MAULES CREEK COAL MINE

2022 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 2022
Annual Review Completion Date	31 December 2022

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 2022 to 31 December 2022, and that I am authorised to make this statement on behalf of Maules Creek Coal Pty Ltd.

Note.

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

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

Name of Authorised Reporting Officer	Jorge Moraga
Title of Authorised Reporting Officer	General Manager

MAULES CREEK COAL MINE

2022 ANNUAL REVIEW

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Name of Authorised Reporting Officer	Jorge Moraga
Title of Authorised Reporting Officer	General Manager

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MAULES CREEK COAL MINE
2022 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 2022) (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[1])	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

Were all the conditions of the relevant approvals complied with?	Yes/No
WAL12480	Yes
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: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non–compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non–compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 4 Non-Compliances

Relevant 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 fixed items. Overall site sound power level is compliant.	Section 6.4.2

2 INTRODUCTION

This is the tenth Annual Review produced for the Maules Creek Coal Mine (MCCM) and has been prepared in accordance with the NSW Department of Planning, Industry and Environment's (DPIE) 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 2022 to 31 December 2022 (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.

A eight modification of PA10_0138 was Lodged in October 2021 and approved in January 2022 allowing for the use of mobile coal sizing within the MCCM operation and the burial of tyres within the MCCM emplacement areas.

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

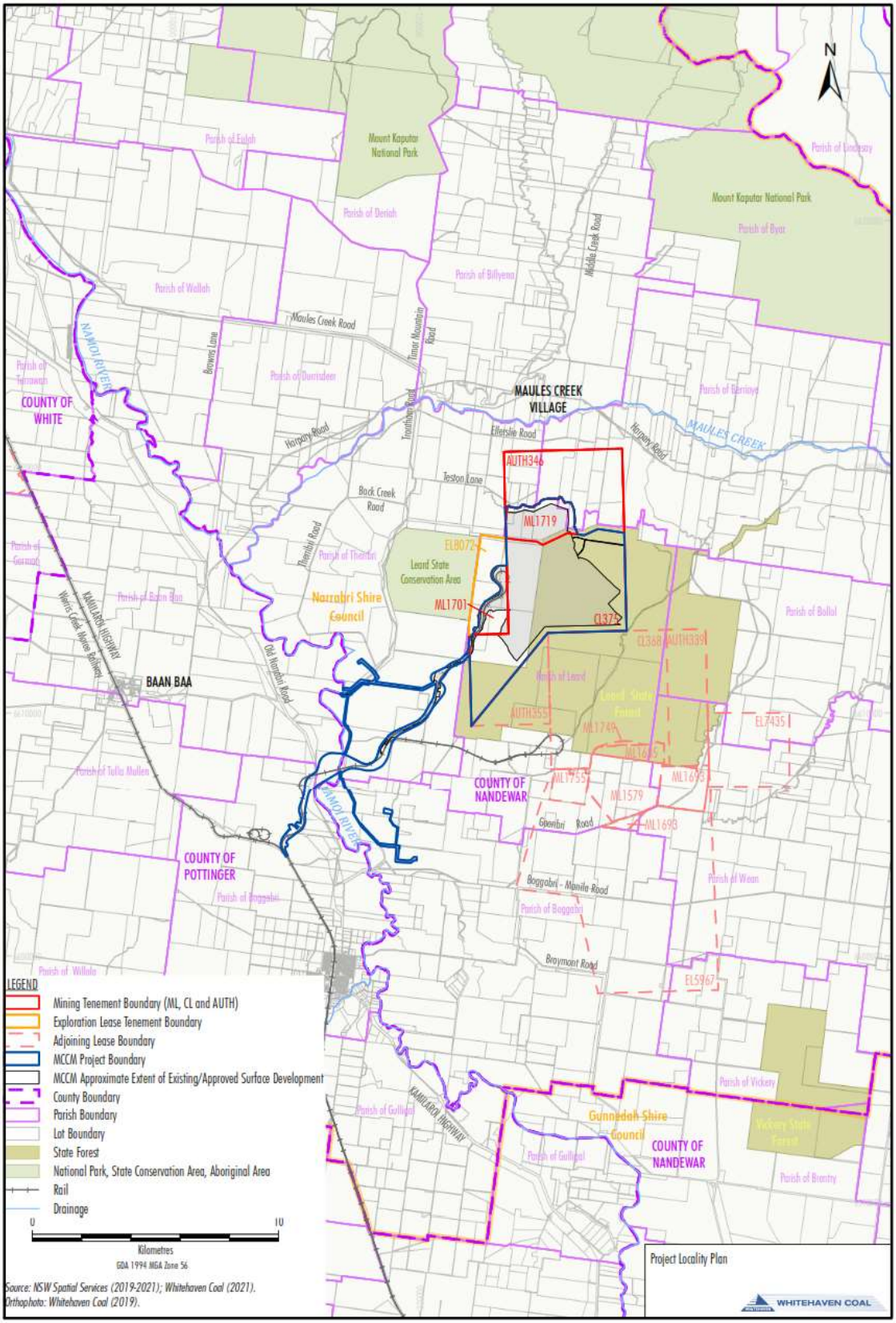


Figure 1 Project Locality Plan

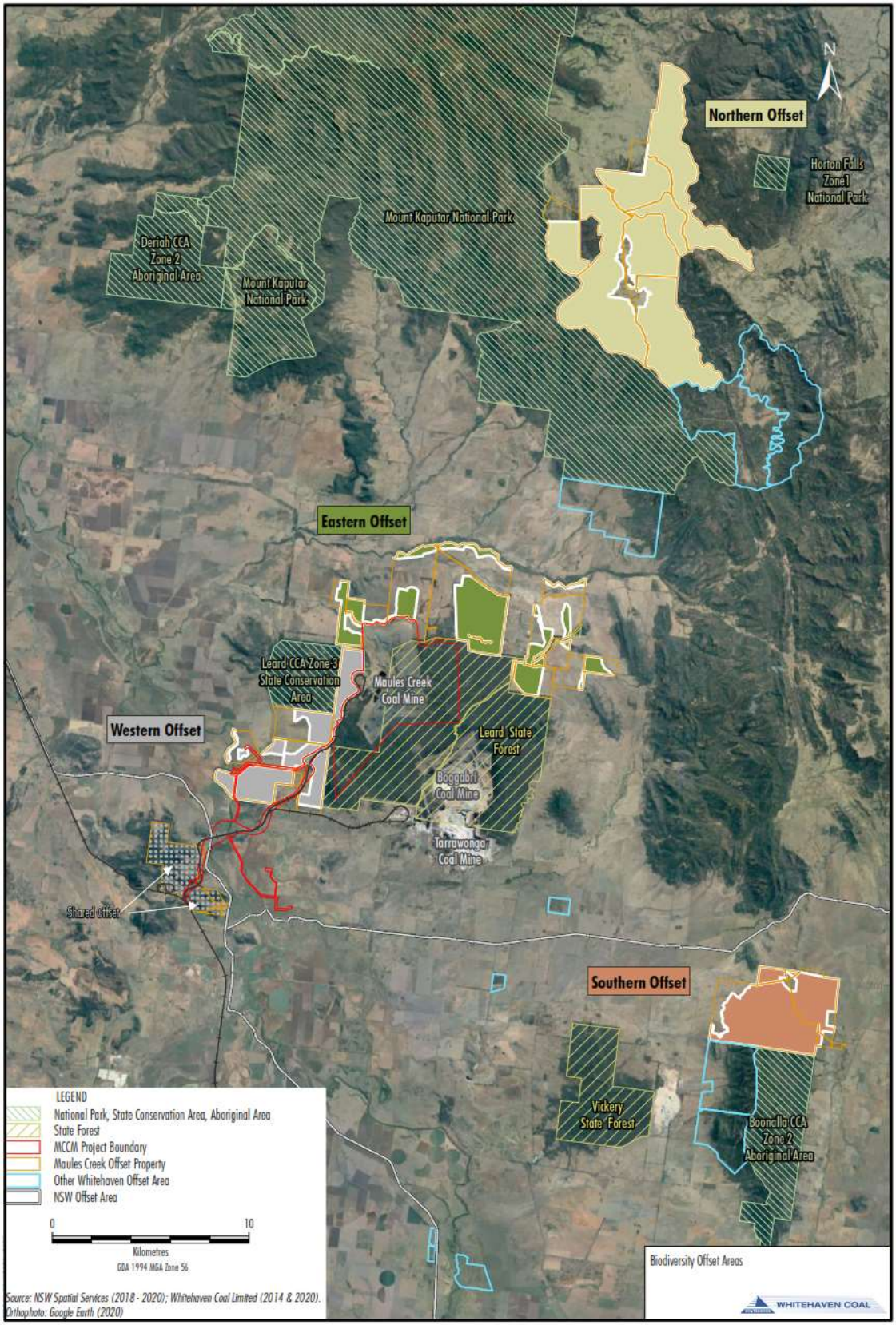


Figure 2 Biodiversity Offset Areas

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 20 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 20 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
Project Approval Modification	PA 10_0138 (MOD8)	Pursuant to the Maules Creek Project Approval Modification Environmental Assessment, the Modification was granted to allow for improved operating efficiencies through the use of mobile coal sizing equipment and mobile rock crushing equipment, as well as disposal of waste heavy vehicle tyres in the waste rock emplacement areas.	Granted on January 2022
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).	Renewed 2016 Expires 28 February 2028
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

Approval	Reference	Detail	Validity Dates
Environment Protection Licence	EPL 20221	The NSW Environment Protection Authority (EPA) issues environment protection licences to the owners or operators of various industrial premises under the *Protection of the Environment Operations Act, 1997* (POEO Act).	Issued 2 May 2013
Environment Protection Licence Variation	EPL 20221	Variation of the EPL to allow for tyre burial in the MCCM pit	Approved 30 March 2022
Mining Operations Plan Amendment B	MOP 2017-2023 Amendment B	Details mining and rehabilitation activities during the applicable period at MCCM.	Approved December 2017 to December 2023
Mining Operations Plan Amendment B Letter Amendment	MOP 2017-2023 Amendment B Letter Amendment	Details mining and rehabilitation activities during the applicable period at MCCM.	Approved December 2020 to December 2023
Maules Creek Coal Complex Forward Plan	July 2022 – June 2025	Details mining and rehabilitation activities during the applicable period at MCCM	Approved In August 2022
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

Approval	Reference	Detail	Validity Dates
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	WAL 27385	38 ML water licence from Namoi Groundwater Zone 4.	Granted 24 April 2012 for perpetuity.
Water Access Licence	WAL12479	78 ML water licence from Namoi Groundwater Zone 11 under works approval 90CA807652.	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

Approval	Reference	Detail	Validity Dates
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
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	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

Approval	Reference	Detail	Validity Dates
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
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.

Approval	Reference	Detail	Validity Dates
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 4 x new clean water diversion dams, pump set, pipe and discharge infrastructure
- Construction of new western infrastructure access road and piping from SD3 to MWD
- Construction of SD3 Spillway
- Construction of zero spill oil system
- Construction of critical spares shed
- Installation of Jumbo Centrifuges
- Installation of Course Coal Centrifuges
- Installation of Lime Dosing Plant
- Mobile bypass crushing circuit

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 2022 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)	64,955,104	57,864,598	75,000,000
ROM Coal	13 Million Tonnes (PA 10_0138 Sch. 2 Cond.6) > 5 Million Tonnes handled (EPL 20221)	12,379,894	10,204,445	12,500,000
Reject Material	NA	2,963,383	2,867,231	2,600,000
Saleable Product	12.4 Million Tonnes (PA 10_0138 Sch.2 Cond.9) > 5 Million Tonnes produced (EPL 20221)	9,368,961	8,764,822	8,800,000

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

All coal produced by MCCM is transported from site via the Maules Creek rail spur, and the shared portion of the Boggabri Coal rail spur in accordance with PA 10_0138 (Schedule 2, Condition 8 and 9; Schedule 3, Condition 65) (Table 7). Appendix B details the coal transport records in accordance with the reporting requirements under Condition 65 (a) and (b) of PA 10_0138.

Table 7 Coal Transport

Parameter	Criteria	Total
Maximum number of laden trains from the site in any one day	10	8
Maximum number of laden trains from the site in a day when averaged over a calendar year	7	3.56
Maximum Tonnes of product coal transported from the site (Mt)	12.4	8.76

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.

4.6.2 Construction Activities

- Commissioning of the life of Mine pumping circuit, forecast for April.
- Concrete extensions of HV wash bay, forecast for mid-year.
- Construction of SD3 Culvert Crossing, forecast for the start of April.
- Installation of platforms at course coal centrifuges, forecast for February.
- De commissioning of access road dams, forecast for the start of.
- Splash curtains on reject bin, forecast for March.

4.6.3 Mine Operations

The mine production rates are planned to increase to approximately 13 Mtpa of ROM coal and approximately 57.9 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 DPIE.

4.6.4 Overburden Emplacements

The OEA will continue to develop generally in accordance with Project Approval PA 10_0138 and the MCC Forward Plan which are available on the Whitehaven Coal website.

4.6.5 Mining Fleet Upgrades

Fleet configuration is stable with no changes during 2022. 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 2023.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The DPE requested consideration of several sections in the Annual Review. Appendix F-1 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 1001.4 millimetres (mm). The annual rainfall total is above the average rainfall recorded in the EA. The maximum rainfall was recorded during October (177.2mm), which is higher than the historical average of (51.2mm). In addition, ten months across the 2022 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 -3.7°C was recorded in July and a maximum temperature of 38.3°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 eight months.

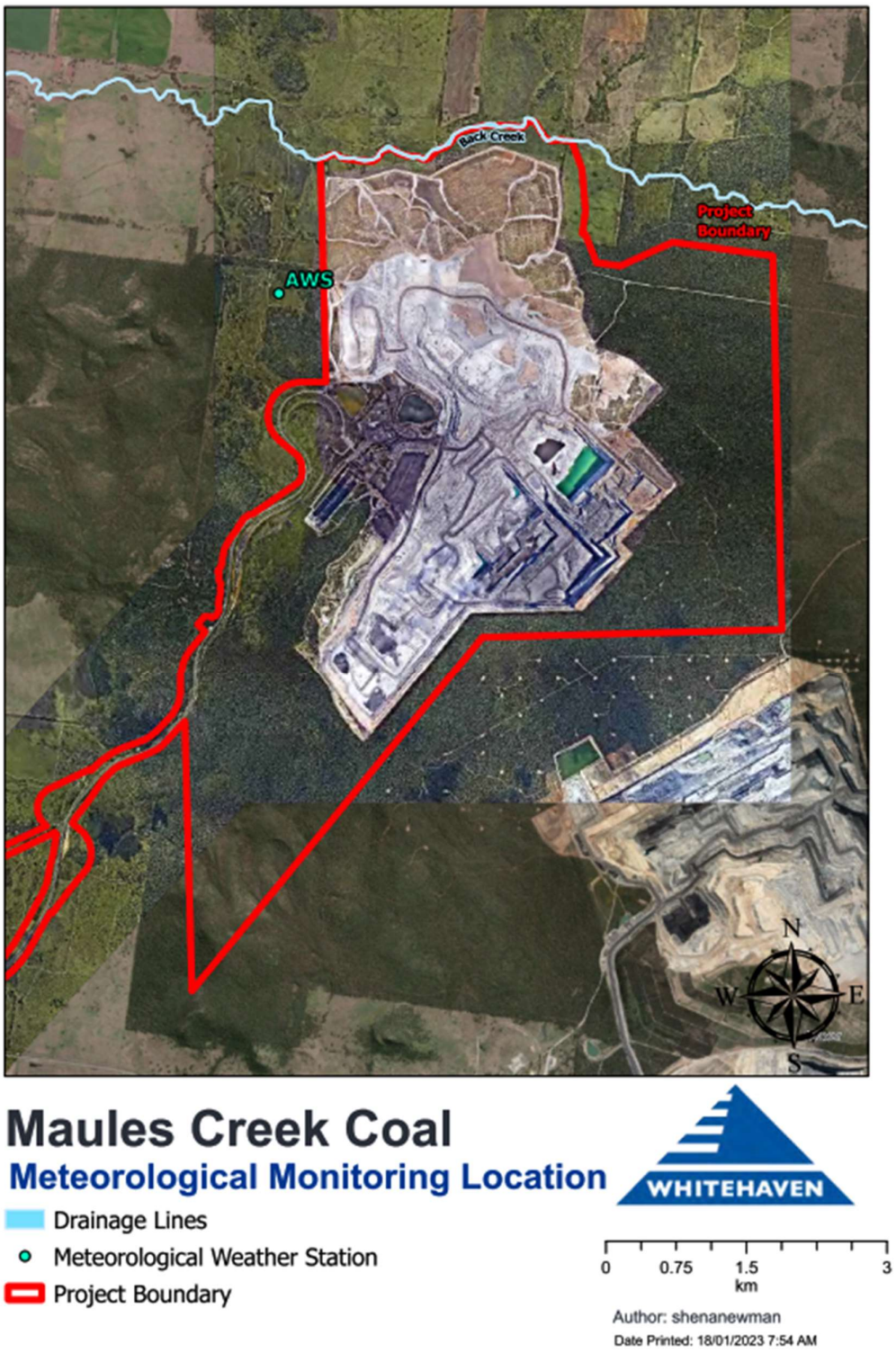


Figure 3 AWS Monitoring Location

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 PM_{10} levels at the MCC TEOM (TEOM1). These results are available publicly 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.
- PM_{10} 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 PM_{10} 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.

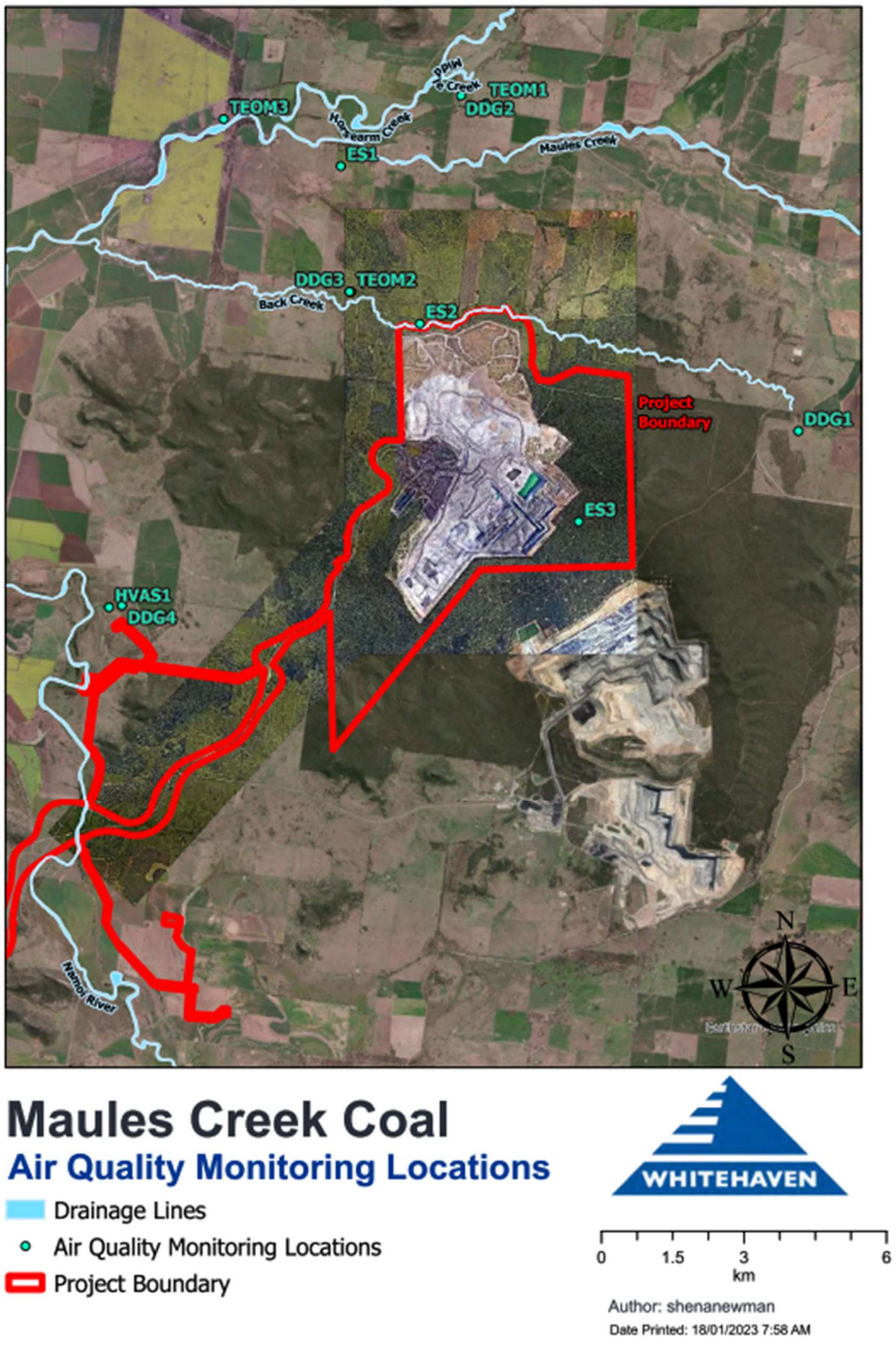


Figure 4 Air Quality Monitoring Locations

6.2.2 Environmental Performance

A summary of the depositional dust air quality monitoring results at MCCM for the 2022 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	10.3 C	0.6	2.6	3.6
February	22 C	0.7	1.5	0.7
March	7.2 C	0.6	2.3	0.3
April	36.3 C	12.5 C	1.9	0.6
May	36.1 C	0.5	2.3	0.8
June	23.4 C	1.2	3.1	4.2 C
July	28.7 C	0.5	1.9	2.2
August	7.2 C	0.2	1.2	0.6
September	12.9 C	0.3	2.4	1.0
October	0.8	0.7	5.6 C	0.3
November	36.5 C	0.0	6.4 C	2.1
December	1.0	4.9 C	1.5	0.6
Annual Average	0.9	0.5	2.1	1.2

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 2022 calendar year. The highest deposited dust recorded in the 2022 varied across a range of months. As such MC1 shows December (1.0 g/m^2), MC2 shows June (1.2 g/m^2), MC3 shows June (3.1 g/m^2), and MC4 shows January (3.6 g/m^2). 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.

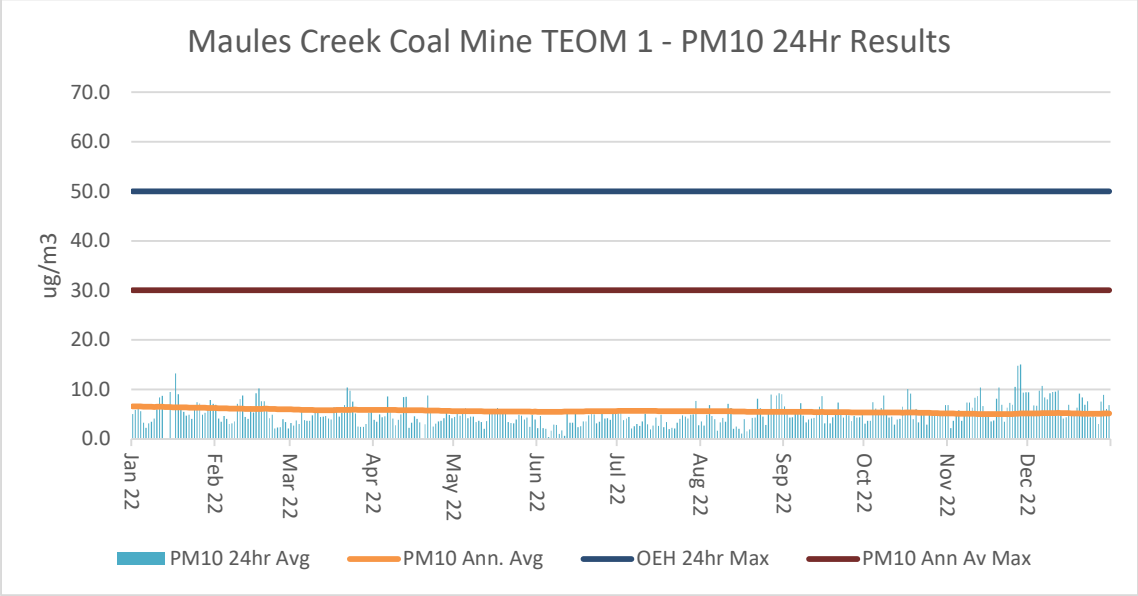
The annual average deposited dust levels measured during 2022 have been compared with the modelling predictions for Year 10. For the purpose of assessing compliance with approved modelling, the level excluding contaminated data has been considered. The measured annual average deposited dust levels in 2022 were elevated when 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 2022 would generally be well aligned with the predicted levels.

PM_{10} 24Hr and Annual Average (TEOM1)

The results collated from TEOM1 did not exceed the did not exceed the 24Hr criteria of 50 µg/m^3 or the rolling average criteria of 30 µg/m^3 (Graph 1). The collated data displays a downward trend potentially attributed to an increase in regular rainfall throughout the year improving soil moisture and promoting vegetation regrowth.

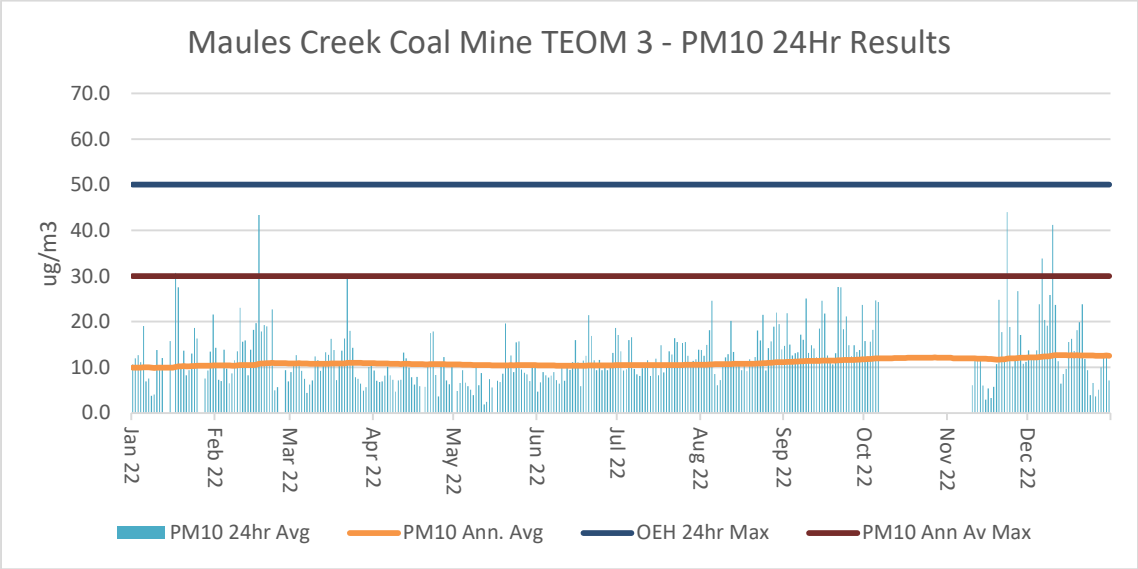
The annual average PM10 levels measured during 2022 have been compared with the modelling predictions for Year 10. The measured annual average PM10 data in 2022 were in general found to align well with the modelling predictions (**Error! Reference source not found.**



Graph 1: PM_{10} 24Hr and Annual Average Results (TEOM1)

PM_{10} 24Hr and Annual Average (TEOM3)

The results collated from TEOM3 did not exceed the did not exceed the 24Hr criteria of 50 µg/m3 or the rolling average criteria of 30 µg/m3 (Graph 2). No data was collected between the 7th of October 2022 until the 9th November 2022 due to a leak within the switching values.



Graph 2: PM_{10} 24Hr and Annual Average Results (TEOM3)

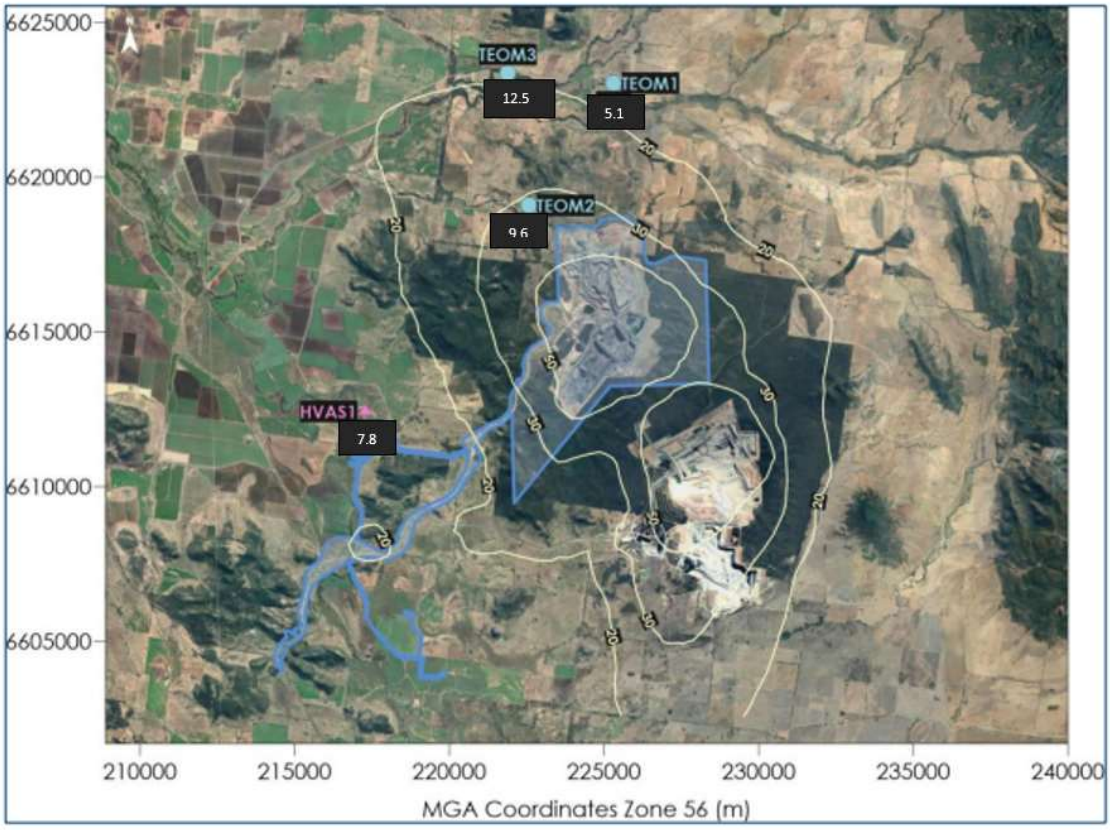
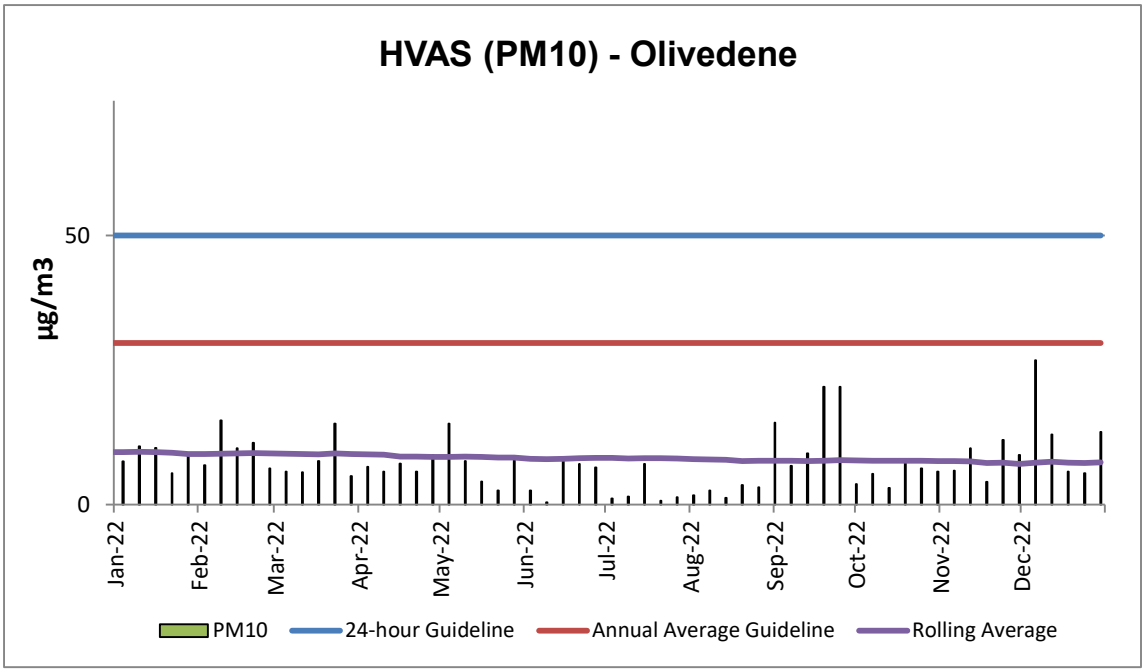


Figure 5 Comparison of measured and predicted annual average PM_{10} levels (µg/m^3) Year 10

PM_{10} 24Hr and Annual Average (HVAS)

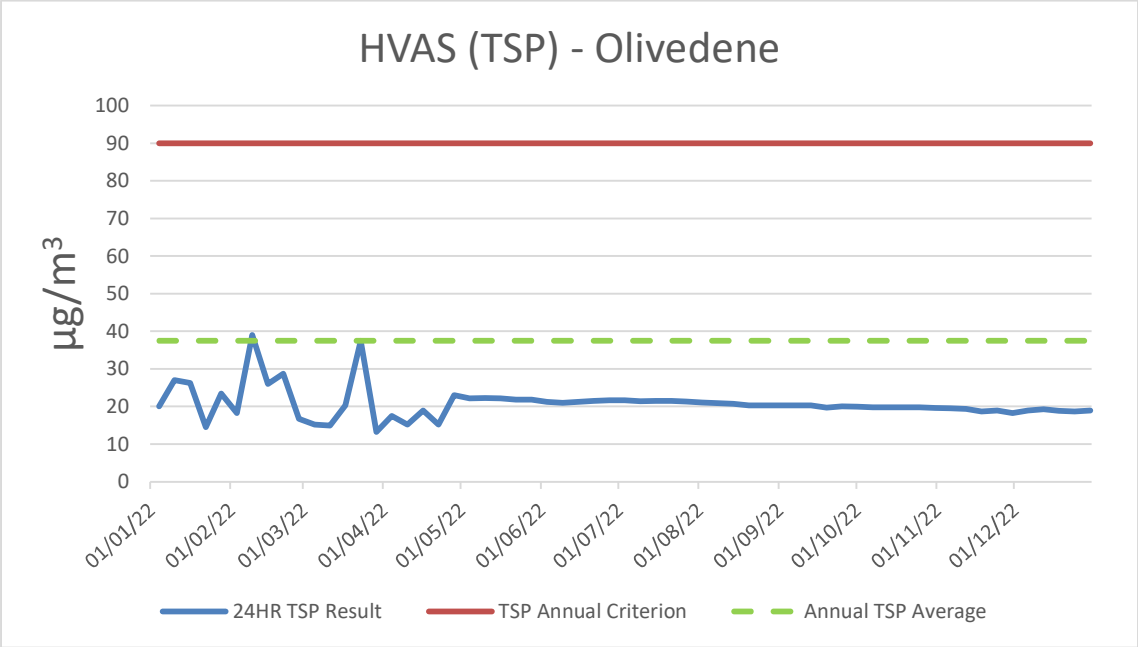
The HVAS PM_{10} monitoring results collated during the reporting period did not exceed the 24Hr criteria of 50 µg/m^3 or the rolling average criteria of 30 µg/m^3 (Graph 3). The annual average displays a declining trend which can potentially be attributed to an increase in regular rainfall throughout the year improving soil moisture and promoting vegetation regrowth.



Graph 3: PM_{10} 24Hr and Annual Average Results (HVAS

Total Suspended Solids (TSP) Annual Average (HVAS)

The TSP rolling annual average collated during the reporting period did not exceed the 90 µg/m^3 Criteria and correlate to the 10 year modelling predictions (Graph 4).



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 (CH_4) from the fracturing of coal seams – Scope 1 and indirect emissions resulting from the MCCM's consumption and use of purchased electricity – Scope 2.

Electricity

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

- The energy efficiency of new electrical equipment is considered during procurement.
- Use of variable speed drives on pumps and conveyors in the CHPP.
- Avoiding idle running of conveyors in the CHPP.
- 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.
- Maximising in-pit dumping

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 Australian Department of Agriculture, Water and the Environment website. The total GHG Emissions attributed to the MCCM reported for the NGERS 2022 Financial Year (FY) reporting period was 294,658 t CO_2-e. This shows a decrease on previous years consistent with a decrease to ROM coal and total over burden moved. The following sections detail the three key GHG contributors calculated for the 2022 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 to current Method 2 site specific emission factor applied during the development of the EA.

Diesel Usage

94,622kL of diesel (stationary and transport use) was consumed equating to 256,400 tCO_2-e GHG Emissions. Diesel usage was slightly higher than that estimated in the EA. This can be attributed to longer hauls which were experienced in relation to overburden placement in out of pit dumps.

Fugitive Emissions

There was an estimated total of 7,956 tCO_2-e fugitive emissions from MCCM in the 2022 FY. This is higher than the EA estimation.

Electricity Consumption

35,688 MWh power equating to approximately 28.194 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 a 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 L4 and M8.
- The MCC Noise Management Plan (NMP) approved by DPE, 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 6** 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.

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, site-only LAeq noise levels decreased over the last two years 2021 and 2022. At 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 2022.

When comparable, noise levels measured in 2022 were lower than noise levels predicted in the Noise Impact Assessment which was prepared for Modification 7 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.

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

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	<20	-	NA
February	NA	<25	-	NA
March	NA	20	-	NA
April	NA	IA	-	NA
May	Noise-enhancing	<25	35	NC
June	NA	<25	-	NA
July	NA	25	-	NA
August	Noise-enhancing	IA	35	NC
September	NA	IA	-	NA
October	NA	29	-	NA
November	NA	27	-	NA
December	NA	<20	-	NA

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

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	<20	-	NA
February	NA	<25	-	NA
March	NA	25	-	NA
April	NA	28	-	NA
May	NA	25	-	NA
June	NA	<25	-	NA
July	NA	30	-	NA
August	NA	IA	-	NA
September	NA	25	-	NA
October	NA	32	-	NA
November	NA	<20	-	NA
December	NA	29	-	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.

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 $L_{Aeq, 15 Minute}$ Compared to 5 Year Predicted $L_{Aeq, 15 Minute}$

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	IA	-	NA
February	NA	IA	-	NA
March	NA	IA	-	NA
April	NA	IA	-	NA
May	NA	IA	-	NA
June	Noise-enhancing	IA	35	NA
July	NA	<25	-	NA
August	NA	IA	-	NA
September	NA	26	-	NA
October	NA	<30	-	NA
November	NA	<25	-	NA
December	NA	IA	-	NA

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

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	<20	-	NA
February	NA	<20	-	NA
March	NA	<20	-	NA
April	NA	26	-	NA
May	Noise-enhancing	<25	49	NC
June	NA	<25	-	NA
July	NA	<20	-	NA
August	NA	IA	-	NA
September	NA	IA	-	NA
October	NA	25	-	NA
November	NA	<20	-	NA
December	NA	26	-	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.
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (eg less than 30 dB), therefore measured and predicted noise levels were not comparable.

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

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	IA	-	NA
February	NA	25	-	NA
March	NA	IA	-	NA
April	NA	IA	-	NA
May	Noise-enhancing	IA	38	NC
June	NA	22	-	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

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

Month	Applicable meteorological condition [1,2]	Measured MCCP $L_{Aeq,15minute}$	Predicted MCCP $L_{Aeq,15minute}$	Difference [3]
January	NA	IA	-	NA
February	NA	<20	-	NA
March	NA	<20	-	NA
April	NA	25	-	NA
May	NA	IA	-	NA
June	Noise-enhancing	IA	40	NC
July	NA	<25	-	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.
3. NC indicates measured MCCP site L_{Aeq} noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" quantity (eg less than 30 dB), therefore measured and predicted noise levels were not comparable.

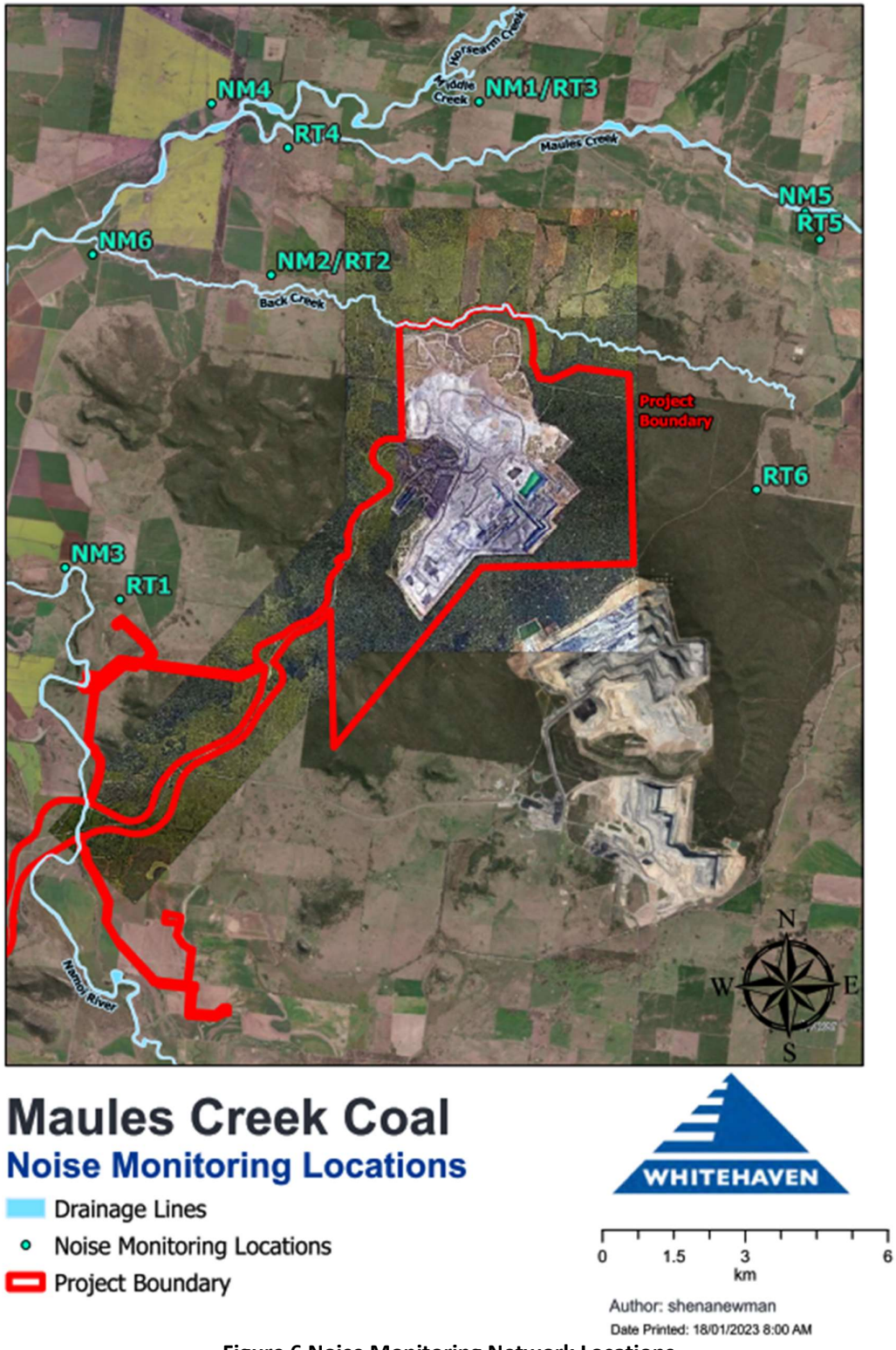


Figure 6 Noise Monitoring Network Locations

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 year-rolling basis. 37 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 or less than the 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. Due to the nature of in-service testing and the layout and operation of the CHPP and other surface plant, it was not always possible to measure each fixed plant item in isolation, this is considered a technical non-compliance as the overall sound power of site was consistent with predictions. Due to the low-frequency content of the CHPP, it interfered with measurement 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 in this 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 2022, and validate the results against the model predictions from the Environmental Assessment NIA.

The validation exercise occurred comparing a period in July 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 the measured equalled the predicted. Model predictions correlated well with actual measured levels at RT1 and RT2, and under-predicted noise levels at RT3, RT4 and RT5. 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 109 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 2022 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 such results that were above the 95th percentile limit. Equalling the same result as per 2021.

Table 15 Summary of Blasting Results

Location	Parameter	Average	Maximum	100% Limit	Exceedance
BM1	Air blast overpressure (dB(Lin Peak))	89.9	107.9	120	-
	Vibration (mm/s)	0.08	0.27	10	-
BM2[#]	Air blast overpressure (dB(Lin Peak))	92.8	112.3	120	-
	Vibration (mm/s)	0.12	0.51	10	-
BM3	Air blast overpressure (dB(Lin Peak))	95.4	113.2	120	-
	Vibration (mm/s)	0.18	0.96	10	-
BM4[#]	Air blast overpressure (dB(Lin Peak))	92.9	111.1	120	-
	Vibration (mm/s)	0.24	1.75	10	-

* BM1 is on mine owned property.

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

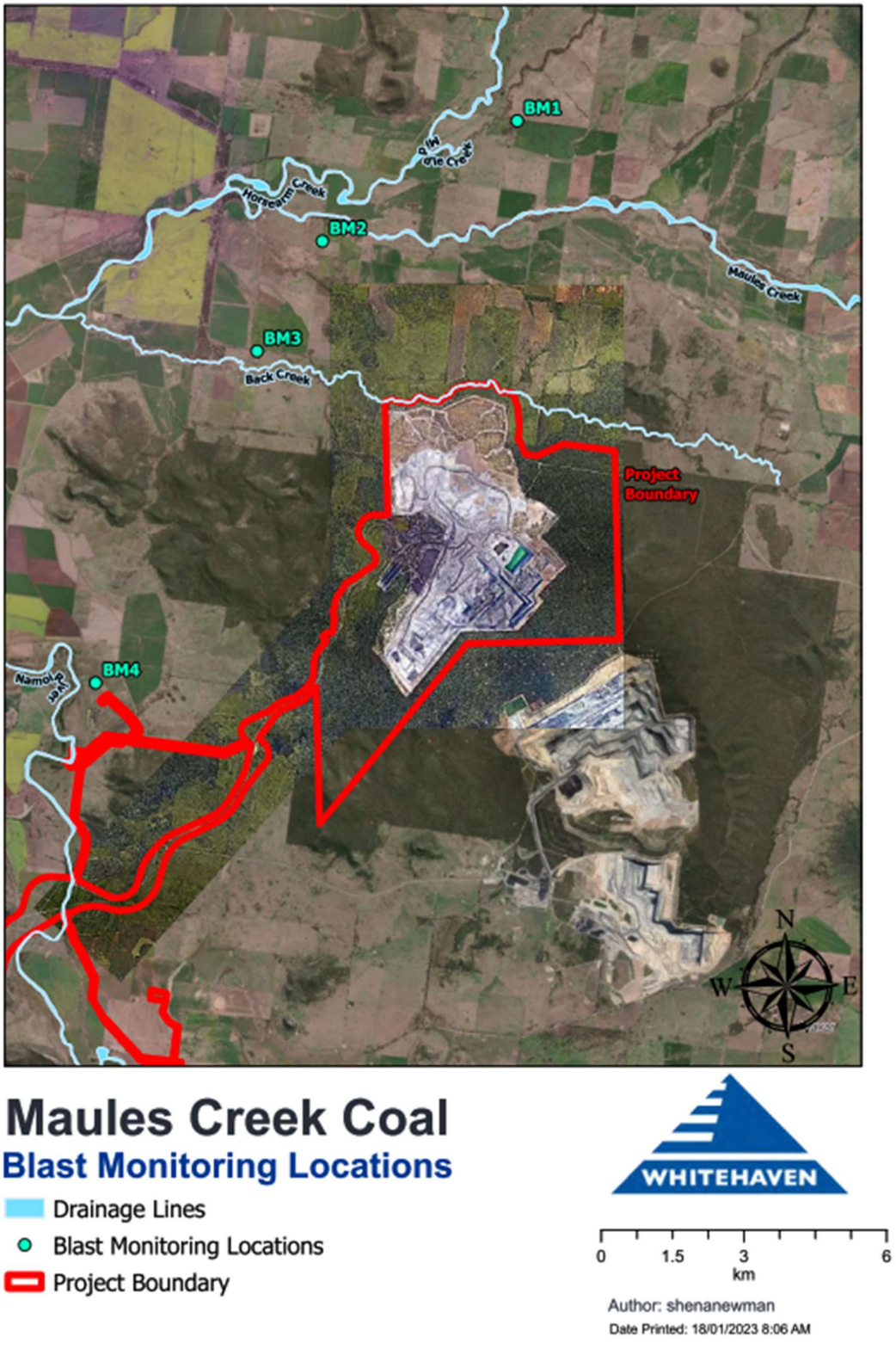


Figure 7 Blast Monitoring Network Locations

6.5.3 Blast Fume

Of the 109 blasts conducted there were 5 significant blast fume events greater then Level 3C (*Australian Explosives Industry & Safety Group* guideline). There were 36 recorded blasts with fume observed within the reporting period. 16 of which were classed as 1A, 3 classed as 1B, 3 classed as 2A, 6 classed as 2B, 3 classed as 3B, 2 classed as 3C, 2 classed as 4B and 1 as 4C. All blasts were video recorded and categorised in line with the BLMP and relevant industry guidelines. Progressive improvements in the blasting performance resulted in the removal of the Prevention Notice issued in 2022.

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, Olivedeen, 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

Regionally central meteorological station to the BOAs is the Gunnedah Pool site (BOM 2023) which has recorded highly variable rainfall over the last 4 years; from driest in 140 years of 237mm in 2019, followed by above average rainfall years in 2020, 2021 and 2022 of 833mm, 990mm and 860mm respectively resulting in major flooding of the Namoi River in October and November 2022. MCCM maintain nine meteorological stations across the BOA with a summary of weather conditions experienced at Offset properties during the 2022 reporting period:

- Roseglass - Maximum monthly average temperature was 32°C in January 2022. Minimum monthly average temperature was 4°C in June 2022. Annual temperature ranges were 0°C to 37°C in 2022. The total annual rainfall in 2022 was 716mm with the maximum in September (110mm) and minimum in June (11mm)
- Wirradale - Maximum monthly average temperature was 30°C in January 2022. Minimum monthly average temperature was 7°C in June 2022. Annual temperature ranges were 3°C to 34°C in 2022. The total annual rainfall in 2022 was 606mm with the maximum in October (143mm) and minimum in June (12mm)
- Wollandilly - Maximum monthly average temperature was 32°C in January 2022. Minimum monthly average temperature was 7°C in June 2022. Annual temperature ranges were 3°C to 38°C in 2022. The total annual rainfall in 2022 was 854mm with the maximum in October (183mm) and minimum in June (10mm)
- Teston South - Maximum monthly average temperature was 33°C in January 2022. Minimum monthly average temperature was 1°C in June 2022. Annual temperature ranges were -4°C to 38°C in 2022. The total annual rainfall in 2022 was 1000mm with the maximum in October (177mm) and minimum in June (15mm);
- Kelso - Maximum monthly average temperature was 35°C in January 2022. Minimum monthly average temperature was 4°C in June 2022. Annual temperature ranges were 0°C to 39°C in 2022. The total annual rainfall in 2022 was 705mm with the maximum in October (151mm) and minimum in June (10mm);
- Triangle - Maximum monthly average temperature was 30°C in January 2022. Minimum monthly average temperature was 5°C in July 2022. Annual temperature ranges were 1°C to 35°C in 2022. The total annual rainfall in 2022 was 944mm with the maximum in October (180mm) and minimum in June (11mm);
- Long Gully - Maximum monthly average temperature was 28°C in January 2022. Minimum monthly average temperature was 2°C in June 2022. Annual temperature ranges were -2°C to 32°C in 2022. The

total annual rainfall in 2022 was 1126mm with the maximum in October (203mm) and minimum in June (18mm);

- Neranghi North - Maximum monthly average temperature was 28°C in January 2022. Minimum monthly average temperature was 6°C in July 2022. Annual temperature ranges were 3°C to 33°C in 2022. The total annual rainfall in 2022 was 1063mm with the maximum in October (184mm) and minimum in December (7mm); and
- Wirradale - Maximum monthly average temperature was 29°C in January 2022. Minimum monthly average temperature was 5°C in July 2022. Annual temperature ranges were 1°C to 34°C in 2022. The total annual rainfall in 2022 was 910mm with the maximum in October (171mm) and minimum in June (17mm)

Offset Security Management

MCCM successfully registered nine Conservation Agreements between 14 March 2020 and 2 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 15.8km of new or repaired fencing (fauna friendly) was constructed along the perimeter of MCCM BOA (Offset properties of Bimbooria, Velyama East, Teston North, Wollondilly, Thornfield, Onavale, Wirradale, Mt Lindsay, Triangle, Long Gully, Olivedeen and Neranghi North) as well as maintenance of signage and gates undertaken as required to continue to restrict unauthorised access and minimise livestock incursion. During the reporting period, 10.2km of redundant internal fences were deconstructed from the Velyama East, Wollondilly, Mt Lindsay and Triangle properties. 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 16 species were collected resulting in 7,290 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 2022 revegetation program as well as planning for the 2023 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 skidsteers 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 2022 revegetation program on the Roseglass, Bimbooria, Cattle Plain and Wollondilly Offset properties. Continuation of above average rainfall and flooding resulting in excessive vegetation growth prevented adequate ground preparation from occurring; as a result adaptive management was undertaken by deferring understorey revegetation into next year. The overstorey revegetation program was undertaken in May and August 2022 with 2,508 hiko seedlings of Box-Gum and other Woodland species planted over 34ha of the MCCM BOA. Combined with favourable seasonal conditions, routine tree watering and maintenance activities post planting have been successful to ensure 72% 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 186 known Aboriginal archaeological heritage sites and 7 European historical heritage sites within the MCCM BOA with each site is maintained with a total of 27.1km of demarcation fencing around all heritage site perimeters and signage to mitigate access and inadvertent disturbance. During this reporting period, 16 new Aboriginal archaeological heritage sites were identified on the Tralee, Triangle and Neranghi North properties. Further, 3.2km of new fencing or fence maintenance was carried out during 2022.

Habitat Management & Ecological Thinning

During the reporting period, habitat augmentation was undertaken with 159 nest boxes targeted for Small Gliders, Greater Gliders, Microbats, Turquoise Parrots, Brown Treecreepers and Pale-headed Snakes installed on the Offset Properties of Bimbooria, Roseglass, Velyama West, Louenville, Wollandilly, Wirradale, Kelso and Mt Lindsay. This brings the total nest boxes installed on the MCCM BOA to 327.

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 2022. The priority weeds identified included legacy weeds inherited from previous owners management regimes such as Buffel Grass, African Love Grass, Pattersons Curse, Marshmallow, Turnip, Fleabane, Common Thorn Apple, 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 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 2,504ha 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 adopting the "monitor, measure and manage" approach to pest animal management; which will allow WHC to implement adaptive management in response to changes being measured through monitoring pest animal species and numbers specific to the different geographical regions of the MCCM BOA. Pest animal monitoring primarily utilises remote sensor cameras for pest animals generally in accordance with the NSW DPI Monitoring Techniques for Vertebrate Pests as cameras now provide the best option of detection for the greatest range of species as well as being complemented by pest animal sighting reports. 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, generally scarce but in medium abundance on some properties. Foxes and Deer are seasonally variable but recorded in medium abundance on some properties. All other pest animal species recorded as scarce to low abundance levels across 2022. 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 pest animal control program across the MCCM BOA with routine 1080 baiting and canid pest ejectors plus Hoggone baiting and trapping programs for Feral Pigs

undertaken throughout 2022. During the reporting period; the 1080 baiting program removed 600 Foxes and/or Wild Dogs from 1762 baits presented and removed 24 Foxes and/or Wild Dogs from 174 canid pest ejectors. The Feral Pig control programs resulted in 185 of 302 Hoggone baits taken; resulting in 34% and 61% of the baits respectively being taken by target pest animals with a further 355 Feral Pigs trapped in 2022 across MCCM BOA. Night time open range shooting programs were implemented in conjunction with the other pest animal programs resulting in an additional 12 Feral Pigs, 12 Foxes, and 3 Deer being controlled in 2022. Feral Goat harvesting during the reporting period resulted in 183 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)). Throughout the reporting period there was above average rainfall, with a number of flood events in the region. A total of 66 observations were recorded within the MCCM BOA with only 4 locations requiring targeted additional track maintenance to mitigate further erosion and sedimentation. The remaining tracks/drainage structures are maintained during routine WHC Biodiversity fire break track maintenance program. There are also a number of legacy erosion sites inherited from previous owners management regimes that are subject to a separate annual inspection process and updates to the WHC erosion register made. During the reporting period, monitoring or remediation actions and investigations commensurate to the risk were undertaken for the 14 erosion sites identified within MCCM BOA.

Grazing Management

MCCM BOAs continued to be destocked and no strategic grazing occurring during the reporting period. There were 21 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 2022 due to the number of heavy rainfall events resulting in damaged fences.

Bushfire Management

In accordance with the BMP, annual fuel load monitoring was undertaken between September and November 2022 as part of planning and assessment of bushfire hazard and ecological burn program for 2023; with the results indicating moderate to high overall fuel loads present. During the reporting period, no bushfires occurred and no woodland ecological burns were possible across 2022 due to excessive fuel moisture and above average

rainfall; but a brief window in June 2022 allowed two grassland ecological burns to be undertaken with 9.8 hectares burnt with moderate intensity on Wollandilly and 49.2 hectares of grasslands burnt on Onavale with moderate intensity. Other fire management implemented by WHC during the reporting period was maintenance carried out as required on 584.4 kilometres of fire trails to a zero fuel barrier standard across the MCCM BOA. WHC maintains regular communications throughout the reporting period with both the Liverpool Range and Namoi-Gwydir Zone RFS teams around planning of WHC BOA site ecological burn programs as well as maintain contact points in case of emergency. WHC maintains a specialist fire fighting contractor for an oncall engagement during the fire season to respond in the event of a bushfire on WHC BOAs and non-mining lands.

Threatened Flora Fencing

During the reporting period, threatened flora inspections were completed on the 56 known threatened flora sites for Tylophora linearis, Pomaderris queenslandica, Thesium australe, Dichanthium setosum and Digitaria porrecta within the MCCM BOA with each site is maintained with a total of 46.2km of demarcation fencing around all site perimeters and signage to mitigate access and inadvertent disturbance. During the reporting period, one new site and 37 metres of new demarcation fencing was installed on Teston South Offset property.

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 2022 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 2022, 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. An artificial cross-pollination trial was attempted in May 2022 with the aim of controlling the pollination of the species with two individual plants trialled but neither plant producing follicles in 2022.

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 previously

collected during 2014/2015; with these ongoing germination and propagation trials resulting in an additional 70 Pomaderris queenslandica being translocated adjacent to the existing enclosures within MCCM Offset Properties in May 2022. Monitoring of the translocated seedlings planted between 2020 and 2022 has recorded 95.2% survival including flowering and seed production from these plants during 2022. Successful seed collection during the reporting has provided the opportunity for further germination and propagation trials with an additional 8.2g of Pomaderris queenslandica seed collected from the Rosevale reference population. In 2020, topsoil containing Pomaderris queenslandica seed was relocated from MCCM and was stockpiled prior to being translocated to a dedicated area constructed with exclusion fencing on the Teston South Offset property. During the reporting period, it was observed that 12 Pomaderris queenslandica had germinated at the stockpile area, with a further 134 germinating in the translocation area.

Monitoring Program

During the reporting period, the ecological monitoring program of the Maules Creek BOA included winter bird surveys that were undertaken in June/July 2022 and annual spring flora monitoring of 92 plots across 13 vegetation zones (VZs) undertaken between October and December 2022 with the fauna monitoring program including 124 standardised bird survey sites, 30 echolocation sites and 24 passive acoustic recorder sites undertaken between January 2022 and November 2022. During the winter bird surveys, six threatened species (Square-tailed Kite, Speckled Warbler, Dusky Woodswallow, Grey-crowned Babbler, Little Lorikeet and Turquoise Parrot) were recorded. During flora monitoring, two VZs (North-west Slopes Dry Sclerophyll Woodlands (Nandewar) – Good condition and New England Grassy Woodlands (Nandewar) – Good condition) were recorded as meeting or exceeding completion criteria for all four biometrics. Native plant species richness (NPS) completion criteria (native species richness benchmark for relevant biometric vegetation communities) was met or exceeded at all 13 VZs. Native overstorey cover (NOS) completion criteria (minimum overstorey cover benchmark for relevant biometric vegetation communities) was met or exceeded at 5 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 VZs. Comparison of individual plot data shows that NPS increased from 86% last year to 90% of plots meeting or exceeding completion criteria in 2022. Native overstorey cover (NOS) increased from 33% last year to 40% of plots meeting or exceeding the completion in 2022. Native midstorey cover (NMS) slightly decreased from 41% last year to 38% of plots meeting or exceeding the completion criteria in 2022. Native ground cover grass (NGCG) remained consistent with 91% of plots meeting or exceeding the completion criteria in 2021 and 2022. A total of 122 bird species were recorded at 135 standardised bird survey sites compared to 111 species across 66 sites in 2021. Species richness by habitat indicated 101 species were recorded in 36 woodland sites (average 20.3, range 3 to 41), 51 species in 33 revegetation/rehabilitation sites (average 8.9, range 0 to 23), and 105 species in 31 naturally regenerating sites (average 20.5, range 5 to 34). Bird survey site access and survey replication was heavily impacted by large rainfall events and flooding. Up to 19 species of

microbat were positively identified from echolocation recordings across 30 sites including five species listed as threatened under the BC Act. Species richness values ranged between 0 and 18. By habitat, 19 species were detected in remnant woodland sites (average 9.86, range 0 - 18), 13 species in naturally regenerating sites (average = 5.9, range 0 - 12) and 10 species in revegetated woodland sites (average 1.6, range 0 - 10).

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 September 2023.

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 2022 including:

- Funding was utilised to manage Swift Parrot mainland winter monitoring program, implementing new survey protocols to evaluate habitat use and movement patterns across south-east Australia;
- Targeted Monitoring Surveys for Regent Honeyeater was funded as well as trialling of nest-protection measures and Noisy Miner management plus the coordination of range-wide volunteer surveys, newsletter and maintenance of sightings database and coordination and fieldwork for captive release program; and
- Critical habitat mapping and use surveys plus genetic testing and analysis for South-eastern Long-eared Bat found high genetic diversity across its entire range. Critical habitat maps will allow more cost-effective management and protection from high intensity fire and forestry activities.

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 2022 clearing program occurred during March - April 2022 and consisted of the clearance of a total of 15.08ha to facilitate the expansion of the mining pit area and improve heavy vehicle access roads.

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 2022 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 2022 clearing works:

- *Microchiroptera* (Microbats)

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, and was approved by DPIE in August 2022. 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 1 September 2022 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 21 extant sites including fencing, potential disturbance

and photographic records. Any required fence maintenance identified during the audit was noted in the resulting 2022 Annual Site Audit report. All Aboriginal cultural heritage objects recovered from MCCM are stored securely at the Red Chief Local Aboriginal Land Council as part of an existing 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 main change to the revised (and now approved) MCCM AACHMP is an update of the methodology for archaeological inspection of clearance areas. As such, 14 hectares of 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. The inspection of the MCCM FY2022 annual clearance areas was undertaken in accordance with the procedure outlined in section 6.4.2 of the revised (but then not yet approved) AACHMP.

Due to unforeseen delays in the approval of the revised AACHMP, the same MCCM FY22 annual clearance areas were subject to a second campaign of archaeological clearance, this time using grader scrapes (in accordance with section 6.4.2 of the older, approved AACHMP). On 28-29 March 2022, an archaeologist and two RAPs visually inspected 13 grader scrapes constituting 26 separate spits across the clearance areas, totalling 12 km of surface inspection. Archaeological monitoring identified one previously unrecorded isolated artefact constituting one new Aboriginal cultural heritage site, which has since been registered on AHIMS (Leard SF IA17). Once approved on AHIMS, the status of the site was updated to ‘destroyed’.

On 22-23 November, the FY2023 annual clearance areas were subject to surface inspection by an archaeological clearance team (consisting of two archaeologists and two RAPs) in accordance with section 6.4.2 of the approved MCCM ACHMP (August 2022). Although the main clearance area was effectively inspected, the inspection of a number of proposed drill pads and associated tracks is not yet complete. As a result, the FY2023 annual clearance areas will be completed in January 2023. A report outlining the results of the FY2023 clearance will be prepared in January 2023 following completion of the task.

Archaeological Due Diligence Assessments

In addition to proposed annual clearance areas, several small infrastructure projects were undertaken within 2022. In accordance with the MCCM AACHMP and industry best practice, any proposed ground disturbance was subject to an Aboriginal Due Diligence Assessment prior to commencement of works. The primary purpose of a Due Diligence Assessment is to ensure that no Aboriginal objects will be harmed by the proposed works. In September 2022, an Aboriginal Due Diligence Assessment was undertaken for the proposed installation of 12

ground water monitoring bores in and around the MCCM. No Aboriginal objects were identified at any of the proposed drill pad locations.

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 the near future.

Aboriginal Heritage Conservation Strategy (AHCS)

As mentioned above, 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 due to the COVID-19 pandemic. The results of the Cultural Values survey will be presented to RAPs during 2023 meeting, after which a 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, although the newly approved AACHMP includes revision of this schedule to annual meeting. In accordance with the revised AACHMP, one RAP meeting was held during 2022, and was open to all RAPs. Despite difficulties of the COVID-19 pandemic, the meeting was held in person in Boggabri in June 2022.

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 2023, several aspects of cultural heritage work will continue, including the implementation of the newly revised MCCM Aboriginal Archaeology Cultural Heritage Management Plan (AACHMP), recently approved. In particular, the AACHMP was 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 was updated by

Whincop Archaeology, reviewed by Whitehaven Coal, and approved by DPIE, was 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 was to remove the use of grader scrapes from the process, as it is considered both ineffective and unnecessarily arduous work. Instead, the ground surface of all Aboriginal cultural heritage sensitive areas will be inspected prior to land clearance works.

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 MCCM HHMP was revised in 2021/2022 and was approved by DPIE on 16 March 2022.

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. The recently approved HHMP (March 2022) includes performance measures for the protection and management of seven (7) historic heritage sites.

6.8.2 Environmental Performance

A site inspection of all known historic heritage sites within the vicinity of the Maules Creek Coal Mine 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 and headstones within the Velyama Burial Ground. All historic heritage sites were considered to be in a generally stable condition. A structural engineering report on the Velyama Shearing Shed identified several necessary repairs to the structure in order to maintain long-term structural integrity.

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).

The Warriahdool Hut is in a deteriorating condition due to natural weathering and insect activity. A report prepared by Whincop Archaeology has recommended that this structure be deliberately demolished to minimise impact to the underlying archaeological deposit; measured drawings and a photographic archive have already been compiled for this heritage site.

6.8.3 Proposed Improvement Measures

Biennial monitoring of historic heritage sites will continue in 2023, with maintenance and weed control to be undertaken as required. The demolition of the derelict, collapsing structure at Warriahdool Hut will improve the safety of this site and will ensure its associated archaeological deposits can be effectively maintained. A Restoration project aimed at repairing the structure of the Velyama Sheering Shed will be conducted in 2023.

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 2022 reporting period an analysis of employee transport records demonstrates waged employees utilising the bus services ranged from 75.06% to 80.14%. This has remained similar to previous years, due to indirect factors such as COVID-19 and flooding.

There were three (3) 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	29370	22046	75.06
Q2	29807	23886	80.14
Q3	28204	22008	78.03
Q4	25970	20759	79.93

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 1.5% for general waste when compared with the previous reporting period.

A total of 649t of general waste and 1269 kl of septic waste was removed in the 2022 reporting period. Approximately 250 t of solid recyclable material and 737 kl of used oils were collected for recycling by a licenced contractor. 96t of regulated waste and 4 Kl 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 2021-2022 Water Year

Passive Take Licenses						
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	76	93	48
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		45
WAL 12613	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 11 Maules Creek Groundwater Source	50	50		0
WAL12491	NSW Murray Darling Basin Porous Rock Groundwater Sources	Upper Namoi Zone 11 Maules Creek Groundwater Source	77	154	2	2
WAL29467	NSW Murray Darling Basin Porous Rock Groundwater Sources	Gunnedah - Oxley Basin Mdb Groundwater Source	306	382.5	633	175
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	1000		458
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	132.4	132.4

WAL12718	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin's Leap) Groundwater Source	102	204	65.8	65.8
WAL12722	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 4 Namoi Valley (Keepit Dam To Gin's Leap) Groundwater Source	77	154	7.7	7.7
WAL12811	Upper and Lower Namoi Groundwater Sources 2003	Upper Namoi Zone 5 Namoi Valley (Gin's Leap to Narrabri) Groundwater Source	135	270	2.9	2.9
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

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 Conditions P1, L1, L2and 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 8** and **Figure 9**. A summary of the surface water quality findings from the reporting period is provided below.

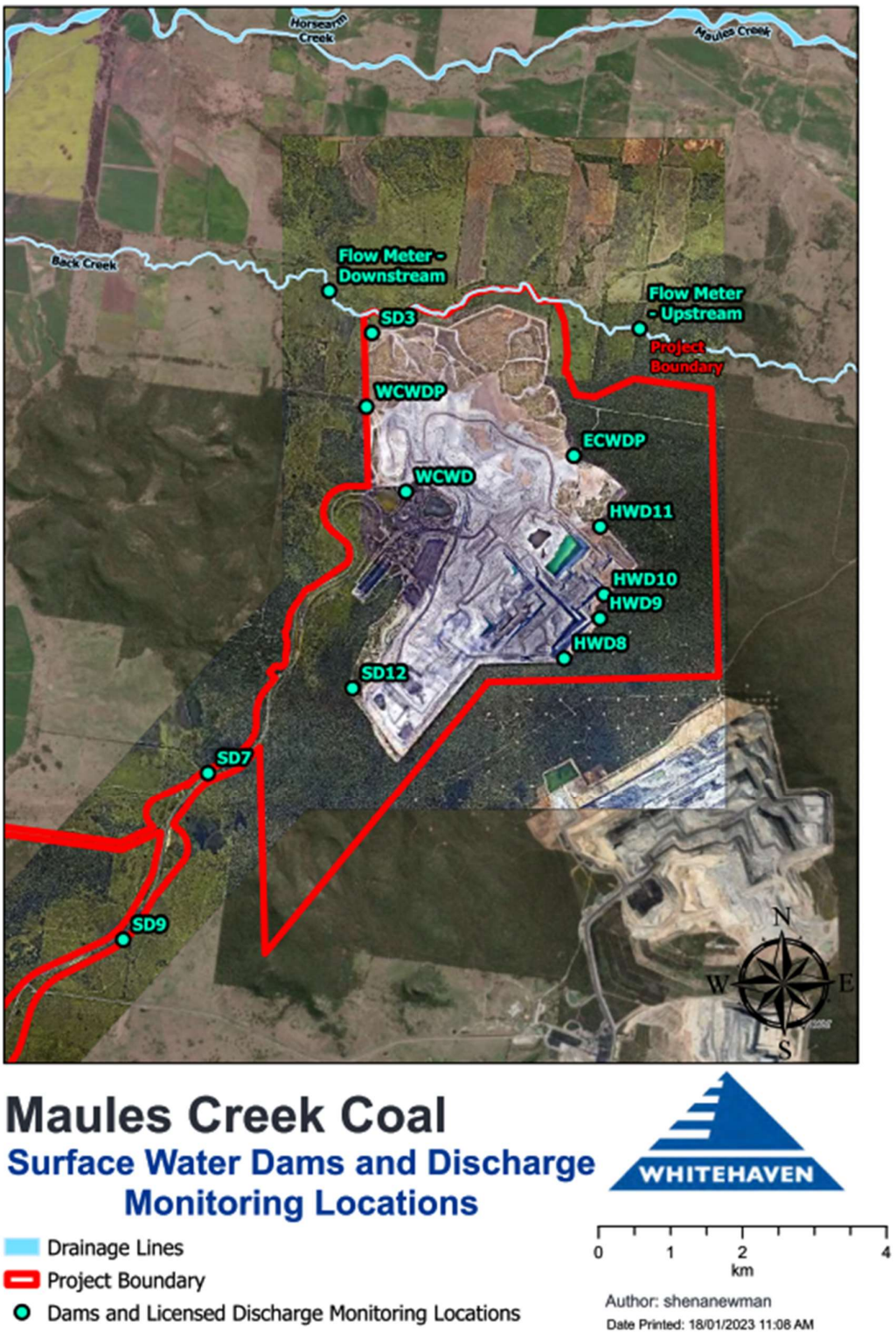


Figure 8 Surface Water Dams and Discharge Monitoring Locations

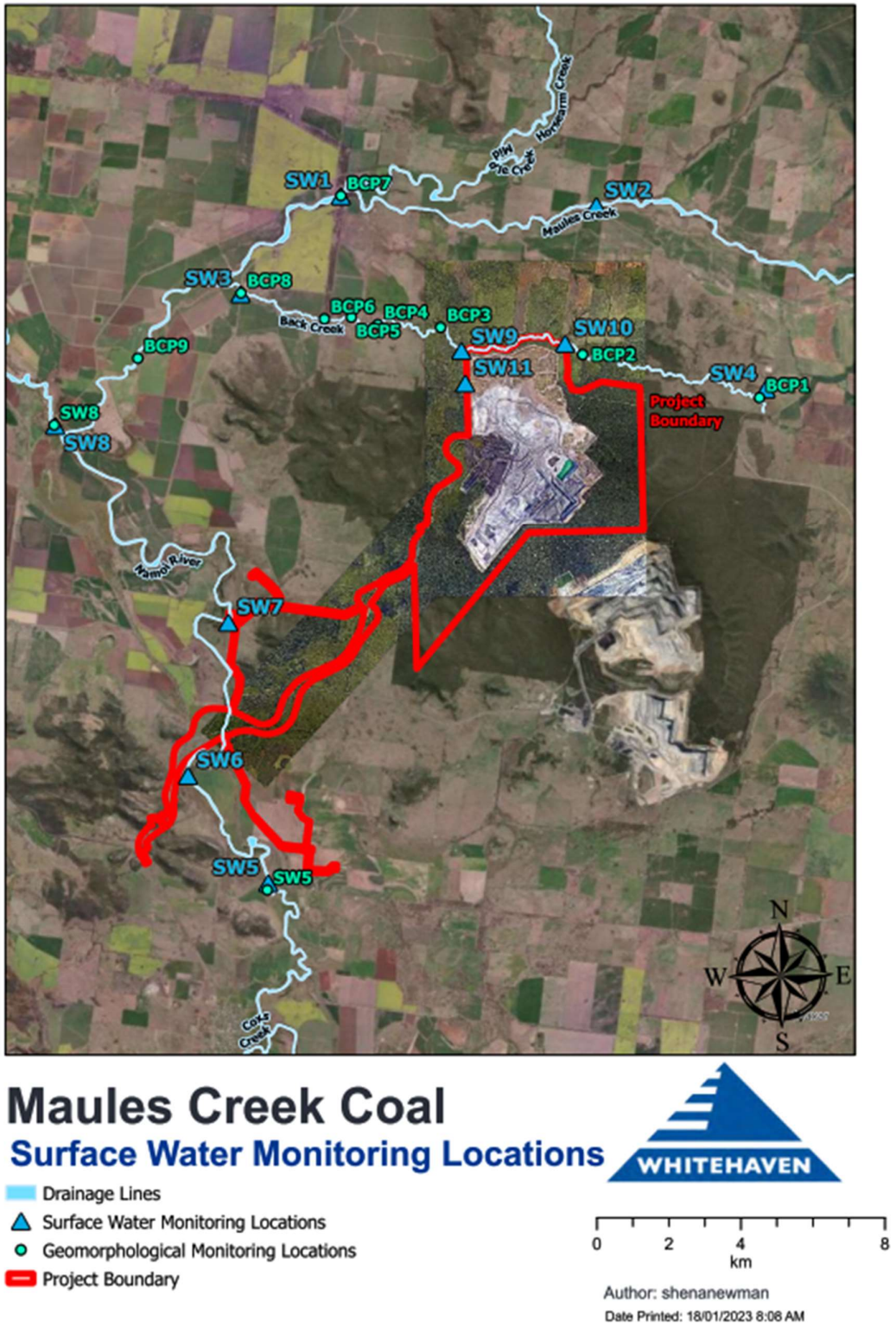


Figure 9 Surface Water and Geomorphological Monitoring Locations

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 2022 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 did not occur during the reporting period. This is attributed to the higher than average annual 2022 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

Controlled discharge events occurred at MCC during the reporting period. All discharge events were in compliance to the EPL and WMP. Controlled discharge events occurred from SD9, HWD9, HWD10, HWD11 and the WCWD. Each discharge event occurred when rainfall exceeded 38.4mm over a consecutive 5 day period. Water samples were collected from the dams in accordance with the licence requirements.

In accordance with MCCM EPL within 12 hours of discharge from the licensed discharge locations, samples were also required to be collected from the ECWDP, WCWDP, flowmeter – upstream and flowmeter – downstream monitoring locations. All water samples collected were recorded and analysed in accordance with the licence requirements. Water quality results for all discharge events are summarised in Appendix D. During this time, water balance modelling was also undertaken for MCCM and is discussed in Section 7.4.

Geomorphological Assessment

Stream and riparian vegetation health assessments were conducted by a qualified consultant in December 2022 at upstream and downstream locations along Maules Creek, Back Creek and the Namoi River. All sites along Back Creek and Maules Creek had water and were sampled, except for BCP8 which was dry. The Namoi River sites were also sampled, except for Henriendri TSR which was inaccessible due to boggy ground. 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).

Macroinvertebrate communities differed between the three waterways sampled, but there was no difference between the control and impact sites. The main factor driving macroinvertebrate community composition was the hydrological regime of each waterway. Flow in Maules Creek, although it had some fluctuations corresponding with rainfall events, did not experience the extreme high flows of Namoi River, nor the low flow and extended drying that occurred in Back Creek. Both flooding and drying constitute disturbances in river ecosystems, potentially reducing macroinvertebrate abundance and diversity. Sensitive macroinvertebrate taxa (those with a SIGNAL score greater than 7, and vulnerable to the sudden changes in flow velocity or water quality caused by flooding and drying) were scarce in Back Creek and Namoi River. The continuous flow in Maules Creek, and the absence of large-scale flooding potentially explains why Maules Creek had higher SIGNAL Scores than the other two waterways, and why the invertebrate community was in better ecological health.

Water quality in Back Creek was within ANZG (2018) range for most variables except for DO at all sites, turbidity at three downstream sites, and pH at BCPX. There was a significant difference between turbidity at sites upstream of the mine and those downstream. Turbidity is caused when sediment-laden runoff enters the stream, and the difference may be due to the sandy substrate surrounding the creek at upstream sites, and the black soil surrounding the creek at downstream sites. However, there may also be some impact from sediment runoff from MCCM if this has not been contained. Apart from turbidity, water quality was relatively consistent along Back Creek.

Riparian vegetation was disturbed at most sites from historical agricultural activities in the surrounding landscape. The groundcover layer was relatively healthy and has recovered from the drought following months of rainfall. There was no difference in RARC between upstream and downstream sites along Back Creek, where scores were relatively low at most sites.

Riparian vegetation and macroinvertebrate communities appear to be in moderate condition, and have changed little since previous sampling in autumn. The main influence on ecological communities appears to have been the regular rainfall and frequent flooding. There is no indication of a direct impact from MCCM.

Turbidity in Back Creek downstream of the mine was higher than at sites upstream of the mine. This was the same situation as the previous survey. A likely explanation for this is the greater prevalence of black soil surrounding the creek at downstream sties compared to the sandy soil upstream. While there was water at most sites in Back Creek, flow was not continuous and at the time of sampling water level was receding.

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 9**.

The groundwater sampling sites on privately owned land are sampled biannually for depth to water and water quality. The regional bores are currently sampled monthly for depth to water and quarterly for water quality. Once the baseline groundwater quality of the regional bore network has been established, water quality monitoring will be conducted on a biannual basis as per the WMP. Bores are sampled in accordance with the 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 2022 calendar year, with the cumulative rainfall departure (CRD) largely increasing over this period. Over the reporting period, groundwater levels remained stable at REG4 and REG5, while declining trends with increases late in the year were observed at MAC1280, and RB05A, with increasing trends observed at REG3, REG6, REG7A (after initial decrease), REG12 (slight), REG13 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 RB05A) are likely attributed to continued depressurisation of this formation as mining progresses, which is consistent with model predictions.

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 2022. 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 2022 monitoring period are consistent with historical trends. Five bores triggered with respect to TDS concentrations (REG3, REG5, REG7A, REG12, REG13, RB05A) while seven bores triggered with respect to sulfate concentrations (MAC1280, 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 2022 all of the bores recorded relatively stable groundwater levels, with some increases greater than 1m observed in BRE2, Morse and Tralee bores, which are 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. Increased values of EC and TDS in BRE2, which have been present since 2017, decreased significantly over the 2022 reporting period to be closer to other private bores. BRE2 did however see a significant increase in pH, exceeding the trigger value. 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 2022 reporting period, ANZECC (2000) guideline values for dissolved metals (largely iron and manganese) were exceeded in the Bas1, Morse, MOR2, and Teston bores.

Vibrating Wire Piezometers

The locations of Vibrating Wire Piezometers (VWPs) is illustrated in 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 2022, decreasing trends in certain coals seams that are monitored by REG01 (VW4), 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, REG02, RB05_VW1). It is noted that most of the previously mentioned bores with decreasing trends also showed an uptick in groundwater level at the end of the 2022 reporting period, indicating a delayed response to increased rainfall. Groundwater levels in REG07 and REG09 have either remained stable or slightly risen over the 2022 monitoring period, suggesting that mining induced depressurisation has not extended this far to the east/southeast.

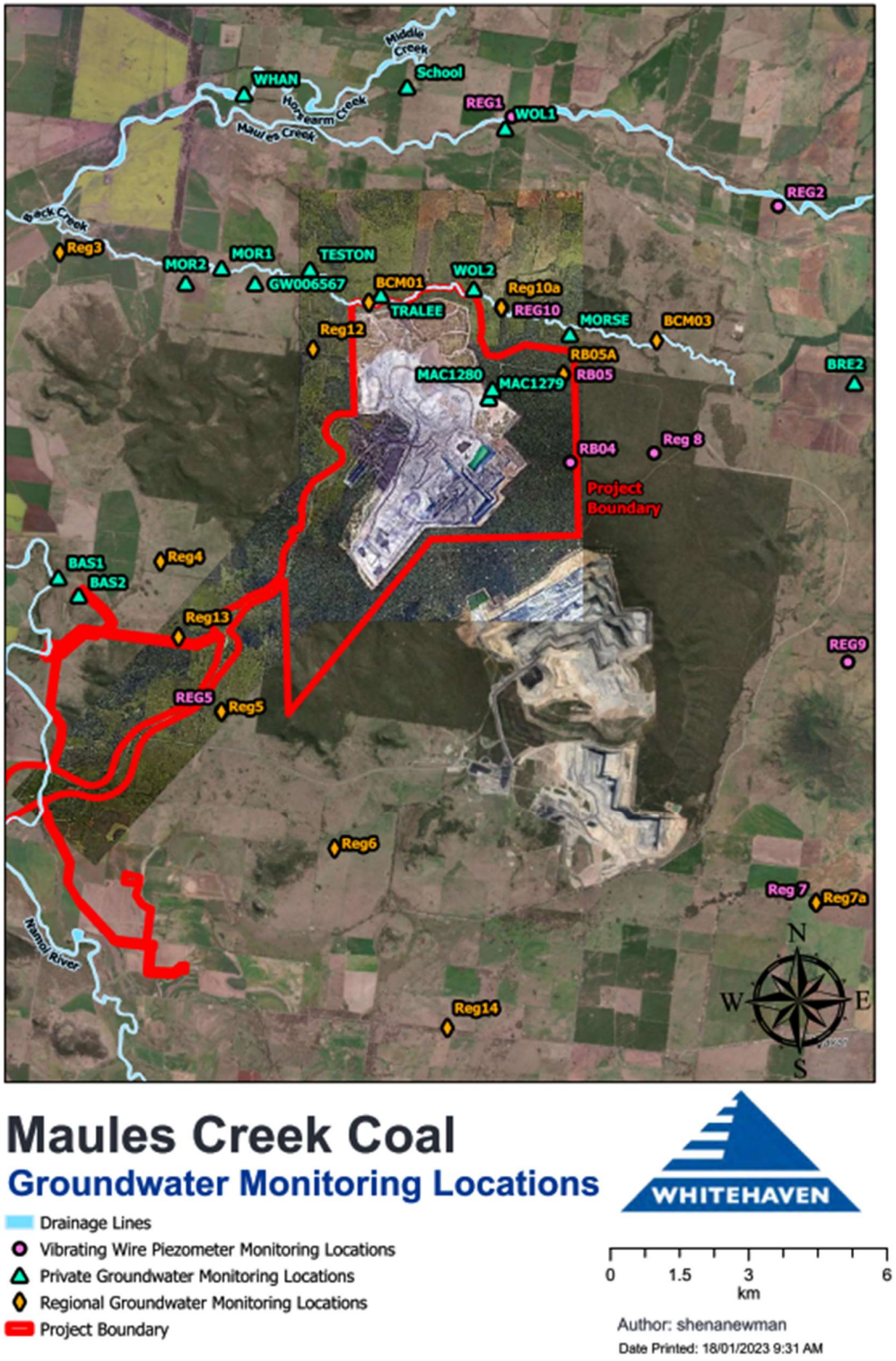


Figure 10 Groundwater Monitoring Locations

7.3.2 Trigger events

An analysis of trigger events as per the WMP was undertaken and is shown within figures and tables (refer Table 18 & Appendix E). 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 2022 reporting period, ANZECC (2000) livestock and/or irrigation guideline values were exceeded for pH (MAC1280, MOR1, and BRE2), sulfate (REG13), and some dissolved metals (MAC1280, REG3, REG5, REG6, REG7A, REG13, RB05a) (refer Appendix E, Table E-3). These exceedances are generally consistent with historical data, noting that MAC1280 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	Yes	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. There has been a near 50-fold increase in sulfate concentration in the December sampling round. This site should be resampled and if the elevated concentrations of sulfate persist the influence of the out of pit waste rock dump should be considered.
RB05A	Merriown Seam	Yes – falling	Yes	No	Water level falling as predicted due to proximity to active mining, with a slight rise in November and December. TDS concentrations have fallen over 2022 after having previously gradually increased since 2018; however, five consecutive samples have still remained above the lower trigger value.
REG12	Boggabri Volcanics	Yes - rising	Yes	No	An approximate 1m increase in groundwater level has been observed, which is consistent with climatic conditions. TDS concentrations fell during the first monitoring period before increasing for the remainder of 2022. 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/variations in the sampling methodology.
REG13	Boggabri Volcanics	Yes – rising	Yes	Yes	Over the 2022 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	Yes - rising	No	Yes	Over the 2022 reporting period, groundwater levels increased, which is consistent with climatic conditions. Sulfate concentrations for each sampling event (except December) exceed the upper trigger value, although values are still within historical ranges.
REG3	Boggabri Volcanics	Yes - rising	Yes	Yes	Historical water level observations suggest that this bore is likely impacted from nearby alluvial extraction. Over the 2022 reporting period, groundwater levels increased, which is consistent with climatic conditions. The upper trigger level was exceeded in every sampling event, although this directly correlates to significant rainfall over the reporting period. Sulfate concentrations fell slightly from the peak in December 2021 but remained above the trigger value and saw another December increase at the end of year. Further monitoring is required to determine if sulfate and TDS 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. A slight increase in groundwater level can be seen at the end of the year. Minimal increase in levels during the wetter than average 2020-2022 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 2022 reporting period are generally stable; however, measurements from March to June fall just 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 2020-2022 period.
REG6	Boggabri Volcanics	Yes – rising	No	Yes	Over the 2022 reporting period, groundwater levels increased from below lower trigger values to above, which is consistent with climatic conditions. Sulfate

					concentrations increased for the first two measurements of 2022 followed by a decrease, falling below the lower trigger in December 2022, although this is consistent with historical records and is not considered to be a cause for concern.
REG7A	Alluvium	Yes – rising	Yes	Yes	Groundwater levels fell until September before a sharp increase from October to November following higher than average rainfall. 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), 2021 (296 ML/year) and in the current 2022 reporting period (110 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, 2022). 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 2022 is as follows for the various model iterations: AGE (2014) – 632 ML/year; AGE (2018) 450 ML/year; and AGE (2021) 603 ML/year. Predictions of groundwater inflow over 2022 is 899ML/year according to the AGE (2022) model update. Estimates of inflow from current modelling (AGE, 2022) are approximately triple the estimated inflows from the site water balance model (WRM, 2023). 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 2022 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 2021-2022 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, 2022) 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, 2022). Modelled water levels for the AGE (2022) model are provided in Appendix E for comparison with monitoring observations. The AGE (2022) groundwater model contains observed rainfall data to June 2019, and uses a synthetic average rainfall dataset after that time. Therefore, the AGE (2022) 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 (2022) 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 2022 compared to the previous year. The estimated inflow of 110 ML/year (0.3 ML/day) (WRM, 2023) is a reasonable matches 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. Due to major flooding events in 2022, additional groundwater monitoring bores are scheduled to be completed in 2023.

7.4 SITE WATER BALANCE

The site water balance for the reporting period is presented below in Table 19 Site Water Balance (Calendar Year 2022).

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 10 of MCCM operations. Rainfall and runoff (4,606 ML) was significantly higher than predicted in the EA for Year 10 (1,103 ML, respectively). This is attributed to the higher than average rainfall received at MCCM in 2022. Actual Namoi River pumping inflow (110.6 ML) was much lower than predicted in the Year 10 (1,860 ML, respectively).

Net CHPP water usage (3,342 ML supply minus 2,460 ML recovery = 882 ML net) is significantly less that the consumption predicted in the EA for Year 10 (2,598 ML, respectively). This is potentially due to the differences between the predicted and actual proportion of ROM coal that is bypassed (and therefore not washed).

Dust suppression usage (1,139 ML) was significantly higher than predicted in the EA for Year 10 (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 (110 ML) are within the range of those predicted in the EA for Year 10 (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 2022)

Aspect	Volume (ML)
Change in Storage	
Start of 2022	1,736
End of 2022	2,988
Net Change in Storage	1,252
Water Inflows	
Namoi River Pumping	111
MAC1498 Bore	0
Olivdene Bore	0
Brighton Bore	0
Roma Bore	0
BCM Bore	0
Rainfall & runoff^	4,606
CHPP Water Recycling	2,460
In-pit Groundwater Seepage[4]	110
Total Inflows	7,287
Water Outflows	
CHPP water use	3,342
Dust suppression	1,139
Evaporation from storages[3]	564
Clearing / construction process water	67.7
Offsite discharge	528
Licence Discharge[5]	103
Total Outflows	6,035
Water Balance (2022)	1,252

1 Includes recorded volumes in RWD2 and MWD1&2, as well as estimated volumes in sediment dams and pits
2 For a balanced system, this value should equal the "net change in storage"
3 The modelled suggests that overflows would have occurred from the sediment dams in October 2022.
4 Overflows from SD9 occurred in February 2022. SD9 was not modelled in the MCCM GoldSIM model.
5 Includes eastern pipeline and WCWDD discharges

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. 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	• Safe, stable and non-polluting • Constructed landforms drain to the natural environment
Final void	• Minimise the size and depth of the final void as far as is reasonable and feasible • Minimise the drainage catchment of the final void as far as is reasonable and feasible
Surface Infrastructure	• To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise
All land, other than the final void	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: ○ 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	• 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 2021	This Reporting Period 2022 (Actual)	Next Reporting Period 2023 (Forecast)
A. Total mine footprint	1,772	1,790	1,757
B. Total active disturbance	1,537	1,514	1,442
C. Land being prepared for rehabilitation	41	40	20
D. Land under active rehabilitation	235	275	295
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 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 2022 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 During 2022 the MOP was superseded by the Maules Creek Mine Complex Forward Plan which is available on the Whitehaven Coal website.

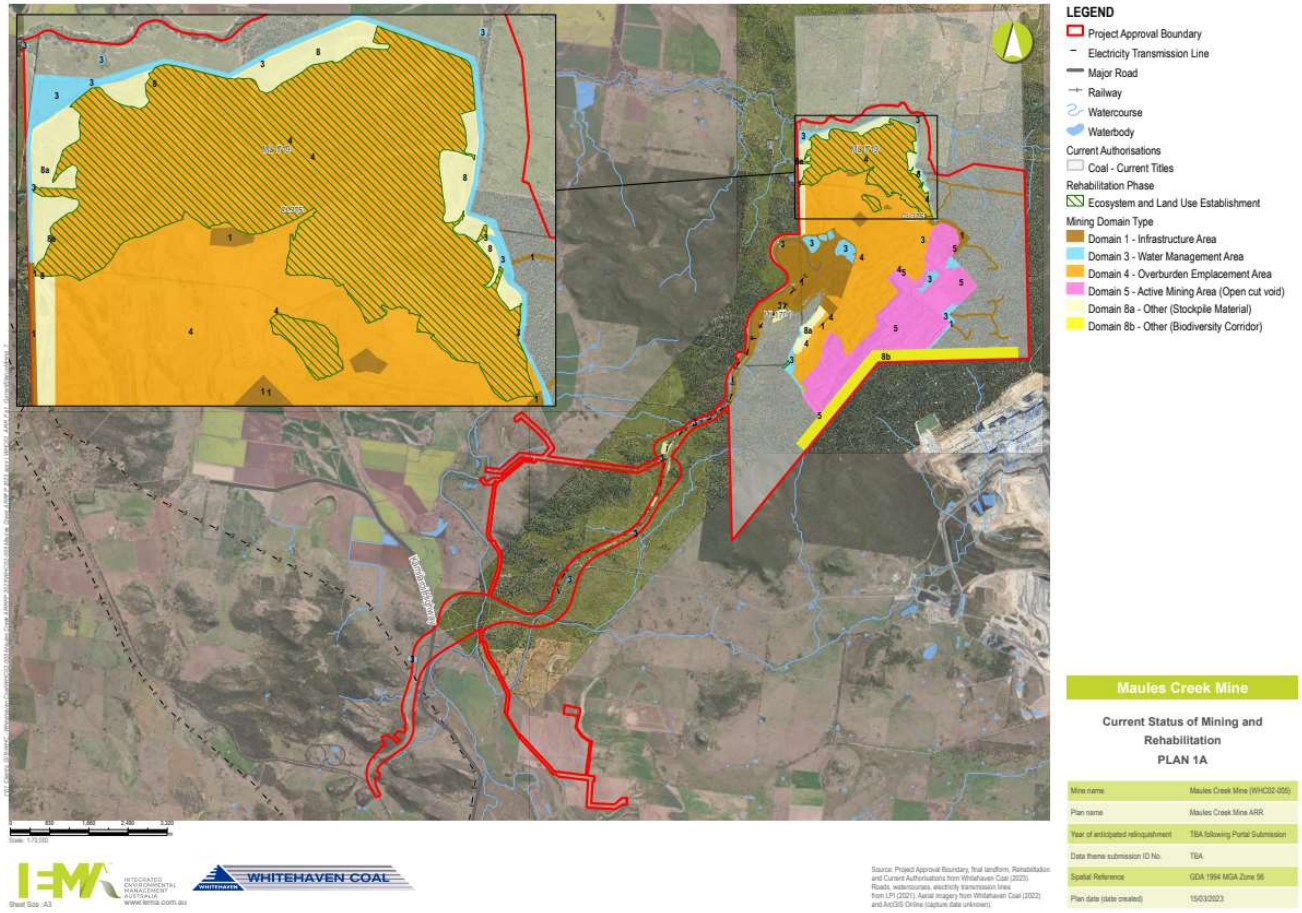


Figure 11 Mining and Rehabilitation Year 1 – FY203

8.1.1.8 Monitoring

Greenfields Agricultural and Environmental Services (Greenfields) was commissioned by Whitehaven Coal Limited (Whitehaven) to undertake the 2022 annual rehabilitation monitoring at Maules Creek Coal Mine (MCCM). Monitoring was conducted in accordance with the MCCM Mine Operations Plan (Mod 8), Mine Site Rehabilitation Plan (2016), EPBC 2010/5566 and the MCCM Rehabilitation Monitoring Procedure and follows previous monitoring conducted by AMBS Ecology & Heritage Pty Ltd (AMBS) in 2020 and 2021. On ground monitoring was undertaken by Benn Knott, Senior Ecologist with Greenfields on the 22nd and 23rd November 2022. Monitoring of rehabilitation at the MCCM was undertaken to:

- evaluate the progress of rehabilitation areas towards meeting the rehabilitation performance indicators and completion criteria;
- determine the requirement for any maintenance and/or contingency measures (e.g. supplementary plantings, erosion control and weed control); and assess the success of MCCM rehabilitation methods/practices.

Fixed monitoring plots measuring 20 x 50 m were established at each rehabilitation and reference monitoring site. Within each plot, a 20 x 20 m quadrat were incorporated to assess floristic composition. The 20 x 20 m quadrat are sampled using a nested method (which segments the quadrat) as described by Morrison et al. (1995) and Lewis et al. (2008).

From monitoring conducted in 2022, a total of 199 species were identified within the eleven monitoring plots, including 132 native species and 67 exotic species. This is a reduction of 4 native species and 8 exotic species from the previous years (2020, 2021) monitoring combined.

In conjunction with the 2020 and 2021 monitoring programs the following species on the seedling list were not recorded in the 2022 monitoring regime; Cassinia spp., Acacia hakeoides, Acacia cheelii, Maytenus cunninghamii, Myoporum montanum, Psydrax odorata, Chrysocephalum apiculatum, Chrysocephalum semipapposum, Dichopogon spp., Hardenbergia violacea, Jasminum lineare, Jasminum suavissimum, Neptunia gracilis, Olearia elliptica, Solanum tetrathecum and Eulalia aurea.

Also the following species on the planting list were not recorded as part of the 2022 monitoring regime; Callitris glaucophylla, Notelaea microcarpa, Pittosporum angustifolium, Alstonia constricta, Eucalyptus melanophloia and Eucalyptus blakelyi. Numerous juvenile species of Eucalyptus exist, however could not be readily identified in their current growth form and were subsequently recorded as Eucalyptus spp.

Native species richness declined from the previous year's monitoring, with monitoring conducted in 2022 recording a total average of 28.6 species across all sites and 2021 recording a total average of 31.4. All sites monitored however recorded values well above the 3rd year mean target.

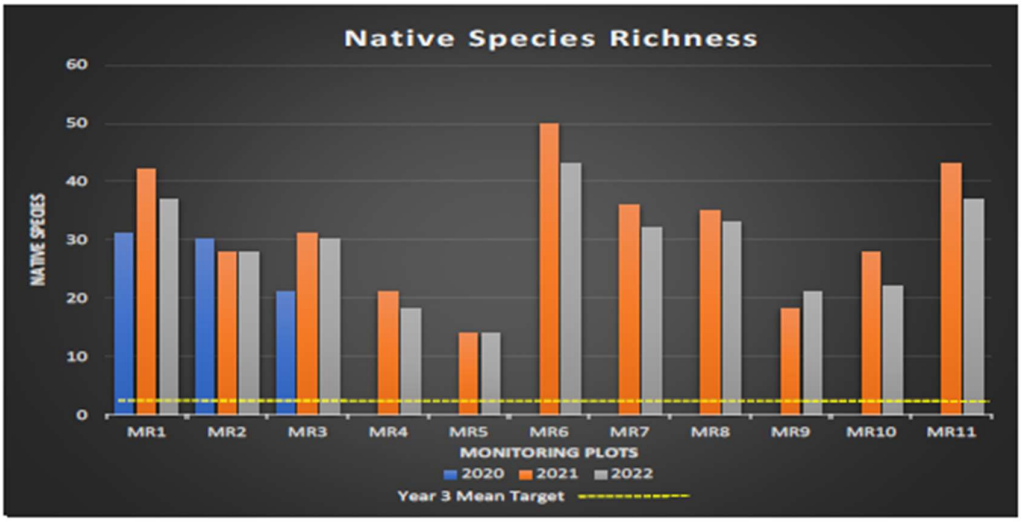


Figure 12 Native Species Richness (20 x 20 m plots) 2020, 2021 and 2022.

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.

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.

Topsoil Balance (M^3)										
Area	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**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	92,029	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	92,029	3,861,483
EA Total for rehab	-	-	-	-	-	-	-	-	-	2,368,000
Net difference	-	-	-	-	-	-	-	-	-	1,493,483

Table 22 Topsoil Balance

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.

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 2022 including:

- Annual spring surveys at potential Swift Parrot foraging habitat sites across their breeding range in Tasmania.

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. gullying and sedimentation resulting in land stability and vegetation growth issues).
- Weed and feral animal infestation.
- Poor vegetation establishment and growth (including the Box-Gum Woodland EEC/CEEC).
- 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 and 2022 rehabilitation areas.

8.1.1.14 Proposed Research and Rehabilitation for 2023

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. SIBERIAN modelling of the rehabilitation area will be conducted during the next reporting period (2023) to assist with effective final landform design.

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 2022 and November 2022. 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:

- Aboriginal Steel Art
- Bash Car 633 Narrabri
- Black & Blue Boxing
- Boggabri Lions Club
- Boggabri Public School
- Boggabri Weekly
- Boggy Ninja
- Collegians Junior Rugby League
- Coona Connections
- Future EDU
- GHFC Pty Ltd
- Gunnedah & District Historical Society Inc
- Gunnedah Athletics Centre Incorporated
- Gunnedah Baptist Community Preschool
- Gunnedah Basketball Association
- Gunnedah Bulldogs Rugby League
- Gunnedah District Aeromodellers
- Gunnedah Eisteddfod Society
- Gunnedah High School
- Gunnedah Homes for the Aged
- Gunnedah Ladies Golf Club
- Gunnedah Meals on Wheels
- Gunnedah Netball Association
- Gunnedah Pistol Club
- Gunnedah Public School
- Gunnedah Rugby League
- Gunnedah Rural Museum

- Gunnedah Show Society
- Gunnedah Touch Association
- Harmony Choir Inc
- Highlanders Women's Rugby League
- Manilla Minor League
- Manilla Show Society
- Maules Creek 100 years
- Maules Creek Campdraft Club
- Namoi Dragons Inc
- Narrabri and District Citizens Boys Club
- Narrabri Business Chamber
- Narrabri District Cricket Association
- Narrabri High School
- Narrabri Industrial Network Inc
- Narrabri Jockey Club
- Narrabri Junior Rugby League
- Narrabri Meals on Wheels
- Narrabri Rugby League
- Narrabri Shire Community Radio
- Narrabri Shire Council
- Narrabri Show Society
- Nurruby Boggabri Community childcare centre & preschool
- Nurruby Childcare Centre and Preschool
- Rotary Club of Gunnedah West Inc
- Rotary Club of Narrabri
- Spring Ridge P&C
- St Barnabas Anglican Church
- St Mary's College
- Swimming Gunnedah Incorporated
- Tamworth and District Charity Campdraft
- Tamworth Business Chamber
- Tamworth Family Support
- Tamworth Gymnastics Club
- Tamworth Pride Inc
- Tamworth Regional Council Manilla Matters Committee
- Teacher Earth Science Education Programme
- Westpac Rescue Helicopter Service

- Winanga-Li Aboriginal Child and Family Centre

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 779 personnel with 528 personnel employed with Whitehaven Coal and 251 personnel employed through labour hire contract partners. Whitehaven Coal continue to focus on local employment with 76% of MCCM employees residing in the Local Government Area's (LGA's) of Gunnedah and Narrabri (including Manilla). The remaining 24% 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 87 permanent roles, of which 47 were local residents (54% of the new recruits; and 6% of the overall workforce); and 12 relocated to live in the Narrabri or Gunnedah LGA as a result of their employment at MCCM (1.5% of the workforce). During this period, MCCM employed 22 new recruits from the Gunnedah LGA (2.9% of the workforce); and 25 new recruits from the Narrabri LGA (3.2% 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:

- 78 (approximately 15%) are Indigenous, with the percentage remaining the same as the previous reporting period;
- 143 (approximately 27%) are women, with the percentage remaining the same as the previous reporting period; and
- 33 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) apprenticeships were accepted, in which three (3) of the accepted apprenticeships were local to the region. This included three (3) Electricians and two (2) Mechanics as part of the WHC MCCM apprenticeship program. This takes the total number of apprenticeships accepted under the program to 66, 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 2022 Whitehaven spent (on an equity joint venture basis):

- $236.9m in salaries, wages, taxes and superannuation to employees
- $548.6m in royalties to the New South Wales Government
- $857.7m on mining, washing and delivering coal onto trains at our mine sites
- $387.7m 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 $700,000 under its VPA as a result of coal sales directly from the MCCM, to be spent on further infrastructure projects.

During the CY2022 period WHC spent approximately $341.8 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	2021	2022
Air quality	0	0
Traffic	2	1
Lighting	2	0
Noise	8	0
Blasting	8	1
Social impacts	2	2
Other	0	0
TOTAL	22	4

Note: a single complaint may involve multiple categories.

9.3.1.1 Complaint Trends

The total number of complaints received in 2022 was significantly lower than those recorded in the 2021 reporting period.

Air quality complaints remained equal to 2021, recording no complaints for the 2022 reporting period.

Traffic complaints decreased from 2021(2), recording one complaints for the 2022 reporting period.

Lighting complaints decreased from 2021 (2), recording no complaints for the 2022 reporting period.

Noise complaints decreased from 2021 (8), recording no complaints for the 2022 reporting period.

Blast complaints decreased from 2021(8), recording one (1) complaint for 2022 reporting period. 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 social 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 2021

A IEA was undertaken in 2021 by an independent consultancy approved by the DPI&E as required under Schedule 5, Condition 10 of the PA10_0138

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). The next IEA will be undertaken in 2024.

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 2022). Further details of any actions undertaken or proposed for non-compliances, including within the following reporting period, are summarised in Table 24.

Table 24 Non-Compliance Details and Proposed Action Plan

Non - Compliance	Date / Location	Cause	Action Plan	Estimated Completion Date
Schedule 3 Condition 12 a)	29/11/22 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 one piece of fixed plant 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

During the reporting period no official cautions, warning letters or penalty notices were issued to MCC.

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)
5/01/2022	10:26	JER02-06-OB MER02-01-PS	0.27	92.8	0.51	105.1	0.96	102.1	1.75	101.7
6/01/2022	15:33	TNN 08-40-OB	0.05	83.1	0.07	83.0	0.07	87.4	0.09	82.3
11/01/2022	15:39	JER02-10-OB	0.24	89.1	0.37	92.4	0.92	93.3	1.52	89.3
13/01/2022	15:31	HRN08-49-OB JEB06-43-PS	0.08	88.6	0.11	88.6	0.27	91.0	0.11	92.9
17/01/2022	15:45	NAG06-27-CO	0.03	101.7	0.10	98.7	0.09	102.5	0.14	103.3
18/01/2022	14:50	TSL09-41-OB	0.09	84.8	0.19	85.6	0.15	90.5	0.30	96.2
22/01/2022	15:24	MER02-07-08-PA	0.02	96.9	0.01	94.4	0.02	97.2	0.04	103.6
24/01/2022	15:21	BRA08-41-OB	0.15	87.5	0.18	92.8	0.39	99.0	0.25	89.3
27/01/2022	15:06	HRN08-51-PS	0.05	85.2	0.07	84.6	0.08	95.0	0.08	89.9
28/01/2022	15:19	TSM09-37-OB	0.06	97.8	0.08	97.4	0.07	94.0	0.11	82.6
29/01/2022	15:54	310-03-05-OB	0.06	90.0	0.11	90.9	0.22	94.9	0.34	91.9
31/01/2022	15:15	BRA08-42-OB	0.17	87.5	0.23	89.4	0.23	93.1	0.29	88.9
5/02/2022	9:30	HRN08-51-OB	0.10	98.2	0.11	102.5	0.14	113.2	0.10	104.9
8/02/2022	12:26	310-04-08-OB 310-03-06-OB JEA02-10-OB-B	0.10	89.2	0.15	94.4	0.41	96.3	0.56	89.3
10/02/2022	15:27	BRA08-37-OB BRA08-38-PS MER07-32-PS	0.19	97.2	0.39	93.1	0.42	109.0	0.55	97.3
14/02/2022	15:20	TSL09-38-OB	0.04	98.3	0.10	93.9	0.06	93.7	0.08	86.4
15/02/2022	15:25	310-04-09-OB	0.11	80.7	0.13	94.3	0.24	101.1	0.58	94.5
18/02/2022	15:28	MER02-05-OB NAG06-29-CO-B & MER Rocks	0.02	88.8	0.03	96.1	0.06	93.9	0.10	92.9
19/02/2022	15:28	BRA08-38-OB TSL09-45-OB-B	0.16	103.1	0.22	95.1	0.20	103.8	0.22	105.5
22/02/2022	15:10	310-03-01-OB	0.08	85.6	0.16	93.6	0.34	94.9	0.58	96.1
23/02/2022	15:27	TSL09-39-OB JER02-08-OB-B	0.03	98.4	0.05	112.3	0.04	101.2	0.05	87.4
28/02/2022	15:36:08 15:36:21	JER06-42-OB JER06-42-PS HRN08-50-OB	0.09 0.05	106.3 106.3	0.23 0.06	101.6 101.5	0.23 0.07	103.6 103.6	0.18 0.05	106 106
4/03/2022	15:31	JEB06-39-OB BRA08-39-OB	0.16	89.7	0.24	97.8	0.2	97.9	0.34	105.3
9/03/2022	15:32	HRN08-48-OB	0.08	99.2	0.11	93.4	0.16	91.8	0.17	109
10/03/2022	15:21	JEB06-43-OB	0.08	92.7	0.16	105.2	0.15	92.1	0.17	110.6
14/03/2022	15:32	MER 02-03-OB SW 02-NAG-PS	0.04	86.7	0.06	90.3	0.14	97.2	0.19	99.3
16/03/2022	16:31	BRA09-41-PS	0.02	79.6	0.05	84.1	0.06	91.7	0.05	87.1

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)
18/03/2022	12:44	JER07-32-OB MER08-35-PS	0.12	101.4	0.27	98.1	0.14	98.4	0.35	86.5
24/03/2022	11:32	TNN 09-40-OB BRA09-39-PS	0.09	86.5	0.1	87.1	0.13	88.9	0.23	109
25/03/2022	12:31	JEB06-44-OB	0.14	97.2	0.15	94	0.15	89.7	0.19	79.2
12/04/2022	12:20	VEL-02-08-OB	0.04	95	0.06	93.4	0.28	96.9	0.16	86.4
14/04/2022	12:26	HRN08-50-TOE	0.02	95.1	0.02	95.1	0.25	96.2	0.03	101.5
20/04/2022	12:27	TNN09-38-OB	0.08	89.1	0.09	84	0.19	92.5	0.11	96.3
21/04/2022	12:07	BRA09-37-PS	0.06	90	0.08	92.9	0.16	89.5	0.08	79.2
22/04/2022	12:26	VEL02-03-OB NAG02-01-PS-B	0.08	107.9	0.1	94.8	0.24	104.5	0.29	106.2
27/04/2022	12:36	TNN09-41-OB BRY09-39-PS	0.1	81.3	0.13	87.8	0.17	96.4	0.18	86
2/05/2022	12:15	TNN09-38-OB-B BRA09-37-PS-B	0.11	82	0.12	92.5	0.1	96.4	0.9	83.4
3/05/2022	12:40	VEL02-02-OB	0.15	84.1	0.13	91.5	0.27	91.5	0.43	86.7
7/05/2022	12:07	TNN09-39-OB-C	0.02	85	0.02	87.5	0.05	91.7	0.02	84.3
9/05/2022	12:24	TNN09-39-OB VEL02-05-OB	0.06	89.7	0.11	102.2	0.09	96.6	0.35	96.3
11/05/2022	12:03	MER06-38-OB VEL06-37-PS	0.06	81	0.09	93.3	0.1	96.1	0.21	96.6
18/05/2022	12:14	VEL02-07-OB	0.03	84.5	0.03	102.1	0.07	99.1	0.17	97.3
19/05/2022	12:13	BRA09-36-OB-A	0.12	91	0.15	99	0.14	95.3	0.21	97.4
23/05/2022	12:23	MER06-37-OB JEB06-45-OB	0.05	87	0.09	90.8	0.08	93	0.1	102
28/05/2022	15:59	BRA09-40-OB TNN09-37-OB	0.09	94.1	0.16	95.9	0.12	98.5	0.26	81
2/06/2022	12:19	NAG02-02-OB	0.08	83.8	0.09	84.9	0.19	88.3	0.62	98.7
3/06/2022	15:30	BRA09-42-OB-A	0.16	83.3	0.24	83.8	0.3	96	0.22	96.6
8/06/2022	12:22	BRA09-36-OB-B	0.02	92.3	0.05	88.8	0.1	90.6	0.04	75
9/06/2022	12:31	MER06-39-OB	0.06	94.1	0.17	94.2	0.18	98.6	0.13	96.1
14/06/2022	12:24	NAG02-04-OB	0.05	84.5	0.06	89.6	0.08	93.8	0.17	91.6
15/06/2022	12:22	MER06-40-OB	0.07	75.6	0.1	76	0.14	89.2	0.16	82.6
18/06/2022	10:14	BRA09-40-OB-B	0.08	88.3	0.07	94.6	0.1	104	0.1	100
20/06/2022	15:14	BRA09-42-OB-B	0.04	85	0.07	86.3	0.08	96.4	0.09	82.8
22/06/2022	12:39	JER07-33-OB-A	0.14	87.5	0.19	88.1	0.18	95.8	0.29	92.9
25/06/2022	12:20	NAG02-02-CO	0.12	91	0.15	93.6	0.2	97.4	0.32	97.3
1/07/2022	12:24	NAG02-06-OB	0.1	89.2	0.09	86.3	0.17	87.4	0.45	85.6
2/07/2022	12:14	VEL06-37-OB	0.08	85.8	0.18	85.3	0.17	88.9	0.14	83.9
4/07/2022	12:20	BRA09-41-OB-A HRN08-48-OB TOES	0.09	86.3	0.17	91	0.15	92.6	0.2	86.4
8/07/2022	12:30	NAG02-03-OB	0.06	86.5	0.1	100.1	0.19	93.3	0.29	83.9
11/07/2022	12:23	JEB07-36-OB-A	0.05	87.7	0.07	102.9	0.08	95.1	0.07	100.4
13/07/2022	12:25	356-07-51-OB	0.04	106	0.04	99.2	0.05	100.1	0.04	111.1
14/07/2022	12:22	TNN09-36-OB-B	0.12	90.2	0.19	96.1	0.17	103.9	0.19	95.9
18/07/2022	12:32	VEL06-40-OB 366-07-52-OB	0.06	88.7	0.16	87.2	0.12	91.8	0.15	100.5

Date	Time	ID/Location	BM1 mm/s	BM1 dBL	BM2 mm/s	BM2 dBL	BM3 mm/s	BM3 dBL	BM4 mm/s	BM4 dBL
Exceedance Criteria (0% (5%))			10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)	10 (5)	120 (115)
20/07/2022	12:27	BRA09-43-OB-A	0.12	88.8	0.13	98.2	0.14	96.5	0.26	109.1
23/07/2022	12:39	JEB07-37-OB-A Strip 8 BRA Rocks	0.08	93.8	0.11	89.8	0.15	92.9	0.14	104.1
26/07/2022	11:32	NAG02-04-CO	0.03	96.1	0.03	102.2	0.09	109.2	0.11	95.5
28/07/2022	12:07	JER04-08-OB MER04-10-PS	0.15	93.2	0.19	96.6	0.38	98.6	0.64	87.6
30/07/2022	15:46	ONV07-45-OB	0.1	94.4	0.1	90.6	0.19	94.6	0.11	93.7
4/08/2022	10:42	295-03-08-OB 275-03-03-PS	0.11	80.7	0.19	83.5	0.52	88.4	0.63	104.6
8/08/2022	12:27	BRA09-43-OB-B-1	0.06	99.3	0.06	94.7	0.07	87.8	0.08	99.1
12/08/2022	10:50	NAG02-05-OB	0.17	74.3	0.11	76	0.27	80.8	0.35	80
16/08/2022	12:13	310-03-01-OB-B	0.06	89.6	0.17	93.1	0.44	94.4	0.4	91.4
22/08/2022	9:33	BRA09-37-OB BRA09-43-OB-B-2	0.12	83.6	0.13	84.1	0.11	88.9	0.25	87.6
24/08/2022	12:15	ONV07-44-OB	0.07	90.8	0.08	102.6	0.6	105.1	0.06	0.06
27/08/2022	12:36	NAG06-38-OB	0.04	92.7	0.08	94.4	0.1	96.3	0.07	99.8
29/08/2022	12:12	BRA09-38-OB	0.08	97.6	0.13	97.4	0.13	99.9	0.16	92.1
31/08/2022	12:10	386-08-54-OB	0.05	101.7	0.06	97.4	0.06	94.9	0.05	98.9
1/09/2022	12:08	JEB04-10-OB	0.07	87.8	0.09	96.4	0.16	95.2	0.35	89.5
5/09/2022	12:26	BRA09-39-OB	0.12	106.8	0.21	99.7	0.14	99.3	0.21	105.6
7/09/2022	12:38	JEB07-36-OB-B NAG02-03-CO	0.05	92	0.1	91.7	0.13	95.8	0.17	94.8
12/09/2022	12:37	JEB07-40-OB	0.11	86.3	0.2	88	0.18	92.5	0.13	95.9
15/09/2022	10:36	HRN356-366-07-53-OB NAG02-05-OB-B	0.09	81.7	0.08	86.3	0.16	91.3	0.38	92
21/09/2022	10:06	JEB-295-03-05-OB	0.04	84.1	0.06	82.6	0.12	87.9	0.24	99.2
26/09/2022	15:12	JEB07-41-OB-A	0.07	87.5	0.24	87.8	0.22	91.7	0.18	83.1
1/10/2022	15:28	JEB07-41-OB-B	0.13	93.7	0.16	87.8	0.14	91	0.3	93.3
4/10/2022	15:50	JER04-08-OB-B JEB-295-03-06-OB-TS	0.14	94.7	0.2	101.6	0.81	106.6	0.44	97.7
7/10/2022	14:33	ONV07-46-OB JEB07-42-OB	0.09	84.3	0.14	91.2	0.15	97.7	0.18	100.6
17/10/2022	12:29	LRN06-37-OB	0.11	91.8	0.18	92	0.22	96.5	0.19	100.9
18/10/2022	12:26	HRN07-51-0B	0.06	95.4	0.08	89.5	0.09	94.1	0.06	86
19/10/2022	10:38	NAG02-03-CO-B	0.03	94.8	0.04	86.6	0.06	91.7	0.08	91.2
28/10/2022	12:23	JEB295-04-04-OB	0.08	82.8	0.14	100.3	0.24	106.4	0.47	87.98
31/10/2022	12:22	VEL06-41-OB JEB04-08-O-C JEB04-08-08-D	0.08	80.3	0.16	95.9	0.17	90.7	0.17	90.2
11/11/2022	12:36	JER295-03-09-OB	0.06	83.8	0.07	101.4	0.14	95.9	0.22	102.7
12/11/2022	15:22	ONV08-46-OB	0.04	79.2	0.06	94.5	0.06	97.7	0.07	94
18/11/2022	9:35	JEB07-34-OB JEB07-37-OB-B	0.12	89.7	0.15	86.3	0.21	91	0.2	95.4
22/11/2022	12:22	JEB09-41-RL	0.07	93.8	0.12	83.7	0.15	96.5	0.14	97.9
25/11/2022	12:24	JEB290-04-09-OB	0.06	89.2	0.09	92.8	0.17	99.9	0.25	84.3
26/11/2022	12:37	JEB07-38-OB-B	0.03	87.2	0.07	87.8	0.05	96.1	0.06	90.2

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)
29/11/2022	12:34	TSU_07_46_OB	0.13	92.4	0.09	95.6	0.14	91.2	0.15	80
2/12/2022	10:09	HRN_07_51_OB_BS	0.11	105.3	0.09	88	0.12	97.8	0.08	104
5/12/2022	12:36	JEB08-41-OB VEL06-38-OB	0.11	85.5	0.13	101.6	0.14	96	0.17	90.2
7/12/2022	12:26	HRN356-07-54-OB	0.04	82.8	0.04	99.6	0.05	90.2	0.05	90.1
12/12/2022	12:43 12:44	MER-07-36-OB VEL-06-36-OB HRD-356-07-54-OB-B	0.09 0.06	92.2 92.2	0.15 0.09	87.9 88.9	0.14 0.07	91.5 91.5	0.16 0.08	90.4 90.4
15/12/2022	12:10	JER295-04-08-OB JER03-09-TOE	0.04	94.4	0.06	94.6	0.02	94.4	0.18	88.7
19/12/2022	12:09	TSU07-47-OB JER09-42-RL	0.13	94.2	0.16	89.9	0.14	95.1	0.15	95.4
20/12/2022	15:20	MER07-34-OB	0.04	97.9	0.08	90.9	0.08	99.9	0.09	97.5
23/12/2022	12:29	VEL 06-41-OB-B JEB 07-42-TOE	0.02	84.1	0.04	92.6	0.04	94.6	0.04	100.5
24/12/2022	15:06	JER295-03-09-OB-C	0	76	0.14	99.8	0.16	85.7	0.25	91.1
30/12/2022	12:23	TSU08-45-OB TSU08-46-PS	0.14	85.5	0.14	88.3	0.33	95.9	0.27	93.7

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	0.88
February	0.69
March	0.78
April	0.95
May	0.87
June	0.88
July	0.81
August	0.71
September	0.81
October	0.63
November	0.54
December	0.59
TOTAL	9.16

Table B-2
Daily Train Movements

Date & Time of Loading			
1/01/2022 4:03	28/03/2022 22:09	16/06/2022 8:57	15/09/2022 11:29
1/01/2022 13:42	29/03/2022 20:28	16/06/2022 12:18	15/09/2022 15:28
1/01/2022 18:59	29/03/2022 23:54	16/06/2022 14:50	15/09/2022 19:27
1/01/2022 21:19	30/03/2022 7:00	17/06/2022 5:46	16/09/2022 1:47
2/01/2022 0:31	30/03/2022 9:05	17/06/2022 11:53	16/09/2022 5:23
2/01/2022 11:14	30/03/2022 19:13	17/06/2022 19:34	16/09/2022 18:43
2/01/2022 14:51	30/03/2022 22:49	17/06/2022 22:08	17/09/2022 2:29
2/01/2022 22:06	31/03/2022 3:05	18/06/2022 14:56	21/09/2022 13:58
3/01/2022 1:07	31/03/2022 7:42	18/06/2022 17:49	21/09/2022 20:19
3/01/2022 3:35	31/03/2022 10:17	18/06/2022 20:11	22/09/2022 3:48
3/01/2022 5:57	31/03/2022 16:07	18/06/2022 22:45	22/09/2022 8:57
3/01/2022 14:48	31/03/2022 23:13	19/06/2022 3:34	22/09/2022 13:17
3/01/2022 20:39	1/04/2022 3:46	19/06/2022 22:23	23/09/2022 4:03
3/01/2022 23:52	1/04/2022 7:55	20/06/2022 0:41	27/09/2022 10:15
4/01/2022 3:46	1/04/2022 11:39	20/06/2022 12:33	27/09/2022 13:06
4/01/2022 6:30	1/04/2022 16:11	20/06/2022 19:44	28/09/2022 15:53
4/01/2022 19:32	1/04/2022 22:28	20/06/2022 23:17	28/09/2022 19:07
4/01/2022 22:17	2/04/2022 1:22	21/06/2022 4:56	28/09/2022 22:28
5/01/2022 2:08	2/04/2022 4:37	21/06/2022 9:12	29/09/2022 7:02
5/01/2022 9:06	2/04/2022 14:12	21/06/2022 12:41	29/09/2022 9:39
5/01/2022 20:57	2/04/2022 20:55	21/06/2022 17:34	29/09/2022 12:09
6/01/2022 1:04	3/04/2022 0:02	21/06/2022 21:46	29/09/2022 20:19
6/01/2022 4:33	3/04/2022 3:10	22/06/2022 9:38	30/09/2022 2:11
6/01/2022 7:08	3/04/2022 5:44	22/06/2022 20:03	30/09/2022 12:11
7/01/2022 4:42	3/04/2022 8:48	22/06/2022 23:39	30/09/2022 14:26
7/01/2022 7:45	3/04/2022 11:21	23/06/2022 3:37	30/09/2022 18:31
7/01/2022 13:22	3/04/2022 13:57	23/06/2022 6:56	30/09/2022 21:14
7/01/2022 20:09	3/04/2022 18:37	23/06/2022 9:28	30/09/2022 23:44
8/01/2022 2:58	3/04/2022 21:55	23/06/2022 11:55	1/10/2022 13:02
8/01/2022 6:14	4/04/2022 4:32	23/06/2022 14:18	1/10/2022 19:28
8/01/2022 12:05	4/04/2022 8:54	23/06/2022 16:51	1/10/2022 23:49
8/01/2022 14:16	4/04/2022 15:14	24/06/2022 1:40	2/10/2022 4:52
8/01/2022 18:37	4/04/2022 17:51	24/06/2022 6:44	2/10/2022 8:40
9/01/2022 1:12	8/04/2022 3:58	24/06/2022 9:15	2/10/2022 15:24
9/01/2022 6:03	8/04/2022 11:20	24/06/2022 11:25	3/10/2022 2:32
9/01/2022 8:58	8/04/2022 14:20	24/06/2022 14:43	3/10/2022 8:23
9/01/2022 14:59	8/04/2022 17:21	24/06/2022 16:58	3/10/2022 12:03
9/01/2022 21:07	8/04/2022 20:49	24/06/2022 19:28	3/10/2022 15:31
9/01/2022 23:41	9/04/2022 3:56	24/06/2022 22:50	3/10/2022 21:32
10/01/2022 7:08	9/04/2022 9:05	25/06/2022 7:14	4/10/2022 6:56
10/01/2022 11:30	9/04/2022 12:29	25/06/2022 10:09	4/10/2022 9:44
10/01/2022 14:38	9/04/2022 18:24	25/06/2022 12:23	4/10/2022 15:48

10/01/2022 18:34	10/04/2022 4:56	25/06/2022 16:23	7/10/2022 15:00
10/01/2022 22:51	10/04/2022 12:14	25/06/2022 22:22	8/10/2022 0:56
11/01/2022 3:08	10/04/2022 15:16	26/06/2022 4:03	8/10/2022 4:06
11/01/2022 5:31	10/04/2022 21:59	26/06/2022 6:43	8/10/2022 6:52
11/01/2022 7:54	11/04/2022 4:37	26/06/2022 9:20	8/10/2022 11:51
11/01/2022 10:22	11/04/2022 7:42	26/06/2022 12:18	8/10/2022 16:19
11/01/2022 20:12	11/04/2022 10:58	26/06/2022 17:37	8/10/2022 21:17
12/01/2022 0:46	11/04/2022 15:50	26/06/2022 20:06	9/10/2022 3:32
12/01/2022 9:11	11/04/2022 20:14	27/06/2022 0:19	9/10/2022 6:10
12/01/2022 20:31	12/04/2022 6:47	27/06/2022 8:57	9/10/2022 13:10
14/01/2022 11:45	12/04/2022 10:02	27/06/2022 17:33	11/10/2022 10:40
14/01/2022 19:50	12/04/2022 17:50	27/06/2022 20:34	12/10/2022 8:31
15/01/2022 0:52	12/04/2022 21:07	27/06/2022 23:29	12/10/2022 23:24
15/01/2022 14:46	13/04/2022 18:36	28/06/2022 4:35	13/10/2022 8:14
16/01/2022 1:09	13/04/2022 22:08	28/06/2022 11:51	13/10/2022 12:36
16/01/2022 3:40	14/04/2022 0:52	28/06/2022 20:52	13/10/2022 18:09
16/01/2022 5:58	14/04/2022 4:17	29/06/2022 4:14	14/10/2022 0:01
16/01/2022 14:40	14/04/2022 7:32	29/06/2022 6:33	14/10/2022 7:06
16/01/2022 19:20	14/04/2022 13:52	29/06/2022 11:25	14/10/2022 9:40
17/01/2022 5:31	15/04/2022 1:05	29/06/2022 19:35	14/10/2022 12:45
17/01/2022 20:43	15/04/2022 5:56	30/06/2022 3:09	14/10/2022 15:36
18/01/2022 1:17	15/04/2022 8:25	30/06/2022 8:18	14/10/2022 19:13
18/01/2022 5:14	15/04/2022 13:11	30/06/2022 11:18	15/10/2022 5:58
18/01/2022 11:10	15/04/2022 15:49	30/06/2022 15:13	15/10/2022 12:47
18/01/2022 19:09	15/04/2022 19:58	30/06/2022 23:57	15/10/2022 15:28
18/01/2022 22:10	16/04/2022 0:30	1/07/2022 4:46	15/10/2022 21:16
19/01/2022 2:14	16/04/2022 3:34	1/07/2022 6:40	16/10/2022 0:03
19/01/2022 8:31	16/04/2022 9:26	1/07/2022 9:38	16/10/2022 4:00
19/01/2022 11:53	16/04/2022 16:21	1/07/2022 12:22	16/10/2022 10:45
19/01/2022 15:13	16/04/2022 19:15	1/07/2022 17:09	16/10/2022 13:31
19/01/2022 21:43	16/04/2022 21:45	2/07/2022 2:25	17/10/2022 7:19
20/01/2022 4:56	17/04/2022 0:49	2/07/2022 17:22	17/10/2022 18:52
20/01/2022 10:10	17/04/2022 11:30	2/07/2022 21:57	17/10/2022 23:18
20/01/2022 15:07	17/04/2022 17:40	3/07/2022 0:19	18/10/2022 2:11
20/01/2022 17:40	17/04/2022 22:03	3/07/2022 2:28	19/10/2022 5:10
20/01/2022 22:17	18/04/2022 1:05	3/07/2022 13:55	19/10/2022 9:16
21/01/2022 2:37	18/04/2022 5:50	3/07/2022 20:09	20/10/2022 4:39
21/01/2022 10:21	18/04/2022 10:07	3/07/2022 23:13	24/10/2022 9:24
21/01/2022 14:39	18/04/2022 14:15	4/07/2022 2:17	25/10/2022 13:00
21/01/2022 20:29	18/04/2022 16:50	4/07/2022 4:39	26/10/2022 11:45
22/01/2022 0:12	18/04/2022 21:37	4/07/2022 8:49	28/10/2022 8:44
22/01/2022 5:01	19/04/2022 3:05	4/07/2022 17:38	28/10/2022 12:56
22/01/2022 10:54	19/04/2022 6:50	4/07/2022 20:11	28/10/2022 19:10

22/01/2022 16:52	19/04/2022 10:10	4/07/2022 22:34	29/10/2022 5:52
22/01/2022 20:28	19/04/2022 18:30	5/07/2022 2:54	29/10/2022 10:01
23/01/2022 0:13	19/04/2022 22:04	5/07/2022 6:46	29/10/2022 14:21
23/01/2022 4:52	20/04/2022 1:47	5/07/2022 10:40	30/10/2022 8:35
23/01/2022 10:55	20/04/2022 5:09	5/07/2022 13:32	30/10/2022 16:30
23/01/2022 17:01	20/04/2022 8:40	6/07/2022 0:25	30/10/2022 22:24
23/01/2022 23:03	20/04/2022 13:05	17/07/2022 17:16	31/10/2022 15:28
24/01/2022 13:58	20/04/2022 16:47	18/07/2022 6:20	31/10/2022 17:33
24/01/2022 17:55	20/04/2022 20:57	18/07/2022 8:54	31/10/2022 20:25
25/01/2022 4:43	21/04/2022 4:25	18/07/2022 11:46	31/10/2022 23:54
25/01/2022 7:53	21/04/2022 8:18	18/07/2022 14:32	1/11/2022 6:20
25/01/2022 21:26	21/04/2022 10:42	18/07/2022 19:16	1/11/2022 22:28
26/01/2022 10:57	21/04/2022 15:17	18/07/2022 23:48	2/11/2022 0:39
26/01/2022 15:44	22/04/2022 1:27	19/07/2022 7:43	2/11/2022 3:02
26/01/2022 21:08	22/04/2022 8:37	19/07/2022 10:16	2/11/2022 14:40
27/01/2022 15:27	22/04/2022 11:18	19/07/2022 14:29	3/11/2022 8:49
27/01/2022 19:24	22/04/2022 14:31	19/07/2022 20:12	3/11/2022 11:17
27/01/2022 23:33	22/04/2022 21:14	20/07/2022 2:14	4/11/2022 8:15
28/01/2022 2:22	23/04/2022 4:27	20/07/2022 6:07	4/11/2022 13:44
28/01/2022 15:37	23/04/2022 7:14	20/07/2022 13:53	5/11/2022 7:30
28/01/2022 20:03	23/04/2022 13:21	20/07/2022 17:48	5/11/2022 12:06
29/01/2022 11:24	23/04/2022 16:54	20/07/2022 21:21	6/11/2022 11:26
29/01/2022 16:04	23/04/2022 20:37	21/07/2022 1:34	7/11/2022 3:37
29/01/2022 19:44	24/04/2022 1:09	21/07/2022 5:07	7/11/2022 6:18
29/01/2022 22:55	24/04/2022 6:26	21/07/2022 8:47	7/11/2022 10:14
30/01/2022 2:05	24/04/2022 11:10	21/07/2022 15:15	7/11/2022 14:47
30/01/2022 16:30	24/04/2022 13:15	21/07/2022 18:52	8/11/2022 0:37
30/01/2022 22:09	25/04/2022 2:05	21/07/2022 22:05	8/11/2022 9:26
31/01/2022 1:27	25/04/2022 12:32	22/07/2022 5:41	8/11/2022 11:43
31/01/2022 7:06	25/04/2022 19:18	22/07/2022 8:41	8/11/2022 14:14
31/01/2022 12:12	25/04/2022 23:24	22/07/2022 11:29	9/11/2022 0:00
31/01/2022 22:56	26/04/2022 6:52	22/07/2022 18:32	9/11/2022 5:08
1/02/2022 7:01	26/04/2022 9:10	23/07/2022 3:55	9/11/2022 10:36
1/02/2022 12:58	26/04/2022 11:34	23/07/2022 9:25	9/11/2022 16:13
1/02/2022 17:14	26/04/2022 18:24	23/07/2022 12:01	10/11/2022 5:28
1/02/2022 21:44	26/04/2022 22:51	23/07/2022 16:51	10/11/2022 8:25
2/02/2022 4:29	27/04/2022 2:09	23/07/2022 21:07	10/11/2022 20:06
2/02/2022 9:48	27/04/2022 18:39	23/07/2022 23:50	11/11/2022 1:22
2/02/2022 16:05	27/04/2022 23:32	24/07/2022 2:40	11/11/2022 7:15
2/02/2022 20:27	28/04/2022 4:17	24/07/2022 5:48	11/11/2022 16:04
3/02/2022 2:49	28/04/2022 8:34	24/07/2022 11:45	11/11/2022 18:33
3/02/2022 11:39	28/04/2022 16:52	24/07/2022 14:15	11/11/2022 21:19
4/02/2022 6:08	28/04/2022 22:16	24/07/2022 21:26	12/11/2022 1:44

4/02/2022 10:29	29/04/2022 2:33	25/07/2022 2:39	12/11/2022 5:33
4/02/2022 13:37	29/04/2022 9:23	25/07/2022 5:23	12/11/2022 8:10
4/02/2022 16:48	29/04/2022 14:04	25/07/2022 7:21	12/11/2022 11:37
4/02/2022 20:49	30/04/2022 0:02	25/07/2022 9:50	12/11/2022 14:17
5/02/2022 1:44	30/04/2022 4:05	25/07/2022 13:31	12/11/2022 16:37
5/02/2022 8:13	30/04/2022 9:50	25/07/2022 16:23	12/11/2022 19:17
5/02/2022 14:37	30/04/2022 14:30	26/07/2022 12:19	12/11/2022 22:10
6/02/2022 2:08	30/04/2022 22:37	26/07/2022 16:11	13/11/2022 1:23
6/02/2022 9:59	1/05/2022 3:20	26/07/2022 19:06	13/11/2022 4:31
6/02/2022 14:17	1/05/2022 12:09	26/07/2022 21:25	13/11/2022 7:50
6/02/2022 20:18	1/05/2022 15:40	27/07/2022 2:08	13/11/2022 14:33
7/02/2022 1:55	1/05/2022 20:29	27/07/2022 8:43	13/11/2022 17:24
7/02/2022 10:20	1/05/2022 22:57	27/07/2022 11:38	13/11/2022 22:14
11/02/2022 21:54	2/05/2022 1:36	27/07/2022 17:41	14/11/2022 9:33
12/02/2022 0:44	2/05/2022 6:42	27/07/2022 20:16	14/11/2022 15:18
12/02/2022 1:53	2/05/2022 9:50	27/07/2022 23:15	14/11/2022 22:46
12/02/2022 21:09	2/05/2022 12:46	28/07/2022 6:32	15/11/2022 2:57
13/02/2022 11:56	2/05/2022 19:59	28/07/2022 19:19	15/11/2022 7:56
13/02/2022 19:55	3/05/2022 2:35	29/07/2022 1:19	17/11/2022 11:39
14/02/2022 5:33	3/05/2022 5:10	29/07/2022 5:18	18/11/2022 10:59
14/02/2022 13:25	3/05/2022 20:15	29/07/2022 8:56	18/11/2022 15:06
14/02/2022 17:40	4/05/2022 1:31	29/07/2022 12:39	19/11/2022 6:24
15/02/2022 4:25	4/05/2022 12:13	29/07/2022 17:17	19/11/2022 9:34
15/02/2022 7:25	4/05/2022 15:38	29/07/2022 20:44	19/11/2022 14:24
15/02/2022 17:48	4/05/2022 22:28	29/07/2022 23:28	20/11/2022 6:27
16/02/2022 2:10	5/05/2022 4:19	30/07/2022 12:52	20/11/2022 10:51
16/02/2022 6:16	5/05/2022 7:40	30/07/2022 17:45	20/11/2022 15:53
16/02/2022 12:53	6/05/2022 3:08	30/07/2022 23:17	21/11/2022 6:44
16/02/2022 21:28	6/05/2022 7:59	31/07/2022 1:48	27/11/2022 11:27
17/02/2022 4:58	6/05/2022 13:38	31/07/2022 7:40	27/11/2022 15:27
17/02/2022 9:11	6/05/2022 19:11	31/07/2022 19:46	28/11/2022 13:12
17/02/2022 12:55	7/05/2022 1:52	1/08/2022 0:46	28/11/2022 18:28
17/02/2022 17:23	7/05/2022 11:17	1/08/2022 5:42	29/11/2022 0:45
18/02/2022 1:18	7/05/2022 13:58	2/08/2022 2:22	29/11/2022 16:19
18/02/2022 15:26	7/05/2022 16:59	2/08/2022 7:32	30/11/2022 5:58
18/02/2022 18:21	7/05/2022 20:43	2/08/2022 15:28	30/11/2022 11:12
18/02/2022 21:06	8/05/2022 8:41	2/08/2022 20:30	30/11/2022 15:19
18/02/2022 23:45	8/05/2022 21:58	2/08/2022 23:44	1/12/2022 2:07
19/02/2022 12:24	9/05/2022 1:02	3/08/2022 2:42	1/12/2022 11:50
19/02/2022 19:46	9/05/2022 6:53	3/08/2022 5:10	1/12/2022 20:43
20/02/2022 3:49	9/05/2022 19:29	3/08/2022 7:59	1/12/2022 23:06
20/02/2022 9:43	10/05/2022 6:50	3/08/2022 15:03	2/12/2022 12:45
20/02/2022 12:36	10/05/2022 9:31	4/08/2022 0:26	2/12/2022 17:34

20/02/2022 16:39	10/05/2022 12:49	4/08/2022 3:55	3/12/2022 2:16
20/02/2022 21:04	10/05/2022 15:39	4/08/2022 7:03	4/12/2022 1:48
21/02/2022 0:17	10/05/2022 19:14	4/08/2022 17:38	5/12/2022 0:56
21/02/2022 13:12	11/05/2022 4:22	5/08/2022 6:01	5/12/2022 4:20
21/02/2022 20:40	11/05/2022 7:17	5/08/2022 9:47	5/12/2022 12:04
22/02/2022 3:53	11/05/2022 12:45	5/08/2022 18:53	5/12/2022 16:03
22/02/2022 8:53	11/05/2022 18:10	5/08/2022 23:09	5/12/2022 23:20
23/02/2022 1:26	12/05/2022 0:28	6/08/2022 2:39	7/12/2022 4:44
23/02/2022 5:33	12/05/2022 13:26	6/08/2022 20:10	7/12/2022 14:29
23/02/2022 12:17	12/05/2022 18:09	6/08/2022 23:51	7/12/2022 18:37
23/02/2022 16:49	12/05/2022 22:26	7/08/2022 15:48	8/12/2022 5:46
23/02/2022 21:24	13/05/2022 3:36	8/08/2022 14:59	8/12/2022 8:43
24/02/2022 1:37	13/05/2022 9:04	8/08/2022 18:21	9/12/2022 12:48
24/02/2022 3:53	13/05/2022 17:33	8/08/2022 21:44	9/12/2022 16:03
24/02/2022 8:51	13/05/2022 20:18	9/08/2022 7:14	10/12/2022 4:23
24/02/2022 19:21	13/05/2022 22:50	9/08/2022 11:59	10/12/2022 17:56
25/02/2022 9:04	14/05/2022 1:54	9/08/2022 22:17	10/12/2022 21:17
25/02/2022 15:38	14/05/2022 7:42	10/08/2022 6:41	11/12/2022 0:15
25/02/2022 20:21	14/05/2022 17:57	10/08/2022 18:05	11/12/2022 9:23
26/02/2022 0:12	14/05/2022 21:25	10/08/2022 22:22	12/12/2022 8:55
26/02/2022 9:24	15/05/2022 0:26	11/08/2022 1:23	12/12/2022 14:57
26/02/2022 13:44	15/05/2022 4:52	11/08/2022 4:50	12/12/2022 20:44
26/02/2022 16:58	15/05/2022 7:19	12/08/2022 2:15	13/12/2022 12:11
26/02/2022 23:18	15/05/2022 12:04	12/08/2022 5:18	14/12/2022 16:44
27/02/2022 2:56	15/05/2022 16:58	12/08/2022 11:33	15/12/2022 1:08
27/02/2022 8:11	16/05/2022 8:28	13/08/2022 6:51	15/12/2022 4:26
27/02/2022 11:48	16/05/2022 19:21	13/08/2022 12:13	16/12/2022 4:07
27/02/2022 15:40	16/05/2022 23:14	13/08/2022 16:20	16/12/2022 9:36
27/02/2022 18:33	17/05/2022 3:05	14/08/2022 7:00	17/12/2022 6:22
28/02/2022 7:11	17/05/2022 19:38	14/08/2022 10:05	18/12/2022 3:49
28/02/2022 10:16	17/05/2022 22:30	14/08/2022 12:53	18/12/2022 6:46
28/02/2022 14:07	18/05/2022 1:29	14/08/2022 15:18	18/12/2022 20:47
28/02/2022 18:08	18/05/2022 5:47	15/08/2022 14:21	19/12/2022 19:33
28/02/2022 21:20	18/05/2022 9:43	15/08/2022 20:00	20/12/2022 0:53
1/03/2022 0:45	18/05/2022 14:49	15/08/2022 23:31	20/12/2022 7:55
1/03/2022 5:17	18/05/2022 23:45	16/08/2022 15:09	20/12/2022 10:56
1/03/2022 12:38	19/05/2022 6:53	16/08/2022 18:47	20/12/2022 15:43
1/03/2022 20:28	19/05/2022 9:09	16/08/2022 23:15	21/12/2022 0:06
1/03/2022 23:24	19/05/2022 15:06	17/08/2022 19:31	21/12/2022 14:17
2/03/2022 2:58	19/05/2022 17:48	18/08/2022 7:56	21/12/2022 17:37
2/03/2022 6:15	19/05/2022 23:50	18/08/2022 10:16	21/12/2022 21:07
2/03/2022 13:33	20/05/2022 2:09	18/08/2022 13:08	22/12/2022 1:38
2/03/2022 17:05	20/05/2022 4:27	18/08/2022 15:45	22/12/2022 20:33

3/03/2022 5:29	20/05/2022 8:17	19/08/2022 14:20	23/12/2022 1:55
3/03/2022 9:54	20/05/2022 11:32	19/08/2022 21:20	23/12/2022 8:14
3/03/2022 16:41	20/05/2022 14:08	20/08/2022 12:03	23/12/2022 12:18
3/03/2022 22:21	20/05/2022 16:41	20/08/2022 14:30	23/12/2022 21:11
4/03/2022 1:38	21/05/2022 0:46	20/08/2022 21:26	24/12/2022 0:04
4/03/2022 9:47	21/05/2022 4:51	20/08/2022 23:23	24/12/2022 6:15
4/03/2022 12:53	21/05/2022 7:42	21/08/2022 6:17	27/12/2022 2:25
4/03/2022 17:56	21/05/2022 16:00	21/08/2022 10:10	27/12/2022 5:17
4/03/2022 22:58	21/05/2022 20:04	21/08/2022 13:41	27/12/2022 11:30
5/03/2022 11:57	21/05/2022 23:32	21/08/2022 19:13	27/12/2022 13:51
5/03/2022 18:09	22/05/2022 2:41	21/08/2022 22:38	27/12/2022 16:36
5/03/2022 21:25	22/05/2022 5:18	22/08/2022 5:21	27/12/2022 18:50
6/03/2022 6:31	22/05/2022 9:15	22/08/2022 18:33	28/12/2022 6:15
6/03/2022 11:42	22/05/2022 13:14	22/08/2022 20:57	28/12/2022 8:26
6/03/2022 17:24	22/05/2022 16:23	23/08/2022 4:27	28/12/2022 15:36
7/03/2022 17:20	23/05/2022 11:11	23/08/2022 10:17	28/12/2022 18:26
7/03/2022 21:27	26/05/2022 19:38	23/08/2022 17:11	28/12/2022 22:36
8/03/2022 2:06	27/05/2022 6:54	23/08/2022 21:18	29/12/2022 1:21
8/03/2022 11:46	27/05/2022 12:54	24/08/2022 6:16	29/12/2022 4:20
8/03/2022 18:20	27/05/2022 17:18	24/08/2022 8:54	29/12/2022 12:39
8/03/2022 23:29	27/05/2022 22:58	24/08/2022 12:07	29/12/2022 16:18
9/03/2022 8:45	28/05/2022 11:05	24/08/2022 14:51	29/12/2022 19:29
9/03/2022 12:06	28/05/2022 15:56	24/08/2022 17:56	29/12/2022 22:27
9/03/2022 16:52	28/05/2022 19:51	25/08/2022 7:40	30/12/2022 1:29
9/03/2022 23:54	28/05/2022 23:22	25/08/2022 11:01	30/12/2022 6:00
10/03/2022 4:47	29/05/2022 4:05	26/08/2022 7:07	30/12/2022 9:10
10/03/2022 8:51	29/05/2022 7:28	26/08/2022 9:37	30/12/2022 18:57
10/03/2022 14:45	29/05/2022 12:13	26/08/2022 12:24	30/12/2022 21:12
11/03/2022 3:29	29/05/2022 18:19	26/08/2022 19:08	31/12/2022 3:28
11/03/2022 13:25	30/05/2022 1:27	27/08/2022 4:01	31/12/2022 11:25
11/03/2022 20:41	30/05/2022 5:58	27/08/2022 12:26	31/12/2022 16:09
12/03/2022 1:32	30/05/2022 15:30	27/08/2022 15:29	31/12/2022 19:34
12/03/2022 10:11	31/05/2022 1:35	27/08/2022 18:54	
13/03/2022 1:49	31/05/2022 8:03	28/08/2022 1:35	
13/03/2022 6:14	31/05/2022 12:46	28/08/2022 16:57	
13/03/2022 13:36	31/05/2022 22:09	28/08/2022 19:56	
13/03/2022 22:14	1/06/2022 3:46	28/08/2022 22:28	
14/03/2022 1:23	1/06/2022 7:52	29/08/2022 6:40	
14/03/2022 7:30	1/06/2022 23:54	29/08/2022 11:03	
14/03/2022 11:38	2/06/2022 3:08	29/08/2022 14:19	
14/03/2022 14:40	2/06/2022 12:13	29/08/2022 23:29	
14/03/2022 16:40	2/06/2022 16:48	30/08/2022 3:17	
15/03/2022 2:49	3/06/2022 0:54	30/08/2022 18:39	

15/03/2022 11:56	3/06/2022 14:16	30/08/2022 22:22	
15/03/2022 14:57	3/06/2022 18:52	31/08/2022 4:23	
15/03/2022 20:14	3/06/2022 20:58	31/08/2022 20:03	
15/03/2022 23:46	4/06/2022 3:52	1/09/2022 0:48	
16/03/2022 21:12	7/06/2022 8:25	1/09/2022 3:26	
17/03/2022 6:52	7/06/2022 20:14	1/09/2022 10:36	
18/03/2022 5:37	8/06/2022 0:21	1/09/2022 14:33	
18/03/2022 17:38	8/06/2022 8:03	2/09/2022 5:11	
18/03/2022 22:33	8/06/2022 10:22	2/09/2022 9:07	
19/03/2022 2:14	8/06/2022 12:22	2/09/2022 12:14	
19/03/2022 13:15	8/06/2022 15:46	2/09/2022 19:23	
19/03/2022 18:00	8/06/2022 17:52	3/09/2022 3:23	
20/03/2022 1:40	9/06/2022 7:32	3/09/2022 13:40	
20/03/2022 11:17	9/06/2022 16:21	4/09/2022 5:57	
20/03/2022 15:13	9/06/2022 18:36	4/09/2022 8:59	
20/03/2022 18:54	10/06/2022 2:13	4/09/2022 15:47	
21/03/2022 13:34	10/06/2022 8:53	4/09/2022 19:10	
21/03/2022 17:25	10/06/2022 18:01	5/09/2022 2:06	
21/03/2022 23:04	11/06/2022 0:25	5/09/2022 21:05	
22/03/2022 3:25	11/06/2022 5:26	6/09/2022 22:41	
22/03/2022 16:24	11/06/2022 7:50	7/09/2022 1:11	
22/03/2022 22:52	11/06/2022 11:33	7/09/2022 5:44	
23/03/2022 7:46	11/06/2022 15:22	7/09/2022 8:43	
24/03/2022 0:28	11/06/2022 22:18	7/09/2022 18:23	
24/03/2022 5:20	12/06/2022 7:48	7/09/2022 22:02	
25/03/2022 1:10	12/06/2022 11:58	8/09/2022 1:36	
25/03/2022 12:17	12/06/2022 15:31	8/09/2022 4:21	
25/03/2022 16:33	12/06/2022 18:27	8/09/2022 7:14	
25/03/2022 19:57	13/06/2022 0:21	8/09/2022 12:26	
25/03/2022 22:56	13/06/2022 9:08	8/09/2022 17:01	
26/03/2022 8:50	13/06/2022 19:11	9/09/2022 4:59	
26/03/2022 14:28	13/06/2022 21:54	9/09/2022 8:45	
27/03/2022 6:19	14/06/2022 9:51	13/09/2022 7:39	
27/03/2022 13:22	14/06/2022 12:09	13/09/2022 15:42	
27/03/2022 15:48	14/06/2022 20:36	14/09/2022 7:12	
27/03/2022 18:38	15/06/2022 2:09	14/09/2022 11:35	
28/03/2022 3:44	15/06/2022 18:25	14/09/2022 16:22	
28/03/2022 7:18	15/06/2022 21:21	14/09/2022 21:58	
28/03/2022 11:06	16/06/2022 0:02	15/09/2022 3:41	
28/03/2022 14:38	16/06/2022 3:55	15/09/2022 11:29	

APPENDIX C

Annual Sound Power Testing

Appendix C
Annual l Testing

Table C-1

Sound Power Level Testing Results

Equipment Model	Plant ID	EA model Lw	EA model LwA	2022 Lw	2022 LwA
TRACKED BULLDOZERS					
CAT D10T	302	129	127	121	119
CAT D10 2T	303	129	127	123	120
CAT D11T	869	129	127	123	121
CAT D10T	876	129	127	122	119
CAT D11T	866	129	127	123	121
CAT D11T	872	129	127	124	122
CAT D10 2T	1093	129	127	121	119
CAT D6 R	WTC20	129	127	116	113
WHEELED BULLDOZERS					
CAT 834G	881	122	115	117	111
WHEEL LOADERS					
WA1200	800	122	115	117	113
DRILLS					
CAT MD6290	451	122	118	119	117
CAT MD6290	453	122	118	119	116
EXCAVATORS					
Hitachi EX3600	221	131	119	119	113
Hitachi EX8000	265	131	119	121	116
	1043	131	119	118	114
Hitachi ZX360	WTC53	131	119	116	112
GRADERS					
CAT 16M	401	118	112	108	106
CAT 16M	402	118	112	109	106
CAT 24M	416	118	112	113	110
CAT 16M	862	118	112	109	107
CAT 14H	WTC48	118	112	107	105
REAR DUMP TRUCKS					
Hitachi EH5000	003	124	117	122	115
Hitachi EH5000	004	124	117	121	115

Equipment Model	Plant ID	EA model Lw	EA model LwA	2022 Lw	2022 LwA
Hitachi EH5000	005	124	117	122	115
Hitachi EH5000	011	124	117	123	116
Hitachi EH5000	019	124	117	122	115
Hitachi EH5000	020	124	117	121	116
Hitachi EH5000	022	124	117	122	116
Hitachi EH5000	026	124	117	121	114
Hitachi EH5000	031	124	117	121	115
Hitachi EH5000	038	124	117	122	115
Hitachi EH3500	040	124	117	121	116
CAT 789 D	838	124	117	123	116
CAT 789 D	884	124	117	122	116
WATER CARTS					
CAT 777G	501	122	115	120	116
CAT 773	806	122	115	118	114
CAT 777G	821	122	115	119	115
STATIONARY PLANT					
Coal Preparation Plant		133	117	129	116
Conveyors (200m section)		113	108	109	104
Conveyors (500m section)		117	112	112	107
Primary ROM sizer		117	109	114	107
Secondary ROM sizer		121	112	117	112
Product Stacker		111	104	106	98
Product Reclaimer		122	115	112	113
Raw Coal Transfer Station		117	103	115	105
CPP product Transfer Station		117	103	116	104
Train Loadout		114	103	120	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 Acis, 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	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L
SW 1	14/01/2022	7.52	438	293	19	9.5	163	32	13	37	2	0.14	<0.0001	<0.001	<0.001	<0.001	0.076	<0.001	<0.01	<0.001	<0.005	<0.05	0.4	0.5	1	<0.0001	0.1	0.3	0.23	4.76	4.33
	15/02/2022	7.56	359	264	30	15	148	35	13	35	2	0.77	<0.0001	<0.001	<0.001	<0.001	0.073	<0.001	<0.01	<0.001	<0.005	<0.05	0.79	0.7	1.1	<0.0001	0.06	0.2	0.11	4.26	4.39
	17/03/2022	7.57	393	285	11	8.6	146	31	12	36	1	0.3	<0.0001	<0.001	0.003	<0.001	0.056	<0.001	<0.01	<0.001	<0.005	<0.05	0.47	0.6	1.2	<0.0001	0.08	0.2	0.13	4.23	4.13
	14/04/2022	7.49	397	282	15	19.7	149	32	12	36	2	1.3	<0.0001	<0.001	<0.001	<0.001	0.06	<0.001	<0.01	<0.001	<0.005	<0.05	1.26	<0.5	0.9	<0.0001	0.08	0.3	0.14	4.26	4.2
	13/05/2022	7.66	488	316	53	25.5	145	35	14	44	2	0.85	<0.0001	<0.001	<0.001	<0.001	0.051	<0.001	<0.01	<0.001	<0.005	<0.05	0.97	<0.5	1.2	<0.0001	0.13	0.3	0.13	4.91	4.86
	14/06/2022	7.61	429	273	<5	3.2	144	31	12	36	1	0.2	<0.0001	<0.001	<0.001	<0.001	0.036	<0.001	<0.01	<0.001	<0.005	<0.05	0.39	<0.5	0.7	<0.0001	0.06	<0.1	0.12	4.19	4.13
	15/07/2022	7.56	335	226	27	5.7	124	26	10	29	1	0.11	<0.0001	<0.001	<0.001	<0.001	0.033	<0.001	<0.01	<0.001	<0.005	<0.05	0.3	<0.5	0.6	<0.0001	0.14	0.3	0.14	3.47	3.41

	16/08/2022	7.59	178	147	5	19.6	77	15	6	15	2	1.57	<0.0001	<0.001	0.003	<0.001	0.024	<0.001	<0.01	<0.001	0.005	<0.05	1.15	<0.5	<0.5	<0.0001	0.11	0.3	0.15	2.01	1.94
	14/09/2022	7.67	226	112	9	13.6	92	18	7	18	2	0.28	<0.0001	<0.001	<0.001	<0.001	0.023	<0.001	<0.01	<0.001	<0.005	<0.05	0.27	<0.5	<0.5	<0.0001	0.25	0.4	0.14	2.36	2.31
	14/10/2022	7.63	249	159	12	12.1	103	20	8	20	1	0.79	<0.0001	<0.001	<0.001	<0.001	0.026	<0.001	<0.01	<0.001	<0.005	<0.05	0.61	<0.5	0.6	<0.0001	0.19	0.5	0.12	2.7	2.55
	21/11/2022	7.74	342	232	<5	7.6	128	30	12	25	2	0.38	<0.0001	<0.001	<0.001	<0.001	0.027	<0.001	<0.01	<0.001	<0.005	<0.05	0.37	<0.5	0.7	<0.0001	0.33	0.5	0.15	3.58	3.62
	16/12/2022	7.66	421	256	<5	1.2	157	35	13	35	2	0.15	<0.0001	<0.001	<0.001	<0.001	0.038	<0.001	<0.01	<0.001	<0.005	<0.05	0.28	<0.5	0.9	<0.0001	0.34	0.5	0.14	4.82	4.39
SW 2	14/01/2022	7.44	459	323	<5	1.1	172	40	15	29	1	0.04	<0.001	<0.001	<0.001	0.032	<0.001	<0.01	<0.001	<0.005	<0.05	0.06	<0.5	1.3	<0.0001	0.2	0.3	0.16	0.07	4.86	4.52
	15/02/2022	7.38	427	490	5	2.2	166	46	16	32	1	0.07	<0.001	<0.001	<0.001	0.023	<0.001	<0.01	<0.001	<0.005	<0.05	0.08	<0.5	1.2	<0.0001	0.2	0.1	0.06	0.04	4.85	5.03
	17/03/2022	7.26	470	333	8	7.4	166	42	15	34	1	0.15	<0.0001	<0.001	<0.001	<0.001	0.021	<0.001	<0.01	<0.001	<0.005	<0.05	0.16	<0.5	1.4	<0.0001	1.88	2.2	0.07	4.89	4.83
	14/04/2022	7.36	474	278	<5	1.4	169	45	16	35	<1	0.04	<0.001	<0.001	<0.001	0.014	<0.001	<0.01	<0.001	<0.005	<0.05	0.06	<0.5	1	<0.0001	0.2	0.9	0.08	0.05	4.95	5.08
	13/05/2022	7.35	512	318	<5	0.8	157	39	15	34	<1	0.08	<0.001	<0.001	<0.001	0.014	<0.001	<0.01	<0.001	<0.005	<0.05	----	<0.5	1.4	<0.0001	0.4	0.3	0.06	0.06	4.78	4.66
	14/06/2022	7.56	526	367	<5	0.3	164	44	16	35	<1	0.02	<0.0001	<0.001	<0.001	<0.001	0.009	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	1	<0.0001	1.5	1.7	0.08	4.93	5.03
	15/07/2022	7.64	521	294	10	1.7	168	47	16	36	<1	0.04	<0.0001	<0.001	<0.001	<0.001	0.01	<0.001	<0.01	<0.001	<0.005	<0.05	<0.05	<0.5	1.2	<0.0001	1.31	1.7	0.06	1.89	5.03
	16/08/2022	7.39	456	282	<5	2.1	162	47	16	32	1	0.12	<0.0001	<0.001	<0.001	<0.001	0.021	<0.001	<0.01	<0.001	<0.005	<0.05	0.12	<0.5	1.3	<0.0001	1.38	1.6	0.08	0.67	5.01
	14/09/2022	7.75	386	274	<5	21.2	157	33	13	26	1	2.24	<0.0001	<0.001	<0.001	<0.001	0.025	<0.001	<0.01	<0.001	<0.005	<0.05	1.26	<0.5	1.1	<0.0001	0.48	0.8	0.1	3.9	4.19
	14/10/2022	7.69	334	287	6	27	138	28	11	24	1	0.5	<0.0001	<0.001	0.001	<0.001	0.023	<0.001	<0.01	<0.001	0.007	<0.05	0.3	<0.5	1.3	<0.0001	0.6	1.4	0.11	3.72	3.37
	21/11/2022	7.79	406	287	<5	7.7	153	38	15	27	2	0.52	<0.0001	<0.001	<0.001	<0.001	0.02	<0.001	<0.01	<0.001	<0.005	<0.05	0.3	<0.5	1.2	<0.0001	0.2	0.5	0.11	4.27	4.36
	16/12/2022	7.51	444	266	<5	0.5	174	42	15	30	2	0.06	<0.001	<0.001	<0.001	0.024	<0.001	<0.01	<0.001	<0.005	<0.05	0.07	1.9	<0.5	<0.0001	0.2	0.2	0.14	0.07	5.07	4.69
SW 4	17/03/2022																														
	14/06/2022																														
	14/09/2022	7.54	209	247	15	121	93	19	4	17	8	8.57	<0.0001	0.004	0.002	0.071	<0.01	0.002	<0.001	0.016	0.006	<0.05	5.26	<0.5	0.6	<0.0001	0.36	1.8	0.15	2.08	2.22
	16/12/2022																														
SW 5	16/03/2022	7.94	310	256	49	52.3	123	23	13	23	3	2.84	<0.0001	0.003	0.003	<0.001	0.118	0.005	<0.01	<0.001	0.006	<0.05	3.44	<0.5	1.7	<0.0001	0.35	1.2	0.19	3.4	3.29
	14/06/2022	8.2	395	256	26	18.2	135	25	17	26	3	1.38	<0.0001	0.002	0.002	<0.001	0.062	0.003	<0.01	<0.001	<0.005	<0.05	1.47	<0.5	0.7	<0.0001	0.32	0.9	0.1	4.01	3.85
	14/09/2022	8.07	380	239	96	92.3	126	26	16	26	3	4.01	<0.0001	0.004	0.005	<0.001	0.131	0.005	<0.01	<0.001	0.013	<0.05	4.11	<0.5	0.7	<0.0001	0.58	1.4	0.23	3.72	3.82

	16/12/2022	8.18	553	327	71	53	212	37	23	44	3	4.32	<0.0001	0.004	0.005	<0.001	0.12	0.006	<0.01	<0.001	0.011	<0.05	4.14	<0.5	1.9	<0.0001	0.55	1.4	0.26	6.36	5.73
SW6	14/01/2022	8.27	642	390	58	36.8	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
	15/02/2022	8.4	399	301	42	28.5																								
	16/03/2022	7.95	318	243	85	71.3																								
	13/04/2022	8.12	370	232	50	38.8																								
	12/05/2022	8.34	517	309	26	22.6																								
	14/06/2022	8.18	402	250	26	20																								
	14/07/2022	8.24	345	224	37	29																								
	16/08/2022	7.83	360	382	529	727																								
	13/09/2022	8.11	470	306	131	101																								
	14/10/2022	7.66	277	141	143	190																								
	21/11/2022	7.98	396	318	183	164																								
	16/12/2022	8.18	552	316	84	66.3																								
SW7	14/01/2022	8.3	630	444	44	25.9	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
	15/02/2022	8.36	397	298	40	30																								
	16/03/2022	7.91	317	265	82	78.9																								
	13/04/2022	8.12	375	234	54	44.1																								
	12/05/2022	8.3	526	294	30	26.4																								
	14/06/2022	8.22	402	238	26	21																								
	15/07/2022	8.21	334	200	34	28.6																								
	16/08/2022	7.41	325	282	118	227																								
	14/09/2022	8.07	372	263	124	84.4																								
	14/10/2022	7.4	282	271	56	133																								
	21/11/2022	7.87	380	267	168	193																								

	16/12/2022	8.27	700	378	56	36.2																								
SW8	17/03/2022	7.97	316	260	67	61.7	126	23	13	23	3	3.57	<0.0001	0.004	0.004	<0.001	0.134	0.006	<0.01	<0.001	0.006	<0.05	4.23	0.8	2	<0.0001	0.34	1.3	0.22	3.49	3.29
	14/06/2022	8.22	393	248	30	22.6	130	26	17	27	3	1.53	<0.0001	0.002	0.002	<0.001	0.057	0.002	<0.01	<0.001	<0.005	<0.05	1.6	<0.5	<0.5	<0.0001	0.3	0.9	0.10	3.88	3.95
	14/09/2022	8.07	394	274	142	112	139	27	17	27	4	1.18	0.0001	0.001	0.004	<0.001	0.148	0.005	<0.01	<0.001	<0.005	<0.05	1.3	<0.5	0.8	<0.0001	0.54	1.4	0.29	4.03	4.02
	16/12/2022	8.31	701	384	73	36.9	266	51	31	55	3	1.49	<0.0001	0.001	0.002	<0.001	0.094	0.003	<0.01	<0.001	<0.005	<0.05	1.63	<0.5	1.4	<0.0001	0.92	1.7	0.24	8.07	7.56
SW9	17/03/2022																													
	14/06/2022																													
	14/09/2022	7.9	216	196	<5	62.9	86	17	4	18	8	5.66	<0.0001	0.003	0.001	0.001	0.029	0.004	<0.01	<0.001	0.016	<0.05	3.33	<0.5	<0.5	<0.0001	0.33	1.2	0.11	2.03	2.16
	16/12/2022																													

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	100th 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	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L
Flowmeter Upstream	16/08/2022	7.55	215	183	13	101	<1	17	4	17	10	8.98	<0.0001	0.005	0.003	0.002	0.047	0.006	<0.01	<0.001	0.017	<0.05	4.36			<0.0001	3.89	6	0.19	1.96	2.17	<5
	16/09/2022	7.16	105	249	152	215	<1	8	2	9	6	13.1	<0.0001	0.008	0.005	0.004	0.178	0.008	<0.01	<0.001	0.023	<0.05	7.7	<0.5	<0.5	<0.0001	0.19	2.1	0.27	0.87	1.11	<5
	28/09/2022	7.5	181	246	14	72.7	<1	14	4	17	7	4.24	<0.0001	0.002	0.003	0.001	0.035	0.005	<0.01	<0.001	0.01	<0.05	2.85	<0.5	<0.5	<0.0001	<0.01	1	0.1	1.75	1.95	<5
	10/10/2022	7.55	174	224	14	62.5	<1	12	3	15	6	4.67	0.001	0.128	<0.0001	0.002	0.002	0.001	0.036	0.005	<0.01	<0.001	0.009	<0.05	3.01	<0.0001	<0.01	1.3	0.12	1.68	1.65	<5
	18/10/2022	7.63	211	157	<5	25.3	<1	16	4	21	7	0.07	<0.001	0.12	<0.0001	<0.001	<0.001	<0.001	0.014	0.002	<0.01	<0.001	<0.005	<0.05	0.05	<0.0001	<0.01	0.7	0.06	2.22	2.22	<5
	21/10/2022	7.63	158	229	181	205	<1	10	3	14	9	3.37	0.002	0.092	<0.0001	0.003	0.01	0.004	0.101	0.005	<0.01	<0.001	0.022	<0.05	3.67	<0.0001	0.08	2.3	0.66	1.43	1.58	<5
Flowmeter Downstream	16/08/2022	7.67	213	278	12	97.9	71	17	4	17	10	9.02	<0.0001	0.005	0.003	0.002	0.046	0.006	<0.01	<0.001	0.014	<0.05	4.39			<0.0001	3.11	5.1	0.2	1.81	2.17	<5
	16/09/2022	7.43	117	241	104	238	45	9	2	10	7	13.4	<0.0001	0.008	0.005	0.004	0.166	0.008	<0.01	<0.001	0.036	<0.05	8.03	<0.5	<0.5	<0.0001	0.31	1.9	0.3	1.01	1.23	<5
	28/09/2022	7.41	211	248	11	60.2	87	18	5	19	8	5.06	<0.0001	0.003	0.026	<0.001	0.032	0.004	<0.01	<0.001	0.01	<0.05	3.23	<0.5	<0.5	<0.0001	0.23	1.3	0.11	2.16	2.34	<5
	10/10/2022	7.36	181	232	10	64.9	71	12	4	16	6	4.83	<0.001	0.122	<0.0001	0.003	0.002	0.001	0.035	0.005	<0.01	<0.001	0.008	<0.05	3.12	<0.0001	0.04	1.3	0.15	1.78	1.78	<5
	18/10/2022	7.84	251	182	<5	15.2	109	20	6	25	9	0.07	<0.001	0.124	<0.0001	<0.001	<0.001	<0.001	0.016	0.002	<0.01	<0.001	<0.005	<0.05	0.05	<0.0001	0.02	0.6	0.09	2.66	2.81	<5
	21/10/2022	7.47	110	190	88	166	42	8	2	9	7	2.87	<0.001	0.104	<0.0001	0.002	0.003	0.002	0.1	0.003	<0.01	<0.001	0.009	<0.05	1.85	<0.0001	0.08	1.7	0.3	1.01	1.13	<5
ECWDP	16/09/2022	7.07	268	415	71	261	23	18	7	20	5	7.93	<0.0001	0.004	0.004	0.004	0.052	0.007	<0.01	<0.001	0.038	<0.05	4.37	<0.5	<0.5	<0.0001	0.3	1.8	0.22	2.28	2.47	<5
	19/09/2022	6.97	220	97	45	224	25	14	6	18	5	16000	<0.1	6	8		69	11	<1	<1	28		3000			0.82	0.3		0.1			<10
	28/09/2022	6.91	162	500	11	235	25	10	4	16	4	9.63	<0.0001	0.004	0.007	0.004	0.043	0.009	<0.01	<0.001	0.02	<0.05	4.66	<0.5	<0.5	<0.0001	0.1	1.9	0.22	1.55	1.63	<5
	10/10/2022	6.86	132	482	21	307	24	3	2	20	4	10.8	0.002	0.179	<0.0001	0.007	0.007	0.006	0.039	0.01	<0.01	<0.001	0.022	<0.05	6.36	<0.0001	0.49	2.4	0.22	0.99	1.29	<5
	18/10/2022	7.12	169	506	<5	233	32	9	4	20	4	0.4	<0.001	0.1	<0.0001	<0.001	0.002	<0.001	0.022	0.004	<0.01	<0.001	<0.005	<0.05	0.27	<0.0001	0.08	2.1	0.29	1.58	1.75	<5
	21/10/2022	6.55	114	447	112	433	43	6	3	14	4	7.88	0.002	0.188	<0.0001	0.004	0.006	0.005	0.087	0.009	<0.01	<0.001	0.022	<0.05	3.77	<0.0001	0.1	2.8	0.57	1.22	1.26	<5
	1/11/2022	7.17	170	77	157	320																										
	14/11/2022	7.3	140	61.9	51	240																										
WCWDP	16/08/2022	8.01	725	418	40	55.7	182	21	10	107	4	2.66	<0.0001	0.002	0.005	<0.001	0.102	0.003	<0.01	<0.001	0.014	0.06	1.9			<0.0001	0.15	1.2	0.22	7.02	6.63	<5
	16/09/2022	7.71	258	326	322	513	86	11	4	33	4	21.6	<0.0001	0.01	0.018	0.005	0.215	0.008	<0.01	<0.001	0.049	<0.05	15.7	<0.5	0.5	<0.0001	0.26	1.5	0.65	2.38	2.42	<5

	10/10/2022 (event 1)	7.77	633	448	26	61.8	160	19	9	99	3	2.65	<0.001	0.08	<0.0001	0.001	0.004	<0.001	0.069	0.002	<0.01	<0.001	<0.005	<0.05	1.94	<0.0001	0.07	1	0.21	6.12	6.07	<5
	21/10/2022 (event 2)	7.91	378	374	183	270	121	14	7	56	5	18.1	<0.001	0.138	<0.0001	0.001	0.008	0.002	0.138	0.004	<0.01	<0.001	0.038	<0.05	14.4	<0.0001	0.18	2	0.58	3.78	3.84	<5
	1/11/2022	8.09	550	250	144	150																										
	14/11/2022	7.29	650	280	80	110																										
WCWD	16/09/2022	7.67	308	335	374	561	96	11	5	41	3	21.9	<0.0001	0.011	0.02	0.005	0.236	0.009	<0.01	<0.001	0.03	<0.05	16	<0.5	<0.5	<0.0001	0.36	1.9	0.65	2.94	2.82	<5
	10/10/2022	7.83	637	424	32	58.6	187	17	9	100	3	0.44	<0.001	0.068	<0.0001	<0.001	0.003	<0.001	0.041	0.002	<0.01	<0.001	<0.005	<0.05	0.28	<0.0001	0.04	1	0.21	6.67	6.09	<5
	21/10/2022	7.7	963	556	88	178	139	17	8	71	136	0.78	<0.001	0.093	<0.0001	<0.001	0.004	<0.001	0.076	0.002	<0.01	<0.001	0.008	<0.05	0.55	<0.0001	0.23	1.2	0.26	8.45	8.07	<5
	24/10/2022	7.89	360	162	188	212																										
	1/11/2022	8.32	660	168	132	180																										
	14/11/2022	8.11	940	410	80	100																										
HWD 10	16/09/2022	7.04	124	568	140	559	25	4	3	16	4	14.1	<0.0001	0.008	0.01	0.009	0.096	0.013	<0.01	<0.001	0.028	<0.05	8.53	<0.5	<0.5	<0.0001	0.53	2.5	0.36	0.92	1.24	<5
	19/09/2022	6.74	150	45	22	294	21	3	3	16	5	7400	<0.1	6	9	N/A	69	11	<1	<1	28	<20	6100	<1	1	<0.05		1.2	<0.005			<10
	28/09/2022	6.89	116	536	27	331	21	3	2	18	4	9.44	<0.0001	0.005	0.008	0.006	0.04	0.011	<0.01	<0.001	0.022	<0.05	5.2	<0.5	<0.5	<0.0001	0.48	2.4	0.24	0.93	1.2	<5
	10/10/2022	6.82	124	609	66	414	24	3	2	19	4	12.2	0.002	0.211	<0.0001	0.007	0.009	0.008	0.065	0.012	<0.01	<0.001	0.027	<0.05	7.44	<0.0001	0.39	2.3	0.29	0.96	1.24	<5
	21/10/2022	7.22	120	515	130	527	27	7	3	14	4	11.5	0.002	0.175	<0.0001	0.005	0.008	0.005	0.072	0.01	<0.01	<0.001	0.028	<0.05	6.18	<0.0001	0.08	1.9	0.26	1.07	1.31	<5
	24/10/2022	6.56	100	42.8	32	255																										
	14/11/2022	6.9	100	45	62	270																										
HWD 9	1/11/2022	7.06	170	81	142	330																										
	14/11/2022	7.09	180	81	169	270																										
HWD 11	16/09/2022	7.12	282	403	102	327	25	18	8	20	5	8.06	<0.0001	0.004	0.004	0.004	0.064	0.007	<0.01	<0.001	0.013	<0.05	4.74	<0.5	<0.5	<0.0001	0.17	1.8	0.24	2.49	2.55	<5
	19/09/2022	6.82	180		21	215	23	10	5	16	5	16000	<0.1	7	7	6	64	12	<1	<1	21	<20	7000	<1	1	0.08		1	0.2			<10
	28/09/2022	7.05	156	499	8	224	25	9	4	18	4	9.24	<0.0001	0.003	0.006	0.004	0.043	0.008	<0.01	<0.001	0.016	<0.05	4.45	<0.5	<0.5	<0.0001	0.03	1.8	0.23	1.46	1.66	300
	18/10/2022	7.16	169	628	14	234	32	10	4	20	4	0.4	<0.001	0.101	<0.0001	<0.001	0.002	<0.001	0.02	0.004	<0.01	<0.001	<0.005	<0.05	0.26	<0.0001	0.08	2	0.25	1.56	1.8	<5
	21/10/2022	7.26	141	433	64	301	28	3	2	16	3	1.27	0.001	0.156	<0.0001	0.001	0.006	0.003	0.057	0.006	<0.01	<0.001	0.014	<0.05	0.8	<0.0001	0.36	2.2	0.32	1.28	1.09	<5
	24/10/2022	6.93	110	49.5	34	225																										
	14/11/2022	6.92	160	72	109	230																										
SD9	25/02/2022	8.02	1220	840	129	81.4																										<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	14/02/2022	-	-	<5
	Conductivity	µs/cm				-	-	1010
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.32
Mine Void	TSS	mg/L	Every 2 Months	1	13/04/2022	-	-	7
	Conductivity	µs/cm				-	-	110
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.29
Mine Void	TSS	mg/L	Every 2 Months	1	15/06/2022	-	-	<5
	Conductivity	µs/cm				-	-	1220
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.17
Mine Void	TSS	mg/L	Every 2 Months	1	12/08/2022	-	-	<5
	Conductivity	µs/cm				-	-	1110
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.38
Mine Void	TSS	mg/L	Every 2 Months	1	13/10/202	-	-	9
	Conductivity	µs/cm				-	-	1080
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.59
Mine Void	TSS	mg/L	Every 2 Months	1	9/12/2022	-	-	<5
	Conductivity	µs/cm				-	-	1000
	Oil & Grease	mg/L				-	-	<5
	pH	pH				-	-	8.48

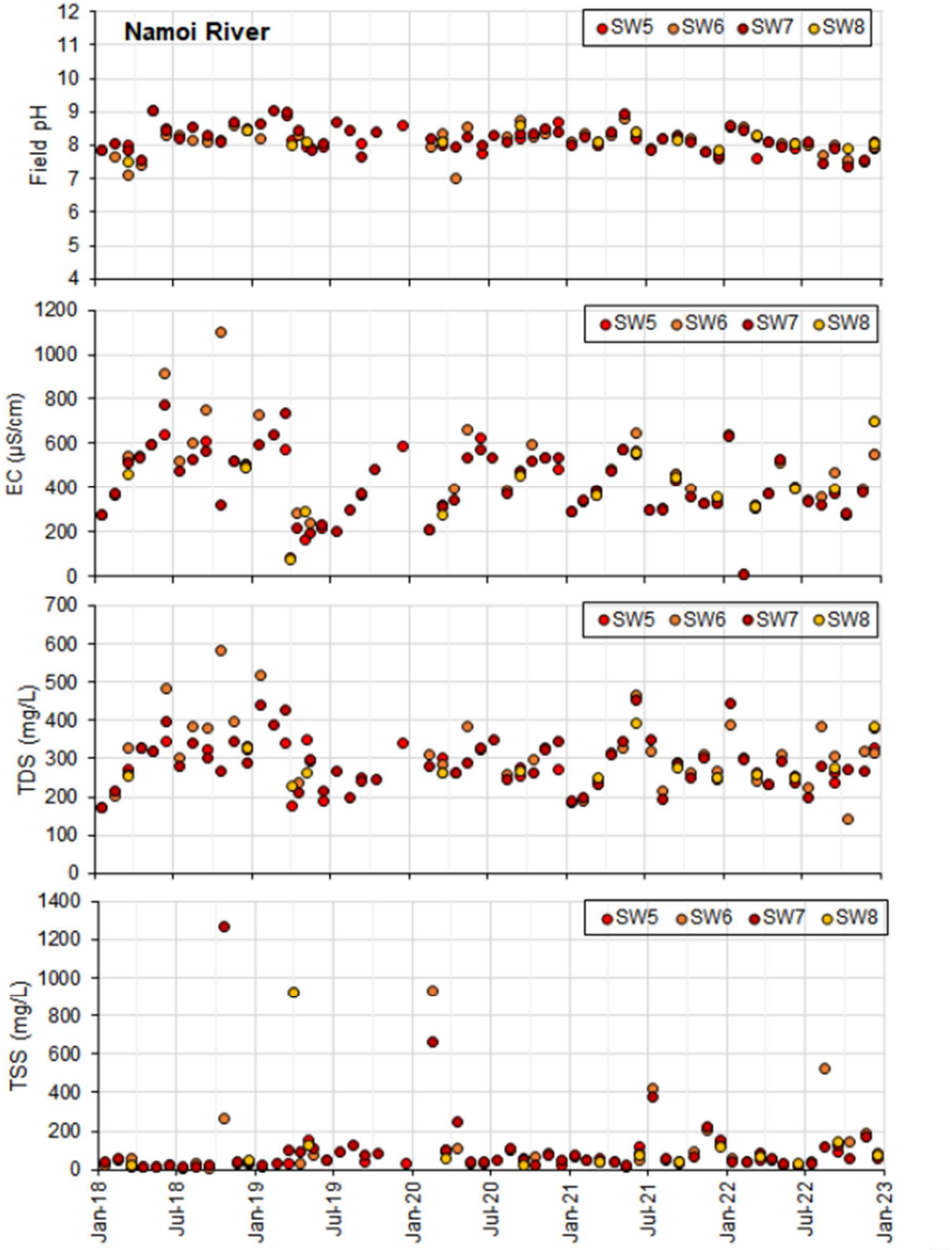


Figure D-1 – Namoi River surface water quality trends (5 year summary – 2018 to 2022)

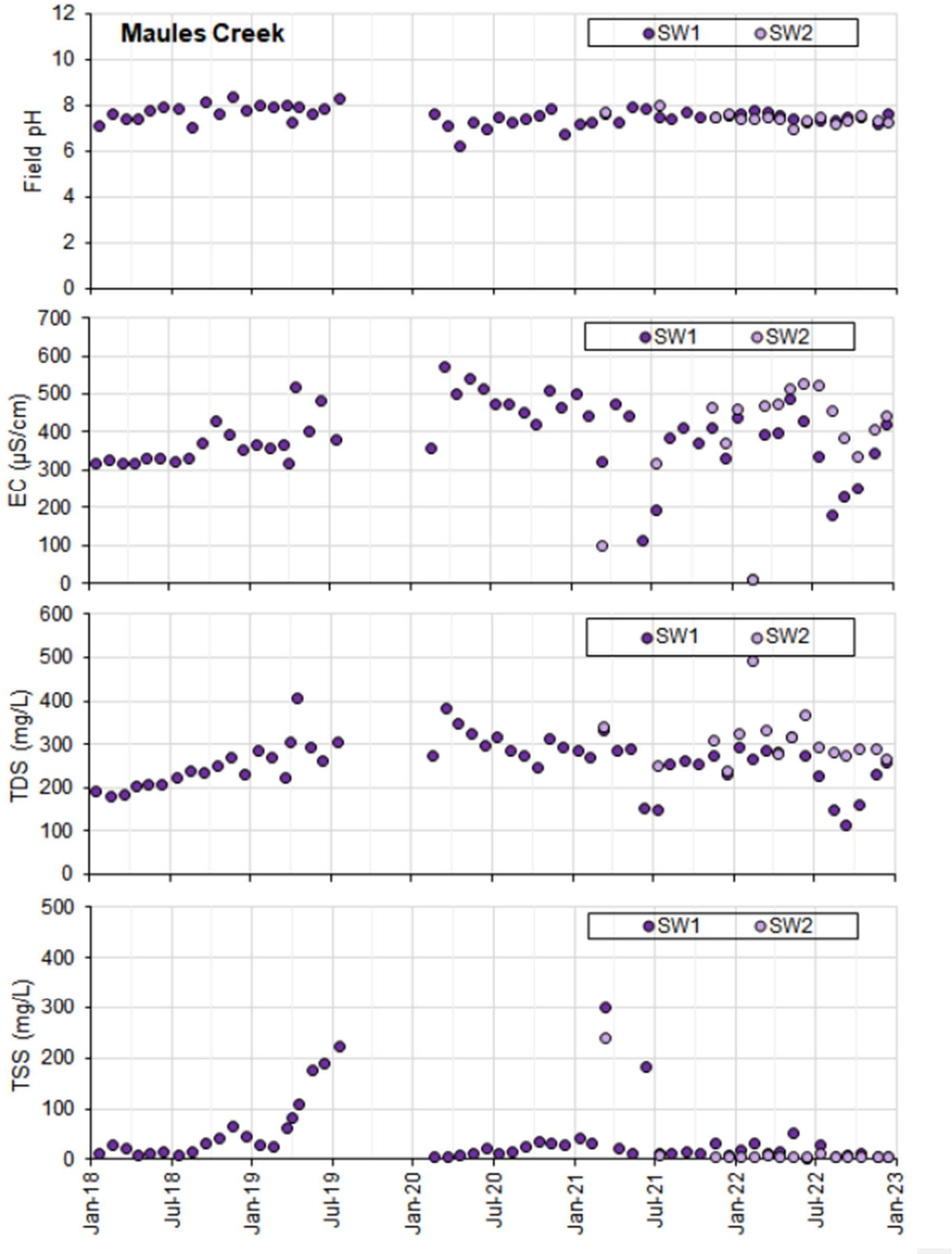


Figure D-2 – Maules Creek surface water quality trends (5 year summary – 2018 to 2022)

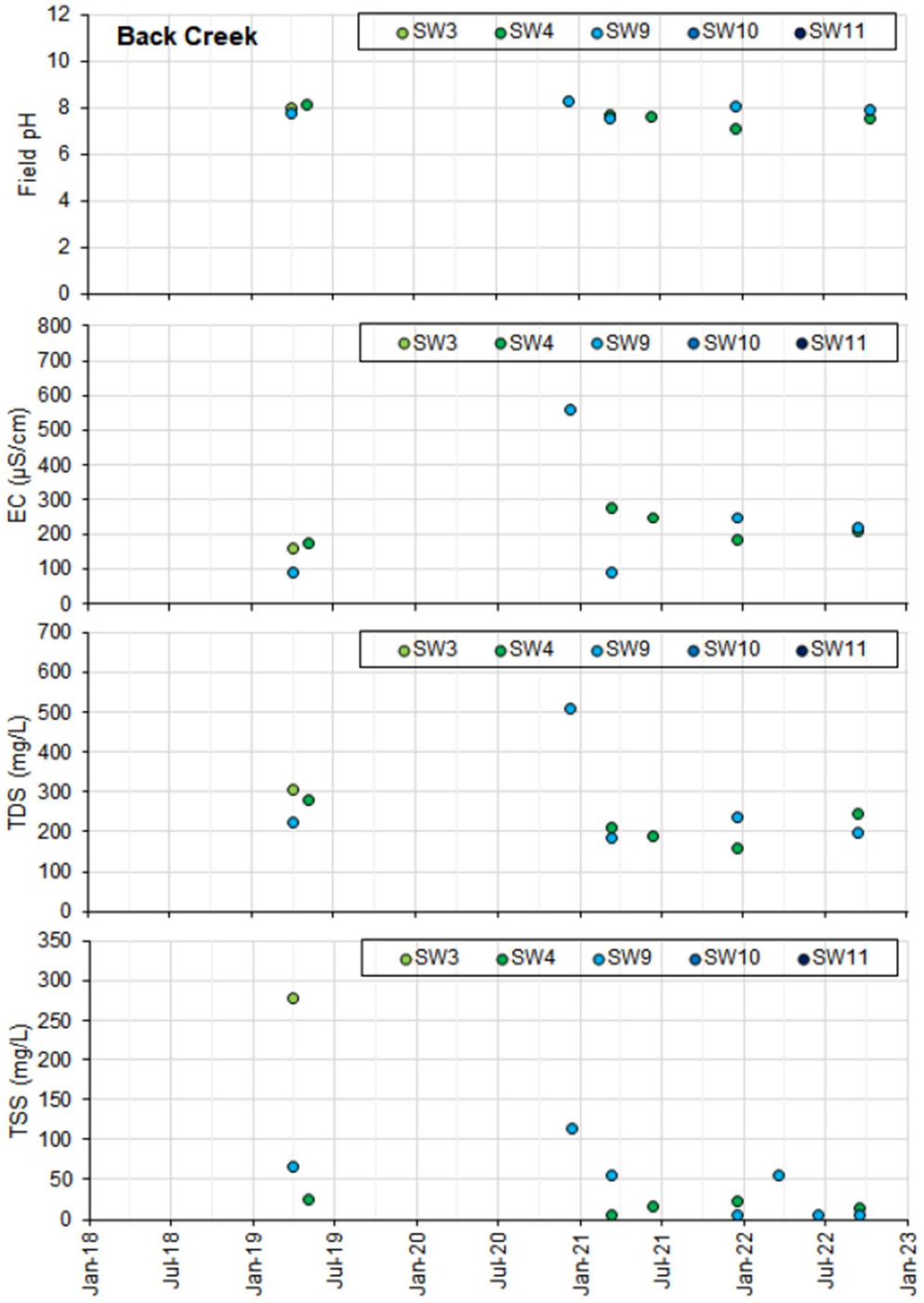


Figure D-3 – Back Creek surface water quality trends (5 year summary – 2018 to 2022)

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
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

Bore ID	Approx. EIS proposed site	Type	Network	Easting (GDA94Z56)	Northing (GDA94Z56)	GL (mAHD)	Bore depth (m)	Screen/sensor depth (mbgl)	Target geology
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
2022-01	77.58	12.19	20.92	17.82	*dry*	21.06	4.22	*dry*	25.62	22.06	19.89	*dry*	*dry*
2022-02	78.03	12.42	21.25	*no access to site*	*no access to site*	20.90	4.71	*no access to site*	25.52	21.86	19.79	*dry*	*dry*
2022-03	78.38	12.33	21.27	18.06	*dry*	20.87	4.77	*dry*	25.51	21.79	19.6	*dry*	*dry*
2022-04	78.75	12.16	21.35	18.06	*dry*	20.69	5.12	*dry*	25.46	21.70	19.26	*dry*	*dry*
2022-05	79.10	12.02	21.32	18.06	*dry*	20.59	5.34	*dry*	25.45	21.62	19.16	*dry*	*dry*
2022-06	79.54	12.01	21.38	18.06	*dry*	20.52	5.44	*dry*	25.39	21.61	19.09	*dry*	*dry*
2022-07	79.83	12.01	21.34	18.03	*dry*	20.35	5.57	*dry*	25.29	21.48	18.98	*dry*	*dry*
2022-08	80.23	11.93	21.38	18	*dry*	20.24	5.73	*dry*	25.30	21.48	18.9	*dry*	*dry*
2022-09	80.57	11.64	21.39	18.03	*dry*	20.13	5.77	*dry*	25.22	21.53	18.88	*dry*	*dry*
2022-10	80.71	11.62	21.40	17.98	*dry*	20.06	4.55	*dry*	25.98	21.10	18.77	*dry*	*dry*
2022-11	80.63	11.24	21.39	17.93	*dry*	19.87	3.25	*dry*	24.36	20.62	18.27	*dry*	*8.61*
2022-12	80.39	10.98	21.36	17.93	*dry*	19.72	3.44	*dry*	24.18	20.16	17.96	*dry*	*dry*

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 SO4 - 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	-	10	0.15	1	20	5	-	-	30	-	-	-	-
	Long-term irrigation water	6.0-8.5	-	-	-	-	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	18/03/2022	7.51	1810	1070	77	0.01	<0.001	0.288	<0.0001	0.001	<0.001	0.027	0.083	0.007	0.008	0.02	0.06	0.08	0.96	0.04	0.05	20.8	19.6	2.85
	20/06/2022	7.54	1820	1070	85	<0.01	<0.001	0.278	<0.0001	<0.001	<0.001	0.023	0.081	0.007	0.008	0.019	<0.05	0.08	0.81	0.02	0.01	19.6	19.8	0.45
	5/09/2022	7.59	1920	1030	75	<0.01	<0.001	0.29	<0.0001	<0.001	<0.001	0.027	0.088	0.008	0.009	0.017	0.06	0.1	0.98	0.01	0.73	20.9	20.2	1.61
	2/12/2022	7.46	1800	1060	82	<0.01	<0.001	0.287	<0.0001	<0.001	<0.001	0.028	0.097	0.007	0.01	0.025	0.06	0.07	0.78	0.22	<0.01	21.2	19.5	4.12
Reg3	18/03/2022	7.74	1220	759	132	<0.01	0.003	0.02	<0.0001	<0.001	<0.001	<0.001	0.192	0.02	0.001	0.007	0.06	0.07	0.36	<0.01	0.01	12.8	12.5	1.5
	10/06/2022	7.66	1290	746	113	<0.01	0.003	0.021	<0.0001	<0.001	<0.001	<0.001	0.198	0.015	0.001	0.008	0.05	0.1	0.3	0.01	0.02	13.4	13	1.25
	5/09/2022	7.86	1270	698	108	<0.01	0.003	0.016	<0.0001	<0.001	<0.001	<0.001	0.2	0.11	0.019		0.02	0.06		0.4	<0.01	0.28	13.2	13.2
	5/12/2022	7.69	1390	922	141	<0.01	0.002	0.023	<0.0001	0.002	<0.001	0.002	0.138	0.011	0.001	0.009	0.1	<0.05	0.02	0.01	0.3	16.3	15.1	3.91
Reg4	8/03/2022	8.35	1150	737	26	<0.01	<0.001	0.01	<0.0001	0.002	<0.001	0.054	0.024	0.004	0.001	0.01	0.09	<0.05	0.11	0.09	0.13	13	12.2	3.08
	9/06/2022	8.23	1200	680	29	<0.01	0.001	0.01	<0.0001	0.003	<0.001	0.061	0.051	0.004	0.001	<0.005	0.07	<0.05	0.19	0.15	0.14	12.6	12.6	0.06
	1/09/2022	8.22	1120	600	12	0.05	0.001	0.01	<0.0001	<0.001	<0.001	0.051	0.068	0.004	0.001	0.014	0.08	<0.05	<0.01	<0.01	0.23	12.2	12	0.85
	1/12/2022	8.33	1100	684	27	<0.01	0.001	0.014	<0.0001	<0.001	<0.001	0.065	0.033	0.004	<0.001	0.008	0.08	<0.05	<0.01	0.02	0.27	12.8	12.1	2.64
Reg5	8/03/2022	8.08	1860	1240	242	0.02	<0.001	0.012	<0.0001	<0.001	<0.001	0.008	0.522	<0.001	0.001	0.006	0.08	<0.05	0.48	0.02	<0.01	19.9	18.5	3.66
	9/06/2022	7.74	1900	1090	257	<0.01	<0.001	0.012	<0.0001	<0.001	<0.001	0.008	0.516	0.002	0.002	0.008	0.05	<0.05	0.39	0.07	<0.01	19.7	18.4	3.41
	1/09/2022	7.87	1870	1080	257	0.05	<0.001	0.01	<0.0001	<0.001	<0.001	0.007	0.444	0.002	0.002	0.03	0.06	<0.05	0.32	0.07	<0.01	19.9	18.5	3.51
	1/12/2022	7.79	1760	1060	268	<0.01	<0.001	0.012	<0.0001	<0.001	<0.001	0.006	0.195	0.003	0.002	0.031	0.06	<0.05	0.08	<0.01	0.02	20.3	18.4	4.93
Reg5a	8/03/2022	*dry*																						
	9/06/2022	*dry*																						
	1/09/2022	*dry*																						
	1/12/2022	*dry*																						
Reg6	3/03/2022	8.07	1900	1230	115	<0.01	<0.001	0.052	<0.0001	0.001	<0.001	0.005	0.054	-	0.004	0.037	0.11	<0.05	0.02	<0.01	0.06	19.4	18.8	1.81
	10/06/2022	7.74	2000	1130	137	<0.01	<0.001	0.029	<0.0001	<0.001	<0.001	0.005	0.287	-	0.004	<0.005	0.11	<0.05	0.54	0.01	0.02	20.3	18.9	3.4
	2/09/2022	7.77	2040	1110	130	<0.01	<0.001	0.042	<0.0001	<0.001	<0.001	0.007	0.137	-	0.003	<0.005	0.08	<0.05	0.1	<0.01	0.03	21	19.8	3.02
	2/12/2022	7.71	1770	1040	103	<0.01	0.001	0.038	<0.0001	<0.001	<0.001	0.004	0.313	-	0.002	<0.005	0.07	<0.05	0.28	<0.01	0.02	19.7	17.4	5.99
Reg7a	2/03/2022	7.2	954	652	60	<0.01	<0.001	0.106	<0.0001	0.004	<0.001	0.003	0.24	<0.001	0.002	0.046	<0.05	<0.05	0.09	0.04	0.6	10.8	10.4	2.13
	10/06/2022	7.09	954	556	58	<0.01	0.001	0.107	<0.0001	0.004	<0.001	0.003	0.254	<0.001	0.002	0.06	<0.05	<0.05	0.03	0.02	0.38	10	10.1	0.49
	6/09/2022	7.16	942	518	58	<0.01	0.001	0.107	<0.0001	0.004	<0.001	0.004	0.247	<0.001	0.001	0.054	<0.05	<0.05	0.04	0.02	0.44	9.96	9.91	0.28
	6/12/2022	7.08	928	602	78	<0.01	0.002	0.104	<0.0001	0.003	<0.001	0.004	0.177	<0.001	0.001	0.041	<0.05	<0.05	<0.01	0.04	1.14	10.7	10.2	2.62

Location	Date	Lab pH value	Lab electrical conductivity @ 25°C	TDS @ 180°C	Sulfate as SO4 - 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	%
Reg12	21/03/2022	7.51	2000	1350	61	<0.01	<0.001	0.069	<0.0001	0.005	<0.001	0.03	0.11	0.003	0.002	0.038	0.13	<0.05	0.06	<0.01	0.05	25.3	23.8	3.14
	20/06/2022	7.53	2220	1420	66	<0.01	<0.001	0.057	<0.0001	0.002	<0.001	0.035	0.093	0.002	<0.001	0.036	0.1	<0.05	0.03	<0.01	<0.01	24	21.4	5.82
	6/09/2022	7.4	2400	1390	69	<0.01	0.001	0.081	<0.0001	0.003	<0.001	0.042	0.071	0.003	0.001	0.036	0.1	0.19	0.08	<0.01	0.48	27.6	25.8	3.38
	5/12/2022	7.43	2200	1470	71	<0.01	<0.001	0.087	<0.0001	0.007	0.003	0.046	0.113	0.003	0.002	0.037	0.1	<0.05	0.02	0.06	0.21	27.9	25.9	3.72
Reg13	7/03/2022	7.65	3400	2630	1130	<0.01	0.001	0.06	0.0004	0.002	<0.001	0.012	0.417	0.01	0.009	0.144	0.12	<0.05	0.02	<0.01	0.01	37.5	38.7	1.69
	9/06/2022	8.18	3670	2690	1210	<0.01	<0.001	0.043	<0.0001	0.001	<0.001	0.015	0.255	0.011	0.004	0.042	0.2	<0.05	0.02	<0.01	<0.01	40.8	39.5	1.64
	1/09/2022	7.71	3700	2600	1230	0.05	<0.001	0.045	0.0009	0.002	<0.001	0.017	0.362	0.011	0.016	0.74	0.22	<0.05	0.03	<0.01	<0.01	40.8	40.5	0.3
	1/12/2022	7.59	3190	2590	1240	<0.01	<0.001	0.048	0.0003	<0.001	<0.001	0.012	0.36	0.009	0.007	0.079	0.17	<0.05	<0.01	<0.01	0.02	41.1	38	3.97
Reg14	7/03/2022	7.56	982	678	56	<0.01	0.002	0.026	0.0002	0.003	<0.001	<0.001	0.098	0.006	0.005	0.073	<0.05	<0.05	0.01	<0.01	0.04	12.4	10.2	9.87
	10/06/2022	7.54	1030	598	52	<0.01	0.003	0.022	<0.0001	<0.001	<0.001	<0.001	0.14	0.006	0.004	0.008	0.06	<0.05	0.02	<0.01	0.03	10.4	10.2	0.91
	2/09/2022	7.55	1060	603	70	<0.01	0.003	0.018	<0.0001	<0.001	<0.001	0.001	0.141	0.006	0.004	0.138	0.06	<0.05	0.02	<0.01	0.31	11.1	11	0.41
	2/12/2022	7.49	919	602	45	<0.01	0.003	0.026	<0.0001	<0.001	<0.001	<0.001	0.168	0.006	0.002	0.006	<0.05	<0.05	<0.01	<0.01	0.02	10.2	9.86	1.91
BCM01	17/03/2022	*dry*																						
	20/06/2022	*dry*																						
	6/09/2022	*dry*																						
	5/12/2022	*dry*																						
BCM03	17/03/2022	*dry*																						
	10/06/2022	*dry*																						
	5/09/2022	*dry*																						
	6/12/2022	*dry*																						
MAC1280	18/03/2022	11.7	3480	2190	14	3.04	<0.001	0.157	<0.0001	0.008	<0.001	0.124	<0.001	0.033	0.015	0.011	<0.05	<0.05	5.74	0.71	0.23	31.8	31.6	0.45
	20/06/2022	11.8	3550	2580	14	2.96	<0.001	0.163	<0.0001	0.008	<0.001	0.13	<0.001	0.032	0.016	0.007	<0.05	<0.05	5.68	0.73	0.15	29.8	33.6	5.88
	5/09/2022	11.7	3820	2330	12	2.06	<0.001	0.208	<0.0001	0.014	<0.001	0.139	<0.001	0.029	0.027	<0.005	<0.05	<0.05	7.64	0.42	0.16	28.6	30.9	3.91
	6/12/2022	10.4	2080	1410	534	0.08	<0.001	0.045	<0.0001	0.006	<0.001	0.099	0.001	0.018	0.004	<0.005	0.07	<0.05	0.59	0.58	1.63	24.4	21	7.38

Private Groundwater Bores

Table E-4

Groundwater Levels

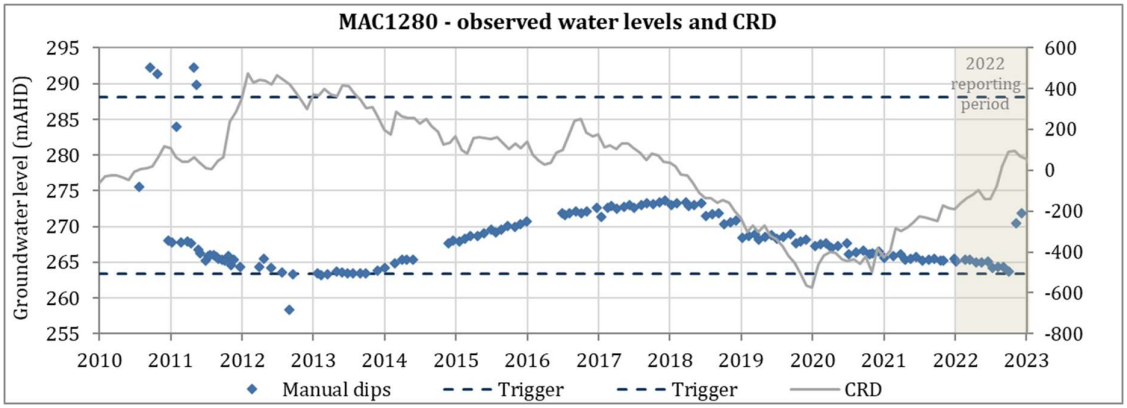
Year-Month	MOR1	MOR2	BRE2	WOL1	WOL2	SCHOOL	WHAN	TRALEE	MORSE	BAS1	BAS2	Teston
2022-02	12.03	13.12	15.23	2.36	13.26	*tap*	*tap*	18.11	21.33	*tap*	7.4	19.35
2022-08	11.92	13	14.54	2.5	25.45	*tap*	3.32	17.56	20.87	*tap*	7.77	19.36

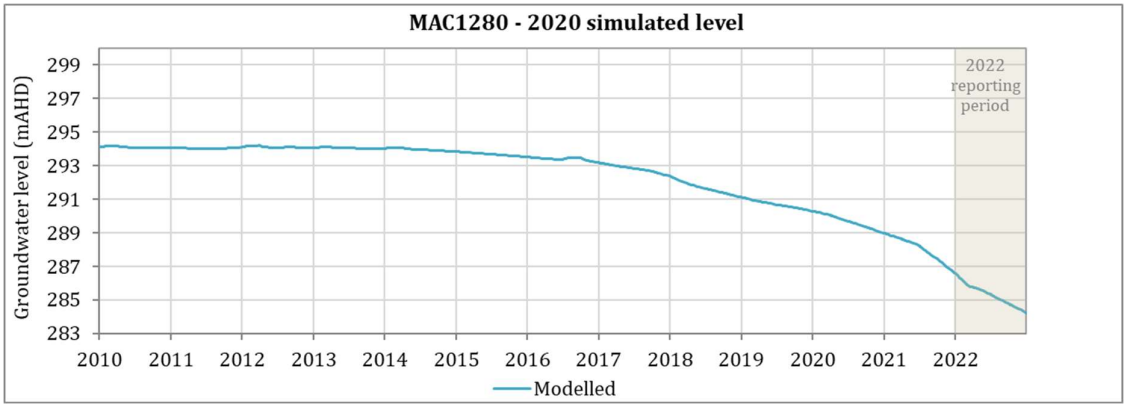
Table E-5

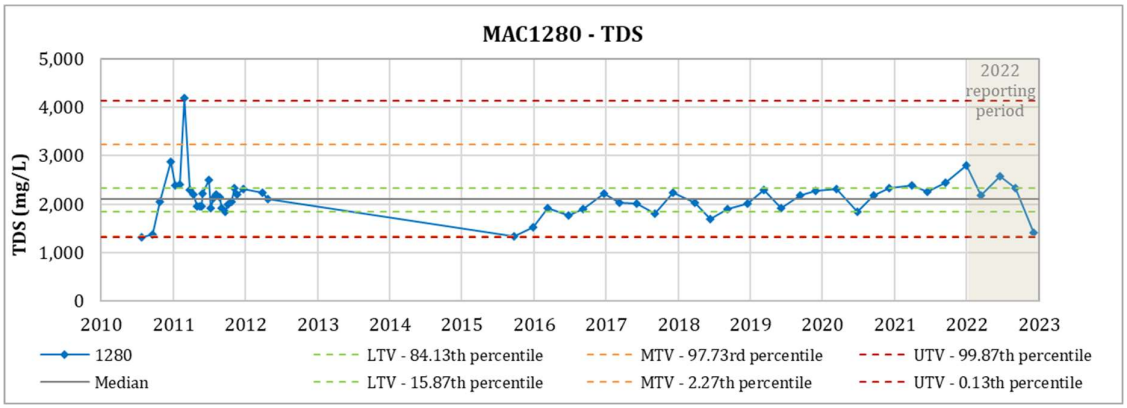
Groundwater Monitoring Results and comparison with ANZECC guideline trigger values

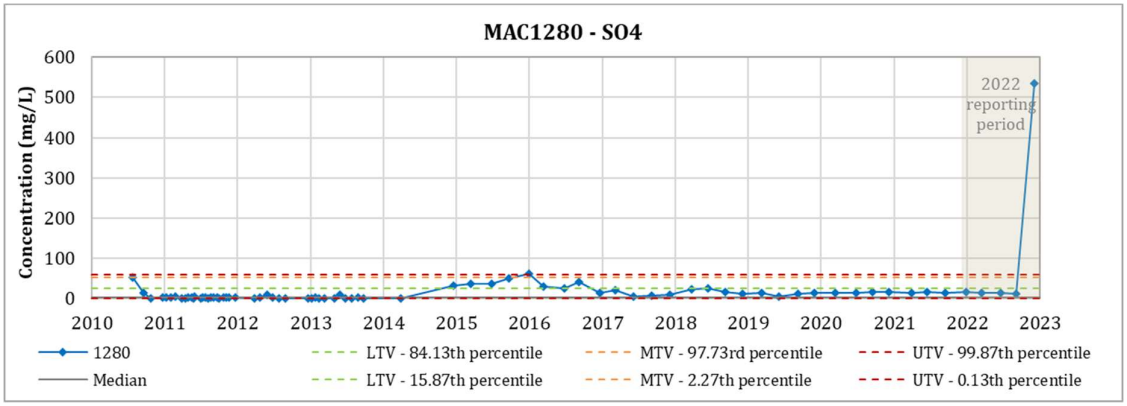
Site	Date	Lab pH value	Lab electrical conductivity @ 25°C	TDS @ 180°C	Sulfate as SO4 - turbimetric	Aluminium (filt.)	Arsenic (filt.)	Barium (filt.)	Cadmium (filt.)	Copper (filt.)	Lead (filt.)	Lithium (filt.)	Manganese (filt.)	Molybdenum (filt.)	Nickel (filt.)	Zinc (filt.)	Boron (filt.)	Iron (filt.)	Ammonia 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	-	10	0.15	1	20	5	-	-	30	-	-	-	-
	Long-term irrigation water	6.0-8.5	-	-	-	-	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
MOR1	1/02/2022	7.5	1170	806	37	<0.01	<0.001	0.138	<0.0001	0.038	0.003	0.011	0.012	0.001	0.024	0.193	<0.05	0.1	0.012	0.001	0.024	0.193	<0.05	0.1
	23/08/2022	8.67	1360	856	44	<0.01	<0.001	0.023	<0.0001	0.005	<0.001	0.023	0.019	0.002	0.005	0.136	<0.05	0.11	0.019	0.002	0.005	0.136	<0.05	0.11
MOR2	1/02/2022	7.43	84	65	11	<0.01	<0.001	0.005	<0.0001	<0.001	0.003	0.005	0.297	<0.001	<0.001	<0.005	0.31	0.37	0.297	<0.001	<0.001	<0.005	0.31	0.37
	23/08/2022	7.38	143	74	<1	<0.01	<0.001	0.005	<0.0001	<0.001	<0.001	0.008	0.254	<0.001	<0.001	0.006	<0.01	0.27	0.254	<0.001	<0.001	0.006	<0.01	0.27
BRE2	1/02/2022	8.64	1270	868	6	<0.01	<0.001	0.03	<0.0001	0.002	<0.001	0.024	0.081	<0.001	0.001	0.007	0.06	<0.05	0.081	<0.001	0.001	0.007	0.06	<0.05
	22/08/2022	9.15	1770	1140	23	<0.01	<0.001	0.009	<0.0001	0.007	<0.001	0.014	0.014	0.002	0.002	<0.005	<0.05	<0.05	0.014	0.002	0.002	<0.005	<0.05	<0.05
WOL1	2/02/2022	7.28	586	386	30	<0.01	<0.001	0.014	<0.0001	<0.001	<0.001	0.002	0.023	0.001	<0.001	0.033	<0.05	<0.05	0.023	0.001	<0.001	0.033	<0.05	<0.05
	23/08/2022	7.08	563	356	37	<0.01	0.001	0.012	<0.0001	0.002	<0.001	0.003	0.022	0.001	<0.001	0.014	<0.05	<0.05	0.022	0.001	<0.001	0.014	<0.05	<0.05
WOL2	8/03/2022	*dry*																						
	1/12/2022	*dry*																						
School raw	2/02/2022	7.7	225	184	3	<0.01	0.001	0.008	<0.0001	0.005	<0.001	0.001	0.006	<0.001	<0.001	0.014	<0.05	<0.05	0.006	<0.001	<0.001	0.014	<0.05	<0.05
	26/08/2022	7.39	384	236	6	<0.01	<0.001	0.009	<0.0001	<0.001	<0.001	0.002	0.003	<0.001	0.001	0.031	<0.05	<0.05	0.003	<0.001	0.001	0.031	<0.05	<0.05
Whan	15/02/2022	7.31	299	233	8	<0.01	<0.001	0.014	<0.0001	<0.001	<0.001	0.002	0.002	<0.001	<0.001	<0.005	<0.05	<0.05	0.002	<0.001	<0.001	<0.005	<0.05	<0.05
	13/08/2022	7.24	309	211	8	<0.01	<0.001	0.013	<0.0001	0.005	<0.001	0.003	0.026	<0.001	0.002	0.14	<0.05	0.05	0.026	<0.001	0.002	0.14	<0.05	0.05
Tralee	17/03/2022	*dry*																						
	5/12/2022	*dry*																						
Morse	1/02/2022	7.24	523	527	<1	0.03	<0.001	0.011	<0.0001	0.007	<0.001	0.011	0.208	<0.001	0.007	0.088	0.06	0.85	0.208	<0.001	0.007	0.088	0.06	0.85
	22/08/2022	7.33	1050	777	26	0.02	<0.001	0.012	<0.0001	0.017	<0.001	0.015	0.3	<0.001	0.004	0.081	<0.05	0.24	0.3	<0.001	0.004	0.081	<0.05	0.24
Bas1	2/02/2022	7	559	354	5	<0.01	<0.001	0.122	<0.0001	<0.001	<0.001	0.002	7.03	<0.001	0.003	0.012	<0.05	0.36	7.03	<0.001	0.003	0.012	<0.05	0.36
	22/08/2022	6.78	494	300	7	<0.01	<0.001	0.044	<0.0001	0.002	<0.001	0.002	6.04	<0.001	0.003	0.017	<0.05	<0.05	6.04	<0.001	0.003	0.017	<0.05	<0.05
Bas2	1/02/2022	no sample																						
	22/08/2022	no sample																						
Teston	1/02/2022	7.32	913	687	10	<0.01	<0.001	0.06	0.0021	0.008	0.004	0.008	0.773	<0.001	0.003	0.017	0.07	3.49	0.773	<0.001	0.003	0.017	0.07	3.49
	22/08/2022	7.17	801	555	<10	<0.01	<0.001	0.064	0.005	0.06	<0.001	0.009	0.251	<0.001	0.003	0.015	0.06	0.12	0.251	<0.001	0.003	0.015	0.06	0.12

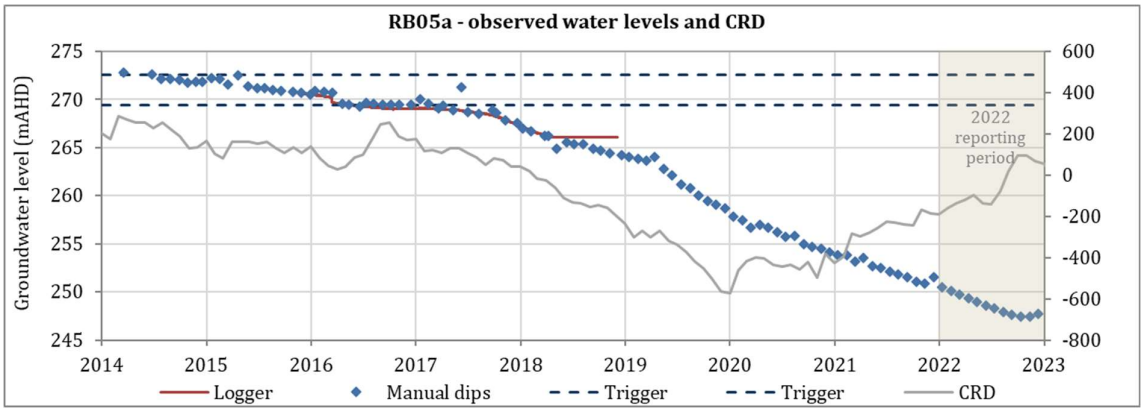
Regional standpipe monitoring bores – observed and modelled water levels, and water quality trigger parameters

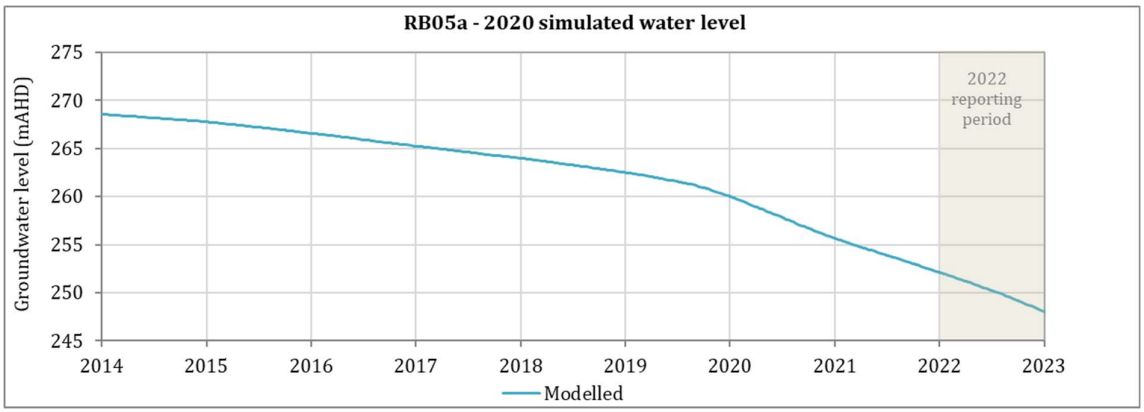


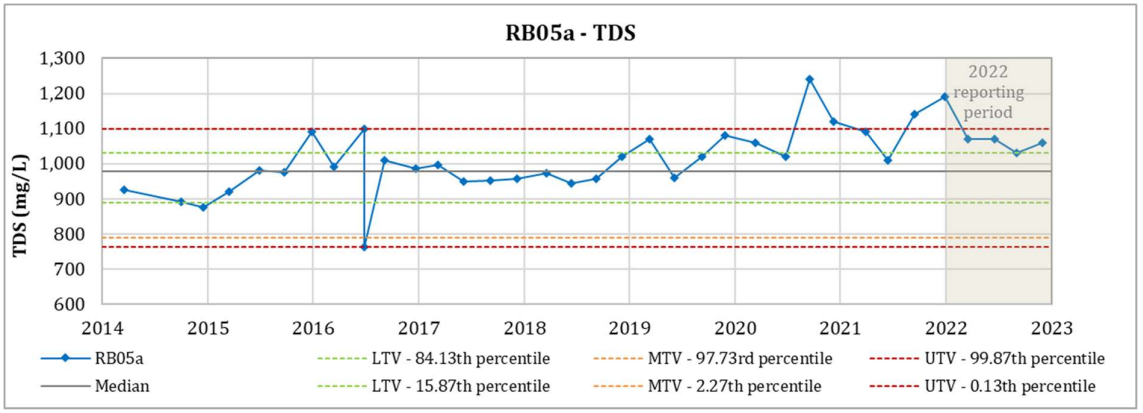


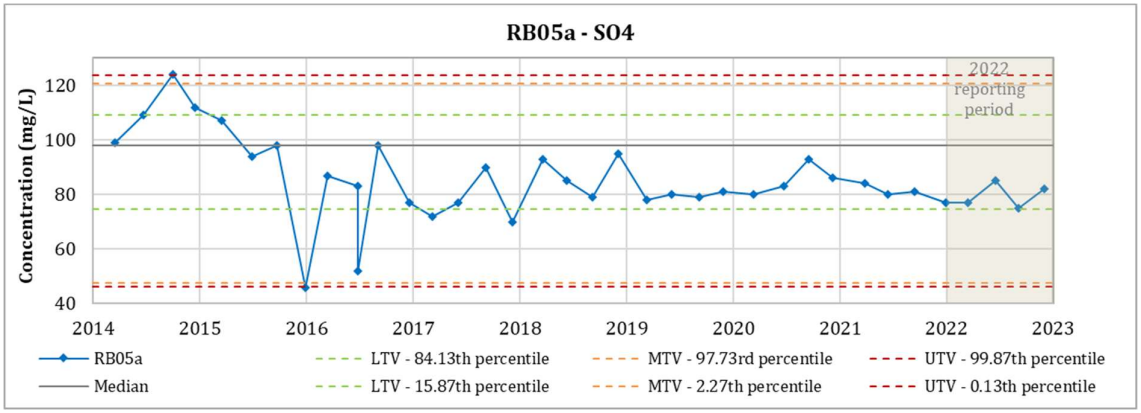


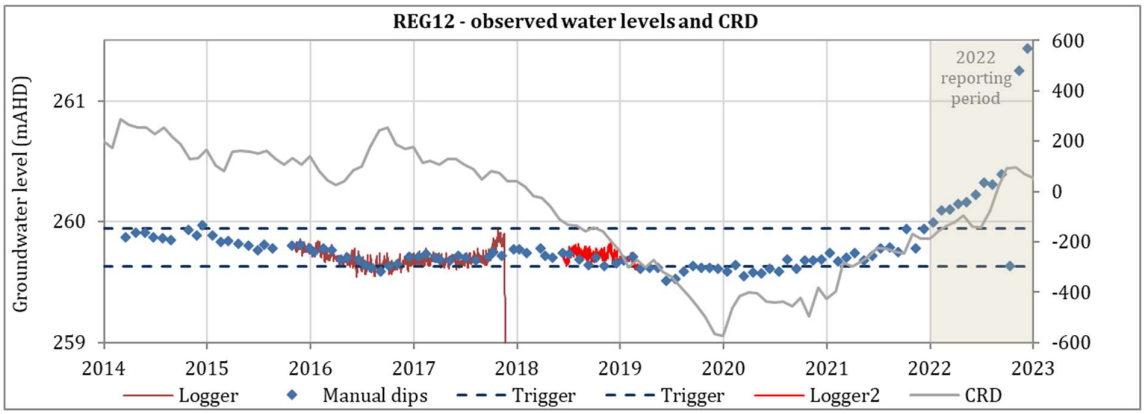

MAC1280 - SO4
Concentration (mg/L)
600
500
400
300
200
100
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
1280
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

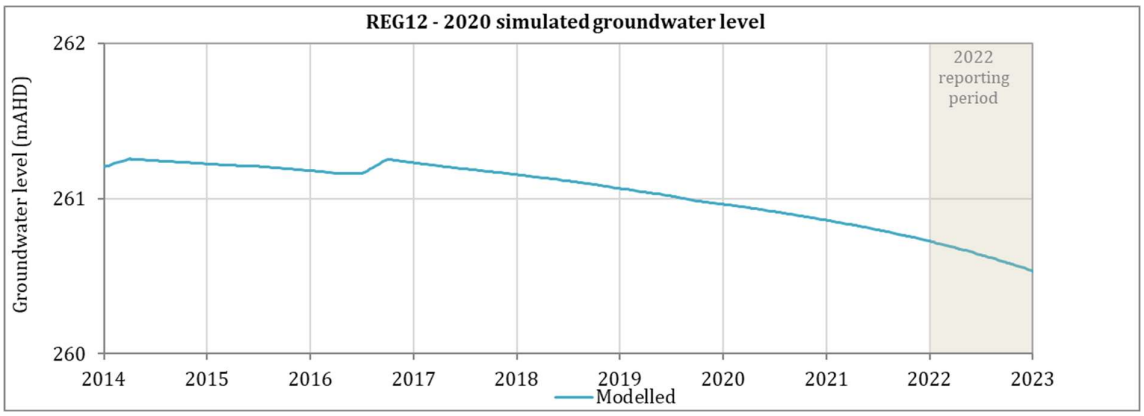

RB05a - observed water levels and CRD
Groundwater level (mAHD)
275
270
265
260
255
250
245
600
400
200
0
-200
-400
-600
-800
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD

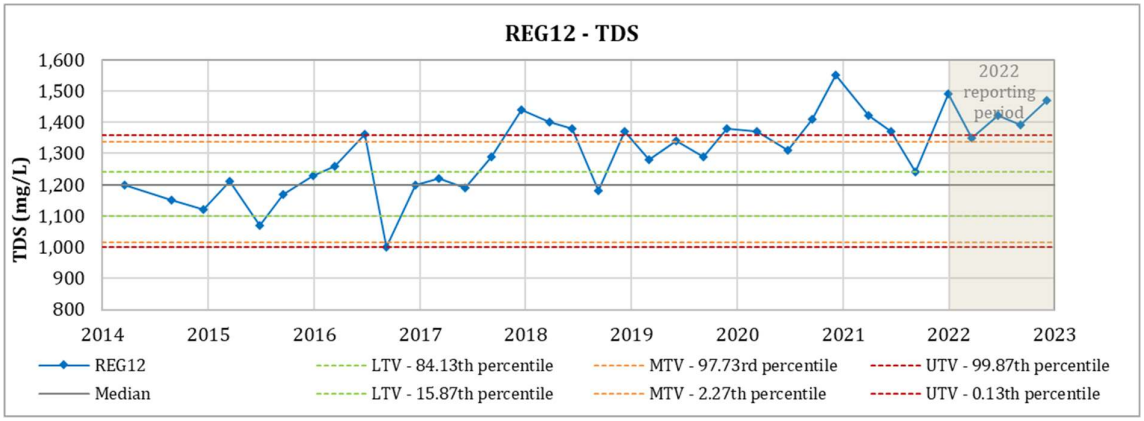

RB05a - 2020 simulated water level
Groundwater level (mAHD)
275
270
265
260
255
250
245
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

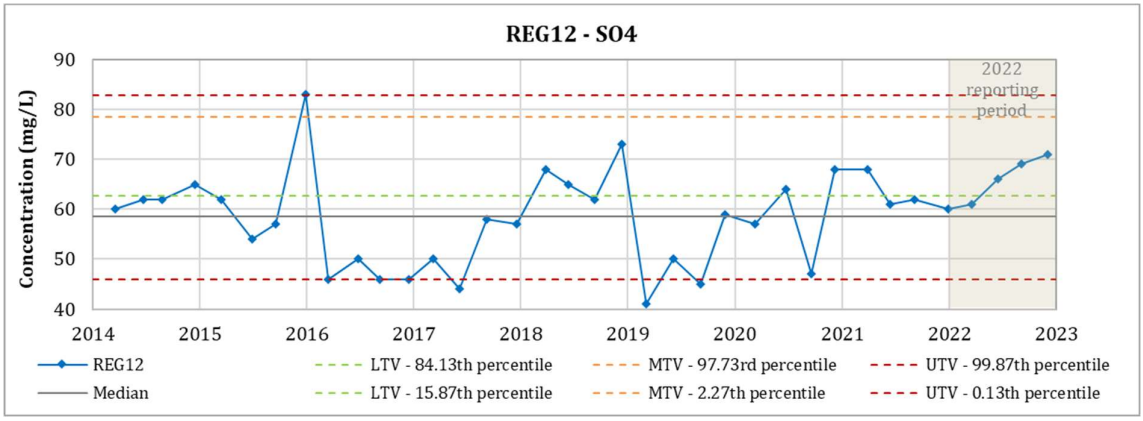

RB05a - TDS
TDS (mg/L)
1,300
1,200
1,100
1,000
900
800
700
600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
RB05a
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

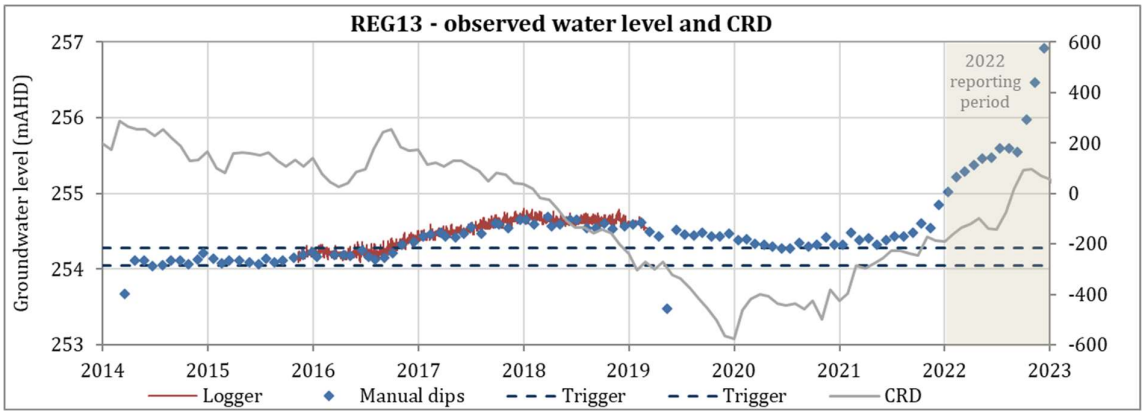

RB05a - SO4
Concentration (mg/L)
120
100
80
60
40
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
RB05a
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

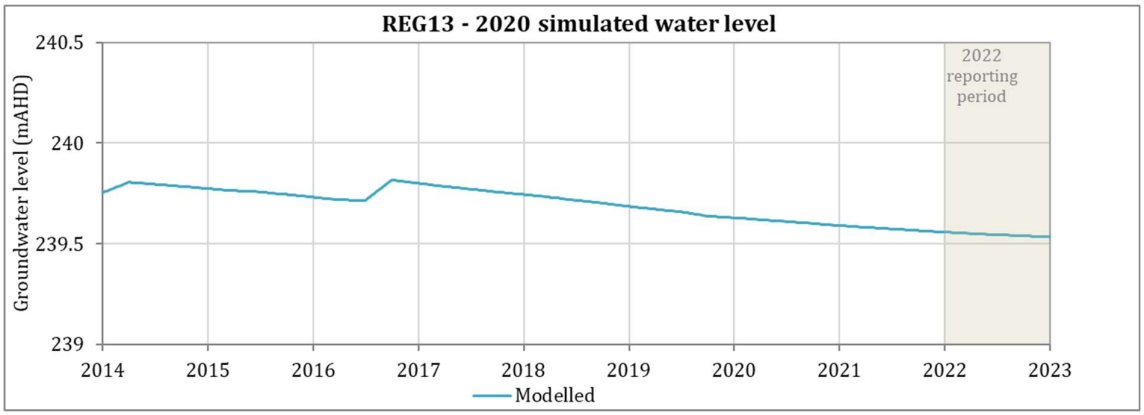

REG12 - observed water levels and CRD
Groundwater level (mAHD)
261
260
259
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
Logger2
CRD

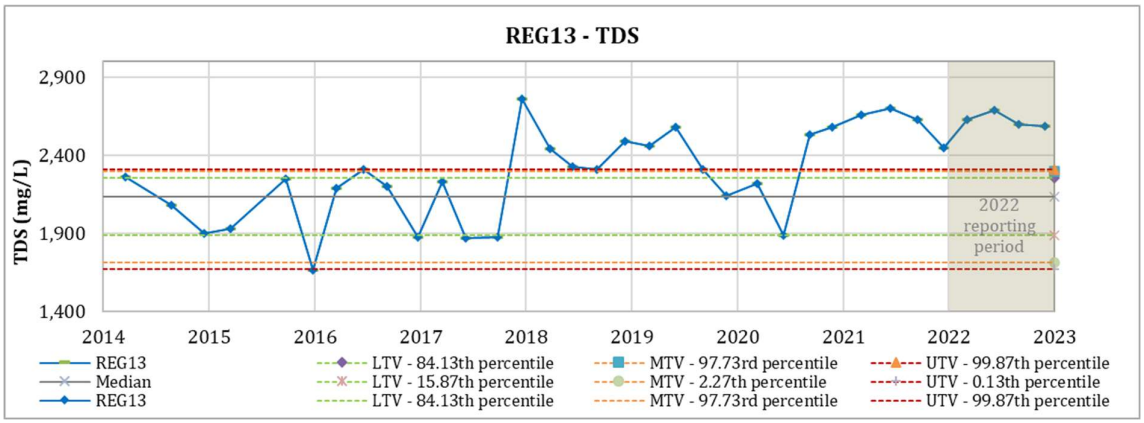

REG12 - 2020 simulated groundwater level
Groundwater level (mAHD)
262
261
260
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

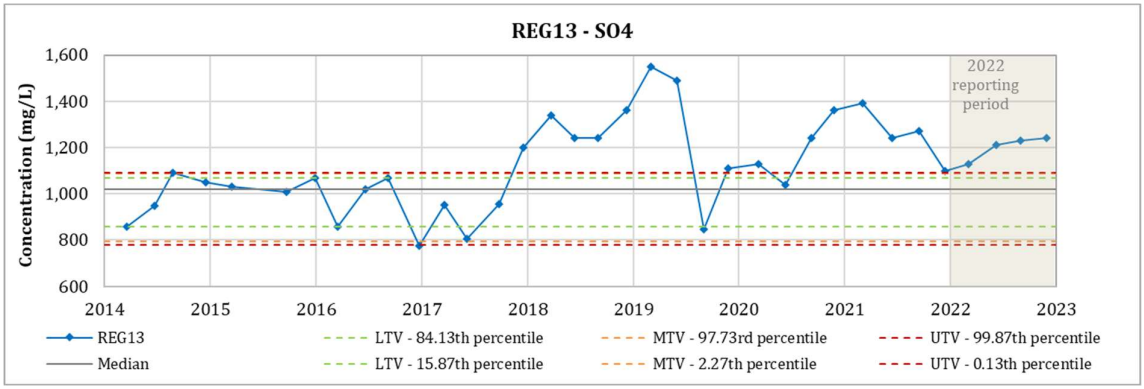

REG12 - TDS
TDS (mg/L)
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG12
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

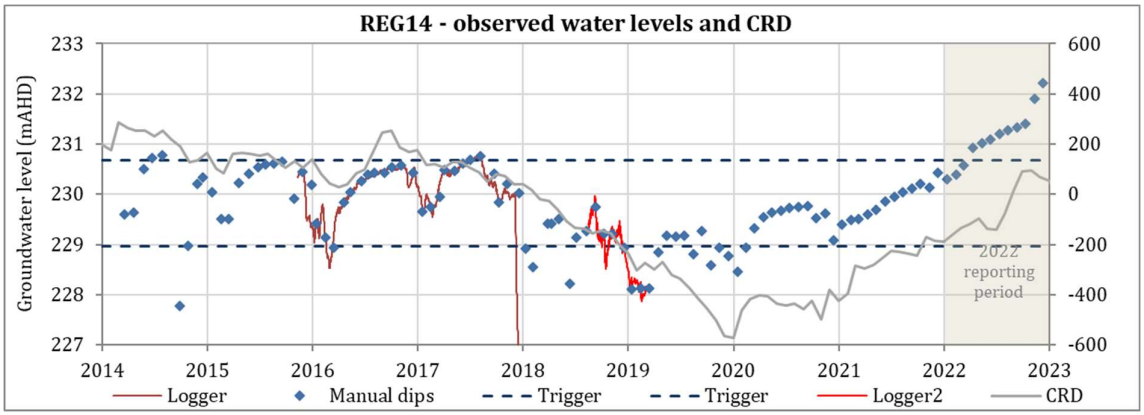

REG12 - SO4
Concentration (mg/L)
90
80
70
60
50
40
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG12
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

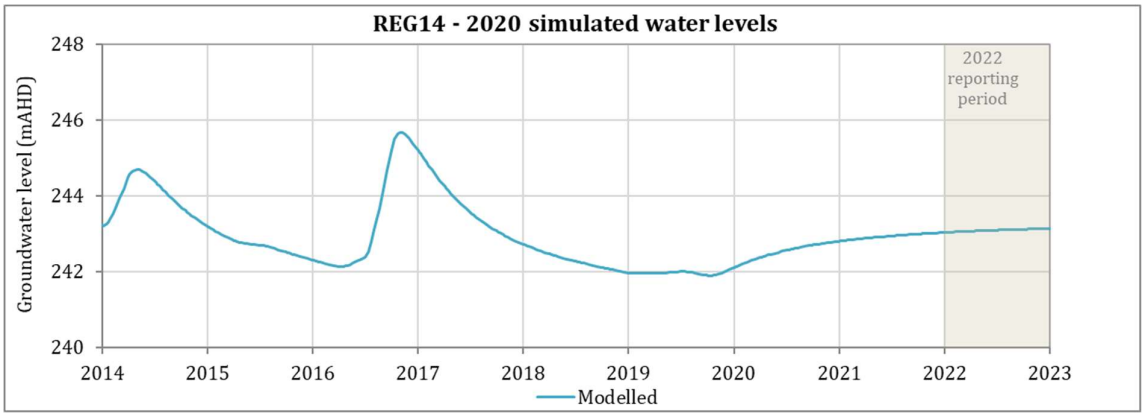

REG13 - observed water level and CRD
Groundwater level (mAHD)
257
256
255
254
253
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD

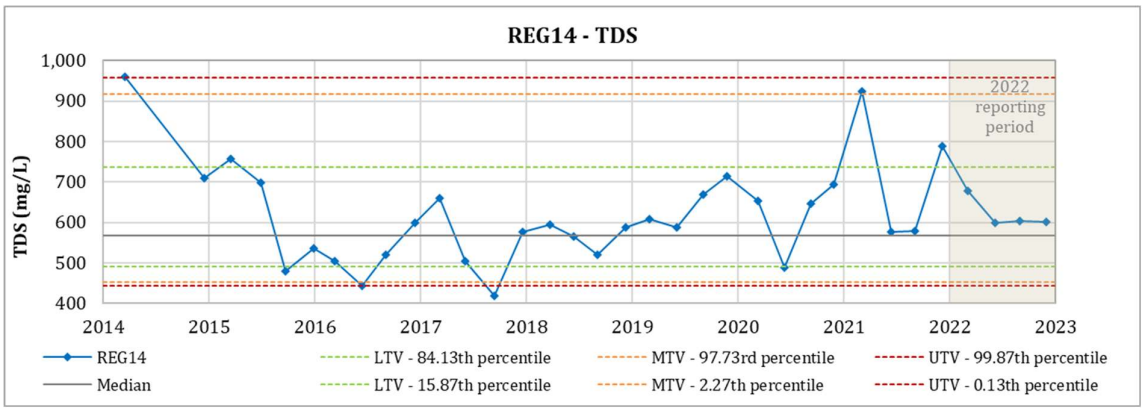

REG13 - 2020 simulated water level
Groundwater level (mAHD)
240.5
240
239.5
239
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

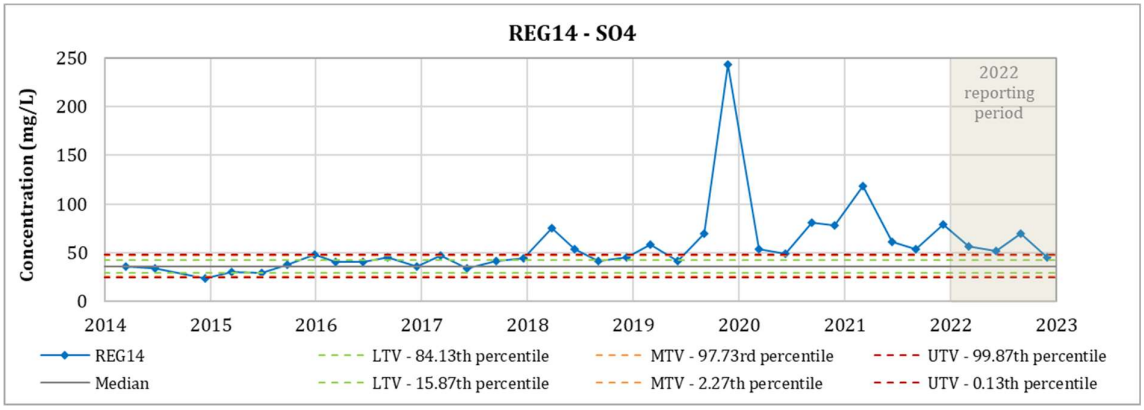

REG13 - TDS
TDS (mg/L)
2,900
2,400
1,900
1,400
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG13
Median
REG13
LTV - 84.13th percentile
LTV - 15.87th percentile
LTV - 84.13th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
MTV - 97.73rd percentile
UTV - 99.87th percentile
UTV - 0.13th percentile
UTV - 99.87th percentile

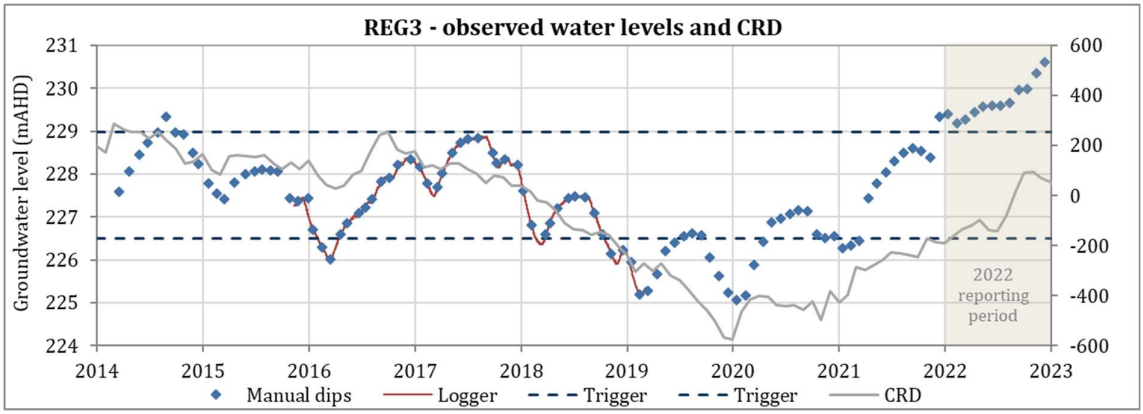

REG13 - SO4
Concentration (mg/L)
1,600
1,400
1,200
1,000
800
600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG13
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

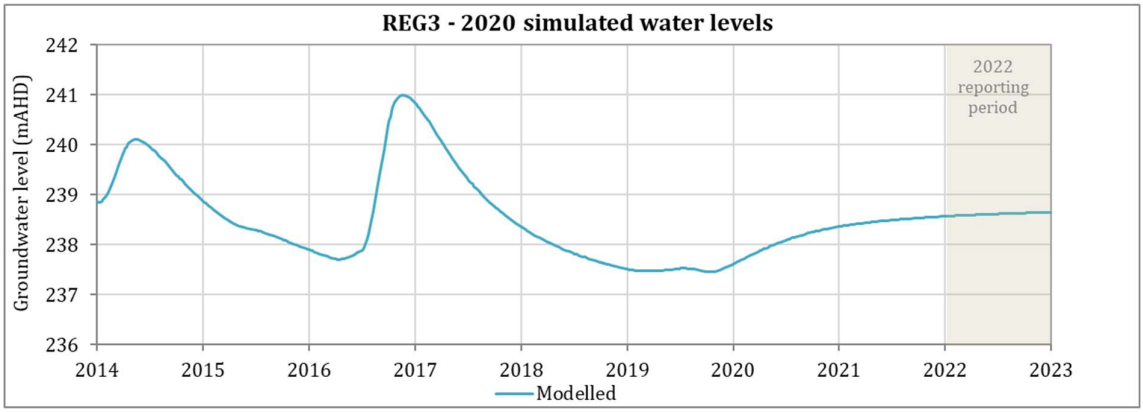

REG14 - observed water levels and CRD
Groundwater level (mAHD)
233
232
231
230
229
228
227
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
Logger2
CRD

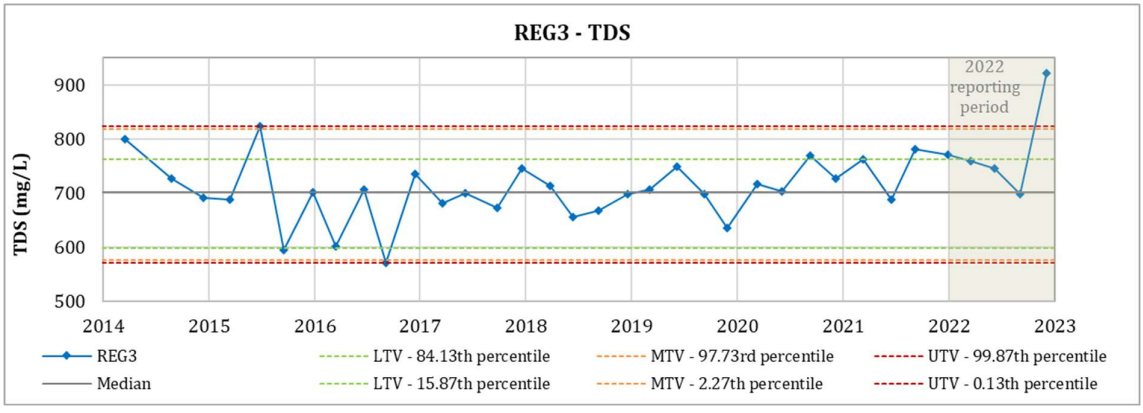

REG14 - 2020 simulated water levels
Groundwater level (mAHD)
248
246
244
242
240
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

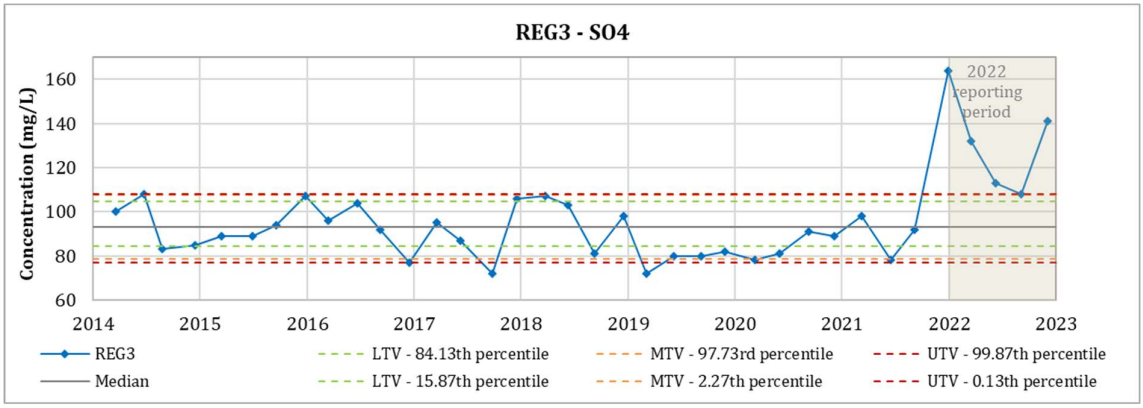

REG14 - TDS
TDS (mg/L)
1,000
900
800
700
600
500
400
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG14
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

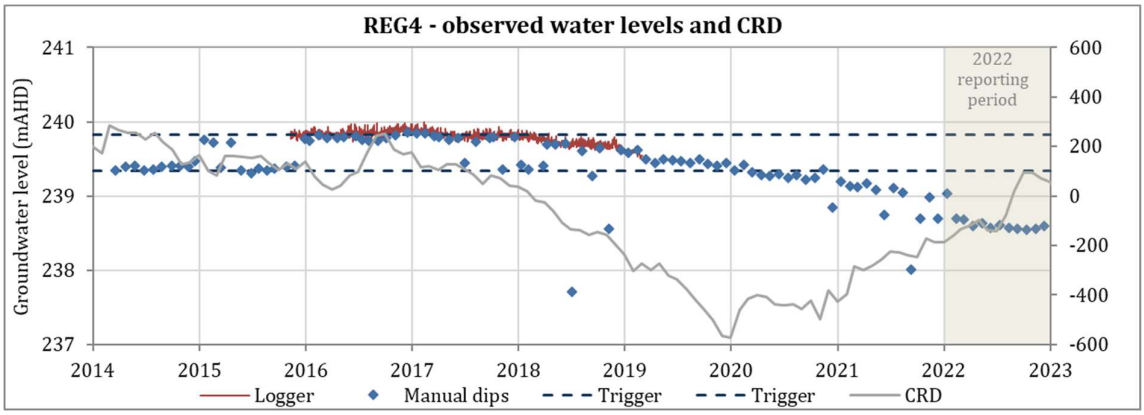

REG14 - SO4
Concentration (mg/L)
250
200
150
100
50
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG14
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

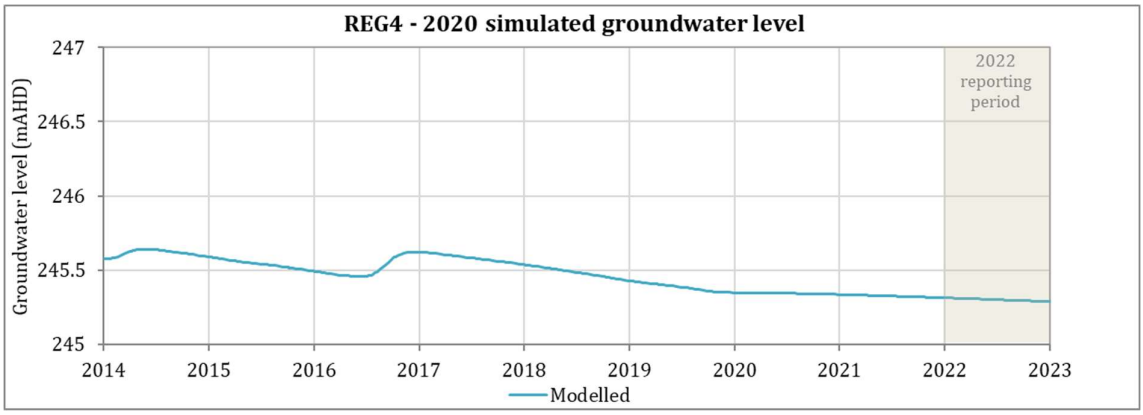

REG3 - observed water levels and CRD
Groundwater level (mAHD)
231
230
229
228
227
226
225
224
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Manual dips
Logger
Trigger
Trigger
CRD

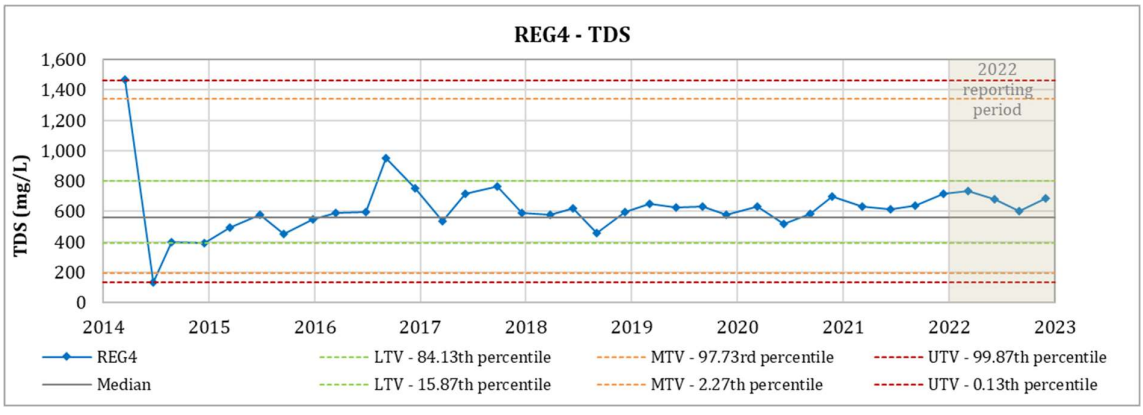

REG3 - 2020 simulated water levels
Groundwater level (mAHD)
242
241
240
239
238
237
236
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

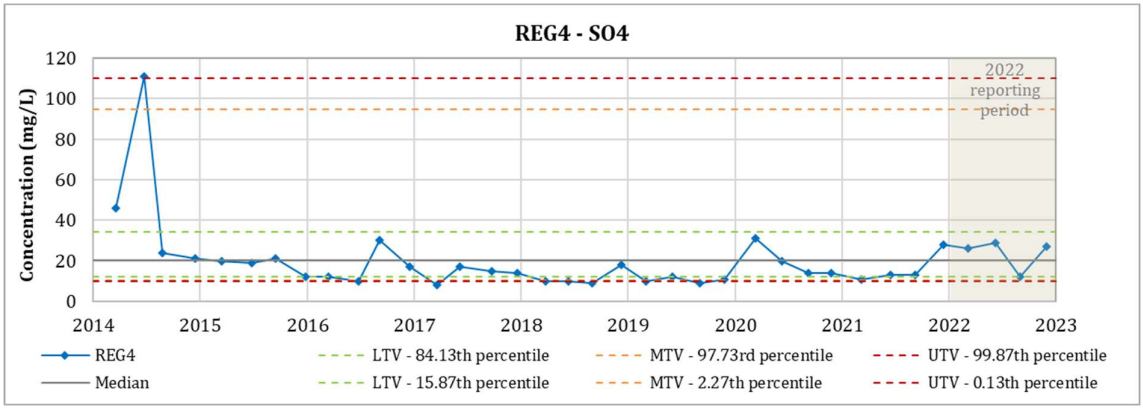

REG3 - TDS
TDS (mg/L)
900
800
700
600
500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG3
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

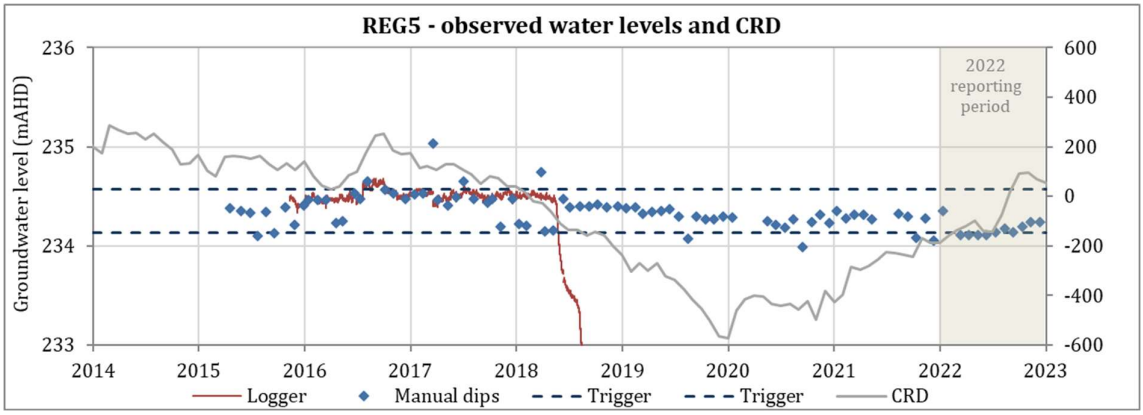

REG3 - SO4
Concentration (mg/L)
160
140
120
100
80
60
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG3
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

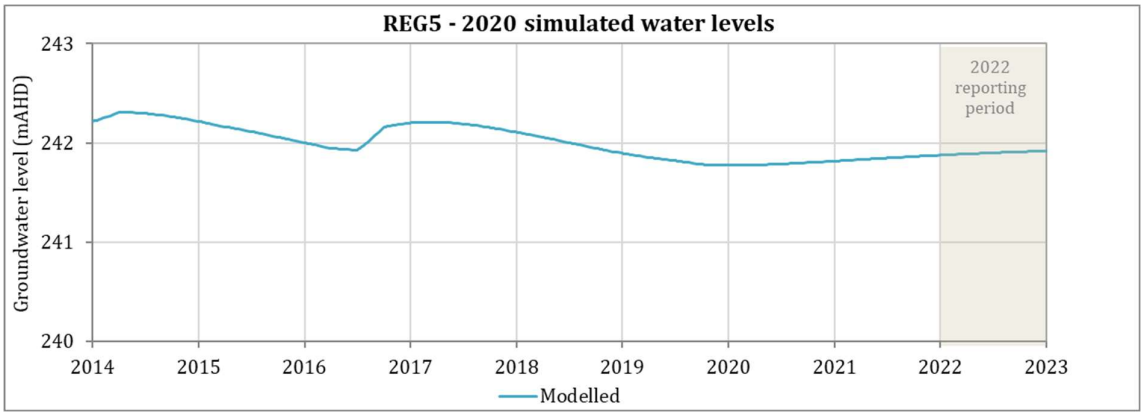

REG4 - observed water levels and CRD
Groundwater level (mAHD)
241
240
239
238
237
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD

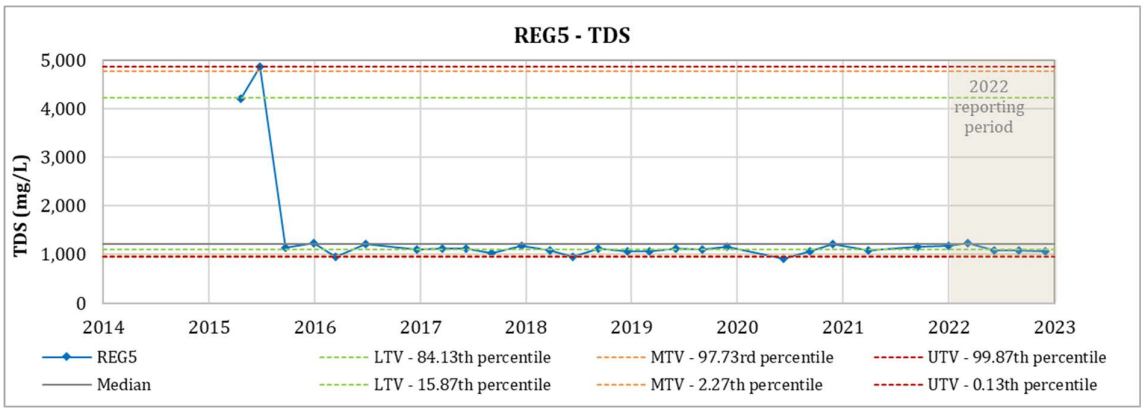

REG4 - 2020 simulated groundwater level
Groundwater level (mAHD)
247
246.5
246
245.5
245
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

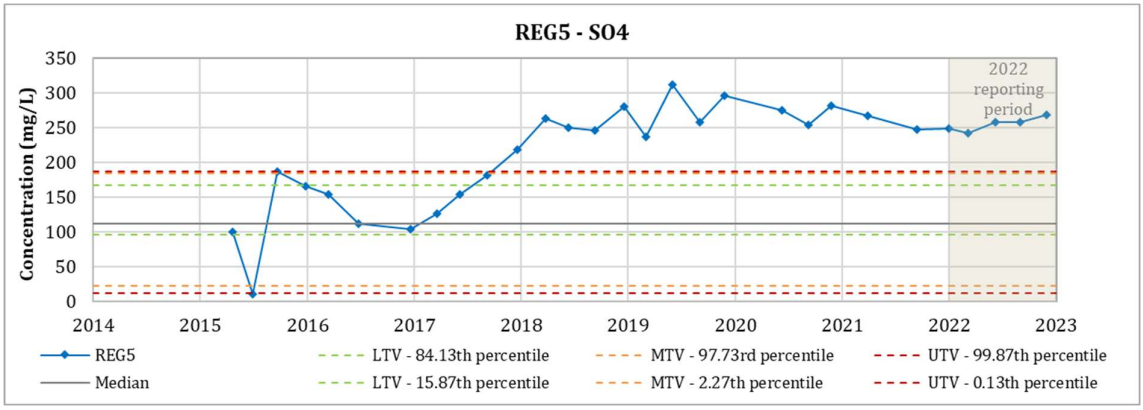

REG4 - TDS
TDS (mg/L)
1,600
1,400
1,200
1,000
800
600
400
200
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG4
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

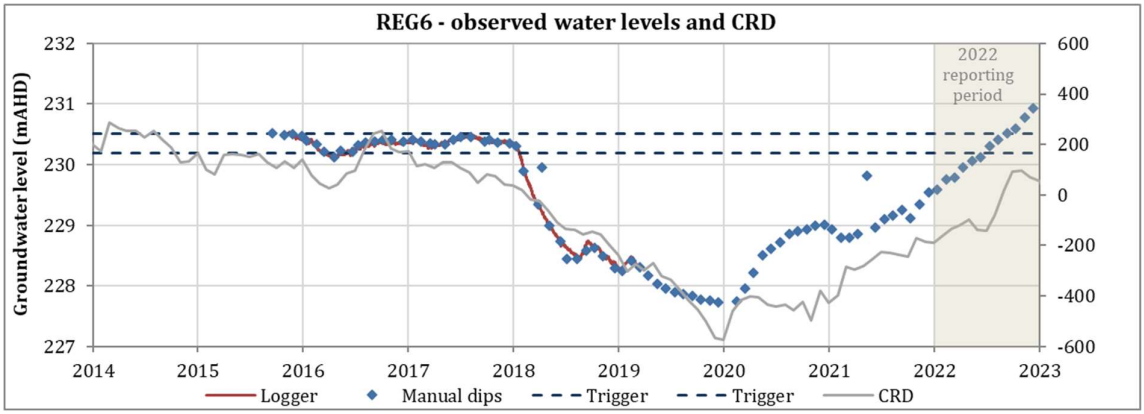

REG4 - SO4
Concentration (mg/L)
120
100
80
60
40
20
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG4
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

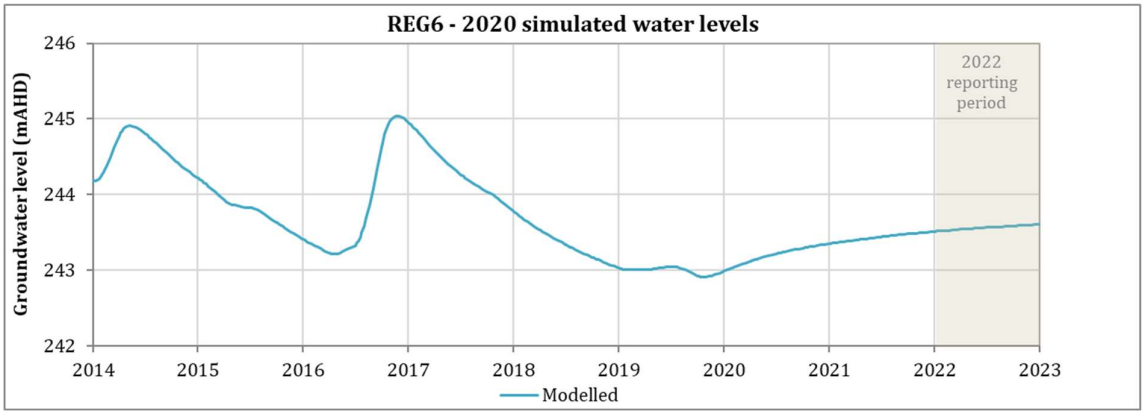

REG5 - observed water levels and CRD
Groundwater level (mAHD)
236
235
234
233
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD

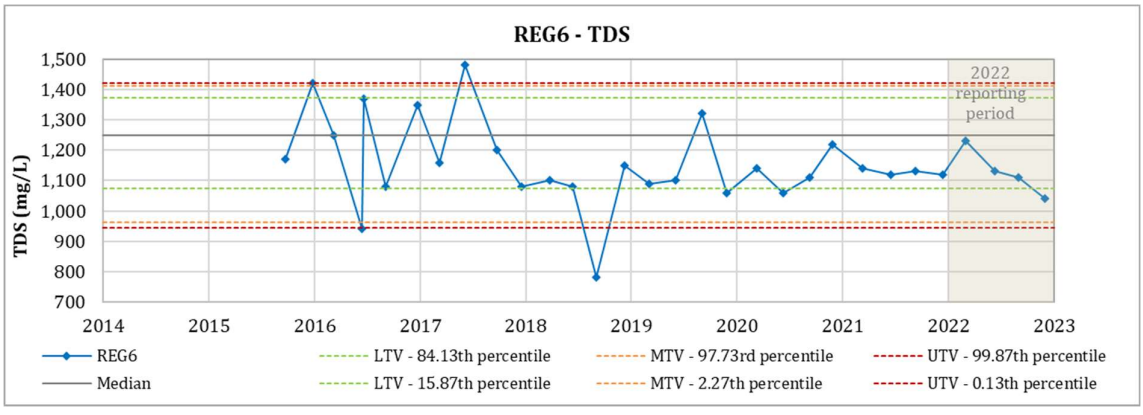

REG5 - 2020 simulated water levels
Groundwater level (mAHD)
243
242
241
240
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

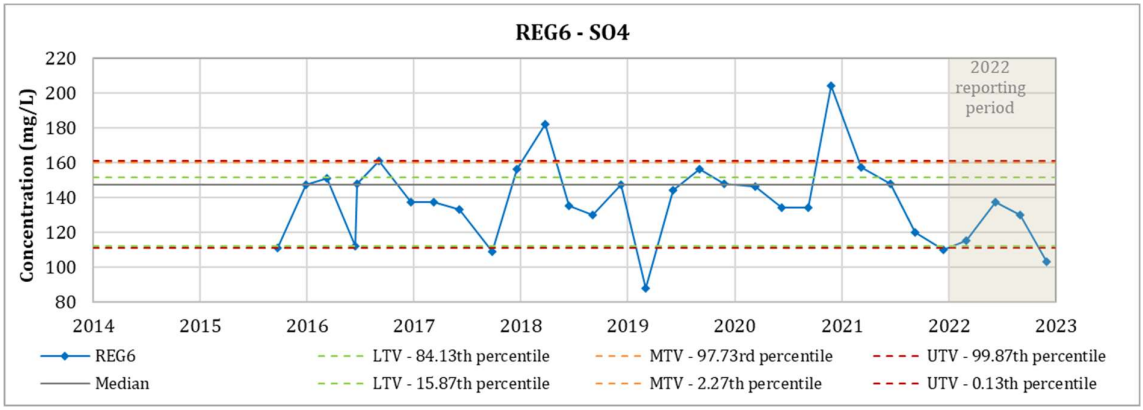

REG5 - TDS
TDS (mg/L)
5,000
4,000
3,000
2,000
1,000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG5
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

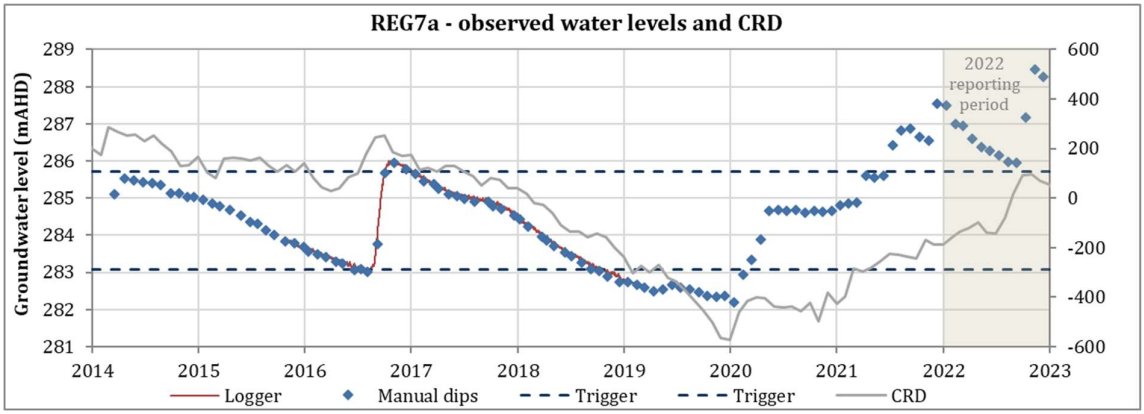

REG5 - SO4
Concentration (mg/L)
350
300
250
200
150
100
50
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG5
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

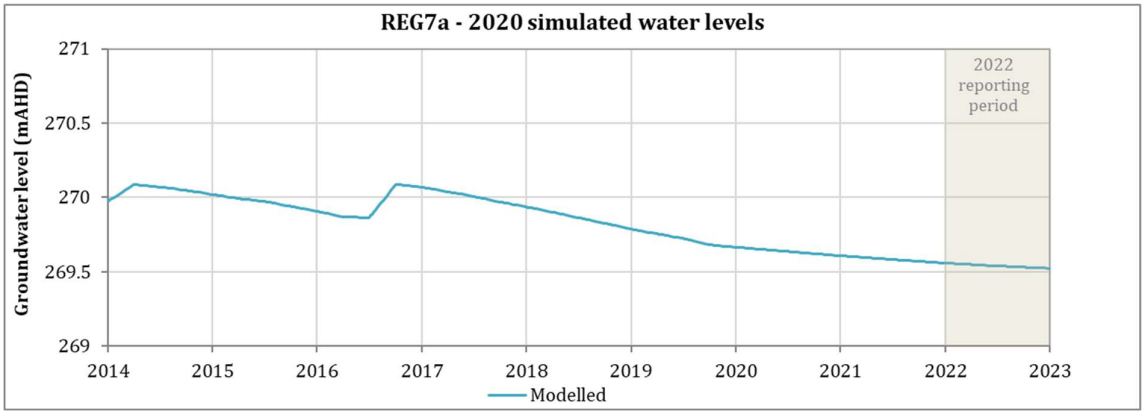

REG6 - observed water levels and CRD
Groundwater level (mAHD)
232
231
230
229
228
227
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD

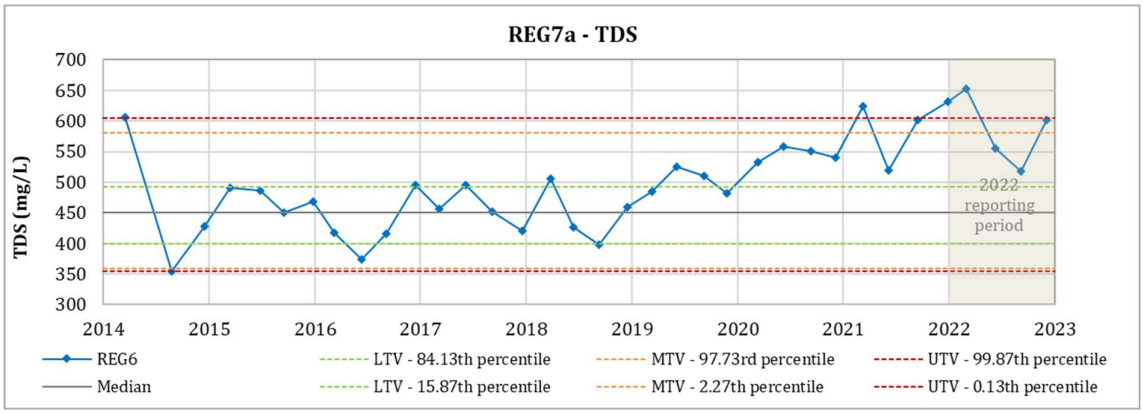

REG6 - 2020 simulated water levels
Groundwater level (mAHD)
246
245
244
243
242
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

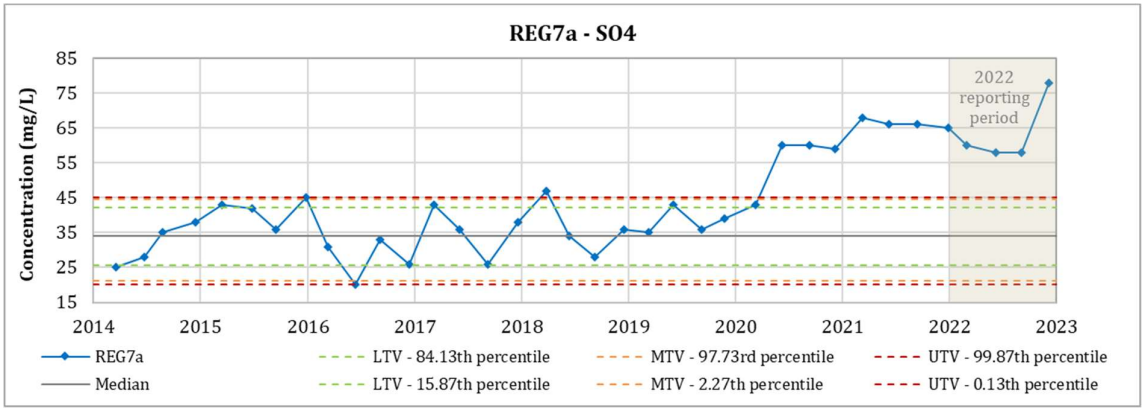

REG6 - TDS
TDS (mg/L)
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG6
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile


REG6 - SO4
Concentration (mg/L)
220
200
180
160
140
120
100
80
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG6
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

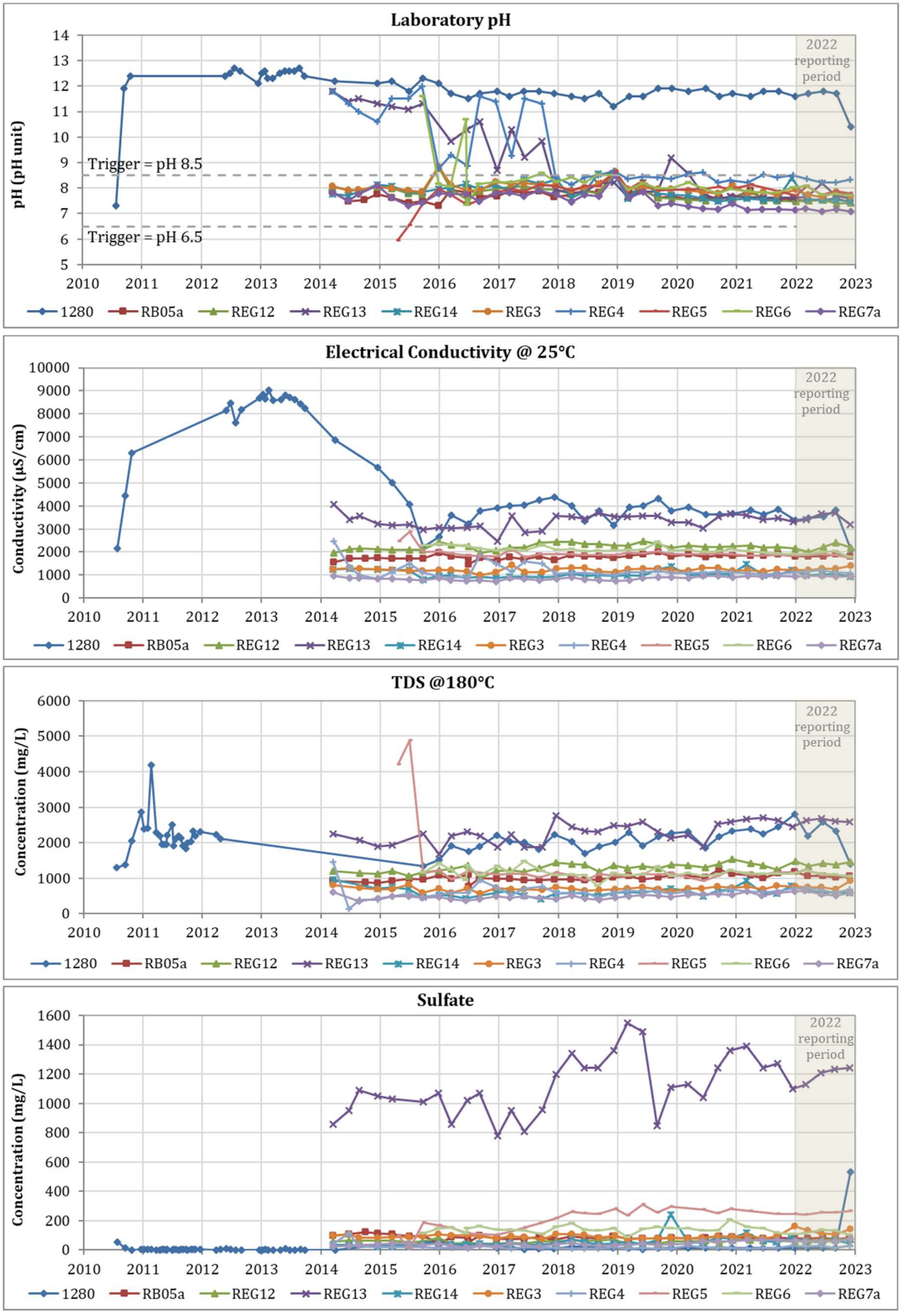

REG7a - observed water levels and CRD
Groundwater level (mAHD)
289
288
287
286
285
284
283
282
281
600
400
200
0
-200
-400
-600
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Logger
Manual dips
Trigger
Trigger
CRD


REG7a - 2020 simulated water levels
Groundwater level (mAHD)
271
270.5
270
269.5
269
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Modelled

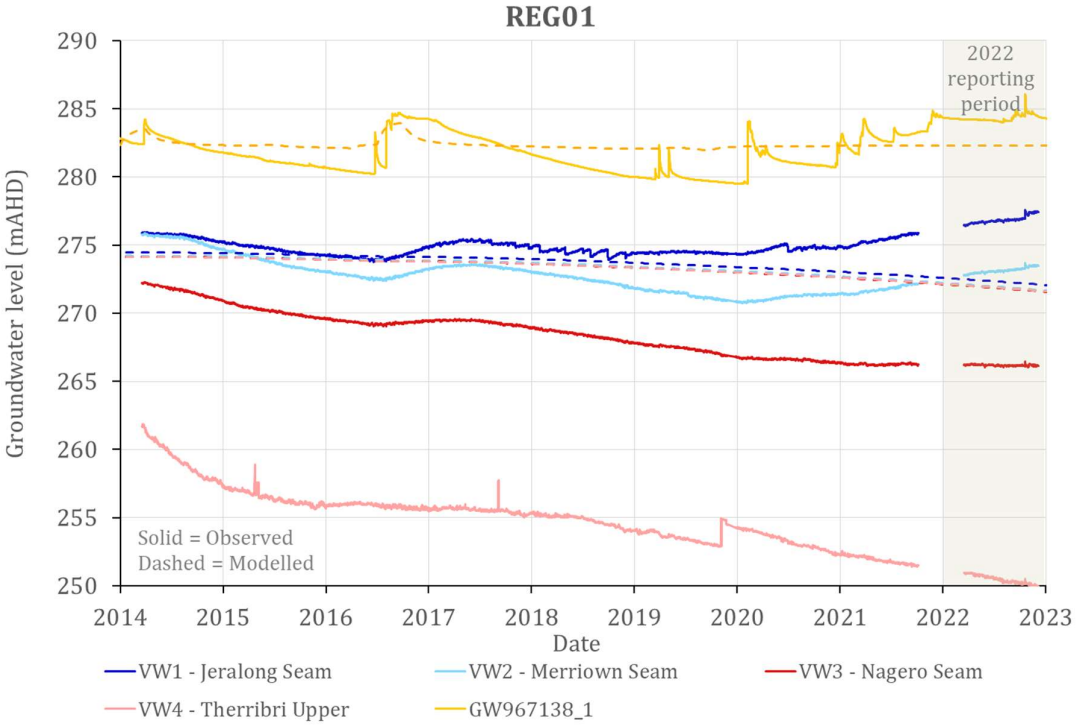

REG7a - TDS
TDS (mg/L)
700
650
600
550
500
450
400
350
300
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG6
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

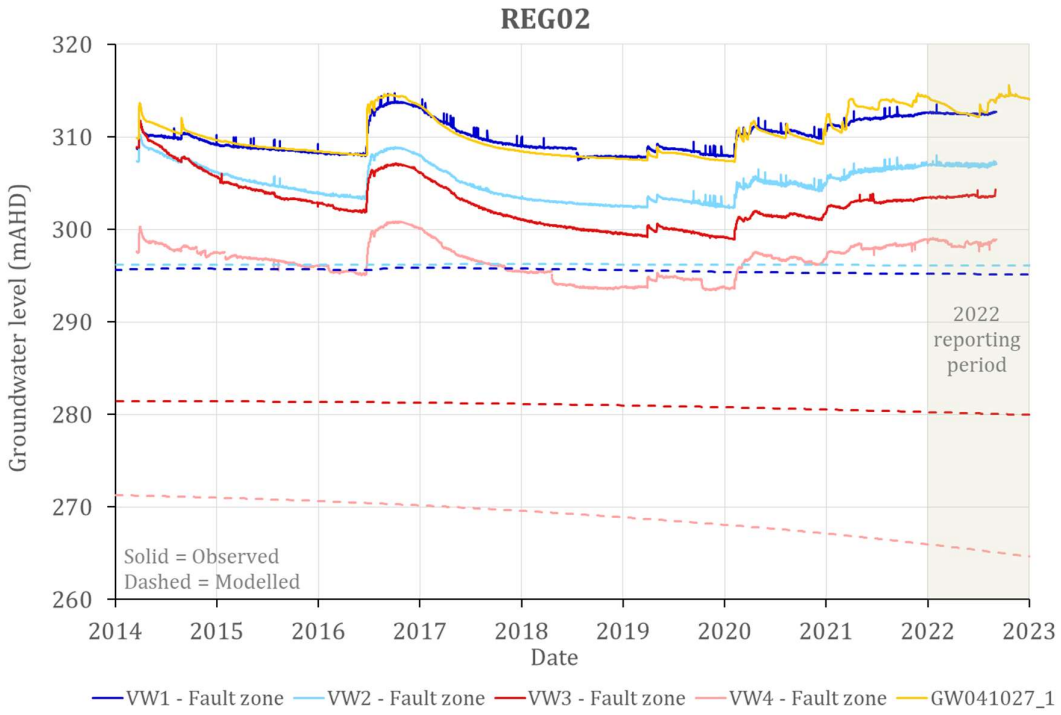

REG7a - SO4
Concentration (mg/L)
85
75
65
55
45
35
25
15
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
REG7a
Median
LTV - 84.13th percentile
LTV - 15.87th percentile
MTV - 97.73rd percentile
MTV - 2.27th percentile
UTV - 99.87th percentile
UTV - 0.13th percentile

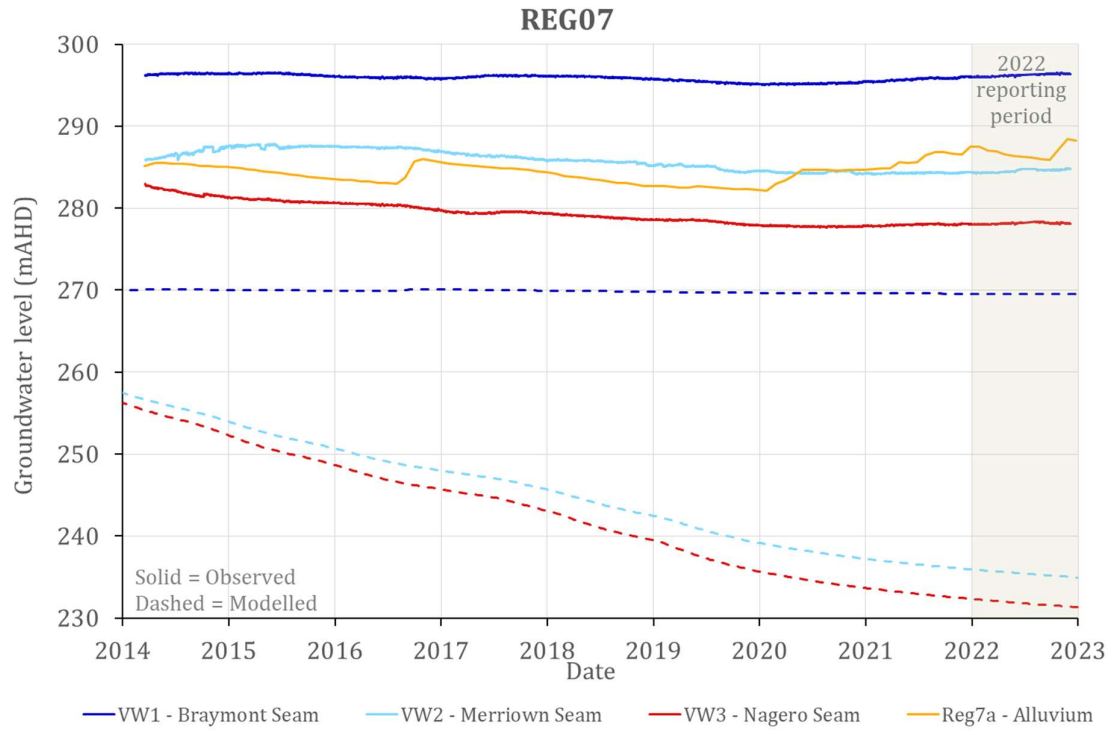
Regional standpipe monitoring bores – Individual water quality parameters

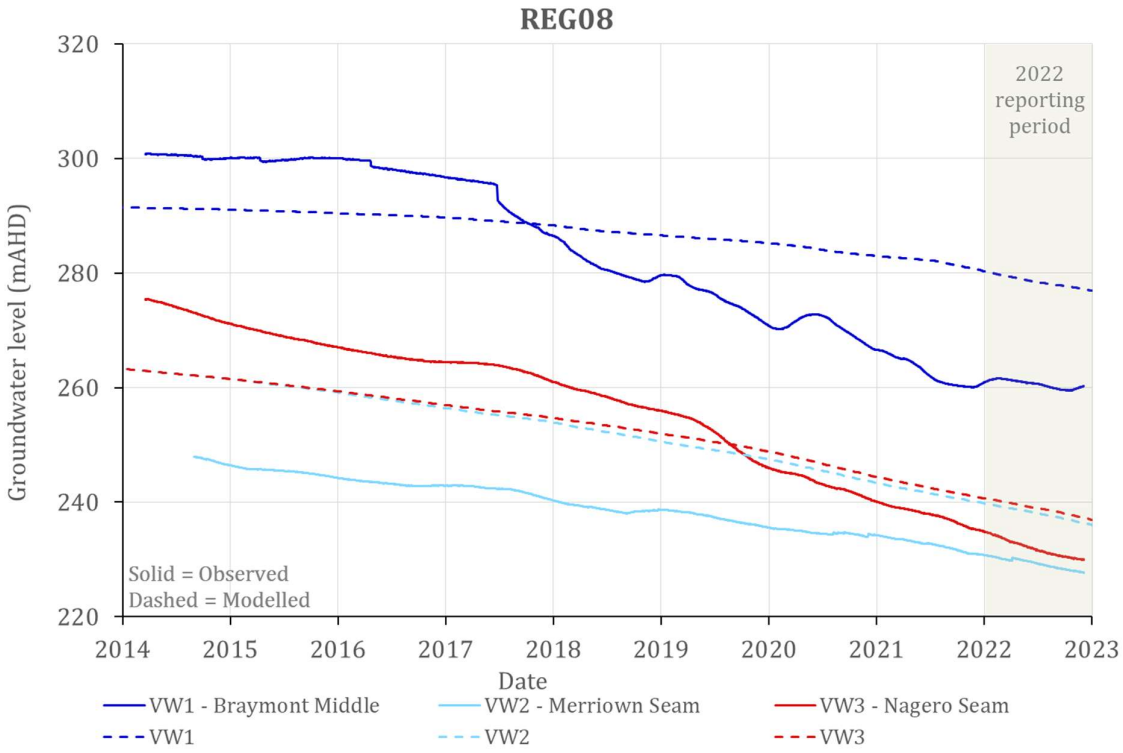


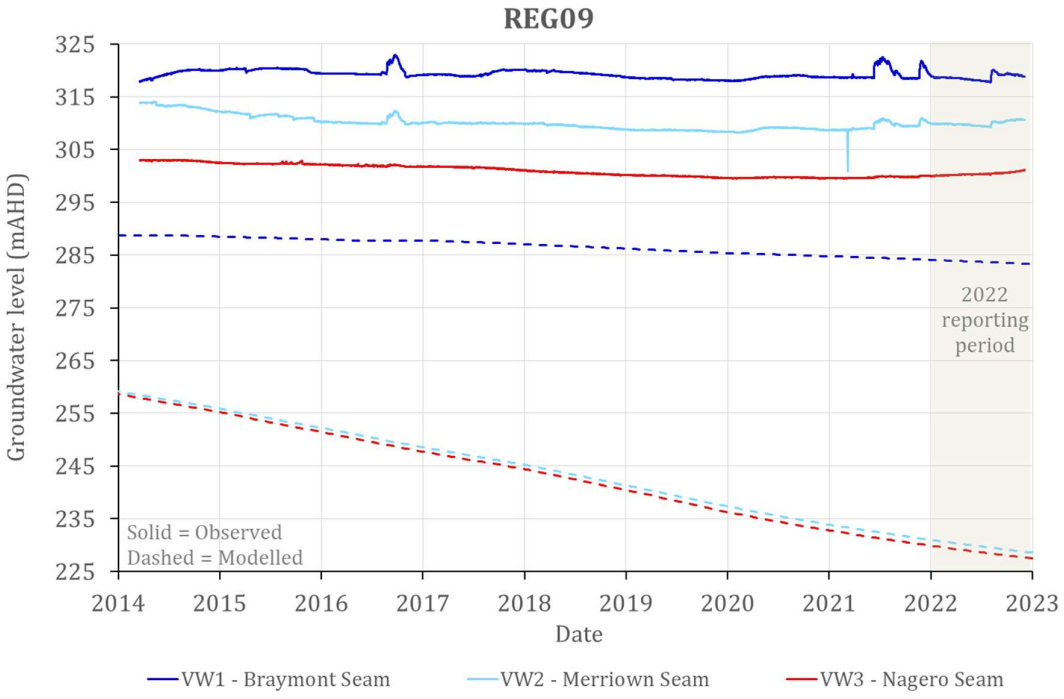
Regional Vibrating Wire Piezometers - observed and modelled water levels

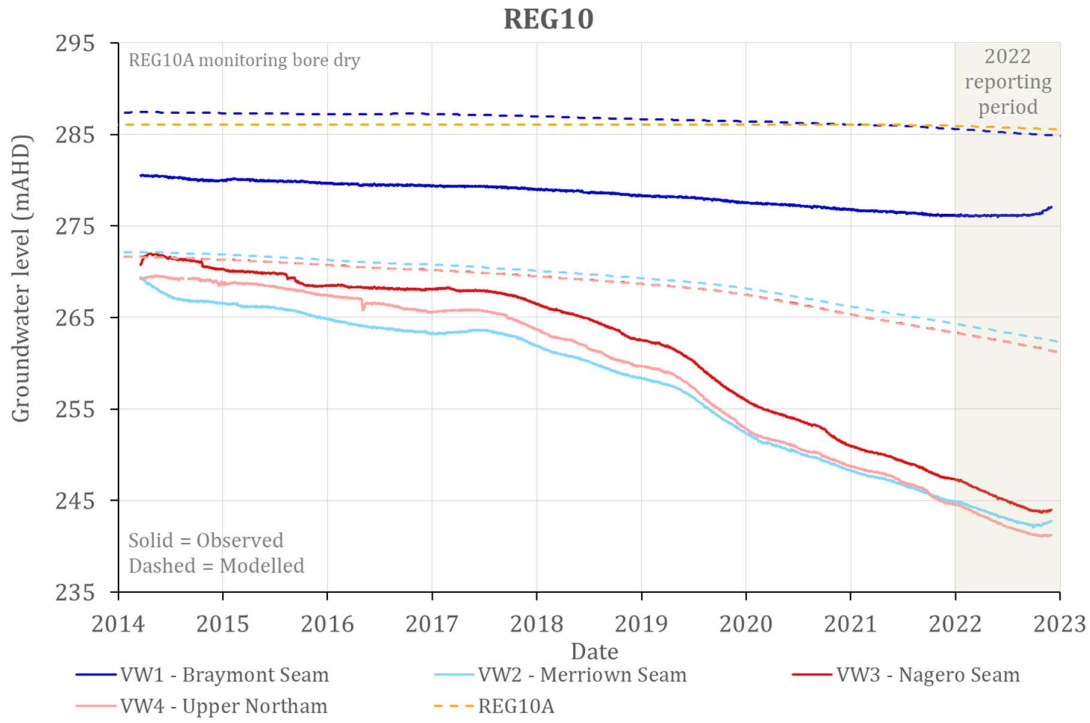


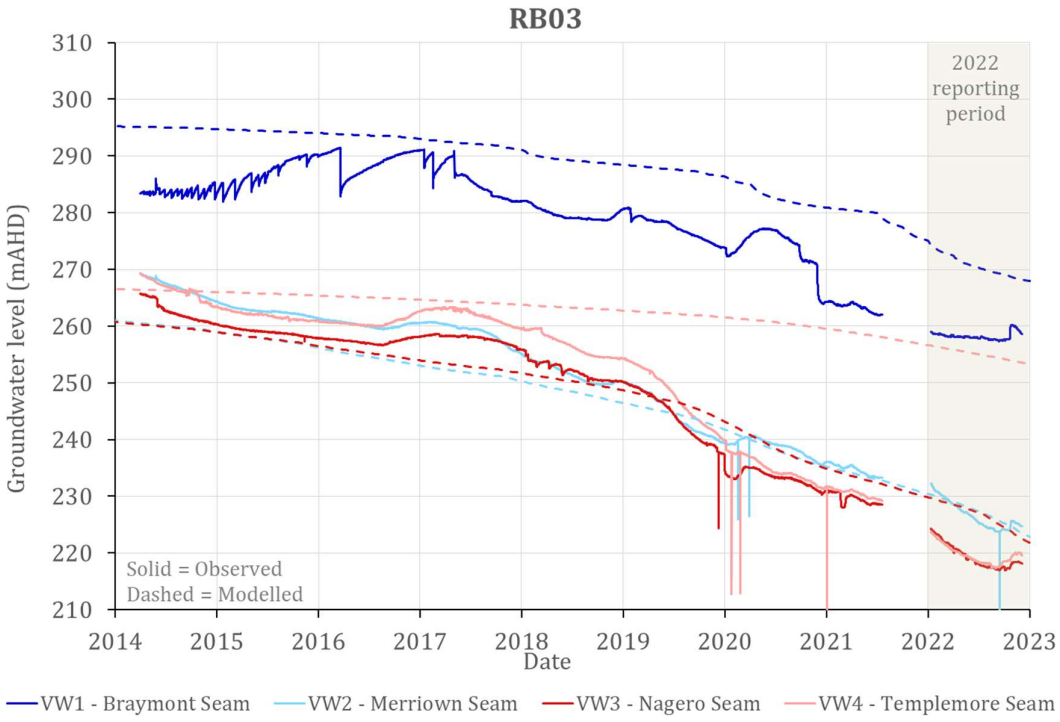


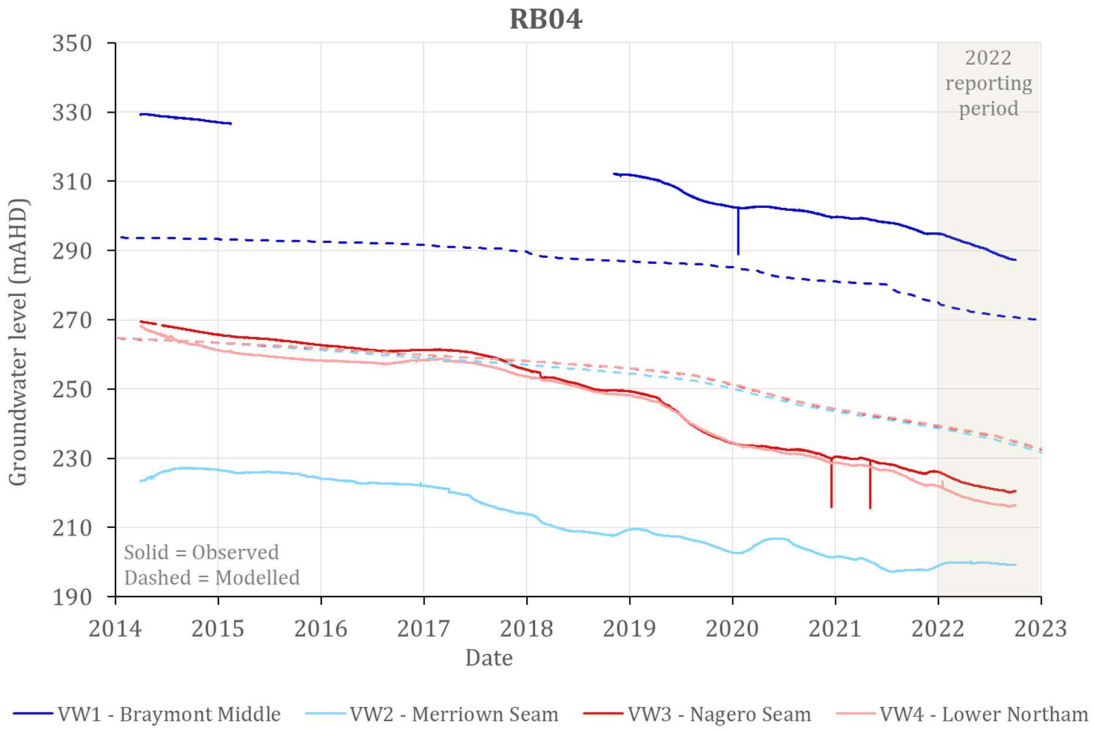

REG07
Groundwater level (mAHD)
300
290
280
270
260
250
240
230
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Seam
VW2 - Merriown Seam
VW3 - Nagero Seam
Reg7a - Alluvium


REG08
Groundwater level (mAHD)
320
300
280
260
240
220
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Middle
VW2 - Merriown Seam
VW3 - Nagero Seam
VW1
VW2
VW3


REG09
Groundwater level (mAHD)
325
315
305
295
285
275
265
255
245
235
225
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Seam
VW2 - Merriown Seam
VW3 - Nagero Seam


REG10
Groundwater level (mAHD)
295
285
275
265
255
245
235
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
REG10A monitoring bore dry
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Seam
VW2 - Merriown Seam
VW3 - Nagero Seam
VW4 - Upper Northam
REG10A


RB03
Groundwater level (mAHD)
310
300
290
280
270
260
250
240
230
220
210
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Seam
VW2 - Merriown Seam
VW3 - Nagero Seam
VW4 - Templemore Seam


RB04
Groundwater level (mAHD)
350
330
310
290
270
250
230
210
190
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Middle
VW2 - Merriown Seam
VW3 - Nagero Seam
VW4 - Lower Northam

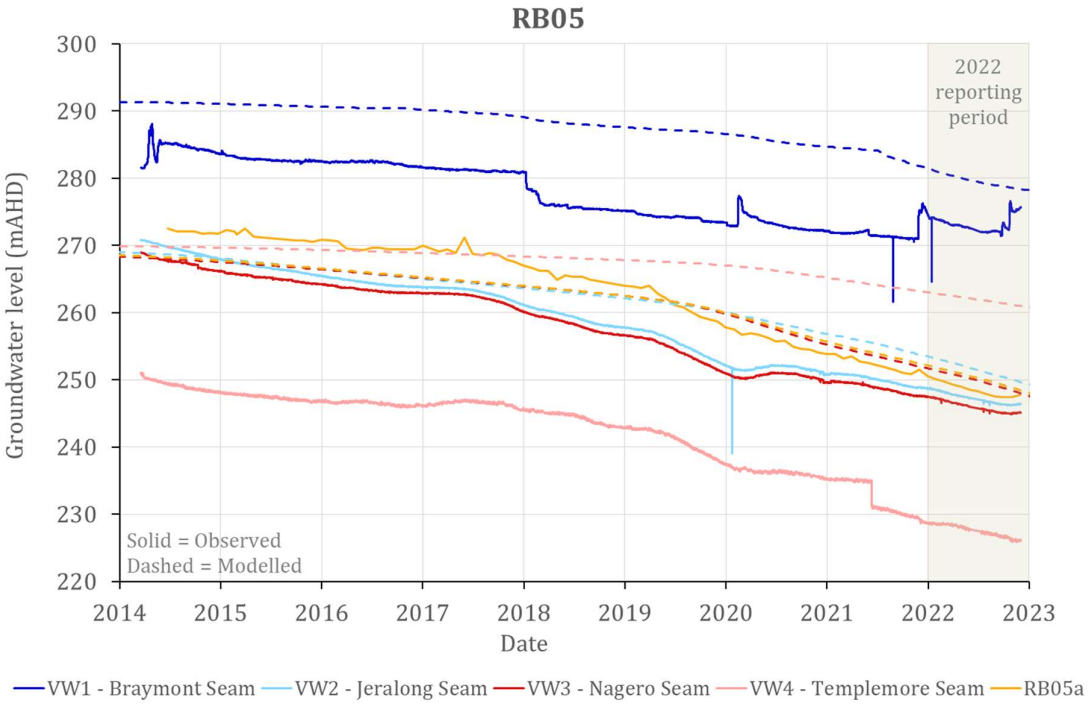

RB05
Groundwater level (mAHD)
300
290
280
270
260
250
240
230
220
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Date
2022 reporting period
Solid = Observed
Dashed = Modelled
VW1 - Braymont Seam
VW2 - Jeralong Seam
VW3 - Nagero Seam
VW4 - Templemore Seam
RB05a

Table E-6
Annual trend analysis

Bore	Annual difference (m)								Geology
	Dec14-Dec15	Dec15-Dec16	Dec16-Dec17	Dec17-Dec18	Dec18-Dec19	Dec19-Dec20	Dec20-Dec21	Dec21-Dec22	
GW967138	-1.03	1.32	-0.52	-1.53	-0.72	3.01	3.75	-0.07	Alluvium
REG1_VW1	-1.04	0.40	0.32	-0.52	-0.06	0.38	1.08	1.60	Jeralong seam
REG1_VW2	-1.71	-0.01	0.09	-1.22	-0.98	0.40	0.78	1.33	Merriown seam
REG1_VW3	-1.46	-0.27	-0.29	-1.16	-0.98	-0.52	-0.17	-0.06	Nagero seam
REG1_VW4	-2.12	-0.15	-0.39	-1.16	0.52	-2.20	-0.84	-1.46	Therribri seam
GW041027	-1.38	5.28	-5.22	-0.91	-0.05	2.15	4.72	-0.22	Alluvium
REG2_VW1	-1.11	5.12	-4.29	-1.31	0.06	1.98	2.61	0.20	Fault zone
REG2_VW2	-2.52	4.32	-4.80	-1.00	-0.12	1.82	2.62	0.19	Fault zone
REG2_VW3	-3.15	3.67	-5.37	-1.69	-0.51	1.96	2.25	0.98	Fault zone
REG2_VW4	-1.18	4.57	-4.99	-1.84	-0.19	2.75	2.51	0.17	Fault zone
REG7A	-1.34	2.09	-1.24	-1.79	-0.37	2.28	2.89	0.73	Alluvium
REG7_VW1	-0.27	-0.31	0.37	-0.36	-0.63	0.12	-0.01	1.13	Braymont seam
REG7_VW2	0.53	-0.53	-1.03	-0.40	-1.08	-0.28	-0.04	0.70	Merriown seam
REG7_VW3	-0.81	-0.80	-0.43	-0.79	-0.64	-0.27	0.01	0.44	Nagero seam
REG8_VW1	-2.29	-1.65	-2.11	-2.25	-7.69	-4.25	-7.16	0.14	Braymont seam
REG8_VW2	0.07	-3.08	-9.92	-8.23	-2.84	-1.55	-3.27	-3.27	Merriown seam
REG8_VW3	-4.24	-2.85	-2.85	-5.36	-9.76	-5.76	-5.31	-5.36	Nagero seam
REG9_VW1	-0.48	-0.57	1.18	-1.15	-0.88	0.58	3.05	-2.86	Braymont seam
REG9_VW2	-1.50	-0.94	-0.04	-1.05	-0.58	0.35	2.25	-0.26	Merriown seam
REG9_VW3	-0.44	-0.51	-0.49	-0.96	-0.64	-0.03	0.51	1.00	Nagero seam
REG10_VW1	-0.24	-0.31	-0.31	-0.71	-0.76	-0.79	-0.65	0.87	Braymont seam
REG10_VW2	-1.68	-1.56	-1.10	-3.77	-5.54	-4.50	-3.46	-2.29	Merriown seam
REG10_VW3	-1.98	-0.38	-1.16	-4.13	-6.13	-5.31	-3.82	-3.51	Nagero seam

Bore	Annual difference (m)								Geology
	Dec14-Dec15	Dec15-Dec16	Dec16-Dec17	Dec17-Dec18	Dec18-Dec19	Dec19-Dec20	Dec20-Dec21	Dec21-Dec22	
REG10_VW4	-1.37	-1.79	-1.62	-4.12	-6.33	-4.64	-4.27	-3.49	Upper Northam seam
RB03_VW1	5.47	1.33	-8.80	-2.57	-5.20	-9.55	-2.60	-3.25	Braymont seam
RB03_VW2	-3.15	-1.23	-4.77	-5.68	-9.96	-4.40	-2.42	-8.52	Merriown seam
RB03_VW3	-2.61	-0.12	-1.41	-6.27	-11.67	-7.87	-2.26	-10.29	Nagero seam
RB03_VW4	-3.29	1.06	-2.13	-5.41	-13.22	-9.63	-2.35	-9.23	Templemore seam
RB04_VW1	-	-	-	-	-9.06	-2.99	-5.01	-7.45	Braymont seam
RB04_VW2	-2.16	-2.44	-8.09	-5.76	-4.89	-2.02	-3.67	1.37	Merriown seam
RB04_VW3	-3.14	-1.71	-4.91	-6.77	-14.37	-4.99	-4.16	-5.57	Nagero seam
RB04_VW4	-3.50	-0.10	-4.06	-5.79	-12.86	-6.65	-6.62	-5.82	Lower Northam seam
RB05A	-1.27	-1.08	-1.93	-3.29	-5.54	-4.61	-2.55	-3.82	Merriown seam
RB05_VW1	-1.39	-0.79	-0.83	-5.75	-1.69	-1.24	2.73	0.63	Braymont seam
RB05_VW2	-2.57	-1.82	-2.20	-3.73	-5.09	-1.49	-2.45	-2.46	Jeralong seam
RB05_VW3	-1.99	-1.39	-2.22	-3.95	-5.15	-1.41	-2.55	-2.51	Nagero seam
RB05_VW4	-1.59	-0.71	-0.09	-2.91	-4.87	-2.61	-6.28	-3.16	Templemore seam
MAC1280	2.69	1.90	0.99	-2.80	-2.68	-1.64	-1.02	6.33	Interburden
REG3	-0.80	0.91	-0.13	-1.99	-0.98	0.76	3.33	1.28	Boggabri Volcanics
REG4	0.30	0.09	-0.06	-0.18	-0.17	-0.60	-0.16	-0.10	Boggabri Volcanics
REG5		0.06	0.00	-0.07	-0.10	-0.21	-0.04	0.19	Boggabri Volcanics
REG6		-0.10	-0.03	-2.06	-0.56	1.28	0.53	1.39	Boggabri Volcanics
REG12	-0.19	-0.07	0.06	-0.11	-0.05	0.08	0.25	1.49	Boggabri Volcanics
REG13	0.02	0.13	0.30	-0.09	-0.10	-0.14	0.52	2.07	Boggabri Volcanics
REG14	-0.15	0.24	-0.39	-1.10	-0.16	0.31	1.34	1.80	Basement

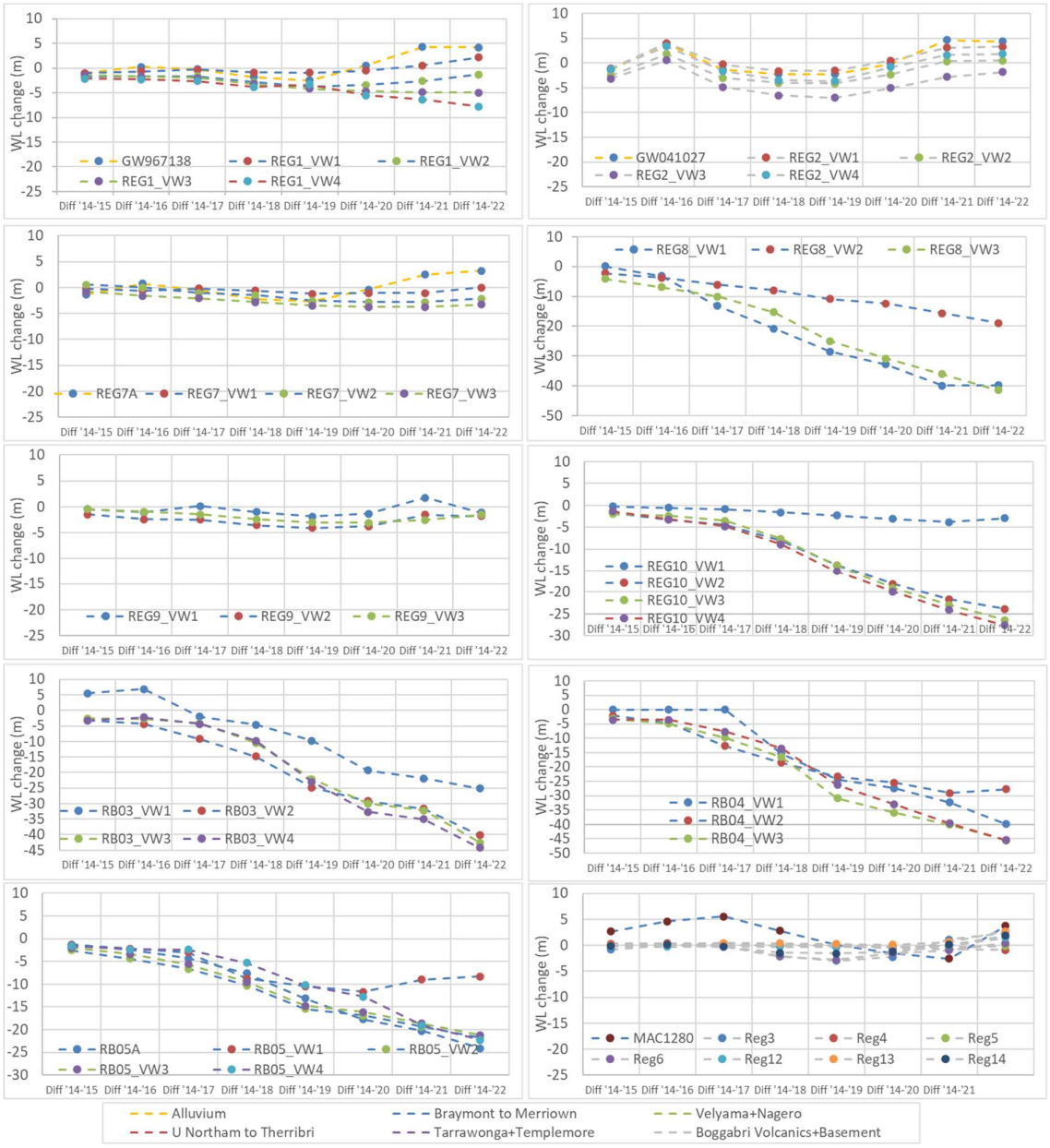
Bore	Cumulative annual difference since December 2014 (m)								Geology
	Diff '14-'15	Diff '14-'16	Diff '14-'17	Diff '14-'18	Diff '14-'19	Diff '14-'20	Diff '14-'21	Diff '14-'22	
GW967138	-1.03	0.29	-0.23	-1.76	-2.48	0.53	4.28	4.21	Alluvium
REG1_VW1	-1.04	-0.64	-0.32	-0.85	-0.91	-0.53	0.55	2.15	Jeralong seam
REG1_VW2	-1.71	-1.72	-1.63	-2.85	-3.83	-3.42	-2.64	-1.31	Merriown seam
REG1_VW3	-1.46	-1.74	-2.03	-3.18	-4.17	-4.69	-4.87	-4.93	Nagero seam
REG1_VW4	-2.12	-2.27	-2.66	-3.82	-3.30	-5.50	-6.34	-7.80	Therribri seam
GW041027	-1.38	3.90	-1.32	-2.22	-2.27	-0.12	4.60	4.38	Alluvium
REG2_VW1	-1.11	4.01	-0.28	-1.59	-1.53	0.46	3.07	3.27	Fault zone
REG2_VW2	-2.52	1.80	-3.00	-4.00	-4.12	-2.30	0.32	0.51	Fault zone
REG2_VW3	-3.15	0.52	-4.85	-6.54	-7.05	-5.09	-2.84	-1.86	Fault zone
REG2_VW4	-1.18	3.39	-1.60	-3.44	-3.63	-0.88	1.63	1.79	Fault zone
REG7A	-1.34	0.75	-0.49	-2.28	-2.65	-0.37	2.52	3.25	Alluvium
REG7_VW1	-0.27	-0.59	-0.22	-0.57	-1.20	-1.08	-1.09	0.04	Braymont seam
REG7_VW2	0.53	0.00	-1.04	-1.44	-2.51	-2.79	-2.83	-2.13	Merriown seam
REG7_VW3	-0.81	-1.61	-2.04	-2.83	-3.47	-3.74	-3.73	-3.29	Nagero seam
REG8_VW1	0.05	-3.13	-13.24	-20.80	-28.49	-32.74	-39.90	-39.76	Braymont seam
REG8_VW2	-2.22	-3.73	-6.07	-8.00	-10.84	-12.39	-15.66	-18.94	Merriown seam
REG8_VW3	-4.15	-6.86	-10.04	-15.24	-25.00	-30.76	-36.07	-41.43	Nagero seam
REG9_VW1	-0.48	-1.04	0.14	-1.02	-1.90	-1.32	1.73	-1.14	Braymont seam
REG9_VW2	-1.50	-2.44	-2.49	-3.53	-4.11	-3.76	-1.52	-1.78	Merriown seam
REG9_VW3	-0.44	-0.95	-1.44	-2.39	-3.04	-3.07	-2.56	-1.56	Nagero seam
REG10_VW1	-0.24	-0.55	-0.87	-1.57	-2.33	-3.12	-3.78	-2.90	Braymont seam
REG10_VW2	-1.68	-3.24	-4.34	-8.11	-13.65	-18.15	-21.60	-23.90	Merriown seam
REG10_VW3	-1.98	-2.35	-3.51	-7.64	-13.76	-19.08	-22.89	-26.40	Nagero seam
REG10_VW4	-1.37	-3.15	-4.77	-8.89	-15.22	-19.86	-24.13	-27.61	Upper Northam seam
RB03_VW1	5.47	6.79	-2.01	-4.58	-9.78	-19.33	-21.93	-25.18	Braymont seam

RB03_VW2	-3.15	-4.38	-9.15	-14.84	-24.80	-29.20	-31.62	-40.14	Merriown seam
RB03_VW3	-2.61	-2.73	-4.13	-10.40	-22.07	-29.94	-32.20	-42.49	Nagero seam
RB03_VW4	-3.29	-2.23	-4.36	-9.77	-22.99	-32.62	-34.97	-44.19	Templemore seam
RB04_VW1	-	-	-	-15.29	-24.35	-27.34	-32.35	-39.80	Braymont seam
RB04_VW2	-2.16	-4.60	-12.69	-18.45	-23.34	-25.36	-29.03	-27.66	Merriown seam
RB04_VW3	-3.14	-4.85	-9.76	-16.53	-30.89	-35.88	-40.04	-45.61	Nagero seam
RB04_VW4	-3.50	-3.60	-7.66	-13.45	-26.31	-32.96	-39.57	-45.39	Lower Northam seam
RB05A	-1.27	-2.35	-4.28	-7.57	-13.11	-17.72	-20.27	-24.09	Merriown seam
RB05_VW1	-1.39	-2.18	-3.01	-8.77	-10.45	-11.69	-8.96	-8.33	Braymont seam
RB05_VW2	-2.57	-4.38	-6.59	-10.32	-15.41	-16.90	-19.35	-21.81	Jeralong seam
RB05_VW3	-1.99	-3.39	-5.60	-9.55	-14.71	-16.12	-18.67	-21.17	Nagero seam
RB05_VW4	-1.59	-2.30	-2.39	-5.30	-10.17	-12.78	-19.06	-22.21	Templemore seam
MAC1280	2.69	4.59	5.58	2.78	0.10	-1.54	-2.56	3.77	Interburden
REG3	-0.80	0.11	-0.02	-2.01	-2.99	-2.23	1.10	2.38	Boggabri Volcanics
REG4	0.30	0.39	0.33	0.15	-0.02	-0.62	-0.78	-0.88	Boggabri Volcanics
REG5		0.06	0.06	-0.01	-0.11	-0.32	-0.36	-0.17	Boggabri Volcanics
REG6		-0.10	-0.13	-2.19	-2.75	-1.47	-0.94	0.45	Boggabri Volcanics
REG12	-0.19	-0.26	-0.20	-0.31	-0.36	-0.28	-0.03	1.46	Boggabri Volcanics
REG13	0.02	0.15	0.45	0.36	0.26	0.12	0.64	2.71	Boggabri Volcanics
REG14	-0.15	0.09	-0.30	-1.40	-1.56	-1.25	0.09	1.89	Basement

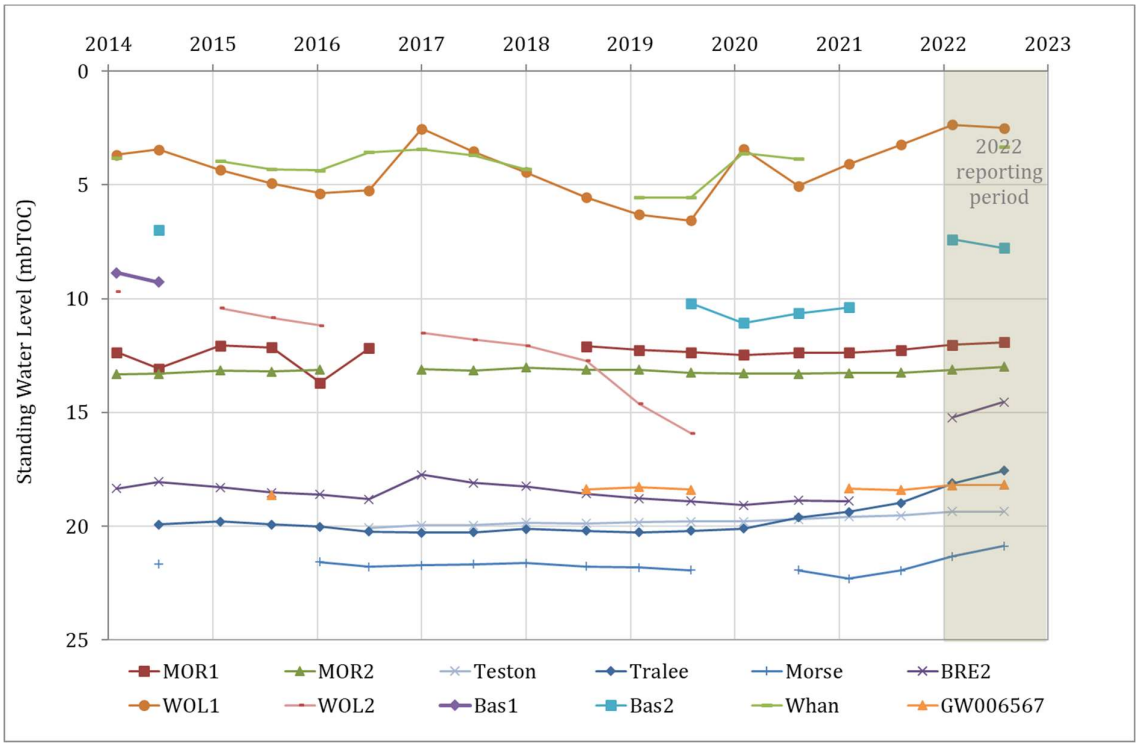
Colour scale (m change)

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

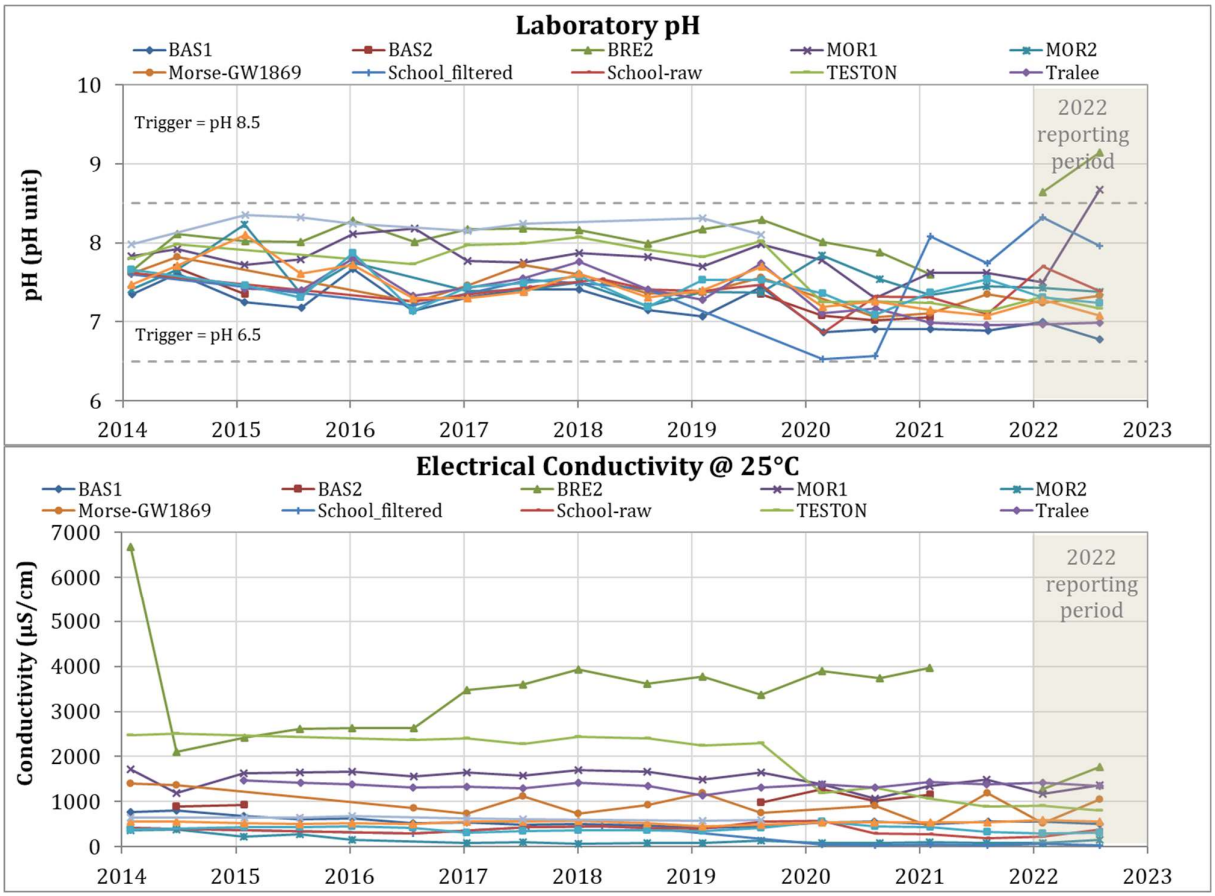
Cumulative annual difference in water level since December 2014

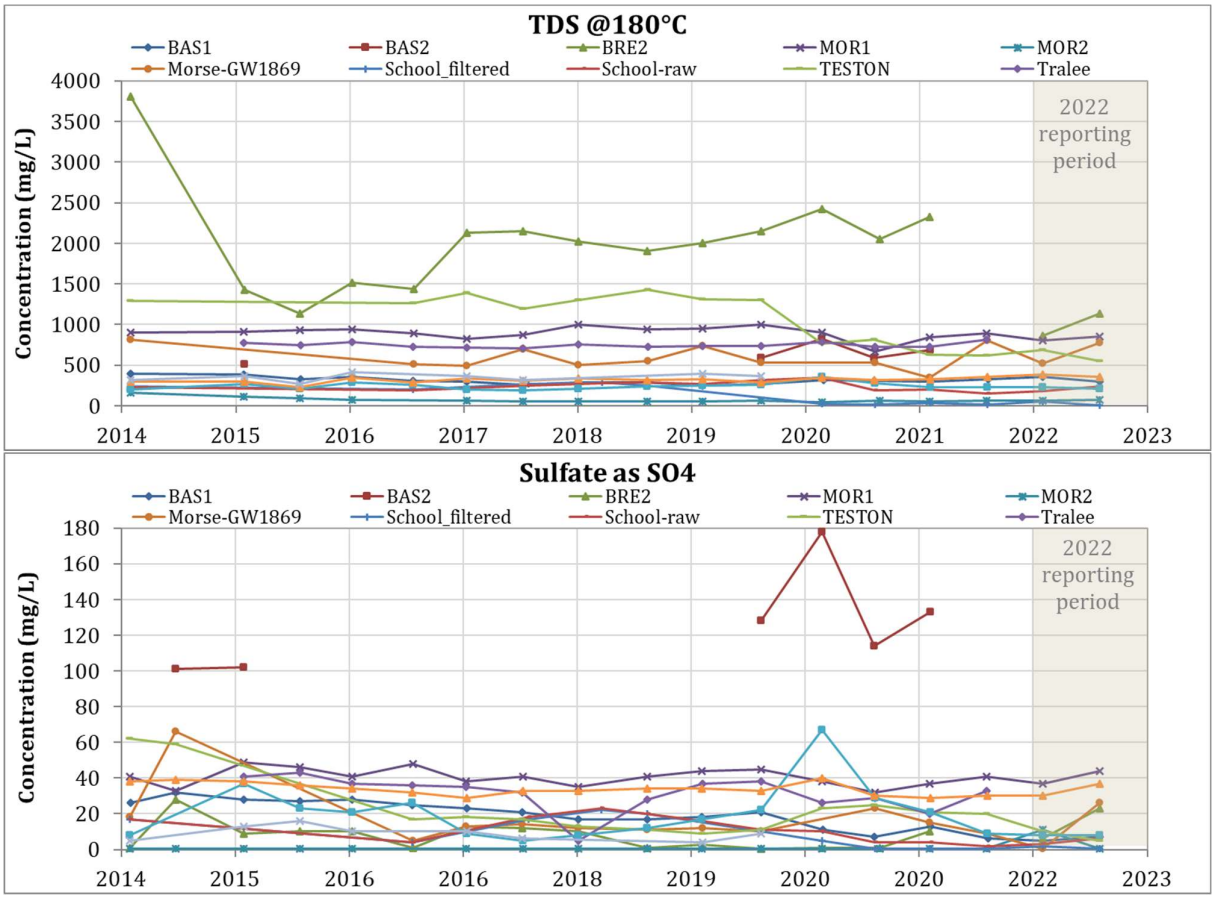


Private Groundwater Bores – Water levels



Private Groundwater Bores – Individual water quality parameters




TDS @180°C
BAS1
BAS2
BRE2
MOR1
MOR2
Morse-GW1869
School_filtered
School-raw
TESTON
Tralee
Concentration (mg/L)
4000
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2022 reporting period
Sulfate as SO4
BAS1
BAS2
BRE2
MOR1
MOR2
Morse-GW1869
School_filtered
School-raw
TESTON
Tralee
Concentration (mg/L)
180
160
140
120
100
80
60
40
20
0
2014
2015
2016
2016
2018
2019
2020
2020
2022
2023
2022 reporting period

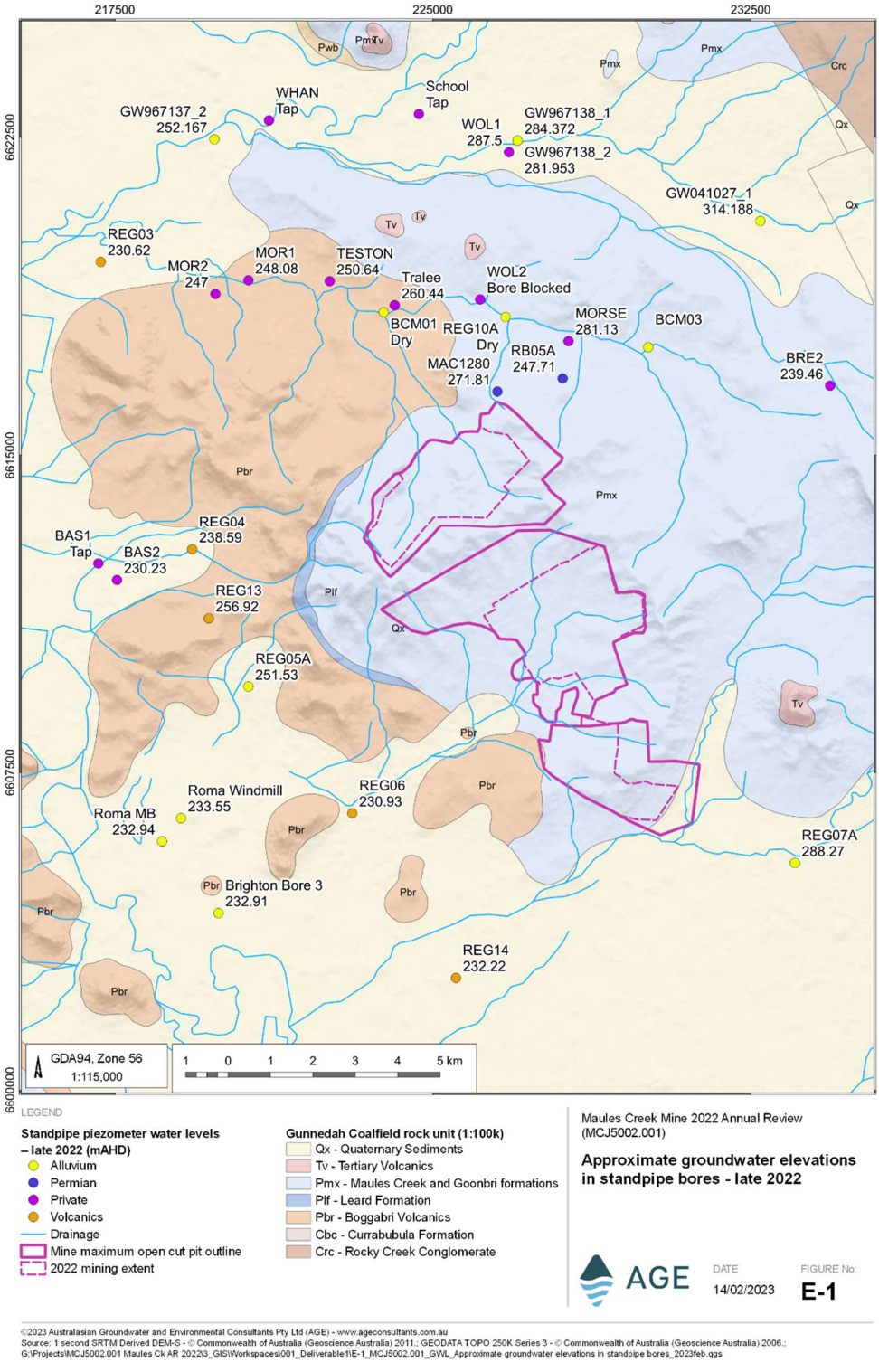


Table E-7

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 Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	10/01/2022 22:30	2.7	0.0	35	Yes	<20	Nil
NM2	10/01/2022 23:30	3.9	0.0	39	No	<20	NA
NM3	10/01/2022 23:40	4.0	0.0	35	No	IA	NA
NM4	10/01/2022 23:00	2.8	0.0	35	Yes	<20	Nil
NM5	10/01/2022 22:00	2.1	0.0	35	Yes	IA	Nil
NM6	10/01/2022 23:56	3.8	0.0	35	No	IA	NA

Table F-2 - February Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	08/02/2022 22:45	0.3	0.0	35	Yes	<25	Nil
NM2	08/02/2022 23:15	0.5	0.0	39	Yes	<25	Nil
NM3	09/02/2022 00:05	0.6	0.0	35	Yes	IA	Nil
NM4	08/02/2022 23:45	0.1	0.0	35	Yes	<20	Nil
NM5	08/02/2022 22:00	0.5	0.0	35	Yes	25	Nil
NM6	09/02/2022 00:09	0.8	0.0	35	Yes	<20	Nil

Table F-3 - March Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	07/03/2022 22:30	0.3	0.0	35	Yes	20	Nil
NM2	07/03/2022 23:30	0.6	0.0	39	Yes	25	Nil
NM3	07/03/2022 23:33	0.7	0.0	35	Yes	IA	Nil
NM4	07/03/2022 23:00	0.6	0.0	35	Yes	<20	Nil
NM5	07/03/2022 22:00	1.0	0.0	35	Yes	IA	Nil
NM6	07/03/2022 23:56	0.3	0.0	35	Yes	<20	Nil

Table F-4 - April Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	12/04/2022 23:30	0.4	0.0	35	Yes	IA	Nil
NM2	12/04/2022 23:00	0.1	0.0	39	Yes	28	Nil
NM3	12/04/2022 23:32	0.3	0.0	35	Yes	IA	Nil
NM4	12/04/2022 22:30	0.8	0.0	35	Yes	26	Nil
NM5	13/04/2022 00:00	0.6	0.0	35	Yes	IA	Nil
NM6	12/04/2022 22:00	0.5	0.0	35	Yes	25	Nil

Table F-5 - May Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	05/05/2022 22:30	1.6	0.0	35	Yes	<25	Nil
NM2	05/05/2022 23:30	1.4	0.0	39	Yes	25	Nil
NM3	05/05/2022 23:45	1.3	0.0	35	Yes	IA	Nil
NM4	05/05/2022 23:00	1.1	0.0	35	Yes	<25	Nil
NM5	05/05/2022 22:00	1.9	0.0	35	Yes	IA	Nil
NM6	05/05/2022 23:56	1.6	0.0	35	Yes	IA	Nil

Table F-6 - June Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	08/06/2022 22:30	0.5	0.0	35	Yes	<25	Nil
NM2	08/06/2022 23:30	0.9	0.0	39	Yes	<25	Nil
NM3	08/06/2022 23:37	1.0	0.0	35	Yes	IA	Nil
NM4	08/06/2022 23:00	0.3	0.0	35	Yes	<25	Nil
NM5	08/06/2022 22:00	0.3	0.0	35	Yes	22	Nil
NM6	08/06/2022 23:57	1.3	0.0	35	Yes	IA	Nil

Table F-7 - July Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	14/07/2022 22:30	0.3	0.0	35	Yes	25	Nil
NM2	14/07/2022 23:30	0.4	0.0	39	Yes	30	Nil
NM3	14/07/2022 23:30	0.4	0.0	35	Yes	<25	Nil
NM4	14/07/2022 23:00	0.5	0.0	35	Yes	<20	Nil
NM5	14/07/2022 22:00	1.2	0.0	35	Yes	IA	Nil
NM6	14/07/2022 23:55	0.3	0.0	35	Yes	<25	Nil

Table F-8 - August Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	22/08/2022 22:30	1.1	0.0	35	Yes	IA	Nil
NM2	22/08/2022 23:30	0.6	0.0	39	Yes	IA	Nil
NM3	22/08/2022 23:32	0.7	0.0	35	Yes	IA	Nil
NM4	22/08/2022 23:00	0.6	0.0	35	Yes	IA	Nil
NM5	22/08/2022 22:00	0.6	0.0	35	Yes	IA	Nil
NM6	22/08/2022 23:56	0.3	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 L_{Aeq} dB [2]	Exceedance dB [3]
NM1	13/09/2022 22:30	0.5	0.0	35	Yes	IA	Nil
NM2	13/09/2022 23:30	0.3	0.0	39	Yes	25	Nil
NM3	13/09/2022 23:27	0.5	0.0	35	Yes	26	Nil
NM4	13/09/2022 23:00	0.3	0.0	35	Yes	IA	Nil
NM5	13/09/2022 22:00	0.8	0.0	35	Yes	IA	Nil
NM6	13/09/2022 23:56	0.4	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 L_{Aeq} dB [2]	Exceedance dB [3]
NM1	4/10/2022 23:00	0.9	0.0	35	Yes	29	Nil
NM2	4/10/2022 23:45	0.3	0.0	39	Yes	32	Nil
NM3	5/10/2022 00:04	0.3	0.0	35	Yes	IA	Nil
NM4	5/10/2022 00:15	0.4	0.0	35	Yes	25	Nil
NM5	4/10/2022 22:18	0.5	0.0	35	Yes	<20	Nil
NM6	5/10/2022 00:46	0.5	0.0	35	Yes	<25	Nil

Table F-11 - November Noise Monitoring

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP L_{Aeq} dB [2]	Exceedance dB [3]
NM1	10/11/2022 22:30	0.9	0.0	35	Yes	27	Nil
NM2	10/11/2022 23:30	0.8	0.0	39	Yes	<20	Nil
NM3	10/11/2022 23:51	0.5	0.0	35	Yes	<25	Nil
NM4	10/11/2022 23:00	0.3	0.0	35	Yes	<20	Nil
NM5	10/11/2022 22:00	0.5	0.0	35	Yes	IA	Nil
NM6	10/11/2022 23:56	0.6	0.0	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 L_{Aeq} dB [2]	Exceedance dB [3]
NM1	20/12/2022 22:30	3.3	0.0	35	No	<20	NA
NM2	20/12/2022 23:30	2.8	0.0	39	Yes	29	Nil
NM3	20/12/2022 23:51	3.0	0.0	35	Yes	IA	Nil
NM4	20/12/2022 23:00	3.5	0.0	35	No	26	NA
NM5	20/12/2022 22:00	4.2	0.0	35	No	IA	NA
NM6	21/12/2022 0:00	3.4	0.0	35	No	<20	NA

Notes:

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. Site-only LAeq,15minute attributed to MCCP, including modifying factors if applicable.

3. NA in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in project approval.

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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	10/01/2022 22:30	2.7	0.0	45	Yes	<20	Nil
NM2	10/01/2022 23:30	3.9	0.0	45	No	<20	NA
NM3	10/01/2022 23:40	4.0	0.0	45	No	IA	NA
NM4	10/01/2022 23:00	2.8	0.0	45	Yes	20	Nil
NM5	10/01/2022 22:00	2.1	0.0	45	Yes	IA	Nil
NM6	10/01/2022 23:56	3.8	0.0	45	No	IA	NA

Table F-14 – February Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	08/02/2022 22:45	0.3	0.0	45	Yes	<25	Nil
NM2	08/02/2022 23:15	0.5	0.0	45	Yes	<25	Nil
NM3	09/02/2022 00:05	0.6	0.0	45	Yes	IA	Nil
NM4	08/02/2022 23:45	0.1	0.0	45	Yes	<20	Nil
NM5	08/02/2022 22:00	0.5	0.0	45	Yes	28	Nil
NM6	09/02/2022 00:09	0.8	0.0	45	Yes	<20	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	07/03/2022 22:30	0.3	0.0	45	Yes	25	Nil
NM2	07/03/2022 23:30	0.6	0.0	45	Yes	40	Nil
NM3	07/03/2022 23:33	0.7	0.0	45	Yes	IA	Nil
NM4	07/03/2022 23:00	0.6	0.0	45	Yes	<20	Nil
NM5	07/03/2022 22:00	1.0	0.0	45	Yes	IA	Nil
NM6	07/03/2022 23:56	0.3	0.0	45	Yes	<20	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	12/04/2022 23:30	0.4	0.0	45	Yes	IA	Nil
NM2	12/04/2022 23:00	0.1	0.0	45	Yes	31	Nil
NM3	12/04/2022 23:32	0.3	0.0	45	Yes	IA	Nil
NM4	12/04/2022 22:30	0.8	0.0	45	Yes	32	Nil
NM5	13/04/2022 00:00	0.6	0.0	45	Yes	IA	Nil
NM6	12/04/2022 22:00	0.5	0.0	45	Yes	28	Nil

TableF-17 – May Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	05/05/2022 22:30	1.6	0.0	45	Yes	28	Nil
NM2	05/05/2022 23:30	1.4	0.0	45	Yes	30	Nil
NM3	05/05/2022 23:45	1.3	0.0	45	Yes	IA	Nil
NM4	05/05/2022 23:00	1.1	0.0	45	Yes	<25	Nil
NM5	05/05/2022 22:00	1.9	0.0	45	Yes	IA	Nil
NM6	05/05/2022 23:56	1.6	0.0	45	Yes	IA	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	08/06/2022 22:30	0.5	0.0	45	Yes	28	Nil
NM2	08/06/2022 23:30	0.9	0.0	45	Yes	<25	Nil
NM3	08/06/2022 23:37	1.0	0.0	45	Yes	IA	Nil
NM4	08/06/2022 23:00	0.3	0.0	45	Yes	<25	Nil
NM5	08/06/2022 22:00	0.3	0.0	45	Yes	25	Nil
NM6	08/06/2022 23:57	1.3	0.0	45	Yes	IA	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	14/07/2022 22:30	0.3	0.0	45	Yes	27	Nil
NM2	14/07/2022 23:30	0.4	0.0	45	Yes	35	Nil
NM3	14/07/2022 23:30	0.4	0.0	45	Yes	27	Nil
NM4	14/07/2022 23:00	0.5	0.0	45	Yes	35	Nil
NM5	14/07/2022 22:00	1.2	0.0	45	Yes	IA	Nil
NM6	14/07/2022 23:55	0.3	0.0	45	Yes	<25	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	22/08/2022 22:30	1.1	0.0	45	Yes	IA	Nil
NM2	22/08/2022 23:30	0.6	0.0	45	Yes	IA	Nil
NM3	22/08/2022 23:32	0.7	0.0	45	Yes	IA	Nil
NM4	22/08/2022 23:00	0.6	0.0	45	Yes	IA	Nil
NM5	22/08/2022 22:00	0.6	0.0	45	Yes	IA	Nil
NM6	22/08/2022 23:56	0.3	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	13/09/2022 22:30	0.5	0.0	45	Yes	IA	Nil
NM2	13/09/2022 23:30	0.3	0.0	45	Yes	28	Nil
NM3	13/09/2022 23:27	0.5	0.0	45	Yes	30	Nil
NM4	13/09/2022 23:00	0.3	0.0	45	Yes	IA	Nil
NM5	13/09/2022 22:00	0.8	0.0	45	Yes	IA	Nil
NM6	13/09/2022 23:56	0.4	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	4/10/2022 23:00	0.9	0.0	45	Yes	34	Nil
NM2	4/10/2022 23:45	0.3	0.0	45	Yes	35	Nil
NM3	5/10/2022 00:04	0.3	0.0	45	Yes	IA	Nil
NM4	5/10/2022 00:15	0.4	0.0	45	Yes	26	Nil
NM5	4/10/2022 22:18	0.5	0.0	45	Yes	<20	Nil
NM6	5/10/2022 00:46	0.5	0.0	45	Yes	27	Nil

Table F23 – November Noise Monitoring – Night

Location	Start Date and Time	Wind Speed m/s	Rainfall mm	Criterion dB	Criterion Applies? [1]	MCCP $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	10/11/2022 22:30	0.9	0.0	45	Yes	30	Nil
NM2	10/11/2022 23:30	0.8	0.0	45	Yes	25	Nil
NM3	10/11/2022 23:51	0.5	0.0	45	Yes	<25	Nil
NM4	10/11/2022 23:00	0.3	0.0	45	Yes	<20	Nil
NM5	10/11/2022 22:00	0.5	0.0	45	Yes	IA	Nil
NM6	10/11/2022 23:56	0.6	0.0	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 $L_{A1,1min}$ dB [2]	Exceedance dB [3]
NM1	20/12/2022 22:30	3.3	0.0	45	No	27	NA
NM2	20/12/2022 23:30	2.8	0.0	45	Yes	32	Nil
NM3	20/12/2022 23:51	3.0	0.0	45	Yes	IA	Nil
NM4	20/12/2022 23:00	3.5	0.0	45	No	30	NA
NM5	20/12/2022 22:00	4.2	0.0	45	No	IA	NA
NM6	21/12/2022 0:00	3.4	0.0	45	No	23	NA

Notes:

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. Site-only LA1,1minute attributed to MCCP.

3. NA in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in project approval.

4. Indicates the application of a 2dB low frequency modifying factor. IA/NM – Inaudible NM – Not measurable

APPENDIX G

DPE RESPONSE TABLE

TABLE F-1

Item	DPE Comment	MCC Response
a)	Section 6.2 - Air Quality	
i.	Graph 2 shows an annual average starting in January 2021; however, results are not available for TEOM 3 till August 2021. Please correct the graph.	Graph 2 has been updated to show a static average over the period it was operational.
ii.	Graphs 1, 2, 3, and 4 are presenting 'rolling' annual averages. Annual averages should start 1 January and end 31 December.	Graphs 1, 2, and 3 have been updated to show a static annual average over the 12-month period. Graph 4 remains unchanged as it was showing a static 12-month average.
b)	Section 6.3.2 Environmental Performance (GHG)	
i.	Total GHG emission for the NGERS 2021 Financial Year reporting period was 333,219 T CO2-e. Total GHG emissions for the NGERS 2020 Financial Year reporting period was 865,669 kT CO2-e. Please explain the large decrease.	FY 21 was the first time that MCCM reported under Method 2 using a site-specific emissions factor rather than a default emissions factor. This resulted in a notable decrease to previous years where the default factor was utilised. 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. Additional wording has been added to section 6.3.2 to explain this change. Additionally there was a reporting error in the 2020 AR which reported the CO2-e in kT instead of T. This error was reported the DPE and rectified in the AR on the 11th November 2021.
ii.	There were 9549 T CO2 -e fugitive emissions in 2021, while in 2020 fugitive emissions were reported as 579,217 kg CO2 -e. Please explain the large increase.	There was a reporting error in the 2020 AR which reported the fugitive emissions in kg instead of T. This error was reported to the DPE and rectified in the AR on the 11th November 2021. As discussed above, in FY21 MCCM reported under Method 2 using a site specific emissions factor. This factor saw a material reduction in reported emissions historically.

		Additional wording has been added to section 6.3.2 to explain this change.
iii.	35 MWh of electricity was reported to have been consumed in 2021 as opposed to 30,660.94 MWh in 2020. Please explain the large decrease.	There was a reporting error in the 2020 AR which reported the electricity in MWh instead of kWh. This error was reported the DPE and rectified in the AR on the 11th November 2021.
iv.	No trends are presented with previous years GHG emissions. Please include this comparison.	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 has seen a marked reduction of emissions reported in comparison to previous years. This has been included in section 6.3.2