MAULES CREEK COAL MINE

2016 ANNUAL REVIEW

Table 1 Annual Review Title Block

Name of Operation	Maules Creek Coal Mine
Name of Operator	Maules Creek Coal Pty Ltd
Development consent / Project Approval #	Project Approval 10_0138
Name of holder of development consent/project approval	Aston Coal 2 Pty Ltd.
Mining lease #	CL 375, ML1719 and ML1701.
Name of holder of mining lease	Maules Creek Coal JV which comprises: Aston Coal 2 Pty Ltd (75%), ICRA MC Pty Ltd (15%), J Power Australia Pty Ltd (10%)
Water Licence #	Refer to Water Licences in Table 1
Name of holder of water licence	Aston Coal 2 Pty Ltd, ICRA MC Pty Ltd, J Power Australia Pty Ltd
MOP/ RMP start date	January 2016
MOP/RMP end date	January 2018
Annual Review Commencement Date	1 January 2016
Annual Review Completion Date	31 December 2016

I, Peter Wilkinson, certify that this audit report is a true and accurate record of the compliance status of Maules Creek Coal Mine for the period 1st January 2016 to 31 December 2016, and that I am authorised to make this statement on behalf of Maules Creek Coal Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of Authorised Reporting Officer	**Peter Wilkinson**
Title of Authorised Reporting Officer	Peter Wilkinson General Manager – Maules Creek Coal
Signature	
Date	23 / 2 / 17.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

MAULES CREEK COAL MINE
2016 ANNUAL REVIEW

1 STATEMENT OF COMPLIANCE

This Annual Review has been prepared to provide a summary of the environmental performance of the Maules Creek Coal Mine (MCCM) over the reporting period. The compliance status of the MCCM against relevant approvals during the reporting period was assessed as at the end of the reporting period (i.e. 31 December 2016) and is summarised in **Table 2**. The compliance status also considers the Leard State Forest Clearing Audit. In addition, compliance with the Environment Protection Licence (EPL) has been assessed where required against the Project Approval, specifically Schedule 3, conditions 33 (c), 38(b) and 40(b).

Table 2 Statement of Compliance

Where all the conditions of the relevant approvals complied with?	Yes/No
Project Approval PA 10_0138	No
Coal Lease CL 375	Yes
Mining Operations Plan (MOP)	Yes
Mining Lease ML 1701	Yes
Mining Lease ML 1719	Yes
Exploration Licence A 346	Yes
Environment Protection Licence (No. 20221)	No
90WA801901 DWE Ref no: 90AL801900	Yes
Groundwater Monitoring Bores: 90BL255779, 90BL255780, 90BL255781, 90BL255782, 90BL255783, 90BL255784, 90BL255785, 90BL255786, 90BL255787, 90BL255788, 90WA822412, 90BL255789 and 90BL255790.	Yes
WAL12811	Yes
WAL29467	Yes
WAL29588	Yes
WAL 27385	Yes
WAL12479	Yes
WAL27383	Yes
WAL13050	Yes

Any non-compliances during the reporting period are detailed in **Table 4** and ranked according to the compliance status key presented in **Table 3**. **Section 11** provides further details of any non-compliance and actions undertaken or proposed for the following reporting period to prevent re-occurrence and mitigate any potential adverse effects.

Table 3 Compliance Status Key

Risk Level	Colour Code	Description
High	Non–compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non–compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non–compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non–compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 4 Non-Compliances

Relevant Approval	Cond. # (Schedule 2)	Condition Description (Summary)	Compliance Status	Comment	Where addressed in Annual Review
PA10_0138	40 (b)	Water Management Plan commitments related to erosion and sediment control.	Non–compliant	Non-compliance identified by DPE regarding maintenance of erosion and sediment controls during the clearing audit.	Section 11, Table 20
	25 (g)	*The proponent shall prepare and implement a Blast Management Plan for the project…This plan must: (g) include a monitoring program for evaluating the performance of the project including: * compliance with the applicable criteria*	Non–compliant	All mine blast monitoring results were not captured at BM1 and BM2. Capture rates for each unit were 98% at BM1 and 94% for BM2. All results were predicted to be within applicable criteria under Table 7 of PA10_0138.	6.5.2
	12 (a)	*Ensure that all equipment and noise control measures deliver sound power levels that are equal to or better than the sound power levels identified in the EA.*	Non–compliant	Sound power levels exceeded the SPL's detailed in the MCC EA during 2015. These were progressively reassessed during 2016 to retest and implement sound suppression measures where practical and feasible.	6.4 Appendix C
	7	*The Proponent shall ensure that operational noise generated by the project does not exceed the criteria in Table 5.*	Non–compliant	Attended noise monitoring included technical exceedances of the 35dB LAeq (15 minute), with the addition of the low frequency modifying factor required under the NSW Industrial Noise Policy. Please refer 6.4.2	6.4.2
	18	*The Proponent shall ensure that the blasting on the site does not cause exceedances of the criteria in Table 7.*	Non–compliant	Blast exceedance of 120dBL was recorded at monitoring location BM1 on 8 July. It is noted that BM1 is at a location on mine-owned land. Subsequent investigation identified no significant impact to private receptors above the blasting criteria.	6.5.2
	63	*The Proponent shall ensure that construction and operational employees are predominantly transported to the site by shuttle bus, consistent with the assumptions used in the traffic study undertaken for the EA.*	Non–compliant	Total percentage of operational employee's transported by shuttle bus to site varied to the assumptions specified in the EA and Project Approval of 90%. A Project Approval Modification 3 was submitted to DPE for approval to amend condition 63 and was awaiting determination at the end of the reporting period.	6.9.3 Section 11, Table 20

Note: Non-compliances identified within the most recent Independent Audits are discussed in Section 11.

2 INTRODUCTION

This is the fourth Annual Review produced for the Maules Creek Coal Mine (MCCM) and has been prepared in accordance with the NSW Department of Planning and Environment's (DPE) Integrated Mining Policy – Annual Review Guideline, October 2015. This document has been prepared to satisfy the following requirements:

- the Annual Review requirements of the DPE under the Project Approval PA 10_0138 (Condition 4 Schedule 5);
- Environmental Management Report requirements of the Division of Resources & Energy (DRE) under the MCCM Mining Leases; and
- the routine reporting expectations of DPI Water.

2.1 PROJECT BACKGROUND

The Maules Creek Coal Mine (MCCM) is located on the north-west slopes and plains of New South Wales (NSW), approximately 18 kilometres (km) north-east of Boggabri within the Narrabri Local Government Area (LGA). The regional centres of Narrabri and Gunnedah are situated approximately 45 km to the north-west and 55 km to the south from the MCCM respectively. The MCCM's regional locality is illustrated in Figure 1.

The ownership of the MCCM currently lies with Maules Creek Coal Joint Venture (MCCJV), which is a joint venture between Aston Coal 2 Pty Limited (a company 100% owned by Whitehaven Coal Limited [Whitehaven]) (75 percent [%]), ITOCHU Coal Resources Australia Maules Creek Pty Ltd (15%) and J-Power Australia Pty Limited (10%). The MCCM is managed by Maules Creek Coal Pty Ltd (MCC) (a wholly owned subsidiary of Whitehaven) on behalf of the MCCJV.

An Environmental Assessment for the Maules Creek Coal Project (referred to herein as the EA) was prepared by Hansen Bailey (2011) and was assessed under the NSW Environmental Planning and Assessment Act, 1979 (EP&A Act). The NSW Planning Assessment Commission (PAC), as a delegate for the NSW Minister for Planning and Infrastructure, issued the State environmental approval for the MCCM on 23 October 2012 (i.e. Project Approval PA 10_0138). The MCCM Commonwealth environmental approval (i.e. EPBC 2010/5566) was granted on 11 February 2013 by the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities.

2.2 PROJECT DESCRIPTION

Project Approval (PA 10_0138) was granted on 23 October 2012 for the construction and operation of an open cut coal mine with an approved maximum ROM coal production rate of 13 Mtpa until the end of December 2034. MCCM covers three mining leases CL 375, ML 1701 and ML1719. The Project Boundary (as defined by PA 10_0138) and mining authorities are shown on Figure 1 and Biodiversity Offset areas on Figure 2.

A modification to PA 10_0138 was lodged and approved in 2013 to allow minor adjustments to the alignment of the CHPP infrastructure and the construction and operation of electrical infrastructure.

A second modification to PA 10_0138 was lodged and approved in 2014 to adjust the location of the raw water pipeline and associated pump station.

A third modification to PA 10_0138 was lodged in May 2016 proposing to amend the employee bus use percentage to better reflect the locally residing workforce and associated transport regime. This modification is currently pending approval at the end of the reporting period and determination anticipated early 2017.

Construction of the MCCM commenced in December 2013 and was substantially completed in 2015. The operations phase of the MCCM commenced in June 2014, and coal was first transported from the MCCM via the rail spur in December of 2014.

The key operational personnel responsible for environmental management at MCCM during the reporting period included:

Name	Peter Wilkinson
Title	General Manager, Maules Creek
Address	Therribri Road, Boggabri, NSW 2382
Phone Number	02 6749 7800

Name	Matthew Sparkes
Title	Mine Manager, Maules Creek
Address	Therribri Road, Boggabri, NSW 2382
Phone Number	02 6749 7800

Name	Scott Mitchell
Title	Environmental Superintendent, Maules Creek
Address	Therribri Road, Boggabri, NSW 2382
Phone Number	02 6749 7800

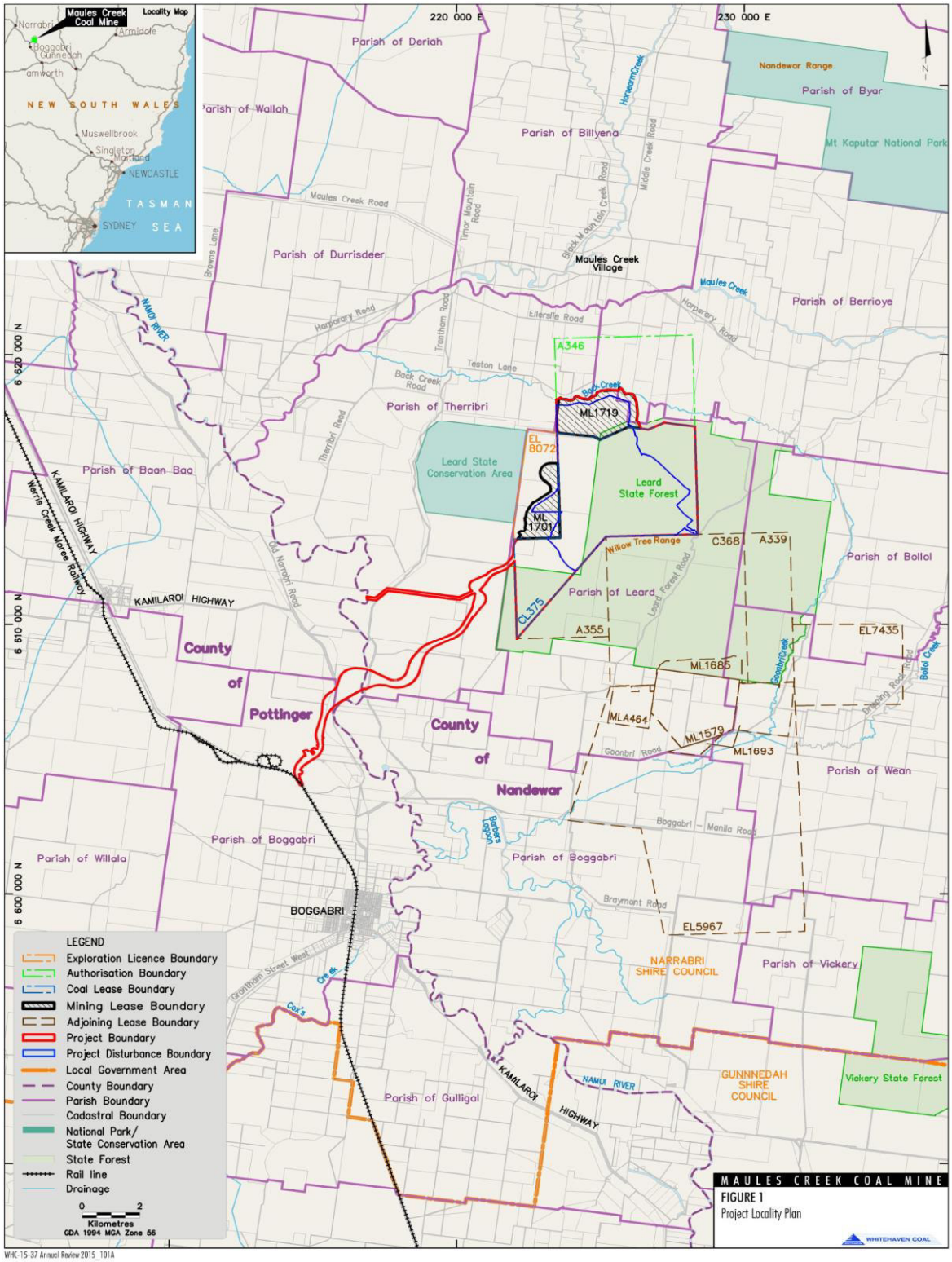


Figure 1 Project Locality Plan

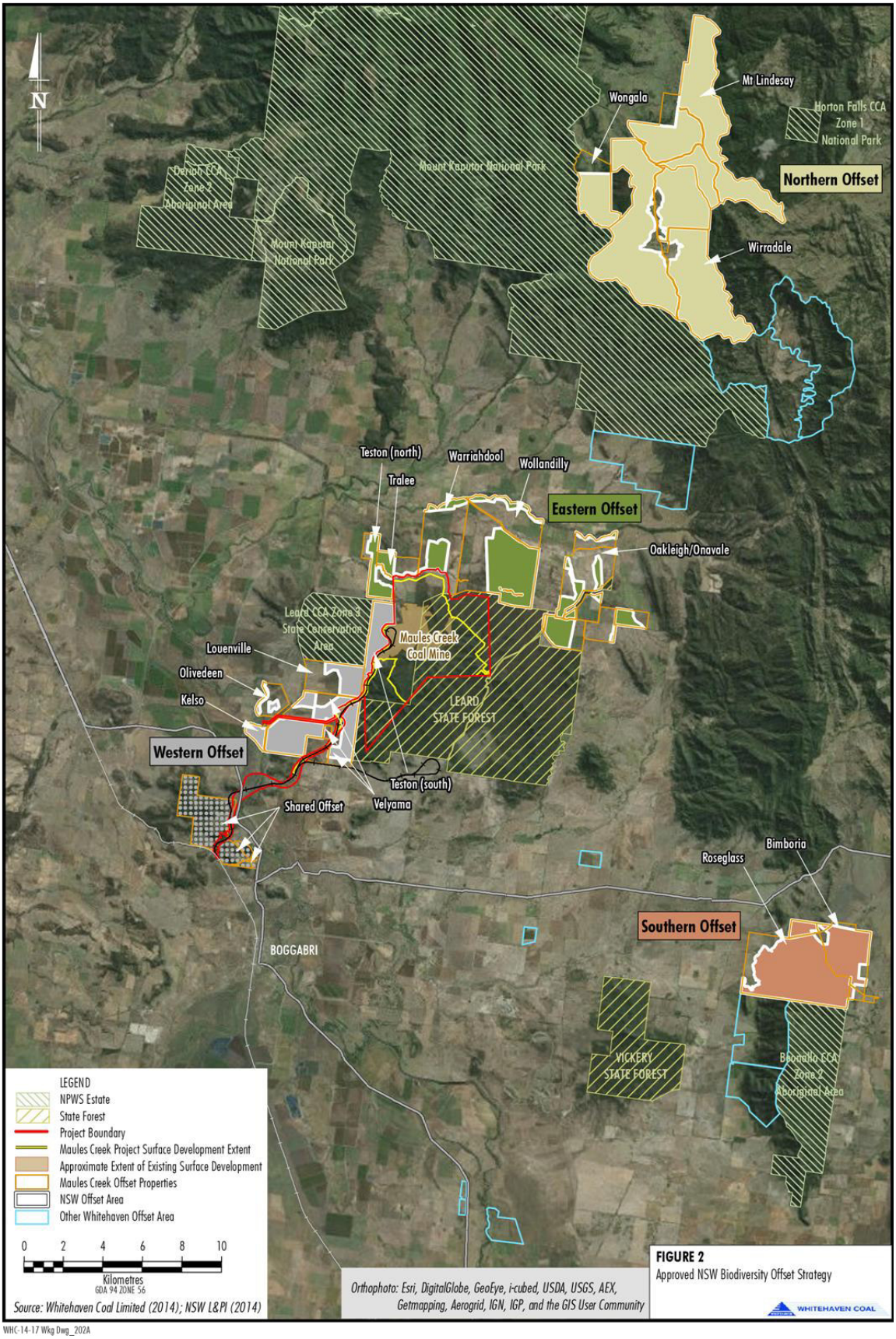


Figure 2 Biodiversity Offset Areas

3 APPROVALS

Table 5 provides a summary of the key licences, leases and approvals that have been obtained for the MCCM to enable the construction and operation of the mine.

Table 5 Licences, Leases and Approvals

Approval	Reference	Detail	Validity Dates
Project Approval	PA 10_0138*	Pursuant to the Project EA, the PAC approval of the MCCM referred to in Schedule 1 subject to the conditions in Schedules 2 to 5. *Note: Modification 3 to the Project Approval was pending determination at the end of the 2016 reporting period.	23 October 2012 to December 2034
Project Approval Modification	PA 10_0138 (MOD1)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow modifications to infrastructure requirements.	Granted on 25 July 2013
Project Approval Modification	PA 10_0138 (MOD2)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow the design of key water related infrastructure to be optimised.	Granted on 10 March 2014
Coal Lease	CL 375	Covers an area of approximately 4,200 hectares (ha). The southern part of the lease covers rights to mine from the surface to unlimited depth (~2,500 ha). The northern part of the lease covers rights to mine from 20 metre (m) depths to unlimited depth (~1,700 ha).	4 June 1991 to 4 June 2033
Authorisation	A 346	Covers the rights of the northern part of CL 375 from the surface to 20 m depth (~1,700 ha).	Expires 28 February 2021
Mining Lease	ML 1719	Covers the area to the north of the surface rights of CL 375, over a portion of A 346 that will accommodate part of the Northern Overburden Emplacement Area (OEA) for the MCCM.	Granted 11 November 2015 to 11 November 2036
Mining Lease	ML 1701	Covers the area to the west of CL 375 within the Project Boundary that will facilitate the extraction of some coal and accommodate some mine related infrastructure.	Granted 9 October 2014 to 9 October 2035
Exploration Lease	EL 8072	Covers the area to the west of CL 375 that will facilitate the extraction of some coal and accommodate some mine related infrastructure.	Expires 12 March 2018
Surface Water Licence	90SL101060	Water supply for mining and irrigation one Overshot dam and a 150 millimetre (mm) Centrifugal Pump.	Renewed November 2015
Water Supply Works Approval	90WA801901 DWE Ref no: 90AL801900	Allows construction of a 610 mm Axial Flow Pump located on the Namoi River.	1 July 1 2004 to 30 June 2017

Approval	Reference	Detail	Validity Dates
Forest Corporation NSW Compensation	N/A	Agreement applies to part of Leard State Forest No. 420 that occurs within CL 375 and any mining lease pursuant to MLA 404 being ML1719.	From March 2014
Emergency Tailings Emplacement	N/A	Notification of High Risk Activity – Emergency Tailings Emplacement	Notification provided April 2015.
Bore Licence	90WA809078	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gins Leap) Groundwater Source.	Commencement 1 November 2006
Bore Licence	90WA809079	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gins Leap) Groundwater Source.	Commencement 1 November 2006
Bore Licence	90WA809300	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Gins Leap to Narrabri) Groundwater Source.	Commencement 1 November 2006
Bore Licence	90WA809127	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gins Leap) Groundwater Source.	Commencement 1 November 2006
Bore Licence	90WA822412	Previously 90BL255704. Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source	Granted 16 January 2012 to 06 June 2025
Bore Licence	90WA820120	Previously 90BL001144. Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source.	Granted 28 February 1939 for perpetuity. Converted 16 January 2012.
Bore Licences	90BL255779 90BL255780 90BL255781 90BL255782 90BL255783 90BL255784 90BL255785 90BL255786 90BL255787 90BL255788 90BL255789 90BL255790	For the purpose of Monitoring Bores.	Granted 25 August 2010 for perpetuity.
Water Access Licence	WAL12811	135 Units with works approval 90CA807230. Upper Namoi Zone 5 Namoi Valley (Gins Leap to Narrabri) Groundwater Source.	Transferred to Aston 16 November 2010 Tenure continuing.
Water Access Licence	WAL29467	6 ML water licence from porous rock water source for construction purposes.	Tenure continuing

Approval	Reference	Detail	Validity Dates
Water Access Licence	WAL29588	300 ML water licence from porous rock water source under works approval 90CA826925.	Granted 21 June 2012 for perpetuity.
Water Access Licence	WAL 27385	38 ML water licence from Namoi Groundwater Zone 4.	Granted 24 April 2012 for perpetuity.
Water Access Licence	WAL12479	78 ML water licence from Namoi Groundwater Zone 11 under works approval 90CA807652.	Granted 2 November 2011 for perpetuity
Water Access Licence	WAL27383	0 ML water licence from Namoi Groundwater Zone 11.	Spare WAL. Granted 24 October 2011 for perpetuity.
Water Access Licence	WAL13050	3000 ML water licence from Lower Namoi Regulated River Water under works approval 90WA801901.	Granted 23 August 2011 for perpetuity.
Environment Protection Licence	EPL 20221	The NSW Environment Protection Authority (EPA) issues environment protection licences to the owners or operators of various industrial premises under the *Protection of the Environment Operations Act, 1997* (POEO Act).	Issued 2 May 2013
Mining Operations Plan Amendment A	MOP 2016-2018	Details mining and rehabilitation activities during the applicable period at MCCM.	8 November 2016 to 30 November 2017

4 OPERATIONS SUMMARY

4.1 EXPLORATION ACTIVITIES

Exploration drilling was undertaken during the reporting period in accordance with the approved Mining Operations Plan (MOP) to further assist production planning and assess coal reserves within CL 375.

All exploration drilling was completed within previously cleared areas to minimise disturbance. Core and chip holes were undertaken to further define coal quality, geotechnical and structural information.

4.2 CONSTRUCTION

Construction of a mobile equipment wash plant, permanent maintenance workshop, stores building, tyre change area and associated storage areas all commenced during the last quarter of 2016. These projects are expected to progressively be completed during FY2017 / 18.

4.3 MINING OPERATIONS

MCCM is an open cut coal mine with an approved maximum ROM coal production rate of 13 Mtpa to December 2034. The 2016 vegetation clearing activities were completed during the annual clearing window (15th February to the 30th April each year). Pre-mining clearance activities are undertaken in line with internal and external approvals including MCC's Land Disturbance Protocol process, within Project Approval and Project Disturbance Boundaries detailed in the Mining Operations Plan (MOP) and Project Approval and in accordance with the MCC Biodiversity Management Plan (BMP). Pre-clearance due diligence activities and various other measures are employed to minimise potential impacts on fauna and heritage during clearing in accordance with the current BMP and the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP). Soil sampling and analysis is also undertaken to guide topsoil salvage activities.

Topsoil was then stripped from the mining area and stockpiled for later use on rehabilitation areas. Overburden was blasted prior to being removed by loader and / or excavator and trucks before proceeding with coal extraction.

Table 6 presents the production summary for the previous and current reporting periods and the anticipated production schedule for the next reporting period.

Table 6 Production Summary

Material	Approved limit	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste Rock / Overburden	55,000,000 m^3 (MOP Year 1, 2016, Table 4)	33,999,071	48,818,073	81,000,000
ROM Coal	13 Million Tonnes (PA 10_0138 Sch. 2 Cond.6) > 5 Million Tonnes handled (EPL 20221)	5.82	8.90	12.0
Reject Material*	NA	0.4	0.61	1.3
Saleable Product	12.4 Million Tonnes (PA 10_0138 Sch.2 Cond.9) > 5 Million Tonnes produced (EPL 20221)	5.34	8.17	10.7

** Coarse and fine reject materials have been combined for reporting purposes as the rejects streams are blended at the CHPP to form a combined reject and tailings material prior to disposal.*

4.4 COAL HANDLING AND PROCESSING

Product coal generated by the MCCM includes bypass coal (i.e. ROM coal that is crushed and screened but not washed in the CHPP) and washed coal that is processed in the CHPP. The product coal is stockpiled and then reclaimed and fed via conveyors to the Train Loading Facility. Once loaded, trains travel from the MCCM via the Maules Creek Rail Spur, Shared Rail Spur and the Werris Creek to Mungindi Railway Line to the Port of Newcastle for export.

4.5 OTHER OPERATIONS

4.5.1 Hours of Operation

Mining operations are conducted up to 24 hours per day, seven days per week.

4.5.2 Transport Rates

Coal is only transported from the MCCM via the Maules Creek rail spur and the shared portion of the Boggabri Coal rail spur.

The number of laden trains and amount of coal transported from MCCM, presented in **Table 7** has been recorded in accordance with:

- Schedule 2 Condition 8 and 9 of PA 10_0138, 'Coal Transport'; and
- Schedule 3 Condition 65 of PA 10_0138, 'Monitoring of Coal Transport'.

Table 7 Coal Transport

Parameter	Criteria	Total
Maximum number of laden trains from the site in any one day	10	7
Maximum number of laden trains from the site in a day when averaged over a calendar year	7	3
Maximum Tonnes of product coal transported from the site (Mt)	12.4	8.3

Appendix B details the coal transport records in accordance with the reporting requirements under Condition 65 (a) and (b) of PA 10_0138.

4.6 NEXT REPORTING PERIOD

4.6.1 Exploration

Exploration drilling will continue to be undertaken at the MCCM to further assess the coal reserves within the tenements. The focus of the ongoing exploration drilling is likely to involve the following:

- investigation of the JORC resource status within A346, in accordance with the DRE requirements for exploration leaseholders;
- further exploration within CL 375; and
- further delineation of outlying coal prospective areas.

Further details of the proposed drilling program are provided in the approved MOP.

4.6.2 Remaining Construction Activities

Remaining construction activities commenced during the last quarter of the reporting period and will be progressively completed during FY2017 / 18.

4.6.3 Mine Operations

The mine production rates are planned to ramp up to approximately 12 Mtpa of ROM coal and approximately 81 million bank cubic metres (Mbcm) of overburden during 2017.

Vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with relevant Environmental Management Plans including the approved BMP and MOP. The clearing program will be undertaken during the annual clearing period from the 15 February to the 30 April as specified within the BMP, except under exceptional circumstances and with the approval of the Secretary of the DPE.

4.6.4 Overburden Emplacements

The OEA will continue to develop generally in accordance with Project Approval PA 10_0138 and the Mining Operations Plan 2016-18 which are available on the Whitehaven Coal website.

4.6.5 Mining Fleet Upgrades

Additional procurement of mining fleet will be subject to mine planning requirements during 2017.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The 2015 Annual Review and regulatory site inspection identified the following actions. These are addressed within this document and also summarised in **Table 8**.

Table 8 Actions from the Previous Annual Review (2015)

Action required from Previous Annual Review	Requested By	Action Taken by the Operator	Where discussed in Annual Review
1. Following approval of the BTM Complex Air Quality Management Strategy (AQMS), future Annual Review's shall include the data for all real-time air quality monitors in the monitoring network under the management of the MCCM.	DPE	BTM Complex Air Quality Management Strategy pending finalisation and approval	Section 6
2. The 2016 Annual Review shall include a report on the validation of the surface water model, including monitoring discharge volumes from the site and comparison of monitoring results with modelled predictions	DPE	Surface water management included in this Annual Review	Section 7

6 ENVIRONMENTAL PERFORMANCE

The following sub-sections report on the environmental performance achieved during the reporting period and provides a summary of the environmental monitoring data compared to data predictions, trends and management measures.

6.1 METEOROLOGICAL MONITORING

Meteorological monitoring is conducted onsite in accordance with Schedule 3 Condition 35 of the PA 10_0138 at the MCC Automatic Weather Station (AWS). Additional weather data is available from other monitoring locations for reference purposes. The location of the MCCM AWS is illustrated on **Figure 3** below, **Table 9** summarises the monthly meteorological conditions at the MCC AWS for the reporting period. The total annual rainfall for the year was approximately 699 millimetres (mm). The annual rainfall total is above the average rainfall recorded in the EA. The maximum rainfall was recorded during August (133.8mm), which is significantly higher than the historical average for this month (34.7mm). In addition, the months of February and November were relatively dryer in comparison to monthly averages recorded in the EA.

The average temperature during the reporting period was 18.6°C, a minimum temperature of -2.4°C was recorded in July and a maximum temperature of 41.3°C was recorded in February. The temperature records and wind patterns are relatively consistent with the long term climatic data recorded at nearby BOM sites and the predictions from the EA.

South-east winds were predominant throughout the first quarter of 2016, consistent with the previous period. From June to December 2016 measured winds were predominantly from the western quadrants.

Table 9 Summary of Weather recorded at the MCC AWS

Month	Measured Rain (mm)	Cumulative Rainfall (mm)	Rainfall Days	2m Temperature (°C)			10m Temperature (°C)			Sigma Theta			10m Wind	
				Min	Mean	Max.	Min	Mean	Max	Min	Mean	Max	Av. Speed (m/s)	Predominant Direction
January	76.4	76.4	10	13	25.3	38.9	13.7	25.5	38.1	0.0	22.3	123.58	2.5	SE
February	0	76.4	0	11	26.7	41.3	12.8	26.8	40.8	0.0	22.3	105.7	2.7	SE
March	33.6	110.0	7	9.6	25.1	36.5	10.9	25.2	35.3	2.7	23.2	102.1	2.2	SE
April	22.4	132.4	6	8.3	21.0	33.5	9.2	20.8	32.9	2.3	23.4	103.9	2	SE
May	39.8	172.2	8	-0.2	14.6	27.2	0.6	15.2	27.2	2.0	26.8	102.7	1.5	SW/NW
June	69.6	241.8	14	-1.5	11.6	20.9	-0.4	12.0	21.1	2.5	20.5	101.5	2.1	W/WNW
July	40.2	282.0	9	-2.4	10.7	23.8	-0.9	11.2	23.8	2.0	23.2	100.3	1.8	WNW
August	133.8	415.8	13	0.3	11.0	22.3	0.7	11.6	22.3	2.4	25.2	103.3	1.6	WNW/SE
September	102.4	518.2	16	1.3	13.8	23.2	2.6	14.2	23.4	2.7	22.9	102.4	2	WNW
October	65.0	583.2	10	1.2	16.0	29.9	2.3	16.8	29.9	0.0	26.2	102.9	1.9	WNW
November	17.6	600.8	4	4.1	21.3	35.5	5.5	22.1	35.5	0.0	28.0	102.9	2.0	SW/WNW
December	98.4	699.2	11	8.2	26.4	41.0	8.8	26.7	40.2	0.0	25.1	101.5	2.2	E/SE-SW

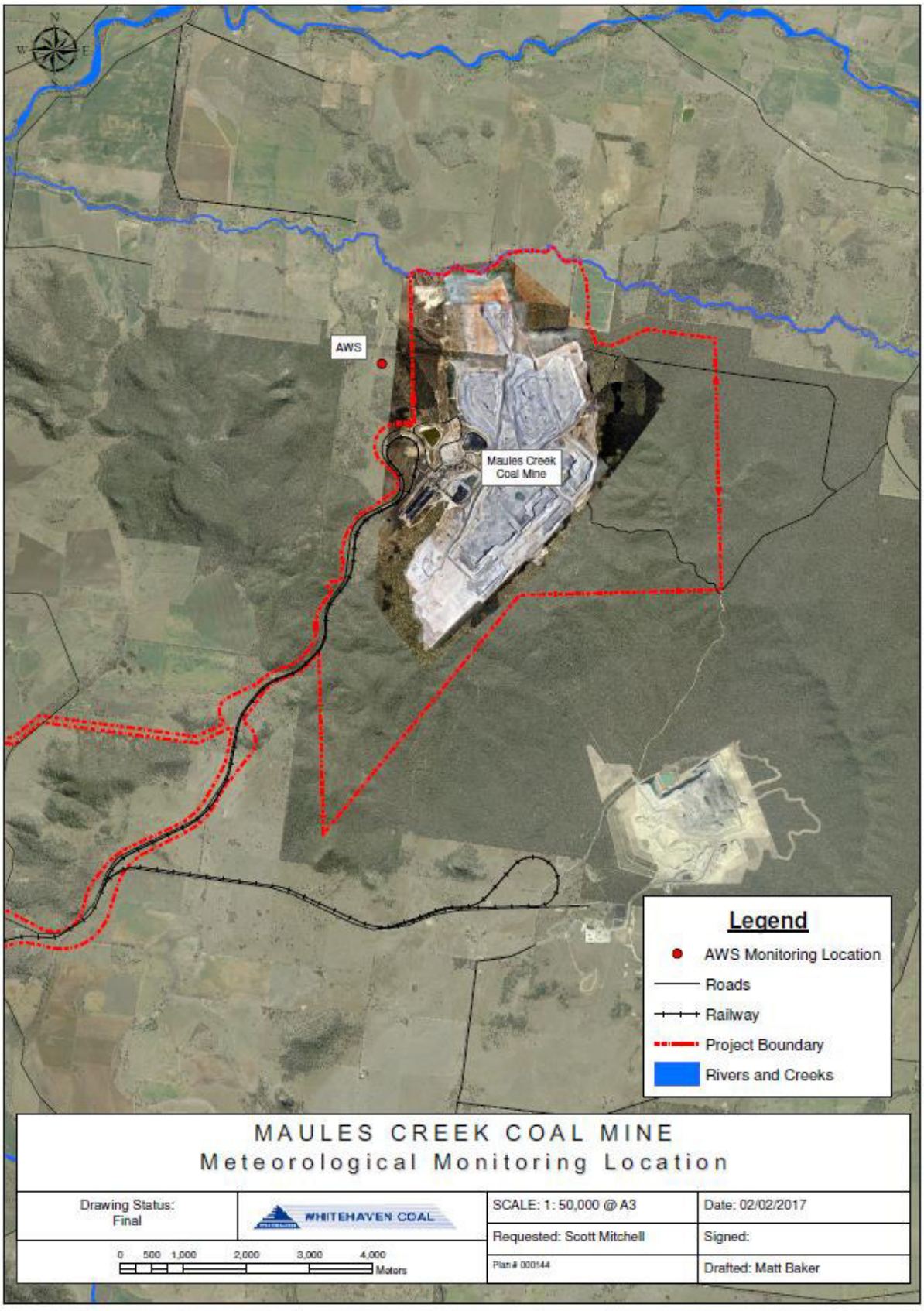


Figure 3 AWS Monitoring Location

6.2 AIR QUALITY

6.2.1 Environmental Management

Potential impacts to air quality at MCCM include airborne dust and odour. These impacts are managed in accordance with the:

- Air quality criteria prescribed under schedule 3 condition 29 of the PA 10_0138;
- EPL 20221 Conditions O3, M2, M3, E1 and E2; and
- the MCC Air Quality and Greenhouse Gas Management Plan (AQGGMP) prepared to satisfy the requirements of the EPL and PA 10_0138.

During the reporting period various controls were implemented to manage dust including:

- use of water carts across the site with water fill points appropriately positioned. Additional contractor water carts are also utilised around infrastructure areas and light vehicle road, together with during clearing, mulching and topsoil stripping activities;
- use of a dust suppressant additive on targeted haul roads;
- modification of work practices where required including changing dumping strategies to lower levels and minimising tipping into strong headwinds;
- temporary cessation of operational equipment as required;
- predictive controls have been identified in the Air Quality Trigger Action Response Plan (TARP) and the daily risk response report presented to key operational personnel;
- pre-strip areas are kept to a minimum and mulch cover used on cleared areas ahead of mining activities where possible;
- maintaining a real time SMS alarming system notifying key operational personnel of elevated dust levels;
- site vehicles restricted to designated routes, with speed limits enforced;
- irrigation in advance of operational digging areas;
- use of water cart sprays at the loading operation circuit;
- blasting activities restricted to suitable weather conditions;
- 24 hour notification to key stakeholders and residents of planned blasts;
- water suppression on conveyor transfers and stockpiles at the CHPP;
- water injection and dust curtains on drilling rigs;
- minimising travel speeds and distances of mining fleet on haul roads;
- implementation of large capacity overburden and coal haul trucks; and
- Addition to the monitoring network of a mobile air quality unit on a mine-owned property on Ellerslie Lane.

The MCC Air Quality Monitoring network is illustrated on **Figure 4** and includes:

- continuous monitoring of PM_{10} levels at the MCC TEOM (TEOM1). It is noted that monitoring results from location MCC TEOM2 shown on **Figure 4** which is located on mine owned land are used by MCC for internal management purposes only.
- PM_{10} levels are measured at the High Volume Air Sampler (HVAS) on a twenty-four hour basis every six days. Total Suspended Particulate Matter (TSP) is inferred from the measured PM_{10} data; and
- a network of four dust deposition gauges (DDGs), measuring deposited dust and particulates on a monthly basis.

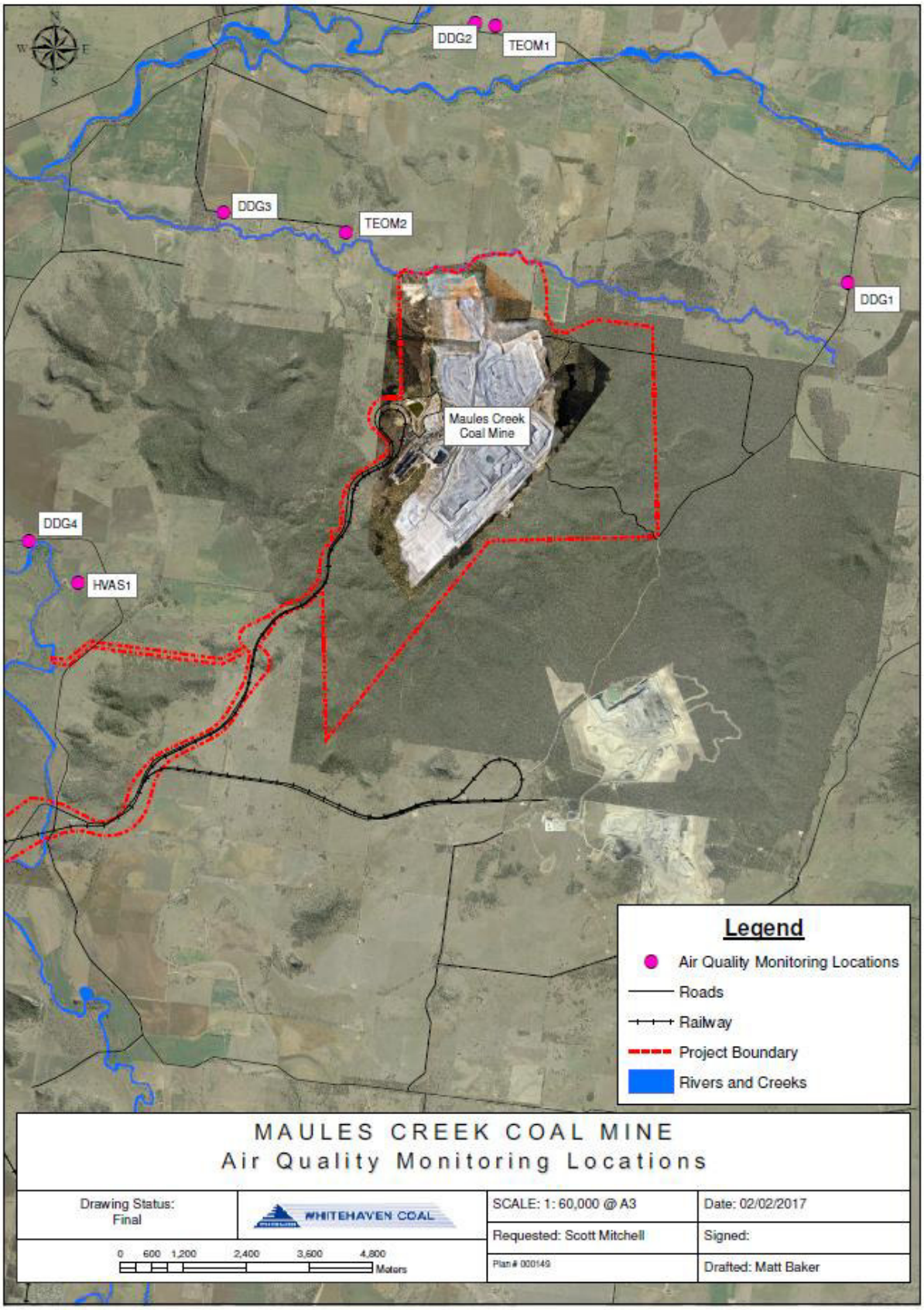


Figure 4 Air Quality Monitoring Location

6.2.2 Environmental Performance

A summary of the air quality monitoring results at MCCM for the reporting period is provided in **Table 7**.

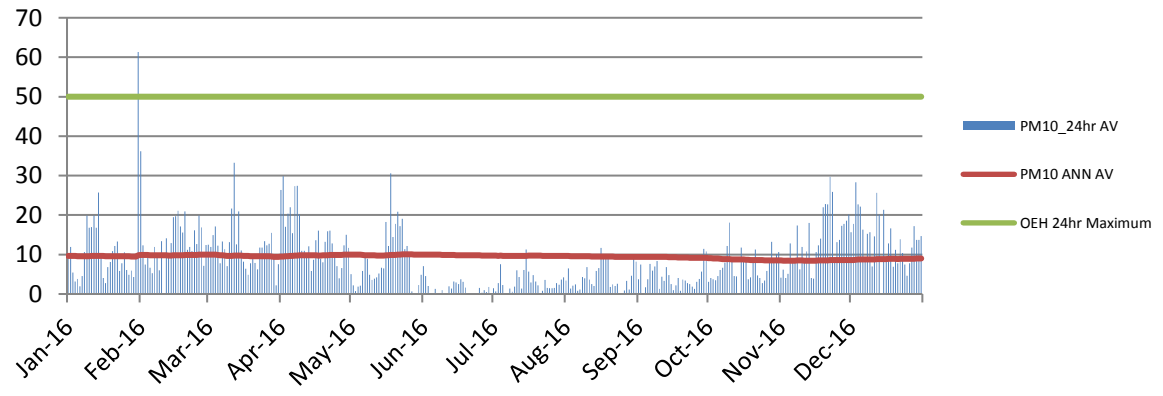
Table 7 Deposited Dust Monitoring Results

Month	MC1 (g/m^2)	MC2 (g/m^2)	MC3 (g/m^2)	MC4 (g/m^2)
Jan-16	*	2.0	0.6	1.2
Feb-16	*	1.9	0.9	1.1
Mar-16	0.5	1.8	1.0	0.5
Apr-16	1.0	3.6	1.3	1.1
May-16	*	4.1	1.5	2.7
Jun-16	3.0	*	1.0	1.1
Jul-16	2.3	0.8	0.6	0.4
Aug-16	1.3	2.7	1.0	0.9
Sep-16	1.8	5.5	1.0	0.9
Oct-16	2.6	1.2	0.8	0.5
Nov-16	3.0	1.5	*	1.0
Dec-16	1.7	*	2.7	2.2
Annual Average	**1.91**	**2.51**	**1.13**	**1.13**

** Results have been removed as they were contaminated (bird droppings, insects and vegetation).*

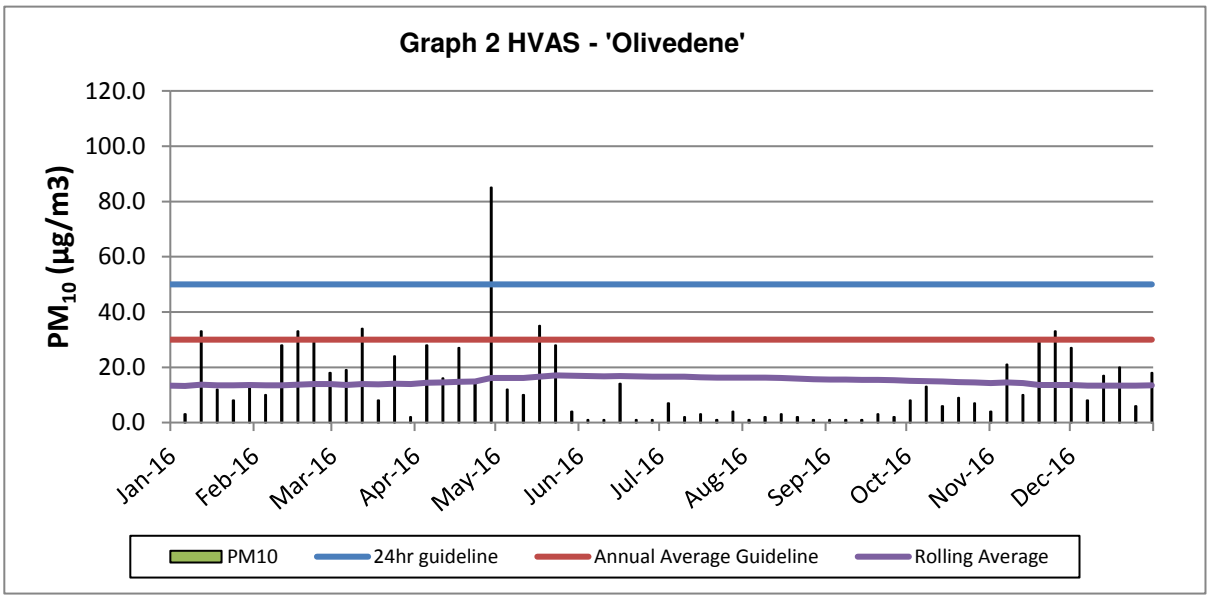
Monitoring conducted at the MCC TEOM1 indicated the PM_{10} annual average remained well below the applicable criteria of 30 µg/m3. Results are also provided and publically available on the NSW EPA website. The EPA and Office of Environment and Heritage (OEH) completed an inspection of TEOM1 and maintenance records during 2016. The audit identified compliance and operation of the unit in accordance with the relevant standards. On the 31 January 2016, TEOM1 recorded a PM_{10} result of 61 µg/m3, above the 24 hour criteria of 50 µg/m3. An investigation identified the contributing factor was a regional event with low air quality between 30 January and 3 February 2016 and not attributable to the MCCM operation. Elevated PM_{10} results were also recorded at other regional NSW TEOM's.

Graph 1 Maules Creek TEOM1 PM10



The PM_{10} monitoring results from TEOM1 are included in the **Graph 1** above.

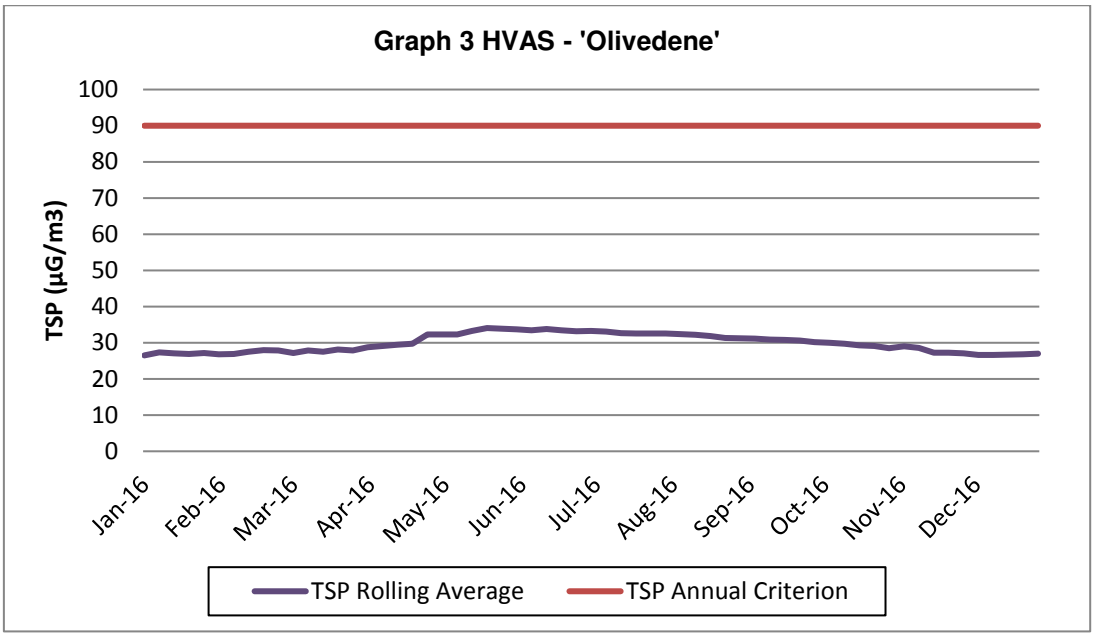
Monitoring conducted at the MCC HVAS indicated the PM_{10} rolling average remained well below the applicable criteria of 30 µg/m^3. On the 29th April 2016, the HVAS recorded a PM10 result of 85 µg/m^3, above the 24 hour criteria of 50 µg/m^3. An investigation into MCC's meteorological and operational data during the 24 hour sampling period revealed that wind direction was predominantly from the south west, west and north-west. This indicates likely sources were from localised non-mining related activities. Results recorded at all other approved MCCM air quality monitoring sites, including closer to the operation, on that day remained within the relevant Project Approval criteria. The HVAS PM_{10} monitoring results are illustrated in the **Graph 2** below.



The air quality monitoring results are generally consistent with previous reporting periods and are in concurrence with the EA predictions.

MCC submitted a report to the EPA in March 2016 in accordance with EPL 20221 Special Condition E1 to measure uncontrolled and controlled haul road emissions. The investigation completed by an independent consultancy determined that based on the recorded PM_{10} concentrations generated on all active haul routes, the actions taken by MCCM to manage haul road emissions were considered appropriate. The report is publically available on the Whitehaven Coal website.

Total Suspended Particulates (TSP) is inferred from the measured PM_{10} data. Monitoring conducted at the MCC HVAS1 indicated the TSP rolling annual average remained well below the applicable criteria provided in Schedule 3 Condition 29 of PA10_0138 of 90 µg/m^3. The TSP monitoring results are illustrated in **Graph 3** below.



6.2.3 Proposed Improvement Measures

The AQMS was submitted to DPE during 2016. Following approval anticipated in 2017, the predictive component of the air quality modelling system will be fully implemented to support operational planning to manage dust generation. The system will also include additional real time sampling units and a meteorological component which will be used to inform planning for daily operational risk. Commissioning and testing of this has progressively occurred during 2016.

An Independent Dust Benchmarking Study was undertaken in 2016 that was commissioned by regulatory agencies. The report is expected to be finalised during the 2017 reporting period. MCC will consider the application of the report recommendations and liaise with EPA and DPE. Further information can be found in **Section 10.2.**

6.3 GREENHOUSE GAS

6.3.1 Environmental Management

Greenhouse Gas (GHG) emissions at MCCM are managed in accordance with Schedule 3 Condition 27 of PA 10_0138 and the AQGHGMP. The main sources of GHG emissions considered in the AQGHGMP are:

- fuel consumption (diesel) during mining operations – Scope 1;
- release of fugitive methane (CH_4) from the fracturing of coal seams – Scope 1; and
- indirect emissions resulting from the MCCM's consumption and use of purchased electricity – Scope 2.

Electricity

A number of controls were applied to reduce electricity consumption at the MCCM during the reporting period, including:

- the energy efficiency of new electrical equipment is considered during procurement;
- use of variable speed drives on pumps and conveyors in the CHPP;
- avoiding idle running of conveyors in the CHPP; and
- turning off unnecessary lighting around the mine site, consistent with safety requirements.

Diesel Consumption

A number of controls were applied to reduce diesel consumption at the MCCM during the reporting period including:

- the fuel efficiency of all mobile and fixed equipment is considered during procurement;
- ensuring dump trucks are fully loaded where possible prior to hauling to maximise efficiency, i.e. fuel used per unit of material moved;
- maximising the efficiency of the mining fleet through regular maintenance;
- minimising the gradient, length and height of loaded haul runs for dump trucks, where possible;
- in-pit and mobile refueling facilities;
- usage of a computer based maintenance and monitoring system for all heavy vehicle use and fuel burn. This system also determines individual equipment utilisation which assists in minimising fleet size and associated wastage; and
- continued operation of the employee shuttle bus system to and from site.

6.3.2 Environmental Performance

GHG emissions associated with the MCCM are reported through participation in the National Pollutant Inventory (NPI) and as part of the Whitehaven Group in the National Greenhouse and Energy Report Scheme (NGERS). NPI data is publically available on the Commonwealth Department of the Environment website. The total GHG Emissions attributed to the MCCM reported for the NGERS 2016 Financial Year (FY) reporting period was 557,775 tCO_2-e. The following sections detail the three key GHG contributors calculated for the 2016 NGER reporting period.

Diesel Usage

Approximately 43,484 kL of Diesel (Stationary and Transport) was consumed equating to 119,168 tCO_2-e GHG Emissions. This is less than the scope 1 emissions predicted in the EA.

Fugitive Emissions

There was an estimated total of 422,603 tCO_2-e fugitive emissions from MCCM in the 2016 FY. This is higher than the EA estimate of 6,849 tCO_2-e. This discrepancy is a result of the emissions calculation methods used. Fugitive gas emissions for MCCM in the 2016 FY were estimated using Method 1 where the EA used a site specific emission factor derived from measurements of gas content for boreholes samples taken for each coal seam.

Electricity Consumption

Approximately 18,620,358 kWh power equating to 15,641 tCO_2-e was consumed by MCCM. This is less than the predicted consumption from the EA of scope 2 emissions of 51,025 tCO_2-e.

6.3.3 Proposed Improvement Measures

Management measures described above will continue to be implemented during the next reporting period, however total emissions are expected to increase as production rate and associate fleet increase.

6.4 NOISE

6.4.1 Environmental Management

Potential noise impacts associated with the MCCM are managed in accordance with the:

- Noise criteria and operating conditions prescribed under Schedule 3 Conditions 7 and 15 of PA 10_0138;
- EPL 20221 Conditions L3 and M7; and
- the MCC Noise Management Plan (NMP) approved by DPE prepared to satisfy the requirements of the EPL and PA 10_0138.

The revised NMP was submitted to DPE for approval during the reporting period.

Additionally, various controls were implemented to manage noise during the reporting period, including but not limited to:

- noise monitoring systems including real time unattended monitoring at representative off-site locations;
- compliance monitoring conducted on a monthly basis;
- meteorological forecasting and daily risk reporting to advise of environmental / weather conditions in advance;
- annual noise model validations;
- continued monitoring of TARP trigger levels and dissemination of trigger alerts to MCCM personnel via SMS;
- training of dispatch and supervisors regarding noise management and TARP's;
- a dispatch operator on shift that monitors the operations and has access to real time noise data, and can advise of any required modifications to work practices. Modifications may include changing dumping strategies, reducing the number of machines operating or ceasing operations entirely;
- roaming inspections by personnel during evening and night time periods at offsite locations to identify any audible mine related noise;
- design of the overburden emplacement areas to include various options for day to day waste rock dump locations (i.e. levels/ heights and aspect/orientation) depending on wind strength and direction. Less acoustically prominent/exposed locations can be utilised during periods of noise-enhancing meteorological conditions;
- Equipment sound power testing and analysis;
- Installation of 'hush-pack' sound suppression to reduce dozer track noise;
- operator awareness to reduce truck noise while tipping loads at the overburden dumps, reversing under the excavators correctly to reduce repositioning horn signals, and 'low-loading' height from excavator buckets to reduce truck loading noise;
- usage of 'silent horns' on the excavator and supporting truck fleet;
- dozer operators instructed to limit any unnecessary tracking;
- ongoing maintenance of the MCC mining fleet including any noise suppression equipment;
- implementation of new exhaust systems on Hitachi EH5000 class trucks; and
- acoustic screening and paneling of parts of the CHPP.

The MCCM Noise Monitoring network is illustrated on **Figure 5** and includes:

- continuous monitoring at real-time monitoring units that are utilised for daily management purposes. An additional unit was installed during 2016 to increase the network to 5 monitoring units; and
- monthly attended monitoring at six locations as described in the EPL (NM1 to NM6).

6.4.2 Environmental Performance

Attended Monitoring

Attended monitoring is completed on a monthly basis by an independent consultant and is used to assess compliance with licence and approval limits for mining generated noise. A summary of the noise monitoring results above criteria at MCCM for the reporting period is provided below. Monthly noise survey results are also available on the MCCM website, included in the EPL monitoring data reports.

During the reporting period there were technical exceedances above the relevant noise criteria when the INP modifying factor was applied. An exceedance of up to 2 dB is not considered significant in accordance with Chapter 11 of the NSW Industrial Noise Policy, which states that a development is only deemed to be in non-compliance when "*the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence condition*." Notwithstanding, results are reported below.

Four measurements of the 15 minute L_{Aeq} at point NM4, with the addition of the low frequency modifying factor required under the INP, recorded levels of 1-3 dB over the criteria during 2016. One measurement on 11 May at monitoring point NM5 exceeded the 15min criterion by 1dB. These results were reported to the required stakeholders. MCCM understands the EPA is currently reviewing the Draft Industrial Noise Guideline to determine suitability of LFN assessment where receptors are a large distance from the noise source.

During the previous reporting period two attended monitoring results were recorded above the noise criteria. A further five attended monitoring results were determined to be above the noise criteria with the addition of the low frequency modifying factor required under the INP. Comparison of attended monitoring results from the 2015 and 2016 reporting periods indicates that the noise management performance at MCCM has improved during 2016.There were no exceedances recorded against the cumulative noise criteria detailed in PA10_0138.

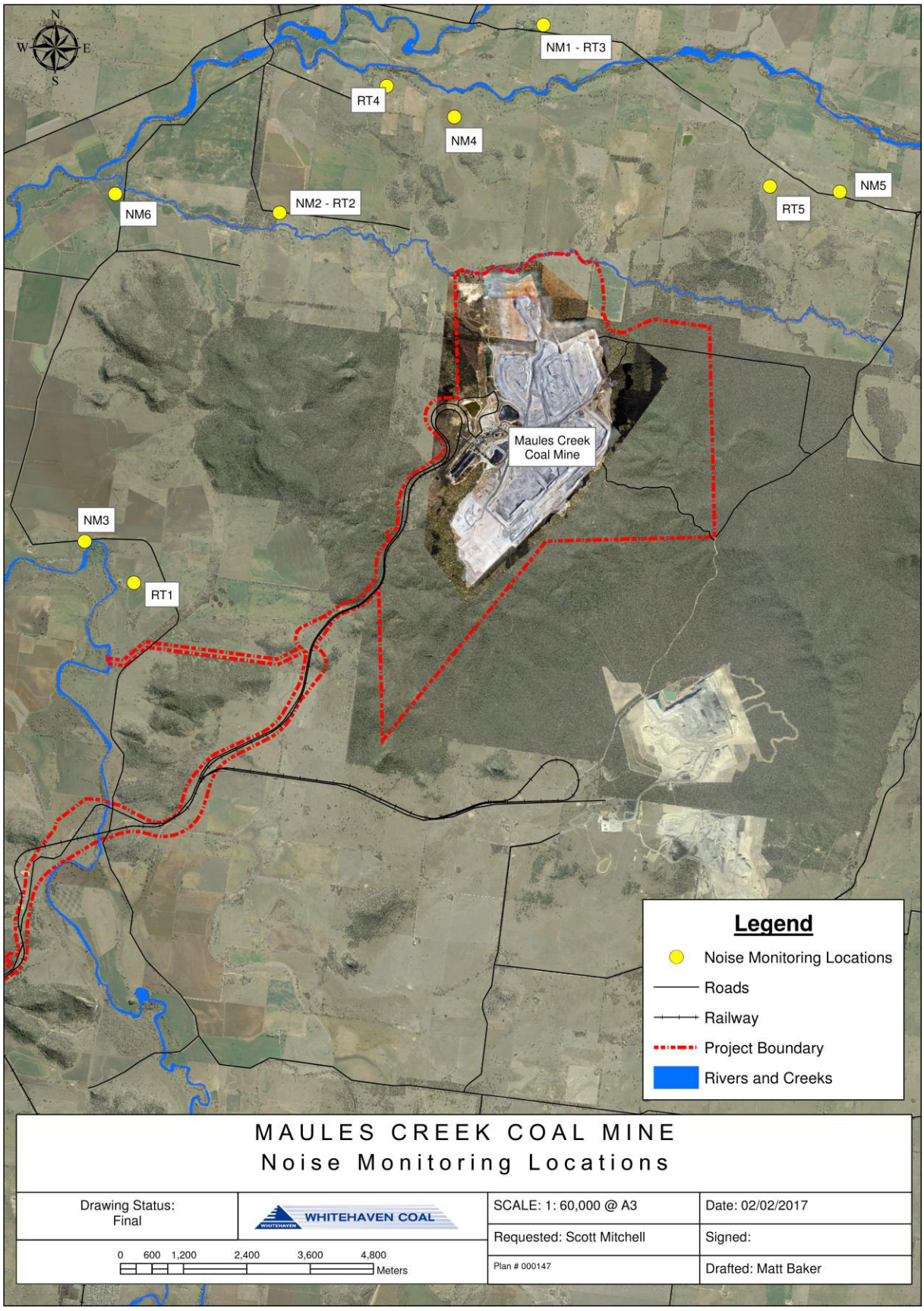


Figure 5 Noise Monitoring Network Locations

Annual Sound Power Testing

Sound power level testing of fixed and mobile plant has been undertaken and results are provided in **Appendix C**.

Performance measures by monthly attended monitoring results support the position that MCCM is operating generally in accordance with the respective Project Approval and EPL 20221 criteria.

MCCM is working with the Original Equipment Manufacturer (OEM) to further develop solutions and reduce SPL on mobile equipment. Considerable work was undertaken during the reporting period to improve exhaust systems on the Hitachi class truck fleet. Additional trialling of dozer 'hush-pack's' was also installed to assist in the mitigation of 'track slap' noise. Furthermore, the technology and installation of 'silent horn's' on the excavator fleet was completed during 2016 in an effort to reduce the use of signalling horns by excavators. MCC advised regulatory agencies during the course of the reporting period regarding progress on noise attenuation and improvement measures undertaken to address the SPL of equipment. Further noise attenuation works under consideration for implementation during the 2017 reporting period include trialling rubber tyred dozers on dumps and investigating options with dozers to reduce track noise.

Additional works in relation to SPL for fixed CHPP plant infrastructure was undertaken during 2016. This consisted of measurement and assessment of various pieces of infrastructure together with installation of screening in proximity to the ROM crusher and acoustic screening walls near train load out infrastructure. Upgrade of water pumps also included enclosure of primary and secondary transfer pumps for the supply of river water.

Annual Validation

Maules Creek Coal (MCC) engaged an acoustic consultancy to undertake a validation assessment of the site noise model to fulfil the requirements of the MCC Noise Management Plan (NMP) and Schedule 3 Condition 16(f). The assessment aimed to review real-time and attended monitoring data for 2016, and validate the results against the model predictions from EA Acoustics Impact Assessment (NIA), prepared by Bridges Acoustics in July 2011.

The validation exercise concluded that monitoring data from the current unattended monitoring locations are considered to provide a good indication of the upper range of received noise levels for the specific meteorological conditions modelled. However, the results indicate a distinction between actual and modelled for the 2016 reporting period. Modelling indicated that the actual enhancement in was significantly less than the modelled prediction for wind direction from a southerly orientation. The results for RT2 and RT4, for example, indicate the model slightly over predicted noise levels at these locations for the various meteorological conditions assessed. The model prediction for RT3 is considered to be accurate in predicting noise at this location when considering a wide range of weather conditions.

Attended monitoring results indicate mine contributed noise levels are generally consistent with the modelled noise predictions for the Project.

6.4.3 Proposed Improvement Measures

A number of improvement measures are proposed for the next reporting period including:

- Consideration of the Mandatory Noise Environmental Audit recommendations and improvement opportunities;
- Field work completed for the rail spur line regarding in accordance with the requirements of Condition 14 of PA 10_0138 with final reporting early 2017;

- Review of dozer 'hush packs' and maintaining engagement with equipment suppliers around relevant technology;
- Finalise work relating to inversion strength and reclassification of stability classes;
- Finalisation of the Leard Forest Precinct Noise Management Strategy (NMS) which was resubmitted to DPE in 2016 with approval anticipated within the next reporting period;
- Additional improvements to the real time environmental noise monitoring system;
- Installation of additional acoustic paneling at the CHPP and review implemented controls; and
- Review attended monitoring locations in liaison with regulatory agencies.

6.5 BLAST

6.5.1 Environmental Management

Blast management measures are implemented at MCCM to support the management and control of post blast fume generation, dust impacts, rock fragmentation, blast overpressure and ground vibration. Blasting impacts associated with the MCCM are managed in accordance with the:

- blasting criteria prescribed under Schedule 3 Conditions 18 to 20 of PA 10_0138; and
- Blast Management Plan (BLMP), MCC Blast Procedures and the Leard Forest Precinct Blast Management Strategy (BLMS) that have been approved to satisfy the requirements of the EPL and PA 10_0138.

During the reporting period a number of controls were applied to reduce the potential for impacts associated with blasting at the MCCM. The key controls implemented include, but were not limited to:

- best practice blast design and drill practices in accordance with the relevant Australian Standards;
- blast scheduling considering meteorological conditions, including wind speed and direction;
- pre-blast assessment for each blast to determine blast exclusion zones, potential fume generation risks and appropriate controls measures to minimise potential risks;
- review of blasts and investigations as required;
- revision to the BLMP and improving commitments and control measures;
- coordination of blasts to avoid cumulative impacts in accordance with the BLMS; and
- the likelihood of fume generation is reduced through consideration of explosive product, geological conditions, best practice loading procedures, blast scheduling, 'sleep-time' and meteorological conditions.

Air blast overpressure and ground vibration monitoring are undertaken at four monitoring locations shown on **Figure 6**.

6.5.2 Environmental Performance

There were 97 blasts during the reporting period. On 8 July 2016 monitoring unit BM1 (on mine-owned property) recorded a peak air vibration (overpressure) of 128.4 dBL, exceeding the applicable limits set out in PA 10_0138 and the MCC EPL 20221 conditions. MCCM reported the exceedance to the regulatory agencies. A mechanical failure at BM1 resulted in no blast data being recorded for two blasts occurring on 19 and 20 September 2016. A mechanical failure at BM2 resulted in no blast data being recorded on 9 February, 22 April and 30 August 2016. An additional mechanical failure at BM2 resulted in no blast overpressure data being recorded for three blasts on in December 2016. All other blast monitors were fully operational during these periods and indicated all blast events remained well within the applicable criteria at these locations. Modelled results indicated all missed blasts were likely

to be within the criteria for both ground vibration and overpressure. Capture rates for each unit was 98% for BM1, 94% for BM2 and 100% for BM3 and 4 respectively. Details of blasts are included in **Appendix A.**

Table 8 summarises the blasting monitoring results during the period.

Table 8 Summary of Blasting Results

Location	Parameter	Average	Maximum	100% Limit	Exceedance
BM1	Air blast overpressure (dB(Lin Peak))	99.35	128.40*	120	Yes
	Vibration (mm/s)	0.20	1.20	10	No
BM2#	Air blast overpressure (dB(Lin Peak))	98.67	117.90	120	No
	Vibration (mm/s)	0.15	0.64	10	No
BM3	Air blast overpressure (dB(Lin Peak))	94.06	110.30	120	No
	Vibration (mm/s)	0.45	1.36	10	No
BM4#	Air blast overpressure (dB(Lin Peak))	97.16	118.5	120	No
	Vibration (mm/s)	0.33	1.11	10	No

* BM1 is on mine owned property. Modelling of the peak airblast result indicated no significant impact to private receivers.

BM2 and BM4 are on property either owned or acquired during the course of reporting period.

As stated above there was one exceedance of the applicable ground vibration limit during the 2016 reporting period at a mine owned property. During the 2015 reporting period all blast events recorded results within the applicable overpressure and ground vibration limits. Average results for the 2015 and 2016 reporting periods at corresponding monitoring sites were generally comparable. This indicates that overall the potential impacts of blasting were effectively managed during the 2016 reporting period.

Both overpressure and ground vibration monitoring results are generally consistent with the findings of the EA predicting they would remain below the relevant amenity criteria at all privately owned residences in the absence of noise enhancing weather conditions.

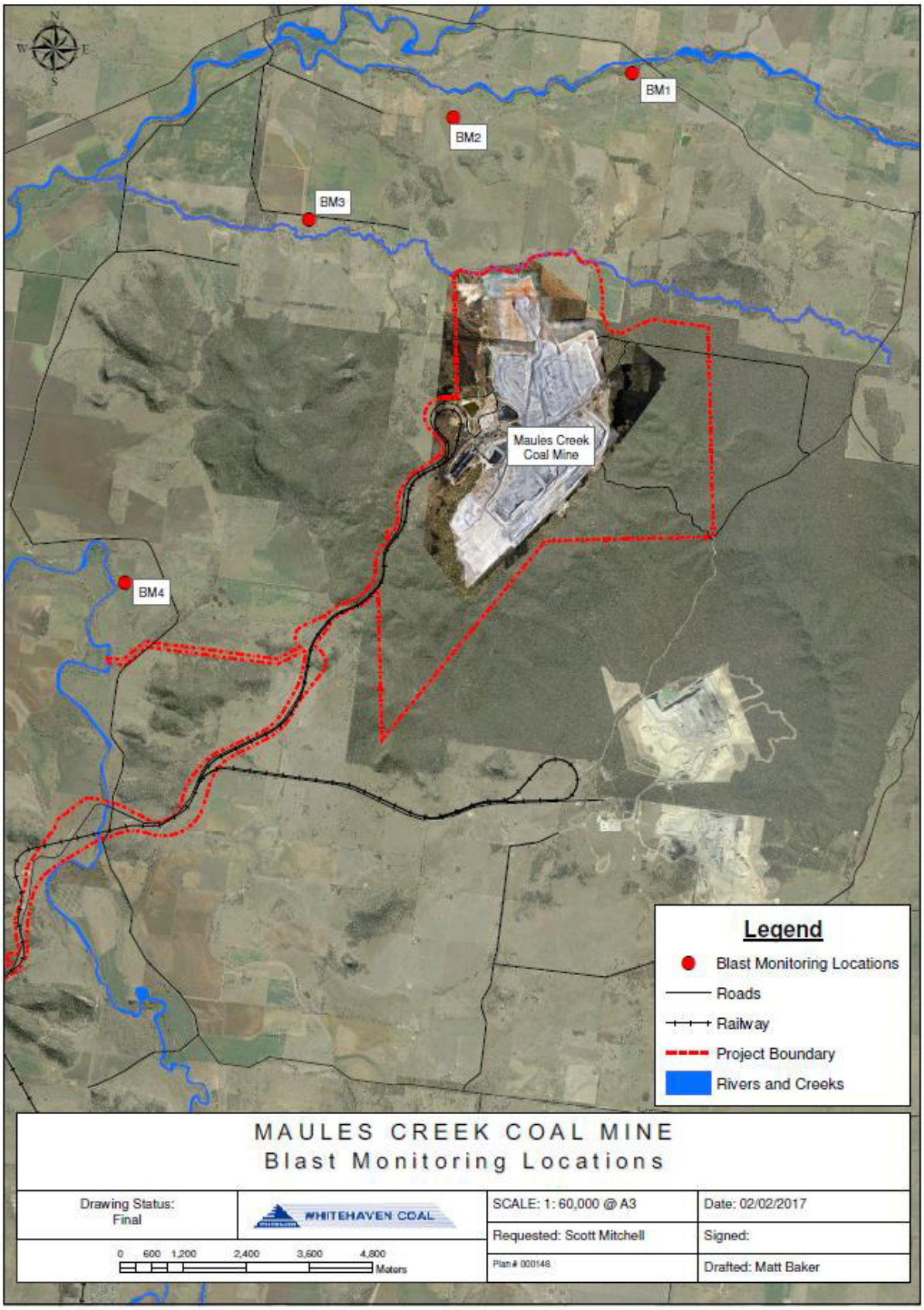


Figure 6 Blasting Monitoring Network Locations

Blast fume generation, including visible NOx fume, varies from yellow to orange to dark red depending on the concentration of NO_2 in the post-blast gases. There were no significant fume events (i.e. greater than Level 3C against the Australia Explosives Industry & Safety Group guideline) during the reporting period. There were a total of 8 blast events classed as Level 1A, 2 classed as Level 1B, 6 classed as Level 2B, 1 classed as 3A, 3 classed as 3B and 1 post blast fume classed as 3C. All blasts were video recorded and categorised in line with the BLMP and relevant industry guidelines.

A post blast gas monitoring study was also completed during the reporting period defining the localised extent of fume dispersion within the active operational area of the mine. A meeting was also held with industry specialists in blasting, regulatory agencies and local community members to present information in relation to post blast fume.

6.5.3 Proposed Improvement Measures

MCC have revised the BLMP during 2016 and will continue to implement the improvements during 2017, including restrictions on blasting under certain meteorological conditions.

The revised Blast and Fume Management Plan was submitted during 2016 following consultation with various stakeholders. This is anticipated to be approved in 2017. A number of commitments are already been applied, including more stringent conditions around meteorological conditions.

6.6 BIODIVERSITY

6.6.1 Environmental Management

Biodiversity was managed in accordance with:

- Schedule 3 Conditions 52 of the PA 10_0138;
- the MCC Biodiversity Management Plan (BMP) and Biodiversity Offset Strategy (BOS) prepared to satisfy the requirements of PA 10_0138.

Various treatments were implemented during the reporting period to mitigate impacts of the MCCM including (but not limited to):

- weed monitoring and inspections;
- feral animal monitoring and inspections;
- seed management and collection;
- flora and fauna monitoring; and
- fuel load assessment.

6.6.2 Environmental Performance

MCCM revised the Biodiversity Management Plan (BMP) following consultation with stakeholders and submitted the BMP to DPE for approval during August 2016. MCCM has an approved NSW Revised Biodiversity Offset Strategy for maintaining and improving 12,169ha of native woodland and forest covering four precincts called the Eastern and Western BOA (adjacent to MCCM, Leard Forest and Leard State Conservation Area); the Southern BOA (adjacent to the Boonalla Aboriginal Area) and the Northern BOA (adjacent to the eastern boundary of Mount Kaputar National Park).

Offset Security Management

WHC has substantially commenced the process towards long term security of MCCM BOA in accordance with Project Approval obligations. OEH (in correspondence dated 1 July 2016) outlined to WHC which BOA would be considered for transfer to Parks Estate which was followed up with site inspections by NPWS and OEH staff on 8 - 9 September and 29 November 2016. The process is

currently with OEH to complete inter-agency notifications before further negotiations can continue. OEH (in correspondence dated 9 December 2016) indicated that for the portions of WHC BOA not being considered for transfer to Parks Estate; can commence the Conservation Agreement application process.

Infrastructure Management

During the reporting period, a total of 14.2 km of new fencing (fauna friendly) was constructed along the perimeter of MCCM BOA as well as installation of new signage and locks on gates as part of taking management control, implementing access management and restricting inadvertent livestock grazing of BOAs. Also during the reporting period, 133.8 km of redundant internal fences were deconstructed across the MCCM BOA. A total of 40m3 of waste incorporating other areas of former agricultural rubbish identified (inherited from previous owners/land managers) was recycled (in the case for scrap metal) or disposed offsite (general municipal waste and tyres) at the Narrabri Waste Management Facility.

Seed Management

Four routine seed assessments were completed across the MCCM BOA, as well as the mine site vegetation, in February (prior to the annual clearing program), May, August and November 2016. These assessments were designed to identify on a seasonal basis the life cycle stage and development of native plants to identify what, where, when and how to target appropriate resources to collect seed for future revegetation programs. The seed assessments resulted in timely and prioritised seed collection with the spatial information directly given to seed collection contractors to undertake the following overstorey seed collection works in accordance with standard industry practice outlined in the Florabank guidelines and BMP:

- February 2016 - MCCM Onsite - *Eucalyptus crebra* and *Eucalyptus dwyeri*;
- March 2016 - Wollandilly BOA - *Eucalptus albens*, *Eucalyptus blakelyi*, *Eucalyptus melliodora* and *Eucalyptus populnea*;
- July 2016 - MCCM Onsite and Velyama BOA – *Casuarina cristata*;
- July 2016 - Mt Lindsay BOA – *Eucalyptus blakelyi, Eucalyptus bridgesiana, Eucalyptus melliodora, Eucalyptus viminalis* and *Leptospermum polygalifolium*; and
- December 2016 - Mt Lindsay BOA – *Callitris glaucophylla, Eucalyptus bridgesiana, Eucalyptus laevopinea* and *Lomandra confertifolia*.

As part of the WHC group wide revegetation planning; a local revegetation provider was engaged in November 2016 with the relevant overstorey species collected above sent away to a reputable nursery for propagation ahead of the planned Autumn 2017 revegetation program for the Eastern and Western BOA of Box Gum and non-EEC/CEEC Woodland. Targeted native understorey species were also collected during the reporting period.

Revegetation Management

In accordance with the BMP revegetation schedule focusing on cleared non-native grassland (former cultivation) and derived native grasslands; WHC organised 3767ha of due diligence assessments of potential Box Gum and non-EEC/CEEC Woodland revegetation across the MCCM BOA investigating potential ecological constraints and heritage sites within areas required to be disturbed as part of the revegetation process. During the reporting period, revegetation ground preparation (dozer ripping three tynes wide to a depth >0.3m every 5m along the contour and lightly scarifying the soil surface to relieve compaction, improve permeability and infiltration to increase sub-surface soil moisture as well

improve soil seed bed to maximise soil-seed contact during sowing) was completed over 784ha of the Eastern BOA between March and June 2016 and 538ha of the Western BOA between July and October 2016.

The record wet weather during winter and early spring significantly delayed and impacted earthmoving machinery undertaking ground preparation of Kelso BOA during September 2016 from minor flooding occurring in the Namoi River. Between April and July 2016, WHC coordinated understorey revegetation of 796ha of the Eastern BOA sown with 3256kg of native grass seed, 177kg of native forb seed and 6376kg of bulking agent (lime). The ecology due diligence identified 658ha of natural regeneration revegetation not requiring additional active revegetation of the cleared non-native grassland and derived native grasslands for a total of 1454ha of revegetation during the 2016 reporting period. The understorey sowing of the Western BOA and overstorey planting of both the Eastern and Western BOAs where the ground has been prepared for revegetation will occur in 2017.

Habitat Management

During the reporting period, MCCM has salvaged timber from its clearing areas however it has not yet been retrieved from the mine boundary and taken to the revegetation areas on Teston North, Teston South, Tralee, Warriahdool or Wollandilly for installation.

Weed Management

WHC coordinated routine formal weed monitoring/inspections undertaken across the MCCM project boundary and MCCM BOA on a biannual and quarterly basis respectively during the reporting period; as well as routine inspections undertaken by Narrabri Shire Council weeds officer. The priority weeds for control were noted as general broadleaf weeds (noxious and environmental species) in areas proposed for revegetation as well as legacy noxious weeds inherited from previous owners' management regimes such as African Box Thorn, Green Cestrum and Cactus species (Common, Tiger and Rope Pear). The weed monitoring/inspections ensure that timely and prioritised weed control is undertaken on a seasonal basis with the spatial information directly given to spraying contractors to identify what, where, when and how to target appropriate resources across the MCCM BOA for weed control.

MCC implemented a weed control program across key areas within the MCCM project boundary in 2016 targeting infrastructure areas, topsoil stockpiles and rail corridor. A comprehensive weed control program also occurred across all MCCM BOAs including 2653ha treated on Eastern BOA, 1692ha treated on Western BOA, 410ha treated on Southern BOA and 1580.6ha treated on Northern BOA. The record wet weather during winter and early spring resulted in significant areas of broadleaf weed requiring spraying. Only appropriately qualified and experienced weed contractors (AQF3 accreditation or higher for use of herbicide) were engaged to undertake weed control works for WHC.

Feral Animals Management

WHC coordinated routine formal feral animal monitoring across lands adjacent to MCCM and MCCM BOA quarterly during 2016. The adoption of a "monitor, measure and manage" approach to feral animal management will allow WHC to implement adaptive management in response to changes being measured through monitoring in feral animal abundance specific to the different geographical regions of the MCCM BOA. Feral animal monitoring utilises the relevant methodologies for specific feral animals generally in accordance with the NSW DPI Monitoring Techniques for Vertebrate Pests so that a range of methods can be used such as transects/spotlighting, sandpads, cameras traps where practicable and relevant to specific offset areas/properties.

Feral animal monitoring on lands adjacent to MCCM indicated the current feral animal populations are at a low background level. As a result of the monitoring program a feral animal control program did not occur on lands adjacent to MCCM during the reporting period.

Monitoring in MCCM BOA demonstrated that the feral animals in moderate to high abundance were the European Red Fox, Feral Pig and Feral Goat. The feral animal monitoring ensures that timely and prioritised feral animal control is undertaken on a seasonal basis identifying what, where, when and how to target appropriate resources across the MCCM BOA for feral animal management.

During the reporting period, WHC implemented a comprehensive feral animal control program across all MCCM BOA with fox and dog baiting; cat and pig trapping undertaken in May (34 fox and 3 dog out of 160 baits taken and 56 pigs trapped), July (35 out of 129 fox baits taken and 1 pig trapped) and November 2016 (25 out of 104 fox baits taken; 1 cat and 8 pigs trapped). The record wet weather during winter and early spring limited the success of control programs during this period with a goat harvester appointed but not being able to successfully get over the ground to muster goats until December 2016. Only appropriately qualified and experienced feral animal contractors (appropriate feral animal management qualifications, NSW gun licence and pesticide accreditation where relevant) were engaged to undertake feral animal control works for WHC.

Soil & Erosion Management

During the reporting period, WHC organised an assessment of soil nutrient status of the Eastern and Western BOAs but no specific treatment or soil erosion mitigation works were undertaken. Additional soil and erosion control works occurred within the Project Boundary including construction of sediment dams, maintenance and desilting of drainage lines and improved pump and pipe infrastructure and diversion drains.

Grazing Management

As former licence agreements ceased or were terminated during the reporting period, extra land came over to WHC biodiversity management, resulting in the areas being destocked.

Bushfire Management

During the reporting period, WHC organised for fuel load monitoring to be undertaken in October 2016 with the average fuel load rating for the MCCM Eastern BOA being High, Western BOA being High, Southern BOA being Moderate and Northern BOA being Moderate in accordance with Overall Fuel Assessment Guide (July 2010). In accordance with the BMP, WHC then prioritised resources targeting maintenance and upgrade of fire breaks and tracks across the Eastern and Western BOAs with 72.8km and 38.6km of fire breaks completed respectively in November 2016.

Monitoring Program

During the reporting period, ecological monitoring of the MCCM BOA consists of annual vegetation and habitat monitoring which was completed between September and November 2016; while fauna monitoring was undertaken in February, May, August and November 2016. In comparison to the 2015 surveys, the annual vegetation and habitat monitoring results from the 2016 shows that species richness increased by 53 native species and 56 exotic species for a total number of plant species recorded in 2016 being 384 native and 178 exotic species as well as an increase in the records of the threatened species *Dichanthium setosum* and *Tylophora linearis* (AMBS, in prep.). Although these increases are most likely attributable to the heavy rainfall prior to the 2016 surveys as compared to rainfall before the 2015 surveys, it may also be the beginning of a trend resulting from the removal of grazing across the offset areas (AMBS, in prep.).

The vertebrate fauna surveys recorded a total of twenty-six species listed under the TSC Act and/or EPBC Act as threatened or migratory during 2016 (AMBS, in prep.); of which six species were recorded for the first time including the Eastern Cave Bat (*Vespadelus troughtoni*), Little Pied Bat (*Chalinolobus picatus*) (probable), Spotted-tailed Quoll (*Dasyurus maculatus maculatus*), Masked Owl (*Tyto novaehollandiae*) (probable), Square-tailed Kite (*Daphoenositta chrysoptera*) and Cattle Egret (*Ardea ibis*).

Pre-Clearing and Clearing Surveys

The 2016 clearing program occurred between February 2016 and April 2016 and consisted of the clearance of a total of approx. 372 ha to facilitate the expansion of the mining pit area (PIT) and the outer pit and overburden area (OOP).

An audit was completed by compliance representatives from the DPE & Department of Industry – Resources & Energy during the vegetation clearing campaign. The audit noted compliance with relevant management plans. One non-compliance in relation to erosion and sediment control was identified and addressed to the satisfaction of DPE. A fact sheet summarising the results of the audit are available on the DPE's website.

The ecological works for the clearing program consisted of the following activities;

- Weed Mapping;
- Threatened Flora Surveys;
- Fauna Pre-clearing Surveys;
- Clearance Supervision; and
- Post-felling re-inspections.

Prior to the commencement of any clearing activities the limits of clearing are surveyed and marked with flagging tape.

The pre-clearance and clearance flora and fauna surveys are conducted in several stages, some of which were ongoing throughout the entire period of works and others were conducted in discrete phases.

Targeted threatened flora surveys were conducted prior to clearing activities commencing in conjunction with weed mapping surveys. All threatened flora identified during these surveys were recorded and their locations mapped using hand held GPS units.

Fauna pre-clearance surveys were also carried out and commenced prior to the beginning of clearance works to ensure that the areas were surveyed within one week of the clearance to minimise the risk of birds nesting between the time of the fauna habitat survey and the commencement of clearance works and ensure the maximum possible wellbeing of the native fauna within the clearance areas as outlined in the BMP. Fauna pre-clearance surveys consisted of identifying, marking and documenting suitable fauna habitat features. These features include significant rock outcrops and crevices, large boulders, nests and, in particular, trees bearing hollows which have the potential to support species such as bats, gliders, possums, reptiles and birds. All fauna pre-clearing teams were equipped with endoscopic cameras to enable the examination of hollows considered likely to contain fauna. Features identified as likely to support resident fauna were marked with a large "H" using fluorescent spray paint as well as with flagging tape and the habitat feature details were recorded using a hand-held GPS unit

In addition to the identification and marking of likely habitat features, nocturnal spotlight surveys were also conducted throughout the clearing footprint area to identify hollows in use by resident fauna such

as the Squirrel Glider (*Petaurus norfolcensis*) as well as potential microbat roosting trees. These surveys were typically conducted through the area surveyed diurnally on that date by the same field team. These surveys were conducted from dusk until approximately two hours after sunset.

Vegetation clearance was conducted following a two stage process, as follows:

- Stage 1 - After an area has been suitably surveyed for fauna habitat features grubbing, dozers then remove all understory vegetation leaving the marked habitat features isolated. Following grubbing works habitat items were allowed to stand overnight. This was to allow resident fauna the opportunity to self-relocate to adjacent undisturbed vegetation; and
- Stage 2 - In the following days, felling machinery conducted the removal of the isolated habitat items under the supervision of an ecology team. Habitat trees were shaken by the clearing machinery prior to felling to encourage fauna which had not already vacated the tree to now do so. After the shaking of the tree and following approval from the ecological team the habitat tree was felled as softly as possible. Following felling the supervising ecology team inspected hollows and loose bark for resident fauna which had not self-relocated and rescued any present fauna.

Fauna was encountered during all work tasks on the 2016 clearance works, including species of frogs, birds, mammals and reptiles. Threatened species (under the *Threatened Species Conservation* (TSC) Act 1995 and/or *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999) were also encountered.

The following threatened fauna species were encountered during 2016 clearing works:

- Brown Treecreeper (Eastern Subspecies) (*Climacteris picumnus victoriae*) – listed as Vulnerable under the TSC Act;
- Grey-crowned Babbler (Eastern Subspecies) (*Pomatostomus temporalis temporalis*) – listed as Vulnerable under the TSC Act;
- Pale Headed Snake (Hoplocephalus bitorquatus) – listed as Vulnerable under the TSC Act;
- Yellow-bellied Sheathtail Bat (Saccolaimus flaviventris) – listed as Vulnerable under the TSC Act; and
- Barking Owl (Ninox connivens) – Listed as Vulnerable under the TSC Act.

Tylophera linearis Management

In accordance with the BMP, Stages 1 (Root Architecture and Growth Study) to 4 (Seed Propagation) of the *Tylophera linearis* translocation program were completed previously in 2014 and 2015. During the reporting period, monitoring continued of the 77 *Tylophera linearis* seedlings transplanted in December 2015 that were propagated from seed collected onsite at MCCM during 2014. Monitoring in February and March 2016 found plants affected by hot weather senescence with only 13 individuals visible (above ground growth). During September 2016 identified a number of transplanted seedlings having resprouted and growing healthy however by December 2016, only one of the translocated plants was present again due to hot weather senescence mirroring the same behaviour as nearby wild populations. No further opportunities to collect seed was identified during clearing operations in February 2016 or from other wild populations in the area.

Pomaderris queenslandica Management

In accordance with the BMP, Stages 1 (Root Architecture) to 4 (Seed Germination) of the *Pomaderris queenslandica* translocation program were commenced previously in 2015. During the reporting period, no transplanting occurred due the poor quality of seed collected due to pest predation as well

as the low survival of cutting taken. In January 2016, additional collection of seed was undertaken, which was more promising due to the absence of pest predation, to be trial germinated at the nursery.

Stygofauna Assessment

In accordance with PA 10_0138, a single round of monitoring for Stygofauna and Groundwater Dependent Ecosystems was carried out in 2015 near the mine including portions of Maules Creek and Namoi River alluviums. The results of the current survey indicate that the ecosystem condition along Maules Creek Alluvium is stable along this sub-catchment as indicated by the relatively consistent invertebrate community composition. There have been no adverse effects on at the Maules Creek subterranean aquatic ecosystem as a result of the mine's operations to date.

6.6.3 Proposed Improvement Measures

A number of improvement measures are proposed for the next reporting period including:

- Follow up monitoring of the success of the Green Cestrum control works, Box Thorn and other weeds will be undertaken through continuation of the weed inspection programs. The format of the weed inspections will be revised in 2017 to ensure that timely and prioritised weed control is implemented across the mine and associated offset areas;
- Continued implementation of an adaptive management approach to MCC weed, seed and feral animal inspection programs; and
- Continuation of propagation and translocation programs for *Tylophora linearis* and *Pomaderris queenslandica*.
- Implement improvements from audit findings.

6.7 ABORIGINAL CULTURAL HERITAGE

6.7.1 Environmental Management

Aboriginal cultural heritage is managed in accordance with the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP) which was prepared to satisfy Schedule 3 Condition 58 and the SOC detailed in the PA 10_0138. The AACHMP was revised during 2016 and is currently pending approval by DPE. The BTM Aboriginal Cultural Heritage Strategy was also submitted to OEH and DPE for approval during 2016.

6.7.2 Environmental Performance

Annual Monitoring Program

The annual monitoring program was undertaken at MCCM in accordance with the requirements of section 6.4.1 of the AACHMP. The annual monitoring program including an Annual Site Audit and the Annual Compliance audit of salvaged objects, undertaken in August 2016 by Registered Aboriginal Party (RAP) representatives accompanied by a specialist archaeologist approved by DPE.

The Annual Site Audit included an inspection of all extant previously identified Aboriginal cultural heritage sites within the MCCM boundary. The inspection assessed the condition of 25 sites including fencing, potential nearby disturbance and photographic records. Any required fence maintenance identified during the audit was carried out immediately during the inspection.

An Annual Compliance Audit of cultural objects collected during previous salvage campaigns was also undertaken. The audit confirmed the artefacts are currently stored securely as an interim measure by Whitehaven Coal Limited. Consultation with RAPs to identify a culturally appropriate keeping place for all salvaged material for the MCCM is ongoing.

Additional Monitoring / Inspection of Sensitive Heritage Areas

Monitoring inspections are undertaken prior to or during topsoil clearance with RAP representatives accompanied by specialist archaeologists. Archaeological monitoring of Cultural Heritage Sensitive Areas was undertaken in March 2016 during the clearing program. Monitoring included the visual inspection of 66 scrapes, totalling 38 km of ground surface inspection.

Archaeological monitoring identified 7 artefacts and 6 new sites were registered. This included one set of rocks with grinding grooves identified. Consultation occurred during 2016 on the identified site and management measures. Revision of the AACHMP was undertaken to include the site referred to as 'Teston GG4'.

There remains low potential for finding significant archaeological sites during the archaeological monitoring process. This is consistent with the findings of the Aboriginal Archaeology Heritage Assessment undertaken as part of the EA.

Archaeological Salvage Program

The majority of identified artefact scatters within the MCCM Boundary have been salvaged in previous reporting periods through surface collection and excavation, however, one further artefact scatter (Teston AS2) was salvaged during February 2016. An Archaeologist and RAP representatives recorded and salvaged artefacts in accordance with the Aboriginal Archaeology and Cultural Heritage Management Plan (AACHMP).

Ongoing Consultation

Following the approval of the revised AACHMP in accordance with section 4.4, meetings are convened on approximately a six monthly basis, which are open to all RAPs to provide a forum for any issues to be raised and for MCC to provide an update on the progress of the MCCM. Two meetings were held during 2016.

Consultation also occurred with Gomeroi Native Title Applicant Group during the reporting period including a visit to site on 5 February 2016. In addition, a number of site visits and meetings with RAP representatives occurred with respect to the identification and management options of a rock feature site identified during 2016.

At the time of publication, advertising for an aboriginal community member to join the MCC Community Consultative Committee was underway. This position is anticipated to be filled during the 2017 reporting period.

Furthermore, MCCM have engaged and supported the development of an indigenous start up business, Gomeroi Country Services Pty Ltd to undertake a number of infrastructure projects during the reporting period.

The Federal Minister for Environment & Energy provided a determination of an application under section 10 of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* with respect to protection of the site referred to as 'Lawlers Well' in December 2016. MCC will continue to engage with RAP's to assist in the salvage of this site in accordance with the AACHMP.

Management of Quinine Bush

Quinine Bush (*Alstonia constricta*) continues to be mapped across the project as part of the pre-clearing surveys. A program of plant and seed collection and propagation has been assessed.

6.7.3 Proposed Improvement Measures

In 2017, several aspects of cultural heritage work will continue, including the annual monitoring program and archaeological monitoring and salvage as required of Cultural Heritage Sensitive Areas during pre-mining clearing works. In addition, ongoing consultation with RAPs will continue to identify a culturally appropriate keeping place for all Aboriginal cultural heritage objects salvaged from the MCCM. The Aboriginal Heritage Conservation Strategy was submitted to DPE in October 2016 and is expected to be approved during the next reporting period.

The revised AACHMP was submitted to DPE for approval following consultation with RAP's during 2016 with approval expected in early 2017. Relocation of 'Teston GG4' is anticipated to occur together with salvage of a number of listed sites within the AACHMP.

6.8 HISTORIC HERITAGE

6.8.1 Environmental Management

Historic heritage will be managed in accordance with Schedule 3 Condition 58 of PA 10_0138 and the Statement of Commitments included in Appendix 5 of PA 10_0138. No development work has occurred that may impact on historic heritage items identified in the EA. An inspection and preparation of the Historic Heritage Management Plan (HHMP) was prepared by an independent consultant for submission for approval by the DPE. The historic heritage values of the MCCM lie principally in the presence of relics, structures and archaeological evidence outside the MCCM Disturbance Boundary on MCC owned land. The EA identified a total of five historic sites, three of which were assessed as being part of one heritage complex site and were all assessed to be of local heritage significance.

6.8.2 Environmental Performance

Inspections of the identified historic heritage sites have been undertaken to assess condition and record any evidence of impacts. These inspections assist in determining ongoing maintenance requirements such as weed control and fence integrity. Photographic records are also recorded at each inspection.

Since Historic Heritage Assessment was undertaken as part of the EA there have been no additional sites identified within MCC owned land. As predicted in the EA, there have been no direct impacts to historic heritage items.

During the reporting period, heritage due diligence assessments of MCCM BOA identified one historical heritage site ("Warriahdool Hut") and aboriginal heritage sites that required identification/demarcating fencing to be installed.

In accordance with Schedule 5 Condition 22 of the PA 10_0138, Statement of Commitments included in Appendix 5 of PA 10_0138 and Section 7.9.3 of the MCCM EA, an oral history report was commenced in 2016 and will be finalised during the next reporting period.

6.8.3 Proposed Improvement Measures

Annual monitoring of historic heritage sites will continue in 2017 and maintenance and weed control will be undertaken as required.

6.9 TRAFFIC

6.9.1 Environmental Management

Traffic impacts associated with the MCCM are managed in accordance with Schedule 3 Condition 59 to 66 of the PA 10_0138 and the Traffic Management Plan (TMP). Various onsite treatments were implemented during the reporting period to mitigate the traffic impacts of the MCCM including:

- a code of conduct for drivers of heavy and light vehicles;
- notification to contractors and staff regarding the driver code of conduct and to advise of any updated access arrangements;
- nominated access routes for all vehicles travelling to and from the MCCM, reinforced by approved signage and quarterly audits;
- provision of a shuttle bus service for staff to access site;
- consideration of school bus pick up and drop off times when scheduling shift changeovers; and
- monitoring of traffic volumes, road safety inspections, quarterly auditing of approved access routes.

6.9.2 Environmental Performance

MCC has conducted quarterly audits to check for non-compliance with regard to access prohibitions as described in the TMP. There was only one occurrence of MCCM related traffic utilising a restricted route to access the site. MCC re-communicated the appropriate access routes with the contracting company involved.

There were two complaints regarding traffic generated by the MCCM received during the reporting period. This is a small increase compared with the 2015 reporting period, during which no complaints were received in relation to traffic.

An information session was held for key stakeholders in relation to the Employee Transport Modification to the Project Approval.

6.9.3 Proposed Improvement Measures

Quarterly audits of restricted roads, monitoring on traffic volumes to the site and responses to any community complaints will continue to be implemented during the next reporting period.

A modification to PA10_0138 was submitted to DPE in May 2016 to address employee transport to site and reflect the changes in workforce demographics and ongoing bus transportation requirements. Approval is anticipated early 2017.

Response to submissions were provided to DPE and a determination is anticipated in early 2017. A subsequent revision of the MCCM Traffic Management Plan will also occur in due course post approval.

6.10 WASTE MANAGEMENT

MCC aims to implement all reasonable and feasible measures to minimise waste and ensure it is appropriately stored, handled and disposed of. Waste Materials at MCCM are managed in accordance with:

- Schedule 3 Condition 70 of PA 10_0138;
- Condition A1 & A3 of the EPL;
- the Materials Safety Management Plan (MSMP) & Pollution Incident Response Management Plan (PIRMP); and

- the legal and strategic framework for managing wastes in NSW.

MCCM waste streams include general waste, hazardous waste and sewage and are collected and disposed of at authorised waste disposal sites by a licenced contractor.

Any mine waste material that is determined to be PAF are placed (buried) in the OEA or within mined-out sections of the open cut once they become available and covered with at least 5 meters of NAF. PAF material will be disposed of in accordance with the MOP in a location to minimise further oxidation and leaching into the surrounding environment. Additional management measures are detailed in the approved MOP.

6.10.1 Environmental Performance

Waste Streams

Inspections of waste management practices are carried out to ensure general, hydrocarbon and recyclable waste is segregated.

Data on waste streams are collated using information provided by the licenced contractors. During the reporting period waste output increased by 31% for general waste when compared with the previous reporting period. An increase in waste production occurred consistent with increased production levels, workforce numbers and operational fleet in 2016.

A total of approximately 361 t of general waste and 2,079,840 L of septic was removed in the 2016 reporting period. Approximately 78 t of solid recyclable material and 569,300 L of used oils were collected to be recycled by a third party authorised contractor.

No incidents relating to waste management practices occurred during the reporting period. Waste management was consistent with relevant management details in the EA.

6.10.2 Proposed Improvement Measures

MCC will continue to monitor, remove, track and report waste streams on a regular basis to effectively manage waste generated by the operation of the MCCM and maximise recycling efficiencies.

MCC will continue to manage and test for potential PAF material and dispose of this material as per the requirements of the MOP.

6.11 HAZARDOUS MATERIALS

6.11.1 Environmental Management

Hazardous materials at the MCCM are managed and disposed of in accordance with the relevant Australian standards.

Any spillages of potentially hazardous materials are required to be reported immediately to determine the appropriate response.

6.11.2 Environmental Performance

Hydrocarbons

No reportable or significant incidents involving fuel storage, handling or delivery occurred during the reporting period. Minor leaks and spills associated with plant maintenance and operation were

managed on site. The PIRMP was not required to be activated for any significant reportable incidents. This will continue to be managed during the next reporting period.

Explosives

No environmental incidents involving explosives handling or storage occurred during the reporting period.

Other Materials

Soil material from temporary maintenance area and material impacted by minor spills in the operational areas were removed and are stored in the Soil Reclamation Area prior to treatment. No reportable incidents involving the handling or storage of other potentially hazardous materials occurred during the reporting period.

6.11.3 Proposed Improvement Measures

Continued operation of a bioremediation area will occur during the next reporting period. Completion of the permanent work shop facility in the next reporting period will also include provision of resources to ensure suitable hydrocarbon spill response.

6.12 VISUAL & LIGHTING

6.12.1 Environmental Management

Visual amenity and lighting impacts associated with the MCCM are managed in accordance with Schedule 3 Condition 67 and 68 of the PA 10_0138. Various onsite treatments were implemented during the reporting period to mitigate visual impacts of the MCCM including (but not limited to):

- use of directional lighting in lieu of general area lighting;
- consideration of fixed versus mobile lighting, locations and orientation;
- fixed lighting designed and procured in general accordance with Australian Standard *AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting* (AS4282);
- visual lighting inspections as required; and
- mine infrastructure designed and managed to blend with the surrounding landscape as far as practicable.

6.12.2 Environmental Performance

A visual and lighting assessment was undertaken during the last quarter of 2016 between the hours of 7pm and 12am to review the lighting levels at nearby receptors and roads. It was determined that there was no direct line of sight exposure for the closest sensitive residences to the north west of MCCM.

No significant discrepancies have yet been identified between the EA predictions and actual visual impacts of the MCCM.

6.12.3 Proposed Improvement Measures

Management measures described above will continue to be implemented during the next reporting period.

6.13 BUSHFIRE

6.13.1 Environmental Management

Bushfire hazards and risks associated with the MCCM are managed in accordance with Schedule 3 Condition 69 of the PA 10_0138, the MCC Bushfire Management Plan and the BMP. Various treatments were implemented during the reporting period to manage and control potential bushfire risks including:

- the addition of a 1000L fire trailer onsite which can be utilised to control any firebreaks if required;
- participation by MCC in the Narrabri Rural Bushfire Brigade meetings;
- implementation of various bushfire hazard controls. Key control measures during the reporting period included Hot Work areas and permits, maintenance of equipment and infrastructure, establishing Asset Protection Zones and assessment of fuel loads;
- monitoring of fuel loads occurred in the MCC offset areas prior to the bushfire season; and
- maintenance of the roads and tracks within the MCCM was undertaken prior to the bushfire season. Roads and tracks can act as firebreaks and help to facilitate access across the site.

6.13.2 Environmental Performance

No bushfires occurred adjacent to or within the MCCM boundary during the reporting period. No significant discrepancies have been identified from the EA predictions.

6.13.3 Proposed Improvement Measures

Management measures described above will continue to be undertaken during the next reporting period being fuel load assessment, maintenance of access tracks, hot work permits and asset protection zones.

6.14 PUBLIC SAFETY

The mine is located on land owned by Whitehaven and State Forest land in a relatively remote rural area, generally in excess of 1 km from any public road. The site is predominately fenced and appropriate gates and warning signs are installed at all vehicle access points.

MCC has installed security gates and warning signs at all vehicle access points to the MCCM. Security personnel conduct roaming patrols and are also positioned at vehicle checkpoints to ensure that members of the public do not inadvertently enter the mine property. Any visitors are required to report to the mine office and unauthorised personnel are not permitted to move around the mine area unaccompanied. During blasting, procedures are in place to ensure that the area around each blast site is clear of personnel and relevant residents are advised in advance of blast scheduling.

6.14.1 Performance

The procedures in place have been effective throughout the reporting period to prevent unauthorised access to the mine site by the general public. On occasion individuals have bypassed locked gates, security guards and fences, and ignored mine area safety signage to access areas of the MCCM.

7 WATER MANAGEMENT

7.1 WATER SUPPLY

A pipeline from the Namoi River is the main source of raw water supply for the MCCM. **Table 9** summarises the water taken by MCC in the previous water year (1 July 2015 – 30 June 2016).

Table 9 - Water Take

Water Licence #	Water Sharing Plan	Water Source and Management Zone	Entitlement	Passive Take/ Inflows	Active Pumping by MCCM**	Total
WAL 27385	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	38	0	0	0
WAL 12811	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source	135	0	0	0
WAL 12491	Upper and Lower Namoi Groundwater Sources	Upper Namoi Zone 11 Maules Creek Groundwater Source	77	0	0	0
WAL 12479	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	78	0	0	0
WAL 27383	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	0	0	0	0
WAL 12480	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	215	0	0	0
WAL 29467	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	6	0	0	0
WAL 29588	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	300	0	0	0
90SL101060*	-	Catchment: Unnamed Water Source	30	0	0	0
WAL 36641	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	800	<10	0	0
WAL 13050	Upper Namoi and Lower Namoi Regulated River Water Sources	Lower Namoi Regulated River Water Source	3,000	0	1295***	1295

** Water Licence 90SL101060 is currently being converted to an approval under the Water Management Act 2000.*

*** Water use applicable to MCCM operations only and excludes any water use by tenants for stock and domestic or irrigation purposes.*

**** Note: In addition to the 1295 ML utilised by the MCCM during the water year period, 136ML of MCCM water allocation was transferred to an alternate water user in April 2016.*

7.2 SURFACE WATER MANAGEMENT

7.2.1 Environmental Management

The MCCM water management system aims to ensure there are no adverse impacts on receiving water quality, to allow for early detection of any potential impacts and develop appropriate corrective actions. Potential impacts to surface water quality are managed in accordance with:

- the surface water criteria prescribed under schedule 3 condition 36 to 40 of the PA 10_0138;
- EPL 20221 Conditions P1, L1, L2, L3 and M2; and
- the MCC Water Management Plan (WMP) prepared to satisfy the requirements of the EPL and PA 10_0138.

During the reporting period various controls strategies were implemented to manage surface water quality including:

- prior to disturbance of land, appropriate erosion and sediment controls were established;
- construction of SD3, an additional sediment dam designed and built in the north western corner of the Project Boundary;
- maintenance of a number of sediment dams previously constructed to collect runoff from disturbed areas, which is then used for dust suppression or pumped to the mine water dam for re-use on site;
- a combination of temporary and permanent clean and dirty water drains have been established to divert runoff from undisturbed areas and collect runoff from disturbed areas;
- additional erosion and sediment control measures have been used for other small disturbance areas including silt fences, rock checks and other measures as required;
- any water collected within the open cut pits is contained and reused on-site;
- no uncontrolled discharge of mine water off-site;
- maintaining an up-to-date water balance to ensure on-site water demands are satisfied whilst minimising offsite water impacts;
- validation of the site water balance model; and
- regular sampling and inspections of the onsite and surrounding surface water system.

Surface water monitoring locations are illustrated on **Figure 7** and **Figure 8**. A summary of the surface water quality findings from the reporting period is provided below.

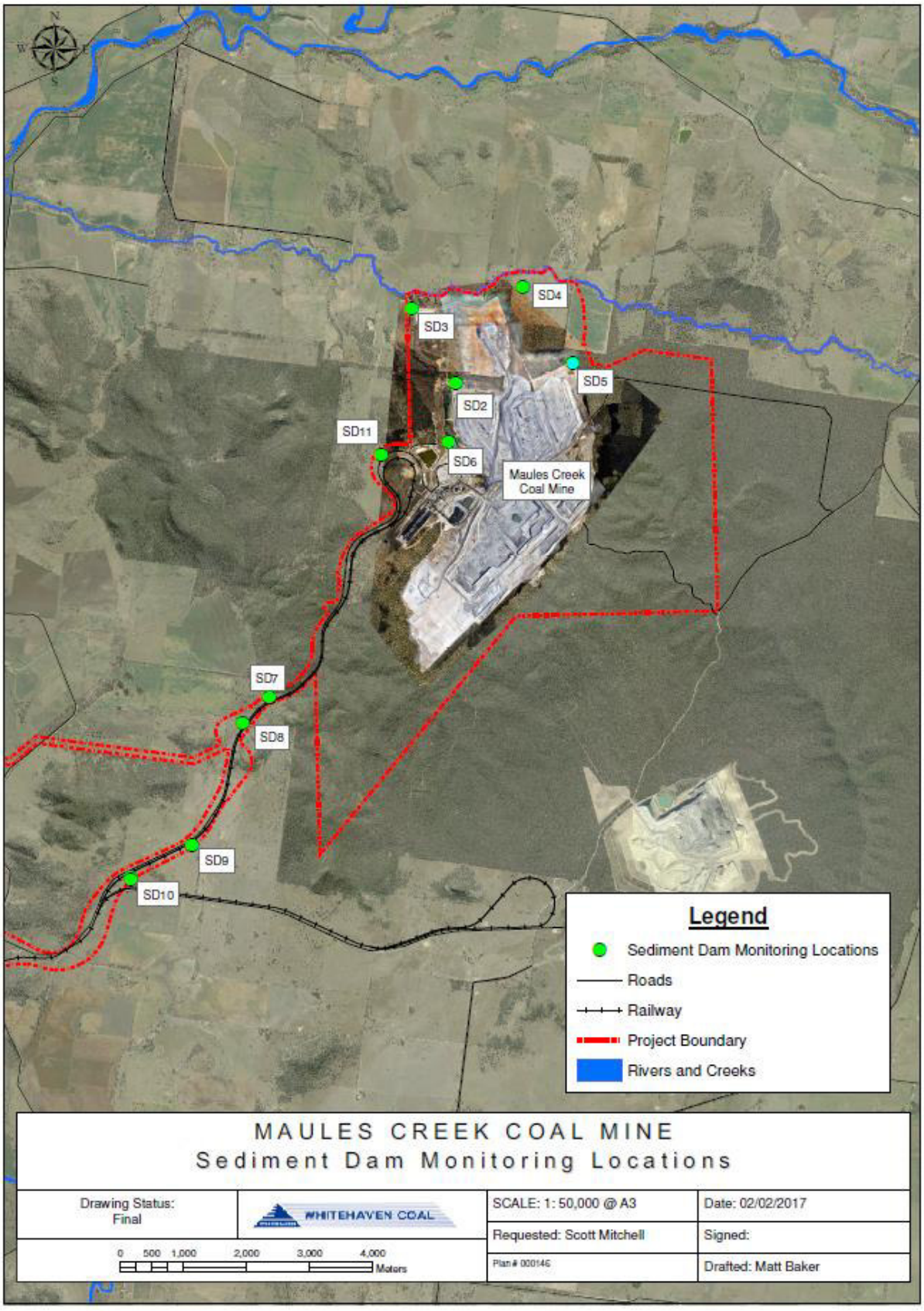


Figure 7 Sediment Dam Monitoring Locations

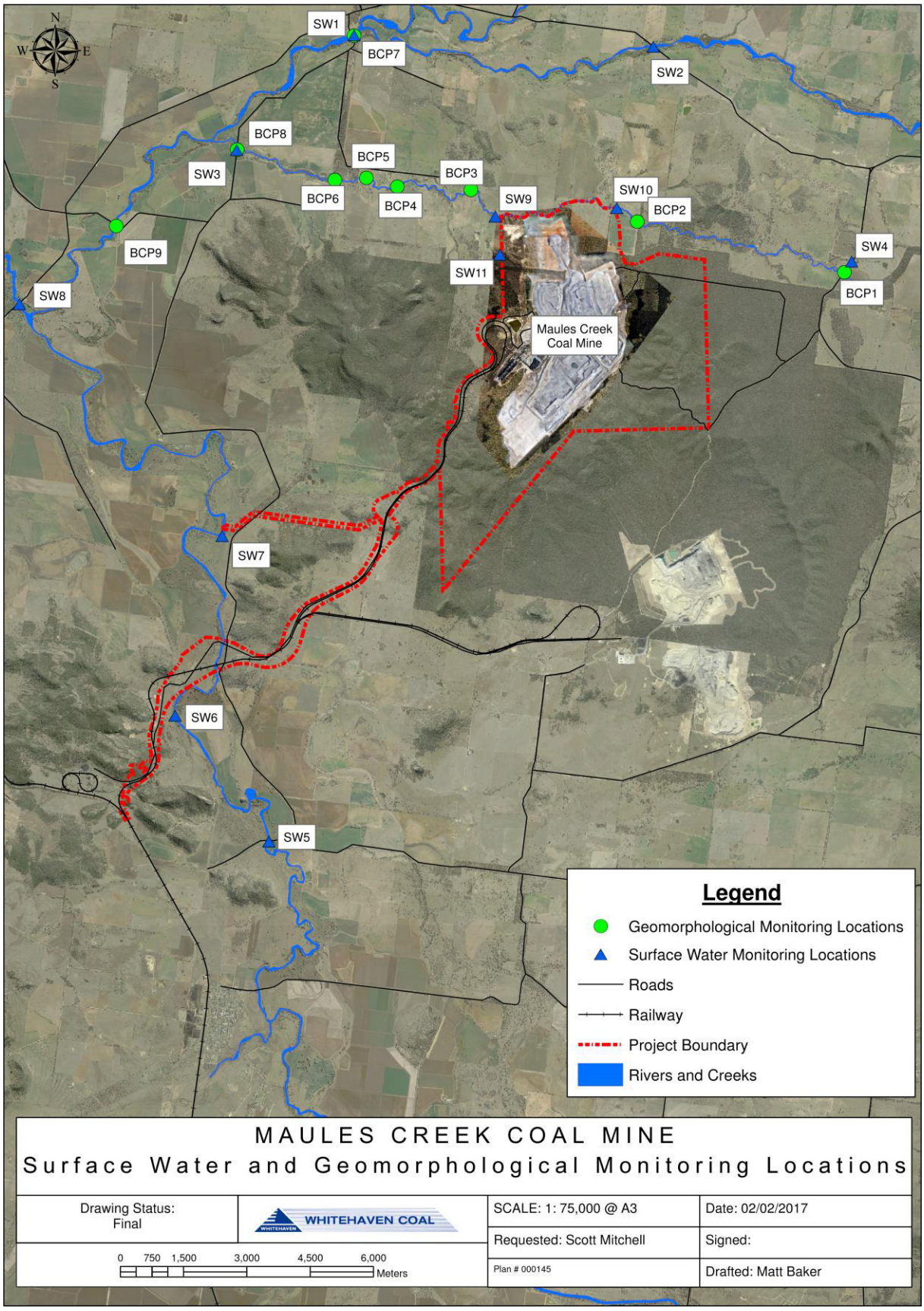


Figure 8 Surface Water and Geomorphological Monitoring Locations

7.2.2 Environmental Performance

Surface Water Quality

Routine surface water monitoring is conducted in surrounding watercourses on a monthly basis and the pH, EC and TSS monitoring results detailed in **Appendix D**. Samples are collected consistent with Water Sampling Methods, AS/NZS5667.1 and AS/NZS 5667.6. All laboratory analyses are conducted by a NATA accredited laboratory.

Laboratory pH in creeks and rivers surrounding the project are all trending generally within the ANZECC acceptable range for Irrigation, Ecosystem Health and Recreation. Back Creek and upper Maules Creek are ephemeral and rarely contain flowing water. There was variation observed in results during the September period following high rainfall. No community complaints were received during the reporting period in relation to surface water quality. Surface water EC and TSS trends are shown in **Appendix D**.

The surface water quality results recorded during the reporting period were generally consistent with historical trends recorded during baseline monitoring and previous years of operations at the MCCM. Additionally, the monitoring results are consistent with the EA prediction that the Project will not adversely affect surface water quality in downstream receiving waters.

Preliminary Trigger Values (PTVs) for twenty six key water quality parameters for Maules Creek, Back Creek and the Namoi River have been included in the WMP. Where insufficient data is available, ANZECC eco-system trigger values have been adopted (eleven parameters). Trigger values have been developed using background data for fifteen parameters. The adopted trigger values will be refined based on further sampling to be undertaken as the operational stages of the MCCM proceed.

Onsite Water Quality

MCC monitors 'mine water' defined in the WMP as water that has come into contact with coal (e.g. groundwater inflows and surface runoff to the open cut pit or stormwater runoff from the ROM and product coal stockpiles). The water quality sampling of any 'mine water' conducted during the 2016 reporting period has been characterised as coal contact water and results shown are in **Appendix D.**

Flow

There was negligible to very low flow recorded at the monitoring points in Back Creek at SW9 or SW10 during the 2016 reporting period. Throughout the reporting period, flow in the Namoi River has been largely dictated by water releases from the Keepit Dam regulated by WaterNSW.

Wet Weather Discharge Monitoring

On four occasions during the reporting period a discharge occurred from sedimentation dam 'SD9' as a result of rainfall measured at MCCM that exceeded 38.4mm over a consecutive 5 day period immediately prior to the discharge occurring. Water samples from SD9 and the upstream and downstream environment were collected and analysed in accordance licence requirements. Water quality results for all events at discharge point SD9 remained within the concentration limits specified in conditions the Maules Creek EPL 20221 and are summarised in **Appendix D.** Site water balance modelling was also undertaken and is discussed in Section 7.4.

Geomorphological Assessment

Stream and riparian vegetation health assessments were conducted by a qualified consultant in November 2016 at upstream and downstream locations along Maules Creek, Back Creek and the Namoi River as illustrated on **Figure 8**. Nine sites have been selected for photographic survey of the

existing geomorphological condition of the downstream drainage system, from the mine site to the Namoi River. Due to land access restrictions, monitoring of one site (BCP4) could not be accessed during the survey period. The assessment included macroinvertebrate monitoring as well as physical and chemical monitoring in accordance with Australian River Assessment System (AusRivAS) guidelines as required in the WMP.

Visual habitat assessments were conducted at eight of the aquatic monitoring sites during the survey period in accordance with the NSW AusRivAS Manual. All eight surveyed sites showed indications of disturbance from current land uses to varying degrees. All observations were recorded utilising the standard NSW AusRivAS field datasheets. A photograph was also taken at each sampling location, both upstream and downstream to provide a visual indication of the habitat at each location, and to form a baseline record of current conditions. The primary disturbances noted at all sites included presence of exotic vegetation, erosion of banks, disturbance from stock, feral animals and disruption of natural hydrology from existing tracks, roads, causeways and other infrastructure. Bank stabilisation and erosion control measures are also in place at SW5.

Water quality measurements were conducted at Namoi River sites (SW5, SW8) and Maules Creek sites (BCP7 and BCP9) as well as within remnant pools at three Back Creek sites (BCP1, BCP2 and BCP6) (total seven sites). No water quality measurements were taken at BCP3, BCP4, BCP5 and BCP 8 as these sections of Back Creek were dry and lacked any remnant pools, or could not be accessed during the survey period.

The in situ water quality recordings for EC and pH for the majority of the sites were largely within the acceptable trigger values listed in the ANZECC guidelines. The EC measurement for site SW8 exceeded ANZECC guidelines at the time of survey. However, freshwater streams with conductivity ranging from 150-500 µS/cm are known to support diverse aquatic life.

Dissolved oxygen for sites with flowing water were within the trigger value ranges. Sites with discrete pools were measured below the trigger value range; these measurements are consistent with the lack of flow and stagnant nature of water present at these sites.

Macroinvertebrate samples were collected at each of the six sites where water quality measurements were conducted. A total length of 10 m of edge and bed/riffle habitat respectively was surveyed along the reach at each location, where possible. The entire length of any remnant pools within the reach was sampled at the three Back Creek sites.

A total of 36 different macroinvertebrate taxa were recorded across the 14 sampled habitats (7 edge and 7 bed samples) with an average of approximately 12 taxa per habitat. The relatively low number of taxa recorded is reflective of the low levels of DO, turbidity and ephemeral nature of Back Creek. Of the three PET taxa, only two, *Ephemeroptera* (mayflies) and *Tricoptera* (caddisflies), were recorded. With the exception of the bed habitat for BCP2, at least one of the six PET taxa recorded was present at each site. SIGNAL scores for the sites ranged from a minimum of 2.2 to a maximum of 5.2.

Overall the watercourses surveyed during November 2016 remained in a moderately to highly disturbed condition due to high levels of exotic vegetation, sediment disturbance from stock and bank erosion which remained consistent with the geomorphological condition of surrounding waterways recorded during the EA.

7.2.3 Proposed Improvement Measures

Water diversion works will continue to target segregation of clean and dirty water as the site expands and new infrastructure is installed. Construction of two additional sediment dams are proposed within the footprint of the next clearing area as part of advancement of the operational pit. Extension of the northern diversion drain will be constructed to ensure water is reported to SD3.

Ongoing work will continue to occur with management of drainage systems, including desilting of sediment dams and drains, and maintenance of sediment dam capacity. A review is planned of sediment control dams to support a revision in monitoring requirements of historical sediment dams utilised during construction. A revision of the WMP will occur to reflect upstream and downstream monitoring locations for geomorphological review.

7.3 GROUNDWATER

7.3.1 Environmental Management

Groundwater at MCCM is managed in accordance with:

- the groundwater criteria prescribed under schedule 3 condition 36 to 40 of the PA 10_0138;
- EPL 20221 Conditions P1 and M2; and
- the MCCM WMP prepared to satisfy the requirements of the EPL and PA 10_0138.

Currently groundwater monitoring is conducted at a network of regional bores and privately owned bores as illustrated in **Figure 9**. The groundwater sampling sites on privately owned land are sampled biannually for depth to water and water quality.

The regional bores are currently sampled monthly for depth to water and quarterly for water quality. Once the baseline groundwater quality of the regional bore network has been established water quality monitoring will be conducted on a biannual basis as per the WMP. Bores are sampled in accordance with the OEH Approved Water Sampling Methods and AS/NZS5667.11. All laboratory analysis is conducted by a NATA accredited laboratory.

In 2010, eight groundwater monitoring bores (MAC252, MAC252R, MAC1218, MAC1219, MAC1259B, MAC1261, MAC1279, MAC1280, and MAC1283) and four vibrating wire piezometers (VWPs) (MAC263, MAC267P, MAC268P, MAC1284) were constructed within former exploration holes to form the EA baseline monitoring network. Since construction, most of the baseline monitoring bores, with the exception of MAC1279 and MAC1280, and all the VWPs have been damaged or destroyed from the progress of mining or external activities beyond the control of MCC.

Owing to the depletion of the baseline network, a replacement monitoring network was developed by MCC in consultation with DPI-Water in Tamworth. The replacement bores have the prefix ‘RB’.

7.3.2 Environmental Performance

There were no non-compliance issues relevant to groundwater management recorded during the reporting period. All bores show trends that are generally within the historical range. Parameters recorded as part of the scheduled groundwater monitoring for this reporting period are summarised below and results provided in **Appendix E**.

Regional Groundwater Bores

Groundwater monitoring results from the regional bore network show groundwater levels to be currently stable. The majority of the regional bores were installed between Q4 2013 and Q1 2014, with the exception of Reg5, Reg5a and Reg6 which were installed in 2015. No drawdown trends have been observed during the reporting period, this is consistent with historical level monitoring results from the regional groundwater bores.

Baseline groundwater quality conditions are still being established, however throughout the reporting period RB01a, RB02a, Reg4 and Reg13 had elevated pH levels (above pH 8.5). Elevated pH levels have generally been measured in these bores since the commencement of monitoring, this has been determined to be a result of low recharge volumes within these bores since the drilling installation. The pH levels at Reg4 increased from 8.88 to 11.6 between the Q2 and Q3 2016 sampling rounds, the elevated result recorded in Q3 are consistent with historical results from Reg4. The pH levels at Reg13 decreased from 10.6 to 8.71 between the Q3 and Q4 2016 sampling rounds, the result recorded in Q4 is significantly lower than historical results from Reg13. This may indicate that the water quality in Reg13 is returning to levels more typical of coal seam lithology, due to the bore recharging following drilling installation. Other regional bores show stable groundwater pH levels, between pH 7 and 8.5, this is characteristic of coal seam lithology, and consistent with historical pH level monitoring results from these bores. RB01a and RB02a are likely to be removed during the advancement of mining in the next reporting period.

Recorded EC levels remained relatively stable during the reporting period and indicate a slightly saline groundwater quality that is characteristic of coal seam lithology. Laboratory conductivity (EC) levels are all within the historical groundwater EC range of 500 to 2500 µs/cm, apart from Reg13. Reg13 EC levels varied from 2460 to 3130 µs/cm during the reporting period, consistent with historical elevated EC levels at this bore. Regional groundwater bore EC levels from the reporting period are generally consistent with historical trends from bores monitored as part of the Maules Creek EA in 2010.

Private Groundwater Bores

Groundwater monitoring results at private bores are similar to those recorded in the regional groundwater bore network with all results displaying constant trends to baseline data from previous years. The standing water levels and pH levels recorded in the reporting period remain consistent with historical data. EC levels are generally consistent with all results between 200 and 2500 apart from BRE2 with slightly elevated levels.

Vibrating Wire Piezometers

Data from the Vibrating Wire Piezometers (VWPs) is downloaded on a monthly basis, the locations of VWPs is illustrated in Figure 9. **Appendix E** includes graphs of recorded temperature and water levels for the reporting period from the VWP network. Groundwater levels in all monitored bores have remained relatively stable over the monitoring period and are consistent with monitoring results from previous years. VWP RB04 is a nested ground water monitoring location with 4 sensors targeting different coal seams. RB04 VW1 located in the Braymont seam ceased capturing data in February 2015, however there are a number of other VWP's located within the Braymont seam that continue to monitor groundwater trends.

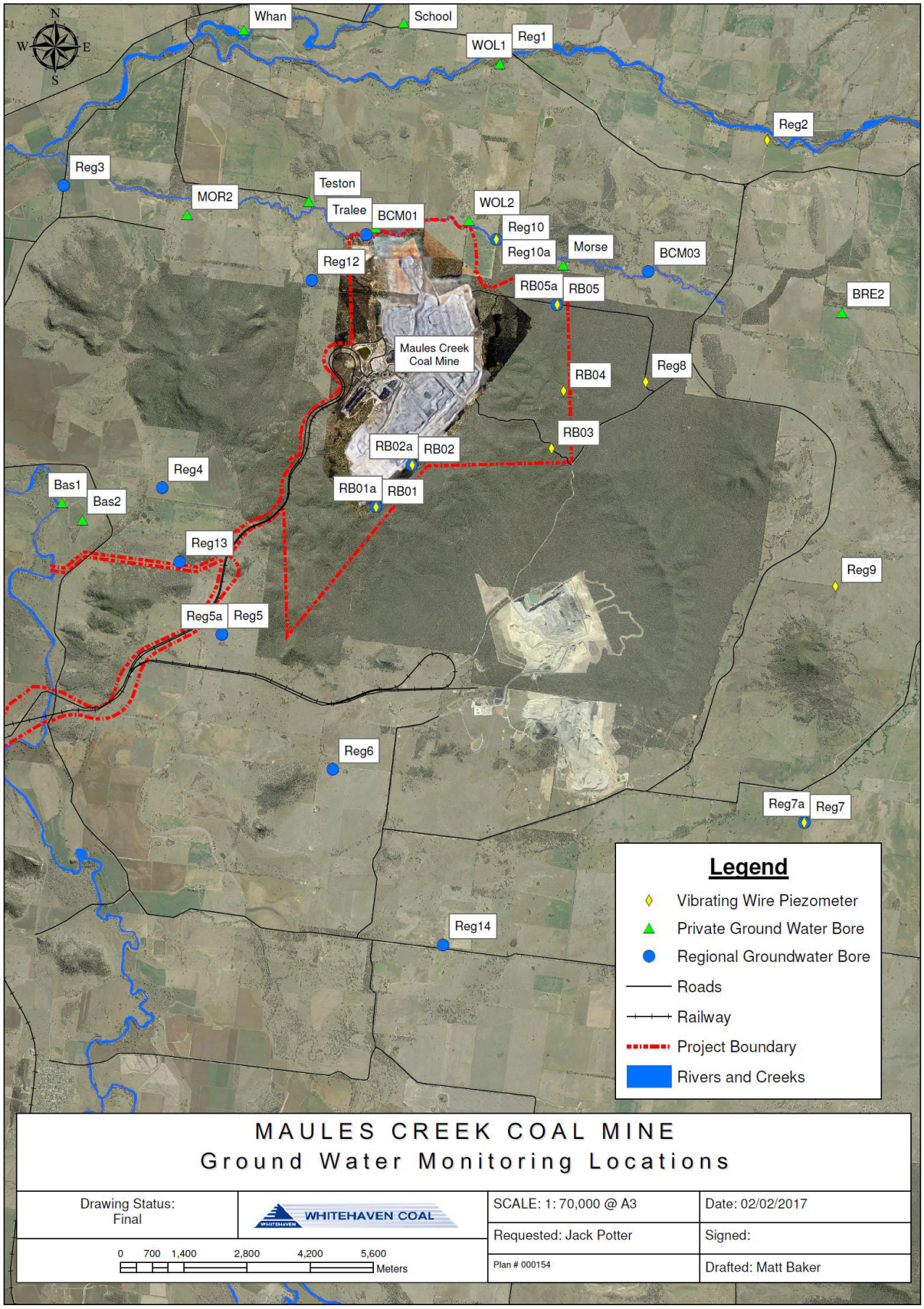


Figure 9 Groundwater Monitoring Locations

Groundwater Inflows

The Groundwater Impact Assessment (AGE, 2011) estimated the rate of groundwater seepage to the open cut pits in the mining complex using a numerical model. AGE (2014) updated the groundwater model and seepage estimates as summarised in the WMP.

As mining progresses, groundwater inflows are predicted to vary with the changing mine layout, depending on the interception of porous rock water sources. The predicted groundwater inflows into the open cut for year 5 were 0.2 ML/day. Groundwater inflows into the active pit have been negligible during 2016 and well below the modelled volume for year 5 of the operation. It is likely that the minor groundwater seepages that have occurred to date have been subject to evaporation prior to accumulation and pooling in-pit.

7.3.1 Proposed Improvement Measures

The groundwater monitoring program and management measures described above will continue to be implemented during the next reporting period. Additional BTM complex wide groundwater modelling will also be finalised to ensure calibration and review of modelled predictions.

7.4 SITE WATER BALANCE

The site water balance for the reporting period is presented below in **Table 10.**

A review of the water balance found that inflows to the site during the reporting period were generally in accordance with the predictions made in the EA for Year 5 of MCCM operations. Pumping from the Namoi River to site was within the allocated water licence entitlement and slightly below the water year period of 2014/15 (see **Table 9**). An upgrade was completed to pumping infrastructure including pump and pipeline capacity to facilitate improved efficiency and rate of extraction from the Namoi River when water is ordered and released by WaterNSW into the system. Captured rainfall and runoff volumes were slightly less than predicted in the EA and WMP in Year 5, while the seepage of groundwater into the pit was negligible during the reporting period and lower than predicted.

Water usage during the reporting period was generally similar to the volumes predicted in the EA for the Year 5 scenario, with the exception of the requirements for dust suppression. These volumes were higher than predicted in the EA and Water Management Plan in order to minimise potential dust emissions from haul roads and other exposed areas during the reporting period.

Table 10 Site Water Balance (CY 2016)

Aspect	Volume (ML)
Change in Storage	
Start of 2016	493
End of 2016[2]	1070
Net Change in Storage	
Water Inflows	
Namoi River Pumping	947*
Rainfall & runoff	1860
CHPP Water Recycling	761
In-pit Groundwater Seepage	<10ML
Total Inflows	
Water Outflows	
CHPP water use	1383
Dust suppression	1166
Evaporation from storages	361
Clearing / construction process water	79
Miscellaneous (washdown bay, etc)	<5
Total Outflows	**2989**
Water Balance (2016)	**577**

* Volume for calendar year

[2] / Includes recorded volumes in RWD2 and MWD1&2, as well as estimated volumes in sediment dams and pits.

8 REHABILITATION

The Rehabilitation Strategy for the MCCM is described in Section 7.16 of the EA. The State and Commonwealth approvals both specify that the rehabilitation of the MCCM must be consistent with the Rehabilitation Strategy (i.e. Condition 71 of Schedule 3 of PA 10_0138 and Condition 26 of EPBC 2010/5566). The MOP summarises the key elements of the Rehabilitation Strategy as well as providing a description of activities and mine landforms.

8.1 REHABILITATION PERFORMANCE DURING THE REPORTING PERIOD

8.1.1 Status of Mining and Rehabilitation

At the completion of the reporting period, all domains were classed as 'active' with only minor rehabilitation activities completed in association with stabilisation following the completion of particular construction activities. **Figure 10** below from the approved MOP represents the mining domains at the completion of the reporting period.

8.1.2 Post Rehabilitation Land Uses

The proposed post mining land use for MCCM will be consistent with the description contained in the EA and as per the requirements of the State and Commonwealth approvals. The area will be returned to a mixture of native vegetation communities including grassy woodland, shrubby woodland/open forest and riparian forest natural forest and woodland. Condition 71 of Schedule 3 of PA 10_0138 lists the overall rehabilitation objectives for the MCCM. These are outlined below in **Table 11** and also included in the MOP.

Table 11 Rehabilitation Objectives

Feature	Objective
Mine site	• Safe, stable and non-polluting • Constructed landforms drain to the natural environment
Final void	• Minimise the size and depth of the final void as far as is reasonable and feasible • Minimise the drainage catchment of the final void as far as is reasonable and feasible
Surface Infrastructure	• To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise
All land, other than the final void	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: o local native plant species; and o a landform consistent with the surrounding environment, in accordance with the Revised Biodiversity Offset Strategy and the BMP (I.e. Conditions 45 and 53 of Schedule 3 of PA 10_0138 respectively).
Community	• Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure

Rehabilitation Performance Indicators**Table 12** summarises the rehabilitation status for the MCCM. Short term (or temporary) rehabilitation, ongoing from the construction phase has included stabilisation of railway batters, road embankments, water management infrastructure and temporary stockpiles. These activities have been undertaken in accordance with the short term objectives defined in the MOP.

Table 12 Rehabilitation Status

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period 2016 (Actual)	Next Reporting Period 2017 (Forecast)
A. Total mine footprint	910	1,274	1,517
B. Total active disturbance	910	1,274	1,517
C. Land being prepared for rehabilitation	0	0	0
D. Land under active rehabilitation	0	0	0
E. Completed rehabilitation	0	0	0

8.1.3 Decommissioning and Demolition Activities

As anticipated in the MOP, no decommissioning activities were undertaken during the reporting period.

8.1.4 Other Rehabilitation Activities

Rehabilitation activities associated with the exploration activities have been undertaken during the reporting period. Where possible, exploration holes were located on previously disturbed land in order to minimise disturbance.

8.1.5 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off has not been requested.

8.1.6 Variations in Activities against MOP/RMP

A MOP amendment was approved during the period, modifications included:

- development of an overburden dump with an approximate capacity of 10.3Mbcm of material;
- changes to improve the efficiency of overburden haulage by reducing haulage distances; and
- increasing total dump space rehabilitated at end of 2019 from approximately 194ha to 201ha.

There were no other variations in activities undertaken at the MCCM to those proposed in the MOP. Representatives from DRE visited MCCM during the reporting period.

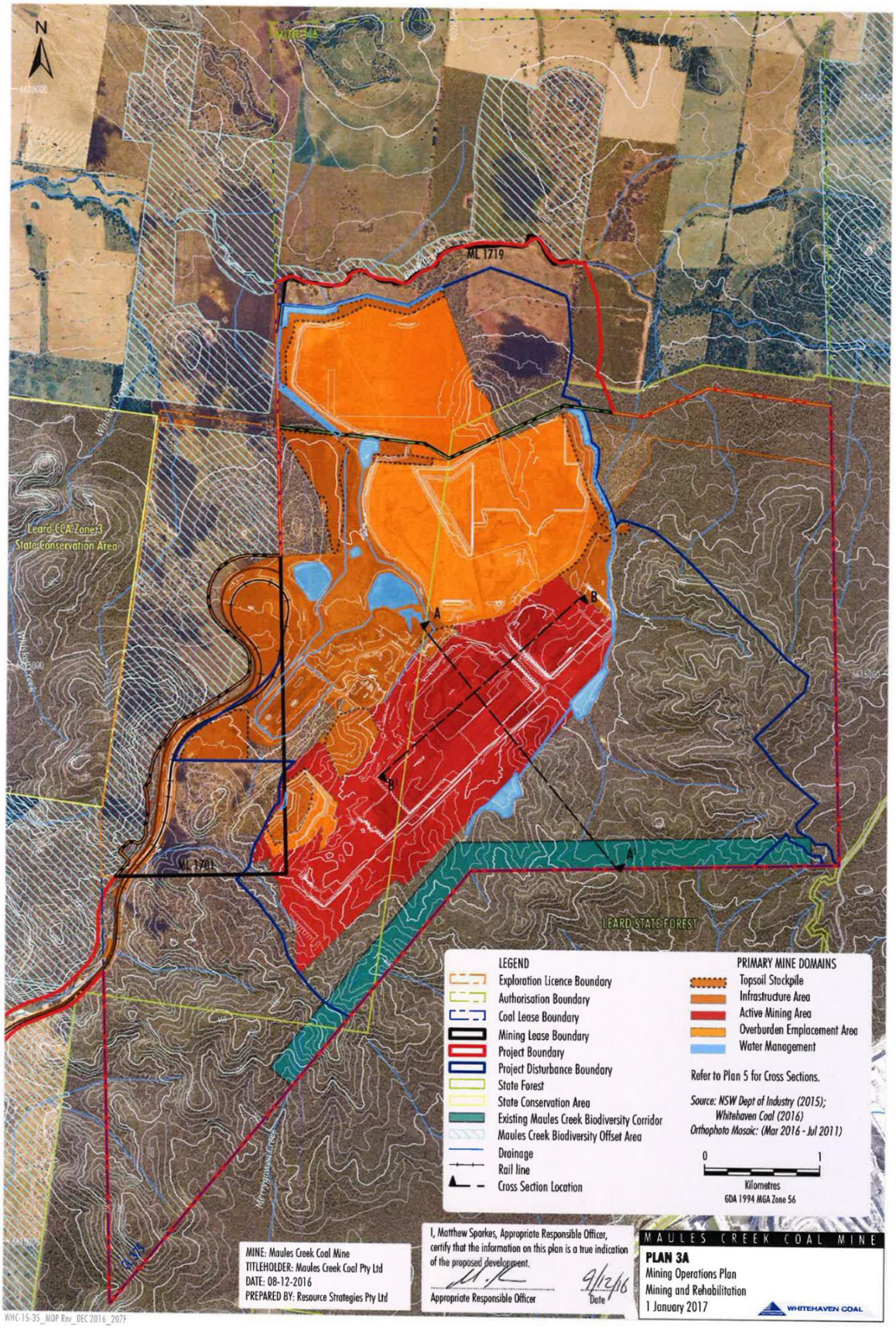


Figure 10 Mining Domains at Completion of the Reporting Period (2016)

8.1.7 Monitoring

There was no progressive rehabilitation undertaken, and accordingly, there are no monitoring results to report for the 2016 period. Visual inspections of short term (or temporary) rehabilitation are undertaken to assess surface stabilisation around infrastructure areas and topsoil stockpiles.

8.1.8 Topsoil Balance

In line with Condition 39 of Schedule 3 of PA 10_0138, and Conditions 26(b), 27(c) and 27(d) of EPBC 2010/5566, the management of topsoil at the MCCM is undertaken in accordance with the Soil Management Protocol.

Detailed soil surveys have been undertaken within the disturbance footprint, prior to the stripping of topsoil. An independent consultant completed surveys assessing suitability of topsoil and subsoils for use on mine rehabilitation and the preparation of stripping plans for each of the topsoil areas. Topsoil volumes stored to date are summarised in **Table 13**. These include a forecast estimate for the ensuing period. MCCM will continue to monitor topsoil volumes to ensure appropriate volumes are recovered for later use on rehabilitation areas. A number of topsoil stockpiles may also require relocation during the following reporting period to enable to progression of mining operations.

Table 13 Topsoil Balance

Area	2014 Soil Balance (m^3)	2015 Soil Balance (m^3)	2016 Soil Balance (m^3)	2017 Soil Balance (m^3)	Total Soil Balance (m^3)
MIA / Construction	539,166	145,990	0	-	-
Mining Operations	252,490	349,928	852,524	-	-
Still to clear / strip	-	-		555,000	-
Totals	**791,656**	**495,918**	**852,524**	**555,000**	**2,695,098**
EA Total for rehab	-	-	-	-	2,368,000
Net difference	-	-	-	-	327,098

8.1.9 Trials, Research Projects and Initiatives

In accordance with Condition 15 of the MCCM EPBC Approval, MCC has committed to provide $1 million for research that will aim to identify effective methodologies for achieving restoration of Box-Gum Woodland CEEC on mine rehabilitation. A Box-Gum Woodland Research Project Plan has been prepared to satisfy the requirements of this condition, this plan outlines five research projects on the restoration of Box-Gum Woodland that will be progressively undertaken throughout the early stages of operations at MCCM. The findings of these research projects will be used to inform MCC on potential improvements to rehabilitation practices to increase the effectiveness Box-Gum Woodland restoration. Part one of the research plan was completed during 2016 and provides a structured review of the rehabilitation of Grassy Box Woodland. Part two of the Research Project Plan is expected to be completed during the FY17/18 period. This project will involve research into the impact of stockpiling on the seed bank viability, physical and biological characteristics of soil.

8.1.10 Key Issues to Achieving Successful Rehabilitation

The key issues to achieving successful rehabilitation at MCCM include:

- excessive erosion and sedimentation (e.g. gullying and sedimentation resulting in land stability and vegetation growth issues);
- weed and feral animal infestation;

- poor vegetation establishment and growth (including the Box-Gum Woodland EEC/CEEC); and
- landform instability.

In cases where rehabilitation performance is sub-optimal, additional management measures will be implemented (e.g. replanting, repairing landform and water management features, application of mulch/fertilisers, feral animal and weed control etc.). A TARP for rehabilitation at the MCCM has been included in the MOP, which outlines appropriate actions and varied responses that will be implemented as required.

8.1.11 Actions for the next reporting period

The rehabilitation actions and detailed justification for the next reporting period are detailed in the approved MOP which covers the 2017 calendar year.

8.1.12 Proposed Research and Rehabilitation for 2017

MCCM is currently in an early operational stage, as such final elevation landforms are not yet available for rehabilitation. Rehabilitation activities will not be undertaken during the 2017 reporting period, with the exception of exploration site rehabilitation and short term (or temporary) rehabilitation, as required. As outlined in **Section 8.1.10** part two of the Box-Gum Woodland Research Project Plan is expected to be completed during the FY2017 / 18 period.

9 COMMUNITY

Social impacts and opportunities associated with the MCCM are managed in accordance with the Social Impact Management Plan (SIMP), Schedule 3 Condition 78 and the Statement of Commitments (SoC) Appendix 5 of PA 10_0138.

9.1 COMMUNITY ENGAGEMENT ACTIVITIES

MCC uses a variety of community engagement and consultation methods including the MCCM Community Consultative Committee (CCC), Whitehaven website, MCCM phone hotline, local media updates, MCCM Open Days, local school visits, sponsorship of local community events and groups, meetings as required with neighbours and a range of stakeholders including government and non-government agencies.

MCCM operates a Community Consultative Committee, with meetings held quarterly during the reporting period, in addition an annual joint meeting between Maules Creek Coal, Boggabri Coal and Tarrawonga Coal Mines CCC's was held during May 2016. Minutes of these meetings are posted on the Whitehaven website.

MCCM are also involved and attend various community events and information forums as part of engaging with the local community including; Business Chamber forums, Progress Association meetings, Council meetings, industry forums, local school functions, community gatherings and charity club functions including Lions and Rotary.

9.2 COMMUNITY CONTRIBUTIONS & INITIATIVES

As well as attending functions, WHC and MCCM also contribute to the community by providing financial support and sponsorship to various community events and initiatives throughout the community, these include:

- Academy Publishing - Children Safety Homework Books
- Australian - Korea Business Council
- Boggabri Sacred Heart PTF Association - Boggabri Community Calendar
- Boggabri Business & Community Association - 2016 Small Business & Community Awards
- Boggabri Community Church - 2016 Carols in the Park
- Boggabri Fishing Club
- Camp Quality - Camp Quality 1000K's for Kids
- Children's Charity Network - Young Indigenous Art & Literacy Program
- Gunnedah and Quirindi Shows
- Gunnedah Volunteer Support Group
- Gunnedah Mine Suppliers Group
- Kamilaroi Aging & Disability – Elders Olympics
- Killarney Bike Classic 2016 - Narrabri Hospital Palliative Care
- Lions Club of Boggabri
- Maules Creek Campdraft Club
- NSW Minerals Council - Sponsorship HSEC Awards Dinner
- Narrabri Local Aboriginal Land Council - Dinner Dance
- NSW Mining Forum – Sponsorship
- Narrabri Lioness Club - Garden & Craft Expo
- Narrabri Education Fund - Tertiary Scholarship

- Narrabri & District Chamber of Commerce - 2016 Business Awards
- Narrabri High School - 2016 Presentation Night
- Paul Vowels - Kids for Charity Ride
- Rotary Club of Boggabri
- Rotary Clubs of Gunnedah
- Wean Picnic Race Club
- Westpac Rescue Helicopter Service
- Winanga-Li Aboriginal Child & Family Centre - Bus Sponsorship

The MCCM Social Impact Management Plan (SIMP) outlines a number of objectives to monitor the effect of the MCCM within the local community relating to housing, employment, training, economic development, community infrastructure and traffic. The following reports on the activities, monitoring and results with regards to the objectives outlined in the SIMP.

Housing

To reduce the pressure on the local short term housing market during this phase of operations third party accommodation was supplied to contractors at the Civeo Accommodation Villages in predominantly Boggabri with some to Narrabri. At the WHC/MCCM peak occupation rate at the Boggabri village which occurred during May 2016 there was still 75 % available rooms, showing that suitable accommodation remained available at the peak time during the reporting period.

In addition, with the ramp up of mining employment this third party accommodation is also available to mine operations employees at a subsidised rate, to assist in reducing peak rental/leasing concerns in the local area. The fee for use, increases every three months in order to encourage employees to move to the area permanently. Whitehaven has a strong focus on employing local people at its operations, and this subsidised approach has been positively received as a short term housing solution by new employees to the mine as they investigate and look to relocate to the local area. WHC will continue to monitor in conjunction with local councils the ongoing housing and accommodation market to ensure impacts are managed.

Employment and Training

As at the end of the reporting period, MCCM workforce, including supplementary labour hire, was 474 with over 75% residing in the local area, which is on par with the previous reporting period. The remaining workforce (including management and professional staff) have permanent residence listed as being outside the Narrabri and Gunnedah LGAs. The associated transport solution of both residential and non –residential workforce is satisfied by the ongoing shuttle bus service that is provided by MCCM for both operational employees as well as staff/management where this is practicable.

Whitehaven's *Workforce Diversity Policy* has supported strong representation of women, Indigenous and young people. Of the 474 MCCM workforce at the end of the period:

- 59 employees (approximately 13%) are Indigenous, with the percentage slightly down from 16% on the previous reporting period;
- 43 employees (approximately 9%) are women, with the percentage down from 14% for the previous reporting period; and

- 53 employees (approximately 9%) are new to mining, a decrease from the previous reporting period of 19%.

Whitehaven and MCCM provide training opportunities for apprenticeships and traineeships in order to support local employment and increase local skills levels. During the reporting period 4 young locals accepted positions as two Apprentice Electricians and two as Apprentice Plant Mechanics as part of the WHC MCCM apprenticeship program at the start of 2017. Taking total number of apprenticeships accepted under the program to 29, since 2011. In addition, two apprentices successfully completed their training and received trade qualifications during the period and one have successfully gained employment as tradesmen with MCCM.

Whitehaven also provides opportunities for scholarships for tertiary studies. During the period MCCM also provided vacation employment to two students in fields of mining engineering and drill and blast.

Provision of employment figures and amount of local spend by WHC is also available and provided to councils as requested to assist the councils in their forward planning, these figures are also included in financial reports released by WHC.

Economic Development

Whitehaven, which includes MCCM contributes financially to the economy at both state and federal level and to the communities in which we operate. Employees and contractors also add a significant economic contribution to the Gunnedah, Narrabri, Boggabri and Werris Creek townships through their purchases from local businesses.

In 2016 Whitehaven spent:

- $148.6m in salaries, wages, taxes and superannuation to employees (on an equity joint venture basis)
- $107.7m in royalties to the New South Wales Government (on an equity joint venture basis)
- Over $513.7m on mining, washing and delivering coal onto trains at our mine sites
- Over $324.5m in port and rail charges for track access haulage costs and port costs
- More than $348,000 towards local education activities and community groups.

Community Infrastructure

During the reporting period MCCM paid a lump sum cash contributions to Narrabri Shire Council (NSC) of $3,200,000 under its VPA to go towards infrastructure projects and upgrades within the Narrabri, Boggabri and Maules Creek communities. In addition, as a result of coal sales directly from the MCCM, approximately $605,196.08 has been paid to NSC during 2016 to be spent on further infrastructure projects.

During the 2016 period WHC spent approximately $200 million with 600 local businesses and suppliers in the Narrabri, Gunnedah, Tamworth and Liverpool Plains Shires. Local jobs and local spend with local businesses will remain a focus in future years.

9.3 COMMUNITY COMPLAINTS

MCC maintains a dedicated Community Hotline (1800 MAULES) for the MCCM which has been upgraded in this period to be answered by an operator. The Community Hotline is advertised on the website, in the local press and was also distributed during 2016 in a letter to local residents advising of contact details.

A summary of the complaints (by category) received by MCCM over the last two reporting years are detailed in **Table 14**. The Community Complaints Register is also available on the Whitehaven Coal website.

Table 14 Summary of Community Complaints and Enquiries

Category	2015	2016
Air Quality	42	37
Traffic	0	2
Surface Water	0	0
Visual Amenity	0	0
Noise	33	35
Blast	4	9
Other	0	4
TOTAL	**79**	**87**

Note: a single complaint may involve multiple categories.

9.3.1 Complaint Trends

The total number of complaints received in 2016 is higher than those recorded in the 2015 reporting period. The increase in complaints is primarily related to noise and blasting related concerns. The majority of complaints were received via submission of complaints to regulatory agencies.

9.3.2 Actions & Proposed Improvements

Community complaints primarily related to noise and air quality concerns. Actions taken in response to complaints included a range of measures, including however not limited to, the following:

- Investigations into specific mining activities;
- Reviewing video footage or visual media where available;
- Reviewing real time data monitoring and operational activities;
- Reviewing daily risk reports to determine appropriate TARP levels dependent on specific mining activities and weather patterns to support operational management;
- Analysis of meteorological data and physical inspections of offsite locations;
- Communicating learnings and issues to operational personnel;
- Community consultation; and
- Ongoing engagement with regulatory agencies and local community members.

10 INDEPENDENT AUDITS

10.1 MANDATORY ENVIRONMENTAL NOISE AUDIT

The Mandatory Environmental Noise Audit (MEA) was required under Condition E3 of the Environmental Protection Licence No. 20221, as per the licence variation of 25 February 2016. MCC commissioned EMM Consulting Pty Limited (EMM), who were approved by the EPA as the independent auditor, to complete a noise management audit at MCCM. The MEA was submitted to EPA during 2016 and is anticipated for approval during the first half of the 2017 reporting period.

10.2 EPA & DPE DUST BENCHMARKING STUDY

Katestone Environmental Pty Ltd (Katestone) was commissioned by the EPA and DPE to complete a Best Practice Benchmarking Study of dust controls applied at MCCM. The final study report is anticipated to be completed by Katestone during the next reporting period.

10.3 LEARD STATE FOREST CLEARING AUDIT

During the 2016 vegetation clearing period, the DPE and DRE conducted an audit into the clearing activities of MCCM and other mines within the area. It was found that MCCM was generally operating at a high level of compliance with the BMP with one non-compliance identified, please refer to section 11.1. A fact sheet is publically available on the DPE website.

10.4 INDEPENDENT ENVIRONMENTAL AUDIT

The Independent Environmental Audit (IEA) was undertaken in 2015, details on the progress made in implementing the audit action plan are provided in **Table 15** below.

Table 15 IEA Action Plan Progress

IEA Recommendations	MCCM Response to Recommendations in IEA	Annual Review Progress Status
The air quality management system includes observations, daily weather reports and forecasts, and ongoing analysis of trends in monitoring. The site should develop a predictive and real time air dispersion model to inform operational decisions around air quality or revise the AQGHGMP to reflect the sites management of air quality without a predictive real time air dispersion model.	The predictive and real time dispersion model will be implemented as part of the BTM Air Quality Management Strategy (AQMS). MCCM will raise the importance of progressing and finalising the AQMS as soon as possible for approval by the DPE with the other mines in the BTM complex.	BTM AQMS resubmitted to DPE 2016
Review the requirements relating to the quinine bush and ensure the site is able to demonstrate compliance with the requirements of the project approval and the AACHMP.	Mapping of the extant Quinine Bushes within the mining footprint will continue to be undertaken.	Completed and ongoing during pre-clearance vegetation surveys.
	A programme of plant and seed collection & propagation will be undertaken in accordance with the AACHMP.	Ongoing. Following collection of available seeds during pre-clearance surveys.

IEA Recommendations	MCCM Response to Recommendations in IEA	Annual Review Progress Status
MCCM should review the GIS attribution of vegetation type names, CEEC status and Project Boundary polygons in the MOP and Mine Site Rehabilitation Plan against those detailed in the EA. This recommendation relates to future revisions of the BMP, Biodiversity Corridor Management Plan and Mine Site Rehabilitation Plan that are required to integrate the actions outlined in the Maules Creek White-Box Yellow-Box Blakely's Red Gum Woodland EEC Implementation Plan and the Maules Creek Threatened Fauna Implementation Plan.	MCCM will review figures to ensure accurate legends accompany each figure and area of vegetation mapped.	Complete
The noise consultant must inform the mine of exceedances in a more timely fashion to allow MCCM to fulfil its reporting requirements.	MCCM has notified the independent noise specialist conducting the attended noise monitoring of the time sensitivities for reporting noise exceedances.	Complete
The EPL summary on the website lists "Measured Levels". It is recommended that future EPL summaries should include "Reportable levels", which are the measured levels plus any applicable modifying factor penalties.	MCCM will revise the EPL monthly summary report to include results that include any modifying factors when applicable.	Complete
The lights above the ROM stockpile and hopper are elevated and the light spill is over a wide area. The light spill should be checked from the nearest residence to the north where this light may be visible at night. If necessary (i.e. light is spilling off site with the potential to impact residents), reorientation of the shields may be required.	Fixed lighting was designed and procured with reference to Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting. MCCM will inspect the light spill and make adjustment if required.	Complete
Follow up the two landowners whose properties MCCM acquired and ask if they will assist in providing the oral history required in the Historic Heritage Management Plan and Project Approval.	MCCM will contact the owners of land acquired by the Project in writing and ask whether they wish to contribute to an oral history report to be complied.	Complete
Commence a seed collection program as detailed in the Biodiversity Management Plan.	Seed collection will occur as outlined in the BMP.	Complete
The MOP Remediation Management Plan requires a significant amount of additional information resulting from the recent development of the White-Box Yellow-Box Blakely's Red-Gum Woodland EEC Implementation Plan and the Threatened Fauna Implementation Plan. Early commencement of rehabilitation trials would help inform the MOP.	The MOP will be updated to include information from the Investigation and Implementation Plans now these plans have been approved.	Complete
The Water Balance requires review.	Water Balance will be reviewed as part of the next revision of the Water Management Plan.	Complete. WMP submitted.

IEA Recommendations	MCCM Response to Recommendations in IEA	Annual Review Progress Status
Review the validity of surface water quality trigger levels in the TARP as the level of data available becomes more extensive.	Surface water quality trigger levels in the TARP will be reviewed as part of the next revision of the Water Management Plan.	Complete
Establish clean water diversions prior to clearing and isolate clean catchment waters from entering the pit.	Clean water diversion drains are being establishing, additional clean water diversions will be installed as clearing/mining progresses.	Ongoing
The use of a single system to record and respond to environmental incidents and complaints should be implemented.	MCCM will implement a system to track and respond to incidents and complaints.	Complete
Ensure impacted residents are informed when monitoring indicates exceedence of environmental parameters at their residence.	Impacted residents to be notified as soon as possible.	Ongoing
Some of the management plans do not include enough of the background data that was used to formulate them. Future revisions should consider ways to present this information to inform the measures described.	Future revisions of management plans will consider the level of background data or reference documents where appropriate.	Ongoing
The management plans all include requirements for review and it is apparent that these occur. The site however needs to document these reviews in order to demonstrate they have occurred particularly when no changes to the management plan eventuate from the review.	MCCM has revised the Document Register to include a record of the revisions undertaken.	Complete
The BTM Complex Strategies constitute an important part of the cumulative management of the impacts from mining in the area. If they remain unapproved, MCCM should consider whether cumulative impacts are adequately addressed and mitigated through a review of the pertinent MCCM management plans.	The BTM Complex strategies are currently being prepared, consulted and reviewed. MCCM will raise the importance of progressing and finalising the Strategies as soon as possible for approval by the DPE and with the other mines in the BTM complex. MCCM will also continue to monitor and consider any potential cumulative impacts to determine whether further revisions of the MCCM Management Plans are required.	Ongoing. Air & noise strategies imminent. Blast approved, and biodiversity and aboriginal cultural heritage strategies pending approval. Water strategy under review.
Review all management plans (particularly the SIMP) for the reporting requirements and add in to the AEMR any requirements that are currently not reported.	2015 AEMR will include the relevant reporting requirements.	Complete

IEA Recommendations	MCCM Response to Recommendations in IEA	Annual Review Progress Status
There are a number of items that have been found to be not compliant in this audit. Many MCCM was aware of prior to the audit and MCCM are addressing or have rectified these issues, the audit will serve the purpose of raising the rest. Future focus is recommended on the following points: • Committing to achievable management options that are timely; • Being prepared for the next phase of site development – particularly the commencement of rehabilitation of the out of pit emplacement; and • Maintaining the relationship with the neighbouring community.	MCCM will continue to focus on achieving future commitments, preparing for the rehabilitation phase of the project and maintaining a good working relationship with the neighbouring community.	Ongoing

The next IEA is required under Schedule 5, Condition 10 of the PA 10_0138 to be submitted to the DPE by the end of September 2018.

11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 NON-COMPLIANCES

The compliance status of the MCCM against relevant approvals during the reporting period was assessed in **Section 1** as of the end of the reporting period (31 December 2016). Further details of any actions undertaken or proposed for non-compliances, including within the following reporting period, are summarised in **Table 15.**

Table 16 Non-Compliance Details and Proposed Action Plan

Non - Compliance	Date / Location	Cause	Action Plan	Estimated Completion Date
Erosion control measures identified during an inspection by DPE required rectification.	February	Maintenance.	MCC rectified the sediment control fencing, constructed an interim sediment dam, rock check-points and drainage contours.	Completed February and March clearing period.
Blast generated an overpressure result at unit BM1 that exceeded blast criteria in Table 7 of PA10_0138.	July	Overpressure	Investigation completed and response provided to regulatory agency.	Completed August
Attended noise monitoring recorded results above the noise criteria specified in Table 5, condition 7 of PA10_0138.	2016	Addition of NSW INP low frequency modification factor.	Refer 6.4.1	Ongoing
100% of blast monitoring results were not captured at BM1 and BM2.	2016	Mechanical faults	Replacement of monitoring unit hardware completed and mobile unit available for contingency	Completed

* Note: Previously reported IEA response to recommendation actions are available on the MCCM website

11.2 REPORTABLE INCIDENTS OR EXCEEDANCES

MCCM reported exceedances related to attended noise monitoring results in March and May that were low level resulting from the addition of a modifying factor required under the NSW INP, refer to section 6.4.2 and an exceedance of the blast overpressure criteria, refer to section 6.5.2.

11.3 REGULATORY ACTIONS

The following official cautions or warning letters, penalty notices or prosecution proceedings were issued to MCC during the reporting period.

- An advisory letter and show cause letters regarding 2015 Sound Power Levels of mobile and fixed plant equipment at MCCM was received from the DPE during May 2016. MCC provided a written response and action plan.

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Activities to be completed in the next reporting period to improve the environmental or community performance of the MCCM, in addition to those separately identified in **Section 11** include:

- Review and revision of various Environmental Management Plans;
- Seeking approval to relevant approval modifications or amendments;
- Implementation of approved Leard Forest Precinct Strategies;
- Consideration and implementation of agreed actions from audits and reviews including the MEA and Katestone Dust Benchmarking study;
- Continued engagement by a newly appointed External Relations Superintendent; and
- A stakeholder information day and identification of community support activities.

APPENDIX A

BLAST MONITORING RECORDS

Appendix A
Blast Monitoring Records

The records presented in Table A-1 have been included to satisfy the blast reporting requirements of Schedule 3 Condition 19 and 20 of PA 10_0138.

Table A-1
Blast Monitoring Records

Date	Time	ID/Location	BM1 mm/s	BM1 dBL	BM2 mm/s	BM2 dBL	BM3 mm/s	BM3 dBL	BM4 mm/s	BM4 dBL
Exceedance Criteria (0% (5%))			10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)
8/01/2016	1259	ONV16, 17, 18 (18PS)	0.208	89.3	0.111	98.1	0.182	95.6	0.156	95.1
13/01/2016	1312	BRA28	0.276	96.9	0.165	92.7	0.32	96.7	0.351	89
15/01/2016	1256	TES40	0.244	109.6	0.187	109.8	0.286	109.5	0.389	118.5
20/01/2016	1304	BRA29	0.395	94.4	0.214	99.9	0.233	104.7	0.427	97
21/01/2016	1250	BRA35, WHR01	0.142	103.6	0.142	103	0.352	106.3	0.391	103.6
22/01/2016	1257	BRA26A	0.069	105.7	0.043	100.4	0.098	110.3	0.76	97.0
25/01/2016	1257	BRA26B	0.055	105.7	0.034	91.4	0.069	100.2	0.118	89
1/02/2016	1255	ONV19	0.149	98.8	0.066	105	0.14	109	0.133	98.1
4/02/2016	1255	BRL08	0.096	102.2	0.078	105.9	0.134	107	0.111	110.1
5/02/2016	1250	BRA33 PS10	0.264	106.4	0.183	106.2	0.266	107	0.282	108.4
10/02/2016	1258	BRA21	0.209	100.4	0.138	103.8	0.324	109.5	0.388	107.1
12/02/2016	1250	BRA31, 34, PS10	0.943	105.9	0.277	101.4	0.426	107	0.257	98.6
19/02/2016	1250	BRA30	0.276	103.6	*	*	0.24	105.5	0.233	90.4
25/02/2016	1305	TNN16	0.205	90.9	0.157	91.4	0.196	98.7	0.416	98.6
26/02/2016	1255	BRA36, PS11	1.203	111.7	0.644	105.4	1.357	109.5	1.094	98.1
4/03/2016	1252	BRA22 & TNN17	0.22	99.9	0.159	99.3	1.02	101.6	0.457	103.6
7/03/2016	1258	TSL41	0.08	108.6	0.056	101.4	0.877	101.6	0.051	97
11/03/2016	1259	TNN18	0.159	93.4	0.142	93.9	0.949	94.2	0.372	95.1
14/03/2016	1250	BRA32	0.164	95.3	0.192	97.4	0.964	96.7	0.273	96.4
17/03/2016	1253	TNN19, BRL09	0.186	104.2	0.105	105.1	0.958	105.5	0.177	107.4
22/03/2016	1258	TES45, 05BRA01b	0.143	96.9	0.16	98.1	1.034	102.7	0.263	104.8
24/03/2016	1250	BRL09a	0.125	96.9	0.115	97.4	0.887	94.2	0.185	89
5/04/2016	12:56	TNN21	0.197	92.2	0.295	91.4	0.981	94.2	0.533	93.5
11/04/2016	13:08	TES43	0.23	100.4	0.183	100.9	0.961	103.7	0.413	100.3
13/04/2016	12:59	BRL10	0.133	102.5	0.104	103.8	0.9	105.9	0.187	99.5
18/04/2016	12:56	BRL10a	0.111	107.1	0.092	106.7	0.956	104.7	0.142	99.5
21/04/2016	13:18	TES44	0.224	99.4	0.206	101.8	1.108	100.9	0.752	95.7
22/04/2016	12:57	ONV21	0.079	98.2	*	*	0.881	96.7	0.99	91.5
26/04/2016	13:01	BRL10b	0.111	94.4	0.088	103.4	0.87	97.7	0.199	108.4
2/05/2016	12:58	TES46	0.246	103.9	0.193	105.9	1.009	102.7	0.541	106.1
5/05/2016	12:54	BRL11	0.189	96.1	0.052	81.8	0.911	95.5	0.233	89
10/05/2016	12:53	TNN22	0.044	108	0.051	97.4	0.843	98.6	0.034	95.7
12/05/2016	12:52	TES45a	0.185	96.9	0.181	95.8	0.956	97.7	0.41	97

Date	Time	ID/Location	BM1 mm/s	BM1 dBL	BM2 mm/s	BM2 dBL	BM3 mm/s	BM3 dBL	BM4 mm/s	BM4 dBL
Exceedance Criteria (0% (5%))			10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)
16/05/2016	12:51	TNN23 BRL13	0.101	97.6	0.086	99.3	0.883	99.5	0.09	97
18/05/2016	12:58	TES47	0.075	102.2	0.069	100.4	0.857	100.2	0.093	94.3
19/05/2016	12:59	BRL12	0.147	104.6	0.109	100.9	0.899	100.9	0.137	90.4
20/05/2016	12:56	BL1635 Bra37	0.112	108	0.137	104.1	0.946	103.7	0.461	100.7
25/05/2016	13:03	BL1636 Bra37 TES45b Bra38	0.176	97.6	0.169	100.9	0.958	106.9	0.393	104.1
2/06/2016	13:00	Bra41-TNN24	0.172	103.3	0.13	103.4	0.935	108.2	0.264	105.5
8/06/2016	12:57	ONV20	0.115	98.2	0.08	99.9	0.855	98.6	0.142	94.3
10/06/2016	12:52	TES49	0.274	94.4	0.179	93.9	0.941	96.7	0.514	91.5
17/06/2016	12:55	BRL	0.174	96.1	0.154	95.8	0.9	99.5	0.224	99.5
22/06/2016	12:49	RL360_01	0.113	95.3	0.089	98.1	0.845	105.9	0.174	94.3
4/07/2016	1258	ONV22	0.101	94.4	0.108	85.4	0.846	95.5	0.213	93.5
6/07/2016	1307	BRL15	0.173	100.9	0.208	102.9	0.206	98.7	0.233	102.7
7/07/2016	12:57	BRA39	0.119	94.4	0.16	92.9	0.203	92.7	*	*
8/07/2016	1250	RL373_01	0.185	128.4	0.217	117.9	0.37	108.7	0.646	105.9
12/07/2016	1250	BRA40	0.168	89.3	0.215	103.4	0.188	98.7	0.513	99.3
13/07/2016	1259	RL355_06	*	*	0.045	96.4	0.049	97.9	0.089	91.8
14/07/2016	1256	BRL_16	0.115	89.3	0.12	91.3	0.112	94	0.129	90.5
18/07/2016	1258	RL373_02	0.046	90.8	0.047	92.9	0.045	96.2	0.099	101.8
26/07/2016	1258	HRN_01	0.176	102.9	0.104	102.9	0.127	101.2	0.223	95.8
29/07/2016	12:56	TNN27 & PS012	0.393	97.6	0.279	97.3	0.347	98.7	0.536	99.6
6/08/2016	10:45	TES50	0.244	107.9	0.102	103.8	0.148	105.7	0.155	108.6
8/08/2016	12:52	BRA42	0.271	102.9	0.211	102.4	0.218	102.7	0.441	93
11/08/2016	12:47	ONV23	0.153	103.9	0.064	97.3	0.166	83.1	0.119	93
12/08/2016	12:59	BRA43	0.21	99.4	0.312	102.9	0.354	83.1	0.998	104.8
18/08/2016	12:58	PSP013	0.33	92.2	0.272	91.3	0.536	91.1	0.82	90.5
19/08/2016	12:57	TNN28	0.207	94.4	0.17	94.2	0.271	94	0.274	98.5
30/08/2016	13:00	TNN26	0.307	103.6	*	*	0.252	86.7	0.822	103.3
1/09/2016	12:56	RL355_07 & PSP014	0.279	100.4	0.095	99.6	0.248	83.1	0.359	104.2
9/09/2016	13:00	HRN03	0.106	96.1	0.093	98.2	0.214	83.1	0.213	104.2
10/09/2016	12:59	TNN25_BRL20	0.221	104.5	0.189	100.9	0.228	83.1	0.427	99
19/09/2016	12:52	BRA45	*	*	0.174	94.3	0.234	83.1	0.349	101
20/09/2016	12:58	RL373_03	*	*	0.102	95.4	0.201	77.1	0.244	99
23/09/2016	13:05	TES52_TES43	0.054	94.4	0.036	89.4	0.112	86.7	0.053	90.5
26/09/2016	13:06	HRN02	0.11	102.5	0.078	100.9	0.195	83.1	0.11	94
28/09/2016	12:46	BRA48	0.168	95.3	0.123	95.4	0.283	83.1	0.293	95
4/10/2016	12:36	TNN29_PS015	0.522	98.2	0.234	102.5	0.281	77.1	0.289	96.5
6/10/2016	12:49	BRA44	0.203	102.2	0.164	99.6	0.231	77.1	0.256	88.9
7/10/2016	12:53	PS018	0.312	95.3	0.381	94.3	0.596	77.1	1.114	95
12/10/2016	12:54	RL373_04	0.185	97.6	0.187	99.6	0.314	77.1	0.387	96.5

Date	Time	ID/Location	BM1 mm/s	BM1 dBL	BM2 mm/s	BM2 dBL	BM3 mm/s	BM3 dBL	BM4 mm/s	BM4 dBL
Exceedance Criteria (0% (5%))			**10 (5)**	**120 (115)**	**10 (5)**	**120 (115)**	**10 (5)**	**120 (115)**	**10 (5)**	**120 (115)**
14/10/2016	12:53	BRA50_TNN30	0.176	97.6	0.159	99	0.183	83.1	0.198	96.5
18/10/2016	12:48	TES51	0.136	94.4	0.096	91.3	0.152	77.1	0.104	91.9
19/10/2016	12:49	RL373_05 RL360_02	0.24	109.5	0.173	109.8	0.313	77.1	0.32	102.2
20/10/2016	12:57	BRA51	0.18	96.9	0.234	96.5	0.258	83.1	0.397	95
26/10/2016	12:59	BRA52	0.151	102.5	0.194	102	0.214	83.1	0.244	95.8
28/10/2016	12:55	HRN04_PS017	0.179	89.3	0.1	91.3	0.242	83.1	0.252	101
31/10/2016	12:52	RL373_06	0.07	98.2	0.051	103.4	0.134	83.1	0.089	103.9
1/11/2016	13:00	RL373_06b_BRA52b	0.127	92.2	0.118	94.3	0.18	77.1	0.237	95
2/11/2016	12:52	TES53A	0.234	97.6	0.255	99	0.234	83.1	0.376	95.8
4/11/2016	12:58	PS019_TNN29B	0.188	93.4	0.123	92.9	0.286	77.1	0.55	88.9
9/11/2016	12:57	TES54_BRL20B_PS022	0.308	96.1	0.226	92.9	0.245	83.1	0.363	103.6
15/11/2016	12:57	BRA53	0.182	97.6	0.167	94.3	0.199	98.3	0.255	95.8
17/11/2016	12:54	RL373_07	0.123	95.3	0.112	99	0.214	99.4	0.252	99.6
18/11/2016	13:06	TES55	0.136	95.3	0.107	95.4	0.146	99.4	0.162	99
24/11/2016	12:57	TES53_56 HRN04B	0.191	106.7	0.13	102.5	0.18	12.2	0.293	97.9
25/11/2016	12:53	TES60	0.299	107.1	0.031	86.9	0.06	98.9	0.046	95.8
29/11/2016	12:55	BRA54_PS023	0.262	100.4	0.168	95.4	0.438	96.2	0.361	91.9
2/12/2016	12:56	TES54B	0.136	99.9	0.097	99.6	0.124	97.6	0.268	94
10/12/2016	12:49	BRA55	0.174	90.9	0.136	*	0.189	75.3	0.258	88.9
12/12/2016	12:57	TES61_PS022b_PS021	0.238	98.8	0.219	*	0.483	81.4	0.66	105.1
13/12/2016	13:16	ONV25	0.196	96.9	0.11	*	0.192	75.3	0.14	93
16/12/2016	12:46	BRA56_PS021b_HRN02b	0.184	96.1	0.147	99.6	0.173	103.5	0.176	114.4
21/12/2016	12:50	RL395_01	0.196	93.4	0.14	98.2	0.266	96.2	0.342	96.5
23/12/2016	12:53	TES58_ONV27_PS019B	0.213	102.2	0.198	103.8	0.244	107.5	0.299	108
24/12/2016	12:41	TES62_PS022C	0.297	95.3	0.164	94.3	0.282	101.5	0.362	97.2

*No Results due to mechanical failure

APPENDIX B

COAL TRANSPORT RECORDS

Appendix B
Coal Transport Records

The records presented in **Appendix B** have been included to satisfy the coal transport reporting requirements of Condition 65 (a) and (b) of PA 10_0138. The amount of coal transported from the site on a monthly basis and the date and time of each rail movement generated by the MCCM has been listed in the **Table B-1 and Table B-2** below.

Table B-1
Coal Transported Monthly

Month	Coal Transported (MT)
January	0.57
February	0.59
March	0.84
April	0.65
May	0.93
June	0.75
July	0.68
August	0.52
September	0.60
October	0.74
November	0.54
December	0.89
TOTAL	**8.3**

Table B-2
Daily Train Movements

Date	Time
1/01/2016	2:59
1/01/2016	9:30
2/01/2016	3:00
2/01/2016	9:54
2/01/2016	15:47
2/01/2016	20:50
3/01/2016	4:20
3/01/2016	6:20
3/01/2016	12:23
3/01/2016	14:25
3/01/2016	20:08
4/01/2016	8:00
4/01/2016	22:15
5/01/2016	1:52

Date	Time
5/01/2016	7:20
6/01/2016	6:15
8/01/2016	12:16
8/01/2016	17:50
8/01/2016	21:25
9/01/2016	9:25
9/01/2016	20:55
10/01/2016	2:28
10/01/2016	6:50
10/01/2016	15:48
11/01/2016	1:14
11/01/2016	7:32
11/01/2016	20:00
12/01/2016	23:10

Date	Time
13/01/2016	1:45
13/01/2016	8:00
13/01/2016	23:00
15/01/2016	12:30
15/01/2016	22:35
16/01/2016	5:30
17/01/2016	6:12
17/01/2016	21:23
19/01/2016	0:05
19/01/2016	1:03
19/01/2016	5:12
19/01/2016	19:10
20/01/2016	9:12
20/01/2016	19:20

Date	Time
20/01/2016	22:04
21/01/2016	6:21
21/01/2016	9:10
21/01/2016	16:30
22/01/2016	8:51
22/01/2016	16:37
23/01/2016	3:39
23/01/2016	16:54
23/01/2016	23:33
24/01/2016	5:30
24/01/2016	14:28
24/01/2016	16:48
24/01/2016	20:23
25/01/2016	4:55
25/01/2016	7:23
25/01/2016	12:37
25/01/2016	22:20
26/01/2016	0:45
26/01/2016	4:43
26/01/2016	11:59
26/01/2016	16:27
26/01/2016	21:16
27/01/2016	0:38
27/01/2016	6:58
27/01/2016	10:54
27/01/2016	22:14
28/01/2016	6:48
28/01/2016	10:18
29/01/2016	16:11
29/01/2016	22:35
31/01/2016	4:22
31/01/2016	6:33
1/02/2016	1:06
1/02/2016	6:50
1/02/2016	20:55
2/02/2016	3:48
2/02/2016	8:20
2/02/2016	22:00
3/02/2016	3:27
3/02/2016	17:05
4/02/2016	1:25
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5/10/2016	20:50
6/10/2016	5:40

Date	Time
6/10/2016	11:30
6/10/2016	17:01
6/10/2016	23:24
7/10/2016	2:46
7/10/2016	10:04
8/10/2016	3:55
8/10/2016	7:02
8/10/2016	11:52
8/10/2016	16:30
8/10/2016	22:45
9/10/2016	4:15
9/10/2016	8:45
9/10/2016	12:04
9/10/2016	14:37
9/10/2016	21:04
10/10/2016	0:20
10/10/2016	5:24
10/10/2016	11:56
14/10/2016	1:30
14/10/2016	12:20
14/10/2016	17:55
14/10/2016	21:05
15/10/2016	0:27
15/10/2016	21:41
16/10/2016	0:57
16/10/2016	6:37
16/10/2016	9:30
16/10/2016	19:45
17/10/2016	0:43
17/10/2016	4:30
17/10/2016	8:20
17/10/2016	13:46
17/10/2016	19:19
18/10/2016	6:30
18/10/2016	13:05
18/10/2016	20:32
19/10/2016	0:32
19/10/2016	8:30
19/10/2016	13:25
19/10/2016	17:31
19/10/2016	21:00
20/10/2016	6:22

Date	Time
20/10/2016	11:05
20/10/2016	15:51
20/10/2016	22:27
21/10/2016	5:39
21/10/2016	7:54
21/10/2016	15:53
21/10/2016	23:07
22/10/2016	5:22
22/10/2016	10:50
22/10/2016	16:15
22/10/2016	23:05
23/10/2016	4:43
23/10/2016	7:53
23/10/2016	12:16
23/10/2016	22:06
24/10/2016	2:12
24/10/2016	7:41
24/10/2016	13:27
25/10/2016	1:16
25/10/2016	5:15
25/10/2016	9:57
25/10/2016	21:46
26/10/2016	6:20
26/10/2016	22:15
27/10/2016	3:09
27/10/2016	9:15
27/10/2016	16:30
28/10/2016	4:25
28/10/2016	11:37
28/10/2016	21:55
29/10/2016	8:40
29/10/2016	16:15
30/10/2016	0:27
30/10/2016	3:12
30/10/2016	6:06
30/10/2016	23:21
31/10/2016	3:57
31/10/2016	12:01
31/10/2016	15:32
31/10/2016	20:22
31/10/2016	23:40
1/11/2016	9:55

Date	Time
1/11/2016	13:35
1/11/2016	21:03
2/11/2016	8:19
2/11/2016	12:07
2/11/2016	22:13
3/11/2016	3:35
3/11/2016	19:35
4/11/2016	6:52
5/11/2016	8:04
5/11/2016	18:10
6/11/2016	2:15
6/11/2016	13:55
7/11/2016	21:02
8/11/2016	5:35
9/11/2016	0:50
9/11/2016	11:41
9/11/2016	19:02
10/11/2016	12:40
10/11/2016	16:34
10/11/2016	21:38
11/11/2016	1:43
11/11/2016	6:47
11/11/2016	17:44
11/11/2016	23:24
12/11/2016	18:56
12/11/2016	22:57
13/11/2016	2:01
13/11/2016	8:30
13/11/2016	19:10
14/11/2016	2:30
14/11/2016	9:45
14/11/2016	22:23
15/11/2016	1:54
15/11/2016	6:09
15/11/2016	13:50
15/11/2016	18:14
16/11/2016	13:52
17/11/2016	0:20
17/11/2016	9:59
17/11/2016	16:28
18/11/2016	5:48
18/11/2016	13:06

Date	Time
18/11/2016	18:58
19/11/2016	0:40
19/11/2016	10:19
19/11/2016	20:15
20/11/2016	4:16
25/11/2016	0:16
25/11/2016	5:00
25/11/2016	5:30
25/11/2016	13:41
25/11/2016	21:12
26/11/2016	0:32
26/11/2016	12:29
26/11/2016	15:47
27/11/2016	0:34
27/11/2016	6:30
27/11/2016	14:05
27/11/2016	17:15
27/11/2016	22:00
28/11/2016	2:14
28/11/2016	5:00
28/11/2016	11:23
29/11/2016	6:15
29/11/2016	13:29
29/11/2016	18:30
30/11/2016	0:23
30/11/2016	0:59
30/11/2016	7:09
30/11/2016	12:39
30/11/2016	17:40
30/11/2016	21:15
1/12/2016	6:43
1/12/2016	15:50
2/12/2016	4:00
2/12/2016	9:30
2/12/2016	12:37
2/12/2016	14:25
2/12/2016	18:03
2/12/2016	21:02
2/12/2016	22:42
3/12/2016	8:00
4/12/2016	0:08
4/12/2016	4:34

Date	Time
4/12/2016	10:50
4/12/2016	14:06
4/12/2016	22:45
5/12/2016	5:09
5/12/2016	10:50
5/12/2016	14:42
5/12/2016	18:51
6/12/2016	1:23
6/12/2016	8:50
6/12/2016	15:00
6/12/2016	21:20
7/12/2016	15:05
7/12/2016	23:09
8/12/2016	1:50
8/12/2016	7:33
8/12/2016	14:47
8/12/2016	18:10
8/12/2016	23:25
9/12/2016	8:40
9/12/2016	13:10
9/12/2016	16:10
9/12/2016	21:45
10/12/2016	2:05
10/12/2016	5:01
10/12/2016	13:17
10/12/2016	16:06
10/12/2016	21:21
11/12/2016	0:26
11/12/2016	5:18
11/12/2016	9:13
11/12/2016	11:46
11/12/2016	18:35
12/12/2016	7:30
12/12/2016	9:40
12/12/2016	13:56
12/12/2016	21:18
13/12/2016	0:20
13/12/2016	6:01
13/12/2016	11:20
13/12/2016	19:49
14/12/2016	0:06

Date	Time
14/12/2016	5:52
14/12/2016	9:58
14/12/2016	18:50
15/12/2016	3:07
15/12/2016	6:07
15/12/2016	12:48
15/12/2016	17:43
15/12/2016	21:30
16/12/2016	4:00
16/12/2016	11:33
16/12/2016	19:15
17/12/2016	1:38
17/12/2016	7:39
17/12/2016	14:29
17/12/2016	19:36
18/12/2016	1:15
18/12/2016	4:09
18/12/2016	8:52
18/12/2016	11:35
18/12/2016	21:25
19/12/2016	3:25
19/12/2016	14:32

Date	Time
19/12/2016	19:22
19/12/2016	21:57
20/12/2016	2:44
20/12/2016	5:28
20/12/2016	8:02
20/12/2016	14:21
21/12/2016	10:13
21/12/2016	20:15
22/12/2016	6:05
22/12/2016	13:10
22/12/2016	21:06
23/12/2016	1:51
23/12/2016	5:21
23/12/2016	9:30
23/12/2016	17:00
24/12/2016	2:09
24/12/2016	7:32
24/12/2016	11:06
24/12/2016	15:33
24/12/2016	21:41
25/12/2016	2:20
25/12/2016	5:46

Date	Time
25/12/2016	9:22
25/12/2016	21:11
26/12/2016	0:54
26/12/2016	4:38
26/12/2016	14:26
26/12/2016	20:00
27/12/2016	5:10
27/12/2016	14:02
27/12/2016	17:38
27/12/2016	22:08
28/12/2016	5:33
28/12/2016	12:05
28/12/2016	22:03
29/12/2016	5:05
30/12/2016	2:22
30/12/2016	5:23
30/12/2016	21:02
31/12/2016	1:58
31/12/2016	13:15
31/12/2016	15:47
31/12/2016	21:00
31/12/2016	23:10

APPENDIX C

Annual Sound Power Testing

Appendix C
Annual Sound Power Testing

Table C-1

Sound Power Level Testing Results

Unit	Equipment Type	Parameter	Criteria dBA	Result dBA
DOZ301	Dozer - CAT D10T	Stationary	115	110.0
		1 Gear Back	127	113.0
DOZ302	Dozer - CAT D10T	Stationary	115	106.0
		1 Gear Back	127	111.0
DOZ303	Dozer - CAT D10T	Stationary	115	106.0
		1 Gear Back	127	110.0
DOZ320	Dozer - CAT D11T	Stationary	115	106.0
		1 Gear Back	127	116.0
DOZ321	Dozer - CAT D11T	Stationary	115	106.0
		1 Gear Back	127	116.0
DOZ322	Dozer - CAT D11T	Stationary	115	107.0
		1 Gear Back	127	114.0
DOZ323	Dozer - CAT D11T	Stationary	115	105.0
		1 Gear Back	127	115.0
DOZ324	Dozer - CAT D11T	Stationary	115	109.0
		1 Gear Back	127	114.0
DOZ816	Dozer - Cat D10T - Emeco DZ266	Stationary	115	105.0
		1 Gear Back	127	110.0
DOZ818	Dozer - Cat D10T - Harris	Stationary	115	108.0
		1 Gear Back	127	115.0
DOZ858	Dozer - Cat D11T - Emeco D	Without track noise	115	109.0
		1 Gear Back (with track noise)	127	115.0
DOZ870	Dozer - Cat D10T - Emeco	Stationary	115	106.0
		1 Gear Back (with track noise)	127	116.0
DOZ871	Dozer - Cat D10T - Emeco DZ252	Stationary	115	109.0
		1 Gear Back (with track noise)	127	118.0
DOZ872	Dozer - Cat D11T - Emeco DZ273	Without track noise	115	107.0
		1 Gear Back (with track noise)	127	121.0
DOZ825	Dozer - Cat D11T - Emeco	Without track noise	115	109.0
		1 Gear Back (with track noise)	127	116.0
DOZ859	Dozer - Cat D11T - Emeco	Without track noise	115	108.0
		1 Gear Back (with track noise)	127	114.0
DOZ860	Dozer - Cat D11T - Emeco	Without track noise	115	114.0
		1 Gear Back (with track noise)	127	117.0
DOZ876	Dozer - Cat D10T - Emeco DZ236	Without track noise	115	107.0
		1 Gear Back (with track noise)	127	113.0
DRG451	Drill - CAT MD6290	Stationary	118	116.0
DRG452	Drill - CAT MD6290	Stationary	118	117.0
DRG453	Drill - CAT MD6290	Stationary	118	116.0
DRG454	Drill - CAT MD6290	Stationary	118	117.0
DRG455	Drill - CAT MD6290	Stationary	118	117.0
DRG830	Drill - SK50F - CJC Drilling - 1V68L71	Stationary	118	116.0

Unit	Equipment Type	Parameter	Criteria dBA	Result dBA
DRG837	Drill - SK50I - CJC Drilling - 1Z69546	Stationary	118	116.0
EXC221	Excavator - Hitachi EX3600	Dynamic	119	117.0
EXC222	Excavator - Hitachi EX3600	Dynamic	119	114.0
EXC223	Excavator - Hitachi EX3600	Dynamic	119	112.0
EXC224	Excavator - Hitachi EX3600	Dynamic	119	117.0
EXC261	Excavator - Hitachi EX8000	Dynamic	123	115.0
EXC262	Excavator - Hitachi EX8000	Dynamic	123	118.0
EXC263	Excavator - Hitachi EX8000	Dynamic	123	116.0
EXC264	Excavator - Hitachi EX8000	Dynamic	123	121.0
EXC810	Excavator - Hitachi EX3600-6	Dynamic	119	113.0
GRD401	Grader - CAT 16M	1 Gear Forward	112	106.0
GRD402	Grader - CAT 16M	1 Gear Forward	112	104.0
GRD415	Grader - CAT 24M	1 Gear Forward	112	107.0
GRD861	Grader - CAT 16M - Emeco MG082	1 Gear forward	112	106.0
GRD862	Grader - CAT 16M - Emeco MG082	1 Gear forward	112	104.0
GRD863	Grader - CAT Peter Harris	1 Gear Forward	112	105.0
RDT001	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT002	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.0
RDT003	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT004	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT005	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT006	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	116.0
RDT007	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT008	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.0
RDT009	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT010	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT011	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT012	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	114.5
RDT013	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT014	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT015	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.0
RDT016	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT017	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.0
RDT018	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.0
RDT019	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT020	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	116.0
RDT021	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT022	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT023	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	116.5
RDT024	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT025	Dump Truck - Hitachi EH5000-3	Average Uphill / Downhill	117	115.5
RDT051	Dump Truck - Hitachi EH3500-3	Average Uphill / Downhill	117	116.0
RDT052	Dump Truck - Hitachi EH3500-3	Average Uphill / Downhill	117	113.5
RDT053	Dump Truck - Hitachi EH3500-3	Average Uphill / Downhill	117	112.5
RDT054	Dump Truck - Hitachi EH3500-3	Average Uphill / Downhill	117	115.5
RDT055	Dump Truck - Hitachi EH3500-3	Average Uphill / Downhill	117	114.0
RDT071	Dump Truck - Hitachi EH4000-AC2	Average Uphill / Downhill	117	115.0

Unit	Equipment Type	Parameter	Criteria dBA	Result dBA
RDT072	Dump Truck - Hitachi EH4000-AC2	Average Uphill / Downhill	117	115.5
RDT101	Dump Truck - CAT 789D XQ	Average Uphill / Downhill	117	113.0
RDT102	Dump Truck - CAT 789D XQ	Average Uphill / Downhill	117	114.0
RDT103	Dump Truck - CAT 789D XQ	Average Uphill / Downhill	117	113.0
RDT104	Dump Truck - CAT 789D XQ	Average Uphill / Downhill	117	112.0
RDT874	Dump Truck - Cat 789C - EMECO - RD259	Average Uphill / Downhill	117	111.0
RDT875	Dump Truck - Cat 789C - EMECO - RD259	Average Uphill / Downhill	117	114.0
RDT882	Dump Truck - Cat 789D - EMECO - RD280	Average Uphill / Downhill	117	114.0
RDT883	Dump Truck - Cat 789D - EMECO - RD281	Average Uphill / Downhill	117	114.0
RDT884	Dump Truck - Cat 789D - EMECO - RD284	Average Uphill / Downhill	117	115.0
RDT885	Dump Truck - Cat 789D - EMECO - RD289	Average Uphill / Downhill	117	115.0
RDT887	Dump Truck - Cat 789C - EMECO - RD182	Average Uphill / Downhill	117	113.0
RDT888	Dump Truck - Cat 789C - EMECO - RD246	Average Uphill / Downhill	117	114.0
RDT889	Dump Truck - Cat 789C - EMECO - RD334	Average Uphill / Downhill	117	115.5
RDT890	Dump Truck - Cat 789C - EMECO - RD335	Average Uphill / Downhill	117	114.5
RDT891	Dump Truck - Cat 789C - EMECO - RD340	Average Uphill / Downhill	117	114.0
WAT501	Watercart - Cat777G	Average	115	109.0
WAT502	Watercart - Cat777G	Average	115	107.7
WAT503	Watercart - Cat777G	Average	115	112.0
WAT801	Watercart - Cat773 - EMECO	Average	115	116.0
WAT802	Watercart - Cat773 - EMECO	Average	115	113.7
WAT803	Watercart - Cat777 - EMECO	Average	115	113.7
WAT814	Watercart - Cat773 - EMECO	Average	115	112.3
WAT821	Watercart - Cat773D - EMECO	Average	115	115.0
WLO806	Wheel Loader - Cat992K - EMECO	Average	115	108.0
WLO811	Wheel Loader - Cat992G - EMECO - WL157	Average	115	111.0
WLO812	Wheel Loader - Cat992K - EMECO	Average	115	110.3
FIXED PLANT				
CHPP			117	116.0
Primary sizer			109	110.0
Secondary sizer			112	115.0
Stacker			104	103.0
Reclaimer			115	107.0
Conveyor 200m			108	105.0
Conveyor 500m			112	109.0
Raw coal transfer station			103	105.0
Train load out transfer station			103	114.0
CHPP Product Transfer Station			103	105.0
Locomotive			96	*
Train loadout			103	114.0
Train on rail spur			108	115.0
Access road			95	98.0

*Result pending at time of report

APPENDIX D

Surface Water

Appendix D
Surface Water

The surface water monitoring results for the reporting period are detailed in the table below.

Table D-1
MCC Surrounding Surface Water Monitoring Results

Site	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Turbidity (NTU)	Total Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Mercury (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Total Anions (mg/L)	Total Cations (mg/L)
SW1	8/01/2016	7.92	398	250	26	12.9	135	30	13	31	2	0.76	<0.0001	<0.001	<0.001	<0.001	0.041	<0.001	<0.01	<0.001	<0.005	<0.05	0.91	<0.0001	0.02	0.3	0.08	3.88	3.97
SW1	12/02/2016	7.7	401	202	16	8.7	126	32	11	30	2	0.26	<0.0001	<0.001	<0.001	<0.001	0.055	<0.001	<0.01	<0.001	<0.005	<0.05	0.44	<0.0001	0.06	0.4	0.11	3.84	3.86
SW1	15/03/2016	7.67	426	260	37	18.7	147	33	13	33	2	0.75	<0.0001	<0.001	<0.001	<0.001	0.046	<0.001	<0.01	<0.001	<0.005	<0.05	1.14	<0.0001	0.01	0.2	0.08	4.23	4.2
SW1	15/04/2016	7.83	380	214	18	10.9	136	30	12	27	<1	0.36	<0.0001	<0.001	<0.001	<0.001	0.047	<0.001	<0.01	<0.001	<0.001	<0.05	0.46	<0.0001	0.07	0.3	0.09	4.04	3.66
SW1	16/05/2016	7.72	391	241	14	4.1	138	34	14	36	2	0.12	<0.0001	<0.001	<0.001	<0.001	0.05	<0.001	<0.01	<0.001	<0.005	<0.05	0.28	<0.0001	0.04	<0.1	0.05	4.11	4.46
SW1	15/06/2016	7.83	407	282	13	3.6	128	31	13	33	2	0.05	<0.0001	<0.001	0.007	<0.001	0.029	<0.001	<0.01	<0.001	<0.005	0.09	0.18	<0.0001	0.02	0.1	0.05	4.13	4.1
SW1	15/08/2016	7.58	367	202	<5	1.2	122	28	11	31	2	0.08	<0.0001	<0.001	<0.001	<0.001	0.035	<0.001	<0.01	<0.001	<0.005	<0.05	0.2	<0.0001	0.21	0.2	0.11	3.97	3.7
SW1	22/08/2016	7.66	451	276	5	2.4	144	38	13	33	2	0.2	<0.0001	<0.001	<0.001	<0.001	0.041	<0.001	<0.01	<0.001	<0.005	<0.05	0.34	<0.0001	0.25	0.2	0.1	4.59	4.45
SW1	14/09/2016	7.2	190	207	270	167	61	14	6	14	2	8.55	<0.0001	0.006	0.005	0.004	0.259	0.006	<0.01	<0.001	0.022	<0.05	8.52	<0.0001	0.07	1.2	0.4	1.64	1.85
SW1	13/10/2016	7.71	416	218	<5	1.2	112	30	11	29	1	0.08	<0.0001	<0.001	<0.001	<0.001	0.034	<0.001	<0.01	<0.001	<0.005	<0.05	0.18	<0.0001	0.17	0.3	0.07	3.49	3.69
SW1	7/11/2016	7.77	388	256	<5	1.5	138	32	12	33	1	0.04	<0.0001	<0.001	<0.001	<0.001	0.045	<0.001	<0.01	<0.001	<0.005	<0.05	0.22	<0.0001	0.16	0.3	0.1	4.03	4.04
SW1	12/12/2016	7.62	394	229	9	4.3	113	28	12	33	2	0.31	<0.0001	<0.001	<0.001	<0.001	0.077	<0.001	<0.01	<0.001	<0.005	<0.05	0.58	<0.0001	0.15	0.4	0.15	3.75	3.87
SW2	8/01/2016	**Dry- No Sample**																											
SW2	12/02/2016	**Dry- No Sample**																											
SW2	15/03/2016	**Dry- No Sample**																											
SW2	15/04/2016	**Dry- No Sample**																											
SW2	16/05/2016	**Dry- No Sample**																											
SW2	15/06/2016	**Dry- No Sample**																											
SW2	15/08/2016	7.64	284	179	<5	4.7	103	25	10	23	2	0.32	<0.0001	<0.001	<0.001	<0.001	0.012	<0.001	<0.01	<0.001	<0.005	<0.05	0.22	<0.0001	0.55	0.6	0.08	3.12	3.12
SW2	22/08/2016	**Dry- No Sample**																											
SW2	14/09/2016	7.09	216	218	104	105	68	15	6	15	2	6.91	<0.0001	0.004	0.004	0.002	0.122	0.003	<0.01	<0.001	0.022	<0.05	5.96	<0.0001	0.08	0.8	0.21	2.04	1.94
SW2	13/10/2016	8.05	373	197	15	3	112	31	12	25	1	0.08	<0.0001	<0.001	0.002	<0.001	0.012	<0.001	<0.01	<0.001	<0.005	<0.05	0.07	<0.0001	0.05	0.2	0.04	3.34	3.65
SW2	7/11/2016	7.83	370	249	<5	2	138	34	13	28	1	0.11	<0.0001	<0.001	<0.001	<0.001	0.018	<0.001	<0.01	<0.001	<0.005	<0.05	0.1	<0.0001	0.58	0.9	0.04	3.94	4.01
SW2	12/12/2016	7.88	428	256	118	14	123	38	16	32	1	1.09	<0.0001	<0.001	<0.001	<0.001	0.122	<0.001	<0.01	<0.001	<0.005	<0.05	1.2	<0.0001	1.9	3.7	0.25	3.99	4.63

Site	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Turbidity (NTU)	Total Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Mercury (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Total Anions (mg/L)	Total Cations (mg/L)
SW3	8/01/2016	**No sample required - no discharge at this location this month**																											
SW3	12/02/2016	**No sample required - no discharge at this location this month**																											
SW3	15/03/2016	**No sample required - no discharge at this location this month**																											
SW3	15/04/2016	**No sample required - no discharge at this location this month**																											
SW3	16/05/2016	**No sample required - no discharge at this location this month**																											
SW3	15/06/2016	**No sample required - no discharge at this location this month**																											
SW3	15/08/2016	**No sample required - no discharge at this location this month**																											
SW3	22/08/2016	**No sample required - no discharge at this location this month**																											
SW3	14/09/2016	**No sample required - no discharge at this location this month**																											
SW3	13/10/2016	**No sample required - no discharge at this location this month**																											
SW3	7/11/2016	**No sample required - no discharge at this location this month**																											
SW3	12/12/2016	**No sample required - no discharge at this location this month**																											
SW4	8/01/2016	**No Sample Required- Non Sampling Month**																											
SW4	12/02/2016	**No Sample Required- Non Sampling Month**																											
SW4	15/03/2016	**Dry- No Sample**																											
SW4	15/04/2016	**No Sample Required- Non Sampling Month**																											
SW4	16/05/2016	**No Sample Required- Non Sampling Month**																											
SW4	15/06/2016	**Dry- No Sample**																											
SW4	15/08/2016	**No Sample Required- Non Sampling Month**																											
SW4	22/08/2016	**No Sample Required- Non Sampling Month**																											
SW4	14/09/2016	6.78	69	112	16	31.3	27	3	1	4	6	2.31	<0.0001	0.002	0.001	<0.001	0.048	0.003	<0.01	<0.001	0.006	<0.05	1.47	<0.0001	0.03	1.1	0.18	0.6	0.56
SW4	13/10/2016	**No Sample Required- Non Sampling Month**																											
SW4	7/11/2016	**No Sample Required- Non Sampling Month**																											
SW4	12/12/2016	**Dry- No Sample**																											
SW5	8/01/2016	**No Sample Required- Non Sampling Month**																											
SW5	12/02/2016	**No Sample Required- Non Sampling Month**																											
SW5	15/03/2016	8.12	565	337	16	12.5	189	38	26	47	4	0.69	<0.0001	<0.001	0.002	<0.001	0.117	0.002	<0.01	<0.001	<0.005	<0.05	0.7	<0.0001	<0.01	0.4	0.06	6.18	4.69
SW5	15/04/2016	**No Sample Required- Non Sampling Month**																											
SW5	16/05/2016	**No Sample Required- Non Sampling Month**																											
SW5	15/06/2016	8.3	691	390	12	9.1	198	46	30	58	4	0.46	<0.0001	<0.001	0.006	<0.001	0.046	0.002	<0.01	<0.001	<0.005	0.11	0.52	<0.0001	0.01	0.3	0.03	7.26	7.39
SW5	15/08/2016	**No Sample Required- Non Sampling Month**																											
SW5	22/08/2016	**No Sample Required- Non Sampling Month**																											
SW5	14/09/2016	7.57	323	294	117	144	108	19	11	20	3	7.43	<0.0001	0.009	0.007	0.002	0.128	0.011	<0.01	<0.001	0.014	<0.05	7.36	<0.0001	0.45	1.2	0.3	3.07	2.8

Site	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Turbidity (NTU)	Total Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Mercury (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Total Anions (mg/L)	Total Cations (mg/L)
SW5	13/10/2016	**No Sample Required- Non Sampling Month**																											
SW5	7/11/2016	**No Sample Required- Non Sampling Month**																											
SW5	12/12/2016	7.91	285	190	47	50	87	20	12	23	3	2.5	<0.0001	0.003	0.003	0.001	0.096	0.004	<0.01	<0.001	0.005	<0.05	3.06	<0.0001	0.1	1	0.18	2.73	3.06
SW6	8/01/2016	8.23	838	454	64	36.5	Suite 2 not required																						
SW6	12/02/2016	8.07	498	264	25	21.4	Suite 2 not required																						
SW6	15/03/2016	7.99	615	318	<5	4.3	Suite 2 not required																						
SW6	15/04/2016	8.43	561	332	15	13.2	Suite 2 not required																						
SW6	16/05/2016	8.32	640	371	10	5.8	Suite 2 not required																						
SW6	15/06/2016	8.25	700	426	12	8.6	Suite 2 not required																						
SW6	15/08/2016	8.1	320	199	20	27.1	Suite 2 not required																						
SW6	22/08/2016	8.1	378	214	29	22.9	Suite 2 not required																						
SW6	14/09/2016	7.75	326	282	84	121	Suite 2 not required																						
SW6	13/10/2016	7.88	387	206	34	34.4	Suite 2 not required																						
SW6	7/11/2016	8.19	447	298	22	32.7	Suite 2 not required																						
SW6	12/12/2016	7.96	274	172	51	49.7	Suite 2 not required																						
SW7	8/01/2016	8.21	797	453	67	39.3	Suite 2 not required																						
SW7	12/02/2016	8.26	483	249	12	11.8	Suite 2 not required																						
SW7	15/03/2016	8.06	673	380	44	38.4	Suite 2 not required																						
SW7	15/04/2016	8.35	606	368	45	35.5	Suite 2 not required																						
SW7	16/05/2016	8.45	638	392	37	27.8	Suite 2 not required																						
SW7	15/06/2016	8.28	569	286	9	9.2	Suite 2 not required																						
SW7	15/08/2016	8.16	325	180	24	30.6	Suite 2 not required																						
SW7	22/08/2016	8.19	376	239	26	24.4	Suite 2 not required																						
SW7	14/09/2016	7.8	338	246	91	121	Suite 2 not required																						
SW7	13/10/2016	8.03	385	210	37	37.7	Suite 2 not required																						
SW7	7/11/2016	8.31	461	306	25	27.7	Suite 2 not required																						
SW7	12/12/2016	8.04	292	188	48	50.1	Suite 2 not required																						
SW8	8/01/2016	**No Sample Required- Non Sampling Month**																											
SW8	12/02/2016	**No Sample Required- Non Sampling Month**																											
SW8	15/03/2016	**Dry- No Sample**																											
SW8	15/04/2016	**No Sample Required- Non Sampling Month**																											
SW8	16/05/2016	**No Sample Required- Non Sampling Month**																											
SW8	15/06/2016	8.29	574	288	<5	10.6	180	38	23	48	4	0.54	<0.0001	<0.001	0.002	<0.001	0.058	0.002	<0.01	<0.001	0.01	0.05	0.31	<0.0001	<0.01	0.5	0.04	5.71	5.98

Site	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Turbidity (NTU)	Total Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Mercury (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Total Anions (mg/L)	Total Cations (mg/L)
SW8	15/08/2016	**No Sample Required- Non Sampling Month**																											
SW8	22/08/2016	**No Sample Required- Non Sampling Month**																											
SW8	14/09/2016	7.77	327	310	105	134	110	22	12	21	3	6.37	<0.0001	0.006	0.006	0.001	0.123	0.007	<0.01	<0.001	0.012	<0.05	6.34	<0.0001	0.47	1.1	0.22	3.13	3.08
SW8	13/10/2016	**No Sample Required- Non Sampling Month**																											
SW8	7/11/2016	**No Sample Required- Non Sampling Month**																											
SW8	12/12/2016	8.06	352	225	48	49.4	109	25	16	29	3	2.35	<0.0001	0.003	0.003	<0.001	0.1	0.004	<0.01	<0.001	<0.005	<0.05	2.74	<0.0001	0.02	0.9	0.17	3.42	3.9
SW9	8/01/2016	**Non Sampling Month**																											
SW9	12/02/2016	**Non Sampling Month**																											
SW9	15/03/2016	**Dry-no sample**																											
SW9	15/04/2016	**Non Sampling Month**																											
SW9	16/05/2016	**Non Sampling Month**																											
SW9	15/06/2016	**Dry-no sample**																											
SW9	15/08/2016	**Non Sampling Month**																											
SW9	22/08/2016	**Non Sampling Month**																											
SW9	14/09/2016	**Unable to access- Site too Muddy**																											
SW9	13/10/2016	**Too wet to access**																											
SW9	7/11/2016	**Non Sampling Month**																											
SW9	12/12/2016	**Non Sampling Month**																											
SW10	8/01/2016	**Dry-no sample**																											
SW10	12/02/2016	**No sample required - no discharge at this location this month**																											
SW10	15/03/2016	**No sample required - no discharge at this location this month**																											
SW10	15/04/2016	**No sample required - no discharge at this location this month**																											
SW10	16/05/2016	**No sample required - no discharge at this location this month**																											
SW10	15/06/2016	**No sample required - no discharge at this location this month**																											
SW10	15/08/2016	**No sample required - no discharge at this location this month**																											
SW10	22/08/2016	**Unable to access site - Site too Muddy**																											
SW10	14/09/2016	**Unable to access site - Site too Muddy**																											
SW10	13/10/2016	**No sample required - no discharge at this location this month**																											
SW10	7/11/2016	**No sample required - no discharge at this location this month**																											
SW10	12/12/2016	**No sample required - no discharge at this location this month**																											
SW11	8/01/2016	**No sample required - no discharge at this location this month**																											
SW11	12/02/2016	**No sample required - no discharge at this location this month**																											
SW11	15/03/2016	**No sample required - no discharge at this location this month**																											

Site	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (mg/L)	Suspended Solids (mg/L)	Turbidity (NTU)	Total Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Sodium (mg/L)	Potassium (mg/L)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Mercury (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Total Anions (mg/L)	Total Cations (mg/L)
SW11	15/04/2016	**No sample required - no discharge at this location this month**																											
SW11	16/05/2016	**No sample required - no discharge at this location this month**																											
SW11	15/06/2016	**No sample required - no discharge at this location this month**																											
SW11	15/08/2016	**No sample required - no discharge at this location this month**																											
SW11	22/08/2016	**Unable to access site**																											
SW11	14/09/2016	**Unable to access site**																											
SW11	13/10/2016	**No sample required - no discharge at this location this month**																											
SW11	7/11/2016	**No sample required - no discharge at this location this month**																											
SW11	12/12/2016	**No sample required - no discharge at this location this month**																											

Sampling was unable to be taken at all monitoring locations as Back Creek and upper Maules Creek are ephemeral.

Table D-2
Sediment Dam Triggers

Parameter	100th percentile
Oil and grease (mg/L)	10
pH	6.5-8.5
Total suspended solids (mg/L)	50

Table D-3
Sediment Dam Discharge Laboratory Monitoring Results

Location	Date	pH Value	Electrical Conductivity @ 25°C (µS/cm)	Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Turbidity (NTU)	Oil & Grease (mg/L)
SD9	3/08/2016	7.49	146	34	194	97.5	<5
SD9	23/08/2016	7.82	656	50	340	105	<5
SD9	24/08/2016	7.75	656	46	308	114	<5
SD9	25/08/2016	7.52	337	43	324	114	<5
SD9	26/08/2016	7.98	514	77	344	126	<5
SD9	27/08/2016	8.03	576	64	496	112	<5
SD9	14/09/2016	7.74	296	8	245	43.8	-
SD9	15/09/2016	7.86	300	39	240*	40.6	<5
SD9	16/09/2016	8.05	482	22	279	153	<5
SD9	20/09/2016	8.37	535	8	344	8.4	<5

* Calculation based on co-efficient

- Not sampled

Table D-4
Off-site Discharge Monitoring Laboratory Results

Location	Date	pH Value	Electrical Conductivity @ 25°C (µS/cm)	Suspended Solids (mg/L)	mg/L Dissolved Solids @ 180°C (mg/L)	Turbidity (NTU)	Aluminium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Manganese (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Zinc (mg/L)	Boron (mg/L)	Iron (mg/L)	Arsemious Acid, As (III) (µg/L)	Arsemious Acid, As (V) (µg/L)	Mercury (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus as P (mg/L)	Reactive Phosphorous as P (mg/L)
SW5	3/08/2016	8.02	352	39	260	65.3	<0.01	<0.0001	<0.001	0.001	<0.001	<0.001	0.002	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	0.9	<0.0001	0.9	<0.0001	0.08
SW8	3/08/2016	7.67	229	137	246	312	<0.01	<0.0001	<0.001	0.002	<0.001	<0.001	0.003	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	0.9	<0.0001	0.9	<0.0001	0.16
SW5	23/08/2016	7.89	386	24	194	23.8	1.18	<0.0001	0.002	0.002	<0.001	0.055	0.002	<0.01	<0.001	<0.005	<0.05	1.4	<0.5	0.7	<0.0001	0.4	0.06	0.02
SW8	23/08/2016	7.95	378	26	224	31.6	1.97	<0.0001	0.002	0.003	<0.001	0.063	0.003	<0.01	<0.001	0.005	<0.05	2.21	<0.5	0.7	<0.0001	0.3	0.07	0.03
SW5	24/08/2016	7.97	399	25	236	27.2	1.2	<0.0001	0.002	0.002	<0.001	0.054	0.002	<0.01	<0.001	<0.005	<0.05	1.41	<0.5	0.6	<0.0001	0.3	0.06	0.01
SW8	24/08/2016	7.28	227	28	169	39	2.58	<0.0001	0.002	0.002	<0.001	0.05	0.002	<0.01	<0.001	0.005	<0.05	2.3	<0.5	0.6	<0.0001	0.5	0.15	0.08
SW5	25/08/2016	7.93	394	23	246	34.5	1.88	<0.0001	0.002	0.003	<0.001	0.059	0.002	<0.01	<0.001	<0.005	<0.05	2.06	<0.5	0.8	<0.0001	0.4	0.1	0.04
SW8	25/08/2016	7.3	106	398	242	308	14.9	<0.0001	0.01	0.01	0.007	0.392	0.012	<0.01	<0.001	0.039	<0.05	18.4	<0.5	1	<0.0001	2	0.67	0.15
SW5	26/08/2016	7.72	302	52	276	109	0.19	<0.0001	<0.001	0.002	<0.001	0.002	0.002	<0.01	<0.001	<0.005	<0.05	0.11	<0.5	0.7	<0.0001	1.1	0.23	0.06
SW8	26/08/2016	7.64	257	64	277	134	0.42	<0.0001	<0.001	0.002	<0.001	0.002	0.001	<0.01	<0.001	<0.005	<0.05	0.25	<0.5	0.8	<0.0001	1.3	0.28	0.09
SW5	27/08/2016	8.03	412	244	284	133	0.07	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	0.015	<0.05	0.05	<0.5	<0.5	<0.0001	1.2	0.21	0.02
SW8	27/08/2016	7.95	355	208	314	173	0.41	<0.0001	<0.001	0.002	<0.001	0.001	0.001	<0.01	<0.001	0.01	<0.05	0.23	<0.5	0.6	<0.0001	1.7	0.27	0.04
SW6*	14/09/2016	7.75	326	282	84	121	6.27	<0.0001	0.007	0.006	0.001	0.113	0.008	<0.01	<0.001	0.016	<0.05	6.35	<0.5	1	<0.0001	1.1	0.24	0.12
SW7*	14/09/2016	7.8	338	246	91	121	4.76	<0.0001	0.006	0.006	0.001	0.123	0.008	<0.01	<0.001	0.01	<0.05	5.18	<0.5	1	<0.0001	1.2	0.28	0.15
SW5	15/09/2016	7.61	203	145	250	217	13.2	0.0002	0.016	0.011	0.003	0.174	0.017	<0.01	<0.001	0.019	<0.05	15.5	<0.5	0.7	<0.0001	1.7	0.41	0.12
SW8	15/09/2016	7.57	237	377	332	477	24	<0.0001	0.021	0.024	0.005	0.408	0.021	<0.01	<0.001	0.044	<0.05	29.1	<0.5	1.1	<0.0001	2.2	0.54	0.14
SW5	16/09/2016	7.63	265	844	400	1100	42	<0.0001	0.045	0.049	0.01	1.24	0.047	<0.01	<0.001	0.085	<0.05	59.2	<0.5	1.2	<0.0001	3.4	1.1	0.16
SW8	16/09/2016	7.49	199	264	250	339	19.4	<0.0001	0.024	0.016	0.004	0.278	0.026	<0.01	<0.001	0.03	<0.05	23.1	<0.5	0.7	<0.0001	1.8	0.56	0.14
SW5	20/09/2016	7.61	296	161	300	243	14.4	<0.0001	0.017	0.013	0.002	0.214	0.02	<0.01	<0.001	0.019	<0.05	17.8	<0.5	0.9	<0.001	1.9	0.63	0.29
SW8	20/09/2016	7.56	320	96	259	156	9.31	<0.0001	0.011	0.011	0.001	0.229	0.014	<0.01	<0.001	0.013	<0.05	11	<0.5	1.3	<0.001	1.9	0.58	0.36

*SW6 and SW7 used as monitoring locations, as SW5 and SW8 were inaccessible due to wet weather.

Site Water Monitoring

Table D-5
On-site Surface Water Monitoring

Site	Parameter	Units	Frequency	Samples	Date	Min	Mean	Max/Only Value
Mine Void	TSS	mg/L	Every 2 Months	1	25/02/2016	-	-	<5
	Conductivity	µs/cm				-	-	1720
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.36
Mine Void	TSS	mg/L	Every 2 Months	1	27/04/2016	-	-	<5
	Conductivity	µs/cm				-	-	1080
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.46
Mine Void	TSS	mg/L	Every 2 Months	1	29/06/2016	-	-	3140
	Conductivity	µs/cm				-	-	1660
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	7.71
Mine Void	TSS	mg/L	Every 2 Months	3	30/08/2016	5	22	43
	Conductivity	µs/cm				487	878	1160
	Oil & Grease	mg/L				<5	<5	7
	pH	pH				4.95	6.78	7.73
Mine Void	TSS	mg/L	Every 2 Months	2	27/10/2016	5	5.5	6
	Conductivity	µs/cm				888	1044	1200
	Oil & Grease	mg/L				<5	<5	<5
	pH	pH				8.02	8.2	8.37
Mine Void	TSS	mg/L	Every 2 Months	1	19/12/2016	12	16	20
	Conductivity	µs/cm				671	832	993
	Oil & Grease	mg/L				<5	<5	<5
	pH	pH				7.96	8.26	8.55

APPENDIX E

Groundwater

Appendix E
Groundwater

Regional Groundwater Bores

Table E-1
Groundwater Levels

SWL	RB01a	RB02a	RB05a	Reg3	Reg4	Reg5	Reg5a	Reg6	Reg7a	Reg10a	Reg12	Reg13	Reg14	BCM01	BCM03
Jan-16	166.4	141.66	57.25	14.9	20.21	17.71	-	20.25	8.15	-	25.86	22.91	20.76	-	-
Feb-16	166.49	141.94	57.35	15.3	20.13	17.71	-	20.31	8.22	-	25.83	22.83	21.04	-	-
Mar-16	166.7	141.85	57.45	15.59	20.17	17.71	-	20.43	8.29	-	25.85	22.89	21.24	-	-
Apr-16	166.87	142.14	58.56	15	20.17	17.94	-	20.52	8.42	-	25.92	22.89	20.34	-	-
May-16	166.97	142.13	58.62	14.75	20.16	17.92	-	20.42	8.48	-	25.91	22.9	20.14	-	-
Jun-16	167.3	142.64	58.82	14.51	20.14	17.64	-	20.43	8.65	-	25.92	22.83	19.92	-	-
Jul-16	167.35	142.51	58.41	14.37	20.19	17.7	-	20.33	8.62	-	25.97	22.92	19.79	-	-
Aug-16	167.59	142.72	58.5	14.18	20.2	17.52	-	20.29	8.7	-	25.99	22.95	19.75	-	-
Sep-16	167.64	141.85	58.62	13.77	20.2	-[2]	-[2]	20.27	7.96	-	26.02	22.93	19.75	-	-
Oct-16	167.53	140.47	58.66	13.69	20.17	17.6	-	20.24	6.03	-	25.98	22.87	19.65	-	-
Nov-16	167.31	139.47	58.67	13.39	20.13	17.64	-	20.24	5.76	-	25.96	22.75	19.6	-	-
Dec-16	167.37	-[1]	58.65	13.25	20.09	17.7	-	20.27	5.94	-	25.9	22.72	19.76	-	-

Shaded cells indicate dry bore.

1 Groundwater level at RBO2 was not measured in December 2016 as there was a blockage in the bore.

2 Groundwater level could not be obtained due to wet weather preventing access to bore.

Table E-2

Groundwater Monitoring Results

Location	Date	pH Value	Electrical Conductivity @ 25°C	TDS @180°C	Aluminium (filt.)	Arsenic (filt.)	Barium (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Lithium (filt.)	Manganese (filt.)	Nickel (filt.)	Zinc (filt.)	Boron (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total Anions	Total Cations
		pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L
RBO1a	10/03/2016	8.68	1030	526	0.02	0.003	0.017	<0.0001	<0.001	<0.001	0.029	0.002	<0.001	<0.005	0.1	<0.05	0.27	0.02	<0.01	9.9	10.7
	28/06/2016	9.11	1010	650	0.03	0.003	0.014	<0.0001	<0.001	<0.001	0.049	0.002	<0.001	<0.005	0.1	<0.05	0.38	<0.01	0.04	11.2	9.76
	6/09/2016	9.17	1040	526	0.04	0.003	0.016	<0.0001	<0.001	<0.001	0.053	<0.001	0.002	<0.005	0.1	<0.05	0.43	<0.01	0.06	10	10.6
	22/12/2016	8.96	1200	784	Sample not obtainable[1]																
RBO2a	10/03/2016	11.7	1460	601	0.01	<0.001	0.328	<0.0001	<0.001	<0.001	0.053	<0.001	0.001	<0.005	<0.05	<0.05	0.42	0.01	0.81	8.05	8.87
	28/06/2016	11.8	1890	565	0.02	<0.001	0.272	<0.0001	<0.001	<0.001	0.044	<0.001	<0.001	<0.005	<0.05	<0.05	0.25	<0.01	0.96	11.6	10.5
	6/09/2016	11.9	2240	590	0.02	<0.001	0.42	<0.0001	<0.001	<0.001	0.053	<0.001	0.001	<0.005	<0.05	<0.05	0.47	<0.01	0.79	14	12.5
	22/12/2016	Sample not obtainable[2]																			
RBO5a	14/03/2016	7.93	1820	990	<0.01	<0.001	0.288	<0.0001	<0.001	<0.001	0.027	0.064	0.004	0.007	0.05	0.34	0.55	0.29	<0.01	19.4	18.5
	28/06/2016	7.82	1740	1100	<0.01	<0.001	0.307	<0.0001	<0.001	<0.001	0.029	0.08	0.006	0.012	0.06	0.62	0.56	<0.01	0.02	20.7	17.3
	6/09/2016	7.68	1760	1010	<0.01	<0.001	0.326	<0.0001	<0.001	<0.001	0.026	0.07	0.012	0.029	0.06	0.69	0.53	<0.01	0.13	18.1	19
	22/12/2016	7.68	1620	986	0.05	<0.001	0.285	<0.0001	<0.001	<0.001	0.027	0.071	0.024	0.032	<0.05	0.35	0.32	<0.01	0.28	18	17.7
Reg3	16/03/2016	8.12	1210	602	<0.01	0.004	0.022	<0.0001	<0.001	<0.001	<0.001	0.185	0.002	0.02	0.06	<0.05	0.04	<0.01	<0.01	12.2	12.3
	21/06/2016	7.9	1150	707	<0.01	0.003	0.014	<0.0001	<0.001	<0.001	0.001	0.12	0.001	0.005	0.06	<0.05	0.13	<0.01	0.05	13.5	11.2
	7/09/2016	7.9	986	572	<0.01	0.003	0.022	<0.0001	0.003	<0.001	0.001	0.181	0.012	0.069	0.06	0.06	1.21	0.08	1.89	9.48	10.5
	16/12/2016	8.25	1120	736	0.02	0.005	0.01	<0.0001	<0.001	<0.001	<0.001	0.093	0.003	<0.005	0.06	0.08	0.09	<0.01	0.17	11.6	11.6
Reg4	16/03/2016	9.31	896	588	<0.01	<0.001	0.031	<0.0001	0.002	<0.001	0.072	0.011	0.001	0.009	0.06	<0.05	0.41	0.06	<0.01	9.54	9.71
	27/06/2016	8.88	921	596	<0.01	<0.001	0.03	<0.0001	<0.001	<0.001	0.058	0.01	<0.001	<0.005	0.07	<0.05	0.37	0.03	0.01	10.5	9.31
	7/09/2016	11.6	1860	950	0.05	<0.001	0.082	<0.0001	0.011	<0.001	0.288	0.003	0.006	<0.005	0.07	<0.05	1.83	0.3	0.88	12.4	11.7
	16/12/2016	11.4	1500	751	0.01	<0.001	0.081	<0.0001	0.002	<0.001	0.291	<0.001	0.003	<0.005	0.05	<0.05	2.21	0.28	0.18	11.2	10.6
Reg5	16/03/2016	7.73	1930	959	0.02	0.002	0.04	<0.0001	<0.001	<0.001	0.006	0.85	0.008	0.023	<0.05	0.1	0.8	<0.01	0.1	20.7	18.7
	27/06/2016	7.35	1830	1210	<0.01	0.003	0.051	<0.0001	<0.001	<0.001	0.007	0.874	0.008	<0.005	0.06	0.18	0.56	<0.01	<0.01	21	18.5
	6/09/2016	Sample not obtainable[3]																			
	22/12/2016	7.85	1800	1110	0.02	0.001	0.041	<0.0001	<0.001	<0.001	0.006	0.704	0.006	0.015	0.06	0.1	0.71	<0.01	0.03	19.7	18.5
Reg5a	16/03/2016	Dry																			
	27/06/2016	Dry																			
	6/09/2016	Sample not obtainable[3]																			
	22/12/2016	Dry																			
Reg6	11/03/2016	8.05	2300	1250	<0.01	0.001	0.054	<0.0001	<0.001	<0.001	0.006	0.129	0.004	<0.005	0.06	<0.05	0.12	<0.01	<0.01	22.6	20.6
	21/06/2016	7.33	2240	1370	<0.01	<0.001	0.058	<0.0001	<0.001	<0.001	0.007	0.047	0.001	<0.005	0.07	<0.05	0.13	<0.01	0.01	21.9	19.4
	5/09/2016	8.16	2160	1080	<0.01	0.002	0.053	<0.0001	<0.001	<0.001	0.003	0.129	0.002	<0.005	0.08	0.08	0.1	<0.01	0.04	21.2	22.1
	23/12/2016	8.26	2050	1350	<0.01	0.001	0.069	<0.0001	<0.001	<0.001	0.02	0.071	0.002	<0.005	0.07	<0.05	0.2	0.03	0.02	20.3	18.6
Reg7a	11/03/2016	7.77	788	418	<0.01	0.008	0.076	<0.0001	<0.001	<0.001	0.001	0.711	0.002	0.029	<0.05	0.35	0.04	<0.01	0.02	8.11	8.57
	14/06/2016	7.77	758	374	<0.01	0.007	0.078	<0.0001	<0.001	<0.001	0.001	0.68	0.001	0.022	<0.05	0.31	0.03	<0.01	<0.01	7.54	7.69
	5/09/2016	7.49	790	416	<0.01	0.006	0.09	<0.0001	<0.001	<0.001	0.002	0.81	0.002	0.019	<0.05	0.44	0.03	<0.01	0.05	7.92	8.51
	15/12/2016	7.8	714	496	0.06	0.006	0.058	<0.0001	0.003	<0.001	<0.001	0.005	0.006	0.023	<0.05	<0.05	0.02	<0.01	0.56	7.75	7.28

Location	Date	pH Value	Electrical Conductivity @ 25°C	TDS @180°C	Aluminium (filt.)	Arsenic (filt.)	Barium (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Lithium (filt.)	Manganese (filt.)	Nickel (filt.)	Zinc (filt.)	Boron (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total Anions	Total Cations
		pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L
Reg10a	14/03/2016	Dry																			
	28/06/2016	Dry																			
	6/09/2016	Dry																			
	22/12/2016	Dry																			
Reg12	14/03/2016	7.97	2310	1260	<0.01	<0.001	0.072	<0.0001	<0.001	<0.001	0.035	0.146	0.004	0.069	0.1	<0.05	0.02	<0.01	<0.01	25	23.7
	27/06/2016	7.54	2240	1360	<0.01	<0.001	0.072	<0.0001	<0.001	<0.001	0.039	0.169	0.002	<0.005	0.09	<0.05	0.08	0.02	<0.01	25.8	21.6
	7/09/2016	7.89	1980	1000	<0.01	<0.001	0.082	<0.0001	0.001	<0.001	0.02	0.256	0.02	0.037	0.1	0.17	0.26	0.04	3.46	20.7	22.3
	16/12/2016	7.97	2060	1200	<0.01	<0.001	0.075	<0.0001	<0.001	<0.001	0.024	0.242	0.005	0.006	0.11	0.48	0.61	<0.01	0.25	22.4	22.1
Reg13	16/03/2016	9.83	3020	2190	0.01	<0.001	0.056	<0.0001	0.004	<0.001	0.275	0.004	0.003	0.022	0.07	<0.05	0.62	0.43	0.66	28.5	29.8
	21/06/2016	10.3	3060	2310	<0.01	0.001	0.038	<0.0001	0.001	<0.001	0.263	<0.001	<0.001	<0.005	0.06	<0.05	0.4	0.01	0.06	31.5	29.3
	7/09/2016	10.6	3130	2200	<0.01	<0.001	0.037	<0.0001	<0.001	<0.001	0.263	<0.001	<0.001	<0.005	0.07	<0.05	0.36	0.03	0.05	35	32.2
	23/12/2016	8.71	2460	1880	0.04	<0.001	0.071	<0.0001	0.003	<0.001	0.226	0.029	0.011	0.016	0.06	<0.05	1.39	1.2	0.8	24.7	25.9
Reg14	11/03/2016	8.01	983	504	<0.01	0.004	0.034	<0.0001	<0.001	<0.001	<0.001	0.306	0.004	0.007	<0.05	0.09	0.04	<0.01	<0.01	9.43	10.2
	14/06/2016	8.15	871	444	<0.01	0.004	0.044	<0.0001	<0.001	<0.001	0.001	0.17	0.002	0.01	<0.05	0.12	0.12	<0.01	0.04	8.58	8.57
	5/09/2016	7.96	921	519	<0.01	0.003	0.043	<0.0001	<0.001	<0.001	0.001	0.19	0.002	<0.005	<0.05	0.09	0.16	<0.01	0.04	8.56	8.56
	15/12/2016	8.12	856	600	<0.01	0.004	0.041	<0.0001	<0.001	<0.001	<0.001	0.154	0.002	<0.005	<0.05	0.08	0.16	<0.01	0.05	9.02	8.97
BCM01	14/03/2016	Dry																			
	27/06/2016	Dry																			
	7/09/2016	Dry																			
	16/12/2016	Dry																			
BCM03	14/03/2016	Dry																			
	28/06/2016	Dry																			
	5/09/2016	Dry																			
	15/12/2016	Dry																			

1 Unable to collect sufficient water to conduct full analysis suite.

2 RBO2 was not sampled in December 2016 as there was a blockage in the bore.

3 Sample could not be obtained due to wet weather preventing access to bore.

Private Groundwater Bores

Table E-3
Groundwater Levels

SWL	MOR1	MOR2	BRE2	WOL1	WOL2	School	Whan	Tralee	Morse	Bas1	Bas2	Teston
Jan-16	13.69	13.12	18.61	5.38	11.18	-[2]	4.37	20.03	21.57	-[3]	-[3]	-[3]
Jul-16	12.17	-[1]	18.81	5.25	-	-[3]	3.57	20.24	21.79	-[3]	-[3]	20.07

Shaded cells indicate dry bore.

1 Groundwater level could not be obtained due to wet weather preventing access to bore.

2 Groundwater level could not be obtained as personnel were unable to access the site.

3 Groundwater level could not be obtained as the site is a capped bore.

Table E-4
Groundwater Monitoring Results

Location	Date	pH Value	Electrical Conductivity @ 25°C	TDS @180°C	Arsenic (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Nickel (filt.)	Zinc (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total Anions	Total Cations
		pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L
MOR1	11/01/2016	8.11	1670	942	<0.001	<0.0001	0.002	<0.001	<0.001	0.018	<0.05	<0.01	<0.01	8.91	16.1	17.6
	25/07/2016	8.18	1560	894	<0.001	<0.0001	0.005	<0.001	0.001	0.087	<0.05	0.02	<0.01	8.99	16.3	17.3
MOR2	11/01/2016	7.75	145	75	<0.001	<0.0001	<0.001	<0.001	<0.001	0.028	0.38	0.19	<0.01	0.08	1.33	1.53
	25/07/2016	Sample not obtainable[1]														
BRE2	11/01/2016	8.28	2630	1520	0.007	<0.0001	<0.001	<0.001	<0.001	0.016	4.53	1.72	0.13	<0.01	27.5	28.6
	25/07/2016	8.01	2630	1440	0.008	<0.0001	<0.001	<0.001	<0.001	0.009	3.45	1.79	0.01	0.02	28.5	27.6
WOL1	11/01/2016	7.72	519	346	<0.001	<0.0001	<0.001	<0.001	<0.001	0.034	<0.05	0.02	<0.01	0.6	5.2	5.78
	22/07/2016	7.3	505	291	<0.001	<0.0001	0.005	<0.001	<0.001	0.024	<0.05	0.01	<0.01	0.6	5.43	5.19
WOL2	11/01/2016	8.24	673	417	<0.001	<0.0001	0.003	<0.001	0.001	0.057	<0.05	1.65	0.51	<0.01	6.67	7.52
	22/07/2016	Dry														
School	11/01/2016	Sample not obtainable[2]														
	22/07/2016	7.26	290	193	<0.001	<0.0001	0.006	<0.001	<0.001	0.077	<0.05	<0.01	<0.01	1	3.16	3.02
Whan	11/01/2016	7.87	452	292	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.005	<0.05	<0.01	<0.01	0.46	4.4	4.93
	22/07/2016	7.14	415	259	<0.001	<0.0001	0.002	<0.001	<0.001	0.009	<0.05	0.02	<0.01	0.66	4.19	4.11
Tralee	11/01/2016	7.8	1380	788	<0.001	<0.0001	<0.001	<0.001	0.009	0.065	16.8	0.54	0.02	0.07	14.7	16.6
	22/07/2016	7.33	1310	724	<0.001	<0.0001	<0.001	<0.001	0.009	0.071	11.2	0.26	0.06	0.03	14.9	15.6
Morse	11/01/2016	Sample not obtainable[2]														
	25/07/2016	7.25	852	516	<0.001	<0.0001	<0.001	<0.001	0.003	0.046	21.2	0.79	<0.01	<0.01	9.95	9.93
Bas1	11/01/2016	7.67	620	357	<0.001	<0.0001	<0.001	<0.001	0.002	0.008	0.11	0.01	<0.01	0.05	6.14	6.84
	22/07/2016	7.14	522	308	<0.001	<0.0001	<0.001	<0.001	0.003	<0.005	0.3	0.02	<0.01	<0.01	5.82	5.46
Bas2	11/01/2016	Sample not obtainable[3]														
	22/07/2016	Sample not obtainable[3]														
Teston	11/01/2016	Sample not obtainable[3]														
	22/07/2016	7.73	2370	1260	0.001	0.0004	0.004	<0.001	0.002	0.014	1.35	0.08	<0.01	0.57	23.8	25.2

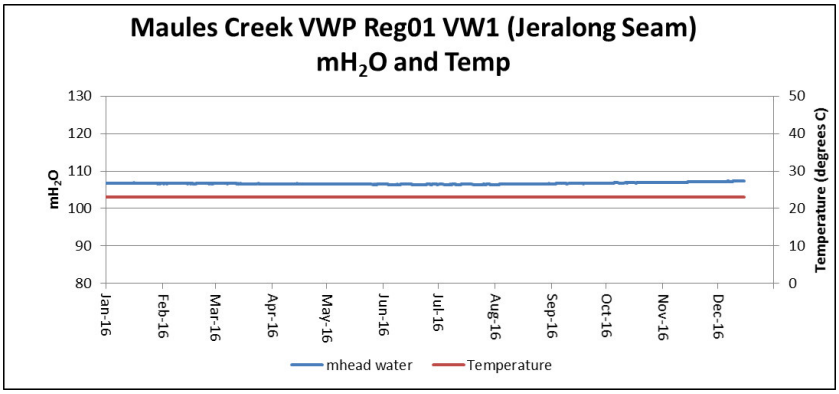
Analysis for Aluminium, Barium, Lithium, Manganese and Boron was not conducted in 2016 at privately owned bores.

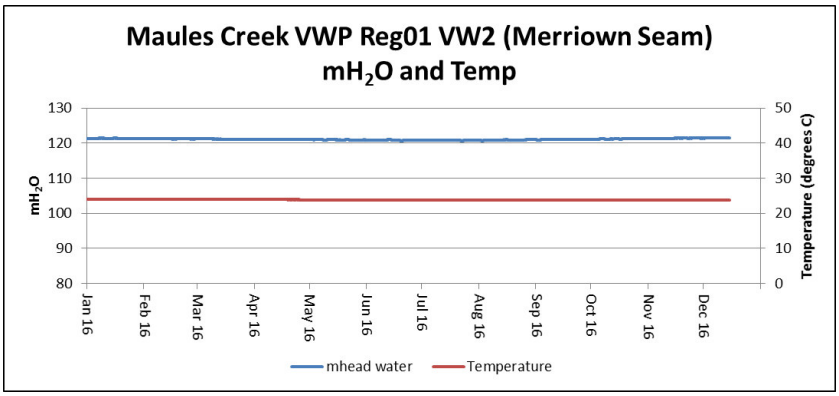
1 Sample could not be obtained due to wet weather preventing access to bore.

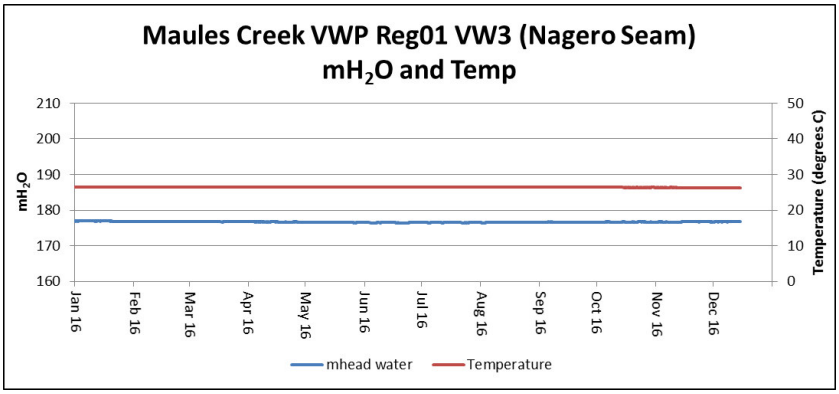
2 Sample could not be obtained as personnel were unable to access the site.

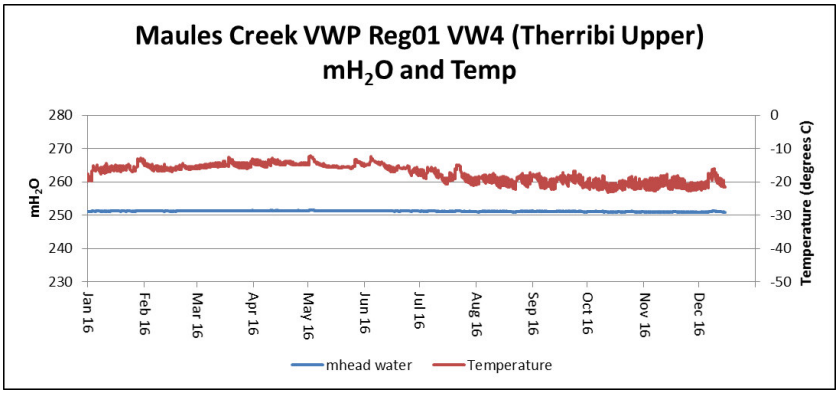
3 Sample could not be obtained as the site is a capped bore and the pump was not operating at the time of sampling.

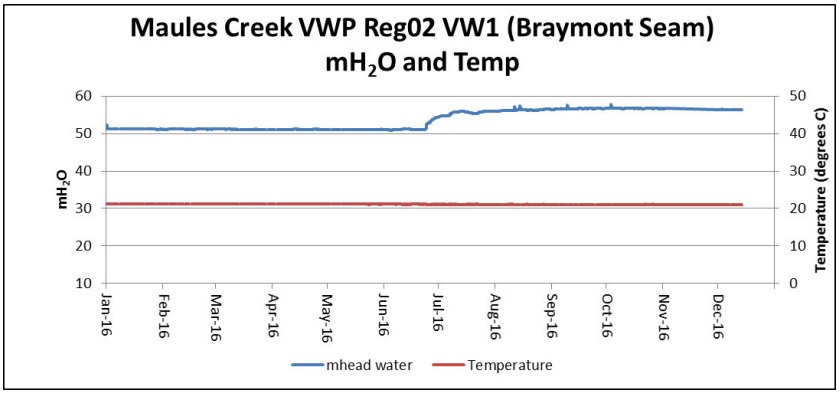
Vibrating Wire Piezometers

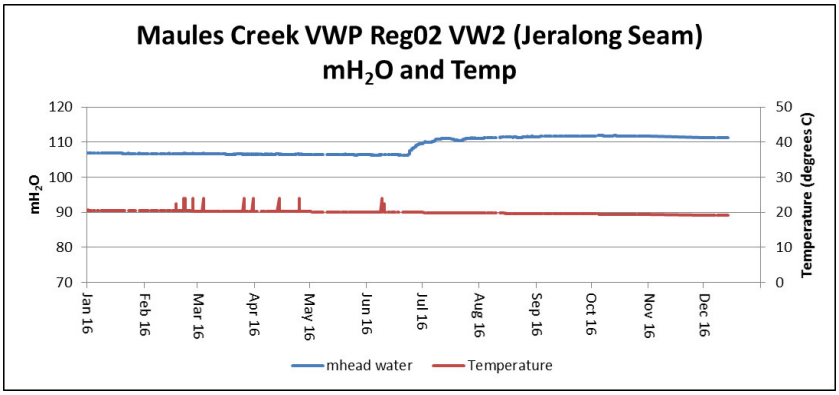


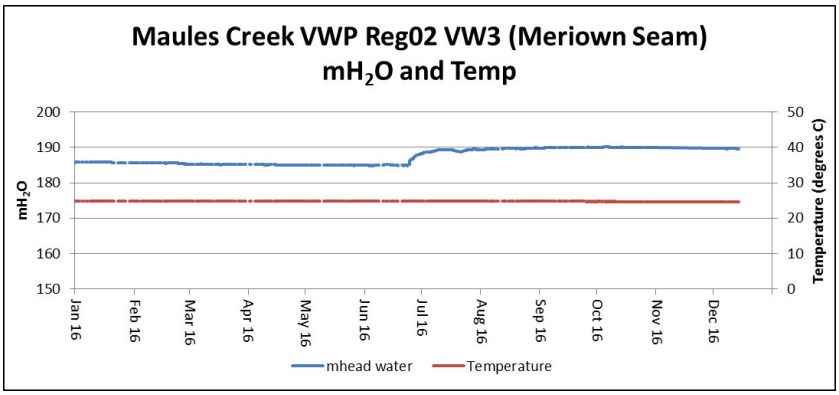


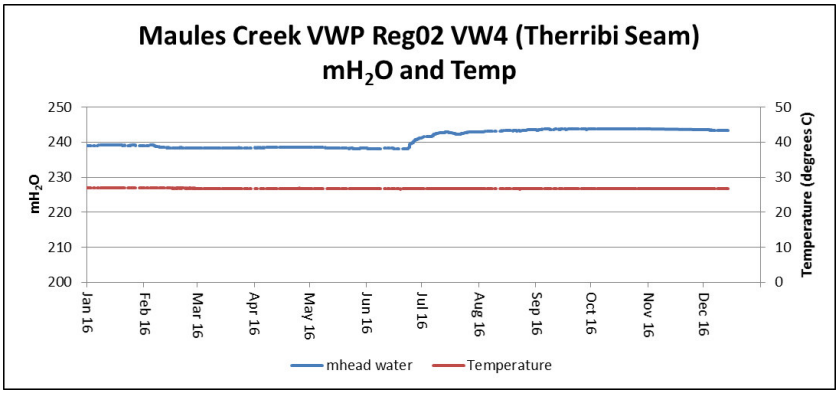


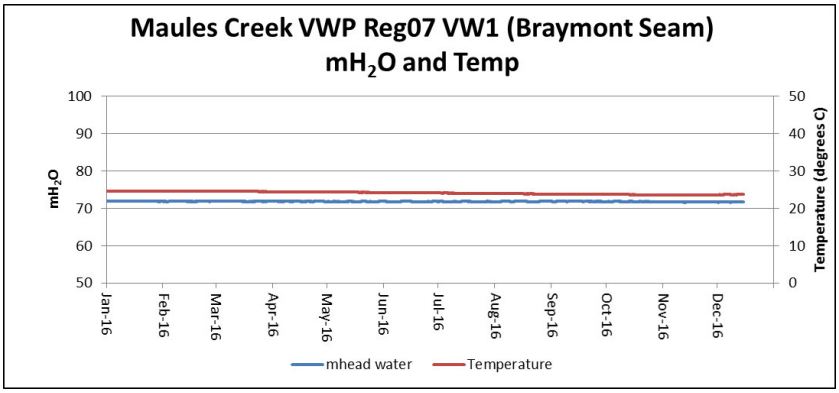


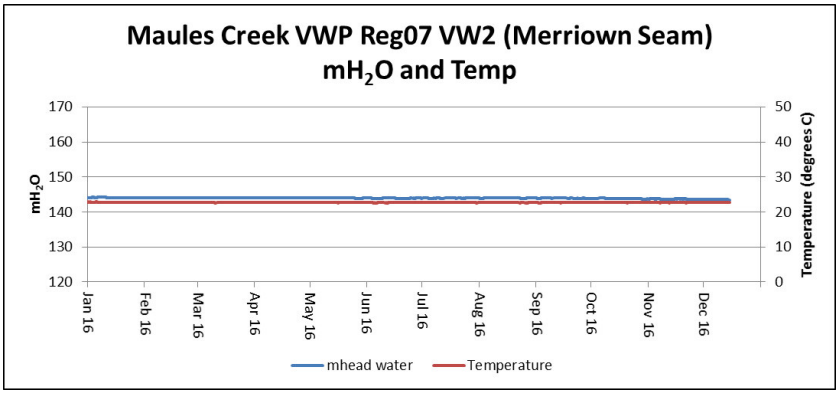

Maules Creek VWP Reg02 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
60
50
40
30
20
10
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

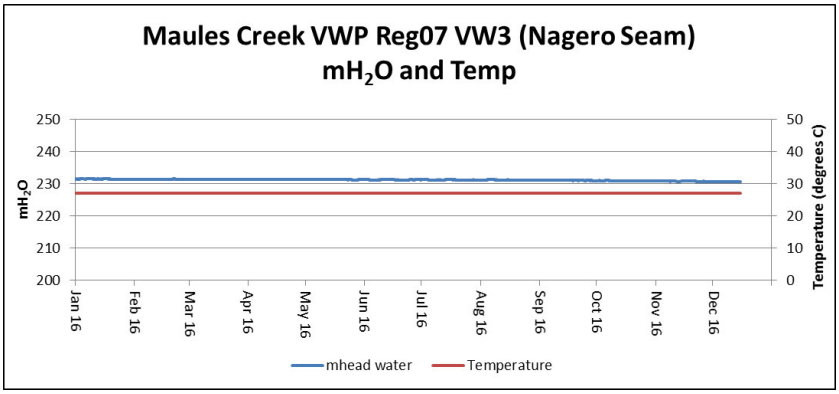

Maules Creek VWP Reg02 VW2 (Jeralong Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
120
110
100
90
80
70
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

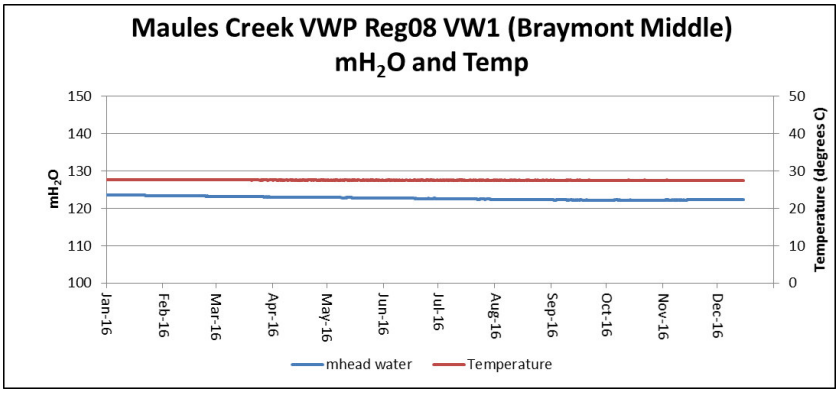

Maules Creek VWP Reg02 VW3 (Meriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
200
190
180
170
160
150
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

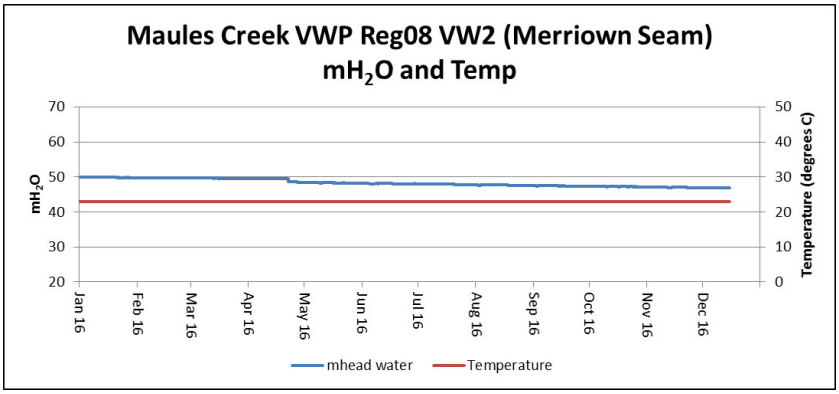

Maules Creek VWP Reg02 VW4 (Therribi Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
250
240
230
220
210
200
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

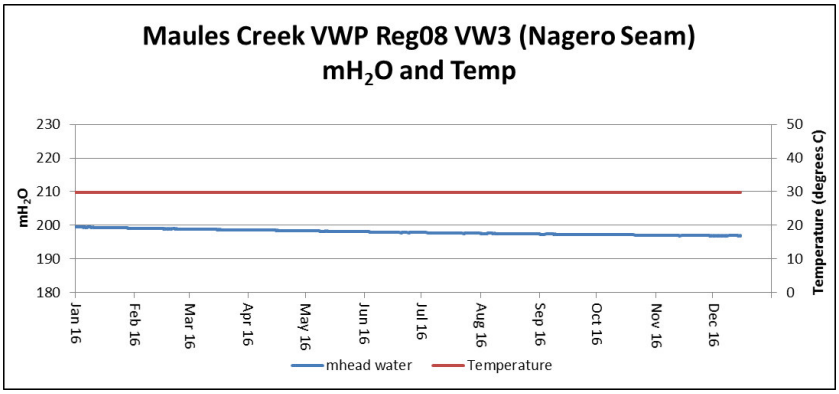

Maules Creek VWP Reg07 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
100
90
80
70
60
50
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

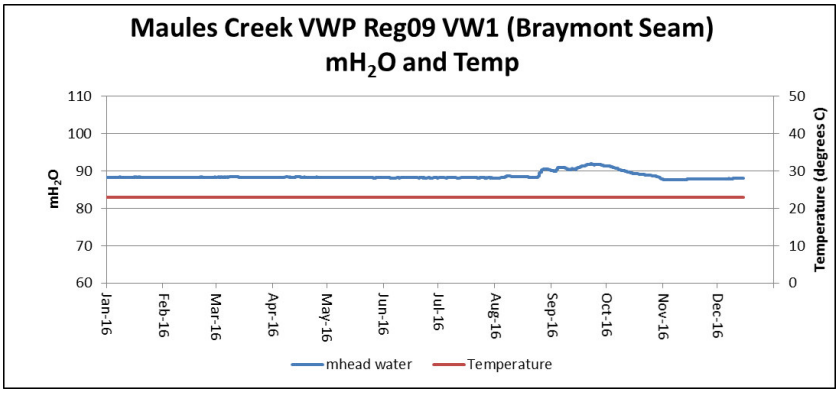

Maules Creek VWP Reg07 VW2 (Merriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
170
160
150
140
130
120
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

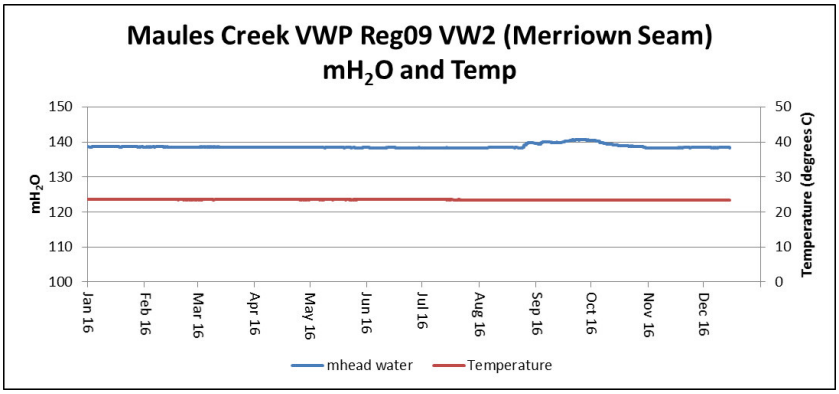

Maules Creek VWP Reg07 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
250
240
230
220
210
200
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

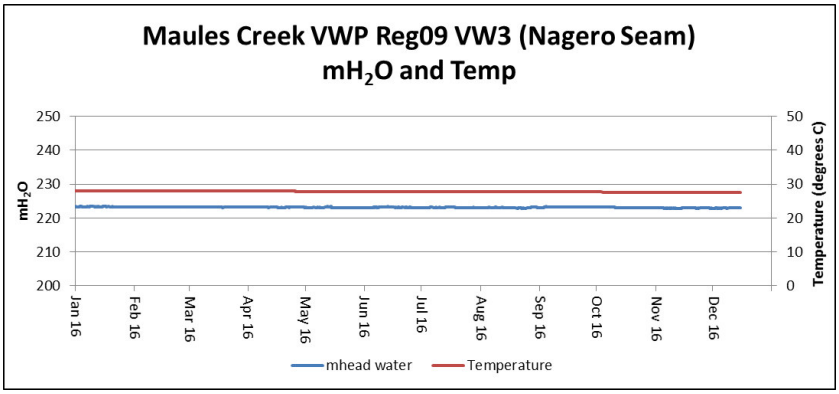

Maules Creek VWP Reg08 VW1 (Braymont Middle)
mH2O and Temp
150
140
130
120
110
100
mH2O
50
40
30
20
10
0
Temperature (degrees C)
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

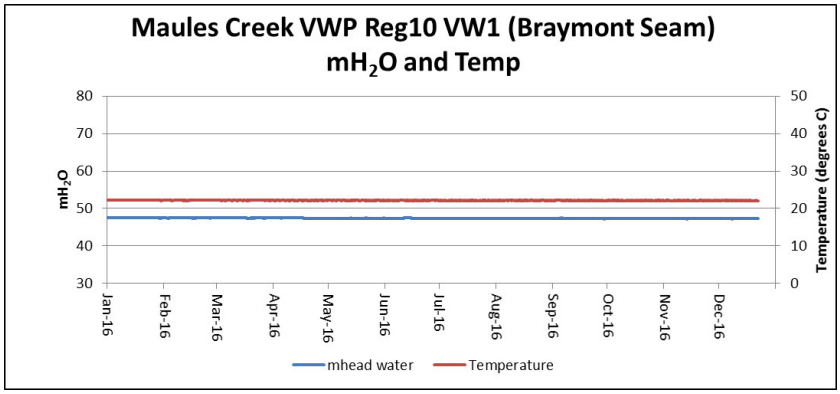

Maules Creek VWP Reg08 VW2 (Merriown Seam)
mH2O and Temp
70
60
50
40
30
20
mH2O
50
40
30
20
10
0
Temperature (degrees C)
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

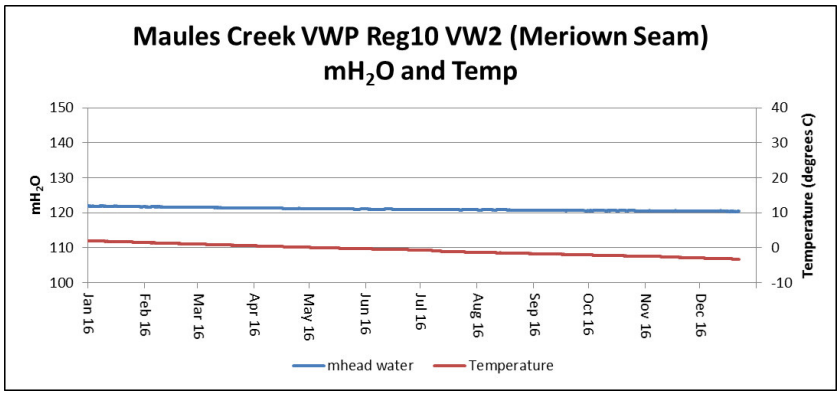

Maules Creek VWP Reg08 VW3 (Nagero Seam)
mH2O and Temp
230
220
210
200
190
180
mH2O
50
40
30
20
10
0
Temperature (degrees C)
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

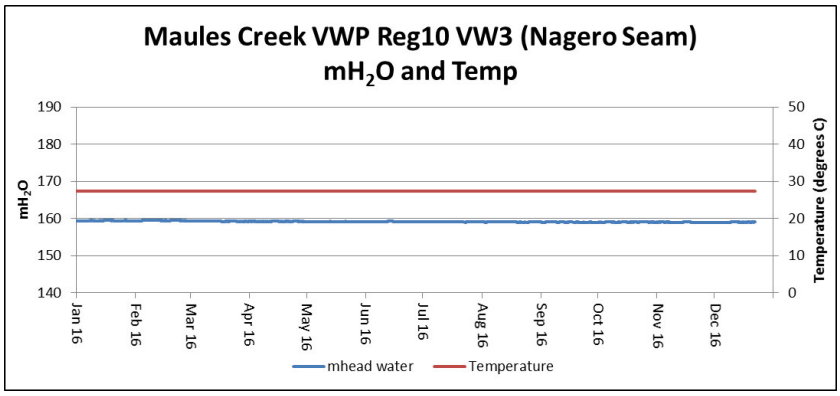

Maules Creek VWP Reg09 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
110
100
90
80
70
60
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

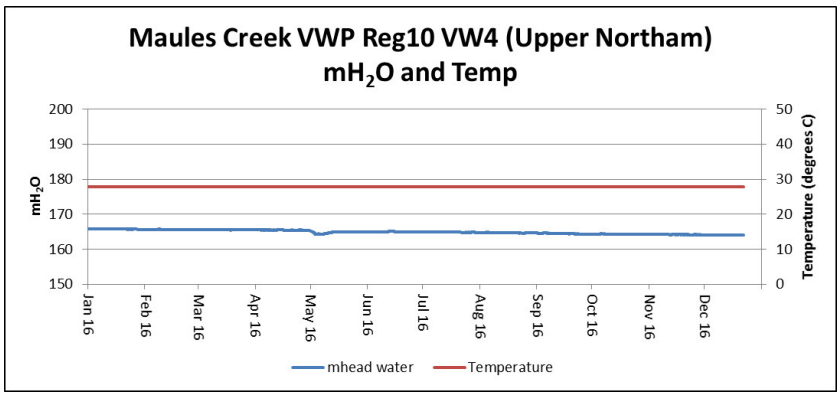

Maules Creek VWP Reg09 VW2 (Merriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
150
140
130
120
110
100
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

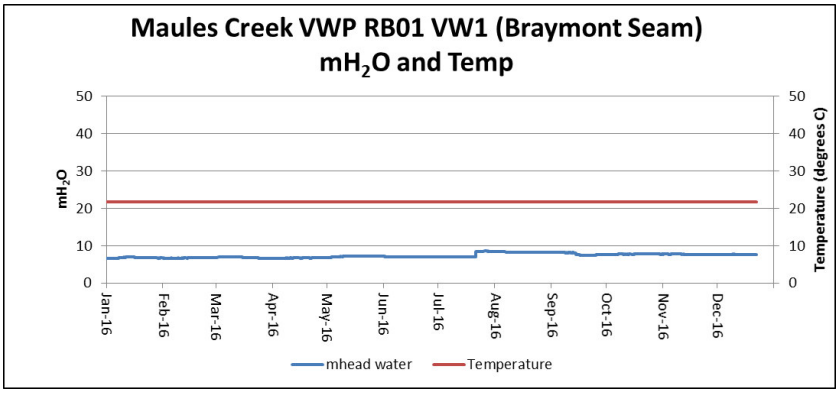

Maules Creek VWP Reg09 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
250
240
230
220
210
200
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

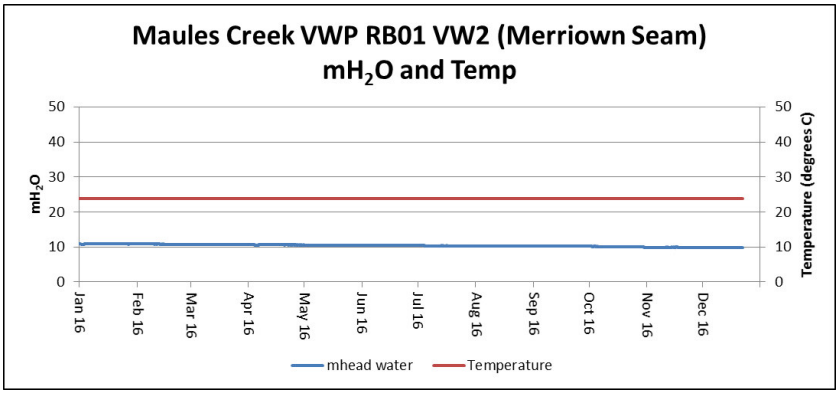

Maules Creek VWP Reg10 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
80
70
60
50
40
30
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

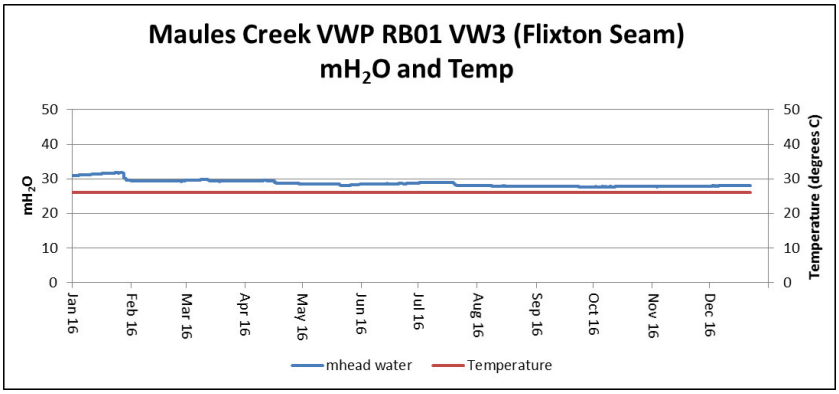

Maules Creek VWP Reg10 VW2 (Meriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
150
140
130
120
110
100
40
30
20
10
0
-10
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

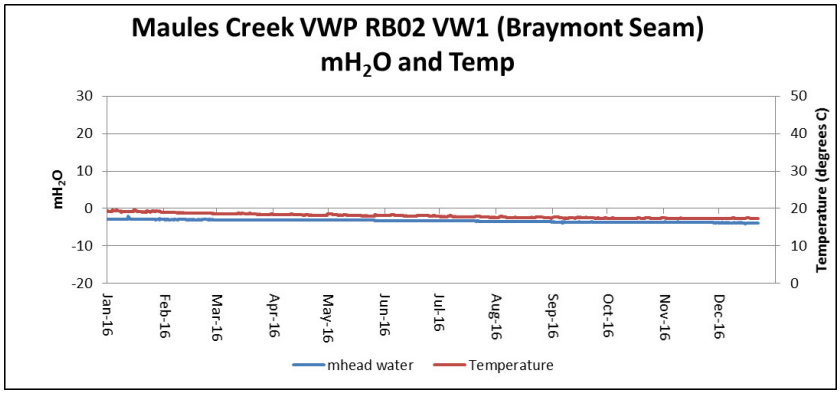

Maules Creek VWP Reg10 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
190
180
170
160
150
140
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

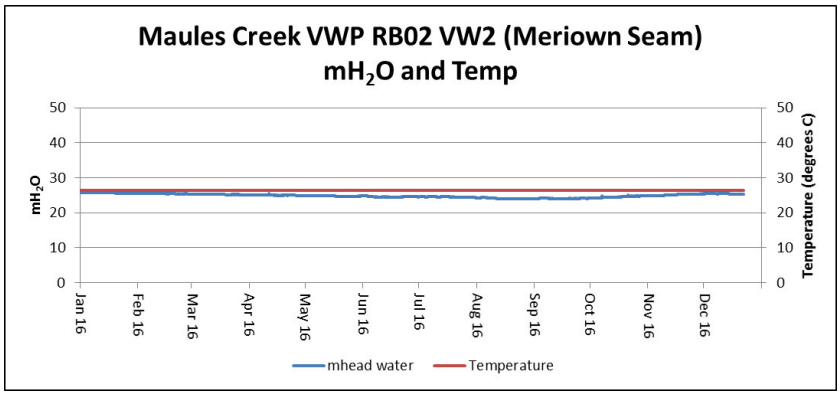

Maules Creek VWP Reg10 VW4 (Upper Northam)
mH2O and Temp
mH2O
Temperature (degrees C)
200
190
180
170
160
150
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

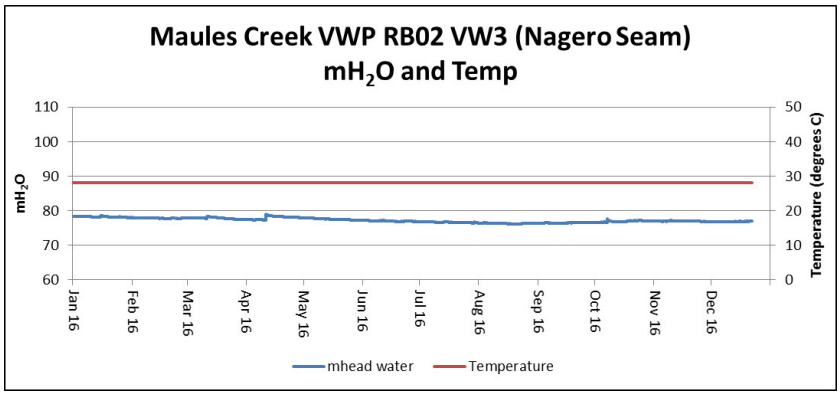

Maules Creek VWP RB01 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
0
10
20
30
40
50
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

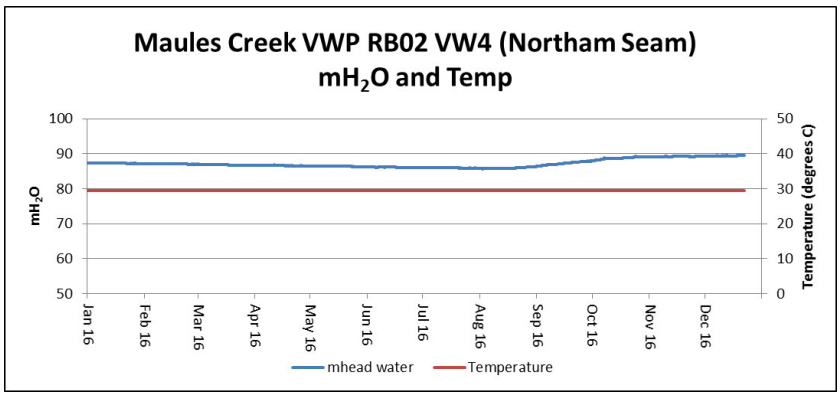

Maules Creek VWP RB01 VW2 (Merriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
0
10
20
30
40
50
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

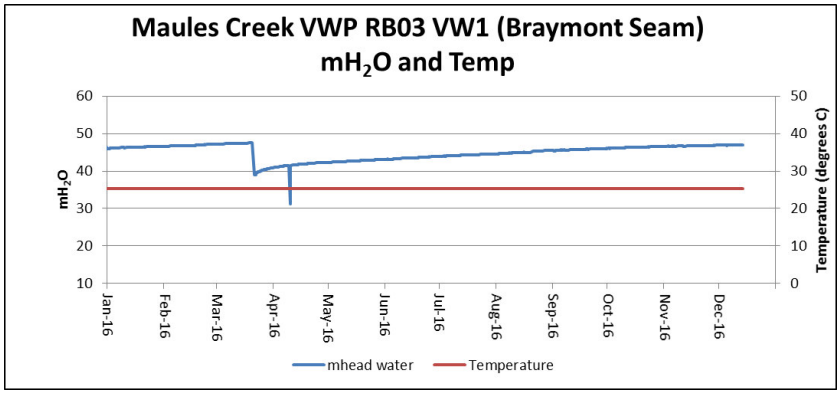

Maules Creek VWP RB01 VW3 (Flixton Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
0
10
20
30
40
50
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

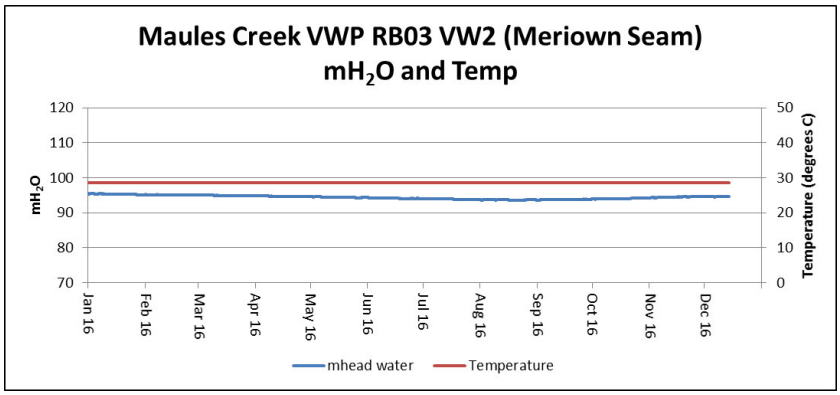

Maules Creek VWP RB02 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
30
20
10
0
-10
-20
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

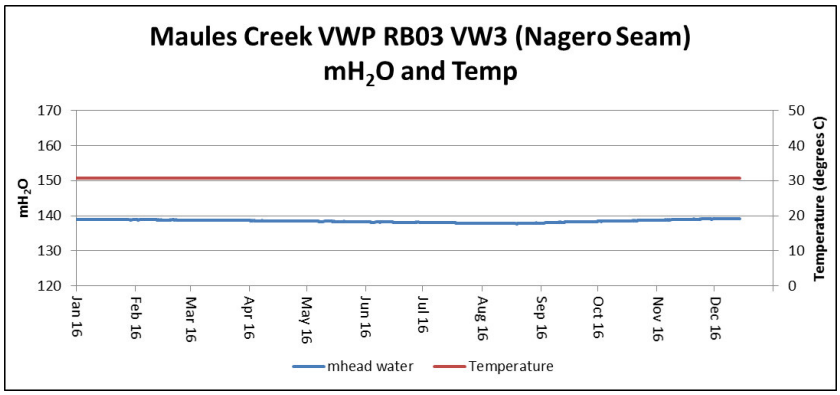

Maules Creek VWP RB02 VW2 (Meriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

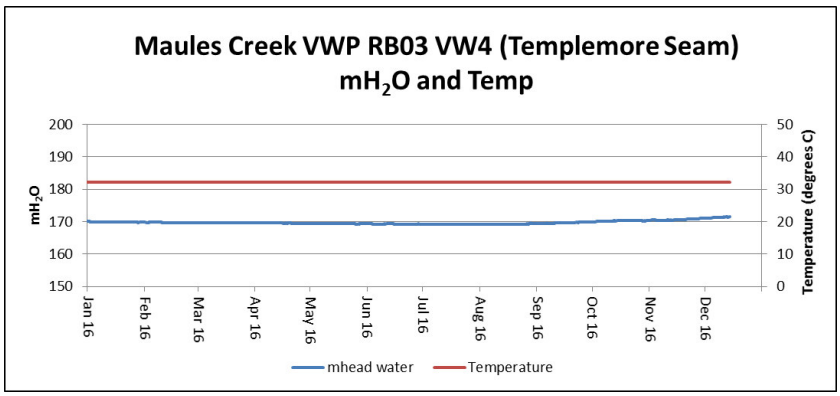

Maules Creek VWP RB02 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
110
100
90
80
70
60
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

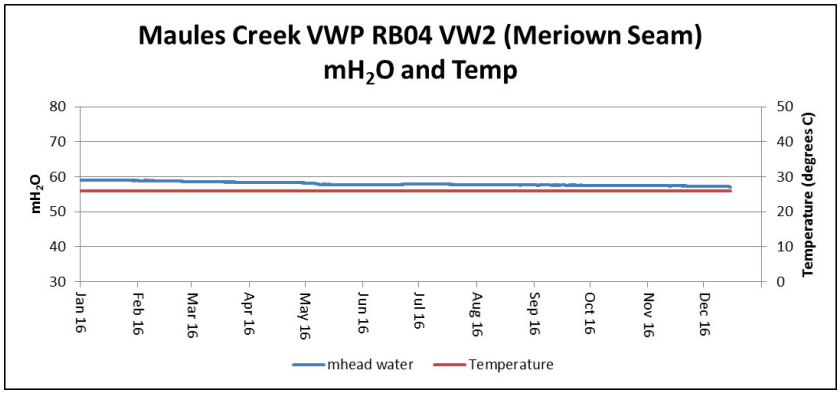

Maules Creek VWP RB02 VW4 (Northam Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
100
90
80
70
60
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

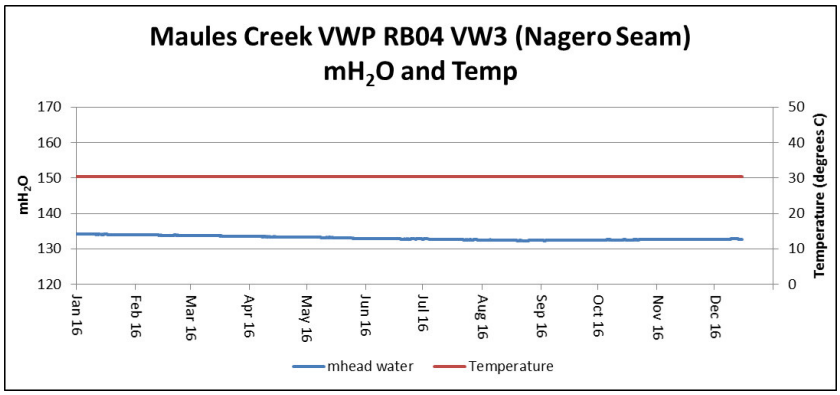

Maules Creek VWP RB03 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
60
50
40
30
20
10
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature

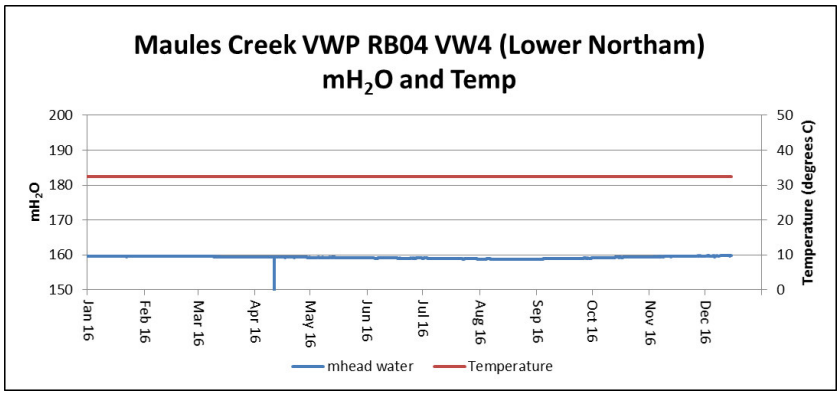

Maules Creek VWP RB03 VW2 (Meriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
120
110
100
90
80
70
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

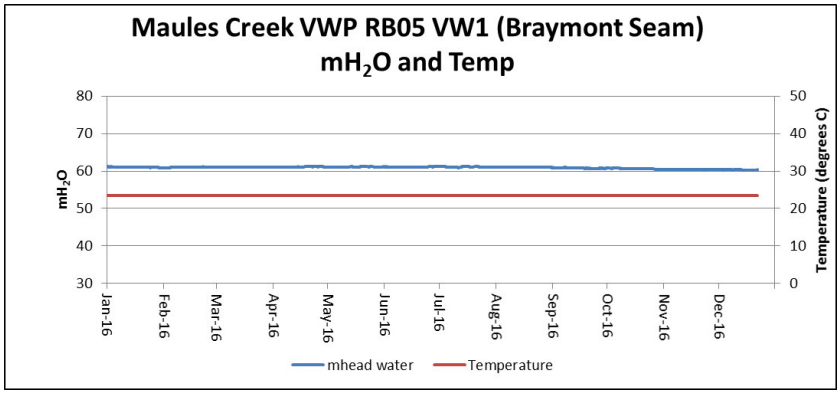

Maules Creek VWP RB03 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
170
160
150
140
130
120
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

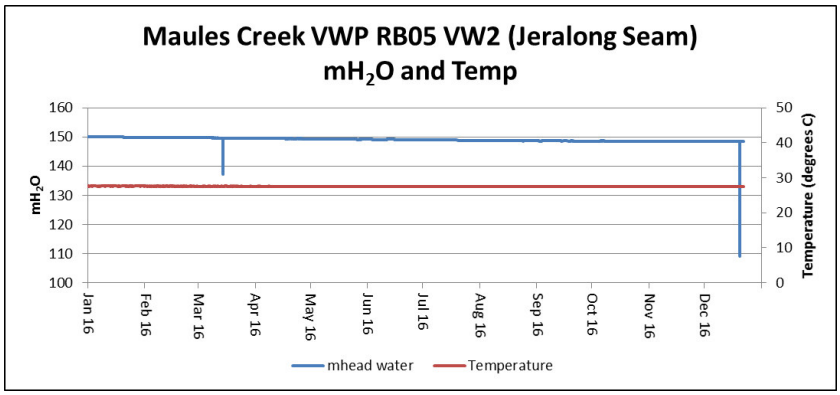

Maules Creek VWP RB03 VW4 (Templemore Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
200
190
180
170
160
150
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

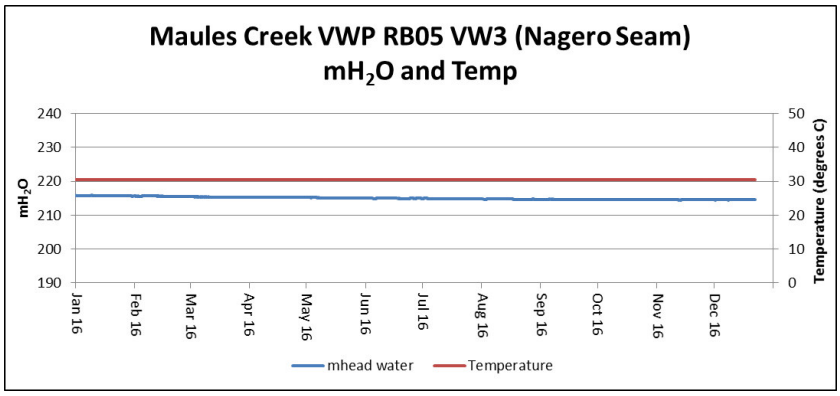

Maules Creek VWP RB04 VW2 (Meriown Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
80
70
60
50
40
30
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature

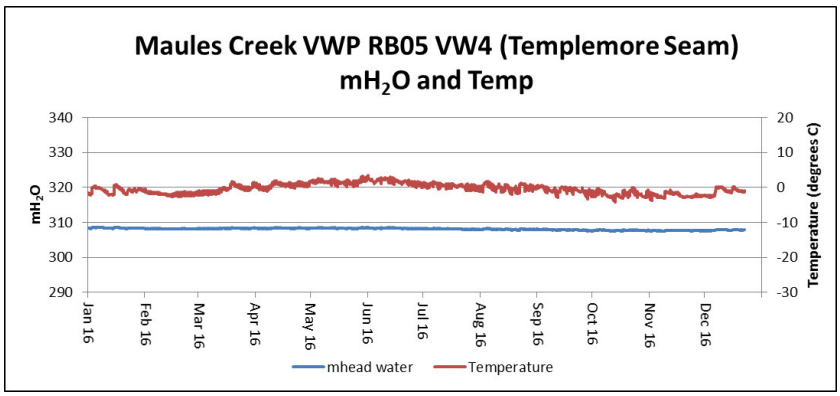

Maules Creek VWP RB04 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
170
160
150
140
130
120
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature


Maules Creek VWP RB04 VW4 (Lower Northam)
mH2O and Temp
mH2O
Temperature (degrees C)
200
190
180
170
160
150
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature


Maules Creek VWP RB05 VW1 (Braymont Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
80
70
60
50
40
30
50
40
30
20
10
0
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
mhead water
Temperature


Maules Creek VWP RB05 VW2 (Jeralong Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
160
150
140
130
120
110
100
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature


Maules Creek VWP RB05 VW3 (Nagero Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
240
230
220
210
200
190
50
40
30
20
10
0
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature


Maules Creek VWP RB05 VW4 (Templemore Seam)
mH2O and Temp
mH2O
Temperature (degrees C)
340
330
320
310
300
290
20
10
0
-10
-20
-30
Jan 16
Feb 16
Mar 16
Apr 16
May 16
Jun 16
Jul 16
Aug 16
Sep 16
Oct 16
Nov 16
Dec 16
mhead water
Temperature