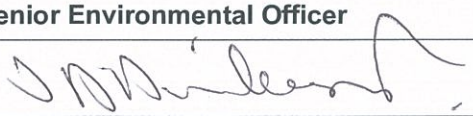
ANNUAL REVIEW
2015

RIX'S CREEK Pty Limited

Name of Operation	Rix's Creek Mine
Name of operator	Bloomfield Collieries Pty Ltd
Development consent / project approval #	DA 49/94
Name of holder of development consent / project approval	Bloomfield Collieries Pty Ltd
Mining Lease #	CL352 & ML1432
Name of holder of mining lease	Bloomfield Collieries Pty Ltd
Water License #	20AL203407, 20AL203406, 20AL203405, 20AL209899, 20AL207389, 20AL209901, 20BL170864, 20BL168734, 20AL209919, 20WA201499
Name of holder of water license	Bloomfield Collieries Pty Ltd
MOP / RMP start date	8/3/2013
MOP / RMP end date	8/3/2020
Annual Review start date	1/1/2015
Annual Review end date	31/12/2015
I, Jason Desmond, certify that this audit report is a true and accurate record of the compliance status of Rix's Creek Mine for the period 1/1/2015 – 31/1/2015 and that I am authorised to make this statement on behalf of Bloomfield Collieries Pty Ltd.	
Name of authorised reporting officer	John Hindmarsh
Title of authorised reporting officer	Senior Environmental Officer
Signature of authorised reporting officer	
Date	19/4/2016

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SECTION 1 STATEMENT OF COMPLIANCE

Were all conditions of the relevant approval(s) complied with?	
DC # DA 49/94 Mod 6	NO
ML # 1432	YES

Development consent DA 49/94 was not complied with (Condition 15 – Off-site water release) and Mining Lease ML 1432 was complied with during the 2015 calendar year. Further details can be found in Section 11 'Incidents and non-compliances during the reporting period'.

SECTION 2 INTRODUCTION

The Annual Environmental Management Report for 2015 is compiled pursuant to Condition 19 of the development consent for Rix's Creek Open Cut Mine. The report is also presented to satisfy the environmental reporting requirements of the NSW Trade and Investment – Division of Resources and Energy (DRE), The Office of Environment and Heritage (OEH), and the Department of Planning and Environment (DPE). This reporting period extends from 1 January 2014 to 31 December 2015.

Rix's Creek Colliery is wholly owned by The Bloomfield Group Ltd. an Australian owned family company. The Bloomfield Group also operates an open cut coal mine at East Maitland, *Bloomfield Collieries Pty. Ltd*, exploration license (EL) 7435 "*Goonbri*", EL5888 and EL5306 "*Bickham*", EL6604, EL7365 and CCL711 "*Curlewis*", engineering businesses *Four Mile Engineering* and *King's Engineering* as well as equity positions in companies specialising in renewable energies, recycling and biofuel production.

Rix's Creek mine commenced operations in July 1990 following the granting of Development Consent and Coal Lease No. 352 on 20 October 1989. This followed the submission of Coal Lease Application No. 185, an Environmental Impact Statement (EIS) and a public inquiry into the development application.

Construction began in late November 1989 establishing access roads, dams, facilities and screening bunds adjacent to the New England Highway. The Mining Operations Plan (MOP) was approved covering a five-year period, which corresponded, to Stage 1 of the mining proposal set out in the EIS.

The initial area was located adjacent to and on the northern side of the New England Highway and utilised bulldozer and scrapers to remove overburden. As mining progressed to greater depths, massive sandstone was encountered, requiring the introduction of overburden blasting. The scraper fleet was substituted with front end loader and trucks as the primary means of overburden removal. The Hebden and Barrett coal seams were mined at the rate of 300,000 tonnes of raw coal per annum.

The mining area was within old underground workings of the New Park Colliery, which dated back to the late 1800's. The underground workings were far more extensive than documented and resulted in poor coal recoveries and quality. This led to the relocation of operations to the north of the mining lease, an area termed the northern mining area or Pit 1.

A bridge over the New England Highway was constructed to enable access to coal reserves in the southern area of the coal lease or Pit 2. Since the completion of the bridge in June 1994 mining operations concentrated in this area. The production rate was then increased to 800,000 tonnes of raw coal per annum.

A coal preparation plant and rail loading facility were commissioned in April 1993, with all product coal being transported by rail to the port of Newcastle, where it is blended with coal from Bloomfield open cut. All product coal is sold on the export market. Prior to the commissioning of Rix's Creek washing and railing facilities, all raw coal was transported to Bloomfield Colliery for washing and blending.

During 1997 the operation expanded following the 1995 Development Consent approval allowing production to increase to current levels.

Along with the continuing operation in Pit 2 operations commenced on the extension of Pit 1 in January 1997. Production increased to 1.7 million tonnes of raw coal. Since 1997 mining operations continued in Pits 1 & 2. During 2002 operations commenced in Pit 3 on the western side of Rix's Creek adjacent to Pit 2. The last coal was extracted from Pit 2 on 23rd June 2003. The emplacement of tailings into the pit 2 void commenced

in July 2005 with capacity reached during May 2014. Operations have continued concurrently in Pit 1 and Pit 3 (West Pit) with approximate production of 1,400,000 tonnes of product coal per annum. Mining in Pit 1 via open-cut finalised in 2014 with the focus of the operations continuing in Pit 3.

On December 18th 2015 Bloomfield Collieries Pty Ltd took ownership of the Vale Integra open-cut mine which will be renamed 'Rix's Creek North'. Rix's Creek North remained in care and maintenance phase during 18th December 2015 to 31st December 2015. A subsequent Annual Review will be prepared for Rix's Creek North (RCN) operations for the 2015 reporting period and as such the environmental performance of RCN will not be incorporated into the 2015 Rix's Creek Annual Review.

Aerial photograph – 30 December 2015.

2.1 Consents, Leases and Licences

A full list of consents, leases and licences held by Rix's Creek Mine is contained in Table 1.

Coal Lease No. 352 was renewed on 20/10/2011 allowing mining operations to continue on the site. Mineral Lease Application No. 17 to remove the surface exclusion from the remaining areas within the lease was submitted in 1995 and access agreements reached with landholders. Mining lease No. 1432 was granted by the Minister on 24/6/1998.

The development application to expand the operation submitted to the Department of Urban Affairs & Planning in November 1994 under the provisions of S.E.P.P. No. 34 was determined by the Minister in October 1995. The development consent came into effect in December 1995, and implementation progressed during 1996.

The Company holds Environmental Protection Licence No. 003391 under the Protection of the Environment Operations Act, 1997. This EPL has been varied to accept wastes on site such as biosolids (rehabilitation), refined oil (blasting) and glycerine (dust suppression). The license has also had variations for PRPs (Pollution Reduction Programs) in regard to *Coal Mine Particulate Matter Control Best Practise* as well as a noise assessment in accordance with the document, 'NSW Industrial Noise Policy', (EPA 2000). The prescribed use classification is Coal Industry Works Class I, and operational scale is more than 500 to 2,000 kilotonnes per annum. On the 18th December 2015 Environmental Protection 003391 was varied to include Rix's Creek North operations.

Rix's Creek P/L is a non-discharging participant in the Hunter River Salinity Trading Scheme holding 5 credits.

An application was made in November 2003 to vary the Development Consent to receive and process coal from Glennies Creek Coal Mine. The Notice of a Modification to a Development Consent under Section 96(2) of the Environmental Planning and Assessment Act 1979 was signed by the Minister on 23rd December 2003, modifying the Rix's Creek Development Consent to allow this activity. No coal was received during 2014.

An application was made in April 2004 to vary the Development Consent to receive coal from Bickham Bulk Sample Exploration Licence operation. The Minister signed the Notification of a Modification to Development Consent under Section 96(2) of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979) on 24th June 2004, modifying the Rix's Creek Development Consent to allow this activity. This activity was completed and the last coal railed in March 2005.

An application for a second crossing of the New England Highway to improve the efficiency of the mining operation was submitted to Department of Planning in March 2009. The Minister approved the modification under Section 96(2) of EP&A Act 1979, on 27 August 2009, for a Cut and Cover Tunnel crossing on the New England Highway. Following final approval of the design by the RTA in October 2010 construction began in November 2010 with completion of the project during June 2012. The first haul truck officially passing under the tunnel on 5 June 2012.

An application for the construction of a rail-loop off the main northern rail-way line onto Rix's Creek owned land was approved in 2013 resulting in modification number 5. No construction has commenced on this project since approval was granted.

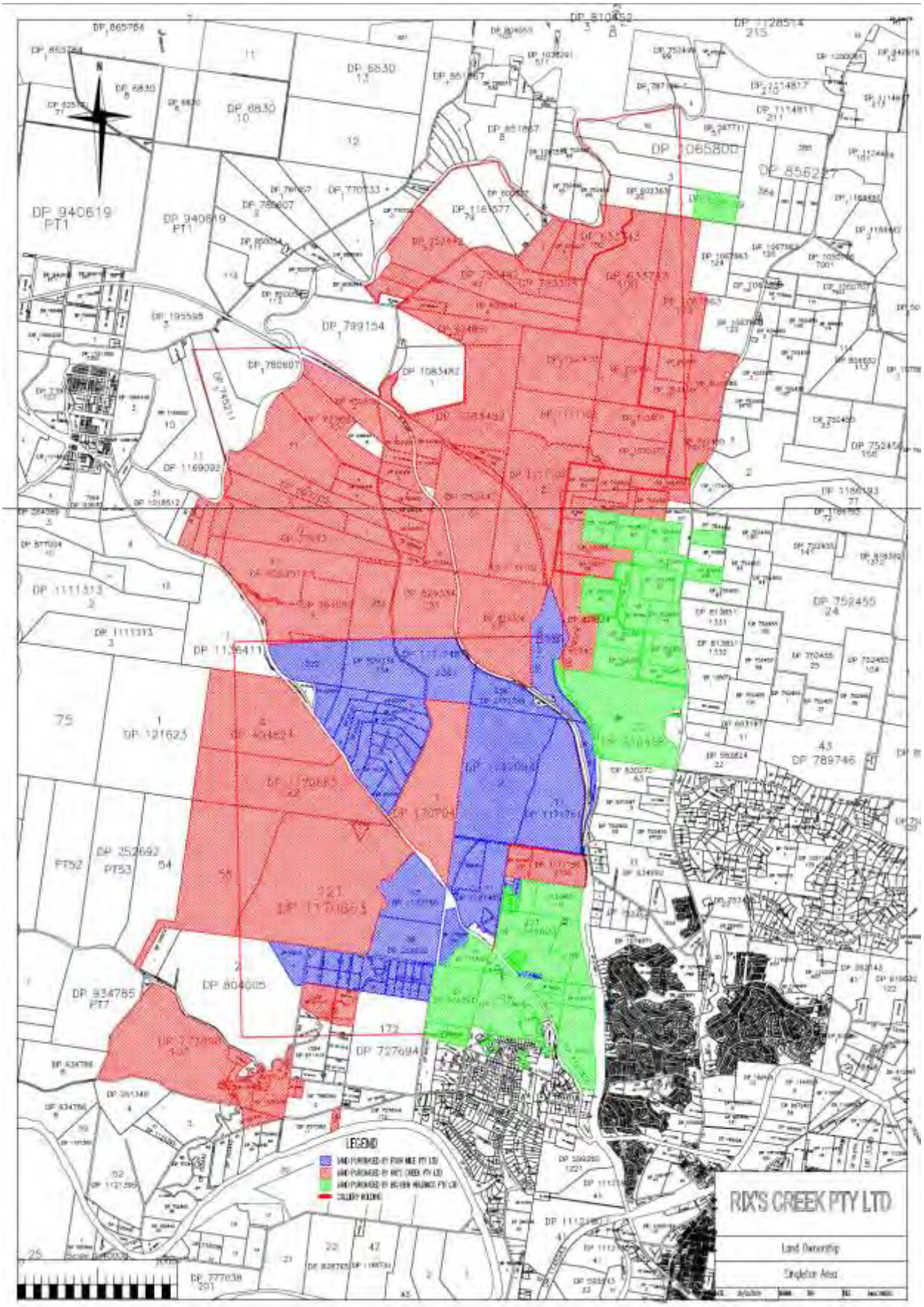
On Friday 4th October 2013 Rix's Creek took ownership of land ahead of the West Pit operations to secure the future of mining within the lease. The three properties purchased include Lot A, D.P.404824 (previously owned by A.Bowman); Lot 122, D.P.1170863 (previously owned by E.S.Bowman); and Lot 55, D.P.252692 (previously owned by Canravo Pty Ltd).

A detailed map of Rix's Creek property ownership can be seen on the following page. Areas hatched in blue, red and green are all owned by the Bloomfield Group.

During 2014 an application to increase total material movement from 15 million BCM to 16.1 million BCM was approved resulting in modification number 6. During 2014 Rix's Creek commenced the Rix's Creek Continuation Project (SSD# 6300) in order for the mine to continue another 21 years

pending the approval of a new development consent. The draft Environmental Impact Statement (EIS) was completed and submitted for adequacy November 2015.

On December 18th 2015 Bloomfield Collieries Pty Ltd took ownership of the Vale Integra open-cut mine which will be renamed 'Rix's Creek North'. Rix's Creek North remained in care and maintenance phase during 18th December 2015 to 31st December 2015.



Land Ownership December 2015.

2.2 Mine Contacts

Rix's Creek Pty Limited

Site:-	Rix's Creek Lane Singleton NSW 2330	Postal Address:-	P O Box 4 EAST MAITLAND NSW 2323.
Telephone:-	02 65788800		
Fax:-	02 65711066		

Rix's Creek Community & Blasting Hotline:-
02 49302665 (24hr)

Mine Manager:- Luke Murray
Responsible for overseeing all operations on site.
Telephone No:- 02 65788802
Mobile:- 0427 292152
E-mail:- lmurray@rixs.com.au

Technical Services Manager:- Chris Moy
Responsible for survey and mine planning.
Telephone No:- 02 65788808
Mobile:- 0415 872425
E-mail:- cmoy@rixs.com.au

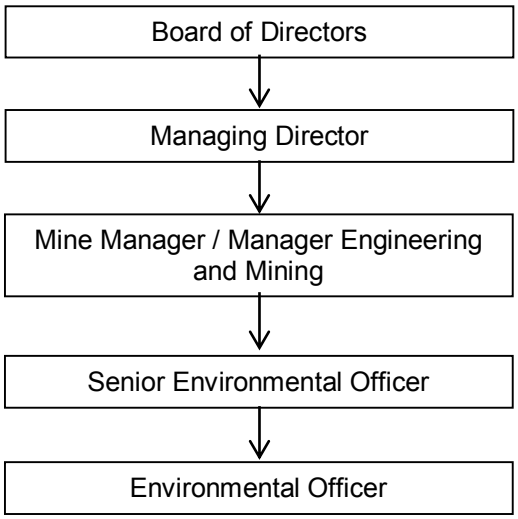
Senior Environmental Officer:- John Hindmarsh
Responsible for consulting with regulatory authorities as required, provide measures for continual improvement to site procedures and ensuring all personnel are trained and competent in relation to rehabilitation of the mine site.
Telephone No:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au

Environmental Officer:- Jason Desmond
Responsible for assisting monitoring and reporting on the environmental performance of the operation and co-ordinating the rehabilitation on the mine site. Provide support for the implementation of the Senior Environmental Officers responsibilities.
Telephone No:- 02 65788826
Mobile:- 0407 246311
E-mail:- jdesmond@rixs.com.au

Bloomfield / Rix's Creek Website:-
www.bloomcoll.com.au

2.3 Organisational Chart (Environment)

As per *Rix's Creek Mine Management Structure Register* document:



2.4 Employment Demography

Rix's Creek currently has 140 full-time employees comprising of staff and operators. The areas which include the largest number of employees are Singleton Council (35%), Maitland City Council (24%) and Cessnock City Council (16%). Rix's Creek mine endeavour to employ local personnel and local contractors are preferentially engaged as required. During 2015 approximately 82% of suppliers / contractors / consultant companies were within the Local Government Area (LGA) whilst approximately 18% fall outside of the LGA.

Table 1 Demographic Breakdown at Rix's 2015

Council Area	Employees
Cessnock City Council	23
Dungog Shire Council	3
Lake Macquarie City Council	5
Maitland City Council	33
Muswellbrook Shire Council	5
Newcastle City Council	6
Port Stephens Council	3
Singleton Council	49
Upper Hunter Shire Council	12
Wyong Shire Council	1
TOTAL	**140**

SECTION 3 – APPROVALS

Table 2 Current Approvals

APPROVAL	ORGANISATION	EXPIRY DATE
Development Consent DA 49/94	Planning NSW	October 2019
Development Consent DA 49/94 Mod 6	Planning NSW	October 2019
Coal Lease No. 352	Dept. Industry & Infrastructure	October 2031
Mining Lease No. 1432 (Section 100 Tailing's Emplacement Area 4 Approval August 2012)	Dept. Industry & Infrastructure	July 2019
Environmental Protection Licence No. 3391	Environment Protection Authority	Anniversary 3rd April each year. Last reviewed 21st December 2015.
Licence No 20SL050160	NSW DPI - Water	January 2018
Licence No 20SL049786	NSW DPI - Water	October 2017
Licence No 20SL060625 Converted to:- Water Access Licence 20AL201498 WAL 11084, Works Approval 20WA201499	NSW DPI - Water	June 2017
Licence No 20WA209900	NSW DPI - Water	December 2016
Notification of Dangerous Goods held on site replacing Dangerous Goods Licence NDG032405	WorkCover	Renewed, until 4/10/2016
New England Highway Closure Approval. ROL 521873	RMS	Renewed 6 monthly. Current ROL until 30/6/2016
Licence No. 20BL170863	NSW DPI - Water	December 2016
Licence No. 20BL170864	NSW DPI - Water	December 2016
License No. 20BL172457	NSW DPI - Water	Perpetuity
License No. 20BL172458	NSW DPI - Water	Perpetuity
License No. 20BL172459	NSW DPI - Water	Perpetuity
License No. 20BL172460	NSW DPI - Water	Perpetuity
License No. 20BL172461	NSW DPI - Water	Perpetuity
License No. 20BL173812	NSW DPI - Water	Perpetuity
License No. 20BL173733	NSW DPI - Water	Perpetuity
License No. 20BL173734	NSW DPI - Water	Perpetuity

SECTION 4 – OPERATIONS SUMMARY

Material	Approved limit	Previous Reporting Period	This Reporting Period	Next Reporting Period
Waste Rock / Overburden	16.1 Million BCM total material movement as per DA 49/94 Mod 6	13, 234,085 BCM	13,364,730 BCM	13,400,000 BCM
ROM Coal / Ore	N/A	2,760,693 t	2,847,899 t	2,700,000 t
Coarse reject / Fine reject (Tailings)	N/A	1,279,115 t	1,341,958 t	1,200,000
Saleable product	N/A	1,481,578 t	1,505,941 t	1,500,000 t

4.1 Exploration

During 2015 no exploration was undertaken ahead of mining in the West Pit as this was completed in 2014 to better understand future resources available. This included contracted exploration drilling of 30 holes drilled at depth to better determine the extent of the resource.

The Rix's Creek lease holding has a modelled resource of 39.1 million tonnes. Under the proposed Development Consent 29 million tonnes is recoverable by open cut method in the West Pit. There is also 8.5 million tonnes potentially gained via underground methods and relevant approvals in the North Pit under currently shaped and rehabilitated land.

Mine life is considered to be approximately 21 years. This is dependent on production rates. Currently the mine produces approximately 1.5 million tonnes saleable per annum with a total movement of 16.1 million bank cubic metres of material (previously 15 million bank cubic metres until Development Consent Modification 6 was approved in November 2014).

4.2 Land Preparation

Pre mining land preparation took place during the reporting period covering an area of 33.3 ha.

All the land area to be disturbed for Pit 1 has been disturbed. No further land disturbance will be necessary. Those area's shaped into final landform design have been rehabilitated as per the normal procedure.

Operations in Pit 3 during the year took place on previously disturbed land with an additional 33.3 ha pre-cleared for the progression of mining operations toward the North-west. Further clearing ahead of the mining operation will be required in 2016 in the West Pit covering an approximate land area of 10.6 ha. Any available topsoil was removed and placed directly on shaped overburden areas as part of the rehabilitation during the year. Excess topsoil was stockpiled and will be reused in the future as reshaped areas become available. Any timber during the pre-clearing process suitable for fencing was re-used on-site as required. Excess timber was stockpiled on-site in manageable stockpiles. Some timber was placed onto rehabilitation areas for habitat construction.

4.3 Construction

The Coal Preparation Plant has undergone modifications to further enhance coal recovery and reduce water usage to maximise washing efficiency. The new design was thoroughly tested throughout 2013 with modifications undertaken where necessary. Stage 1 of a small-scale tailing's drying process was commissioned during November 2013 with early results proving very successful. This process led to Rix's Creek receiving two more solid-bowl centrifuge tailing's drying units and commissioning during November 2014 to minimise the need for tailing's dams and maximise in-pit dumping of washing plant waste product. During 2015 Rix's Creek efficiently used all three solid-bowl units a majority of the year with the successful trial of disposing the solid-bowl waste in-pit (co-disposal) and minimising fine reject deposited into the tailing's dam on-site.

No other new infrastructure construction took place during 2015. During 2016 the predominant infrastructure upgrades is noise shielding of the Rix's Creek CHPP on the southern and eastern sides (which minimises noise towards the Retreat / Singleton Heights areas).

4.4 Mining

Rix's Creek Mine during 2014 operated three shifts a day, 15 shifts a week for 48 weeks. Day shift operated between 06:30 and 14:30, afternoon shift operated between the hours of 14:30 and 22:30 hours and night shift 22:30 and 06:30. The operation employs a total of 140 personnel.

The major operation took place in Pit 3 (West Pit), western side of Rix's Creek adjacent to Pit 2 (South Pit). The last coal to be removed from Pit 1 (North Pit), north of New England Highway via open-cut means was extracted in February 2014. Tailing's Emplacement Area # 4 in the Pit 1 void was approved in August 2012 with the facility receiving its first tailing's during May 2014. This void is expected to continue receiving a low amount of tailing's pending the tailing's drying process which may prolong the facilities livelihood. This tailing's facility will hopefully be the last on-site whilst mining via open-cut methods.

There has been no major change to mining methods on site during the year. Overburden and inter-burden were removed utilising the Liebherr R9800 excavator, Hitachi EX5500 excavator, Hitachi EX3600 excavator, and large front end loaders (Caterpillar 994 & 992). These machines load 220 (Caterpillar 793) and 180 (Caterpillar 789) tonne rear dump trucks. Associated with this machinery is the normal suite of ancillary equipment (bulldozers, graders, water carts and drills) used in the overburden and coal removal process.

During 2016 the main pit expansion areas will include mining of the Rix's Creek North (formally Vale Integra) site once relevant approvals are granted. Rix's Creek West Pit will continue to progress in a north-west direction aligned with the current MOP in place (I.e. between the out of pit dump and the New England Highway).

Table 3 is a list and number of the major pieces of equipment utilised on site for the mining operation.

Table 3. Equipment List 2015

EQUIPMENT LIST 2015	
Caterpillar 789 Truck	6
Caterpillar 793 Truck	11
Caterpillar 994 Front-End Loader	2
Caterpillar 992 Front-End Loader	2
Caterpillar 988 Front-End Loader	1
Caterpillar 950 Front-End Loader	1
Liebherr R9800 Excavator	1
Hitachi EX5500 Excavator	1
Hitachi EX3600 Excavator	1
Caterpillar D 11 Bulldozer	5
Caterpillar D 10 Bulldozer	5
Caterpillar Tiger R690B Bulldozer	1
Caterpillar 16G Grader	2
Caterpillar 24H Grader	1
Redrill SK75	1

Redrill SK50	1
Caterpillar 785 Water Cart (114,000 l)	2
Caterpillar 777 Water Cart (80,000 l)	1
ACCO Water Cart (10,000 l)	1

During 2016 the mining fleet upgrades will include the introduction of sound-attenuated Cat 789 Trucks which were purchased as part of the Vale Integra ownership.

4.5 Mineral Processing

The basis of the Coal Preparation Plant design is:-

- 600 tph plant to process coking and steaming coal,
- raw coal feed size washed -50 mm to +0,
- -50 mm to +1.5 mm washed in heavy medium cyclones,
- -1.5 mm to +0.350mm is cleaned in spirals,
- -0.350 mm is cleaned by mechanical flotation (3 rougher cells and 2 cleaning cells),
- raw coal feed 600 tph maximum = 100 % of nominal feed rate,
- -50 mm to +1.5 mm = 70 % maximum = say 420 tph maximum,
- -1.5 mm to + -0.350 mm = 20 % maximum = say 120 tph,
- -0.350 to 0 mm = 10 % = say 60 tph,
- -feed rates

	Nominal (tph)
design feed to plant	650 (dependant on feed quality)
design feed to heavy medium cyclones	420 (designed to be 70-75% of ROM feed)
design feed to fines plant	180

- allow -0.350 mm to 0 mm = 10 % of plant feed = 60 tph maximum
- should the design feed rate to any circuit be exceeded, due to sizing variations, the plant feed rate would be reduced while the anomaly persisted.

Table 4. Production and Waste Summary

Figures in () are for the current year	Cumulative Production (cubic metres)		
	Start of Reporting Period	**At end of Reporting Period**	**End of next reporting (estimated)**
Topsoil stripped (bcm)*	398,755	432,065 (33,310)	442,665 (10,600)
Topsoil used/spread (bcm)*	265,753	287,453 (21,700)	307,353 (19,900)
Waste Rock (bcm)	195,346,555	208,711,285 (13,364,730)	222,111,285 (13.4 million)
Run Of Mine Coal (tonne)	41,727,236	44,575,135 (2,847,899)	47,275,135 (2.7 million)
Processing Waste Tailings / Chitter (tonne)	16,923,284	18,265,242 (1,341,958)	19,565,242 (1.3 million)
Coal (tonne)	24,761,952	26,267,893 (1,505,941)	27,767,893 (1.5 million)

** Topsoil figures are not from the commencement of the mining operations.*

The recovery of saleable to run of mine coal for the year was 52.9% lower than last year 53.7%. This is lower than the long-term average to date of 60% and a continued decrease from the previous four years ~6%. This may be due to different coal quantities washed from the Pit 3 area (i.e. high ash, sulphur, moisture).

Raw coal is dumped by truck or loader into a 600 tonne receival hopper. From the hopper the coal is conveyed at 600-650 tph to a raw coal sizing screen. The raw coal screen is fitted with a double deck and wet screened. The top deck allows wet and +50 mm raw coal to enter the rotary breaker. The lower deck conveys wet -50 mm to +10 mm raw coal to be directed via a chute to the plant feed conveyor. The -10 mm slurry is directed into a conical sump and pumped to the plant.

The -50 mm from the sizing screen and the rotary breaker combine and are conveyed to the coal preparation plant. Material not broken in the rotary breaker is conveyed separately and removed by truck.

In the coal preparation plant the -50 mm to 0 mm raw coal from the primary raw coal sizing and breaker system is further sized on de-slime screens with each size fraction being cleaned in separate circuits.

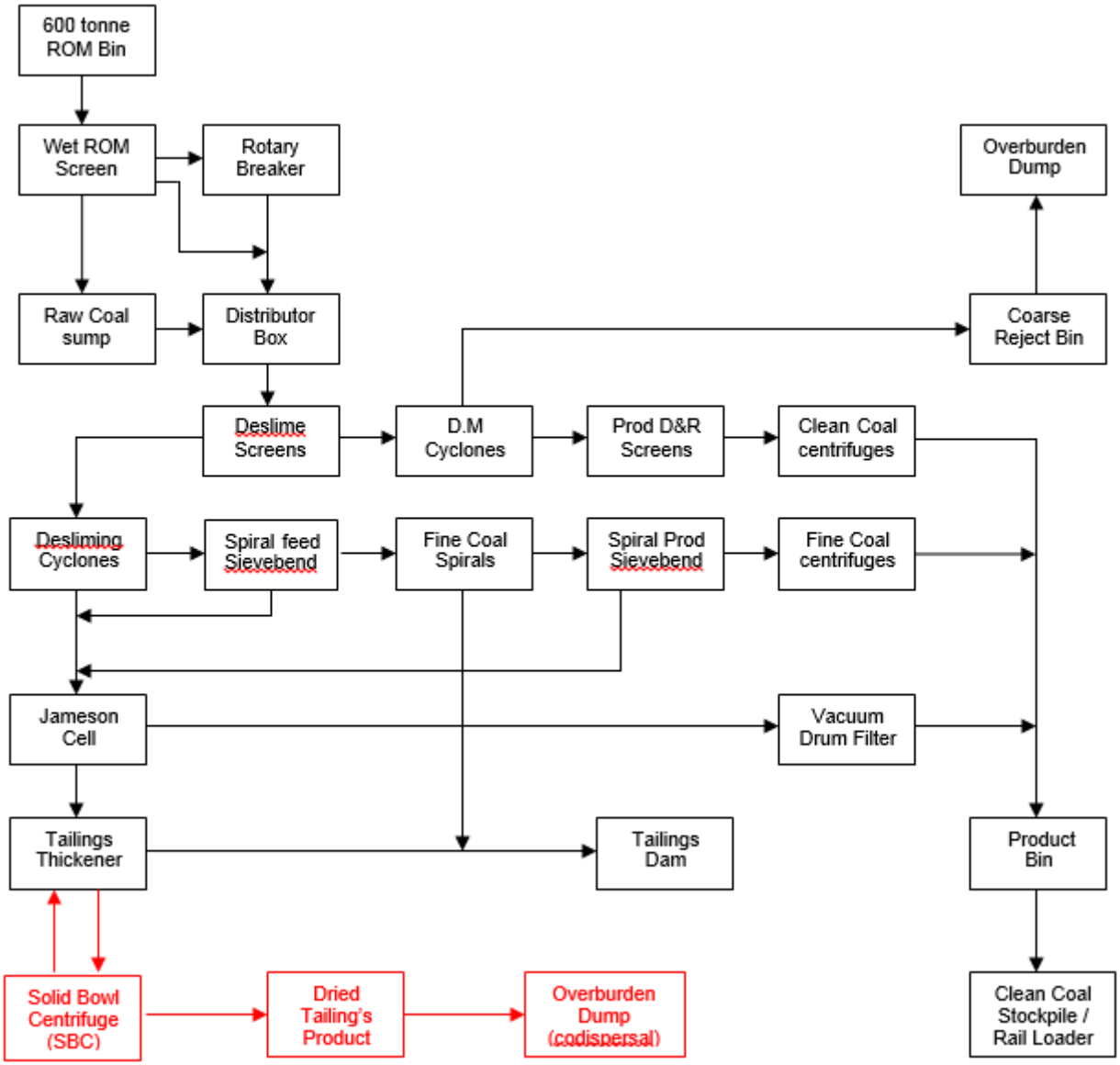
Heavy media cyclones treat -50 mm to +1.5 mm fraction. Spiral clean -1.5 mm to 0.350 mm. The – 0.350 mm is cleaned in the mechanical cell flotation. The washed product is dewatered in centrifuges and vacuum drum filter then conveyed to a 1,000 tonne bin.

Process Waste: The coarse reject is conveyed to a 500 tonne truck-loading bin. The thickened tailings are pumped to the tailings emplacement if required or if the solid-bowl centrifuge has any mechanical or electrical issues. The solid-bowl centrifuge dried tailing's is disposed of in pit (co-dispersal) via haul trucks and this is the preferential mode of disposal prior to utilising the tailings emplacement.

Coarse reject from the coal preparation plant reports to the reject bin. From this bin it is trucked to the open cut area to be disposed of within the spoil material. Coarse reject disposal within the spoil material is controlled by the production supervisor, with tip areas being located on the basis of environmental constraints, the potential for spontaneous combustion and the stability of tip faces within the spoil area. All carbonaceous and reject material is covered by a minimum of 2 m of inert overburden material before the spoil area is shaped and rehabilitated.

The fine reject consists of a slurry of clay, silt and composite mineral and coal particles -2.2 mm to ~0 mm in size with water to a pulp density of 1.25% specific gravity and approximately 25% solids to water ratio. This slurry is pumped from the underflow of the tailings thickener through a pipeline to the tailings emplacement dam. The previous tailings emplacement (#2) ceased operation in July 2005 when tailings began being received into the old Pit 2 void (tailings emplacement #3). Tailing's emplacement #3 reached capacity during May 2014 with tailing's emplacement #4 (within Pit 1 void) now being used as the new tailing's storage area. With the dried tailing's process currently working effectively this tailing's facility should be adequate for the life of mine.

Tailing's emplacement #2 was successfully capped and partially rehabilitated in 2013 with rehabilitation of the area completed in 2014. Tailing's Dam #3 has been allowed to dewater and dry since May 2014. This area is being covered with overburden material and when this is completed then the area will be rehabilitated. This process is expected to be completed by 2016. Rix's Creek have installed a third-scale dry tailing's process in December 2013 to allow reject to be trucked to the open cut area and disposed of within the spoil material. Since the one-third scale 'trial' proved effective in early 2014 another two units were installed during December 2014 to allow nearly all washed reject to be placed in-pit with overburden. This product is estimated to be 70% solids 30% moisture in comparison to traditional tailing's slurry which is generally 25% solids and 75% moisture content. During 2015 the solid-bowl process worked quite well with only minor mechanical and electrical issues minimising the effective utilisation of all three units, again, the tailing's dam # 4 could be used for full coal washing capabilities to be maintained.



*Currently in 'trial' at full >90% drying stage with all three SBC's.

Coal Preparation Plant Schematic

Table 5. Production History

YEAR	RON-of-MINE COAL PRODUCTION (tonnes)	OVERBURDEN REMOVAL (bank cubic metres)	APPROVAL LIMIT (bank cubic metres)
1990	300,000		
1994	800,000		
1997	1,700,000	7,198,000	15,000,000
1998	1,800,000	7,052,000	15,000,000
1999	1,888,900	7,635,000	15,000,000
2000	2,288,900	7,635,000	15,000,000
2001	1,679,400	7,460,000	15,000,000
2002	1,754,001	7,787,685	15,000,000
2003	1,943,095	8,768,068	15,000,000
2004	1,931,383	8,511,771	15,000,000
2005	1,628,753	9,567,000	15,000,000
2006	2,015,042	11,547,989	15,000,000
2007	2,096,320	11,150,416	15,000,000
2008	2,096,697	11,020,152	15,000,000
2009	2,338,424	10,698,123	15,000,000
2010	2,367,229	10,267,881	15,000,000
2011	2,212,703	10,589,386	15,000,000
2012	2,689,935	10,341,895	15,000,000
2013	2,747,880	11,502,321	15,000,000
2014	2,760,693	13,234,085	16,100,000*
2015	2,847,899	13,364,730	16,100,000

*Development Consent Mod 6 approval granted November 2014.

The tailings is transported by pipeline and safeguarded by:-

- use of welded PVC pipe;
- containment dams located along the length of the pipeline;
- regular pipeline inspections; and
- sequential flow meters.

The solid-bowl centrifuge system will enable a lower amount of tailing's to be transported by pipeline as the water removed during the tailing's 'drying' process allows for co-disposal of the 'dried' tailing's within the open cut emplacement area in a similar fashion to overburden. Early testing of dump areas has shown minimal surface slumping / cracking when this dried tailing's material is capped with sufficient overburden material from the mining process.

Return water is decanted from the emplacement area and pumped back to the containment water system that feeds the coal preparation plant. This maximises the recycling of mine water across site. Even with the tailing's line not pumping at times water enters this area via rainfall and runoff as it is a large catchment.

Following the start of mining in 1990 coal was transported by road to Bloomfield Colliery at East Maitland for beneficiation and shipping to the port of Newcastle. This ceased in 1993 following the commissioning of the coal preparation plant and construction of the joint rail loop with Camberwell Coal and rail loading facility. Since 1993 all product coal has been transported, by rail to the port of Newcastle. There has been no change to the method of transport since the rail loading facility commenced operation.

Application was made during 2000 to increase the level of the 2nd tailings emplacement by 15 metres. This increased the life of the emplacement by 3 years and allowed the area (now rehabilitated) to better fit in with the surrounding landscape. The emplacement ceased operation in July 2005 when tailings receival commenced in the Pit 2 void (or 3rd Tailing's emplacement). The old emplacement

was allowed to drain prior to commencing capping and rehabilitation. Capping with overburden, final landform design and rehabilitation was completed during 2014. Some areas were direct seeded with native tree species during autumn 2015 which was additional to the 3 ha of tree species already direct seeded and tube stock planted to date.

A similar production level will be maintained for 2015 with the budget being 1.5 million saleable tonnes from 2.7 million tonnes of ROM coal. The total bank cubic metres moved across site will be limited to 16.1 million tonnes with the previous limit being 15 million tonnes in 2013.

4.6 Waste Management

Waste Water: Grey water generated on site consisting of domestic waste water from the bathhouse, associated amenity areas and administration area pass through a septic system approved by the local authorities (OSSM Approval No: 2820/2002 expiry 1/3/2017). The septic tank provides a primary and secondary treatment process with solid waste processed by anaerobic bacteria. Effluent then passes to a maturation pond prior to disposal by evaporation and land irrigation. The Septic system is cleaned out 6-monthly by a suitably qualified waste contractor and the resulting waste is removed from site.

Waste Oil: Waste oil from mining equipment as a result of scheduled maintenance operations, breakdown repairs and the oil arrestor is collected in a storage tank and there after removed for recycling by a waste oil collector, Australian Waste Oil Refineries. This oil is processed and returned to site and used in blasting operations at the required specifications. During 2013 a variation to Rix's Creek EPL 3391 included specifications on the refined oil used in this process.

Most mining machinery is greased automatically by an on board system. The system is refilled from a bulk bin on the mobile service cart. Alternatively, this is carried out in the main workshop.

Any oily water from spills or contained within bunded storage areas are also collected by a waste oil collector, Australian Waste Oil Refineries. Water high in sediment, coal fines, clays is also handled via a contractor company, Transpacific Industries and handled on-site via the Tailing's Dam facility which has similar quality stored water via the tailing's line from the CHPP.

Waste Metal: Scrap metal is collected for recycling on a regular basis as required. The metal recycler sorts into hard and soft metal for further economic benefit to the company.

Copper Bin: Assorted copper on site, mostly from electrical wiring, is recycled by a metal contractor and collected on a regular basis as required. Most wiring remains with the protective layer attached but where economical a contractor strips assorted wire on-site for further economic benefit to the company. A copper waste bin is located in the electrical workshop to further minimise waste.

Waste Tyres: Discarded earthmoving machinery tyres not suitable for reuse are disposed of progressively in the void of the mining process and buried, as at present there is no recycling process available for heavy earthmoving machinery tyres in the Hunter Valley. The number of tyres disposed of simultaneously being restricted to 6 to reduce bulk, with the void then progressively backfilled with overburden and rehabilitated in the normal process. Some tyres are recycled across site and used for roadside protection, haul truck parking dividers, signage bases, etc.

General Waste: General garbage is placed in large bins and taken off site by a waste contractor for disposal in the Council landfill site.

Paper/Cardboard Recycling: Paper and Cardboard is placed in large bins and taken off site by contractor for further recycling. Small paper/recycling bins are placed within the main office, workshop and CHPP to enhance recycling.

Plastic wrapping: Plastic wrapping recycling was introduced during 2015 to site. Plastic used in the wrapping of parts and other assorted uses across site is placed in tied-off bags within the store and collected with the paper/cardboard recycling for further recycling off-site by the waste contractor.

Batteries: Small general use batteries (AA, AAA, C, D, etc) recycling was introduced during 2015 to site. Sealed battery tubs are located within the offices and electrical workshop for further recycling off site by the waste contractor.

Oil Filter Bin: Used oil filters from heavy vehicles are placed in a large bin near the main workshop and taken off site by contractor for cleaning and recycling at the waste contractor's facility.

Used printer cartridges: These are placed in a large bin within the main office and taken off site by contractor for recycling at the waste contractor's facility as required.

Rix's Creek is looking at further waste segregation of rubber (i.e. hoses) on site with assistance from the waste contractor.

Table 6. Waste Volumes

2015	Waste Oil (L)	Waste Metal (kg)	General Waste (kg)	Paper/Cardboard Recycling (kg)	Oil Filters (kg)
1st Quarter	0	14,080	18,094	1,468	2,140
2nd Quarter	106,000	32,406	11,024	4,299	1,975
3rd Quarter	142,850	15,300	11,448	5,400	3,631
4th Quarter	46,000	28,960	11,088	7,776	0
TOTAL	**294,850**	**90,746**	**51,654**	**18,943**	**7,746**

4.7 Product Stockpiles

Raw coal is transported from the active mining areas in 180 and 220 tonne and rear dump trucks (Caterpillar 789 and 793) to the 30,000 tonne capacity run of mine (ROM) stockpile at the coal preparation plant prior to washing.

Product coal (clean coal) is conveyed to a 1,000 tonne bin and then transported by road vehicles 2.0 kilometres to the rail loading facilities. Each road vehicle holds approximately 48 tonnes of clean coal. The capacity of the clean coal stockpile at the rail loading facility is 185,000 tonnes. During 2002 sections of the stockpile area were resurfaced and additional drainage installed. This work was completed in May 2004. The completion was delayed due to stockpile levels.

4.8 Hazardous Material Management

Rix's Creek are the holder of Dangerous Goods Licence No:- NDG032405. Under the new legislation Occupational Health and Safety Amendment (Dangerous Goods) Regulation 2005 notification was renewed in August 2015 until 4/10/2016. The listing of dangerous goods stored on site is listed below:-

Depot 1	Above ground tank for Class C1, UN 00C1 Diesel.	110,000 litres
Depot 2	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 5	Above ground tank for Class C1, UN 00C1 Diesel.	90,000 litres
Depot 6	Above ground tank for Class 3, UN 1989 Aldehydes, N.O.S.	15,000 litres
Depot 8	Above ground tank for Class C1, UN 00C1 Combustible liquids	60,000 litres
GAS1	Cylinder store for Class 2.1, UN1001 Acetylene, dissolved	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1072 Oxygen, compressed	1,000 litres
GAS2	Cylinder store for Class 2.2, UN1006 Argon, compressed	1,000 litres
RCN1	Above ground tank for Class 5.1, Ammonium Nitrate	50,000 kg
TKN1	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	60,000 kg
TKN2	Above ground tank for Class 5.1, Ammonium Nitrate Emulsion	30,000 kg

A separate licence for the storage and handling of explosives on the site has also been made to Workcover. License number:- XSTR100131 was renewed in June 2012 until 5/7/2017. The listing of explosives stored on site is listed below:-

MAG1	Magazine Class 1.1B, UN 360, Detonator Assemblies non-electric	10,000 units
MAG1	Magazine Class 1.4S, UN 349, Articles, Explosives, N.O.S.	10,000 metres
MAG1	Magazine Class 1.4B, UN 255, Detonators, Electric for blasting	10,000 units
MAG2	Magazine Class 1.1D, UN 65, Cord, detonating, flexible	3,000 metres
RCN1	Explosives Recepticle Class 5.1, Ammonium Nitrate (ANFO)	50,000 kg
TNK1	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	80,000 litres
TNK2	Above ground tank Class 5.1, UN 3375, ANFO Emulsion	36,000 litres

Access to Material Safety Data Sheets is through the ChemAlert web site. The register is continually updated as new products are brought onsite.

Explosives are stored in explosive magazines located on site. The magazines comply with the relevant standards for storage of explosives AS 2187.

4.9 Other Infrastructure Management

There has been an ongoing maintenance program on infrastructure associated with the Rix's Creek mining operation. This has included painting of assorted buildings and substations sheds across site.

Rix's Creek is required to use the Camberwell Coal rail loop to transport product coal to the port of Newcastle for export. The rail loading facility and clean coal stockpile is located off the mining lease adjacent to the northern boundary on land owned by the company. As of the 18th December 2015 this rail-loop is now owned and maintained by the company.

SECTION 5 – ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

5.1 Actions Required at Previous AEMR Review

The last annual environmental inspection took place on 27th May 2015; this inspection was undertaken to review the 2014 reporting period by NSW Trade & Investment – Division of Resources & Energy (DRE) conjoint with NSW Planning and Environment (DPE). A review of the report was undertaken followed by a site tour and close-out site inspection meeting. The review was undertaken by Marianne Bonnay (Inspector Environmental, DRE), and Chris Knight (Senior Planning Officer Compliance, DPE).

Actions required at review by DPE:

No	Issue/Observation	Action	Responsibility	Due	Action
1	Please include a site water balance for the period which is covered by the AEMR.	Water balance in 2015 AEMR is expected to contain the site water balance for the period 1/1/2015 until 31/12/2015.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 80
2	Noise monitoring results.	To ensure compliance with consent DA49/94, please also include attended noise monitoring results in La(10).	John Hindmarsh / Jason Desmond	2015 AEMR	Page 51
3	Groundwater level information.	Please provide additional groundwater level information including graphs of monitoring results and a discussion on trigger levels.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 90-97
4	Energy Use and greenhouse gas emissions associated with the development.	In alignment with Condition 14 of DA 49/94 please provide written comment within future AEMR's as to how the company is implementing feasible and reasonable measures to minimise energy use and greenhouse gas emissions associated with the development.	John Hindmarsh / Jason Desmond	2015 AEMR	Not in Annual Review Guidelines. NGERS report submitted 6/10/2015
5	Rehabilitation Management.	Condition 16B(v) in DA 49/94 requires a "Detailed description of what measures would be implemented over the next 3 years" – the current Rehabilitation Management Plan is dated 9/11/2011 and is therefore out of date and requires review.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 133
6	Greenhouse gas emissions.	A discussion in regard to the reduction of greenhouse gas emissions (Condition 14A) should be included in the AEMR.	John Hindmarsh / Jason Desmond	2015 AEMR	Not in Annual Review Guidelines. NGERS report submitted 6/10/15
7	Blast Fume Management Strategy.	In relation to the blast fume complaint on 16/4/2014 in Table 23 of the AEMR, can you please in future AEMR's provide the level of fume classification as per the Blast Fume Management Strategy.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 55
8	April 2015 storm event.	Action from the inspection of the sediment dams (out-of-pit dump) conducted by DPE on 23rd April 2015 please provide a report and proposed action plan to DPE by 15th July 2015.	John Hindmarsh / Jason Desmond	2015 AEMR	Submitted 16th July 2015 to DPE. Also Appendix 4.

Actions required at review by DRE:

No	Issue/Observation	Action	Responsibility	Due	Action
1	Water balance for this AEMR period not provided.	Provide appropriate water balance in the 2015 AEMR.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 80
2	Glycerine trials for dust suppression are to be resumed.	Provide up-date and results on glycerine trials.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 67-68
3	Variation between 2014 MOP year and actual year with respect to total area disturbed and rehabilitated.	Justify variations in AEMR.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 115
4	Localised sinkhole observed NE of highway / bridge.	Back fill the sinkhole.	John Hindmarsh / Jason Desmond	31 August 2015	Page 76
5	Clean water diversion flooded after the April 2015 storm.	Implement measures to prevent overflow during any future storm event.	John Hindmarsh / Jason Desmond	2015 AEMR	Page 90

SECTION 6 ENVIRONMENTAL PERFORMANCE

An extensive environmental monitoring program is conducted throughout the site and surrounding areas to monitor the impacts of the operation. Environmental parameters monitored include local meteorology, air quality, water quality, vibration and noise.

Plan 1 shows the location of monitoring sites for the various environmental parameters.

6.1 Meteorological

The mine operates a meteorological station on the site. The previous station was located on the northern side of the New England Highway, adjacent to the haul road, leading to the operations on the southern side of the Highway. This unit required replacement during 2014. The new meteorological station is located on the southern side of the New England Highway, adjacent to the Pit 3 operations near Granbalang trig station. This new weather station commenced during April 2014 and has real-time capabilities for all personnel to access via computer or phone. The station records the following environmental parameters:-

- wind speed and direction;
- temperature (2m and 10m);
- relative humidity;
- solar radiation; and
- rainfall.

These parameters are recorded at 10-minute intervals and downloaded on a monthly basis. To complement this Rix's Creek is a member of the Upper Hunter Sounding Group Joint Venture (UHSGJV) which provides access to an atmospheric prediction model providing more accurate weather parameter predictions for the Rix's Creek operation. This information is used by management to access environmental conditions for blast scheduling, and determine when adverse conditions exist to cease dumping to exposed locations. This model also forecasts meteorological data for the following day so operational activities can be scheduled for the predicted conditions.
Rix's Creek installed a new meteorological station near Pit 3 during 2014 so it is closer to the continuation of mining in this area.

6.1.1 Rainfall

Total rainfall for the period was 961.75 mm over 74 days, which was 263.75 mm above average for the year compared to 2014 where rainfall was 606.75 mm or 91.25 mm below average. The yearly average for Singleton is 698 mm. The monthly rainfall data is provided in Table 7 and Figure 1 shows the results graphically.

January, April, May, August, November and December were the only months to receive above average rainfall. April received extensive rainfall with five times the average amount whilst November and December also received extensive rainfall with nearly double the above average rainfall for both months. February, March, June, July, September and October received approximately less than half the monthly average rainfall.

Table 7 Annual Rainfall

RIX'S CREEK ANNUAL RAINFALL 2015													
Month	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
Total Rainfall	189	17.25	24.5	257.5	71	32.25	17	47.75	18.25	31.25	114	142	961.75
Average Rainfall	75	72	71	56	46	57	51	42	45	51	58	74	698
Wet days (>0.5 mm rainfall)	10	5	6	12	11	7	5	2	6	6	10	9	74

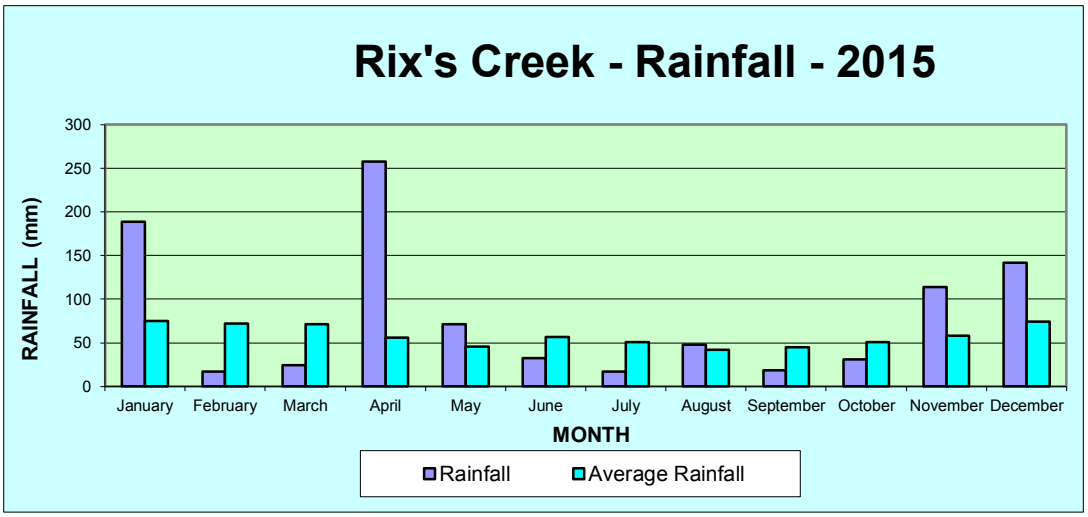


Figure 1 Annual Rainfall 2015

6.1.2 Temperature

The maximum temperature of 36.1 °C occurred on 1st December and the minimum temperature of 3.3 °C was recorded on 28th July. Figure 2 shows the monthly average maximum and minimum temperatures for the site.

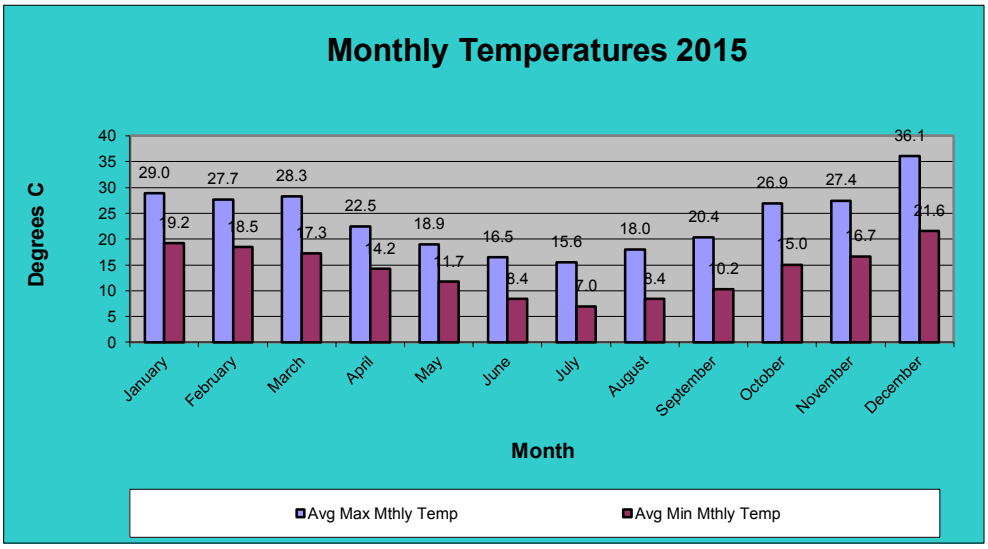


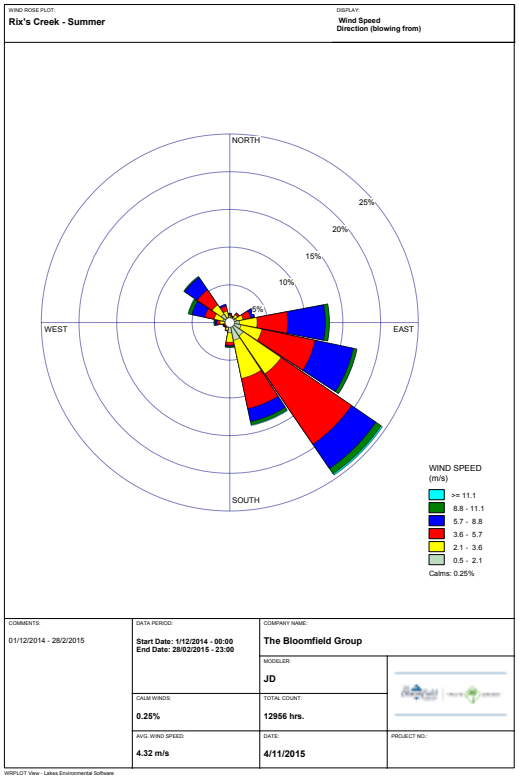
Figure 2 Monthly Average Maximum & Minimum Temperature 2015

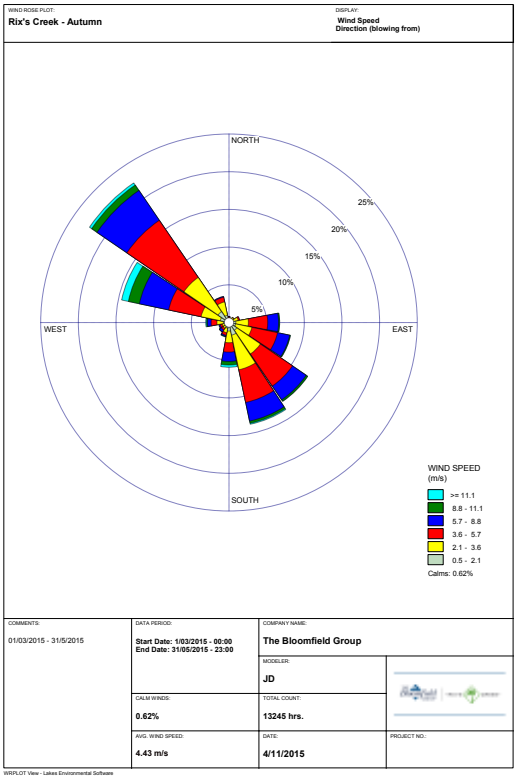
6.1.3 Wind Speed and Direction

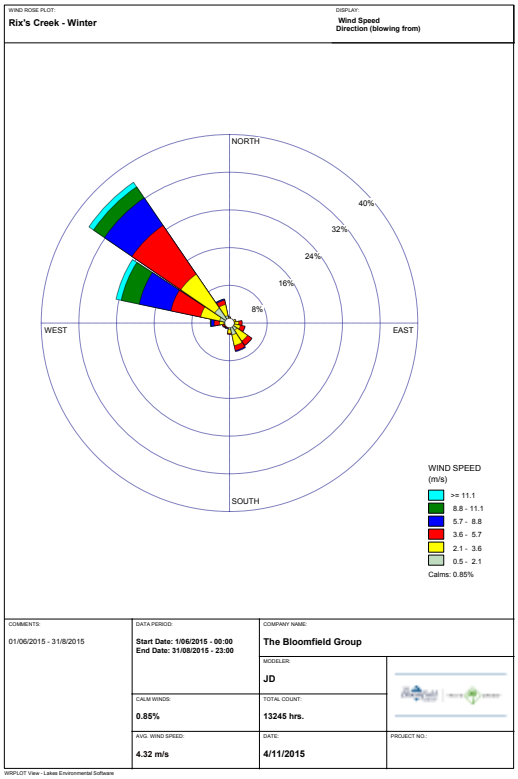
The results of wind speed and direction monitoring shows similar trends to previous years. During summer the winds predominate from the south east and winter the northwest. Autumn and spring are transitional seasons with winds distributed between both northwest and south-easterly directions.

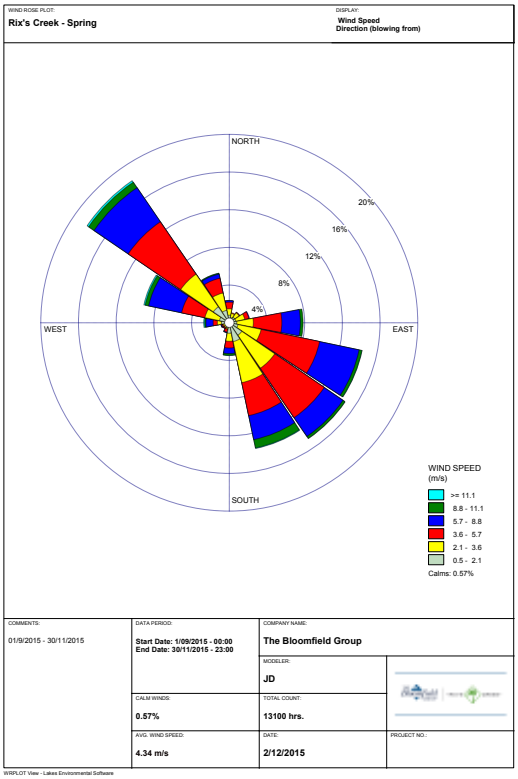
Figure 3 shows the seasonal windroses generated for the site on a seasonal basis.

Figure 3 Windroses for Rix's Creek 2015










Rix's Creek Pty. Limited
Environmental Monitoring Sites
Figure 2
Camberwell Noise
Dights Crossing Rd
Gauge 28
Gauge 6
Gauge 25
Gauge 23
Water 8
Water 1
Gauge 22
Gauge 1
Gauge 21
Rix's Creek Mine
Gauge 31
Gauge 7
Water 2
Water 7
Retreat Noise
Retreat HVAS
Gauge 26
Rixs Creek
Gauge 20
Gauge 17
Water 9
Water 5
Gauge 19
Gauge 30
Gauge 5
Rix's Creek HVAS
Gauge 10
Gauge 18
Gauge 11
Water 10
Water 3
Gauge 3
Gauge 32
Gauge 33
Gauge 9
Gauge 15
Maison Dieu Noise
Gauge 16
Gauge 8
Gauge 29
Mines Rescue HVAS
Singleton Heights Noise
Gauge 27
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2013 Whereis® Sensis Pty Ltd
Image © 2013 Sinclair Knight Merz
3.75 km
56 H 326137.46 m E 6400980.48 m S
Long Point
Dec 16, 2008
Eye alt 12.97 km
Google
Gresford Rd

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6.1.4 Operational Noise

6.1.5 Environmental Management

Under the Development Consent DA 49/94 operational noise level limits were set for daytime and night-time levels.

'The Applicant shall

i) comply with L_A10 Daytime noise level design goals set out below:

The Retreat	*42 dB(A)*
Singleton Heights	*42 dB(A)*
Maison Dieu Road	*38 dB(A)*

ii) comply with L_A10 Night time noise level design goals set out below:

The Retreat	*40 dB(A)*
Singleton Heights	*40 dB(A)*
Maison Dieu Road	*38 dB(A)*

These goals relate to average atmospheric conditions (neutral atmospheric) and not to inversion conditions.'

The Development Consent also sets out a monitoring program to be conducted to show that the operation is meeting the noise criteria as set. This program includes measuring background noise levels at four locations over a 72-hour period, during each quarter. The locations of the monitoring sites are:

1) Lot 2 'The Retreat' off Bridgman Road
2) Lot 2 'Glen Lemon' Maison Dieu Road
3) 40 Wilcox Ave, Singleton Heights
4) Ernst property New England Highway Camberwell

These sites are shown in Plan 1.

During the 2013 AEMR review it was requested by the Department of Planning and Environment that the noise monitoring results include only the mine's noise contribution rather than total noise levels, and to include the applicable noise criteria and EIS predictions also. Table including noise level ranges is not required as per past reports. Any data and a discussion of low frequency noise assessment (less than 1,000 hz) would also be helpful. The following Project specific criteria is based on the Rix's Creek Pollution Reduction Program (PRP) Environmental Noise Assessment report (12323_PRP_R02.pdf).

Table 8. Rix's Creek Project Specific Levels (PSL) Criteria

Location	Not Winter – Night LAeq, 15 minute	Winter – Night LAeq, 15 minute	Not Winter – Night LA1, 1 minute	Winter – Night LA1, 1 Minute
Retreat	35	41	45	45
Maison Dieu	35	45	45	47
Singleton Heights	35	41	45	45
Camberwell	35	42	45	45

The readings are made with an Acoustic Research Laboratories EL-215 Portable Statistical Noise Logger and Ngara noise logger.

This standard monitoring procedure provides measurements of the background noise levels at the sites that may be influenced by noise from the operation, but does not provide actual measured operational noise at the locations. The logger measures total environmental noise at the site. To better determine the level of noise the operation may be contributing to the background noise environment, at the monitoring sites, on site attended monitoring is undertaken during the 72 hour monitoring period. Attended monitoring is undertaken during the day and night over the monitoring period. A hand held Rion NL-62 sound level meter set on 'fast' response is used to give an $L_{A10,15min}$

& $L_{AEQ,15min}$ noise level for the operation at the site. This instrument is capable of making a sound recording of the noise. This can later be played back to listen to the contributing noise sources. During 2015 a frequency card was again utilised in the Rion NL-62 sound level meter to record noise frequency levels in the <1000 Hz range (generally 16 – 800 Hz).

Part of the Development Consent conditions relating to noise required the preparation of a Noise Management Plan for the operation. The Noise Management Plan was submitted to the EPA in November 1996. This Plan looks at all control measures in place on site to minimise the level of noise emanating from the operation. The Plan also describes the procedures for dealing with noise episodes that exceed the limits as set out above, if and when they occur. The Noise Management Plan underwent review during 2015 with a new NMP to be implemented during 2016 once approved to do so.

Plant and equipment noise levels are monitored on a quarterly basis. Individual items of plant are measured to check that noise attenuating equipment e.g. silencers, are operating effectively and if any deterioration in efficiency is detected then the items are altered or replaced. All new mining equipment coming to site will be noise attenuated.

6.1.6 Environmental Performance

Background noise levels were monitored at the 4 sites on a quarterly basis (Table 9) during the year. All four quarters of monitoring was done by a noise consultant. The locations of the sites are indicated in Plan 1. Aside to the monitoring required to satisfy the requirements of the current Development Consent, attended noise monitoring was undertaken on a monthly basis from January through to December 2015 by a noise consultant. Aside to this attended noise monitoring was carried out on a nightly basis from January through to December 2015 by internal personnel.

Table 11 outlines the range of noise levels recorded at the sites during the monitoring periods. These readings are of the total localised noise levels and are not of operational noise levels. The attended monitoring undertaken during the periods give a better understanding of the operational noise levels at the monitoring sites. Attended monitoring was carried out to give an indication of the operations contribution to the noise environment.

Table 9. Schedule of Noise Monitoring

	LOCATION	MONITORING	DATE
Site 1	The Retreat	First Quarter	16/03/15 09:30
			19/03/15 10:30
		Second Quarter	14/07/15 11:00
			17/07/15 10:00
		Third Quarter	7/09/15 11:00
			10/09/15 14:00
		Fourth Quarter	1/12/15 10:15
			4/12/14 12:45
Site 2	Maison Dieu Road	First Quarter	23/03/15 12:00
			26/03/15 12:30
		Second Quarter	20/07/15 12:45
			23/07/15 14:30
		Third Quarter	14/09/15 10:00
			17/09/15 13:00
		Fourth Quarter	7/12/15 10:00
			11/12/15 13:00
Site 3	Singleton Heights	First Quarter	16/03/15 10:00
			19/03/15 11:00
		Second Quarter	14/07/15 11:30
			17/07/15 10:30
		Third Quarter	7/09/15 11:30
			10/09/15 14:30
		Fourth Quarter	1/12/15 10:00
			4/12/15 13:00
Site 4	Camberwell	First Quarter	23/3/15 12:45

			26/03/15 13:15
		Second Quarter	20/07/15 13:30
			23/07/15 15:15
		Third Quarter	14/09/15 10:45
			17/09/15 13:45
		Fourth Quarter	7/12/15 10:15
			11/12/15 13:15

The levels recorded at the sites during the monitoring periods throughout the year are consistent with levels recorded since the commencement of mining operations and are well within the range of results presented to the Commission of Inquiry and established prior to the commencement of mining. It would appear that noise levels are influenced in all locations by a number of localised factors outside of as well as within mine operating hours.

It can be seen from Table 11 that the noise levels vary significantly between recording periods and between sites. This reflects the localised noise sources around the sites during the periods and not the effects of the mining operation. The Retreat site showed operational noise was evident during the first, second and third quarter monitoring round with significant noise being audible under certain weather conditions, in particular a north westerly wind influence. The Maison Dieu area throughout the year had some audible but not measureable results during the second and third quarter monitoring it was most noticeable. The Singleton Heights and Camberwell sites were mostly inaudible and measureable in terms of Rix's Creek operational noise. The Singleton Heights site was evident during the third quarter monitoring whilst the Camberwell site was noticeable during the fourth quarter. It was always a view by the company to further minimise noise by moving the operation away from populated areas as mining progresses (such as Singleton Heights/Retreat/Maison Dieu).

During the 72 hour monitoring periods throughout the year attended on site monitoring was undertaken at all sites for a minimum of one 15 minute period during the day and again in the night. This monitoring has been undertaken in an attempt to better determine the actual level of noise the operation is contributing to the acoustic environment at the monitoring sites.

Table 10. Noise monitoring exceedances based on PSL Criteria

Site	Time	Date	Wind speed m/s	VTG	LAeq Criterion	Criterion applies?	RC LAeq / LA1,1min	Exceedance with MET	Exceedance regardless
First Quarter									
Retreat	00:28	01/4/2015	2.3	-1	35	Y	32 (LAeq)	Nil	Nil
	00:28	01/4/2015	2.3	-1	45	Y	40 (LA1,1min)	Nil	Nil
Maison Dieu	23:03	31/3/2015	4.3	0.5	35	N	IA	Nil	Nil
	23:03	31/3/2015	4.3	0.5	45	N	IA	N/A	Nil
Singleton Heights	00:03	01/4/2015	3.8	0.5	35	N	<25 (LAeq)	N/A	Nil
	00:03	01/4/2015	3.8	0.5	45	N	<25 (LA1,1min)	N/A	Nil
Camberwell	23:33	31/3/2015	4.5	0.5	35	N	28 (LAeq)	N/A	Nil
	23:33	31/3/2015	4.5	0.5	45	N	<30	N/A	Nil
Second Quarter									
Retreat	00:39	24/7/2015	0.5	0.5	42	Y	30	Nil	Nil
	00:39	24/7/2015	0.5	0.5	45	Y	34 (LA1,1min)	Nil	Nil
Maison Dieu	23:08	23/7/2015	0.3	0.5	45	Y	30	Nil	Nil
	23:08	23/7/2015	0.3	0.5	47	Y	33 (LA1, 1min)	N/A	Nil
Singleton Heights	00:17	24/7/2015	0.3	4.1	41	N	IA	N/A	Nil

	00:17	24/7/2015	0.3	4.1	45	N	IA	N/A	Nil
Camberwell	23:45	23/7/2015	0.0	4.1	41	N	IA	N/A	Nil
	23:45	23/7/2015	0.0	4.1	45	N	IA	N/A	Nil
Third Quarter									
Retreat	02:02	15/09/15	3.5	-1.0	35	N	34	Nil	Nil
	02:02	15/09/15	3.5	-1.0	45	N	39 (LA1, 1min)	N/A	N/A
Maison Dieu	22:40	14/09/15	0.5	4.1	35	N	29	N/A	N/A
	22:40	14/09/15	0.5	4.1	45	N	41 (LA1, 1min)	N/A	N/A
Singleton Heights	01:22	15/09/15	3.5	-1.0	35	N	33	N/A	N/A
	01:22	15/09/15	3.5	-1.0	45	N	37 (LA1, 1min)	N/A	N/A
Camberwell	00:46	15/09/15	1.3	-1.0	35	Y	<20	Nil	Nil
	00:46	15/09/15	1.3	-1.0	45	Y	31 (LA1, 1min)	Nil	Nil
Fourth Quarter									
Retreat	22:40	14/12/15	5.3	0.5	35	N	30	N/A	N/A
	22:40	14/12/15	5.3	-1.0	45	N	IA	N/A	N/A
Maison Dieu	00:16	15/12/15	5.8	-1.0	35	N	25	N/A	N/A
	00:16	15/12/15	5.8	-1.0	45	N	<30 (LA1, 1min)	N/A	N/A
Singleton Heights	23:10	14/12/15	5.8	-1.0	35	N	IA	N/A	N/A
	23:10	14/12/15	5.8	-1.0	45	N	IA	N/A	N/A
Camberwell	00:48	15/12/15	5.0	0.5	35	N	30	N/A	N/A
	00:48	15/12/15	5.0	0.5	45	N	36 (LA1, 1min)	N/A	N/A

VTG: Vertical Temperature Gradient
NM: denotes audible noise but not measureable
IA: denotes inaudible noise
N/A: in exceedance column means atmospheric conditions outside conditions specified in PSL so criterion is not applicable.

The following are the attended monitoring results for each quarter.

First quarter 2015. March monitoring.

Retreat

5.1.4 RC4 – Retreat Road

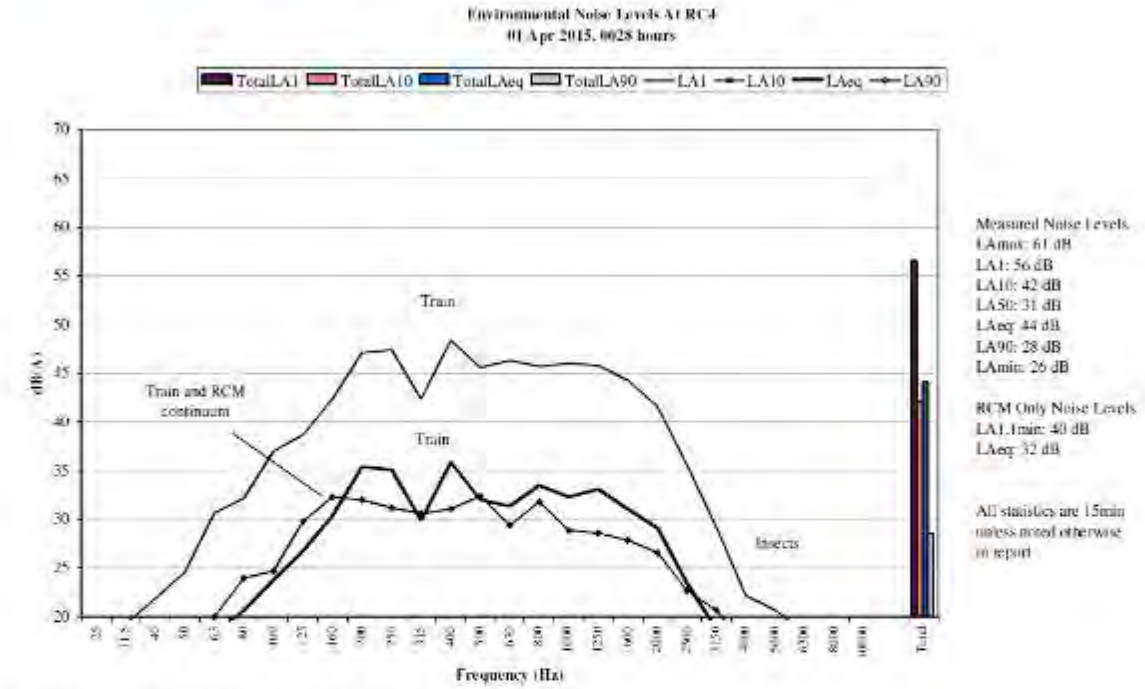


Figure 6: Environmental Noise Levels, Retreat Road

A rear dump truck engine, exhaust and fan continuum was audible from RCM throughout most of the measurement. Transmission noise, impact noise and track noise were also noted. These sources generated the site only L_{Aeq} of 32 dB. Impact noise generated the site only $L_{A1,1minute}$ of 40 dB.

A train was responsible for the measured L_{A1} and L_{Aeq} and was a major contributor to the measured L_{A10}. RCM contributed to the measured L_{A10} and was primarily responsible for the measured L_{A90}.

Insects, frogs, dogs and road traffic noise were also noted.

Figure 4 Environmental Noise Levels, Retreat Road

Maison Dieu Area

5.1.2 RC2 – Maison Dieu Road

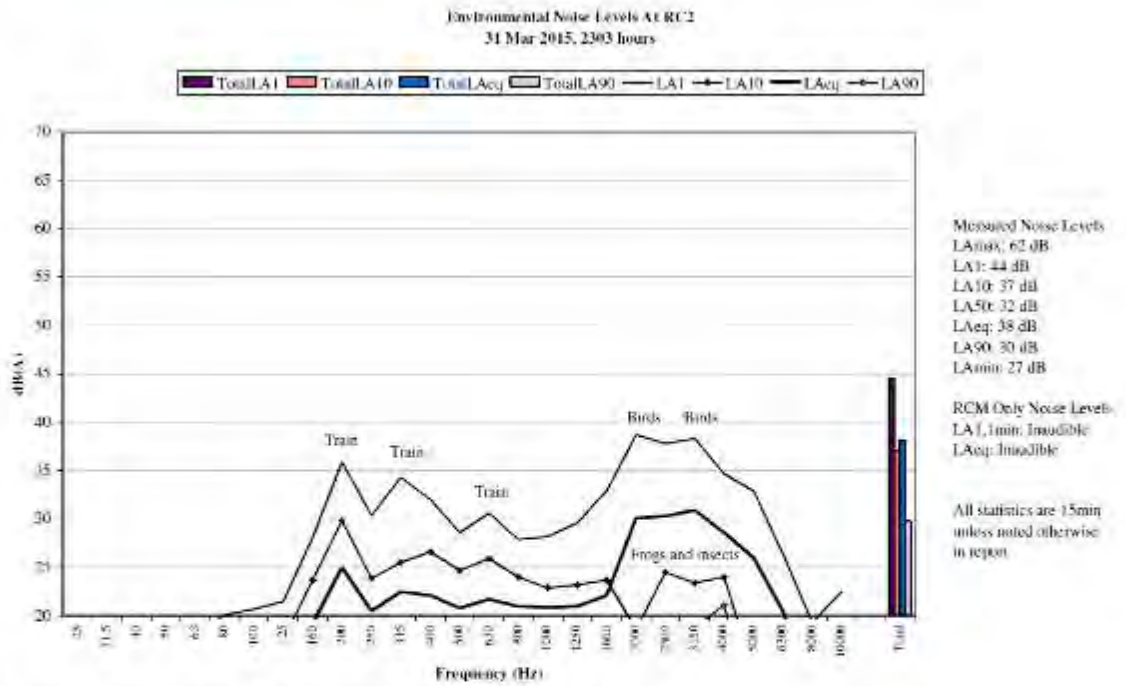


Figure 4: Environmental Noise Levels, Maison Dieu Road

RCM was inaudible.

Birds were primarily responsible for the measured L_{A1} and were major contributors to the measured L_{Aeq}. A train primarily generated the measured L_{A10}. A local industrial continuum and insects generated the measured L_{A90}.

Local industrial reverse alarms, road traffic noise, an aircraft, owls, dogs and other wildlife were also noted.

Figure 5 Environmental Noise Levels, Maison Dieu Road

Singleton Heights

5.1.3 *RC3 – Rodd Close*

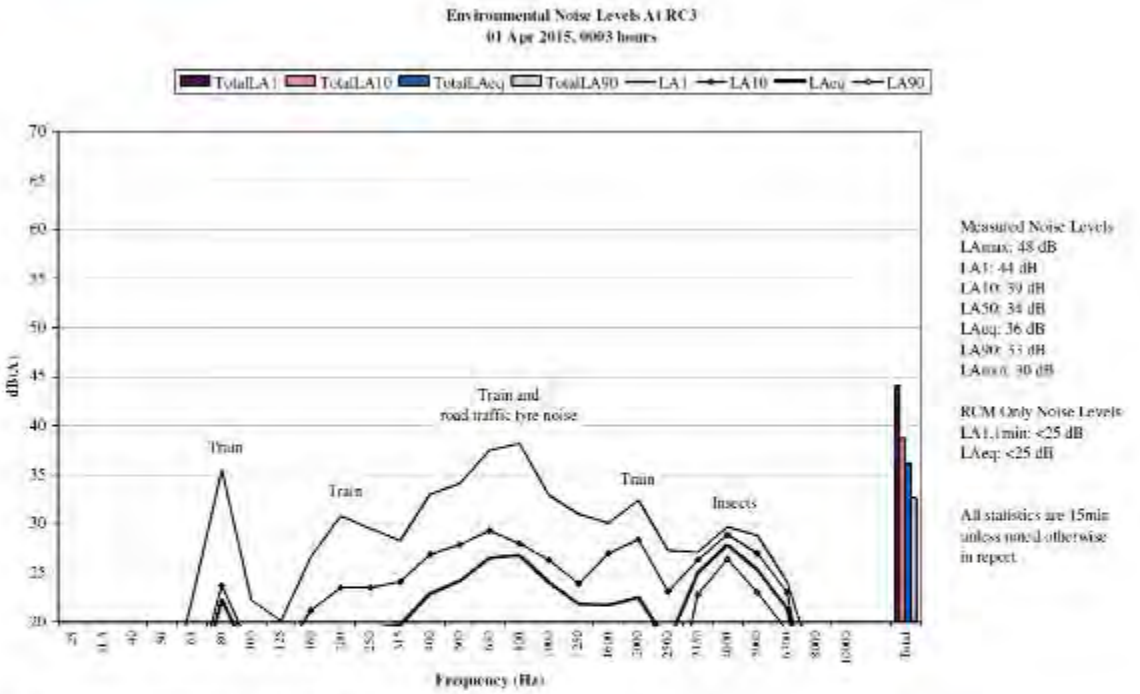


Figure 5: Environmental Noise Levels, Rodd Close

A continuum from RCM was audible at times during the measurement generating a site only L_{Aeq} of less than 25 dB and $L_{A1,1minute}$ of less than 25 dB.

A train and road traffic tyre noise were responsible for the measured L_{A1}. A train, road traffic tyre noise and insects primarily generated the measured L_{A10} and L_{Aeq}. Insects generated the measured L_{A90}.

Residential noise and bats were also noted.

Figure 6 Environmental Noise Levels, Rodd Close

Camberwell

5.1.1 RC1 – McInerneys Road

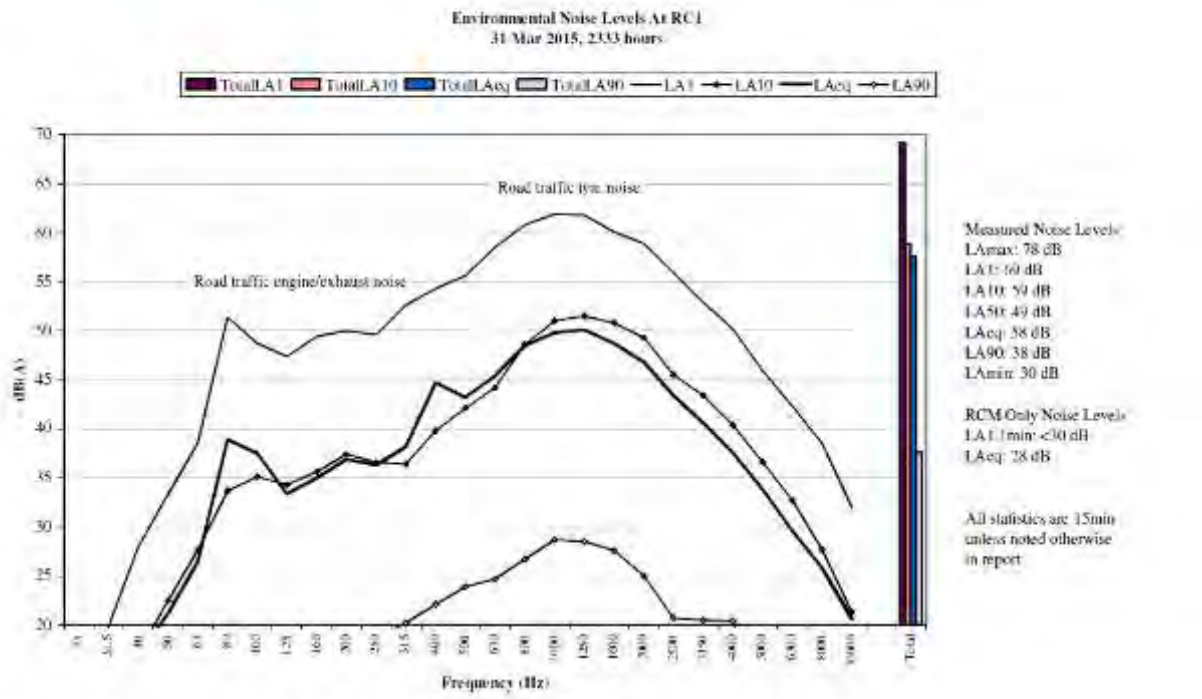


Figure 3: Environmental Noise Levels, McInerneys Road

An engine continuum from RCM was audible throughout the measurement generating the site only L_{Aeq} of 28 dB and $L_{A1,1minute}$ of less than 30 dB.

Road traffic was responsible for the measured levels.

Insects and a train were also noted.

Figure 7 Environmental Noise Levels, McInerneys Road

Second quarter 2015. July monitoring

Retreat

5.1.4 RC4 – Retreat Road

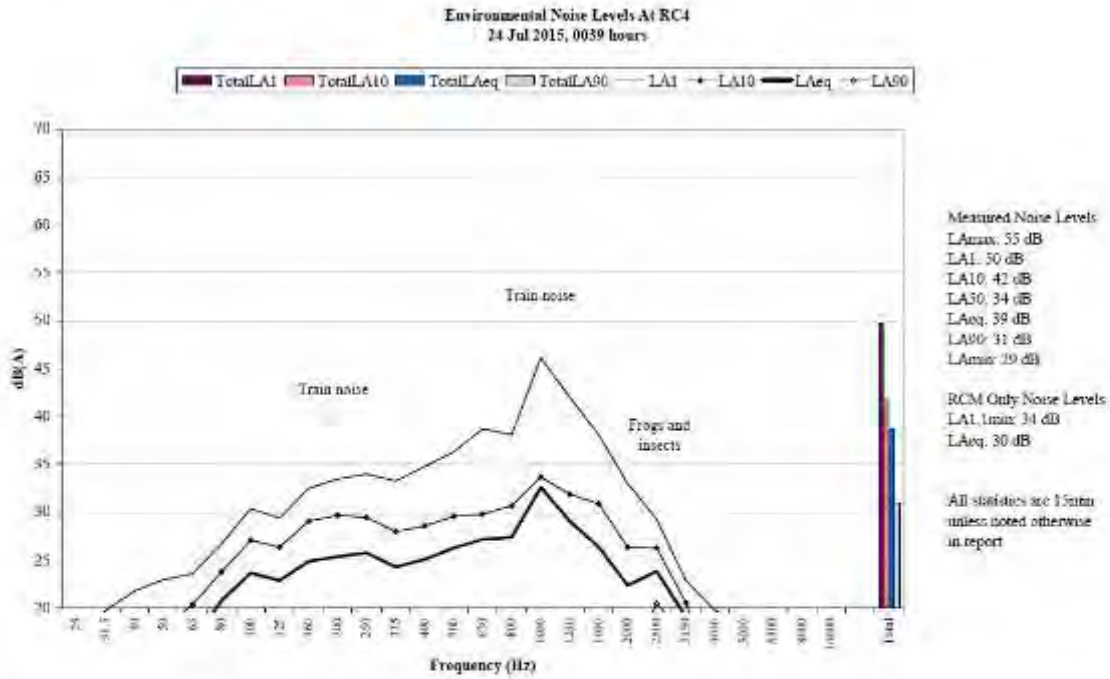


Figure 6: Environmental Noise Levels, Retreat Road

A continuum from RCM was audible throughout the measurement, generating the site only L_{Aeq} of 30 dB. A surge in the continuum generated the site only $L_{A1,1minute}$ of 34 dB.

A train primarily generated the measured L_{A1}, L_{A10} and L_{Aeq}. The continuum from RCM was primarily responsible for the measured L_{A90}.

Frogs and insects were also noted.

Figure 8 Environmental Noise Levels, Retreat Road

Maison Dieu Area

5.1.2 RC2 – Maison Dieu Road

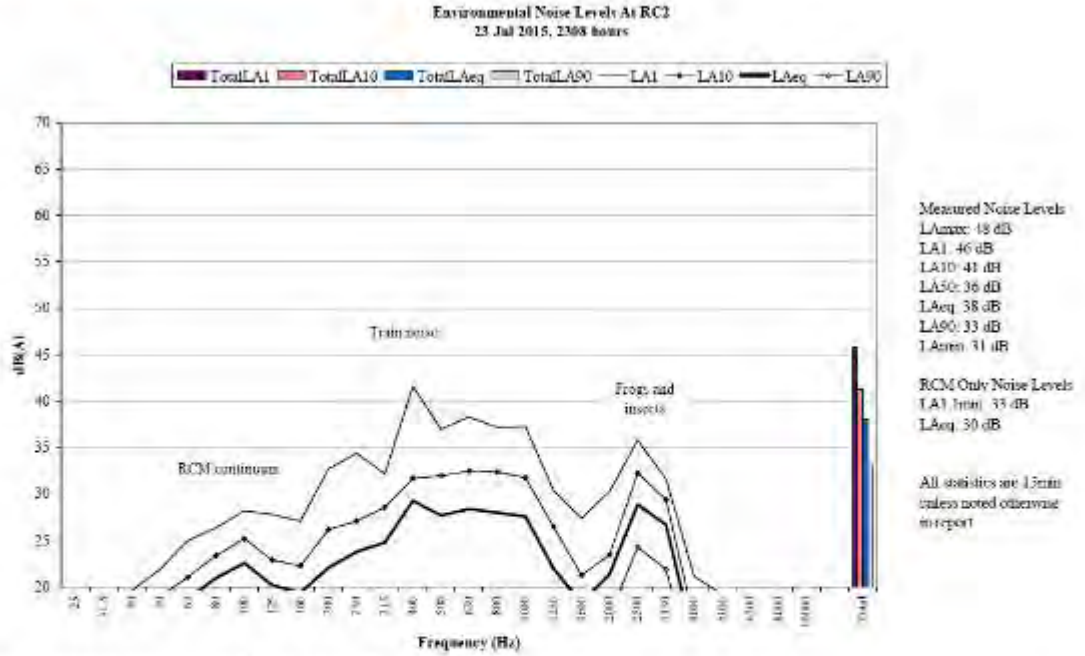


Figure 4: Environmental Noise Levels, Maison Dieu Road

A continuum from RCM was audible throughout the measurement, generating the site only L_{Aeq} of 30 dB and the site only $L_{A1,1minute}$ of 33 dB.

A train primarily generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs, insects and the continuum from RCM generated the measured L_{A90}.

Road traffic tyre noise was also noted.

Figure 9 Environmental Noise Levels, Maison Dieu Road

Singleton Heights

5.1.3 RC3 – Rodd Close

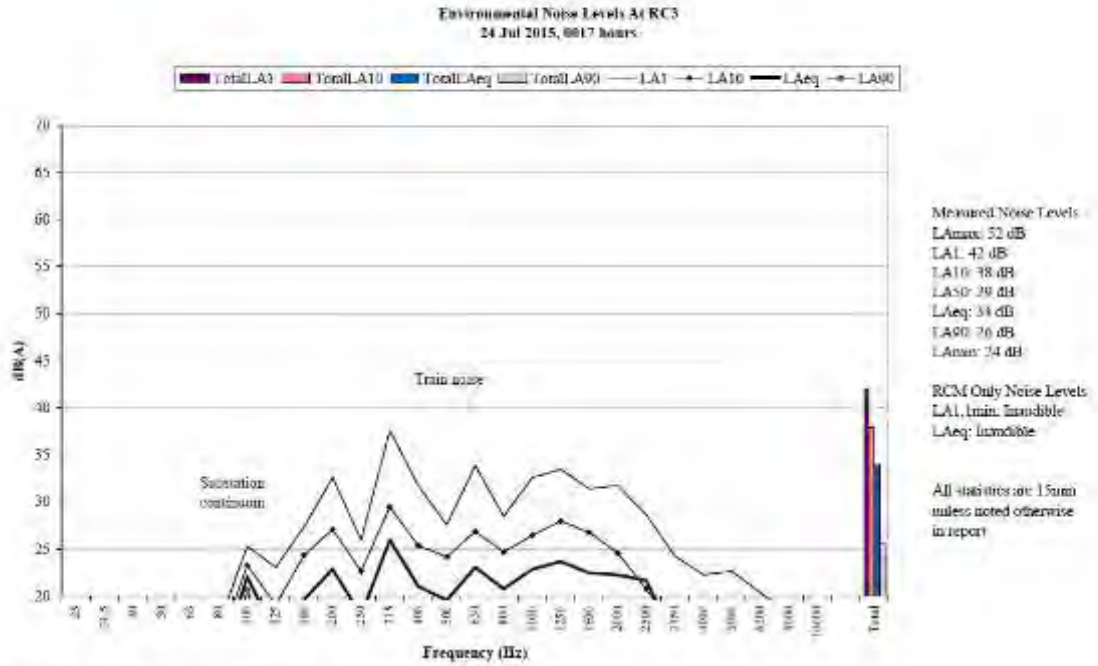


Figure 5: Environmental Noise Levels, Rodd Close

RCM was inaudible.

A train was primarily responsible for the measured L_{A1}, L_{A10} and L_{Aeq}. A nearby substation continuum primarily generated the measured L_{A90}.

Dogs, bats and road traffic tyre noise were also noted.

Figure 10 Environmental Noise Levels, Rodd Close

Camberwell

5.1.1 RC1 – McInerneys Road

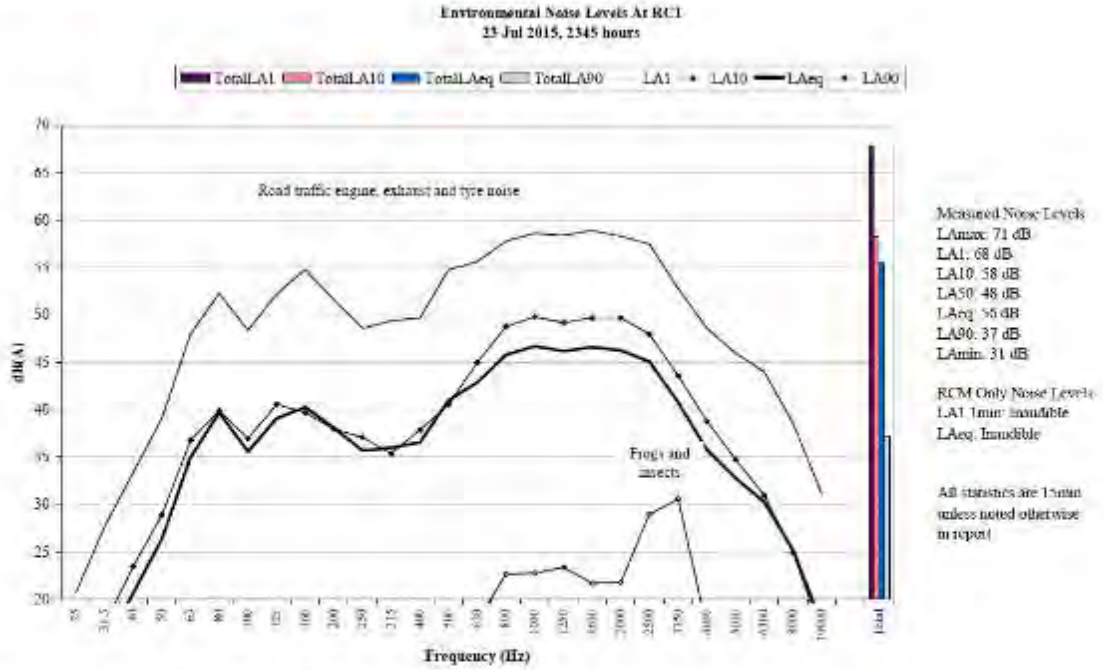


Figure 3: Environmental Noise Levels, McInerneys Road

RCM was inaudible.

Road traffic tyre, engine and exhaust noise generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs and insects generated the measured L_{A90}.

A train was also noted.

Figure 11 Environmental Noise Levels, McInerneys Road

Third quarter 2015. September monitoring.

Retreat

5.1.4 *RC4 – Retreat Road*

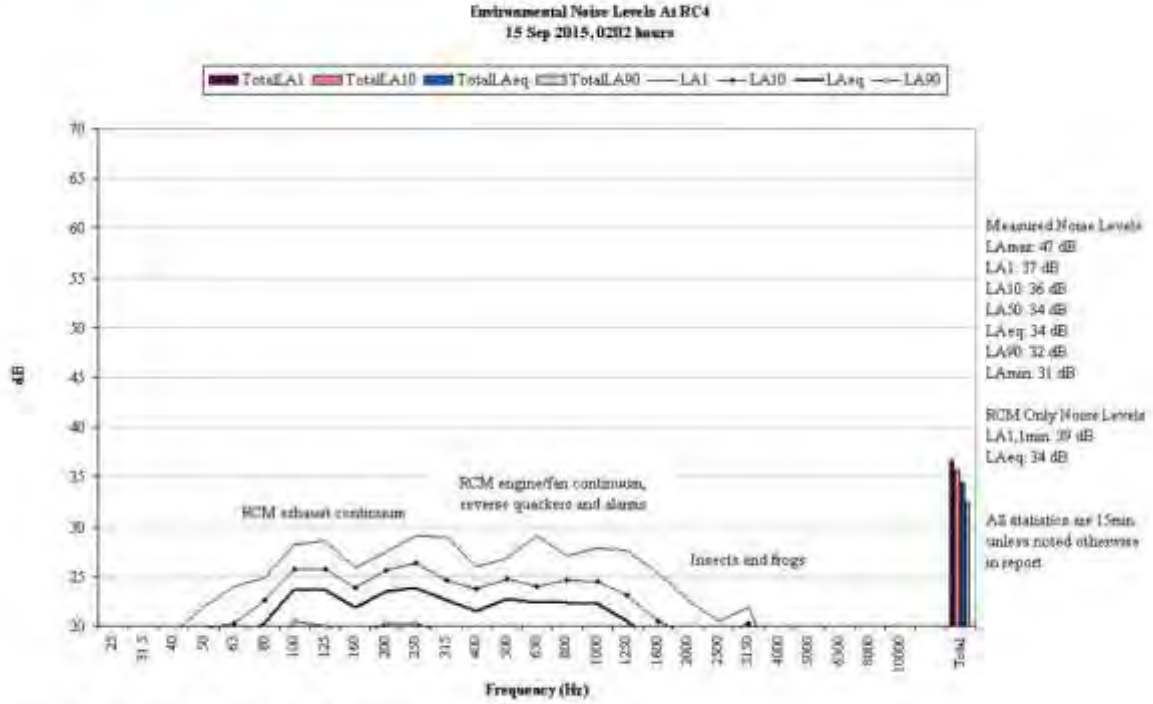


Figure 6: Environmental Noise Levels, Retreat Road

RCM was audible throughout the measurement for an exhaust and engine/fan continuum, reverse quackers and alarms, generating the site only L_{Aeq} of 34 dB. A surge in the continuum generated the $L_{A1,1minute}$ of 39 dB.

RCM was responsible for the L_{A1}, L_{A10} and L_{Aeq} and contributed to the L_{A90}. Insects and frogs contributed to the L_{A90}.

Figure 12: Environmental Noise Levels, Retreat Road

Maison Dieu Area

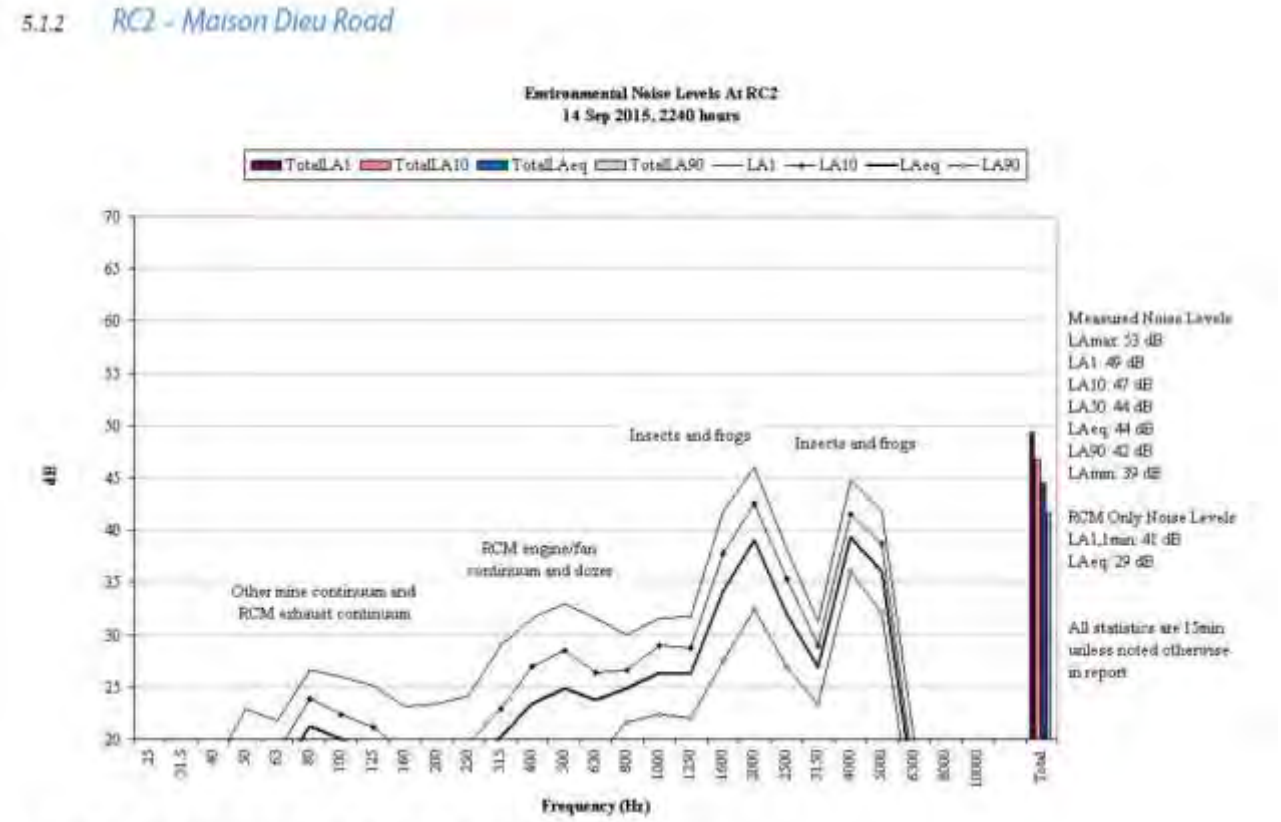


Figure 4: Environmental Noise Levels, Maison Dieu Road

RCM was audible throughout the measurement for an exhaust and engine/fan continuum, generating the site only L_{Aeq} of 29 dB. A single instance of excavator track noise generated the $L_{A1,1minute}$ of 41 dB.

Insects and frogs generated all measured levels.

A continuum from another mine was also noted, dominating the low frequency environment.

Figure 13: Environmental Noise Levels, Maison Dieu Road

Singleton Heights

5.13 RC3 – Rodd Close

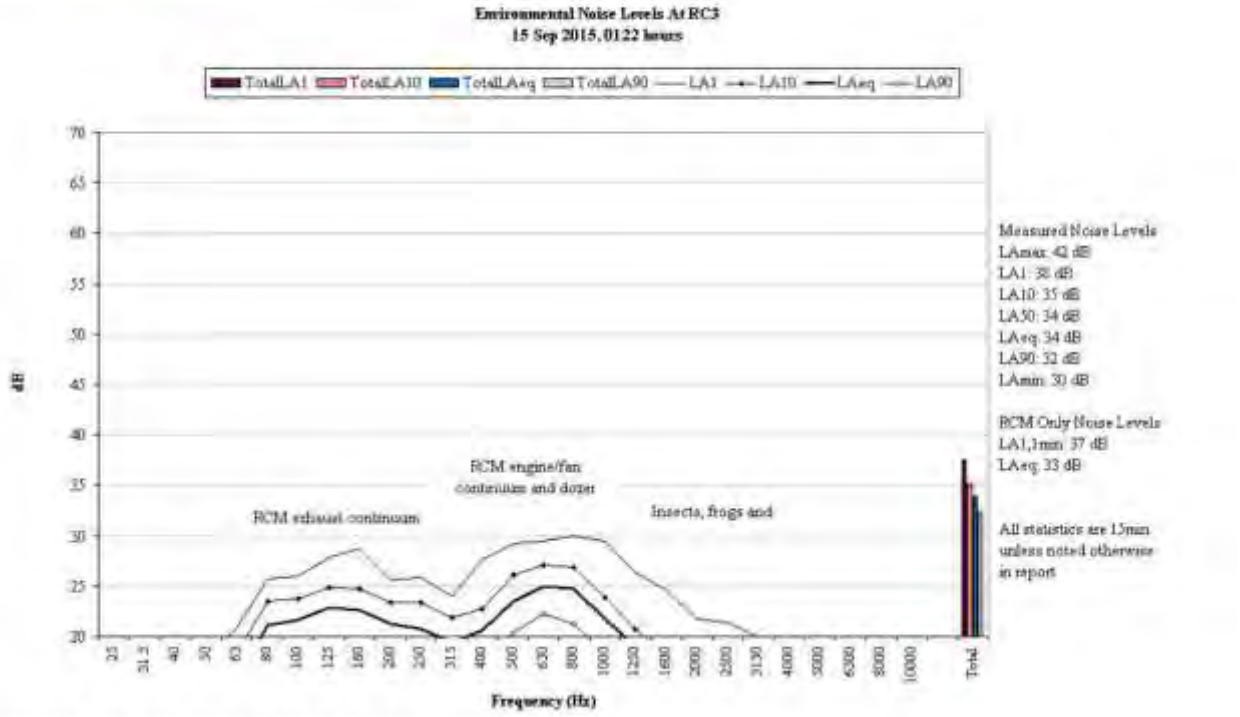


Figure 5: Environmental Noise Levels, Rodd Close

RCM was audible throughout the measurement for an exhaust and engine/fan continuum, generating the site only L_{Aeq} of 33 dB. A surge in the continuum generated the $L_{A1,1minute}$ of 37 dB.

Birds generated the L_{Amax}. RCM was responsible for the L_{A1}, L_{A10}, L_{Aeq} and L_{A90}. Insects and frogs were a minor contributor to the measured L_{Aeq} and L_{A90}.

Dogs were also noted.

Figure 14: Environmental Noise Levels, Rodd Close

Camberwell

5.1.1 *RC1 – McInerneys Road*

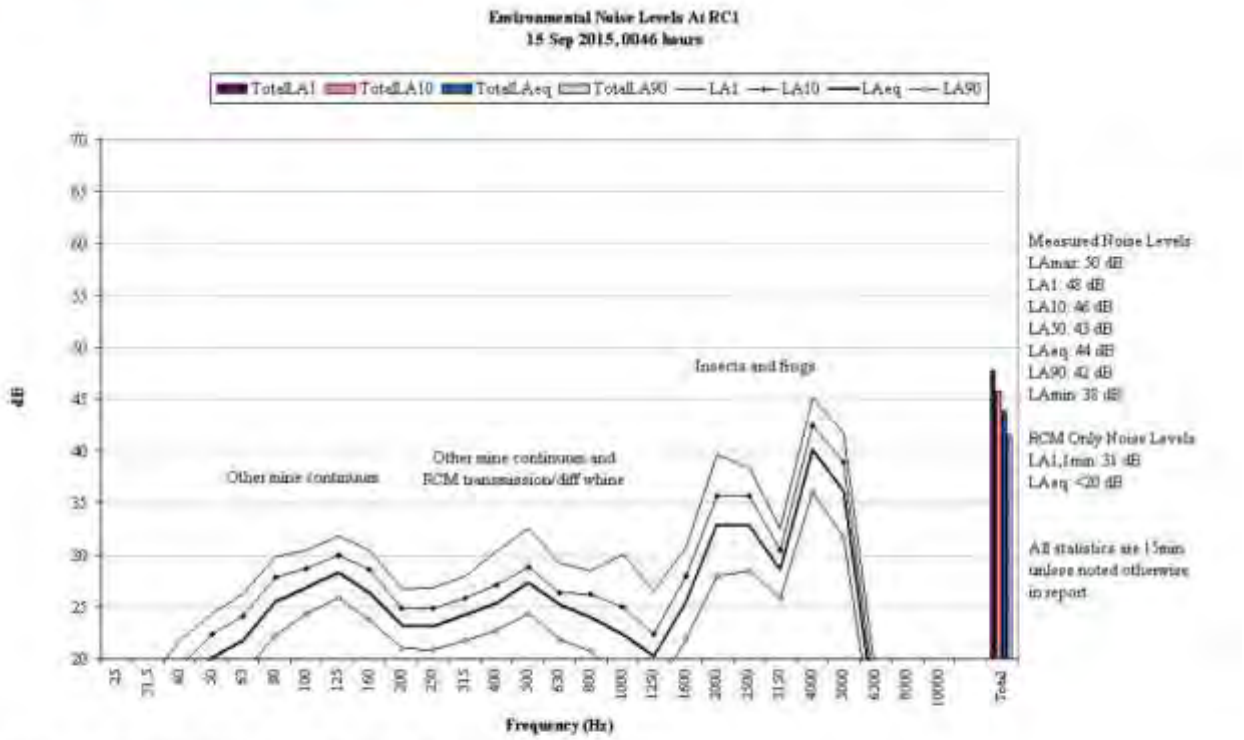


Figure 3: Environmental Noise Levels, McInerneys Road

RCM was audible for a regular continuum and four instances of haul truck transmission and differential whine, generating a site only L_{Aeq} of less than 20 dB and $L_{A1,1minute}$ of 31 dB.

Insects and frogs were primarily responsible for all measured levels.

Noise from another mining operation was also noted.

Figure 15: Environmental Noise Levels, McInerneys Road

Fourth quarter 2015. December monitoring.

Retreat

5.1.4 RC4 – Retreat Road

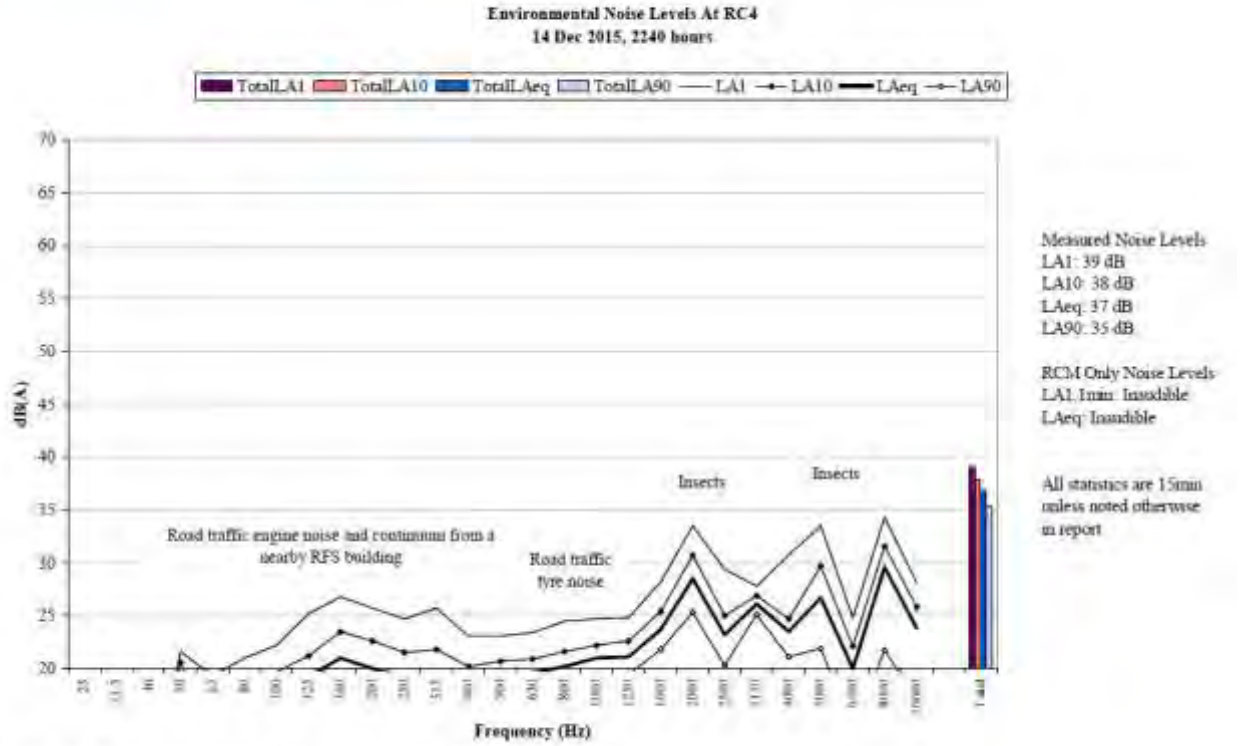


Figure 6: Environmental Noise Levels, Retreat Road

RCM was inaudible.

Insects primarily generated the measured levels.

A continuum from a nearby Rural Fire Services building, road traffic, dogs and birds were also noted.

Figure 16: Environmental Noise Levels, Retreat Road

Maison Dieu Area

5.1.2 RC2 – Maison Dieu Road

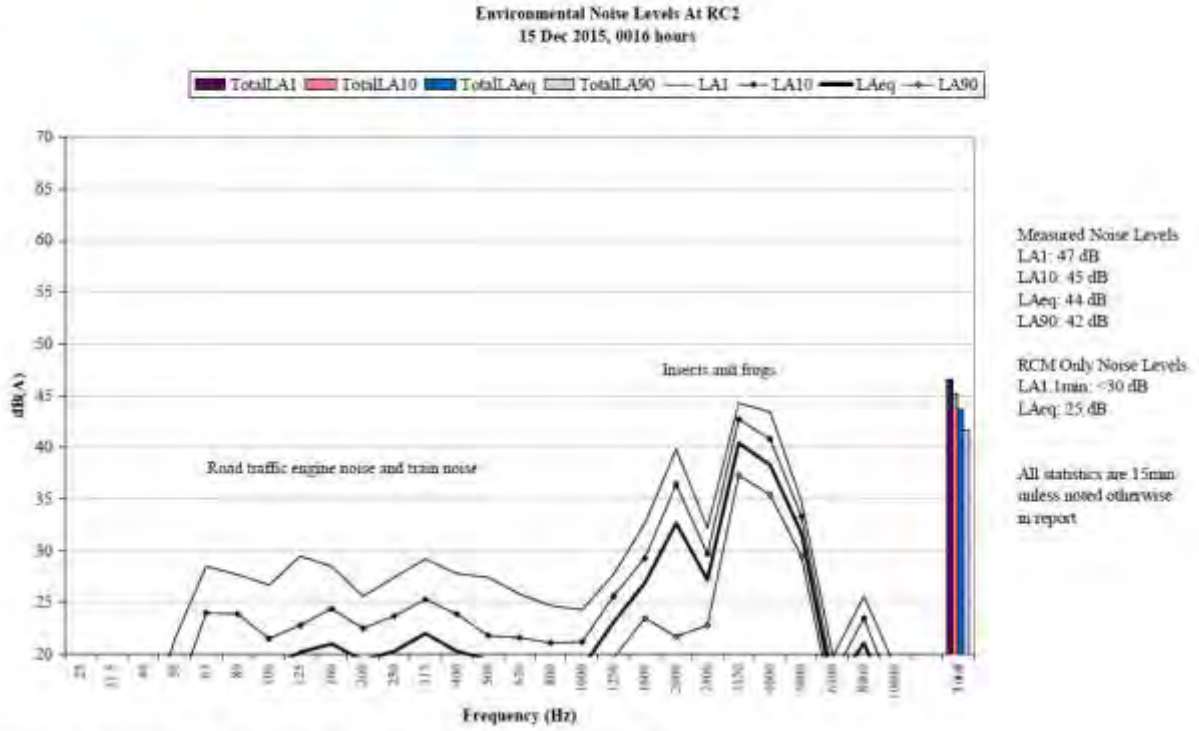


Figure 4: Environmental Noise Levels, Maison Dieu Road

RCM was audible as an engine continuum throughout the measurement, generating the site only L_{Aeq} of 25 dB and site only $L_{A1,1minute}$ of less than 30 dB.

Insects and frogs generated the measured levels.

Road traffic noise, birds and train noise were also noted.

Figure 17: Environmental Noise Levels, Maison Dieu Road

Singleton Heights

5.1.3 RC3 – Rodd Close

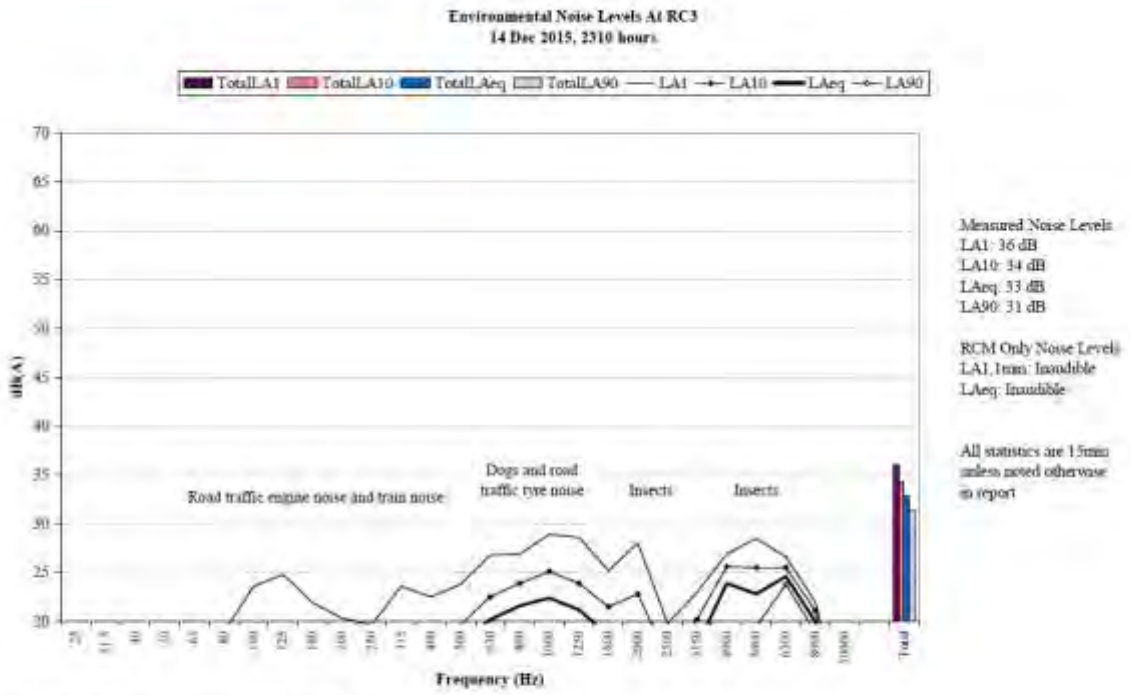


Figure 5: Environmental Noise Levels, Rodd Close

RCM was inaudible.

Road traffic tyre noise, dogs and insects generated the measured L_{A1}. Road traffic tyre noise and insects generated the measured L_{A10}, L_{Aeq} and L_{A90}.

Road traffic engine noise, train noise and frogs were also noted.

Figure 18: Environmental Noise Levels, Rodd Close

Camberwell

5.1.1 RC1 – McInerneys Road

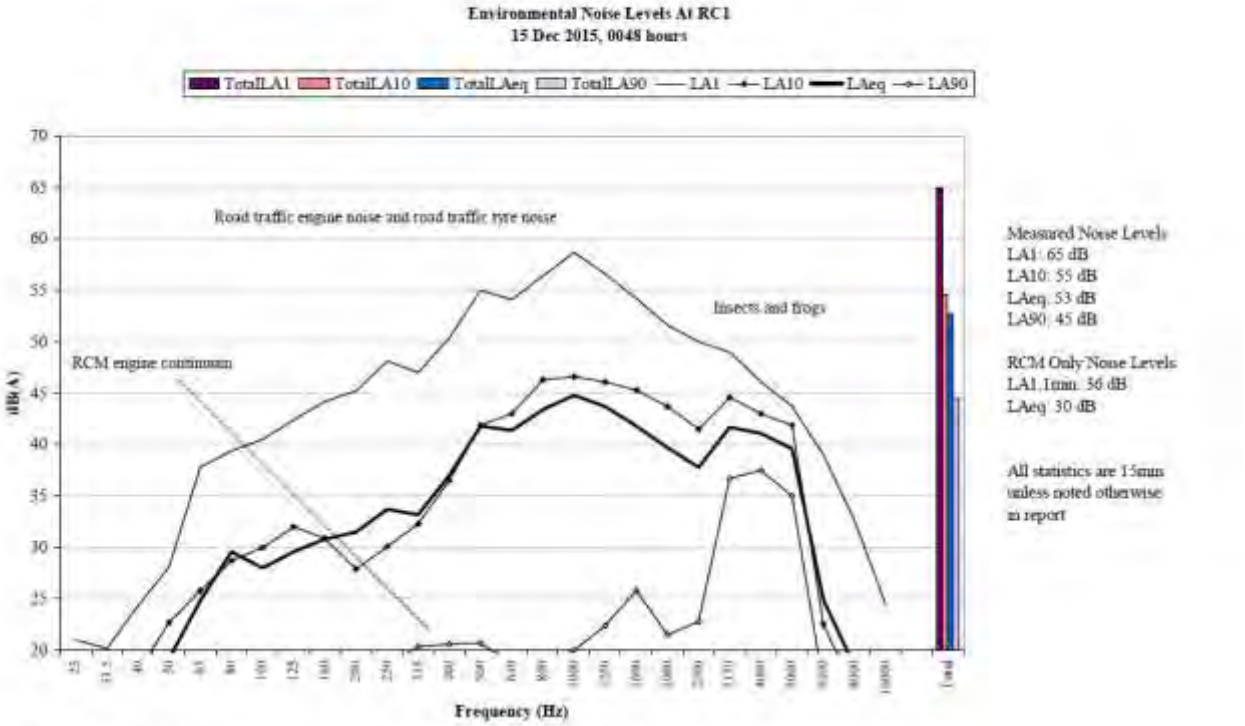


Figure 3: Environmental Noise Levels, McInerneys Road

RCM was audible at times as engine continuum, rear dump trucks and transmission whine, generating a site only L_{Aeq} of 30 dB. A surge in engine continuum generated the site only $L_{A1,1minute}$ of 36 dB.

Road traffic tyre noise generated the measured L_{A1} and primarily generated the measured L_{A10} and L_{Aeq}. Insects and frogs contributed tot he measured L_{A10} and L_{Aeq} and generated the measured L_{A90}.

Dogs and train noise were also noted.

Figure 19: Environmental Noise Levels, McInerneys Road

The quarterly results from noise monitoring of individual items of equipment are shown in Appendix 3.

Rix's Creek has changed the monitoring and reporting of noise during 2015 as it goes through a transition period from the existing 1995 development consent into the hopefully new consent (2016-onwards for a period of 21 years). In the meantime, to satisfy consent requirements, both 72 hour monitoring (current Consent requirement) and attended monitoring results (Updated current noise monitoring procedure) will be reported in the AEMR.

During the 2014 AEMR review it was requested by the Department of Planning and Environment (DPE) that the noise monitoring results also include total noise levels. A table including noise level ranges is again required as per past reports and this is provided in Table 11 contrary to the paragraph above. This table was not included in the 2014 AEMR due to changes requested in the 2013 AEMR review by DPE.

Table 11. Background Noise Levels - $L_{A90,15minute}$, $L_{Aeq,15minute}$ & $L_{A10,15minute}$

GEOMETRIC MEAN L_{A90}, L_{AEQ} and L_{A10}										
Site	Quarter	Day Time (7:00 – 18:00)			Evening (18:00 – 22:00)			Night Time (22:00 – 7:00)		
		$L_{A}90$	L_{Aeq}	$L_{A}10$	$L_{A}90$	L_{Aeq}	$L_{A}10$	$L_{A}90$	L_{Aeq}	$L_{A}10$
The Retreat	First	31.6	46.5	54.2	31.1	46.7	48.3	28.1	41.5	43.8
	Second	41.2	60.0	63.9	37.5	55.2	57.3	41.8	55.8	55.5
	Third	45.6	63.2	66.1	40.6	58.2	59.1	40.9	56.7	55.4
	Fourth	48.8	61.3	63.5	50.9	60.1	60.7	38.6	49.6	48.4
Maison Dieu	First	36.3	45.1	46.6	44.6	47.9	48.1	38.2	42.1	44.3
	Second	41.1	48.2	50.0	38.9	45.5	46.2	37.9	42.2	43.6
	Third	37.8	46.2	48.7	35.6	41.3	42.6	33.9	38.4	39.3
	Fourth	51.1	67.9	70.1	48.4	60.6	61.4	48.6	54.0	55.7
Singleton Heights	First	41.3	48.2	50.8	44.1	48.9	50.1	39.7	41.5	43.1
	Second	40.4	50.7	52.3	38.6	45.7	47.7	36.9	44.7	47.7
	Third	42.3	53.1	55.4	40.0	47.8	49.6	32.2	46.4	49.5
	Fourth	50.4	70.5	72.9	49.5	68.6	70.6	43.9	54.7	56.7
Camberwell	First	43.7	50.1	54.4	43.2	50.8	54.6	43.7	51.2	54.6
	Second	46.6	53.0	56.1	46.3	52.6	56.1	43.8	51.6	55.1
	Third	54.3	64.1	67.6	53.6	64.1	67.6	44.5	60.3	65.3
	Fourth	44.2	51.8	54.4	43.1	49.5	52.7	42.6	48.8	52.1

6.1.7 Reportable Incidents

Sixteen (16) complaints and two (2) enquiries have been received in relation to operational noise over the reporting period. Over this period seven (7) complaints were from the one complainant in Maison Dieu over various dates, two (2) were from another complainant within Maison Dieu, whilst another two (2) were from another complainant situated at Long Point over various dates. The other complainants were individual residents located within Camberwell and Maison Dieu areas over various dates.

Table 12. Noise Complaints

DATE	LOCATION	DESCRIPTION
14/1/2015	Maison Dieu	Noise from Rix's Creek operation disturbing sleep. Noise monitoring levels within compliance.
4/3/2015	Maison Dieu	Noise from Rix's Creek Operation clearly heard at night. Continuous low frequency noise. Noise monitoring levels within compliance.
16/3/2015	Camberwell	Noise from Rix's Creek Operation clearly heard in the morning. Continuous low frequency noise. Noise monitoring levels within compliance.
25/3/2015	Maison Dieu	Noise from Rix's Creek Operation clearly heard at night and had for last several nights. Noise monitoring levels within compliance.
29/3/2015	Camberwell	Noise complaint on a Sunday morning when mine not operating.
8/6/2015	Maison Dieu	Noise coming from Rix's Creek operation. OCE modified operation and noise monitoring levels within compliance.
15/6/2015	Camberwell	Noise coming from Rix's Creek operation. Noise monitoring levels within compliance.
3/7/2015*	Maison Dieu	Inquiry into West Pit noise from operation as well as offsite noise monitoring near house.
22/7/2015	Wattle Ponds	Noise from Rix's Creek ROM Pad disturbing resident. Ceased loading SBC from area.
1/8/2015	Maison Dieu	Noise from West Pit operation disturbing sleep. OCE amended operation even though noise monitoring levels within compliance.
1/8/2015	Maison Dieu	Complaint regarding West Pit operation disturbing sleep. OCE amended operation lower in pit and complainant provided with OCE's direct phone number. Noise monitoring levels within compliance.
1/8/2015	Maison Dieu	Complaint regarding West Pit operation disturbing sleep. OCE amended operation lower in pit and complainant provided with

		OCE's direct phone number. Noise monitoring levels within compliance.
5/11/2015	Maison Dieu	Noise from operation disturbing sleep. Noise monitoring conducted at residence and operation modified prior to rain.
21/11/2015*	Maison Dieu	Inquiry into noise from West Pit operation.
24/11/2015	Maison Dieu	Noise from operation disturbing sleep. Noise monitoring conducted at residence and operation modified. Noise monitoring levels maintained within compliance.
25/11/2015	Long Point	Noise from operation disturbing sleep. Noise monitoring conducted at residence and operation modified. Noise monitoring levels maintained within compliance.
10/12/2015	Maison Dieu	Noise from operation disturbing sleep. Noise monitoring conducted at residence and New England Highway dominant noise source.
17/12/2015	Long Point	Noise from operation disturbing sleep. Noise monitoring conducted at residence and levels within compliance.

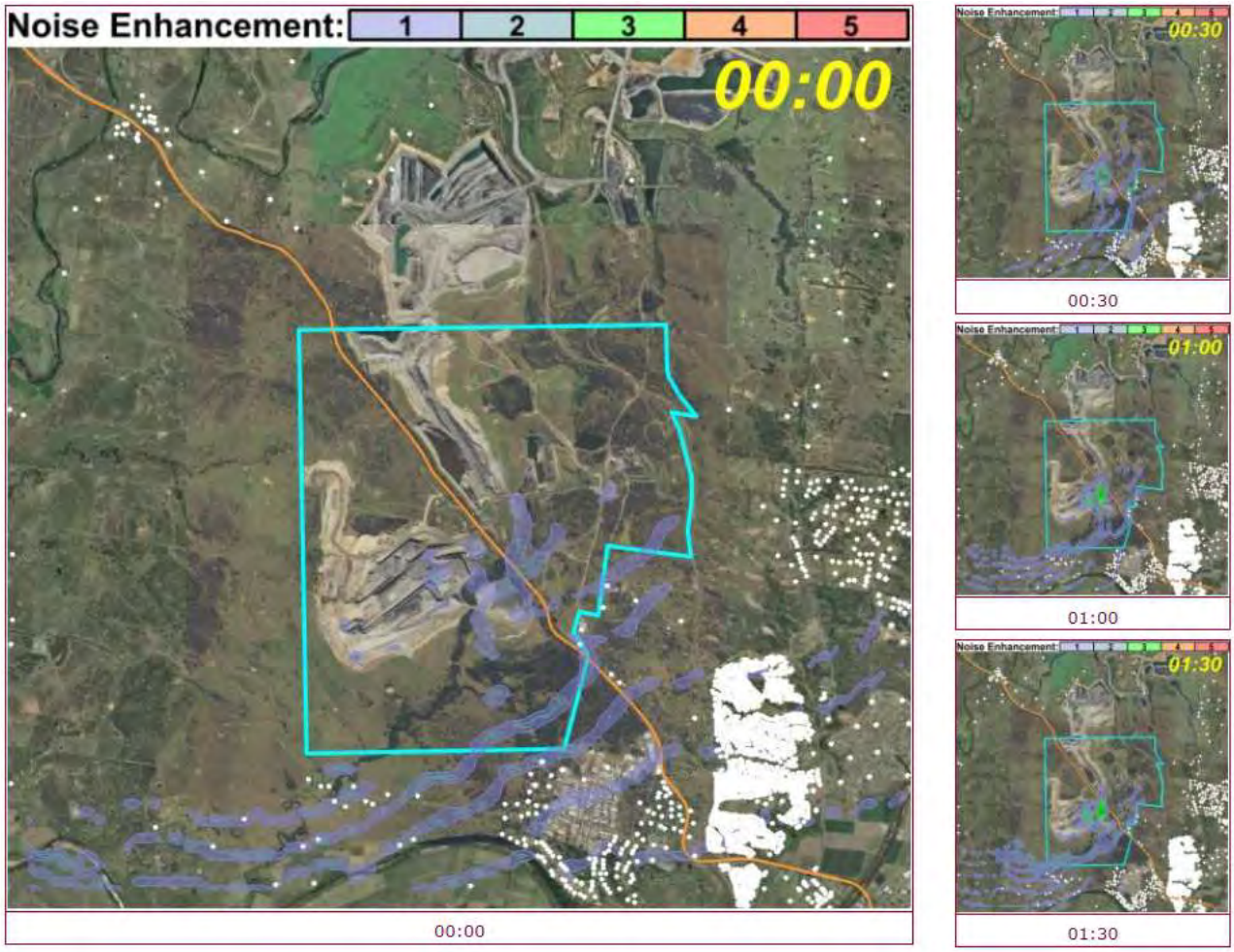
* Inquiry

6.1.8 Further Improvements.

All equipment is checked and maintained on a regular basis to ensure noise attenuation equipment silencers – mufflers are operational. All new equipment is fitted with broad band reversing alarms to minimise offsite noise impacts. Sound suppression will continue for any new pieces of equipment prior to commencing work/s on-site.

An acoustic bund on the Singleton side of the ROM pad at the CHPP has been built to attenuate noise directed to the Retreat area for noise from haul trucks on the ROM pad. This bund was rehabilitated with various over storey and understorey species in May 2013 to further minimise offsite impacts. Limited tree success due to dry conditions were restocked during April 2014 and more tube stock will be planted on the bund in autumn 2015 for noise and visual amenity aspects. Further noise attenuation work is also being installed for the CHPP (eastern and southern walls) and ROM Pad receival hopper to minimise noise travelling south-east from this area.

During 2014 Rix's Creek worked with Todoroski Air Sciences (TAS) and Nigel Holmes to develop a 3-D predictive noise model for the Mine. The meteorological data from the Hunter Valley Meteorological Sounding Group Joint Venture (HVMSGJV), meteorological forecasts for the Rix's Creek mine site is used to develop half hourly predictions, of noise enhancement conditions, for each twenty four hours of Mine production. To date noise enhancement has been in predicted area's shown on model. The model was upgraded during 2015 to include all offsite receptors (residences) as follows:



*White dots indicate off-site receptors / residences closest to mining operation.

The use of the Todoroski 3-D noise model to predict areas of possible meteorological enhancement of Rixs Creek open cut noise, to plan mine working faces has been successful in controlling it's noise impact to current Environment Protection License (EPL 3391) Project Specific Noise Criteria as per Noise Pollution Production Program (U1 Premises Noise Limits: 12323_PRP_R02 as submitted by Global Acoustics). An integral part of the Noise Management Plan is using real time attended monitoring. The monitoring results assist in calibration of the noise model and production shift supervisor placement of the mines production units to keep mine noise levels to license conditions.

6.2 Blasting

6.2.1 Environmental Management

Blasting criteria for mining at Rix's Creek is specified in the Development Consent conditions and Environmental Protection License. The conditions state that blasting is to be carried out in accordance with the recommendations of Australian Standard 2187-1993 and in terms of ANZECC Guidelines and to the satisfaction of the EPA.

Blasting is not to be carried out within 500 m of the New England Highway or an approved deviation of the highway while open to traffic. During the year blasting in Pit 1 and Pit 3 has taken place within the 500m exclusion zone under an approved procedure to close the Highway to traffic during blasting. The Company has approval from the Roads and Maritime Services (RMS) to conduct closures of the Highway for blasting under a Road Occupancy License (currently ROL 511703) – This approval is renewed every six months.

The conditions specified in the Development Consent and Environmental Protection License require blasts to be designed to minimise air blast overpressure and ground vibration. A NONEL (non-electric) system is used so that any blast only has less than 5 % probability of exceeding an air blast

overpressure of 115 $dB_{(Linear)}$ to a maximum of 120 $dB_{(Linear)}$ and vibration with peak particle velocity of 5 mm/sec to a maximum of 10 mm/sec at the closest residence (not owned by the applicant outside the mining lease).

Instantaneous wind speed and direction information is available to management to be used in scheduling blasting operations to minimise offsite effects of air blast overpressure and dust. The Company is one of the joint venture partners in the Meteorological Sounding Group. This group has purchased equipment to measure wind speed, direction and temperature in the atmosphere. This data is then used to better predict the impacts of atmospheric conditions that can result in overpressure enhancement off site. The on-site weather station also has real-time data that can be viewed at any time by relevant site personnel. This weather station has the ability to alarm when conditions are not suitable for blasting i.e. wind speed currently greater than 10 m/s.

All blasts are monitored to record air blast overpressure and peak particle velocity at residences most likely to be effected. The modelling of dust and fume associated with blasting commenced during March 2012 and verified using DustTrak DRX dust monitors and App-Tek OdaStat gas monitors. During 2012 approximately 40 blasts were monitored in conjunction with the model. The monitoring was in conjunction with Rix's Creek daily EnvMet and NOx emissions predictive modelling. The NOx modelling shows various predicted outcomes and has played an integral part of Rix's Blast regime during 2013 to 2015 and can be seen in Figure 20. The pink dots on the model are the closest residences/receptor's that can potentially be impacted via blasting.

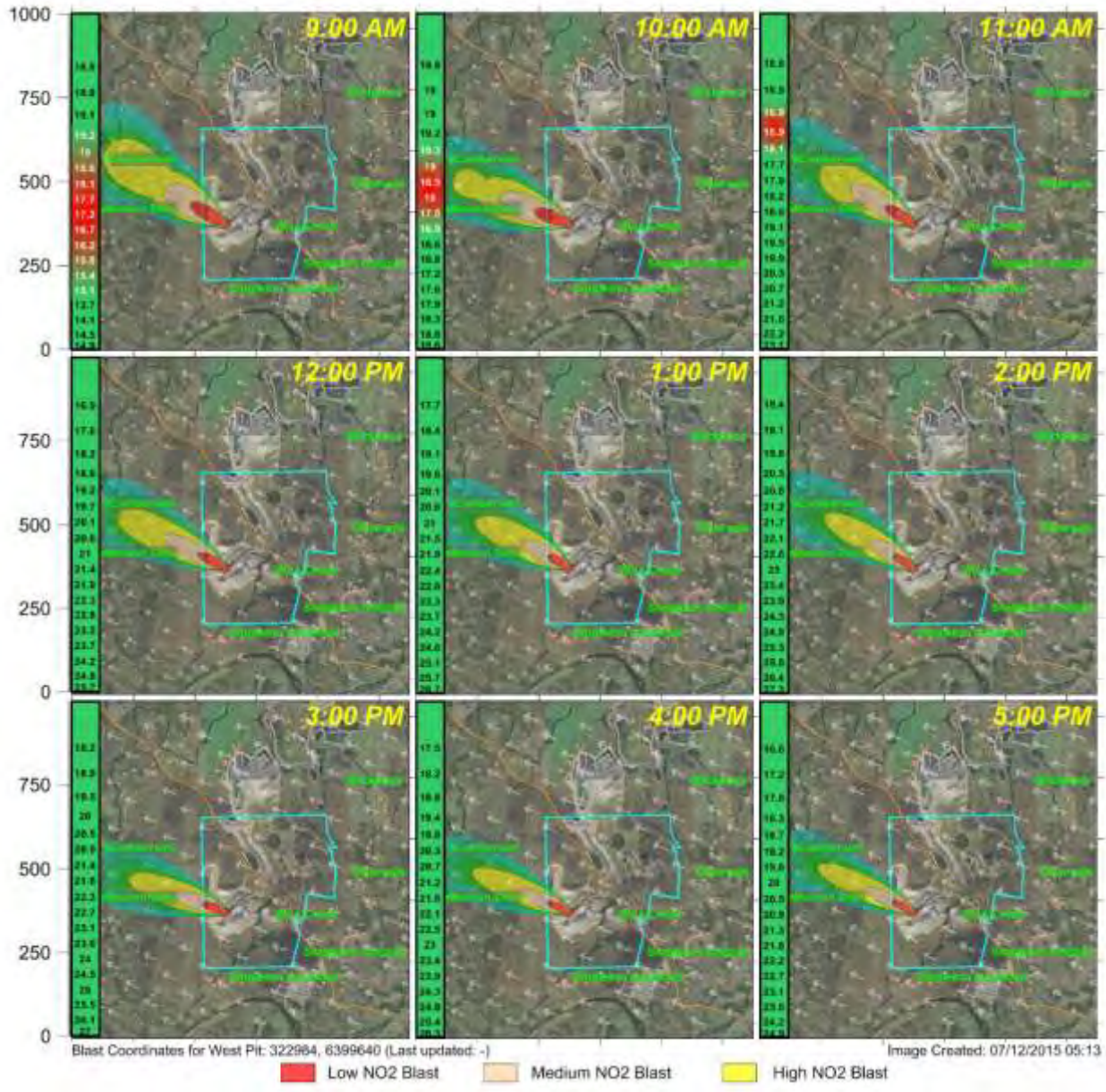


Figure 20. Blast Dust / Fume 'Plume' Model 2015.

6.2.2 Environmental Performance

During 2015 a total of 118 production blasts were initiated into overburden in Pit 3 or West pit.

See Appendix 2 for monitoring results of individual blasts.

Of the 118 blasts, no blasts recorded vibration over 5 mm/sec and one blasts (0.8%) recorded overpressure above 115 dB_{Linear}, (115.2 @ Retreat on the 28/02/2015) however, this blast did not exceed 120 dB_{Linear}. 53 blasts were cancelled and rescheduled due to unfavourable weather conditions, this included windspeed, wind direction, dust potential, fume potential and overpressure potential. Several other blasts were delayed and / or prevented due to rainfall.

Of the 118 blasts the fume ratings recorded were as follows:

Rating		A	B	C
0	93	-	-	-
1	-	20	1	-
2	-	3	1	-
3	-	-	-	-
4	-	-	-	-
5	-	-	-	-

6.2.3 Reportable Incidents

During 2015 four (4) complaints were received by the Company relating to four blasts (equates to 3.4% of all blasts). See Table 13 for details.

Table 13. Blast Complaints

DATE	LOCATION	RESOLUTION
23/6/2015	Singleton	Complaint from DPE (Singleton Compliance) regarding overpressure from blast. Rix's Creek provided blast results to DPE (Singleton Compliance) and blast overpressure was not exceeded at any Rix's Creek monitoring site.
24/6/2015	Singleton	Complaint from DPE (Singleton Compliance) regarding overpressure from blast. Rix's Creek provided blast results to DPE (Singleton Compliance) and blast overpressure was not exceeded at any Rix's Creek monitoring site.
8/7/2015	Singleton Heights	Complaint from Singleton Heights resident regarding overpressure from blast. Rix's Creek provided blast results to resident and blast overpressure was not exceeded at any Rix's Creek site.
10/7/2015	Singleton	Complaint from DPE (Singleton Compliance) regarding overpressure from blast. Rix's Creek provided blast results to DPE (Singleton Compliance) and blast overpressure was not exceeded at any Rix's Creek monitoring site. Rix's Creek agreed to installing a new blast meter near Singleton Council for future monitoring.

6.2.4 Further Improvements

The Company is part of the Terrock EnvMet Research Project. This allows access to the prediction model for atmospheric enhancement for overpressure. This information is used to access the potential for overpressure enhancement due to the predicted atmospheric conditions throughout the day. This information can then be used to schedule blasting operations to minimise off site environmental impacts resulting from blast overpressure. The models (overpressure, fume and dust) are now capable to have predictive forecasting for atmospheric conditions two days ahead to further enhance undertaking blasting during ideal weather conditions. The models have also been updated to include nearest receptors which are likely to be affected by blasting activities.

Rix's Creek have access to several predictive weather models in which products are selected for blasting based on possible weather conditions prior to blasting. Blast products will continually be reviewed and trialled where thought beneficial throughout 2016 to minimise fume emitted from

blasting. Fume will continually be monitored on site to manage any onsite and offsite impacts in the case of a fume event resultant from a blast. Two gas analysers are also set-up downstream of all blasts to monitor any potential gasses released from blasts on the site boundary.

Rix's Creek blast fume model was updated again in 2015 to progress from the previous 2D ground level model to one displaying the modelling of altitude (up to 1000m) as well as wind speed and direction to further assist the scheduling of blasting activities.

The ACCO 10,000L water cart will continually be used across site to minimise dust from hardstand areas, concrete surfaces and in particular what it was purchased for crusting drill cuttings from the drill and blast process. The watering of drill cuttings generally follows the path of the drill on the shot and also when unfavourable wind conditions are predicted.

An additional blast meter was installed during August 2015 near the Singleton Council chambers (within the Singleton UHAQMN fenced site) to monitor any potential blast impacts near Singleton CBD. This was a proactive initiative the company agreed upon with the input from DPE.

6.3 Air Quality

Dust and noise are the main air quality parameters that the operation has the potential to impact. There are a range of operational procedures in place to minimise the potential to generate emissions and actions to mitigate impacts in the surrounding environment.

6.3.1 Environmental Management

An air quality monitoring program is in place for the Rix's Creek operation covering the area surrounding the operation. This program involves monitoring air quality for dust particulates. The air quality assessment criteria are listed in Table 144.

Table 14. Air Quality Assessment Criteria

POLLUTANT	STANDARD	AVERAGE PERIOD	AGENCY
Insoluble Solids Dust Deposition	4 g/m^2/month	Annual	DECC
Total Suspended Particulate Matter (TSP)	90 ug/m^3	Annual mean	National health & Medical Research Council (NHMRC)
Particulate Matter < 10 um (PM_{10})	30 ug/m^3	Annual mean	National Environment Protection Measure for Ambient Air Quality
	50 ug/m^3	(24 hour average, 5 exceedances permitted a year	

A total of 30 dust deposition gauges are located on and around the mining lease area. The location of these gauges are listed in Table 15 and shown in Plan 1.

The dust deposition gauges conform to Australian Standard 2724.1- 1984 Ambient Air - Particulate Matter, Part 1 - Determination of Deposited Matter expressed as insoluble solids and ash residue. Gauges have 150 mm funnels located 2 metres above the ground.

Samples are collected by AECOM, Singleton and analysed by ALS Laboratories which is a NATA registered laboratory.

High volume air samplers are located at three sites on the eastern side of the lease i.e. between the operation and the populated area of Singleton. These samplers run for 24 hours on a six day cycle and provide information on total suspended particulates (TSP) and particulates less than 10 micron (PM_{10}) in diameter and operate in accordance with Australian Standard 2724.3 and AS3580.9.3:2003

These units are located at:-

1) Rix's Creek Lane;
2) Singleton Heights - Mines Rescue Station; and
3) Off Bridgman Road - Lot 2, The Retreat.

The locations of the monitors are shown in Plan 1.

Environmental controls employed to minimise dust generation includes the application of recycled mine water to haulage roads and areas with heavy use by machinery, application of recycled mine water to drill pads (i.e. fine cuttings) and sprinkler systems on coal stockpile areas and the surrounds of the washing plant.

Conveyor systems at the washing plant and rail loader are enclosed on at least two sides to control dust.

Operational procedures for blasting include not blasting under adverse weather conditions i.e. high wind and direction conditions; when there is a likelihood that dust generated from the blast will reduce visibility at the lease boundary or New England Highway. Wind speed and direction information is available at the office for staff to make informed decisions regarding the prevailing weather conditions when scheduling blasts. This data is available real time from Rix's Creek weather station as well as the Hunter Valley Meteorological Sounding Group Joint Venture - Lemington site and through improved localised meteorologic daily forecasts.

This information is used to schedule operations so as to minimise the potential for dust emissions. Under adverse weather conditions overburden is not dumped to exposed locations. When these conditions exist the overburden removal and dumping operation is modified with dumping occurring either in pit or to areas not exposed to the prevailing winds, alternatively operations may be ceased until conditions are suitable. For blasting, information is used in a model to predict the potential for meteorological reinforcement of overpressure as well as directional travel of dust/fume from a blast. The model shows the likelihood and receptors that may be affected by the blast which in turn can alter the timing of the blast being initiated.

Rix's Creek is an active participant of the Upper Hunter Air Quality Monitoring Network. The network consists of Industry and Government. The aim is to establish a network of air quality monitors located throughout the valley from Singleton to Muswellbrook to monitor air quality. There are currently 14 monitoring sites operational. One of the monitoring sites is located between the Rix's Creek mine and Singleton town ship on land owned by the Company. This monitoring site was commissioned in August 2011 and is currently displayed on the OEH website known as 'Singleton NW' and displays wind speed, wind direction and PM10 data on a continuous basis. Rix's Creek has an annual data agreement to access data from this station for a fee.

Table 15. Dust Monitoring Sites

SITE	LOCATION
1	Adjacent to railway line on East Boundary
2	Adjacent to railway line on East Boundary
3	Near old railway cutting
~~4~~	Near Middle Falbrook Road, North boundary (discontinued - area now active mine)
5	Rix's Creek Lane East Boundary
6	Near New England Highway
7	Paddock opposite middle Falbrook Road intersection – moved to Bowman boundary fence during July 2012
8	Off Maison Dieu Road
9	Off Maison Dieu Road near Dight's Crossing intersection
10	Off Maison Dieu Road
11	Wattle Ponds Road
~~12~~	Oval near Singleton Civic Centre (discontinued due to constant vandalism)
13	Lawson Avenue, Singleton Heights
14	Mines Rescue Station, Singleton Heights
15	Gardner Circuit, Singleton Heights

16	46 D'Arbon Crescent, Singleton Heights
17	The Retreat
18	Bridgeman Road
19	Main Northern Railway
20	Bridgeman Road
21	Bridgeman Road
22	Bridgeman Road
23	Main Northern Railway
~~24~~	Off Middle Falbrook Road (discontinued - now active mining area)
25	Off New England Highway
26	Granbalang – Off New England Highway
27	Off Wattle Ponds Road adjacent to Hunter River
28	Off New England Highway north-west of lease. Relocated August 2011
29	South of Maison Dieu Road
30	West of lease
31	West of lease
32	Pre-School Gardner Circuit
33	Wright Property Maison Dieu

6.3.2 Environmental Performance

Insoluble Solids

29 of the 30 gauges comply with the DECC Insoluble Solids Dust Deposition assessment criteria of an annual average result of less than 4 gm/m^2/month. One gauge (Gauge 26) exceeded this limit with an annual average of 4.2 gm/m^2/month. This gauge had three high readings throughout the year (10.7 gm/m^2/month in January, 7.5 gm/m^2/month in April and 6.5 gm/m^2/month in September) which increased the overall yearly average. The high January reading is presumed to be due to a localised factor as the remaining 29 gauges had below average results for the month.

Table 16 summarises the monthly insoluble solids deposition results for the year along with long-term averages. The results show a similar result in comparison to the 2014 results. Eleven (11) gauges exhibited an increase in insoluble solids dust deposition result when compared to 2014, with fourteen (14) gauges showing a decrease, whilst five (5) remained the same. The overall yearly average of all gauges for 2015 was 1.9 g/m^2/month, showing the same result as 2014 result of 1.9 g/m^2/month.
In 2015 eight (8) of the dust deposition gauges (27%) exceeded the arbitrary an annual average result of 2 g/m^2/month which was the same as eight (8) or 27% in 2014. This is interesting as 2015 was considered a very wet year whilst 2014 was considered a very dry year in comparison to the annual rainfall average for Singleton.

The results from previous years are listed below:-

- 8 gauges or 27% exceeded 2 g/m^2/month 2015
- 8 gauges or 27% exceeded 2 g/m^2/month 2014
- 11 gauges or 37% exceeded 2 g/m^2/month 2013
- 17 gauges or 57% exceeded 2 g/m^2/month 2012
- 15 gauges or 50% exceeded 2 g/m^2/month 2011
- 4 gauges or 13% exceeded 2 g/m^2/month 2010
- 17 gauges or 57% exceeded 2 g/m^2/month 2009
- 6 gauges or 20% exceeded 2 g/m^2/month 2008
- 5 gauges or 17% exceeded 2 g/m^2/month 2007
- 10 gauges or 33% exceeded 2 g/m^2/month 2006
- 5 gauges or 17% exceeded 2 g/m^2/month 2005
- 7 gauges or 23% exceeded 2 g/m^2/month 2004
- 4 gauges or 13% exceeded 2 g/m^2/month 2003
- 12 gauges or 40% exceeded 2 g/m^2/month 2002
- 11 gauges or 37% exceeded 2 g/m^2/month 2001
- 9 gauges or 32% exceeded 2 g/m^2/month 2000
- 10 gauges or 35% exceeded 2 g/m^2/month 1999

- 11 gauges or 39% exceeded 2 g/m^2/month 1998
- 12 gauges or 35% exceeded 2 g/m^2/month 1997
- 13 gauges or 35% exceeded 2 g/m^2/month 1996
- 4 gauges or 15% exceeded 2 g/m^2/month 1995

From the above long term results, the insoluble solids dust deposition levels listed for 2015 showed the same result when compared to 2014, when using an arbitrary indicator level of 2 gm/m^2/month annual average result. The recommended deposition limit is 4 gm/m^2/month.

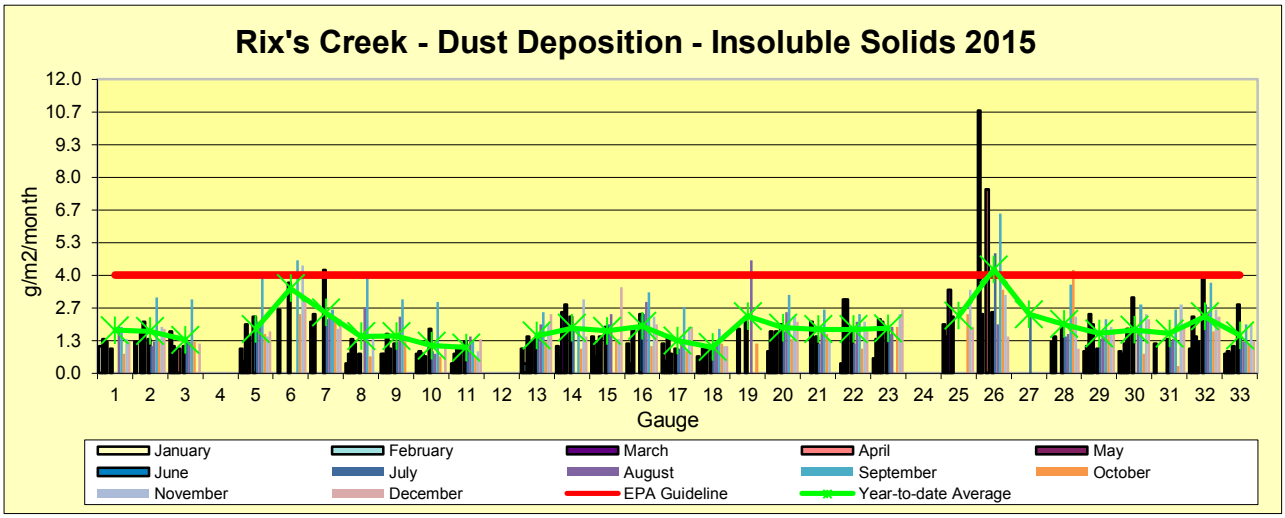


Figure 21 Rix's Creek Insoluble Solids Dust Deposition 2015

Figure 21 displays the individual monthly insoluble solids deposition rates for each gauge and annual average deposition result in gm/m^2/month. The graph does not contain any contaminated results nor have they been included in the annual averages. Fifty-eight (58) results were contaminated over the year with either organic matter or bird droppings. An increase from forty (40) contaminated results in 2014. There was also two occasions where there was no result. One gauge was found damaged at the site, whilst the other gauge was stolen.

Some sites individual monthly result exceeded the annual limit of 4.0 gm/m^2/month and these results are most likely as a result of localised episodic events. The maximum result was in January at Site 26 measuring 10.7 gm/m^2/month. This site is located within 50 metres of an active haul road to the West Pit out of pit dump with results seen to decrease as the year progressed and the gauge was relocated slightly further away from the active mining operation. Gauge 27 had 11 contaminated results throughout the year due to mainly bird droppings. This gauge may be relocated during 2016 to decrease the potential of further contaminated results.

Figure 22 shows the running 12 month rolling averages for dust deposition and gives a good indication of any trends that may be emerging around the site. From the graph the gauges with the higher results; gauges 6, 7 and 26 are located in close proximity to Pit 1 and Pit 3 mining operations (see Plan 1). These same gauges recorded similar trends in 2012, 2013 and 2014 in comparison to the other gauges.

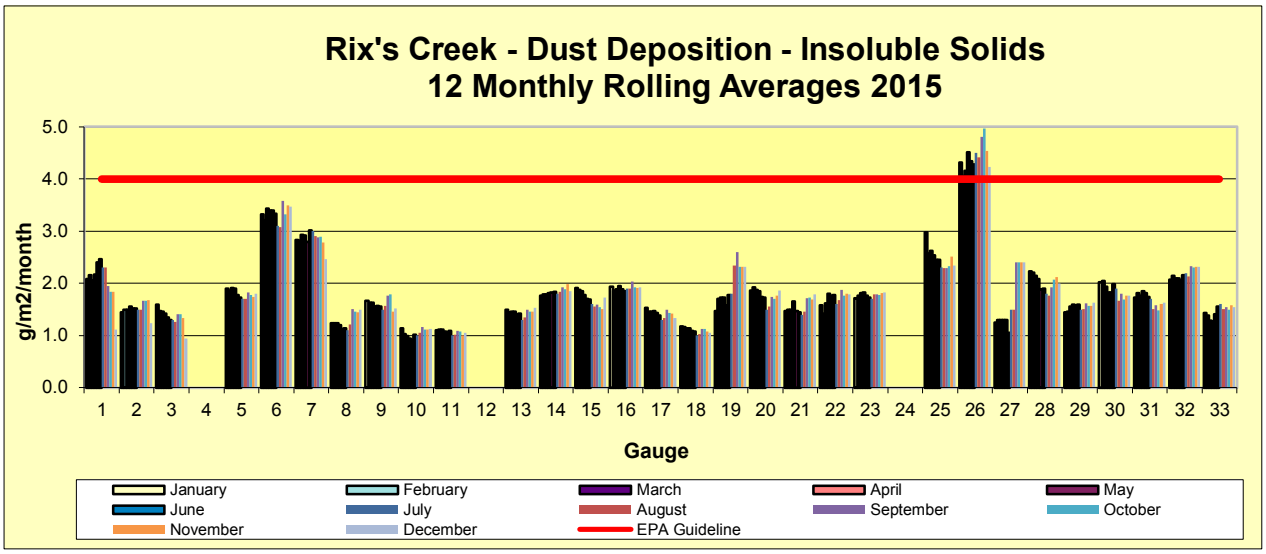


Figure 22 Insoluble Solids Dust Deposition 12 Monthly Rolling Averages 2015

Table 16. Annual Average Dust Deposition Insoluble Solids 2015

SITE	MAXIMUM RESULT 2015	MINIMUM RESULT 2015	YEARLY AVERAGE 2015	YEARLY AVERAGE 2014	LONG TERM AVERAGE (1984 – 2015)	No. of UNCONTAMINATED RESULTS	No result
1	4.7	0.8	1.8	2.1	2.3	9	0
2	3.1	1.1	1.7	1.4	2.1	11	0
3	3.0	0.8	1.4	1.5	1.4	11	0
4	-	-	-	-	-	-	-
5	4.1	0.5	1.8	1.9	2.2	12	0
6	4.6	2.4	3.5	3.2	2.2	6	0
7	4.2	1.8	2.5	2.9	2.1	10	0
8	3.9	0.4	1.5	1.3	1.1	9	0
9	3.0	0.8	1.5	1.7	1.2	10	0
10	2.9	0.7	1.1	1.1	1.2	12	1
11	1.5	0.4	1.1	1.2	1.9	12	0
12	-	-	-	-	-	-	-
13	2.5	0.4	1.5	1.5	1.3	12	0
14	3.0	0.6	1.8	1.8	2.0	12	1
15	3.5	0.7	1.7	2.0	2.0	11	0
16	3.3	0.4	1.9	2.0	1.7	11	0
17	2.7	0.5	1.3	1.5	2.1	12	0
18	1.8	0.5	1.1	1.2	1.3	12	0
19	4.6	1.2	2.3	1.7	2.0	5	0
20	3.2	0.9	1.9	2.1	4.3	12	0
21	2.6	1.2	1.8	1.4	2.9	8	0
22	3.0	0.4	1.8	1.7	1.5	11	0
23	2.6	0.6	1.8	1.8	2.2	11	0
24	-	-	-	-	-	-	-
25	3.4	1.5	2.3	2.9	2.2	8	0
26	10.7	1.5	4.2	3.6	1.6	11	0
27	2.4	2.4	2.4	1.4	3.1	1	0
28	4.2	1.0	2.0	2.2	1.5	10	0
29	2.4	0.9	1.6	1.6	0.9	11	0
30	3.1	0.8	1.8	2.0	1.0	10	0
31	2.8	0.3	1.6	1.7	1.1	8	0
32	3.9	1.0	2.3	2.2	0.8	12	0
33	2.8	0.8	1.5	1.4	0.8	12	0

The annual deposition results from 1996 to 2015 are plotted in Figure 23. From the graph it is difficult to pick any major trends in deposition results for any gauge over the 20 years of results. No gauges in 2015 had any major trends away from previous year's data.

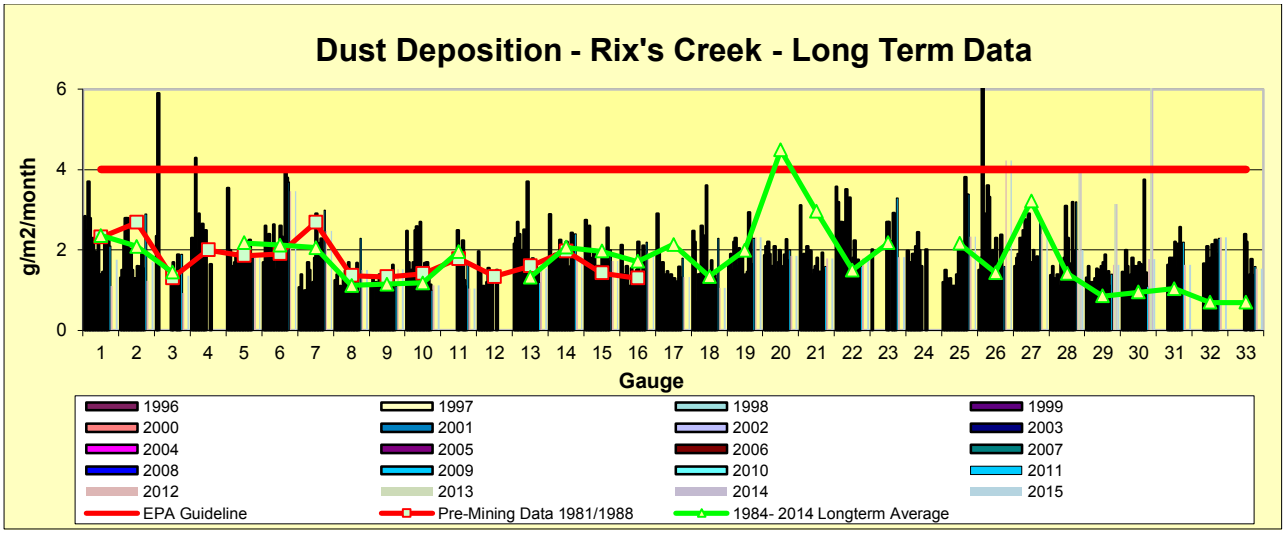


Figure 23 Long Term Insoluble Solids Dust Deposition Results

Figure 24 and Figure 25 are isopleths plots showing dust deposition concentrations from the monitoring results. Figure 24 indicates the higher concentrations are being associated in close proximity to the active mining areas, in particular Pit 3 pre-strip.

The following is an extract from 'PAE Limited' report who produced the isopleth plots from the yearly data.

'Please note that our concerns regarding this method of presentation remain unchanged from our memorandum we included with the 1996 data analysis, dated 17th March 1997. In that memorandum we raised the concern that the data used to generate these plots have been prepared from 27 data points (now 31) covering a reasonably large area. It is assumed by the plotting software that there is smooth variation in dust from one data point to the next. In reality these values can vary significantly over very short distances and the plots may therefore not reflect the real detail in dust deposition.'

Figure 24 Measured Annual Average Insoluble Solids Isopleths 2015

Figure 25 Measured Long Term Average Insoluble Solids Isopleths 1984 – 2015

Figure 26 **Measured Long Term Average Insoluble Solids Isopleths 1995 – 2015 (20 years)**

Total Suspended Particulates

All sites are below the limit set by the National health & Medical Research Council (NHMRC) air quality guideline (Table 14) annual average of 90 *u*g/m^3. The maximum, minimum and average results are summarised in Table 17 and Figure 27 show the individual results for each site throughout the year and monthly averages. There was 33 out of a possible 183 results (18%) that exceeded the annual average limit of 90 *u*g/m^3. Mines Rescue 6 results, Retreat 14, and Rix's Creek 13 results.

The last 10 years individual results that exceeded the Annual Average level of 90 *u*g/m^3 are:-

- 33 results – 18% in 2015
- 39 results – 21% in 2014
- 60 results – 33% in 2013
- 32 results – 17% in 2012
- 34 results – 19% in 2011
- 35 results – 19% in 2010
- 44 results – 24% in 2009
- 36 results – 20% in 2008
- 18 results – 10% in 2007
- 40 results – 22% in 2006
- 28 results – 15% in 2005

Table 17. Total Suspended Particulates (*u*g/m^3) 2015

GAUGE	MINIMUM		MAXIMUM		AVERAGE		No. of RECORDINGS
	2015	2014	2015	2014	2015	2014	
Mines Rescue Station	11	15	131	115	51.2	52.4	100 (%)
Rix's Creek	7	12	189	230	61.3	68.1	100 (%)
The Retreat	12	17	284	273	59.7	72.5	100 (%)

The average TSP results decreased at all of the three sites – Mines Rescue by 1.2 *u*g/m^3, Rix's Creek by 6.8 *u*g/m^3 and The Retreat by 12.8 *u*g/m^3 as per Table 17 above.

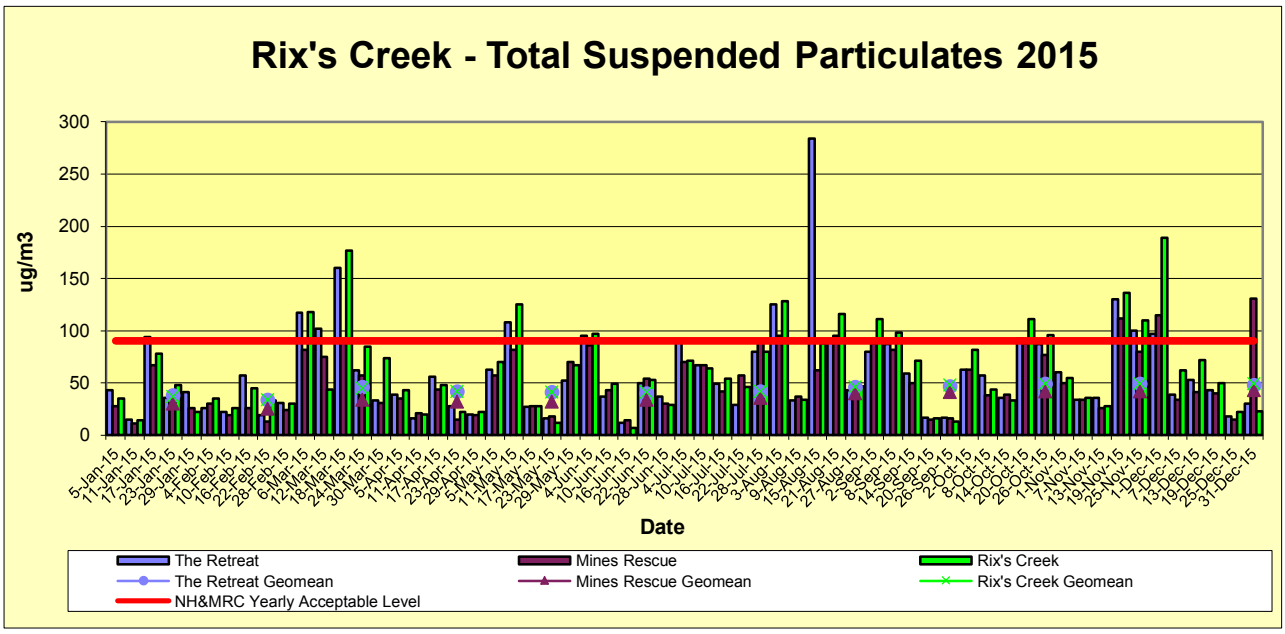


Figure 27 Total Suspended Particulates 2015

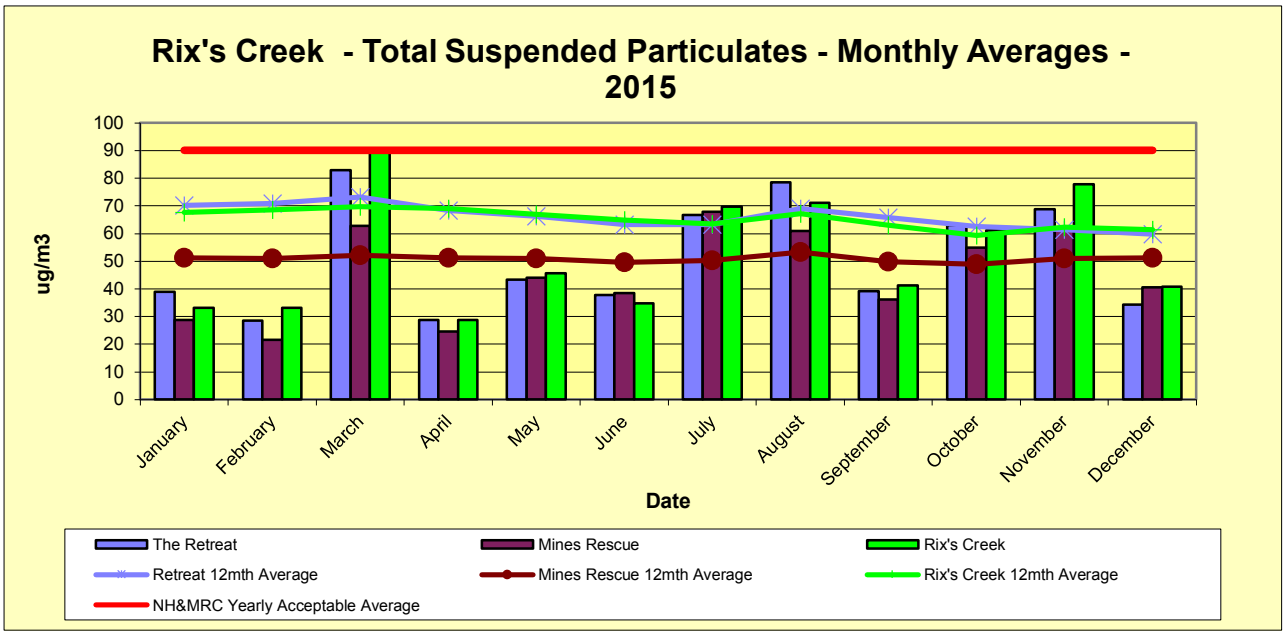


Figure 28 Total Suspended Particulates Monthly Averages & 12 Monthly Rolling Averages

Figure 28 shows the monthly average results for each site during the year along with the running 12 monthly averages. The monthly results were elevated at the Retreat and Rix's Creek sites for March and August. June through to October were all subsequently dry months of the year regarding low rainfall. The Retreat August results also had higher than usual results most likely from localised climatic conditions as well as nearby factors. This is particularly evident on the 15th August when 284 *u*g/m^3 was recorded compared to 62 *u*g/m^3 at the Mines Rescue and 88 *u*g/m^3 at Rix's Creek.

Particulates Less Than 10 Micron

The daily goal of 50 *u*g/m^3 was exceeded at the Rix's Creek site on 2 occasions.

Throughout the reporting period no problems were experienced with 100% of the data collected.

The annual averages for all three sites decreased compared to last year's results. Being a wetter year this result would have been assumed to decrease. The Mines Rescue Station decreased 2 *u*g/m^3, Rix's Creek site has decreased (5 *u*g/m^3) compared to last year's result while the Retreat site decreased by 4 *u*g/m^3. All sites are well under the 30 *u*g/m^3 annual average limit.

Table 188. Particulate Matter < 10 Micron 2015 (*u*g/m^3)

GAUGE	MINIMUM		MAXIMUM		Average		No. of RECORDINGS
	2015	2014	2015	2014	2015	2014	
Mines Rescue Station	4	6	42	50	18	20	100 (%)
Rix's Creek	3	5	79	91	22	27	100 (%)
The Retreat	4	5	46	58	18	22	100 (%)

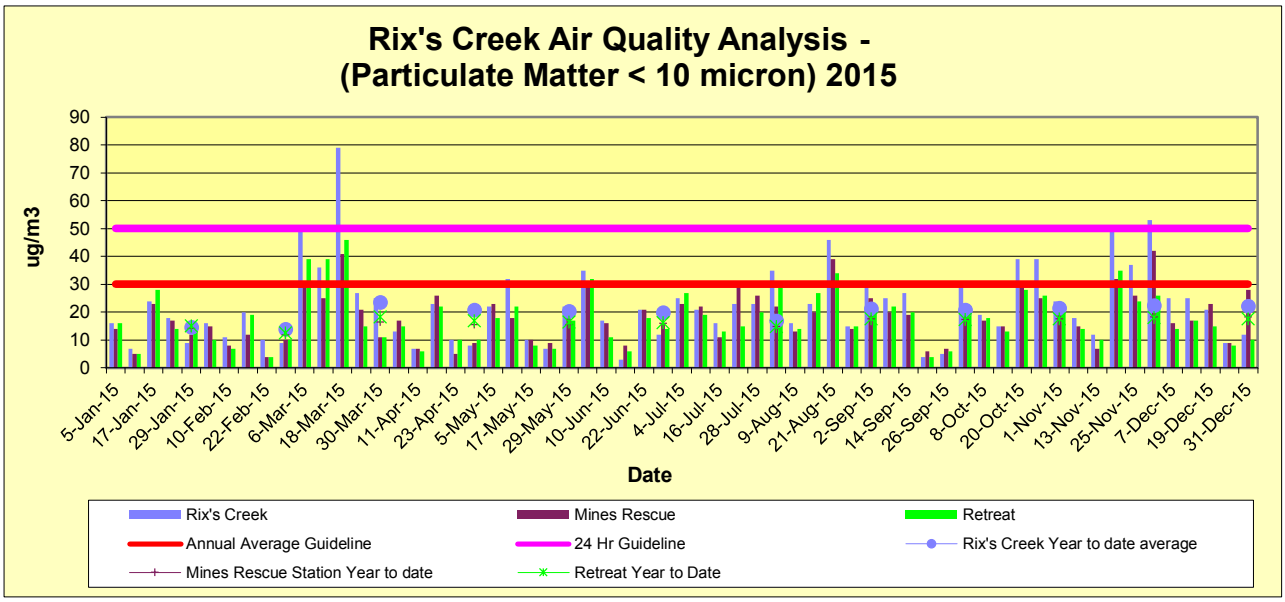


Figure 29 Particulate Matter <10 Micron 2015

Individual run results are depicted in Figure 29 with the monthly results and 12 monthly rolling averages shown in Figure 30.

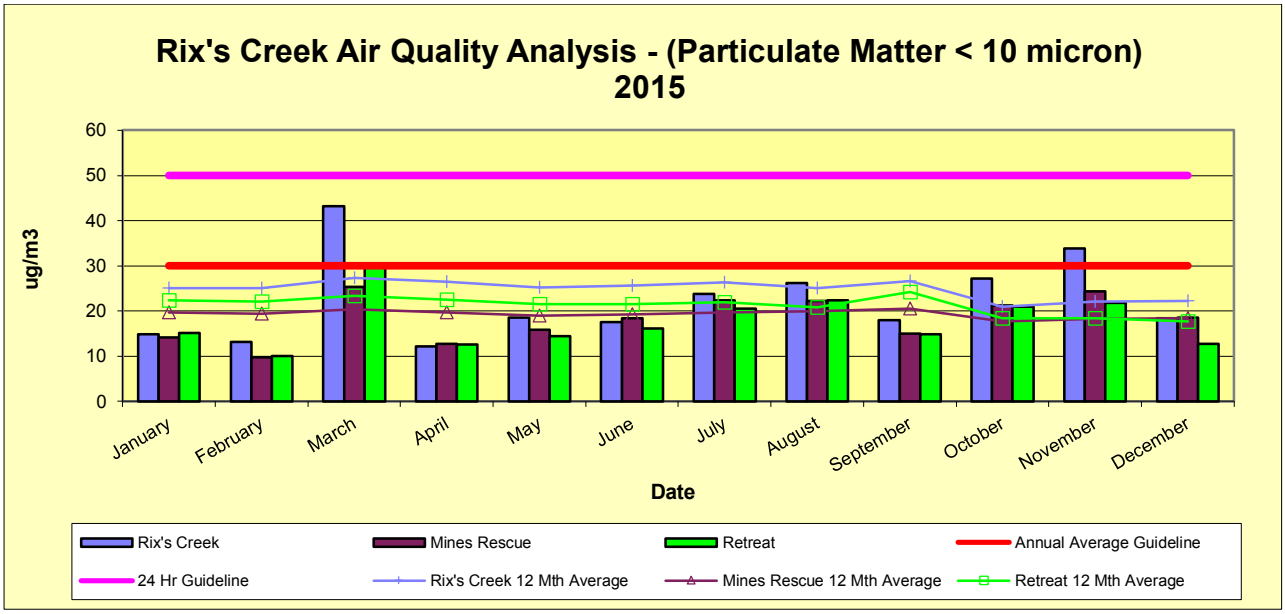


Figure 30 Particulate Matter < 10 Micron Monthly Averages & 12 Monthly Rolling Averages 2015

6.3.3 Reportable Incidents

No complaints were received in relation to air quality during the 2015 reporting period.

6.3.4 Further Improvements

The EPA issued in January 2013 a Specific Exemption under Part 6, Clause 51 and 51A of Protection of the Environment Operations (Waste) Regulation 2005 – The Rix's Creek glycerine exemption 2013 for 3 months to trial the use of glycerine as a dust suppressant for the control of vehicle generated dust. The glycerine was mixed in water carts at a 2% solution and sprayed onto haul roads. During the 3 month trial period a number of studies were conducted to satisfy the requirements of the exemption looking at the possible impacts on groundwater and surface waters. Another study

examined the breakdown of the glycerine when applied on haul roads. The glycerine had to be tested to ensure its chemical attributes. Over the period of the trial, results of the chemical analysis returned some results outside the parameters set under the exemption. At the completion of the trial period reports of the studies were submitted to the EPA. Further work was undertaken over the rest of 2014 in an attempt to ascertain the source of the out of specification chemical analysis results of the glycerine. The trial was then suspended until the outcome of this investigation was known. A report was then submitted to the EPA outlining the results of this investigation into the anomalies. The anomalies arose out of differences in laboratory analytical capabilities and were not as result of sample contamination as was initially suspected.

A new Glycerine exemption was issued in November 2014 and is valid until May 2016. Trialling of the glycerine for dust suppression commenced in early 2015 with results well below the parameters set under this exemption. To date no glycerine has been recorded in surface water or groundwater analysis undertaken during May and November 2015 monitoring. During 2015 a total of 228,000 litres was received to site and applied to haul roads via water carts. A soil study across active haul road locations will be undertaken in March 2016 as well as further groundwater sampling during May 2016 before the application and subsequent exemption ends.

An additional PRP '*Coal Mine Wind Erosion of Exposed Land Assessment'* was enacted during October 2014 requiring an assessment of the exposed areas on site to be conducted as at the 31st December 2014. This report was submitted to the EPA at the end of March 2015 and can be found in Appendix 4.

Rix's Creek has trialled irrigating its blasted benches following a blast being initiated and levelled off prior to an excavator entering the area and removing the blasted dirt. This has helped saturate the top surface layer of the material forcing it to crust and prevent dust lift-off. The irrigation uses water from within the active mining area to essentially wet the area as if rainfall would. During 2016 Rix's Creek plans to extend the length of pipe to increase the size of coverage across a blasted area.

During 2016 a site-specific dust forecasting tool will be used to predict the potential for dust emissions being created on site and affecting air quality. This forecasting tool uses predictive met-data to highlight times throughout the day the operation may be affected. Based on this the operation can be modified before the high potential of dust to occur. This includes utilising increased supervisor inspections, additional water carts, re-schedule servicing of equipment, work lower in the pit, shut-down equipment, activate water sprays on stockpiles to name a few.

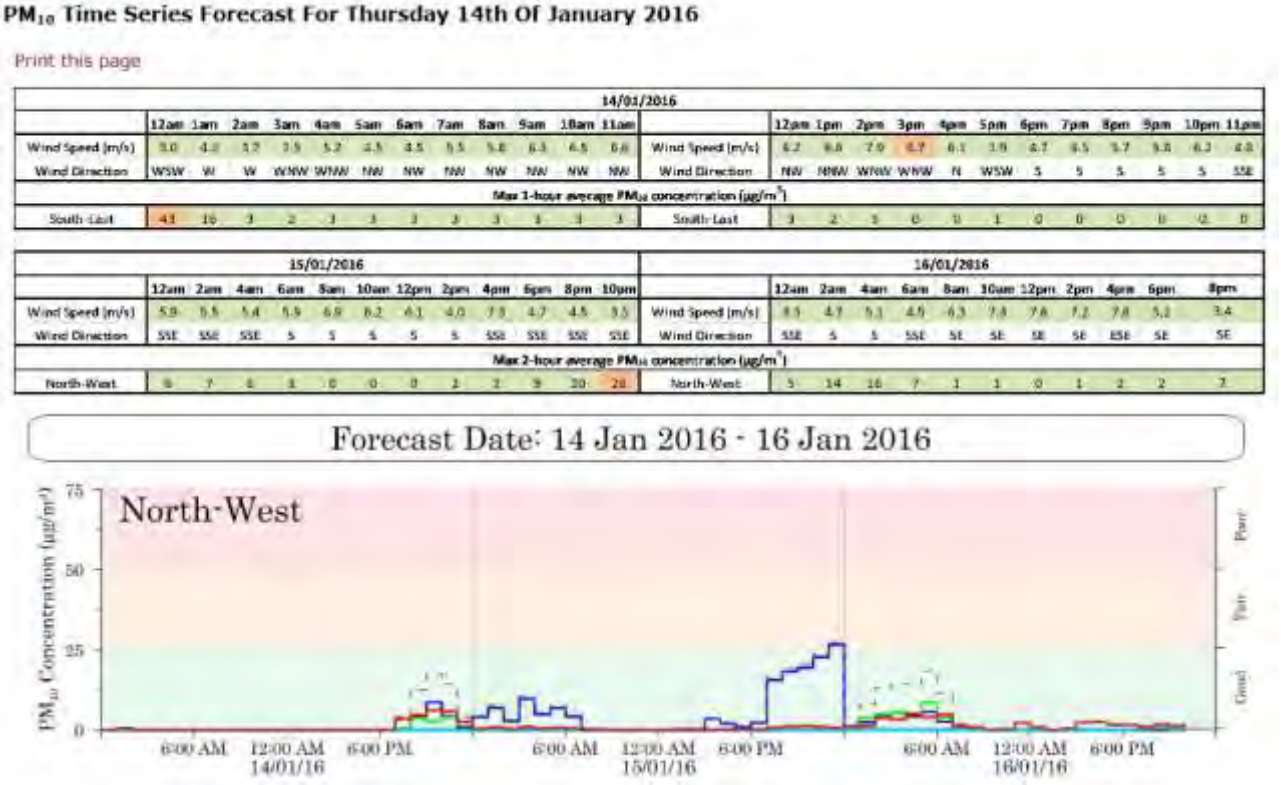


Plate. 1 Evidence of dust forecasting tool to assist operations during 2016 and beyond

6.4 Contaminated Polluted Land

6.4.1 Environmental Management

No contaminated or polluted land has been identified at Rix's Creek. No significant hydrocarbon or chemical spills accrued requiring special response, clean-up or ongoing management.

6.4.2 Environmental Performance

Quarterly inspections of hydrocarbon storage facilities are completed as part of the site EMS, and no land contamination or significant pollution incidents were reported during these inspections.

6.4.3 Reportable Incidents

No reportable incidents relating to land contamination occurred during the 2015 reporting period.

6.4.4 Further Improvements

The inspection regime is ongoing and management practises are in place to identify and control leaks or spills before they become contamination issues. The bioremediation area is regularly monitored and maintained as necessary. Signs were erected to this area following a 2014 inspection where it was recommended by DP&E to make site personnel more aware.

6.5 Threatened Flora and Fauna

6.5.1 Environmental Management

No threatened species have been identified on site in the EIS prepared for the operation or since then as the operation has progressed. No area of significant habitat exists on the site. "*The site has been extensively disturbed as a result of previous land uses and similar species and habitats exist in surrounding areas. No rare or endangered plant or animal species were observed during the study or are likely to occur on the site."* Environmental Impact Statement for Proposed Modification of Mining Operations – Rix's Creek Coal Mine, November 1994.

6.5.2 Environmental Performance

Areas of timber clearing were undertaken in advance of Pit 3 and for haul road access to the Pit 3 out of pit dump. No threatened flora and fauna issues were encountered during clearing operations.

6.5.3 Reportable Incidents

No reportable incidents relating to flora and fauna management occurred during the 2015 reporting period.

6.5.4 Further Improvements

Trees associated with timber clearing of good structural value are re-used in the creation of fence posts for the site. Timber ahead of Pit 3 was used for the construction of approximately 500 ironbark split posts stored on-site for future fencing. Several cleared trees were also placed onto rehabilitation areas for alternative habitat.

Rix's Creek is a participating member of the Upper Hunter Strategic Assessment (UHSA) with likely impacts on threatened biodiversity being assessed using the Biodiversity Certification Assessment Methodology (BCAM). BCAM is being used to quantify biodiversity value as ecosystem or threatened species credits.

6.6 Weeds & Pests

6.6.1 Environmental Management

A weed control program is undertaken on site each year. During the year areas were targeted to control African Boxthorn, Mother of Millions, Prickly/Creeping/Tiger Pear, Paterson's Curse, Blue Heliotrope, Galenia, St. John's wart, Scotch/Safron thistle, Cotton bush, Lantana, Castor Oil, Green Cestrum, Bitou bush, Pampas grass and African Olive. During January extensive Pear control was carried out across rehabilitated areas on the South Pit dump, North Pit Dump topsoil stockpiles and undisturbed land ahead of the West Pit operations which followed up on November 2014 spraying. The first quarter of 2015 was focussed on Pear control works on the entire site with focus on the West Pit pre-strip undisturbed areas. The second quarter of 2015 was focussed on Mother of Millions mostly in remnant vegetation adjoining rehabilitated areas. The third quarter of 2015 focussed on Galenia across all rehabilitation areas on site. The last quarter of 2015 was focused on African Olive control across adjoining adjustment land and within several rehabilitation areas. The works were done to minimise the spread of African olive from undisturbed areas into rehabilitation areas. Assorted weeds and grasses surrounding site infrastructure and topsoil stockpiles were also controlled as required.

Throughout May, 1080 Wild Dog Baiting was undertaken across site in consultation with LHPA's aerial baiting in surrounding areas. During April Kangaroo culling was conducted on site. During October and November a qualified pest control contractor sprayed the entire site with odourless chemical prior to summer.

6.6.2 Environmental Performance

The following weed species have been identified and treated on-site during 2015:-

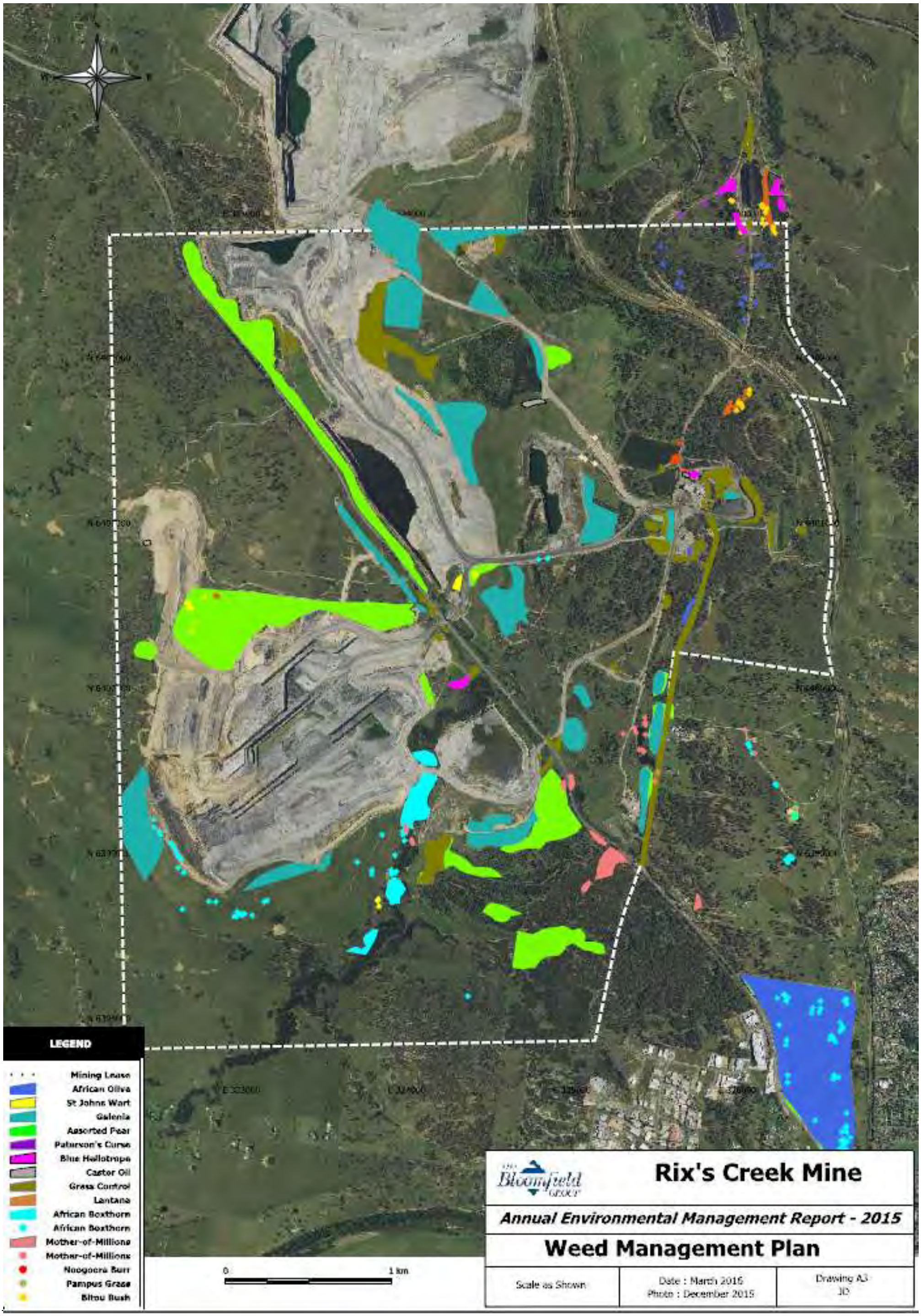
- Mother-of-millions, *Bryophyllum* spp. (class 3);
- Galenia, *Galenia pubescens* (non noxious – class 4 Tamworth);
- Pampas grass, *Cortaderia* spp. (class 4);
- Prickly pear, *Cylindropuntia* spp. (class 4);
- Creeping pear, *Cylindropuntia* spp. (class 4);
- Tiger pear, *Cylindropuntia* spp. (class 4);
- African boxthorn, *Lycium ferocissimum* (class 4);
- St John's wort, *Hypericum perforatum* (class 4);
- Paterson's curse, *Echium plantaginuem* (class 4);
- Castor Oil, *Ricinus communis* (non noxious – class 4 Sydney area);
- Blue Heliotrope, *Heliotropium amplexicaule* (non noxious - class 4 outside of Singleton LGA);
- Cotton bush, *Gomphocarpus fruticosus* (non noxious);
- Green Cestrum, *Cestrum parqui* (class 3);
- Bitou bush, *Chrysanthemoides monilifera* (non-noxious – class 3/4 out of Singleton LGA);
- Lantana, *Lantana* spp. (class 4);
- Noogoora burr, *Xanthium occidentale* (class 4); and
- African Olive, *Olea europaea subspecies Africana* (class 4).

The following 1080 baits have been laid on site during 2015:

- 20 ground meat baits (targeting wild dogs) during Autumn.

The Autumn 1080 baiting program was aligned with the Upper Hunter 1080 Wild Dog Aerial baiting program. During this period Rix's Creek also undertook their Kangaroo culling program.

During April, qualified open range shooters conducted a Kangaroo culling program across site. The shooting was undertaken across five nights (across several weeks) with 204 Eastern Grey Kangaroo's (*Macropus giganteus*) culled and tagged with tags supplied by National Parks and Wildlife Service (NPWS). NPWS also provided approval for meat to be taken off-site and provided to local Wild Dog Associations for wild dog control during the May aerial baiting program as well as ground baiting for wild dog control in the local area. The total meat provided for baiting purposes totaled 1050 kg from 204 culled Kangaroos in which Wild Dog Associations and the LHPA typically struggle for funding.


LEGEND
Mining Lease
African Olive
St Johns Wart
Galenia
Assorted Pear
Paterson's Curse
Blue Heliotrope
Castor Oil
Grass Control
Lantana
African Boxthorn
African Boxthorn
Mother-of-Millions
Mother-of-Millions
Noogoora Burr
Pampas Grass
Bitou Bush
0
1 km
The Bloomfield Group
Rix's Creek Mine
Annual Environmental Management Report - 2015
Weed Management Plan
Scale as Shown
Date : March 2016
Photo : December 2015
Drawing A3
3D

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6.6.3 Reportable Incidents

No reportable incidents relating to weed and/or pest management occurred during the 2015 reporting period.

6.6.4 Further Improvements

An annual weed spraying program is undertaken to control the weeds listed in section 3.8.2. The following weed species have been identified on-site and will be managed as practicable in 2016:-

- Prickly pear, *Cylindropuntia* spp. (class 4);
- Galenia, *Galenia pubescens* (non noxious – class 4 Tamworth); and
- African Olive, *Olea europaea subspecies Africana* (class 4).

Several goats have been seen around site and disturbing rehabilitation areas. These will be monitored and managed where possible during 2016. Continuation of Kangaroo culling program aligned with the annual wild dog aerial baiting program for Upper Hunter and WDA's requirements will also continue during 2016.

6.7 Visual, Stray Light

6.7.1 Environmental Management

It is a Development Consent requirement to direct or screen floodlighting away from residences and roads.

Progressive rehabilitation of mining disturbed land is the main strategy for minimising visual impacts from Rix's Creek. As well as providing a safe and stable landform, one of the key objectives of rehabilitation planning is to provide vegetated landforms that blend with the surrounding landscape.

6.7.2 Environmental Performance

There is a standard operational procedure for lights not to be directed towards the New England Highway, main northern railway line or towards local residences.

6.7.3 Reportable Incidents

No incidents were recorded during the reporting period relating to lighting.

6.7.4 Further Improvements.

There has been an ongoing maintenance program replacing existing older lights with new modern LED lighting that shields and directs light more towards the ground surface rather than outwards.
Rix's Creek personnel conducting attended noise monitoring also inspect for any lights not compliant with the site's development consent and report to the shift supervisor.

6.8 Aboriginal Heritage

6.8.1 Environmental Management

Aboriginal heritage issues identified in the EIS have been addressed. Application was made and Consent No:- SZ 163 granted on 25/5/97 under Section 90 of National Parks and Wildlife Act , 1974 to Carry out the Destruction of an Aboriginal Relic/Place. The Consent was issued in relation to Aboriginal sites NWP #37-6-244 and #37-6-245.

6.8.2 Environmental Performance

The Company has given an undertaking to the Wonnarua Tribal Council Inc. to widen the exclusion from mining corridor to 40 m along the western side of Rix's Creek before mining commences in Pit 3 – West Pit. The sites listed as R1, R2, 12 and 15 will be fenced around to ensure they are not damaged during the life of mining. This was maintained in 2015.

The Company also agreed to leave a 40 metre buffer strip along Rix's Creek to preserve any possible Aboriginal heritage sites that may be associated with the Creek that were not identified.

Aboriginal sites within the mine path were identified and HLA-Envirosciences Pty Limited (now AECOM Australia) were engaged to prepare a section 90 'Consent to Destroy' application and research design for the investigation and mitigation of several known sites within the Rix's Creek mining lease.

An initial inspection and investigation of the sites took place in December 2006 involving members of the Aboriginal community. Following from this an application for Consent to Destroy was submitted to Department of Environment and Conservation in early April 2007. Approval for the Consent to Destroy was given in November 2007. Collection of artefacts took place in December 2007. One area was partially under water as the site was located on the edge of a dam. This area was revisited in February 2009 when the water was drained from the dam and the area dry. Only a few small artefacts were identified and collected.

During 2013 the proposed Rix's Creek rail loop was examined by AECOM and several Aboriginal community members for inspection and investigation of any potential sites. The construction of this rail loop did not commence during 2015.

During 2014 the proposed Rix's Creek Continuation Project area was examined by AECOM and several Aboriginal community members for inspection and investigation of any potential sites (archaeological due diligence assessment).

6.8.3 Reportable Incidents

No artefacts were identified during operations over the 2015 reporting period.

6.8.4 Further Improvements.

It was decided to replace the collected artefacts under the Section 90 Consent to Destroy to an area protected from mining adjacent to Rix's Creek. This area was initially identified as a potential artefact site. The area is in the bend of the Creek and has been fenced to exclude access. When the study of the artefacts has concluded then they will be placed in this area.

The next step for the Rix's Creek Continuation project will be the development of an Aboriginal Cultural Heritage Management Plan which will set out procedures for the management of Aboriginal cultural heritage within the disturbance footprint of the project.

6.9 Natural Heritage

6.9.1 Environmental Management

The Rix's Creek Coke Ovens and associated works adjacent to Rix's Creek Lane are the subject of an Order made under Section 130 (1) of the Heritage Act, 1997. The order was made on 23/7/82.

The Rix's Creek Coke Ovens are also classified by the Natural Trust of Australia and are included in the Trust Register.

As such the Company prepared in 1989 a Rix's Creek Coke Ovens Conservation Plan. The Plan outlines the measures the Company has put in place and operational controls to conserve the area.

The Plan was reviewed during 2004 by Peter Lonergan of Cracknell & Lonergan a heritage architect. The following recommendations were made:-

> *17. It is my opinion that any active conservation to the fabric is unwarranted and inappropriate. The ovens ceased operation some 60 years prior to the conservation plan and now 15 years later little further deterioration has*

occurred, or is evident.

6.9.2 Environmental Performance

A program of cutting and cleaning the dead wood around the area was undertaken during 2006 and weed control over the area is undertaken as necessary. Mother-of-Millions weeds around the area were sprayed again this year as well as assorted Pear (*Opuntia spp.*) species. Some scattered African Boxthorn weed species were also found and sprayed as necessary. Galenia was sprayed across several old spoil heaps. Restricted access and security of the area has been maintained throughout 2015.

6.9.3 Reportable Incidents

There were no reportable incidents in relation to natural heritage during the 2015 reporting period.

6.9.4 Further Improvements.

The program of protection of the Coke oven area will continue. Annual inspections are undertaken of the area. Any weeds identified will be sprayed. Vegetation maintenance may be required as necessary.

6.10 Spontaneous Combustion

6.10.1 Environmental Management

The coal seams mined at the site are not susceptible to spontaneous combustion. All stockpiles are however inspected regularly to check for heating of the material. Any coal mined and not able to be washed is stockpiled in-pit onto overburden where no combustible materials surround it.

6.10.2 Environmental Performance

N/A

6.10.3 Reportable Incidents

There were no reportable incidents relating to spontaneous combustion during the 2015 reporting period.

6.10.4 Further Improvements.

Monitoring of stockpiles will continue as an ongoing operational procedure.

6.11 Bushfire

6.12.1 Environmental Management

Fuel reduction programs are undertaken on an as needed basis and done in conjunction with the local Rural Fire Service (RFS).

6.12.2 Environmental Performance

A bushfire was ignited via a passing motorist on the New England Highway September. The fire burnt remnant vegetation within the 100 m mining exclusion zone from the highway centreline towards the North Pit mining. The approximate area burnt was one hectare with the fire contained by the RFS who accessed via the New England Highway.

A slashing program was undertaken regularly to reduce fuel loads. As well as reducing fuel loads mulching this material into the surface will enhance the rehabilitation through improved nutrient recycling as the material decomposes over time. Excessive grass and weeds were sprayed around

site infrastructure to further reduce fuel loads. Rix's Creek and AustGrid also conducted spraying and mulching of power line easements across site throughout the year.

Grazing of cattle was undertaken around mining activities to apply grazing pressure to land ahead of the West Pit during 2015. This will continue in 2016 as the mining operation continues in a north-westerly direction along the New England Highway. Some cattle were also brought onto a 55 hectare area of west pit pasture rehabilitation fenced in December 2015 for further reduction of fuel loads.

During 2014 Rix's Creek purchased a property and existing four-bay shed in Maison Dieu in which the shed is provided to the Rural Fire Service – Darlington brigade in sponsorship by the Bloomfield Group at no cost. This sponsorship continued in 2015.

6.12.3 Reportable Incidents

There was one bushfire on the New England Highway fence line near the North Pit highwall / mining void during the 2015 reporting period. This was contained by the RFS.

6.12.4 Further Improvements.

Fuel reduction programs are undertaken on an as needed basis and done in conjunction with the local Rural Fire Service and local landholders. Areas of land owned within the lease and outside of the active mining area and rehabilitated areas will continually be leased to lessee's to graze cattle in a bid to minimise fuel loads across site.

6.13 Mine Subsidence

6.13.1 Environmental Management

Areas of the Rix's Creek mine site are undermined by historic underground workings. Sink holes associated with shallow workings are infrequent. If identified, the standard management procedure is to flag off and isolate the sink holes from access, back fill the holes and monitor for further subsidence. Once deemed stable, the area will then be rehabilitated and periodic inspections will continue.

6.13.2 Environmental Performance

One sink hole was identified during the reporting period. This was in an area of known pre-existing underground working's (shallow) near the coking ovens heritage area. The hole become exposed after heavy rainfall in April and was backfilled to minimise potential subsidence in the future.

6.13.3 Reportable Incidents

There were no reportable incidents in relation to mine subsidence during the 2015 reporting period.

6.13.4 Further Improvements

Identified sink holes will be remediated and the heritage areas will be protected. No other improvements to subsidence management are planned.

6.14 Hydrocarbon Contamination

6.14.1 Environmental Management

No areas of hydrocarbon contamination have been identified within the Rix's Creek lease area. Management is geared to contamination prevention. Procedures are in place on site to handle any hydrocarbon spills. Containment equipment is located in the store, site workshops, CHPP as well as the fuel farm.

Hydrocarbon storages at Rix's Creek consist of 3 bulk storage areas. The main fuel farm for distillate and lubrication oils for machinery. The second smaller area for hydrocarbons used in the CHPP and

the third a tank for processed oil/diesel for use in explosives.

The hydrocarbon storage areas have the storage tanks located within a bunded area capable of containing greater than 110 % of the largest storage tank. The bunded area is lined with an impervious 'Claymax' product barrier. Any fluids including water and hydrocarbons drain to a sump where the water is decanted and processed through an oil arrestor to remove any hydrocarbons. The hydrocarbons are directed to a waste oil tank for recycling. The water goes into the contaminated water system for recycling through the CHPP.

The refuelling fill-point drains to a sump where the water and any hydrocarbons are directed through the oil arrestor. Following the DP&E 2013 AEMR review and site inspection the fill-point area had a new bunded concrete apron installed during December 2014 to prevent diesel spilling on unsealed ground.

All machinery is fitted with quick fill mechanisms. The inlets and outlets, at the refuelling bay and mobile tanker are positively closed with an automatic cut off when full. This refuelling method is quick and minimises any potential for spillage during the refuelling operation.

6.14.2 Environmental Performance

There were no major hydrocarbon spills during the year. Any minor spills are cleaned up and any contaminated material is placed in a remediation area.

6.14.3 Reportable Incidents

Nil

6.14.4 Further Improvements

The use of S200 / Micro-blaze for minor hydrocarbon spills to assist in the breaking down of hydrocarbons via bacteria will continue during 2015. This technique has proven effective and was used several times throughout the year to clean up areas around the fuel farm, oil/water sumps, and equipment.

The site remediation area is regularly turned over via backhoe within each cell. Soil samples are taken for total petroleum hydrocarbons (TPH) in which the cell results are to be less than 1000 ppm. Once results are below this criteria it can be placed back into the open cut pit. Generally after the soil has been stored for a long period and has grassed over it is a good indication to conduct soil sampling.

6.15 Public Safety.

6.15.1 Environmental Management

Visual bunds were constructed along the New England Highway adjacent to the old Middle Fallbrook Road and the southern side of the Highway from Rix's Creek to the old 'Granbalang' entrance during 2008.

These bunds were sown with a cover crop and planted with tube stock to further screen the operation and blend in with the existing remaining trees retained along the edge of the Highway. Establishment of the trees was poor and these have been prepared for replanting during 2008. Replanting of these bunds took place in 2009 with high success rates aligned with good rainfall following planting.

New bunds ahead of the West Pit operation were completed during early 2014. These were seeded by hand with two hectares of tree species (facing the highway) and two hectares of pasture species (facing the West Pit). Several hundred Casuarina luehmannii (Bull Oak) species were also planted amongst the hand seeded area's to improve tree success. To date a lot of seedlings have germinated in the area.

Fences along the New England Highway were checked during the year and repaired as necessary with 'No Trespassing' signs replaced every 100 m along the fences on both sides of the New England

Highway in which the lease intersects. Gates along the New England Highway as well as bordering rehabilitation areas were chained secure during the 2015 period to prevent unauthorised access.

6.15.2 Environmental Performance

There was illegal entry gained near the New England Highway with several tree's felled and timber cut and removed from site. Police were notified of the illegal access and with assistance from adjacent landholders the illegal trespassers details were provided to the police for further action.

6.15.3 Reportable Incidents

One public safety incident was reported to police during the 2015 reporting period.

6.15.4 Further Improvements

The installation of more visual bunds will be placed along the Highway corridor of the West Pit ahead of the operation during 2016/17 and rehabilitated to final landform design to improve the West Pit's visual amenity. These bunds will be installed beside the 2014 created highway bunds. A colorbond fence was also installed during 2014 alongside Rix's Creek cut and cover tunnel for further visual amenity between the tunnel and a visual bund. An additional 2030 tube stock were also planted during autumn 2015 to further screen the mining operation from passing motorists.

No other overall improvements are planned to manage public safety, however Rix's Creek will continue to maintain existing fencing, gates, barriers and signage.

SECTION 7 WATER MANAGEMENT

7.1 Water Licences

Rix's Creek has the following licences:

Water License #	Water sharing plan, sources and management zone (as applicable)	Entitlement
20AL203407	Regulated River (General Security)	159 Units
20AL203406	Regulated River (General Security)	49.5 Units
20AL203405	Regulated River (General Security)	49.5 Units
20AL203405	Domestic & Stock	24 Units
20AL209899	Water sharing plan – Hunter unregulated and alluvial water sources 2009	150 Units
20AL207389	Water sharing plan – Hunter unregulated and alluvial water sources 2009	5 Units
20WA209901	Water sharing plan – Hunter unregulated and alluvial water sources 2009	300 Units
20BL170863	Open Cut (dewatering groundwater) Hard Rock	100 ML
20BL170864	1 x Bore (dewatering groundwater)	100 ML
20BL168734	1 x Bore (monitoring bore)	1 ML
20AL209919	Water sharing plan – Hunter unregulated and alluvial water sources 2009	91 Units
20WA201499	Water sharing plan – Hunter unregulated and alluvial water sources 2009	1 Units

7.2 Water Management

A Water Management Plan was developed for the site during the year (2010) as part of the development consent modification approval requirements for the cut and cover tunnel. This included a site water balance for the operation. A sample static water balance was calculated for (2015) providing information on inputs and outputs for the site and the results are shown in Table 19.

Table 19. Sample Static Water Balance (2015)

Water Stream	2015 (ML)
Inputs	
Imported Fresh Water	0
Imported Potable	10
Groundwater Seepage To Open Cuts	47
Underground Dewatering	0
Rainfall Runoff – Into Dirty Water System	2,747
Recycled to CHPP from Tails & Storage (not included in total)	(262)
Water from ROM Coal	189
Total Inputs	**3,003**
Outputs	
Groundwater Seepage Out	0
Dust Suppression – Water Carts	620
Exported to Other Mines – Dirty Water	0

Evaporation Fans & Sprays	0
Evaporation - Mine Water & Tailings Dams	449
Entrained in Process Waste	402
Water in Product Coal	123
Potable Usage	10
Total Outputs	**1,604**
Estimated Change in Pit Storage (increased)	**1,389**

* Note. As a first preference contaminated water is used in the coal preparation plant and for dust suppression before water from clean water dams is utilised.

Water requirements on site are normally met from stored water. There are 3 clean water dams, total capacity 95 ML and 2 mine water dam's capacity 44 ML. CWD 4 is now in the dirty water system and the capacity is approximately 335 ML. The West Pit dam or DWD 3 capacity is 33.5 ML and this is the primary source of water for the newer water cart fill station in the West Pit. The old north pit void is also used to store mine water and has a capacity of some 1,100 ML. This was previously thought to be 2,473 ML prior to underground water seepage during May 2012 restricting the volume of water stored in this area.

Table 20. Model Catchment Areas to Rix's Creek storages and runoff volumes from 2015

Catchment	Area (ha)	Runoff (ML)	Classification
North Pit Storage	62 28 42 102 30.6		Mining Are (Surface only) Undisturbed Roads/Industrial/Hardstand (Surface only) Spoil – Unrehabilitated Rehabilitated Spoils
Subtotal*	**264.6**	1041	
Old North Pit	4.5 14.2 4.4		Mining Area (Surface only) Spoil - Unrehabilitated Roads/Industrial/Hardstand (Surface only)
Subtotal*	85.4 **108.5**	294	Rehabilitated Spoils
CWD4-DWD4 + DWD1	87.6 1.8 68.7 28.9		Undisturbed Spoil – Unrehabilitated Rehabilitated Spoils Roads/Industrial/Hardstand (Surface only)
Subtotal*	**183.4**	417	
DWD2	2 12.5		Roads/Industrial/Hardstand (Surface only) Spoil - Unrehabilitated
Subtotal*	14.5	26	
DWD3	0.4 1.5 1.2 1.8		Roads/Industrial/Hardstand (Surface only) Undisturbed Rehabilitated Spoils Spoil - Unrehabilitated
	4.9	31	
Old South Pit-Tailing Dam 3	10.7 11.4		Tailing Dam Surface Spoil - Unrehabilitated
Subtotal*	**22.1**	165	
Coal Loader Storage	10.8		Undisturbed

Subtotal*	5 **2.9** **18.7**	51	Roads/Industrial/Hardstand (Surface only) Coal Pads
West Pit Storage Subtotal*	115.1 58.7 17.6 1.8 1.0 **194.2**	723	Mining Pit (Surface only) Spoil – Unrehabilitated Roads/Industrial/Hardstand (Surface only) Rehabilitated Spoils Undisturbed
TOTAL	**810.9**	**2748**	

Table 21 provides a summary of water stored on site during the reporting period.
Water levels in storage were high throughout the year due to periods of significant rainfall well above average which included April (257.5 mm) and December (142 mm) 2015. During the year no water was pumped from Glennies Creek using allocation owned by the Company and temporary transfer. The Company has acquired general security water licences with a total of 100 ML allocation. Water licenses are also held that allow for the harvesting of some 655ML on site.

No water was taken from Vale – Integra 'Glennies Creek' underground mine during 2015. The last water transferred was during 2006 when Rix's Creek received 110 ML of recycled water from the Underground Mine.

Mine water dams are used to manage contaminated water from disturbed areas and water make from the active mining areas. Water is also pumped from old underground workings on site to supplement surface storage when necessary. These workings are also used to store water during wet periods. In times of above average rainfall excessive contaminated water from active mining operations within Pit 1 and Pit 3 is transferred to the tailings dam (tailing's dam # 4), however, this is not preferential. This water is recycled to the coal preparation plant and provides one of the major sources of supply for the coal preparation plant.

In terms of a mid-term contingency plan, Rix's Creek plan are modelling forecast water storages each year to determine whether water is required to be imported or discharged from site via an off-site model managed by a water consultant. In terms of long-term contingency plan Rix's Creek may require a discharge point to be installed in order to manage water in times of above average rainfall in which water storages are near 100% water capacity and unable to handle large rainfall events.

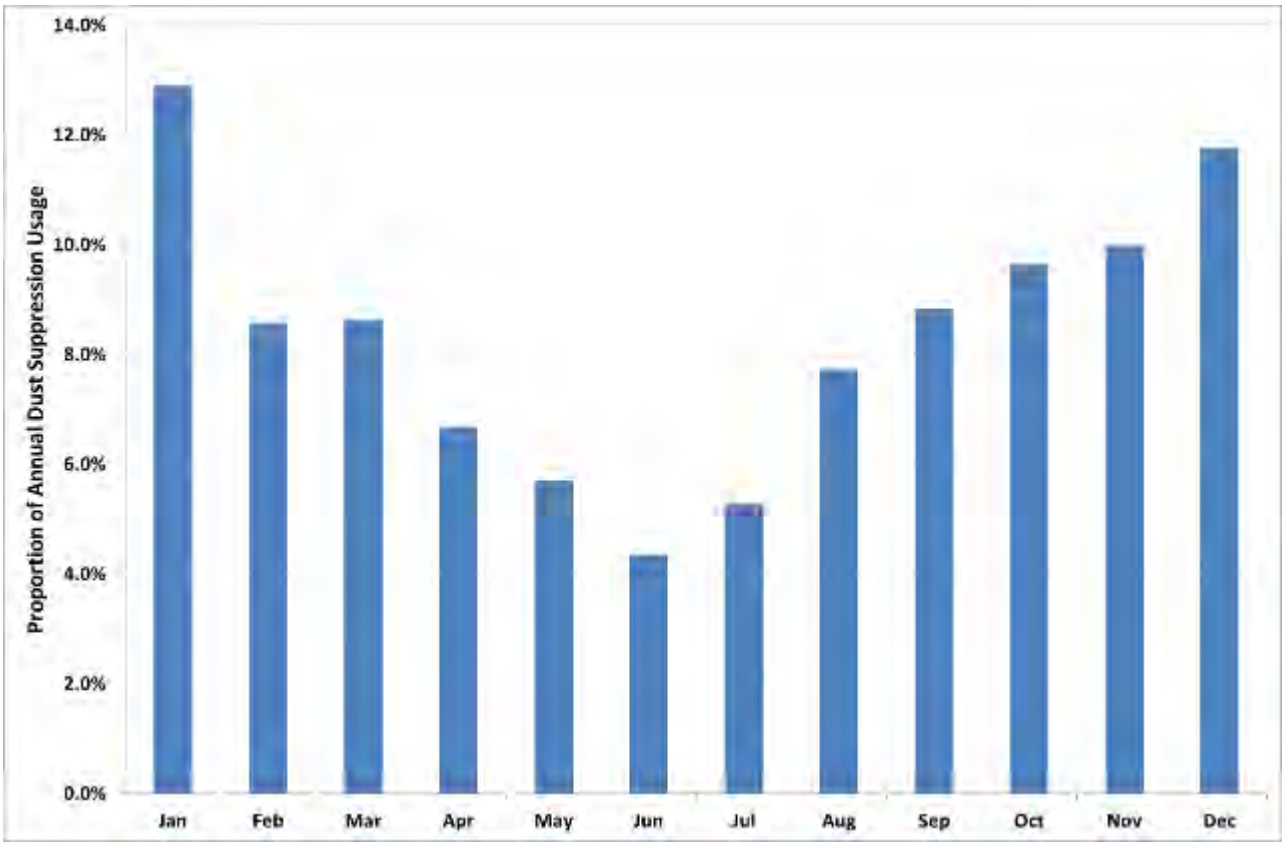
Table 21. Stored Water during 2015

(If more than one storage of each type, list separately)	**Volumes held (cubic metres)**		
	Start of Reporting Period	**At end of Reporting Period**	**Storage Capacity**
Clean water	CWD 1 – 9 ML CWD 2 – 7 ML CWD 6 – 62 ML Sediment Dam Pit 3 – East – 8 ML Sediment Dam Pit 3 – West – 8 ML Sediment Dam – North – 8 ML	CWD 1 – 10 ML CWD 2 – 10 ML CWD 6 – 75 ML Sediment Dam Pit 3 – East – 10 ML Sediment Dam Pit 3 – West – 10 ML Sediment Dam – North – 10 ML	CWD 1 – 10 ML CWD 2 – 10 ML CWD 6 – 75 ML Sediment Dam Pit 3 – East – 10 ML Sediment Dam Pit 3 – West – 10 ML Sediment Dam – North – 10 ML
Dirty water	DWD 1 – 28 ML DWD 2 – 14 ML CWD 4 – 215 ML Rail Loader – 28 ML Old North Pit - 852 ML West Pit Dam – 32 ML	DWD 1 – 27 ML DWD 2 – 15 ML CWD 4 – 312 ML Rail Loader - 38 ML Old North Pit - 907 ML West Pit Dam – 33 ML	DWD 1 – 28 ML DWD 2 – 16 ML CWD 4 – 335 ML Rail Loader – 38 ML Old North Pit - 1,100 ML West Pit Dam – 33.5 ML
Controlled discharge	Nil	Nil	Nil

water (salinity trading schemes)			
Contaminated water	Nil	Nil	Nil
Regulated Allocation water from Glennies Creek	Nil		

Potable water for the bathhouse and administration building was delivered on site from Singleton town water supply. A pipeline allows potable water to be supplied directly from this supply. This can be seen in Table 19.

The major water use on site is the coal preparation plant requiring 20 ML per week. However a large proportion of this is recycled from the tailings emplacement situated in the North Pit (Pit 1) void. At present this void and subsequent decant has an approximate remaining capacity of 0 ML (at the end of the reporting period water was at its maximum level) with this number fluctuating as disused tailings from the coal preparation plant accumulate below the dirty water surface and water is continually pumped off the top of the settled tailings. Approximately 130.3 ML is lost in product coal per year.
Dust suppression consumes between 3 - 10 ML per week depending on seasonal conditions. This variance can be seen in the following graph. The highest percentage months are in the warmer periods such as January and December.



As a first preference contaminated water is used in the coal preparation plant and for dust suppression before water is utilised from the clean water storage dams. Fresh water usage is minimised as best as possible. Fresh water imported from Singleton Council reservoir is taken at an average rate of 10 ML/year. This is added to the 2015 Sample Static Water Balance.

7.3 Surface Water

7.3.1 Environmental Management

The water management system at Rix's Creek as outlined in the EIS, has been designed with the primary objectives of:-

- segregation of uncontaminated, clean water runoff, from contaminated-mine water on site; and
- priority use of and safe disposal on site of contaminated water.

Clean Water

Runoff from undisturbed areas is directed away from mining operations through diversion banks and channels. The clean water is directed into Rix's Creek, which flows through the lease. North of the New England Highway the Creek consists of a number of flow lines in smaller catchments. South of the Highway Rix's Creek is a defined flow line amongst a belt of riparian vegetation.

Water quality is monitored in the Creek on a monthly basis when there is sufficient water to sample as Rix's Creek is an ephemeral stream. Water quality is also monitored in a smaller creek north of the operation labelled Deadman's Creek.

Contaminated Water

Runoff from disturbed areas is contained within a system of detention dams designed to allow settlement of the suspended solids. Runoff from active mining areas is pumped to the dirty water storages.

Tailings from the coal beneficiation process are directed to the emplacement area and water decanted off the tailing's dam surface is recycled through the coal handling and preparation plant.

First priority is given to the use of contaminated water in mine operations. Contaminated water is used in the coal beneficiation process and for dust suppression via water carts for haul road watering and spraying coal stockpiles.

Hunter River Salinity Trading Scheme

Rix's Creek is a member of the Hunter River Trading Scheme holding 5 salt credits. Rix's Creek is classified as a non-discharging credit holder. Although Rix's Creek is a member of the scheme there has been no need to discharge saline water and the instrumentation necessary to participate in the scheme was not installed. As a consequence, Rix's Creek is unable to discharge and EPA has subsequently revoked the discharge component of the Environmental Protection Licence.
Credits are traded to other operations when required. Rix's Creek has traded credits to Glencore (formally Xstrata) in the past for example.

7.3.2 Environmental Performance

Rix's Creek runs the length of the mining lease area. A small portion on the east side of the site adjacent to Rix's Creek Lane is drained by a tributary of Rix's Creek, known as 'Stone Quarry Gully'. Grab samples are taken from the Creek in four locations. They are:-

- Site 1 - Railway Underpass, as the Creek enters the site;
- Site 2 - New England Highway Bridge, at the mid-point through the mine site;
- Site 10 – Below Operation, on Rix's Creek below the operation; and
- Site 3 - Maison Dieu Road Bridge, after the Creek has left the site.

Sampling site locations are indicated on Plan 1. Samples are taken on a monthly basis. Above average rainfall was received during January, April, November and December. Throughout 2015 the Creek was dry until subsequently high rainfall in April. In addition to monthly sampling, the Creek is also sampled under flow conditions to monitor conditions considered more representative of the water quality in Rix's Creek during flow. Due to the drier than normal conditions of 2012, 2013 and 2014 there was minimal flow to the creek throughout the start of the year until April 2015. Due to the high rainfall and subsequent flow during April, the annual full suite analysis monitoring was also conducted during this month to give a good representation of water quality.

Table 22 to Table 23 show results of the analysis and Figure 32, Figure 33, Figure 34 and Figure

35 being graphical representations of these results.

Grab samples are analysed for water quality parameters of pH, electrical conductivity, total dissolved solids and total suspended solids. The water samples are analysed by Steel River Testing Mayfield as well as ALS Laboratory Group at Warabrook. Both laboratories are registered by the National Association of Testing Authorities, Australia.

Yearly rainfall was 263.75 mm above average for 2015 at 961.75 mm (See Figure 1 Annual Rainfall 2015) Historical averages at Singleton Post Office (1881- 1967) is 698 mm.

Annual rainfall results are seen for the last 17 years:-

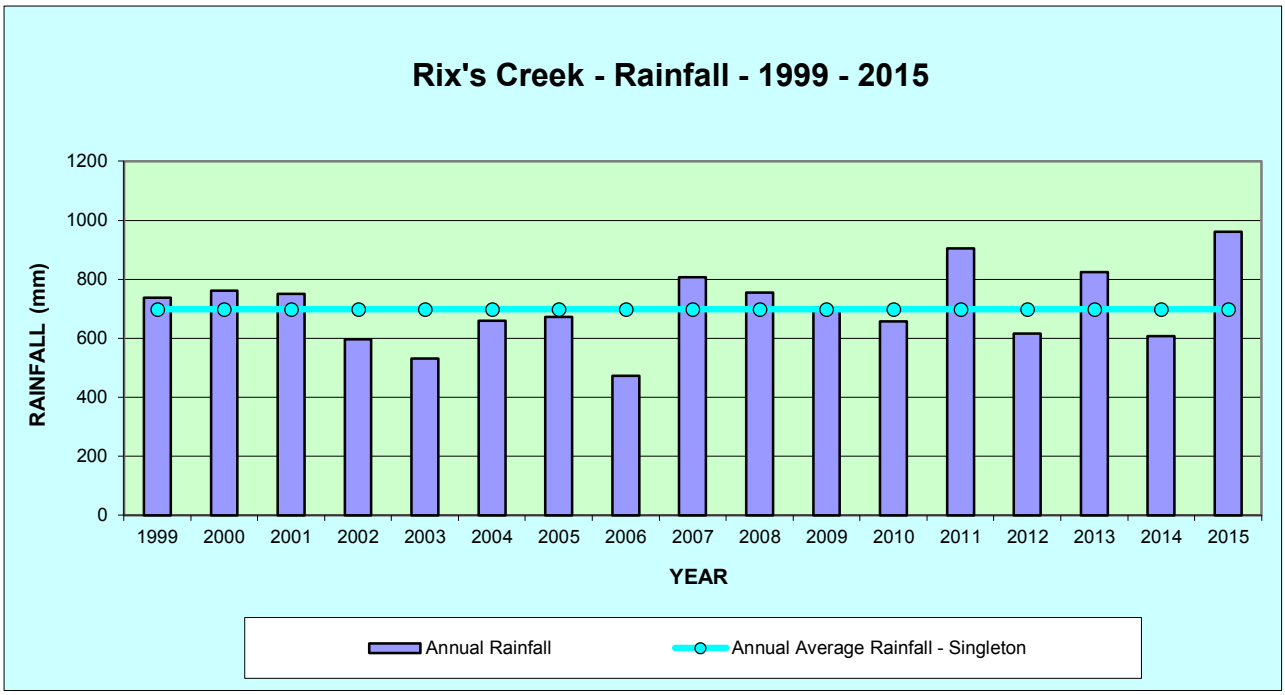


Figure 31. Annual rainfall at Rix's Creek 1999-2015

The rainfall and flows in Rix's Creek again highlight the irregular weather pattern in the Hunter Valley. The water quality in Rix's Creek reflects its ephemeral nature being affected by rainfall events and resultant flow / no flow conditions.

Table 22. Rix's Creek (Site 1 – Railway Underpass) Water Quality 2015

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	Flow	7.3	97	203	299
27/02/2015	Nil	7.8	21	255	384
31/03/2015	Nil	8.2	8	350	492
27/04/2015	Flow	7.43	8	215	259
27/05/2015	Nil	7.4	51	283	426
30/06/2015	No	7.1	15	614	473
28/07/2015	No	7.6	11	653	445
27/08/2015	Trickle	7.5	4	378	439
30/09/2015	No	8.6	6	635	563
20/10/2015	No	9.4	20	749	737
25/11/2015	No	7.8	16	305	403
14/12/2015	No	8.5	14	332	452

Table 23. Rix's Creek (Site 2 - New England Highway) Water Quality 2015

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	Flow	7.3	34	213	325
27/02/2015	Nil	7.3	91	426	556
31/03/2015	Dry	-	-	-	-
27/04/2015	Flow	7.34	7	310	579
27/05/2015	Nil	7.6	15	384	635
30/06/2015	No	7.3	9	930	950
28/07/2015	No	7.4	7	665	896
27/08/2015	Flow	7.5	11	513	698
30/09/2015	Dry	-	-	-	-
20/10/2015	Dry	-	-	-	-
25/11/2015	No	7.1	30	448	681
14/12/2015	Dry	-	-	-	-

Table 24. Rix's Creek (Site 10 - Below Operation) Water Quality 2015

DATE	Flow	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	Flow	7.6	39	259	293
27/02/2015	Nil	7.3	7	348	518
31/03/2015	Dry	-	-	-	-
27/04/2015	Flow	7.65	<5	342	567
27/05/2015	Nil	7.7	17	327	494
30/06/2015	No	7.6	15	639	1138
28/07/2015	No	7.3	9	721	1010
27/08/2015	Flow	7.8	20	510	785
30/09/2015	Dry	-	-	-	-
20/10/2015	Dry	-	-	-	-
25/11/2015	No	7.3	15	484	647
14/12/2015	No	7.3	49	433	805

Table 25. Rix's Creek (Site 3 - Maison Dieu) Water Quality 2015

DATE	FLOW	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	Flow	7.3	64	197	238
27/02/2015	Nil	7.6	29	351	533
31/03/2015	Dry	-	-	-	-
27/04/2015	Flow	7.16	6	482	876
27/05/2015	Trickle	7.3	30	411	691
30/06/2015	No	7.2	19	790	1392
28/07/2015	Trickle	7.3	6	1650	2850
27/08/2015	Flow	7.3	20	630	833
30/09/2015	Dry	-	-	-	-
20/10/2015	Dry	-	-	-	-
25/11/2015	No	7.3	23	537	832
14/12/2015	No	7.6	26	697	1184

The **pH** of Rix's Creek (Figure 32) during 2015 ranged between 7.1 (June) at the Railway Underpass and 9.4 (October) at the Railway Underpass under nil flow conditions. The pH trend in the Creek is to decrease under flow conditions and increase in times of nil flow. The decrease in pH under flow conditions reflects the acidic nature of rainfall. The trends and results are consistent with previous year's results.

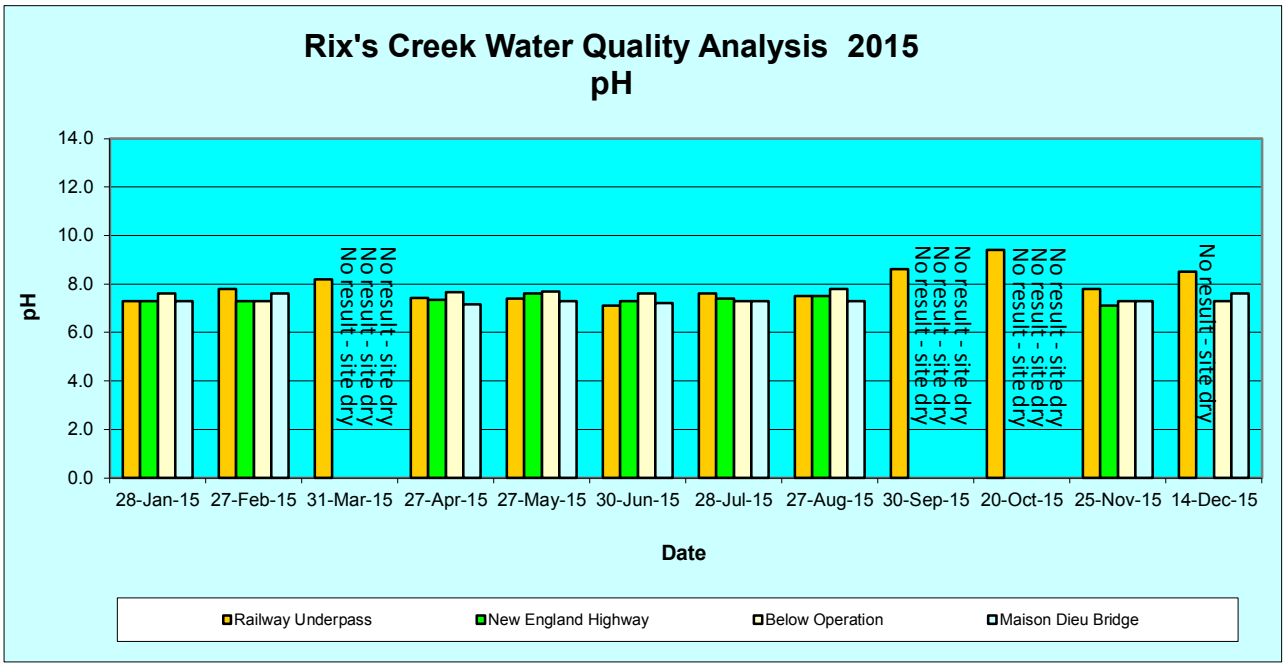


Figure 32 Rix's Creek Water Quality 2015 - pH.

Total dissolved solids (Figure 33) ranged from 197 mg/l (January) – Maison Dieu Bridge to 1,650 mg/l (July) – Maison Dieu Bridge. The high results in June and July reflect dry conditions in the Creek. The high July result for the Maison Dieu Bridge site is an example of this due to dry conditions in June and July. The trend with total dissolved solids is to decrease in the lower catchment and again this is consistent with previous year's results. The trend under flow conditions shows a general decrease down the catchment reflecting a flushing of the Creek with fresh water. Again this is dependent on the size of the flow. The higher the runoff and resultant flow, produces greater decreases in total dissolved solids results throughout the catchment.

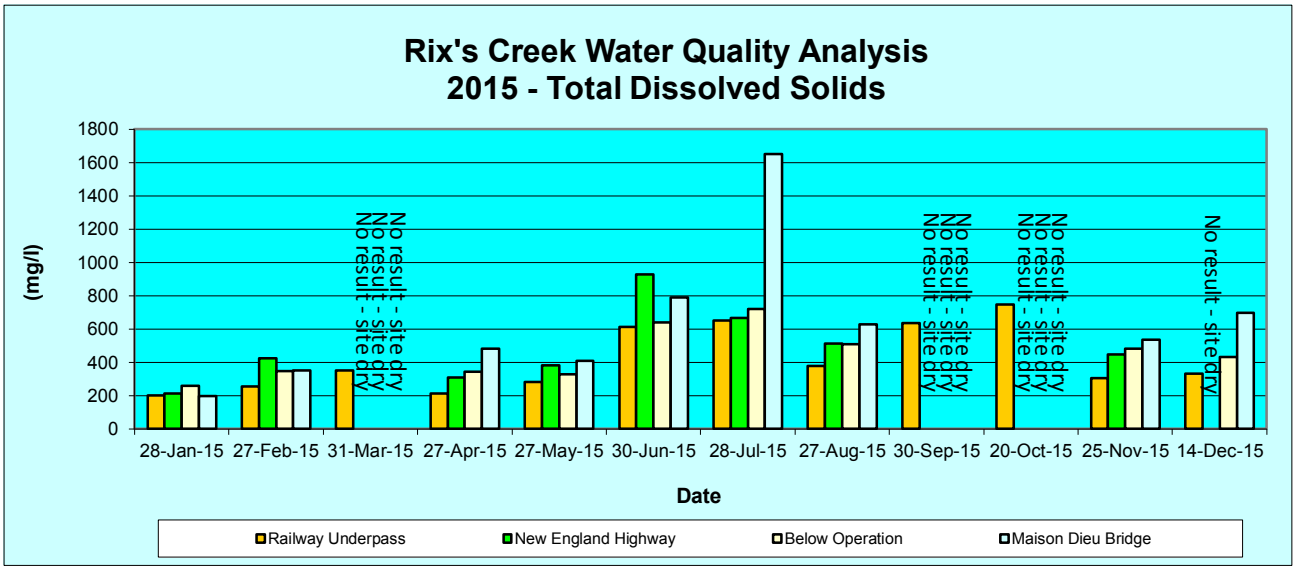


Figure 33 Rix's Creek Water Quality 2015 - Total Dissolved Solids

Total suspended solids (Figure 34) results ranged from 4 mg/l (August) at the Railway Underpass site under no flow conditions to 97 mg/l (January) at the Railway Underpass site with a low flow following several months of the site having no flow. The general trend is for levels to increase down the catchment under flow conditions. The past trend is an indication that the water flowing in the Creek increases the sediment load down the catchment. The May result depicts this after heavy April rainfall.

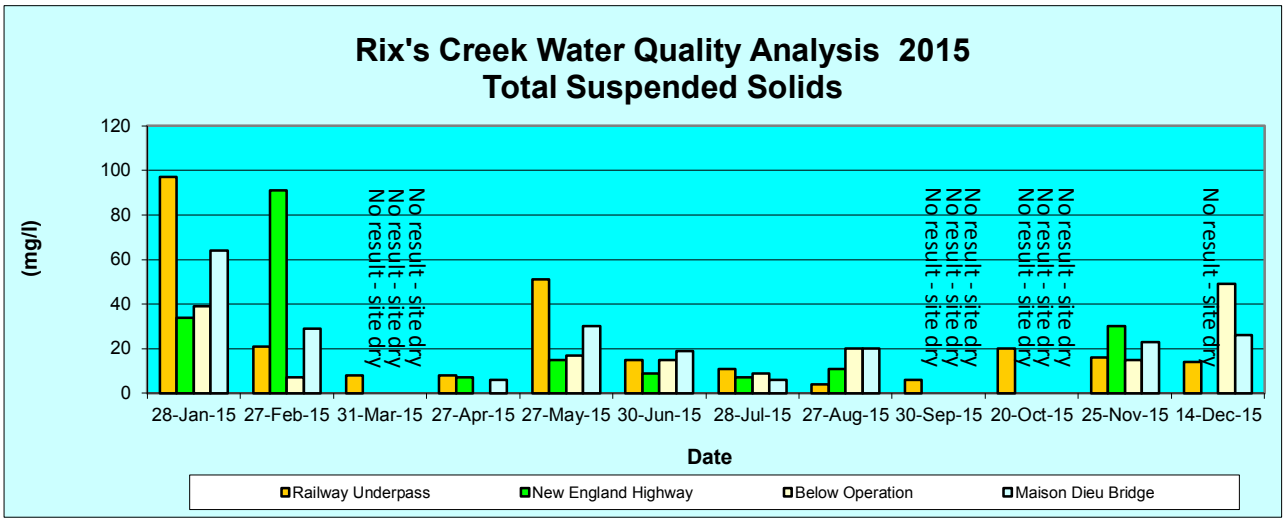


Figure 34 Rix's Creek Water Quality 2015 - Total Suspended Solids

The water quality parameter of **salinity** measured as specific conductance - electrical conductivity (EC) Figure 36 tends to mirror total dissolved solids Figure 33. The results under flow conditions typically decrease down the catchment reflecting a flushing of the Creek with clean runoff water. During times of no flow the salinity increases at all sites, as the water becomes stagnant. This is evident from June and July at all four sites which were lower than average rainfall months. Results ranged from 238 uS/cm (January) at the Maison Dieu Bridge site to 2850 uS/cm (July) at the Maison Dieu Bridge. The high July result at the Maison Dieu site occurred due to the dry conditions and minimal creek flow in the months prior to the next rainfall event (November).

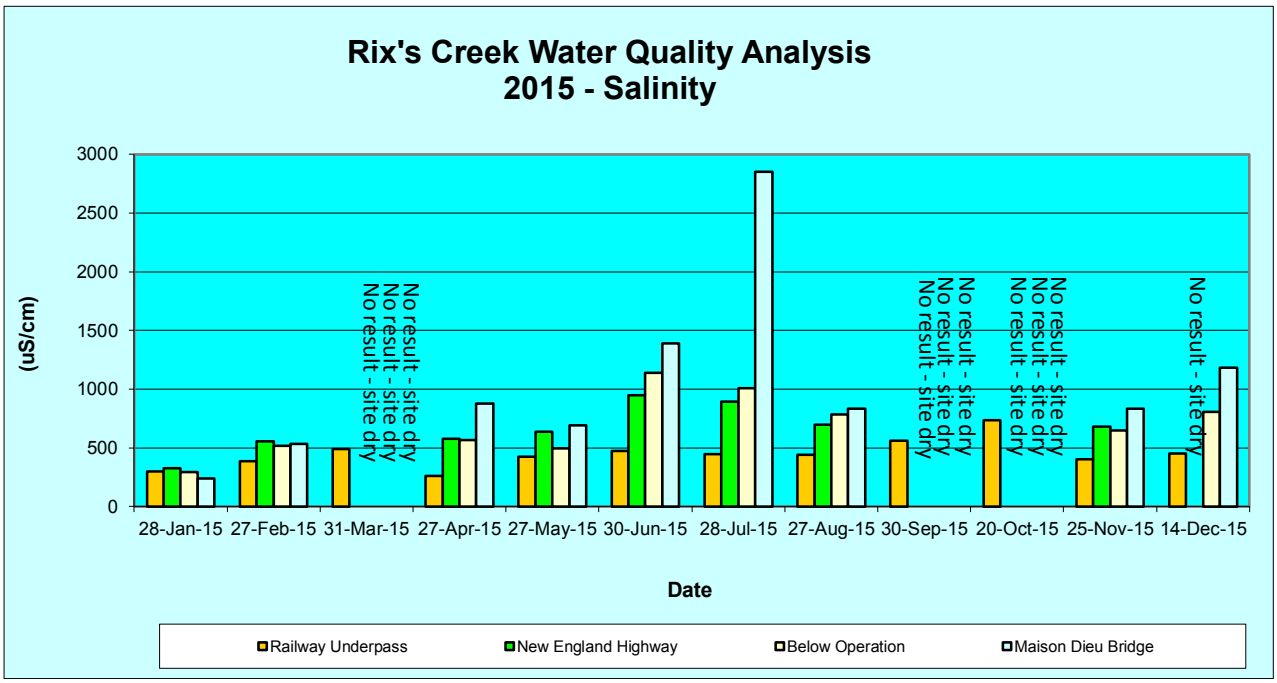


Figure 35 Rix's Creek Water Quality 2015 - Electrical Conductivity (Salinity)

The variations in water quality throughout the catchment are dependent on the amount of rainfall and resultant runoff flushing stagnant water through the catchment. During times of nil flow the pH, electrical conductivity and total dissolved solids increase. Conversely total suspended solids are highest following storm events.

Water storage dams 1, 2, and 6 are sampled and analysed monthly. The locations of these dams are shown on Figure 1 with the relationship being:-

Site 4 - Clean Water Dam 1 - (CWD 1)
Site 5 - Clean Water Dam 2 - (CWD 2)
Site 7 - Clean Water Dam 6 - (CWD 6)

These results are indicative of site variations that occur as a result of soil qualities and weather patterns.

Table 26. Clean Water Dam 1 (CWD 1) Water Quality 2015

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	6.6	54	93	66
27/02/2015	6.7	11	124	104
31/03/2015	6.9	16	140	149
27/04/2015	7.07	8	150	158
27/05/2015	7.0	19	185	170
30/06/2015	7.0	8	191	225
28/07/2015	7.2	7	249	212
27/08/2015	7.0	9	269	244
30/09/2015	8.4	6	398	279
20/10/2015	8.5	5	490	262
25/11/2015	8.9	7	176	254
14/12/2015	9.7	1	238	263

The water quality in water storages from undisturbed catchments on site is of higher quality i.e. lower salinity. See Table 26, Table 27 and Table 28.

pH ranged from 6.6 (CWD 1) to 9.7 (CWD 1). Salinity ranged from 66 *u*S/cm (CWD 1) to 290 *u*S/cm (CWD 6). TSS ranged from 1 mg/l (CWD 1 and CWD 2) to 54 mg/l (CWD 1). TSS levels are generally higher in low salinity water, as higher salt concentrations act to flocculate the suspended clay particles settling them out of suspension.

Table 27. Clean Water Dam 2 (CWD 2) Water Quality 2015

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	6.8	38	96	131
27/02/2015	6.8	11	132	129
31/03/2015	7.2	16	143	183
27/04/2015	7.01	6	154	133
27/05/2015	7.1	13	156	156
30/06/2015	7.0	16	148	189
28/07/2015	7.3	4	247	160
27/08/2015	7.1	9	178	181
30/09/2015	7.7	25	159	212
20/10/2015	7.9	9	146	203
25/11/2015	8.6	1	133	223
14/12/2015	8.3	3	208	260

Table 28. Clean Water Dam (CWD 6) Water Quality 2015

DATE	pH	TOTAL SUSPENDED SOLIDS mg/l	TOTAL DISSOLVED SOLIDS mg/l	SPECIFIC CONDUCTANCE *u*S/cm
28/01/2015	7.5	15	134	244
27/02/2015	7.9	14	198	271
31/03/2015	8	14	218	290
27/04/2015	7.32	18	171	154
27/05/2015	7.3	8	119	190
30/06/2015	7.3	19	190	226
28/07/2015	7.7	6	235	218
27/08/2015	7.6	3	247	219
30/09/2015	7.8	27	208	244
20/10/2015	8.1	19	212	238
25/11/2015	7.9	17	216	280
14/12/2015	8.1	16	243	290

7.3.3 Reportable Incidents

There was one reportable incident relating to water during the 2015 reporting period. This occurred during April 2015 and can be found in Appendix 4. Subsequently all site sediment dams were cleaned as necessary during June/July 2015 with sediment placed within overburden dumps on site. This is detailed in Section 7.5.

7.3.4 Further Improvements

The surface monitoring program developed as part of the Water Management Plan includes annual analysis for major ions. Surface water monitoring results will be compared to impact assessment criteria trigger levels for any exceedances of the criteria. Where it is determined the exceedance is attributed to mining operations further investigations will be undertaken as per the "Surface Water Impact Assessment Criteria, Trigger Levels and Response Plan Rix's Creek Open Cut Coal Mine." The trigger levels were previously greater than 99th percentile (1st and 99th percentile pH), however, the Department of Planning met with Rix's Creek during September 2013 to review the Water Management Plan for site and determined the 95 percentile (5th and 95th for pH) would be more suited for site trigger levels. The 95 percentile was used as a trigger level for all 2015 results.

During 2015 Rix's Creek additionally monitored several sites before (dams) and along Dead Man's Creek as per the monthly surface water regime for internal reference. This will continue during 2016.

7.4 Ground Water

7.4.1 Environmental Management

The Groundwater Monitoring Plan is an integral component of the Water Management Plan. The plan identifies locations and schedule for monitoring.

A number of groundwater monitoring sites have been identified to enable the development of a suitable groundwater monitoring network. In May 2010, five standpipe piezometer monitoring bores were installed (BH1 to BH5) along with an existing production bore (20BL170864). During 2015 an additional two standpipe piezometer monitoring bores were installed (BH7 and BH8) these make up the monitoring network.

Groundwater monitoring continued in 2015, with quarterly monitoring of field parameters including:- Electrical conductivity (EC), Total dissolved solids (TDS) and pH. Annual sampling was undertaken for comprehensive laboratory analysis of a broader suite of parameters including:

- Physical properties (EC, TDS, and pH);
- Major cations and anions (Ca, Mg, Na, K, Cl, SO4, HC)3 and CO3);
- Nutrients;
- Dissolved metals; and
- TPH / TRH.

During the May and November rounds of monitoring additional analysis was undertaken for BH3, BH4 and BH5 regarding glycerine monitoring requirements. These additional sampling parameters included:

- Dissolved oxygen; and
- Glycerine.

The development of open cut mines has the potential to form a sink into which groundwater will flow from the coal measures and therefore control the piezometric head immediately around the pit. Due to the very low hydraulic conductivities of the mined seams and minor seepages noted to date, this impact is expected to be limited to the area immediately around the pits. There are likely to be limited regional groundwater level drawdown impacts as a result of current mine activities and these will be confined to the basin structure that contains the Rix's Creek mine site.

Other mining activities that have the potential to impact groundwater levels and quality are:

- Tailings emplacement area - groundwater pollution;
- Spoils and emplacement – contribution of salt to surface water and groundwater;
- Surface water bodies – these may locally control groundwater levels in surrounding spoil and Permian strata; and
- Waste dumps & Coal Handling plant – surface water runoff and associated water quality issues.

Low pit inflows observed to date, combined with the lower hydraulic conductivities of the mined coal seams expected at depth, suggest that groundwater drawdown from mining in the proposed continuation of mining will not emanate outside the basin structure (which falls within the Mine Lease).

7.4.2 Environmental Performance

Data collected during the groundwater monitoring included:-

- Analyses of groundwater level and water quality data

Four piezometers are installed into the Permian coal measures and three into overlaying regolith. Their locations are shown on Figure 37. Piezometers BH1, BH2, BH5 and BH7 are the deeper bore holes into the coal measures while Piezometers BH3, BH4 and BH8 are shallow into the overlying regolith. The monitoring network also included the existing production bore 20BL170864. Piezometer BH6 was proposed but not constructed due to several problems when drilling during 2015, hence BH8 was drilled in its place.

Table 29. Rix's Creek Groundwater Monitoring Network

Bore ID	Easting (UTM84)	Northing (UTM84)	Type	Depth (mbgl)	Location	Screened Aquifer
BH1	323190	6400562	Standpipe Piezometer	130	Middle of basin	Upper / Lower Arties
BH2	322936	6401923	Standpipe Piezometer	90	West of basin, close to outcrop	Lower Barrett
BH3	325457	6401923	Standpipe Piezometer	11	East of waste dump / backfill area	Regolith and shallow coal seams
BH4	323982	6398666	Standpipe Piezometer	10	Rix's Creek south of Pit 3	Regolith
BH5	324562	6399924	Standpipe Piezometer	66.5	East of Rix's Creek / tailings emplacement area	Lower Barrett
20BL170864	324633	6400335	Production bore	~70	Above underground workings	All coal seams
BH7	323345	6401709	Standpipe Piezometer	200.5	Bottom of basin	Hebden
BH8	321803	6401175	Standpipe Piezometer	20	Dead Man's Creek west of coal outcrop	Regolith

Figure 36. Groundwater Monitoring Network

Groundwater Levels

Groundwater level monitoring was monitored on a monthly basis in all piezometers and the existing bore (20BL170864) which intercepts the underground workings during January to November in 2011. After approval of Rix's Creek Water Management Plan 2011 (WMP) by NSW Office of Water (NOW) groundwater level monitoring has been undertaken on a quarterly basis from 2012 to 2015.

A water level transducer placed in BH4 during November 2012 is set to record groundwater levels at 12 hourly intervals. This enables the groundwater levels to be compared against surface water flows in Rix's Creek. An additional water level transducer was installed during May 2015 in BH8 to compare surface water flows in Dead Man's Creek.

The groundwater levels are presented in Figure 37 and data collected to date show that:-

- BH1 which monitors the Upper Arties seams to the north of Pit 3, revealed a groundwater level head of about 17 - 22 m above the base of the Arties seam (31.58 - 37.48 mAHD) prior to insufficient water in the bore expected by dewatering as Pit 3 moves north-west towards the bore. This bore was replaced in 2015 with BH8. BH8 measured 82.78 – 82.92 mAHD since being installed;
- The groundwater elevations within the underground working (which extends down to the Barrett seam) and BH5 (which monitors the Lower Barrett seam, between the old underground workings and Pit 2) are 55.46 – 58.65 mAHD and 52.55 – 56.05 mAHD, respectively;
- Groundwater levels in BH2 which was screened in the Lower Barrett Seam near the outcrop, suggest the seam has been dewatered in the area. This is mostly likely due to neighbouring influences of the Camberwell Open Cut Pit, which mined down to the Lower Barrett seam, rather than Pit 1, which mined down to the overlying Upper Liddell Seams. The groundwater elevation last recorded 49.06 mAHD in February 2012. Since this date no measurements have been recorded due to the peizometer being 'bent' preventing water level and bailer access. This bore was replaced in 2015 with BH7. BH7 measured 61.95 – 62.21 mAHD since being installed;
- BH3 which is screened in both the regolith and shallow coal measures reported groundwater elevations between 95.69 – 95.92 mAHD (4.31 – 4.08 m below the ground); and
- BH4 which is located 50 m to the east of Rix's Creek, revealed a groundwater elevation of 60.93 – 61.4 mAHD (2.07 – 1.60 m below ground level) which is similar to the floor of Rix's Creek (61 mAHD).

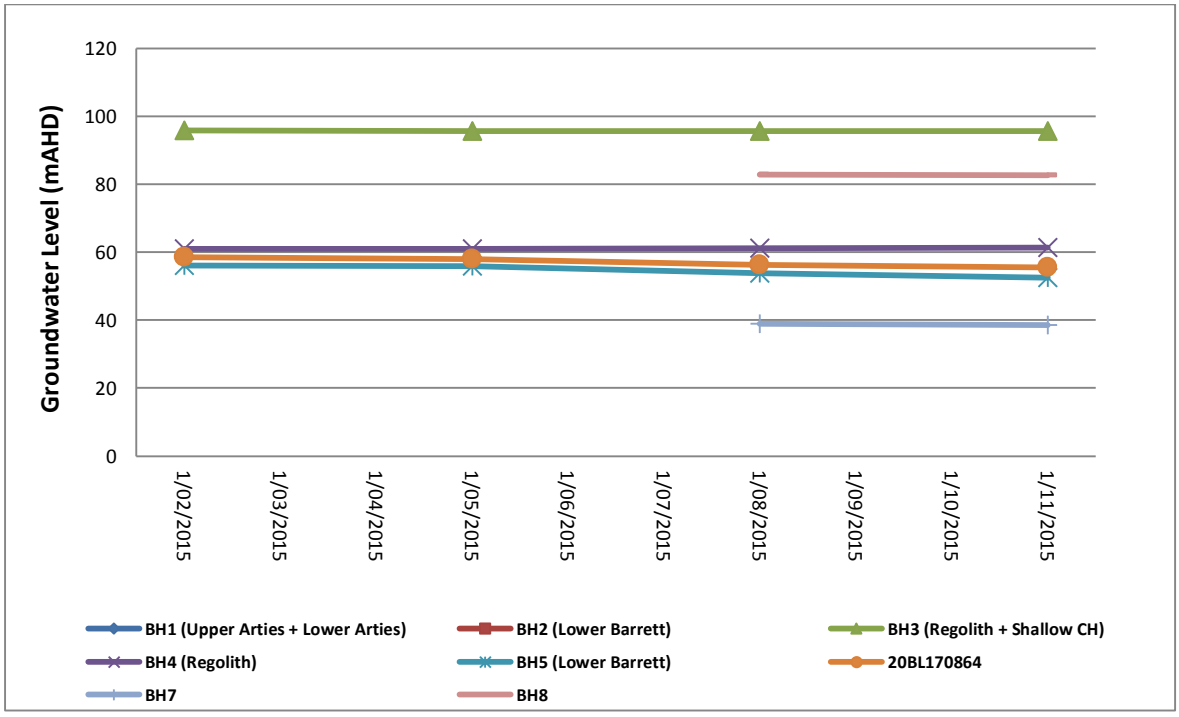


Figure 37. Hydrographs of BH1 to BH8 during 2015

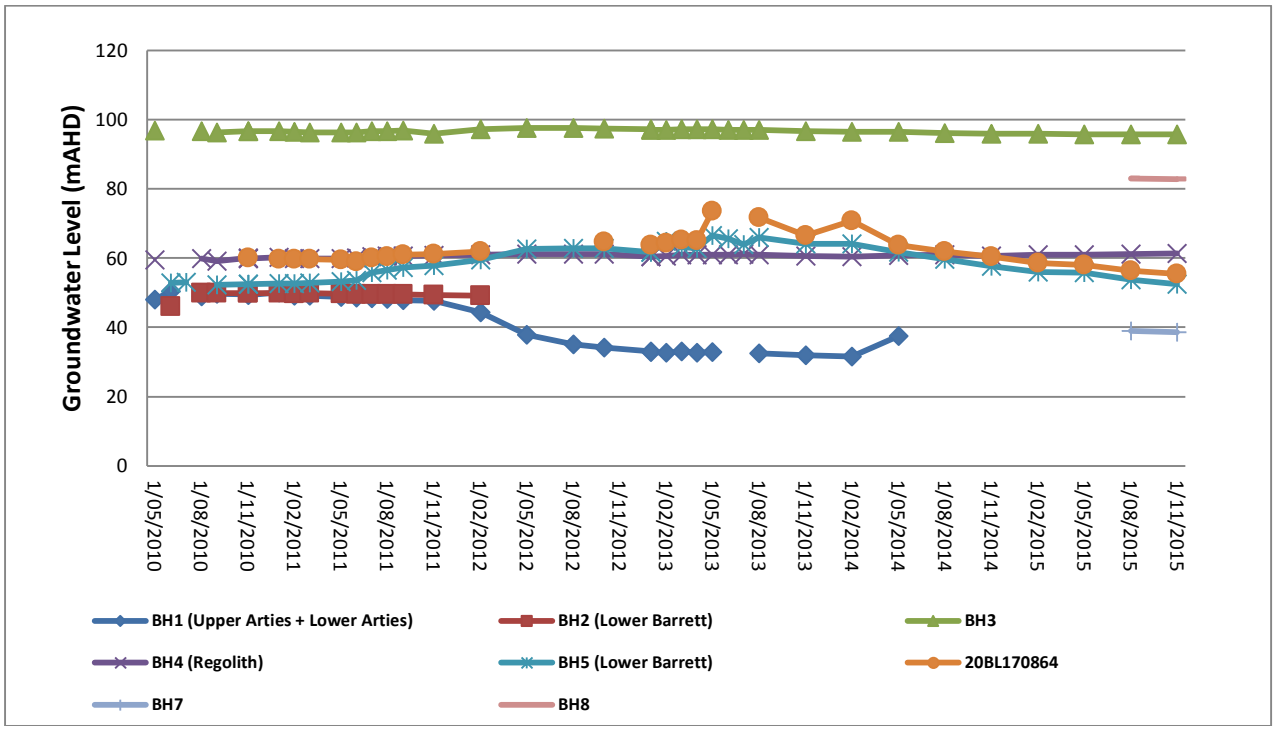


Figure 38. Hydrographs of BH1 to BH5 from 2010-2015

Figure 39 shows all six bores have remained fairly consistent since the commencement of monitoring ground water levels. Figure 40 also displays a consistent ground water EC (mS) throughout the period of monitoring. This is all consistent with the ground water monitoring showing that Rix's Creek open-cut is within a contained 'basin' where ground water is not impacted greatly by mining.

Groundwater Quality

Prior to collecting water samples the Piezometers were either pumped or bailed until at least 3 bore volumes had been purged to ensure that the samples were represented of the groundwater quality at the time of sampling. The samples were collected in laboratory prepared containers, stored on ice and submitted with a chain of custody to ALS Environmental Pty Ltd (ALS) on an annual basis. Their laboratory is NATA accredited for the analyses undertaken. Due to the depth of BH1 (81.42 mbgl) it is hard to recognise if the samples are representative of the groundwater quality in the bore. This is again shown in Figure 40 in which it is the only bore with a fluctuations of EC (26/7/2011 and 1/11/2011) evident since the commencement of monitoring.

The analyses included for BH1-BH5 & 20BL170864:

- General: pH, EC, total dissolved solids (TDS) and alkalinity;
- Major ions: Sulphate, chloride, calcium, magnesium, sodium, potassium, carbonate and bicarbonate (as CaCO3);
- Dissolved metals: Arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium and zinc;
- Nutrients: Nitrite (as N), nitrate (as N) and nitrite + nitrate (as N), total nitrogen, ammonia as N, total phosphorus as P; and
- Total Petroleum Hydrocarbons (TPH) and Total Recoverable Hydrocarbons (TRH).

Salinity

The average salinity values of the groundwater sampled from the screened bore in the coal seam (BH5) ranged between 4,620 to 6,370 mg/L showing high levels of salinity. BH2 is also within the coal seam but was unable to be sampled during 2015. The last time it was successfully sampled was November 2011. A replacement bore for BH2 was installed during July 2015 named BH7 which measured 3,880 mg/L in August 2015. The average salinity value within the regolith (BH3 and BH4) is also high ranging from 5,690 to 21,000 mg/L. These levels are all consistent with the sites WMP.

Over the monitoring period salinity levels are shown to remain constant in the coal seams and the regolith. This indicates limited connectivity with surface water and no water quality impacts from mining operations.

BH1 was unable to be sampled during 2015 due to dewatering. The last time it was successfully sampled in November 2012 it had an salinity value of 650 mg/L which may have been due to the bore being dewatered and/or sampled rainwater sitting in the bore casing with previous year's results being much higher. Relatively low salinity levels were also observed in BH1 prior to July 2011 which suggested mixing influences from the water that was used during the drilling process to flush the hole, and hence, values were not representative of the screened aquifer. The borehole was successfully purged and sampled using a submersible pump in July 2011. Analysis of this sample indicated much higher salinity levels (11,010 mg/L), which are consistent with typical groundwater salinities of coal measures.

Another new bore installed during July 2015 was BH8 which was installed near Dead Man's Gully Creek ahead and outside of the West Pit operation. This bore is a shallow bore adjacent to the Creek and measured salinity levels between 5,800 mg/L and 12,100 mg/L during the end of 2015.

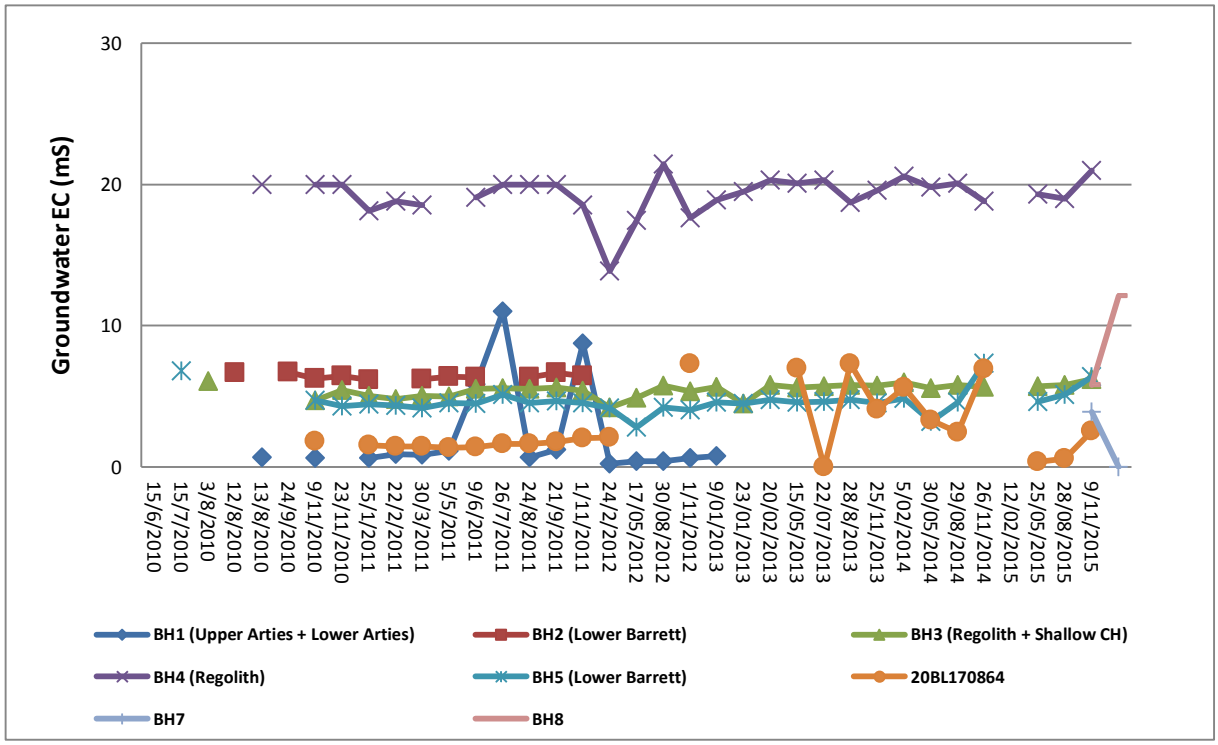


Figure 39. Hydrographs of BH1 to BH5 from 2010-2015

Figure 40 displays the EC across all bores since the commencement of monitoring. It is evident BH4 has the highest average salinity reading whilst BH1 had the lowest average readings across this time period. It is also worthwhile noting the frequency of monitoring changing from monthly (2010-2011) to quarterly (2012-present).

Major Ions

Aside from BH1 and BH2, groundwater samples collected from the piezometers showed a dominance in chloride ions in respect to bicarbonate and calcium ions, which is indicative of old ground waters, which are not readily recharged and/or are remote from recharge zones. This is particularly the case for BH4, which targets the shallow regolith near Rix's Creek. The high groundwater salinity (19,300 to 21,000 mg/L), suggests that ground waters within the regolith are not hydraulically connected to Rix's Creek, which is characterised by occasional surface water flows of much lower salinity (400 to 1,500 mg/L) typically.

Dissolved Metals

Comparison of the analysis results for dissolved metals against the ANZECC guideline values for the protection of Freshwater Ecosystems (ANZECC, 2000) shows a number of exceedances of the guideline values, as follows:

- Copper was detected above the freshwater ecosystem value limit of 0.0014 mg/L in BH3 and production bore 20BL170864 at concentrations of 0.036 and 0.028 mg/L respectively;
- Nickel was detected above the freshwater ecosystem value limit of 0.011 mg/L in BH3 at concentrations of 0.013; and
- Zinc was detected in piezometers BH3, production bore 20BL170864 and BH5 at concentrations of 0.070, 0.094 and 0.023 mg/L respectively, which exceeded the freshwater ecosystem guideline of 0.008 mg/L.

This is consistent with baseline studies showing in the Rix's Creek WMP that there is a number of exceedances of the guidelines values with arsenic, chromium, cadmium, copper, nickel and zinc.

Nutrients

Comparisons of the analyses for nutrients against the ANZECC guideline values for protection of Freshwater Ecosystems (ANZECC, 2000) shows a number of exceedances of the guideline values, as follows:

- Total kjeldahl nitrate concentration in 20BL170864 measured 1.02 mg/L, which exceeds the freshwater ecosystem protection guideline limit of 0.25 mg/L (Nitrate as N); and
- Total nitrogen concentration in all piezometers ranged from 0.4 to 3.4 mg/L, which exceeds the freshwater ecosystem protection guideline limit of 0.35 mg/L (Total N).

This is consistent with baseline studies showing in the Rix's Creek WMP that there is a number of exceedances of the guidelines values with total nitrogen concentrations, total kjeldahl nitrate and total phosphorus concentrations.

7.4.3 Reportable Incidents

No reportable incidents relating to groundwater pollution occurred during the 2015 reporting period.

7.4.4 Further Improvements

Now land has been purchased ahead of the Pit 3 operation, a new borehole (BH8) was established outside of the intended mining area as BH1 is dewatered and will be mined through within the next several years. This borehole is within close proximity to Dead Man's Creek. This borehole was placed outside of the Pit 3 rehabilitation to monitor ground water outside of the geology / basin of Rix's Creek mine and any influences on Dead Man's Creek. BH2 (bent bore) was also replaced by BH7 which is in a suitable location along the North Pit high wall approximately 500 m south-east of its previous location. Any other future bores will be dependent on the Rix's Creek Continuation of Mining project (2016 – beyond).
Groundwater monitoring results will be continually monitored in line with the site's approved Water Management Plan currently in place.

7.5 Erosion and Sediment

7.5.1 Environmental Management

Erosion and sedimentation control is an integral part of the water management across the entire site. Erosion control on reshaped and rehabilitation areas is achieved by having the minimum delay in time and area between the active mining operation and establishing rehabilitation. Revegetation of rehabilitation areas is undertaken as soon as an area becomes available with the aim to establishing a minimum of 70% ground cover, the level required to adequately control soil erosion. Accompanied with this is the use of sediment detention basins in front of the operation, along haulage roads and on drainage lines flowing from establishing rehabilitation areas.

Throughout July 2015 all sediment dams across site were de-silted whilst climatic conditions were dry allowing adequate access and works to take place. A lot of dams contained a high amount of sediment due to the April storm event. This required the use of a long-reach excavator. Several other smaller sediment dams and drainage lines were also cleaned via an on-site backhoe as required throughout the year. These sediment dams contain the same material as that excavated from the open cut operation as well as clays, soil and silt from the natural environment.

Plate. 2 Evidence of sediment dam cleaned out along North Pit haul road during July 2015

7.5.2 Environmental Performance

Total Suspended Solids (TSS) results from water sampling is used as a key indicator of sediment control. TSS results are discussed in Section 3.4 Surface Water Pollution.

7.5.3 Reportable Incidents

No reportable incidents relating to erosion and sediment occurred during the 2015 reporting period.

7.5.4 Further Improvements

An erosion and sediment control plan has been developed as part of a Water Management Plan. The plan was prepared in response to a condition of the approval for a modification to the development consent enabling the construction of a second crossing of the New England Highway (Modification #4). Relevant recommendations identified in the control plan will be incorporated into the operation as the mine progresses.
Any sediment collected within the light-vehicle wash-down pad, heavy-vehicle wash-down pad, diesel fill-point sump, electrical workshop sump, mechanical workshop sump are all cleaned regularly with the sediment particles relocated to the site bioremediation area.

SECTION 8 REHABILITATION

8.1 Buildings

Maintenance of structures is undertaken on as needs basis throughout the year. Throughout 2014 infrastructure sheds and structures were painted as necessary. The colour scheme is light green with this same colour utilised on the colorbond fencing installed adjacent to the bridge of the cut and cover tunnel as well as major infrastructure across the site.

8.2 Rehabilitation of Disturbed Land

Re-contouring, topsoil handling and revegetation techniques are generally well established at Rix's Creek and undertaken in accordance with the Bloomfield Mining Operations Land Rehabilitation Management System (LRMS).

The key elements of the LRMS include:-

- setting overall rehabilitation aim and objectives;
- developing appropriate rehabilitation indicators and completion criteria;
- undertaking land rehabilitation;
- developing and implementing a rehabilitation assessment program;
- continuing rehabilitation management and maintenance; and
- presenting a request for rehabilitation sign-off to regulators, supported by results from the assessment program.

The aim of rehabilitation at Rix's Creek Colliery is to reinstate the pre-mining land capability of grazing land, with stable landforms, compatible with the surrounding landscape, and allow for a range of possible post-mining land-uses such as agricultural lots. As of 2015 Rix's Creek is beginning to achieve large parcels of grazing land in which The Bloomfield Group is hopeful of purchasing cattle in the near future to assess if the pasture rehabilitation is sustainable long-term prior to sign-off. Pasture sampling for feed quality analysis has also been monitored since 2013 through a 4 ha trial on the North Pit rehabilitation to monitor the effectiveness of biosolids used in rehabilitation areas to gain a better understanding if the pasture rehabilitation will be sustainable long-term.

The rehabilitation is undertaken to meet the following objectives.

General

- Land will be rehabilitated in accordance with relevant NSW Department of Industry – Resources & Energy (DRE) standards applicable at the time of rehabilitation i.e. Mining Operations Plan (MOP) guidelines, September 2013.
- Rehabilitated land will represent a minimal source of offsite environmental impacts, such as dust, water pollution, visual amenity and weeds.
- Rehabilitated land will require ongoing management inputs no greater than similar adjacent land.
- Rehabilitation will be compatible with the proposed post-mining land-use.

Landform

- Rehabilitated land will be safe and stable.
- Land capability will be returned to a class similar to that existing prior to the commencement of mining.
- Mined land will be re-contoured to a landform compatible with the surrounding natural landscape.
- Reinstate a stable drainage network.

Vegetation

- Rehabilitated land will be topsoiled, fertilised and sown with grass and/or native vegetation species.
- A sustainable vegetation cover will be established on rehabilitated land.
- Grazing areas will be established with a range of species suitable for pasture production in the area.
    - An example of a species mix that may be used as per Rix's Creek MOP is:-
    - **Pasture mix #1** - Rhodes Grass, Couch, Rye, Sub. Clover, Wolly Pod Vetch, Green Panic, Sirosa Phalaris, Sephi Barrel Medic, Lucerne, and Kikuyu. All summer / winter active.

Pasture mix #1 was amended in the 2013 Rix's Creek MOP with Rhodes grass being restricted from previously used rates of 5 kg/ha back to 1 kg/ha to minimise potential for 'monocultures' of Rhodes grass being dominant in the pasture rehabilitation area.

- Tree areas will be established with native species by either direct seeding or tubestock planting techniques.
    - An example of a native species mix that may be used as per Rix's Creek MOP:-
    - **Tree mix #1** - *Eucalyptus crebra, E. fibrosa, , E. mollucana, E. melliodora, Corymbia maculate, Acacia decora, A. falcata, A. implexa, A. paradoxa, A. salicina, Casuarina luehmannii, Hardenbergia violacea*, and hybrid *Eucalyptus* spp. suitable for plantations.

Rehabilitation is generally carried out on a seasonal basis in Spring and Autumn. Cover crops used in pasture rehabilitation may be adjusted to suit the climatic conditions at time of sowing. Preferred species may also require adjustment due to availability.

During the reporting period a total of 21.7 ha were rehabilitated. A further breakdown of this can be seen in Table 30.

Table 30. 2015 Rehabilitation Summary

Locator	Site Name	Type	Date Sown	Species mix	Area (ha)
North Pit	9-ways tunnel batter	Pasture	February	Pasture #1	0.7
North Pit	RL140 (north of 4 ha trial area)	Pasture	March	Pasture #1	1.1
North Pit	RL140 north of tree stand (adjacent to TD#2)	Tree's	March	Tree #1	0.5
North Pit	RL140 Dump	Tree's	April	Tree #1	1.0
North Pit	RL140 Decommissioned road	Pasture	April	Pasture #1	2.0
West Pit	Valley facing Maison Dieu	Pasture	July	Pasture #2	2.0
North Pit	RL140 Dump	Pasture	July	Pasture #2	5.5
North Pit	RL140 Decommissioned road	Pasture	August	Pasture #2	1.6
West Pit	Out of Pit Dump (low batter)	Pasture	October	Pasture #1	2.4
West Pit	Out of Pit Dump (top batter)	Pasture	October	Pasture #1	1.5
North Pit	9-ways	Pasture	October	Pasture #1	0.9
North Pit	RL140 Dump	Pasture	November	Pasture #1	1.0
North Pit	RL140 Dump	Tree's	November	Tree #1	0.5

West Pit	Out of Pit Dump (low batter)	Pasture	November	Pasture #1	1.0
TOTAL 2015					**21.7**
CUMULATIVE TOTAL INCLUDING 2015					**396.1**

North Pit 9-ways tunnel batter

The North Pit 9-ways tunnel batter was rehabilitated in February 2015 totalling 0.7 ha. This area was direct seeded via tractor using pasture species (Pasture mix #1). The pasture species were seeded on the highway (eastern) facing side of the cut and cover tunnel to improve visual amenity for passing road users.

The 9-ways batter was created using overburden from the West Pit, clay and subsoil from the West Pit pre-strip, shaped into a 10 degree slope and overlaid with approximately 100-200 mm of topsoil using a D10 dozer. Topsoil was sourced from the freshly stripped West Pit pre-strip. Prior to seeding the area was spread with biosolids at a rate of 50 tonnes / hectare and ripped into the soil with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the rehabilitation area has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Early indications show a moderate to high rate of seedlings emerging. A cover crop was also applied to minimise the weed potential and provide good visual amenity to passing road users. Early indications also show some weed (prickly pear and galenia) which will be monitored and managed accordingly.

Plate. 3 North Pit – 9-ways tunnel batter (visible from New England Highway) – three months after seeding

North Pit RL140 (north of 4 ha pasture trial area)

The North Pit RL140 (north of 4 ha pasture trial area) was rehabilitated in March 2015 totalling 1.1 ha. This area was direct seeded via tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation to fill to final design level then clay and subsoil from the West Pit pre-strip was shaped onto a 2-10 degree slope of the area and overlaid with approximately 100-200 mm of topsoil using a D10 dozer. The topsoil was from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 80 tonnes / hectare and ripped into the soil with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Early indications show a moderate to high rate of seedlings emerging. A cover crop was also applied to stabilise the slope and minimise the weed potential. Early indications also show some weed (galenia) which will be monitored and managed accordingly. The area was also rock-rolled via a tractor and drum-roller during May 2015 minimising the amount of surface rocks creating a smoother pasture area.

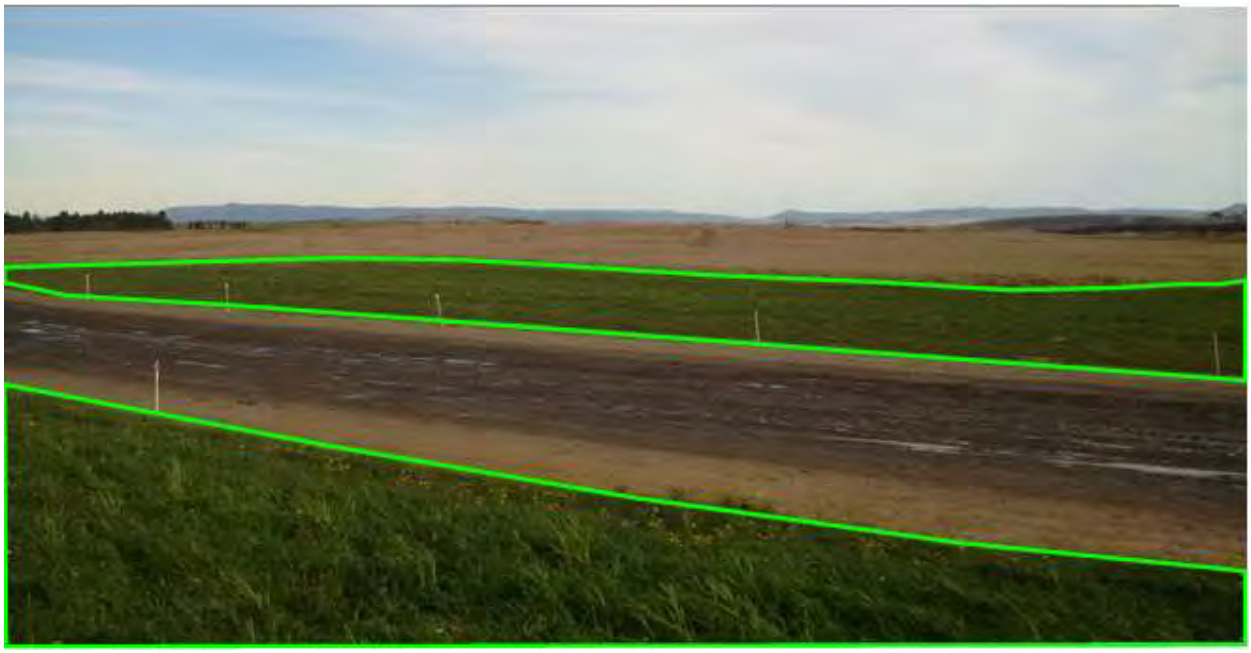


Plate. 4 North Pit RL140 (north of 4 ha pasture trial area) facing south

North Pit dump RL140 north of tree stand (adjacent to TD#2)

The North Pit dump RL140 north of tree stand (adjacent to TD#2) area was rehabilitated in March 2015 totalling 0.5 ha. This area was direct seeded via a tractor using tree species (Tree mix #1).

The area was created using overburden from the North Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto a 1-2 degree slope. This slight slope was overlaid with approximately 100-200 mm of topsoil using a D10 dozer. The topsoil was from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 50 tonnes / hectare and ripped into the soil with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 100 kg/ha. A cover crop was also applied to minimise the weed potential. Early indications also show some weed

(galenia and scotch thistle) which will be monitored and managed accordingly.

Plate. 5 North Pit dump RL140 north of tree stand (adjacent to TD#2) tree rehabilitation facing south

North Pit RL140 Dump (tree's)

The North Pit RL140 Dump (tree's) site was rehabilitated in April 2015 totalling 1.0 ha. This area was direct seeded via a tractor using tree species (Tree mix #1).

The area was created using overburden from the West Pit operation then clay and subsoil from the West Pit pre-strip was overlaid onto a 1-2 degree slope. The clay and subsoil was shaped approximately 300-500 mm thick. This was then overlaid with approximately 100-200 mm of topsoil using a D10 dozer. The topsoil was from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 40 tonnes / hectare and ripped into the soil with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 100 kg/ha. Early indications also show some weed (galenia and prickly pear) which will be monitored and managed accordingly. This area forms part of a habitat corridor being created across the North Pit dump from Tailing's Dam #2 across to Deadman's Hill on the New England Highway.

Plate. 6 North Pit RL140 Dump (tree's)

North Pit RL140 Decommissioned Road

The North RL140 Decommissioned Road site was rehabilitated in April 2015 totalling 2.0 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1). Further rehabilitation was done during August 2015 totalling 1.6 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #2).

The area was created using overburden from the North Pit operation. It was ripped via a D6 dozer due to compaction from being used as a road then clay and subsoil from the West Pit pre-strip was shaped onto the 1-2 degree slope. This slope was overlaid with approximately 100-200 mm of topsoil from the adjacent North Pit topsoil stockpile area using a D6 dozer. Prior to seeding the area was spread with biosolids at a rate of 80 tonnes / hectare and ripped into the soil with a tractor with rip lines running across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. No cover crop was used. Early indications also show some weed (galenia) which will be monitored and managed accordingly. Some rock and timber structures were also created throughout the area as habitat for ground-dwelling creatures.

Plate. 7 North Pit RL140 Decommissioned Road (rehabilitated during April) facing south-east

Plate. 8 North Pit RL140 Decommissioned Road (rehabilitated during August) facing south-west

West Pit dump (valley facing Maison Dieu)

The West Pit (valley facing Maison Dieu) site was rehabilitated in July 2015 totalling 2.0 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #2).

The area was created using overburden from the West Pit operation then clay and subsoil from the West Pit pre-strip was shaped onto an approximately 10 degree slope. This slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area and pushed out via D10 dozer. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope, minimise the weed potential and provide good visual amenity towards the Maison Dieu residential area and New England Highway. Early indications also show some weed (galenia) which will be monitored and managed accordingly. Some rock and timber structures were also created throughout the area as habitat for ground-dwelling creatures.

Plate. 9 West Pit dump (valley facing Maison Dieu) facing west – photo taken after direct seeding

Plate. 10 West Pit dump (valley facing Maison Dieu) facing west – photo taken August 2015

North Pit RL140 dump

The North Pit RL140 dump site was rehabilitated in July 2015 totalling 5.5 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #2) during July and pasture species (Pasture mix #1) during November.

The area was created using overburden from the West Pit operation then clay and subsoil (300-500 mm thick) from the West Pit pre-strip was shaped onto a generally flat slope. This 1-2 degree slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 100 tonnes / hectare and ripped into the soil with a tractor. The rip lines

were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Early indications also show some weed (scotch thistle and galenia) which will be monitored and managed accordingly. Some rock and timber structures were also created throughout the area as habitat for ground-dwelling creatures.

Plate. 11 North Pit RL140 dump facing south – photo taken while spreading topsoil over subsoil

Plate. 12 North Pit RL140 dump facing south-west – photo taken in July after direct seeding

West Pit Out of Pit Dump (low batter)

The West Pit, Out of Pit Dump (low batter) site was rehabilitated throughout October 2015 (2.4 ha) and November 2015 (1.0 ha) totalling 3.4 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation then shaped into a 10 degree slope with a D10 dozer. The whole area was overlaid with approximately 100-200 mm of topsoil from the West Pit Out of Pit Dump stripped area. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope and minimise the weed potential. Two contour banks were also installed across the slope with a D10 dozer at a fall of 0.5 degree's. These banks were installed to minimise erosion down the 10 degree batter. To date the banks have worked effectively.

Plate. 13 West Pit - Out of Pit Dump (low batter) rehabilitation facing east

West Pit Out of Pit Dump (top batter)

The West Pit Out of Pit Dump (top batter) site was rehabilitated throughout October 2015 totalling 1.5 ha. This area was direct seeded via a tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation then shaped into a 10 degree slope with a D10 dozer. The whole area was overlaid with approximately 100-200 mm of topsoil from the West Pit Out of Pit Dump stripped area. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope and minimise the weed potential.

Plate. 14 West Pit - Out of Pit Dump (top batter) rehabilitation facing north

North Pit 9-ways

The North Pit 9-ways site was rehabilitated in October 2015 totalling 0.9 ha. This area was direct seeded by tractor using pasture species (Pasture mix #1).

This area was created using overburden from the North Pit operation that was stockpiled on the site and required shaping to final design. The slope of the area varies from 2 – 10 degrees. The whole area was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. A cover crop was also applied to stabilise the slope and minimise the weed potential.

Plate. 15 Rehabilitation at North Pit 9-ways facing south

North Pit RL140 dump (Pasture)

The North Pit RL140 dump (pasture) site was rehabilitated in November 2015 totalling 1.0 ha. This area was direct seeded by tractor using pasture species (Pasture mix #1).

The area was created using overburden from the West Pit operation then clay and subsoil (300-500 mm thick) from the West Pit pre-strip was shaped onto a generally flat slope. This 1-2 degree slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 90 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 200 kg/ha. Some rock and timber structures were also created throughout the area as habitat for ground-dwelling creatures.

Plate. 16 Rehabilitation at North Pit RL140 dump facing north

North Pit RL140 dump (tree)

The North Pit RL140 dump (tree) site was rehabilitated in November 2015 totalling 0.5 ha. This area was direct seeded by tractor using tree species (tree mix #1).

The area was created using overburden from the West Pit operation then clay and subsoil (300-500 mm thick) from the West Pit pre-strip was shaped onto a generally flat slope. This 1-2 degree slope was overlaid with approximately 100-200 mm of topsoil from the West Pit pre-strip area. Prior to seeding the area was spread with biosolids at a rate of 40 tonnes / hectare and ripped into the soil with a tractor. The rip lines were created across the contour to minimise erosion from surface run-off.

The material used in the construction has no relevant chemical characteristics, acid forming or spontaneous combustion potential. During the seeding process a starter fertiliser was spread at a rate of 100 kg/ha. Some rock and timber structures were also created throughout the area as habitat for ground-dwelling creatures.

Plate. 17 Rehabilitation at North Pit RL140 dump facing north

During May 4900 tube stock were planted across site as summer temperatures settled. These areas were predominately along the New England highway for visual screening, on top of the North Pit Dump for habitat corridor creation, on the South Pit dump rehabilitation site and on the ROM Pad noise bund for noise screening purposes. The tube stock were planted with water-saving gel and fertiliser. Tree guards were planted in several areas where necessary.

Throughout the year habitat construction took place across the North Pit dump rehabilitated areas through the installation of reused timber 'stag' tree's, rock piles and timber piles. Several possum and bird nest boxes for current and future habitat needs were also installed across this area.

Several rehabilitation areas on the North Pit dump were rolled via a drum-roller after pasture area's had greater than 70% coverage to minimise rock presence at the surface and too allow weed management to be easily carried out for short ground-dwelling species such as *galenia pubescens* (galenia). This was undertaken throughout 2015 across new and previous rehabilitation areas totalling approximately 10 ha.

Table 30 shows 21.7 ha was rehabilitated in 2015 giving Rix's Creek a cumulative area rehabilitated of 396.1 ha since 1990. This cumulative area is 6.0 ha ahead of the MOP cumulative total of 390.1 ha in 2015 as seen in Table 31. This is a great outcome to date as Rix's Creek MOP is aligned to maximum production rates of 15 million BCM (Bank Cubic Metres) of material movement per year (now 16.1 million BCM), with Rix's Creek generally well below this level in all its previous years of operation.

Table 31. 2015 Rehabilitation and Disturbance Areas (ha) compared to MOP

Domain / Phase	2015 MOP	2015 Actual	2016 MOP	2017 MOP
Infrastructure Area	59.9	67.6	59.7	62.5
Tailing's Emplacement Area	16.9	39.1	17.6	19.3
Active Mining Area	100.7	151.4	82	84.4
Overburden Emplacement Area	263.9	311.5	258.9	260.5
Rehabilitated Lands – Pasture; Landform Establishment	0	21.7	0	0
Rehabilitated Lands – Pasture; Ecosystem and Landuse Establishment	10	0	56.7	7
Rehabilitated Lands – Pasture; Ecosystem and Landuse Sustainability	69.9	0	80	136.7
Total Rehabilitation – Ecosystem and Landuse Sustainability (incl. pre MOP rehabilitation)	390.1	396.1	400.2	456.9
Rehabilitated Lands – Trees over Grass; Ecosystem and Landuse Sustainability	92.9	92.9	92.9	92.9

Table 32 & Table 31 outline the progression of rehabilitation and this is shown in the Rehabilitation Plan 2015.
The areas previously treated with biosolids are still proving to perform exceptionally well when compared to other areas. The biosolids greatly enhances revegetation onsite given the poor quality of available topsoil. A 4 ha area was chosen on top of the North Pit Dump to conduct a trial of biosolids and compost for comparative analysis of effective rehabilitation ameliorants. This area was sown in August 2013 with good results seen during the 24 monthly analysis even through dry conditions. The area received very good rainfall in April 2015 and is expected to have further improved results during the 36-month pasture analysis (to be undertaken in 2016).

The shaped area requiring rehabilitation at the end of the reporting period was 9 ha with the area estimated to be rehabilitated during 2016 is 19.9 ha.

Two area's to be disturbed during 2016 (approximately 10.6 ha in total) are in front of the West Pit through pre-stripping activities as mining in this area progressively moves in a north-westerly direction.

Table 32. Rehabilitation Summary

	Area Affected/Rehabilitated (hectares)			
	To date	Last report	Next Report (estimated)	
A: MINE LEASE AREA				
A1 Mine Lease(s) Area	1,823.3 ha			
B: DISTURBED AREAS				
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	67.6	67.8	67.6	
B2: Active Mining Area (excluding items B3 - B5 below)	151.4	150.2	148.4	
B3 Waste emplacements, (active/unshaped/in or out-of-pit)	302.5	304.3	324.1	
B4 Tailings emplacements, (active/unshaped/uncapped)	39.1	21.9	35.1	
B5 Shaped waste emplacement (awaits final vegetation)	9.0	6.3	5.0	
ALL DISTURBED AREAS	569.6	550.5	580.2	F1
C REHABILITATION PROGRESS				
C1 Total Rehabilitated area (except for maintenance)	396.1	374.4	416.0	F2
D: REHABILITATION ON SLOPES				
D1 10 to 18 degrees	5.2	5.2	5.2	
D2 Greater than 18 degrees	-	-	-	
E: SURFACE OF REHABILITATED LAND				
E1 Pasture and grasses	290.2	270.5	310.1	
E2 Native forest/ecosystems	-	-	-	
E3 Plantations and crops (Includes Tree Plantation 51 ha and bunds along Highway**)**	105.9	103.9	105.9	
E4 Other (include non-vegetative outcomes)	-	-	-	

Table 33. Maintenance Activities on Rehabilitation Land

(This period's activities and activities proposed in the next reporting period)

NATURE OF TREATMENT	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report period	Next period	
Additional erosion control works (drains re-contouring, rock protection)	3	3	Contour banks constructed on 10 degree rehabilitation areas on the West Pit out-of-pit-dump. Sediment dams constructed to decant runoff of sediment and reduce runoff as well in this area.
Re-covering (detail - further topsoil, subsoil sealing etc)	0	0	Further topsoil placed on North Pit pin dump from erosion due to high rainfall.
Soil treatment (detail - fertiliser, lime, gypsum etc)	21.7	19.9	Biosolids applied to all pasture areas rehabilitated. Some tree seed areas either received low rates of biosolids or did not receive biosolids in 2014 where high quality topsoil with tree seed bank is spread onto rehabilitation areas.

Treatment/Management (detail - grazing, cropping, slashing etc)	75	80	65 ha grazed on West Pit pasture rehabilitation area since April 2015. 5 ha of rock rolling and 5 ha slashing of rehabilitated areas was completed in 2015. Further rehabilitation will be slashed during 2016.
Re-seeding/Replanting (detail - species density, season etc)	7	0	7 ha to was reseeded in 2015 on the North Pit dump that did not receive biosolids application.
Adversely Affected by Weeds (detail - type and treatment)	320	150	Localised areas across the site. Large areas of assorted Pear species, Galenia and African Olive were priority for 2015. Small areas of Mother–of-Millions and Paterson's Curse sprayed as well as other assorted species. This will be ongoing in 2016 with increased focus again on Galenia especially in older rehabilitation as well as follow up African Olive spraying from 2015 works.
Feral animal control (detail - additional fencing, trapping, baiting etc)	200	200	Population has been increasing and an application will be made to cull excess numbers across the site. Now allowed to harvest meat from cull. During 2013, 2014 and 2015 meat was provided for baiting purposes from culled Kangaroos in which Wild Dog Associations and the LHPA typically struggle for funding.

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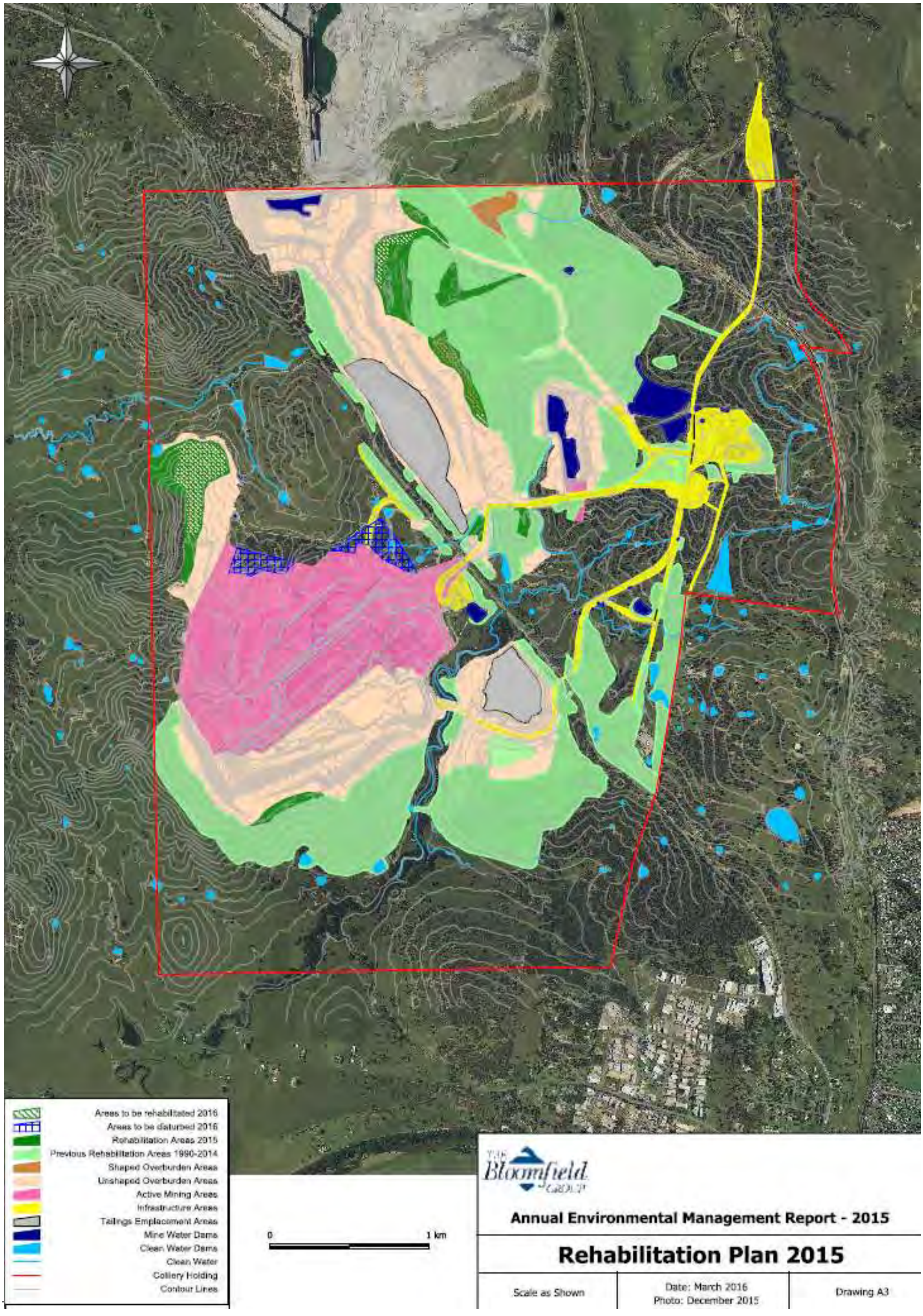
Areas to be rehabilitated 2016
Areas to be disturbed 2016
Rehabilitation Areas 2015
Previous Rehabilitation Areas 1990-2014
Shaped Overburden Areas
Unshaped Overburden Areas
Active Mining Areas
Infrastructure Areas
Tailings Emplacement Areas
Mine Water Dams
Clean Water Dams
Clean Water
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Annual Environmental Management Report - 2015
Rehabilitation Plan 2015
Scale as Shown
Date: March 2016
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Rehabilitation Areas 2015
Previous Rehabilitation Areas 1990-2014
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Annual Environmental Management Report - 2015
Rehabilitation Areas 2015
Scale as Shown
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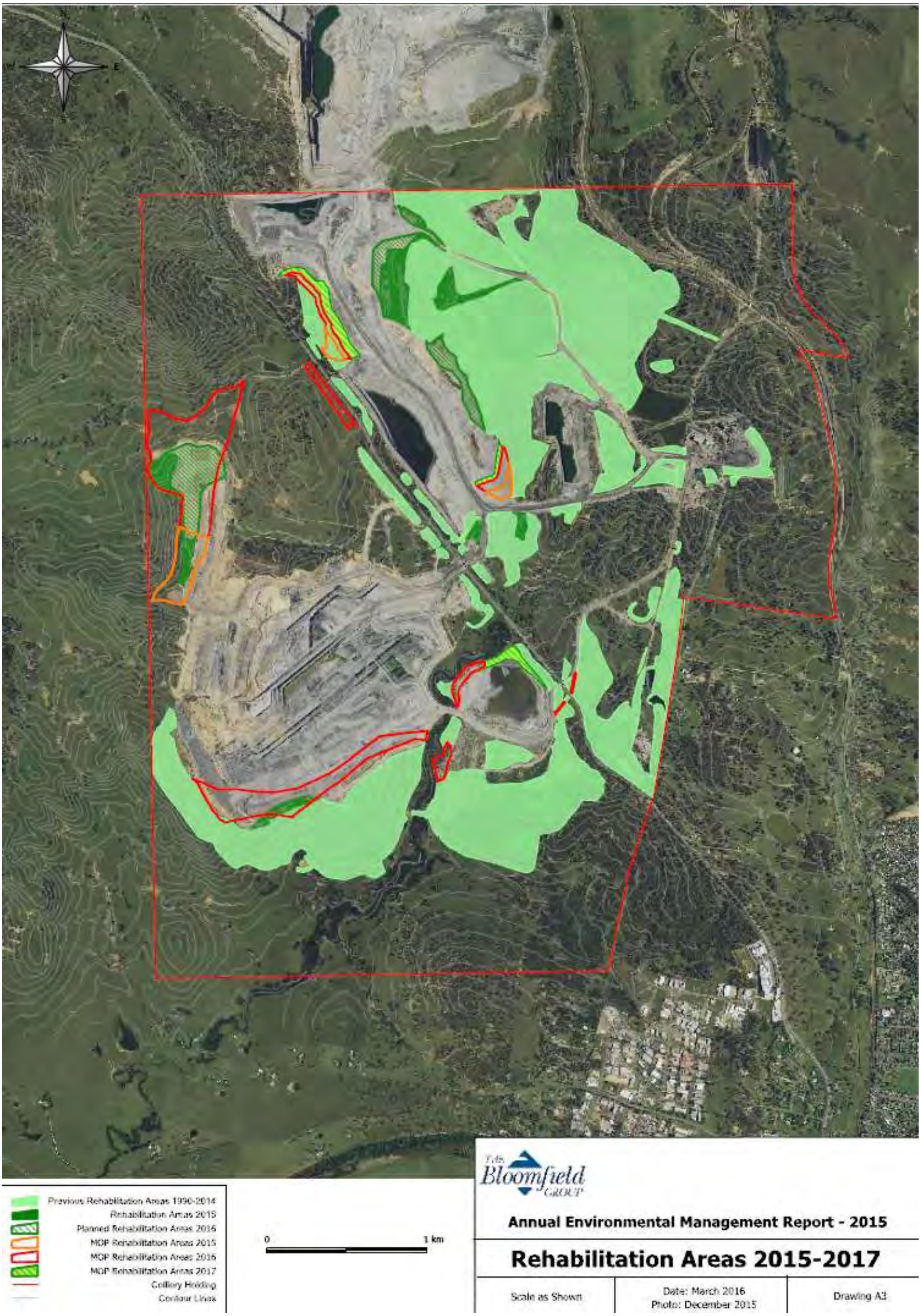
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Rehabilitation Areas 2015-2017
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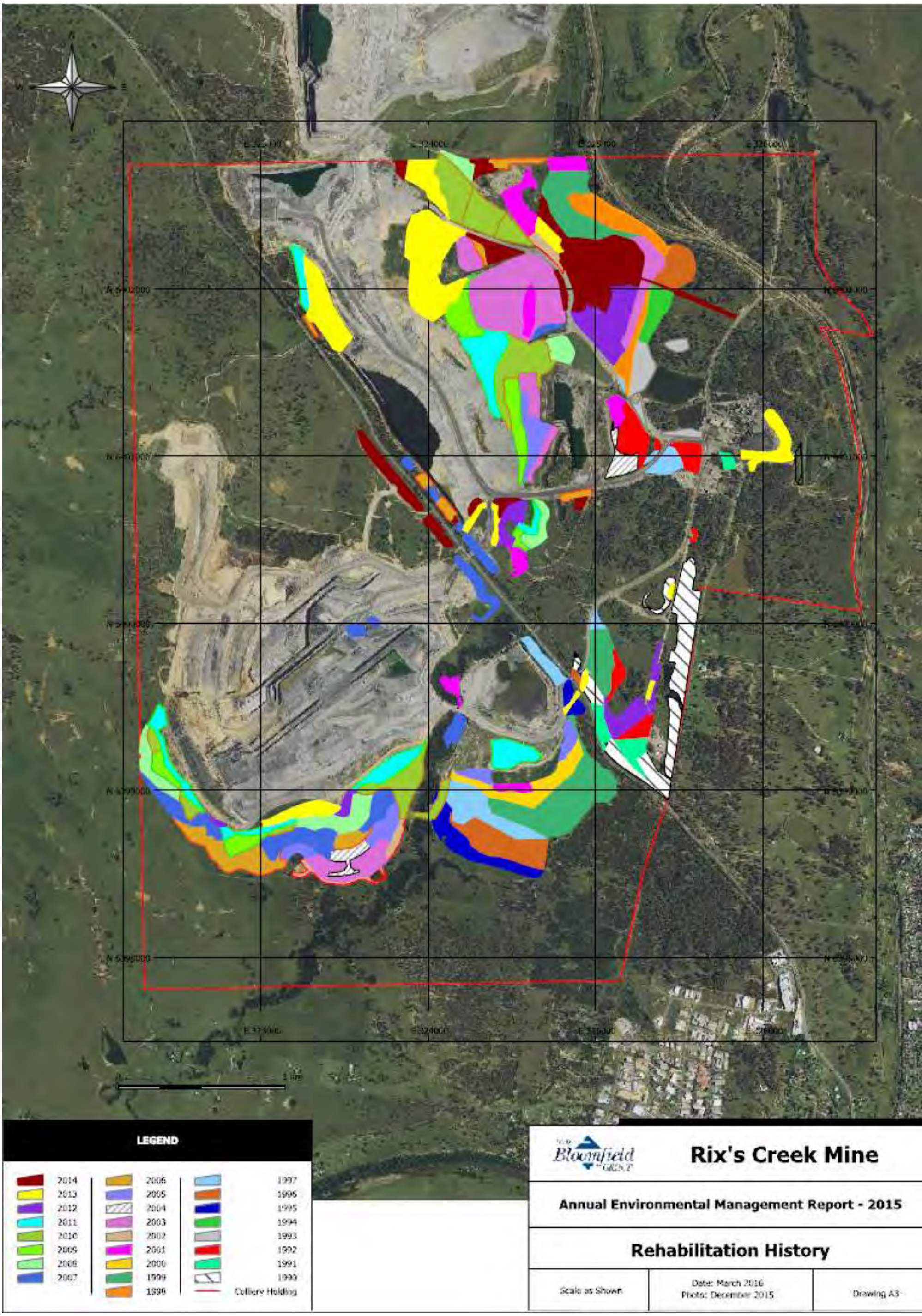
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8.3 Other Infrastructure

No major infrastructure was installed during 2015.

Rix's Creek mine during 2015 purchased and installed another two solid-bowl centrifuge units following on from the initial trial unit. The additional two units (making three in total) were brought into full-production during 2015 and will be continually utilised due to their success. These were additional to the existing CHPP infrastructure area already existing on-site.

8.4 Rehabilitation Trials and Research

A 4 ha rehabilitation trial comprising of four 1 ha quadrats was conducted on site during August 2013. During 2014 this trial was monitored in February (six months after sowing) and August (12 months after sowing). During 2015 this trial was monitored during August (24 months after sowing). Rix's Creek set up this trial to compare the conventionally used biosolids with compost (reuse of garden green waste) to evaluate the effectiveness of both products in contributing to long-term sustainability for the site. The four 1 ha quadrats were sown with conventional methods using pasture species already used on site with soil treatment as follows:

- Quadrat 1: Control with 200 kg starter fertiliser applied
- Quadrat 2: Compost at 80 t / ha
- Quadrat 3: Compost at 140 t /ha
- Qaudrat 4: Biosolids at 140 t / ha (maximum allowable rate).

The six, 12 and 24 monthly results to date can be seen in the graph below. To date all sites are similar in terms of pasture composition and species diversity but dry conditions have seen the rehabilitation growth rates lower than average annual growth rates across the site. Physically looking at the area's during August 2015 the control plot is much lower in quality then the three other plots, whilst the biosolids plot is slightly higher in quality then the other plots. These plots will be monitored again in August 2016 to see any seasonal influences and further rehabilitation progression (after 36 months) on the four trial plots. All four sites over the timeline of the trial have increased in stability and nutrition. In terms of soil infiltration the biosolids and control results have increased then plateau whils both the compost sites have slightly decreased from the 12 to 24 months results. The 36 months results (done in 2016) will be interesting to determine any further trends.

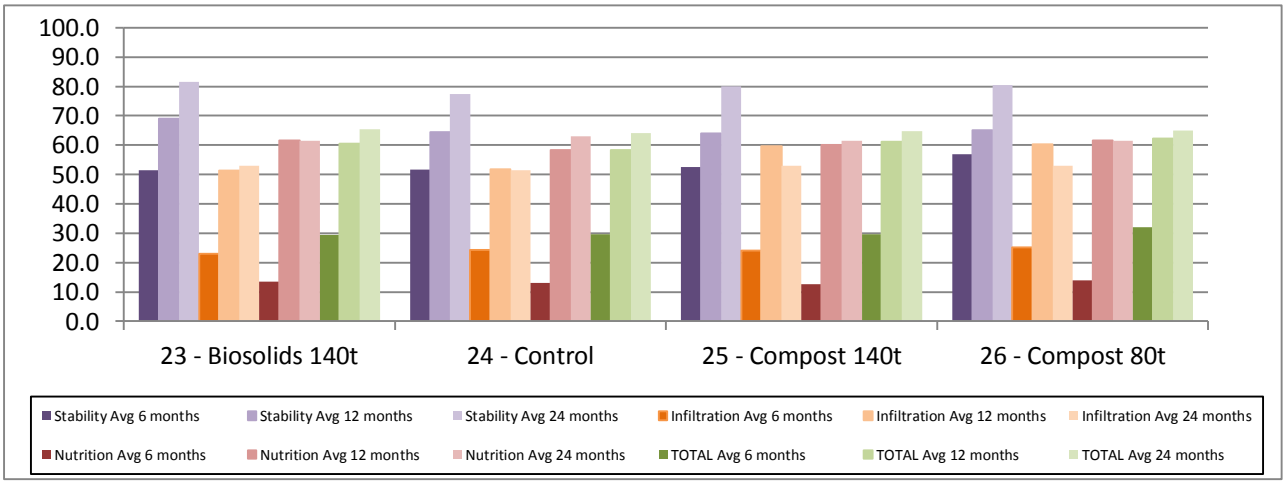
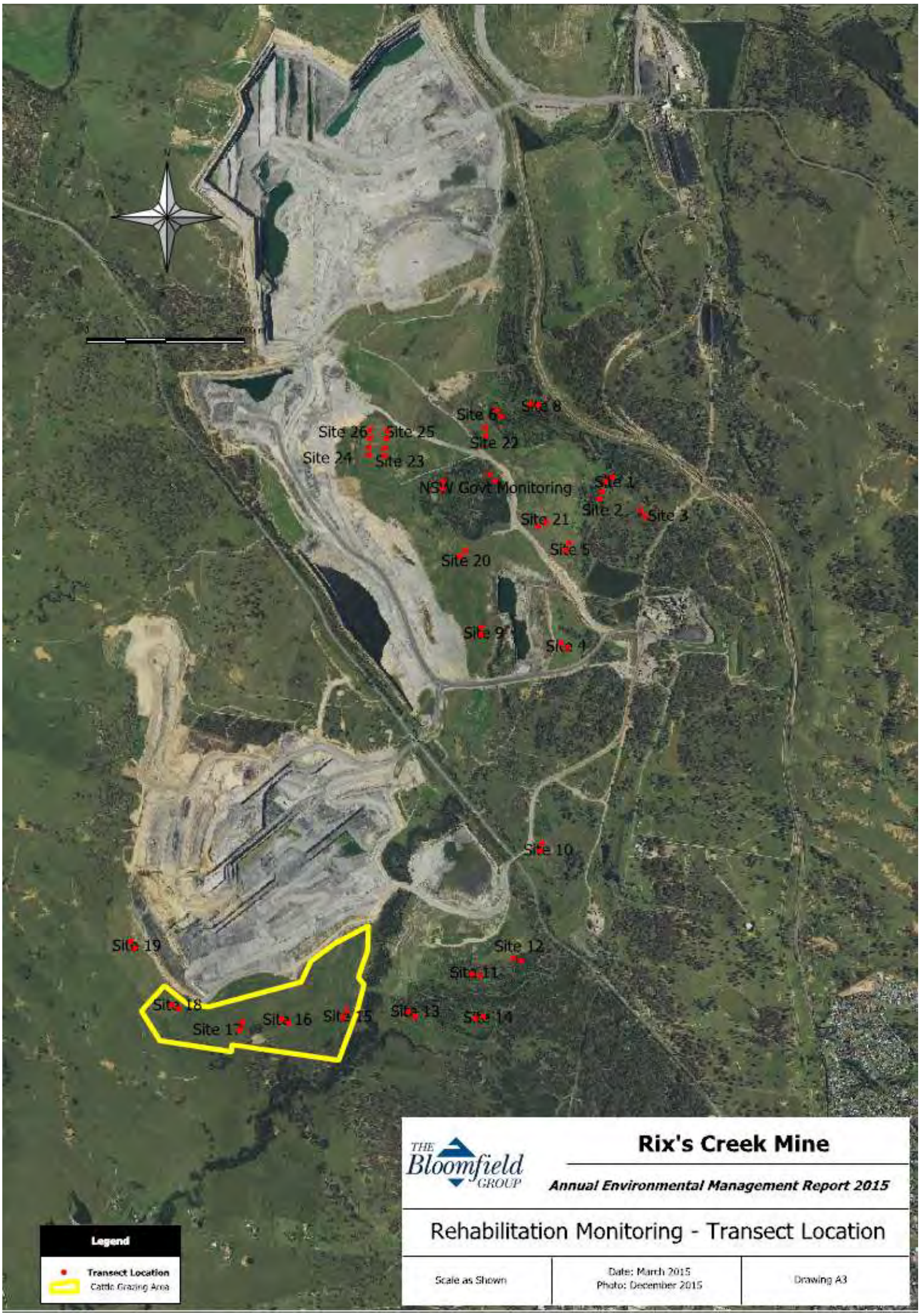


Figure 40. Summary of Rix's Creek 4 ha trial on North Pit Dump.

8.5 Rehabilitation Monitoring

Rehabilitation monitoring is conducted at Rix's Creek mine as per Bloomfield Mining Operations Land Rehabilitation Management System (LRMS). Monitoring was conducted in January 2011 on eighteen (18) existing sites and two (2) new sites less than 12 months after establishment. Rehabilitation monitoring was planned for November 2013, however, this was completed in January 2014. The timing was still throughout a prolonged dry period with similar rehabilitation conditions seen across all

sites without the delay in monitoring having any impact. The monitoring included six (6) new sites, four of these being within the rehabilitation trial area of 4 ha (four 1 ha quadrats). The ultimate goal of rehabilitation monitoring is to assess rehabilitated land success prior to final sign-off by DRE. Rehabilitation monitoring was further conducted during December 2015 across the 26 sites done in 2013/2014. Out of the 26 sites monitored there was four (4) sites that are currently being grazed by cattle being sites 15, 16, 17, and 18. No areas have been applied to DRE for final sign-off, this was last done in 2009. Rix's Creek is hopeful to graze some of its pasture rehabilitation areas in the next several years to show evidence that the land can be sustainable for long-term grazing following the completion of mining.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Site 26
Site 25
Site 22
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Site 23
NSW Govt Monitoring
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Site 21
Site 5
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Site 9
Site 4
Site 10
Site 19
Site 12
Site 11
Site 18
Site 17
Site 16
Site 15
Site 13
Site 14
Legend
Transect Location
Cattle Grazing Area
THE Bloomfield GROUP
Rix's Creek Mine
Annual Environmental Management Report 2015
Rehabilitation Monitoring - Transect Location
Scale as Shown
Date: March 2015
Photo: December 2015
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8.5.1 Rehabilitation Monitoring Results

In regards to monitoring results the data was collected for each monitoring site with groundcover quadrats one (1) to five (5) being averaged to provide a representation of zone stability, zone infiltration, zone nutrition and an overall result (average of stability, infiltration and nutrition). This provides a clearer representation of the data recorded from rehabilitation monitoring in 2008, 2011, 2014 and 2015. The most significant changes seen across the sites are between the 2014 and 2015 dates for six new sites (site 21 – 26) which were monitored for the first time in 2014. Nearly all sites showed an overall increase of quality to those monitored in previous years with monitoring undertaken during a significantly drier than normal period.

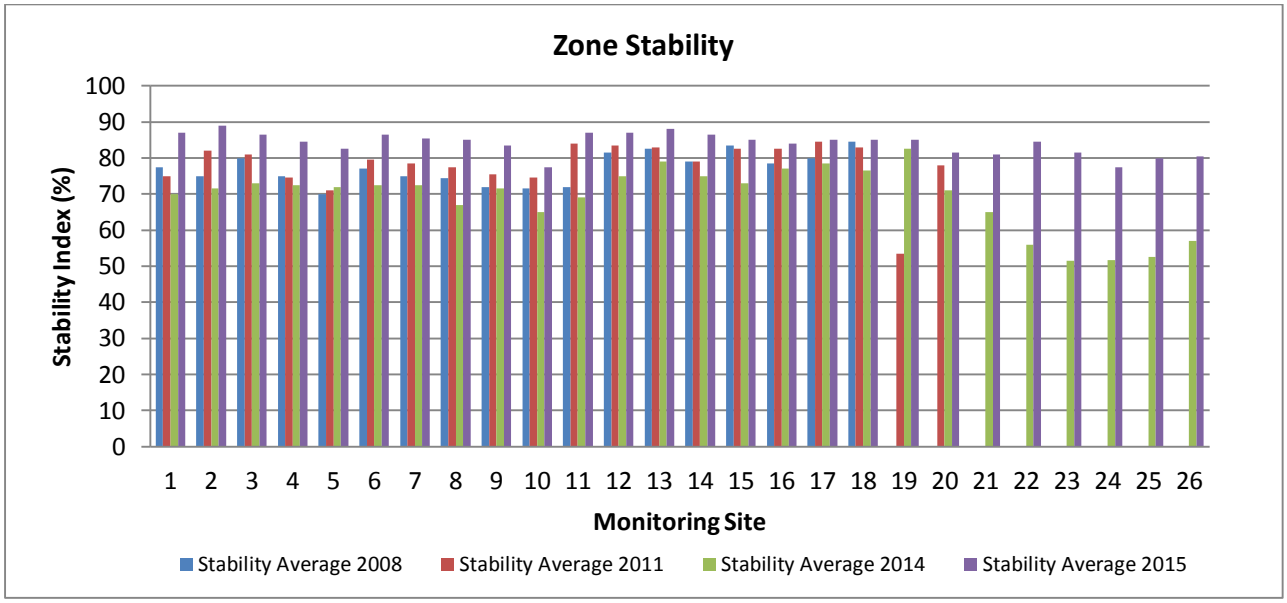

Figure 42. Rehabilitation Monitoring Zone Stability

Zone stability in 2008 ranged from 70% (site 5) to 84.5% (site 18), while 2011 ranged from 53.5% (site 19) to 84.5% (site 17), 2014 ranged from 51.5% (site 23) to 82.5% (site 19), and 2015 ranged from 77.5% (site 10) to 89% (site 2). Stability across all sites is relatively high except in 2014 for sites 21 to 26 which was rehabilitation less than 12 months old. The higher stability results for these 6 sites in 2015 has been due to the rehabilitation becoming more established (three years old). The high stability index for all sites suggests rehabilitation is working effectively by preventing erosion and stabilising the soil surface.

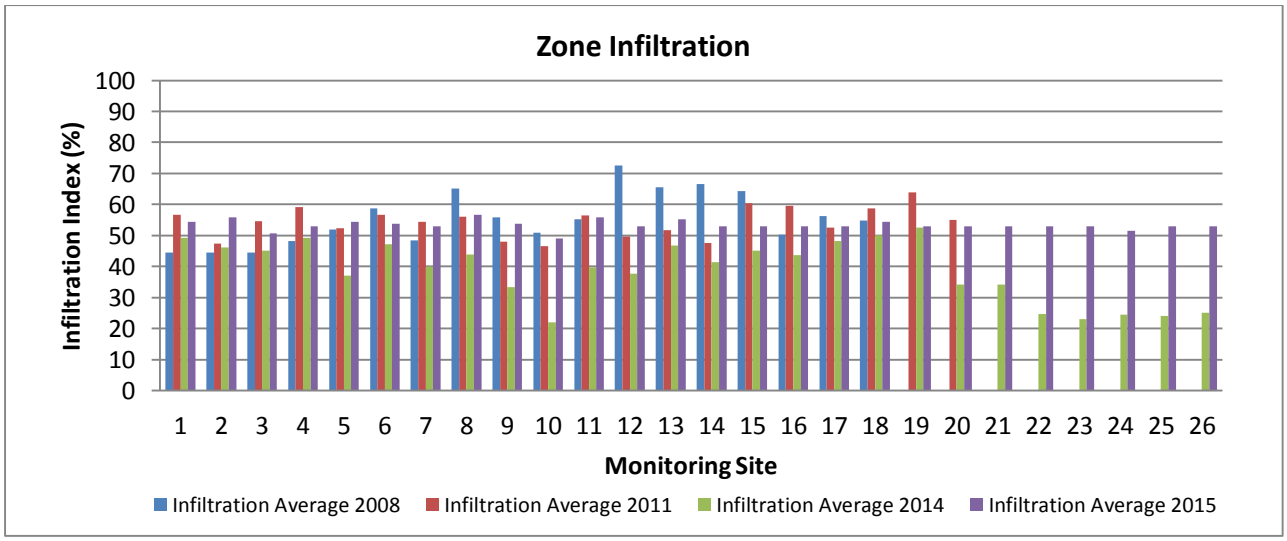

Figure 43. Rehabilitation Monitoring Zone Infiltration

Zone infiltration in 2008 ranged from 44.4% (site 1) to 72.6% (site 12), while 2011 ranged from 46.6% (site 10) to 63.8% (site 19), 2014 ranged from 22.1% (site 10) to 52.6% (site 19), and 2015 ranged from 49% (site 10) to 56.7% (site 8). Infiltration across all sites is relatively consistent for all monitoring periods with a noticeable decrease across the newer sites in 2014 (site 21 to 26). The higher infiltration results for these 6 sites in 2015 has been due to the rehabilitation becoming more established (three years old). This is reflective of the high stability seen in Figure 42 suggesting typical results for the hard-crusting nature of the soils found across the site and high vegetation cover.

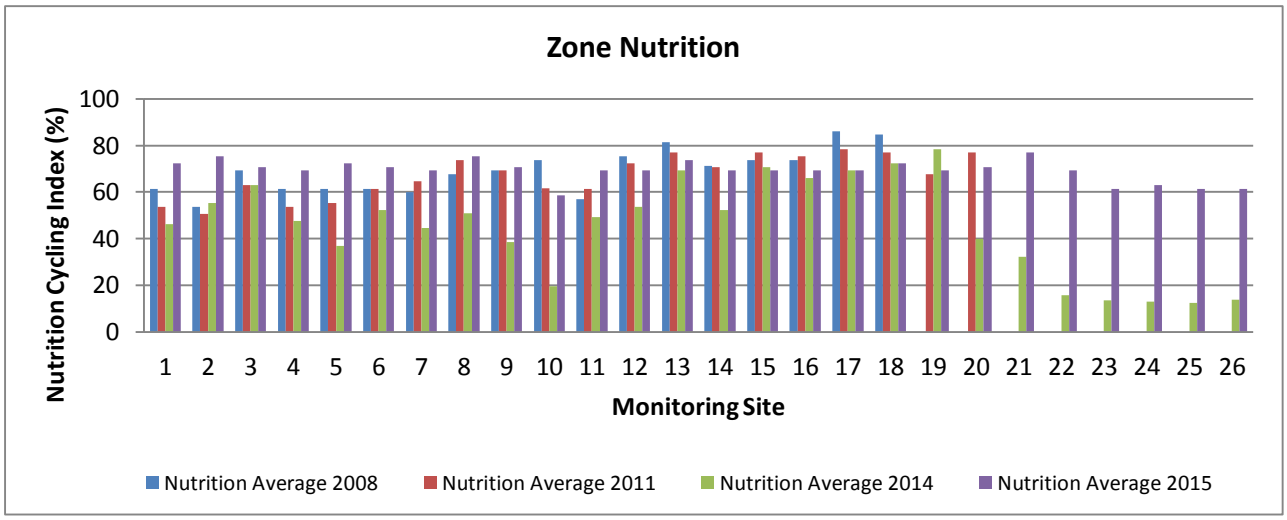

Figure 44. Rehabilitation Monitoring Zone Nutrition

Zone nutrition cycling in 2008 ranged from 53.8% (site 2) to 86.1% (site 17), while 2011 ranged from 50.8% (site 2) to 78.4% (site 17), 2014 ranged from 12.54% (site 25) to 78.44% (site 19), and 2015 has ranged from 58.5% (site 10) to 76.9% (site 21). Zone nutrition across all sites is average to high for all monitoring periods whilst 2014 is low for the new transect sites (site 21 to site 26). Again these sites increased in nutrition in 2015 due to the rehabilitation becoming more established (three years old). Zone nutrition is how effectively organic matter is cycled back into the soil. This can be dependent on soil quality, presence of available organic matter, likelihood of being captured and incorporated into the soil surface and run-off (to transport litter or even remove in times of high rainfall events). Zone nutrition can be highly variable from site to site due to these assorted factors.

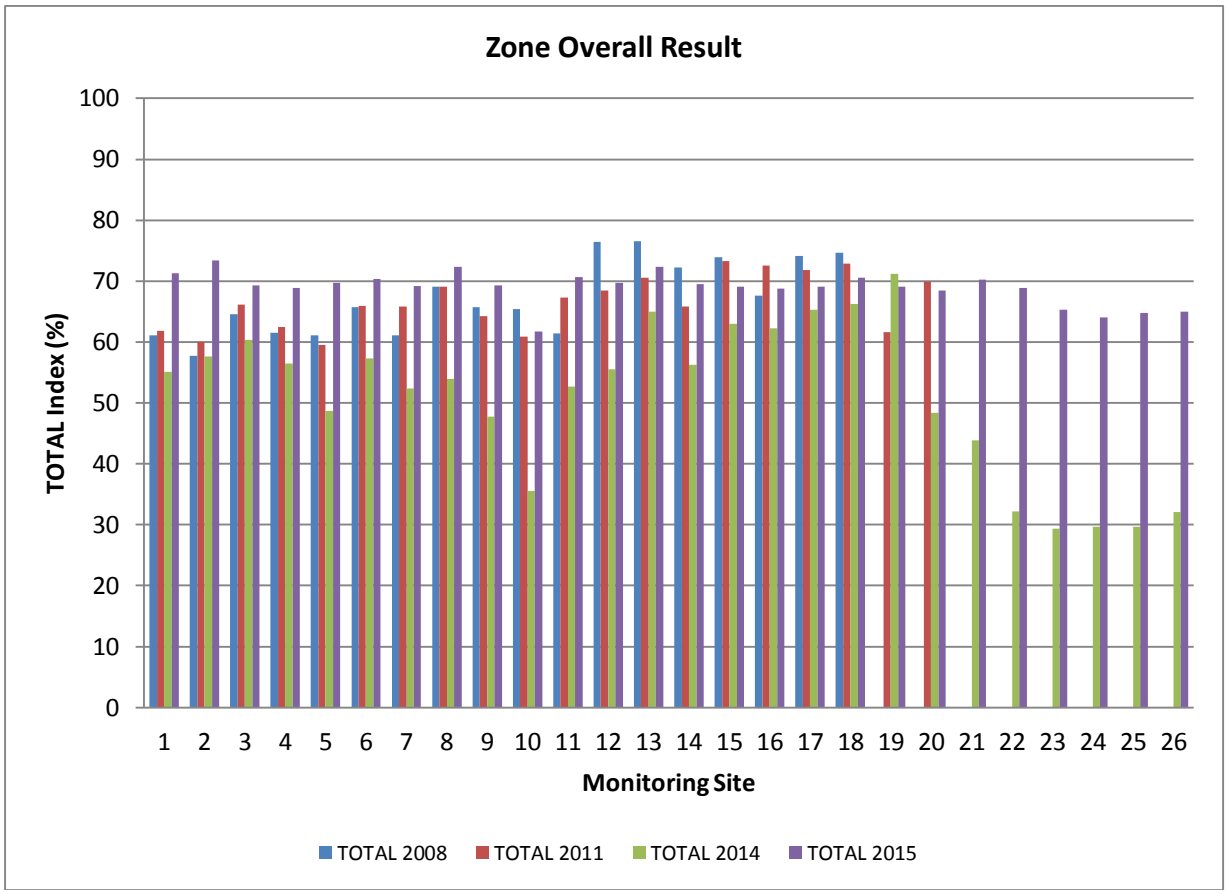

Figure 45. Rehabilitation Monitoring Zone Overall Result

This overall result is an average of the results seen in Figures 42, 43 and 44. 2008 had an overall total average of 67.2%, 2011 had a similar total average of 66.5%, 2014 had a lower average of 51.1%, and 2015 had a total average of 68.9% being the highest average out of all the monitoring years. The lower average result in 2014 is most likely linked to the lower values seen across new rehabilitation sites being monitored (sites 21 to 26). This shows no great change in the results which could be linked to the monitoring beginning in 2008 across established sites (greater than 12 months old) and Rix's Creek mine maintaining consistent rehabilitation techniques and species up to 2015 and beyond. The only outstanding results can be seen from the newly established rehabilitation sites and linked to drier than normal conditions from time of sowing.

Of interest is that sites 15 – 18 within the cattle grazing area have shown no significant changes in the monitoring data after being grazed since April – December 2015 (nine months). These sites will be continually monitored to assess the long-term effectiveness of the cattle on the pasture rehabilitation.

8.6 Further Development of the Final Rehabilitation Plan

Rix's Creek Mining Operations Plan was issued 8 March 2013 which conform to the new MOP guidelines developed by DRE. In accordance with the MOP Rix's Creek will provide rehabilitated land that meets the rehabilitation objectives throughout the different phases for the life of mine over the seven year period. The MOP will continue to be undertaken in accordance with the procedures outlined in it, so post mined lands are suitable for post-mining land use and in a state suitable for DRE sign-off. The Rix's Creek Mine MOP is approved to 8 March 2020.
Final rehabilitation outcomes are being agreed as Rix's Creek develops its new EIS for the Rix's Creek Continuation of Mining project. If granted to mine for another 21 years, a MOP variation will be submitted aligned to any further changes made to the new consent. During the next AEMR period rehabilitation will be undertaken in line with production and the MOP with no different techniques being utilised compared with previous years. The 4 ha pasture trial on the North Pit dump will be monitored and pasture mass data will be gathered to show the area can be

preferentially grazed in the next several years. Further monitoring will be undertaken where cattle is also grazing pasture rehabilitation areas on site to prove its effectiveness.

8.7 Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	Year 2014 (ha)	Year 2015 (ha)	Year 2016 (ha)
A. Total mine footprint	1823.3	1823.3	1823.3
B. Total active disturbance	550.5	569.6	580.2
C. Land being prepared for rehabilitation	6.3	9.0	5.0
D. Land under active rehabilitation	0	0	0
E. Completed rehabilitation	374.4	396.1	416.0

SECTION 9 COMMUNITY

9.1 Community Engagement.

Rix's Creek is required under the development consent to participate and co-operate with a Community Consultative Committee (CCC). The committee consists of three community representatives and is chaired by Council and other Govt representatives are invited to participate on the committee. Rix's Creek was the first mine in the Hunter Valley to have a CCC which has operated for 24 years.

The Committee representatives are:-

Chairperson:-	Councillor Val Scott
Community representatives:-	Patricia Bestic
	Reg Eveleigh
	Michelle Higgins
DPE representative:-	Chris Knight
Company representatives:-	Mine Manager – Luke Murray
	Senior Environmental Officer – John Hindmarsh
	Environmental Officer – Jason Desmond

The Committee met two times during the year. Once on 12th May 2015 to present the Annual Environmental Management Report (AEMR) for 2014, and again on 8th September 2015 for the presentation of 6 monthly environmental monitoring results for the January to June 2015 monitoring period.

The Company is a financial member of the Hunter Coal Environmental Group (HCEG).

The company is a financial member of the Hunter Valley Combined Wild Dog Association (HVCWDA) Incorporation.

The company is also part of the Upper Hunter Mining Dialogue (UHMD) in association with the NSW Minerals Council (NSWMC) which brings industry, community, and key stakeholder groups together across various projects and goals relating to:-

- Land Management
- Social Impacts and Infrastructure
- Water
- Emissions and Health

The Bloomfield Group UHMD representatives are:-

Executive Oversight Committee (Chair):-	Managing Director / CEO – John Richards
Steering Commitee:-	General Manager Mining Development – Garry Bailey
Emissions and Health Working Group:-	Senior Environmental Officer – John Hindmarsh
Land Management Working Group:-	Environmental Officer – Jason Desmond
Water Working Group:-	Environmental Officer – Greg Lamb
Social Impacts and Infrastructure Working Group:-	Executive Assistant to Managing Director – Suzie Messner

9.2 Community Contributions.

The company provides annual donations to approximately 30 charitable groups as well as annual sponsorship to around 50 local community groups. In particular in the Singleton Community over the last five years:

- Samaritans and the Singleton Christmas Lunch
- Singleton Legacy
- Cancer Council Singleton Office – patient support and carer transport
- Rose Point Park Tree Planting
- Many Local Junior Sporting groups
- Singleton Show

- Singleton High School, Singleton Public School, Singleton Pre-School
- Singleton Hospital and Hunter New England Health
- Uniting Care Disability Services
- SES, Salvation Army, Red Cross
- Westpac Helicopter Services
- Darlington Bush Fire Services
- Scouts and Girl Guides

Rix's Creek has had collaboration with Newcastle University and Australian Coal Association Research Program (ACARP) to support effective innovation and development for the improvement of mine operations and environmental practices. This is highlighted recently with the revolutionary tailings drying project that will do away with the need for Tailings Dams.

9.3 Community Complaints.

All complaints are dealt with under the '*Complaints Protocol for Rix's Creek Coal Mine'* as set up in response to the Rix's Creek Environmental Monitoring Committee under the original development Consent. The protocol is used to register and investigate all complaints. All complaints are referred to the Mine Manager, Mr. Luke Murray and are dealt with on an individual basis.

The Company policy is to personally deal with every complainant to expedite a resolution to his or her concern.

Table 34. Complaints 2015

No.	Date Received	How Received	Complaints					
			Blast	Noise	Dust	Water	Lights	Odour
1	14/1/2015	Phone		X				
2	4/3/2015	Phone		X				
3	16/3/2015	Rix's Creek Hotline		X				
4	25/3/2015	Phone		X				
5	29/3/2015	Rix's Creek Hotline		X				
6*	6/5/2015	Rix's Creek Hotline	X*					
7	8/6/2015	Phone		X				
8	15/6/2015	Rix's Creek Hotline		X				
9	23/6/2015	Phone	X					
10	24/6/2015	Phone	X					
11*	3/7/2015	Phone		X*				
12	8/7/2015	Rix's Creek Hotline	X					
13	10/7/2015	Phone	X					
14	22/7/2015	Phone		X				
15	1/8/2015	Rix's Creek Hotline		X				
16	1/8/2015	Phone		X				
17	1/8/2015	Website		X				
18	5/11/2015	Phone		X				
19*	21/11/2015	Phone		X*				
20	24/11/2015	Phone		X				
21	25/11/2015	Phone		X				
22	10/11/2015	Phone		X				
23	17/12/2015	Phone		X				

* Enquiry

Twenty (20) complaints were received by the Company during the year. Six were on the Rix's Creek Hotline, eleven were direct phone calls to the company from residents, and three were direct from Planning and Compliance (DPE). Three (3) enquiries were made on the 6/5/2015 (Rix's hotline) relating to blasting, 3/7/2015 (phone) relating to noise and 21/11/2015 (phone) relating to noise and not a complaint.

All complaints have been dealt with in the various sections of the report specific to that complaint.

Table 35. Complaints 2001-2015

Year	Complaints	Enquiries	Complaints					
			Blast	Noise	Dust	Water	Lights	Odour
2001	7		2	1	3	1		
2002	29		11	9	8	1		
2003	16		5	10	1			
2004	10		7	1	1		1	
2005	12	2	4	6	1		1	
2006	27	1	4	21	1			1
2007	14		7	4			1	2
2008	4		4					
2009	7		2		5			
2010	11		2	3	3	1	2	
2011	11	5	6	2	2			1
2012	20	2	9	4	7			
2013	19	5	8	10				1
2014	20	4	2	15	3			
2015	20	3	4	16				
Average 2001-2015	15.1	3.1	5.1	6.0	3.2	1.0	1.3	1.3

Rix's Creek received 20 complaints in 2015 which is above average, however it was the same amount as 2014. It is preferential no complaints are received and Rix's Creek endeavour to work with the community to minimise and eliminate the sites environmental impacts.

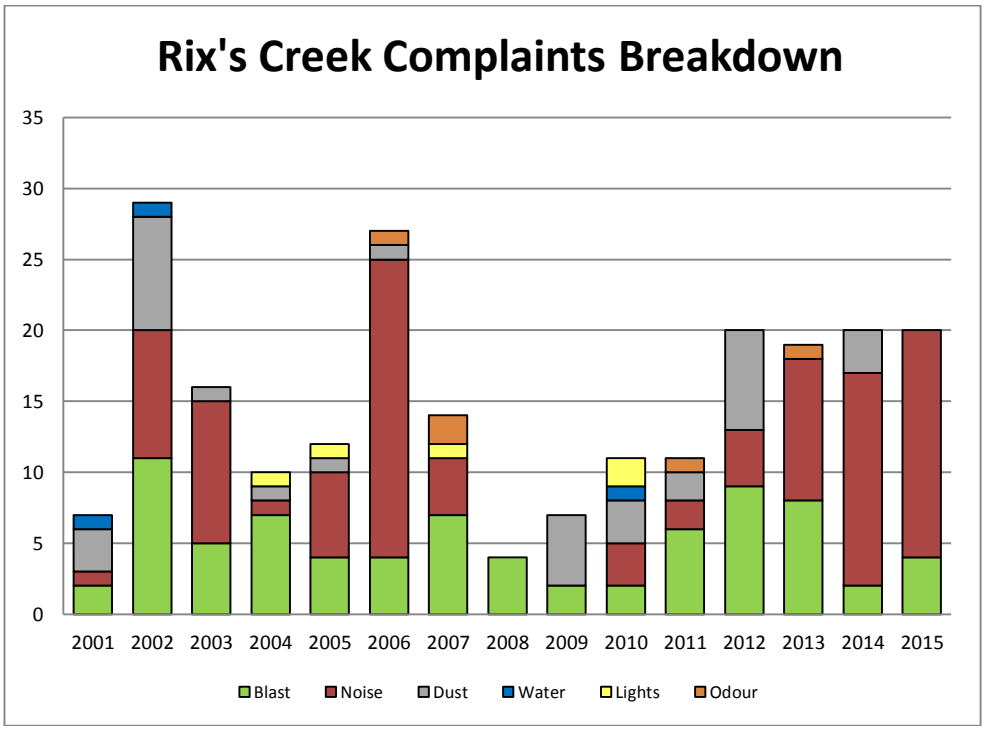

Figure 416. Summary of Rix's Creek Complaints 2001-2015.

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SECTION 10 – INDEPENDENT AUDIT

There was no independent audit undertaken throughout the reporting period.

The last Independent Audit was carried out in 2011 with the summary of non-compliances / action plan of development consent seen below:

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
3	The Applicant shall ensure that all statutory requirements including but not restricted to those set down by the Local Government Act, 1993, Pollution Control Act, 1970, Clean Air Act, 1961, Clean Water Act, 1970, Noise Control Act, 1975, Protection of the Environment Administration Act, 1991 and all other relevant legislation, Regulations, Australian Standards, Codes, Guidelines and Notices, Conditions, Directions, Notices and Requirements of the Department of Environment, Climate Change and Water (DECCW), Department of Industry and Investment (DII), and Roads and Traffic Authority (RTA), are fully met.	Sighted Bloomfield Group Environmental Management System which includes requirements to manage compliance in a systemic manner. Unable to sight a current 'Approval to Operate' for an On-site Sewage Management Systems (OSMS) as per Local Government (General) Regulation 2005. Unable to sight evidence that all conditions of the Road Occupancy Licence (licence number 773, extension 7, expires 31/12/11), which allows blasting within 500m upon the closure of the New England Highway are implemented, specifically: - the licencee undertakes to erect permanent mine blasting road closure signage in accordance with RTA signage standards on both approaches to the road closure points indicating the time and day of the next blast, the anticipated delay and a contact telephone number for public inquiries, - the licencee undertakes to notify local emergency services of a closure on the morning of each subject closure, - the licencee undertakes to provide regular media releases to local newspaper and radio services indicating times/days of anticipated mine blasting road closures,	Medium	1. Obtain an Approval to Operate from SSC. **Approval received 19/12/2011.** 2. Erect mine blast road closure signage on the New England Highway. **RTA has approved sign type and location in 2012 and signs erected in 2013.** 3. Add local emergency services to road closure/blasting notifications **Completed in 2012.** 4. Advertise road closures in the Singleton Argus and on the Bloomfield Group website. **RMS (formally RTA) Notified prior to any road closures. Blasting Hotline on Bloomfield Group website.**

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
6 i (c)	A comprehensive plan of landscape management which shall include detailed plans, specifications for the maintenance of all landscape works and plantings, and maintenance of building materials and claddings, proposed screen plantings and mounding along the New England Highway and mine overburden dumps.	Sighted a detailed visual amenity plan - Rix's Creek Landscape Plan (June 1996). Establishment of effective screen plantings and mounding was observed along the New England Highway and Rix's Lane, which is beyond the commitment of the June 1996 Plan. Unable to sight evidence of a formal building maintenance program or inclusion of building maintenance specifications within the Landscape Management Plan (V2 18-3-10 Rix's Final Draft). Site inspection observed a number of sheet metal panels missing on the train load out bin conveyor cladding and the coal bin remains unpainted (see Photo 11 in the audit report) It was stated that building maintenance is undertaken as part of the general maintenance program on site. A major project has been undertaken (2010-2011), where major infrastructure i.e. Washing plant structure, Clean coal bin, workshop located beside the office and store and maintenance shed located on the top pad have been painted to blend with surrounds (site inspection confirmed recent works).	Low	Update the Landscape Management Plan to include building/infrastructure maintenance. Review sheet metal cladding and repair as necessary on the train load out conveyor. **No formal building maintenance program, however, building maintenance is undertaken on an as-needs basis with 2 yearly structural integrity inspections in Rix's 'Pulse' system.**
9i	The Applicant shall prepare and implement a Traffic Management Plan for the development, to the satisfaction of the Director-General. The Plan must be submitted to the Director-General for approval prior to commencement of construction of the cut and cover tunnel	Unable to sight evidence that a Traffic Management Plan has been submitted to DoPI for approval prior to construction. Traffic control plan submitted and approved by RTA as a component of the Work Authorisation Deed (contract number 09-2535-2274), sighted.	Low	The Traffic Management Plan was submitted to DoPI (email - Howard Reed, Scott Brooks) on 24 November 2011. **Approval gained in 2012.**

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
11i	The Applicant shall measure, record and report the LA 10,15 min noise level over a representative 72 hour period at four (4) locations determined by the DECCW from five (5) nominated locations closest to the mining operations. The report shall include a record of the meteorological conditions at the time of monitoring and shall be conducted on a quarterly basis. Monitoring shall commence immediately after the date of this Consent.	Sighted quarterly monitoring data from The Retreat, Singleton Heights, Camberwell and Maison Dieu reported in the AEMRs (2007-2010). Portable met station set up at monitoring sites to record local met data and is reported on graphs. However, unable to determine if monitoring undertaken under neutral conditions, to allow an assessment of monitoring results against the design goal noise levels set in the consent. It is noted, that the Industrial Noise Policy (not applied at present at Rix's Creek) does not relate to neutral atmospheric conditions. Further, a description of the mining activity at the time of monitoring is not presented in the AEMR to assess that average conditions have been measured.	Medium	AEMR to include an assessment of the monitoring results with regard to the design goal noise levels, with respect to meteorological conditions at the time of monitoring. Provide a description of the mining activity at the time of monitoring is not presented in the AEMR **Rix's monitors weather conditions and attended monitoring conducted when mine operating. Attended field sheets record weather conditions and mining operations at time of noise monitoring sessions. Real-time weather station installed during 2014 to further improve any meteorological changes i.e. temperature inversions.**

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
14 iii	Install automatic water sprays on the coal stockpiles such that the stockpiles are sprayed when the wind speed from any direction exceeds 5.6m/s;	ROM coal stockpile sprays are not automated for wind speed greater than 5.6m/s - they are manually operated based on visual assessment of need. However wind speeds may exceed parameters when the operation is unmanned (e.g. weekend). It was stated (pers. comm. J. Hindmarsh) that the moisture content of coal is generally >10%. Dust emissions were not evident at the time of inspection at the rail loader stockpiles. Automatic sprays are installed at the rail loader product stockpiles but are not operated as the coal is damp. Operations are ceased during adverse weather conditions. The ROM Coal bin has automatic sprays that are tripped when a truck tips, but it is not utilised if loader tipping into the bin. If loader feeds bin, then generally pushing into high level bin and minimal dust is generated.	Low	Previous compliance audit finding - issue not adequately resolved with the OEH/DoPI. Ensure that adequate dust mitigation is applied at all times. **Rix's Creek has reinstated stockpile sprays and SafeMine detection system for Loader / Trucks emptying ROM Coal into the ROM Hopper.**
15A v	The Applicant shall prepare and implement an Erosion and Sediment Control Plan. This Plan must: Describe what measures would be implemented to monitor and maintain the structures over time.	Sighted the Water Management Plan (30/03/10) which includes an Erosion and Sediment Control Plan (Part C and Appendix A). The ESCP requires 'All sediment dams will be inspected quarterly to ensure they have at least 75% of their capacity available for sediment retention. Desilting will be undertaken as soon as practicable, with silt being disposed of to an area approved by RXC. Details will be recorded on inspection logs'. Sighted inspection logs for sediment dams on site and appropriate checklists developed. Unable to sight evidence that these inspections are being completed quarterly.	Low	Ensure that inspections are completed quarterly and actions resolved in timely manner. **Conducted quarterly with no inspections missed for 2012-2015.**

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
16 A ii	Rehabilitation Management Plan to be submitted for approval by the Director-General by 31 March 2010;	Sighted Rehabilitation Management Plan (V2 240310 Rix's Final Draft). Unable to sight evidence that this plan has been approved by the D-G. Sighted an email, dated 19/05/2010, from Alison O'Reilly (DoPI) noting that there were a few conditions that have not been addressed; specifically 16B ii - measures for short, medium, long-term, 16B v, 16B vii - potential risks to be addressed, 16B viii - more information required including group documents.	Low	Amend the RMP and gain approval from the D-G. Implement the requirements of the RMP. **Revised RMP resubmitted November 2011 to Planning with approval granted in 2012.**
19 i (d)	The Applicant shall prepare and submit to DII for approval an Annual Environmental Management Plan Report. The report shall include: a review of performance in terms of the conditions of development consent;	Unable to sight an assessment of performance in terms of the conditions of this consent. Sighted a letter (DoPI to Rix's Creek, 08/06/2011) requesting that in future reports a compliance table be included.	Low	Include in the 2011 AEMR a compliance assessment of the conditions of development consent. **Included in 2012 AEMR.**
19 i (h)	The Applicant shall prepare and submit to DII for approval an Annual Environmental Management Plan Report. The report shall include: set out environmental management targets for the next year.	Unable to sight specific targets for the next year within the AEMR	Low	Include in the 2011 AEMR environmental targets for 2012. **Included in 2012 AEMR.**
27 i	The Applicant shall monitor the amount of waste generated by the project;	Unable to sight adequate records relating to all wastes generated on site for the audit period.	Medium	Maintain records of all wastes generated and disposed (including trackable wastes and tyres) **Waste figures for all waste provided by waste contractor and displayed in AEMR.**

Condition	Condition Requirement	Audit Evidence / Observations	Significance	Recommendation
27 iv	The Applicant shall ensure irrigation of treated wastewater is undertaken in accordance with DECC's Environmental Guideline for the Utilisation of Treated Effluent; and	Unable to sight a current SSC approval to operate a Sewage Management System (last approval 1989). Environmental Guideline, Section 5.3 describes monitoring requirements, unable to sight evidence of a monitoring program for the management of the onsite sewage treatment and irrigation system.	Medium	Gain an Approval to Operate for the OSMS. Undertake monitoring (water/soil) of the effluent treatment area. **Approval received 19/12/2011 from Singleton Council. Water monitoring downstream of site conducted monthly.**

Rix's Creek outcomes of Independent Environmental Audit recommendations.

The next independent audit is scheduled for 2016 i.e. five years after 2011.

SECTION 11 – INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

Rix's Creek Development Consent DA 49/94 was not complied with during the 2015 reporting period. Any non-compliance and follow-up recommendations is included in this table.

Condition #	Compliant?	Reason	Recommendation
1	Yes	N/A	N/A
2	Yes	N/A	N/A
3	Yes	N/A	N/A
4	Yes	N/A	N/A
5	Yes	N/A	N/A
6	Yes	N/A	N/A
7	Yes	N/A	N/A
8	Yes	N/A	N/A
9	Yes	N/A	N/A
10	Yes	N/A	N/A
11	Yes	N/A	N/A
12	Yes	N/A	N/A
13	Yes	N/A	N/A
14	Yes	N/A	N/A
15	No	Water released off-site during April 2015 storm event.	Report submitted to DPE found in Appendix 4 of this report.
16	Yes	N/A	N/A
17	Yes	N/A	N/A
18	Yes	N/A	N/A
19	Yes	N/A	N/A
20	Yes	N/A	N/A
21	Yes	N/A	N/A
22	Yes	N/A	N/A
23	Yes	N/A	N/A
24	Yes	N/A	N/A
25	Yes	N/A	N/A
26	Yes	N/A	N/A – Another Independent Environmental Audit due 2016
27	Yes	N/A	N/A
28	Yes	N/A	N/A

Rix's Creek Mining Lease No 1432 was complied with during the 2015 reporting period. Any non-compliance and follow-up recommendations will be included in this table, however, this is not applicable during 2015.

Condition #	Compliant?	Reason	Recommendation
1-3	Yes	N/A	N/A
14-18	Yes	N/A	N/A
19-27	Yes	N/A	N/A
29-32	Yes	N/A	N/A
41-51	Yes	N/A	N/A
54	Yes	N/A	N/A

SECTION 12 – ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The operations for the coming year will be similar to 2015. Mining will be focussed in the West Pit (Pit 3). Due to coal advances in Pit 3 a majority of overburden from Pit 3 will be placed in the North Pit (Pit 1) until coal reserves move in a northward fashion. Pit 3 will require progressive pre-stripping ahead of the mining operations. Coal advancement in Pit 3 was limited in 2015 again due to water within the active mining area preventing coal access and the subsequent rehabilitation progression on the Pit 3 dump. During 2016 this should begin to occur as overburden can begin to be filled in the Pit 3 voids behind the coal resource. During 2015 rehabilitation was ahead of the proposed MOP area due to the additional overburden dumped within the Pit 1 void which was not able to be dumped behind the Pit 3 operation due to water in the active mining area.

The overall production level scheduled in the MOP is for the approved development consent level of a maximum material movement on site of 16.1 million cubic metres as shown in Table 36. During 2014 approval was granted to increase the previous level of 15 million cubic metres to a maximum material movement on site of 16.1 million cubic metres. This is projected to be similar in 2016 with slightly higher rates of overburden movement with saleable coal remaining the same. The overburden increase is aligned to Rix's Creek life-of-mine ratio for dirt to coal movement to keep the mine economically viable. The increased overburden movement is aligned to the increasing strip ratio as the West Pit progresses north-west.

The other activity of significance will be related to the purchase of the former Vale – Integra open cut site, now known as 'Rix's Creek North'. This site will be brought out of its current care and maintenance phase into production at a smaller scale once relevant approvals and management plans are approved. This will be covered more in the 2016 AEMR.

Table 36. Mining Operation Plan Production Schedule

Year	Area	Description	Overburden (bank cubic metres)	Saleable (tonnes)	Strip Ratio
2014 Actual production	Pit 1	Arties	110,435	61,379	1.80
	Pit 3	Barrett	13,123,650	1,420,199	9.24
	Total		13,234,085	1,481,578	8.93
2015 Projected	Pit 1	Arties	0	0	-
	Pit 3	Barrett	13,630,000	1,450,000	9.4
	Total		13,630,000	1,450,000	9.4
2015 Actual production	Pit 1	Arties	0	0	-
	Pit 3	Barrett	13,364,730	1,505,941	8.87
	Total		13,364,730	1,505,941	8.87
2016 Projected	Pit 1	Arties	0	0	-
	Pit 3	Barrett	13,630,000	1,500,000	9.1
	Total		13,630,000	1,500,000	9.1

The area rehabilitated in 2015 was 21.7 ha. The cumulative rehabilitation area to date is 396.1 ha, which is 6 ha ahead of the MOP cumulative total at 2015 of 390.1 ha. Areas are being prepared for final shaping and topsoiling during early to mid, 2016 and throughout the remainder of the year. The area planned for rehabilitation during 2016 is estimated to be approximately 19.9 ha. Based on the 2015 cumulative rehabilitation to date totalling 396.1 ha only 4.1 ha is required to be rehabilitated to meet 2016 MOP requirements (being 400.2 ha).

Environmental management is an ongoing process at Rix's Creek with continual improvement being made to the existing systems already in place.

Appendix 1 Air Quality Monitoring Data

	Rix's Creek Dust Deposition Insoluble Solids 2015														
	c = Contaminated Result														
	ns = no sample														
Gauge	**Jan-15**	**Feb-15**	**Mar-15**	**Apr-15**	**May-15**	**Jun-15**	**Jul-15**	**Aug-15**	**Sep-15**	**Oct-15**	**Nov-15**	**Dec-15**	**Max**	**Min**	**Avg**
1	1.1	1.4	1.3	**6.8c**	4.7	**17.3c**	**19.3c**	1.9	1.9	0.8	1.4	1.3	4.7	0.8	1.8
2	1.3	**2.1c**	1.6	2.1	1.9	1.4	1.1	1.3	3.1	1.4	1.9	1.8	3.1	1.1	1.7
3	1.7	1.1	0.8	1.0	1.0	1.1	1.4	1.3	3.0	1.3	**23.9c**	1.2	3.0	0.8	1.4
5	1.0	0.5	2.0	1.5	1.4	2.3	2.1	1.9	4.1	1.6	1.5	1.7	4.1	0.5	1.8
6	**1.3c**	2.6	**4.3c**	**4.4c**	**4.5c**	3.7	**3.8c**	**4.2c**	4.6	2.4	4.4	3.1	4.6	2.4	3.5
7	2.1	2.4	**10.1c**	**7.9c**	2.6	4.2	2.2	2.3	2.6	2.3	1.8	2.2	4.2	1.8	2.5
8	0.4	0.8	1.4	1.2	**2.2c**	0.8	**2.4c**	2.7	3.9	0.7	1.6	**2.3c**	3.9	0.4	1.5
9	0.8	0.8	1.6	1.0	1.9	1.2	1.3	2.3	3.0	1.3	**4.5c**	**3.6c**	3.0	0.8	1.5
10	0.8	0.9	0.8	0.7	1.0	1.8	0.9	0.8	2.9	0.7	**ns**	1.1	2.9	0.7	1.1
11	0.4	0.8	1.0	1.1	1.3	1.3	0.9	1.5	1.3	0.7	0.9	1.4	1.5	0.4	1.1
13	1.0	0.4	1.5	1.3	1.1	1.4	1.5	2	2.5	1.3	2.0	2.4	2.5	0.4	1.5
14	1.1	0.6	2.5	2.8	1.9	2.3	1.8	**ns**	1.8	1.0	3.0	1.5	3.0	0.6	1.8
15	1.5	0.7	1.2	1.5	1.5	1.9	2.0	2.4	**4.0c**	1.4	1.4	3.5	3.5	0.7	1.7
16	1.2	0.4	1.9	**6.1c**	1.3	2.4	2.4	2.9	3.3	1.1	2.3	2.0	3.3	0.4	1.9
17	1.2	0.5	1.5	0.8	1.2	1.0	1.0	1.4	2.7	0.9	1.9	1.9	2.7	0.5	1.3
18	0.7	0.5	1.0	1.0	0.9	1.1	1.0	1.3	1.8	1.2	1.1	1.1	1.8	0.5	1.1
19	**27.1c**	**7c**	1.8	**4.3c**	1.9	2.1	**3.1c**	4.6	**3.5c**	1.2	**7.4c**	**26.6c**	4.6	1.2	2.3
20	0.9	1.7	1.4	1.7	1.4	2.0	1.7	2.5	3.2	1.4	2.3	2.1	3.2	0.9	1.9
21	**1.4c**	**2.2c**	**3c**	2.1	2.0	1.5	1.2	1.9	2.6	1.6	1.4	**2.7c**	2.6	1.2	1.8
22	**0.9c**	0.4	3.0	3.0	1.0	1.8	1.2	2.1	2.4	1.0	2.1	1.7	3.0	0.4	1.8
23	0.6	1.4	2.2	2.1	1.7	1.7	1.6	1.9	**16.2c**	1.9	2.4	2.6	2.6	0.6	2.3
25	2.0	1.5	3.4	2.3	1.8	**8.3c**	**22.3c**	**7.4c**	**13.3c**	2.4	3.4	1.9	3.4	1.5	4.2
26	10.7	2.4	**10.9c**	7.5	2.0	2.5	4.9	2	6.5	3.4	3.2	1.5	10.7	1.5	2.4
27	**2.8c**	**5c**	**4.4c**	**7.1c**	**16.3c**	**9.4c**	2.4	**6.4c**	**11.6c**	**9.0c**	**12.3c**	**19.2c**	2.4	2.4	2.0
28	**7.4c**	1.3	1.5	**4.1c**	1.1	1.9	1.5	1.6	3.6	4.2	2.3	1.0	4.2	1.0	1.6
29	0.9	1.1	2.4	2.0	**6.6c**	1.0	1.4	1.5	2.2	1.7	1.9	1.8	2.4	0.9	1.8
30	0.9	0.8	1.2	1.8	6c	3.1	**9.5c**	1.7	2.8	0.8	2.4	2.2	3.1	0.8	1.6
31	1.2	**6.6c**	**3.3c**	**12.3c**	**3.4c**	1.4	1.3	1.4	2.6	0.3	2.8	2.0	2.8	0.3	2.3
32	1.0	2.3	1.5	1.3	2.2	3.9	2.8	2.5	3.7	1.7	2.6	2.3	3.9	1.0	1.5
33	0.8	0.9	0.8	1.1	2.8	2.8	1.5	1.3	2.0	1.2	2.0	1.3	2.8	0.8	1.9

TOTAL SUSPENDED PARTICILATES 2015 (ug/m3)				
	Date	Retreat Site	Mines Rescue Site	Rix's Creek Site
1	5-Jan-15	43	28	35
2	11-Jan-15	15	11	14
3	17-Jan-15	94	67	78
4	23-Jan-15	36	37	48
5	29-Jan-15	41	26	22
6	4-Feb-15	26	30	35
7	10-Feb-15	22	19	26
8	16-Feb-15	57	26	45
9	22-Feb-15	19	13	33
10	28-Feb-15	31	24	30
11	6-Mar-15	117	82	118
12	12-Mar-15	102	75	44
13	18-Mar-15	160	89	177
14	24-Mar-15	62	57	85
15	30-Mar-15	33	31	74
16	5-Apr-15	39	35	43
17	11-Apr-15	16	21	20
18	17-Apr-15	56	44	48
19	23-Apr-15	28	15	22
20	29-Apr-15	20	19	22
21	5-May-15	63	57	70
22	11-May-15	108	82	125
23	17-May-15	27	28	28
24	23-May-15	16	18	12
25	29-May-15	52	70	67
26	4-Jun-15	95	86	97
27	10-Jun-15	37	43	49
28	16-Jun-15	12	14	7
29	22-Jun-15	50	54	53
30	28-Jun-15	37	30	29
31	4-Jul-15	92	70	71
32	10-Jul-15	67	67	64
33	16-Jul-15	49	42	54
34	22-Jul-15	29	57	46
35	28-Jul-15	80	91	80
36	3-Aug-15	125	95	128
37	9-Aug-15	33	37	34
38	15-Aug-15	284	62	88
39	21-Aug-15	92	95	116
40	27-Aug-15	43	44	47
41	2-Sep-15	80	88	111
42	8-Sep-15	87	82	98

43	14-Sep-15	59	50	71
44	20-Sep-15	17	15	16
45	26-Sep-15	17	16	13
46	2-Oct-15	63	63	82
47	8-Oct-15	57	38	44
48	14-Oct-15	36	39	33
49	20-Oct-15	**93**	88	**111**
50	26-Oct-15	87	77	**96**
51	1-Nov-15	60	50	55
52	7-Nov-15	34	34	36
53	13-Nov-15	36	26	28
54	19-Nov-15	**130**	**112**	**136**
55	25-Nov-15	**100**	80	**110**
56	1-Dec-15	**97**	**115**	**189**
57	7-Dec-15	39	34	62
58	13-Dec-15	53	41	72
59	19-Dec-15	43	40	50
60	25-Dec-15	18	15	22
61	31-Dec-15	30	**131**	23
	Runs	61	61	61
	DNR	0	0	0
	% run	100.00%	100.00%	100.00%
	Maximum	**284**	**131**	**189**
	Minimum	12	11	7
	Average	59.7	51.2	61.3
	Results >90 ug/m3 Annual Average Limit	14	6	13

Bold – results > 90 *u*g/m^3 - annual average limit (EPA Air Quality Assessment Criteria)

Laboratory reports are available upon request from the Company.

Rix's Creek Particulate Matter <10 Micron Results 2015				
	Date	1	2	3
		Rix's Creek site	Mines Rescue Site	Retreat Site
1	5-Jan-15	16	14	16
2	11-Jan-15	7	5	5
3	17-Jan-15	24	23	28
4	23-Jan-15	18	17	14
5	29-Jan-15	9	12	13
6	4-Feb-15	16	15	10
7	10-Feb-15	11	8	7
8	16-Feb-15	20	12	19
9	22-Feb-15	10	4	4
10	28-Feb-15	9	10	10
11	6-Mar-15	49	29	39
12	12-Mar-15	36	25	39
13	18-Mar-15	79	41	46
14	24-Mar-15	27	21	15
15	30-Mar-15	25	11	11
16	5-Apr-15	13	17	15
17	11-Apr-15	7	7	6
18	17-Apr-15	23	26	22
19	23-Apr-15	10	5	10
20	29-Apr-15	8	9	10
21	5-May-15	22	23	18
22	11-May-15	32	18	22
23	17-May-15	10	10	8
24	23-May-15	7	9	7
25	29-May-15	22	19	17
26	4-Jun-15	35	31	32
27	10-Jun-15	17	16	11
28	16-Jun-15	3	8	6
29	22-Jun-15	21	21	18
30	28-Jun-15	12	16	14
31	4-Jul-15	25	23	27
32	10-Jul-15	21	22	19
33	16-Jul-15	16	11	13
34	22-Jul-15	23	30	15
35	28-Jul-15	23	26	20
36	3-Aug-15	35	22	29
37	9-Aug-15	16	13	14
38	15-Aug-15	23	20	27
39	21-Aug-15	46	39	34
40	27-Aug-15	15	14	15
41	2-Sep-15	31	25	22
42	8-Sep-15	25	20	22
43	14-Sep-15	27	19	20
44	20-Sep-15	4	6	4
45	26-Sep-15	5	7	6
46	2-Oct-15	29	23	22
47	8-Oct-15	19	17	18
48	14-Oct-15	15	15	13

49	20-Oct-15	39	30	28
50	26-Oct-15	39	25	26
51	1-Nov-15	24	19	20
52	7-Nov-15	18	15	14
53	13-Nov-15	12	7	10
54	19-Nov-15	49	32	35
55	25-Nov-15	37	26	24
56	1-Dec-15	**53**	42	26
57	7-Dec-15	25	16	14
58	13-Dec-15	25	17	17
59	19-Dec-15	21	23	15
60	25-Dec-15	9	9	8
61	31-Dec-15	12	28	10
	Runs	61	61	61
	DNR	0	0	0
	%	100%	100%	100%
	Maximum	79	42	46
	Minimum	3	4	4
	Average	22	18	18
	Results >50 ug/m3	2	0	0

Bold – results > 50 *u*g/m^3 – daily air quality limit over a 24 hour averaging period (EPA Air Quality Assessment Criteria)

Laboratory reports are available upon request from the Company.

Appendix 2 Blast Results

BLAST RESULTS 2015

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
20/01/2015									
	11:17 AM								
		WP09 L17 S1							
			4.8	138	0				
						0.51	98.3	Wright	Maison Dieu
						0.24	79.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
22/01/2015									
	2:32 PM								
		WP11 Lemington 42							
			6.8	95	0				
						<0.3	<113	Dunn	MAISON
						0.22	96.2	Wright	Maison Dieu
						0.06	103.5	Mines	SINGLETON
27/01/2015									
	11:18 AM								
		WP08 L19							
			8.8	137	0				
						<0.3	<113	Dunn	MAISON
						0.06	90.7	Wright	Maison Dieu
						0.06	90.4	Mines	SINGLETON
4/02/2015									
	11:01 AM								
		WP08 L19							
			3.8	144	0				
						0.11	91.8	Wright	Maison Dieu
						0.1	86.2	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
5/02/2015									
	10:00 AM								
		WS11 A23 Peak 3							
			2.8	139	0				
						0.2	102.5	Wright	Maison Dieu
						0.08	82.8	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
11/02/2015									
	2:22 PM								
		WP08 Extended L19 S2							
			4	83	0				
						<0.3	<113	Dunn	MAISON
						0.15	100.5	Wright	Maison Dieu
						0.13	88.5	Mines	SINGLETON
		WP08 L19 S3							
			4	83	0				
						0.13	88.5	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.15	100.5	Wright	Maison Dieu

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
17/02/2015									
	11:06 AM	WP08 Extended L19 S4	2	63	0				
						0.09	105.1	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.08	95.1	Wright	Maison Dieu
18/02/2015									
	11:02 AM	WP10 Lemington 35	2.3	110	0				
						<0.3	<113	Dunn	MAISON
						0.07	89.8	Wright	Maison Dieu
						0.03	91.6	Mines	SINGLETON
20/02/2015									
	10:56 AM	WP11 Lemington 42 S3	4	113	0				
						<0.3	<113	Dunn	MAISON
						0.06	90.2	Wright	Maison Dieu
						0.04	80.2	Mines	SINGLETON
25/02/2015									
	11:22 AM	WP09 L19	2.3	117	0				
						0.24	91.9	Wright	Maison Dieu
						0.11	85.3	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
27/02/2015									
	11:01 AM	WP08 Extended L19	2.3	158	0				
						0.2	93	Wright	Maison Dieu
						0.06	82.5	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
3/03/2015									
	2:28 PM	WS11 Level 1B	2.3	338	0				
						<0.3	<113	Dunn	MAISON
						0.22	102	Wright	Maison Dieu
						0.08	93.3	Mines	SINGLETON
10/03/2015									
	11:13 AM	WS11 1B S2	4.5	150	0				
						<0.3	<113	Dunn	MAISON
						0.2	101.9	Wright	Maison Dieu
						0.08	93.3	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
12/03/2015									
	2:26 PM								
		WS11 1B S4							
			5.5	90	0				
						<0.3	<113	Dunn	MAISON
						0.19	105.8	Wright	Maison Dieu
						0.12	85.4	Mines	SINGLETON
17/03/2015									
	2:23 PM								
		WP08 Extended L17							
			1.5	181	0				
						<0.3	<113	Dunn	MAISON
						0.62	96.9	Wright	Maison Dieu
						0.4	88.7	Mines	SINGLETON
19/03/2015									
	11:17 AM								
		WP08 Extended L17							
			3	86	0				
						0.52	94.4	Wright	Maison Dieu
						0.31	88.3	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
25/03/2015									
	11:05 AM								
		WP08 L17 S3							
			2.8	91	0				
						0.39	96.2	Wright	Maison Dieu
						0.51	90.4	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
30/03/2015									
	2:26 PM								
		WP10 Lemington 35 S2							
			5.8	117	0				
						<0.3	<113	Dunn	MAISON
						0.1	93.8	Wright	Maison Dieu
						0.08	87.6	Mines	SINGLETON
31/03/2015									
	11:08 AM								
		WP08 Extended L19/18							
			3.8	136	0				
						0.44	95.4	Wright	Maison Dieu
						0.56	92.1	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
2/04/2015									
	2:31 PM								
		WS11 A25							
			2.5	297	0				
						<0.3	<113	Dunn	MAISON
						0.28	111.6	Wright	Maison Dieu
						0.11	106.1	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
17/04/2015									
	2:29 PM								
		WP09 L17/16							
			3.5	112	0				
						<0.3	<113	Dunn	MAISON
						0.68	102.2	Wright	Maison Dieu
						0.17	87.3	Mines	SINGLETON
30/04/2015									
	11:15 AM								
		WP08 Extended L15							
			4.5	118	0				
						<0.3	<113	Dunn	MAISON
						1.32	109.2	Wright	Maison Dieu
						1.38	94.9	Mines	SINGLETON
1/05/2015									
	11:28 AM								
		WP08 Extended L19/18							
			5.3	156	0				
						<0.3	<113	Dunn	MAISON
						0.08	89.1	Wright	Maison Dieu
						0.07	80.4	Mines	SINGLETON
7/05/2015									
	9:09 AM								
		WP10 PG28 Presplit							
			8	306	0				
						<0.3	<113	Dunn	MAISON
						0.22	105.1	Wright	Maison Dieu
						0.06	97.6	Mines	SINGLETON
8/05/2015									
	11:12 AM								
		WP08 Extended L19/18							
			7.3	314	0				
						<0.3	<113	Dunn	MAISON
						0.15	101	Wright	Maison Dieu
						0.07	92	Mines	SINGLETON
12/05/2015									
	9:34 AM								
		WP08 Extended L15 Presplit							
			9.8	303	0				
						<0.3	<113	Dunn	MAISON
						0.73	104	Wright	Maison Dieu
						0.65	108.6	Mines	SINGLETON
15/05/2015									
	11:09 AM								
		WP08 Extended L15							
			3	196	0				
						<0.3	<113	Dunn	MAISON
						1.09	109	Wright	Maison Dieu
						1.32	96	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	2:20 PM	WP10 Lemington 38	4.5	143	0				
						<0.3	<113	Dunn	MAISON
						0.07	94.5	Wright	Maison Dieu
						0.03	85.5	Mines	SINGLETON
18/05/2015									
	11:08 AM	WS11 A23	1.5	166	0				
						<0.3	<113	Dunn	MAISON
						0.15	107	Wright	Maison Dieu
						0.09	89.7	Mines	SINGLETON
	2:27 PM	WP10 PG29	2	154	0				
						0.33	92.9	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.79	99.4	Wright	Maison Dieu
19/05/2015									
	2:25 PM	WP08 Extended L19	5.8	311	0				
						0.06	95.7	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.11	100.1	Wright	Maison Dieu
21/05/2015									
	2:25 PM	WP10 Lemington 38	4	313	0				
						<0.3	<113	Dunn	MAISON
						0.16	100.4	Wright	Maison Dieu
						0.04	92.2	Mines	SINGLETON
26/05/2015									
	2:30 PM	WP08 Extended L17/16	1.5	278	0				
						<0.3	<113	Dunn	MAISON
						0.52	101.5	Wright	Maison Dieu
						0.28	95.8	Mines	SINGLETON
28/05/2015									
	2:21 PM	WP08 Ext L19/18	6	292	0				
						0.06	110.7	Mines	SINGLETON
						0.14	110.3	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
29/05/2015									
	2:27 PM								
		WP10 Lemington 38	7.3	301	0				
						0.09	100.8	Wright	Maison Dieu
						0.04	101.2	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
		WP10 PG28 Presplit	7.3	301	0				
						0.04	101.2	Mines	SINGLETON
						0.09	100.8	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
2/06/2015									
	2:25 PM								
		WP08 Extended L19/18	2.5	300	0				
						<0.3	<113	Dunn	MAISON
						0.44	101.7	Wright	Maison Dieu
						0.29	98.6	Mines	SINGLETON
3/06/2015									
	2:21 PM								
		WP10 PG29	1.3	21	0				
						<0.3	<113	Dunn	MAISON
						0.66	95	Wright	Maison Dieu
						0.16	90.7	Mines	SINGLETON
4/06/2015									
	2:24 PM								
		WS11 L15	4.8	301	0				
						<0.3	<113	Dunn	MAISON
						0.28	104.7	Wright	Maison Dieu
						0.15	94.5	Mines	SINGLETON
10/06/2015									
	11:16 AM								
		WP08 UB Presplit	2.8	131	0				
						1.71	97.5	Wright	Maison Dieu
						0.33	87.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
12/06/2015									
	11:01 AM								
		WP08 Extended L17/16	2.8	120	0				
						0.24	83.5	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.23	93.4	Wright	Maison Dieu
16/06/2015									
	11:16 AM								
		WS11 L17/16	1	125	0				
						0.09	91.2	Mines	SINGLETON
						0.23	99	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	11:42 AM	WP08 Extended L17/16	1.3	142	0				
						<0.3	<113	Dunn	MAISON
						0.51	92.3	Wright	Maison Dieu
						0.22	88.4	Mines	SINGLETON
19/06/2015									
	1:20 PM	WS09 A25	2	297	0				
						<0.3	<113	Dunn	MAISON
						1.34	111.1	Wright	Maison Dieu
						0.25	102.2	Mines	SINGLETON
23/06/2015									
	11:14 AM	WP08 Extended L17/16	1.3	303	1				
						0.14	91.7	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.4	98	Wright	Maison Dieu
24/06/2015									
	2:22 PM	WS11 L17/16	3.8	285	1				
						0.1	96.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.17	104.1	Wright	Maison Dieu
26/06/2015									
	2:25 PM	WS11 L17/16	3.5	158	0				
						<0.3	<113	Dunn	MAISON
						0.14	101.5	Wright	Maison Dieu
						0.05	80.6	Mines	SINGLETON
30/06/2015									
	11:08 AM	WS11 A25	4	324	0				
						<0.3	<113	Dunn	MAISON
						0.27	107.7	Wright	Maison Dieu
						0.1	97.5	Mines	SINGLETON
	2:34 PM	WP08 Barrett	4	307	0				
						1.81	107.5	Wright	Maison Dieu
						0.65	102.1	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
1/07/2015									
	2:23 PM								
		WS11 L13							
			3	324	0				
						<0.3	<113	Dunn	MAISON
						0.27	106.8	Wright	Maison Dieu
						0.08	101.4	Mines	SINGLETON
		WS11 L17/16							
			3	324	0				
						<0.3	<113	Dunn	MAISON
						0.27	106.8	Wright	Maison Dieu
						0.08	101.4	Mines	SINGLETON
7/07/2015									
	2:25 PM								
		WS11 L15							
			1.5	278	0				
						<0.3	<113	Dunn	MAISON
						0.22	99.4	Wright	Maison Dieu
						0.07	86.6	Mines	SINGLETON
	2:36 PM								
		WP08 Extended L13 Presplit							
			2	276	0				
						<0.3	<113	Dunn	MAISON
						1.04	89.7	Wright	Maison Dieu
						0.33	84.8	Mines	SINGLETON
8/07/2015									
	2:30 PM								
		WP08 Extended L15							
			2.3	114	1				
						<0.3	<113	Dunn	MAISON
						1.21	101	Wright	Maison Dieu
						1.22	88.4	Mines	SINGLETON
9/07/2015									
	10:59 AM								
		WP10 Lemington 35							
			1.3	225	0				
						<0.3	<113	Dunn	MAISON
						0.1	93.2	Wright	Maison Dieu
						0.04	86.8	Mines	SINGLETON
10/07/2015									
	11:00 AM								
		WP10 Lemington 35							
			4	314	1				
						0.13	104.8	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
						0.05	108.6	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
16/07/2015									
	11:10 AM								
		WP08 Extended L13 Presplit	7.8	276	0				
						1.42	91.6	Wright	Maison Dieu
						0.3	93.1	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
20/07/2015									
	2:29 PM								
		WP10 Lemington 35	4	123	0				
						<0.3	<113	Dunn	MAISON
						0.1	89.4	Wright	Maison Dieu
						0.05	81.2	Mines	SINGLETON
	2:41 PM								
		WP08 Extended L15	3	97	0				
						<0.3	<113	Dunn	MAISON
						1.29	103.2	Wright	Maison Dieu
						0.88	95.2	Mines	SINGLETON
21/07/2015									
	2:20 PM								
		WS11 A23	1.3	302	0				
						0.12	99.4	Wright	Maison Dieu
						0.1	94.9	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
23/07/2015									
	2:25 PM								
		WS11 Lower Barrett	1.8	275	0				
						0.21	107.6	Wright	Maison Dieu
						0.08	96.8	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
29/07/2015									
	2:27 PM								
		WS09 A25 Ramp	2.3	75	0				
						<0.3	<113	Dunn	MAISON
						1.06	104.6	Wright	Maison Dieu
						0.33	90.9	Mines	SINGLETON
	2:46 PM								
		WP08 Extended L15	1.8	105	0				
						<0.3	<113	Dunn	MAISON
						1.41	99.2	Wright	Maison Dieu
						0.63	91.5	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
4/08/2015									
	9:10 AM	WP09 L17/16	*1.5*	*152*	*0*				
						<0.3	<113	Dunn	MAISON
						0.42	94.1	Wright	Maison Dieu
						0.13	88.4	Mines	SINGLETON
	9:11 AM	WP08 Extended L15 redrill	*1.8*	*157*	*0*				
						<0.3	<113	Dunn	MAISON
						0.15	87.3	Wright	Maison Dieu
						0.07	79	Mines	SINGLETON
	9:30 AM	WP10 PG Presplit	*2.5*	*153*	*0*				
						<0.3	<113	Dunn	MAISON
						0.52	90	Wright	Maison Dieu
						0.11	80.9	Mines	SINGLETON
	11:00 AM	WP10 Lemington 35	*1.3*	*35*	*0*				
						0.03	84.8	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.06	89.9	Wright	Maison Dieu
11/08/2015									
	9:11 AM	WP08 Extended L15	*3*	*314*	*0*				
						0.42	104.2	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						1.32	108.3	Wright	Maison Dieu
12/08/2015									
	11:07 AM	WP10 PG26 Presplit	*1.5*	*269*	*0*				
						<0.3	<113	Dunn	MAISON
						0.51	112.1	Wright	Maison Dieu
						0.33	108.5	Mines	SINGLETON
14/08/2015									
	11:08 AM	WP08 Extended L13 Presplit	*6*	*317*	*0*				
						<0.3	<113	Dunn	MAISON
						0.99	91.9	Wright	Maison Dieu
						0.6	90.3	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	4:05 PM	WS11 L20	4	318	0				
						0.06	92.2	Mines	SINGLETON
						0.13	101.6	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
	4:07 PM	WS11 Lower Barrett	4	318	0				
						0.12	97.6	Wright	Maison Dieu
						0.04	91.5	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
19/08/2015	11:08 AM	WS11 L40	1	141	0				
						<0.3	<113	Dunn	MAISON
						0.69	103.1	Wright	Maison Dieu
						0.19	93.8	Mines	SINGLETON
	11:12 AM	WP10 P29	1.5	75	0				
						<0.3	<113	Dunn	MAISON
						0.68	103.6	Wright	Maison Dieu
						0.26	95.1	Mines	SINGLETON
2/09/2015	2:39 PM	WP08 Extended L15	5.8	354	0				
						<0.3	<113	Dunn	MAISON
						1.33	108.6	Wright	Maison Dieu
						0.93	98.9	Mines	SINGLETON
4/09/2015	1:40 PM	WS11 A25	2	103	0				
						<0.3	<113	Dunn	MAISON
						0.23	99	Wright	Maison Dieu
						0.1	102.9	Mines	SINGLETON
	1:45 PM	WS11 L15/L17/16	2	103	0				
						<0.3	<113	Dunn	MAISON
						0.21	100	Wright	Maison Dieu
						0.09	93.2	Mines	SINGLETON
9/09/2015	2:28 PM	WP10 PG29 / Lem 30	3	312	0				
						0.39	98.7	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.73	104.1	Wright	Maison Dieu

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
10/09/2015									
	10:57 AM								
		WS12 Road Shot	*1.8*	*200*	*0*				
						0.36	94.9	Mines	SINGLETON
						0.12	100.3	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
	2:36 PM								
		WP10 PG29 / Lem30	*4.5*	*104*	*0*				
						<0.3	<113	Dunn	MAISON
						0.75	102.4	Wright	Maison Dieu
						0.36	94.9	Mines	SINGLETON
		WS11 Lemington 40	*4.8*	*88*	*0*				
						<0.3	<113	Dunn	MAISON
						0.43	95.7	Wright	Maison Dieu
						0.22	82.3	Mines	SINGLETON
16/09/2015									
	2:30 PM								
		WP08 Extended L13	*3.3*	*295*	*0*				
						0.05	92.3	Wright	Maison Dieu
						0.03	91.4	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
	2:40 PM								
		WS12 Road Pattern 2	*3.3*	*302*	*0*				
						0.32	99	Wright	Maison Dieu
						0.12	97.1	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
22/09/2015									
	11:32 AM								
		WP08 Extended Hebden	*6.5*	*298*	*0*				
						<0.3	<113	Dunn	MAISON
						1.18	99.9	Wright	Maison Dieu
						0.41	98.9	Mines	SINGLETON
24/09/2015									
	9:24 AM								
		WP08 Extended Barrett	*6.8*	*164*	*0*				
						<0.3	<113	Dunn	MAISON
						1.07	101.7	Wright	Maison Dieu
						1.02	88.8	Mines	SINGLETON
1/10/2015									
	11:00 AM								
		WS11 L15	*1.5*	*294*	*0*				
						<0.3	<113	Dunn	MAISON
						0.28	100.2	Wright	Maison Dieu
						0.1	93.9	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	VIBRATION mm/sec / OVERPRESSURE dBL		LOCATION	
					COMPLAINTS			
	2:21 PM							
		WP09 L16/17						
			5.3	283	0			
					<0.3	<113	Dunn	MAISON
					0.3	100.3	Wright	Maison Dieu
					0.14	94.2	Mines	SINGLETON
2/10/2015								
	11:13 AM							
		WE08 L13						
			3.8	87	0			
					<0.3	<113	Dunn	MAISON
					0.82	99	Wright	Maison Dieu
					0.79	91.4	Mines	SINGLETON
	11:14 AM							
		WE08 L15						
			3.8	87	0			
					0.79	91.4	Mines	SINGLETON
					<0.3	<113	Dunn	MAISON
					0.82	99	Wright	Maison Dieu
	11:27 AM							
		WE08 Barrett						
			2.3	92	0			
					1	87.2	Mines	SINGLETON
					<0.3	<113	Dunn	MAISON
					1.29	107	Wright	Maison Dieu
	11:28 AM							
		WP10 PG29						
			2.3	92	0			
					<0.3	<113	Dunn	MAISON
					0.19	99.4	Wright	Maison Dieu
					0.12	91.7	Mines	SINGLETON
8/10/2015								
	2:41 PM							
		WE08 Hebden Presplit						
			6.8	111	0			
					<0.3	<113	Dunn	MAISON
					1.1	88.3	Wright	Maison Dieu
					0.42	91.9	Mines	SINGLETON
9/10/2015								
	9:15 AM							
		WS11 L13						
			1	208	0			
					0.05	89.8	Mines	SINGLETON
					0.12	101.1	Wright	Maison Dieu
					<0.3	<113	Dunn	MAISON
	11:04 AM							
		WP10 PG28						
			3.5	193	0			
					0.3	92.2	Wright	Maison Dieu
					0.12	89.1	Mines	SINGLETON
					<0.3	<113	Dunn	MAISON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	2:21 PM	WS12 Road Shot #3	2.3	349	0				
						<0.3	<113	Dunn	MAISON
						0.19	95.9	Wright	Maison Dieu
						0.05	90.1	Mines	SINGLETON
14/10/2015									
	2:25 PM	WE08 Hebden Presplit	5.5	116	0				
						<0.3	<113	Dunn	MAISON
						0.68	80.4	Wright	Maison Dieu
						0.44	77.1	Mines	SINGLETON
27/10/2015									
	11:05 AM	WP10 PG29	6.3	161	0				
						<0.3	<113	Dunn	MAISON
						0.35	92.6	Wright	Maison Dieu
						0.16	87.5	Mines	SINGLETON
30/10/2015									
	11:00 AM	WS11 L13	1.8	79					
						<0.3	<113	Dunn	MAISON
						0.16	99.6	Wright	Maison Dieu
						0.07	94.8	Mines	SINGLETON
		WS11 Lower Barrett	1.8	79	0				
						<0.3	<113	Dunn	MAISON
						0.16	99.6	Wright	Maison Dieu
						0.07	94.8	Mines	SINGLETON
	2:28 PM	WE08 Barrett	4	108	0				
						1.26	85.7	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.12	105.2	Wright	Maison Dieu
16/11/2015									
	11:43 AM	WS11 Upper Barret	3.3	137	0				
						0.06	96.8	Mines	SINGLETON
						0.2	99.3	Wright	Maison Dieu
						<0.3	<113	Dunn	MAISON
	2:29 PM	WE08 Extended Barrett	2.8	135	0				
						<0.3	<113	Dunn	MAISON
						1.06	97.4	Wright	Maison Dieu
						0.83	98.2	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
24/11/2015									
	10:46 AM								
		WS11 A23							
			3	*82*	*0*				
						<0.3	<113	Dunn	MAISON
						0.17	101.2	Wright	Maison Dieu
						0.06	95.1	Mines	SINGLETON
	2:32 PM								
		WP10 PG28							
			1.8	*63*	*0*				
						0.28	96.2	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						1.04	104.5	Wright	Maison Dieu
27/11/2015									
	11:17 AM								
		WP10 PG28							
			6.8	*75*	*0*				
						0.12	87.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.46	96.8	Wright	Maison Dieu
3/12/2015									
	2:32 PM								
		WP09 L15							
			6.8	*91*	*0*				
						<0.3	<113	Dunn	MAISON
						1.76	103.4	Wright	Maison Dieu
						0.71	105.6	Mines	SINGLETON
4/12/2015									
	11:11 AM								
		WS11 Lower Barrett							
			4	*102*	*0*				
						<0.3	<113	Dunn	MAISON
						0.18	98.9	Wright	Maison Dieu
						0.07	84.1	Mines	SINGLETON
7/12/2015									
	2:27 PM								
		WE08 L13							
			8	*116*	*0*				
						0.1	86.8	Wright	Maison Dieu
						0.11	95.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
10/12/2015									
	11:07 AM								
		WS11 L20							
			2.5	*305*	*0*				
						<0.3	<113	Dunn	MAISON
						0.11	105.2	Wright	Maison Dieu
						0.07	95	Mines	SINGLETON

DATE	TIME	LOCATION	WIND SPEED m/sec	WIND DIRECTION	COMPLAINTS	VIBRATION mm/sec	OVERPRESSURE dBL	LOCATION	
	11:09 AM	WS11 Lower Barrett	2.5	305	0				
						<0.3	<113	Dunn	MAISON
						0.32	102.2	Wright	Maison Dieu
						0.09	94.2	Mines	SINGLETON
15/12/2015									
	2:15 PM	WS12 Road	2.8	129	0				
						<0.3	<113	Dunn	MAISON
						0.12	94.6	Wright	Maison Dieu
						0.1	83.8	Mines	SINGLETON
17/12/2015									
	11:15 AM	WS11 Lemington 32	3.8	106	0				
						<0.3	<113	Dunn	MAISON
						0.31	99.7	Wright	Maison Dieu
						0.1	83.2	Mines	SINGLETON
	2:27 PM	WS09 A25	3.5	141	0				
						<0.3	<113	Dunn	MAISON
						0.16	98.6	Wright	Maison Dieu
						0.07	83.7	Mines	SINGLETON
18/12/2015									
	2:30 PM	WS11 PG28	2.8	120	0				
						<0.3	<113	Dunn	MAISON
						0.34	95.7	Wright	Maison Dieu
						0.08	90.1	Mines	SINGLETON
31/12/2015									
	2:20 PM	WP10 PG28	4	108	0				
						0.67	105.6	Mines	SINGLETON
						<0.3	<113	Dunn	MAISON
						0.8	94.7	Wright	Maison Dieu

Appendix 3 Quarterly Noise Monitoring Results for Items of Equipment

PLANT AND EQUIPMENT LEVELS.

First quarter results 2015:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	91	12.0 m
Bulldozer Cat D11 – 2	91	12.0 m
Bulldozer Cat D11 – 3	91	12.0 m
Bulldozer Cat D11 – 4	92	12.0 m
Bulldozer Cat D11 – 7	91	12.0 m
Bulldozer Cat D11 – 8	91	12.0 m
Bulldozer Cat D10 – 5	91	12.0 m
Bulldozer Cat D10 – 8	90	12.0 m
Bulldozer Cat D10 – 10	90	12.0 m
Bulldozer Cat D10 – 11	90	12.0 m
Bulldozer Cat D10 – 13	90	12.0 m
Front-End Loader Cat 950 - 1	91	12.0 m
Front-End Loader Cat 988 - 1	90	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G – 2	87	12.0 m
Grader Caterpillar 16G – 4	88	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	84	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 – 5	89	12.0 m
Water Cart Cat 785 – 1	88	12.0 m
Water Cart Cat 785 – 2	88	12.0 m
Dump Truck Cat 789 – 1	91	12.0 m
Dump Truck Cat 789 – 6	91	12.0 m
Dump Truck Cat 789 – 9	89	12.0 m
Dump Truck Cat 789 – 10	88	12.0 m
Dump Truck Cat 789 – 11	90	12.0 m
Dump Truck Cat 789 – 12	90	12.0 m
Dump Truck Cat 793 – 1	90	12.0 m
Dump Truck Cat 793 – 2	90	12.0 m
Dump Truck Cat 793 – 3	90	12.0 m
Dump Truck Cat 793 – 4	91	12.0 m
Dump Truck Cat 793 – 5	91	12.0 m
Dump Truck Cat 793 – 6*	-	-
Dump Truck Cat 793 – 7	90	12.0 m
Dump Truck Cat 793 – 8	90	12.0 m
Dump Truck Cat 793 – 12	90	12.0 m
Dump Truck Cat 793 – 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	120	12.0 m
Liebherr R9800 Excavator	114	12.0 m

*793-6 Damaged Fourth quarter 2014

Second quarter results 2015:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	91	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	92	12.0 m
Bulldozer Cat D11 - 7	91	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	91	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	91	12.0 m
Front-End Loader Cat 988 - 1	91	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	88	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	87	12.0 m
ReDrill SK 50-2	84	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	89	12.0 m
Water Cart Cat 785 - 1	89	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	89	12.0 m
Dump Truck Cat 789 - 10	89	12.0 m
Dump Truck Cat 789 - 11	90	12.0 m
Dump Truck Cat 789 - 12	90	12.0 m
Dump Truck Cat 793 - 1	90	12.0 m
Dump Truck Cat 793 - 2	90	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Liebherr R9800 Excavator	114	12.0 m

Third quarter results 2015:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	92	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	92	12.0 m
Bulldozer Cat D11 - 7	90	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	91	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	91	12.0 m
Front-End Loader Cat 988 - 1	91	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	87	12.0 m
Grader Caterpillar 16G - 4	88	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	86	12.0 m
ReDrill SK 50-2	84	12.0 m
Acco Water Cart	79	12.0 m
Water Cart Cat 777 - 5	89	12.0 m
Water Cart Cat 785 - 1	89	12.0 m
Water Cart Cat 785 - 2	88	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	90	12.0 m
Dump Truck Cat 789 - 10	89	12.0 m
Dump Truck Cat 789 - 11	90	12.0 m
Dump Truck Cat 789 - 12	91	12.0 m
Dump Truck Cat 793 - 1	91	12.0 m
Dump Truck Cat 793 - 2	90	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	90	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	91	12.0 m
Dump Truck Cat 793 – 15*	90	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Liebherr R9800 Excavator	114	12.0 m

*Cat 793-15 commenced August 2015.

Fourth quarter results 2015:-

PLANT & EQUIPMENT	SOUND POWER LEVEL dB(A)	DISTANCE FROM MONITOR TO MACHINE
Cat 690B Tiger	92	12.0 m
Bulldozer Cat D11 - 2	91	12.0 m
Bulldozer Cat D11 - 3	91	12.0 m
Bulldozer Cat D11 - 4	92	12.0 m
Bulldozer Cat D11 - 7	90	12.0 m
Bulldozer Cat D11 - 8	91	12.0 m
Bulldozer Cat D10 - 5	91	12.0 m
Bulldozer Cat D10 - 8	90	12.0 m
Bulldozer Cat D10 - 10	91	12.0 m
Bulldozer Cat D10 - 11	90	12.0 m
Bulldozer Cat D10 - 13	90	12.0 m
Front-End Loader Cat 950- 1	91	12.0 m
Front-End Loader Cat 988 - 1	91	12.0 m
Front-End Loader Cat 992 - 5	88	12.0 m
Front-End Loader Cat 992 - 8	87	12.0 m
Front-End Loader Cat 994 -2	86	12.0 m
Front-End Loader Cat 994 -3	87	12.0 m
Grader Caterpillar 16G - 2	88	12.0 m
Grader Caterpillar 16G - 4	88	12.0 m
Grader Caterpillar 24H	88	12.0 m
ReDrill SK 75	86	12.0 m
ReDrill SK 50-2	84	12.0 m
Acco Water Cart	78	12.0 m
Water Cart Cat 777 - 5	88	12.0 m
Water Cart Cat 785 - 1	89	12.0 m
Water Cart Cat 785 - 2	89	12.0 m
Dump Truck Cat 789 - 1	91	12.0 m
Dump Truck Cat 789 - 6	91	12.0 m
Dump Truck Cat 789 - 9	90	12.0 m
Dump Truck Cat 789 - 10	90	12.0 m
Dump Truck Cat 789 - 11	91	12.0 m
Dump Truck Cat 789 - 12	91	12.0 m
Dump Truck Cat 793 - 1	91	12.0 m
Dump Truck Cat 793 - 2	90	12.0 m
Dump Truck Cat 793 - 3	90	12.0 m
Dump Truck Cat 793 - 4	91	12.0 m
Dump Truck Cat 793 - 5	91	12.0 m
Dump Truck Cat 793 - 7	90	12.0 m
Dump Truck Cat 793 - 8	90	12.0 m
Dump Truck Cat 793 - 12	91	12.0 m
Dump Truck Cat 793 - 13	90	12.0 m
Dump Truck Cat 793 – 14	90	12.0 m
Dump Truck Cat 793 – 15	90	12.0 m
Hitachi 3600 Excavator	118	12.0 m
Hitachi 5500 Excavator	119	12.0 m
Liebherr R9800 Excavator	115	12.0 m

*Cat 992-8 commenced October 2015.

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Appendix 4 Rix's Creek April 2015 water release incident

Bloomfield Mining Operations
Significant Incident Investigation

Rix's Creek – Mine Water Release

22nd April 2015

INVESTIGATION TEAM

Luke Murray	Mine Manager
Garry Bailey	General Manager Mining Development
John Hindmarsh	Senior Environmental Officer
Jason Desmond	Environmental Officer

COPIES TO

John Richards
Renata Roberts
Luke Murray
John Hindmarsh (File)
Jason Desmond

Dept. Planning & Infrastructure
Environmental Protection Authority (EPA)
NSW Trade & Investment, Resources & Energy

INCIDENT DESCRIPTION

During the period from 19/4/2045 to 23/4/2015 a significant rainfall event occurred across the region with the site receiving 199.5mm.

DATE	RAINFALL
20/4/2015	10.5
21/4/2015	93
22/4/2015	80.5
23/4/2015	15.5
TOTAL RAINFALL	**199.5**

This rainfall event produced significant runoff across the site. Water management structures filled with some filling to capacity and overflowing as a result of the excessive runoff. Analysis of the rainfall data indicates this event matches an Annual Exceedance Probability of 10% or a 1-in-10 year rainfall intensity storm (see Appendix I. *Review of the Reservoir Performance of Dam 10 and Dam 11 at the Rixs Creek Colliery Coal Loader.* JP Environmental July 2015).

This incident was reported to DP&I, Scott Brooks, on 23rd April, 2015 when he undertook a site inspection. The EPA Pollution Line was also contacted at 13.33 on Thursday 23rd April, 2015. The report was logged and Reference Number: - C05767-2015 issued.

Bloomfield Mining Operations
Significant Incident Investigation

Rix's Creek – Mine Water Release

22nd April 2015

INCIDENT OUTCOME

The excessive runoff that the 199.5 mm of rain produced across the site resulted in:-

- Three sediment containment dams filling to capacity and overflowing releasing water into drainage lines that ran off site.
  - The overflow water from two sediment dams ran into Deadman's Gully which flows offsite.
  - The other sediment dam overflowed into Rixs Creek which runs offsite. The volume of the flow in Rixs Creek adjacent to this sediment was sufficiently large enough to back water up into the overflow of this dam for a period of time during the event.
- The containment dam at the clean coal stockpile and rail loading facility overflowed with the water running into Black Wattle Creek and offsite. A clean water diversion upstream of the containment dam over topped. This clean water flowed into the containment dam contributing to the overflow.
- Water samples were taken on 23rd April, 2015 of the structures that overflowed with one sediment dam not being able to be accessed. (Table 1.) A sample of this structure was taken on Monday 27th April, 2015 when a full round of surface water monitoring across the Rix's Creek operational site was undertaken in line with the Water Management Plan coinciding with annual surface water quality monitoring program.
- The sample results are provided in Table 1, and location of the structures shown in Figure 1.
-

Table 1: Water sample results from structures that overflowed.

Location	Date	pH	Electrical Conductivity (uS/cm)	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)
1 – Rail Loader Containment Dam	23/4/2015 13.00	7.3	474	126	280
2 - Sediment Dam - North	23/4/2015 14.00	7.8	2,060	56	1,080
3 - West Pit OOPD Sediment Dam (West)	23/4/2015 13.40	6.9	135	17,730	1,160
4 - West Pit OOPD Sediment Dam (East)	27/05/2015 13:15	7.3	122	1,730	2,300

Note: Locations shown in Figure 1.

Bloomfield Mining Operations
Significant Incident Investigation

Rix's Creek – Mine Water Release
22nd April 2015

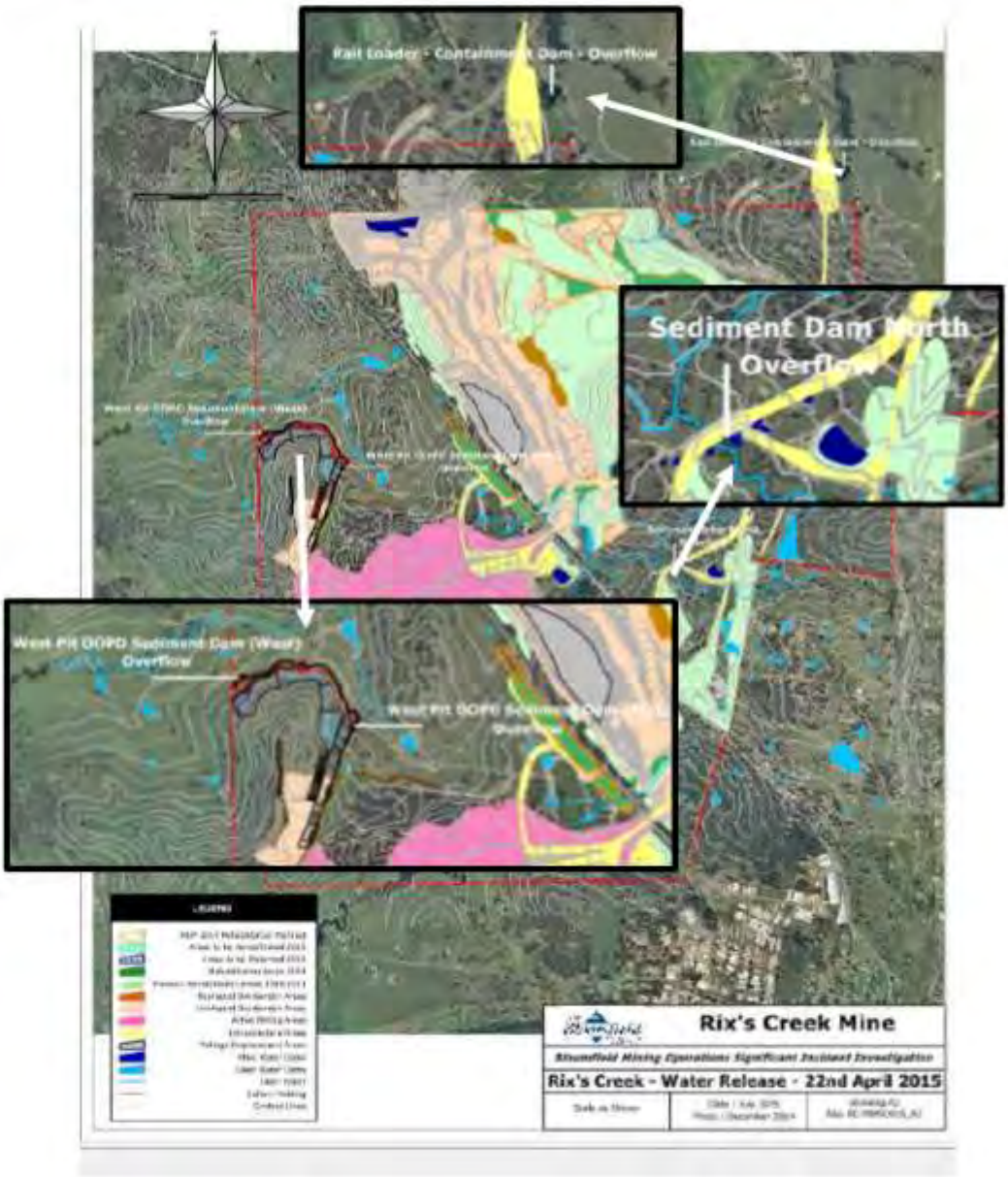

Figure 1: Location Diagram.

Bloomfield Mining Operations
Significant Incident Investigation

Rix's Creek – Mine Water Release

22nd April 2015

EVENTS RELATED TO THE INCIDENT

- The 50mm of rain received in early April would have provided recharge to soil moisture.
- Heavy rainfall (199.5mm over 4 days) caused the sediment containment dams to fill with runoff water and overflow. These were:-
  - Sediment dam north, Photograph 1,
  - West Pit out-of-pit-dump Sediment Dam (East), Photograph 2,
  - West Pit out-of-pit-dump Sediment Dam (West), Photograph 3.
- The clean water diversion dam bank overtopped into the rail loader containment dams. Photograph 4.
- The capacity of the overflow of the clean water diversion dam had been restricted with vegetation growth and debris collected in the vegetation.
- The additional water filled the rail loader containment dams causing them to over flow into Black Wattle Creek.
- Review of the storage capacity of the rail loader containment dams using a daily water balance model (Appendix I) indicated they would not have overflowed in this rainfall event or any rainfall event since their construction prior to 1993 from internal catchment runoff.
- The rail loader containment dams were constructed prior to the commissioning of the rail loader back in 1993.

Photograph 1: Sediment Dam North.

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Significant Incident Investigation

Rix's Creek – Mine Water Release
22nd April 2015

Photograph 1A: Flow in Rixs Creek adjacent to Sediment dam north.

Photograph 2: West Pit out-of-pit-dump Sediment Dam (East).

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Significant Incident Investigation

Rix's Creek – Mine Water Release
22nd April 2015

Photograph 3: West Pit out-of-pit-dump Sediment Dam (West).

Photograph 4: Clean Water Diversion Dam

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Significant Incident Investigation

Rix's Creek – Mine Water Release

22nd April 2015

INVESTIGATION CONCLUSIONS

The incident was investigated and the following conclusions drawn:

- The runoff from the rainfall event exceeded the capacity of the sediment containment dams resulting in them filling and overtopping.
- The restriction in the outlet of the clean water dam and diversion resulted in the dam wall overtopping into the rail loader containment dams.
- The clean water dam overtopping into the rail loader containment dams exceeded their storage capacity causing them to overflow into Black Wattle Creek.

FOLLOW-UP

- The sediment dam's water levels were lowered by pumping water from them back into the mine water storages in preparation for the next runoff event.
- At the rail loader clean water diversion, some vegetation was removed from the dam overflow and diversion channel as a temporary repair.
- A hydrological Investigation is being undertaken to recalculate the required capacity of the clean water diversion and compare this against the current capacity.
- Following this investigation any modifications to the channel and/or surge capacity on the dam will be undertaken if necessary to align capacity or the structure with the design calculated capacity.
- When the area dries sufficiently any necessary earthworks will be undertaken.

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