dB(A)	Night dB(A)
01-Jul-15	37.0	37.6	39.2
02-Jul-15	35.1	36.8	41.3
03-Jul-15	37.2	35.6	34.8
04-Jul-15	37.1	36.2	33.4
05-Jul-15	33.2	35.8	38.5
06-Jul-15	39.3	37.0	37.0
07-Jul-15	34.3	32.1	32.2
08-Jul-15	33.4	31.2	34.3
09-Jul-15	34.2	34.9	35.8
10-Jul-15	37.9	36.1	38.7
11-Jul-15	37.4	34.8	34.5
12-Jul-15	36.4	40	34.1
13-Jul-15	41.0	37.4	34.4
14-Jul-15	39.0	40.7	36.1
15-Jul-15	34.4	30.1	30.4
16-Jul-15	35.0	36.9	35.3
17-Jul-15	38.1	40.9	35.8
18-Jul-15	35.7	34.1	31.0
19-Jul-15	34.0	40.6	34.9
20-Jul-15	33.9	33	32.5
21-Jul-15	35.1	37.7	39.5
22-Jul-15	38.2	38	38.3
23-Jul-15	36.0	36.3	35.1
24-Jul-15	38.3	29.9	30.9
25-Jul-15	40.3	38	38.9
26-Jul-15	36.3	35.3	38.9
27-Jul-15	39.2	42.7	37.1
28-Jul-15	34.5	41.5	41.2
29-Jul-15	39.5	36.5	38.6
30-Jul-15	37.5	38.5	39.1
31-Jul-15	37.4	34.4	33.2

August	Day dB(A)	Evening dB(A)	Night dB(A)
01-Aug-15	30.9	29.8	30.9
02-Aug-15	31.5	29.6	36.8
03-Aug-15	36.7	35.6	38.6
04-Aug-15	36.9	40.5	36.0
05-Aug-15	41.0	41.6	37.8
06-Aug-15	37.3	40.5	37.3
07-Aug-15	36.1	37.3	32.7
08-Aug-15	36.7	37.3	35.8
09-Aug-15	33.7	35.2	33.1
10-Aug-15	37.9	38.6	41.3
11-Aug-15	37.3	43.5	40.3
12-Aug-15	39.9	37.9	39.5
13-Aug-15	40.4	35.5	36.8
14-Aug-15	35.7	45.3	32.3
15-Aug-15	29.0	28.8	35.8
16-Aug-15	31.7	35	37.5
17-Aug-15	36.1	38.1	37.0
18-Aug-15	36.0	39.2	36.4
19-Aug-15	33.0	38.6	33.7
20-Aug-15	33.3	32.9	40.1
21-Aug-15	33.9	36.5	42.8
22-Aug-15	31.3	35.1	39.0
23-Aug-15	45.5	33.1	37.4
24-Aug-15	41.1	43.3	32.1
25-Aug-15	37.5	38.2	39.5
26-Aug-15	36.1	30.3	34.7
27-Aug-15	38.3	33.1	32.9
28-Aug-15	37.3	35.9	36.5
29-Aug-15	36.2	36.2	36.0
30-Aug-15	36.0	35.3	32.4
31-Aug-15	35.2	35.9	36.6

September	Day dB(A)	Evening dB(A)	Night dB(A)
01-Sep-15	36.4	37.5	35.8
02-Sep-15	34.6	35.3	35.5
03-Sep-15	37.0	35.5	35.6
04-Sep-15	34.9	38.6	32.3
05-Sep-15	35.2	37.5	38.6
06-Sep-15	30.9	31.6	33.2
07-Sep-15	35.3	40.1	37.3
08-Sep-15	37.1	35.6	36.3
09-Sep-15	37.8	42.4	43.7
10-Sep-15	34.8	33	35.2
11-Sep-15	35.8	36.5	36.0
12-Sep-15	36.5	45.8	38.9
13-Sep-15	40.6	37.2	43.9
14-Sep-15	33.1	34.8	37.3
15-Sep-15	35.7	36.8	37.3
16-Sep-15	34.2	36.8	34.9
17-Sep-15	33.6	35.4	36.3
18-Sep-15	33.5	29.4	30.7
19-Sep-15	30.1	36.8	34.1
20-Sep-15	29.2	30.9	34.2
21-Sep-15	33.5	35.7	37.7
22-Sep-15	41.7	33.8	41.0
23-Sep-15	36.0	33.7	38.9
24-Sep-15	35.8	39.9	36.8
25-Sep-15	35.2	37.2	32.3
26-Sep-15	28.5	27.4	30.3
27-Sep-15	30.5	30.7	34.7
28-Sep-15	33.8	38.1	37.2
29-Sep-15	32.7	36.9	39.0
30-Sep-15	34.5	37.1	35.7

October	Day dB(A)	Evening dB(A)	Night dB(A)
01-Oct-15	34.0	36.7	39.9
02-Oct-15	32.0	34.0	32.1
03-Oct-15	30.0	36.9	34.9
04-Oct-15	34.2	35.5	42.2
05-Oct-15	29.4	37.1	39.9
06-Oct-15	33.7	36.4	37.9
07-Oct-15	33.4	29.7	32.3
08-Oct-15	32.0	32.0	32.7
09-Oct-15	31.4	31.3	32.9
10-Oct-15	34.5	34.9	36.4
11-Oct-15	33.9	32.2	32.9
12-Oct-14	34.7	32.5	35.0
13-Oct-15	33.5	31.2	32.5
14-Oct-15	31.3	36.4	33.5
15-Oct-15	32.3	29.6	37.8
16-Oct-15	34.8	45.8	32.3
17-Oct-15	30.1	30.1	28.2
18-Oct-15	32.8	29.3	32.2
19-Oct-15	33.5	33.5	35.2
20-Oct-15	33.7	33.6	34.9
21-Oct-15	35.1	33.9	32.1
22-Oct-15	34.5	33.7	31.8
23-Oct-15	32.6	30.5	33.1
24-Oct-15	31.5	32.5	29.7
25-Oct-15	32.5	33.4	36.9
26-Oct-15	39.9	32.3	34.5
27-Oct-15	36.6	30.2	32.8
28-Oct-15	34.0	29.6	34.6
29-Oct-15	32.7	30.2	33.4
30-Oct-15	35.0	32.0	31.3
31-Oct-15	32.7	31.2	29.7

November	Day dB(A)	Evening dB(A)	Night dB(A)
01-Nov-15	30.8	32.6	40.4
02-Nov-15	37.2	31.4	*BarnOwl down*
03-Nov-15		*BarnOwl down*	
04-Nov-15	26.1	23.1	24.9
05-Nov-15	30.3	30.6	32.8
06-Nov-15	36.8	34.6	30.7
07-Nov-15	32.9	31.6	32.1
08-Nov-15	31.8	31.5	32.2
09-Nov-15	32.6	34.4	33.1
10-Nov-15	31.4	30.3	30.5
11-Nov-15	33.3	30.4	30.6
12-Nov-15	34.5	31.5	31.2
13-Nov-15	33.3	38.1	31.4
14-Nov-15	28.2	29.7	30.5
15-Nov-15	31.2	30.8	31.8
16-Nov-15	32.9	31.4	33.0
17-Nov-15	33.5	32.3	44.7
18-Nov-15	36.1	34.9	38.1
19-Nov-15	34.7	39.6	37.8
20-Nov-15	37.2	45.7	36.3
21-Nov-15	33.2	31.5	32.2
22-Nov-15	33.1	33.9	37.2
23-Nov-15	37.3	37.9	30.9
24-Nov-15	32.2	27.7	34.3
25-Nov-15	32.7	33.8	35.0
26-Nov-15	39.5	35.3	30.9
27-Nov-15	31.8	29.9	28.4
28-Nov-15	30.3	30	29.2
29-Nov-15	31.1	31.1	29.3
30-Nov-15	35.7	34	36.3

December	Day dB(A)	Evening dB(A)	Night dB(A)
01-Dec-15	33.8	29	30.7
02-Dec-15	35.5	35.1	36.2
03-Dec-15		*BarnOwl down*	35.6
04-Dec-15	34.6	36.8	29.2
05-Dec-15		*BarnOwl down*	
06-Dec-15		*BarnOwl down*	
07-Dec-15	32	32.1	31.5
08-Dec-15	33.2	29.6	33.0
09-Dec-15	33.6	28.5	33.9
10-Dec-15	32.9	31	35.5
11-Dec-15	39.7	40.4	36.8
12-Dec-15		*BarnOwl down*	
13-Dec-15		*BarnOwl down*	
14-Dec-15	35.5	36.1	33.3
15-Dec-15	32.3	38.8	34.6
16-Dec-15	35.1	*BarnOwl down*	
17-Dec-15	38.7	41.2	35.3
18-Dec-15	35.3	33.7	38.8
19-Dec-15	32.6	36.1	30.6
20-Dec-15	32	36.4	32.8
21-Dec-15	37.5	33.8	33.6
22-Dec-15	37.2	26.5	31.7
23-Dec-15	29.2	25.2	24.4
24-Dec-15	34	26.6	17.6
25-Dec-15	23.9	24.4	14
26-Dec-15		*BarnOwl down*	
27-Dec-15		*BarnOwl down*	
28-Dec-15		*BarnOwl down*	
29-Dec-15	30.4	29.4	32.4
30-Dec-15	30	30.7	32.0
31-Dec-15	30.3	33	30.4

BarnOwl experienced two separate power outages resulting from electrical storms through November. Several outages were experienced through December both due to intermittent power failures and PC stability issues.

Appendix E: 2015 Blast Monitoring Results

Table 54: Blast Monitoring Results

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
02/01/2015	SPW14	Overburden	81.0	0.01	91.9	0.01	82.7	0.01
06/01/2015	SPE14	Parting	86.5	0.02	90.7	0.06	92.5	0.05
07/01/2015	ROM1	Parting	105.3	0.73	103.9	0.75	98.4	0.51
08/01/2015	EN01	Overburden	87.9	0.04	90.2	0.06	89.6	0.05
16/01/2015	ROM2	Overburden + Pre-split	99.9	0.98	104.2	1.65	105.5	1.14
20/01/2015	SPE14	Parting	99.4	0.07	99.1	0.14	99.4	0.19
02/02/2015	ROM2	Trim + Pre-split	109.4	0.74	108.5	1.08	102.3	0.97
06/02/2015	SPW13	Parting	91.9	0.06	91.1	0.17	96.3	0.09
06/02/2015	SPW13	Parting	85.4	0.00	98.7	0.01	92.6	0.01
10/02/2015	EN01	Pre-split	90.7	0.13	92.2	0.27	88.1	0.13
10/02/2015	EN01	Pre-split	89.4	0.13	90.6	0.14	87.9	0.08
17/02/2015	SPE14	Parting	87.4	0.04	90.7	0.16	87.3	0.04
19/02/2015	SPW15	Pre-split	89.8	0.06	90.0	0.17	91.8	0.04
20/02/2015	SPW13	Parting	83.9	0.02	91.8	0.06	85.0	0.03
27/02/2015	EN01	Overburden	97.2	0.34	99.5	0.55	101.3	0.51
12/03/2015	SPW15	Overburden	92.0	0.13	95.7	0.21	94.6	0.14
17/03/2015	SPW14	Overburden	93.1	0.04	93.9	0.06	94.8	0.04
18/03/2015	SPE14	Parting	84.7	0.04	88.3	0.07	84.8	0.05
20/03/2015	SPE14	Parting	93.7	0.03	94.9	0.06	94.6	0.05

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
23/03/2015	EN01	Trim	94.8	0.08	99.1	0.12	101.1	0.13
27/03/2015	NN14	Through Seam	99.6	0.22	100.0	0.08	98.7	0.08
02/04/2015	NN14	Through Seam	96.8	1.19	94.5	0.39	93.7	0.16
10/04/2015	EN01	Overburden	111.3	0.17	110.7	0.34	110.1	0.38
14/04/2015	ROM1	Pre-split	90.1	0.19	92.7	0.25	89.9	0.38
16/04/2015	NN14	Through Seam	93.7	0.92	97.1	0.25	98.8	0.22
29/04/2015	NN14	Through Seam	107.0	0.99	101.4	0.20	85.7	0.10
29/04/2015	ROM1	Overburden	107.1	0.13	101.3	0.18	94.4	0.11
30/04/2015	EN01	Overburden	84.0	0.14	88.7	0.29	95.0	0.34
05/05/2015	ROM1	Pre-split	75.7	0.30	93.4	0.28	91.0	0.32
06/05/2015	EN01	Overburden	92.4	0.12	94.8	0.24	104.2	0.11
08/05/2015	EN01	Overburden	90.1	0.26	91.4	0.72	91.1	0.44
12/05/2015	SPE14	Parting	84.8	0.06	97.3	0.30	104.0	0.17
19/05/2015	ROM1	Overburden	94.2	0.89	94.3	1.13	96.6	0.60
19/05/2015	EN01	Pre-split	70.1	0.16	84.7	0.16	89.8	0.20
21/05/2015	SPE14	Parting	73.4	0.03	80.0	0.17	82.4	0.07
26/05/2015	EN01	Overburden	83.6	0.11	85.8	0.21	87.9	0.09
29/05/2015	SPW15	Overburden	85.8	0.07	95.1	0.17	96.0	0.13
29/05/2015	ROM1	Pre-split	-	-	90.2	0.10	98.1	0.07
03/06/2015	ROM1	Parting	103.4	0.15	97.7	0.22	99.1	0.13
03/06/2015	SPW15	Overburden	87.5	0.02	95.5	0.05	91.1	0.01
09/06/2015	SPW14	Overburden	88.8	0.11	92.7	0.19	91.6	0.11
10/06/2015	SPW15	Pre-split	102.7	0.07	98.5	0.12	93.0	0.07
11/06/2015	SPW14	Overburden	83.8	0.03	91.2	0.05	90.9	0.03

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
11/06/2015	SPW15	Pre-split	83.8	0.03	91.2	0.05	90.9	0.03
15/06/2015	SPW15	Overburden	90.3	0.02	90.6	0.04	92.3	0.02
16/06/2015	SPE14	Parting	93.2	0.05	96.1	0.19	96.1	0.08
19/06/2015	SPW14	Pre-split	81.9	0.06	96.3	0.05	101.7	0.05
23/06/2015	ROM1	Overburden	85.9	0.31	96.6	0.74	92.9	0.37
25/06/2015	SPW14	Overburden	82.3	0.04	89.0	0.06	93.9	0.03
26/06/2015	ROM1	Overburden	94.3	0.78	91.1	0.36	83.9	0.30
01/07/2015	EN01	Overburden	87.8	0.16	93.3	0.27	99.1	0.13
03/07/2015	ROM1	Overburden	100.4	1.65	99.7	0.99	97.3	0.70
07/07/2015	EN01	Overburden	97.5	0.05	98.6	0.13	95.0	0.06
15/07/2015	SPW15	Pre-split	82.3	0.05	88.7	0.06	94.3	0.04
17/07/2015	NN15	Pre-split	93.7	1.22	97.2	0.64	100.0	0.42
21/07/2015	SPW15	Overburden	89.2	0.05	92.4	0.13	93.4	0.06
03/08/2015	NN15	Pre-split	97.9	0.91	90.1	0.27	95.3	0.20
04/08/2015	EN01	Parting	89.3	0.13	89.3	0.19	94.0	0.15
06/08/2015	SPW15	Parting	88.0	0.03	90.3	0.08	88.8	0.04
10/08/2015	NN15	Through Seam	97.7	1.52	103.5	0.43	108.8	0.38
18/08/2015	NN15	Through Seam	109.3	1.76	103.2	0.77	101.4	0.44
20/08/2015	SPW15	Parting	92.3	0.05	95.8	0.08	92.6	0.04
21/08/2015	ROM1	Trim	89.6	0.11	89.3	0.11	87.1	0.10
27/08/2015	NN15	Pre-split	81.2	0.65	82.5	0.10	86.9	0.04
28/08/2015	EN01	Overburden	82.1	0.02	94.6	0.03	92.3	0.02
28/08/2015	SPW15	Parting	85.2	0.04	94.0	0.07	96.0	0.03

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
07/09/2015	NN15	Through Seam	89.6	0.95	90.1	0.28	97.1	0.09
09/09/2015	SPW15	Parting	84.2	0.04	90.1	0.07	87.6	0.04
17/09/2015	SPW15	Parting	91.0	0.05	92.4	0.10	87.1	0.06
21/09/2015	ROM1	Parting	98.6	0.09	98.5	0.09	93.5	0.04
24/09/2015	SPW15	Parting	102.4	0.09	103.5	0.31	100.1	0.08
03/10/2015	SPW15	Parting	90.4	0.08	93.7	0.25	91.7	0.09
06/10/2015	SPW15	Parting	92.7	0.03	96.1	0.07	86.9	0.03
08/10/2015	SPW15	Pre-split	95.2	0.11	100.8	0.13	99.2	0.11
09/10/2015	NN14	Pre-split	94.6	0.45	93.4	0.18	91.0	0.10
15/10/2015	SPW15	Overburden	96.8	0.09	99.5	0.16	98.9	0.11
16/10/2015	EN01	Overburden	95.9	0.04	95.9	0.09	90.9	0.04
20/10/2015	NN15	Through Seam	101.1	0.50	97.2	0.19	94.4	0.10
20/10/2015	SPW15	Pre-split	87.5	0.11	93.0	0.13	89.4	0.16
30/10/2015	SPW15	Overburden	91.2	0.06	94.6	0.18	97.5	0.14
02/11/2015	SPW15	Parting	89.1	0.03	93.0	0.05	90.9	0.04
09/11/2015	SPW15	Pre-split	89.8	0.06	106.1	0.12	108.0	0.07
12/11/2015	EN02	Pre-split	82.3	0.19	89.9	0.26	90.9	0.27
16/11/2015	SPW15	Pre-split	81.0	0.02	87.3	0.04	90.2	0.04
18/11/2015	SPW15	Overburden	88.5	0.15	86.8	0.41	93.7	0.15
19/11/2015	SPW15	Pre-split	77.3	0.06	82.5	0.10	79.9	0.07
23/11/2015	SPW15	Overburden	90.9	0.02	101.5	0.04	100.0	0.02
3/12/2015	SPW15	Overburden	94.2	0.09	105.7	0.18	94.6	0.12
7/12/2015	SPW15	Overburden + Pre-split	92.3	0.11	93.1	0.28	92.9	0.10

Date	Location	Type	Antiene (AB) dB(L)	Antiene (R) mm/sec	DeBoer (AB) dB(L)	DeBoer (R) mm/sec	Sharman (AB) dB(L)	Sharman (R) mm/sec
8/12/2015	SPW15	Parting	84.8	0.02	86.8	0.08	86.9	0.02
14/12/2015	ROM02	Overburden + Pre-split	100.3	0.69	102.7	1.00	100.4	0.69
17/12/2015	EN01	Parting	94.7	0.19	95.4	0.31	96.0	0.33
18/12/2015	SPW15	Parting	86.1	0.01	88.7	0.04	86.1	0.02
24/12/2015	SPW15	Trim	80.4	0.02	95.6	0.05	96.3	0.02
30/12/2015	SPW15	Parting	101.1	0.04	100.6	0.12	97.0	0.05

Appendix F: 2015 Enquiries, Concerns and Complaints

Table 55: List of Enquiries, Concerns and Complaints Received throughout 2015

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
January				
16/01/2015	Pamger Drive, Muswellbrook	Complaint	Blast - Vibration	Complaint received via phone call about vibrations felt at the complainant's residence on the 16/1/2015 at 14:42. Blast ROM2-RL-BK1-4 occurred at 14:42 on this date. Discussion held with Drill & Blast Engineer to look at opportunities to reduce offsite impacts. Drill & Blast Engineer to review vibration predictions prior to the next couple of ROM blasts.
16/01/2015	Hassell Road, Muswellbrook	Complaint	Blast - Vibration	Complaint received via phone call about vibrations felt at the complainant's residence on the 16/1/2015 at 14:42. Blast ROM2-RL-BK1-4 occurred at 14:42 on this date. Complainant stated that it 'shook the s**t out of the house', blast was bad and overpressure and vibration were distinct.
16/01/2015	Pamger Drive, Muswellbrook	Complaint	Blast - Vibration	Complaint received via phone call about vibrations felt at the complainant's residence on the 16/1/2015 at 14:42. Blast ROM2-RL-BK1-4 occurred at 14:42 on this date. Complainant stated that the blast was felt throughout the house. He also stated that his toilet bowl had recently cracked - possibly due to blasting.
27/01/2015	Scone Resident	Complaint	Odour - Spon Com	Enquiry/complaint received via phone call regarding spon com odour at complainant's residence. Complainant adamant Drayton is the source of the odour. Complainant has an on-going history with odour complaints against Drayton and is located in Scone approximately 30km away. This has been a recurring complainant and the SHE manager has been the focal point for managing this.
February				
02/02/2015	Pamger Drive, Muswellbrook	Complaint	Blast - Vibration	Complaint received via phone call about vibrations felt at the complainant's residence on 2/02/2015 at 14:05. Blast in ROM had occurred at 14:04 on this date. Complainant stated that a visiting friend was quite alarmed by the house shaking.
27/02/2015	Hassell Road, Muswellbrook	Complaint	Blast - Vibration	DoPE received a complaint from near neighbour on Hassell Road regarding a blast at Drayton on Friday afternoon. JB provided the blast results (101.3dBl and 0.51mm/s) to DoPE who were going to respond to complainant. Complainant did not have environmental enquiries number. DoPE to call complainant back.
March				
				Nil complaints or enquiries received this month
April				

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
				Nil complaints or enquiries received this month
May				
19/05/2015	Balmoral Road, Muswellbrook	Complaint	Blast - Vibration	Received a complaint from Vera Doherty today regarding vibration from ROM blast fired at approximately 9:10am. Also mentioned that she felt multiple blasts one day last week and MAC nor Drayton had notified her and she did not know if either had blasted (none were Drayton). She asked if Drayton could please notify her prior to all shots, not just the north pit shots. I told her we would start doing this as of today.
19/05/2015	Pamger Drive, Muswellbrook	Complaint	Blast - Vibration	Received a complaint from Robert Halloran on the 20/5/15 regarding the vibration from the ROM blast fired at approximately 9:10am (19/5/15) and a blast on 20/5/15 approx. 10:20am. Complainant stated that both blasts results in bad vibration at their residence. Environment coordinator rang complainant back to discuss complaint and confirmed that the blast on 20/5/15 was not a Drayton shot. Environment coordinator spoke with Mt Arthur to confirm Wednesday blast as being Mt Arthur's. Provided complainant's contact details for Mt Arthur to contact the complainant directly.
June				
10/06/2015	Scone Resident	Complaint	Odour - Spon Com	Received a complaint from resident at Scone about smelling spon com or sulphur in the air, allegedly from Drayton, at 5.10pm. The complainant intended to raise a complaint with the EPA and requested a phone call back. SHE Manager rang complainant back on 11/06/2015 to discuss the complaint. SHE Manager also spoke with EPA representative regarding the complaint.
23/06/2015	Hassell Road, Muswellbrook	Complaint	Blast - Vibration	Received a complaint on the 23/6/15 regarding vibration from the ROM blast fired at approximately 2:05pm (23/6/15). Complainant stated that blast had resulted in vibration and noise at their residence. Environmental graduate verbally committed to investigate the blast results from the in-situ blast monitor at the complainants residence against compliance limits and have the Environmental Coordinator to call back and discuss but the complainant said that this would not be necessary. Blasting results were all within compliance limits.

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
July				
03/07/2015	Pamger Drive, Muswellbrook	Complaint	Noise	Complaint received from the Environmental Complaint Hotline (forwarded to Environmental Coordinator). Complaint regarding ongoing noise at the complainant's residence from 5am on the morning of 3/7/15. Environmental Coordinator attended complainant's residence at ~8:35AM by which time the complainant stated that the noise had reduced significantly. Environmental Coordinator and the complainant discussed possibly sources of the noise. The complainant stated the noise sounded like the washery. The CHP supervisor was contacted and noted that there was a train being loaded between ~2am and 5:30am and that the CHP was not operating between 5:30 and 8:00am. Environmental Coordinator asked the complainant to write down the times that he hears elevated noise levels. The complainant mentioned the noise is usually worse from Fridays to Sundays.
03/07/2015	Balmoral Road, Muswellbrook	Enquiry	Blast noise	An enquiry was made regarding what sounded like blasts at ~11:30am, 12:00pm and 12:10pm on the 3/7/15. Environmental Coordinator spoke to the complainant and confirmed that Drayton did not fire a blast at any of the aforementioned times. Environmental Coordinator suggested that the enquire with Mt Arthur Coal to determine if they had any blasts.
03/07/2015	Hassell Road, Muswellbrook	Complaint	Blast - Vibration	Complaint received from the Environmental Complaint Hotline (forwarded to Environmental Graduate). Complainant stated that blast vibration was felt at the complainant's residence at two times during the day. Environmental graduate confirmed that the latter timeframe was consistent with a Drayton shot in the NN Pit, but confirmed that any other blasting during the day was not from Drayton. Complainant requested Drayton representatives attend the residence to inspect alleged cracking as a result of blasting activities. Environmental Graduate scheduled to visit on 6/7/15, however complainant was sick and did not reschedule.
August				
06/08/2015	Castle Rock Road, Muswellbrook	Enquiry	Blast - Vibration	An enquiry was made via phone to the environmental hotline about a blast at approximately 10.00am that was loud and shook the enquirer's house (on Castle Rock Rd). SHE Manager called back to discuss with the enquirer. Enquirer mentioned that she had called Mangoola and was told it was not them. SHE Manager confirmed that Drayton did not fire a blast at the time in question (10.00am). SHE Manager suggested the enquirer check with Bengalla or Mt Arthur Coal.

Date	Location	Enquiry, Concern OR Complaint	Nature	Outcome
18/08/2015	Hassell Road, Muswellbrook	Complaint	Blast - Vibration	Complaint was made via phone at 2.10pm on Tuesday 18/8/15 regarding a shot in the NN pit that shook the complainant's house. Environmental Coordinator left message on complainants machine at 2.51pm and called again at 4.00pm but did not leave a second message. Environmental Coordinator spoke to complainants on Wednesday 19/8/15. The complainant stated he was at home and felt the blast standing outside. Environmental Coordinator and Environmental Officer attended complainant's residence at 2.00pm on the 19/8/15. Concerns were raised by the complainants regarding the impacts of Drayton's blasting on their house. They showed examples of areas of concern including; expanding cracks in gyprock, cracks in cement path, gaps around windows and cracks in tiles. Concerns were also raised regarding dust on the roof, gutter and garage doors, as well as the number of kangaroos coming from Drayton owned land. Complainants mentioned they intend to complain to the Mine Subsidence Board, and plan to write a letter to Drayton asking for a building inspection on their house. Building inspections have subsequently been undertaken by consultants.
September				
				Nil enquiries, concerns or complaints recorded.
October				
				Nil enquiries, concerns or complaints recorded.
November				
				Nil enquiries, concerns or complaints recorded.
December				
				Nil enquiries, concerns or complaints recorded.

Appendix G: Anglo American Safety, Health and Environment Risk Matrix

Table 56: Anglo American Risk Matrix

AAplc Risk Matrix	Hazard Effect/ Consequence				
Loss Type	**1. Insignificant**	**2. Minor**	**3. Moderate**	**4. High**	**5. Major**
(S/H) **Harm to people (safety /health)**	First aid case / Exposure to minor health risk	Medical Treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
(EI) **Environmental Impact**	Minimal environmental harm – L1 incident	Material environmental harm – L2 incident remediable short term	Serious environmental harm – L2 incident remediable within LOM	Major environmental harm – L2 incident remediable post LOM	Extreme environmental harm – L3 incident irreversible
(BI/MD) **Business interruption / Material damage and other consequential losses**	No disruption to operation 5% loss of budgeted operating profit / listed assets	Brief disruption to operation 10% loss of budgeted operating profit / listed assets	Partial shutdown / 15% loss of budgeted operating profit / listed assets	Partial loss of operation / 20% loss of budgeted profit / listed assets	Substantial or total loss of operation 25% loss of budgeted profit / listed assets
(L&R) **Legal and regulatory**	Low level legal issue	Minor legal issue: non- compliance and breaches of the law	Serious breach of law: investigation / report to authority, prosecution and/or moderate penalty possible	Major breach of the law: considerable prosecution and penalties	Very considerable penalties & prosecutions. Multiple law suits & jail terms
(R/S/C) **Impact on reputation, social and community**	Slight impact – public awareness may exist but no public concern	Limited impact – local public concern	Considerable impact – regional public concern	National impact – national public concern	International impact - international public attention

Likelihood	Examples	Risk Rating				
5 (Almost Certain)	The unwanted event has occurred frequently: occurs in order of one or more times per year & is likely to reoccur within 1 year	11 (M)	16 (S)	20 (S)	23 (H)	25 (H)
4 (Likely)	The unwanted event has occurred infrequently: occurs in order of less than once per year & is likely to reoccur within 5 years	7 (M)	12 (M)	17 (S)	21 (H)	24 (H)
3 (Possible)	The unwanted event has happened in the business at some time: or could happen within 10 years	4 (L)	8 (M)	13 (S)	18 (S)	22 (H)
2 (Unlikely)	The unwanted event has happened in the business at some time: or could happen within 20 years	2 (L)	5 (L)	9 (M)	14 (S)	19 (S)
1 (Rare)	The unwanted event has never been known to occur in the business: or it is highly unlikely that it will occur within 20 years	1 (L)	3 (L)	6 (M)	10 (M)	15 (S)

Risk Rating	Risk Level	Guidelines for Risk Matrix
21 to 25	High (H)	Eliminate, avoid, implement specific action plans / procedures to manage & monitor
13 to 20	Significant (S)	Proactively manage
6 to 12	Medium (M)	Actively manage
1 to 5	Low (L)	Monitor & manage as appropriate

Appendix H: 2015 Rail Activity Statement

RAIL ACTIVITY STATEMENT

FOR PERIOD 1/1/2015 - 31/12/2015

(Destination for all trains was Port of Newcastle)

	Drayton Coal				Mt Arthur Coal		Total Rail Activity	
Date	Start Load Time	End Load Time	Total Train Movements/ day	Total tonnage/ day	Total Train Movements/ day	Total tonnage/ day	Total Train Movements / day	Total Tonnage/ day
1-Jan-15	12:50 19:47	17:16 23:35	4	17,009.20	12	51,806.90	16	68,816.10
2-Jan-15	00:00 13:02	03:15 16:50	4	17,668.60	14	60,296.60	18	77,965.20
3-Jan-15	11:50 17:52	15:35 21:34	4	17,813.45	12	51,312.40	16	69,125.85
4-Jan-15					16	69,091.70	16	69,091.70
5-Jan-15	02:38 10:46	06:21 14:21	4	17,877.80	16	77,648.40	20	95,526.20
6-Jan-15	03:10 12:26 07:23	06:30 15:52 22:33	6	25,247.40	14	51,624.40	20	76,871.80
7-Jan-15	08:14	11:49	2	8,297.00	10	51,246.40	12	59,543.40
8-Jan-15					12	51,513.30	12	51,513.30
9-Jan-15	05:10 12:45 22:10	10:19 17:10 (02:39)	6	23,527.05	16	59,412.50	22	82,939.55
10-Jan-15	04:25	08:22	2	8,988.80	14	68,575.30	16	77,564.10
11-Jan-15	02:43	06:40	2	9,192.80	16	60,225.40	18	69,418.20
12-Jan-15					8	41,518.60	8	41,518.60
13-Jan-15					12	51,071.10	12	51,071.10
14-Jan-15	08:02 20:10	11:55 23:46	4	17,451.80	6	16,944.40	10	34,396.20
15-Jan-15	12:50 23:20	16:09 (02:48)	4	17,487.00	14	59,349.30	18	76,836.30
16-Jan-15					18	68,115.40	18	68,115.40
17-Jan-15	23:15	(04:15)	2	9,195.40	12	68,730.30	14	77,925.70
18-Jan-15	06:10 12:45	09:20 15:44	4	16,486.20	14	51,360.40	18	67,846.60
19-Jan-15	04:03 12:05	07:46 15:55	4	17,904.20	12	59,829.90	16	77,734.10
20-Jan-15	06:50	14:18	2	18,102.00	12	42,839.30	14	60,941.30
21-Jan-15	02:13 09:25 19:35	05:58 14:50 23:08	6	16,955.60	20	85,408.90	26	102,364.50
22-Jan-15	03:45 12:38	07:17 15:55	4	16,861.90	18	77,209.70	22	94,071.60
23-Jan-15	03:30	07:43	2	8,584.80	12	50,941.40	14	59,526.20
24-Jan-15	00:15 13:10 21:16	03:40 16:23 (09:24)	6	25,170.30	16	68,432.50	22	93,602.80

25-Jan-15					14	60,135.30	14	60,135.30
26-Jan-15					16	77,039.50	16	77,039.50
27-Jan-15					14	59,882.80	14	59,882.80
28-Jan-15					10	34,272.10	10	34,272.10
29-Jan-15					14	68,657.90	14	68,657.90
30-Jan-15					4	8,786.60	4	8,786.60
31-Jan-15					0	8,562.90	0	8,562.90
1-Feb-15					10	42,496.60	10	42,496.60
2-Feb-15	12:33 23:10	13:25 (02:48)	4	10,961.40	14	51,591.10	18	62,552.50
3-Feb-15	06:40	20:41	2	8,680.00	16	68,060.30	18	76,740.30
4-Feb-15	02:15 22:45	05:45 (02:00)	4	16,909.20	18	85,775.50	22	102,684.70
5-Feb-15	19:33	22:40	2	8,034.20	10	42,772.10	12	50,806.30
6-Feb-15	02:50 14:30 20:09	06:25 18:30 23:50	6	25,792.20	2	0.00	8	25,792.20
7-Feb-15	02:10 09:18 17:00	05:33 12:50 21:00	6	26,442.00	6	25,593.20	12	52,035.20
8-Feb-15	02:22 10:20 16:20 22:12	05:41 14:00 19:37 (03:08)	8	34,794.65	14	58,488.20	22	93,282.85
9-Feb-15	09:40	13:05	2	8,794.80	12	59,548.60	14	68,343.40
10-Feb-15					14	51,159.90	14	51,159.90
11-Feb-15	20:25	(00:35)	2	8,535.60	16	68,542.50	18	77,078.10
12-Feb-15	04:50 11:55	08:40 16:02	4	16,991.40	20	85,096.80	24	102,088.20
13-Feb-15					18	84,852.90	18	84,852.90
14-Feb-15					18	68,346.70	18	68,346.70
15-Feb-15					16	68,329.20	16	68,329.20
16-Feb-15					18	76,796.50	18	76,796.50
17-Feb-15	20:30	(03:06)	2	8,783.60	14	68,338.00	16	77,121.60
18-Feb-15					14	59,872.70	14	59,872.70
19-Feb-15					16	59,952.70	16	59,952.70
20-Feb-15					14	68,626.30	14	68,626.30
21-Feb-15	22:37	(02:05)	2	8,437.00	16	59,922.20	18	68,359.20
22-Feb-15	12:22 20:20	15:45 (03:00)	4	17,257.40	14	59,677.10	18	76,934.50
23-Feb-15					12	60,356.90	12	60,356.90
24-Feb-15	04:45 17:50	08:40 20:55	4	16,851.20	18	68,469.70	22	85,320.90
25-Feb-15	00:35 10:18	04:00 13:28	4	16,901.50	14	68,201.70	18	85,103.20
26-Feb-15	00:00	02:30	2	5,783.80	18	67,941.10	20	73,724.90
27-Feb-15	10:00	13:55	2	8,513.00	12	59,397.40	14	67,910.40
28-Feb-15	03:05 16:11	06:26 19:45	4	16,326.20	16	68,493.50	20	84,819.70

1-Mar-15	03:20 23:45	07:40 (02:55)	4	13,373.40	16	68,414.80	20	81,788.20
2-Mar-15	08:58 15:27	12:18 18:24	4	25,472.00	16	59,828.00	20	85,300.00
3-Mar-15	00:40 07:11	04:00 11:25	4	8,377.20	12	59,641.60	16	68,018.80
4-Mar-15	07:40 14:40 21:42	11:58 19:48 (00:40)	6	26,012.20	16	59,792.10	22	85,804.30
5-Mar-15	20:45	(00:25)	2	8,608.20	8	42,064.80	10	50,673.00
6-Mar-15	04:25 12:10 19:13	08:15 15:35 22:50	6	24,057.20	12	51,222.40	18	75,279.60
7-Mar-15	01:47 08:20 20:10	05:56 12:00 23:57	6	25,520.40	10	34,209.50	16	59,729.90
8-Mar-15	09:00 16:15	13:15 21:39	4	23,867.80	16	68,057.20	20	91,925.00
9-Mar-15	00:27	04:56	2		14	58,652.80	16	58,652.80
10-Mar-15					0	8,489.40	0	8,489.40
11-Mar-15							0	0.00
12-Mar-15							0	0.00
13-Mar-15	00:00	03:45	2	8,611.00	6	24,943.60	8	33,554.60
14-Mar-15	07:33	11:20	2	9,050.20	10	34,091.00	12	43,141.20
15-Mar-15	02:00 07:52	05:22 11:07	4	18,029.00	16	68,159.30	20	86,188.30
16-Mar-15	16:47	21:04	2	8,510.20	18	76,975.30	20	85,485.50
17-Mar-15					10	42,592.70	10	42,592.70
18-Mar-15					14	59,869.40	14	59,869.40
19-Mar-15					16	76,914.70	16	76,914.70
20-Mar-15	02:25 19:00	06:50 22:10	4	17,135.40	16	68,220.40	20	85,355.80
21-Mar-15					16	68,300.60	16	68,300.60
22-Mar-15					16	59,572.00	16	59,572.00
23-Mar-15	20:40	(00:47)	2	8,531.40	16	76,596.20	18	85,127.60
24-Mar-15	03:42 19:36	07:42 21:30	4	17,145.00	16	59,991.20	20	77,136.20
25-Mar-15	10:20	15:10	2	9,102.40	12	51,873.60	14	60,976.00
26-Mar-15					16	76,721.60	16	76,721.60
27-Mar-15					8	34,030.60	8	34,030.60
28-Mar-15	08:48	13:27	2	8,749.10	14	51,170.30	16	59,919.40
29-Mar-15					8	34,029.60	8	34,029.60
30-Mar-15					12	51,548.10	12	51,548.10
31-Mar-15					14	68,956.90	14	68,956.90
1-Apr-15					16	60,030.00	16	60,030.00
2-Apr-15	01:40 12:05	05:10 15:10	4	17,373.80	14	68,435.20	18	85,809.00
3-Apr-15	01:33 14:18 21:00	04:31 17:50 (01:14)	6	26,523.95	14	60,023.80	20	86,547.75
4-Apr-15	17:55	21:39	2	8,739.40	12	42,968.80	14	51,708.20

5-Apr-15					12	59,609.40	12	59,609.40
6-Apr-15					12	50,799.60	12	50,799.60
7-Apr-15	17:00	21:10	2	17,780.20	10	42,671.70	12	60,451.90
8-Apr-15	01:53	04:53	2		10	42,932.20	12	42,932.20
9-Apr-15					12	42,798.50	12	42,798.50
10-Apr-15					8	42,453.00	8	42,453.00
11-Apr-15	09:00	12:30	2	8,555.60	14	50,377.00	16	58,932.60
12-Apr-15					16	76,217.60	16	76,217.60
13-Apr-15	07:25 20:21	11:10 (00:10)	4	17,217.20	16	59,192.80	20	76,410.00
14-Apr-15	05:04 10:30	09:10 13:45	4	17,702.00	10	50,508.00	14	68,210.00
15-Apr-15	01:30 08:30 18:05	05:16 12:35 21:10	6	26,299.00	10	42,923.20	16	69,222.20
16-Apr-15	02:18 10:15	07:33 13:35	4	16,868.60	14	50,817.20	18	67,685.80
17-Apr-15	09:20 16:10	13:30 19:35	4	17,907.60	16	68,106.60	20	86,014.20
18-Apr-15					16	76,291.00	16	76,291.00
19-Apr-15					18	67,836.70	18	67,836.70
20-Apr-15					16	68,367.00	16	68,367.00
21-Apr-15					6	24,357.40	6	24,357.40
22-Apr-15					0	8,546.00	0	8,546.00
23-Apr-15							0	0.00
24-Apr-15							0	0.00
25-Apr-15							0	0.00
26-Apr-15							0	0.00
27-Apr-15							0	0.00
28-Apr-15							0	0.00
29-Apr-15	17:15	20:55	2	8,609.40			2	8,609.40
30-Apr-15	09:30	22:39	2	8,542.00	6	25,386.20	8	33,928.20
1-May-15	06:15 21:57	09:25 (02:16)	4	17,096.00	12	43,002.80	16	60,098.80
2-May-15	15:10	18:56	2	8,902.40	12	51,277.40	14	60,179.80
3-May-15					10	51,372.30	10	51,372.30
4-May-15					10	42,240.20	10	42,240.20
5-May-15					8	34,096.00	8	34,096.00
6-May-15					6	25,173.80	6	25,173.80
7-May-15					10	42,348.60	10	42,348.60
8-May-15					10	42,165.40	10	42,165.40
9-May-15	05:00 14:12	08:54 18:14	4	16,499.20	8	33,810.00	12	50,309.20
10-May-15	08:45 15:09	11:52 17:55	4	15,301.70	12	50,603.30	16	65,905.00
11-May-15					14	50,823.60	14	50,823.60
12-May-15					14	51,221.40	14	51,221.40

13-May-15					12	68,147.20	12	68,147.20
14-May-15					10	42,456.00	10	42,456.00
15-May-15	02:50	06:15	2	8,076.60	10	34,062.00	12	42,138.60
16-May-15					20	84,943.60	20	84,943.60
17-May-15	02:15	06:40	2	8,311.20	12	59,433.90	14	67,745.10
18-May-15					14	50,895.50	14	50,895.50
19-May-15					0	8,481.80	0	8,481.80
20-May-15							0	0.00
21-May-15							0	0.00
22-May-15					8	34,111.80	8	34,111.80
23-May-15					16	68,140.40	16	68,140.40
24-May-15					12	42,484.00	12	42,484.00
25-May-15					12	59,802.60	12	59,802.60
26-May-15					16	68,234.00	16	68,234.00
27-May-15					14	59,719.20	14	59,719.20
28-May-15					16	59,260.80	16	59,260.80
29-May-15					14	67,822.00	14	67,822.00
30-May-15					16	59,373.00	16	59,373.00
31-May-15					16	76,455.60	16	76,455.60
1-Jun-15					14	59,505.60	14	59,505.60
2-Jun-15					8	33,880.80	8	33,880.80
3-Jun-15	09:05 16:20	13:12 19:28	4	16,395.50	12	42,408.40	16	58,803.90
4-Jun-15	01:45 13:23 20:21	05:45 17:01 23:54	6	24,859.40	16	76,114.20	22	100,973.60
5-Jun-15	16:25	20:25	2	9,152.35	18	76,709.00	20	85,861.35
6-Jun-15	00:46 07:40 19:00	03:56 10:00 22:29	6	25,462.40	18	76,216.80	24	101,679.20
7-Jun-15					18	76,188.40	18	76,188.40
8-Jun-15					20	76,533.00	20	76,533.00
9-Jun-15	07:30	11:18	2	9,104.50	12	51,280.80	14	60,385.30
10-Jun-15					12	59,182.60	12	59,182.60
11-Jun-15					12	42,576.40	12	42,576.40
12-Jun-15					16	76,582.80	16	76,582.80
13-Jun-15	11:47 19:20	15:13 22:30	4	16,564.20	14	59,532.60	18	76,096.80
14-Jun-15	04:00 12:33 20:40	07:24 16:30 (00:05)	6	24,942.60	20	76,861.80	26	101,804.40
15-Jun-15	04:40 16:30	08:26 20:47	4	16,497.40	18	76,543.30	22	93,040.70
16-Jun-15	20:00	(00:05)	2	7,602.90	20	93,737.60	22	101,340.50

17-Jun-15					20	85,309.60	20	85,309.60
18-Jun-15					22	85,346.60	22	85,346.60
19-Jun-15	07:30 16:00	11:00 20:46	4	15,981.40	16	75,375.22	20	91,356.62
20-Jun-15					14	42,814.00	14	42,814.00
21-Jun-15	11:10	15:55	2	8,497.20	20	102,005.60	22	110,502.80
22-Jun-15	00:46	03:42	2	8,011.60	20	76,600.00	22	84,611.60
23-Jun-15	07:48	10:57	2	8,266.20	16	68,490.00	18	76,756.20
24-Jun-15	11:08	14:22	2	8,472.30	20	85,591.80	22	94,064.10
25-Jun-15					12	60,060.20	12	60,060.20
26-Jun-15					16	59,680.60	16	59,680.60
27-Jun-15	07:32	11:48	2	8,883.00	20	85,243.60	22	94,126.60
28-Jun-15	01:45 09:05 15:30	06:27 13:25 19:32	6	33,560.20	18	85,288.20	24	118,848.40
29-Jun-15	01:09 17:55	05:30 21:35	4	7,857.20	14	60,089.00	18	67,946.20
30-Jun-15	01:33	05:29	2	8,398.00	10	34,018.40	12	42,416.40
1-Jul-15	08:50 21:10	13:20 (01:10)	4	16,974.20	8	35,461.60	12	52,435.80
2-Jul-15					10	44,327.00	10	44,327.00
3-Jul-15	01:55 12:18	05:36 16:05	4	16,812.80	12	53,192.40	16	70,005.20
4-Jul-15	07:42	11:17	2	8,055.20	18	79,788.60	20	87,843.80
5-Jul-15					16	70,923.20	16	70,923.20
6-Jul-15					12	53,192.40	12	53,192.40
7-Jul-15					12	53,192.40	12	53,192.40
8-Jul-15							0	0.00
9-Jul-15	18:25	22:45	2	9,089.48			2	9,089.48
10-Jul-15	20:00	(01:00)	2	8,997.80			2	8,997.80
11-Jul-15	12:00	16:32	2	9,246.00	12	53,192.40	14	62,438.40
12-Jul-15	16:15	20:40	2	8,196.30	10	44,327.00	12	52,523.30
13-Jul-15	03:30	08:16	2	8,045.00	8	35,461.60	10	43,506.60
14-Jul-15							0	0.00
15-Jul-15							0	0.00
16-Jul-15							0	0.00
17-Jul-15	03:40 16:40 23:55	08:14 19:52 (04:12)	6	26,093.20			6	26,093.20
18-Jul-15	12:30	17:25	2	9,329.65	10	44,327.00	12	53,656.65
19-Jul-15	16:30	20:55	2	8,859.86	14	62,057.80	16	70,917.66
20-Jul-15					14	62,057.80	14	62,057.80
21-Jul-15	15:23	19:00	2	9,061.40	12	53,192.40	14	62,253.80
22-Jul-15	04:25 12:55 18:10	08:40 16:10 21:40	6	23,271.60	12	53,192.40	18	76,464.00
23-Jul-15	04:05 17:15	07:45 20:37	4	16,585.20	14	62,057.80	18	78,643.00

24-Jul-15	01:50 12:30	05:26 16:30	4	18,857.92	10	44,327.00	14	63,184.92
25-Jul-15	00:10 12:49	03:31 16:15	4	17,865.10	12	53,192.40	16	71,057.50
26-Jul-15	18:10	22:50	2	8,923.50	20	88,654.00	22	97,577.50
27-Jul-15	03:30 07:30 17:05	07:06 10:35 21:10	6	27,013.40	14	62,057.80	20	89,071.20
28-Jul-15	02:00 16:30 22:35	05:45 21:02 (03:02)	6	25,576.00	8	35,461.60	14	61,037.60
29-Jul-15	05:05 12:10	09:35 16:20	4	26,612.00	10	44,327.00	14	70,939.00
30-Jul-15	03:15 13:20	06:45 17:45	4	8,832.00	14	62,057.80	18	70,889.80
31-Jul-15	02:06	08:09	2	8,464.00	6	26,596.20	8	35,060.20
1-Aug-15					2	8,865.40	2	8,865.40
2-Aug-15					6	26,596.20	6	26,596.20
3-Aug-15					12	53,192.40	12	53,192.40
4-Aug-15					12	53,192.40	12	53,192.40
5-Aug-15	07:36 16:50	13:31 20:36	4	16,835.00	18	79,788.60	22	96,623.60
6-Aug-15					14	62,057.80	14	62,057.80
7-Aug-15					20	88,654.00	20	88,654.00
8-Aug-15	13:36 19:30	17:36 22:30	4	17,760.00	18	79,788.60	22	97,548.60
9-Aug-15	07:36	10:38	2	8,510.00	12	53,192.40	14	61,702.40
10-Aug-15	09:03	(04:45)	2	8,510.00	20	88,654.00	22	97,164.00
11-Aug-15	18:35	21:55	2	8,417.50	12	53,192.40	14	61,609.90
12-Aug-15	00:12 08:10 20:22	03:18 11:27 (00:45)	6	26,177.50	14	62,057.80	20	88,235.30
13-Aug-15	04:00 10:39	08:42 14:00	4	17,020.00	18	79,788.60	22	96,808.60
14-Aug-15	16:50	20:15	2	8,880.00	10	44,327.00	12	53,207.00
15-Aug-15					6	26,596.20	6	26,596.20
16-Aug-15	01:55 08:34	04:56 11:04	4	17,020.00	10	44,327.00	14	61,347.00
17-Aug-15	16:29	19:38	2	8,510.00	6	26,596.20	8	35,106.20
18-Aug-15							0	0.00
19-Aug-15							0	0.00
20-Aug-15	00:50	03:50	2	8,510.00	2	8,865.40	4	17,375.40
21-Aug-15	20:51	(00:14)	2	8,880.00	10	44,327.00	12	53,207.00
22-Aug-15	03:25	06:55	2	8,880.00	16	70,923.20	18	79,803.20
23-Aug-15	01:59 17:15	05:04 23:07	4	17,297.50	20	88,654.00	24	105,951.50
24-Aug-15					14	62,057.80	14	62,057.80
25-Aug-15	23:45	(02:50)	2	8,880.00	16	70,923.20	18	79,803.20

26-Aug-15	09:40 22:55	12:25 (01:05)	4	17,020.00	6	26,596.20	10	43,616.20
27-Aug-15	08:05	11:05	2	8,510.00	8	35,461.60	10	43,971.60
28-Aug-15					10	44,327.00	10	44,327.00
29-Aug-15	03:50 15:15	06:20 18:00	4	16,095.00	16	70,923.20	20	87,018.20
30-Aug-15	05:45 15:00	09:05 17:53	4	17,390.00	12	53,192.40	16	70,582.40
31-Aug-15	08:30	11:25	2	8,510.00	16	70,923.20	18	79,433.20
1-Sep-15	11:25	14:40	2	8,510.00	16	70,923.20	18	79,433.20
2-Sep-15					20	88,654.00	20	88,654.00
3-Sep-15					16	70,923.20	16	70,923.20
4-Sep-15	06:30 16:20	10:45 20:02	4	17,020.00	10	44,327.00	14	61,347.00
5-Sep-15	09:00 19:45	13:08 22:15	4	17,760.00	18	79,788.60	22	97,548.60
6-Sep-15	02:45	05:25	2	8,417.50	14	62,057.80	16	70,475.30
7-Sep-15					8	35,461.60	8	35,461.60
8-Sep-15					8	35,461.60	8	35,461.60
9-Sep-15	10:10 19:10	13:21 22:50	4	17,297.50	6	26,596.20	10	43,893.70
10-Sep-15					6	26,596.20	6	26,596.20
11-Sep-15					12	53,192.40	12	53,192.40
12-Sep-15	11:33 18:05	14:58 21:40	4	17,390.00	8	35,461.60	12	52,851.60
13-Sep-15	12:10 21:00	16:00 (01:12)	4	17,557.00	22	97,519.40	26	115,076.40
14-Sep-15					12	53,192.40	12	53,192.40
15-Sep-15	08:55	12:55	2	8,059.80	16	70,923.20	18	78,983.00
16-Sep-15					10	44,327.00	10	44,327.00
17-Sep-15					6	26,596.20	6	26,596.20
18-Sep-15	02:30	07:00	2	7,859.60	6	26,596.20	8	34,455.80
19-Sep-15	16:43	20:04	2	8,470.20	12	53,192.40	14	61,662.60
20-Sep-15	01:22	04:13	2	8,455.80	12	53,192.40	14	61,648.20
21-Sep-15					12	53,192.40	12	53,192.40
22-Sep-15	11:10	17:10	2	9,011.00	10	44,327.00	12	53,338.00
23-Sep-15	01:30	06:21	2	9,037.00	10	44,327.00	12	53,364.00
24-Sep-15					12	53,192.40	12	53,192.40
25-Sep-15					8	35,461.60	8	35,461.60
26-Sep-15					8	35,461.60	8	35,461.60
27-Sep-15					14	62,057.80	14	62,057.80
28-Sep-15					12	53,192.40	12	53,192.40
29-Sep-15					14	62,057.80	14	62,057.80

30-Sep-15	00:42 10:00 15:33 21:50	03:57 12:50 18:30 (01:27)	8	33,710.80	18	79,788.60	26	113,499.40
1-Oct-15					14	62,057.80	14	62,057.80
2-Oct-15					14	62,057.80	14	62,057.80
3-Oct-15					18	79,788.60	18	79,788.60
4-Oct-15	09:50	13:32	2	8,455.90	14	62,057.80	16	70,513.70
5-Oct-15	00:33	04:22	2	8,226.60	8	35,461.60	10	43,688.20
6-Oct-15					10	44,327.00	10	44,327.00
7-Oct-15							0	0.00
8-Oct-15							0	0.00
9-Oct-15					6	26,596.20	6	26,596.20
10-Oct-15					12	53,192.40	12	53,192.40
11-Oct-15					10	44,327.00	10	44,327.00
12-Oct-15					8	35,461.60	8	35,461.60
13-Oct-15					12	53,192.40	12	53,192.40
14-Oct-15	16:52	19:20	2	8,381.20	6	26,596.20	8	34,977.40
15-Oct-15	00:55	05:00	2	8,375.20	8	35,461.60	10	43,836.80
16-Oct-15	16:50	21:12	2	8,745.60	6	26,596.20	8	35,341.80
17-Oct-15					12	53,192.40	12	53,192.40
18-Oct-15	10:30	14:30	2	9,083.00	12	53,192.40	14	62,275.40
19-Oct-15					12	53,192.40	12	53,192.40
20-Oct-15					8	35,461.60	8	35,461.60
21-Oct-15					10	44,327.00	10	44,327.00
22-Oct-15					14	62,057.80	14	62,057.80
23-Oct-15					16	70,923.20	16	70,923.20
24-Oct-15					20	88,654.00	20	88,654.00
25-Oct-15					18	79,788.60	18	79,788.60
26-Oct-15	09:31	14:40	2	8,500.80	16	70,923.20	18	79,424.00
27-Oct-15	04:24	09:50	2	8,870.40	10	44,327.00	12	53,197.40
28-Oct-15	05:57	10:13	2	8,408.40	8	35,461.60	10	43,870.00
29-Oct-15					8	35,461.60	8	35,461.60
30-Oct-15					16	70,923.20	16	70,923.20
31-Oct-15					20	88,654.00	20	88,654.00
1-Nov-15					14	62,057.80	14	62,057.80
2-Nov-15					12	53,192.40	12	53,192.40
3-Nov-15					12	53,192.40	12	53,192.40
4-Nov-15					8	35,461.60	8	35,461.60
5-Nov-15					12	53,192.40	12	53,192.40
6-Nov-15					14	62,057.80	14	62,057.80
7-Nov-15					14	62,057.80	14	62,057.80
8-Nov-15					18	79,788.60	18	79,788.60
9-Nov-15					14	62,057.80	14	62,057.80

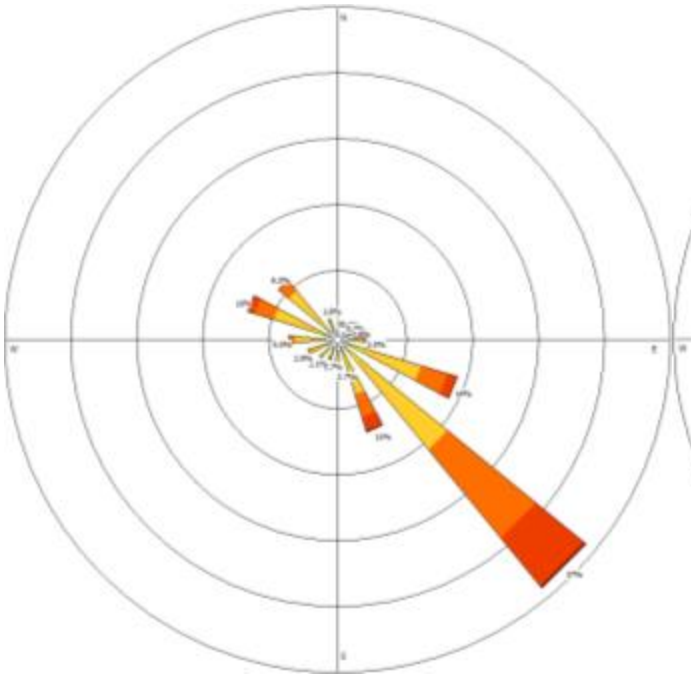
10-Nov-15							0	0.00
11-Nov-15							0	0.00
12-Nov-15							0	0.00
13-Nov-15					8	35,461.60	8	35,461.60
14-Nov-15					12	53,192.40	12	53,192.40
15-Nov-15					14	62,057.80	14	62,057.80
16-Nov-15					14	62,057.80	14	62,057.80
17-Nov-15	19:35	23:00	2	8,870.40	12	53,192.40	14	62,062.80
18-Nov-15	14:50	23:38	2	8,408.40	16	70,923.20	18	79,331.60
19-Nov-15	15:00	20:20	2	8,408.80	16	70,923.20	18	79,332.00
20-Nov-15	01:27 10:30 16:10	08:09 13:55 19:45	6	27,450.20	14	62,057.80	20	89,508.00
21-Nov-15	01:45 09:55	05:23 13:37	4	17,593.00	20	88,654.00	24	106,247.00
22-Nov-15	00:23 07:20 23:15	03:30 11:49 (02:35)	6	26,025.20	16	70,923.20	22	96,948.40
23-Nov-15					4	17,730.80	4	17,730.80
24-Nov-15					12	53,192.40	12	53,192.40
25-Nov-15					12	53,192.40	12	53,192.40
26-Nov-15					10	44,327.00	10	44,327.00
27-Nov-15					14	62,057.80	14	62,057.80
28-Nov-15					14	62,057.80	14	62,057.80
29-Nov-15					18	79,788.60	18	79,788.60
30-Nov-15					10	44,327.00	10	44,327.00
1-Dec-15					10	44,327.00	10	44,327.00
2-Dec-15	20:15	23:55	2	8,155.20	10	44,327.00	12	52,482.20
3-Dec-15	01:45 11:50	04:50 16:00	4	17,780.40	20	88,654.00	24	106,434.40
4-Dec-15	01:05 07:45 16:40	04:30 12:20 20:31	6	25,685.22	16	70,923.20	22	96,608.42
5-Dec-15					12	53,192.40	12	53,192.40
6-Dec-15	03:17	07:10	2	8,562.20	20	88,654.00	22	97,216.20
7-Dec-15					12	53,192.40	12	53,192.40
8-Dec-15					16	70,923.20	16	70,923.20
9-Dec-15					14	62,057.80	14	62,057.80
10-Dec-15					16	70,923.20	16	70,923.20
11-Dec-15					12	53,192.40	12	53,192.40
12-Dec-15					12	53,192.40	12	53,192.40
13-Dec-15					16	70,923.20	16	70,923.20
14-Dec-15	03:10 19:00	08:40 22:08	4	16,898.04	2	8,865.40	6	25,763.44

15-Dec-15	07:24 19:08	10:18 22:06	4	17,040.30	12	53,192.40	16	70,232.70
16-Dec-15					10	44,327.00	10	44,327.00
17-Dec-15	11:33 18:00	14:21 21:40	4	16,726.40	10	44,327.00	14	61,053.40
18-Dec-15	(23:36) 11:00 20:25	02:43 15:25 (00:00)	6	25,616.20	14	62,057.80	20	87,674.00
19-Dec-15	02:25 08:16 17:25	05:20 12:49 21:00	6	25,364.56	12	53,192.40	18	78,556.96
20-Dec-15	07:50 17:00	11:25 20:20	4	17,125.40	18	79,788.60	22	96,914.00
21-Dec-15	11:15	16:00	2	8,883.80	18	79,788.60	20	88,672.40
22-Dec-15	03:12 23:16	08:05 (03:42)	4	18,028.90	8	35,461.60	12	53,490.50
23-Dec-15	09:22 23:30	13:45 (02:35)	4	17,770.50	12	53,192.40	16	70,962.90
24-Dec-15	08:02	10:53	2	9,159.40	6	26,596.20	8	35,755.60
25-Dec-15							0	0.00
26-Dec-15	11:25	16:15	2	8,042.10	6	26,596.20	8	34,638.30
27-Dec-15	22:35	(01:43)	2	7,956.20	10	44,327.00	12	52,283.20
28-Dec-15	03:55	06:51	2	8,097.80	16	70,923.20	18	79,021.00
29-Dec-15					16	70,923.20	16	70,923.20
30-Dec-15					14	62,057.80	14	62,057.80
31-Dec-15					14	62,057.80	14	62,057.80

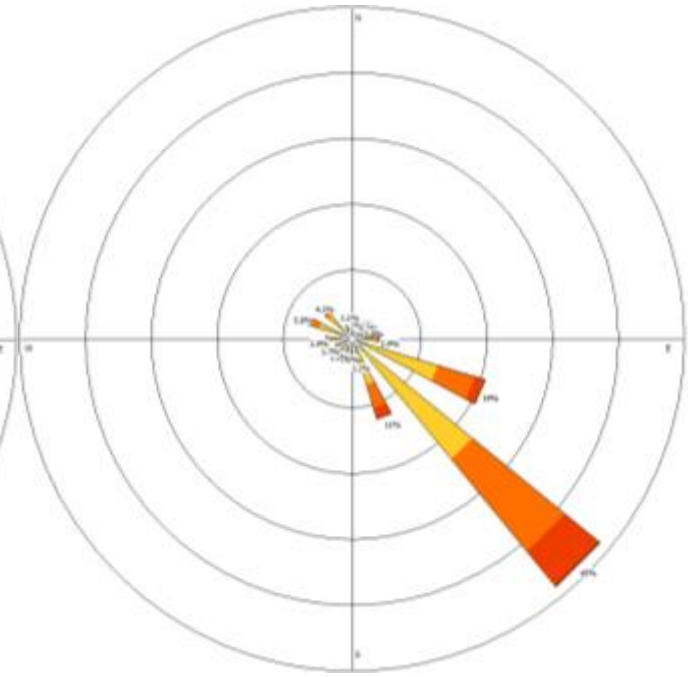
PERIOD SUMMARY			
Maximum train movements / day (Drayton)	8	Limit	12
Maximum train movements / day (MAC)	22	Limit	No limit
Maximum combined train movements	30	Limit	30
Total Tonnes (Drayton)	2,557,203	Tonnes	
Total Tonnes (Mt Arthur Coal)	18,954,592	Tonnes	
Combined Tonnes (Antiene Rail Spur)	***21,511,795***	Tonnes	

Appendix I: Monthly Wind Speed and Direction 2015

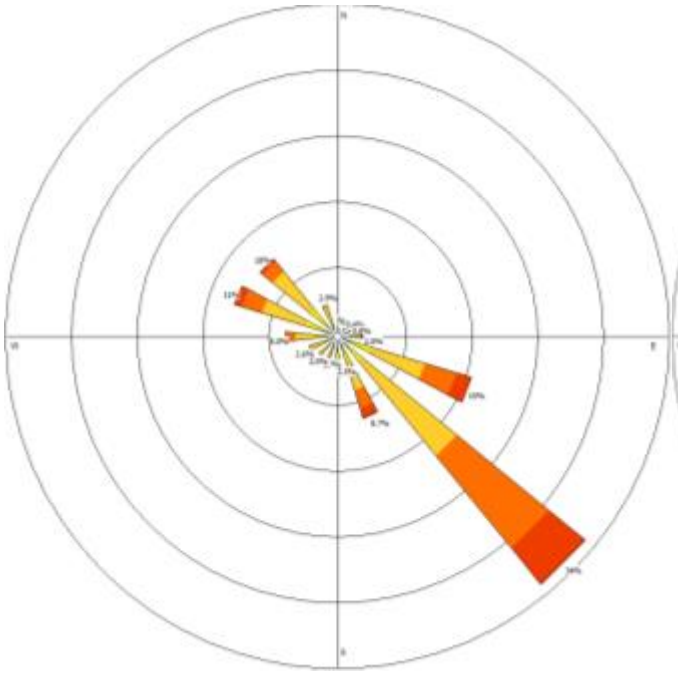
January 2015



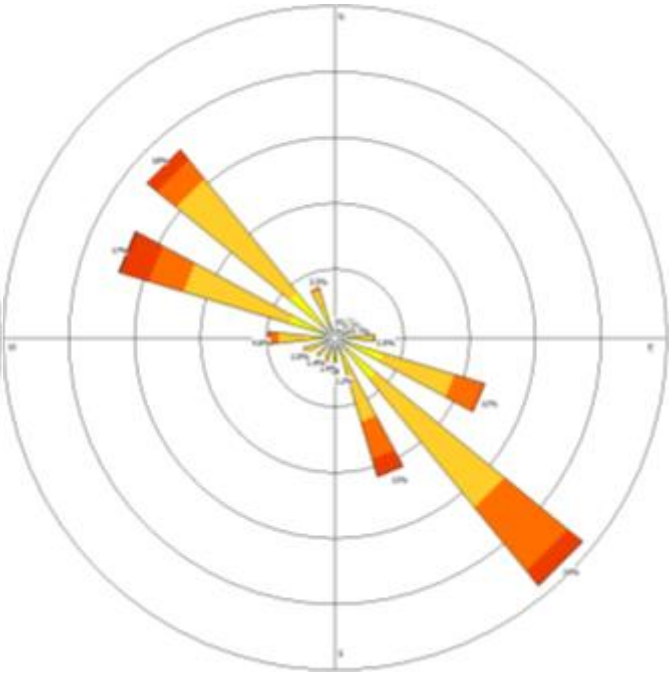
February 2015



March 2015

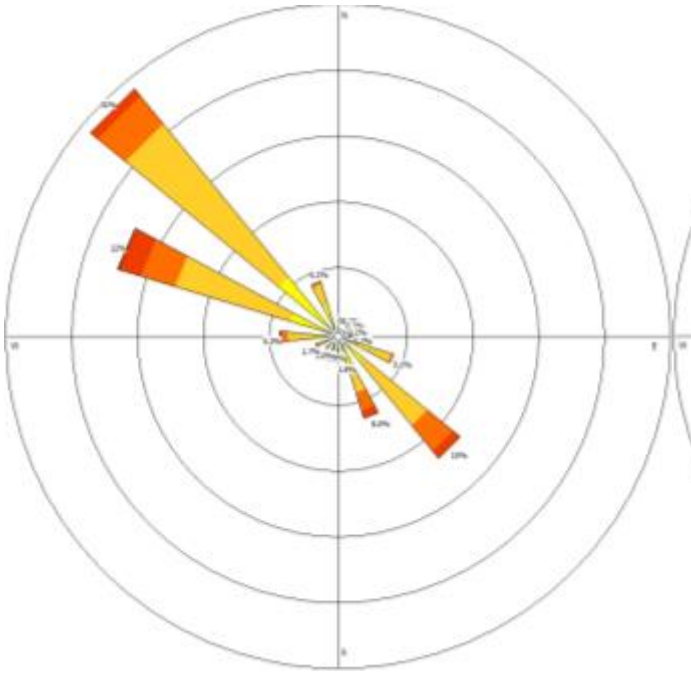


April 2015

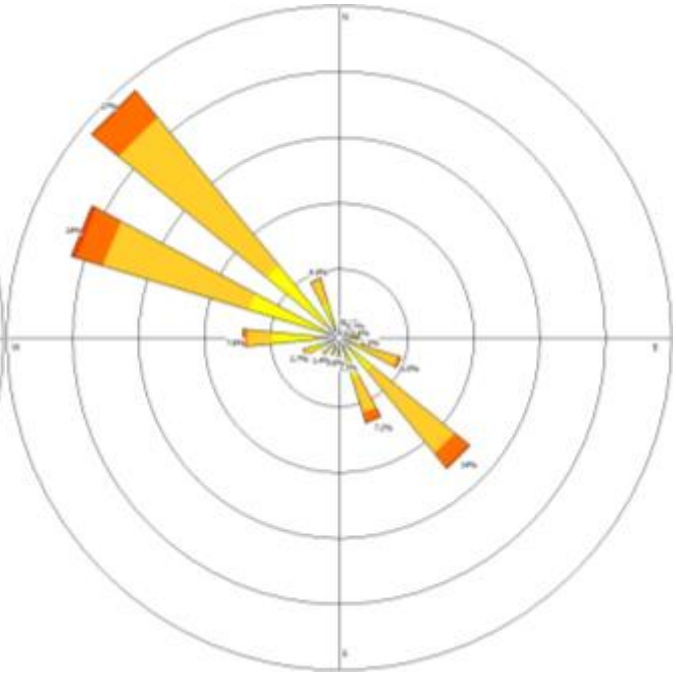


Legend

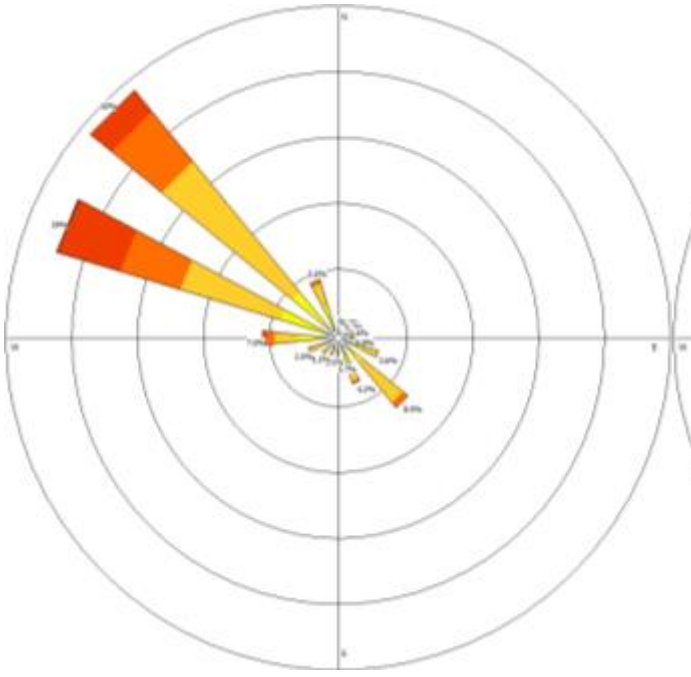
May 2015



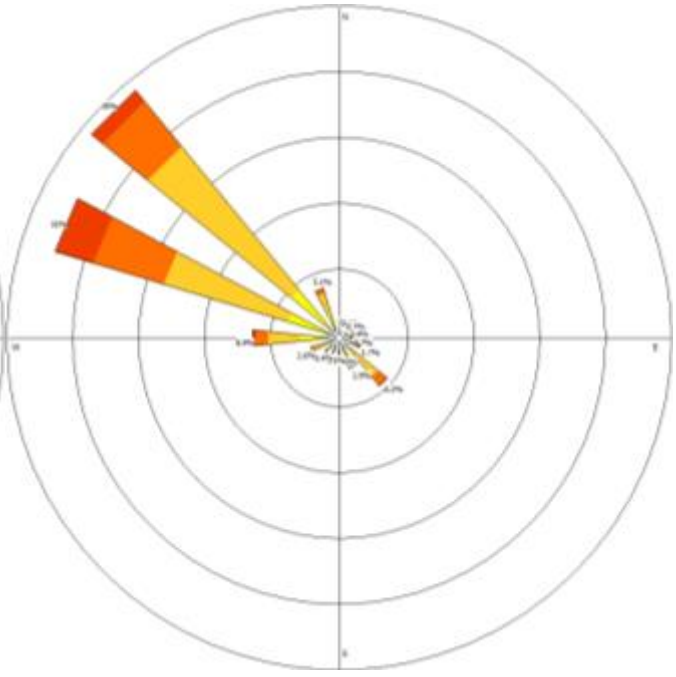
June 2015



July 2015



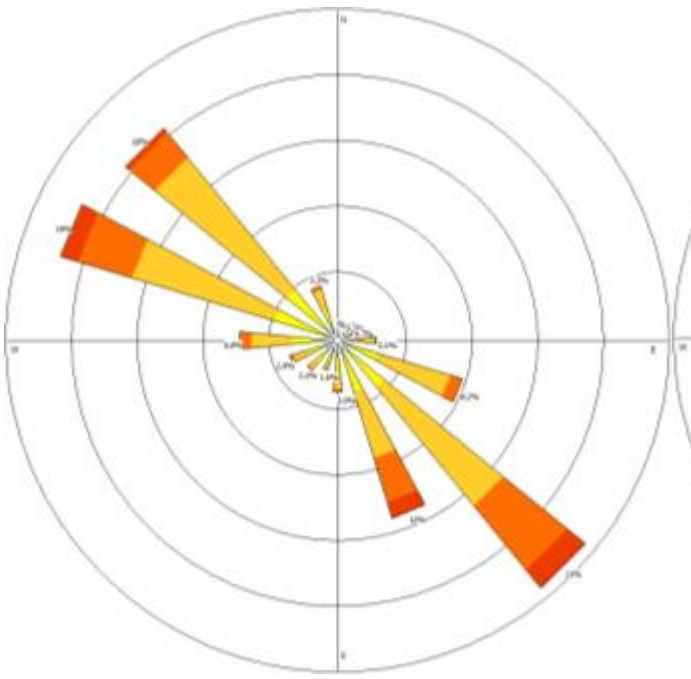
August 2015

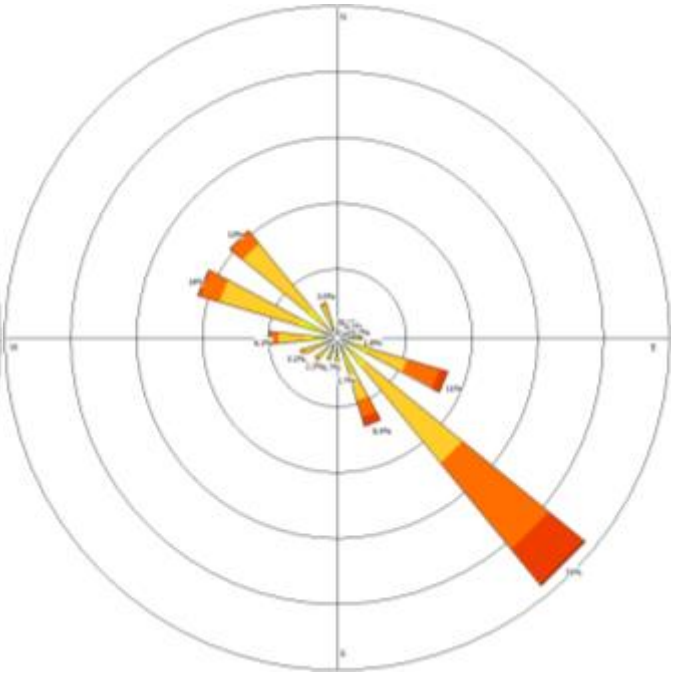


Legend

September 2015

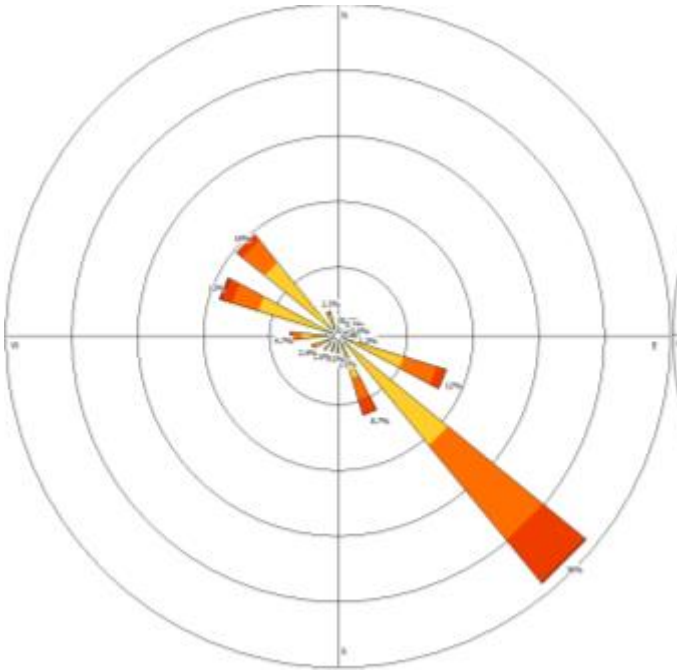
October 2015

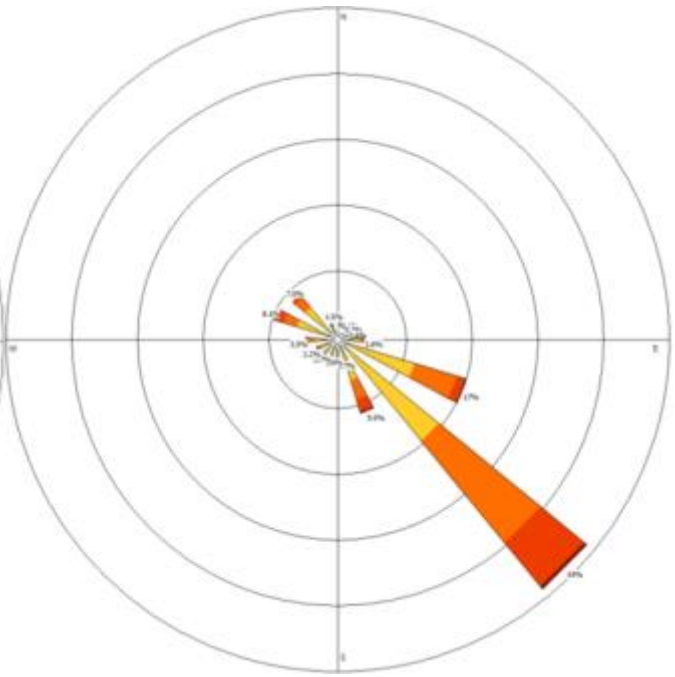




November 2015

December 2015





Legend

THIS PAGE IS INTENTIONALLY LEFT BLANK