Annual Review
Rocglen Coal Mine

Name of operation	Rocglen Coal Mine
Name of operator	Whitehaven Coal Mining Pty Ltd
Development consent/project approval number	PA 10_0015
Name of holder of development consent/project approval	Whitehaven Coal Mining Pty Ltd
Mining lease number	ML 1620, ML 1662
Name of holder of mining lease	Whitehaven Coal Mining Pty Ltd
Water licence number	WAL29461 and WAL 36758
Name of holder of water licence	Whitehaven Coal Mining Pty Ltd
RMP start date	2 August 2022, reported on calendar year
Annual review start date	1 January 2022
Annual review end date	31 December 2022
I, Daryl Robinson, certify that this audit report is a true and accurate record of the compliance status of Rocglen Coal Mine for the period 1st January 2022 to 31st December 2022, and that I am authorised to make this statement on behalf of Whitehaven Coal Mining 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	Andrew Raal
Title of authorised reporting officer	Superintendent Closed Mines
Signature of authorised reporting officer	
Date	01 June 2023

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APPENDIX

APPENDIX 1. SURFACE WATER
APPENDIX 2. GROUNDWATER

1. STATEMENT OF COMPLIANCE

The compliance status of Rocglen Coal Mine (RCM) as at 31st December 2022 is summarised in **Table 1A**. **Table 1B** notes non-compliances that occurred during the reporting period, as well as non-compliances from previous reporting periods that still require management action.

TABLE 1A - STATEMENT OF COMPLIANCE

Were all conditions of the relevant approval(s) complied with?	
PA10_0015	No
EPL 12870 (applicable conditions above)	No
ML 1620	Yes
ML 1662	Yes
WAL 29461	Yes
WAL 36758	Yes

TABLE 1B - NON-COMPLIANCES

Relevant Approval	Condition Numbers	Condition Description (summary)	Compliance Status	Comment	Where Addressed in Annual Review
PA 10_0015	Schedule 5, Condition 4	Management Plans	Administrative non-compliance	All Management Plans will be reviewed moving forward.	Section 6.4.3 and Section 10
PA 10_0015	Schedule 3, Condition 21	Surface water discharge comply with limits set for the property by EPL.	Non-compliant	Exceedance of TSS limit	Section 7.1.4
EPL 12870	L2.4 and L2.5	Discharge Limit Exceedance	Non-compliant	Exceedance of TSS limit	Section 7.1.4
EPL 12870	O1.1	Licensed activities must be carried out in a competent manner, including processing, handling, movement and storage of materials and substances.	Non-compliant	IBC containers re-arranged on base of bund facing towards contained workshop area.	Section 10
EPL 12870	M2.3	Water monitoring requirements	Non-compliant	Sampling undertaken by competent site personnel will record field pH and conductivity.	Section 10

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)

Figure 1. Compliance status key for Table 1B

2. INTRODUCTION

This is the fourteenth Annual Review (AR), previously Annual Environmental Management Report, produced for the RCM, and it has been prepared in accordance with Conditions 4 and 5 of Mining Lease (ML1620) (Mining Act 1992), Condition 4 of Mining Lease (ML1662) and Condition 3 Schedule 5 of PA 10_0015, as modified. This report covers the period between the 1st January 2022 and the 31st December 2022. The AR follows the format required by the NSW Government Annual Review Guideline (October, 2015).

The RCM is located approximately 28km north of Gunnedah (refer **Figure 1**). The RCM is owned by Whitehaven Coal Limited (WCL) and operated by Whitehaven Coal Mining Pty Ltd (WCMPL).

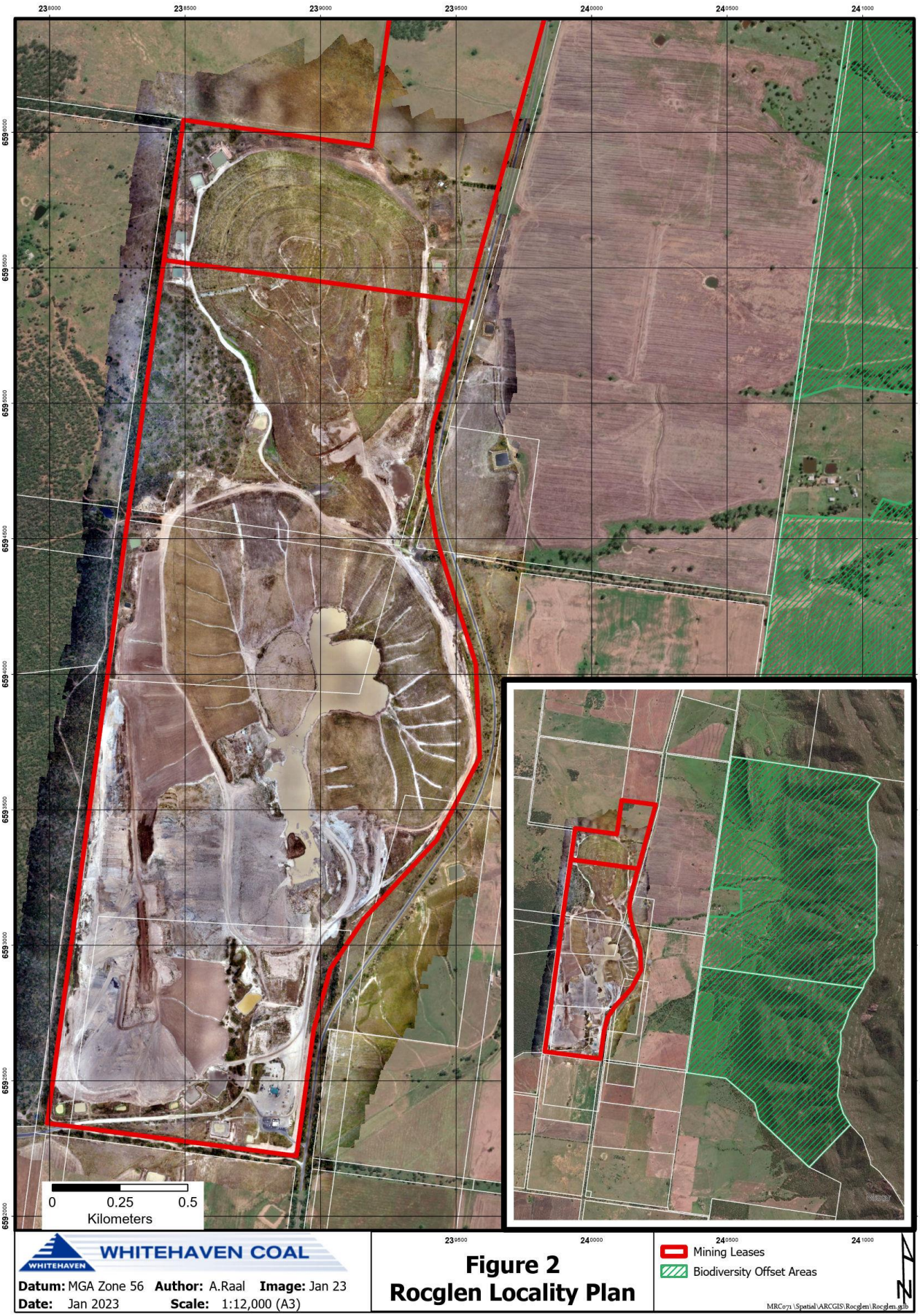
The RCM was initially approved on the 15th April 2008 under PA 06_0198 with a minor modification (PA 06_0198 MOD1) granted in May 2010 to address highwall stability issues. Whitehaven submitted a Project Application, and accompanying Environmental Assessment, under Part 3A of the *Environmental Planning and Assessment Act 1979* in March 2010. PA 10_0015 was issued on the 27th September 2011 and allows for additional extraction of up to 5 million tonnes of coal at a maximum recovery rate of 1.5 million tonnes per annum (i.e. increased project life of the operation of coal extraction by up to four years).

PA 10_0015 was modified initially in November 2014 to condition cumulative coal haulage from the Tarrawonga/Vickery/Rocglen mines. In August 2015 another modification was made allowing changes to coal reject haulage to the site. During February 2017, PA10_0015 was modified to permit increased coal haulage during the 2017 calendar year, and then again in October 2018 to allow the continuation of the increased haulage into the 2018 calendar year.

2.1 Mine Contacts

The management personnel responsible for operational and environmental performance at the RCM and their relevant contact details are follows:

- Mr Daryl Robinson, Manager - Environment and Mine Rehabilitation Gunnedah Open Cut Operations - retains responsibility for mining activities at the site. Contact: (02) 6740 7000.
- Mr Andrew Raal, Superintendent Closed Mines – oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6740 7009.


0
0.25
0.5
Kilometers
WHITEHAVEN COAL
Datum: MGA Zone 56 Author: A.Raal Image: Jan 23
Date: Jan 2023 Scale: 1:12,000 (A3)
Figure 2
Rocglen Locality Plan
Mining Leases
Biodiversity Offset Areas
N
MRC071\Spatial\ARCGIS\Rocglen\Rocglen.gdb

3. APPROVALS

3.1 Tenements, Licences and Approvals

Table 3.1 identifies the approvals in place for the RCM at the end of the reporting period, the issuing/responsible Authority, dates of issue, expiry date and relevant comments.

TABLE 3.1 - TENEMENTS, LICENCES AND APPROVALS

Responsible Authority	Type of Lease, Licence, Approval	Date of Issue	Expiry	Comments
Department of Planning and Environment (DP&E)	Project Approval PA10_0015	27th September 2011	N/A	Mining operations are required to cease end of December 2022
Environment Protection Authority (EPA)	Environment Protection Licence 12870 (EPL12870)	31st July 2008	N/A Anniversary Date: 31st July	Application for licence relinquishment in next reporting year
Department of Environment – Division of Resources and Geoscience (DRG)	ML1620	10th June 2008	10th June 2029	-
Department of Environment – Division of Resources and Geoscience (DRG)	ML1662	9th January 2012	9th January 2033	-
Division of Resources and Geoscience (DRG)	Rehabilitation Management Plan	2nd July 2022	N/A	Reviewed and reported against annually
Department of Primary Industries – Water (DPI Water)	WAL 36758	4th September 2014	In perpetuity	In process of being sold/ transferred.

4. OPERATIONS SUMMARY

4.1 Mining Operations

TABLE 4.1 - PRODUCTION SUMMARY

Material	Approved Limit	Previous Reporting Period (actual)	This Reporting Period (actual)	Next Reporting Period (forecast)
Waste Rock/Overburden	N/A	2,331,374 bcm	921,292 bcm	673,921 bcm
ROM Coal/Ore	1,500,000 t	0	0	0
Reject Material[1]	700,000 t	0	0	0
Saleable Product	N/A	0	0	0

4.2 Other Operations

4.2.1 Hours of Operations

RCM hours of operation during the reporting period were within Project Approval limits, which permit mining 24 hours per day Monday to Saturday, with the exclusion of public holidays. Blasting is restricted to 9:00am – 5:00pm Monday to Saturday. As of the first of July 2019, the shifts at Rocglen were minimised in line with the transition from coal production to rehabilitation. Currently the mine operates one shift, a 9.5-hour day shift on weekdays (7am – 4.30pm). Other ancillary tasks and maintenance activities may have extended hours.

4.2.2 Coal Haulage

For the reporting period there were no haulage movements for ROM coal or receival of Coal rejects.

4.2.3 Exploration

No exploration drilling was undertaken on the Mining Lease (ML1620, ML 1622) during the reporting period, and none planned for the next 12 months.

4.3 Next Reporting Period

Production has now ceased for the RCM, with no coal production. Works undertaken will be limited to rehabilitation which will include: Bulk earth moving/shaping using dozers, placement of subsoil and topsoil, seeding, tube stock planting and rock lining of drainage structures.
Any vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with the approved associated Management Plans.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Department of Planning, Industry and Environment – Resources Regulator Department of primary industry (DPE-RR) issued no request for any changes.

6. ENVIRONMENTAL PERFORMANCE

The following sub-sections document the implementation and effectiveness of the various control strategies adopted by RCM, together with monitoring data for the reporting period. Life of mine monitoring data is included as appendices to this AR, where relevant, to allow for discussion on longer-term trends.

6.1 Air Quality

6.1.1 Criteria

The air quality criteria applicable to RCM are specified in PA 10_0015 and summarised below.

TABLE 6.1.1 - AIR QUALITY CRITERIA

Air Quality Type	Criteria
Acceptable Mean Annual Increase in Deposited Dust	2 g/m^2/month
Mean Annual Dust Deposition (all sources)	4 g/m^2/month
Mean Annual Total Suspended Particulate (TSP) Matter (all sources) Concentration	90 $\mu g/m^3$
Mean Annual PM_{10} Particulate Level	30 $\mu g/m^3$
24hr Mean PM_{10} Particulate Level	50 $\mu g/m^3$

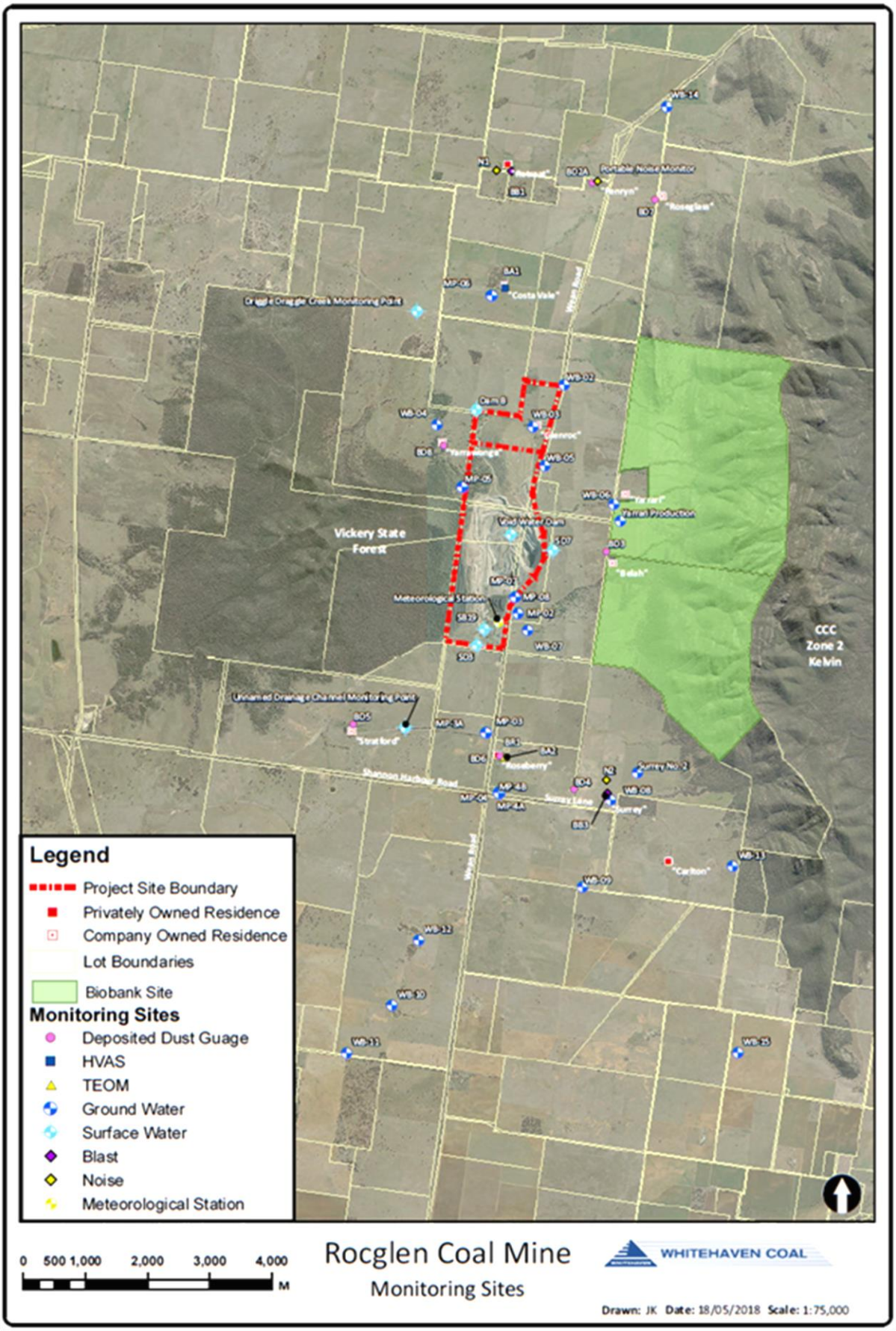


Figure 3. Monitoring Locations

6.1.2 Environmental Management Measures

Monitoring of Deposited Dust is undertaken on a monthly basis, whilst PM_{10} levels are monitored every 6 days. Table 6.1.2a and Figure 4 below presents a summary of the Deposited Dust monitoring data.

TABLE 6.1.2A - DEPOSITED DUST RESULTS

Site	EPL I.D. No.	Property Name	Annual Mean Total Insoluble Solids (g/m^2/month)	Annual Mean Ash (%)	Long Term Insoluble Solids Mean
BD3		Belah	1.6	0.5	1.8
BD4	4	Surrey	1.7	0.4	1.0
BD5		Stratford	1.9	0.6	2.2
BD6	6	Roseberry	1.1	0.5	2.6
BD7		Roseglass	1.4	0.5	1.4
BD8		Yarrawonga	0.8	0.4	2.6
BD2-A		Penryn	1.7	0.4	1.4

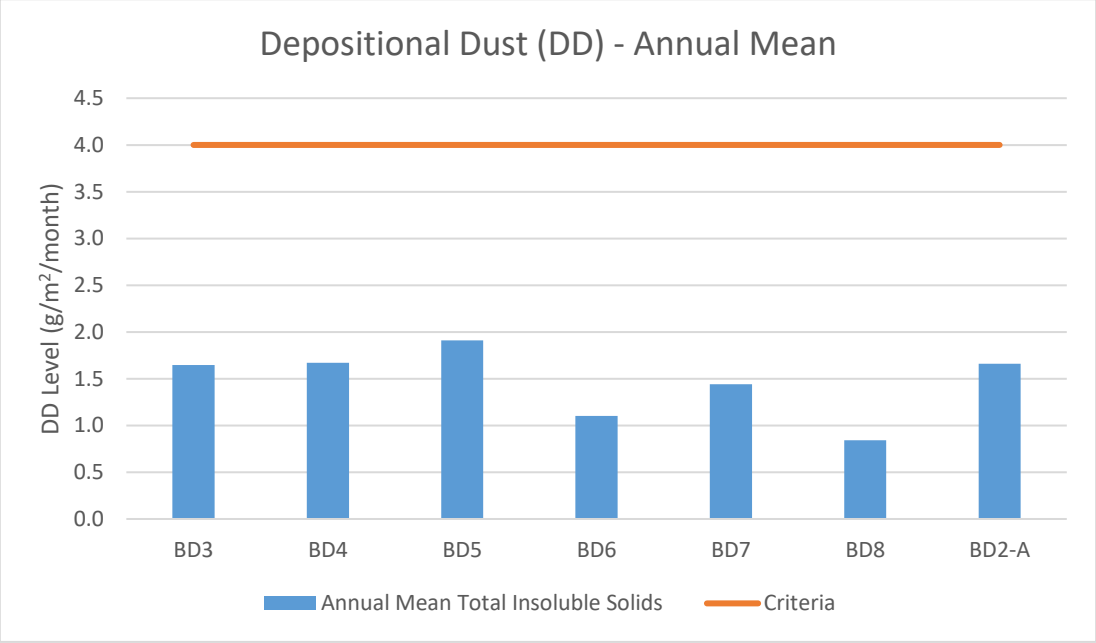


Figure 4. Annual mean depositional dust

A review of the above, shows that the annual mean limit for deposited dust was below the set criteria at each monitoring site.

RCM had two High Volume Air Samplers (HVAS) (PM_{10}) monitoring during Q1 of the reporting period. Following approval from DPE on 11 April 2022 to remove HVAS located to the north of the mine on the project related property 'Costa Vale', monitoring at this location ceased in May 2022. For the remainder of the reporting period, RCM had one licenced HVAS (EPL ID - 10) monitoring operations

which is located to the south-east of the mine on 'Roseberry' (a privately owned property under private agreement). Figures 5 and 6 display the PM10 24hr results for 'Costa Vale' and 'Roseberry' respectively.

TABLE 6.1.2B - PM10 SUMMARY DATA

PM10 Summary				
Sites	**Costa Vale- Full data set**	**Costa Vale -excluding extraordinary events**	**Roseberry- Full data set**	**Roseberry- excluding extraordinary events**
No. of readings	23	23	61	61
No. days above criteria	0	0	2	2
Maximum	23.8	23.8	55.3	55.3
Minimum	1.9	1.9	0.05	0.05
Mean	8.2	8.2	5	5
Comment	Costa Vale HVAS removed in May 2022 following approval of updated AQGHG Management Plan on 11 April 2022			

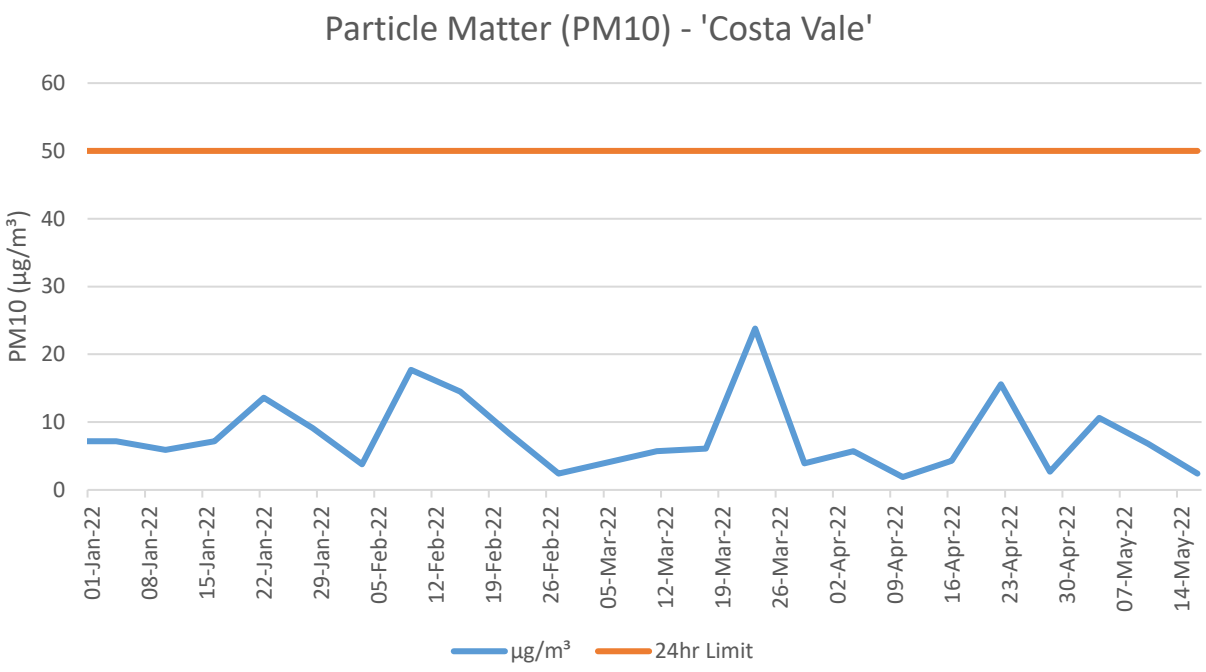


Figure 5. 'Costa Vale' Particulate Matter (PM10)

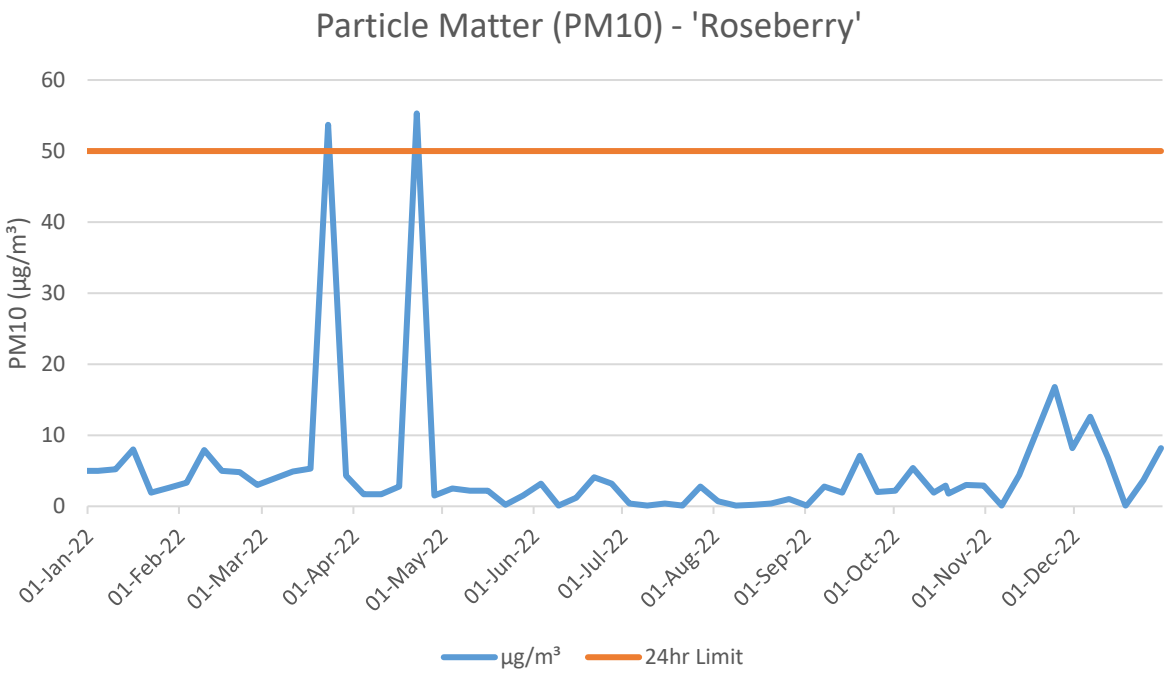


Figure 6. 'Roseberry' Particulate Matter (PM10)

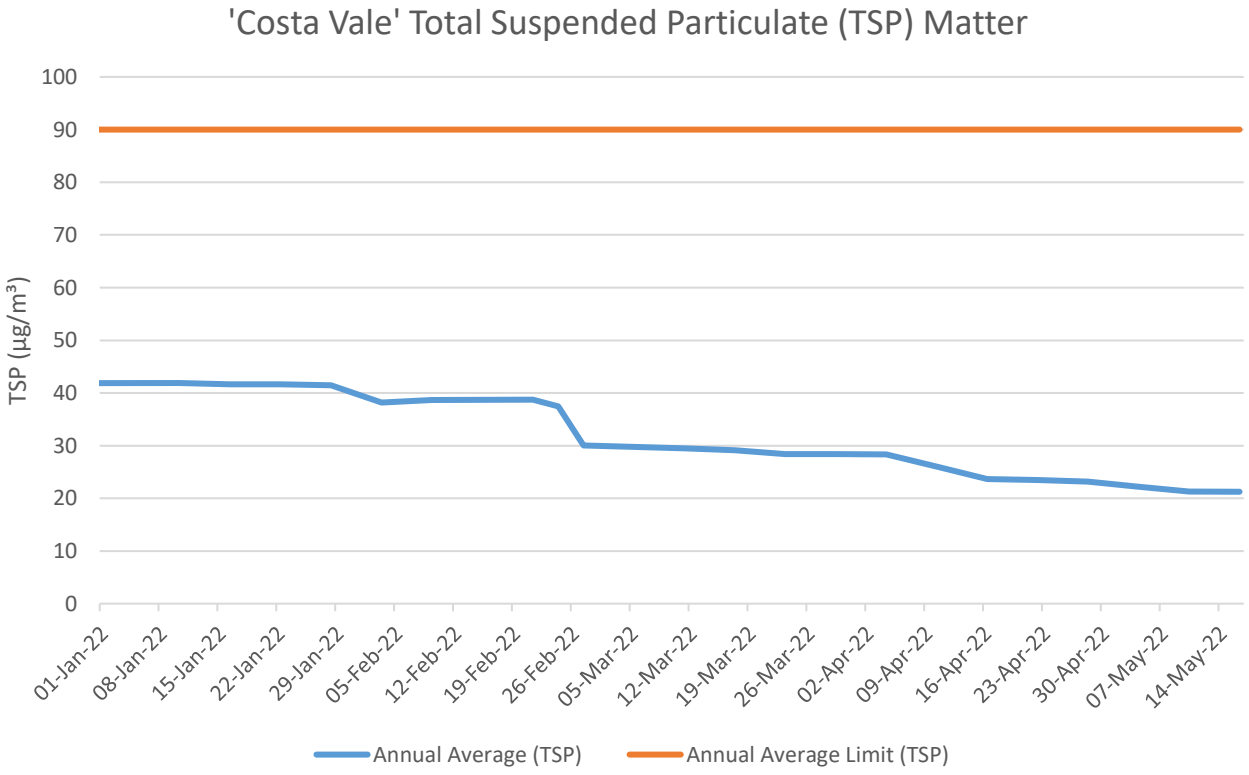


Figure 7. 'Costa Vale' TSP Annual Rolling Mean (full data set)

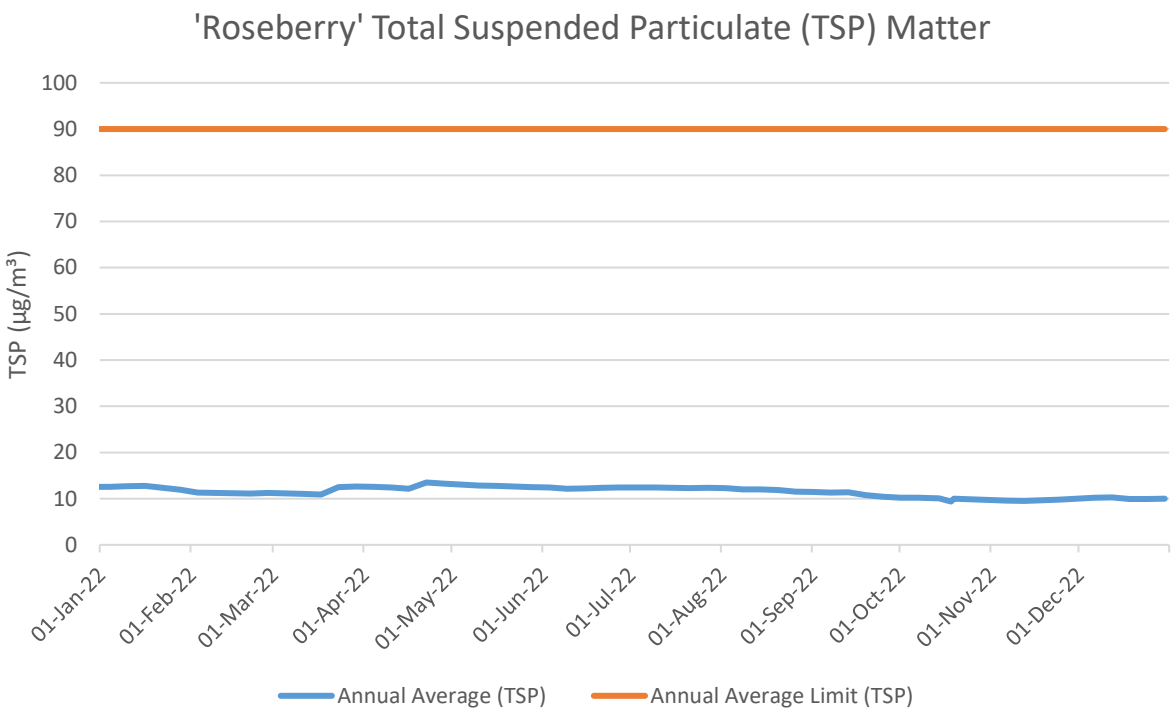


Figure 8. 'Roseberry' TSP Annual Rolling Mean (full data set)

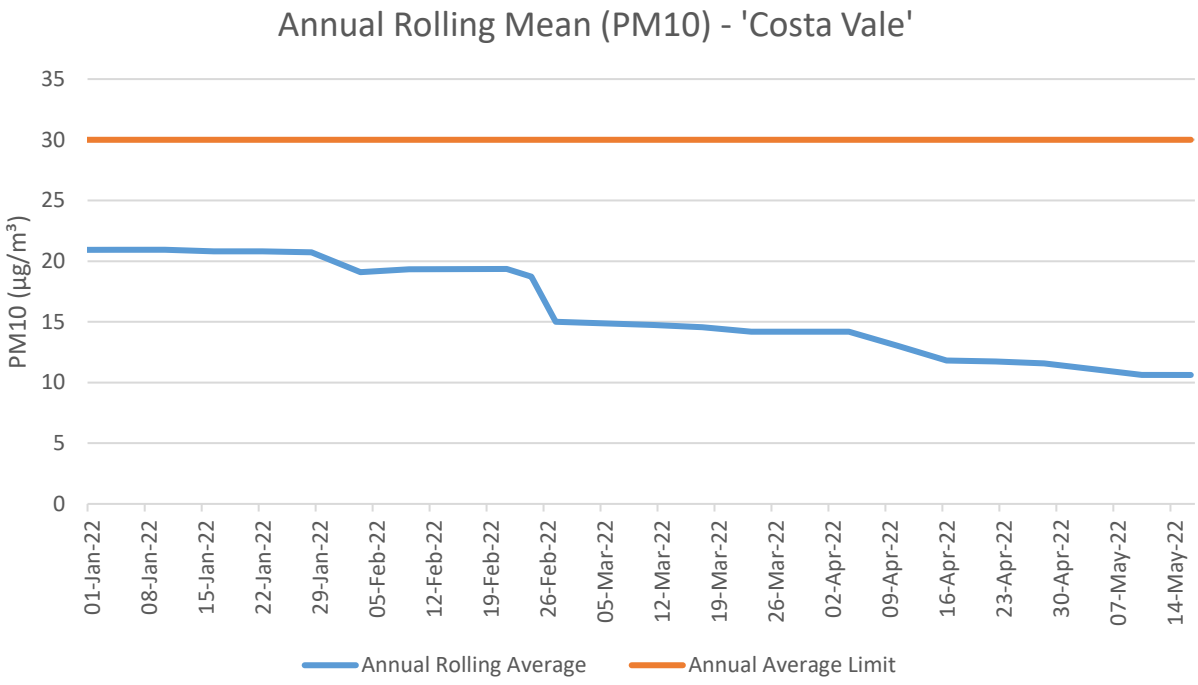


Figure 9. 'Costa Vale' PM10 Annual Rolling Mean (full data set)

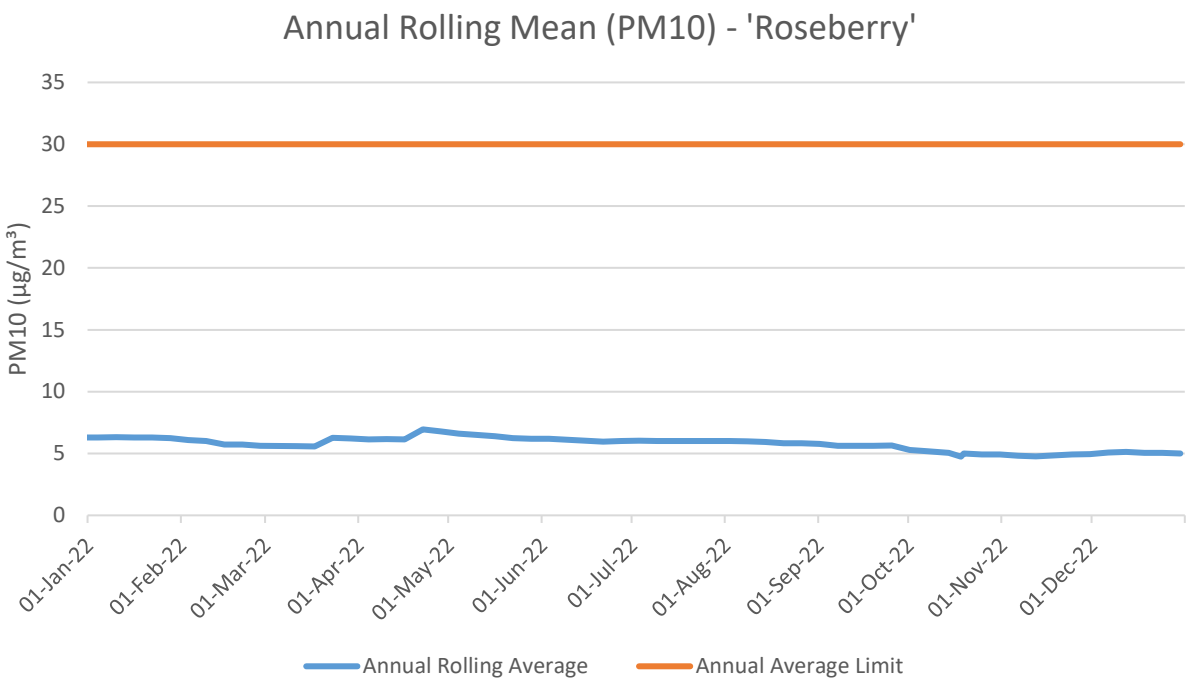


Figure 10. 'Roseberry' PM10 Annual Rolling Mean (full data set)

There were two occasions at 'Roseberry' where the 24hr limit of 50 µg/m³ was exceeded, 53.7µg/m³ on 23 March 2022 and 55.3µg/m³ on 22 April 2022. Both events were reported to DPE via portal. The events were determined to be not mine related (agricultural activities). Annual rolling mean for TSP and PM10 reported below limits.

6.1.3 Long Term Trends

Dispersion modelling undertaken for the Rocglen Extension Project Environmental Assessment (EA) (PAEHolmes, 2011) predicted that depositional dust would comply with assessment criteria at all nearby residential properties except 'Yarrawonga' (for the proposed mine extension alone). Results from this reporting period, along with those in past years, are generally consistent with the prediction.

Modelling predicted only one exceedance a year at 'Roseberry' and 'Glenroc', and it was noted cumulative 24-hour impacts were unlikely to arise (PAEHolmes, 2011). The EA noted that in conditions of significant high winds and dust storms, the proportional contribution of mining activities to the total PM10 concentration would be low (PAEHolmes, 2011). As the mine site has now ceased production and earthworks are limited to day shift only with reduced equipment on site local contribution from mining has decreased. Bulk haulage of material for rehabilitation was completed in 2021.

6.1.4 Key Environmental Performance/Management Issues

Dust levels have decreased due to wet weather and good vegetation cover across the local region where Rocglen Mine is situated. Bulk excavation and haulage of material ceased in September 2021.

6.1.5 Proposed Improvements to Environmental Management

None proposed for the next reporting period as dust monitors have been working correctly and site activity will be decreasing, with large areas rehabilitated and seeded which would further reduce potential dust generation.

6.2 Onsite Biodiversity

6.2.1 Introduction

A detailed annual ecological assessment of rehabilitated areas and analogue sites was undertaken by Aspect Ecology Pty Ltd during October/November 2022. Monitoring was undertaken using the Whitehaven Annual Rehabilitation Monitoring Methodology (WARMM—Aspect Ecology 2022).

Monitoring in the Woodland Domain comprised:

- one repeat analogue site;
- repeat monitoring of one previously established 'best-on-offer' (DPE 2020) local analogue site and establishment of two new analogue sites, situated in the target vegetation community of Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (Plant Community Type ID 592 in the BioNet Vegetation Classification System);
- nine repeat rehabilitation sites, capturing all extant years seeded (2013–16);
- eight new sites established in 2022; and
- 26 woodland RPAs, focussing especially on new rehabilitation.

Monitoring in the Pasture Domain comprised:

- a repeat monitoring of the reference site, which was co-located with the reference plots using historical methodologies near the Canyon Mine;
- two newly rehabilitated pasture sites.
- four repeat pasture rehabilitation sites;
- two repeat monitoring sites, established in the year 2014;
- one repeat monitoring site established in 2015 and one established in 2016 for rehabilitation; and
- 13 pasture RPAs, focussing especially on new rehabilitation.

6.2.2 Woodland Domain

Groundcover

In analysing the nine sites that are consecutively repeated for the four years (2019, 2020, 2021 and 2022) in Rocglen (**Figure 11**), it can be observed that at six sites the desirable value was equal to, or above, the average value of desirable values in the previous years. The sites that maintained or increased the percentage of native cover are RGR1937, RGR1934, RGR1924, RGR1984, RGR1974 and RGR19134 (**Figure 11**)**.**

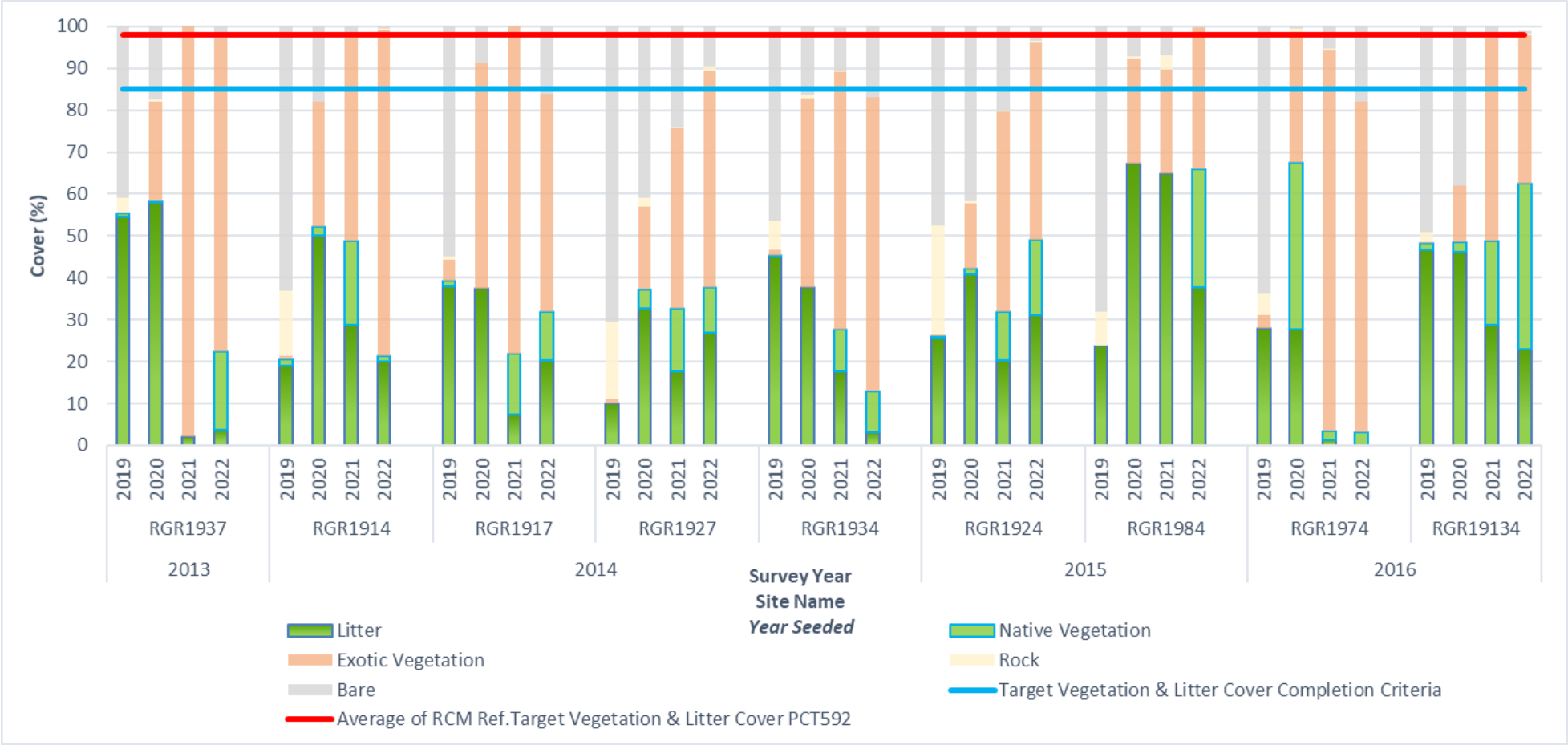


Figure 11. Average Percentage Cover of Groundcover Components within each Woodland Domain Rehabilitation Year at Rocglen Coal Mine, comparing the 2019, 2020, 2021 and 2022 Monitoring Seasons.

< 2m tall Tree density

The density of trees less than two metres is included in annual monitoring to underdtand seedling establishment and progress toward recruitment in the >2m tall canopy layer. All sites, except one, were observed to have seedlings present (Figure 12). All but two repeat sites exhibited increases in seedling density since 2021, with the exceptions being RGR19174 and RGR1934—both from 2014—which had a minor to moderate decrease. The seedling density within the new (2021) rehabilitation was relatively low, with all site exhibiting less than 50 stems/ha.

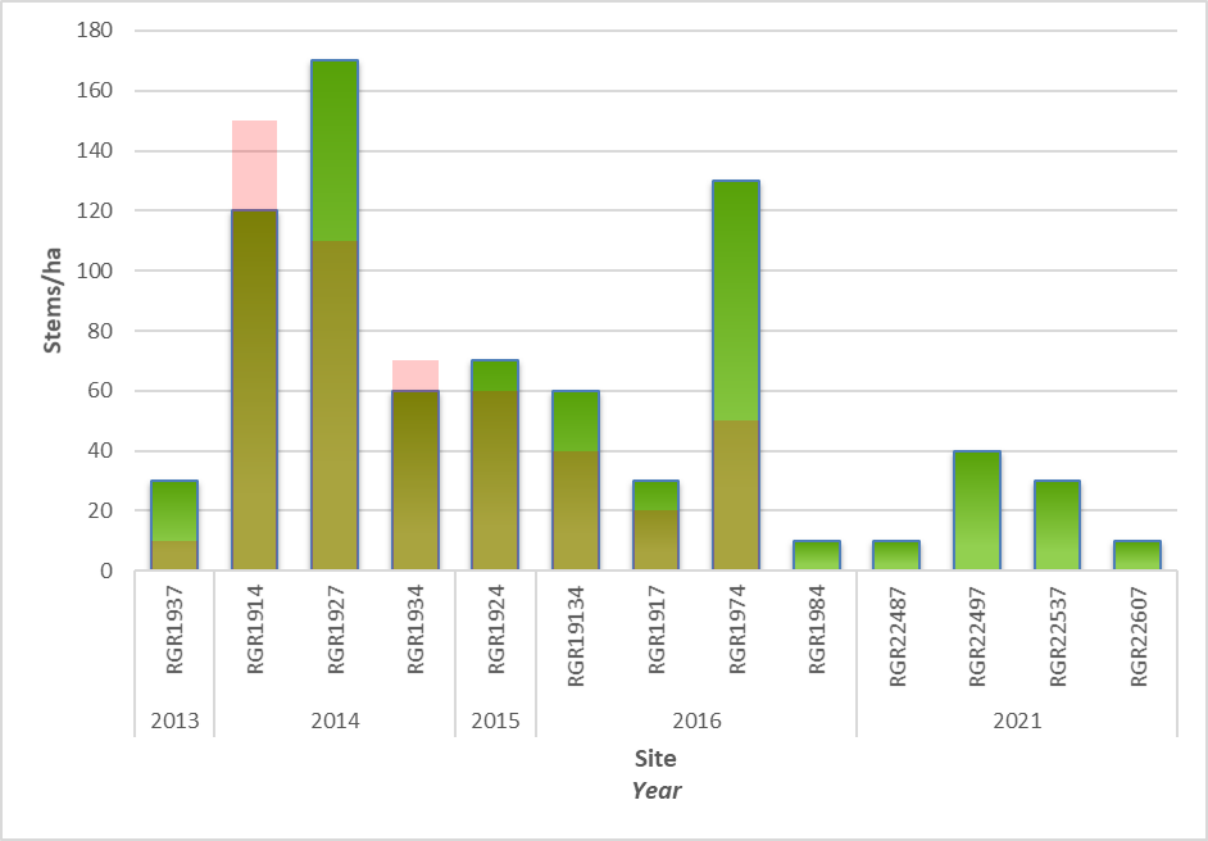


Figure 12. Density of tree seedlings within rehabilitation sites at Rocglen Coal Mine in 2022, grouped by year seeded.

6.2.3 Pasture Domain

Ground cover

Of the four sites monitored since 2020 at Rocglen, two exhibited a significant increase in the rate of vegetative cover over this period. The 2022 monitoring recorded values between 93.7% and 100%—higher than the minimum target cover of 85%. The average analogue site vegetative cover was 98.2% (Figure 13).

The lowest average vegetation cover rates are related to the two new sites in the year 2022 with the rates of 9.8% (RGR22257) and 31.5% (RGR22617) (Figure 13).

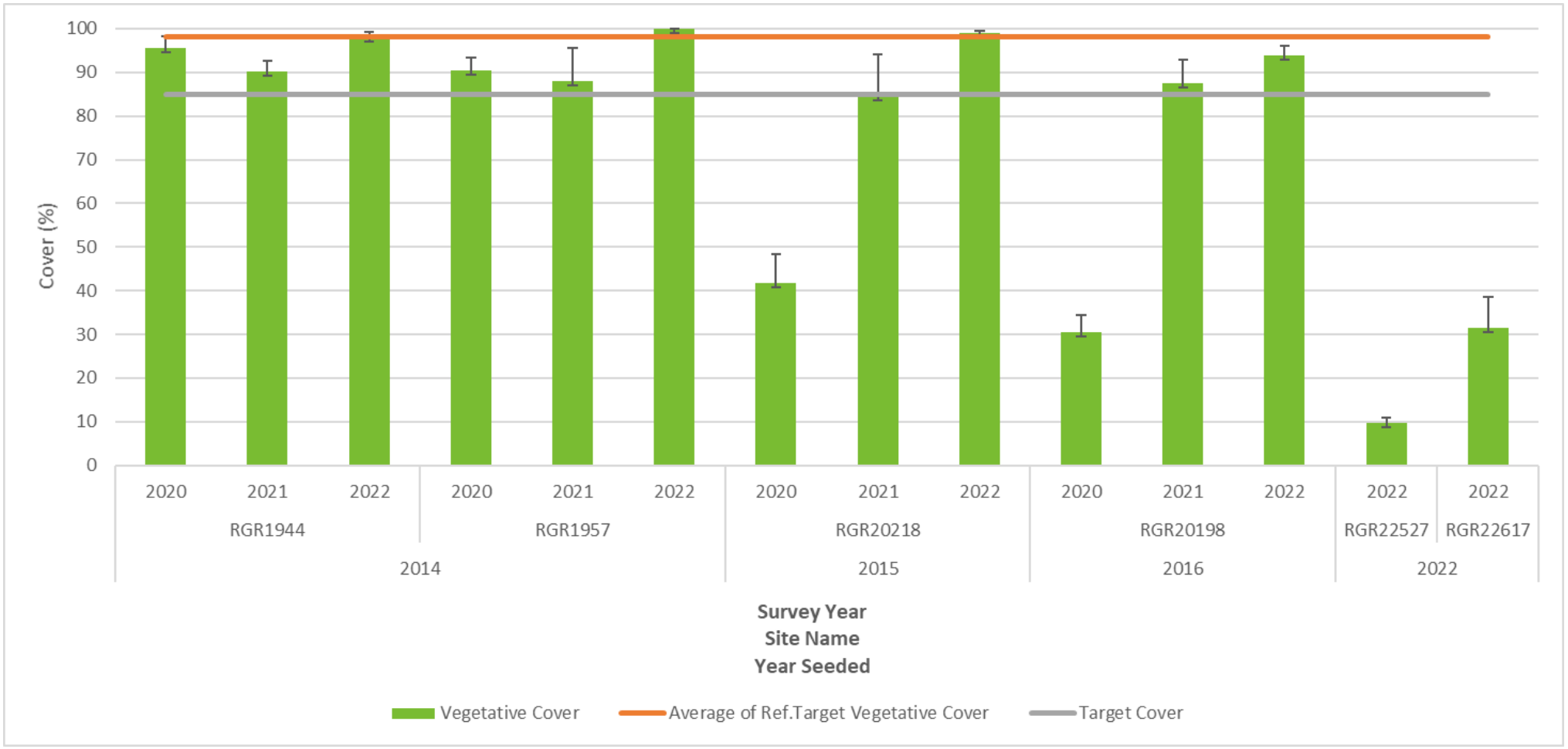


Figure 13. Combined Pasture completion criteria ground cover components (vegetation and litter) at Rocglen Mine. Line shows minimum MOP completion criteria target of 85%. Bars show standard error of the mean.

6.2.4 Fauna

Fauna habitat included log piles, stag trees, and pondage areas. Native animals sighted included Eastern Grey Kangaroos, numerous bird species, and frogs. Feral pigs were observed at one site.

6.2.5 Recommendations

It is recommended that:

- Newly established woodland rehabilitation continues to be monitored for native seed germination.
- In older areas of rehabilitation, continue to implement planting where sections of the Woodland Domain yet to achieve required density.
- Overall steps be taken to improve native groundcover diversity, using species recorded in the analogue sites.

6.3 Biodiversity Offset Area (BOA) Management

The approved WHC Biobank Biodiversity Offset Management Plan (BOMP, 2013) outlines the Biodiversity Offset Strategy (BOS) requiring 1,524ha of native woodland to be maintained and improved on the Yarrari and Belah properties (collective known as Biobank BOA) with subsequent biobanking credits retired relating to the Rocglen Coal Mine, Canyon Coal Mine, the original Tarrawonga Coal Mine with the final credits retired in 2022 for the Vickery Coal Mine.

6.3.1 Offset Security Management

The WHC Biobank BOA was secured under a NSW Biobanking Agreement on 28 June 2012 (now considered a Biodiversity Stewardship Agreement under the Biodiversity Conservation Act 2016). The BOMP outlines the intention to transfer the property to the National Parks Estate as an addition to the Boonalla Aboriginal Area (formerly Kelvin State Forest) after Year 10 (~2023), subject to NPWS negotiation and agreement.

6.3.2 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. WHC maintains a meteorological station adjacent to the Biobank BOA with a summary of weather conditions experienced at the Roseglass Offset property during the 2022 reporting period being a maximum monthly average temperature of 32°C in January 2022 and a minimum monthly average temperature of 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).

6.3.3 Infrastructure Management

During the reporting period, existing fencing (fauna friendly) was maintained along the perimeter of Biobank BOA as well as maintenance of signage and gates undertaken as required to continue to restrict unauthorised access and minimise livestock incursion. There are no known remaining derelict assets/infrastructure items to be removed but if any are found, those items will continue to be assessed, removed and remediated as required prior to transfer of Yarrari and Belah Offset properties to National Park Estate.

6.3.4 Seed Management

No seed was collected on the Biobank BOA during the reporting period as not required.

6.3.5 Revegetation Management

The revegetation schedule within Biobanking Agreement 43 requires enhancement planting to occur between Year 8 (2021) and 10 (2023) as required. During the reporting period, no specific revegetation management works were undertaken as not required.

6.3.6 Heritage Management

During the reporting period, annual heritage inspections were completed on the 32 known Aboriginal archaeological heritage sites within the Biobank BOA with each site maintained with a total of 4.95km of demarcation fencing around the heritage site perimeter and signage to mitigate access and inadvertent disturbance.

6.3.7 Habitat Management

During the reporting period, no specific habitat management works were undertaken as not required.

6.3.8 Weed Management

WHC coordinated routine formal weed monitoring/inspections undertaken across Biobank BOA in February, May, September and December 2022. The priority weeds identified included legacy weeds inherited from previous owners' management regimes such as African/Consul Lovegrass, Buffel Grass, Box Thorn, Bathurst Burr and Common Prickly Pear 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 Biobank BOA for weed control.

During the reporting period, WHC implemented a weed control program across the Biobank BOA including 275ha treated between January and December 2022 targeting primarily African Lovegrass, Buffel Grass, Bathurst Burr and other broadleaf weeds, Box Thorn, and Prickly Pear weed species as required. Only appropriately qualified and experienced weed contractors (AQF3 accreditation or higher for use of herbicide) were engaged to undertake weed control works for WHC.

6.3.9 Feral Animals Management

WHC undertook routine pest animal monitoring across the Biobank BOA in 2022 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 in pest animal abundance specific to the different geographical regions of the Biobank 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 and Feral Pigs can be high in abundance seasonally with 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 Biobank BOA for pest animal management.

During the reporting period, WHC implemented a comprehensive pest animal control program across the Biobank BOA with routine 1080 and Hoggone baiting and trapping programs for Feral Pigs undertaken throughout 2022. During the reporting period; the 1080 baiting program removed 77 Foxes from 168 baits presented and the Hoggone baiting program removed 49 Feral Pigs from 244 baits presented across the Biobank BOA resulting in 45% and 20% of baits respectively being taken by target feral animals. A further 147 pigs were trapped and removed across the Biobank BOA in 2022. There were 200 Goats harvested at the Biobank BOA during the reporting period with saleable Goats on sold to an abattoir. Only appropriately qualified and experienced pest animal contractors (appropriate pest animal management qualifications, NSW firearms licence and pesticide accreditation where relevant) were engaged to undertake pest animal control works for WHC.

6.3.10 Soil & Erosion Management

Annual inspections were undertaken including unsealed fire break tracks and associated drainage structures across the Biobank 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 2 observations were recorded within the Biobank BOA with no 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 with no other erosion sites present on Biobank BOA.

6.3.11 Grazing Management

Biobank BOA was destocked in 2016 and continued to be destocked with no strategic grazing occurring during the reporting period. There were two instances of stock incursion during the reporting period; with stock on each occasion retrieved and fencing repaired as required.

6.3.12 Bushfire Management

The Biobanking Agreement 43 prohibits the use of fire within the Biobank BOA until Year 40. During the reporting period, no bushfires occurred and no ecological burns were undertaken. Other fire management implemented by WHC during the report period was maintenance on 33.8 kilometres to zero fuel barrier standard across the Biobank BOA. WHC maintains regular communications throughout the reporting period with the Liverpool Range Zone RFS team around planning of WHC Biodiversity's ecological burn programs as well as maintaining contact points in case of emergency. WHC maintains a specialist firefighting contractor for an on-call engagement during the fire season to respond in the event of a bushfire on WHC BOAs and non-mining lands.

6.3.13 Monitoring Program

During the reporting period, the ecological monitoring program of the Biobank BOA included winter bird surveys that were undertaken in June/July 2022 and annual spring flora monitoring of 32 plots across five vegetation zones (VZs) undertaken during September and November 2022. During the winter bird surveys, no threatened species were recorded. During flora monitoring, three VZs (Dry Rainforests – Good condition, North-west Slopes Dry Sclerophyll Woodlands – Good condition and Western Slopes Grassy Woodlands – Good condition) were recorded as meeting or exceeding completion criteria for all 4 biometrics. Native plant species richness (NPS) completion criteria (native species richness benchmark for relevant biometric vegetation communities) were met or exceeded at 4 out of 5 VZs. Native overstorey cover (NOS) completion criteria (minimum overstorey cover benchmark for relevant biometric vegetation communities) was met or exceeded at 3 out of 5 VZs. Native midstory cover (NMS) completion criteria (minimum midstory cover benchmark for relevant biometric vegetation communities) was met or exceeded at all five VZs. Native ground cover grass (NGCG) completion criteria (minimum groundcover benchmark for relevant biometric vegetation communities) were met or exceeded at 4 out of 5 VZs. Comparison of individual plot data shows that NPS decreased slightly from 81% last year to 78% of plots meeting or exceeding completion criteria in 2022. Native overstorey cover (NOS) increased from 31% last year to 41% of plots meeting or exceeding the completion criteria in 2022. Native midstory cover (NMS) increased from 78% last year to 94% of plots meeting or exceeding the completion criteria in 2022. Native ground cover grass (NGCG) increased from 66% last year to 84% of plots meeting or exceeding the completion criteria in 2022.

6.4 Blasting

6.4.1 Criteria

Blasting criteria for RCM are noted in PA10_0015 and included in Table 6.4.1 below.

TABLE 6.4.1 - BLASTING CRITERIA

Location	Airblast Overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable Exceedance
Residence on privately-owned land	115	5	5% of the total number of blasts over a period of 12 months
	120	10	0%

Note: criteria do not apply if the Proponent has a written agreement with the relevant landowner to exceed the criteria, and the Proponent has advised the Department in writing of the terms of this agreement.

6.4.2 Key Environmental Performance/Management Issues

No blasting was undertaken during the reporting period.

6.4.3 Proposed Improvements to Environmental Management

RCM Blast Management Plan will continue to be reviewed and updated as required.

6.5 Operational Noise

6.5.1 Criteria

The operational noise criteria specified in PA10_0015 and EPL 12870 are as follows:

TABLE 6.5.1A - ATTENDED NOISE MONITORING CRITERIA

Location	Day	Evening	Night	
All privately-owned land	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(1min)}$
	35	35	35	45

The cumulative road noise criteria specified in PA10_0015 (RCM) and PA11_0047 (Tarrawonga) are below:

TABLE 6.5.1B - CUMULATIVE ROAD NOISE CRITERIA

Location	**Day** $L_{Aeq(15hour)}$	**Evening** $L_{Aeq(15hour)}$	**Night** $L_{Aeq(9hour)}$
All privately-owned residences	60	60	55

6.5.2 Environmental Management Measures

Control of noise generation and propagation at the mine is by a combination of general source and propagation path methods including:

- Where operationally feasible, scheduling activities to minimise operation of equipment in exposed locations when winds are blowing towards residences and elevated locations when temperature inversions are present;
- Equipment removal or replacement;
- Changing operation procedures;
- Restricting hours of operation;
- Enclosure of fixed items of plant, e.g., generators;
- On-going site road maintenance using the mine-based grader; and
- Regular equipment maintenance.

6.5.3 Key Environmental Performance/Management Issues

Site activity remains limited to rehabilitation activities with reduced equipment on site.

6.5.4 Long Term Trends

The RCM Extension Project Environmental Assessment (EA) – Noise and Vibration Impact Assessment conducted by Spectrum Acoustics (2010), shows historical traffic noise measurements to vary from 3-9 dB below the 60dB(A) criteria – no significant change in levels were predicted to be observed at 'Brooklyn' following the extension. During 2019 and 2020 monitoring, readings were often inaudible at the monitoring locations, supporting those predictions in the EA. Previous years of monitoring have also shown compliance with the criteria.

6.5.5 Proposed Improvements to Environmental Management

There are no proposed improvements to environmental noise management in the upcoming reporting period. Current mine working hours are day time only with reduced equipment on site.

6.6 Aboriginal Heritage Management

6.6.1 Environmental Management Measures

In 2010, RPS archaeologists conducted an assessment and field survey of the potential impact of the Rocglen Extension on Aboriginal heritage. The archaeological field survey, which covered the area proposed to be disturbed by the expansion of the Northern Emplacement Area, was undertaken with

members of four local Aboriginal Stakeholder groups. In summary, three stone artefact sites were located comprising of one isolated find (IF1) and two artefact scatters (AS1 and AS2). To date, the measures in place to protect Aboriginal Cultural Heritage are considered satisfactory, with all measures identified in the EA and consent criteria in place.

6.6.2 Consultation

No further stripping or clearing was undertaken during the reporting period outside areas previously assessed by the RCM Registered Aboriginal Parties or during the EA assessments, and as such no consultation has been undertaken.

6.6.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

6.6.4 Proposed Improvements to Environmental Management

No improvements are proposed to be undertaken during the upcoming reporting period.

6.7 Bushfire Management

6.7.1 Environmental Management Measures

The mine maintains firebreaks around both its landholding and the mine area and maintains firefighting equipment as well as earthmoving equipment, a water truck, which would be used to control fires. RCM personnel also liaise with the local (Nandewar) Rural Fire Service (RFS) and Regional Fire Control, as required. Previously on request from the RFS due to drought conditions and lack of water availability, the mine has nominated a dam on site that can be used as a water source during emergencies. Whitehaven Coal have engaged a firefighting contract company LRM Fire and Rescue on a retainer bases to assist in case of any fire breakout.

6.7.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period, with no fires occurring on site or on project-related mine-owned land.

6.7.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

6.8 Waste

6.8.1 Environmental Management Measures

During 2022, RCM engaged a contractor (Namoi Waste Corporation) that is responsible for the collection and management of the entire waste streams generated at the mine.

6.8.2 Key Environmental Performance

During the reporting period there were no incidents relating to waste management.

6.8.3 Proposed Improvements to Environmental Management

Rocglen continues to reduce waste via a number of initiatives including recycling (oils, greases, scrap steel and domestic recyclables).

6.9 Environmental Performance Summary

An environmental performance summary for RCM is presented in Table 6.9 below.

TABLE 6.9 ENVIRONMENTAL PERFORMANCE SUMMARY

Aspect	Approval Criteria/EIS Prediction	Performance During the Reporting Period	Trend/Key Management Implications	Implemented/Proposed Management Actions
Air Quality	Refer to Section 6.1	No Exceedances at Depositional dust gauges and no mine related exceedances at Rosebery 24hr HVAS sampler.	Nil	Onsite dust management will follow the Air Quality Management Plan, and will be aided given the state of the mine, with reduced shifts, no coal production and progressive vegetation of site.
Biodiversity	Refer to Section 6.2 and Section 6.3	Biobank BOA continues to maintain compliance with BOMP while restoration works are ongoing.	Nil	Nil
Blasting	Refer to Section 6.4	Approval criteria met.	Nil	No further blasting on site
Noise	Refer to Section 6.5	Approval criteria met.	Nil	Nil
Heritage	Refer to Section 6.6	Approval criteria met.	Nil	Nil
Bushfire Management	Refer to Section 6.7	No bushfires on site or in biobank site during reporting period.	Nil	Nil
Rehabilitation	Refer to Section 8.2	Ongoing.	Nil	Rehabilitation undertaken as per RMP.
Water	Refer to Section 7.1.3 and 7.1.4	12 wet weather discharge and 13 controlled releases. One	Nil	RCM notified relevant agencies. Reviewed site access during flooding condition.

		discharge exceeded EPL TSS limit (50mg/L)		

7. WATER MANAGEMENT

7.1 Surface Water Management

The mine lies within the catchment of the Namoi River, and in close proximity to Driggle Draggle Creek. The design of sediment detention basins on site aims to limit the opportunity of discharge of runoff from mine-disturbed areas, until such time as the licenced discharge criteria is met. All sediment basins, storage dams and associated banks and drains have been designed and constructed in accordance with the *Managing Urban Stormwater: Soils and Construction Vol 2E Mines and Quarries* (DECC, 2008) in conjunction with the references to Volume 1 (Landcom, 2004).

7.1.1 Surface Water Monitoring Results

In addition to any monitoring required during discharge events, RCM has a requirement to undertake surface water monitoring on a quarterly basis. Whilst there are no criteria or concentration limits specified for the quarterly surface water samples, the results do provide an indication as to the quality of waters onsite. The assessment of sediment load, electrical conductivity, pH, oil and grease, and other monitoring parameters during these quarterly water monitoring rounds also provides an indication of the ability of those storages to meet water quality criteria should a wet weather discharge occur, and if additional treatment methods would be warranted to minimise potential for a non-compliant discharge. The quarterly surface water testing includes the Void Water Dam (Void), three additional out-of-pit surface water storages (SD3, SB19 & Dam B), and one offsite, upstream dam (SD7). A summary of water quality results is given in **Table 7.1.1**, and complete surface water quality monitoring results are provided in Appendix 1.

TABLE 7.1.1 SUMMARY SURFACE WATER MONITORING RESULTS

Storage	No. Samples	Annual Mean Oil and Grease	Annual Mean Conductivity µS/cm	pH Range	Annual Mean TSS mg/L
Void	4	<5	550	8.3 – 8.6	752
SD3	6	<7	541	7.77 – 8.8	73
SB19	4	<7	735	8.4 – 8.7	1,302
Dam B	4	<5	315	7.6 – 8.5	38
SD7	6	<5	192	6.55 – 8.6	319

7.1.2 Long Term Trends

The surface water assessment carried out by GSS Environmental for the Extension EA predicted that there would be minimal impact on flow regimes downstream of the Project due to the RCM, which has proven to be generally correct over the long-term operations of the site.
Soil and water assessments for the site suggested that Total Suspended Soils (TSS) was likely to be the key water quality parameter requiring management during the life of the Project to ensure the water quality in downstream watercourses is not impacted. TSS levels for Southern Discharge Dam 3 (SD3) ranged between 10 mg/L and 173 mg/L with a mean of 73 mg/L, Dam B ranged between 13 mg/L and 74 mg/L with a mean of 38 mg/L, the Rocglen in pit Void Dam (Void) TSS levels ranged between 76 mg/L and 2,020 mg/L with a mean of 752 mg/L. Monitoring site SB19 recorded a minimum value of 22 mg/L and a maximum value of 3430 mg/L and recorded a mean of 982 mg/L. TSS levels at Southern Discharge Dam 7 (SD7) ranged between 29 mg/L and 1640 mg/L with a mean of 319 mg/L. The high levels of TSS were most likely due to the high runoff from rain events.

7.1.3 Discharges

There are two Licenced Discharge Points (LDPs) nominated in the current EPL 12870, LDP11 to the south of the site, and LDP12 to the north of the site.

There were ten uncontrolled wet weather discharges from Dam SD3 through licenced discharge point LDP11 on the 22nd February 2022, 8th March 2022, 28th March 2022, 15th May 2022, 5th August 2022, 16th September 2022, 9th October 2022, 21st October 2022, 1st November 2022 and 14th November with respective rainfall totals for the preceding 5 days being 55.2mm, 44.2mm, 45.4mm, 39.4mm, 60mm, 55.8mm, 49mm, 79.6mm, 47mm, 48.2mm. All results were within EPL standards excluding one event on 16th September when TSS exceeded the 50mg/L limit following a rain event.

There were ten controlled discharges from Dam SD3 through licenced discharge point LDP11 on the 5th May 2022, 23rd May 2022, 2nd June 2022, 9th June 2022, 3rd August 2022, 26th August 2022, 8th September 2022, 14th September 2022, 22nd September 2022, 5th October 2022. Water qualities were within EPA standards excluding one discharge event on 22 September 2022 (see section 7.1.4). Discharges were undertaken after the dam sediment load was reduced by flocculating the dam, and water quality samples taken to confirm all criteria were within EPA approval limits.

There were two uncontrolled wet weather discharges from Dam B through licenced discharge point LDP12 on the 21st October 2022 and 14th November 2022 with respective rainfall totals for the four days leading up to the discharge day and including discharge day being 79.6mm, 48.2mm. Water qualities were within EPA standards.

There were three controlled discharges from Dam B through licenced discharge point LDP12 on the 5th October 2022, 28th October 2022 and 23rd November 2022. Water qualities were within EPA standards. Discharges were undertaken after the dam sediment load was reduced by flocculating the dam, and water quality samples taken to confirm all criteria were within EPA approval limits.

7.1.4 Uncontrolled Water Release

22 September 2022 – Following 55.8 mm between 4:45 PM on the 15 September 2022 and 03:00 AM on the 16 September 2022 and an additional 26.6mm of rain on 21 September 2022, RCM released water via LDP11 (EPL Licenced discharge point 11). Water exceeded EPL limits for Total Suspended Solids (TSS), measuring 3,480mg/L, a retest of the sample returned a value of 1,980mg/L. This was reported to EPA and Department of Planning and an internal investigation was conducted. Main cause of the exceedance was lack of access to site during flooding conditions as reported to regulatory agencies.

7.1.5 Supplementary Water Sources

No supplementary water was sourced.

7.2 Groundwater Management

7.2.1 Environmental Performance/Management

The mine's performance with respect to groundwater performance/management, the prevention of pollution, and the assessment of impacts on groundwater availability to other surrounding users, has been assessed through groundwater level and chemistry monitoring undertaken at a series of bores within the Project Area and adjacent properties.

7.2.2 Groundwater Monitoring

Groundwater sampling and analysis was undertaken by ALS Acril Pty Ltd during the reporting period at the Groundwater Monitoring Points identified in **Figure 3**. Surface Water Level (SWL), Electrical Conductivity (EC) and pH are recorded on a quarterly basis, with representative metals and ions analysed six monthly in accordance with the approved Water Management Plan.

7.2.3 Groundwater Levels

Monitoring piezometers to the south east of the void, MP7 and MP8 increased by 4m with MP2 and MP2a showing a rise of 1m. Water levels at MP3, MP4a and MP4b stabilised. Water levels at MP7 & MP8 are related to isolated perched aquifer adjoining the mine void.

Groundwater levels to the north of the void continued to rise, with MP6 rising by 1m, WB-5 rising by 1.2m, and WB3 increasing by 1.5m. Water level trends in all other bores have had a slight rise due to increased rainfall.

The mine void was backfilled in December 2020 above groundwater inflow level. There was no bore water extraction or groundwater take from void seepage during the reporting period.

7.2.4 Groundwater Quality

Analysis of samples taken during the reporting period has shown that groundwater quality has remained generally consistent with historical data at all locations monitored. Water quality has been

compared to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZG (August 2018).

7.2.5 Long Term Trends

The hydrogeological assessment undertaken by Douglas Partners for the Extension EA concluded that drawdown on the surrounding groundwater system as a result of the expanded mining operation would be limited during the operation of the mine. This is due to faulting in the vicinity of the mine and generally low permeability of the Maule's Creek Formation Strata, with hydraulic connectivity within the alluvium at the north and south of the site considered to be limited.

The hydrogeological assessment predicted that groundwater levels would be drawn down by approximately 30 metres in close proximity to the pit and that this drawdown would be "mostly limited to within the fault block which surrounds the mine." The drawdown seen at bores MP-7 and MP-8 is consistent with these predictions. Water levels continue to return to pre mining levels as illustrated in Figures 14 and 15.

7.2.6 Groundwater Management

Pumping from the void ceased in February 2020 therefore the water held in the in-pit dams across the reporting period are from rainfall capture.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up, with contaminated soil placed in the designated bioremediation areas; and
- Fuels, oil and grease being stored within a bunded area, constructed in accordance with EPA requirements.

As discussed previously, groundwater from surrounding bores is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine.

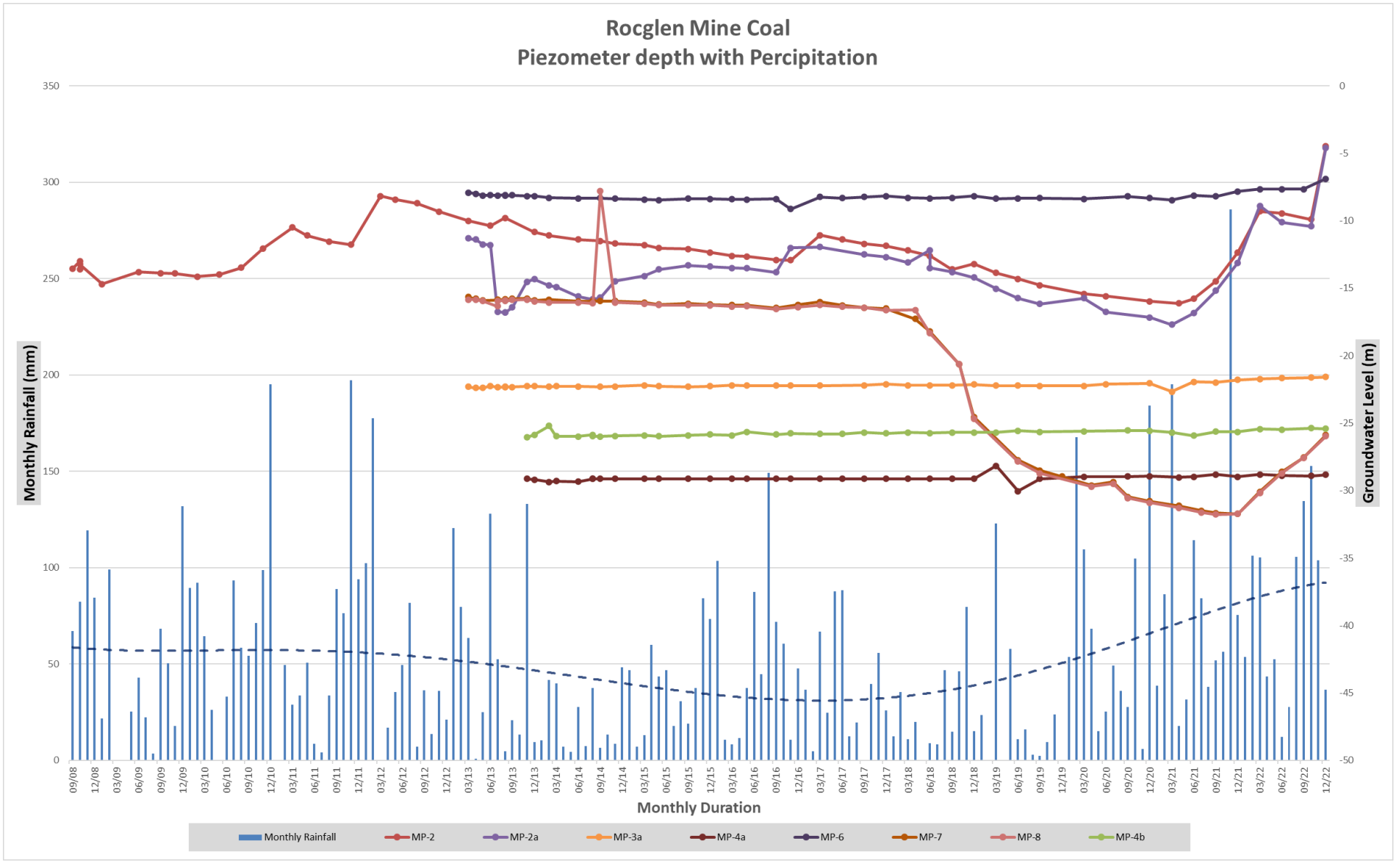


Figure 14. Rocglen Mine Groundwater Piezometer Depth

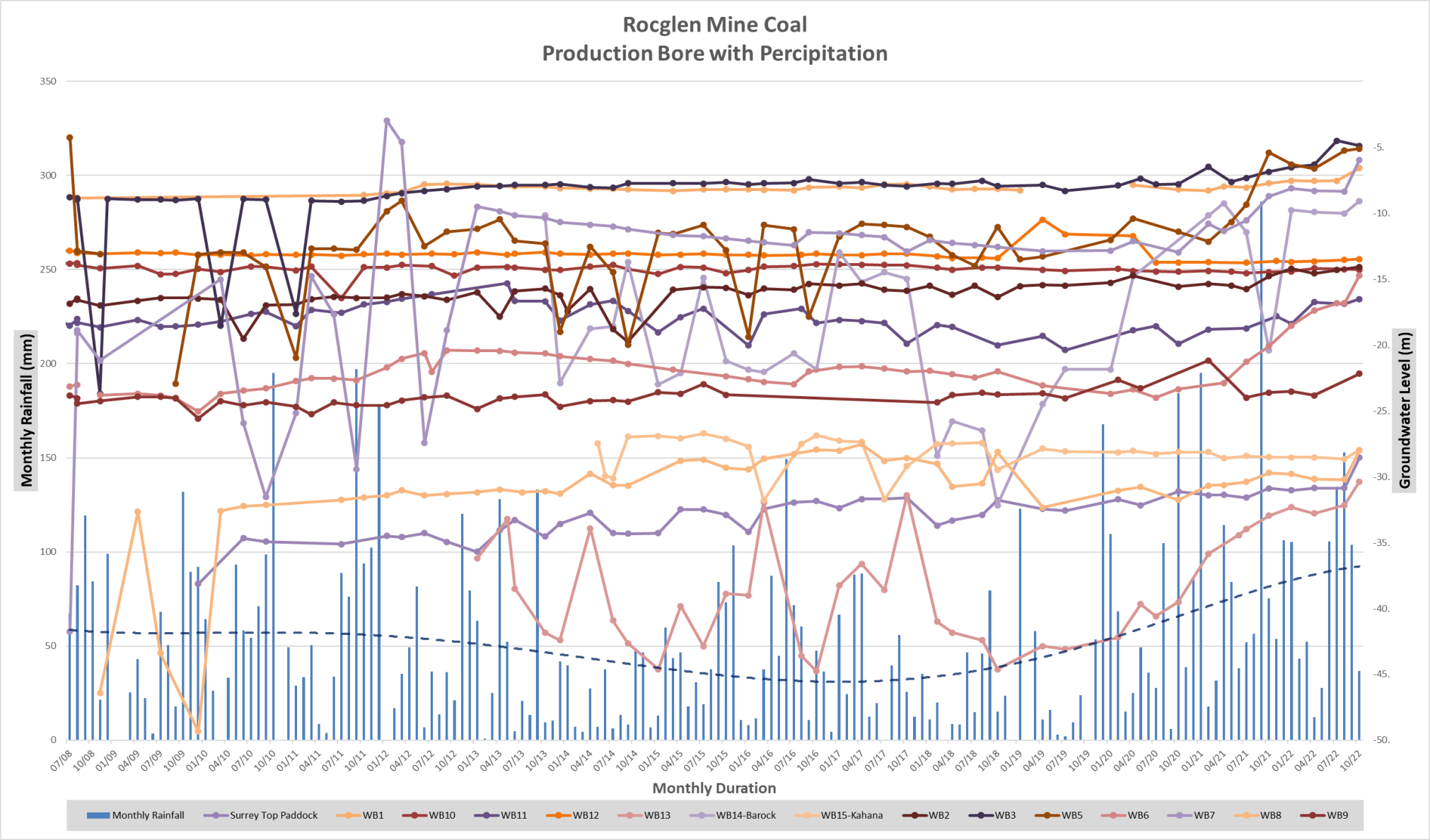


Figure 15. Rocglen Mine Groundwater Production Bore Depth

7.3 Water Take

The water taken by the operation is summarised in Table 7.3, and shows compliance with the licence entitlements. Groundwater takes from the void seepage ceased in February 2020.
Site water usage for 2022 for dust suppression was approximately 12.49ML, which was sourced from rainfall runoff in the various sedimentation dams.

TABLE 7.3 WATER TAKE

Water Licence Number	Water Sharing Plan, Source and Management Zone (as applicable)	Entitlement	Passive take/inflows	Active Pumping	TOTAL
WAL36758	Gunnedah-Oxley Basin Mdb Groundwater Source	700 units	0	0	0ML

8. REHABILITATION

8.1 Rehabilitation Performance during the Reporting Period

8.1.1 Status of Mining and Rehabilitation

The status of mining and rehabilitation at the completion of the reporting period is presented in Table 8.1.1 and Figure 16.

TABLE 8.1.1 REHABILITATION STATUS

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	2021 (ha)	2022 (ha)	2023 (ha)
A. Total Mine Footprint	374.9	374.9	374.9
B. Total Active Disturbance	67.4	105.4	37.9
C. Land Being Prepared for Rehabilitation	83.5	72.7	0
D. Land Under Active Rehabilitation	225	196.3	337
E. Completed Rehabilitation	0	0	0

* Refer to Annual Review Guideline (pg. 11) for description of mine area types.

8.1.2 Post Rehabilitation Land Uses

The disturbed area within the Project Site will be restored to either woodland or pasture.

8.1.3 Rehabilitation Monitoring

Detailed annual ecological rehabilitation monitoring was undertaken by Aspect Ecology, with summary of results documented in section 6.2.

8.1.4 Renovation or Removal of Buildings

No buildings were removed or constructed during the reporting period.

8.1.5 Other Rehabilitation Undertaken

Rehabilitation planting was undertaken from March 2022 into early October 2022.

TABLE 8.1.5 HIKO SEEDLING PLANTED

Area	Hiko Seedlings planted
Year 2020	
Northern Dump	**7,200**
Eastern Boundary Screen	**980**
Year 2021	
Northern Dump	**1,434**
Eastern Void	**1,894**
Southern Void	**987**
Year 2022	
Northern Dump	**1,300**
Eastern Void	**8,594**
Southern & Western Void	**470**

8.1.6 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off has not been requested for any rehabilitated areas.

8.1.7 Variations in Activities against RMP

Rehabilitation in the void was less than predicted due to lack of access due to extreme wet weather and flooding of the void.

8.1.8 Trials, Research Projects and Initiatives

A seeding trial commenced in Q4 2022 on topsoil stockpile located near the office. 6 plots were established to test native seed germination. All vegetation was stripped using dozer and grader, area was seeded using mechanical method (tractor). Ongoing trials will continue at other closed mine sites managed by Whitehaven Coal Rehabilitation and Closed Mines team.

8.1.9 Key Issues to Achieving Successful Rehabilitation

There are four key issues in achieving successful rehabilitation, including:

- Poor vegetation establishment and growth due to poor soils, nutrient issues and weed competition;
- Weed and feral animal infestation;
- Excessive erosion and sedimentation resulting in land stability and vegetation growth issues; and
- Harsh weather conditions limiting growth, i.e., extended periods of drought or intense rainfall.

In cases where performance is sub-optimal, additional management measures will be implemented (e.g., replanting/seeding, repairing landform and water management features, additional soil amelioration, feral animal and weed control etc.). Advice may also be sought from the Whitehaven Biodiversity specialist and/or contractor companies, to determine the best course of action.

8.2 Actions for Next Reporting Period

- Void, Landform, 33ha landform
- Void, Ecosystem Establishment 53ha
- Western Overburden Dump, 27.5ha landform
- Western Overburden Dump, Ecosystem Establishment 62ha
- All remaining infrastructure to be removed (office Complex and Workshop, car park)

Figure 16. Annual Review Plan

9. COMMUNITY

9.1 Community Consultation

In accordance with Schedule 5 Condition 5 of PA 10_0015, a Community Consultative Committee (CCC) continues to be operated for RCM. The committee comprises representatives of Gunnedah Shire Council, RCM and the community.
Since its inception, the CCC has met on a regular basis. Two meetings were held during the reporting period in March 2022 and September 2022. Due to the mine going into closure the independent chairperson has changed the meeting frequency to annually.

9.2 Community Complaints

RCM has a designated complaints line advertised on the Whitehaven Coal Website. In the event of a complaint, details pertaining to the complainant, complaint, and action taken are recorded. A complaints register is maintained on Whitehaven's website. No complaints were received during the reporting period.

TABLE 9.2 COMPLAINTS HISTORY

Topic	Calendar Year						
	2016	2017	2018	2019	2020	2021	2022
Air Quality	-	-	-	-	-	-	-
Blasting	**3**	1	-	-	-	-	-
Noise	-	-	-	-	-	-	-
Water Quality	-	-	-	-	-	-	-
Other	-	-	1	-	-	1	-

9.3 Community Engagement and Contributions

Community contributions are managed in accordance with the Whitehaven Coal Donations and Sponsorship Policy. Whitehaven Coal donated $147,172.72 to local Gunnedah and Regional groups during the reporting period. Groups which received contributions included, but were not limited to the following;

Gunnedah LGA:

Gunnedah Rural Museum
Gunnedah Ladies Golf Club
Gunnedah Bulldogs Rugby League
Gunnedah District Aeromodellers
Gunnedah District Australian Football Club
Gunnedah Shire Council
Black & Blue Boxing
Gunnedah Show Society

G S Kidd School
Gunnedah Rugby League
Gunnedah Pistol Club
Gunnedah Eisteddfod Society
Gunnedah High School
Whitbread Memorial Fund
Gunnedah Netball Association
Gunnedah Netball Association
Gunnedah Athletics Centre Incorporated
White Cockatoos Gomeroi Roos
Gunnedah Public School
Gunnedah & District Historical Society Inc
Gunnedah Meals on Wheels
GHFC Pty Ltd
Swimming Gunnedah Incorporated
Gunnedah Touch Association
Gunnedah Baptist Community Preschool
Gunnedah Homes for the Aged
Gunnedah Basketball Association
Swimming Gunnedah Incorporated
Gunnedah High School
Black and Blue Boxing Gunnedah
Dorothea Mackellar Poetry Awards
Winanga-Li Aboriginal Child and Family Centre
McLean Care Mackellar
Gunnedah Ministers Fraternal
Gunnedah Public School P&C Association
St Mary's College
Rotary Club of Gunnedah West Inc
Week of Speed
Curlewis Public School P&C
Winanga-Li Aboriginal Child and Family Centre
The Rotary Club of Gunnedah

10. INDEPENDENT AUDIT

The most recent Independent Environmental Audit (IEA) occurred during the reporting period, with submission of the final report and response to Audit Recommendations submitted to the Department in May 2022. Non-compliances identified by the IEA were risk ranked by the auditor in accordance with Figure 1. RCM subsequently developed an Audit Action Plan for the non-compliances. The Audit Action Plan is available on the Whitehaven Coal website, there are no outstanding audit actions.

Next Independent Audit is scheduled for 2025.

11. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 Reportable Incidents

There was one reportable incident during the reporting period which is addressed in section 7.1.4.

11.2 Non-compliances.

Non-compliances during the review period are listed in Table 11.2.

TABLE 11.2 NON-COMPLIANCES

Approval(s)	Schedule/Condition	Non-compliance	Action(s)
PA 10_0015	Schedule 5, Condition 4	Blast MP and Traffic MP was not reviewed, as there was no blasting on site or haulage.	As per audit recommendation all MP's are reviews as required.
PA 10_0015 EPL 12870	Schedule 3, Condition 21 L2.4 and L2.5	21 September 2022, RCM released water via LDP11 (EPL Licenced discharge point 11). Water exceeded EPL limits for Total Suspended Solids (TSS), measuring 3,480mg/L. Was reported to regulatory authorities. No action was taken as regional area was declared flood disaster zone, and due to lack of access to mine site. Additional	Actions undertaken included the following: • Diversion of runoff water from southern dump to the void during high Rainfall. • Upgrade and refurbishment program of mine pumping and pipeline system • Mine Water Storage Management TARP has been reviewed and updated • New depth gauge boards with RL have installed
EPL 12870	O1.1	IBCs in used oil bay could potentially leak outside of bunded area.	Location of IBCs rack moved to adjacent bunded area removing risk of any leaked material landing outside of a bunded area.
EPL 12870	M2.3	Utilise the in-situ sampling method for conductivity and and pH.	All water samples now reported using field measurements from handheld probes and not lab results.

11.3 Regulatory Actions

None

12. ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The following measures will be continued, or implemented, in the next reporting period:

- Undertake rehabilitation activities in accordance with the RMP timing;

- The continuation of environmental monitoring and management, as per the relevant approvals and environmental management plans;
- Planting of remaining disturbed area to ecosystem establishment.
- Completion of all disturbed areas to ecosystem establishment.
- Removal of all fixed infrastructure as apart of final rehabilitation.
- Review and revise (where required) various environmental management plans, as per PA 10_0015; and
- Continue community liaison and engagement with local stakeholders, as required.
- Completion of native seedling trial on topsoil stockpiles.

Appendix 1: Surface Water

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: Clarified Water O/S (Maintenance water separator); Northing: 238844.6392; Easting: 6592481.4637

	21-Feb-22	18-May-22	10-Aug-22	10-Nov-22
Rec ID	**84530**	**85628**	**86515**	**88030**
Lab Ref	**94401**	**95451**	**96306**	**97796**
Antimony (total)	<0.001	<0.001	<0.001	<0.001
Appearance	Turbid	Turbid	Turbid	Turbid
Arsenic-Total (mg/L)	0.002	0.029	0.011	0.004
Colour	Brown	Grey	Brown	BROWN
EC - Field	325	575	680	380
Electrical Conductivity @ 25°C	295	533	642	308
Molybdenum (total)	0.006	0.049	0.057	0.019
Odour	Sloght	Sour	Nil	Nil
Oil & Grease	9	<5	41	11
pH (pH Unit)	7.1	6.7	6.5	8.2
pH Value (pH Unit)	7.01	6.69	5.9	7.88
Selenium-Total (mg/L)	<0.01	0.03	<0.01	<0.01
Temperature	25.9	14.7	13.8	25.4
Total Organic Carbon	121	184	471	19
Total Suspended Solids (TSS)	425	620	7,520	696

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: Dam A1 (Northern dam); Northing: 238494.9; Easting: 6595600.3

	17-Jan-22	21-Feb-22	01-Mar-22
Rec ID	**84192**	**84609**	**84611**
Lab Ref			**94480**
Electrical Conductivity @ 25°C	319		325
Oil & Grease	<5		<5
pH Value (pH Unit)	8.47		7.87
Total Organic Carbon	8		6
Total Suspended Solids (TSS)	18	19	12

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: DAMB (Northern Discharge Dam); Northing: 238544.8162; Easting: 6595821.1792

	21-Feb-22	18-May-22	10-Aug-22	10-Nov-22
Rec ID	**84527**	**85625**	**86518**	**88027**
Lab Ref	**94398**	**95448**	**96309**	**97793**
Antimony (total)	<0.001	<0.001	<0.001	<0.001
Appearance	Turbid	Turbid	Turbid	Turbid
Arsenic-Total (mg/L)	0.004	0.004	0.003	0.002
Colour	Brown	Brown	Brown	BROWN
EC - Field	330	310	325	295
Electrical Conductivity @ 25°C	341	305	283	249
Molybdenum (total)	0.002	0.002	0.001	<0.001
Odour	Nil	Nil	Nil	Nil
Oil & Grease	<5	<5	<5	<5
pH (pH Unit)	8.5	7.7	7.6	8.3
pH Value (pH Unit)	7.36	8	8.1	8.34
Selenium-Total (mg/L)	<0.01	<0.01	<0.01	<0.01
Temperature	26.4	17.7	14.2	26.1
Total Organic Carbon	9	5	7	5
Total Suspended Solids (TSS)	34	13	74	31

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: DDCK (Driggle Draggle Creek, Northern downstream discharge); Northing: 237523.242; Easting: 6597670.7348

	05-Aug-22	16-Sep-22	09-Oct-22	21-Oct-22	01-Nov-22	14-Nov-22
Rec ID	**86465**	**87095**	**87725**	**87994**	**88409**	**88420**
Lab Ref	**96256**	**96884**			**98160**	**98171**
Appearance						Clear
EC - Field	102	67	68.1	104.7	117.7	153
Electrical Conductivity @ 25°C	92	87	100	127	158	404
Oil & Grease	<5	<5	<5	<5	<5	<5
pH (pH Unit)	7.24	7.26	6.86	7.62	7.31	7.53
pH Value (pH Unit)	6.9	7.13	8.81	7.25	7.3	7.8
Temperature	11.5	13	17.5	17.1	16.9	19.2
Total Organic Carbon	14	12	17	12	18	36
Total Suspended Solids (TSS)	68	44	24	106	15	56

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: LDP11 (Southern Discharge Point); Northing: 238501.8099; Easting: 6592285.8534

	22-Feb-22	23-Feb-22	08-Mar-22	28-Mar-22	05-May-22	15-May-22	23-May-22	02-Jun-22	09-Jun-22	03-Aug-22	05-Aug-22	26-Aug-22	08-Sep-22
Rec ID	**84540**	**84569**	**84658**	**85002**	**85451**	**85536**	**85691**	**85753**	**85841**	**86437**	**86466**	**86775**	**87122**
Lab Ref	**94411**	**94440**	**94527**	**94868**	**95275**	**95359**	**95514**	**95576**	**95635**	**96228**	**96257**	**96566**	
Appearance					Clear			Clear	Clear				
Arsenic-Total (mg/L)													
Colour					Clear	Turbid	Clear	Clear	Clear				
Comments					Controlled	WW	Controlled	Controlled	Controlled	Testing dam	WW	Controlled	Controlled
EC - Field					370.3	289.5	385.7	365	300.5	433.4	81.4	369.7	201
Electrical Conductivity @ 25°C	603	590	348	356	467	378	490	575	442	560	183	421	444
Odour						Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Oil & Grease	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
pH (pH Unit)					8.12	8.48	8.41	8.39	8.49	8.5	7.52	8.41	7.77
pH Value (pH Unit)	7.82	8.01	7.76	7.77	8.22	8.4	8.42	7.83	7.26	8.47	7.51	8.14	8.16
Temperature					19	17.8	14.1	10.5					
Total Organic Carbon	8	6	5	16	3	4	3	3	2.4	3	11	2	3
Total Suspended Solids (TSS)	285	253	911	2,220	19	4,540	14	<5	10	28	5,450	13	27

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

	09-Sep-22	14-Sep-22	16-Sep-22	22-Sep-22	05-Oct-22	07-Oct-22	09-Oct-22	21-Oct-22	01-Nov-22	14-Nov-22
Rec ID	**86929**	**87012**	**87096**	**87689**	**87615**	**87688**	**87712**	**87796**	**88410**	**88419**
Lab Ref	**96718**	**96801**	**96885**					**97566**	**98161**	**98170**
Appearance										Murky
Arsenic-Total (mg/L)				0.003						
Colour										Browny
Comments	Water	Controlled	WW	Discharge	Controlled	No Discharge	WW	A.Raal	WW	WW
EC - Field	320.2	220	117	254.1	277.5		279.7	97.2	167.9	938
Electrical Conductivity @ 25°C	354	279	120	303	224	164	305	144	105	153
Odour	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Oil & Grease	85	<5	<5	<5	<5	<5	<5	<5	<5	<5
pH (pH Unit)	7.4	7.63	7.38	8.5	8.43		7.34	8.29	7.81	8.38
pH Value (pH Unit)	7.87	7.49	7.42	8.58	7.73	7.47	8.06	7.12	7.04	7.64
Temperature		13.7	17.2		18.2		19.3	17.4	17.2	19.5
Total Organic Carbon	13	8	16	5	9	3	12	8	20	13
Total Suspended Solids (TSS)	72	23	714	3,480	25	13	165	2,280	136	1,880

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: LDP12 (Northern Discharge Point); Northing: 238519.0283; Easting: 6596030.2887

	15-May-22	05-Oct-22	21-Oct-22	27-Oct-22	14-Nov-22	23-Nov-22
Rec ID	**85549**	**87616**	**87798**	**87992**	**88418**	**88647**
Lab Ref	**95372**		**97568**		**98169**	
Appearance			Slightly	Clear	Clear	CLear
Colour				CLear	L.Brown	CLear
Comments	Unabale to	Controlled	A.Raal	Controlled	WW	Controlled
EC - Field		298	145.7	342	347	229.6
Electrical Conductivity @ 25°C		300	172	270	276	266
Odour			Nil	Nil	Nil	Nil
Oil & Grease		<5	<5	<5	<5	<5
pH (pH Unit)		7.96	7.88	8.1	8.29	8.06
pH Value (pH Unit)		7.65	7.5	8.62	8.05	8.13
Total Organic Carbon		6	6	26	6	6
Total Suspended Solids (TSS)		37	158	33	36	26

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: SB19 (Final ROM Containment Dam); Northing: 238616.3226; Easting: 6592501.3803

	17-Jan-22	21-Feb-22	18-May-22	10-Aug-22	10-Nov-22
Rec ID	**84164**	**84526**	**85624**	**86519**	**88026**
Lab Ref		**94397**	**95447**	**96310**	**97792**
Antimony (total)		<0.001	<0.001	<0.001	<0.001
Appearance		Turbid	Turbid	Turbid	Turbid
Arsenic-Total (mg/L)		0.011	0.023	0.04	0.006
Colour		Brown	Brown	Brown	BROWN
EC - Field		1,000	480	650	810
Electrical Conductivity @ 25°C	2,040	1,060	606	615	712
Molybdenum (total)		0.008	<0.001	<0.001	0.016
Odour		Nil	Nil	Nil	Nil
Oil & Grease	5	<5	<5	<12	<5
pH (pH Unit)		8.7	8.4	8.5	8.6
pH Value (pH Unit)	8.87	8.74	8.37	8.49	8.93
Selenium-Total (mg/L)		<0.01	0.03	0.02	<0.01
Temperature		24.5	16.8	14.2	22.6
Total Organic Carbon	12	12	3	190	7
Total Suspended Solids (TSS)	22	428	3,430		48

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: SD3 (Southern Discharge Dam); Northing: 238626.3039; Easting: 6592319.8866

	21-Feb-22	05-May-22	18-May-22	10-Aug-22	08-Sep-22	10-Nov-22
Rec ID	**84525**	**85450**	**85623**	**86520**	**86931**	**88025**
Lab Ref	**94396**	**95274**	**95446**	**96311**	**96720**	**97791**
Antimony (total)	<0.001		<0.001	<0.001		<0.001
Appearance	Turbid	Clear	Turbid	Turbid		Turbid
Arsenic-Total (mg/L)	0.006		0.009	0.069		0.005
Colour	Brown	Clear	Brown	Brown		BROWN
Comments		Controlled				
EC - Field	640	360.6	540	615	220.1	875
Electrical Conductivity @ 25°C	662	458	556	570	444	719
Molybdenum (total)	0.008		0.002	<0.001		0.012
Odour	Nil	Nil	Nil	Nil	Nil	Nil
Oil & Grease	<5	<5	<5	<12	<5	<5
pH (pH Unit)	8.8	8.13	8.2	8.2	7.77	8.4
pH Value (pH Unit)	8.46	8.09	7.86	8.65	8.16	8.91
Selenium-Total (mg/L)	<0.01		<0.01	0.09		<0.01
Temperature	25.5	18.1	16.3	12.8	13.2	22.7
Total Organic Carbon	16	3	5	152	3	5
Total Suspended Solids (TSS)	77	10	173		27	80

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: SD7 (Upstream Dam to east of Pit); Northing: 239721.4068; Easting: 6593828.1269

	21-Feb-22	18-May-22	10-Aug-22	21-Oct-22	01-Nov-22	10-Nov-22
Rec ID	**84528**	**85626**	**86517**	**87799**	**88411**	**88029**
Lab Ref	**94399**	**95449**	**96308**	**97569**	**98162**	**97795**
Antimony (total)	<0.001	<0.001	<0.001			<0.001
Appearance	Turbid	Turbid	Slightly	Slightly	Slightly	Turbid
Arsenic-Total (mg/L)	0.003	0.003	<0.001			0.002
Colour	Brown	Brown	Brown	brown	Clear	BROWN
Comments				A.Raal	WW	
EC - Field	210	250	180	326	43.8	140
Electrical Conductivity @ 25°C	183	152	129	38	49	100
Molybdenum (total)	<0.001	<0.001	<0.001			<0.001
Odour	Nil	Nil	Nil	Nil	Nil	Nil
Oil & Grease	6	<5	<5	<5	<5	<5
pH (pH Unit)	8.6	7.6	7.3	6.78	6.55	7.8
pH Value (pH Unit)	7.3	7.51	7.12	6.71	7.03	7.48
Selenium-Total (mg/L)	<0.01	<0.01	<0.01			<0.01
Temperature	26.3	18.1	15.8	17.1	16.9	21.3
Total Organic Carbon	15	14	15	8	13	19
Total Suspended Solids (TSS)	123	34	1,640	31	29	57

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: UNDC (Unidentified Drainage Channel, Southern downstream discharge); Northing: 237347.9362; Easting: 6590960.0102

	28-Feb-22	05-Aug-22	09-Sep-22	16-Sep-22	22-Sep-22	09-Oct-22	21-Oct-22	01-Nov-22	14-Nov-22
Rec ID	**85003**	**86464**	**86930**	**87094**	**87731**	**87726**	**87797**	**88412**	**88417**
Lab Ref	**94869**	**96255**	**96719**	**96883**			**97567**	**98163**	**98168**
Appearance								Slightly	Murky
Colour								Brown	L.Brown
Comments							A.Raal	WW	WW
EC - Field			126.1	105.8	174.1	165.5	67.1	100.8	102
Electrical Conductivity @ 25°C	276	127	210	134	206	145	80	129	113
Oil & Grease	<5	<5	<5	<5	<5	<5	<5	<5	<5
pH (pH Unit)			7.34	7.08	7.2	7.1	7.16	6.85	6.84
pH Value (pH Unit)	7.22	6.83	7.32	7.3	7.52	8.18	6.81	7.15	7.26
Temperature			17.7	15.2	19.1	17.5	17.5	16.7	19.5
Total Organic Carbon	16	12	14	13	10	17	9	14	12
Total Suspended Solids (TSS)	286	351	1,080	276	899	40	76	45	33

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: Void (Rocglen In pit Void Dam); Northing: 243470.8552; Easting: 6617301.6235

	21-Feb-22	18-May-22	10-Aug-22	10-Nov-22
Rec ID	**84529**	**85627**	**86516**	**88028**
Lab Ref	**94400**	**95450**	**96307**	**97794**
Aluminium (total) (mg/L)		109		
Appearance	Slight Turbid	Turbid	Turbid	Turbid
Arsenic-Total (mg/L)		0.015		
Bicarbonate Alkalinity as CaCO3		138		
Chloride (mg/L)		27		
Colour	Slight Brown	Brown	Brown	BROWN
EC - Field	540	590	620	450
Electrical Conductivity @ 25°C	517	488	553	386
Iron-Total (mg/L)		81.7		
Manganese (total)		1.06		
Odour	Nil	Nil	Nil	Nil
Oil & Grease	<5	<5	<5	<5
pH (pH Unit)	8.3	8.5	8.6	8.4
pH Value (pH Unit)	7.96	8.13	8.43	8.27
Sodium		93		
Temperature	24.7	15.3	14.3	24.2
Total Organic Carbon	5	3	38	3
Total Suspended Solids (TSS)	76	827	2,020	83

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site:	***Rocglen***		
From Date:	***01-Jan-2022***	**To Date:**	***31-Dec-2022***
Standard:	***<Blank>***		

Appendix 2: Groundwater

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP2; Northing: 239156; Easting: 6592783

	22-Mar-22	04-Oct-22	16-Dec-22
Rec ID	**84863**	**87392**	**88844**
Lab Ref	**94729**	**97180**	
Aluminium (total) (mg/L)	2.84	0.1	
Ammonia as Nitrogen (N)	1.37	0.03	
Appearance	Clear	CLEAR	
Arsenic-Total (mg/L)	<0.001	<0.001	
Barium (total)	1.17	1.04	
Beryllium (total)	<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	440.	514.	
Boron (total)	0.08	0.05	
Cadmium-Total (mg/L)	0.0002	<0.0001	
Calcium-Dissolved (mg/L)	283.	290.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1	
Chloride (mg/L)	1,450.	1,450.	
Chromium-Total (mg/L)	0.003	<0.001	
Cobalt	0.001	<0.001	
Colour	Clear	CLEAR	Clear
Comments	LOGGER DOWNLOAD		Belmont
Copper-Total (mg/L)	0.035	0.003	
EC - Field	5,200.	5,350.	5,160.
Electrical Conductivity @ 25°C (µS/cm)	5,340.	5,410.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1	
Ionic Balance (%)	4.2	2.73	
Iron-Total (mg/L)	5.58	0.22	
Lead-Total (mg/L)	0.009	<0.001	
Magnesium-Dissolved (mg/L)	171.	169.	
Manganese (total)	0.088	0.007	
Mercury-Total (mg/L)	<0.0001	<0.0001	
Nickel-Total (mg/L)	0.006	0.001	
Nitrate as N (mg/L)	2.36	0.69	
Nitrite + Nitrate as N (mg/L)	2.36	0.69	
Nitrite as N (mg/L)	<0.01	<0.01	
Odour	Nil	NIL	Nil
pH (pH Unit)	6.8	6.9	7.
pH Value (pH Unit)	7.55	7.32	

Potassium-Dissolved (mg/L)	7.	6.	
Purge Type	Bail	BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01	
Sodium-Dissolved (mg/L)	596.	592.	
Standing Water Level			4.48
Stick up	1.	1.	1.
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	11.	11	
Temperature	21.8	21.7	21.5
Total Alkalinity as CaCO3 (mg/L)	440.	514.	
Total Anions	49.9	51.4	
Total Cations	54.3	54.3	
Total Dissolved Solids @180°C-Total (mg/L)	3,780.	3,780.	
Vanadium	<0.01	<0.01	
Water Depth to Stand	10.03	10.89	5.48
Zinc (total)	0.116	0.016	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-2a; Northing: ; Easting:

	22-Mar-22	08-Jun-22	04-Oct-22	16-Dec-22
Rec ID	**84864**	**85957**	**87397**	**88855**
Lab Ref	**94730**	**95751**	**97185**	
Aluminium (total) (mg/L)	0.03		0.02	
Ammonia as Nitrogen (N)	<0.01		0.02	
Appearance	Clear		CLEAR	
Arsenic-Total (mg/L)	0.002		0.003	
Barium (total)	0.705		0.628	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	530.		577.	
Boron (total)	0.11		0.08	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	146.		144.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	637.		629.	
Chromium-Total (mg/L)	0.002		0.004	
Cobalt	<0.001		<0.001	
Colour	Clear		CLEAR	Clear
Comments	LOGGER DOWNLOAD	LOGGER DOWNLOADE		
Copper-Total (mg/L)	0.081		0.074	
EC - Field	2,900.		3,080.	3,020.
Electrical Conductivity @ 25°C (µS/cm)	2,870.		2,880.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	0.86		1.13	
Iron-Total (mg/L)	0.12		<0.05	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	61.		59.	
Manganese (total)	0.005		0.003	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	0.003		0.004	
Nitrate as N (mg/L)	3.53		3.76	
Nitrite + Nitrate as N (mg/L)	3.53		3.76	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil		NIL	Nil
pH (pH Unit)	7.3		7.3	7.2
pH Value (pH Unit)	7.83		7.73	

Potassium-Dissolved (mg/L)	3.		3.	
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	410.		405.	
Standing Water Level				4.59
Stick up	0.7		0.7	0.7
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	55.		55	
Temperature			23.6	22.9
Total Alkalinity as CaCO3 (mg/L)	530.		577.	
Total Anions	29.7		30.4	
Total Cations	30.2		29.7	
Total Dissolved Solids @180°C-Total (mg/L)	1,820.		1,710.	
Vanadium	0.02		0.02	
Water Depth to Stand	9.59		11.1	5.29
Zinc (total)	0.035		0.031	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP3; Northing: 238838; Easting: 6589909

	04-Mar-22	08-Jun-22	04-Oct-22	05-Dec-22
Rec ID	**86652**	**85948**	**87812**	**88846**
Lab Ref	**96443**	**95742**	**97581**	
Comments	DRY. NO SAMPLE	DRY	DRY	Dry
Stick up	0.93		0.93	0.93

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-3a; Northing: ; Easting:

	04-Mar-22	08-Jun-22	04-Oct-22	05-Dec-22
Rec ID	**84635**	**85958**	**87398**	**88856**
Lab Ref	**94504**	**95752**	**97186**	
Aluminium (total) (mg/L)	0.09		0.03	
Ammonia as Nitrogen (N)	<0.01		<0.01	
Appearance	Clear		CLEAR	
Arsenic-Total (mg/L)	0.005		0.005	
Barium (total)	0.09		0.078	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	509.		499.	
Boron (total)	0.06		<0.05	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	19.		19.	
Carbonate Alkalinity as CaCO3 (mg/L)	2.		<1	
Chloride (mg/L)	116.		101.	
Chromium-Total (mg/L)	0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear		CLEAR	Clear
Comments		LOGGER DOWNLOADE		Stratford
Copper-Total (mg/L)	0.003		0.002	
EC - Field	1,320.		1,200.	1,280.
Electrical Conductivity @ 25°C (µS/cm)	1,320.		1,170.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	3.2		1.02	
Iron-Total (mg/L)	0.1		<0.05	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	14.		15.	
Manganese (total)	0.012		0.003	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		<0.001	
Nitrate as N (mg/L)	0.68		0.66	
Nitrite + Nitrate as N (mg/L)	0.68		0.66	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil		NIL	Nil
pH (pH Unit)	7.9		7.7	7.7
pH Value (pH Unit)	8.25		8.04	

Potassium-Dissolved (mg/L)	2.		2.	
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	257.		267.	
Standing Water Level	21.73			21.58
Stick up	0.6		0.6	0.6
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	36.		36	
Temperature	23.7		21.6	22.4
Total Alkalinity as CaCO3 (mg/L)	510.		499.	
Total Anions	14.2		13.6	
Total Cations	13.3		13.8	
Total Dissolved Solids @180°C-Total (mg/L)	810.		722.	
Vanadium	0.03		0.03	
Water Depth to Stand	22.33		22.23	22.18
Zinc (total)	0.006		0.016	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP4; Northing: ; Easting:

	04-Mar-22	08-Jun-22	04-Oct-22	05-Dec-22
Rec ID	**86653**	**85949**	**87813**	**88847**
Lab Ref	**96444**	**95743**	**97582**	
Comments	DRY. NO SAMPLE	DRY	DRY	Dry
Stick up	0.98		0.98	0.98

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP4-a (Surrey New); Northing: ; Easting:

	04-Mar-22	04-Oct-22	05-Dec-22
Rec ID	**84633**	**87393**	**88848**
Lab Ref	**94502**	**97181**	
Aluminium (total) (mg/L)	0.02	0.07	
Ammonia as Nitrogen (N)	0.37	0.28	
Appearance	Clear	CLEAR	
Arsenic-Total (mg/L)	0.002	<0.001	
Barium (total)	0.407	0.38	
Beryllium (total)	<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	611.	631.	
Boron (total)	<0.05	<0.05	
Cadmium-Total (mg/L)	0.0002	<0.0001	
Calcium-Dissolved (mg/L)	34.	35.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1	
Chloride (mg/L)	1,380.	1,330.	
Chromium-Total (mg/L)	<0.001	<0.001	
Cobalt	<0.001	<0.001	
Colour	Clear	CLEAR	Clear
Comments			Surrey Lane
Copper-Total (mg/L)	<0.001	0.002	
EC - Field	5,650.	5,420.	5,760.
Electrical Conductivity @ 25°C (µS/cm)	5,690.	5,600.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1	
Ionic Balance (%)	2.24	0.23	
Iron-Total (mg/L)	0.06	0.1	
Lead-Total (mg/L)	<0.001	<0.001	
Magnesium-Dissolved (mg/L)	28.	30.	
Manganese (total)	0.644	0.742	
Mercury-Total (mg/L)	<0.0001	<0.0001	
Nickel-Total (mg/L)	0.001	<0.001	
Nitrate as N (mg/L)	0.01	<0.01	
Nitrite + Nitrate as N (mg/L)	0.01	<0.01	
Nitrite as N (mg/L)	<0.01	<0.01	
Odour	Nil	NIL	Nil
pH (pH Unit)	7.5	7.6	7.5
pH Value (pH Unit)	8.14	7.97	

Potassium-Dissolved (mg/L)	2.	3.	
Purge Type	Bail	BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01	
Sodium-Dissolved (mg/L)	1,080.	1,110.	
Standing Water Level	28.81		28.83
Stick up	0.85	0.85	0.85
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	107.	106	
Temperature	22.3	21.4	21.7
Total Alkalinity as CaCO3 (mg/L)	611.	631.	
Total Anions	53.4	52.3	
Total Cations	51.	52.6	
Total Dissolved Solids @180°C-Total (mg/L)	3,140.	3,090.	
Vanadium	<0.01	<0.01	
Water Depth to Stand	29.66	29.77	29.68
Zinc (total)	0.006	0.014	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP4-b (Surrey New); Northing: ; Easting:

	04-Mar-22	08-Jun-22	04-Oct-22	05-Dec-22
Rec ID	**84634**	**85951**	**87394**	**88849**
Lab Ref	**94503**	**95745**	**97182**	
Aluminium (total) (mg/L)	0.13		0.06	
Ammonia as Nitrogen (N)	<0.01		<0.01	
Appearance	Clear		CLEAR	
Arsenic-Total (mg/L)	0.004		0.003	
Barium (total)	0.093		0.081	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	668.		699.	
Boron (total)	<0.05		<0.05	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	11.		11.	
Carbonate Alkalinity as CaCO3 (mg/L)	11.		<1	
Chloride (mg/L)	572.		542.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear		CLEAR	Clear
Comments	LOGGER DOWNLOAD	LOGGER DOWNLOADE	LOGGER DOWNLOADE	Surrey Lane
Copper-Total (mg/L)	0.008		0.007	
EC - Field	3,290.		3,240.	3,390.
Electrical Conductivity @ 25°C (µS/cm)	3,130.		3,000.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	4.15		1.49	
Iron-Total (mg/L)	0.24		0.1	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	10.		11.	
Manganese (total)	0.141		0.148	
Mercury-Total (mg/L)	0.0002		<0.0001	
Nickel-Total (mg/L)	0.001		<0.001	
Nitrate as N (mg/L)	0.03		0.04	
Nitrite + Nitrate as N (mg/L)	0.03		0.04	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil		NIL	Nil
pH (pH Unit)	7.6		7.9	7.6
pH Value (pH Unit)	8.31		8.19	

Potassium-Dissolved (mg/L)	2.		2.	
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	649.		674.	
Standing Water Level	25.43			25.42
Stick up	0.9		0.9	0.9
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	122.		120	
Temperature	22.2		21.6	21.7
Total Alkalinity as CaCO3 (mg/L)	678.		699.	
Total Anions	32.2		31.8	
Total Cations	29.6		30.8	
Total Dissolved Solids @180°C-Total (mg/L)	1,820.		1,800.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	26.33		26.27	26.32
Zinc (total)	0.02		0.017	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP5; Northing: 238269; Easting: 6594817

	04-Oct-22	05-Dec-22
Rec ID	**87809**	**88840**
Lab Ref	**97578**	
Comments	DRY	Dry-Yarrawonga
Stick up	0.85	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-5a; Northing: ; Easting:

	04-Mar-22	08-Jun-22	04-Oct-22	05-Dec-22
Rec ID	**86656**	**85959**	**87817**	**88857**
Lab Ref	**96447**	**95753**	**97586**	
Comments	DRY. NO SAMPLE	DRY - GREY MUD ON	DRY - GREY MUD ON	Dry-Grey Mud on Probe
Stick up	0.8		0.8	0.8

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-6; Northing: ; Easting:

	04-Mar-22	08-Jun-22	21-Sep-22		05-Dec-22
Rec ID	**84636**	**85960**	**87231**	**87818**	**88858**
Lab Ref	**94505**	**95754**	**97019**	**97587**	
Aluminium (total) (mg/L)	0.04		0.02		
Ammonia as Nitrogen (N)	0.76		0.78		
Appearance	Clear		Clear	CLEAR	
Arsenic-Total (mg/L)	0.004		0.004		
Barium (total)	0.182		0.209		
Beryllium (total)	<0.001		<0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	754.		688.		
Boron (total)	0.08		0.06		
Cadmium-Total (mg/L)	<0.0001		<0.0001		
Calcium-Dissolved (mg/L)	6.		6.		
Carbonate Alkalinity as CaCO3 (mg/L)	7.		<1		
Chloride (mg/L)	132.		138.		
Chromium-Total (mg/L)	<0.001		<0.001		
Cobalt	<0.001		<0.001		
Colour	Clear		Clear	CLEAR	Clear
Comments		LOGGER DOWNLOADE		LOGGER DOWNLOADE	Costa Vale
Copper-Total (mg/L)	0.003		<0.001		
EC - Field	1,700.		1,640.	1,640.	1,680.
Electrical Conductivity @ 25°C (µS/cm)	1,780.		1,750.		
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1		
Ionic Balance (%)	1.7		3.07		
Iron-Total (mg/L)	0.64		0.69		
Lead-Total (mg/L)	<0.001		<0.001		
Magnesium-Dissolved (mg/L)	6.		6.		
Manganese (total)	0.049		0.049		
Mercury-Total (mg/L)	<0.0001		<0.0001		
Nickel-Total (mg/L)	0.002		0.002		
Nitrate as N (mg/L)	0.01		<0.01		
Nitrite + Nitrate as N (mg/L)	0.01		<0.01		
Nitrite as N (mg/L)	<0.01		<0.01		
Odour	Nil		Nil	NIL	Nil
pH (pH Unit)	7.7		7.8	7.8	7.8
pH Value (pH Unit)	8.3		8.14		

Potassium-Dissolved (mg/L)	4.		5.		
Purge Type	Bail			BAIL	Bail
Selenium-Total (mg/L)	<0.01		<0.01		
Sodium-Dissolved (mg/L)	400.		410.		
Standing Water Level	7.65				6.9
Stick up	0.65		0.65	0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	<1		<1		
Temperature	21.9		19.8	19.8	20.8
Total Alkalinity as CaCO3 (mg/L)	761.		688.		
Total Anions	18.9		17.6		
Total Cations	18.3		18.8		
Total Dissolved Solids @180°C-Total (mg/L)	1,100.		1,080.		
Vanadium	<0.01		<0.01		
Water Depth to Stand	8.3		8.3	8.3	7.55
Zinc (total)	0.009		0.006		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-7; Northing: ; Easting:

	04-Mar-22	21-Sep-22		21-Dec-22
Rec ID	**84932**	**87232**	**87819**	**88859**
Lab Ref	**94798**	**97020**	**97588**	
Aluminium (total) (mg/L)	0.03	0.03		
Ammonia as Nitrogen (N)	<0.01	<0.01		
Appearance	Clear	Clear	CLEAR	
Arsenic-Total (mg/L)	0.003	0.003		
Barium (total)	0.72	0.921		
Beryllium (total)	<0.001	<0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	634.	561.		
Boron (total)	0.23	0.09		
Cadmium-Total (mg/L)	<0.0001	<0.0001		
Calcium-Dissolved (mg/L)	92.	106.		
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1		
Chloride (mg/L)	586.	675.		
Chromium-Total (mg/L)	<0.001	<0.001		
Cobalt	<0.001	<0.001		
Colour	Clear	Clear	CLEAR	Clear
Comments				Mine Site
Copper-Total (mg/L)	0.002	0.006		
EC - Field	3,150.	3,350.	3,350.	3,460.
Electrical Conductivity @ 25°C (µS/cm)	2,920.	3,180.		
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1		
Ionic Balance (%)	0.95	1.36		
Iron-Total (mg/L)	0.09	0.05		
Lead-Total (mg/L)	<0.001	<0.001		
Magnesium-Dissolved (mg/L)	57.	60.		
Manganese (total)	0.032	0.074		
Mercury-Total (mg/L)	<0.0001	<0.0001		
Nickel-Total (mg/L)	0.002	0.002		
Nitrate as N (mg/L)	1.46	1.22		
Nitrite + Nitrate as N (mg/L)	1.49	1.22		
Nitrite as N (mg/L)	0.03	<0.01		
Odour	Nil	Nil	NIL	Nil
pH (pH Unit)	7.3	7.	7.	7.1
pH Value (pH Unit)	7.87	8.		

Potassium-Dissolved (mg/L)	3.	3.		
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01		
Sodium-Dissolved (mg/L)	489.	496.		
Standing Water Level				25.89
Stick up	0.65	0.65	0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	41.	37.		
Temperature	22.6	20.9	20.9	21.5
Total Alkalinity as CaCO3 (mg/L)	634.	561.		
Total Anions	30.	31.		
Total Cations	30.6	31.9		
Total Dissolved Solids @180°C-Total (mg/L)	1,830.	1,780.		
Vanadium	0.03	0.03		
Water Depth to Stand	30.73	28.19	28.19	26.54
Zinc (total)	0.021	0.057		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: MP-8; Northing: ; Easting:

	23-Mar-22	21-Sep-22		21-Dec-22
Rec ID	**84933**	**87233**	**87820**	**88861**
Lab Ref	**94799**	**97021**	**97589**	
Aluminium (total) (mg/L)	0.02	0.02		
Ammonia as Nitrogen (N)	0.79	0.86		
Appearance	Clear	Clear	CLEAR	
Arsenic-Total (mg/L)	0.002	0.003		
Barium (total)	0.894	0.986		
Beryllium (total)	<0.001	<0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	593.	581.		
Boron (total)	0.18	0.07		
Cadmium-Total (mg/L)	<0.0001	<0.0001		
Calcium-Dissolved (mg/L)	202.	204.		
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1		
Chloride (mg/L)	1,210.	1,220.		
Chromium-Total (mg/L)	<0.001	<0.001		
Cobalt	<0.001	0.002		
Colour	Clear	Clear	CLEAR	Clear
Comments				Mine Site
Copper-Total (mg/L)	0.003	0.001		
EC - Field	4,830.	4,880.	4,880.	4,920.
Electrical Conductivity @ 25°C (µS/cm)	4,730.	4,780.		
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1		
Ionic Balance (%)	1.62	0.36		
Iron-Total (mg/L)	0.73	1.99		
Lead-Total (mg/L)	<0.001	<0.001		
Magnesium-Dissolved (mg/L)	124.	118.		
Manganese (total)	1.8	2.22		
Mercury-Total (mg/L)	<0.0001	<0.0001		
Nickel-Total (mg/L)	0.001	0.002		
Nitrate as N (mg/L)	<0.01	0.03		
Nitrite + Nitrate as N (mg/L)	0.04	0.03		
Nitrite as N (mg/L)	0.05	<0.01		
Odour	Nil	Nil	NIL	Nil
pH (pH Unit)	7.	7.	7.	7.
pH Value (pH Unit)	7.79	7.97		

Potassium-Dissolved (mg/L)	6.	5.		
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01		
Sodium-Dissolved (mg/L)	625.	608.		
Standing Water Level				25.98
Stick up	0.65	0.65	0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	6.	5.		
Temperature	22.4	20.7		21.6
Total Alkalinity as CaCO3 (mg/L)	593.	581.		
Total Anions	46.1	46.1		
Total Cations	47.6	46.5		
Total Dissolved Solids @180°C-Total (mg/L)	3,170.	2,940.		
Vanadium	<0.01	<0.01		
Water Depth to Stand	30.81	28.23	28.23	26.63
Zinc (total)	0.057	0.021		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: Production Bore; Northing: 240803; Easting: 6594267

	10-Mar-22	21-Sep-22		21-Sep-22	05-Dec-22
Rec ID	**84681**	**87230**	**87810**	**87810**	**88843**
Lab Ref	**94550**	**97018**	**97579**	**97579**	
Aluminium (total) (mg/L)	0.01	<0.01			
Ammonia as Nitrogen (N)	0.02	0.05			
Appearance	Clear	Claer		CLEAR	
Arsenic-Total (mg/L)	0.001	<0.001			
Barium (total)	0.096	0.102			
Beryllium (total)	0.001	<0.001			
Bicarbonate Alkalinity as CaCO3 (mg/L)	146.	212.			
Boron (total)	0.13	0.09			
Cadmium-Total (mg/L)	0.0001	<0.0001			
Calcium-Dissolved (mg/L)	107.	139.			
Carbonate Alkalinity as CaCO3 (mg/L)	1.	<1			
Chloride (mg/L)	1,110.	1,120.			
Chromium-Total (mg/L)	0.001	<0.001			
Cobalt	0.001	<0.001			
Colour	Clear	Clear	CLEAR		Clear
Comments	PUMP OVER BORE		PUMP OVER BORE		Yarri-Pump Over Bore
Copper-Total (mg/L)	0.001	0.002			
EC - Field	3,150.	4,200.	4,200.		4,230.
Electrical Conductivity @ 25°C (µS/cm)	3,900.	4,010.			
Hydroxide Alkalinity as CaCO3 (mg/L)	1.	<1			
Ionic Balance (%)	0.23	0.33			
Iron-Total (mg/L)	0.05	<0.05			
Lead-Total (mg/L)	0.001	<0.001			
Magnesium-Dissolved (mg/L)	48.	49.			
Manganese (total)	0.002	0.017			
Mercury-Total (mg/L)	0.0001	<0.0001			
Nickel-Total (mg/L)	0.001	0.001			
Nitrate as N (mg/L)	1.27	1.93			
Nitrite + Nitrate as N (mg/L)	1.27	1.93			
Nitrite as N (mg/L)	0.01	<0.01			
Odour	Nil	Nil	NIL		Nil
pH (pH Unit)	7.9	8.	8.		8.3
pH Value (pH Unit)	7.82	8.12			

Potassium-Dissolved (mg/L)	4.	4.			
Purge Type	Tap		TANK		Tank
Selenium-Total (mg/L)	0.01	<0.01			
Sodium-Dissolved (mg/L)	604.	589.			
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	61.	57.			
Temperature	22.8	17.1	17.1		23.1
Total Alkalinity as CaCO3 (mg/L)	146.	208.			
Total Anions	35.5	36.9			
Total Cations	35.7	36.7			
Total Dissolved Solids @180°C-Total (mg/L)	2,670.	2,620.			
Vanadium	0.01	<0.01			
Zinc (total)	0.005	0.007			

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: Surrey Top Paddock; Northing: ; Easting:

	23-Mar-22	04-Oct-22	07-Dec-22
Rec ID	**84931**	**87395**	**88852**
Lab Ref	**94797**	**97183**	
Aluminium (total) (mg/L)	0.22	0.26	
Ammonia as Nitrogen (N)	<0.01	0.04	
Appearance	Clear	CLEAR	
Arsenic-Total (mg/L)	0.002	<0.001	
Barium (total)	0.13	0.034	
Beryllium (total)	<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	513.	395.	
Boron (total)	0.33	0.07	
Cadmium-Total (mg/L)	<0.0001	<0.0001	
Calcium-Dissolved (mg/L)	126.	82.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1	
Chloride (mg/L)	864.	629.	
Chromium-Total (mg/L)	<0.001	<0.001	
Cobalt	<0.001	<0.001	
Colour	Clear	CLEAR	Clear
Comments			Surrey
Copper-Total (mg/L)	0.005	0.002	
EC - Field	3,670.	2,910.	1,570.
Electrical Conductivity @ 25°C (µS/cm)	3,840.	2,700.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1	
Ionic Balance (%)	2.29	0.56	
Iron-Total (mg/L)	0.37	0.4	
Lead-Total (mg/L)	<0.001	<0.001	
Magnesium-Dissolved (mg/L)	91.	55.	
Manganese (total)	0.016	0.022	
Mercury-Total (mg/L)	<0.0001	<0.0001	
Nickel-Total (mg/L)	0.002	<0.001	
Nitrate as N (mg/L)	6.67	3.54	
Nitrite + Nitrate as N (mg/L)	6.69	3.54	
Nitrite as N (mg/L)	0.02	<0.01	
Odour	Nil	NIL	Nil
pH (pH Unit)	7.1	7.6	7.3
pH Value (pH Unit)	7.99	7.85	

Potassium-Dissolved (mg/L)	20.	5.	
Purge Type	Bail	BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01	
Sodium-Dissolved (mg/L)	582.	420.	
Standing Water Level	31.04		28.56
Stick up	0.31	0.31	0.31
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	154.	81	
Temperature	21.8	21.8	21.1
Total Alkalinity as CaCO3 (mg/L)	513.	395.	
Total Anions	37.8	27.3	
Total Cations	39.6	27.	
Total Dissolved Solids @180°C-Total (mg/L)	2,370.	1,540.	
Vanadium	0.02	0.01	
Water Depth to Stand	31.35	31.17	28.87
Zinc (total)	0.068	0.029	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB1; Northing: 238738; Easting: 6597885

	04-Mar-22	08-Jun-22	21-Sep-22		21-Sep-22	05-Dec-22
Rec ID	**86655**	**85955**	**87234**	**87816**	**87234**	**88853**
Lab Ref	**96446**	**95749**	**97022**	**97585**	**97022**	
Comments	BROKEN WINDMILL	SWL ONLY - BROKEN		BROKEN WINDMILL	Windmill over bore	SWL Only- Broken
Standing Water Level						6.59
Stick up	0.4			0.4		0.4
Water Depth to Stand	7.96	7.98	7.95	7.95		6.99

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB10; Northing: 237137; Easting: 6586489

	17-Mar-22	04-Oct-22	21-Dec-22
Rec ID	**84774**	**87389**	**88832**
Lab Ref	**94640**	**97177**	
Aluminium (total) (mg/L)	0.03	0.02	
Ammonia as Nitrogen (N)	1.3	0.22	
Appearance	Clear	SLIGHT TURBID	
Arsenic-Total (mg/L)	<0.001	0.002	
Barium (total)	0.054	0.044	
Beryllium (total)	<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	642.	678.	
Boron (total)	0.1	0.07	
Cadmium-Total (mg/L)	<0.0001	<0.0001	
Calcium-Dissolved (mg/L)	119.	149.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1	
Chloride (mg/L)	121.	162.	
Chromium-Total (mg/L)	<0.001	<0.001	
Cobalt	<0.001	<0.001	
Colour	Clear	SLIGHT BROWN	Clear
Comments			Brolga-Shed
Copper-Total (mg/L)	0.002	0.002	
EC - Field	1,450.	1,830.	1,890.
Electrical Conductivity @ 25°C (µS/cm)	1,750.	1,940.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1	
Ionic Balance (%)	0.65	0.4	
Iron-Total (mg/L)	6.14	14.1	
Lead-Total (mg/L)	<0.001	<0.001	
Magnesium-Dissolved (mg/L)	69.	76.	
Manganese (total)	0.056	0.072	
Mercury-Total (mg/L)	<0.0001	<0.0001	
Nickel-Total (mg/L)	<0.001	<0.001	
Nitrate as N (mg/L)	0.06	0.04	
Nitrite + Nitrate as N (mg/L)	0.06	0.05	
Nitrite as N (mg/L)	<0.01	0.01	
Odour	Nil	NIL	Nil
pH (pH Unit)	7.3	6.9	7.
pH Value (pH Unit)	7.94	7.27	

Potassium-Dissolved (mg/L)	1.	<1	
Purge Type	Bail	BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01	
Sodium-Dissolved (mg/L)	201.	245.	
Standing Water Level	14.44		14.31
Stick up	0.07	0.07	0.07
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	212.	290	
Temperature	24.2	20.5	20.8
Total Alkalinity as CaCO3 (mg/L)	642.	678.	
Total Anions	20.6	24.2	
Total Cations	20.4	24.3	
Total Dissolved Solids @180°C-Total (mg/L)	1,020.	1,240.	
Vanadium	<0.01	<0.01	
Water Depth to Stand	14.51	14.32	14.38
Zinc (total)	0.024	0.125	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB11; Northing: 236405; Easting: 6585725

	06-Jan-22	17-Mar-22	04-Oct-22	22-Dec-22
Rec ID	**83908**	**84773**	**87388**	**88831**
Lab Ref		**94639**	**97176**	
Aluminium (total) (mg/L)		<0.01	<0.01	
Ammonia as Nitrogen (N)		<0.01	<0.01	
Appearance	Clear	Clear	CLEAR	
Arsenic-Total (mg/L)		<0.001	<0.001	
Barium (total)		0.082	0.068	
Beryllium (total)		<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)		433.	417.	
Boron (total)		0.09	<0.05	
Cadmium-Total (mg/L)		<0.0001	<0.0001	
Calcium-Dissolved (mg/L)		82.	85.	
Carbonate Alkalinity as CaCO3 (mg/L)		<1	<1	
Chloride (mg/L)		32.	33.	
Chromium-Total (mg/L)		<0.001	<0.001	
Cobalt		<0.001	<0.001	
Colour	Clear	Clear	CLEAR	Clear
Comments	Brolga - Solar			Brolga-Solar
Copper-Total (mg/L)		0.005	0.021	
EC - Field	975.	960.	940.	1,040.
Electrical Conductivity @ 25°C (µS/cm)		974.	926.	
Hydroxide Alkalinity as CaCO3 (mg/L)		<1	<1	
Ionic Balance (%)		1.35	3.07	
Iron-Total (mg/L)		<0.05	0.09	
Lead-Total (mg/L)		<0.001	0.003	
Magnesium-Dissolved (mg/L)		44.	42.	
Manganese (total)		<0.001	<0.001	
Mercury-Total (mg/L)		<0.0001	<0.0001	
Nickel-Total (mg/L)		<0.001	<0.001	
Nitrate as N (mg/L)		0.2	0.21	
Nitrite + Nitrate as N (mg/L)		0.2	0.21	
Nitrite as N (mg/L)		<0.01	<0.01	
Odour	NIL	Nil	NIL	Nil
pH (pH Unit)	7.3	7.5	7.5	7.4
pH Value (pH Unit)		8.03	7.86	

Potassium-Dissolved (mg/L)		1.	2.	
Purge Type	Tap	Tap	TAP	Tap
Selenium-Total (mg/L)		<0.01	<0.01	
Sodium-Dissolved (mg/L)		92.	90.	
Standing Water Level	17.82	18.41		16.52
Stick up	0.25	0.25	0.25	0.25
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)		90.	82	
Temperature	22.7	22.5	20.4	21.9
Total Alkalinity as CaCO3 (mg/L)		433.	417.	
Total Anions		11.4	11.	
Total Cations		11.7	11.7	
Total Dissolved Solids @180°C-Total (mg/L)		678.	572.	
Vanadium		<0.01	<0.01	
Water Depth to Stand	18.07	18.66	17.13	16.77
Zinc (total)		0.009	0.045	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB12; Northing: 237562; Easting: 6587535

	06-Jan-22	17-Mar-22	04-Oct-22	21-Dec-22
Rec ID	**83909**	**84775**	**87390**	**88836**
Lab Ref		**94641**	**97178**	
Aluminium (total) (mg/L)		0.08	0.29	
Ammonia as Nitrogen (N)		1.4	0.93	
Appearance	Clear	Clear	SLIGHT TURBID	
Arsenic-Total (mg/L)		<0.001	0.002	
Barium (total)		0.028	0.021	
Beryllium (total)		<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)		451.	407.	
Boron (total)		0.07	<0.05	
Cadmium-Total (mg/L)		<0.0001	<0.0001	
Calcium-Dissolved (mg/L)		11.	7.	
Carbonate Alkalinity as CaCO3 (mg/L)		25.	15	
Chloride (mg/L)		43.	30.	
Chromium-Total (mg/L)		<0.001	<0.001	
Cobalt		<0.001	<0.001	
Colour	Clear	Clear	SLIGHT BROWN	Clear
Comments	Brolga - Front NO ACCESS			Brolga-Front
Copper-Total (mg/L)		<0.001	0.003	
EC - Field	960.	915.	990.	940.
Electrical Conductivity @ 25°C (µS/cm)		964.	834.	
Hydroxide Alkalinity as CaCO3 (mg/L)		<1	<1	
Ionic Balance (%)		1.73	1.44	
Iron-Total (mg/L)		1.58	5.28	
Lead-Total (mg/L)		<0.001	<0.001	
Magnesium-Dissolved (mg/L)		17.	10.	
Manganese (total)		0.07	0.309	
Mercury-Total (mg/L)		<0.0001	<0.0001	
Nickel-Total (mg/L)		<0.001	0.002	
Nitrate as N (mg/L)		0.01	0.01	
Nitrite + Nitrate as N (mg/L)		0.01	0.02	
Nitrite as N (mg/L)		<0.01	0.01	
Odour	Nil	Nil	NIL	Nil
pH (pH Unit)	8.2	8.	8.2	8.3
pH Value (pH Unit)		8.43	8.39	

Potassium-Dissolved (mg/L)		4.	5.	
Purge Type	Bail	Bail	BAIL	Bail
Selenium-Total (mg/L)		<0.01	<0.01	
Sodium-Dissolved (mg/L)		215.	199.	
Standing Water Level	13.64	13.7		13.5
Stick up	0.22	0.22	0.22	0.22
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)		14.	18	
Temperature	22.5	22.6	20.9	21.4
Total Alkalinity as CaCO3 (mg/L)		476.	423.	
Total Anions		11.	9.67	
Total Cations		11.4	9.96	
Total Dissolved Solids @180°C-Total (mg/L)		570.	512.	
Vanadium		<0.01	<0.01	
Water Depth to Stand	13.86	13.92	13.78	13.72
Zinc (total)		0.033	0.19	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB13; Northing: ; Easting:

	17-Mar-22	29-Jun-22	04-Oct-22	07-Dec-22
Rec ID	**84777**	**85956**	**87396**	**88854**
Lab Ref	**94643**	**95750**	**97184**	
Aluminium (total) (mg/L)	0.2		<0.01	
Ammonia as Nitrogen (N)	0.36		<0.01	
Appearance			CLEAR	
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.023		0.014	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	496.		423.	
Boron (total)	0.1		0.07	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	213.		249.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	878.		881.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour			CLEAR	Clear
Comments		PUMP REMOVED -		Carlton Solar
Copper-Total (mg/L)	0.007		0.002	
EC - Field	3,490.		3,630.	3,710.
Electrical Conductivity @ 25°C (µS/cm)	3,130.		3,530.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	3.14		0.56	
Iron-Total (mg/L)	13.2		<0.05	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	76.		77.	
Manganese (total)	0.41		0.005	
Mercury-Total (mg/L)	<0.0001		0.0001	
Nickel-Total (mg/L)	0.007		<0.001	
Nitrate as N (mg/L)	0.01		3.89	
Nitrite + Nitrate as N (mg/L)	0.01		3.9	
Nitrite as N (mg/L)	<0.01		0.01	
Odour			NIL	Nil
pH (pH Unit)	7.1		7.3	7.4
pH Value (pH Unit)	7.8		7.77	

Potassium-Dissolved (mg/L)	4.		4.	
Purge Type	Bail		TANK	Tank
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	386.		376.	
Standing Water Level	32.32			30.37
Stick up	0.15		0.15	0.15
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	62.		111	
Temperature	22.1		20.2	22.6
Total Alkalinity as CaCO3 (mg/L)	496.		423.	
Total Anions	36.		35.6	
Total Cations	33.8		35.2	
Total Dissolved Solids @180°C-Total (mg/L)	2,380.		2,460.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	32.47		32.31	30.52
Zinc (total)	0.122		0.017	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB-14-Barock ; Northing: ; Easting:

	04-Mar-22	04-Oct-22	05-Dec-22
Rec ID	**84934**	**87821**	**88863**
Lab Ref	**94800**	**97590**	
Aluminium (total) (mg/L)	0.05		
Ammonia as Nitrogen (N)	<0.01		
Appearance	Clear		
Arsenic-Total (mg/L)	0.009		
Barium (total)	0.384		
Beryllium (total)	<0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	497.		
Boron (total)	0.15		
Cadmium-Total (mg/L)	<0.0001		
Calcium-Dissolved (mg/L)	46.		
Carbonate Alkalinity as CaCO3 (mg/L)	<1		
Chloride (mg/L)	131.		
Chromium-Total (mg/L)	0.002		
Cobalt	<0.001		
Colour	Clear		
Comments		PUMP NOT OPERATING -	No Sample- Pump not
Copper-Total (mg/L)	0.027		
EC - Field	1,270.		
Electrical Conductivity @ 25°C (µS/cm)	1,290.		
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		
Ionic Balance (%)	3.03		
Iron-Total (mg/L)	0.38		
Lead-Total (mg/L)	0.004		
Magnesium-Dissolved (mg/L)	24.		
Manganese (total)	0.013		
Mercury-Total (mg/L)	<0.0001		
Nickel-Total (mg/L)	0.002		
Nitrate as N (mg/L)	1.07		
Nitrite + Nitrate as N (mg/L)	1.08		
Nitrite as N (mg/L)	0.01		
Odour	Nil		
pH (pH Unit)	7.6		
pH Value (pH Unit)	8.12		

Potassium-Dissolved (mg/L)	3.		
Purge Type	Tap		
Selenium-Total (mg/L)	<0.01		
Sodium-Dissolved (mg/L)	239.		
Standing Water Level	9.77		9.08
Stick up	0.3	0.3	0.3
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	12.		
Temperature	23.4		
Total Alkalinity as CaCO3 (mg/L)	497.		
Total Anions	13.9		
Total Cations	14.7		
Total Dissolved Solids @180°C-Total (mg/L)	816.		
Vanadium	0.06		
Water Depth to Stand	10.07	10.32	9.38
Zinc (total)	0.112		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB-15 Kahana; Northing: ; Easting:

	10-Mar-22	29-Jun-22	04-Oct-22	08-Dec-22
Rec ID	**84682**	**85963**	**87399**	**88862**
Lab Ref	**94551**	**95757**	**97187**	
Aluminium (total) (mg/L)	0.16		0.04	
Ammonia as Nitrogen (N)	29.6		14.3	
Appearance	Clear		CLEAR	
Arsenic-Total (mg/L)	0.001		<0.001	
Barium (total)	0.197		0.208	
Beryllium (total)	0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	819.		807.	
Boron (total)	0.07		0.05	
Cadmium-Total (mg/L)	0.0001		<0.0001	
Calcium-Dissolved (mg/L)	178.		206.	
Carbonate Alkalinity as CaCO3 (mg/L)	1.		<1	
Chloride (mg/L)	186.		209.	
Chromium-Total (mg/L)	0.001		<0.001	
Cobalt	0.001		<0.001	
Colour	Clear		CLEAR	Clear
Comments	SAMPLE SLIGHT	NEW LEASEE		Well
Copper-Total (mg/L)	0.009		0.003	
EC - Field	1,230.		1,680.	1,460.
Electrical Conductivity @ 25°C (µS/cm)	1,980.		1,820.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.		<1	
Ionic Balance (%)	7.53		2.62	
Iron-Total (mg/L)	5.88		8.79	
Lead-Total (mg/L)	0.001		<0.001	
Magnesium-Dissolved (mg/L)	56.		62.	
Manganese (total)	1.34		2.07	
Mercury-Total (mg/L)	0.0001		<0.0001	
Nickel-Total (mg/L)	0.002		<0.001	
Nitrate as N (mg/L)	0.01		<0.01	
Nitrite + Nitrate as N (mg/L)	0.01		<0.01	
Nitrite as N (mg/L)	0.01		<0.01	
Odour	Strong Odour		YES ODOUR	Nil
pH (pH Unit)	7.		7.	7.1
pH Value (pH Unit)	7.73		7.45	

Potassium-Dissolved (mg/L)	12.		8.	
Purge Type	Tank		BAIL	Bail
Selenium-Total (mg/L)	0.01		<0.01	
Sodium-Dissolved (mg/L)	110.		122.	
Standing Water Level	28.54			27.99
Stick up	0.28		0.28	0.28
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	10.		<1	
Temperature	21.5		20.5	22.2
Total Alkalinity as CaCO3 (mg/L)	819.		807.	
Total Anions	21.6		22.	
Total Cations	18.6		20.9	
Total Dissolved Solids @180°C-Total (mg/L)	1,040.		1,020.	
Vanadium	0.01		<0.01	
Water Depth to Stand	28.82		28.94	28.27
Zinc (total)	0.531		0.107	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB2; Northing: 239906; Easting: 6596452

	04-Mar-22	21-Sep-22		21-Sep-22	05-Dec-22
Rec ID	**84632**	**87227**	**87806**	**87227**	**88837**
Lab Ref	**94501**	**97015**	**97575**	**97015**	
Aluminium (total) (mg/L)	0.12	<0.01			
Ammonia as Nitrogen (N)	0.04	0.03			
Appearance	Slight Turbid		SLIGHT TURBID	Slightly turbid	
Arsenic-Total (mg/L)	<0.001	<0.001			
Barium (total)	0.112	0.014			
Beryllium (total)	<0.001	<0.001			
Bicarbonate Alkalinity as CaCO3 (mg/L)	160.	261.			
Boron (total)	0.2	0.11			
Cadmium-Total (mg/L)	<0.0001	<0.0001			
Calcium-Dissolved (mg/L)	83.	75.			
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1			
Chloride (mg/L)	1,760.	1,310.			
Chromium-Total (mg/L)	<0.001	<0.001			
Cobalt	<0.001	<0.001			
Colour	Greenish	Green	GREEN		Green
Comments					Gate#3-Windmill
Copper-Total (mg/L)	0.004	0.003			
EC - Field	5,720.	4,700.	4,700.		4,710.
Electrical Conductivity @ 25°C (µS/cm)	5,870.	4,470.			
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1			
Ionic Balance (%)	1.59	0.96			
Iron-Total (mg/L)	0.33	0.39			
Lead-Total (mg/L)	<0.001	<0.001			
Magnesium-Dissolved (mg/L)	214.	181.			
Manganese (total)	0.111	0.06			
Mercury-Total (mg/L)	<0.0001	<0.0001			
Nickel-Total (mg/L)	<0.001	<0.001			
Nitrate as N (mg/L)	<0.01	0.05			
Nitrite + Nitrate as N (mg/L)	<0.01	0.05			
Nitrite as N (mg/L)	<0.01	<0.01			
Odour	Nil	Nil	NIL		Nil
pH (pH Unit)	8.	8.1	8.1		8.2
pH Value (pH Unit)	8.15	8.24			

Potassium-Dissolved (mg/L)	25.	28.			
Purge Type	Tank		TANK		Tank
Selenium-Total (mg/L)	<0.01	<0.01			
Sodium-Dissolved (mg/L)	662.	506.			
Standing Water Level	14.58				14.08
Stick up	0.38	0.38	0.38		0.38
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	<1	<1			
Temperature	24.9	14.5	14.5		23.1
Total Alkalinity as CaCO3 (mg/L)	160.	261.			
Total Anions	52.8	42.2			
Total Cations	51.2	41.4			
Total Dissolved Solids @180°C-Total (mg/L)	3,580.	2,880.			
Vanadium	<0.01	<0.01			
Water Depth to Stand	14.96	14.71	14.71		14.46
Zinc (total)	0.007	<0.005			

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB3; Northing: 239394; Easting: 6595776

	23-Mar-22	21-Sep-22		21-Dec-22
Rec ID	**84930**	**87228**	**87807**	**88838**
Lab Ref	**94796**	**97016**	**97576**	
Aluminium (total) (mg/L)	0.03	<0.01		
Ammonia as Nitrogen (N)	2.84	0.39		
Appearance	Clear	Clear	CLEAR	
Arsenic-Total (mg/L)	0.001	0.001		
Barium (total)	0.015	0.01		
Beryllium (total)	<0.001	<0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	428.	465.		
Boron (total)	0.42	<0.05		
Cadmium-Total (mg/L)	<0.0001	<0.0001		
Calcium-Dissolved (mg/L)	252.	252.		
Carbonate Alkalinity as CaCO3 (mg/L)	<1	<1		
Chloride (mg/L)	1,070.	1,100.		
Chromium-Total (mg/L)	<0.001	<0.001		
Cobalt	<0.001	<0.001		
Colour	Clear	Clear	CLEAR	Clear
Comments				Glenroc
Copper-Total (mg/L)	<0.001	<0.001		
EC - Field	4,330.	4,250.	4,250.	4,310.
Electrical Conductivity @ 25°C (µS/cm)	4,160.	4,150.		
Hydroxide Alkalinity as CaCO3 (mg/L)	<1	<1		
Ionic Balance (%)	3.26	0.53		
Iron-Total (mg/L)	<0.05	<0.05		
Lead-Total (mg/L)	<0.001	<0.001		
Magnesium-Dissolved (mg/L)	180.	171.		
Manganese (total)	0.423	0.166		
Mercury-Total (mg/L)	<0.0001	<0.0001		
Nickel-Total (mg/L)	0.002	<0.001		
Nitrate as N (mg/L)	3.06	0.77		
Nitrite + Nitrate as N (mg/L)	3.1	0.77		
Nitrite as N (mg/L)	0.04	<0.01		
Odour	Nil	Nil	NIL	Nil
pH (pH Unit)	7.1	7.1	7.1	7.2
pH Value (pH Unit)	7.78	7.8		

Potassium-Dissolved (mg/L)	3.	2.		
Purge Type	Bail		BAIL	Bail
Selenium-Total (mg/L)	<0.01	<0.01		
Sodium-Dissolved (mg/L)	336.	318.		
Standing Water Level				4.91
Stick up	0.58	0.58	0.58	0.58
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	33.	31.		
Temperature	21.5	20.1	20.1	20.9
Total Alkalinity as CaCO3 (mg/L)	428.	465.		
Total Anions	39.4	41.		
Total Cations	42.1	40.5		
Total Dissolved Solids @180°C-Total (mg/L)	3,560.	2,990.		
Vanadium	0.03	0.04		
Water Depth to Stand	7.16	5.1	5.1	5.49
Zinc (total)	0.017	0.012		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB4; Northing: 237847; Easting: 6595819

	05-Dec-22
Rec ID	**88839**
Lab Ref	
Comments	Pump Over Bore-

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB5; Northing: 239586; Easting: 6595157

	10-Mar-22	04-Oct-22	05-Dec-22
Rec ID	**84679**	**87804**	**88841**
Lab Ref	**94548**	**97574**	
Aluminium (total) (mg/L)	0.44		
Ammonia as Nitrogen (N)	0.07		
Appearance	Clear	SLIGHT TURBID	
Arsenic-Total (mg/L)	0.001		
Barium (total)	0.072		
Beryllium (total)	0.001		
Bicarbonate Alkalinity as CaCO3 (mg/L)	193.		
Boron (total)	0.07		
Cadmium-Total (mg/L)	0.0001		
Calcium-Dissolved (mg/L)	83.		
Carbonate Alkalinity as CaCO3 (mg/L)	1.		
Chloride (mg/L)	654.		
Chromium-Total (mg/L)	0.001		
Cobalt	0.001		
Colour		SLIGHT BROWN	Brown
Comments	SUBMERSIBLE PUMP		Gate#1
Copper-Total (mg/L)	0.003		
EC - Field	1,410.	1,235.	1,315.
Electrical Conductivity @ 25°C (µS/cm)	2,350.		
Hydroxide Alkalinity as CaCO3 (mg/L)	1.		
Ionic Balance (%)	1.17		
Iron-Total (mg/L)	2.61		
Lead-Total (mg/L)	0.001		
Magnesium-Dissolved (mg/L)	73.		
Manganese (total)	0.293		
Mercury-Total (mg/L)	0.0001		
Nickel-Total (mg/L)	0.001		
Nitrate as N (mg/L)	0.06		
Nitrite + Nitrate as N (mg/L)	0.06		
Nitrite as N (mg/L)	0.01		
Odour		NIL	Nil
pH (pH Unit)	7.5	8.2	8.
pH Value (pH Unit)	7.76		

Potassium-Dissolved (mg/L)	13.		
Purge Type	Bail	BAIL	Bail
Selenium-Total (mg/L)	0.01		
Sodium-Dissolved (mg/L)	280.		
Standing Water Level	6.32		5.48
Stick up	0.4	0.4	0.4
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	43.		
Temperature	20.5	20.5	21.6
Total Alkalinity as CaCO3 (mg/L)	193.		
Total Anions	23.2		
Total Cations	22.7		
Total Dissolved Solids @180°C-Total (mg/L)	1,730.		
Vanadium	0.01		
Water Depth to Stand	6.72	5.66	5.52
Zinc (total)	0.033		

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB6; Northing: 240696; Easting: 6594539

	10-Mar-22	21-Sep-22	04-Oct-22	05-Dec-22
Rec ID	**84680**	**87229**	**87391**	**88842**
Lab Ref	**94549**	**97017**	**97179**	
Aluminium (total) (mg/L)	0.31	0.04	1.29	
Ammonia as Nitrogen (N)	15.3	24.	0.03	
Appearance	Clear	Clear	CLEAR	
Arsenic-Total (mg/L)	0.001	<0.001	<0.001	
Barium (total)	0.108	0.244	0.034	
Beryllium (total)	0.001	<0.001	<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	158.	149.	234.	
Boron (total)	0.05	<0.05	<0.05	
Cadmium-Total (mg/L)	0.0001	<0.0001	<0.0001	
Calcium-Dissolved (mg/L)	59.	54.	25.	
Carbonate Alkalinity as CaCO3 (mg/L)	1.	<1	<1	
Chloride (mg/L)	362.	479.	302.	
Chromium-Total (mg/L)	0.001	<0.001	<0.001	
Cobalt	0.001	<0.001	<0.001	
Colour		Clear	CLEAR	Clear
Comments				Yarri-Windmill removed
Copper-Total (mg/L)	0.034	0.032	0.018	
EC - Field	1,020.	1,920.	1,920.	2,860.
Electrical Conductivity @ 25°C (µS/cm)	1,420.	1,710.	1,240.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.	<1	<1	
Ionic Balance (%)	4.08	4.2	0.76	
Iron-Total (mg/L)	1.11	2.28	1.93	
Lead-Total (mg/L)	0.001	<0.001	0.001	
Magnesium-Dissolved (mg/L)	24.	28.	30.	
Manganese (total)	1.43	2.13	0.051	
Mercury-Total (mg/L)	0.0001	<0.0001	<0.0001	
Nickel-Total (mg/L)	0.002	<0.001	0.002	
Nitrate as N (mg/L)	0.67	<0.01	1.6	
Nitrite + Nitrate as N (mg/L)	5.29	0.11	1.6	
Nitrite as N (mg/L)	4.62	0.15	<0.01	
Odour	Nil	Nil	NIL	Nil
pH (pH Unit)	8.	7.6	7.6	7.9
pH Value (pH Unit)	7.76	7.93	8.15	

Potassium-Dissolved (mg/L)	31.	31.	11.	
Purge Type	bail		BAIL	Bail
Selenium-Total (mg/L)	0.01	<0.01	<0.01	
Sodium-Dissolved (mg/L)	155.	176.	213.	
Standing Water Level	18.54			14.74
Stick up	0.49	0.49	0.49	0.49
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	7.	<1	13	
Temperature	21.7	19.5	19.5	21.7
Total Alkalinity as CaCO3 (mg/L)	158.	138.	234.	
Total Anions	13.5	16.3	13.5	
Total Cations	12.4	15.2	13.3	
Total Dissolved Solids @180°C-Total (mg/L)	946.	950.	717.	
Vanadium	0.01	<0.01	<0.01	
Water Depth to Stand	19.03	17.33	17.33	15.23
Zinc (total)	0.102	0.082	0.052	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB7; Northing: 239321; Easting: 6592514

	22-Mar-22	08-Jun-22	04-Oct-22	16-Dec-22
Rec ID	**86651**	**85947**	**87811**	**88845**
Lab Ref	**96442**	**95741**	**97580**	
Comments	BROKEN WINDMILL	SWL ONLY - BROKEN	BROKEN WINDMILL	SWL Only- Broken
Standing Water Level				5.95
Stick up	0.27		0.27	0.27
Water Depth to Stand	8.37	8.56	8.61	6.22

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB8; Northing: 240654; Easting: 6589786

	23-Mar-22	04-Oct-22	07-Dec-22
Rec ID	**86654**	**87814**	**88850**
Lab Ref	**96445**	**97583**	
Comments	PUMP OVER BORE	PUMP OVER BORE - SWL	SWL Only- Pump Over
Standing Water Level			28.
Stick up	0.5	0.5	0.5
Water Depth to Stand	30.29	30.73	28.5

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2022* **To Date:** *31-Dec-2022*
Standard: *<Blank>*

Data Point: WB9; Northing: 240222; Easting: 6588393

	17-Mar-22	04-Oct-22	07-Dec-22
Rec ID	**84776**	**87815**	**88851**
Lab Ref	**94642**	**97584**	
Comments	UNABLE TO COLLECT	LANDOWNER ADVISED NO	Carlton Front
EC - Field			1,230.
pH (pH Unit)			7.5
Purge Type			Tank
Standing Water Level	23.54		22.19
Stick up	0.31	0.31	0.31
Temperature			22.9
Water Depth to Stand	23.85		22.5

Outliers: 0

Field Name	Result	Outlier Comment