

MAULES CREEK COAL MINE

2021 ANNUAL REVIEW

Table 1 Annual Review Title Block



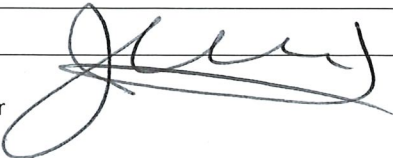
Name of Operation	Maules Creek Coal Mine
Name of Operator	Maules Creek Coal Pty Ltd
Development consent / Project Approval #	Project Approval 10_0138
Name of holder of development consent/project approval	Aston Coal 2 Pty Ltd.
Mining lease #	CL 375, ML1719 and ML1701.
Name of holder of mining lease	Maules 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 2
Name of holder of water licence	Aston Coal 2 Pty Ltd, ICRA MC Pty Ltd, J Power Australia Pty Ltd
MOP/ RMP start date	November 2018
MOP/RMP end date	January 2023
Annual Review Commencement Date	1 January 2021
Annual Review Completion Date	31 December 2021
<p>I, Jorge Moraga, certify that this audit report is a true and accurate record of the compliance status of Maules Creek Coal Mine for the period 1 January 2021 to 31 December 2021, and that I am authorised to make this statement on behalf of Maules Creek Coal Pty Ltd.</p> <p>Note.</p> <p>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.</p> <p>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).</p>	
Name of Authorised Reporting Officer	Jorge Moraga
Title of Authorised Reporting Officer	General Manager 

TABLE OF CONTENTS

1	STATEMENT OF COMPLIANCE	1
2	INTRODUCTION	4
2.1	PROJECT BACKGROUND AND DESCRIPTION	4
2.2	MINE CONTACTS	5
3	APPROVALS.....	8
4	OPERATIONS SUMMARY	14
4.1	EXPLORATION ACTIVITIES.....	14
4.2	CONSTRUCTION	14
4.3	MINING OPERATIONS	14
4.4	COAL HANDLING AND PROCESSING	15
4.5	OTHER OPERATIONS	15
4.6	NEXT REPORTING PERIOD.....	16
5	ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW.....	17
6	ENVIRONMENTAL PERFORMANCE.....	17
6.1	METEOROLOGICAL MONITORING	17
6.2	AIR QUALITY.....	19
6.3	GREENHOUSE GAS	27
6.4	NOISE	29
6.5	BLAST	36
6.6	BIODIVERSITY.....	39
6.7	ABORIGINAL CULTURAL HERITAGE.....	47
6.8	HISTORIC HERITAGE.....	49
6.9	TRAFFIC.....	50
6.10	WASTE MANAGEMENT.....	51
6.11	HAZARDOUS MATERIALS	52
7	WATER MANAGEMENT	54
7.1	WATER SUPPLY	54
7.2	SURFACE WATER MANAGEMENT	55
7.3	GROUNDWATER	61
7.4	SITE WATER BALANCE.....	70

8	REHABILITATION	71
8.1	REHABILITATION PERFORMANCE DURING THE REPORTING PERIOD.....	71
9	COMMUNITY	77
9.1	COMMUNITY ENGAGEMENT ACTIVITIES	77
9.2	COMMUNITY CONTRIBUTIONS & INITIATIVES	78
9.3	COMMUNITY COMPLAINTS	81
10	INDEPENDENT AUDITS	83
10.1	INDEPENDENT ENVIRONMENTAL AUDIT 2018.....	83
11	INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD	89
11.1	NON-COMPLIANCES	89
11.2	REPORTABLE INCIDENTS OR EXCEEDANCES	89
11.3	REGULATORY ACTIONS	89
12	ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD	90

LIST OF TABLES

Table 1	Annual Review Title Block.....	i
Table 2	Statement of Compliance	1
Table 3	Compliance Status Key.....	2
Table 4	Non-Compliances	3
Table 5	Licences, Leases and Approvals	8
Table 6	Production Summary	14
Table 7	Coal Transport.....	15
Table 8	Deposited Dust Monitoring Results	22
Table 9	NM1 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	31
Table 10	NM2 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	31
Table 11	NM3 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	32
Table 12	NM4 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	32
Table 13	NM5 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	33
Table 14	NM6 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$	33
Table 15	Summary of Blasting Results.....	37
Table 16	Traffic Survey Results.....	51
Table 17	Water Take For the 2020-2021 Water Year	54
Table 18	Groundwater Trigger Events.....	66
Table 19	Site Water Balance (Calendar Year 2021)	71
Table 20	Rehabilitation Objectives	72
Table 21	Rehabilitation Status.....	73

Table 22 Topsoil Balance	76
Table 23 Summary of Community Complaints and Enquiries.....	81
Table 24 IEA Recommendations and Actions	83
Table 25 Non-Compliance Details and Proposed Action Plan.....	89

LIST OF FIGURES

Figure 1 Project Locality Plan.....	6
Figure 2 Biodiversity Offset Areas	7
Figure 3 AWS Monitoring Location.....	18
Figure 4 Air Quality Monitoring Locations.....	21
Figure 5 Comparison of measured and predicted annual average PM ₁₀ levels (µg/m ³) Year 5	24
Figure 6 Comparison of measured and predicted annual average PM ₁₀ levels (µg/m ³) Year 10	25
Figure 7 Noise Monitoring Network Locations	34
Figure 8 Blast Monitoring Network Locations	38
Figure 9 Sediment Dam Monitoring Locations	57
Figure 10 Surface Water and Geomorphological Monitoring Locations	58
Figure 11 Groundwater Monitoring Locations	65
Figure 12 Mining Domains at Completion of the Reporting Period (2021)	74
Figure 13 Native Species Richness in the 20 x 20 m plots in 2020 and 2021.....	75

LIST OF APPENDICES

Appendix A Blast Monitoring Records	91
Appendix B Coal Transport Records.....	95
Appendix C Annual Sound Power Testing.....	105
Appendix D Surface Water.....	109
Appendix E Groundwater.....	120
Appendix F Attended Noise Monitoring.....	156
Appendix G DPE Response Table	165

**MAULES CREEK COAL MINE
2021 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 2021) and is summarised in Table 2. In addition, compliance with the Environment Protection Licence (EPL) has been assessed where required against the Project Approval, specifically Schedule 3, conditions 26, 30, 33 (c), 38 (b) and 40 (b).

Table 2 Statement of Compliance

Were 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) (applicable conditions as above)	Yes
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
WAL12791	Yes
WAL29467	Yes
WAL29588	Yes
WAL27385	Yes
WAL12479	Yes
WAL27383	Yes
WAL13050	Yes
WAL41585	Yes
WAL36641	Yes
WAL12491	Yes
WAL12480	Yes

Were all the conditions of the relevant approvals complied with?	Yes/No
WAL12645	Yes
WAL 12718	Yes
WAL 12722	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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 Documentation	Condition. #	Condition Description (Summary)	Compliance Status	Comment	Where addressed in Annual Review
PA10_0138	Schedule 3 Condition 12 a)	Ensure all equipment and noise control measures deliver sound power levels that are equal to or better than the MCC EA	Non-compliant	Technical non-compliance of a limited number of individual items. Overall site sound power level is compliant.	Section 6.4.2

2 INTRODUCTION

This is the ninth 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 Department Planning, Industry and Environment - Resources Regulator under the MCCM Mining Leases; and
- the routine reporting expectations of DPIE-Water.

Though primarily covering the period from 1 January 2021 to 31 December 2021 (the reporting period), where relevant the Annual Review provides information on historical aspects of the Maules Creek Coal Mine, longer term trends in environmental monitoring results and provides relevant information on activities to be undertaken during the ensuing reporting period, or beyond.

2.1 PROJECT BACKGROUND AND DESCRIPTION

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 MCCM's regional locality is illustrated in Figure 1.

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) 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. 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.

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.

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 and approved in January 2017 to amend the percentage of employee bus use to better reflect the locally residing workforce and associated transport regime.

A fourth modification to PA10_0138 was lodged in 2017 and withdrawn in 2018 in relation to sound power level conditions.

A fifth modification to PA10_0138 was Lodged in December 2019 and approved in January 2020 to allow for the installation of a water pipeline from the nearby, Whitehaven owned Olivedene property to the mining operation.

A sixth modification to PA10_0138 was Lodged in December 2019 and approved in January 2020 to allow for the installation of a water pipeline from the nearby, Whitehaven owned Brighton and Roma properties to the mining operation.

A seventh modification to PA10_0138 was Lodged in February 2021 and approved in August 2021 allowing for an extension of the Northern Emplacement footprint, and an increase to the maximum height of a section of the Northern Emplacement by 1 metre, incorporating macro and micro relief.

2.2 MINE CONTACTS

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

Name	Jorge Moraga
Title	General Manager
Address	Therribri Road, Boggabri, NSW 2382
Phone Number	02 6749 7800

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

Name	Talan Breaden
Title	Manager HSEC
Address	Therribri Road, Boggabri, NSW 2382
Phone Number	02 6749 7800

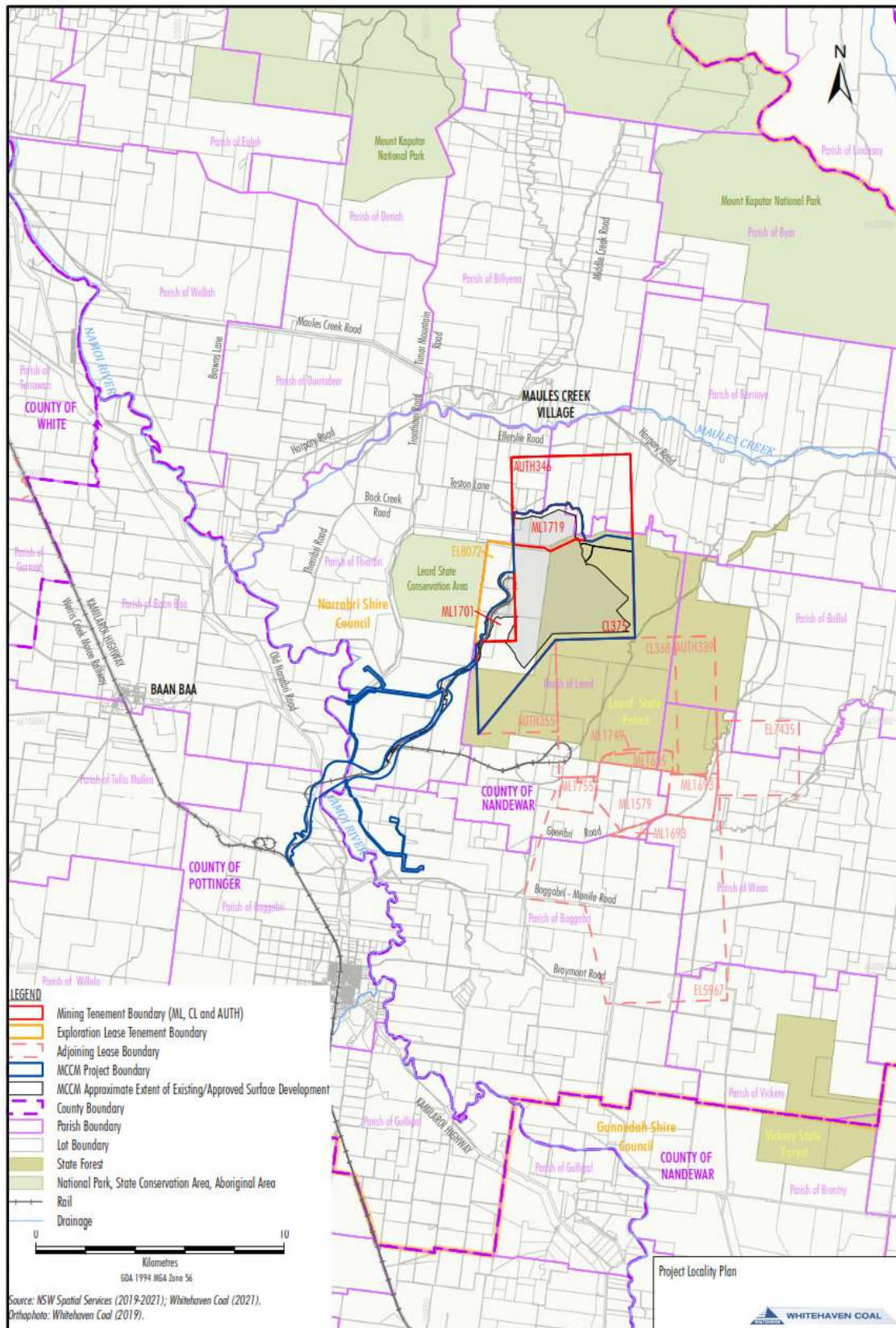


Figure 1 Project Locality Plan

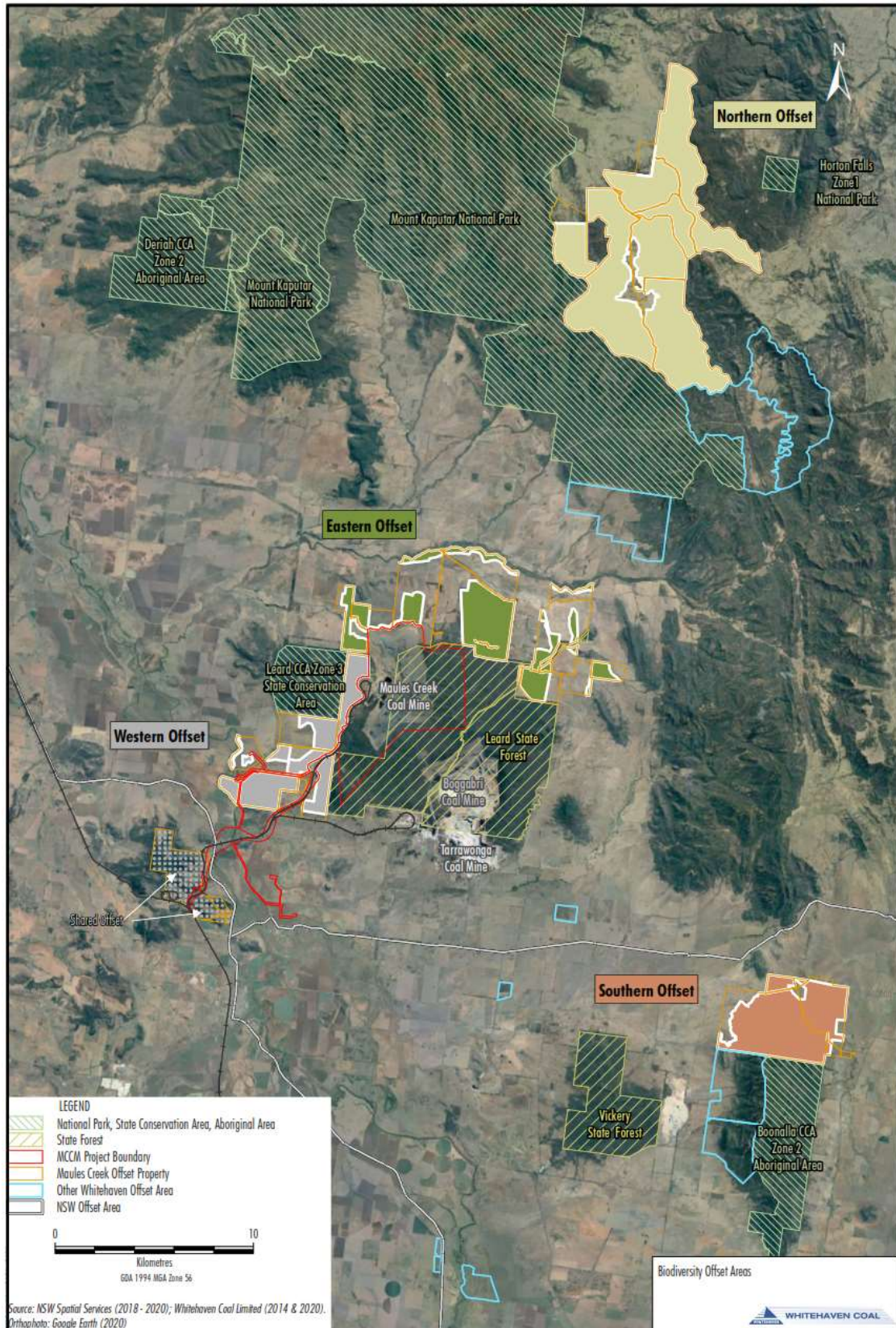


Figure 2 Biodiversity Offset Areas

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.	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
Project Approval Modification	PA 10_0138 (MOD3)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to amend the employee bus use percentage to better reflect the locally residing workforce and associated transport regime.	Granted on 13 January 2017
Project Approval Modification	PA 10_0138 (MOD5)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow the installation of a water pipeline from the nearby Whitehaven owned Olivedene property to the mining operation.	Granted on December 2019
Project Approval Modification	PA 10_0138 (MOD6)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow the installation of a water pipeline from the nearby, Whitehaven owned Brighton and Roma properties to the mining operation.	Granted on December 2019

Approval	Reference	Detail	Validity Dates
Project Approval Modification	PA 10_0138 (MOD7)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow for an extension of the Northern Emplacement footprint, and an increase to the maximum height of a section of the Northern Emplacement by 1 metre, incorporating macro and micro relief.	Granted on August 2021
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 (1270 ha).	Renewal Pending
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 an area west of ML1701 (303 ha)	Renewal pending
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 <i>Protection of the Environment Operations Act, 1997</i> (POEO Act).	Issued 2 May 2013
Mining Operations Plan Amendment B	MOP 2018-2022 Amendment B	Details mining and rehabilitation activities during the applicable period at MCCM.	Approved November 2020

Approval	Reference	Detail	Validity Dates
Mining Operations Plan Amendment B Letter Amendment	MOP 2018-2022 Amendment B Letter Amendment	Details mining and rehabilitation activities during the applicable period at MCCM.	Approved July 2021
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.	Updated 1 July 2021
Emergency Tailings Emplacement	N/A	Notification of High Risk Activity – Emergency Tailings Emplacement	Notification provided April 2015.
Surface Water Licence Water Supply Works and Water Use Approval	WAL41585	Previously 90SL101060. Water supply for mining and irrigation one overshot dam and a 150 millimetre (mm) Centrifugal Pump. 30 units. Under works approval 90CA834999	Converted to WAL41585 Renewed 1 July 2017. Expires 9 November 2025
Water Supply Works Approval	90WA801901 DWE Ref no: 90AL801900	Allows construction of a 610 mm Axial Flow Pump located on the Namoi River.	Issue date: 1/07/2004 Expiry date: 30/06/2027
Water Access Licence	WAL12811	135 ML with works approval 90CA807230. Upper Namoi Zone 5 Namoi Valley (Gins Leap to Narrabri) Groundwater Source.	Issue Date: 1/11/2006 Expiry Date: 6/11/2030
Water Access Licence	WAL12791	112 ML with works approval 90CA807180. Upper Namoi Zone 5, Namoi Valley (Gins Leap to Narrabri) Groundwater Source.	Issue Date: 1/11/2006 Expiry Date: 31/10/2026
Water Access Licence	WAL29467	306 ML water licence from porous rock water source for construction purposes. Refer 90WA822412	Issue Date: 16/01/2012 Expiry Date: 6/06/2025
Water Access Licence	WAL29588	0ML water licence from porous rock water source under works approval 90CA826925.	Issue Date: 16/01/2012 Expiry Date: 6/06/2022
Water Access Licence	WAL 27385	38 ML water licence from Namoi Groundwater Zone 4.	Granted 24 April 2012 for perpetuity.

Approval	Reference	Detail	Validity Dates
Water Access Licence	WAL12479	78 ML water licence from Namoi Groundwater Zone 11 under works approval 90CA807652.	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
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.	Issue Date: 1/07/2004 Expiry Date: 30/06/2027
Water Access Licence	WAL36641	800 ML water licence from Gunnedah-Oxley Basin MDB groundwater source.	Perpetuity
Water Access Licence	WAL12491	77 ML water licence from Upper Namoi Zone 11 under works approval 90CA807676	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Water Access Licence	WAL12480	215 ML water licence from Upper Namoi Zone 11 under works approval 90CA807654.	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Water Access Licence	WAL12645	35 ML water licence from Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap). Under works approvals 90CA806981	Issue Date: 1/11/2006 Expiry Date: 31/10/2026
		35 ML water licence from Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap). Under works approvals 90CA806830 & 90WA807004	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Water Access Licence	WAL12718	102 ML Water licence from the upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin'S Leap) Groundwater Source. Under works approval 90CA807012	Issue Date: 1/11/2006 Expiry Date: 19/05/2031

Approval	Reference	Detail	Validity Dates
Water Access Licence	WAL12722	77 ML water licence from Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin's Leap) Groundwater Source. Under works approval 90CA807023	Issue Date: 1/11/2006 Expiry Date: 27/05/2031
Bore Licence	90CA807230	Bore Constructed in the Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source. Works approval for WAL12811.	Issue Date: 1/11/2006 Expiry Date: 6/11/2030
Bore Licence	90CA807180	Bore Constructed in the Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source. Works approval for WAL12791.	Issue Date: 1/11/2006 Expiry Date: 31/10/2026
Bore Licence	90WA822412	Previously 90BL255704. Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source. Works approval for WAL29467.	Granted 16 January 2012 to 06 June 2025
Bore Licence	90CA826925	Gunnedah-Oxley Basin Mdb Groundwater Source. Works approval for WAL29588.	Issue Date: 16/01/2012 Expiry Date: 15/01/2022
Bore Licence	90CA807652	Upper Namoi Zone 11, Maules Creek Groundwater Source. Works approval for WAL12479.	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Bore Licence	90WA801901	Lower Namoi Regulated River Water Source. Works approval for WAL13050.	Issue Date: 1/07/2004 Expiry Date: 30/06/2027
Bore Licence	90CA807676	Upper Namoi Zone 11, Maules Creek Groundwater Source. Works approval for WAL12491.	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Bore Licence	90CA807654	Upper Namoi Zone 11, Maules Creek Groundwater Source. Works approval for WAL12480.	Issue Date: 1/11/2006 Expiry Date: 31/10/2029
Bore Licence	90CA807012	Bore Constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin'S Leap) Groundwater Source. Works approval for WAL12718.	Issue Date: 1/11/2006 Expiry Date 19/05/2031

Approval	Reference	Detail	Validity Dates
Bore Licence	90CA807023	Bore constructed in the Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin'S Leap) Groundwater Source. Works approval for WAL12722.	Issues Date: 1/11/2006 Expiry Date: 27/5/2031
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	90WA820120	Previously 90BL001144. Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source.	Granted 28 February 1939 for perpetuity. Converted 16 January 2012.
Bore License	90MW8333037	Gunnedah - Oxley Basin Murray Darling Basin Groundwater Source. Works approval for WAL36641	Perpetuity
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.
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

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. Core and chip holes were undertaken to further define coal quality, geotechnical and structural information.

4.2 CONSTRUCTION

During the reporting period the following construction works occurred:

- Construction of a new western clean water diversion dam, pump set, pipe and discharge infrastructure
- Construction of new in pit water fill point
- Upgrade of light vehicle wash bay to include ramps
- Construction of new electric pump stations for bore water transfer.
- Construction of new Security Hut
- Construction of Administration buildings
- Renovation of the Production Hub
- Relocation of Hanwha yard
- Concrete extension for Maintenance

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. Pre-mining clearance activities including ecological, archaeological and soil analysis were undertaken in line with the relevant approvals and management plans. The 2021 vegetation clearing activities were completed during the approved annual clearing period (15th February to the 30th April each year).

Topsoil was reclaimed from the area to be mined and stockpiled for later use on rehabilitation areas. Overburden is 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	81,000,000m ³ (MOP Year 1, 2017, Table 4)	66,329,608	64,955,104	74,320,336
ROM Coal	13 Million Tonnes (PA 10_0138 Sch. 2 Cond.6) > 5 Million Tonnes handled (EPL 20221)	11,746,975	12,379,894	13,000,000

Material	Approved limit	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Reject Material	NA	2,928,040	2,963,383	2,594,287
Saleable Product	12.4 Million Tonnes (PA 10_0138 Sch.2 Cond.9) > 5 Million Tonnes produced (EPL 20221)	8,870,352	9,368,961	10,405,713

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	3.61
Maximum Tonnes of product coal transported from the site (Mt)	12.4	9.19

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:

- Further exploration within ML 1701.
- Further delineation of outlying coal prospective areas.

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

4.6.2 Construction Activities

- Construction of new 22kv electrical transmission line from sub-station to electric pump set.
- Eastern high wall dams, piping and pumping included – Forecast completion March.
- Construction of lime dosing plant – Forecast completion Early February
- Construction of western infrastructure access road – Forecast completion July.
- Relocation of pipe works from SD3 to MWD – Forecast completion Early March.
- Mobile bypass crushing circuit

4.6.3 Mine Operations

The mine production rates are planned to ramp up to approximately 13 Mtpa of ROM coal and approximately 78.5 million bank cubic metres (Mbcm) of overburden during 2022.

Vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with relevant Environmental Management Plans. 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 by 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 2019-22 which are available on the Whitehaven Coal website.

4.6.5 Mining Fleet Upgrades

Fleet configuration is stable with no changes during 2021. As required, assets are converted to work in the Autonomous Haulage System where they receive additional hardware and software to make the compatible with the operating systems.

Additional procurement of mining fleet will be subject to mine planning requirements in 2022.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The DPIE requested consideration of several sections in the Annual Review. Appendix F includes a table summarising the feedback and the relevant section where this is addressed.

6 ENVIRONMENTAL PERFORMANCE

The following sub-sections report on the environmental performance achieved during the reporting period and provide 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 in Figure 3. The total annual rainfall recorded for the year was approximately 961.2 millimetres (mm). The annual rainfall total is above the average rainfall recorded in the EA. The maximum rainfall was recorded during November (231.8mm), which is higher than the historical average of (58.0mm). In addition, eight months across the 2021 calendar year produced rainfall results above the mean rainfall recorded in the EA.

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. The average temperature during the reporting period was 17°C, a minimum temperature of -3.9°C was recorded in July and a maximum temperature of 37.7°C was recorded in January. Each month of the reporting period recorded an average wind direction from the southern quadrants, with south easterly winds predominating for a total of seven months.

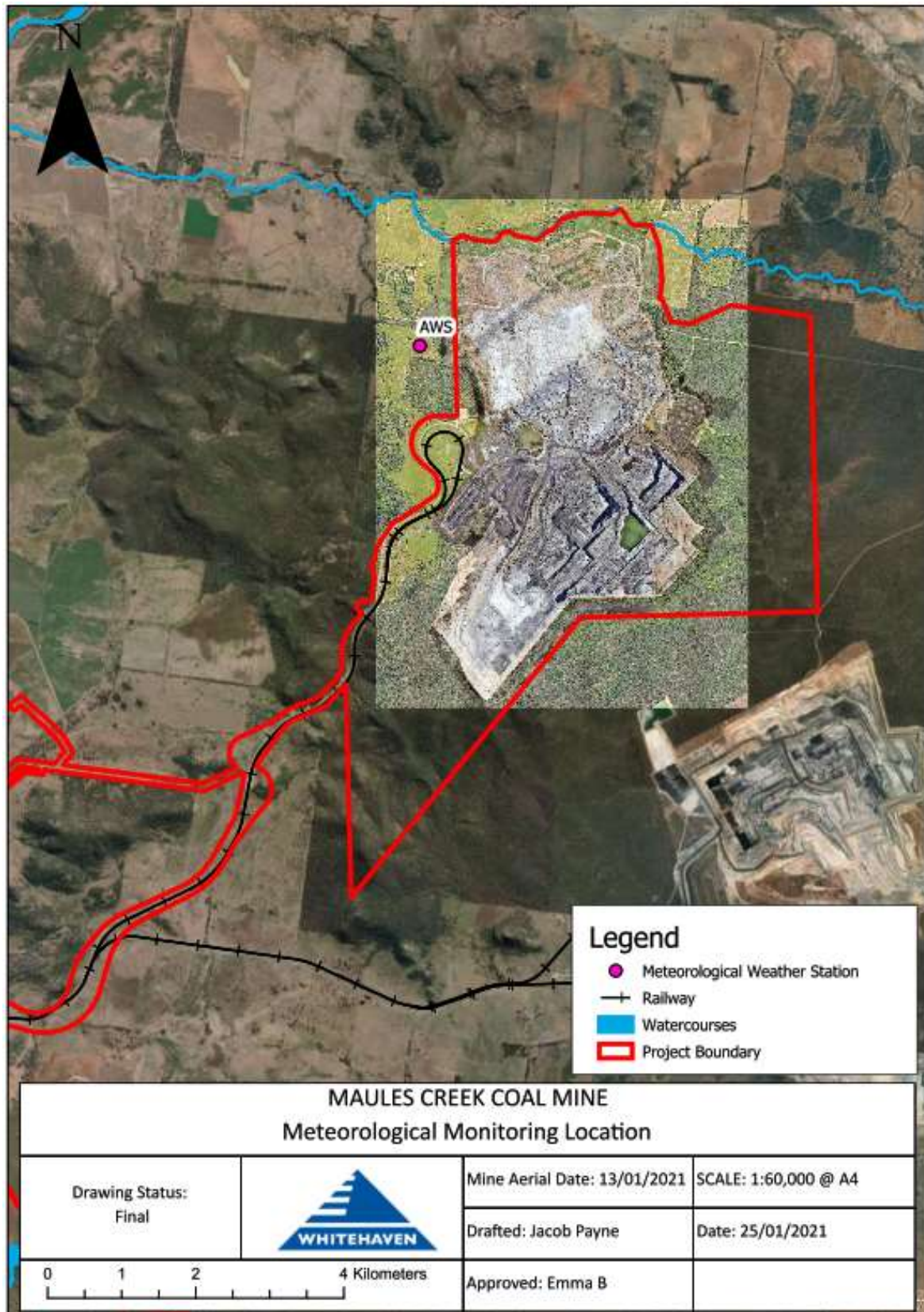


Figure 3 AWS Monitoring Location

6.2 AIR QUALITY

6.2.1 Environmental Management

Potential impacts to air quality are managed in accordance with the:

- Air quality criteria prescribed under schedule 3 condition 29 of the Project Approval;
- Relevant EPL conditions; and
- The MCC Air Quality and Greenhouse Gas Management Plan (AQGGMP).

Maules Creek Coal Mine implements a range of controls to manage dust, including but not limited to:

- Utilising water carts across the site with water fill points appropriately positioned. Additional contractor water carts are also employed around infrastructure areas and light vehicle roads, together with during clearing, mulching and topsoil stripping activities;
- Use of a dust suppressant additive on targeted haul roads;
- Visual dust assessments regularly undertaken on haul roads;
- Modification of work practices where required including changing dumping strategies;
- Temporary cessation of operational equipment as required;
- Predictive controls and Air Quality Trigger Action Response Plan (TARP) together with 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;
- Operation of a real time SMS alarming system notifying of elevated dust levels;
- Site vehicles restricted to designated routes, with speed limits enforced;
- 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;
- Additional units within the air quality monitoring network; and
- Meteorological monitoring system used to identify conditions pertaining to elevated dust risk.

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

- Continuous monitoring of PM₁₀ levels at the MCC TEOM (TEOM1). These results are available publically via the EPA website. It is noted that the location MCC TEOM2, shown on Figure 4 is located on mine owned land and the results are used by MCC for internal management purposes only.
- A third TEOM (TEOM 3) was installed in the Maules Creek area for management purposes during late 2017. This was commissioned as a recommendation from the Katestone Dust Benchmarking Study.
- TEOM3 was relocated to a new property in the Maules Creek area during the 2020 calendar year.
- PM₁₀ levels are measured at a High Volume Air Sampler (HVAS) on a twenty-four hour basis every six days. Total Suspended Particulate Matter (TSP) is inferred from the measured PM₁₀ data.
- A network of four dust deposition gauges (DDG's), measuring deposited dust and particulates on a monthly basis.
- Additional sampling units (E-sampling trailer units) to provide input data for the predictive air quality monitoring software.

In addition to the above, the Boggabri - Tarrawonga - Maules Creek (BTM) Air Quality Management Strategy (AQMS) was approved in 2017. Predictive air quality modelling simulation software is fully implemented to

inform operational risk. During the reporting period new predicative air quality software was trialled and implemented across the BTM

The NSW Office Environment & Heritage (OEH) and the NSW EPA installed a number of TEOM monitoring units in late 2017. The Namoi Region Air Quality Advisory Committee was established by the Minister for the Environment of which Whitehaven Coal is a stakeholder on the committee.

Daily ambient air quality data for PM10 and PM2.5 particulate sizes from the Maules Creek TEOM1 monitoring unit is provided and published on the OEH managed air quality website. This has occurred since 2016 prior to the establishment of the Namoi Region Air Quality Monitoring Project.



Figure 4 Air Quality Monitoring Locations

6.2.2 Environmental Performance

A summary of the depositional dust air quality monitoring results at MCCM for the 2021 reporting period is provided in Table 8 .

Table 8 Deposited Dust Monitoring Results

Month	MC1 (g/m ²)	MC2 (g/m ²)	MC3 (g/m ²)	MC4 (g/m ²)
January	10.5 ^C	2.4	3.3	0.8
February	4.7 ^C	3.0	2.1	1.5
March	1.4	2.7	2.4	1.2
April	1.2	2.2	0.5	0.3
May	3.0	2.0	3.2	1.1
June	4.3 ^C	0.9	0.9	0.2
July	4.1 ^C	3.6	0.7	3.8
August	0.7	1.3	0.3	2.6
September	0.5	6.2 ^C	1.4	0.3
October	2.3	0.8	1.0	0.3
November	12.9 ^C	3.6	1.6	0.6
December	6 ^C	0.8	2.1	1.1
Annual Average	1.52	2.12	1.63	1.15

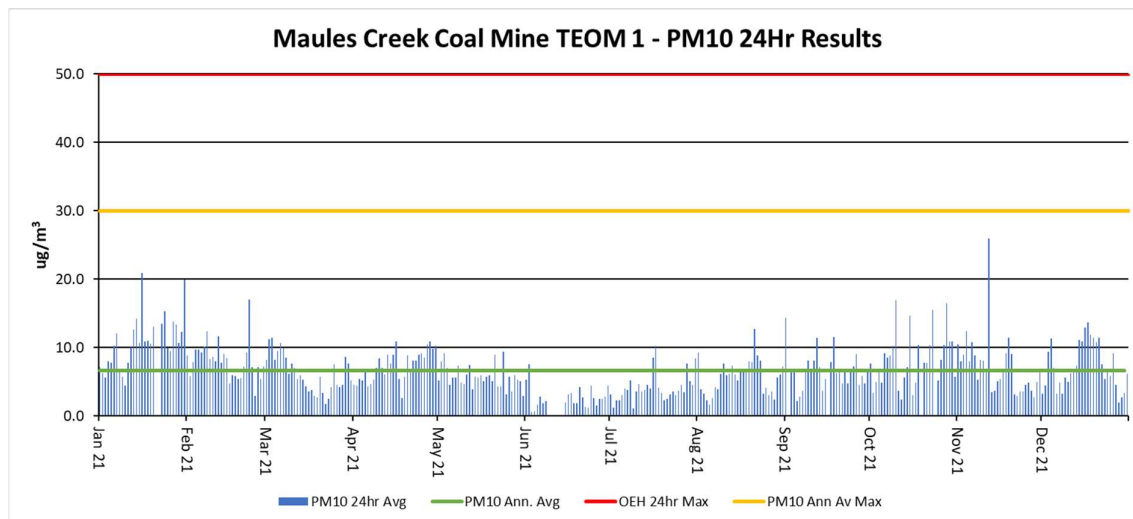
C = Results contaminated by deposits deemed unrelated to mining activities (bird droppings, insects and vegetation).

Deposited dust monitoring data demonstrated compliance with the Project Approval (<4g/m²) throughout the 2021 calendar year. The highest deposited dust recorded in the 2021 varied across a range of months. As such MC1 shows May (3.0 g/m²), MC2 shows July & November (3.6 g/m²), MC3 shows January (3.3 g/m²), and MC4 shows July (3.8 g/m²). Dust gauge results can be significantly impacted by localised sources (e.g. due to dust from livestock, agriculture, lawn mowers, cars travelling on local dirt roads, etc.) and are susceptible to contamination from organic material (such as plant detritus and droppings from birds which often perch on the gauges). As dust fallout generally occurs within relatively close proximity to sources, elevated dust gauge results are often caused by sources nearby to the monitor. However during certain meteorological conditions results can also be influenced by sources further afield and larger scale events such as regional dust storms.

The annual average deposited dust levels measured during 2021 have been compared with the modelling predictions for Year 5 and Year 10. For the purpose of assessing compliance with approved modelling the level excluding contaminated data has been considered. The measured annual average deposited dust levels in 2021 were elevated compared with the modelling predictions. It is however noted that the modelling predictions from the AQA used an annual average deposited dust background (contribution from non-mining sources) of 0.5 g/m² /month whilst the historical pre mining era deposited dust monitoring data (collected from 1982 to 1986) presented in the AQA show an annual average of 1.9g/m² /month deposited dust in the area. It is therefore considered that the background deposited dust concentration was potentially underestimated in the modelling. If an approximate background of 1.9g/m² /month were adopted in the predicted levels, the measured annual average deposited dust levels (excluding contaminated data) in 2021 would generally be well aligned with the predicted levels.

PM₁₀ 24Hr and Annual Average (TEOM1)

Elevated results above the 24 hour average did not occur during the reporting period. The annual average continues on a downward trend from previous years, this is attributable to an increase in regular rainfall throughout the year improving soil moisture and promoting vegetation regrowth. The 2021 annual average for PM₁₀ was 6.6ug/m³.



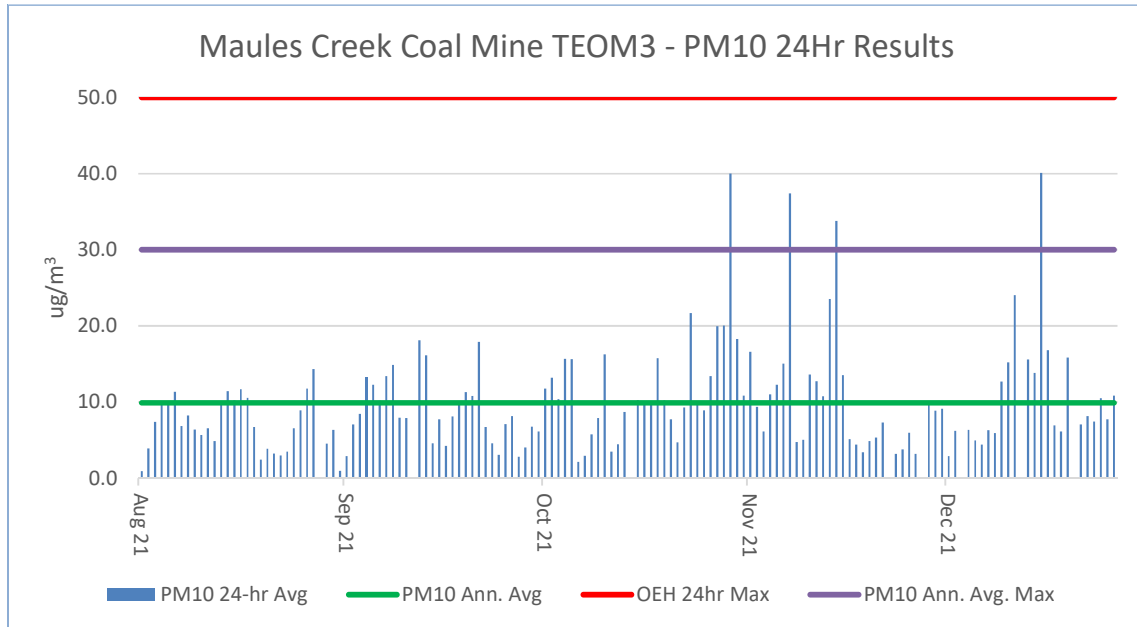
Graph 1: PM₁₀ 24Hr and Annual Average Results (TEOM1)

The annual average PM₁₀ levels measured during 2021 have been compared with the modelling predictions for Year 10. The measured annual average PM₁₀ data in 2021 were in general found to align well with the modelling predictions (**Figure 5** and **Figure 6**).

PM₁₀ 24Hr and Annual Average (TEOM3)

During the reporting period, elevated results above the 24 hour average did not occur, this is a decrease from the eleven occurrences from 2020.

Data from TEOM3 ceases on the 18th of August 2020 until it was relocated to a new location. As stated in the previous reporting period, TEOM3 was awaiting a permanent power supply and associated infrastructure to be installed. Returning to operations again in August 2021. For the period of operation at the new location the Figure 4 shows the new location in relation to Maules Creek Coal’s other air quality monitoring equipment.



Graph 2: PM₁₀ 24Hr and Annual Average Results (TEOM3)

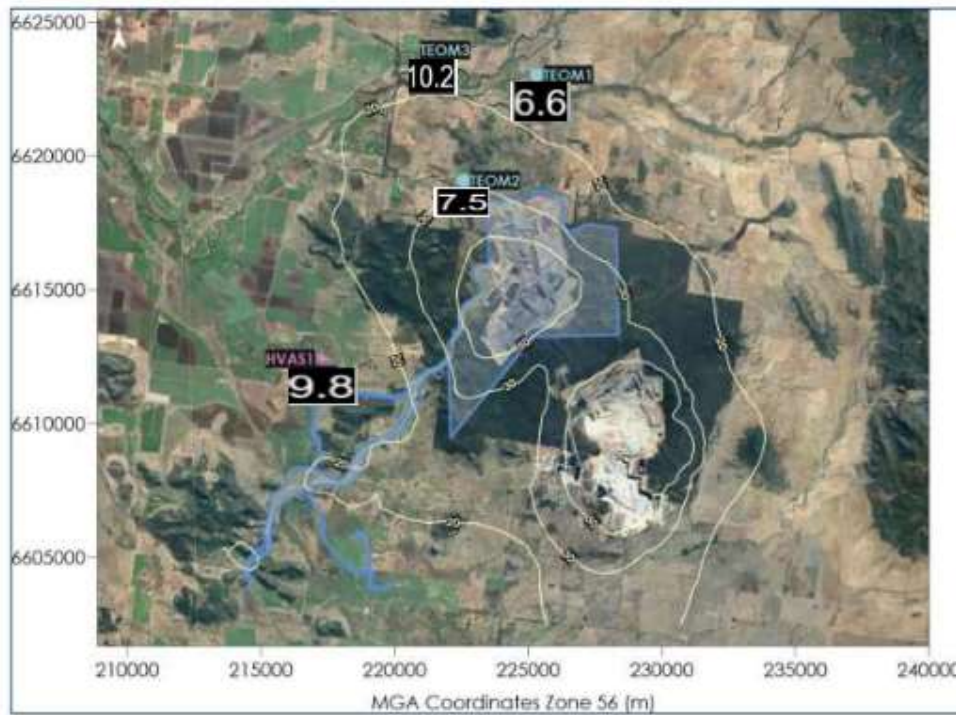


Figure 5 Comparison of measured and predicted annual average PM₁₀ levels (µg/m³) Year 5

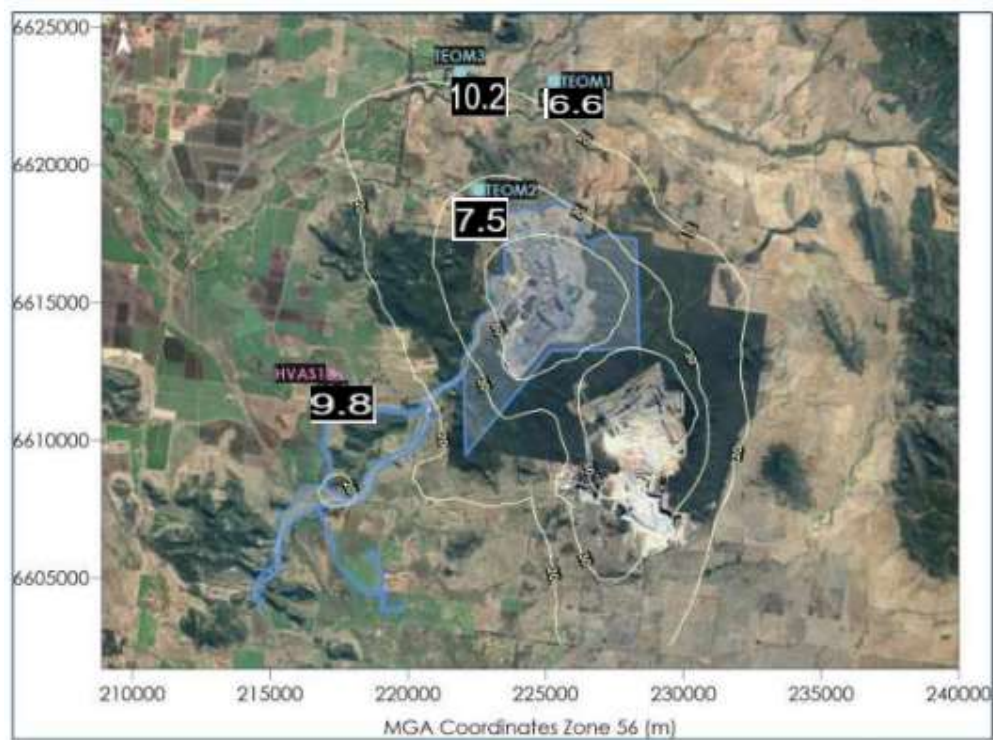
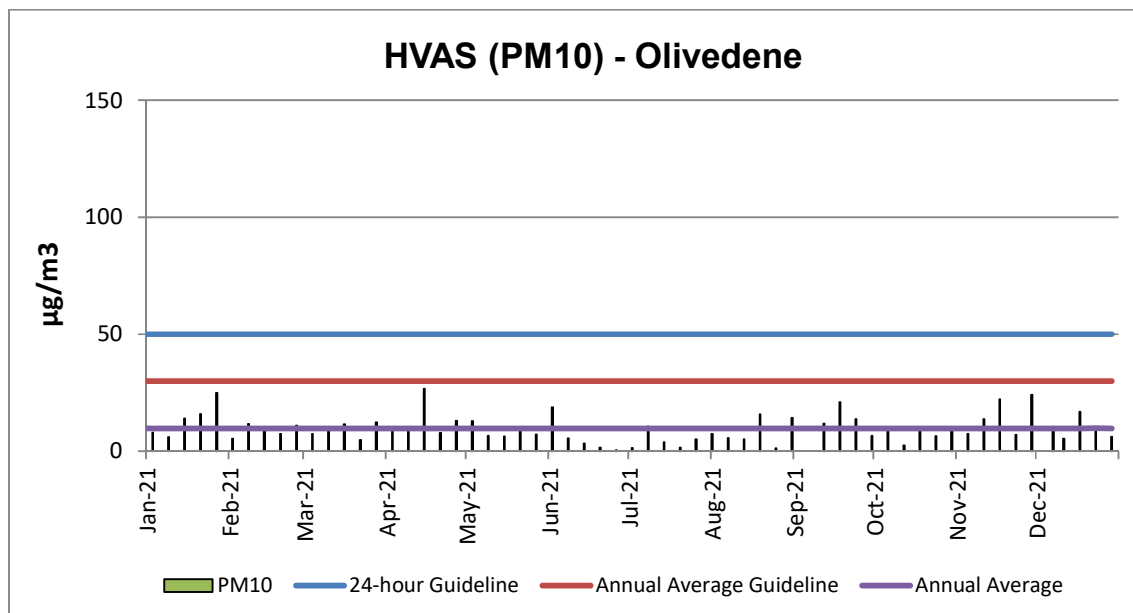


Figure 6 Comparison of measured and predicted annual average PM₁₀ levels (µg/m³) Year 10

PM₁₀ 24Hr and Annual Average (HVA51)

The HVA5 PM₁₀ monitoring results are illustrated in Graph 3 below. Monitoring conducted at the MCC HVA5 shows that the 24Hr criteria of 50 µg/m³ was not exceeded during the reporting period.

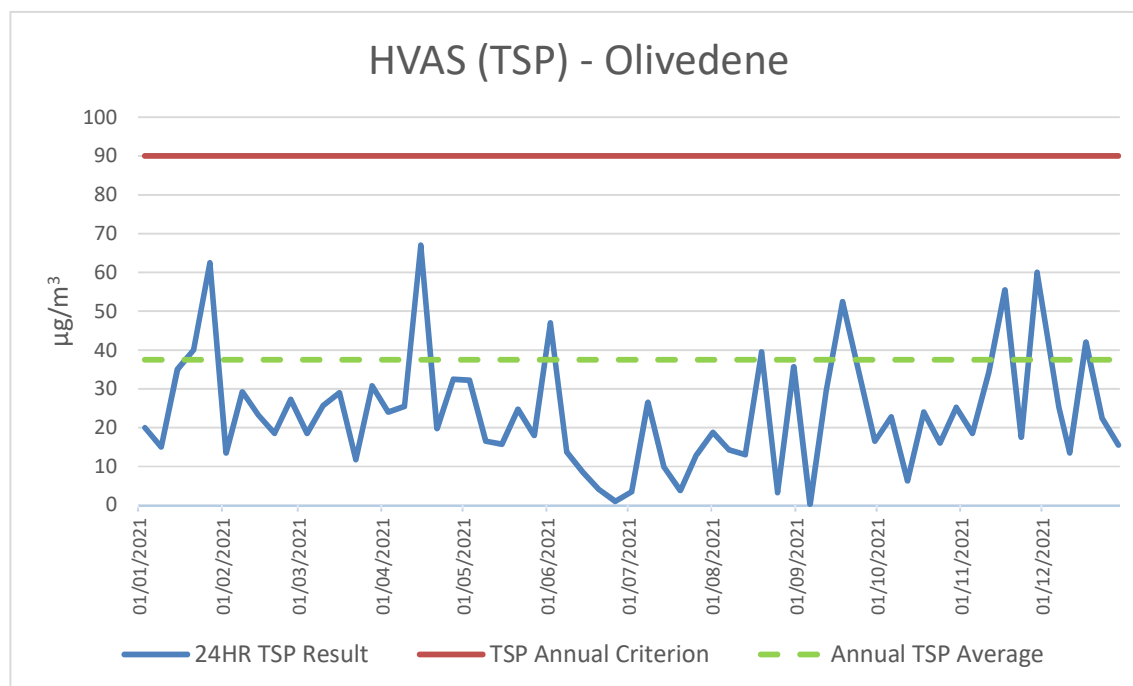
The PM₁₀ annual average remained below the applicable criteria of 30 µg/m³ for the reporting period. Overall the annual average trend indicated in Graph 3 is on a downward trend, this is attributable to an increase in regular rainfall throughout the year improving soil moisture and promoting vegetation regrowth.



Graph 3: PM₁₀ 24Hr and Annual Average Results (HVAS1)

Total Suspended Solids (TSP) Annual Average (HVAS)

Total Suspended Particulates (TSP) is inferred from the measured PM₁₀ data. Monitoring conducted at the MCCM HVAS indicated the TSP annual average remained below the applicable criteria provided in Schedule 3 Condition 29 of PA10_0138 of 90 µg/m³. The TSP monitoring results are illustrated in Graph 4 below. The annual average TSP levels measured during 2021 have been compared with the modelling predictions for Year 5 and Year 10. The 2021 measured annual average TSP data appears to be well aligned with the modelling predictions.



Graph 4: TSP Results (HVAS1)

6.2.3 Proposed Improvement Measures

Proposed measures to continuously improve include:

- Continued application of the BTM predictive modelling software and refinement where necessary;
- A move to in-pit dumping;
- Continue overburden shaping to assist with enabling the placement of topsoil and rehabilitation establishment in the northern emplacement of the MCCM footprint; and
- Continued engagement with the EPA regarding the Namoi Regional Air Quality Monitoring network.

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 (CH₄) 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.
- Management of lighting around the mine site.
- Use of bypass coal.

Diesel Consumption

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

- 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;
- Mine planning efficiencies to minimise the gradient, length and height of loaded haul runs for dump trucks, where possible.
- In-pit and mobile refueling facilities.
- Monitoring system for heavy vehicle use and fuel burn. This system also determines individual equipment utilisation which assists in minimising fleet size and associated wastage.
- Continued operation of the employee shuttle bus system to and from site.

6.3.2 Environmental Performance

Greenhouse Gas 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 publicly available on the Commonwealth Department of Agriculture, Water and the Environment website. The total GHG Emissions attributed to the MCCM reported for the NGERS 2021 Financial Year (FY) reporting period was 333,219 t CO₂-e. The following sections detail the three key GHG contributors calculated for the 2021 NGER reporting period. Prior years reported higher than the EA estimated fugitive emissions. This was a result of the emissions calculation method used for fugitive gas that utilised the Method 1 approach, which is an over-estimation versus a significantly lower and closely aligned site specific emission factor applied during the EA. 2021 is the first year MCC has reported emissions under Method 2 using a site specific emissions factor rather than a default emissions factor for fugitive emissions. This resulted in a notable decrease to emissions reported compared to previous years.

Diesel Usage

107,104kL of diesel (stationary and transport use) was consumed equating to 290,227 tCO₂-e GHG Emissions. Diesel usage was slightly higher than that estimated in the EA and has slightly increased in comparison to 2020. This can be attributed to longer hauls which were experienced in relation to overburden placement in out of pit dumps, with more coal mined in 2021 than estimated in the EA.

Fugitive Emissions

There was an estimated total of 9,549 tCO₂-e fugitive emissions from MCCM in the 2021 FY. This is slightly higher than EA estimation however a significant percentage decrease in previously reported fugitive emissions. 2021 FY was the first time MCCM reported under Method 2 using a site specific emissions factor rather than a default emissions factor for fugitive emissions.

MCCM have been working with external consultants over the last 2 years to undertake a comprehensive gas sampling program to determine site specific emission factors for each coal seam, and develop an operations emissions model to facilitate reporting under Method 2.

Electricity Consumption

35,300 MWh power equating to approximately 28.594 kT CO₂-e was consumed by MCCM. This is less than the predicted consumption from the EA of scope 2 emissions of 68 kT CO₂-e. This reduction in electricity consumption can be attributed to an increase in by-pass coal. This results in coal not being washed through the onsite CHPP, resulting in lower electricity usage.

6.3.3 Proposed Improvement Measures

Management measures described above will continue to be implemented during the next reporting period. In pit dumping will continue with reliance of out of pit dumps reducing resulting in an expected reduction of diesel usage.

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.
- The MCC Noise Management Plan (NMP) approved by DPIE, and prepared to satisfy the requirements of the EPL and PA 10_0138.

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

- Real-time unattended noise monitoring systems at representative locations within the local area.
- Monthly compliance attended monitoring by independent acoustic consultants.
- Meteorological forecasting and daily risk reporting to advise of weather conditions in advance.
- Annual noise model validation (refer 6.4.2).
- Continued monitoring of TARP levels and dissemination of trigger alerts to MCCM personnel via SMS.
- Training of dispatch and supervisors regarding noise management and TARP's.
- Dispatch operator that monitors 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.
- Roaming inspections by personnel at offsite locations to identify any audible mine related noise.

- Installation of a Multi-Directional Noise Compass.
- Utilising overburden emplacement areas with acoustic shielding and higher windrows.
- Equipment sound power testing and analysis of fixed and mobile fleet.
- Operator training and awareness to reduce equipment noise.
- Use of 'silent horns' on the excavator and supporting truck fleet.
- Ongoing maintenance of the MCC mining fleet including any noise suppression equipment.
- Design and trials of new muffler systems on Hitachi 5000 class trucks.
- Low frequency noise assessments.

The MCCM noise monitoring network is illustrated on **Figure 7** and includes:

- Continuous monitoring at real-time monitoring units that are utilised for daily management purposes.
- Monthly attended monitoring at six locations as described in the EPL (NM1 to NM6).

6.4.2 Environmental Performance

Attended Monitoring

The Noise Policy for Industry (NPfI) was introduced in late 2017. The application of the low frequency assessment consistent with the NPfI was applied during the reporting period.

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. Monthly noise survey results are available in the EPL monitoring data reports available on the MCCM website. During this reporting period, there were no exceedances recorded.

When the Acoustic Impact Assessment (NIA) was initially prepared in 2011, modifying factors were not assessed in accordance with the NPfI however the NPfI has been applied where required to all attended monitoring results, so the measured LAeq (15 min), has been compared with the predicted LAeq (15 min) without the modifying factors applied. When compared, noise levels measured at NM1 in 2021 were lower than noise levels predicted for Year 5 in the Environmental Assessment (EA).

Data trends over the life of the mine indicate that site-only LAeq noise levels have been low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations. At NM1 and NM2, site-only LAeq noise levels have increased slightly over the life of the project. At NM3, NM5, and NM6, site-only LAeq noise levels have remained very low throughout the life of the project and at NM4, site-only LAeq noise levels increased slightly from 2014 to 2016 and decreased from 2016 to 2021.

When comparable, noise levels measured in 2021 were lower than noise levels predicted for Year 5 in the EA at all monitoring locations during all measurements. Predictions in the EA represent worst-case noise impact under prevailing conditions, so it is expected that actual noise levels would typically be lower than these predictions. When the EA was initially prepared in 2011, modifying factors were not assessed in accordance with the NPfI which was not issued until 2017. This is the primary cause of discrepancy, as without application of the modifying factor, measured noise levels were lower than predicted in the EA.

Table 9 NM1 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	NA	<20	-	NA
February	Noise-enhancing	27	35	-8
March	NA	26	-	NA
April	NA	IA	-	NA
May	NA	<20	-	NA
June	NA	NM	-	NA
July	NA	26	-	NA
August	NA	27	-	NA
September	NA	IA	-	NA
October	NA	27	-	NA
November	NA	IA	-	NA
December	NA	23	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.

Table 10 NM2 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	NA	<25	-	NA
February	NA	25	-	NA
March	NA	<25	-	NA
April	NA	IA	-	NA
May	NA	<20	-	NA
June	NA	NM	-	NA
July	NA	IA	-	NA
August	NA	IA	-	NA
September	NA	IA	-	NA
October	NA	<25	-	NA
November	NA	IA	-	NA
December	NA	<20	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.

Table 11 NM3 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	Standard	<25	35	NC
February	NA	IA	-	NA
March	NA	IA	-	NA
April	NA	IA	-	NA
May	NA	<20	-	NA
June	NA	IA	-	NA
July	NA	IA	-	NA
August	NA	IA	-	NA
September	NA	IA	-	NA
October	NA	IA	-	NA
November	NA	IA	-	NA
December	NA	IA	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.

Table 12 NM4 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	NA	<25	-	NA
February	Noise enhancing	<20	49	NC
March	NA	<20	-	NA
April	NA	IA	-	NA
May	NA	<20	-	NA
June	NA	NM	-	NA
July	NA	IA	-	NA
August	NA	IA	-	NA
September	NA	IA	-	NA
October	NA	<25	-	NA
November	NA	IA	-	NA
December	NA	<20	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.

Table 13 NM5 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	NA	IA	-	NA
February	NA	IA	-	NA
March	NA	27	-	NA
April	NA	29	-	NA
May	NA	<20	-	NA
June	NA	26	-	NA
July	NA	23	-	NA
August	NA	25	-	NA
September	NA	IA	-	NA
October	NA	28	-	NA
November	NA	IA	-	NA
December	NA	<25	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.

Table 14 NM6 Measured $L_{Aeq, 15 \text{ Minute}}$ Compared to 5 Year Predicted $L_{Aeq, 15 \text{ Minute}}$

Month	Applicable Meteorological Condition ^{1,2}	Measured MCCP $L_{Aeq,15\text{minute}}$	Predicted MCCP $L_{Aeq,15\text{minute}}$	Difference ^{2,3}
January	NA	<20	-	NA
February	NA	IA	-	NA
March	NA	IA	-	NA
April	NA	IA	-	NA
May	Standard	<20	40	NC
June	NA	NM	-	NA
July	NA	IA	-	NA
August	NA	IA	-	NA
September	NA	IA	-	NA
October	NA	<20	-	NA
November	NA	IA	-	NA
December	NA	IA	-	NA

Notes:

1. Refer to Table 3.1 for applicable meteorological conditions;
2. NA indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions, and were not applicable for comparison; and
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (e.g. less than 30 dB), therefore measured and predicted noise levels were not comparable.



Figure 7 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. One-third of all plant are required to be measured on a three-rolling basis. 55 individual pieces of mobile plant were tested during the reporting period. Sound power levels from all mobile plant were less than or equal to the predicted sound power targets described in the Project EA for modelling purposes. The total sound power level for stationary plant this reporting period is approximately equal to last reporting period. Results recorded for some pieces of stationary plant within the CHPP were once again greater than the power targets described in the Project EA due to the layout and operation of the CHPP and other surface plant. During testing it was not possible to measure each fixed plant item in isolation. Due to the low-frequency content of the CHPP, it interfered with measurements of other nearby sources. Feed/product conveyors and other transfer stations could not always be isolated which likely increased background noise levels and/or reduced the possible measurement positions used during the assessment.

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

MCCM is continuing to further develop solutions to manage sound power levels on mobile equipment. Ongoing work continued during the reporting period to improve exhaust systems on the Hitachi class truck fleet.

Annual Validation

Maules Creek Coal 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 2021, and validate the results against the model predictions from the Environmental Assessment NIA.

The validation exercise occurred comparing a period in August and concluded that the EA Project acoustic impact assessment model was generally more conservative in predicting noise impact relative to predictions for actual operations. Measured 90th percentile low pass LAeq were compared with 90th percentile model predictions to evaluate correlation between model predictions and measured mining noise.

Results indicate the model provided a good level of accuracy in predicting noise when considering a wide range of weather conditions. Predictions were lower than the Project Acoustic Impact Assessment at all locations other than RT5, for which a difference of plus 1dB was predicted. Model predictions correlated well with actual measured levels at RT1, RT3, RT4, and over predicted RT2. Depending on contributions from other mines at RT5, the model either correlated well, or tended to under predict for that location.

Proposed Improvement Measures

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

- Utilise the directional noise monitor implemented at RT5 to assess noise contributions of other mining operations
- Further review of exhaust systems on haul trucks.
- Operational planning to continue to include screening options for overburden dumps.
- Pending approval and implementation of the updated NMP.
- Additional improvements to the real time environmental noise monitoring system.
- Transition to a higher volume of in-pit dumping

- Work collaboratively with Boggabri Coal and Tarrawonga Coal to minimise noise impacts

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.
- Blast Management Plan (BLMP), relevant MCC procedures and the BTM Blast Management Strategy (BTMBS) 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.
- Coordination of blasts to avoid cumulative impacts in accordance with the BLMS.
- 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 10.

6.5.2 Environmental Performance

There were 100 blasts carried out during the reporting period. All blast monitors were fully operational during the reporting period. All events remained within the applicable criteria at these locations. Details of blasts are included in Appendix A. Complete capture rate for each unit occurred where blasts were above the trigger threshold. **Table 15** Summary of Blasting Results summarises the blasting monitoring results during the period.

As stated above there were no monitored exceedances of the applicable ground vibration and air blast overpressure limits during the 2021 reporting period at the Maules Creek monitors. Both overpressure and ground vibration monitoring results are consistent with the predicted blasting impacts described within the EA. During the reporting period, there were no results that were above the 95th percentile limit. This has decreased from three when comparing to the previous reporting period (2020).

Table 15 Summary of Blasting Results

Location	Parameter	Average	Maximum	100% Limit	Exceedance
BM1	Air blast overpressure (dB(Lin Peak))	92.48	111.3	120	-
	Vibration (mm/s)	0.09	0.43	10	-
BM2 [#]	Air blast overpressure (dB(Lin Peak))	96.16	114.9	120	-
	Vibration (mm/s)	0.15	0.66	10	-
BM3	Air blast overpressure (dB(Lin Peak))	98.23	113.0	120	-
	Vibration (mm/s)	0.17	0.99	10	-
BM4 [#]	Air blast overpressure (dB(Lin Peak))	96.97	111.2	120	-
	Vibration (mm/s)	0.31	2.78	10	-

* BM1 is on mine owned property.

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

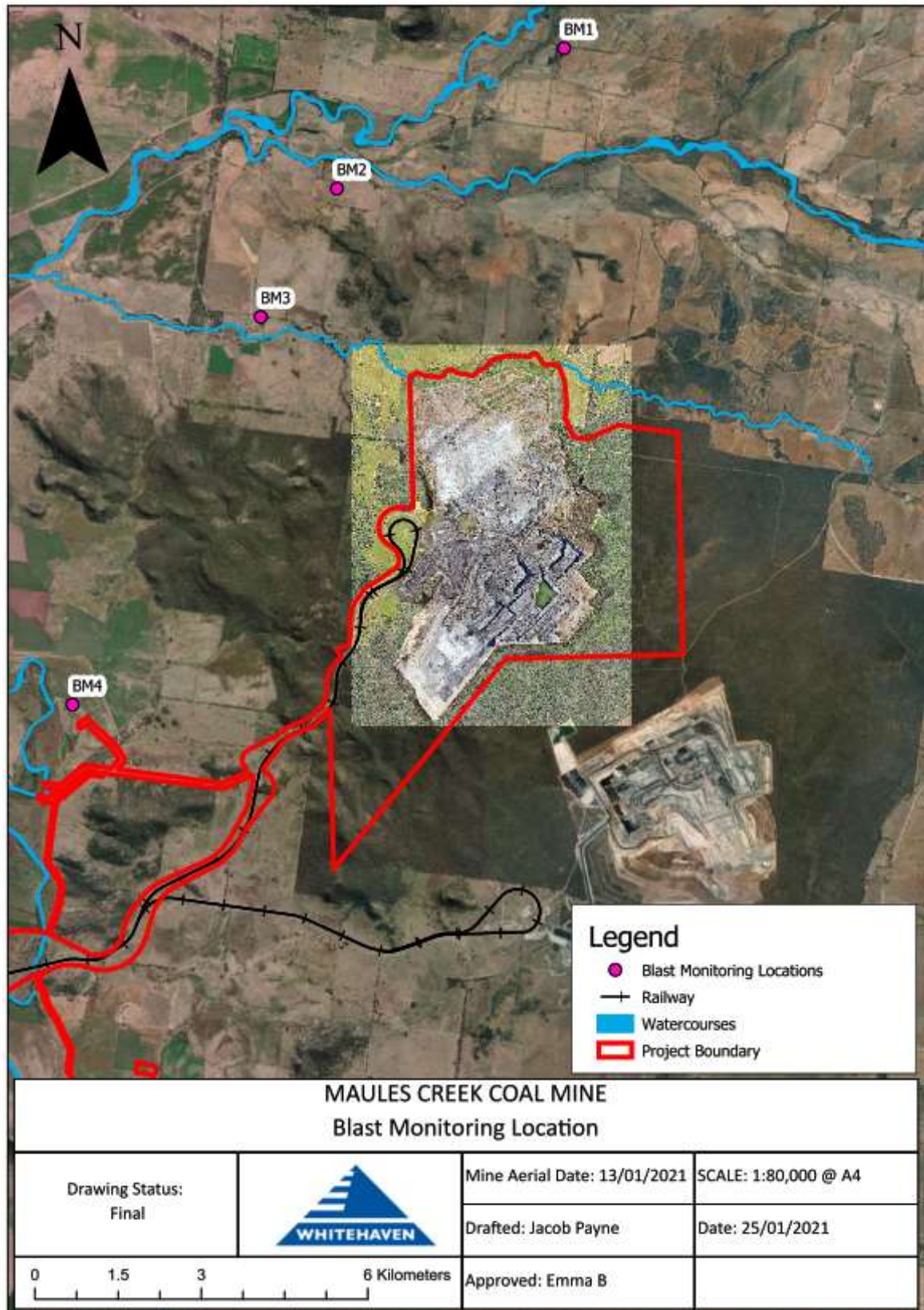


Figure 8 Blast Monitoring Network Locations

6.5.3 Blast Fume

Blast fume generation, including visible NO_x fume, varies from yellow to orange to dark red depending on the concentration of NO₂ in the post-blast gases. There were 3 significant fume events (i.e. greater than Level 3C classified against the *Australian Explosives Industry & Safety Group* guideline) during the reporting period. There were 39 recorded blasts with fume observed within the 2021 calendar year. 7 of those were classed as 1A, 1 classed as 1B, 2 classed as 2A, 9 classed as 2B and 20 classed as 3B. All blasts were video recorded and categorised in line with the BLMP and relevant industry guidelines.

6.5.4 Proposed Improvement Measures

Continual refinement to blasting design, geological definition, and engagement with blasting product suppliers, shall occur during the next reporting period.

6.6 BIODIVERSITY

6.6.1 Environmental Management

Biodiversity was managed in accordance with:

- Schedule 3 Conditions 52 of the PA 10_0138; and
- 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 Maules Creek Coal Mine (MCCM) – Biodiversity Offset Area (BOA) Management

MCCM Revised Biodiversity Management Plan (BMP) was approved by the former NSW DPE on 26th April 2017 and the Revised NSW Biodiversity Offset Strategy was approved by former NSW DPE on 27th October 2015 for the MCCM Biodiversity Offset Area (BOA) to maintain and improve 12,169ha of native woodland and forest covering offset properties adjacent to MCCM, Leard Forest and Leard State Conservation Area; plus properties adjacent to the Boonalla Aboriginal Area and the largest group of properties to the west of Barraba bordering Mount Kaputar National Park. During the reporting period, Commonwealth DAWE approved the removal of Teston North, Tralee, Cattle Plain, Warriahdool, Olivdeen, Blue Range and Rocklea properties from the Commonwealth Offset Strategy as well as approving the MCCM Offset Management Plan on 20th December 2021.

Weather Summary of MCCM Offset Properties (2021)

Regionally central meteorological station to the BOAs is the Gunnedah Pool site (BOM 2021) which has recorded highly variable rainfall over the last 3 years; from driest in 140 years of 237mm in 2019, followed by above average rainfall years in 2020 and 2021 of 833mm and 990mm respectively resulting in major flooding of the Namoi River in November and December 2021. MCCM maintain five meteorological stations across the BOA with a summary of weather conditions experienced at Offset properties during the 2021 reporting period:

- Roseglass - Annual average daily temperature ranged between 1°C in July and 37°C in January. The total annual rainfall was 775mm with the maximum in November (171mm) and minimum in May (19mm);
- Wirradale - Annual average daily temperature ranged between 2°C in July and 33°C in January. The total annual rainfall was 779mm with the maximum in November (149mm) and minimum in April (19mm);
- Wollandilly - Annual average daily temperature ranged between 3°C in July and 37°C in January. The total annual rainfall was 786mm with the maximum in November (187mm) and minimum in April (16mm);
- Teston South - Annual average daily temperature ranged between 4°C in July and 38°C in January. The total annual rainfall was 1018mm with the maximum in November (232mm) and minimum in April (21mm); and
- Kelso - Annual average daily temperature ranged between 1°C in July and 39°C in January. The total annual rainfall was 731mm with the maximum in November (144mm) and minimum in April (14mm).

Offset Security Management

MCCM successfully registered nine Conservation Agreements between 14th March 2020 and 2nd June 2021 on the land titles for the 15 Offset properties being secured as part of the MCCM BOS. The Conservation Agreements were secured under Part 5 Division 3 of the Biodiversity Conservation Act 2016 and thus completing the in perpetuity legal mechanism required by the Commonwealth EPBC Act Approval 2010/5566 Condition 13 and NSW Project Approval 10_0138 Schedule 3 Condition 54. WHC will reengage with NPWS that had previously shown interest in certain MCCM Offset properties being transferred to National Park Estate.

Infrastructure & Waste Management

During the reporting period, a total of 3.8km of new or repaired fencing (fauna friendly) was constructed along the perimeter of MCCM BOA (Offset properties of Roseglass, Onavale, Teston North, Neranghi North and Mt Lindesay) as well as maintenance of signage and gates undertaken as required to continue to restrict unauthorised access and minimise livestock incursion. Also during the reporting period, 7.3km of redundant internal fences were deconstructed from the Wirradale Offset and Coonoor properties and 52 items of redundant or derelict assets/infrastructure were removed, previously associated with the former agricultural use of the MCCM BOA. Waste removed is either recycled (in the case for scrap metal) or disposed offsite (general municipal waste and tyres) at local Waste Management Facilities. Any remaining derelict assets/infrastructure items will continue to be assessed, removed and remediated as required prior to potential transfer of MCCM Offset properties to National Park Estate.

Seed Management

The routine seed assessments for the MCCM BOA aims 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. A total of 21 species were collected resulting in 6,068 grams of local provident seed from across the MCCM BOA. As part of the WHC group wide revegetation planning; the onsite collected seed was supplemented with commercially sourced local and regional provident seed by reputable seed collectors. A local revegetation provider was engaged to propagate the seed to produce Box Gum and non-EEC/CEEC Woodland overstorey species seedlings required for the completed 2021 revegetation program as well as planning for the 2022 revegetation program for the MCCM BOA.

Revegetation Management

The MCCM BMP revegetation strategy focuses on restoration and revegetation of cleared non-native grassland (former cultivation) and derived native grasslands and assisting natural regeneration in better quality woodland areas. During the reporting period, revegetation ground preparation utilised tractors and excavators augering holes (to a depth >0.3m) to relieve compaction, improve permeability and infiltration to increase sub-surface soil moisture for planting as part of the 2021 revegetation program on the Kelso, Velyama West, Louenville, Teston South, Teston North, Tralee, Onavale and Wollondilly Offset properties. There was no understorey revegetation carried out during the reporting period due to above average rainfall and vegetation growth preventing ecological burns from being undertaken and thus preventing adequate ground preparation from occurring. The overstorey revegetation program was undertaken between June and October 2021 with 10,850 hiko seedlings of Box-Gum and other Woodland species planted and 83 threatened species transplanted over 196ha of the MCCM BOA. Combined with favourable seasonal conditions, routine tree watering and maintenance activities post planting have been successful to ensure 84% survival has been achieved for the MCCM BOA which is commensurate with the target Woodland vegetation structure.

Heritage Management

During the reporting period, annual heritage inspections were completed on the 168 known Aboriginal archaeological heritage sites and 7 European historical heritage sites within the MCCM BOA. Each site is maintained with demarcation fencing around the heritage site perimeter and signage to mitigate access and disturbance. During this reporting period, four new Aboriginal archaeological heritage site were identified on the Bimbooria, Neranghi North and Triangle properties. Further, 12.7km of fencing was maintained during 2021 of the total 35km of demarcation fencing around these heritage sites across the MCCM BOA.

Habitat Management & Ecological Thinning

During the reporting period, habitat augmentation was undertaken with 369 previously stockpiled timber logs being installed on the Velyama West Offset property to create a coarse woody debris habitat area linking remnant vegetation within the “east-west” corridor identified in MCCM MP 10_0138. Further, 168 nest boxes targeted for Small Gliders, Greater Gliders, Microbats, Turquoise Parrots, Brown Treecreepers and Pale-headed Snakes were installed on the Offset Properties of Bimbooria, Roseglass, Velyama West, Louenville, Teston North, Wollandilly, Wirradale and Mt Lindesay during reporting period.

The WHC Offsets Ecological Thinning Stage 1 Assessment (AMBS, 2020) concluded that there was no evidence of direct impacts from Callitris (Cypress Pine) regrowth to native plant species richness (composition) or density (structure) within remnant Box Gum Woodland vegetation communities and did not establish a relationship between those variables and Callitris density (i.e. basal area). The WHC Offsets Ecological Thinning Stage 2 Assessment (AMBS, 2022) undertook desktop remote sensing to spatially analyse where potentially dense Callitris occurs in Box Gum Woodland across MCCM BOA and undertook targeted ground truthing field surveys to validate and quantify against Ecological Thinning criteria. Stage 2 Assessment concluded that no areas on MCCM BOA supported inappropriate Callitris regrowth therefore finding that Ecological Thinning management could not be justified at this point in time on MCCM Offset properties (AMBS, 2022).

Weed Management

WHC coordinated routine formal weed monitoring/inspections undertaken across MCCM BOA in February, May, September and December 2021. The priority weeds identified included legacy weeds inherited from previous owners management regimes such as Buffel Grass, African Love Grass, Pattersons Curse, African Box Thorn, Prickly Pear, Green Cestrum, Bathurst Burr, Sweet Rose Briar, St John's Wort, Blackberry, Coolatai Grass and Johnson's Grass as well as a range of broadleaf weeds within revegetation areas. 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. During the reporting period, WHC implemented a comprehensive weed control program across the MCCM BOA including 9,625ha treated on Offset Properties including spraying of fire break tracks. Only appropriately qualified and experienced weed contractors (AQF3 accreditation or higher for use of herbicide) were engaged to undertake weed control works for WHC.

Pest Animal Management

WHC undertook routine pest animal monitoring across the MCCM BOA in February, May, September, and November 2021. The adoption of a "monitor, measure and manage" approach to pest animal management will allow WHC to implement adaptive management in response to changes being measured through monitoring in pest animal abundance specific to the different geographical regions of the MCCM BOA. Pest animal monitoring utilises the relevant methodologies for specific pest 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 and cameras traps where practicable and relevant to specific Offset regions and properties. Monitoring demonstrated that certain animals like Eastern Grey Kangaroos have high abundance all year; while Feral Pigs are seasonally variable but can be in high abundance. Hares are seasonally variable in Medium abundance on some properties. All other pest animal species recorded as scarce to low abundance levels across 2021. The pest animal monitoring ensures that timely and prioritised pest animal control is undertaken on a seasonal basis identifying what, where, when and how to target appropriate resources across the MCCM BOA for pest animal management.

During the reporting period, WHC implemented a comprehensive feral animal control program across the MCCM BOA with routine 1080 baiting and pig trapping programs undertaken in March (216 Foxes and 18 Feral Dogs baited from 988 baits presented, and 46 Feral Pigs Trapped), June & July (240 Foxes and 1 Feral Dog baited from 966 baits presented, 94 Feral Pigs trapped), September (186 Foxes baited from 699 baits presented and 67 Feral Pigs trapped) and December 2021 (126 Foxes removed from 355 baits presented and 3 Feral Pigs trapped). Over

3,008 baits were presented on the MCCM BOA in 2021 resulting in 26% to be taken by pest animals. Night time open range shooting programs were implemented in conjunction with the other pest animal programs resulting in an additional 20 Rabbits, 1 Feral Cat, 110 Hares, 92 Feral Pigs, 20 Foxes and 13 Deer being controlled in 2021. Feral Goat harvesting during the reporting period resulted in 263 Goats being captured with saleable Goats on sold to an abattoir. Only appropriately qualified and experienced feral animal contractors (appropriate feral animal management qualifications, NSW fire arm licence and pesticide accreditation where relevant) were engaged to undertake feral animal control works for WHC.

Soil & Erosion Management

Annual inspections were undertaken including unsealed fire break tracks and associated drainage structures across the MCCM BOA to review appropriate erosion and sediment control measures required in accordance with the Blue Book (Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004)). Despite the above average rainfall during the reporting period; only 4 locations of targeted additional maintenance was identified out of 32 observations within the MCCM BOA to mitigate further erosion and sedimentation. The remaining sites and tracks/drainage structures are maintained during routine WHC Biodiversity fire break track maintenance program.

Grazing Management

MCCM BOAs continued to be destocked and no strategic grazing occurring during the reporting period. There were 20 instances of stock incursion during the reporting period; with the stock on each occasion retrieved and fencing repaired as required. A higher number of stock incursions was experienced during 2021 due to the number of heavy rainfall events resulting in damaged fences.

Bushfire Management

During the reporting period, no bushfires occurred and no ecological burns were undertaken due to the above average rainfall experienced across the year.

Threatened Flora Fencing

During the reporting period, threatened flora inspections were completed on the 55 known threatened flora sites for *Tylophora linearis*, *Pomaderris queenslandica*, *Thesium australe*, *Dichanthium setosum* and *Digitaria porrecta* within the MCCM BOA. Each site is maintained with demarcation fencing around the threatened flora site perimeter and signage to mitigate access and disturbance.

***Tylophora linearis* Management**

In accordance with the BMP, Stages 1 (Root Architecture) to 4 (Seed Propagation) of the *Tylophora linearis* translocation program had previously been completed in 2014 and 2015; with the Growth Study ongoing during the reporting period. Monitoring has continued of the 77 *Tylophora linearis* seedlings transplanted within Wollandilly Offset property during December 2015 that were propagated from seed collected onsite at MCCM during 2014. Continued flowering of the transplanted *Tylophora linearis* in 2021 indicates that the

transplantation project is contributing towards an established and viable population of *Tylophora linearis* within the Wollandilly Offset property. Quarterly inspections of known *Tylophora linearis* populations were undertaken to identify reproductive material which could be collected for additional germination trials. Further observations of flowering individuals were made throughout 2021, although no seed production was observed and no other seed collection opportunities were identified from the MCCM clearing area or natural *Tylophora linearis* populations during the reporting period.

***Pomaderris queenslandica* Management**

In accordance with the BMP, Stages 1 (Root Architecture) to 4 (Seed Germination) of the *Pomaderris queenslandica* translocation program had previously been completed in 2015 and 2016. An additional germination and propagation trial was commenced in 2019 from *Pomaderris queenslandica* seed collected during 2014/2015 resulting in a total of 34 seedlings being planted across the MCCM Offset Properties in July 2020. Further, germination and propagation trials occurred across 2020 and 2021, with a total of 83 *Pomaderris queenslandica* grown from the previously collected seed and planted adjacent to the existing enclosures within Offset Properties between August and September 2021. Ongoing monitoring of the seedlings planted in 2020 and 2021 has recorded approximately 96 % survival including flowering and seed production from these plants in the second half of 2021. Successful seed collection during 2020 has provided the opportunity for further germination and propagation trials.

Monitoring Program

The ecological monitoring program of the MCCM BOA included winter bird surveys undertaken in August 2021, annual fauna monitoring undertaken for 2021 involving 66 bird survey sites, 8 pitfall and funnel trap sites, 34 active forage sites, 10 spotlight sites, seven harp trap sites, 16 anabat sites and 34 motion detection camera sites plus annual spring flora monitoring of 92 sites across 13 vegetation zones (VZs) between September – December 2021. Overall flora and fauna monitoring results reflected the above average rainfall favourable conditions in 2021 compared to the drought conditions across 2018 and 2019. During the winter bird surveys, seven threatened species (Speckled Warbler, Dusky Woodswallow, Brown Treecreeper (eastern subspecies), Diamond Firetail, Grey-crowned Babbler, Little Lorikeet and Turquoise Parrot) were recorded. During flora monitoring, 3 VZs (North-west Slopes Dry Sclerophyll Woodlands (Nandewar) – Good condition, North-west Slopes Dry Sclerophyll Woodlands (Brigalow Belt South) – Good condition and New England Grassy Woodlands (Nandewar) – Good condition) were recorded as meeting or exceeding completion criteria for all 4 biometrics. Native plant species richness (NPS) completion criteria (native species richness benchmark for relevant biometric vegetation communities) was met or exceeded at 12 out of 13 VZs. Native overstorey cover (NOS) completion criteria (minimum overstorey cover benchmark for relevant biometric vegetation communities) was met or exceeded at 4 out of 13 VZs. Native midstorey cover (NMS) completion criteria (minimum midstorey cover benchmark for relevant biometric vegetation communities) was met or exceeded at 6 out of 13 VZs. Native ground cover grass (NGCG) completion criteria (minimum groundcover benchmark for relevant biometric vegetation communities) was met or exceeded at all 13 out of 13 VZs. Comparison of individual plot data shows that NPS increased from 72% last year to 86% of sites meeting or exceeding completion criteria in 2021. Native overstorey cover (NOS) increased from 18% last year to 33% of sites meeting or exceeding the completion in 2021. Native midstorey cover (NMS) increased from 25% last year to 39% of sites meeting or exceeding the completion criteria in 2021. Native ground cover grass (NGCG) increased slightly from 86% last year to 91% of sites meeting or exceeding the completion criteria in 2021. During the winter bird surveys, seven threatened species (Speckled Warbler, Dusky

Woodswallow, Brown Treecreeper (eastern subspecies), Diamond Firetail, Grey-crowned Babbler, Little Lorikeet and Turquoise Parrot) were recorded. For annual spring bird surveys; a total of 111 bird species were recorded at 66 standardised bird survey sites compared to 131 species across 85 sites in 2020; while richness by habitat found 68 species were recorded in 24 woodland sites (average 12.8, range 2 to 24), 38 species in 21 revegetation/rehabilitation sites (average 5.7, range 1 to 22), and 78 species in 21 naturally regenerating sites (average 14.6, range 5 to 28). While more bird species were detected and average species richness per site was higher in 2020; species richness values were very similar when corrected for survey effort. A total of 9 species of microbat were detected by harp trap in 2021 including five records of Corben's Long-eared Bat (*Nyctophilus corbeni*). Average species richness at the woodland sites was 3.4, with a range from 2 to 6. Preliminary microbat richness was lower than 2020 however species richness per site was higher in 2021. A total of 37 species of herpetofauna (reptiles and amphibians) were recorded during annual monitoring. Preliminary pitfall and funnel trapping surveys detected 19 species of herpetofauna; while richness by habitat found 10 species in remnant woodland (average 3.75; range 3 to 5), 3 species in naturally regenerating woodland (average 1.5, range 0 to 3) and 7 species in revegetated woodland (average 2.5, range 0 to 4). Active search surveys detected 23 species of herpetofauna; while richness by habitat found 22 species in remnant woodland (average 2.8, range 0 to 4), 5 species in naturally regenerating woodland (average 0.7, range 0 to 3) and 4 species in revegetated woodland (average 0.1, range 0 to 2). Targeted nocturnal reptile surveys were completed at 10 sites and detected 23 species across all native vertebrate taxa (average 5.89, range 3 to 10). Motion detection camera surveys detected 74 native fauna species including 54 bird species, 9 mammal species and 11 reptile species. Five confirmed threatened species were recorded; Spotted-tailed Quoll (*Dasyurus maculatus*), Koala (*Phascolarctos cinereus*), Powerful Owl (*Ninox strenua*), Diamond Firetail (*Stagonopleura guttata*) and Brush Turkey (Nandewar and Brigalow Belt South bioregions threatened population). By habitat type, 71 species were detected in remnant woodland and 16 species were detected in revegetated woodland.

Audits and Reviews

There was no Independent Biodiversity Audit or Leard Forest Regional Biodiversity Strategy Review during the reporting period. Next Independent Biodiversity Audit is due by the end of December 2022.

Research

In accordance with Condition 15 & 16 of the MCCM EPBC Approval 2010/5566, MCC must fund \$1 million into research of Box Gum Woodland mining rehabilitation as well as \$1.5 million into research for threatened species recovery actions for the Regent Honeyeater, Swift Parrot and South-eastern (Corbens) Long-eared Bat. In accordance with approved Research Project Plans; Maules Creek Coal funded the following activities during 2021 including:

- Annual spring surveys at potential Swift Parrot foraging habitat sites across their breeding range in Tasmania;
- Research for Regent Honeyeater involved designing, installation and undertaking survey of nest predation mitigation structures plus Noisy Miner management and facilitation/ coordination of twice annual volunteer survey programs; and
- Radio tracking of habitat and roost usage research for South-eastern Long-eared Bat as well continuing development of acoustic techniques for *Nyctophilus* species call identification.

The findings of these research projects will be used to inform MCC on potential improvements to rehabilitation and restoration practices in particular during Box-Gum Woodland revegetation activities but also the management of threatened species both onsite and in the Biodiversity Offset Areas.

Pre-Clearing and Clearing Surveys

The 2021 clearing program occurred during March - April 2021 and consisted of the clearance of a total of 49.958ha to facilitate the expansion of the mining pit area and the outer pit and western out of pit dump area (WOOP).

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

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

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

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

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

Fauna pre-clearance surveys were also conducted in the week prior to the clearing works, to minimise the risk of birds nesting between the time of the survey and the commencement of clearing. This process ensures the maximum possible wellbeing of the native fauna within the clearing 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 and flagging tape. Habitat features were recorded using hand held GPS units.

In addition to the identification and marking of likely habitat features, nocturnal spotlight surveys were conducted throughout the clearing area to identify hollows in use by resident fauna such as the Squirrel Glider (*Petaurus norfolcensis*) and microbats. 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 removed 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.

- 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 throughout the 2021 clearance works, including species of mammals and reptiles. Threatened species under the Biodiversity Conservation Act 2016 (Formerly called the *Threatened Species Conservation* (TSC) Act 1995) and/or the *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999 were also encountered.

The following threatened fauna species were encountered during 2021 clearing works:

- Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)

6.6.3 Proposed Improvement Measures

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

- Follow up monitoring of revegetation and weed management works across the offset areas and associated adaptive management;
- Continued implementation and progression of research projects required under the EPBC approval (refer section 8.1.1.9) ;
- Continuation of propagation and translocation programs for *Tylophora linearis* and *Pomaderris queenslandica*; and
- 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 in 2021 by Whincop Archaeology, but is yet to be approved by DPE; the currently approved AACHMP is the 2016 revised version. The BTM Aboriginal Cultural Heritage Strategy was approved in November 2017.

6.7.2 Environmental Performance

Annual Monitoring Program

The Annual Site Audit (the Audit) was undertaken on 28 September 2021 with two Registered Aboriginal Party (RAP) representatives accompanied by a qualified archaeologist. The Audit included an inspection of all extant previously identified Aboriginal cultural heritage sites within the approved project boundary of the MCCM; all sites located within the MCCM biodiversity offset areas are inspected as part of a broader biodiversity offsets annual inspection. The Audit assessed the condition of 19 extant sites including fencing, potential nearby

disturbance and photographic records. Any required fence maintenance identified during the audit was not carried out, but noted in the resulting 2021 Annual Site Audit report. Three new Aboriginal cultural heritage sites were identified during the Audit: two artefact scatters near Back Creek (Back Creek As7 and Back Creek AS8) and a set of three grinding grooves (Teston GG5) located in the same drainage line as Teston GG3.

All Aboriginal cultural heritage objects recovered from MCCM are stored securely at the Red Chief Local Aboriginal Land Council as part of an approved Care Agreement, which was approved in early 2018. In accordance with the Care Agreement, Red Chief LALC is responsible for a regular audit of the artefact archive.

Additional Monitoring / Inspection of Sensitive Heritage Areas

The inspection of the 2021 annual clearance areas was undertaken at MCCM on 12-16 April 2021 during the clearing program. Archaeological inspection of Aboriginal cultural heritage sensitive areas was undertaken prior to topsoil clearance with RAP representatives accompanied by specialist archaeologists, in accordance with the requirements of section 6.4.2 of the currently approved AACHMP. The archaeologist and two RAPs visually inspected 25 grader scrapes constituting 50 separate spits across the clearance areas, totalling 48 hectares. Archaeological monitoring identified one previously unrecorded isolated artefact constituting one new Aboriginal cultural heritage site, which has since been registered on AHIMS (Leard SF IA16). Once approved on AHIMS, the status of this site was updated to 'destroyed'. Furthermore, additional artefacts were identified adjacent to an existing artefact scatter (Leard SF AS7), which effectively constituted an extension to this site. The AHIMS record was updated accordingly.

The main change to the revised (but not yet approved) MCCM AACHMP is an update of the methodology for archaeological inspection of clearance areas. As such, the 2022 clearance areas were subject to archaeological inspection in December 2021 with the expectation that the AACHMP would be approved in time for the clearance window. On 15 December 2021, an archaeologist and two RAPs inspected the ground surface of the 2022 clearance areas prior to the commencement of ground disturbance. No new sites were identified during this process. If the draft revised AACHMP is not approved by the commencement of the 2022 annual clearance window program, the archaeological inspection of these clearance areas will be repeated according to the pre-existing methodology.

Archaeological Salvage Report

All artefact sites identified within the MCCM disturbance area have been salvaged in previous reporting periods through a combination of surface collection, test excavation and open-area excavation. The MCCM Archaeological Salvage report is being prepared and will be completed in 2022.

Aboriginal Heritage Conservation Strategy (AHCS)

As previously mentioned, the Aboriginal Heritage Conservation Strategy was approved by the DPIE in November 2017. In February 2020, the Cultural Values report was completed and endorsed by RAPs involved in the survey. The final draft report will be presented to the wider Aboriginal community at an 'On-Country' workshop event to be held on one of the Maules Creek offsets. This event, which was scheduled to occur in 2020/2021, has been delayed until 2022 (due to the COVID pandemic), after which a final report on the results of the AHCS works will be prepared and finalised.

Ongoing Consultation

In accordance with the AACHMP, meetings with RAPs are convened approximately every six months. Two meetings were held during 2021, and were open to all RAPs. Despite difficulties of the COVID pandemic, meetings were held in person in Boggabri in June and December 2021.

Management of Quinine Bush

Quinine Bush (*Alstonia constricta*) continues to be mapped across the project as part of the land pre-clearance surveys, with the aim of identifying opportunities for seed collection and propagation. Ecologists have also been trained on the identification of potential Aboriginal scarred trees during the pre-clearance surveys.

6.7.3 Proposed Improvement Measures

In 2022, several aspects of cultural heritage work will continue, including the implementation of the newly revised MCCM Aboriginal Archaeology Cultural Heritage Management Plan (AACHMP), once approved. In particular, the AACHMP has been updated to reflect the current status of Aboriginal sites, but also to develop an improved methodology for the inspection of annual clearance areas. The AACHMP, which has been updated by Whincop Archaeology and reviewed by Whitehaven Coal, has been updated to replace the use of grader scrapes during clearance with a targeted inspection of the ground surface prior to disturbance. This main change to the clearance methodology within the AACHMP was proposed by RAPs during RAP consultation meetings. The intention is to remove the use of grader scrapes from the process, as it is considered both ineffective and unnecessarily arduous work. The proposed change is for the ground surface of all Aboriginal cultural heritage sensitive areas to be inspected prior to land clearance works. Some other minor changes to the AACHMP have also been presented to the RAPs for review.

Other Aboriginal cultural heritage work in 2022 will include the Annual Site Audit of Aboriginal cultural heritage sites. Consultation via meetings will also continue in 2022, and RAPs will be consulted regarding the results of the cultural values survey of the MCCM biodiversity offset areas, COVID pandemic permitting. The MCCM salvage report, which provides a history of Aboriginal occupation and land use in the project area based on the results of the archaeological salvage program, will also be completed during 2022.

6.8 HISTORIC HERITAGE

6.8.1 Environmental Management

Historic heritage is 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, as well as specific management measures contained within the Maules Creek Historic Heritage Management Plan (HHMP).

The original Historic Heritage Assessment undertaken as part of the EA identified five (5) historic heritage sites within MCC owned land. In 2016, an assessment was undertaken to address the proposed realignment of a river water pipeline in proximity to two additional historic heritage sites (Harparary Site Complex), which were deemed to be of local significance and were subsequently added to the MCCM HHMP.

In 2020, the condition of the two structures of the Harparary Site Complex was assessed in July 2020, concluding that both buildings were ruinous and in very poor condition. Due to the deteriorated fabric of the buildings, and

their unsafe condition, it was recommended that these two structures, which were on the verge of collapse, be removed. As a result, the nature of these two sites have been updated in the HHMP to represent archaeological site only (i.e. not structural element). NSW DPIE were notified on 22nd December 2020 of the demolition of the Harparary Complex Historical Heritage Sites in accordance with the MCCM Historical Heritage Management Plan. MCC is currently awaiting approval of the updated HHMP.

6.8.2 Environmental Performance

A site inspection of all known historic heritage sites within the Maules Creek vicinity was undertaken as per Section 4.3.1 of the HHMP to ensure protective fencing was installed and adequate and to monitor the ingress of weeds at the seven (7) historic heritage sites. The site inspection included an assessment of the structural integrity of Velyama Shearing Shed. All historic heritage sites were considered to be in a stable condition.

As predicted in the EA, the mining activity has not directly impacted the historic heritage items, although the extreme deterioration and unsafe condition of the two Harparary Complex structures has resulted in the deliberate demolition of these buildings. While this has resulted in a partial loss of historic heritage value, each site maintains an intact archaeological record that retains historic heritage values of local significance (their significance is primarily associated with the historical and archaeological values associated with the archaeological deposits at the site).

6.8.3 Proposed Improvement Measures

Biennial monitoring of historic heritage sites will be undertaken in 2022, with maintenance and weed control to be undertaken as required. The demolition of the derelict, collapsing structures at Harparary Complex has improved the safety of these sites and will ensure their associated archaeological deposits can be effectively maintained.

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 management measures 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 employees to access site;
- Consideration of school bus pick up and drop off times when scheduling shift changeovers;
- Monitoring of traffic volumes, road safety inspections, quarterly auditing of approved access routes;
- Results for coal transport monitoring are made publically available on the MCC website annually;

- Community feedback via MCCM community contact line, website request and email, as well as consultation with the Community Consultative Committee (CCC); and
- Consultation with the relevant authorities to obtain necessary permits prior to the movement of oversized loads on public roads.

6.9.2 Environmental Performance

MCC has conducted an annual audit regarding local road access restrictions as described in the TMP. Over the course of 2021 reporting period an analysis of employee transport records demonstrates waged employees utilising the bus services ranged from 73.48% to 79.95%. This has subsequently dropped from previous years, due to indirect factors such as COVID-19 and flooding.

There were no complaints regarding traffic generated by the MCCM received during the reporting period.

The utilisation of the Boggabri access road off the Kamilaroi Highway was the primary access for mine related traffic during the reporting period which assisted in reducing vehicle interactions of mine and public traffic on Therribri Road.

6.9.3 Proposed Improvement Measures

Annual audits of restricted roads, quarterly monitoring of traffic volumes to the site and responses to any community complaints will continue to be implemented during the next reporting period. Section 6 of the MCC Traffic Management Plan requires quarterly traffic surveys to be undertaken, these surveys assess operations, maintenance and CHPP wages employees utilise the bussing service. Results for these surveys are presented in Table 16 Traffic Survey Results below.

Table 16 Traffic Survey Results

Period	Wages Employees Accessing Site During Survey Period	Wages Employees Utilising Bus	Bus Utilisation (%)
Q1	33435	26732	79.95
Q2	32762	25882	79.00
Q3	35828	28264	78.89
Q4	24571	18055	73.48

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).
- 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. Sewage waste from the CHPP office building is now treated on site.

Any mineral waste material within the operation that is determined to be potentially acid forming (PAF) are placed (buried) in the OEA or within mined-out sections of the open cut and covered with non-acid generating material at a location to minimise further oxidation. 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 decreased by approximately 8.2% for general waste when compared with the previous reporting period.

A total of 463 t of general waste and 1886 kl of septic waste was removed in the 2021 reporting period. Approximately 352 t of solid recyclable material and 1102 kl of used oils were collected for recycling by a licenced contractor. 106 t of regulated waste and 4kl of Coolant was also removed from site by a licensed contractor.

Waste management was consistent with the relevant management details in the EA and there were no significant incidents relating to waste management practices during the reporting period.

6.10.2 Proposed Improvement Measures

MCC will continue to monitor and report waste streams on a regular basis to effectively manage waste generated by the operation of the MCCM.

MCC will continue to manage and check 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

No reportable or significant incidents involving hazardous materials 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 relating to hazardous materials. 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.

6.11.3 Proposed Improvement Measures

Continued operation of a bioremediation area will occur during the next reporting period.

7 WATER MANAGEMENT

7.1 WATER SUPPLY

Table 17 Water Take For the 2020-2021 Water Year

Passive Take Licences						
Water Licence #	Water Sharing Plan	Water Source and Management Zone	Share Units (ML)	Available Water (ML)	Passive Take (ML)	Usage (ML)
WAL 27385	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	38	69	70	34
WAL 36548	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source	36	72		36
WAL12491	Upper and Lower Namoi Groundwater Sources	Upper Namoi Zone 11 Maules Creek Groundwater Source	77	154	1	1
WAL29467	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	306	382.5	502	306
WAL29588	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	0	0		0
WAL36641	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	800	1,000		196
License Extraction Points						
WAL41585	NA	Catchment: Unnamed Water Source	30	30	0	0
WAL13050	Upper Namoi and Lower Namoi Regulated River Water Sources	Lower Namoi Regulated River Water Source	3,000	3,000	251	251
WAL12718	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin's Leap) Groundwater Source	102	204	0	0

WAL12722	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin's Leap) Groundwater Source	77	154	0	0
WAL12811	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source	135	270	0	0
WAL12479	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	78	156	0	0
WAL27383	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	0	0	0	0
WAL12480	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	215	430	0	0

~Inclusive of 38ML of entitlement, 25ML carry over from Water Year 2018/2019.

^Inclusive of 102ML of entitlement, 102ML carry over from Water Year 2018/2019, and 267ML of temporary transfers.

*Inclusive of 77ML of entitlement, 77ML carry over from Water Year 2018/2019, and 432ML of temporary transfers.

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.
- 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.
- 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.
- 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.
- Regular sampling and inspections of the onsite and surrounding surface water system.

Surface water monitoring locations are illustrated on **Figure 9** and **Figure 10**. A summary of the surface water quality findings from the reporting period is provided below.

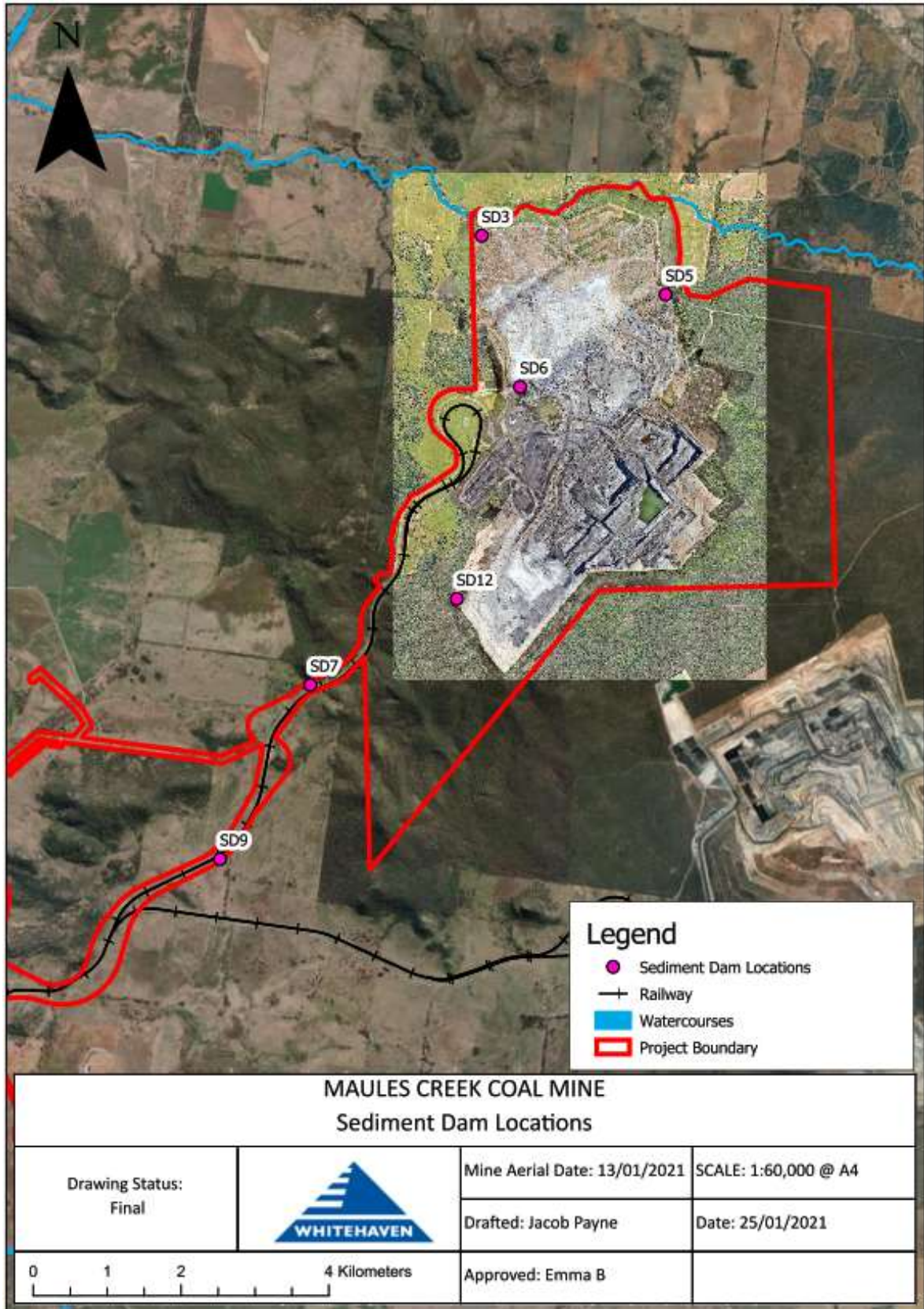


Figure 9 Sediment Dam Monitoring Locations

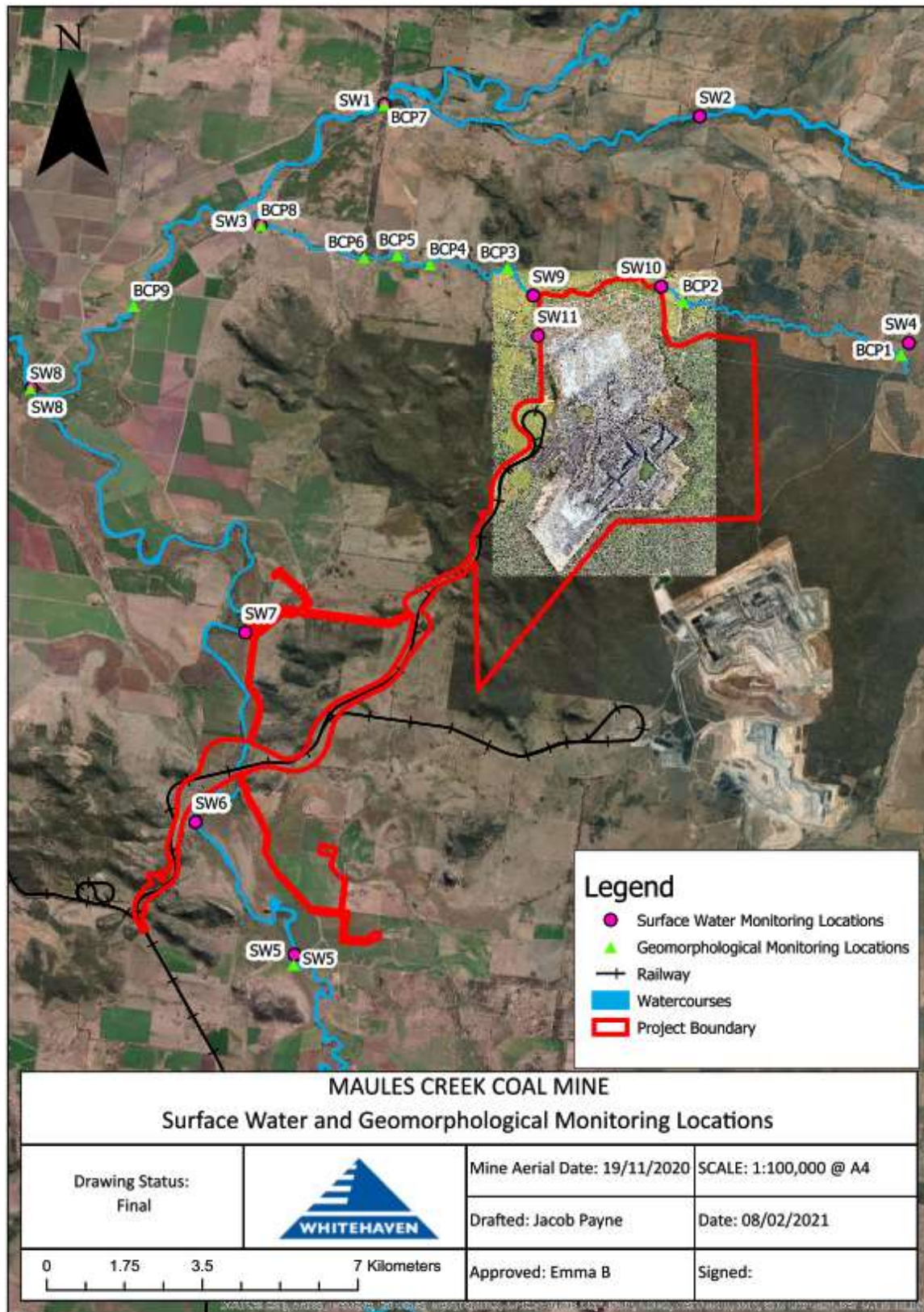


Figure 10 Surface Water and Geomorphological Monitoring Locations

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 are detailed in Appendix D. Samples are collected consistent with Water Sampling Methods, AS/NZS5667.1 and AS/NZS 5667.6. All laboratory analysis is 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. 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.

Overall, 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. Water quality trends from 2016 are included in Appendix D and show that EC, TDS and TSS values fluctuate between wet and dry periods throughout the monitoring period since the commencement of monitoring.

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) in Appendix D. Trigger values have been developed using background data for fifteen parameters. The adopted trigger values will be refined as the operational stages of the MCCM proceeds. Monitored values above the PTV's are related to variable flow and upstream effects not attributable to the operation.

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 2021 reporting period has been characterised as coal contact water and results shown are in Appendix D.

Flow

Throughout the reporting period, flow in the Namoi River has been largely dictated by natural flows following wet weather activities. Inflow pumping from the Namoi River to site was significantly lower than predicted in the EA for Year 5 (1,620 ML) and Year 10 (1860 ML) respectively. This is attributed to the higher than average annual 2021 rainfall recorded at the mine site providing an adequate supply of water for operational use. Flows in Back Creek are noted in monitoring data following intense rainfall events.

Wet Weather Discharge Monitoring

During the reporting period, four licensed discharge events occurred from sediment dam SD9 (8th to 11th June, 8th November, 21st October to 1st November, 8th to 11th December) and one discharge from sediment dam SD3 (21st November). Each occasion was due to rainfall exceeding 38.4mm over a consecutive 5 day period immediately prior to the discharge occurring. Discharges that occurred throughout November and December were related to intense rainfall events, which resulted in major floods within the North West Region.

Water samples from SD3 and SD9 were collected and analysed in accordance with the licence requirements. Water quality results for all discharge events remained in compliance 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 December 2021 at upstream and downstream locations along Maules Creek, Back Creek and the Namoi River as illustrated on figure 8. Ten of 12 sites were selected, due to the Namoi being inaccessible, for photographic survey of the existing geomorphological condition of the downstream drainage system, from the mine site to the Namoi River. 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 Water Management Plan (WMP).

For the first time since the commencement of sampling, water was present at all the sites along Back Creek and Maules Creek. The Namoi River was not sampled because the sites were inaccessible due to flooding.

Temperature was between 22.2 and 25.1 °C in Back Creek, and 20.9 and 23.8 °C in Maules Creek. Other water quality variables were influenced by the high rainfall and sediment-laden runoff that occurred in the days before sampling. Electrical conductivity was between 213 and 349 µS/cm and was within the ANZECC Trigger range at all sites. Turbidity was high at all sites, exceeding the ANZECC range. The lowest measurement was at BCP9, the downstream site on Maules Creek, with a turbidity of 28.5 NTU. It was highest at BCP4 and BCP5, with 79.6 and 79.9 NTU. All sites had DO concentrations below the recommended ANZECC guideline values. Water that has recently fallen as rain generally has a dissolved oxygen concentration close to saturation. However, it is possible that the high silt load in the water has generated a high oxygen demand and contributed to the low DO concentration.

There is no recommended ANZECC range for alkalinity, but previous assessments for MCCM have used the range of 75 to 200 ppm as the acceptable level for aquatic life (Cumberland Ecology 2021). Alkalinity during the 2021 survey was between 79 ppm at BCP3, closest to MCCM, and 126 ppm at BCP8, the furthest site downstream along Back Creek. The two Maules Creek sites had alkalinity measurements of 120 and 118 ppm.

Although the ANZECC guidelines do not provide a trigger value for alkalinity, an alkalinity range of 75 – 200 ppm is considered suitable for most aquatic life. Although the ANZECC guidelines provide an ideal pH range of 6.5 – 8, several aquatic organisms can be tolerant of pH levels up to 9. The recorded alkalinity levels were within suitable ranges to support aquatic life.

A total of 50 invertebrate taxa were collected across all sites during December 2021, more than twice the number (22 taxa) collected in 2020. Generally, taxonomic richness at each site was higher than that of the corresponding site from 2020 (Cumberland Ecology 2021). Last year, richness in Back Creek ranged from 3 to 15 taxa, while in the two habitats sampled at BCP7, 8 (edge) and 7 (bed) taxa were collected. The mayfly family Baetidae, midge

larvae Chironomidae, and diving beetle Dytiscidae occurred at all sites in 2021, though not in both habitats. Coenagrionidae damselflies were at all sites except BCP9, and Caenidae mayflies were at all sites except BCP3 and BCP8.

Edge habitats had more taxa than bed habitats at all sites along Back Creek except for BCPX, with the edge at BCP2 having the highest (22 taxa) and the bed at BCP3 having the lowest (3 taxa) richnesses. Edge habitats upstream of MCCM have higher taxonomic richness than sites downstream, and there is a steady decline with distance from BCP3 to BCP5, then BCPX. Likewise, there were more taxa in the edge at Maules Creek upstream of the Back Creek confluence than downstream of the confluence.

High rainfall throughout 2021 resulted in regular flow in Back Creek, and occasional flooding. During the survey period in December 2021, all sites on Back Creek and Maules Creek were flowing at levels slightly higher than the bank. The two sites along Namoi River were flooded and could not be safely accessed or sampled.

All sites were in poor ecological condition when compared to AUSRIVAS reference sites. However, overall the sites had better taxonomic richness, higher SIGNAL Scores, and appeared in better physicochemical condition in 2021 than in 2020. There were 50 invertebrate taxa collected in 2021, compared to 2020. The main reason for the improvement in aquatic ecosystem health was the frequency with which water was flowing in the creeks. Longer and more regular periods of flow increased the time available for aquatic macroinvertebrates to colonise the creek. Although flow was not continuous throughout the year and Back Creek still dried up to isolated refuge pools, these pools were connected by flow following high rainfall, and invertebrates were able to disperse along the creek.

Riparian condition along Back Creek also benefited from the high rainfall, which encouraged grass to grow along the bank, providing cover to reduce the amount of erosion. Sites in the middle reaches of Back Creek had relatively healthy populations of *Melaleuca bracteata*, which provided shade and litter to the aquatic habitat, as well as bank structure and stability. However, the riparian zone along this section of Back Creek is restricted to a narrow band of vegetation surrounded by large areas of land cleared for agriculture, or downstream of BCP6 is non-existent. Although in relatively poor condition, the functional condition of the Back Creek riparian zone appears healthier than previous years because of the increased cover in the ground layer and because many of the *melaleuca* were flowering.

7.3 GROUNDWATER

7.3.1 Environmental Management

Groundwater at MCCM is managed in accordance with:

- the groundwater criteria prescribed under schedule 3 conditions 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.
- An updated WMP has been submitted to the DPE and is currently awaiting consultation from NRAR and DPE Water.

Currently groundwater monitoring is conducted at a network of regional bores and privately owned bores as illustrated in **Figure 11**.

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 Approved Water Sampling Methods and AS/NZS5667.11. All laboratory analysis is conducted by a NATA accredited laboratory.

In 2010, eight groundwater monitoring bores and four vibrating wire piezometers were constructed within former exploration holes ('MAC' bores) to collect pre-mining information as part of the Environmental Assessment (EA). All of these bores were progressively removed by mining or external activities, with the exception of one bore (MAC1280).

A replacement monitoring network was developed by MCCM in consultation with DPI-Water in 2013. The majority of the replacement bores were installed between 2013 and 2014. The replacement bores have the prefix 'RB' or 'BCM'. The two 'BCM' bores were installed along Back Creek to investigate the potential for a shallow water table to be present that could support vegetation occurring within the riparian zone along the drainage line. The progression of mining resulted in the removal of RB01, RB01A, RB02 and RB02A in 2017, and an alternative sampling location was identified, and continued to be sampled, pending amendment of the EPL.

A network of 17 additional monitoring bores and vibrating wire piezometers (VWPs) were proposed as part of the EA to monitor the cumulative impact of the BTM complex on the groundwater regime. The bores were also installed between 2013 and 2014 and positioned in lines radiating out from the Maules Creek Mine. The purpose of these sites was to monitor for depressurisation in the Permian strata and any potential water level drawdown within the surrounding alluvial aquifer. Details for each of the monitoring sites are provided in Appendix E.

This table indicates where a bore has been installed in proximity to the preliminary sites recommended within the Maules Creek EA, and the original bore numbering proposed within the EA. The monitoring sites are either PVC monitoring bores (standpipes) for shallow strata, or arrays of multi-level VWPs installed within multiple coal seams at different depths. Paired VWP arrays with a shallow standpipe were installed in some sites to allow for monitoring of the connectivity between shallow aquifers and deeper coal seams. The sites chosen also aimed, where possible, to be adjacent to existing shallow alluvial monitoring bores monitored by the NSW government to further assist in monitoring and understanding connectivity between the different geological units. These bores have the prefix 'REG' indicating they are for monitoring behaviour of 'regional' groundwater systems.

7.3.2 Environmental Performance

Parameters recorded as part of the scheduled groundwater monitoring for this reporting period are summarised below and results are provided in Appendix E. The appendix also includes graphs that compare the measured groundwater levels with predicted water levels from the 2020 groundwater model for each bore, in addition to presenting water level and water quality observations against triggers that were generally developed in accordance with the methodology proposed in the Water Management Plan.

Groundwater level trigger values were based on the 5th and 95th percentile values of all manual observations that were collected from regional monitoring bores until the end of 2016. Although observations between mid-2015 and the end of 2016 coincide with the preliminary period of operation, this data was included as baseline to establish a greater data set for analysis.

Groundwater quality trigger values were developed for Total Dissolved Solids (TDS) and sulfate using the control chart methodology. A control chart is an x-y chart with three additional horizontal 'control lines' running parallel to the horizontal axis. The 'control lines' are equivalent to one, two and three standard deviations based on the baseline data (until the end of 2016). Equivalent percentiles are used to assist interpretation. Trigger events occur when:

- one data point is greater than the 99.87th percentile (3 standard deviations);
- two consecutive data points greater than the 97.73rd percentile (2 standard deviations); and
- five successive data points greater than the 84.13th percentile (1 standard deviation).

When evaluating the results from control charts it is important to note that water chemistry results for each bore have some natural variability and are influenced by factors such as bore construction, sample depth, the sample collection method, climatic conditions, and aquifer conditions. Therefore, changes to previously observed trends do not necessarily indicate an impact from mining, but simply trigger further investigations to determine the cause of the variability.

Control charts were developed for total dissolved solids (TDS) but not for electrical conductivity (EC) as there are no ANZECC guideline values for EC. TDS is directly correlated with EC, allowing control charts developed for TDS to be used to evaluate changes in the salinity of groundwater.

The concentrations of dissolved metals and nutrients in groundwater samples were compared against the ANZECC (2000) and NHMRC (2011) guideline values. The concentrations of dissolved metals are commonly low and often fall below the level of laboratory detection. It is important to note that the adopted thresholds simply provide information on the beneficial uses of the water, and are not necessarily indicators of impacts from mining.

Regional Groundwater Bores

Groundwater level/quality monitoring in regional bores was respectively conducted quarterly/bi-annually during the reporting period. Graphs showing trends in groundwater level and water quality for the regional bores are included within **Appendix E**.

Rainfall was higher than average throughout the 2021 calendar year, with the cumulative rainfall departure (CRD) largely increasing over this period. Over the reporting period, groundwater levels remained stable trends at REG5, while declining trends were observed at MAC1280 (slight), REG4, and RB05A, with increasing trends observed at REG3, REG6, REG7A, REG12 (slight), REG13 (slight), and REG14. Increasing groundwater levels are consistent with the higher than average rainfall over the reporting period, which is shown by increases to the CRD. Conversely, groundwater levels decreases that were observed in monitoring bores that are installed into the coal measures (MAC1280 and RB5A) are likely attributed to continued depressurisation of this formation as mining progresses, which is consistent with model predictions. There is also some evidence that groundwater level declines observed in Boggabri Volcanics bore REG4 may also be related to mining, although it is noted that the total drawdown since 2014 is only 0.78 m.

Figure E1, which is included within **Appendix E**, is a spatial representation of recent groundwater levels from standpipe bores within the monitoring network. Groundwater levels generally decrease in elevation down the alignment of Maules Creek and Back Creek, indicating that groundwater flow is a reflection of the topography in these areas. Depressed groundwater levels are evident in the Permian monitoring bores in close proximity to the

mining area, as has been predicted by numerical modelling. The Permian monitoring locations east of the Maules Creek mining area recorded the greatest reductions in water level across the monitoring network during 2021. The monitoring network targets a range of different stratigraphic units and groundwater systems at different vertical elevations, and therefore it is not appropriate to present water level contour lines on **Figure E1**. Despite this, the available water level hydrographs can be interpreted to assess hydraulic gradients vertically and spatially.

TDS concentrations are variable within the monitoring network and range from fresh to moderately saline. The majority of the TDS concentrations that were recorded over the 2021 monitoring period are consistent with historical trends. Five bores triggered with respect to TDS concentrations (REG5, REG7A, REG12, REG13, RB05A), while six bores triggered with respect to sulfate concentrations (REG3, REG5, REG6, REG7A, REG13, REG14). These trigger events are discussed further in Section 7.3.2.

Private Groundwater Bores

Groundwater monitoring was conducted at private bores twice during the reporting period. Not all bores could be sampled for level or quality on both occasions due to bore access restrictions or blockages. Graphs showing trends in groundwater level and water quality for the private bores are included within **Appendix E**. During 2021 all of the bores recorded relatively stable groundwater levels, with an increase of approximately 1.8 m observed in WOL1, which is likely associated with higher than average rainfall.

The pH, EC, TDS and sulfate concentrations all remained relatively stable during the reporting period and values are generally consistent with historical data. The sulfate concentration in BAS2 is significantly higher than other private bores. Increased values of EC and TDS in BRE2, which have been present since 2017, remain elevated over the 2021 reporting period. The historical dataset for these private bores suggests that exceedances of NHRMC (2011) drinking water guidelines are relatively common, with these relatively elevated concentrations likely representative of natural groundwater. Over the 2021 reporting period, ANZECC (2000) guideline values for dissolved metals (largely iron) were exceeded in the Bas1, Bas2, BRE2, Morse, MOR2, Teston and Tralee bores.

Vibrating Wire Piezometers

The locations of Vibrating Wire Piezometers (VWPs) is illustrated **Figure 11**. **Appendix E** includes graphs of water levels for each VWP array plus any adjacent shallow standpipe monitoring bores. The data collected by the VWP data loggers is downloaded on a monthly basis. The VWPs measure water pressure (equivalent to water level) within select coal seams and observations from sensors at different depths show groundwater level differences that occur vertically within the geological sequence. VWP water level variations demonstrate different trends that are often related to climatic conditions and/or mining. The VWPs that are in close proximity to the active mining areas indicate that depressurisation is occurring as mining progresses, which is consistent with numerical modelling. Climatic influences are also evident within some of the VWPs, with significant rainfall events (CRD spikes/long-term increases) leading to rising groundwater levels in some sensors and gradual declines that are likely associated with previous droughts. Graphs of compiled VWP recordings are also included in **Appendix E**. During 2021, decreasing trends in certain coal seams that are monitored by REG01, REG08, REG10, RB03, RB04, and RB05 were observed, which are consistent with long-term depressurisation that has been ongoing during mining activities. Conversely, the influence of higher than average rainfall has resulted in a groundwater levels increases at some locations (REG01, RB05_VW1). This rainfall also led to a significant increase in the groundwater levels in the REG02 fault zone VWP, where a strong direct correlation to rainfall and recharge has previously been seen. Groundwater levels in REG07 and REG09 have either remained stable or slightly risen over the 2021 monitoring period, suggesting that mining induced depressurisation has not extended this far to the east/southeast.



Figure 11 Groundwater Monitoring Locations

7.3.2 Trigger events

An analysis of trigger events as per the WMP was undertaken and is shown within figures and tables in **Appendix E**. The trigger events are also summarised below in **Table 18**. The concentrations of dissolved metals and nutrients within the monitoring bores were compared with the thresholds from the ANZECC guidelines (refer **Appendix E, Table E-3**).

The historical dataset for these monitoring bores suggests that exceedances of NHRMC (2011) drinking water guidelines are common, with these relatively elevated concentrations likely representative of natural groundwater. Over the 2021 reporting period, ANZECC (2000) livestock and/or irrigation guideline values were exceeded for pH (MAC1280, REG4), sulfate (REG13), and some dissolved metals (MAC1280, REG3, REG5, REG6, REG7A, REG13, REG14, MAC1280) (refer **Appendix E, Table E-3**). These exceedance are generally consistent with historical data, noting that MAC1280 is likely remains impacted by the grout that was used during installation of the bore.

Table 18 Groundwater Trigger Events

Bore	Geology	Triggered?			Comment
		Level	TDS	SO ₄	
MAC1280	Permian	No	No	No	Groundwater level declines do not reflect climatic conditions, although are consistent with model predictions. TDS concentrations have slowly increased since 2015. pH has been consistently elevated since the start of sampling, which is attributed to cement grout installation impacts.
RB05A	Merriown Seam	Yes – falling	Yes	No	Water level falling as predicted due to proximity to active mining. TDS concentrations exceed the upper trigger level twice within the reporting period. Gradual increases in TDS concentrations are apparent since 2018.
REG12	Boggabri Volcanics	No	Yes	No	A minor increase in groundwater level has been observed, which is consistent with climatic conditions. TDS concentrations fell between December 2020 and September 2021, although again increased to a level above the upper trigger value in December 2021. Elevated concentrations are consistent with most other monitoring bores and may be attributed to an increased level of recharge throughout the year, or possibly with issues/variability in the sampling methodology.
REG13	Boggabri Volcanics	Yes – rising	Yes	Yes	Over the 2021 reporting period, groundwater levels increased, which is consistent with climatic conditions. TDS and sulfate concentrations were higher than the upper trigger value throughout the reporting period. Elevated concentrations are consistent with historical observations, as well as the concentrations measured in most other monitoring bores. Elevated concentrations may be attributed to an increased level of recharge throughout the year, or

					possibly with issues/variations in the sampling methodology.
REG14	Basement	No	No	Yes	Over the 2021 reporting period, groundwater levels increased, which is consistent with climatic conditions. Sulfate concentrations for each sampling event exceed the upper trigger value, although values are still within historical ranges.
REG3	Boggabri Volcanics	Yes	No	Yes	Historical water level observations suggest that this bore is likely impacted from nearby alluvial extraction. Over the 2021 reporting period, groundwater levels increased, which is consistent with climatic conditions. The upper trigger level was exceeded in December 2021, although this directly correlates to significant rainfall over the preceding month. Sulfate concentrations are largely consistent with historical results; however, the concentration recorded in December 2021 exceeded the upper trigger value and is the highest level on record. Further monitoring is required to determine if sulfate remains at an increased concentration.
REG4	Boggabri Volcanics	Yes – falling	No	No	Groundwater level variations are generally consistent with the gradual decline that has been ongoing since 2017. Monthly fluctuations in June, September, October and December 2021 appear to be erroneous measurements. No increase in levels during the wetter than average 2020/2021 may suggest that previous declines are not attributable to drought. However, it should be noted that the cumulative decline over four years is less than 1 m.
REG5	Boggabri Volcanics	Yes	Yes	Yes	Groundwater levels over the 2021 reporting period are generally stable and largely fall within baseline ranges, although two measurements in October/December fall below the lower trigger value. TDS concentrations are consistent with the historical dataset and fall below the lower set of triggers. These triggers are likely inappropriate due to the uncharacteristically high concentrations at the start of the monitoring record skewing data. Sulfate concentrations have remained stable since 2018 (at concentrations above the upper trigger value) after reaching these elevated concentrations between 2018 and 2019. Previously it has been conceptualised that a relative absence of recharge has been the cause of these elevated levels. However, a decrease has not been observed over the wetter than average 2020/2021 period.
REG6	Boggabri Volcanics	Yes – rising	No	Yes	Over the 2021 reporting period, groundwater levels increased, which is consistent with climatic conditions. These levels still fall below the lower trigger value, with a significant decline taking place during the 2017 to 2020 drought. Since sulfate

					concentrations reached a historical high in December 2020, concentrations have continuously fallen throughout 2021. Sulfate concentrations fell below the lower trigger in December 2021, although this is consistent with historical records and is not considered to be a cause for concern.
REG7A	Alluvium	Yes – rising	Yes	Yes	Higher than average rainfall throughout 2021 has led to more than a 2.5 m rise in groundwater levels over the reporting period. Groundwater levels have been higher than the upper trigger since July 2021, although this is considered to be a natural response. Elevated TDS and sulfate concentrations, which fall above the upper trigger value, are likely a result of an increased level of recharge throughout the year and a rising water table.

7.3.3 Groundwater Inflows

Surface water balance estimates of groundwater inflow that reports to the mining area was negligible in the 2017 calendar year (less than 10 ML/year), after which volumes are estimated to have increased in 2018 (578 ML/year), 2019 (231 ML/year), 2020 (218 ML/year), and in the current 2021 reporting period (296 ML/year) (WRM, 2022). This increase after 2017 reflects the deepening of the pit below the regional water table. As mining progresses, groundwater inflows are predicted to vary with the changing mine layout, depending on the interception of porous rock water sources and the area of the mine being developed.

The Groundwater Impact Assessment (AGE, 2011) estimated the rate of groundwater seepage to the open cut pits in the mining complex using a cumulative numerical model. AGE (2014) updated the groundwater model and seepage estimates as summarised in the WMP. The groundwater model was further updated in 2018 (AGE, 2018) and again in 2020 (AGE, 2021). The Maules Creek mine plan was amended as part of 2020 updates to the model to better reflect the actual progression of mining up to March 2019.

Predictions of groundwater inflow over 2021 is as follows for the various model iterations: AGE (2014) – 632 ML/year; AGE (2018) 450 ML/year; and AGE (2021) 603 ML/year. Estimates of inflow from current modelling (AGE, 2021) are approximately double the estimated inflows from the site water balance model (WRM, 2022). It is important to note that estimates for the numerical groundwater models represent groundwater removed by pumping, water that evaporates from the highwall, and water bound with coal and spoil. In contrast the water balance method only estimates the volume of water that flows into the mine water circuit. Both methods are therefore not directly comparable due to differing underlying assumptions.

Monitoring to the east of Maules Creek Mine (REG08, REG10, RB03, RB04, RB05) has shown declining groundwater levels since the onset of monitoring in 2014, and drawdown that was observed over 2021 is consistent with this trend. This depressurisation of the coal seams is expected to be a response to mining at Maules Creek since the pit floor moved below the water table. Additionally, Boggabri Mine is progressing northwards towards Maules Creek Mine, and a cumulative impact is likely to be contributing to the observed depressurisation. Groundwater levels in REG07 and REG09 have remained stable since the onset of monitoring, suggesting that mining induced depressurisation has not extended this far to the east/southeast.

Inflows for the 2020-2021 water year have been accounted for via the different groundwater licenses held by Maules Creek (listed in Section 7.1) and were determined using proportional takes for each of the alluvial water sources based on the numerical modelling outputs (AGE, 2020) for the same period.

The passive take from the alluvial Upper and Lower Namoi Groundwater Sources cannot be directly measured or validated, and therefore the takes must be estimated via numerical groundwater modelling, and validated through groundwater level monitoring between the mines and the alluvial zones. There is therefore an inherent uncertainty in the estimates of the passive takes from the alluvial aquifers that cannot be reduced as direct measurement of this flow change is not possible.

7.3.4 Validation of Groundwater Model

As required by Schedule 3, condition 40 (c) of PA10_0138, a review of the measured groundwater monitoring results against predictions made within the 2014 groundwater model was undertaken by AGE. This review commenced in 2016 as part of a wider review of groundwater processes occurring in the Maules Creek area. The validation/verification process involved comparing:

- measured groundwater levels and trends in the monitoring bore and vibrating wire piezometer (VWP) network with the model predictions; and
- estimates of pit inflow from site water balances with model predictions.

The groundwater model was updated and recalibrated in 2018 (AGE, 2018) and again in 2020 (AGE, 2021). Modelled water levels for the 2020 model are provided in Appendix E for comparison with monitoring observations. The 2020 groundwater model contains observed rainfall data to June 2019, and uses a synthetic average rainfall dataset after that time. Therefore, the AGE (2020) model more accurately accounts for the period of drought that occurred between 2017 and 2020 compared to the AGE (2018) model, where only 2017 conditions were captured (calibration dataset to December 2017).

Overall, the trends observed in the standpipe monitoring bores are comparable, even if the matches to absolute water level elevations are variable. Modelled groundwater level predictions at VWPs are generally similar to observed trends, although absolute water level elevations are again variable. Numerical modelling for the BTM Complex has always struggled to accurately match the trends and absolute levels observed in VWPs, including vertical hydraulic gradients. VWP simulations of the AGE (2021) model are a significant improvement relative to previous modelling in this regard, although matching observations in VWPs that are not yet depressurised by mining (REG02, REG07, REG09) is still problematic.

Water balance estimates of pit inflow have increased in 2021 compared to the previous year. The estimated inflow of 295 ML/year (0.81 ML/day) (WRM, 2022) matches well with the groundwater model when taking into account the different assumptions that underly each method (as discussed in **Section 7.3.3**).

7.3.5 Proposed Improvement Measures

The groundwater monitoring program and management measures described above will continue to be implemented during the next reporting period. Additional groundwater monitoring bores are scheduled to be drilled in 2022.

7.4 SITE WATER BALANCE

The site water balance for the reporting period is presented below in **Table 19** Site Water Balance (Calendar Year 2021).

A review of the water balance found that inflows to the site during the reporting period were higher than the predictions made in the EA for Year 5 and Year 10 of MCCM operations. Rainfall and runoff (3,959 ML) was significantly higher than predicted in the EA for Year 5 and Year 10 (1,233 ML and 1,103 ML, respectively). This is attributed to the higher than average rainfall received at MCCM in 2021. Actual Namoi River pumping inflow (204 ML) was much lower than predicted in the EA for Year 5 and Year 10 (1,620 ML and 1,860 ML, respectively).

Net CHPP water usage (4,016 ML supply minus 2,845 ML recovery = 1,171 ML net) is significantly less than the consumption predicted in the EA for Year 5 and Year 10 (2,384 ML and 2,598 ML, respectively). This is due to the differences between the predicted and actual proportion of ROM coal that is bypassed (and therefore not washed).

Dust suppression usage (1,151 ML) was significantly higher than predicted in the EA for Year 5 and Year 10 (328 ML and 453 ML, respectively) - this is due to active management measures in place to minimise potential dust emissions from haul roads and other exposed areas during the reporting period.

Estimated in-pit groundwater inflows (296 ML) are within the range of those predicted in the EA for Year 5 and Year 10 (36 ML and 350 ML, respectively). Over the last 3 reporting years notable groundwater inflow was observed in the operation. This is likely to be attributed to the mining sequence progressing deeper within the stratigraphy, resulting in increased groundwater inflow from the coal seams.

Table 19 Site Water Balance (Calendar Year 2021)

Aspect	Volume (ML)
Change in Storage	
Start of 2021	999
End of 2021 ²	2,602
Net Change in Storage	1,604
Water Inflows	
Namoi River Pumping	204
MAC1498 Bore	0
Olivdene Bore	0
Brighton Bore	0
Roma Bore	0
BCM Bore	0
Rainfall & runoff [^]	3,959
CHPP Water Recycling	2,845
In-pit Groundwater Seepage ⁴	296
Total Inflows	7,304
Water Outflows	
CHPP water use	4,016
Dust suppression	1,151
Evaporation from storages ³	476
Clearing / construction process water	57
Offsite discharge	0
Licence Discharge ⁵	0
Total Outflows	5,699
Water Balance (2021)	1,604

* Volume for calendar year

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

Based on flow meter readings

[^] Based on the calibrated MCCM water balance model, using site rainfall data

³ Based on the calibrated MCCM water balance model, using SILO datadrill evaporation data

⁴ Based on model calibration, operational observation & pumping meter records

⁵ SD9 is not modelled in the MCC GOLDSIM model

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

8.1.1.1 Status of Mining and Rehabilitation

At the completion of the reporting period, all domains were classed as 'active' and 40 ha of rehabilitation was completed in association with stabilisation following the completion of particular construction activities. **Figure 12** below from the approved MOP represents the mining domains at the completion of the reporting period. Progressive shaping occurred on the northern emplacement, with approximately 233 hectares seeded to achieve a Box Gum Woodland.

8.1.1.2 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 20 and also included in the MOP.

Table 20 Rehabilitation Objectives

Feature	Objective
Mine site	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Constructed landforms drain to the natural environment
Final void	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise
All land, other than the final void	<ul style="list-style-type: none"> • Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: <ul style="list-style-type: none"> ○ Local native plant species; and ○ 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	<ul style="list-style-type: none"> • Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure

8.1.1.3 Rehabilitation Performance Indicators

Table 21 summarises the rehabilitation status for the MCCM. Rehabilitation activities continued on the Northern Overburden Emplacement Area. During the reporting period 40.6ha of spoil were reshaped with topsoil spread. And all land currently under active rehabilitation has been seeded with a White Box Gum woodland mix. In addition to the seeding, tube stock seedlings were planted over a 10 ha section on the lower north-eastern slopes of the rehabilitation area.

Table 21 Rehabilitation Status

Mine Area Type	Previous Reporting Period 2020	This Reporting Period 2021 (Actual)	Next Reporting Period 2022 (Forecast)
A. Total mine footprint	1,433	1,478	1,503
B. Total active disturbance	1,661	1,694	1,696
C. Land being prepared for rehabilitation	54	41	40
D. Land under active rehabilitation	193	235	270
E. Completed rehabilitation	-	-	-

8.1.1.4 Decommissioning and Demolition Activities

As anticipated in the MOP, no decommissioning activities of permanent infrastructure was undertaken during the reporting period.

8.1.1.5 Other Rehabilitation Activities

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

8.1.1.6 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off has not been requested.

8.1.1.7 Variations in Activities against MOP/RMP

A letter amendment to the MOP was approved during the 2021 reporting period that included modifications and refinement to the mine design, topsoil stockpiles, waste emplacement areas, rehabilitation trials and disturbance areas within the MOP term. The MOP was approved for the period November 2020 – January 2023 and is available on the Whitehaven Coal website.

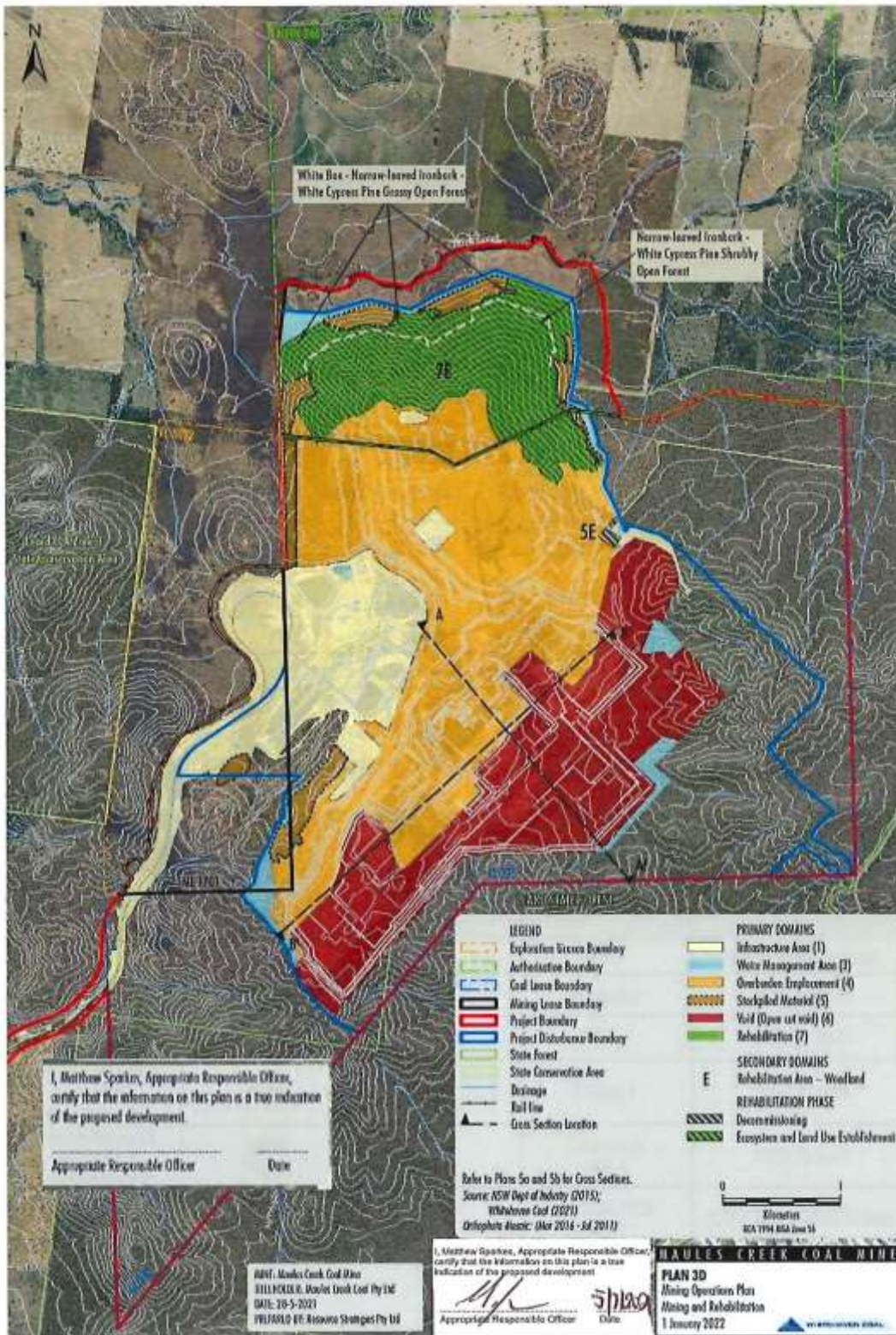


Figure 12 Mining Domains at Completion of the Reporting Period (2021)

8.1.1.8 Monitoring

An area of 193ha consisting of 10ha seeded in 2019 and 180ha seeding in 2020 was monitored in spring 2021. A total of 211 species have been identified since monitoring surveys commenced in 2020; including 136 native species and 75 exotic species. During the 2020 monitoring a total of 65 species were identified which included 41 native species and 24 exotic species. 94 additional native species and 51 new exotic species were recorded in 2021. Native species richness surpasses the mean and minimum targets across all plots which have been monitored (**Figure 13 Native Species Richness in the 20 x 20 m plots in 2020 and 2021.**). There was no overstorey cover recorded in any of the 50m transects, however there were planted saplings recorded at all plots. There was a total mortality of 29 saplings observed across since the baseline survey in 2021. Native midstorey cover was above the Year 1 and Year 2 mean and minimum targets and was high in plots established in 2020. Native grass cover was at or above benchmark for the majority of the plots. Additional seeding has occurred in areas where low grass cover was observed.

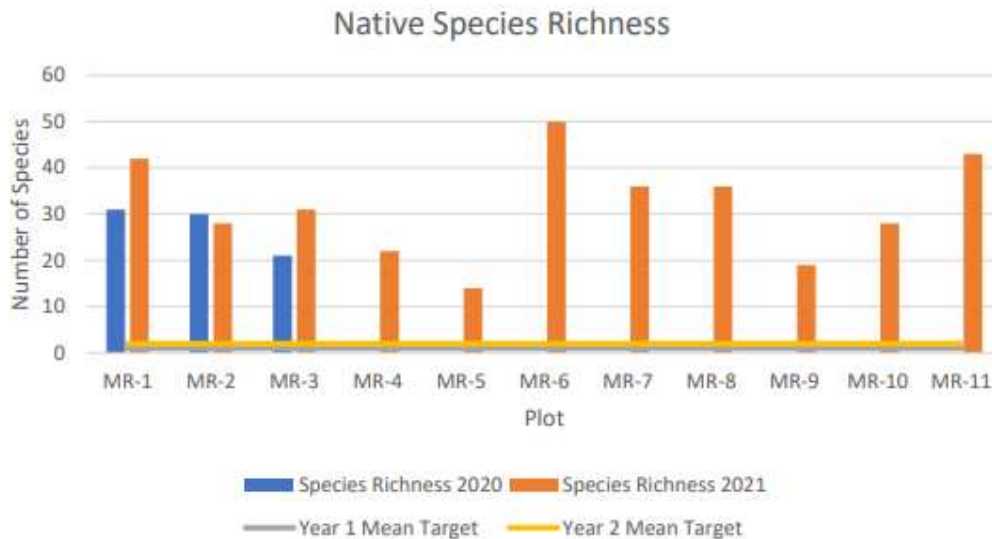


Figure 13 Native Species Richness in the 20 x 20 m plots in 2020 and 2021.

Visual inspections of short term (or temporary) rehabilitation are undertaken to assess surface stabilisation around infrastructure areas and topsoil stockpiles.

8.1.1.9 Topsoil Stripping and Stockpiling

During the reporting period topsoil and subsoils were stripped and stockpiled to address the objectives in the SHMP within the MOP. Long-term stockpiles were seeded with White Box Gum Woodland seed mix as part of the 2021 seeding program.

8.1.1.10 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 22**. 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 22 Topsoil Balance

Topsoil Balance (M ³)									
Area	2014	2015	2016	2017	2018	2019	2020	2021	Total
MIA / Construction	539,166	145,990	-	-	-	-	-	-	685,156
Mining Operations	252,490	349,928	852,524	762,718	251,075	225,173	127,086	72,000	2,892,994
Still to clear / strip	-	-	-	-	-	-	-	-	283,333
Totals	791,656	495,918	852,524	762,718	251,075	225,173	127,086	72,000	3,861,483
EA Total for rehab	-	-	-	-	-	-	-	-	2,368,000
Net difference	-	-	-	-	-	-	-	-	1,493,483

8.1.1.11 Trials, Research Projects and Initiatives

In accordance with Condition 15 & 16 of the MCCM EPBC Approval 2010/5566, MCC must fund \$1 million into research of Box Gum Woodland mining rehabilitation as well as \$1.5 million into research for threatened species recovery actions for the Regent Honeyeater, Swift Parrot and South-eastern (Corbens) Long-eared Bat. In accordance with approved Research Project Plans; Maules Creek Coal funded the following activities during 2019 including:

- Annual spring surveys at potential Swift Parrot foraging habitat sites across their breeding range in Tasmania.
- Research for Regent Honeyeater involved designing, installation and undertaking survey of nest predation mitigation structures plus Noisy Miner management and facilitation/coordination of twice annual volunteer survey programs.
- Radio tracking of habitat and roost usage research of South-eastern Long-eared Bat as well continuing development of acoustic techniques for Nyctophilus species call identification.
- Draft reporting of the seed bank within natural and stockpiled soil samples at the MCCM.

The findings of these research projects will be used to inform MCC on potential improvements to rehabilitation and restoration practices in particular during Box-Gum Woodland revegetation activities but also the management of threatened species both onsite and in the Biodiversity Offset Areas.

8.1.1.12 Key Issues to Achieving Successful Rehabilitation

The key issues to achieving successful rehabilitation at MCCM include:

- Excessive erosion and sedimentation (e.g. gullyng 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).
- 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.). During the reporting period a Corrective Actions Protocol was developed which will allow for tracking and reporting on all corrective actions undertaken in relation to the rehabilitation.

An updated TARP for rehabilitation at MCCM has been included in the MOP, which outlines appropriate actions and varied responses that will be implemented as required.

8.1.1.13 Actions for the next reporting period

The rehabilitation actions and detailed justification for the next reporting period are detailed in the MOP. Rehabilitation is continuing on the northern overburden emplacement area. During the next reporting period significant tube stock will be planted across the 2021 rehabilitation areas.

8.1.1.14 Proposed Research and Rehabilitation for 2022

MCCM will continue to progressively shape available areas that are at final landform and elevation for rehabilitation. Continuing shaping and rehabilitation of available areas will be targeted in the north-eastern extent of the overburden emplacement during the 2022 reporting period. Minor exploration site rehabilitation and short term (or temporary) rehabilitation will also occur as required. As outlined in Section 8.1.1.11, implementation of research into both the Box-Gum Woodland rehabilitation and Threatened Species recovery actions is underway and, on the research schedule, is on track for completion in 2022/2023.

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 wide variety of community engagement and consultation methods including the;

- MCCM Community Consultative Committee (CCC),
- Boggabri-Tarrawonga-Maules Creek (BTM) combined CCC,
- Whitehaven website,
- MCCM phone hotline and dedicated email address,
- MCCM Mine Tours,
- local School visits and presentations to Students and Teachers in and out of School,

- sponsorship and engagement with local Community events and Groups,
- meetings as required with Neighbours,
- a range of stakeholders including; Government and non-Government Agencies, and
- local Media updates

While many events went ahead as planned Covid-19 constraints meant some events were postponed or cancelled altogether.

MCCM operates a Community Consultative Committee, with meetings held quarterly during the reporting period. In addition a joint meeting between Maules Creek Coal, Boggabri Coal and Tarrawonga Coal Mines CCC's was held in May 2021. A second joint meeting was scheduled for early November, however due to COVID restrictions this did not go ahead. Minutes of these meetings are posted on the Whitehaven website once ratified at the following meeting.

MCCM are also involved and attend various community events and information forums as part of engaging with the local Community including; Business Chamber forums, Council meetings, Industry forums, local School and Business functions, Community gatherings and Charity Club functions across four (4) LGA areas.

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 included:

Baan Baa Tennis Club
Barada Barna Aboriginal Corporation
Black n Blue Boxing
Carols in the Park - St Barnabas
Clontarf Foundation
Collegians Junior Rugby League
Country North Cowboys Police Rugby League
Country Universities Centre North West
Curlewis Pre-School
Curlewis Public School
Currabubula Red Cross
Firebug Photography
Forest Coach Lines Pty Ltd
Future EDU Inc
Gunnedah Bulldogs Rugby League Club
Gunnedah Can Assist
Gunnedah Eisteddfod Society
Gunnedah High School
Gunnedah Ministers Fraternal
Gunnedah PCYC/ Joblinkplus
Gunnedah Public School
Gunnedah Shire Band Incorporated
Gunnedah Show Society
Gunnedah South Public School

Gunnedah Water Tower Museum
Gunny Munny
Janice Knox
Legacy
Liverpool Plains Reconciliation & Retaining Local Youth Ride
Maules Creek Campdraft Club
Narrabri High School
Narrabri LALC
Narrabri Rugby League Football Club
Narrabri Show Society
Nurruby Children's Services Incorporated
Operation Pilgrimage Group
Rotary Club of Quirindi
Rotary Mental Health
Sacred Heart School Parents & Friends
Special Children's Christmas Parties
Spring Ridge Parents & Citizens
St Marys College
The Gunnedah Tennis Club
The OBG Co
The Rotary Club of Narrabri
The Rotary Club of Tamworth First Light
Two Rivers Arts Council
West Tigers Rugby League Club
Westpac Rescue Helicopter Service

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. The SIMP is currently in the process of being updated and has been sent to the Council's, Indigenous Representatives, Community Representatives and DPIE for review and comments.

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.

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 into the local community 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. It is acknowledged the housing market is becoming tighter as more people move from the city to the bush across

the regions. MCCM are considering what options there might be to alleviate the strain on the housing and rental market while maintaining housing opportunities for employees.

Employment and Training

As at the end of the reporting period, the total full time equivalent (FTE) Workforce was 766 personnel with 517 personnel employed with Whitehaven Coal and 249 personnel employed through labour hire contract partners. Whitehaven Coal continue to focus on local employment with 72% of MCCM employees residing in the Local Government Area's (LGA's) of Gunnedah and Narrabri (including Manilla). The remaining 28% of WHC MCCM employees (including management and professional staff) have permanent residence listed as being outside the Narrabri and Gunnedah LGAs.

During this period, MCCM recruited 120 permanent roles, of which 76 were local residents (63% of the new recruits; and 10% of the overall workforce); and 21 relocated to live in the Narrabri or Gunnedah LGA as a result of their employment at MCCM (3% of the workforce). During this period, MCCM employed 37 new recruits from the Gunnedah LGA (5% of the workforce); and 39 new recruits from the Narrabri LGA (5% of the workforce).

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 MCCM workforce at the end of the period:

- 91 (approximately 12%) are Indigenous, with the percentage remaining the same as the previous reporting period;
- 121 (approximately 16%) are women, with the percentage remaining the same as the previous reporting period; and
- 51 commenced roles as a Trainee Operator (new to mining).

Whitehaven and MCCM provide training opportunities for apprenticeships in order to support local employment and increase local skill levels. During the reporting period five (5) locals accepted apprenticeships as, one (1) Auto Electrician, two (2) Mobile Plant Fitter, one (1) Electronics and Communications Technician and one (1) Electrician as part of the WHC MCCM apprenticeship program. This takes the total number of apprenticeships accepted under the program to 61, since 2011.

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, Werris Creek and Tamworth townships through their purchases from local businesses.

In 2021 Whitehaven spent:

- \$202.482m in salaries, wages, taxes and superannuation to employees (on an equity joint venture basis)
- \$105.8m in royalties to the New South Wales Government (on an equity joint venture basis)

- Over \$846.7m on mining, washing and delivering coal onto trains at our mine sites
- Over \$403.0m in port and rail charges for track access haulage costs and port costs

Community Infrastructure

During the reporting period MCCM paid Narrabri Shire Council (NSC) over \$600,000 under its VPA as a result of coal sales directly from the MCCM, to be spent on further infrastructure projects.

During the 2021 period WHC spent approximately \$344.7 million with 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

Whitehaven maintains a dedicated Community Hotline 1800 WHAVEN (1800 942836) for all the sites including MCCM and is answered by an operator. The contact line continues to be advertised on the Whitehaven Coal website, MCCM CCC meeting and minutes, in Community Newsletters and newspaper advertising.

A summary of the complaints (by category) received by MCCM over the last two reporting years are detailed in Table 23. The Community Complaints Register is also available on the Whitehaven Coal website and a summary provided at CCC meetings.

Table 23 Summary of Community Complaints and Enquiries

Category	2020	2021
Air quality	1	0
Traffic	0	2
Lighting	1	2
Noise	1	8
Blasting	5	8
Social impacts	0	2
Other	3	0
TOTAL	11	22

Note: a single complaint may involve multiple categories.

9.3.1.1 Complaint Trends

The total number of complaints received in 2021 was significantly higher than those recorded in the 2020 reporting period.

Air quality complaints decreased from 2020 (1), recording no complaints for the 2021 reporting period.

Two lighting complaints were received in 2021 up from one in 2020. MCC liaised with the property owners and adjusted the lighting plants accordingly. A lighting review was also undertaken at the property which indicated no exceedance of criteria.

Noise complaints increased from 2020. The EPA reviewed noise data supplied by MCC and no further action was taken.

Blast complaints increased from five (5) to eight (8) in 2021. All monitoring data was compliant with licencing conditions. All monitoring data was supplied to the regulatory agency and complainants.

9.3.1.2 Actions & Proposed Improvements

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

- Investigations into specific mining activities and trialing and implementing equipment upgrades;
- 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 INDEPENDENT ENVIRONMENTAL AUDIT 2018

AN IEA was undertaken in 2021 by an independent auditor approved by the DPE as required under Schedule 5, Condition 10 of the PA10_0138 however at the time of reporting the final IEA report had been lodged and is awaiting approval by the DPE. Upon approval of the final audit report, MCC will include details of the findings and proposed actions within the next Annual Review.

Prior to the above, the last approved IEA was undertaken in 2018. All actions from the 2018 IEA had been addressed and closed out prior to undertaking the 2021 IEA.

The following actions were identified during the 2018 IEA in Table 24 below. A copy of the audit report and the action plan in response to the audit recommendations is available on the Whitehaven Coal website. These include recommendations that may have been relevant during the audit period however outside the applicable Annual Review reporting period. All actions were completed prior to this Annual Review period, or alternatively continued to be reviewed and applied as required (i.e. real time noise monitoring).

Table 24 IEA Recommendations and Actions

Item	Assessment requirement	Auditor recommendation	Proposed Action	Estimated completion date						
Sch 2 Cond 10	<i>By the end of 2013, or as otherwise agreed by the Secretary, the Proponent shall surrender the existing development consent (i.e. DA85/1819) for mining on the site in accordance with Section 104A of the EP&A Act.</i>	This is a legacy Administrative Non Compliance. MCCM satisfied the requirements of this condition during the current audit period, however the required date was not met. No further action required.	No further action required	Not applicable.						
Cond 17	<i>By the end of March 2013, unless the Secretary agrees otherwise, the Proponent shall enter into a planning agreement with Council in accordance with: (a) Division 6 of Part 4 of the EP&A Act; and (b) the terms of the Proponent's offer in Appendix 3.</i>	No further action required as this is a legacy ANC relating to timeframe.	No further action required	Not applicable						
Sch 3 Cond 7	<p>Noise Criteria <i>Except for the noise affected land in Table 1, the Proponent shall ensure that operational noise generated by the project does not exceed the criteria in Table 5.</i></p> <table border="1"> <caption>Table 5: Noise criteria dB(A)</caption> <thead> <tr> <th>Land</th> <th>Day/Evening/Night LAeq(5 min)</th> <th>Night LA1 (1 min)</th> </tr> </thead> <tbody> <tr> <td>All privately-owned residences</td> <td>35</td> <td>45</td> </tr> </tbody> </table> <p><small>Note:</small></p> <ul style="list-style-type: none"> Noise generated by the project is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Operational noise includes noise from the mining operations and the use of private roads and rail spurs. 	Land	Day/Evening/Night LAeq(5 min)	Night LA1 (1 min)	All privately-owned residences	35	45	MCCM is to ensure that all noise mitigation measures are implemented and TARPs are monitored and responded to accordingly to minimise the potential for noise exceedances.	MCC will continue to monitor real time noise levels and respond to TARP levels and responsibilities specified within the NMP. Attended monitoring results and compliance will be reported within the required external reports (EPL monthly report and Annual Review).	Ongoing
Land	Day/Evening/Night LAeq(5 min)	Night LA1 (1 min)								
All privately-owned residences	35	45								

	<p>However, these noise criteria do not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.</p>			
12	<p>Attenuation of Plant The Proponent shall:</p> <p>(a) ensure that:</p> <ul style="list-style-type: none"> • all mining trucks and water carts used on the site are commissioned as noise suppressed (or attenuated) units; • 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, and correspond to best practice or the application of the best available technology economically achievable; • where reasonable and feasible, improvements are made to existing noise suppression equipment as better technologies become available; and <p>(b) monitor and report on the implementation of these requirements annually on its website.</p>	<p>MCCM needs to continue to implement improvement of controls to reduce the sound power levels of the equipment that exceeds the EA criteria.</p>	<p>MCCM will continue to undertake SPL testing and report on mitigation measures within the Annual Review.</p>	<p>Ongoing</p>
24	<p>BLASTING Operating Conditions The Proponent shall not undertake blasting on-site within 500 metres of:</p> <p>(a) any public road without the approval of Council; or (b) any land outside the site that is not owned by the Proponent, unless:</p> <ul style="list-style-type: none"> • the Proponent has a written agreement with the relevant landowner to allow blasting to be carried out closer to the land, and the Proponent has advised the Department in writing of the terms of this agreement, or • the Proponent has: <ul style="list-style-type: none"> ○ demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the land without compromising the safety of the people or livestock on the land, or damaging the buildings and/or structures on the land; and ○ updated the Blast Management Plan to include the specific measures that would 	<p>No further action required, as all necessary agreements are now in place.</p>	<p>Complete</p>	<p>Complete</p>

	<p><i>be implemented while blasting is being carried out within 500 metres of the land.</i></p>			
33	<p>AIR QUALITY & GREENHOUSE GAS Operating Conditions The Proponent shall:</p> <ul style="list-style-type: none"> (a) <i>implement best management practice to minimise the off-site odour, fume and dust emissions of the project, including best practice coal loading and profiling and other measures to minimise dust emissions from coal transportation by rail;</i> (b) <i>operate a comprehensive air quality management system on site that uses a combination of predictive meteorological forecasting, predictive and real time air dispersion modelling and real-time air quality monitoring data to guide the day to day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures (such as relocate, modify and/or suspend operations) to ensure compliance with the relevant conditions of this approval;</i> (c) <i>manage PM2.5 levels in accordance with any requirements of an EPL;</i> (d) <i>minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d in condition 29);</i> (e) <i>minimise any visible off-site air pollution;</i> (f) <i>minimise the surface disturbance of the site generated by the project; and</i> (g) <i>co-ordinate the air quality management on site with the air quality management at other mines within the Leard Forest Mining Precinct to minimise the cumulative air quality impacts of the mines, to the satisfaction of the Secretary.</i> 	<p>No further action required as the predictive model is now operational and the official caution related to a specific event with no ongoing air quality impacts.</p>	<p>Operation of the predictive tool is implemented and safeguards in place to ensure continued operation.</p>	<p>Complete</p>
66	<p>Rail Transport Within 12 months of the completion of the Gunnedah Traffic Study, the Proponent shall:</p> <p>.....</p> <ul style="list-style-type: none"> b) <i>provide a report of the outcomes of this liaison and identify reasonable and feasible proposals recommended by the Proponent and/or the Gunnedah Shire Council towards implementing the Study's recommendations, to the satisfaction of the Secretary.</i> 	<p>No further action required as this is a legacy ANC.</p>	<p>No further action required.</p>	<p>Complete.</p>

70	<p>WASTE The Proponent shall:</p> <p>(a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the project;</p> <p>(b) ensure that the waste generated by the project is appropriately stored, handled and disposed of; and monitor and report on the effectiveness of the waste minimisation and management measures in the Annual Review.</p>	Review waste management practices around segregation of waste.	Reviewed. New waste management contract provider implemented.	Complete.
Schedule 4 Condition 2	<p>NOTIFICATION OF LANDOWNERS/TENANTS Prior to entering into any tenancy agreement for any land owned by the Proponent that is predicted to experience exceedances of the recommended dust and/or noise criteria, or for any of the land listed in Table 1 that is subsequently purchased by the Proponent, the Proponent shall:</p> <p>(a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time);</p> <p>(b) advise the prospective tenants of the rights they would have under this approval; and</p> <p>(c) request the prospective tenants consult their medical practitioner to discuss the air quality monitoring data and predictions and health impacts arising from this information, to the satisfaction of the Secretary.</p>	No further action required given that Tenancy Agreement is in accordance with this condition.	No further action required.	Complete.
Schedule 4 Condition 13	<p>Online Communication of Onsite Activities and Monitoring of Noise and Air Quality The Proponent shall, within 3 months of the date of this approval:</p> <p>(a) make the following information for the project publicly available on its website, on a daily basis and in a clearly understandable form:</p> <ul style="list-style-type: none"> • daily weather forecasts for the coming week; • proposed operational responses to these weather forecasts; • real-time noise and air quality monitoring data (subject to any necessary caveats); and • any operational responses that were taken in response to the noise and air quality monitoring data, and <p>(b) make provision on its website for the provision of on-line and/or email comments by members of the</p>	MCCM should include on its website details about its daily "operational responses" to the weather forecast.	Complete. Daily website details now address the recommendation. Additionally, operational responses are already included within the respective management plans. Furthermore, a daily risk output from 'Envirosuite' informs weather conditions and risk levels, with controls already identified within the management plans applied accordingly. An administrative change was made to the new website format to include reference to proposed operational responses.	Complete

	<i>community regarding this information, to the satisfaction of the Secretary</i>			
Appendix 5 Statement of Commitment s	<i>Mining Operations</i> <i>Maules Creek Coal shall surrender its existing development consent DA 85/1819 following the grant of the Project Approval.</i>	Refer to CoA Schedule 2 condition 10. This is a legacy ANC. No further action required.	No further action required.	Complete.
Coal Lease 375				
Condition 10.	<i>Blasting</i> <i>Blast Overpressure</i> <i>The lease holder must ensure that the blast overpressure noise level generated by any blasting within the lease area does not exceed 120 dB (linear) and does not exceed 115 dB (linear) in more than 5% of the total number of blasts over a period of 12 months, at any dwelling or occupied premises, as the case may be, unless determined otherwise by the Department of Environment, Climate Change and Water.</i>	Refer to CoA Condition 18.	Noted. No further exceedances have occurred since this event. This unit was on mine owned land.	Not applicable.
Condition 14	<i>Roads and Tracks</i> <i>During wet weather the use of any road or track must be restricted so as to prevent damage to the road or track.</i>	MCCM should endeavour and commit to restricting unnecessary traffic movement on roads and tracks in wet weather.	The Resources Regulator completed an audit in May 2018 and identified this condition was compliant. Many tracks and roads are inaccessible in wet conditions. Pre-work notification to biodiversity contractors is provided to specify the level of access permitted, including excluding access where required. Section 6.12 of the Biodiversity Management Plan addresses control of access and designated tracks. No further controls are proposed.	Not applicable
CoA PA10_0138 Management Plans				
25	<i>Blast Management Plan</i> <i>The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary.</i>	Ensure approval records for all plans requiring Secretary approval are maintained. Ensure that all blast notifications are issued in accordance with the BMP.	Noted.	As required



45	<p><i>Revised Biodiversity Offset Strategy</i> <i>The Proponent shall prepare and implement a revised biodiversity offset strategy for the identified offset areas in Table 16 to the satisfaction of the Secretary. The revised Strategy must:</i> (a) <i>not reduce the size or quality of the proposed offset areas;</i> (b) <i>be consistent (as far as is possible) with the recommendations and objectives of the Leard Forest Mining Precinct Regional Biodiversity Strategy;</i></p>	<p>There is an opportunity to update the BOS to ensure the consistency as required by condition (b).</p>	<p>Noted. The BOS has been revised to align, as far as possible, with the objectives of the RBS and is still pending approval from DP&E.</p>	<p>Complete.</p>
----	---	--	--	------------------

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 2021). Further details of any actions undertaken or proposed for non-compliances, including within the following reporting period, are summarised in Table 25.

Table 25 Non-Compliance Details and Proposed Action Plan

Non - Compliance	Date / Location	Cause	Action Plan	Estimated Completion Date
Schedule 3 Condition 12 a)	1/8/2020 MCC CHPP	Individual fixed plant items located at the CHPP do not have the ability to be measured in isolation of the running plant. This has resulted in a Technical non-compliance of a limited number of fixed plant individual items whilst undertaking sound power testing. Overall site sound power level is compliant.	Continue maintenance program, testing and reporting	Complete

11.2 REPORTABLE INCIDENTS OR EXCEEDANCES

Each type of incident or exceedance has been described in Table 4 of this report. All reportable non-compliances have been reported to the relevant agencies in line with the reporting process.

11.3 REGULATORY ACTIONS

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

- Official caution under section 142A of the POEOA Act issued by the EPA in July in relation to the burial of 229 end of life haul truck tyres in 2018.
- Prevention notice issued under section 96 POEO Act issued by the EPA in November. This was issued to monitor blasting performance in the MCCM.

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 implementing revised management plans, progressing overburden shaping and rehabilitation opportunities, undertaking research related projects regarding Box-Gum Grassy Woodlands, and continuing identification of community support opportunities.

APPENDIX A

BLAST MONITORING RECORDS

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)
2/01/2021	15:21	JEA06-27-OB TSL06-50-OB MER06-27-PS Rocks	0.04	103.6	0.04	97.1	0.05	106	0.11	100.6
6/01/2021	12:31	ONV08-40-OB	0.07	91.9	0.08	86.3	0.11	97.5	0.11	97.5
8/01/2021	10:01	JEA-01_05_OB-B BRY 07 14- OB	0.04	93.3	0.09	105	0.16	103.2	0.28	110.1
11/01/2021	12:26	BRY07-39-OB	0.1	97.4	0.18	94.9	0.15	98.7	0.15	96
14/01/2021	15:29	VEL06-34-OB LRA05-36-OB	0.05	89.3	0.1	98.6	0.12	92.9	0.18	98.7
16/01/2021	12:18	ONV08-39-OB HRN09-39-TO	0.05	98.9	0.08	99	0.08	96.4	0.17	94.3
18/01/2021	12:14	TSL06-51-OB	0.02	96.4	0.03	87.7	0.03	95.5	0.04	94
22/01/2021	16:29	NAG05-34-CO	0.08	96.5	0.17	100.7	0.15	108.6	0.16	98.6
25/01/2021	12:11	275-06-26-OB MER06-26-PS	0.09	99.1	0.014	94.9	0.13	106.3	0.35	97.9
28/01/2021	9:54	VEL05-39-OB	0.05	91.6	0.13	104.5	0.13	102.1	0.1	111.2
29/01/2021	16:37	NAG05-30-OB	0.11	94.2	0.28	89.6	0.28	93	0.67	95.7
2/02/2021	16:06	HRN09-41-OB	0.03	88	0.07	94.1	0.05	91.5	0.05	83.5
4/02/2021	16:48	JEA01-03-OB	0.06	81.8	0.08	82.8	0.17	92.1	0.23	94
8/02/2021	10:08	VEL03-38-OB NAG02-39-PS	0.05	98.2	0.14	102.2	0.21	104.8	0.18	105.4
10/02/2021	16:45	ONV08-36-OB NAG05-35-CO TSL06-49-PA	0.09	103.8	0.14	97	0.22	109.5	0.2	103.1
13/02/2021	12:10	JEA01-03-OB-B	0.04	82.5	0.05	95.4	0.09	87.8	0.13	94.9
19/02/2021	16:07	NAG05-30-CO TNN06-51-OB	0.03	97.9	0.05	94	0.13	101.6	0.11	99.5
24/02/2021	12:36	VEL06-33-OB NAG06-37-MS VEL06-36-OB JEA06-26-OB	0.12	95.6	0.35	100.2	0.42	103.5	0.4	98.1
27/02/2021	10:13	TNN06-50-OB	0.13	95.6	0.21	93.5	0.18	100.27	0.19	107.7
3/03/2021	15:59	TNN06-49-OB	0.02	90.2	0.02	89.9	0.03	95.6	0.02	97.1
5/03/2021	12:29	VEL06-34-OB-B NAG06-35-MS	0.03	90	0.08	96.7	0.08	96.9	0.11	87.4
9/03/2021	12:09	HRD09-36-OB	0.02	90.4	0.03	94.4	0.04	90.3	0.04	87.5
12/03/2021	15:33	295-02-05-OB MER01-05-OB NAG01-03-MS	0.1	86.6	0.18	95.7	0.25	96.4	0.48	93.8
16/03/2021	16:44	TSU08-42-OB	0.06	91.4	0.09	100.2	0.1	102.3	0.12	96.9
22/03/2021	14:28	NAG05-39-OB LRN05-39-MS	0.16	82.3	0.36	86.3	0.39	97.7	0.42	102
30/03/2021	16:51	TSU08-44-OB	0.06	91.8	0.12	93.3	0.1	97.6	0.17	94.7
6/04/2021	12:23	BRT06-50-OB	0.13	97.8	0.17	94.4	0.32	102	0.21	102.1
9/04/2021	12:35	NAG04-39-OB	0.12	92.8	0.24	94.8	0.43	99.6	0.44	95.6
12/04/2021	12:17	MER01-04-OB NAG01-04-MS	0.17	97.4	0.21	100.6	0.46	94.9	0.86	97.3
16/04/2021	13:30	BRT06-51-OB BRT06-51-MS TSU-08-44-OB-Trim	0.11	89.6	0.2	98.5	0.2	98.3	0.22	96.8
20/04/2021	16:29	ONV09-36-OB TSL09-36-MS	0.08	85.2	0.13	100.5	0.13	90.7	0.16	94.3
24/04/2021	13:00	TSU08-38-OB	0.08	94.8	0.13	96.1	0.25	107.6	0.33	103.9

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)
26/04/2021	15:34	MER06-26-OB	0.03	88.2	0.03	93.1	0.04	95.8	0.09	100.4
29/04/2021	15:19	VEL06-31-OB	0.05	91.5	0.07	88.3	0.07	95.1	0.19	97.4
30/04/2021	15:31	NAG03-39-OB	0.09	104.6	0.16	88	0.24	93.8	0.32	93.8
5/05/2021	15:08	TSL08-35-PS	0.08	111.3	0.1	99.7	0.07	105.4	0.21	89.2
6/05/2021	12:27	BRT06-48-OB	0.08	91.8	0.12	92.9	0.15	101.6	0.18	98
11/05/2021	13:02	TSU_08_40_OB	0.05	84.2	0.11	101.9	0.09	94.8	0.15	94
17/05/2021	12:34	MER01-03-OB 295-02-06-OB	0.13	91.3	0.18	91.2	0.27	98.6	0.44	99.1
21/05/2021	12:42	TSU08-35-OB	0.11	98.6	0.16	97.1	0.1	109	0.22	100
24/05/2021	12:24	HRD09-41-PA	0.06	89.7	0.12	95.4	0.13	98.2	0.2	97.7
25/05/2021	15:28	TSU08-36-OB	0.14	96.5	0.2	91.6	0.22	96	0.31	98.2
28/05/2021	16:32	NAG02-39-OB	0.13	92.1	0.37	88.9	0.47	95.4	0.65	90.3
2/06/2021	15:25	NAG06_36_CA HRN_09_47_OB	0.13	86.4	0.26	89.9	0.32	96.9	0.38	93.9
7/06/2021	12:34	NAG01-07-TS	0.06	84	0.09	93.9	0.11	93.7	0.29	88.5
11/06/2021	12:41	NAG06-35-OB	0.09	88	0.19	101.4	0.22	95.6	0.29	96.1
15/06/2021	12:20	HRD09-42-PA-A	0.02	84	0.03	82.5	0.03	92.5	0.03	98.9
19/06/2021	12:31	VEL06-27-OB	0.03	95.5	0.05	94.9	0.08	95.1	0.15	95.9
20/06/2021	12:41	ONV09-40-OB HRD09-42-PA-B HWD10-OB	0.06	94.7	0.07	90.9	0.08	102.2	0.09	101.1
28/06/2021	12:31	NAG-01-05-TS	0.05	98.3	0.05	92.9	0.09	102.1	0.18	98.4
30/06/2021	15:27	210-06-30-CA 190-06-31-PS	0.14	92.8	0.23	94.3	0.3	103.6	0.66	101.4
5/07/2021	15:30	NAG05-39-OB-B	0.1	94.4	0.09	91.2	0.12	106.5	0.16	97.7
6/07/2021	12:23	TSL08-43-OB TSL09-37-PS	0.13	95.9	0.15	95.3	0.12	99	0.12	109.5
13/07/2021	15:25	NAG03-39-OB-B NAG03-39-OB-C	0.06	87.7	0.1	91.8	0.12	93.6	0.2	90.5
14/07/2021	16:41	190-06-31-OB 190-06-31-MS	0.15	84.4	0.25	81.5	0.22	90.6	0.55	95.2
19/07/2021	16:00	295-02-09-OB JEA02-09-MS MER06-24-PS	0.15	106.3	0.15	109.1	0.36	111.4	0.59	105.6
21/07/2021	15:24	TSL08-44-OB	0.03	95.5	0.04	89.9	0.06	99.9	0.07	92.5
27/07/2021	12:34	ONV09-43-OB HW-DAM09 TSL09-43-MS	0.08	84.6	0.15	95.9	0.09	87.6	0.12	92.1
29/07/2021	12:31	190-06-30-OB 190-06-30-MS	0.15	104	0.56	110.1	0.37	106.8	1.18	109.6
31/07/2021	12:23	TSM08-38-PA BRY08-45-PS TSL08-44-TRIM	0.08	98.3	0.13	99.7	0.07	101.2	0.2	107
3/08/2021	16:06	NAG01-05-OB-B 295-02-02-OB 295-02-01-PS	0.12	85.5	0.1	111	0.16	99.2	0.34	97.6
7/08/2021	16:35	TSM08-39-OB TNN08-35-OB HW-DAM08 BRY08-36-PS	0.07	98.3	0.14	103.4	0.07	97.1	0.11	92.3
10/08/2021	15:40	190-06-29-OB	0.11	85.2	0.21	82.8	0.14	87.2	0.93	92.2
17/08/2021	16:42	FLX06_32_PS LRN06-31-OB NAG01-05-CO	0.22	100.9	0.42	100.7	0.43	106.7	0.63	102.4
21/08/2021	15:28	TSU09-37-OB	0.09	90.8	0.13	91.2	0.08	103.3	0.15	97.4
23/08/2021	15:22	NAG01-07-CO	0.02	94.5	0.02	96.4	0.05	86.9	0.05	94.9
30/08/2021	16:01	295_01_09_OB MER06-24-PS B	0.43	93.1	0.66	95.4	0.99	105.9	2.78	104.3
31/08/2021	15:45	NAG06-30-OB	0.06	90.1	0.1	94.2	0.1	92.8	0.25	89.2

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)
2/09/2021	12:35	BRL03-48-OB	0.05	86.6	0.1	100.7	0.1	94.6	0.13	91.8
4/09/2021	13:16	TSU09-38-OB	0.1	91.4	0.14	99.7	0.1	100	0.21	100.9
7/09/2021	16:13	TNN08-45-OB BRY08-44-PS	0.06	91.9	0.09	90	0.1	99.2	0.19	99.7
9/09/2021	3:54	LRN06-32-OB LRN05-39-OB	0.04	88.2	0.08	101.8	0.07	97.1	0.1	94.5
13/09/2021	12:58	295-01-09-OB-B 295-04-01-PS	0.13	90.5	0.16	107.4	0.16	93.4	0.64	96.9
16/09/2021	12:20	TNN08-44-OB BRY08-44-PS-B	0.05	85.5	0.08	96.9	0.06	90.3	0.13	99.3
22/09/2021	12:47	295-02-03-OB 295-02-01-PS-B NAG01-03-CO	0.13	95.6	0.19	98.4	0.27	100.4	0.59	99.7
22/09/2021	12:48	JEB06-40-OB	0.08	95.9	0.27	97.8	0.12	97.6	0.17	95.4
23/09/2021	16:29	TSU09-45-OB	0.03	94.8	0.03	94.5	0.04	98.7	0.05	97.6
27/09/2021	16:01	310-04-07-OB	0.12	98.4	0.16	90.4	0.42	87.2	0.77	89.4
28/09/2021	16:09	TSU09-44-OB	0.05	95.5	0.07	93.3	0.05	95.1	0.08	99.4
2/10/2021	15:31	TNN08-36-OB	0.04	91.8	0.08	104.6	0.06	100.5	0.1	97.9
7/10/2021	10:30	JER02-09-OB	0.08	87.6	0.08	94.7	0.09	95.8	1.52	109
9/10/2021	16:03	310-03-02-OB	0.07	94	0.12	96.1	0.25	100.8	0.46	100.9
16/10/2021	16:46	NAG06-29-OB FLX06-31-PS	0.1	92.2	0.19	105.9	0.13	102.1	0.25	93
18/10/2021	15:43	LRN06-31-CO	0.03	92.7	0.05	101	0.06	100.9	0.09	96.3
25/10/2021	16:17	JER02-05-OB JER02-01-PS	0.19	90.1	0.31	98.5	0.38	97.6	0.99	92.5
30/10/2021	16:03:20	NAG06-31-OB	0.08	95.5	0.14	105.3	0.08	103.8	0.15	94.7
	16:03:31	FLX06-31-PS	0.02	100.6	0.03	105.3	0.03	103.7	0.05	94.7
2/11/2021	10:41:53	TSU09-46-OB	0.07	87.2	0.09	90.4	0.07	91.4	0.1	87
	10:42:03		0.03	87.2	0.05	90.4	0.04	91.4	0.07	87
6/11/2021	16:30	TSU09-49-OB-B	0.06	88.8	0.12	83.3	0.07	91.8	0.18	90.5
9/11/2021	12:41	BRY08-36-OB	0.1	90.4	0.14	99.5	0.1	94.9	0.23	100.4
13/11/2021	9:41	JER02-07-OB NAG06-31-OB-B	0.06	87.3	0.06	114.9	0.06	113	0.17	101.8
15/11/2021	15:32	BRY08-36-OB-B	0.16	87.3	0.19	111	0.14	105.7	0.27	101.9
16/11/2021	15:52	JEB06-41-OB JEB06-41-PS	0.37	106.4	0.47	101.6	0.41	104.8	0.59	98.5
4/12/2021	15:39	BRY08-40-OB	0.15	98.1	0.43	100	0.19	111.2	0.46	91.8
10/12/2021	12:41	JER02-07-OB-B	0.04	80.7	0.05	109	0.04	86.1	0.24	89.5
15/12/2021	15:28	TSM09-40-OB TNN 08-39-OB-A	0.09	93.7	0.18	97.7	0.18	98.8	0.19	90.8
17/12/2021	10:29	BRL06-45-PA	0.01	79.6	0.03	89.4	0.02	82.9	0.02	86.4
21/12/2021	15:39	NAG06-30-CO	0.02	89.6	0.07	103.4	0.04	96.8	0.03	82
23/12/2021	10:18	JER02-08-OB	0.28	93.8	0.36	101.1	0.71	103.2	1.16	99.4
24/12/2021	12:15	TNN08-39-OB-B	0.12	82.3	0.1	83.5	0.13	89.5	0.11	89.9
30/12/2021	15:35	TSU09-46-OB-C	0.08	93.8	0.11	89.8	0.09	94.2	0.17	93.3

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	0.93
February	0.79
March	0.62
April	0.84
May	0.85
June	1.1
July	0.81
August	0.71
September	0.81
October	0.63
November	0.55
December	0.59
TOTAL	9.19

Table B-2
Daily Train Movements

Date & Time of Loading			
1/01/2021 0:18	1/04/2021 20:02	23/06/2021 6:20	22/09/2021 20:17
1/01/2021 4:14	2/04/2021 6:55	23/06/2021 12:55	23/09/2021 0:52
1/01/2021 7:48	2/04/2021 10:05	23/06/2021 15:42	23/09/2021 3:52
1/01/2021 10:36	2/04/2021 12:57	24/06/2021 3:27	23/09/2021 6:59
1/01/2021 14:10	2/04/2021 18:07	24/06/2021 6:21	23/09/2021 12:02
1/01/2021 20:38	3/04/2021 1:06	24/06/2021 16:49	23/09/2021 15:26
2/01/2021 6:24	3/04/2021 9:19	24/06/2021 23:27	23/09/2021 19:14
2/01/2021 9:38	3/04/2021 14:54	25/06/2021 4:44	24/09/2021 0:49
2/01/2021 15:05	3/04/2021 20:37	25/06/2021 7:23	24/09/2021 7:21
2/01/2021 19:09	4/04/2021 2:59	25/06/2021 9:48	24/09/2021 11:41
3/01/2021 10:21	4/04/2021 5:58	25/06/2021 19:13	24/09/2021 14:38
3/01/2021 15:05	4/04/2021 8:18	25/06/2021 22:00	24/09/2021 18:08
3/01/2021 20:15	4/04/2021 13:18	26/06/2021 1:05	24/09/2021 23:18
4/01/2021 0:10	4/04/2021 17:32	26/06/2021 3:31	25/09/2021 4:50
4/01/2021 3:32	4/04/2021 22:41	26/06/2021 5:53	25/09/2021 19:05
4/01/2021 6:31	5/04/2021 1:47	26/06/2021 8:59	26/09/2021 2:16
4/01/2021 14:49	5/04/2021 5:35	26/06/2021 11:38	26/09/2021 16:07
4/01/2021 17:40	5/04/2021 11:23	26/06/2021 18:44	27/09/2021 1:15
4/01/2021 22:53	5/04/2021 15:47	26/06/2021 21:45	27/09/2021 13:25
5/01/2021 3:19	5/04/2021 19:28	27/06/2021 4:14	27/09/2021 16:08
5/01/2021 6:00	6/04/2021 1:46	27/06/2021 8:01	27/09/2021 18:54
5/01/2021 12:56	6/04/2021 12:16	27/06/2021 13:02	27/09/2021 21:41
5/01/2021 17:35	6/04/2021 16:35	27/06/2021 16:00	28/09/2021 5:40
5/01/2021 20:03	6/04/2021 21:18	27/06/2021 17:57	28/09/2021 13:54
6/01/2021 1:21	7/04/2021 0:18	28/06/2021 3:09	28/09/2021 17:15
6/01/2021 8:19	7/04/2021 6:02	28/06/2021 12:10	28/09/2021 20:07
6/01/2021 12:05	7/04/2021 11:20	28/06/2021 14:26	29/09/2021 3:35
6/01/2021 15:56	7/04/2021 15:11	28/06/2021 16:19	29/09/2021 14:39
7/01/2021 8:27	7/04/2021 21:42	28/06/2021 20:00	30/09/2021 1:22
7/01/2021 12:43	8/04/2021 2:56	28/06/2021 23:24	30/09/2021 4:27
7/01/2021 16:01	8/04/2021 10:03	29/06/2021 1:51	1/10/2021 3:07
8/01/2021 2:40	9/04/2021 4:38	29/06/2021 6:35	1/10/2021 7:26
8/01/2021 9:33	9/04/2021 7:30	29/06/2021 11:51	1/10/2021 14:17
8/01/2021 15:29	9/04/2021 11:58	29/06/2021 18:55	1/10/2021 17:59
8/01/2021 20:35	9/04/2021 15:49	29/06/2021 22:10	1/10/2021 20:44
9/01/2021 1:37	9/04/2021 22:09	30/06/2021 5:03	2/10/2021 7:25
9/01/2021 6:56	10/04/2021 4:18	30/06/2021 8:10	2/10/2021 11:48
9/01/2021 9:57	10/04/2021 13:50	30/06/2021 11:34	2/10/2021 16:01
9/01/2021 19:34	10/04/2021 16:26	30/06/2021 18:09	2/10/2021 19:07

10/01/2021 3:20	10/04/2021 20:03	30/06/2021 21:43	2/10/2021 22:15
10/01/2021 5:52	10/04/2021 22:23	1/07/2021 4:23	3/10/2021 1:25
10/01/2021 13:04	11/04/2021 1:10	1/07/2021 18:03	3/10/2021 8:31
10/01/2021 19:14	11/04/2021 8:09	1/07/2021 21:41	3/10/2021 11:54
11/01/2021 5:18	11/04/2021 13:41	2/07/2021 1:49	6/10/2021 18:55
11/01/2021 17:50	11/04/2021 20:00	2/07/2021 7:09	6/10/2021 23:51
11/01/2021 20:26	12/04/2021 1:07	2/07/2021 17:13	7/10/2021 4:45
12/01/2021 0:16	12/04/2021 9:21	2/07/2021 23:54	7/10/2021 8:38
12/01/2021 5:42	12/04/2021 12:17	3/07/2021 2:48	7/10/2021 18:10
12/01/2021 14:35	12/04/2021 18:57	3/07/2021 5:33	7/10/2021 21:06
13/01/2021 4:05	12/04/2021 22:55	3/07/2021 14:57	8/10/2021 10:54
13/01/2021 6:32	13/04/2021 3:10	3/07/2021 21:31	8/10/2021 15:01
13/01/2021 9:41	13/04/2021 6:04	4/07/2021 1:05	8/10/2021 17:58
13/01/2021 12:00	13/04/2021 18:50	4/07/2021 5:05	8/10/2021 22:07
13/01/2021 17:33	13/04/2021 21:53	5/07/2021 9:08	9/10/2021 2:48
13/01/2021 21:41	14/04/2021 0:01	5/07/2021 11:43	9/10/2021 11:03
14/01/2021 2:25	14/04/2021 3:55	5/07/2021 19:33	9/10/2021 15:49
14/01/2021 7:17	14/04/2021 7:28	6/07/2021 3:27	9/10/2021 21:47
14/01/2021 13:07	14/04/2021 14:12	6/07/2021 8:06	9/10/2021 22:21
14/01/2021 18:03	15/04/2021 3:56	6/07/2021 10:36	10/10/2021 1:23
15/01/2021 9:54	15/04/2021 13:43	6/07/2021 16:30	10/10/2021 4:36
15/01/2021 16:02	15/04/2021 13:43	6/07/2021 22:30	11/10/2021 13:04
15/01/2021 20:36	15/04/2021 17:54	7/07/2021 2:17	11/10/2021 17:58
16/01/2021 3:37	15/04/2021 22:02	7/07/2021 6:10	11/10/2021 22:03
16/01/2021 12:42	16/04/2021 1:51	7/07/2021 10:08	12/10/2021 0:53
16/01/2021 17:57	16/04/2021 15:11	7/07/2021 21:50	12/10/2021 3:55
17/01/2021 12:21	16/04/2021 19:08	8/07/2021 0:26	12/10/2021 9:10
17/01/2021 17:58	17/04/2021 2:02	8/07/2021 5:36	12/10/2021 17:07
18/01/2021 0:28	17/04/2021 8:57	8/07/2021 9:51	12/10/2021 20:24
18/01/2021 4:05	17/04/2021 15:40	8/07/2021 19:25	13/10/2021 2:29
18/01/2021 14:32	17/04/2021 22:19	9/07/2021 2:24	13/10/2021 6:29
18/01/2021 19:24	18/04/2021 0:57	9/07/2021 8:16	13/10/2021 9:26
18/01/2021 23:12	18/04/2021 7:44	9/07/2021 10:45	13/10/2021 12:49
19/01/2021 20:34	18/04/2021 11:01	9/07/2021 21:05	14/10/2021 4:04
20/01/2021 0:36	18/04/2021 14:19	10/07/2021 0:18	14/10/2021 8:23
20/01/2021 8:00	18/04/2021 22:03	10/07/2021 3:09	15/10/2021 0:19
20/01/2021 15:02	19/04/2021 1:44	10/07/2021 7:18	15/10/2021 6:14
20/01/2021 22:38	19/04/2021 9:12	10/07/2021 10:18	15/10/2021 12:38
21/01/2021 7:57	19/04/2021 18:43	10/07/2021 15:16	15/10/2021 15:21
21/01/2021 10:22	19/04/2021 22:15	10/07/2021 21:27	15/10/2021 18:02
21/01/2021 13:18	20/04/2021 2:02	11/07/2021 10:03	16/10/2021 0:46
21/01/2021 17:08	20/04/2021 6:25	11/07/2021 15:08	16/10/2021 4:11
21/01/2021 20:05	20/04/2021 11:40	11/07/2021 22:32	16/10/2021 13:10

22/01/2021 2:55	20/04/2021 15:37	12/07/2021 4:32	16/10/2021 18:58
22/01/2021 6:53	20/04/2021 21:53	12/07/2021 21:45	17/10/2021 6:57
22/01/2021 13:44	21/04/2021 7:45	13/07/2021 0:43	17/10/2021 10:24
22/01/2021 17:13	21/04/2021 12:37	13/07/2021 8:03	17/10/2021 14:52
22/01/2021 22:20	21/04/2021 16:21	13/07/2021 11:12	17/10/2021 22:29
23/01/2021 3:34	21/04/2021 20:21	13/07/2021 22:20	18/10/2021 4:36
23/01/2021 7:32	22/04/2021 14:54	14/07/2021 1:19	18/10/2021 8:19
23/01/2021 13:04	23/04/2021 0:51	14/07/2021 9:37	18/10/2021 15:12
23/01/2021 16:23	23/04/2021 7:37	14/07/2021 14:28	18/10/2021 18:09
24/01/2021 1:11	24/04/2021 2:11	14/07/2021 17:31	19/10/2021 18:25
24/01/2021 9:48	24/04/2021 11:59	15/07/2021 20:55	21/10/2021 14:38
24/01/2021 14:02	24/04/2021 17:12	16/07/2021 2:16	22/10/2021 3:32
24/01/2021 16:53	24/04/2021 23:19	16/07/2021 12:49	26/10/2021 8:36
24/01/2021 21:19	25/04/2021 2:58	16/07/2021 17:19	26/10/2021 13:52
25/01/2021 6:15	25/04/2021 12:07	17/07/2021 3:07	26/10/2021 16:28
25/01/2021 11:39	25/04/2021 19:29	17/07/2021 6:26	27/10/2021 7:35
25/01/2021 23:52	26/04/2021 0:47	17/07/2021 21:07	27/10/2021 12:50
26/01/2021 3:23	26/04/2021 5:26	17/07/2021 23:57	27/10/2021 15:43
26/01/2021 6:23	26/04/2021 8:54	18/07/2021 9:06	27/10/2021 20:11
26/01/2021 9:42	26/04/2021 12:32	18/07/2021 15:52	28/10/2021 12:25
26/01/2021 13:35	26/04/2021 20:08	18/07/2021 18:41	28/10/2021 19:01
26/01/2021 15:54	29/04/2021 20:19	19/07/2021 7:54	28/10/2021 22:57
26/01/2021 20:01	30/04/2021 0:56	19/07/2021 19:03	29/10/2021 2:42
27/01/2021 6:38	30/04/2021 12:03	19/07/2021 22:41	29/10/2021 14:58
27/01/2021 9:35	1/05/2021 1:25	20/07/2021 3:22	29/10/2021 19:10
27/01/2021 18:08	1/05/2021 8:50	20/07/2021 19:04	29/10/2021 23:15
28/01/2021 2:02	1/05/2021 15:06	20/07/2021 22:46	30/10/2021 7:30
28/01/2021 5:09	1/05/2021 20:17	21/07/2021 4:15	30/10/2021 22:07
28/01/2021 8:45	2/05/2021 4:04	21/07/2021 8:17	31/10/2021 1:54
28/01/2021 13:58	2/05/2021 12:49	22/07/2021 9:07	31/10/2021 6:15
28/01/2021 16:37	2/05/2021 23:23	22/07/2021 15:24	31/10/2021 8:53
28/01/2021 20:41	3/05/2021 2:17	22/07/2021 20:23	1/11/2021 5:28
29/01/2021 12:29	3/05/2021 6:30	23/07/2021 9:58	1/11/2021 10:15
29/01/2021 23:27	3/05/2021 11:02	23/07/2021 14:15	1/11/2021 13:27
30/01/2021 3:07	3/05/2021 17:09	24/07/2021 9:35	2/11/2021 5:27
30/01/2021 7:49	3/05/2021 20:50	24/07/2021 13:45	2/11/2021 17:07
31/01/2021 0:28	4/05/2021 0:40	24/07/2021 16:41	2/11/2021 22:26
31/01/2021 4:16	4/05/2021 8:18	24/07/2021 20:30	3/11/2021 2:23
31/01/2021 19:03	4/05/2021 12:01	25/07/2021 0:18	3/11/2021 7:05
31/01/2021 22:30	4/05/2021 18:03	25/07/2021 2:46	3/11/2021 20:21
1/01/2021 0:18	4/05/2021 22:45	25/07/2021 5:58	4/11/2021 2:36
1/01/2021 4:14	5/05/2021 4:55	25/07/2021 11:06	4/11/2021 6:45
1/01/2021 7:48	5/05/2021 9:17	25/07/2021 19:24	4/11/2021 12:26

1/01/2021 10:36	5/05/2021 15:56	26/07/2021 0:21	4/11/2021 15:58
1/01/2021 14:10	5/05/2021 20:21	26/07/2021 3:48	5/11/2021 0:37
1/01/2021 20:38	6/05/2021 18:21	26/07/2021 12:44	5/11/2021 4:32
2/02/2021 7:55	6/05/2021 22:16	27/07/2021 8:05	5/11/2021 9:06
2/02/2021 11:22	7/05/2021 2:17	27/07/2021 14:22	5/11/2021 18:42
2/02/2021 16:22	7/05/2021 6:25	27/07/2021 20:56	5/11/2021 21:18
2/02/2021 21:15	7/05/2021 10:24	28/07/2021 0:47	6/11/2021 9:30
3/02/2021 0:21	7/05/2021 14:58	28/07/2021 7:38	6/11/2021 13:17
3/02/2021 9:23	7/05/2021 19:15	28/07/2021 11:01	6/11/2021 20:33
3/02/2021 12:31	7/05/2021 23:20	28/07/2021 19:01	7/11/2021 3:03
3/02/2021 20:04	8/05/2021 1:59	29/07/2021 5:15	7/11/2021 6:48
4/02/2021 0:53	8/05/2021 8:40	29/07/2021 9:22	7/11/2021 10:17
4/02/2021 5:31	8/05/2021 15:10	29/07/2021 14:20	8/11/2021 10:25
4/02/2021 9:31	8/05/2021 19:28	29/07/2021 20:48	8/11/2021 14:22
5/02/2021 5:01	8/05/2021 22:38	30/07/2021 1:30	9/11/2021 2:44
5/02/2021 11:21	9/05/2021 2:51	30/07/2021 5:04	9/11/2021 10:05
5/02/2021 14:37	9/05/2021 9:09	30/07/2021 15:22	9/11/2021 21:44
5/02/2021 19:17	9/05/2021 14:54	30/07/2021 20:35	10/11/2021 7:31
5/02/2021 22:33	9/05/2021 19:16	31/07/2021 0:42	10/11/2021 11:39
6/02/2021 6:52	10/05/2021 1:07	31/07/2021 8:22	10/11/2021 15:10
6/02/2021 12:36	10/05/2021 11:32	31/07/2021 12:33	11/11/2021 4:04
6/02/2021 17:33	10/05/2021 19:43	1/08/2021 9:13	11/11/2021 6:46
6/02/2021 23:17	11/05/2021 0:24	1/08/2021 18:57	11/11/2021 10:06
7/02/2021 2:07	11/05/2021 3:56	1/08/2021 22:04	11/11/2021 14:13
7/02/2021 4:37	11/05/2021 6:56	2/08/2021 11:04	12/11/2021 0:39
7/02/2021 7:22	11/05/2021 11:06	2/08/2021 14:22	12/11/2021 17:14
7/02/2021 15:25	11/05/2021 16:10	2/08/2021 18:17	12/11/2021 19:48
7/02/2021 19:46	11/05/2021 20:33	3/08/2021 2:32	13/11/2021 6:17
8/02/2021 3:42	12/05/2021 5:16	3/08/2021 9:04	13/11/2021 10:51
8/02/2021 7:14	12/05/2021 11:32	3/08/2021 15:17	13/11/2021 19:18
8/02/2021 9:52	12/05/2021 17:27	4/08/2021 3:59	13/11/2021 23:39
8/02/2021 18:54	12/05/2021 23:41	4/08/2021 8:35	14/11/2021 3:13
12/02/2021 3:04	13/05/2021 14:28	4/08/2021 23:50	14/11/2021 17:47
13/02/2021 3:04	13/05/2021 22:21	5/08/2021 7:14	14/11/2021 20:12
13/02/2021 11:15	14/05/2021 19:13	5/08/2021 10:23	15/11/2021 3:35
13/02/2021 18:36	15/05/2021 2:28	5/08/2021 18:11	15/11/2021 9:40
14/02/2021 4:20	15/05/2021 7:12	6/08/2021 5:18	15/11/2021 12:11
14/02/2021 9:39	15/05/2021 11:41	6/08/2021 9:05	15/11/2021 15:27
14/02/2021 13:36	15/05/2021 15:51	6/08/2021 12:24	16/11/2021 0:28
14/02/2021 18:54	16/05/2021 7:58	6/08/2021 18:08	16/11/2021 3:21
14/02/2021 21:43	16/05/2021 11:07	6/08/2021 22:07	16/11/2021 16:11
15/02/2021 2:17	16/05/2021 23:14	7/08/2021 0:56	16/11/2021 20:14
15/02/2021 6:50	17/05/2021 4:55	7/08/2021 8:25	17/11/2021 12:54

15/02/2021 18:14	17/05/2021 10:13	7/08/2021 13:52	17/11/2021 16:26
15/02/2021 20:49	17/05/2021 15:46	7/08/2021 20:21	17/11/2021 20:59
16/02/2021 3:05	18/05/2021 4:42	8/08/2021 4:57	18/11/2021 9:14
16/02/2021 9:23	18/05/2021 10:05	8/08/2021 8:19	18/11/2021 12:55
16/02/2021 14:58	18/05/2021 19:06	8/08/2021 12:38	18/11/2021 17:32
16/02/2021 23:44	18/05/2021 23:22	8/08/2021 18:43	18/11/2021 21:26
17/02/2021 2:24	19/05/2021 8:08	9/08/2021 4:09	19/11/2021 1:59
17/02/2021 8:17	19/05/2021 18:39	9/08/2021 8:23	19/11/2021 8:41
17/02/2021 11:55	20/05/2021 0:55	12/08/2021 22:23	19/11/2021 13:32
17/02/2021 21:57	20/05/2021 5:18	13/08/2021 3:48	19/11/2021 23:47
18/02/2021 2:28	20/05/2021 22:55	13/08/2021 7:02	20/11/2021 8:01
18/02/2021 6:19	21/05/2021 3:17	14/08/2021 1:13	20/11/2021 12:25
18/02/2021 9:23	21/05/2021 10:03	14/08/2021 9:15	20/11/2021 16:34
18/02/2021 13:56	21/05/2021 15:23	14/08/2021 13:43	20/11/2021 23:35
18/02/2021 22:39	21/05/2021 21:02	14/08/2021 18:40	21/11/2021 2:20
19/02/2021 5:21	22/05/2021 5:43	15/08/2021 0:36	21/11/2021 8:43
19/02/2021 7:51	22/05/2021 9:22	15/08/2021 13:37	4/12/2021 18:04
19/02/2021 10:39	22/05/2021 14:05	15/08/2021 22:17	4/12/2021 22:05
19/02/2021 13:33	22/05/2021 19:58	16/08/2021 3:24	5/12/2021 1:50
19/02/2021 19:56	22/05/2021 23:54	16/08/2021 10:38	5/12/2021 19:40
19/02/2021 23:20	23/05/2021 5:09	16/08/2021 13:20	6/12/2021 15:51
20/02/2021 2:19	23/05/2021 9:07	16/08/2021 18:01	7/12/2021 3:33
20/02/2021 9:59	23/05/2021 15:35	17/08/2021 8:53	7/12/2021 14:06
20/02/2021 15:32	23/05/2021 20:28	17/08/2021 16:41	8/12/2021 8:40
20/02/2021 21:41	24/05/2021 0:28	18/08/2021 0:24	8/12/2021 14:59
21/02/2021 0:40	24/05/2021 4:21	18/08/2021 5:45	8/12/2021 18:38
21/02/2021 3:14	24/05/2021 8:08	18/08/2021 9:58	9/12/2021 2:32
21/02/2021 8:48	24/05/2021 12:52	18/08/2021 22:00	9/12/2021 20:10
21/02/2021 11:15	27/05/2021 18:23	19/08/2021 2:23	10/12/2021 1:08
21/02/2021 17:23	27/05/2021 21:44	19/08/2021 18:41	10/12/2021 5:05
22/02/2021 0:54	28/05/2021 1:21	19/08/2021 23:19	10/12/2021 16:33
22/02/2021 3:15	28/05/2021 5:43	20/08/2021 23:24	10/12/2021 22:37
22/02/2021 8:20	28/05/2021 8:39	21/08/2021 2:19	11/12/2021 7:54
22/02/2021 12:28	28/05/2021 19:18	21/08/2021 18:25	11/12/2021 10:47
22/02/2021 15:57	29/05/2021 14:28	22/08/2021 0:21	11/12/2021 14:41
22/02/2021 18:48	29/05/2021 18:50	22/08/2021 18:49	13/12/2021 22:14
22/02/2021 21:39	29/05/2021 21:43	23/08/2021 1:03	14/12/2021 2:03
23/02/2021 13:41	30/05/2021 1:26	23/08/2021 5:08	14/12/2021 5:07
23/02/2021 16:15	30/05/2021 4:35	24/08/2021 2:36	14/12/2021 17:35
23/02/2021 22:33	30/05/2021 11:00	24/08/2021 5:05	14/12/2021 20:36
24/02/2021 2:07	30/05/2021 16:09	24/08/2021 8:13	14/12/2021 23:53
24/02/2021 19:21	30/05/2021 20:39	24/08/2021 12:16	15/12/2021 4:58
24/02/2021 23:48	31/05/2021 5:26	24/08/2021 15:59	15/12/2021 9:19

25/02/2021 5:17	31/05/2021 9:03	25/08/2021 4:38	15/12/2021 19:56
25/02/2021 7:49	31/05/2021 14:56	25/08/2021 8:04	16/12/2021 0:11
25/02/2021 16:17	31/05/2021 18:13	25/08/2021 12:01	16/12/2021 7:17
26/02/2021 10:44	31/05/2021 21:06	25/08/2021 20:40	16/12/2021 15:42
26/02/2021 14:02	1/06/2021 0:16	26/08/2021 23:08	17/12/2021 0:05
26/02/2021 17:57	1/06/2021 5:52	27/08/2021 6:23	17/12/2021 13:42
26/02/2021 20:27	1/06/2021 10:09	27/08/2021 9:00	17/12/2021 19:34
26/02/2021 23:53	1/06/2021 14:17	28/08/2021 2:26	18/12/2021 0:09
27/02/2021 4:28	1/06/2021 17:58	28/08/2021 4:50	18/12/2021 4:18
27/02/2021 9:26	1/06/2021 21:58	28/08/2021 8:29	18/12/2021 16:41
27/02/2021 11:44	2/06/2021 1:14	28/08/2021 10:48	18/12/2021 21:03
27/02/2021 16:52	2/06/2021 4:58	28/08/2021 13:53	19/12/2021 1:20
27/02/2021 19:31	2/06/2021 8:19	28/08/2021 17:45	19/12/2021 5:15
28/02/2021 1:41	2/06/2021 11:36	29/08/2021 0:46	19/12/2021 16:06
28/02/2021 5:42	2/06/2021 15:06	29/08/2021 4:47	20/12/2021 4:27
28/02/2021 8:58	3/06/2021 2:27	29/08/2021 10:21	20/12/2021 11:41
28/02/2021 12:54	3/06/2021 5:04	29/08/2021 19:35	20/12/2021 20:26
28/02/2021 17:06	3/06/2021 8:00	29/08/2021 22:15	22/12/2021 11:06
1/03/2021 3:47	3/06/2021 12:25	30/08/2021 6:08	23/12/2021 6:05
1/03/2021 6:07	3/06/2021 14:55	30/08/2021 10:01	23/12/2021 8:58
1/03/2021 14:25	3/06/2021 21:00	30/08/2021 14:22	23/12/2021 12:28
1/03/2021 17:23	4/06/2021 5:52	30/08/2021 17:50	23/12/2021 15:48
1/03/2021 21:30	4/06/2021 9:41	31/08/2021 1:50	23/12/2021 18:55
2/03/2021 2:23	4/06/2021 12:49	31/08/2021 7:07	24/12/2021 3:44
2/03/2021 4:39	4/06/2021 17:18	31/08/2021 11:18	24/12/2021 8:09
2/03/2021 10:26	5/06/2021 2:26	31/08/2021 20:27	24/12/2021 11:18
2/03/2021 13:29	5/06/2021 11:00	1/09/2021 0:19	26/12/2021 23:43
2/03/2021 19:03	5/06/2021 16:01	1/09/2021 6:33	27/12/2021 2:09
2/03/2021 21:57	5/06/2021 22:35	2/09/2021 2:09	27/12/2021 9:59
3/03/2021 9:45	6/06/2021 6:39	2/09/2021 7:22	27/12/2021 15:55
3/03/2021 23:01	6/06/2021 12:45	2/09/2021 16:59	27/12/2021 23:05
4/03/2021 3:09	6/06/2021 19:03	2/09/2021 19:37	28/12/2021 3:52
4/03/2021 6:02	7/06/2021 1:05	3/09/2021 1:04	28/12/2021 9:48
4/03/2021 9:23	7/06/2021 8:20	3/09/2021 4:39	28/12/2021 13:12
4/03/2021 11:43	7/06/2021 13:45	3/09/2021 7:57	28/12/2021 15:41
5/03/2021 6:14	8/06/2021 9:10	3/09/2021 15:27	28/12/2021 18:17
5/03/2021 11:07	8/06/2021 12:41	3/09/2021 19:51	29/12/2021 5:53
5/03/2021 13:49	8/06/2021 19:53	3/09/2021 23:16	29/12/2021 8:47
5/03/2021 20:47	9/06/2021 3:37	4/09/2021 9:43	29/12/2021 13:38
6/03/2021 9:16	9/06/2021 6:02	4/09/2021 17:03	29/12/2021 17:14
6/03/2021 14:41	9/06/2021 11:37	4/09/2021 23:23	29/12/2021 20:36
6/03/2021 19:18	10/06/2021 1:17	5/09/2021 8:40	29/12/2021 23:13
6/03/2021 23:07	10/06/2021 5:08	5/09/2021 11:44	30/12/2021 4:18

7/03/2021 3:06	10/06/2021 9:32	5/09/2021 15:11	30/12/2021 11:44
7/03/2021 7:34	10/06/2021 13:41	6/09/2021 1:45	30/12/2021 14:29
8/03/2021 1:39	10/06/2021 16:23	6/09/2021 9:47	30/12/2021 21:44
8/03/2021 11:08	10/06/2021 20:14	6/09/2021 23:56	31/12/2021 7:34
8/03/2021 15:36	11/06/2021 12:50	7/09/2021 4:25	31/12/2021 14:15
9/03/2021 9:35	11/06/2021 16:10	7/09/2021 11:08	31/12/2021 16:33
9/03/2021 23:56	11/06/2021 19:59	7/09/2021 17:03	31/12/2021 19:12
10/03/2021 4:15	12/06/2021 2:44	7/09/2021 23:47	
10/03/2021 8:30	12/06/2021 7:43	8/09/2021 3:34	
10/03/2021 13:47	12/06/2021 11:02	8/09/2021 8:31	
10/03/2021 23:57	12/06/2021 16:32	8/09/2021 13:02	
11/03/2021 2:22	12/06/2021 18:44	8/09/2021 20:21	
11/03/2021 17:33	12/06/2021 21:35	9/09/2021 0:04	
12/03/2021 7:22	13/06/2021 0:49	9/09/2021 11:24	
12/03/2021 15:01	13/06/2021 5:46	9/09/2021 14:46	
12/03/2021 19:02	13/06/2021 10:49	9/09/2021 17:47	
13/03/2021 14:26	13/06/2021 13:47	9/09/2021 20:41	
13/03/2021 17:44	13/06/2021 16:23	10/09/2021 0:57	
13/03/2021 21:06	13/06/2021 19:52	10/09/2021 5:29	
14/03/2021 7:48	13/06/2021 23:52	10/09/2021 18:01	
14/03/2021 12:06	14/06/2021 3:38	11/09/2021 2:32	
14/03/2021 21:26	14/06/2021 12:24	11/09/2021 8:46	
15/03/2021 11:00	14/06/2021 16:34	11/09/2021 15:13	
15/03/2021 14:59	14/06/2021 21:29	11/09/2021 20:08	
15/03/2021 19:36	15/06/2021 1:50	12/09/2021 2:30	
16/03/2021 7:00	15/06/2021 5:39	12/09/2021 12:12	
17/03/2021 4:29	15/06/2021 13:27	12/09/2021 16:44	
18/03/2021 2:25	15/06/2021 20:02	13/09/2021 0:18	
24/03/2021 10:33	16/06/2021 3:25	13/09/2021 4:11	
25/03/2021 10:58	16/06/2021 12:52	13/09/2021 14:53	
25/03/2021 15:51	16/06/2021 19:31	14/09/2021 2:16	
25/03/2021 22:11	17/06/2021 3:35	14/09/2021 21:26	
26/03/2021 7:26	17/06/2021 8:51	15/09/2021 3:32	
26/03/2021 17:52	17/06/2021 16:02	15/09/2021 9:01	
26/03/2021 20:22	17/06/2021 21:09	15/09/2021 12:24	
27/03/2021 3:18	18/06/2021 1:23	15/09/2021 17:45	
27/03/2021 7:30	18/06/2021 8:06	15/09/2021 21:02	
27/03/2021 11:41	18/06/2021 10:48	16/09/2021 9:07	
27/03/2021 14:25	18/06/2021 15:15	16/09/2021 12:24	
27/03/2021 21:06	19/06/2021 2:49	16/09/2021 16:10	
28/03/2021 9:21	19/06/2021 5:27	16/09/2021 21:31	
28/03/2021 15:11	19/06/2021 15:16	17/09/2021 1:04	
28/03/2021 17:42	19/06/2021 18:04	17/09/2021 4:47	

28/03/2021 21:57	19/06/2021 21:29	17/09/2021 11:08	
29/03/2021 0:27	20/06/2021 3:43	17/09/2021 20:37	
29/03/2021 6:07	20/06/2021 6:51	18/09/2021 0:14	
29/03/2021 9:40	20/06/2021 9:19	18/09/2021 8:00	
29/03/2021 14:47	20/06/2021 12:38	18/09/2021 18:12	
30/03/2021 1:11	20/06/2021 16:00	19/09/2021 0:33	
30/03/2021 8:35	20/06/2021 21:21	19/09/2021 16:52	
30/03/2021 20:37	21/06/2021 8:26	20/09/2021 4:16	
31/03/2021 2:33	21/06/2021 11:27	21/09/2021 12:00	
31/03/2021 6:49	21/06/2021 14:26	21/09/2021 15:45	
31/03/2021 16:46	21/06/2021 22:29	22/09/2021 3:29	
1/04/2021 1:01	21/06/2021 23:07	22/09/2021 6:11	
1/04/2021 4:50	22/06/2021 3:23	22/09/2021 10:04	
1/04/2021 8:07	22/06/2021 8:03	22/09/2021 13:33	
1/04/2021 13:37	22/06/2021 13:17	22/09/2021 16:07	

APPENDIX C

Annual Sound Power Testing

**Appendix C
Annual Sound Power Testing**

Table C-1

Sound Power Level Testing Results

Equipment Model	Plant ID	EA model Lw	EA model LwA	2021 Lw	2021 LwA
TRACKED BULLDOZERS					
CAT D11T	320	129	127	122	120
CAT D11T	322	129	127	125	123
CAT D11T	323	129	127	124	123
CAT D11T	324	129	127	125	121
Komatsu 475	350	129	127	122	120
Komatsu 475	352	129	127	120	117
CAT D10T	869	129	127	124	121
CAT D10T	876	129	127	121	119
CAT D9T	WTC18	129	127	119	116
CAT D9T	WTC26	129	127	118	116
CAT D10T	WTC29	129	127	122	120
CAT D6T XL	WTC38	129	127	118	115
WHEELED BULLDOZERS					
CAT 854G	877	122	115	115	112
DRILLS					
CAT MD6290	456	122	118	121	120
CAT K50	150	122	118	119	117
EXCAVATORS					
Hitachi EX3600	223	131	119	120	112
Hitachi EX5600	241	131	113	119	111
Hitachi EX8000	261	131	119	123	115
Hitachi EX8000	262	131	119	122	114
Hitachi EX3600	810	131	119	117	110
ZX290	WTC31	131	119	111	107
374F	WTC34	131	119	112	106
GRADERS					
CAT 24M	415	118	112	113	109
CAT 16M	864	118	112	109	106
REAR DUMP TRUCKS					
Hitachi EH5000	001	124	117	122	116

Equipment Model	Plant ID	EA model Lw	EA model LwA	2021 Lw	2021 LwA
Hitachi EH5000	002	124	117	120	115
Hitachi EH5000	010	124	117	121	115
Hitachi EH5000	013	124	117	121	116
Hitachi EH5000	021	124	117	122	116
Hitachi EH5000	023	124	117	122	116
Hitachi EH5000	025	124	117	121	115
Hitachi EH5000	028	124	117	121	116
Hitachi EH5000	032	124	117	123	117
Hitachi EH5000	035	124	117	121	115
Hitachi EH5000	039	124	117	122	116
Hitachi EH5000	042	124	117	121	116
Hitachi EH5000	043	124	117	120	115
Hitachi EH5000	045	124	117	122	116
Hitachi EH3500	051	124	117	121	114
Hitachi EH3500	052	124	117	121	115
Hitachi EH3500	053	124	117	121	115
Hitachi EH3500	054	124	117	119	114
CAT 789 CXQ	104	124	117	123	117
CAT 789 CXQ	838	124	117	122	117
CAT 789 CXQ	839	124	117	121	116
CAT 789 CXQ	844	124	117	122	115
CAT 789 CXQ	874	124	117	122	116
CAT 789 CXQ	875	124	117	122	115
CAT 789 CXQ	882	124	117	123	116
CAT 789 CXQ	885	124	117	121	115
CAT 789 CXQ	887	124	117	121	115
CAT 789 CXQ	895	124	117	122	116
WATER CARTS					
CAT 777G	503	122	115	117	113
CAT 777G	803	122	115	118	114
CAT 777G	806	122	115	117	114

Equipment Model	Plant ID	EA model Lw	EA model LwA	2021 Lw	2021 LwA
STATIONARY PLANT					
Coal Preparation Plant		133	117	130	116
Conveyors (200m section)		113	108	108	104
Conveyors (500m section)		117	112	111	107
Primary ROM sizer		117	109	115	107
Secondary ROM sizer		121	112	118	111
Product Stacker		111	104	107	100
Product Reclaimer		122	115	113	104
Raw Coal Transfer Station		117	103	115	106
CPP product Transfer Station		117	103	115	104
Train Loadout		114	103	121	116

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

Location	Date	pH Value	Electrical Conductivity @ 25°C	Total Dissolved Solids (TDS)	Suspended Solids (SS)	Turbidity	Total Alkalinity as CaCO3	Calcium (filt.)	Magnesium (filt.)	Sodium (filt.)	Potassium (filt.)	Aluminium (total)	Cadmium (total)	Chromium (total)	Copper (total)	Lead (total)	Manganese (total)	Nickel (total)	Selenium (total)	Silver (total)	Zinc (total)	Boron (total)	Iron (Total)	Arsenious Acid, As (III)	Arsenic Acid As (V)	Mercury	Nitrite + Nitrate as N	Total Nitrogen	Total Phosphorus as P	Total Anions	Total Cations
		pH Unit	µS/cm	mg/L	mg/L	NTU	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	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L
SW1	12/01/2021	7.2	500	285	40	27.4	175	41	15	37	2	1.06	<0.0001	<0.001	<0.001	<0.001	0.2	<0.001	<0.01	<0.001	<0.005	<0.005	1.28			<0.0001	0.14	0.3	0.4	0.15	0.04
	9/02/2021	7.23	444	270	31	21.9	166	37	14	34	2	0.65	<0.0001	<0.001	0.001	<0.001	0.165	<0.001	<0.01	<0.001	<0.005	<0.005	1.17			<0.0001	0.04	0.3	0.3	0.15	0.04
	12/03/2021	7.56	320	331	300	329	138	25	8	30	8	17.9	<0.0001	0.012	0.009	0.006	0.327	0.011	<0.01	<0.001	0.033	<0.005	12.1	<0.5	3.2	<0.0001	0.23	1.8	2	0.58	0.26
	13/04/2021	7.42	472	286	20	9.9	168	38	15	38	2	0.5	<0.0001	<0.001	<0.001	<0.001	0.112	<0.001	<0.01	<0.001	<0.005	<0.005	0.69	<0.5	0.6	<0.0001	0.31	0.2	0.5	0.12	0.06
	12/05/2021	7.36	440	288	10	8.8	162	37	15	36	2	0.21	<0.0001	<0.001	<0.001	<0.001	0.102	0.002	<0.01	<0.001	<0.005	<0.005	0.5	0.6	<0.5	<0.0001	0.3	0.1	0.4	0.09	0.06
	11/06/2021	7.28	110	153	184	125	60	10	4	11	3	5.26	<0.0001	0.004	0.001	0.001	0.303	0.005	<0.01	<0.001	0.011	<0.005	6.84	<0.5	<0.5	<0.0001	0.47	1.4	1.9	0.71	0.21
	13/07/2021	7.43	192	150	10	10.6	98	15	6	17	2	1.15	<0.0001	<0.001	<0.001	<0.001	0.026	<0.001	<0.01	<0.001	<0.005	<0.005	0.94	<0.5	<0.5	<0.0001	0.17	0.2	0.4	0.15	0.12

	11/08/2021	7.36	384	254	12	7.4	146	30	12	32	2	0.01	<0.0001	<0.001	<0.001	<0.001	0.061	<0.001	<0.01	<0.001	0.009	<0.05	<0.05	0.5	<0.0001	0.27	<0.1	0.3	0.12	0.07			
	13/09/2021	7.58	411	261	14	6.4	136	29	11	39	1	<0.001	<0.0001	<0.001	0.003	<0.001	0.048	<0.001	<0.01	<0.001	<0.005	<0.005	<0.05	<0.5	0.7	<0.0001	0.17	<0.1	0.2	0.11	0.07		
	15/10/2021	7.53	370	252	12	7	146	32	12	33	2	<0.001	<0.0001	<0.001	<0.001	<0.001	0.059	<0.001	<0.01	<0.001	<0.005	<0.005	<0.05	<0.5	0.6	<0.0001	0.13	0.1	0.2	0.12	0.07		
	16/11/2021	7.47	412	274	30	29.3	170	37	14	39	2	<0.001	<0.0001	<0.001	<0.001	<0.001	0.091	<0.001	<0.01	<0.001	<0.005	<0.005	<0.05	<0.5	0.9	<0.0001	0.11	<0.1	0.1	0.16	0.07		
	17/12/2021	7.64	330	230	8	8.1	127	28	13	28	2	<0.001	<0.0001	<0.001	<0.001	<0.001	0.046	<0.001	<0.01	<0.001	<0.005	<0.005	<0.05	<0.5	1	<0.0001	0.21	0.2	0.4	0.13	0.1		
SW2	12/01/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		
	9/02/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		
	12/03/2021	7.16	98	339	240	582	<1	<1	40	40	<10	2	7	2	6	8	24.1	<0.0001	0.011	0.008	0.009	0.626	0.01	<0.01	<0.001	0.041	<0.05	15.6	<0.5	0.9			
	13/04/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		
	12/05/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
	11/06/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	13/07/2021	8.02	319	251	8	16.3	<1	<1	131	131	24	19	24	11	20	1	1.94	<0.0001	0.001	0.002	<0.001	0.015	0.002	<0.01	<0.001	<0.005	<0.05	1.3	<0.5	1.2	<0.0001		
	11/08/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
	13/09/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	15/10/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
16/11/2021	7.57	464	310	<5	1.7	<1	<1	187	187	23	34	47	17	35	2	<0.001	<0.0001	<0.001	<0.001	0.096	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	1.4	<0.0001				
17/12/2021	7.7	372	238	<5	4	<1	<1	147	147	20	26	35	16	27	2	<0.001	<0.0001	<0.001	<0.001	0.035	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	1.4	<0.0001				
SW4	12/03/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		
	11/06/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
	13/09/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
	17/12/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
SW5	12/03/2021	7.86	391	242	42	40.6	<1	<1	145	145	32	24	33	15	25	5	1.74	<0.0001	0.002	0.004	<0.001	0.113	0.004	<0.01	<0.001	0.008	<0.05	1.85	<0.5	1.3	<0.0001		
	11/06/2021	8.05	568	460	120	166	<1	<1	187	187	52	57	38	24	55	5	6.02	<0.0001	0.006	0.006	<0.001	0.159	0.014	<0.01	<0.001	0.017	<0.05	5.78	<0.5	1	<0.0001		
	13/09/2021	8.14	464	289	32	32	<1	<1	169	169	30	30	31	18	33	3	<0.001	<0.0001	<0.001	0.004	<0.001	0.003	<0.001	<0.01	<0.001	<0.005	<0.05	<0.5	0.9	<0.0001			

	16/12/2021	7.75	334	246	141	144	<1	<1	130	130	20	20	27	15	22	5	<0.01	<0.0001	<0.001	0.002	<0.001	0.006	0.003	<0.01	<0.001	<0.005	<0.05	0.07	<0.5	1.4	<0.0001					
SW6	12/01/2021	7.99	295	186	67	79.3																														
	9/02/2021	8.08	339	188	48	52																														
	12/03/2021	7.95	364	238	38	30.9																														
	13/04/2021	8.18	483	314	39	28.7																														
	12/05/2021	8.32	573	326	16	17.1																														
	11/06/2021	8.26	645	466	52	46.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR		
	13/07/2021	7.81	296	320	420	459																														
	11/08/2021	7.98	310	216	50	36.5																														
	13/09/2021	8.16	462	290	41	34.6																														
	15/10/2021	8.07	392	264	94	57.6																														
	16/11/2021	7.62	326	311	201	285																														
16/12/2021	7.74	329	266	128	150																															
SW7	12/01/2021	7.98	289	190	74	83.3																														
	9/02/2021	8.02	341	200	51	57.9																														
	12/03/2021	7.84	378	232	58	50.3																														
	13/04/2021	8.24	475	309	42	17.7																														
	12/05/2021	8.3	571	345	26	22.2																														
	11/06/2021	8.14	552	453	86	145	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
	13/07/2021	7.79	300	350	379	499																														
	11/08/2021	8.02	297	194	54	37.3																														
	13/09/2021	8.16	435	284	36	35.2																														
	15/10/2021	8.05	356	249	66	47																														
	16/11/2021	7.65	327	303	222	314																														

	16/12/2021	7.68	326	250	152	163																																
SW8	12/03/2021	7.89	364	248	43	43.2	134	31	15	23	5	2.46	0.006	<0.001	0.113	0.004	<0.001	<0.001	<0.005	<0.05	1.88	0.2	0.03	1	1	0.12												
	11/06/2021	8.23	556	393	75	102	168	42	25	48	4	7.99	0.002	<0.001	0.099	0.008	<0.001	<0.001	0.009	<0.05	4.7	0.2	2.31	0.9	3.2	0.26												
	13/09/2021	8.17	447	275	38	36.1	146	30	17	32	3	<0.001	0.004	<0.001	0.002	0.001	<0.001	<0.001	<0.005	<0.05	<0.05	0.2	0.39	0.5	0.9	0.14												
	17/12/2021	7.77	362	250	119	138	146	31	18	25	5	<0.001	0.002	<0.001	0.002	0.003	<0.001	<0.001	<0.005	<0.05	<0.05	0.2	0.55	1	1.6	0.39												
SW9	12/03/2021	7.22	89	186	56	173	<1	<1	35	35	<10	6	6	1	9	6	7.58	<0.0001	0.004	0.01	0.003	0.14	0.006	<0.001	<0.001	0.015	<0.05	5.22	0.7	1	<0.0001							
	11/06/2021	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
	13/09/2021	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
	16/12/2021	7.84	249	238	6	17.7	<1	<1	100	100	<10	19	22	7	21	12	0.05	<0.0001	<0.001	0.002	<0.001	0.014	0.004	<0.001	<0.001	0.009	<0.05	0.08	<0.5	0.8	<0.0001							

MCC Surrounding Surface Water Monitoring Results

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

**Table D-3
Off-site Discharge Monitoring Laboratory Results**

Location	Date	pH	Electrical Conductivity @ 25°C	Total Dissolved Solids @ 180°C	Suspended Solids	Turbidity	Total Alkalinity as CaCO3	Calcium	Magnesium	Sodium	Potassium	Aluminium (total)	Cadmium (total)	Chromium (total)	Copper (total)	Lead (total)	Manganese (total)	Nickel (total)	Selenium (total)	Silver (total)	Zinc (total)	Boron (total)	Iron (total)	Arsenious Acid, As (III)	Arsenic Acid, As (V)	Mercury	Nitrite + Nitrate as N	Total Nitrogen as N	Total Phosphorus as P	Total Anions	Total Cations	Oil and Grease		
		pH Unit	µS/cm	mg/L	mg/L	NTU	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	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
SW1	08/11/2021	7.07	254	330	876	1170	90	22	9	20	3	29.3	0.0001	0.016	0.032	0.023	0.93	0.014	<0.01	<0.001	0.092	<0.05	22.8	<0.5	2.3	<0.0001	0.28	3.6	0.9	2.75	2.78	----		
	22/11/2021	7.91	186	294	456	363	78	16	5	20	6	2.02	<0.0001	<0.001	0.002	<0.001	0.012	0.002	<0.01	<0.001	<0.005	<0.05	0.87	----	----	<0.0001	0.1	2.4	0.59	1.87	2.23	----		
	08/12/2021	7.6	359	270	14	8.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
	09/12/2021	7.45	168	193	58	190	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SW2	08/11/2021	7.58	160	266	324	320	72	16	5	14	2	1.9	<0.0001	0.001	0.004	<0.001	0.014	0.002	<0.01	<0.001	<0.005	<0.05	1	----	----	<0.0001	0.07	1.9	0.5	1.64	1.87	----		
	22/11/2021	7.58	160	266	324	320	72	16	5	14	2	1.9	<0.0001	0.001	0.004	<0.001	0.014	0.002	<0.01	<0.001	<0.005	<0.05	1	----	----	<0.0001	0.07	1.9	0.5	1.64	1.87	----		
	08/12/2021	7.83	249	225	114	97	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
	09/12/2021	7.82	227	266	72	131	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
	10/12/2021	7.7	241	244	46	79.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SW3	22/11/2021	7.23	141	288	67	191	60	12	3	11	14	1.78	<0.0001	0.001	0.003	<0.001	0.012	0.003	<0.01	<0.001	<0.005	<0.05	0.82	----	----	<0.0001	0.09	2	0.58	1.37	1.68	----		
	08/12/2021	6.97	141	221	107	149	79	12	3	13	11	7.07	<0.0001	0.003	0.004	0.002	0.182	0.005	<0.01	<0.001	0.015	<0.05	4.39	<0.5	0.8	<0.0001	0.14	1.8	0.52	1.86	1.69	----		
	09/12/2021	7.51	155	326	203	372	95	14	2	12	7	0.001	0.006	0.004	0.003	0.34	0.021	<0.01	0.21	0.03	11.7						0.23		0.58	2.01	1.56			
SW4	08/11/2021	6.4	49	260	154	307	25	3	2	6	5	15.8	<0.0001	0.01	0.005	0.005	0.072	0.009	<0.01	<0.001	0.019	<0.05	8.03	<0.5	<0.5	<0.0001	0.04	1.2	0.13	0.61	0.7	<5		
	22/11/2021	7.1	94	186	18	37.2	36	6	2	6	13	1.99	<0.0001	0.001	0.002	<0.001	0.014	0.003	<0.01	<0.001	<0.005	<0.05	0.86	<0.5	<0.5	<0.0001	<0.01	1.9	0.17	0.89	1.06	<5		
	08/12/2021	6.54	96	147	12	24.4	55	7	3	7	12	3.23	<0.0001	0.002	0.002	<0.001	0.039	0.004	<0.01	<0.001	0.007	<0.05	2.06	<0.5	<0.5	<0.0001	0.03	2	0.18	1.3	1.21	<5		
	09/12/2021	6.64	104	158	12	27.4	55	6	2	6	11	<0.001	0.002	<0.001	<0.001	0.033	0.008	<0.01	0.111	<0.005	1.47						0.02		0.2	1.27	1.01			
	10/12/2021	7.72	124	165	12	21.4	72	9	3	6	11	0.001	0.002	<0.001	0.002	0.028	0.008	<0.01	0.146	0.025	1.11						0.03		0.15	1.66	1.24			
SW5	08/11/2021	7.71	463	294	30	25.3	150	35	22	32	3	1.3	<0.0001	0.001	0.003	<0.001	0.053	0.002	<0.01	<0.001	0.006	<0.05	1.48	<0.5	1.1	<0.0001	0.3	0.8	0.09	4.57	5.02	<5		
	22/11/2021	7.49	237	280	345	352	89	18	9	19	6	0.58	<0.0001	<0.001	0.004	<0.001	0.005	0.004	<0.01	<0.001	<0.005	<0.05	0.45	<0.5	1.3	<0.0001	1.32	3.4	0.88	2.45	2.62	<5		
	08/12/2021	7.33	241	179	103	81.2	120	20	12	18	4	6.27	<0.0001	0.007	0.008	0.001	0.16	0.007	<0.01	<0.001	0.014	<0.05	6.26	<0.5	1.2	<0.0001	0.28	1.3	0.24	3.08	2.87	<5		
	09/12/2021	7.36	295	245	406	431	135	21	12	20	6	0.003	0.019	0.004	0.005	0.411	0.021	<0.01	0.302	0.039	22						0.39		0.91	3.52	3.06			

Location	Date	pH	Electrical Conductivity @ 25°C	Total Dissolved Solids @180°C	Suspended Solids	Turbidity	Total Alkalinity as CaCO3	Calcium	Magnesium	Sodium	Potassium	Aluminium (total)	Cadmium (total)	Chromium (total)	Copper (total)	Lead (total)	Manganese (total)	Nickel (total)	Selenium (total)	Silver (total)	Zinc (total)	Boron (total)	Iron (total)	Arsenic Acid, As (III)	Arsenic Acid, As (V)	Mercury	Nitrite + Nitrate as N	Total Nitrogen as N	Total Phosphorus as P	Total Anions	Total Cations	Oil and Grease
		pH Unit	µS/cm	mg/L	mg/L	NTU	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	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW8	08/11/2021	7.72	436	254	45	24.6	147	34	21	31	3	1.48	<0.0001	0.002	0.003	<0.001	0.059	0.002	<0.01	<0.001	0.006	<0.05	1.68	<0.5	1.1	<0.0001	0.1	0.8	0.13	4.4	4.85	<5
	22/11/2021	7.58	251	280	330	273	97	19	9	20	6	0.59	<0.0001	<0.001	0.004	<0.001	0.004	0.003	<0.01	<0.001	<0.005	<0.05	0.43	<0.5	1.3	<0.0001	0.94	2.8	0.8	2.66	2.71	<5
	08/12/2021	7.22	235	194	162	136	119	20	11	18	4	10.3	<0.0001	0.011	0.01	0.002	0.233	0.012	<0.01	<0.001	0.019	<0.05	9.02	<0.5	1.1	<0.0001	0.28	1.5	0.35	3.04	2.79	<5
	09/12/2021	7.27	258	232	375	389	122	19	11	17	4	0.003	0.016	0.004	0.004	0.388	0.018	<0.01	0.274	0.042	20.2						0.34		0.71	3.15	2.7	
SW9	08/11/2021	6.05	87	129	289	393	32	6	2	10	5	11.6	<0.0001	0.007	0.007	0.006	0.323	0.008	<0.01	<0.001	0.024	<0.05	6.88	<0.5	<0.5	<0.0001	0.09	1.3	0.43	0.89	1.03	<5
	22/11/2021	7.61	237	335	76	212	94	13	3	33	10	1.69	<0.0001	<0.001	0.003	<0.001	0.009	0.002	<0.01	<0.001	<0.005	<0.05	0.77	<0.5	0.6	<0.0001	0.03	1.8	0.46	2.36	2.59	<5
	08/12/2021	6.73	120	186	84	101	66	11	3	10	8	4.8	<0.0001	0.002	0.003	0.002	0.083	0.006	<0.01	<0.001	0.008	<0.05	2.99	<0.5	0.6	<0.0001	0.04	1.5	0.18	1.57	1.44	<5
	09/12/2021	6.82	159	247	72	112	84	13	4	10	9	0.001	0.003	0.002	0.002	0.101	0.013	<0.01	0.202	0.018	4.49					0.07		0.21	1.9	1.64		
	10/12/2021	7.09	194	276	24	81	90	15	4	13	8	0.002	0.003	0.002	0.004	0.065	0.011	<0.01	0.231	0.01	3.37					0.08		0.13	2.19	1.85		
SW10	08/11/2021	6.16	41	130	221	272	16	2	<1	4	7	10.9	<0.0001	0.008	0.005	0.004	0.269	0.008	<0.01	<0.001	0.03	<0.05	6.68	<0.5	<0.5	<0.0001	0.2	1.8	0.4	0.38	0.45	----
	22/11/2021	7.33	133	223	53	101	57	11	3	11	10	1.2	<0.0001	<0.001	0.002	<0.001	0.011	0.003	<0.01	<0.001	<0.005	<0.05	0.55	----	----	<0.0001	0.06	1.8	0.14	1.34	1.53	----
	08/12/2021	6.84	121	195	50	81.1	68	11	3	11	9	3.58	<0.0001	0.002	0.002	0.001	0.068	0.005	<0.01	<0.001	0.01	<0.05	2.25	----	----	<0.0001	0.02	1.5	0.17	1.64	1.5	----
	09/12/2021	6.79	162	248	45	93.2	81	13	4	11	9	0.001	0.003	0.002	<0.001	0.08	0.012	<0.01	0.216	0.008	3.09					0.06		0.2	1.87	1.69		
	10/12/2021	7.04	180	274	14	77.3	84	14	4	13	8	0.002	0.003	0.002	0.004	0.048	0.011	<0.01	0.225	0.008	2.76					<0.01		0.14	2.07	1.8		
SW11	08/12/2021	8.24	1140	----	----	----	207	----	----	----	----	0.08	<0.0001	<0.001	0.003	<0.001	0.014	0.009	<0.01	<0.001	0.006	0.06	<0.05	0.8	0.8	<0.0001	0.44	1.2	0.02	----	----	<5
	09/12/2021	7.55	322	410	115	280	146	15	6	44	3	0.001	0.011	0.003	0.003	0.129	0.01	<0.01	0.263	0.016	9.83					0.21		0.81	3.51	3.23		
SW12	08/11/2021	6.47	83	181	246	359	33	6	1	10	6	11.3	<0.0001	0.006	0.007	0.006	0.326	0.008	<0.01	<0.001	0.022	<0.05	6.78	<0.5	0.5	<0.0001	0.09	1.4	0.48	0.91	0.97	----
	08/12/2021	7.36	238	163	115	85.2	120	20	12	18	4	5.13	<0.0001	0.006	0.007	<0.001	0.156	0.008	<0.01	<0.001	0.011	<0.05	5.33	<0.5	1.1	<0.0001	0.27	1.2	0.24	3.1	2.87	<5
	09/12/2021	7.04	176	244	55	96.6	83	13	4	11	9	0.002	0.003	0.002	0.001	0.08	0.013	<0.01	0.207	0.012	4.18					0.06		0.2	1.94	1.69		
SW13	08/11/2021	5.32	5	<10	<5	0.2	<1	<1	<1	1	<1	<0.01	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	<0.5	<0.0001	<0.01	<0.1	<0.01	<0.01	0.04	<5
	08/12/2021	6.03	<1	<10	<5	<0.1	<1	<1	<1	<1	<1	<0.01	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	<0.5	<0.0001	<0.01	<0.1	<0.01	<0.01	<0.01	<5
	09/12/2021	5.96	<1	<10	<5	<0.1	<1	<1	<1	<1	<1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001	<0.005	<0.05				<0.01		0.02	<0.01	<0.01	<0.01	<5

Table D-4
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	8/02/2021	-	-	<5
	Conductivity	µs/cm				-	-	1010
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.26
Mine Void	TSS	mg/L	Every 2 Months	1	12/04/2021	-	-	16
	Conductivity	µs/cm				-	-	1140
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.21
Mine Void	TSS	mg/L	Every 2 Months	1	11/06/2021	-	-	6
	Conductivity	µs/cm				-	-	1230
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.2
Mine Void	TSS	mg/L	Every 2 Months	1	11/08/2021	-	-	66
	Conductivity	µs/cm				-	-	1170
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.28
Mine Void	TSS	mg/L	Every 2 Months	1	13/10/2021	-	-	10
	Conductivity	µs/cm				-	-	1160
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.18
Mine Void	TSS	mg/L	Every 2 Months	1	20/12/2021	-	-	24
	Conductivity	µs/cm				-	-	969
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	7.9

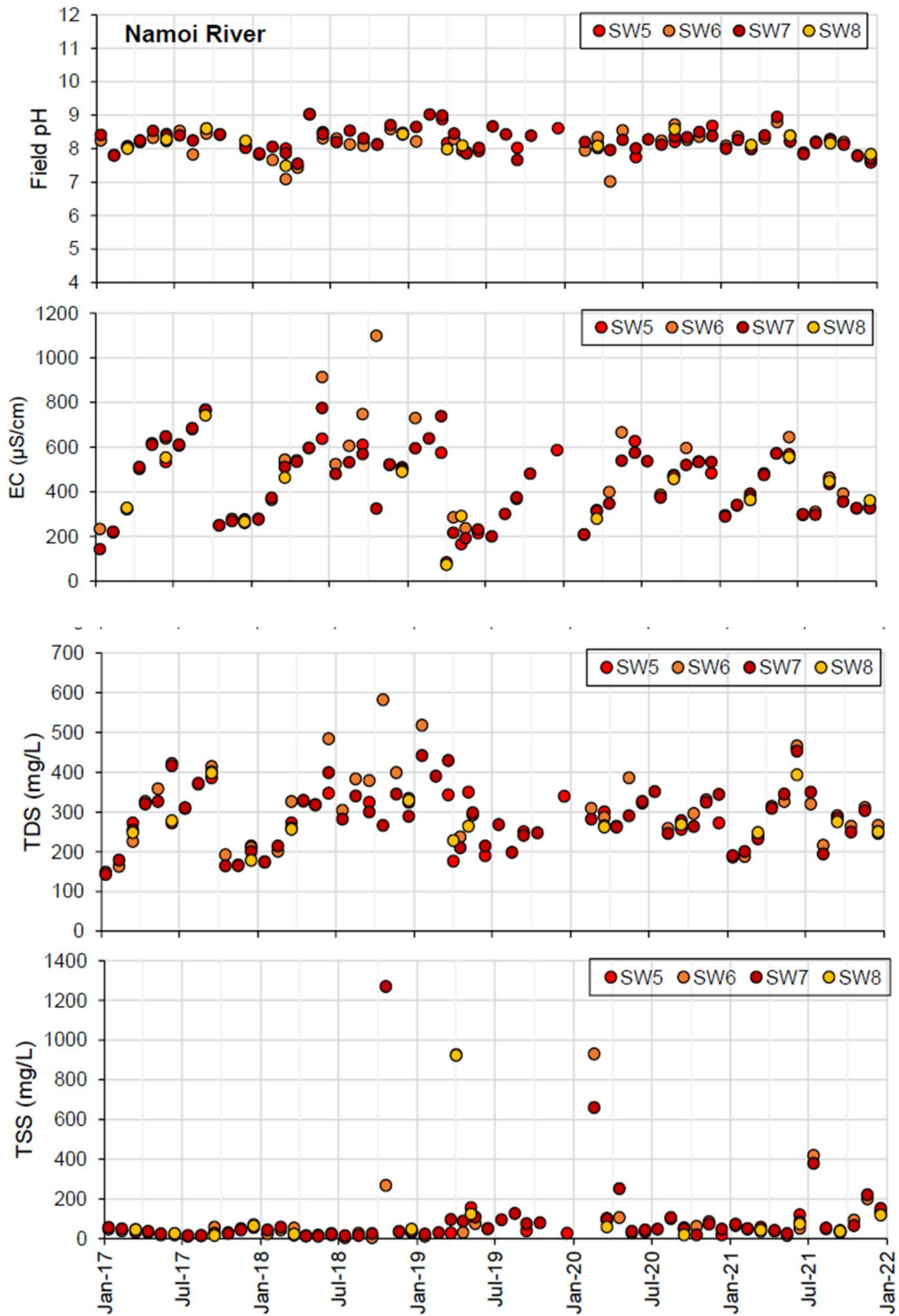


Figure D-1 – Namoi River surface water quality trends (5 year summary – 2017 to 2021)

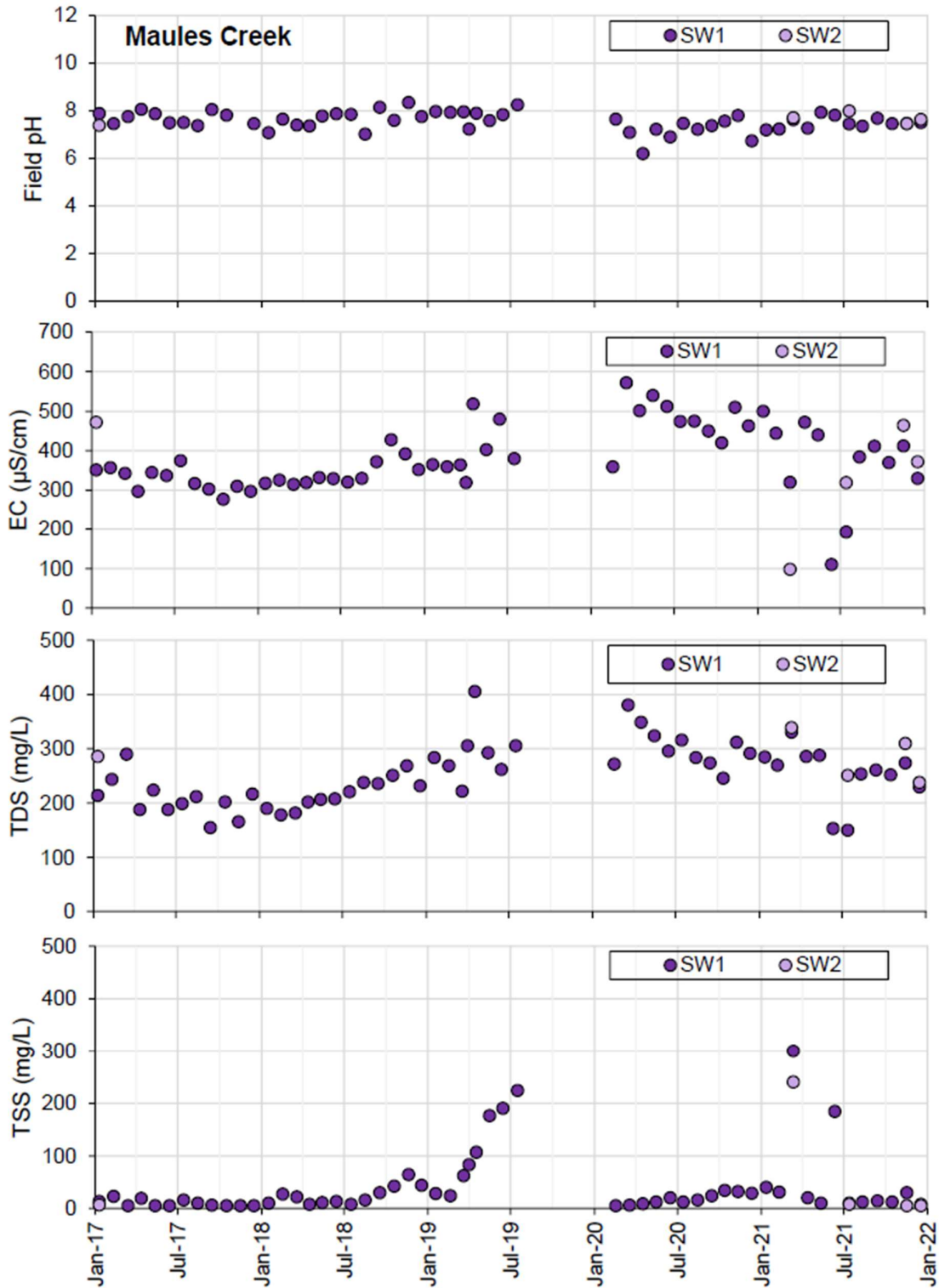


Figure D-2 – Maules Creek surface water quality trends (5 year summary – 2017 to 2021)

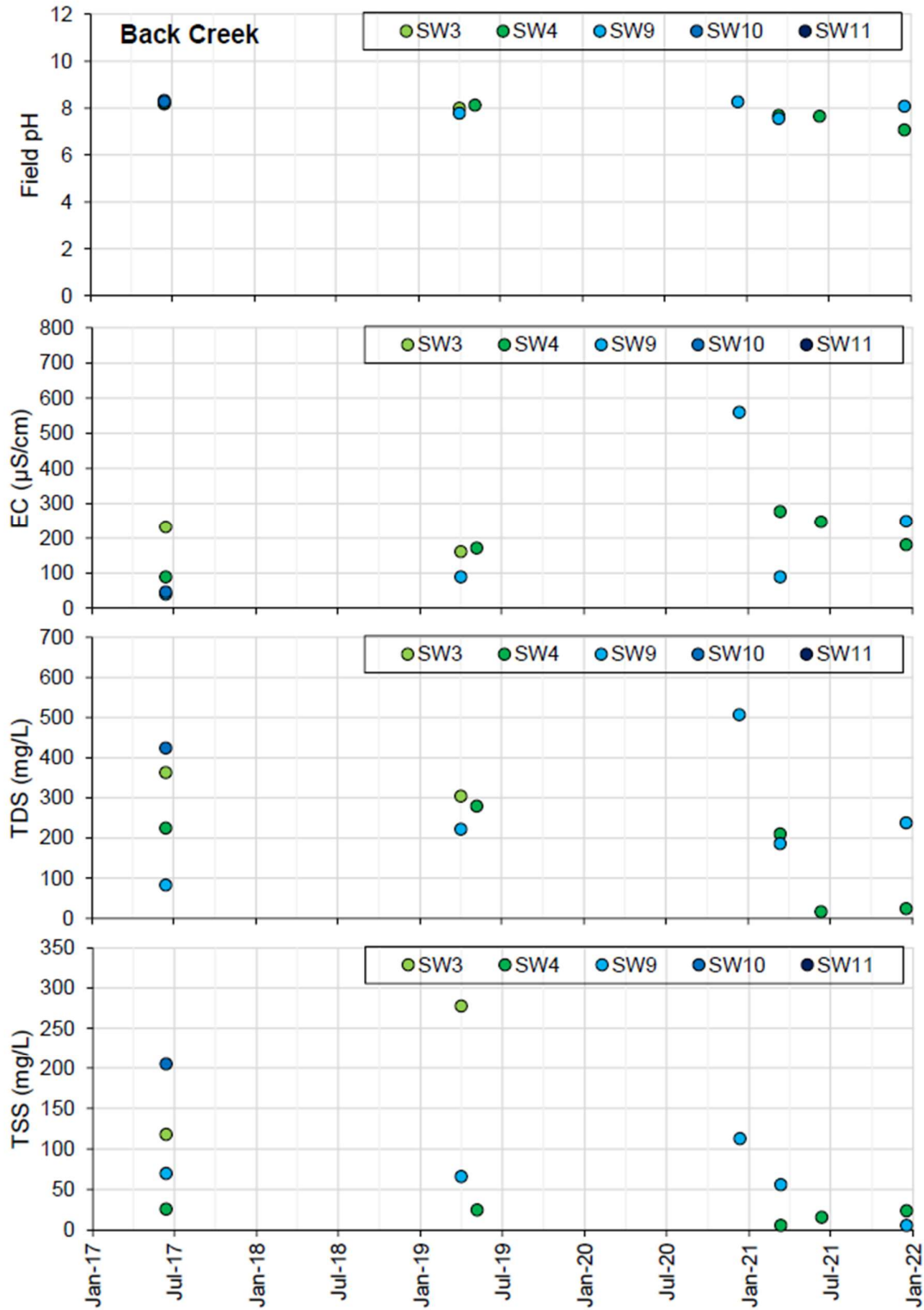


Figure D-3 – Back Creek surface water quality trends (5 year summary – 2017 to 2021)

APPENDIX E
Groundwater

**Appendix E
Groundwater**

**Table E-1
Active monitoring bore details**

Bore ID	Approx. EIS proposed site	Type	Network	Easting (GDA94Z56)	Northing (GDA94Z56)	GL (mAHD)	Bore depth (m)	Screen/sensor depth (mbgl)	Target geology
BCM01	BCMB01	SP (dry)	Maules Creek	223841	6618371	273.39	10	6.75 - 9.75	Alluvium
BCM03	BCMB03	SP (dry)	Maules Creek	230085	6617546	305.02	10	6.75 - 9.75	Alluvium
MAC1280	-	SP	Maules Creek	226525	6616503	322.5	146	56 – 59	Interburden between Braymont seams
RB03_VW1	-	VWP	Maules Creek	227947	6613635	407.89	-	164	Braymont seam
RB03_VW2	-	VWP	Maules Creek	227947	6613635	407.89	-	242	Merriown seam
RB03_VW3	-	VWP	Maules Creek	227947	6613635	407.89	-	289	Nagero seam
RB03_VW4	-	VWP	Maules Creek	227947	6613635	407.89	-	317	Templemore seam
RB04_VW1	-	VWP	Maules Creek	228213	6614910	437.53	-	209	Braymont seam
RB04_VW2	-	VWP	Maules Creek	228213	6614910	437.53	-	272.5	Merriown seam
RB04_VW3	-	VWP	Maules Creek	228213	6614910	437.53	-	309	Nagero seam
RB04_VW4	-	VWP	Maules Creek	228213	6614910	437.53	-	339	Lower Northam seam
RB05A	-	SP + logger	Maules Creek	228065	6616810	328.1	246.5	239 - 245	Merriown seam
RB05_VW1	-	VWP	Maules Creek	228071	6616813	328.4	-	107	Braymont seam
RB05_VW2	-	VWP	Maules Creek	228071	6616813	328.4	-	213	Jeralong seam
RB05_VW3	-	VWP	Maules Creek	228071	6616813	328.4	-	280	Nagero seam
RB05_VW4	-	VWP	Maules Creek	228071	6616813	328.4	-	390	Templemore seam
REG1_VW1	L1VWP2	VWP	Regional	226946	6622396	286.17	-	118.7	Jeralong seam
REG1_VW2	L1VWP2	VWP	Regional	226946	6622396	286.17	-	134.5	Merriown seam

Bore ID	Approx. EIS proposed site	Type	Network	Easting (GDA94Z56)	Northing (GDA94Z56)	GL (mAHD)	Bore depth (m)	Screen/sensor depth (mbgl)	Target geology
REG1_VW3	L1VWP2	VWP	Regional	226946	6622396	286.17	-	193.5	Nagero seam
REG1_VW4	L1VWP2	VWP	Regional	226946	6622396	286.17	-	281.5	Therribri seam
REG2_VW1	-	VWP	Regional	232722	6620459	317.01	-	60	Fault zone
REG2_VW2	-	VWP	Regional	232722	6620459	317.01	-	120	Fault zone
REG2_VW3	-	VWP	Regional	232722	6620459	317.01	-	200	Fault zone
REG2_VW4	-	VWP	Regional	232722	6620459	317.01	-	260	Fault zone
REG3	L2VWP2	SP + logger	Regional	217164	6619558	241.6	57	50.50 - 56.50	Boggabri Volcanics
REG4	L3MB1	SP + logger	Regional	219323	6612763	259.95	72.5	65.5 - 71.5	Boggabri Volcanics
REG5	-	SP + logger	Regional	220649	6609521	252.17	78.7	72.2 - 78.2	Boggabri Volcanics
REG5A	-	SP (dry)	Regional	220646	6609514	252.03	22	18 – 21	Alluvium
REG6	L4VWP1	SP + logger	Regional	223100	6606534	250.65	96	88.0 – 94.0	Boggabri Volcanics
REG7_VW1	-	VWP	Regional	233543	6605348	291.62	-	67.5	Braymont seam
REG7_VW2	-	VWP	Regional	233543	6605348	291.62	-	148.2	Merriown seam
REG7_VW3	-	VWP	Regional	233543	6605348	291.62	-	242.5	Nagero seam
REG7A	-	SP + logger	Regional	233545	6605359	291.71	36	24 - 30	Alluvium
REG8_VW1	L5VWP1	VWP	Regional	230030	6615113	341.6	-	91.5	Braymont seam
REG8_VW2	L5VWP1	VWP	Regional	230030	6615113	341.6	-	221	Merriown seam
REG8_VW3	L5VWP1	VWP	Regional	230030	6615113	341.6	-	274	Nagero seam
REG9_VW1	-	VWP	Regional	234233	6610591	346.81	-	115.8	Braymont seam
REG9_VW2	-	VWP	Regional	234233	6610591	346.81	-	175.2	Merriown seam
REG9_VW3	-	VWP	Regional	234233	6610591	346.81	-	268	Nagero seam
REG10_VW1	L1VWP1	VWP	Regional	226723	6618261	287.12	-	55	Braymont seam

Bore ID	Approx. EIS proposed site	Type	Network	Easting (GDA94Z56)	Northing (GDA94Z56)	GL (mAHD)	Bore depth (m)	Screen/sensor depth (mbgl)	Target geology
REG10_VW2	L1VWP1	VWP	Regional	226723	6618261	287.12	-	144.2	Merriown seam
REG10_VW3	L1VWP1	VWP	Regional	226723	6618261	287.12	-	178	Nagero seam
REG10_VW4	L1VWP1	VWP	Regional	226723	6618261	287.12	-	185.5	Upper Northam seam
REG10A	BCMB02	SP (dry)	Regional	226717	6618260	287.12	10	6.75 - 9.75	Alluvium
REG12	L2MB1	SP + logger	Regional	222632	6617358	285.61	48.3	38.4 - 44.4	Boggabri Volcanics
REG13	-	SP + logger	Regional	219713	6611129	277.08	133	128 - 132	Boggabri Volcanics
REG14	-	SP + logger	Regional	225547	6602649	250.18	102	90 - 96	Basement
WHAN (GW060214)	-	Bore	Private	221134	6622897	264*	10	TBC	TBC
School (GW027653)	-	Bore	Private	224673	6623048	282*	8.4	TBC	Gravel
WOL1 (GW062778)	-	Bore	Private	226799	6622149	290*	7.2	TBC	TBC
WOL2	-	Bore	Private	226119	6618673	285*	TBC	TBC	TBC
MOR1	-	Bore	Private	220649	6619125	260*	TBC	TBC	TBC
MOR2	-	Bore	Private	219871	6618803	2560*	TBC	TBC	TBC
TESTON (GW003489)	-	Bore	Private	222568	6619102	270*	45.4	TBC	Hard rock
TRALEE (GW003478)	-	Bore	Private	224102	6618538	278*	33.8	TBC	Basalt
MORSE (GW001869)	-	Bore	Private	228203	6617691	302*	63.1	TBC	Sandstone
BRE2 (GW000583)	-	Bore	Private	234377	6616639	354*	96.3	TBC	Hard rock
BAS1	-	Bore	Private	217107	6612427	239*	TBC	TBC	TBC
BAS2	-	Bore	Private	217548	6612037	238*	TBC	TBC	TBC
Roma Windmill	-	SP	Regional	219058	6606417	240*	~12	TBC	Alluvium
Roma MB	-	SP	Regional	218612	6605871	240*	89	TBC	Alluvium
Brighton Bore 3	-	SP	Regional	219942	6604179	241*	16.4	12.8 - 15.8	Alluvium

SP = standpipe bore, VWP = vibrating wire piezometer, logger = datalogger installed, dry = bore currently dry so no datalogger installed.

Details for private bores have been estimated based on the registered bore closest to the monitored location. Not all construction details are available for each site, and several bores are some distance from the closest registered bore so all construction details remain uncertain. * = elevation of private bore interpolated from groundwater model DEM, TBC = To be confirmed.

Regional Groundwater Bores

Table E-2
Groundwater Levels (metres below bore datum)

Year-Month	RB05A	Reg3	Reg4	Reg5	Reg5A	Reg6	Reg7A	Reg10Aa	Reg12	Reg13	Reg14	BCM01	BCM03
2021-01	74.24	15.33	20.75	17.82	<i>dry</i>	21.71	6.9	<i>dry</i>	25.87	22.75	20.78	<i>dry</i>	<i>dry</i>
2021-02	74.30	15.26	20.82	17.89	<i>dry</i>	21.86	6.85	<i>dry</i>	25.94	22.60	20.70	<i>dry</i>	<i>dry</i>
2021-03	74.90	15.16	20.83	17.86	<i>dry</i>	21.85	6.84	<i>dry</i>	25.91	22.69	20.68	<i>dry</i>	<i>dry</i>
2021-04	74.58	14.15	20.78	17.86	<i>dry</i>	21.79	6.11	<i>dry</i>	25.87	22.67	20.59	<i>dry</i>	<i>dry</i>
2021-05	75.41	13.81	20.87	17.90	<i>dry</i>	20.83	6.16	<i>dry</i>	25.93	22.75	20.49	<i>dry</i>	<i>dry</i>
2021-06	75.64	13.55	21.20	<i>no access to site</i>	<i>dry</i>	21.68	6.10	<i>dry</i>	25.89	22.69	20.32	<i>dry</i>	<i>dry</i>
2021-07	75.95	13.29	20.84	<i>no access to site</i>	<i>dry</i>	21.55	5.28	<i>dry</i>	25.83	22.64	20.23	<i>dry</i>	<i>dry</i>
2021-08	76.27	13.10	20.90	17.85	<i>dry</i>	21.49	4.88	<i>dry</i>	25.82	22.64	20.13	<i>dry</i>	<i>dry</i>
2021-09	76.61	12.99	21.94	17.87	<i>dry</i>	21.39	4.85	<i>dry</i>	25.86	22.60	20.07	<i>dry</i>	<i>dry</i>
2021-10	77.03	13.05	21.25	18.09	<i>dry</i>	21.53	5.07	<i>dry</i>	25.67	22.48	19.97	<i>dry</i>	<i>dry</i>
2021-11	77.19	13.21	20.97	17.89	<i>dry</i>	21.31	5.16	<i>dry</i>	25.83	22.53	20.04	<i>dry</i>	<i>dry</i>
2021-12	76.57	12.26	21.26	18.12	<i>dry</i>	21.11	4.17	<i>dry</i>	25.67	22.23	19.76	<i>dry</i>	<i>dry</i>

Shaded cells indicate dry bore.

Table E-3

Groundwater Monitoring Results and comparison with ANZECC guideline trigger values

Location	Date	Lab pH value	Lab electrical conductivity @ 25°C	TDS @ 180°C	Sulfate as SO ₄ - turbimetric	Aluminium (filt.)	Arsenic (filt.)	Barium (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Lithium (filt.)	Manganese (filt.)	Molybdenum (filt.)	Nickel (filt.)	Zinc (filt.)	Boron (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total anions	Total cations	Ionic balance
		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	mg/L	mg/L	meq/L	meq/L	%
ANZECC Guideline value	Drinking water	6.5-8.5	-	600	500/250	0.2**	0.01	0.2*	0.002*	2/1	0.01*	-	0.5*/0.1**	0.05*	0.02*	3	4*	0.3**	0.5	3	50	-	-	-
	Livestock drinking water	-	-	3000-13000	1000-2000	5	0.5	-	0.01	0.5-5	0.1	-	-	0.15	1	20	5	-	-	30	-	-	-	-
	Long-term irrigation water	6.0-8.5	-	-	-	5	0.1	-	0.01	0.2	2	2.5	0.2	0.01	0.2	2	0.5	0.2	-	-	-	-	-	-
	Limit of reporting	0.1	1	1	1	0.01	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.05	0.05	0.01	0.01	0.01	0.01	0.01	0.01
RB05a	30/03/2021	7.91	1840	1090	84	0.01	<0.001	0.286	<0.0001	<0.001	<0.001	0.028	0.078	0.006	0.008	0.008	0.06	0.07	0.78	0.04	<0.01	21	19.2	4.27
	16/06/2021	7.56	1830	1010	80	0.01	<0.001	0.309	<0.0001	0.004	<0.001	0.025	0.098	0.008	0.01	0.014	<0.05	0.05	0.81	0.01	<0.01	21.5	19.3	5.44
	16/09/2021	7.56	1890	1140	81	<0.01	<0.001	0.283	<0.0001	<0.001	<0.001	0.026	0.074	0.006	0.008	0.019	0.06	0.06	0.80	0.01	<0.01	19.9	18.8	2.99
	30/12/2021	7.53	1820	1190	77	<0.01	<0.001	0.311	<0.0001	0.004	<0.001	0.026	0.073	0.006	0.007	0.013	<0.05	0.08	0.86	0.03	<0.01	20.2	18.8	3.76
Reg3	11/03/2021	7.79	1220	763	98	<0.01	0.003	0.016	<0.0001	<0.001	<0.001	<0.001	0.181	0.014	0.001	0.007	0.06	0.08	0.05	<0.01	<0.01	14	12.8	4.73
	17/06/2021	7.86	1150	688	78	<0.01	0.004	0.015	0.0002	<0.001	<0.001	<0.001	0.166	0.018	<0.001	<0.005	<0.05	0.08	0.05	<0.01	<0.01	13.1	12.1	3.96
	8/09/2021	7.73	1240	782	92	<0.01	0.003	0.018	<0.0001	<0.001	<0.001	<0.001	0.160	0.015	<0.001	0.009	0.06	<0.05	0.04	<0.01	<0.01	13.5	11.9	6.04
	31/12/2021	7.93	1230	771	164	0.02	0.005	0.026	<0.0001	0.002	<0.001	<0.001	0.126	0.024	0.003	0.016	0.08	<0.05	0.14	0.04	0.12	12.4	12.8	1.32
Reg4	10/03/2021	8.21	1080	634	11	<0.01	<0.001	0.007	<0.0001	<0.001	<0.001	0.063	0.014	0.004	0.001	0.005	0.07	<0.05	0.06	0.20	<0.01	12.4	11.3	4.92
	15/06/2021	8.52	1020	612	13	<0.01	0.001	0.006	<0.0001	0.001	<0.001	0.093	<0.001	0.003	0.002	<0.005	0.07	<0.05	0.13	0.22	0.05	11.6	10.7	4.07
	8/09/2021	8.42	1050	636	13	<0.01	<0.001	0.012	<0.0001	<0.001	<0.001	0.080	0.007	0.005	0.002	<0.005	<0.05	<0.05	0.05	0.13	0.17	11.4	10.6	3.80
	15/12/2021	8.49	1130	718	28	<0.01	0.002	0.012	<0.0001	0.002	<0.001	0.068	0.014	0.004	<0.001	<0.005	0.10	<0.05	0.06	0.17	0.42	11.1	12.4	5.71
Reg5	31/03/2021	8.13	1830	1090	267	<0.01	<0.001	0.013	<0.0001	<0.001	<0.001	0.009	0.227	0.004	0.002	0.009	<0.05	<0.05	0.13	<0.01	<0.01	19.4	18.5	2.49
	15/06/2021	<i>no access</i>																						
	15/09/2021	7.88	1870	1160	247	<0.01	<0.001	0.016	<0.0001	<0.001	<0.001	0.006	0.291	0.003	0.002	<0.005	0.06	<0.05	0.13	<0.01	0.18	19	17.6	3.77
	31/12/2021	7.7	1830	1170	248	<0.01	<0.001	0.017	<0.0001	0.002	<0.001	0.003	0.475	0.001	0.002	0.008	<0.05	<0.05	0.67	<0.01	0.03	19.4	19.6	0.56
Reg5a	31/03/2021	<i>dry</i>																						
	20/05/2021	<i>dry</i>																						
	15/09/2021	<i>dry</i>																						
	31/12/2021	<i>dry</i>																						
Reg6	10/03/2021	7.89	2020	1140	157	<0.01	<0.001	0.045	<0.0001	<0.001	<0.001	0.007	0.096	-	0.003	0.02	0.07	<0.05	0.07	<0.01	<0.01	22	18.9	7.66
	16/06/2021	7.82	1970	1120	148	<0.01	<0.001	0.036	<0.0001	<0.001	<0.001	0.006	0.240	-	0.004	<0.005	0.07	<0.05	0.25	<0.01	0.02	21.3	18.9	5.84
	9/09/2021	7.83	1950	1130	120	<0.01	<0.001	0.049	<0.0001	<0.001	<0.001	0.004	0.158	0.008	0.004	<0.005	0.07	<0.05	0.22	<0.01	<0.01	19.9	17.2	7.46
	15/12/2021	8.02	1920	1120	110	<0.01	0.001	0.061	<0.0001	<0.001	<0.001	0.006	0.066	0.01	0.003	0.018	0.10	<0.05	0.02	<0.01	0.02	18.5	18.4	0.1
Reg7a	10/03/2021	7.14	968	624	68	<0.01	0.001	0.102	<0.0001	<0.001	<0.001	0.003	0.282	<0.001	0.002	0.036	<0.05	<0.05	0.13	0.02	0.46	10.2	10	0.67
	8/06/2021	7.17	936	520	66	<0.01	<0.001	0.109	<0.0001	<0.001	<0.001	0.002	0.292	0.001	0.003	0.027	<0.05	<0.05	<0.01	0.02	0.50	11	10.1	4.30
	15/09/2021	7.17	957	602	66	<0.01	<0.001	0.112	<0.0001	0.002	<0.001	0.003	0.246	<0.001	0.003	0.047	<0.05	<0.05	<0.01	0.03	0.53	10.7	9.89	4.12
	30/12/2021	7.15	948	632	65	<0.01	0.002	0.121	<0.0001	0.007	<0.001	0.003	0.252	<0.001	0.005	0.077	<0.05	<0.05	0.02	0.03	0.65	10.1	10.4	1.61

Location	Date	Lab pH value	Lab electrical conductivity @ 25°C	TDS @ 180°C	Sulfate as SO4 - turbimetric	Aluminum (filt.)	Arsenic (filt.)	Barium (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Lithium (filt.)	Manganese (filt.)	Molybdenum (filt.)	Nickel (filt.)	Zinc (filt.)	Boron (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total anions	Total cations	Ionic balance	
		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	mg/L	mg/L	meq/L	meq/L	%	
Reg12	30/03/2021	7.87	2270	1420	68	<0.01	0.001	0.069	<0.0001	0.003	<0.001	0.038	0.093	0.003	0.002	0.032	0.1	0.14	0.03	<0.01	<0.01	26.1	24.7	2.82	
	16/06/2021	7.5	2180	1370	61	<0.01	<0.001	0.073	<0.0001	0.003	<0.001	0.03	0.138	0.003	0.003	0.022	0.09	0.06	0.04	<0.01	<0.01	26.6	24	5.03	
	8/09/2021	7.52	2230	1240	62	<0.01	0.001	0.058	<0.0001	<0.001	<0.001	0.032	0.087	0.002	0.002	0.023	0.10	<0.05	0.03	<0.01	0.03	25.5	22.9	5.35	
	31/12/2021	7.47	2160	1490	60	<0.01	0.001	0.08	<0.0001	0.007	<0.001	0.037	0.103	0.003	0.003	0.052	0.10	<0.05	0.04	<0.01	0.02	22.9	24.7	3.76	
Reg13	5/03/2021	7.65	3590	2660	1390	<0.01	<0.001	0.048	<0.0001	<0.001	<0.001	0.018	0.354	0.010	0.005	0.066	0.15	<0.05	0.04	<0.01	<0.01	44.4	38.2	7.53	
	15/06/2021	7.62	3420	2700	1240	<0.01	0.001	0.048	0.0003	0.002	<0.001	0.018	0.382	0.008	0.012	0.153	0.16	<0.05	0.07	<0.01	<0.01	40.9	39.2	2.20	
	15/09/2021	7.63	3490	2630	1270	<0.01	<0.001	0.053	<0.0001	<0.001	<0.001	0.016	0.338	0.01	0.012	0.032	0.15	<0.05	0.01	<0.01	<0.01	40.8	37.1	4.76	
	16/12/2021	7.62	3330	2450	1100	<0.01	0.002	0.054	<0.0001	<0.001	<0.001	0.066	0.360	0.016	0.004	0.01	0.16	<0.05	0.33	<0.01	0.05	36.6	37.4	0.98	
Reg14	5/03/2021	7.6	1470	924	118	<0.01	0.003	0.018	<0.0001	<0.001	<0.001	0.003	0.148	0.005	0.003	0.051	0.08	<0.05	<0.01	<0.01	0.04	16.1	14.7	4.68	
	16/06/2021	7.54	996	576	61	<0.01	0.002	0.024	<0.0001	<0.001	<0.001	<0.001	0.202	0.006	0.008	0.005	<0.05	<0.05	0.04	<0.01	<0.01	11.3	10.4	3.78	
	6/09/2021	7.53	1010	578	54	<0.01	0.003	0.036	<0.0001	<0.001	<0.001	0.002	0.141	0.005	0.009	0.011	<0.05	<0.05	<0.01	<0.01	<0.01	10.9	9.69	5.88	
	7/12/2021	8.4	1230	788	79	0.01	0.003	0.02	<0.0001	0.004	<0.001	0.003	0.086	0.006	0.005	0.024	0.10	0.07	0.06	<0.01	0.02	12.2	12.8	2.44	
BCM01	30/03/2021	<i>dry</i>																							
	16/06/2021	<i>dry</i>																							
	8/09/2021	<i>dry</i>																							
	31/12/2021	<i>dry</i>																							
BCM03	30/03/2021	<i>dry</i>																							
	22/06/2021	<i>dry</i>																							
	16/09/2021	<i>dry</i>																							
	17/12/2021	<i>dry</i>																							
MAC1280	30/03/2021	11.6	3820	2390	15	2.88	0.001	0.17	<0.0001	0.012	<0.001	0.126	<0.001	0.029	0.017	0.009	<0.05	<0.05	6.08	0.47	0.24	31.1	31.9	1.17	
	16/06/2021	11.8	3640	2250	16	3.34	<0.001	0.153	<0.0001	0.019	<0.001	0.116	0.004	0.027	0.017	0.008	<0.05	<0.05	5.94	0.63	0.09	34.0	31.0	4.68	
	16/09/2021	11.8	3840	2440	14	2.78	<0.001	0.173	<0.0001	0.008	<0.001	0.12	<0.001	0.028	0.019	0.008	<0.05	<0.05	6.22	0.62	0.03	32.2	30.5	2.76	
	30/12/2021	11.6	3380	2800	16	3.57	0.001	0.143	<0.0001	0.01	<0.001	0.129	<0.001	0.033	0.011	0.008	<0.05	<0.05	5.40	0.99	0.33	30.5	29.1	2.32	

Private Groundwater Bores

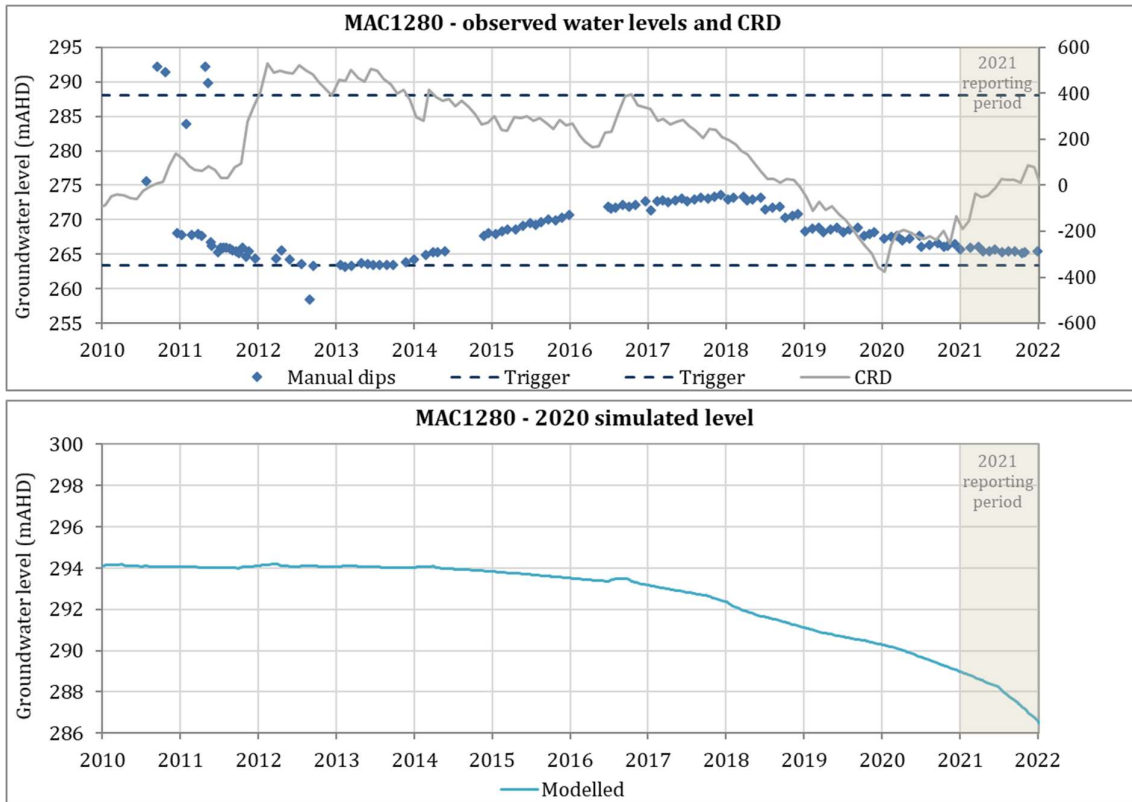
Table E-4
Groundwater Levels

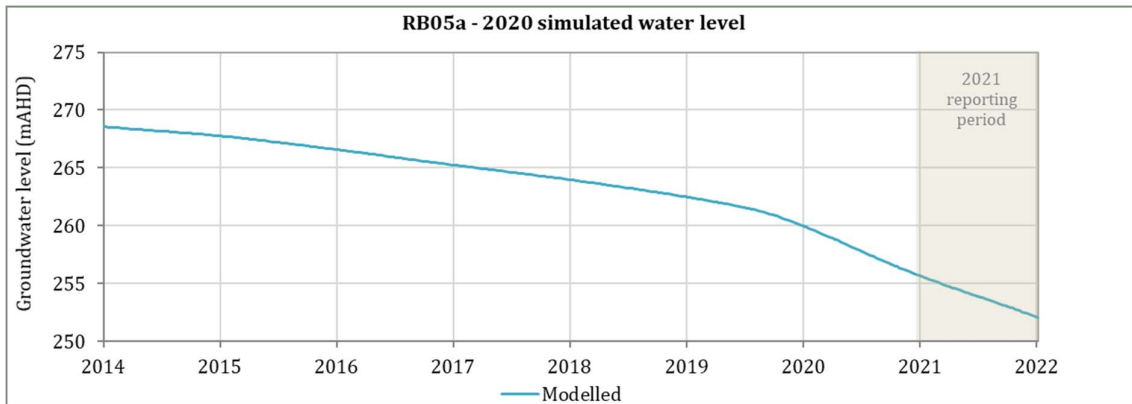
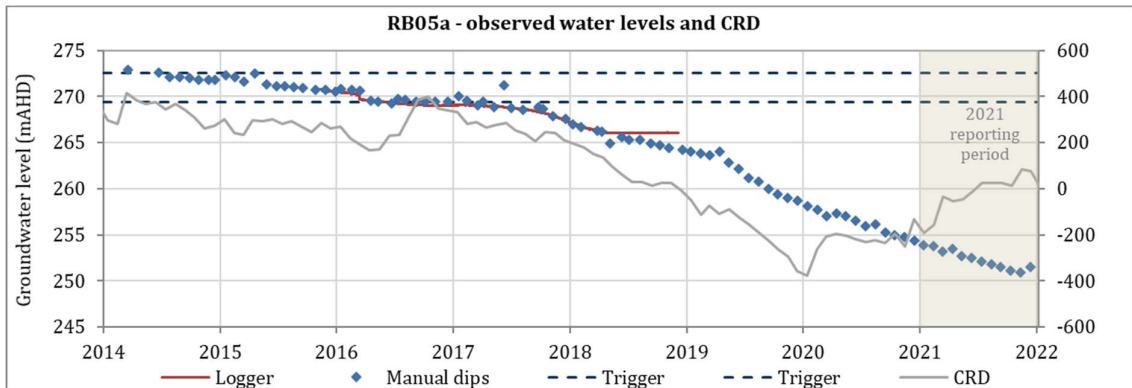
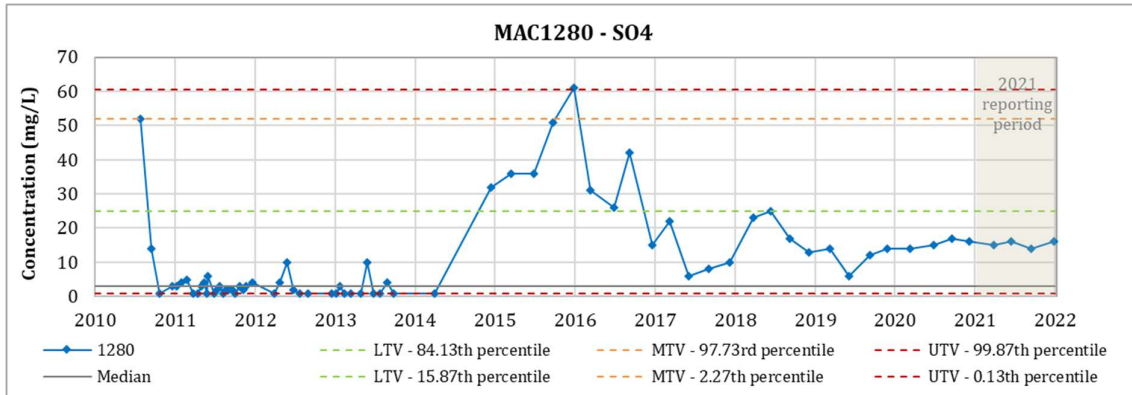
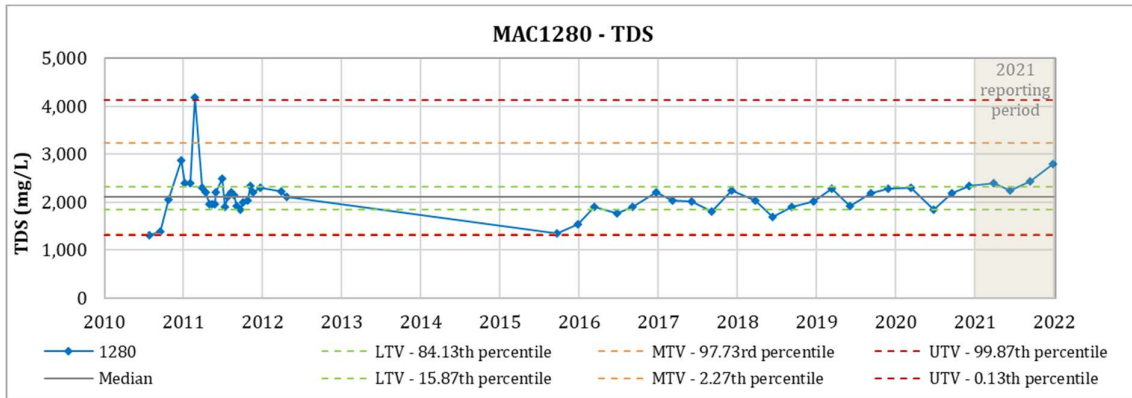
Year-Month	MOR1	MOR2	BRE2	WOL1	WOL2	SCHOOL	WHAN	TRALEE	MORSE	BAS1	BAS2	Teston
2021-01	12.37	13.27	18.90	4.09	<i>blocked</i>	<i>tap</i>	<i>tap</i>	19.37	22.30	<i>tap</i>	10.38	19.59
2021-08	12.25	13.25	<i>no access</i>	3.23	<i>blocked</i>	<i>tap</i>	<i>tap</i>	18.98	21.95	<i>tap</i>	<i>no access</i>	19.54

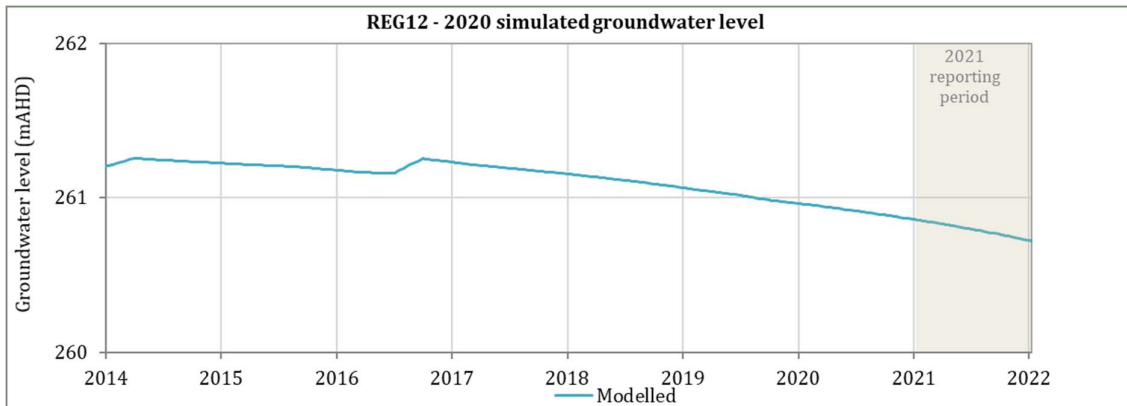
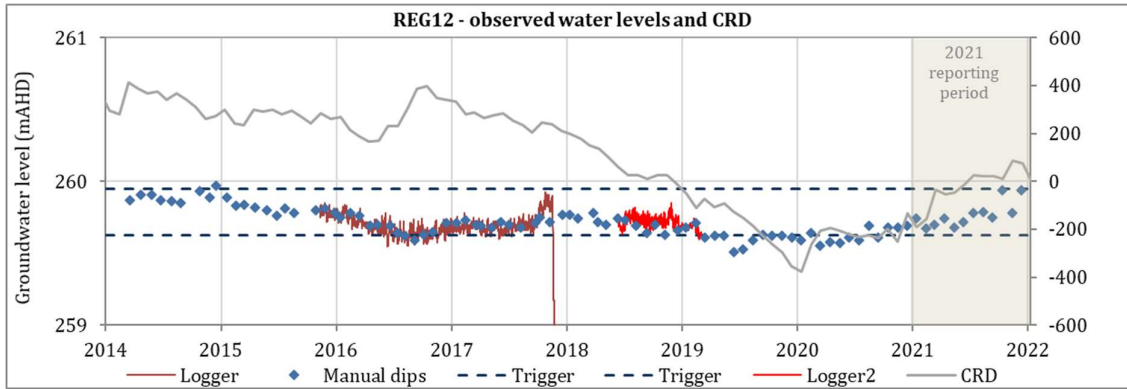
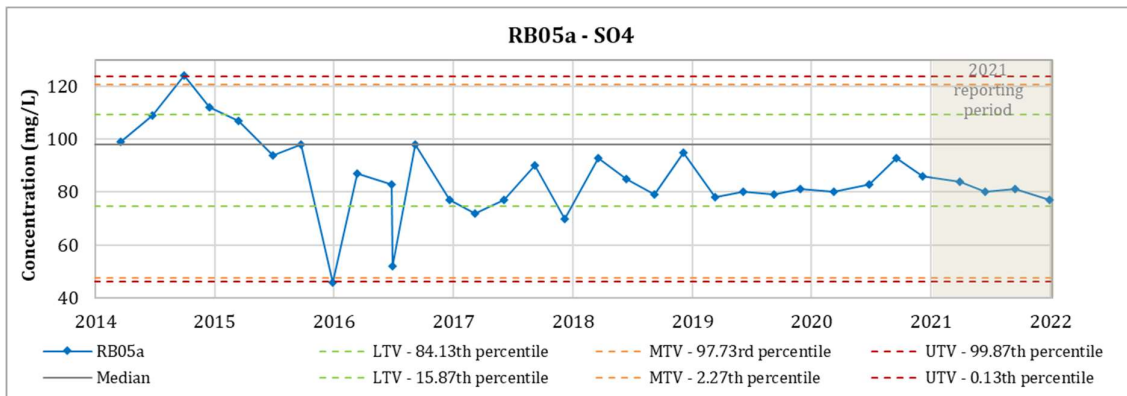
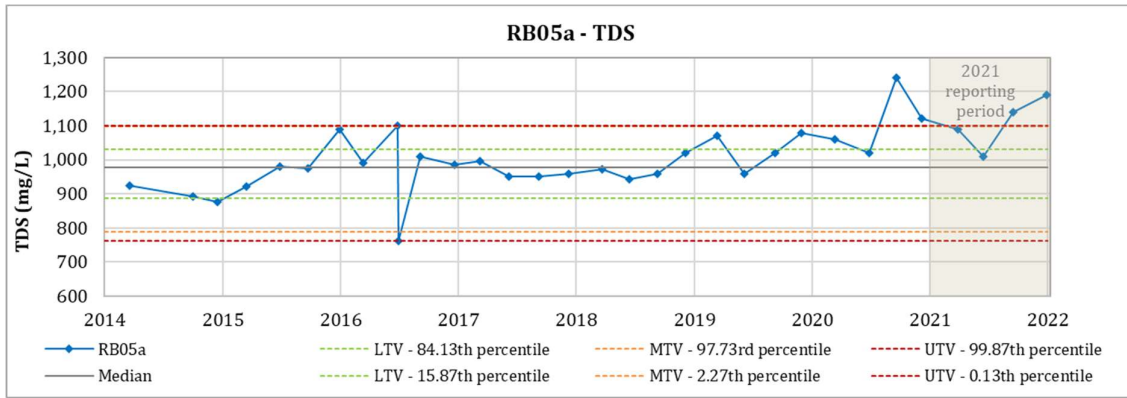
Table E-5
Groundwater Monitoring Results and comparison with ANZECC guideline trigger values

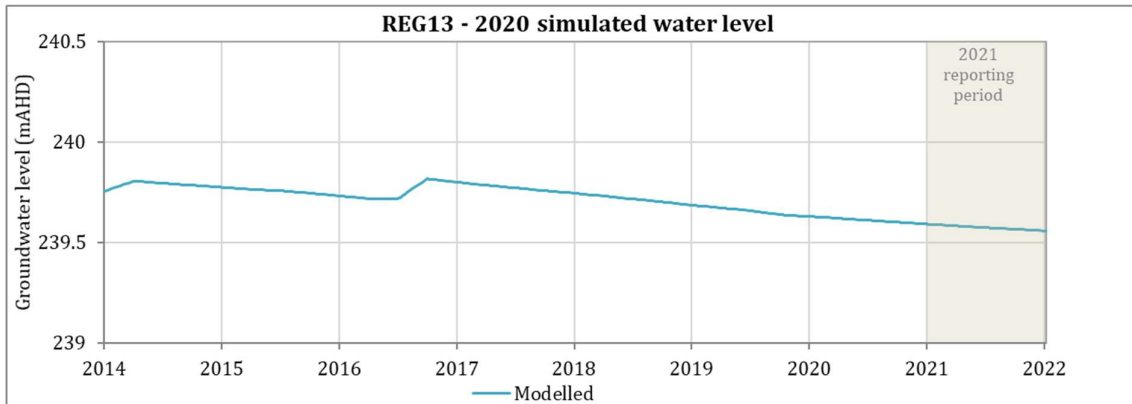
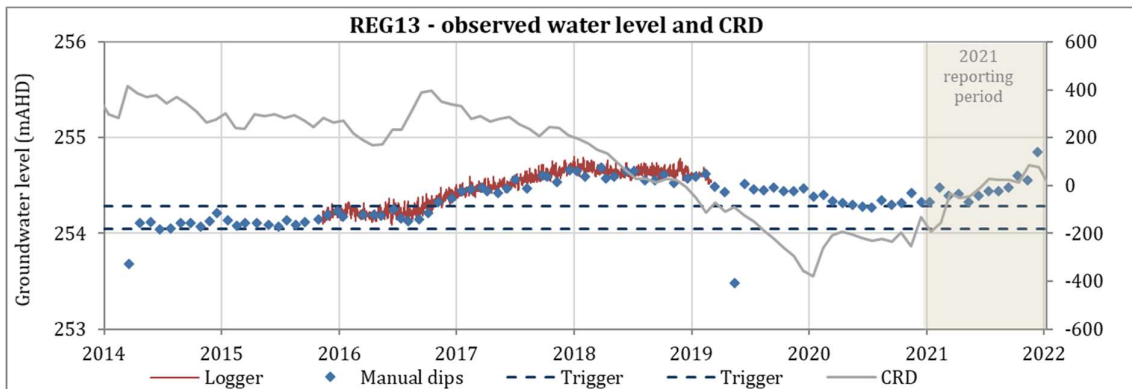
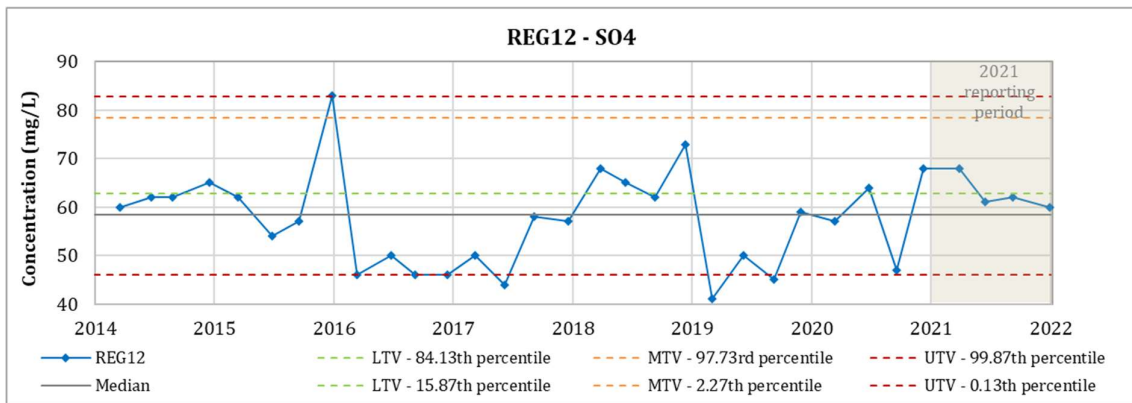
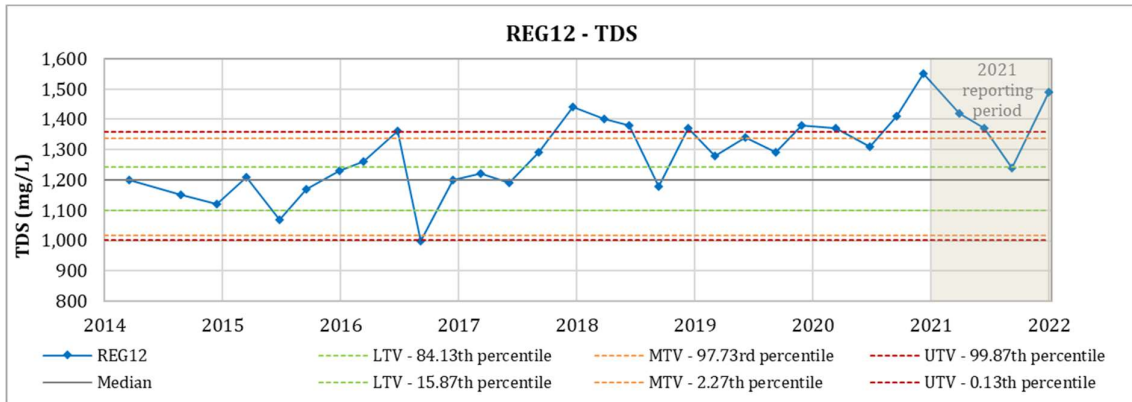
Site	Date	Lab pH value	Lab electrical conductivity @ 25°C	TDS @ 180°C	Sulfate as SO4 - turbimetric	Arsenic (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Nickel (filt.)	Zinc (filt.)	Iron (filt.)	Ammonia as N	Nitrite as N	Nitrate as N	Total anions	Total cations	Ionic balance
		pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L
ANZECC Guideline value	Drinking water	6.5-8.5	-	600	500/250	0.01	0.002*	2/1	0.01*	0.02*	3	0.3**	0.5	3	50	-	-	-
	Livestock drinking water	-	-	3000-13000	1000-2000	0.5	0.01	0.5-5	0.1	1	20	-	-	30	-	-	-	-
	Long-term irrigation water	6.0-8.5	-	-	-	0.1	0.01	0.2	2	0.2	2	0.2	-	-	-	-	-	-
Limit of reporting		0.1	1	1	1	0.001	0.0001	0.001	0.001	0.001	0.005	0.05	0.01	0.01	0.01	0.01	0.01	0.01
MOR1	4/02/2021	7.62	1340	846	37	<0.001	<0.0001	0.007	<0.001	<0.001	0.1	<0.01	0.01	<0.01	19.9	13	13.3	1.2
	5/08/2021	7.62	1490	890	41	0.001	<0.0001	0.001	<0.001	<0.001	0.11	<0.01	0.26	<0.01	8.98	17.1	14.3	9.14
MOR2	4/02/2021	7.34	91	50	<1	<0.001	<0.0001	<0.001	<0.001	<0.001	0.011	0.25	0.22	0.14	0.12	0.97	0.99	-
	5/08/2021	7.45	88	61	<1	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.005	0.51	0.42	<0.01	0.09	1.24	0.91	-
BRE2	4/02/2021	7.60	3960	2330	<10	0.008	<0.0001	<0.001	<0.001	0.002	<0.005	0.88	2.94	<0.01	0.04	42.8	42.1	0.82
	6/08/2021	no access																
WOL1	5/02/2021	7.15	541	324	29	<0.001	<0.0001	0.003	<0.001	<0.001	0.053	0.16	0.06	<0.01	1.21	5.62	5.77	1.37
	6/08/2021	7.08	546	360	30	<0.001	<0.0001	0.001	<0.001	<0.001	0.007	<0.05	0.02	<0.01	1.41	5.89	5.76	1.18
WOL2	24/02/2020	bore blocked																
	11/08/2020	bore blocked																
School raw	5/02/2021	7.31	269	197	4	<0.001	<0.0001	0.004	<0.001	0.001	0.018	<0.05	0.07	<0.01	0.82	2.93	3.04	1.83
	6/08/2021	7.1	182	152	2	<0.001	<0.0001	0.002	<0.001	0.002	0.034	<0.05	0.03	<0.01	0.61	2.41	2.17	-
Whan	5/02/2021	7.37	441	232	21	<0.001	<0.0001	0.018	<0.001	<0.001	0.039	<0.05	0.15	<0.01	0.65	4.7	4.91	2.14
	6/08/2021	7.54	328	233	9	<0.001	<0.0001	<0.001	<0.001	<0.001	0.011	<0.05	<0.01	<0.01	0.1	4.05	3.78	3.48
Tralee	4/02/2021	6.99	1440	730	20	<0.001	<0.0001	<0.001	<0.001	0.003	0.02	22	3.59	<0.01	0.07	16.9	16.8	0.38
	5/08/2021	6.96	1380	814	33	<0.001	<0.0001	<0.001	<0.001	0.004	0.016	13.9	1.96	0.02	0.12	17.3	16	3.74
Morse	4/02/2021	7.11	456	350	15	<0.001	0.011	0.001	<0.001	0.006	0.038	6.14	1.26	<0.01	0.02	4.73	5.05	3.24
	6/08/2021	7.35	1190	804	9	<0.001	0.011	<0.001	<0.001	0.004	0.02	7.97	1.9	<1.00	<1.00	14.7	13.4	4.52
Bas1	5/02/2021	6.91	505	294	13	<0.001	<0.0001	<0.001	<0.001	0.002	0.116	0.34	0.05	<0.01	<0.01	5.7	5.5	1.74
	10/08/2021	6.89	557	330	6	<0.001	<0.0001	<0.001	<0.001	0.003	0.013	1.66	0.13	<0.01	0.01	6.62	6.1	4.06
Bas2	5/02/2021	7.06	1150	684	133	<0.001	<0.0001	<0.001	<0.001	0.001	19.4	0.14	0.06	<0.01	0.04	12.8	11.7	4.36
	10/08/2021	no access																
Teston	4/02/2021	7.24	1070	632	21	<0.001	0.0028	0.01	<0.001	0.005	0.014	0.82	0.57	<0.01	0.09	12.2	10.5	7.58
	5/08/2021	7.13	887	616	<20	<0.001	0.0054	0.082	<0.001	0.004	0.012	0.09	0.05	<0.01	6.95	10.1	9.77	1.55

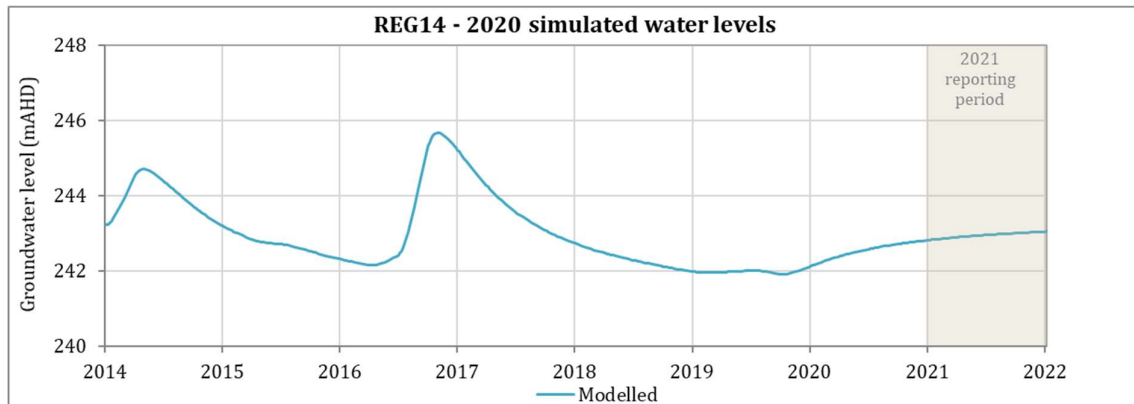
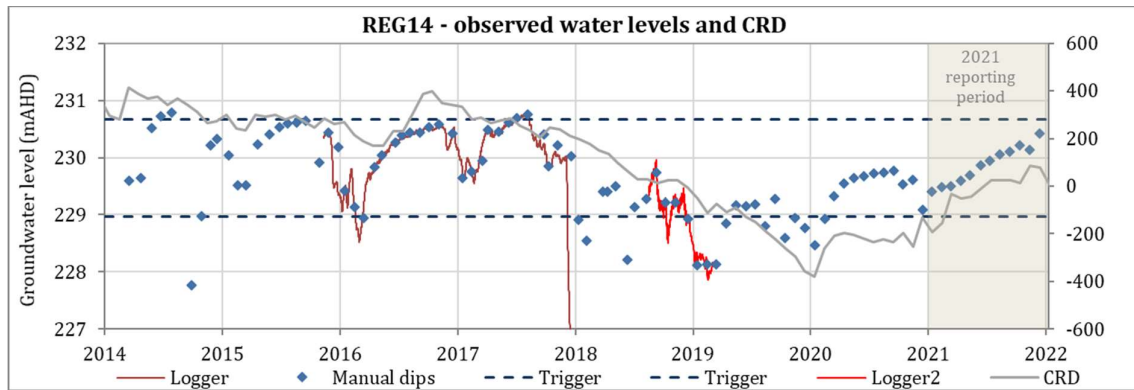
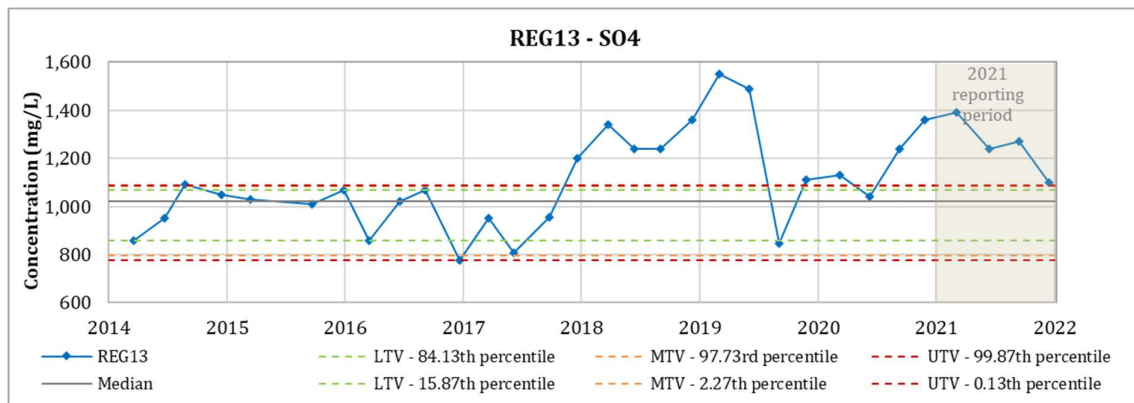
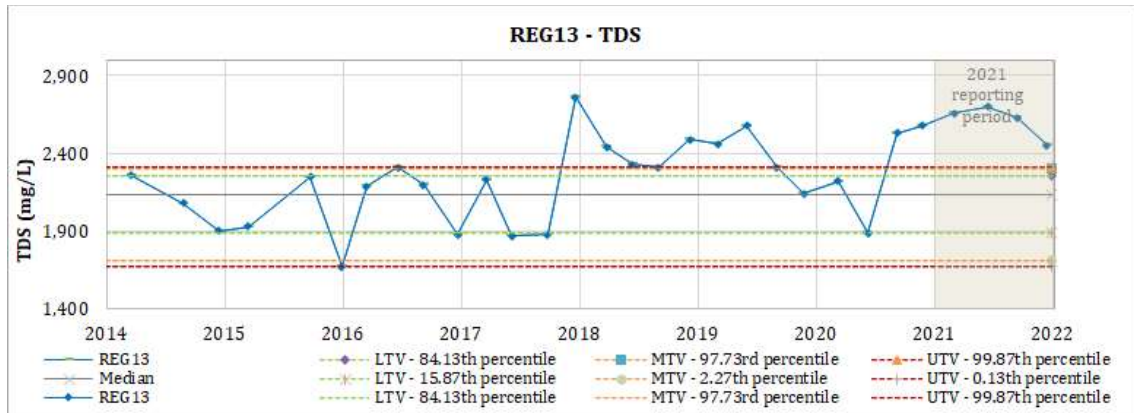
Regional standpipe monitoring bores – observed and modelled water levels, and water quality trigger parameters

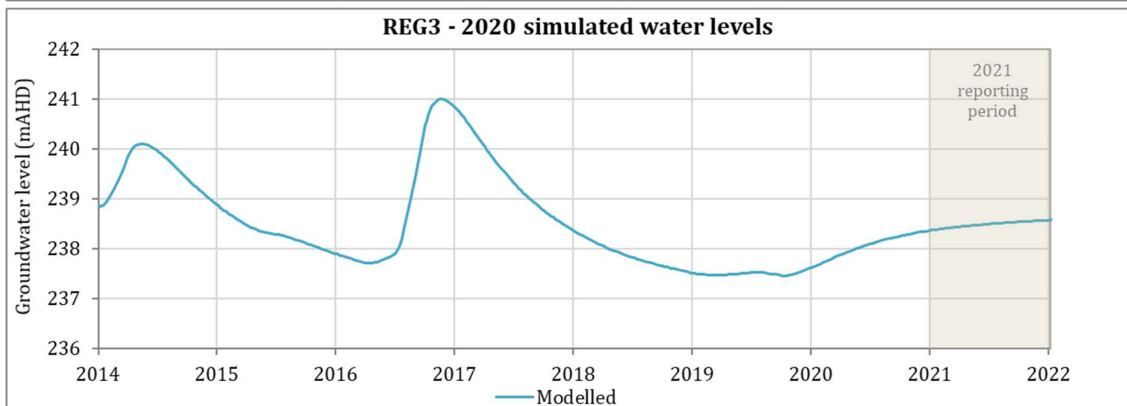
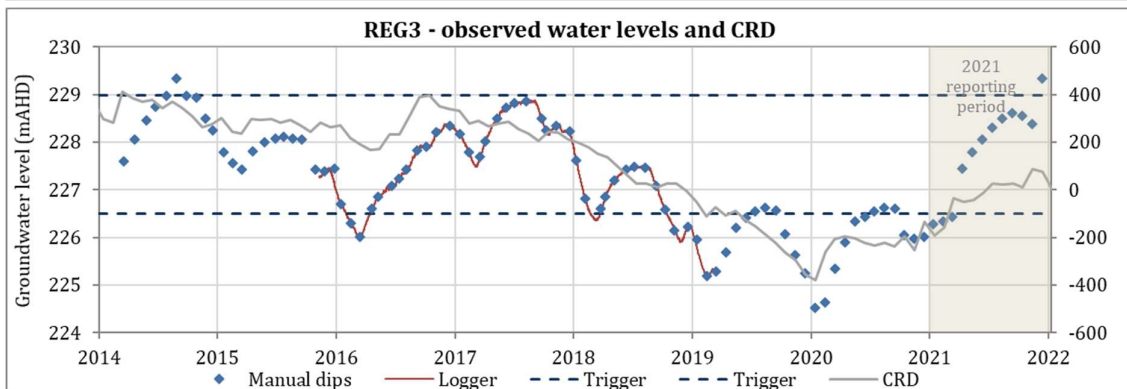
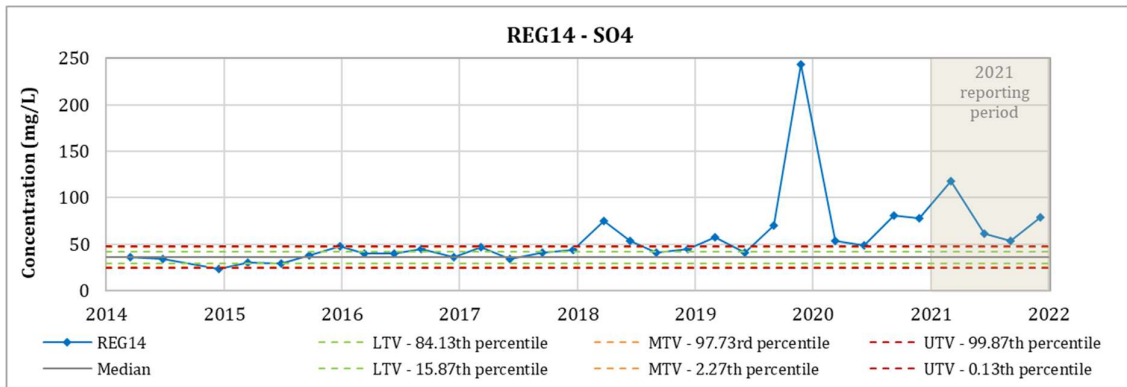
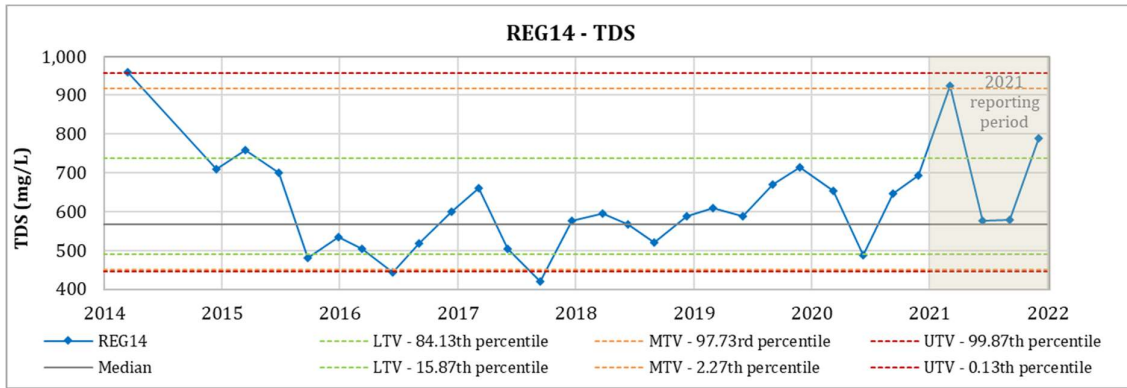


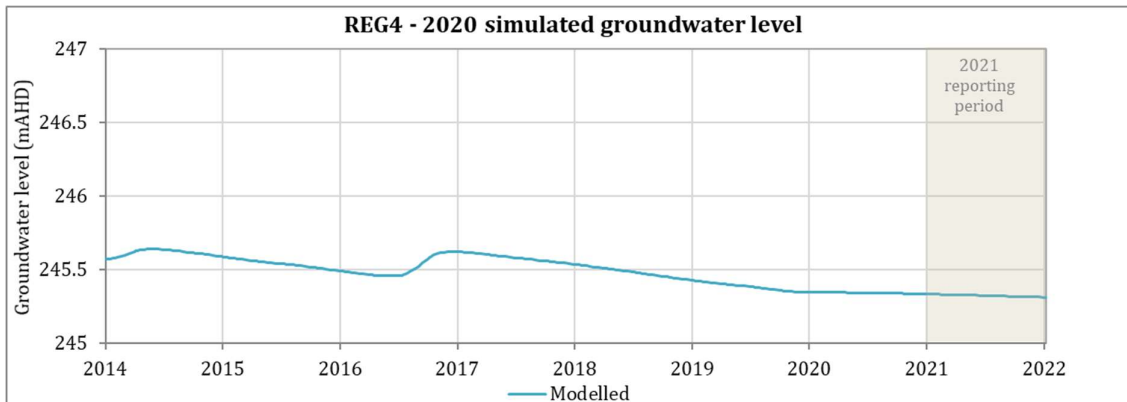
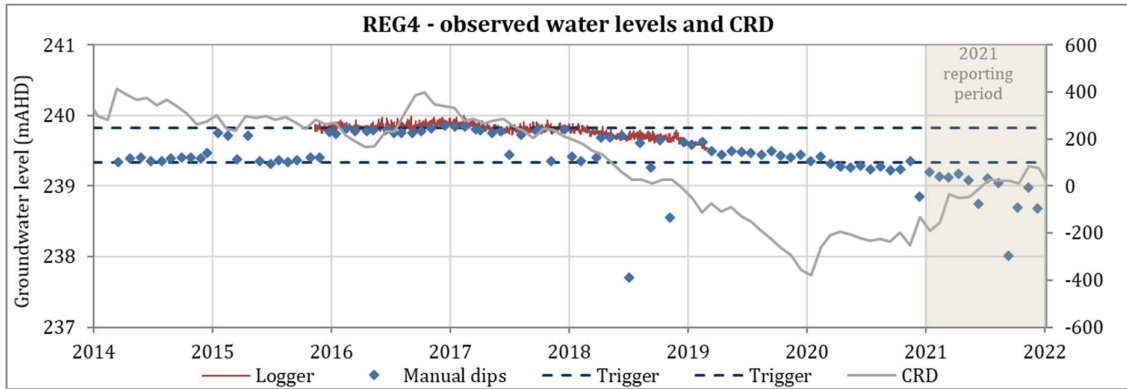
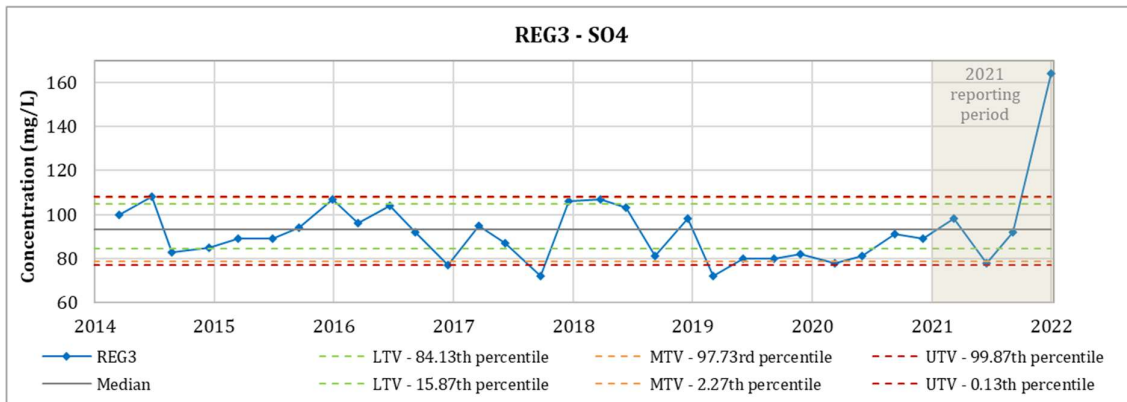
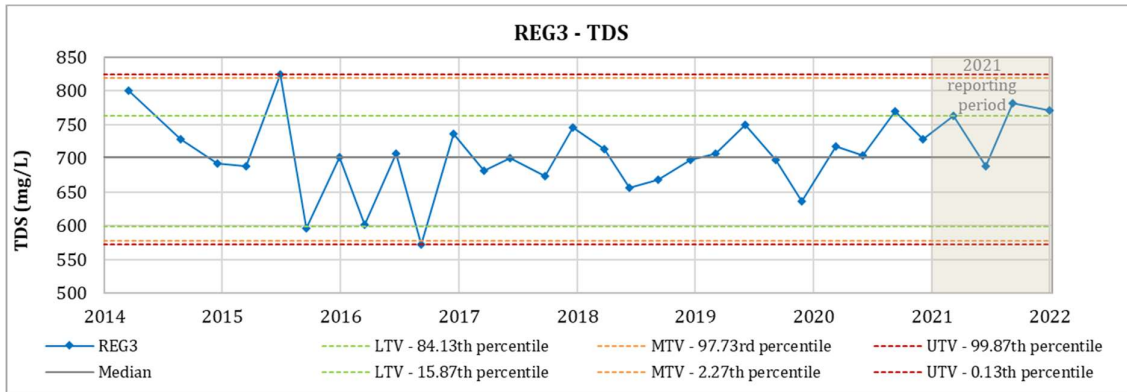


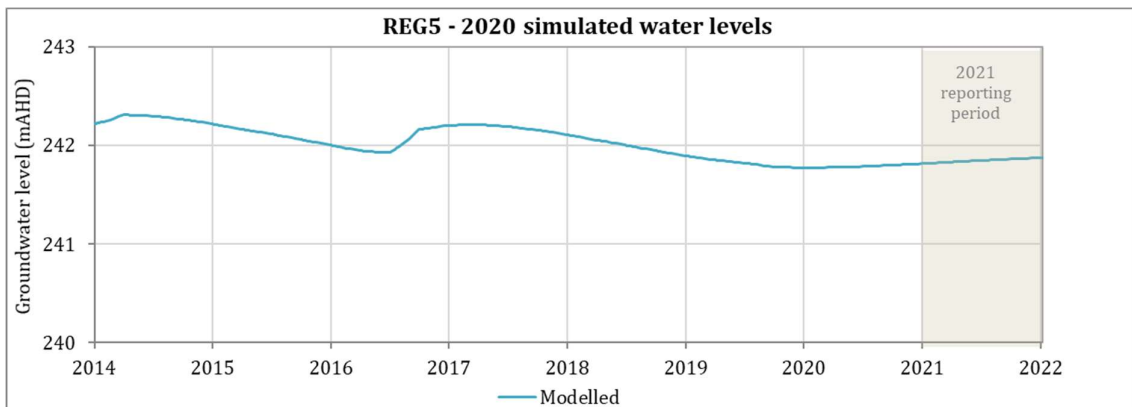
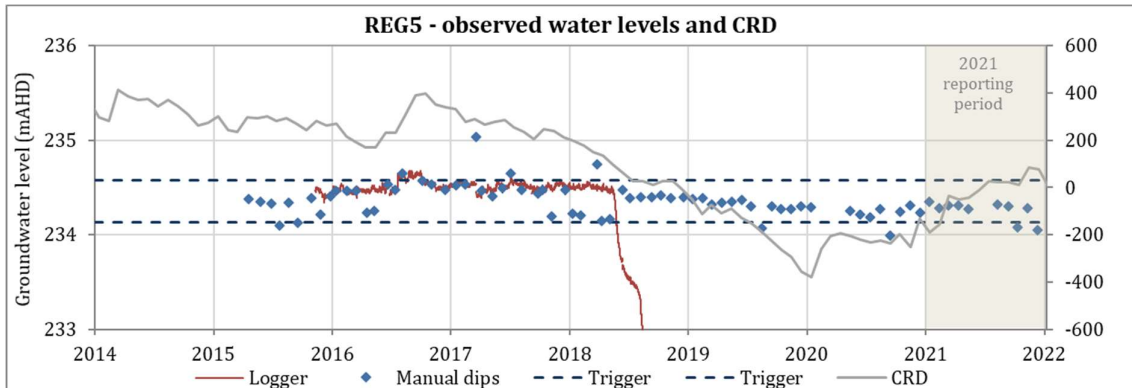
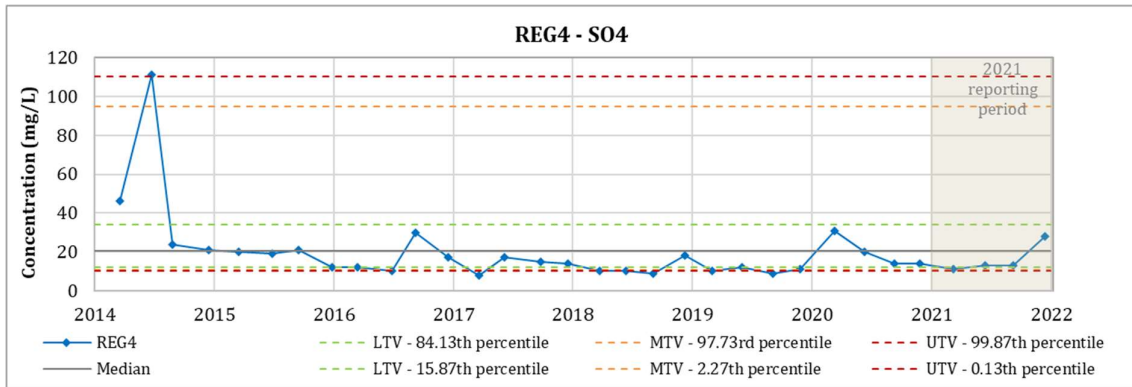
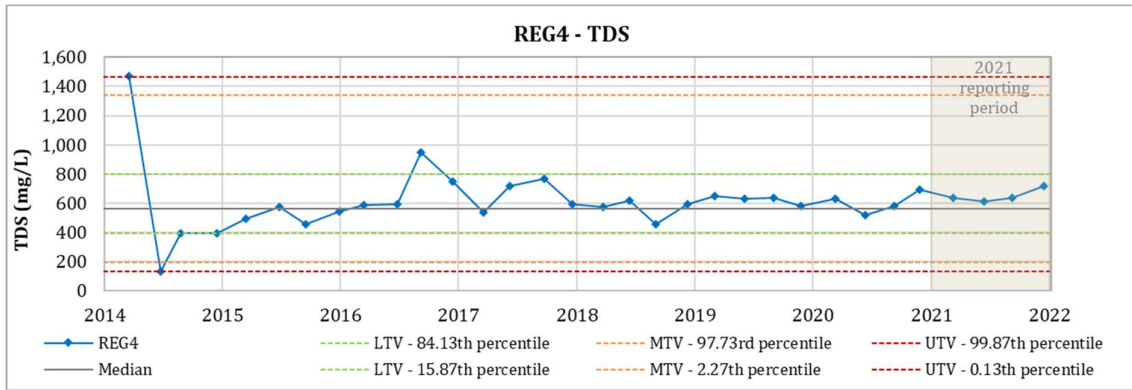


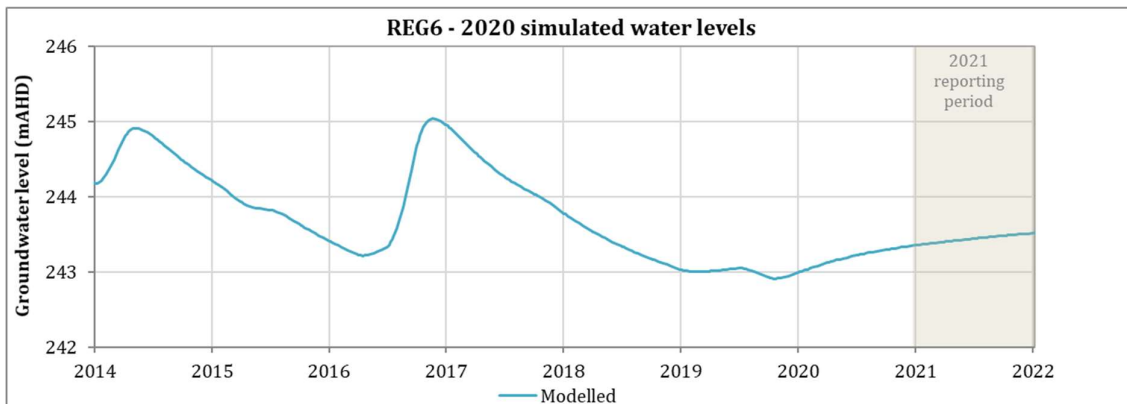
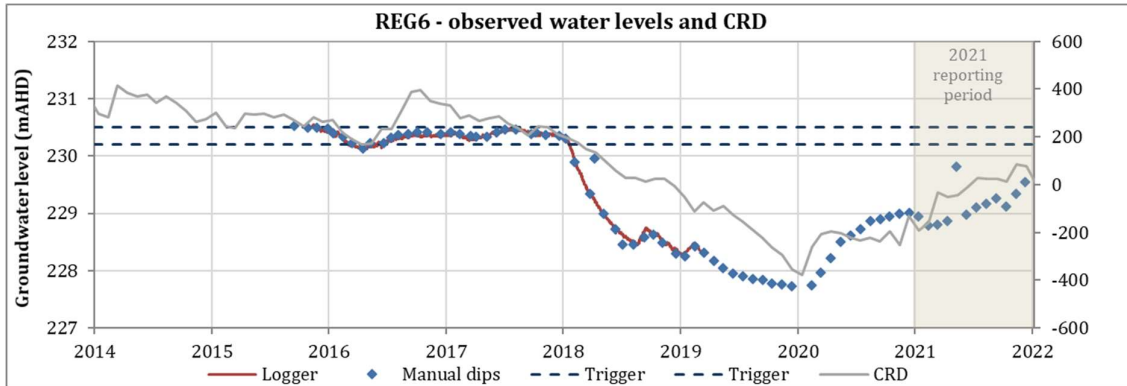
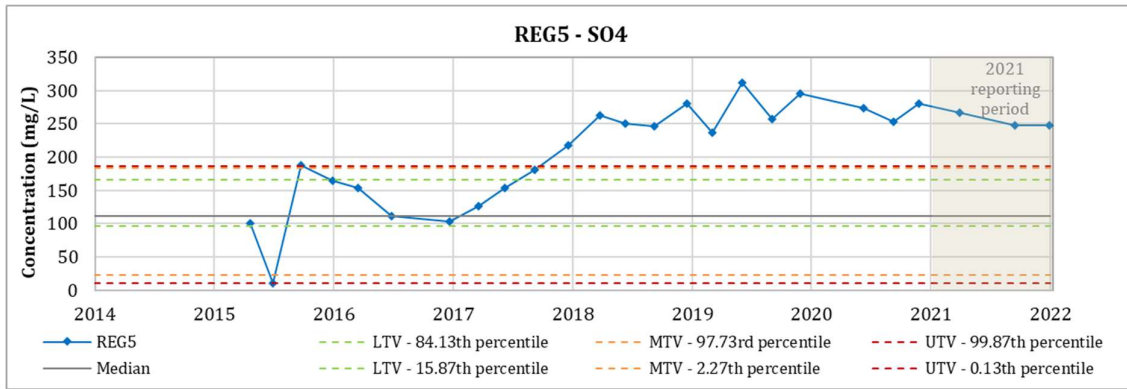
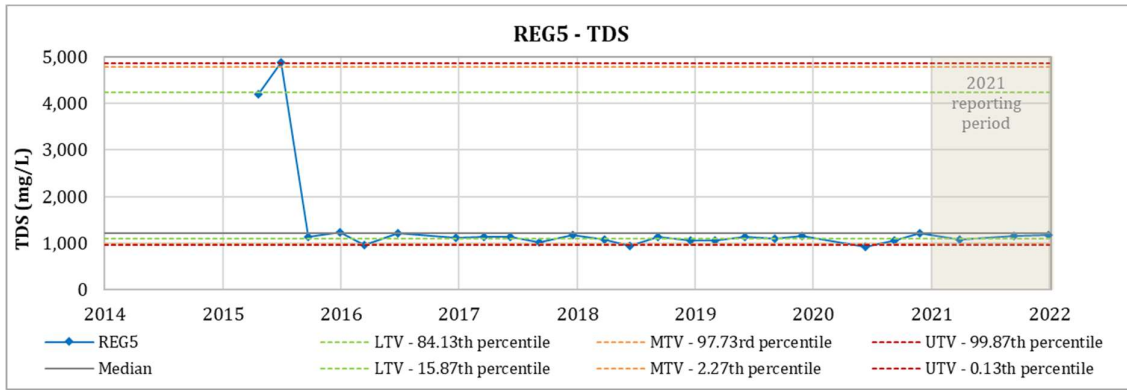


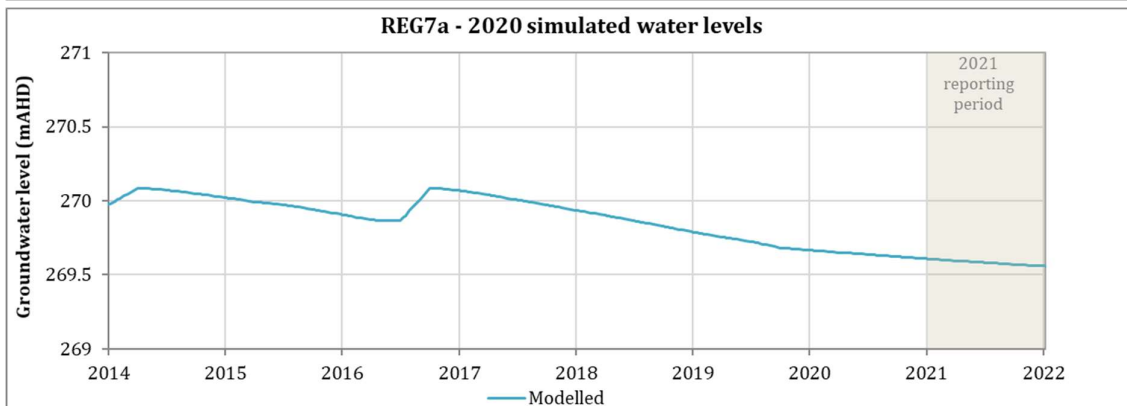
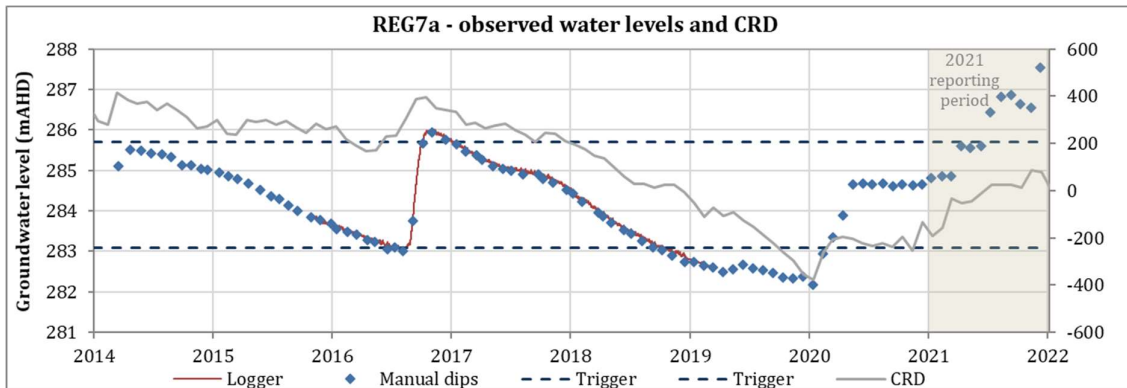
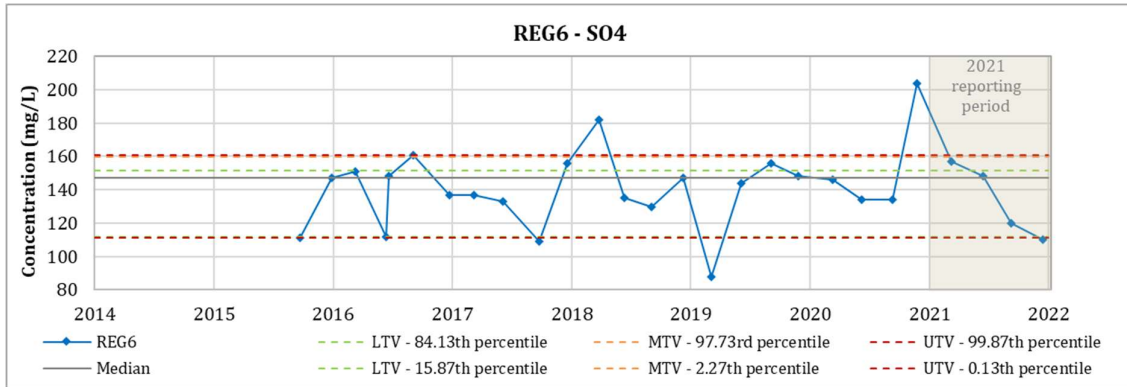
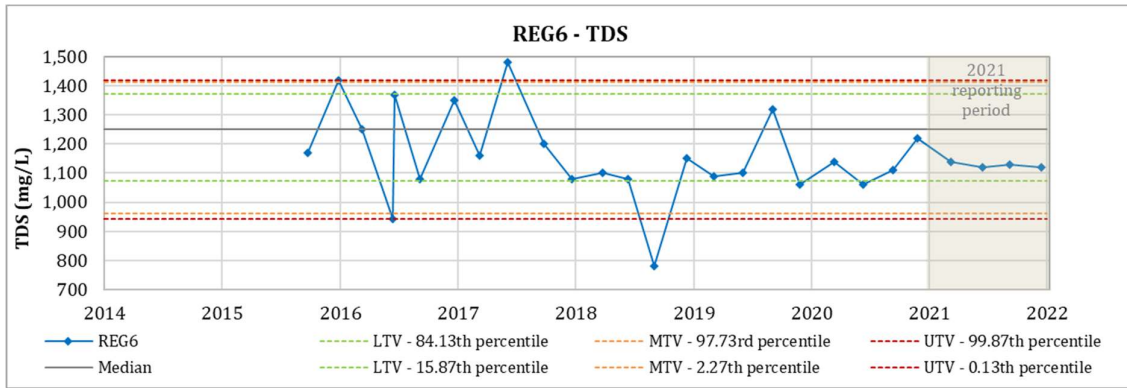


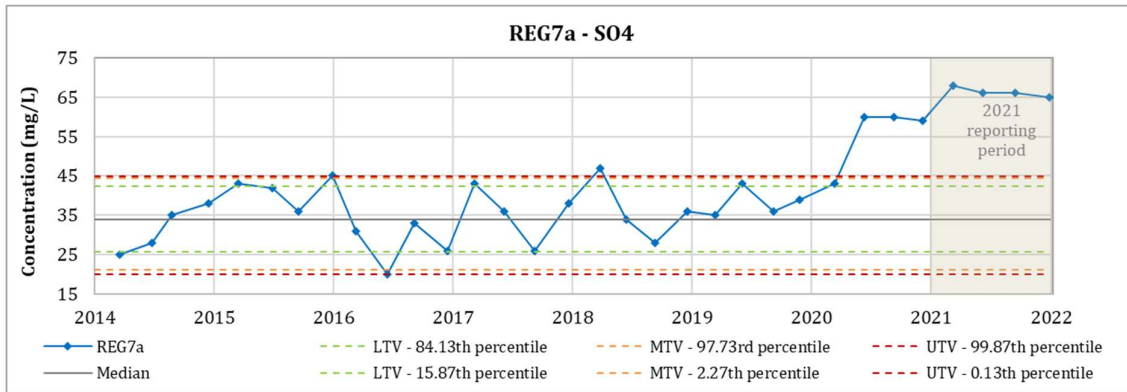
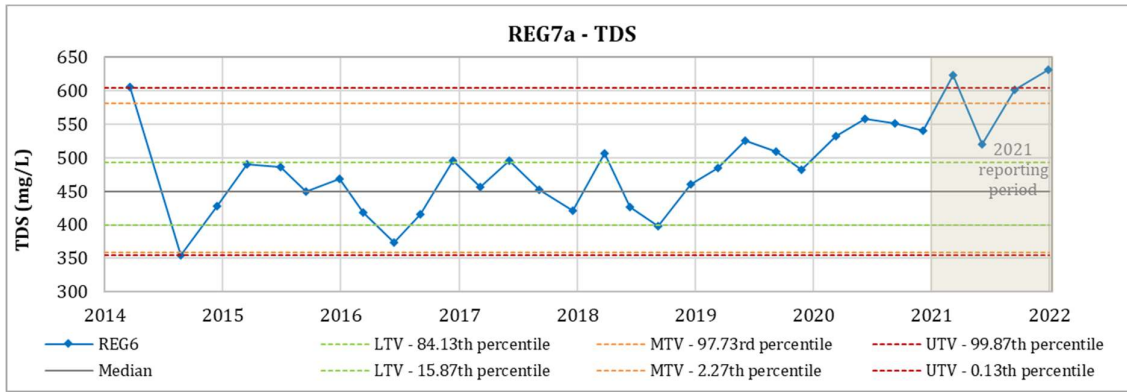




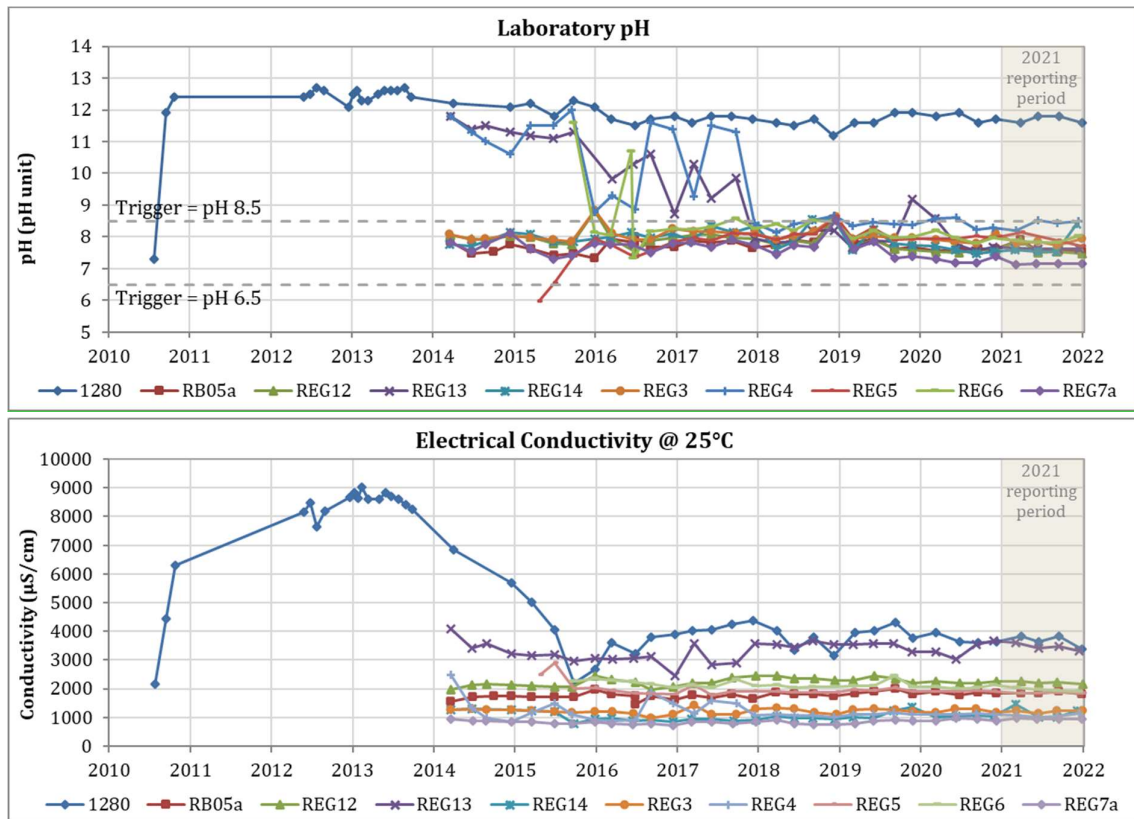


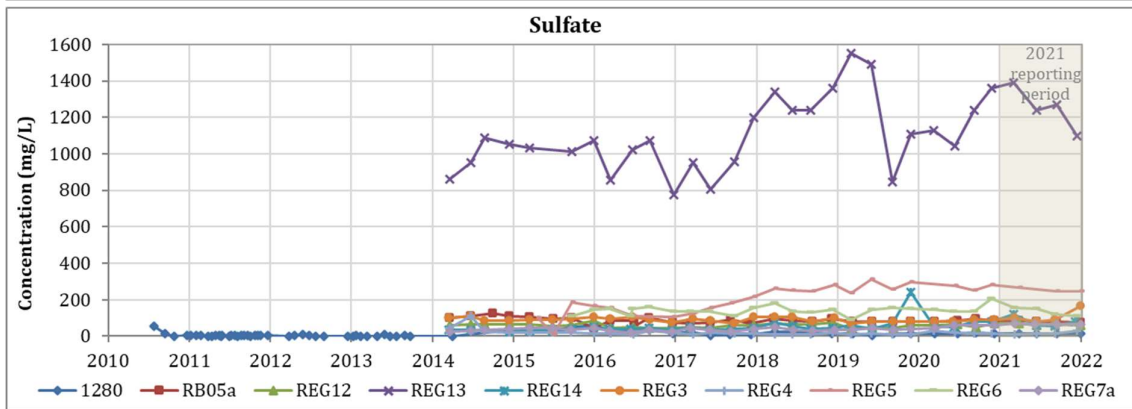
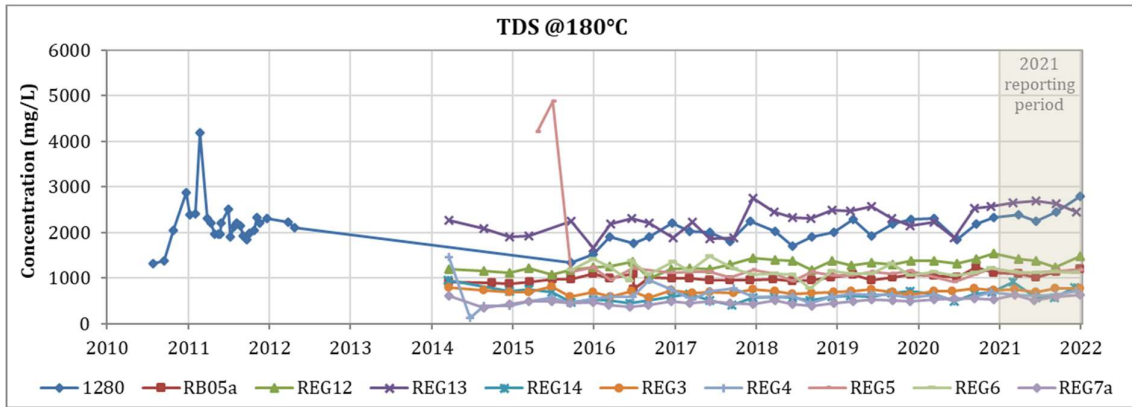




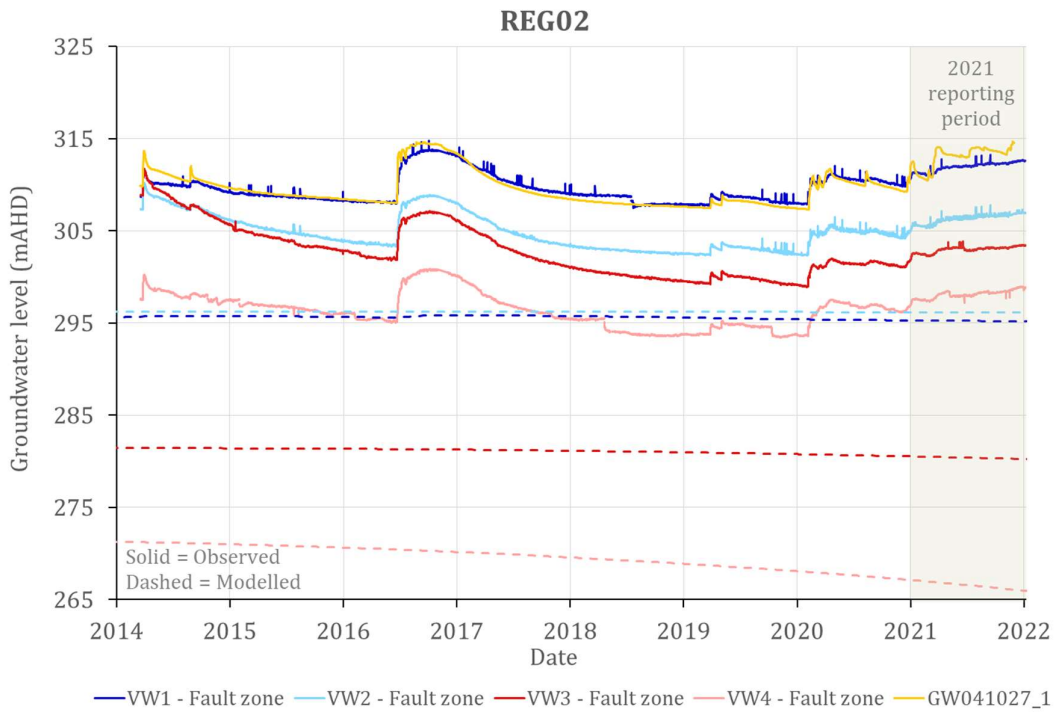
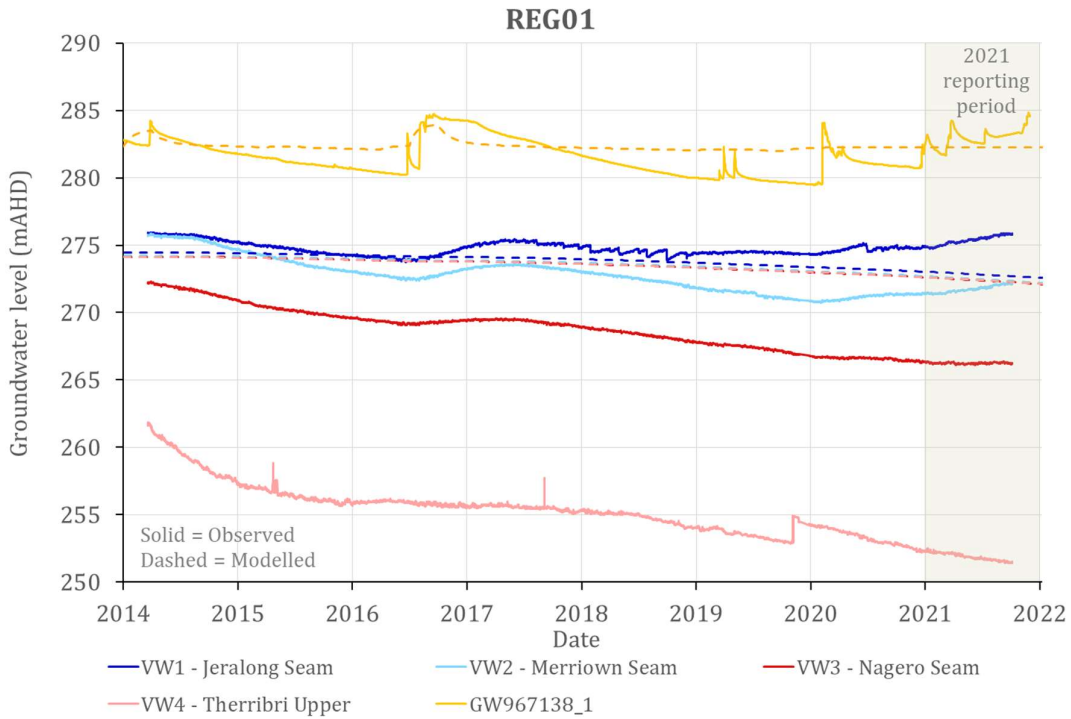


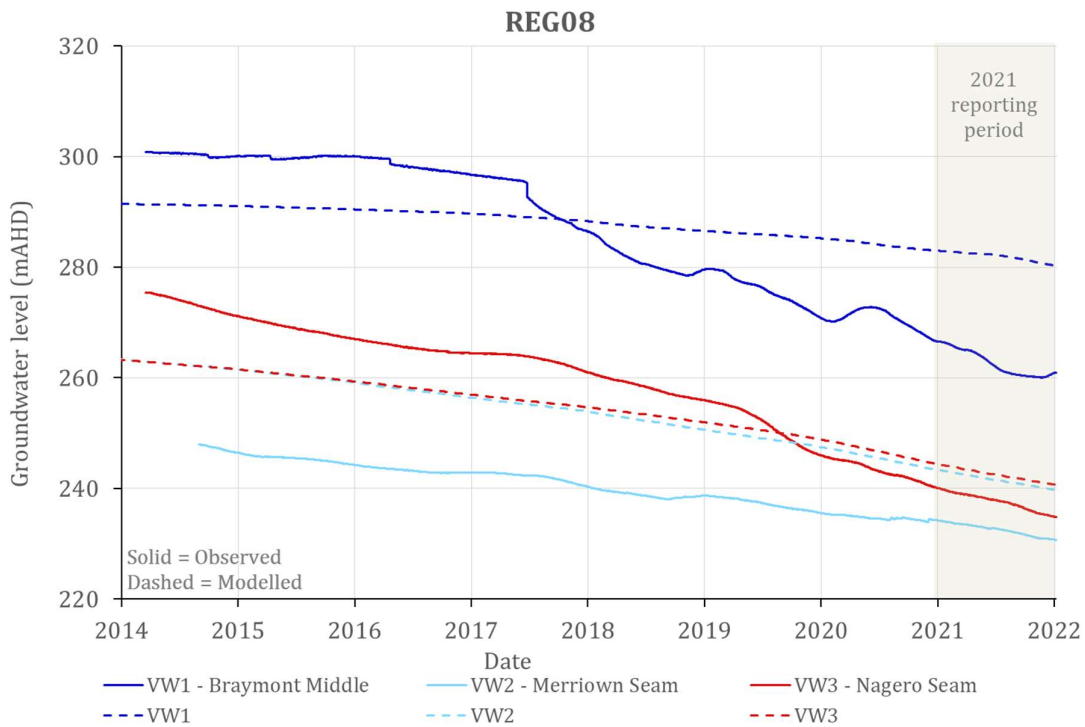
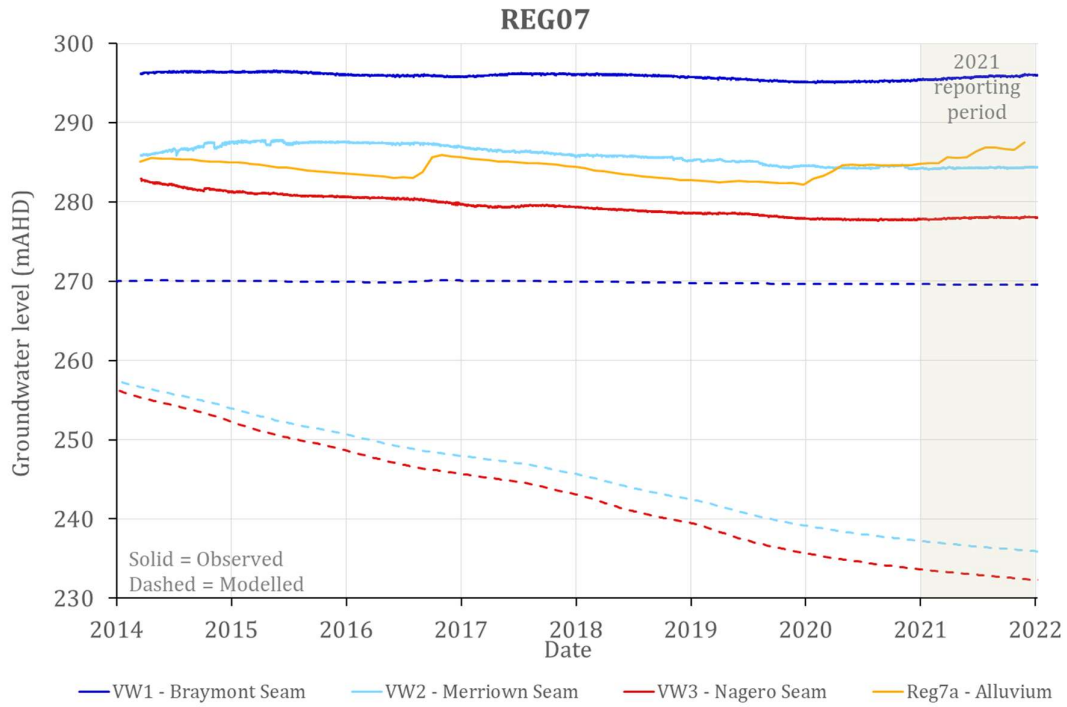
Regional standpipe monitoring bores – Individual water quality parameters

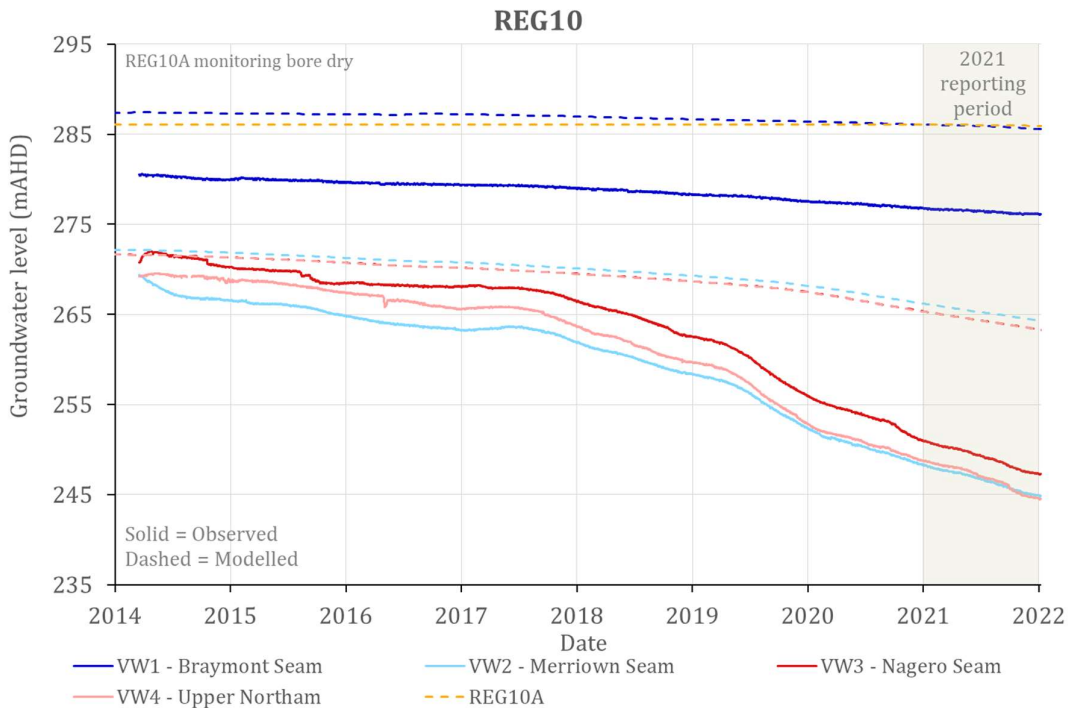
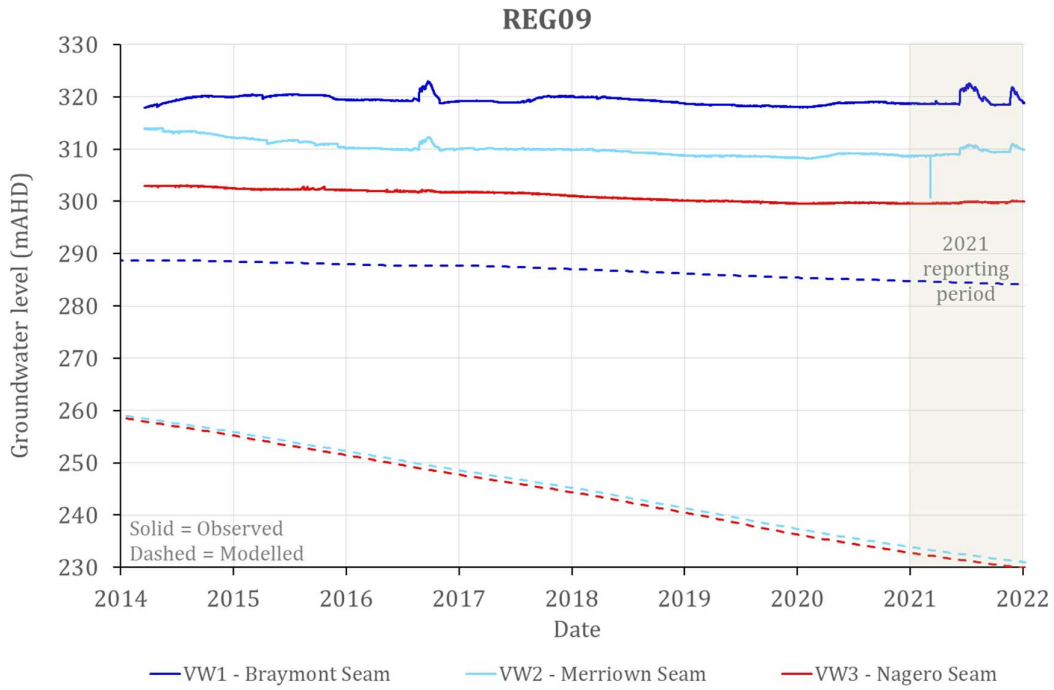


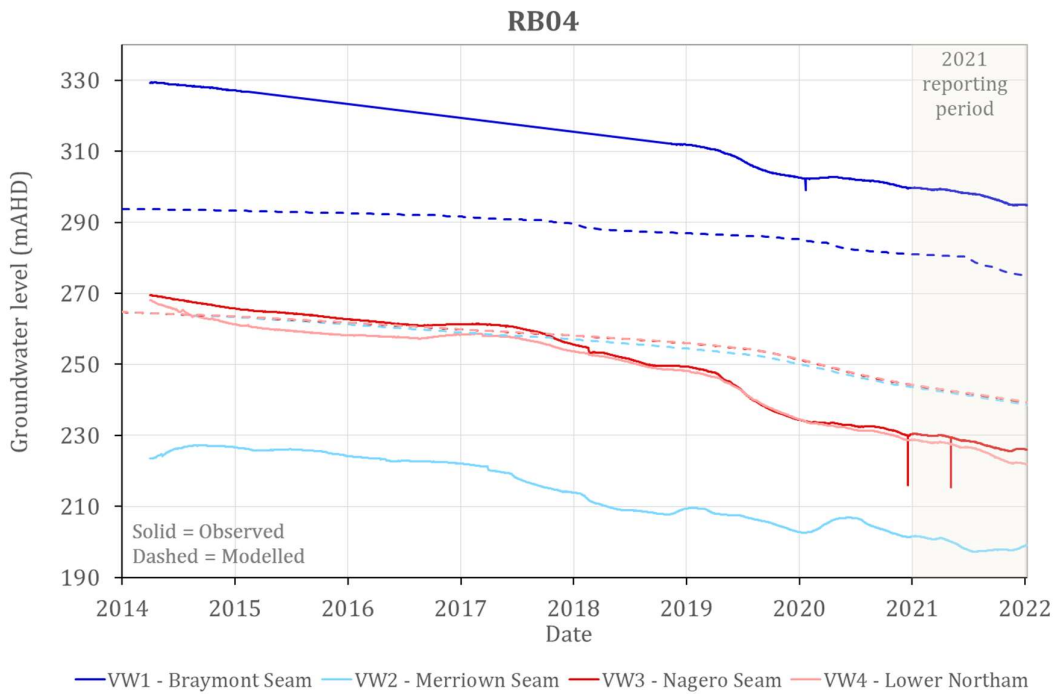
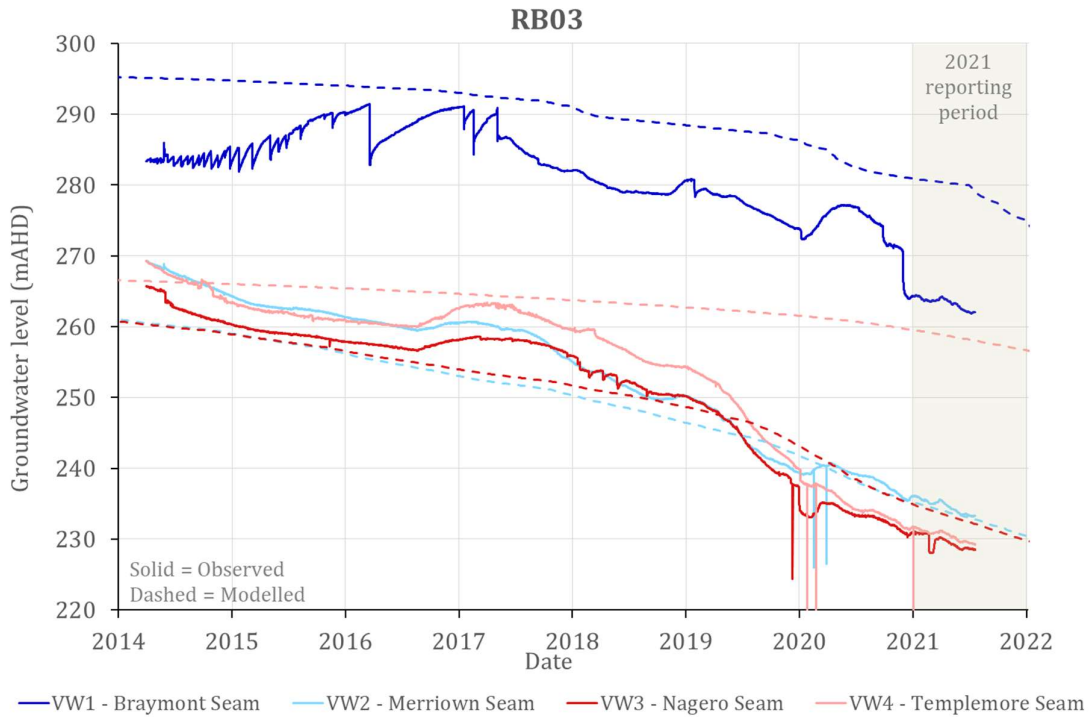


Regional Vibrating Wire Piezometers - observed and modelled (2021) water levels









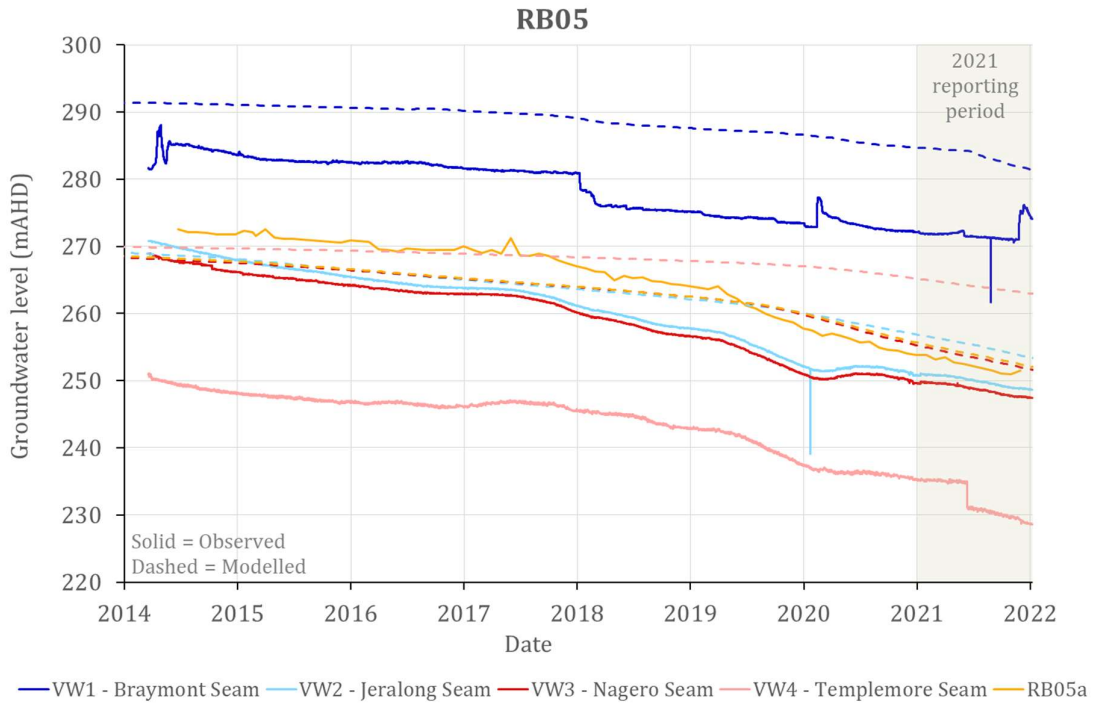


Table E-6
Annual trend analysis

Bore	Annual difference (m)							Geology
	Dec'14-Dec'15	Dec'15-Dec'16	Dec'16-Dec'17	Dec'17-Dec'18	Dec'18-Dec'19	Dec'19-Dec'20	Dec'20-Dec'21	
GW967138	-1.03	1.32	-0.52	-1.53	-0.72	3.01	3.75	Alluvium
REG1_VW1	-1.04	0.40	0.32	-0.52	-0.06	0.38	1.08	Jeralong seam
REG1_VW2	-1.71	-0.01	0.09	-1.22	-0.98	0.40	0.78	Merriown seam
REG1_VW3	-1.46	-0.27	-0.29	-1.16	-0.98	-0.52	-0.17	Nagero seam
REG1_VW4	-2.12	-0.15	-0.39	-1.16	0.52	-2.20	-0.84	Therribri seam
GW041027	-1.38	5.28	-5.22	-0.91	-0.05	2.15	4.72	Alluvium
REG2_VW1	-1.11	5.12	-4.29	-1.31	0.06	1.98	2.61	Fault zone
REG2_VW2	-2.52	4.32	-4.80	-1.00	-0.12	1.82	2.62	Fault zone
REG2_VW3	-3.15	3.67	-5.37	-1.69	-0.51	1.96	2.25	Fault zone
REG2_VW4	-1.18	4.57	-4.99	-1.84	-0.19	2.75	2.51	Fault zone
REG7A	-1.34	2.09	-1.24	-1.79	-0.37	2.28	2.89	Alluvium
REG7_VW1	-0.27	-0.31	0.37	-0.36	-0.63	0.12	-0.01	Braymont seam
REG7_VW2	0.53	-0.53	-1.03	-0.40	-1.08	-0.28	-0.04	Merriown seam
REG7_VW3	-0.81	-0.80	-0.43	-0.79	-0.64	-0.27	0.01	Nagero seam
REG8_VW1	-2.29	-1.65	-2.11	-2.25	-7.69	-4.25	-7.16	Braymont seam
REG8_VW2	0.07	-3.08	-9.92	-8.23	-2.84	-1.55	-3.27	Merriown seam
REG8_VW3	-4.24	-2.85	-2.85	-5.36	-9.76	-5.76	-5.31	Nagero seam
REG9_VW1	-0.48	-0.57	1.18	-1.15	-0.88	0.58	3.05	Braymont seam
REG9_VW2	-1.50	-0.94	-0.04	-1.05	-0.58	0.35	2.25	Merriown seam
REG9_VW3	-0.44	-0.51	-0.49	-0.96	-0.64	-0.03	0.51	Nagero seam
REG10_VW1	-0.24	-0.31	-0.31	-0.71	-0.76	-0.79	-0.65	Braymont seam
REG10_VW2	-1.68	-1.56	-1.10	-3.77	-5.54	-4.50	-3.46	Merriown seam
REG10_VW3	-1.98	-0.38	-1.16	-4.13	-6.13	-5.31	-3.82	Nagero seam

Bore	Annual difference (m)							Geology
	Dec'14-Dec'15	Dec'15-Dec'16	Dec'16-Dec'17	Dec'17-Dec'18	Dec'18-Dec'19	Dec'19-Dec'20	Dec'20-Dec'21	
REG10_VW4	-1.37	-1.79	-1.62	-4.12	-6.33	-4.64	-4.27	Upper Northam seam
RB03_VW1	5.47	1.33	-8.80	-2.57	-5.20	-9.55	-2.60	Braymont seam
RB03_VW2	-3.15	-1.23	-4.77	-5.68	-9.96	-4.40	-2.42	Merriown seam
RB03_VW3	-2.61	-0.12	-1.41	-6.27	-11.67	-7.87	-2.26	Nagero seam
RB03_VW4	-3.29	1.06	-2.13	-5.41	-13.22	-9.63	-2.35	Templemore seam
RB04_VW1	-	-	-	-	-9.06	-2.99	-5.01	Braymont seam
RB04_VW2	-2.16	-2.44	-8.09	-5.76	-4.89	-2.02	-3.67	Merriown seam
RB04_VW3	-3.14	-1.71	-4.91	-6.77	-14.37	-4.99	-4.16	Nagero seam
RB04_VW4	-3.50	-0.10	-4.06	-5.79	-12.86	-6.65	-6.62	Lower Northam seam
RB05A	-1.27	-1.08	-1.93	-3.29	-5.54	-4.31	-2.85	Merriown seam
RB05_VW1	-1.39	-0.79	-0.83	-5.75	-1.69	-1.23	-0.01	Braymont seam
RB05_VW2	-2.57	-1.82	-2.20	-3.73	-5.09	-1.96	0.47	Jeralong seam
RB05_VW3	-1.99	-1.39	-2.22	-3.95	-5.15	-1.93	0.52	Nagero seam
RB05_VW4	-1.59	-0.71	-0.09	-2.91	-4.87	-2.87	0.26	Templemore seam
MAC1280	2.69	1.90	0.99	-2.80	-2.68	-0.49	-3.07	Interburden
REG3	-0.80	0.91	-0.13	-1.99	-0.98	0.76	3.33	Boggabri Volcanics
REG4	0.30	0.09	-0.06	-0.18	-0.17	-0.60	-0.16	Boggabri Volcanics
REG5	-	0.06	0.00	-0.07	-0.10	-0.21	-0.04	Boggabri Volcanics
REG6	-	-0.10	-0.03	-2.06	-0.56	1.28	0.53	Boggabri Volcanics
REG12	-0.19	-0.07	0.06	-0.11	-0.05	0.08	0.25	Boggabri Volcanics
REG13	0.02	0.13	0.30	-0.09	-0.10	-0.14	0.52	Boggabri Volcanics
REG14	-0.15	0.24	-0.39	-1.10	-0.16	0.31	1.34	Basement

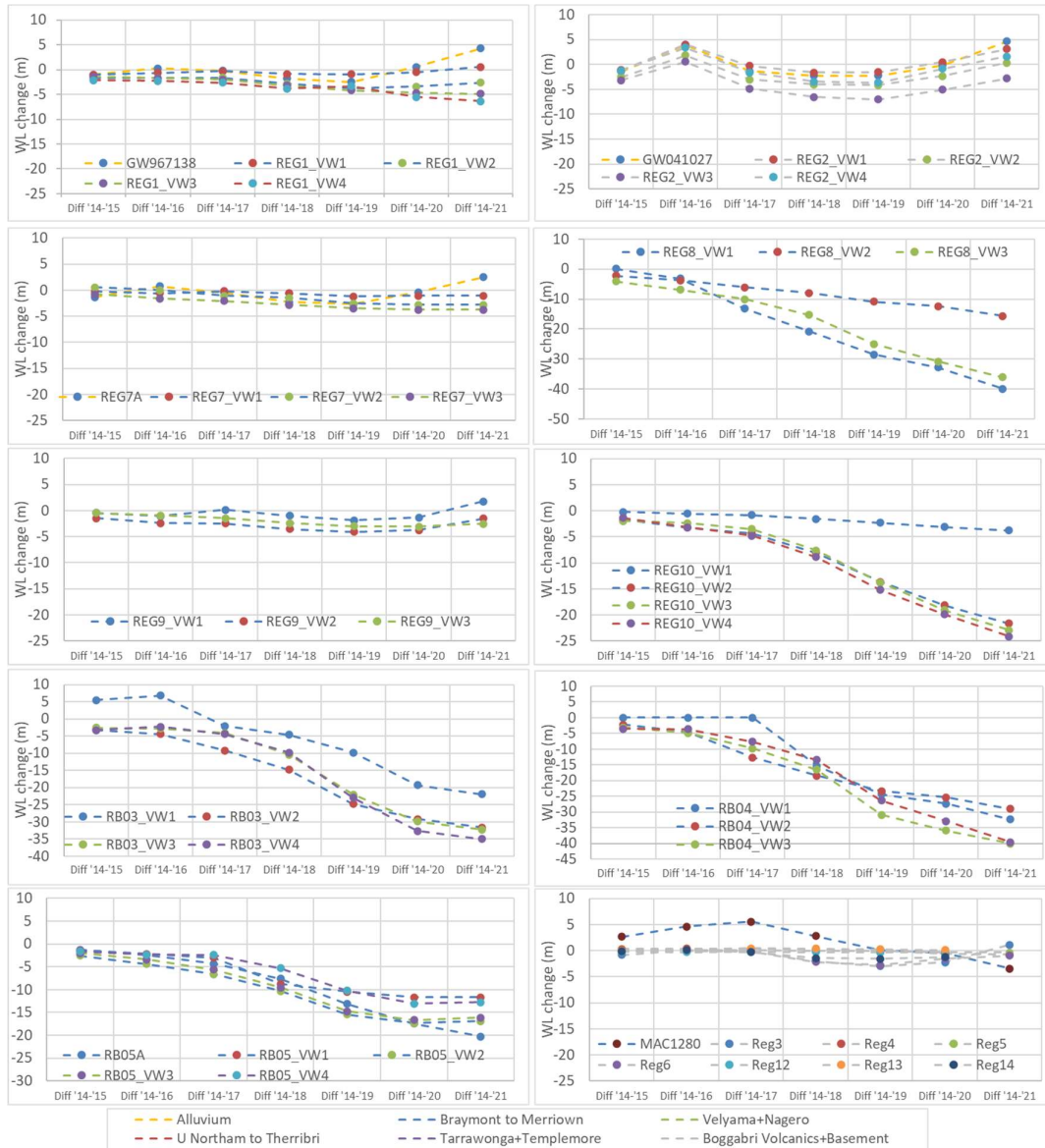
Bore	Cumulative annual difference since December 2014 (m)							Geology
	Diff '14-'15	Diff '14-'16	Diff '14-'17	Diff '14-'18	Diff '14-'19	Diff '14-'20	Diff '14-'21	
GW967138	-1.03	0.29	-0.23	-1.76	-2.48	0.53	4.28	Alluvium
REG1_VW1	-1.04	-0.64	-0.32	-0.85	-0.91	-0.53	0.55	Jeralong seam
REG1_VW2	-1.71	-1.72	-1.63	-2.85	-3.83	-3.42	-2.64	Merriown seam
REG1_VW3	-1.46	-1.74	-2.03	-3.18	-4.17	-4.69	-4.87	Nagero seam
REG1_VW4	-2.12	-2.27	-2.66	-3.82	-3.30	-5.50	-6.34	Therribri seam
GW041027	-1.38	3.90	-1.32	-2.22	-2.27	-0.12	4.60	Alluvium
REG2_VW1	-1.11	4.01	-0.28	-1.59	-1.53	0.46	3.07	Fault zone
REG2_VW2	-2.52	1.80	-3.00	-4.00	-4.12	-2.30	0.32	Fault zone
REG2_VW3	-3.15	0.52	-4.85	-6.54	-7.05	-5.09	-2.84	Fault zone
REG2_VW4	-1.18	3.39	-1.60	-3.44	-3.63	-0.88	1.63	Fault zone
REG7A	-1.34	0.75	-0.49	-2.28	-2.65	-0.37	2.52	Alluvium
REG7_VW1	-0.27	-0.59	-0.22	-0.57	-1.20	-1.08	-1.09	Braymont seam
REG7_VW2	0.53	0.00	-1.04	-1.44	-2.51	-2.79	-2.83	Merriown seam
REG7_VW3	-0.81	-1.61	-2.04	-2.83	-3.47	-3.74	-3.73	Nagero seam
REG8_VW1	0.05	-3.13	-13.24	-20.80	-28.49	-32.74	-39.90	Braymont seam
REG8_VW2	-2.22	-3.73	-6.07	-8.00	-10.84	-12.39	-15.66	Merriown seam
REG8_VW3	-4.15	-6.86	-10.04	-15.24	-25.00	-30.76	-36.07	Nagero seam
REG9_VW1	-0.48	-1.04	0.14	-1.02	-1.90	-1.32	1.73	Braymont seam
REG9_VW2	-1.50	-2.44	-2.49	-3.53	-4.11	-3.76	-1.52	Merriown seam
REG9_VW3	-0.44	-0.95	-1.44	-2.39	-3.04	-3.07	-2.56	Nagero seam
REG10_VW1	-0.24	-0.55	-0.87	-1.57	-2.33	-3.12	-3.78	Braymont seam
REG10_VW2	-1.68	-3.24	-4.34	-8.11	-13.65	-18.15	-21.60	Merriown seam
REG10_VW3	-1.98	-2.35	-3.51	-7.64	-13.76	-19.08	-22.89	Nagero seam
REG10_VW4	-1.37	-3.15	-4.77	-8.89	-15.22	-19.86	-24.13	Upper Northam seam

RB03_VW1	5.47	6.79	-2.01	-4.58	-9.78	-19.33	-21.93	Braymont seam
RB03_VW2	-3.15	-4.38	-9.15	-14.84	-24.80	-29.20	-31.62	Merriown seam
RB03_VW3	-2.61	-2.73	-4.13	-10.40	-22.07	-29.94	-32.20	Nagero seam
RB03_VW4	-3.29	-2.23	-4.36	-9.77	-22.99	-32.62	-34.97	Templemore seam
RB04_VW1	-	-	-	-15.29	-24.35	-27.34	-32.35	Braymont seam
RB04_VW2	-2.16	-4.60	-12.69	-18.45	-23.34	-25.36	-29.03	Merriown seam
RB04_VW3	-3.14	-4.85	-9.76	-16.53	-30.89	-35.88	-40.04	Nagero seam
RB04_VW4	-3.50	-3.60	-7.66	-13.45	-26.31	-32.96	-39.57	Lower Northam seam
RB05A	-1.27	-2.35	-4.28	-7.57	-13.11	-17.42	-20.27	Merriown seam
RB05_VW1	-1.39	-2.18	-3.01	-8.77	-10.45	-11.68	-11.69	Braymont seam
RB05_VW2	-2.57	-4.38	-6.59	-10.32	-15.41	-17.37	-16.90	Jeralong seam
RB05_VW3	-1.99	-3.39	-5.60	-9.55	-14.71	-16.64	-16.12	Nagero seam
RB05_VW4	-1.59	-2.30	-2.39	-5.30	-10.17	-13.04	-12.78	Templemore seam
MAC1280	2.69	4.59	5.58	2.78	0.10	-0.39	-3.46	Interburden
REG3	-0.80	0.11	-0.02	-2.01	-2.99	-2.23	1.10	Boggabri Volcanics
REG4	0.30	0.39	0.33	0.15	-0.02	-0.62	-0.78	Boggabri Volcanics
REG5	-	0.06	0.06	-0.01	-0.11	-0.32	-0.36	Boggabri Volcanics
REG6	-	-0.10	-0.13	-2.19	-2.75	-1.47	-0.94	Boggabri Volcanics
REG12	-0.19	-0.26	-0.20	-0.31	-0.36	-0.28	-0.03	Boggabri Volcanics
REG13	0.02	0.15	0.45	0.36	0.26	0.12	0.64	Boggabri Volcanics
REG14	-0.15	0.09	-0.30	-1.40	-1.56	-1.25	0.09	Basement

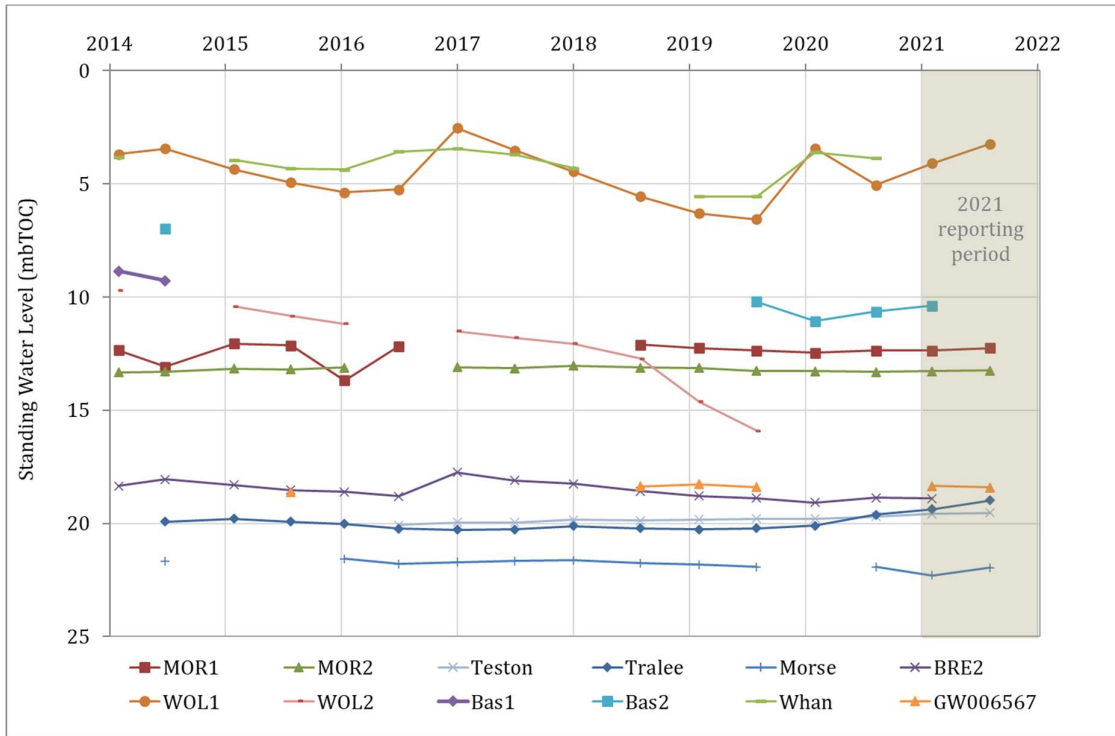
Colour scale (m change)

Rise 5 to 10	2 to 5	1 to 2	1 to -1	-1 to -2	-2 to -5	-5 to -10	-10 to -15	>-15	Fall
--------------	--------	--------	---------	----------	----------	-----------	------------	------	------

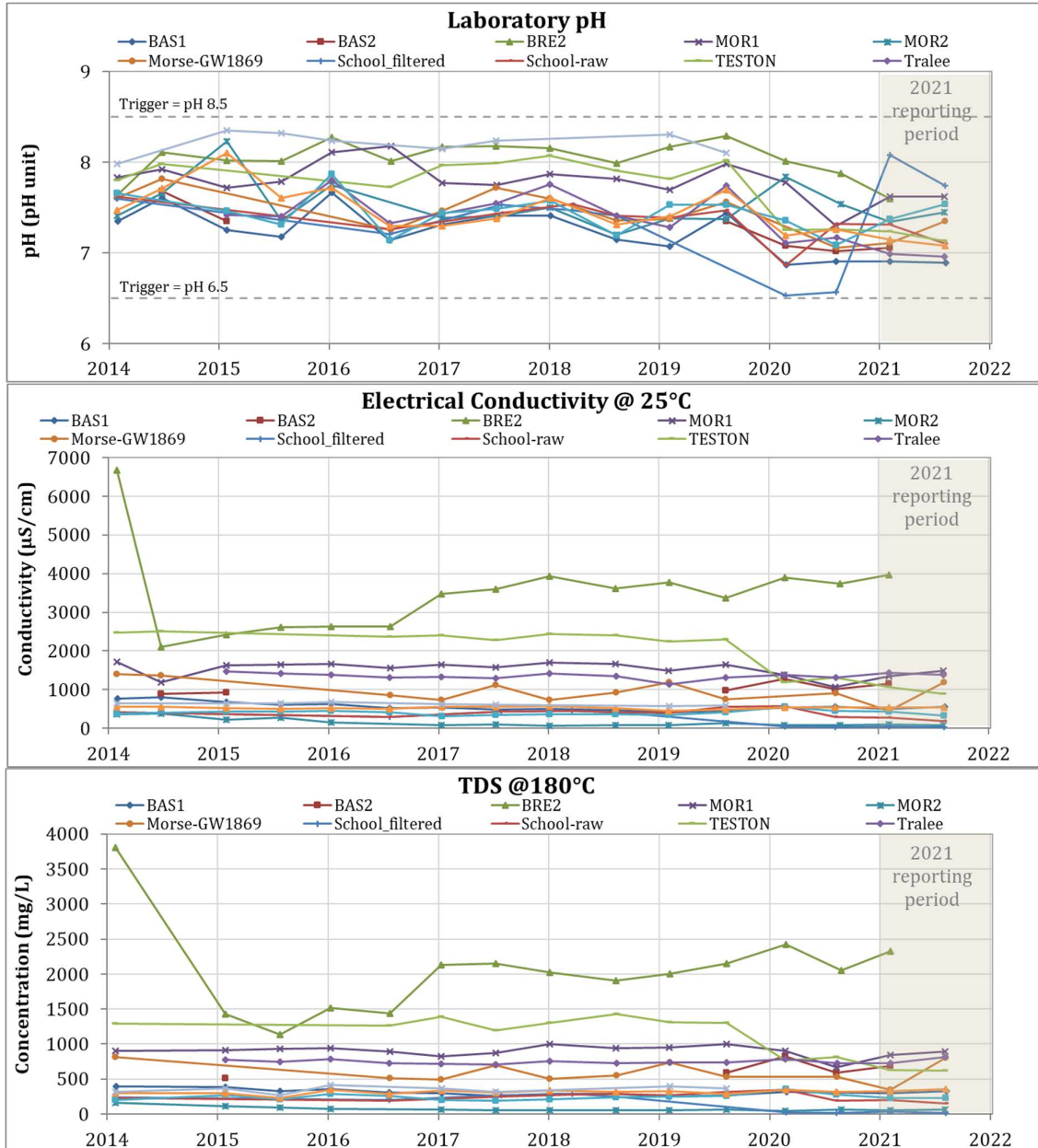
Cumulative annual difference in water level since December 2014

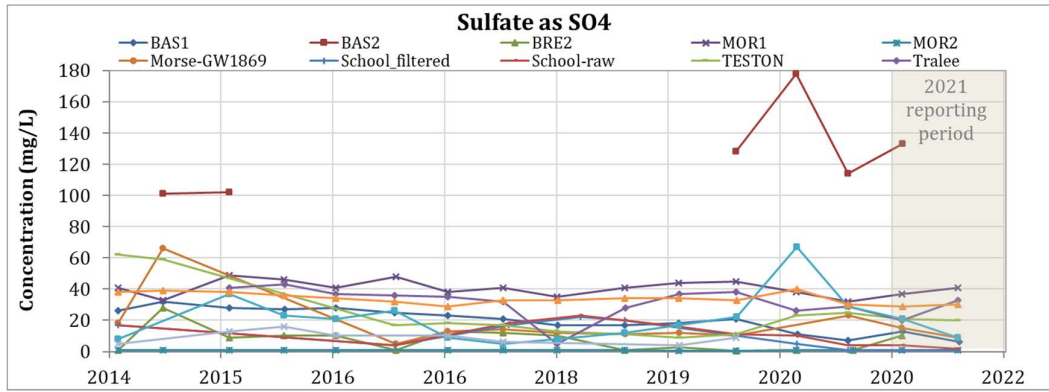


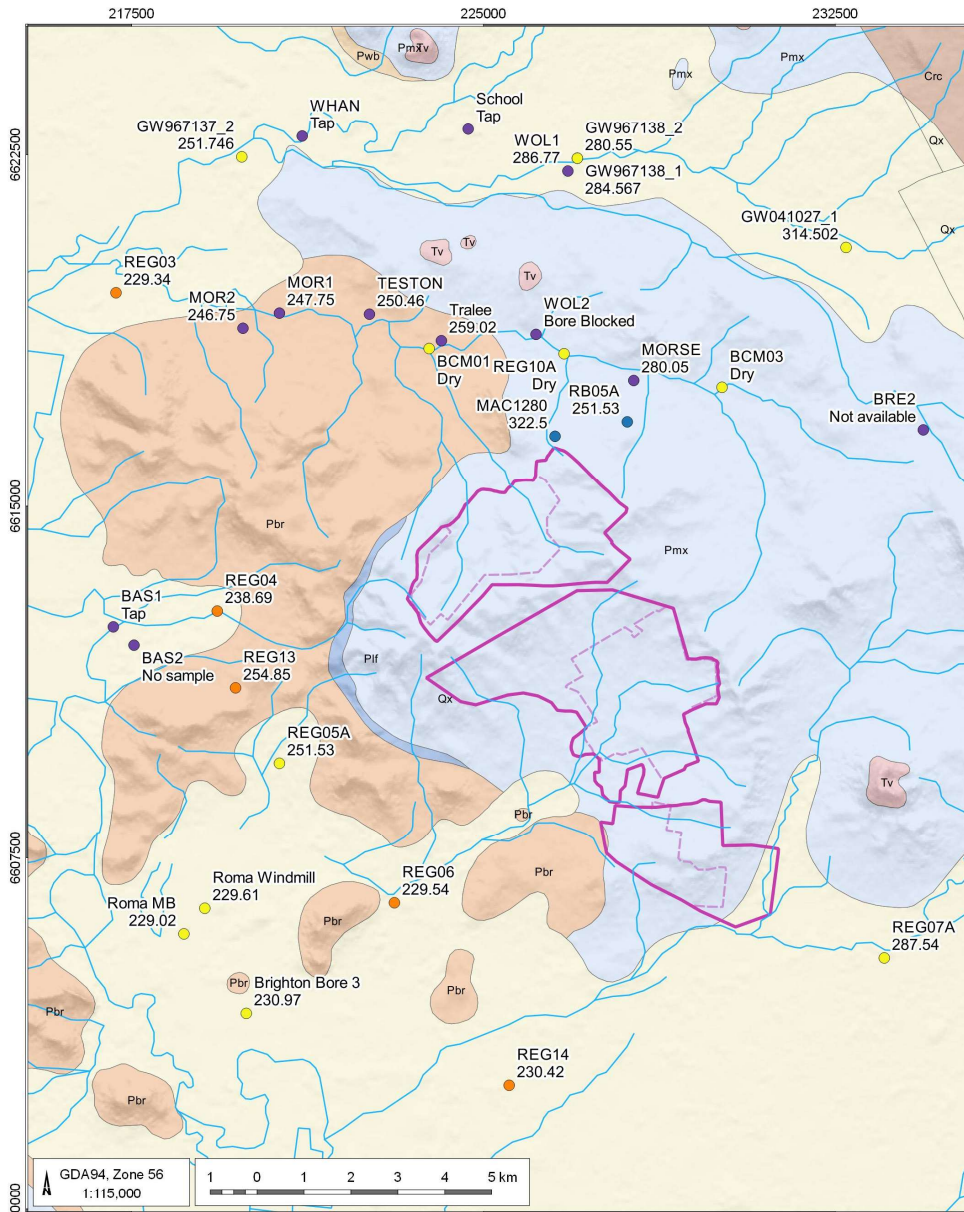
Private Groundwater Bores – Water levels



Private Groundwater Bores – Individual water quality parameters







LEGEND

Standpipe piezometer water levels - late 2021 (mAHD)

- Alluvium
- Permian
- Private
- Volcanics
- Drainage
- Mine maximum open cut pit outline
- Approx. 2021 mining extent

Gunnedah Coalfield rock unit (1:100k)

- Qx - Quaternary Sediments
- Tv - Tertiary Volcanics
- Pmx - Maules Creek and Goonbri formations
- Pif - Leard Formation
- Pbr - Boggabri Volcanics
- Cbc - Currabubula Formation
- Crc - Rocky Creek Conglomerate

Maules Creek Mine Annual Review (MCJ5001.001)

Approximate groundwater elevations in standpipe bores - late 2021

DATE: 25/02/2022

FIGURE No: **E-1**

©2022 Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) - www.ageconsultants.com.au
 Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011.; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006.;
 G:\Projects\MCJ5001.001\Maules Ck annual review 2021\GIS\Workspaces\001_Deliverable\1E-1_MCJ5001.001_GWL_Approximate groundwater elevations in standpipe bores - late 2021.ags

Table E-7
Additional (non-Maules Creek mine) bores used in this report

Bore ID	Type	Network	Easting (GDA95 Z56)	Northing (GDA95 Z56)	Ground Elevation (mAHD)	Bore Depth (m)	Screen/Sensor Depth (mbgl)	Target Geology
GW967137	SP	DPI Water	219846	6622452	258.79	84	8-11	Alluvium
GW967138	SP	DPI Water	227001	6622422	288.55	89.6	7-10	Alluvium
GW041027	SP	DPI Water	232730	6620523	318.45	83.5	8.3-14.3	Alluvium
IBC2102	SP	Boggabri Coal	226892	6611771	322	85	78-82	Merriown Seam
IBC2103	SP	Boggabri Coal	226898	6611773	321.8	59	50-56	Jeralong Seam
IBC2104	SP	Boggabri Coal	228336	6612215	331.1	87	80-84	Braymont Seam
IBC2105	SP	Boggabri Coal	228321	6612212	331.4	160	151-157	Merriown Seam
IBC2110 (MW3)	SP	Boggabri Coal	225939	6607684	272.8	100	91-97	Boggabri Volcanics
IBC2111	SP	Boggabri Coal	225950	6607683	272.7	45	36-42	Boggabri Volcanics
IBC2181	SP	Boggabri Coal	226848	6612477	335.2	114	105-111	Merriown Seam
MW6	SP	Tarrawonga Coal	225385	6607871	264.41	32	29-32	Alluvium
GW3115	Bore	Private/Boggabri	225174	6608903	280 (estimated)	TBC	TBC	Boggabri Volcanics

APPENDIX F

ATTENDED NOISE MONITRORING RESULTS

LAeq, 15minute GENERATED BY MCCM AGAINST OPERATIONAL NIGHT NOISE CRITERIA

Table F-1 – January 2021 Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	12/01/2021 22:30	1.3	0	35	Yes	<20	Nil
NM2	12/01/2021 23:31	0.9	0	39	Yes	<25	Nil
NM3	12/01/2021 23:44	1.0	0	35	Yes	<25	Nil
NM4	12/01/2021 23:00	1.6	0	35	Yes	<25	Nil
NM5	12/01/2021 22:00	0.4	0	35	Yes	IA	Nil
NM6	13/01/2021 00:00	0.6	0	35	Yes	<20	Nil

Table F-2 - February Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	11/02/2021 22:30	1.1	0.0	35	Yes	27	Nil
NM2	11/02/2021 23:31	1.0	0.0	39	Yes	25	Nil
NM3	11/02/2021 23:40	1.0	0.0	35	Yes	IA	Nil
NM4	11/02/2021 23:00	1.2	0.0	35	Yes	<20	Nil
NM5	11/02/2021 22:00	1.0	0.0	35	Yes	IA	Nil
NM6	11/02/2021 23:58	0.6	0.0	35	Yes	IA	Nil

Table F-3 - March Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	25/03/2021 22:45	0.5	0.0	35	Yes	26	Nil
NM2	26/03/2021 00:15	0.5	0.0	39	Yes	<25	Nil
NM3	25/03/2021 23:38	0.3	0.0	35	Yes	IA	Nil
NM4	25/03/2021 23:45	0.4	0.0	35	Yes	<20	Nil
NM5	25/03/2021 22:15	0.4	0.0	35	Yes	27	Nil
NM6	26/03/2021 00:41	0.4	0.0	35	Yes	IA	Nil

Table F-4 - April Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	14/04/2021 22:30	0.4	0.0	35	Yes	IA	Nil
NM2	14/04/2021 23:30	0.5	0.0	39	Yes	IA	Nil
NM3	14/04/2021 23:34	0.4	0.0	35	Yes	IA	Nil
NM4	14/04/2021 23:00	0.3	0.0	35	Yes	IA	Nil
NM5	14/04/2021 22:00	0.3	0.0	35	Yes	29	Nil
NM6	14/04/2021 23:57	0.5	0.0	35	Yes	IA	Nil

Table F-5 - May Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	06/05/2021 22:40	0.9	0.0	35	Yes	<20	Nil
NM2	06/05/2021 23:45	0.4	0.0	39	Yes	<20	Nil
NM3	06/05/2021 23:33	0.4	0.0	35	Yes	<20	Nil
NM4	06/05/2021 23:13	0.4	0.0	35	Yes	<20	Nil
NM5	06/05/2021 22:08	0.9	0.0	35	Yes	<20	Nil
NM6	07/05/2021 00:15	0.9	0.0	35	Yes	<20	Nil

Table F-6 - June Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	17/06/2021 22:30	0.4	0	35	Yes	NM	Nil
NM2	17/06/2021 23:30	0.4	0	39	Yes	NM	Nil
NM3	17/06/2021 22:00	0.4	0	35	Yes	IA	Nil
NM4	17/06/2021 23:00	0.3	0	35	Yes	NM	Nil
NM5	17/06/2021 22:00	0.4	0	35	Yes	26	Nil
NM6	17/06/2021 23:58	0.4	0	35	Yes	NM	Nil

Table F-7 - July Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	19/07/2021 22:30	0.2	0.0	35	Yes	26	Nil
NM2	19/07/2021 23:30	0.2	0.0	39	Yes	IA	Nil
NM3	19/07/2021 22:00	0.1	0.0	35	Yes	IA	Nil
NM4	19/07/2021 23:00	0.2	0.0	35	Yes	IA	Nil
NM5	19/07/2021 22:00	0.1	0.0	35	Yes	23	Nil
NM6	20/07/2021 00:00	0.4	0.0	35	Yes	IA	Nil

Table F-8 - August Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	03/08/2021 22:30	0.1	0.0	35	Yes	27	Nil
NM2	03/08/2021 23:30	2.1	0.0	39	Yes	IA	Nil
NM3	03/08/2021 23:45	2.8	0.0	35	Yes	IA	Nil
NM4	03/08/2021 23:00	0.2	0.0	35	Yes	IA	Nil
NM5	03/08/2021 22:00	0.2	0.0	35	Yes	25	Nil
NM6	03/08/2021 23:56	2.4	0.0	35	Yes	IA	Nil

Table F-9 - September Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	08/09/2021 22:30	0.2	0.0	35	Yes	IA	Nil
NM2	08/09/2021 23:30	0.7	0.0	39	Yes	IA	Nil
NM3	08/09/2021 23:39	0.4	0.0	35	Yes	IA	Nil
NM4	08/09/2021 23:00	0.2	0.0	35	Yes	IA	Nil
NM5	08/09/2021 22:00	0.5	0.0	35	Yes	IA	Nil
NM6	08/09/2021 23:57	0.5	0.0	35	Yes	IA	Nil

Table F-10 - October Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	19/10/2021 22:30	0.9	0.0	35	Yes	27	Nil
NM2	19/10/2021 23:46	0.6	0.0	39	Yes	<25	Nil
NM3	19/10/2021 23:37	0.7	0.0	35	Yes	IA	Nil
NM4	19/10/2021 23:00	0.5	0.0	35	Yes	<25	Nil
NM5	19/10/2021 22:00	0.6	0.0	35	Yes	28	Nil
NM6	20/10/2021 00:13	0.4	0.0	35	Yes	<20	Nil

Table F-11 - November Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	03/11/2021 22:30	0.4	0	35	Yes	IA	Nil
NM2	03/11/2021 23:30	0.7	0	39	Yes	IA	Nil
NM3	03/11/2021 23:28	0.7	0	35	Yes	IA	Nil
NM4	03/11/2021 23:00	0.2	0	35	Yes	IA	Nil
NM5	03/11/2021 22:00	0.6	0	35	Yes	IA	Nil
NM6	03/11/2021 23:56	0.9	0	35	Yes	IA	Nil

Table F-12 - December Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LAeq dB ²	Exceedance dB ³
NM1	15/12/2021 22:30	0.3	0.0	35	Yes	23	Nil
NM2	16/12/2021 00:00	0.5	0.0	39	Yes	<20	Nil
NM3	15/12/2021 23:37	0.4	0.0	35	Yes	IA	Nil
NM4	16/12/2021 00:30	0.2	0.0	35	Yes	<20	Nil
NM5	15/12/2021 22:01	0.5	0.0	35	Yes	<25	Nil
NM6	16/12/2021 01:00	0.1	0.0	35	Yes	IA	Nil

(1). Noise emission limits do not apply during periods of rainfall or winds greater than 3 metres per second (at a height of 10 metres);

(2). Estimated or measured LAeq,15minute attributed to MCCM;

(3). NA in exceedance column means criterion is not applicable, either due to atmospheric conditions outside those specified in project approval or due to property acquisition by MCC; and

(4). Indicates the application of a 2dB low frequency modifying factor.

IA/NM – Inaudible NM – Not measurable

LA1, 1minute GENERATED BY MCC AGAINST OPERATIONAL NIGHT NOISE CRITERIA

Table F-13 - January Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	12/01/2021 22:30	1.3	0	45	Yes	<20	Nil
NM2	12/01/2021 23:31	0.9	0	45	Yes	<25	Nil
NM3	12/01/2021 23:44	1.0	0	45	Yes	<25	Nil
NM4	12/01/2021 23:00	1.6	0	45	Yes	26	Nil
NM5	12/01/2021 22:00	0.4	0	45	Yes	IA	Nil
NM6	13/01/2021 00:00	0.6	0	45	Yes	<20	Nil

Table F-14 – February Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	11/02/2021 22:30	1.1	0.0	45	Yes	33	Nil
NM2	11/02/2021 23:31	1.0	0.0	45	Yes	40	Nil
NM3	11/02/2021 23:40	1.0	0.0	45	Yes	IA	Nil
NM4	11/02/2021 23:00	1.2	0.0	45	Yes	<20	Nil
NM5	11/02/2021 22:00	1.0	0.0	45	Yes	IA	Nil
NM6	11/02/2021 23:58	0.6	0.0	45	Yes	IA	Nil

Table F-15 - March Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	25/03/2021 22:45	0.5	0.0	45	Yes	<30	Nil
NM2	26/03/2021 00:15	0.5	0.0	45	Yes	<25	Nil
NM3	25/03/2021 23:38	0.3	0.0	45	Yes	IA	Nil
NM4	25/03/2021 23:45	0.4	0.0	45	Yes	<20	Nil
NM5	25/03/2021 22:15	0.4	0.0	45	Yes	30	Nil
NM6	26/03/2021 00:41	0.4	0.0	45	Yes	IA	Nil

Table F-16 - April Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	14/04/2021 22:30	0.4	0.0	45	Yes	IA	Nil
NM2	14/04/2021 23:30	0.5	0.0	45	Yes	IA	Nil
NM3	14/04/2021 23:34	0.4	0.0	45	Yes	IA	Nil
NM4	14/04/2021 23:00	0.3	0.0	45	Yes	IA	Nil
NM5	14/04/2021 22:00	0.3	0.0	45	Yes	32	Nil
NM6	14/04/2021 23:57	0.5	0.0	45	Yes	IA	Nil

Table F-17 – May Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	06/05/2021 22:40	0.9	0.0	45	Yes	<20	Nil
NM2	06/05/2021 23:45	0.4	0.0	45	Yes	<25	Nil
NM3	06/05/2021 23:33	0.4	0.0	45	Yes	<25	Nil
NM4	06/05/2021 23:13	0.4	0.0	45	Yes	<20	Nil
NM5	06/05/2021 22:08	0.9	0.0	45	Yes	<20	Nil
NM6	07/05/2021 00:15	0.9	0.0	45	Yes	<20	Nil

Table F-18 - June Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	17/06/2021 22:30	0.4	0	45	Yes	NM	Nil
NM2	17/06/2021 23:30	0.4	0	45	Yes	NM	Nil
NM3	17/06/2021 22:00	0.4	0	45	Yes	IA	Nil
NM4	17/06/2021 23:00	0.3	0	45	Yes	NM	Nil
NM5	17/06/2021 22:00	0.4	0	45	Yes	34	Nil
NM6	17/06/2021 23:58	0.4	0	45	Yes	NM	Nil

Table F-19 - July Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	19/07/2021 22:30	0.2	0.0	45	Yes	29	Nil
NM2	19/07/2021 23:30	0.2	0.0	45	Yes	IA	Nil
NM3	19/07/2021 22:00	0.1	0.0	45	Yes	IA	Nil
NM4	19/07/2021 23:00	0.2	0.0	45	Yes	IA	Nil
NM5	19/07/2021 22:00	0.1	0.0	45	Yes	27	Nil
NM6	20/07/2021 00:00	0.4	0.0	45	Yes	IA	Nil

Table F-20 – August Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	03/08/2021 22:30	0.1	0.0	45	Yes	30	Nil
NM2	03/08/2021 23:30	2.1	0.0	45	Yes	IA	Nil
NM3	03/08/2021 23:45	2.8	0.0	45	Yes	IA	Nil
NM4	03/08/2021 23:00	0.2	0.0	45	Yes	IA	Nil
NM5	03/08/2021 22:00	0.2	0.0	45	Yes	30	Nil
NM6	03/08/2021 23:56	2.4	0.0	45	Yes	IA	Nil

Table F-21 - September Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	08/09/2021 22:30	0.2	0.0	45	Yes	IA	Nil
NM2	08/09/2021 23:30	0.7	0.0	45	Yes	IA	Nil
NM3	08/09/2021 23:39	0.4	0.0	45	Yes	IA	Nil
NM4	08/09/2021 23:00	0.2	0.0	45	Yes	IA	Nil
NM5	08/09/2021 22:00	0.5	0.0	45	Yes	IA	Nil
NM6	08/09/2021 23:57	0.5	0.0	45	Yes	IA	Nil

Table F-22 - October Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	19/10/2021 22:30	0.9	0.0	45	Yes	29	Nil
NM2	19/10/2021 23:46	0.6	0.0	45	Yes	30	Nil
NM3	19/10/2021 23:37	0.7	0.0	45	Yes	IA	Nil
NM4	19/10/2021 23:00	0.5	0.0	45	Yes	<25	Nil
NM5	19/10/2021 22:00	0.6	0.0	45	Yes	31	Nil
NM6	20/10/2021 00:13	0.4	0.0	45	Yes	<20	Nil

Table F23 – November Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	03/11/2021 22:30	0.4	0	45	Yes	IA	Nil
NM2	03/11/2021 23:30	0.7	0	45	Yes	IA	Nil
NM3	03/11/2021 23:28	0.7	0	45	Yes	IA	Nil
NM4	03/11/2021 23:00	0.2	0	45	Yes	IA	Nil
NM5	03/11/2021 22:00	0.6	0	45	Yes	IA	Nil
NM6	03/11/2021 23:56	0.9	0	45	Yes	IA	Nil

Table F-24 - December Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies ¹	MCCP LA1,1min dB ²	Exceedance dB ³
NM1	15/12/2021 22:30	0.3	0.0	45	Yes	28	Nil
NM2	16/12/2021 00:00	0.5	0.0	45	Yes	<20	Nil
NM3	15/12/2021 23:37	0.4	0.0	45	Yes	IA	Nil
NM4	16/12/2021 00:30	0.2	0.0	45	Yes	<20	Nil
NM5	15/12/2021 22:01	0.5	0.0	45	Yes	<25	Nil
NM6	16/12/2021 01:00	0.1	0.0	45	Yes	IA	Nil

Notes:

1. Noise emission limits do not apply during periods of rainfall or wind speeds greater than 3 metres per second (at 10 metres);
 2. Estimated or measured LAeq,15minute attributed to MCCM;
 3. Estimated or measured LA1,1minute attributed to MCCM;
 4. NA in exceedance column means atmospheric conditions outside those specified in Project Approval and criterion is not applicable.
- IA – Inaudible NM – Not measurable

APPENDIX G

DPE RESPONSE TABLE

TABLE F-1

Item	DP&E response	MCCM response
1	<p>Schedule 5, Condition 4(b) of the Approval requires the Annual Review to include a comprehensive review of the monitoring results and complaint records. The Annual Review must be updated to include the following matters:</p> <ul style="list-style-type: none"> i. Noise monitoring including providing noise monitoring data, including reporting on environmental performance for noise in accordance with the Department’s Annual Review Guideline (2015). Further Figure 5 must be updated to show the noise monitoring locations and not air quality monitoring locations. <p>Further detail should be provided to provide a comprehensive review of complaints against relevant statutory requirements, limits or performance measures/criteria.</p>	<p>i. Section 6.4.2 was updated, comparisons have been made to the EA predications and previous year’s data. Figure 9 has been updated to show the noise monitoring locations. Appendix F contains attended noise monitoring data.</p> <p>ii. Section 9.3.1.1 Complaint Trends updated.</p>
2	<p>Schedule 5, Condition 4(d) of the Approval requires the Annual Review to identify any trends in the monitoring data over the life of the project. The Annual Review must be updated to provide monitoring data trends for the following aspects:</p> <ul style="list-style-type: none"> i. Greenhouse gas emission (Section 6.3) <p>Noise (Section 6.4)</p>	<p>i. Section 6.3.2 updated to include monitoring trends.</p> <p>ii. Section 6.4 updated to include monitoring trends.</p>
2	<p>Schedule 5, Condition 4(e) of the Approval requires the Annual Review to identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies. The Annual Review must be updated to provide comparison to predictions for the following aspects:</p> <ul style="list-style-type: none"> i. Air quality (Section 6.2) ii. Greenhouse gas emission (Section 6.3) iii. Noise (Section 6.4) iv. Blasting (Section 6.5) <p>Traffic (Section 6.9)</p>	<p>i. Section 6.2 was updated to identify and analyse any causes of significant discrepancies.</p> <p>ii. Section 6.3 was updated to identify and analyse any causes of significant discrepancies.</p> <p>iii. Section 6.4 was updated to identify and analyse any causes of significant discrepancies.</p> <p>iv. Section 6.5 was updated, blasting was within EA predicted impacts.</p> <p>v. Section 6.9 updated, traffic was consistent with Mod 3 traffic predictions.</p>
4	<p>Following review of the reported deposited dust levels in Section 6.2.2 the Department considers that using historical monitoring results from the affected site</p>	<p>Section 6.2.2 was updated to discuss causes of elevated dust level.</p>

	is not a valid method of discounting mine-related activity as the cause of a dust event. Section 6.2.2 must be updated to clarify the potential cause of the elevated dust levels;	
5	The Annual Review must be updated to report the amended Table 11 Water Take For the 2019-2020 Water Year, as provided to the Department following Annual Review submission;	Table 17 was updated.
6	In accordance with the Department’s Annual Review Guideline (2015) the Annual Review must report on the cause of all incidents and non-compliances. The reporting of non-compliances in Table 20 must be updated to report the cause of all incidents. Separate Cause and Details columns is recommended to be provided. Further the Annual Review should report if all non-compliances were reported to the relevant agencies.	MCC notes that table 26 currently contains a column entitled ‘Cause’, information within Table 20 is consistent with Section 11 of the Department’s Annual Review Guideline (2015).
7	A Review of the Maules Creek Coal website has identified that the following documents are not uploaded to the website. These documents must be uploaded to the website: <ul style="list-style-type: none"> • Bushfire management plan • Historic CCC meeting minutes 	The Bushfire Management Plan is an internal document, not requiring Secretary approval, as such is not displayed on the Company’s website Historical CCC minutes are all displayed on the WHC website at https://whitehavencoal.com.au/our-business/our-assets/maules-creek-mine/