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
MOP start date	31 March 2019
MOP end date	30 March 2022, Extension 2 July 2022
Annual review start date	1st January 2021
Annual review end date	31st December 2021

I, Andrew Raal, certify that this audit report is a true and accurate record of the compliance status of Rocglen Coal Mine for the period 1st January 2021 to 31st December 2021, 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	29/04/2021

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1. STATEMENT OF COMPLIANCE

The compliance status of Rocglen Coal Mine (RCM) as at 31st December 2021 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	Yes
EPL 12870 (applicable conditions above)	Yes
ML 1620	Yes
ML 1662	Yes
WAL 29461	Yes
WAL 36758	Yes

TABLE 1B - NON-COMPLIANCES

Relevant Approval	Condition, Schedule and Number	Condition Description (summary)	Compliance Status	Comment	Where Addressed in Annual Review
None					

Compliance status key for **Table 1b**

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)

2. INTRODUCTION

This is the thirteenth 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 2021 and the 31st December 2021. 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).

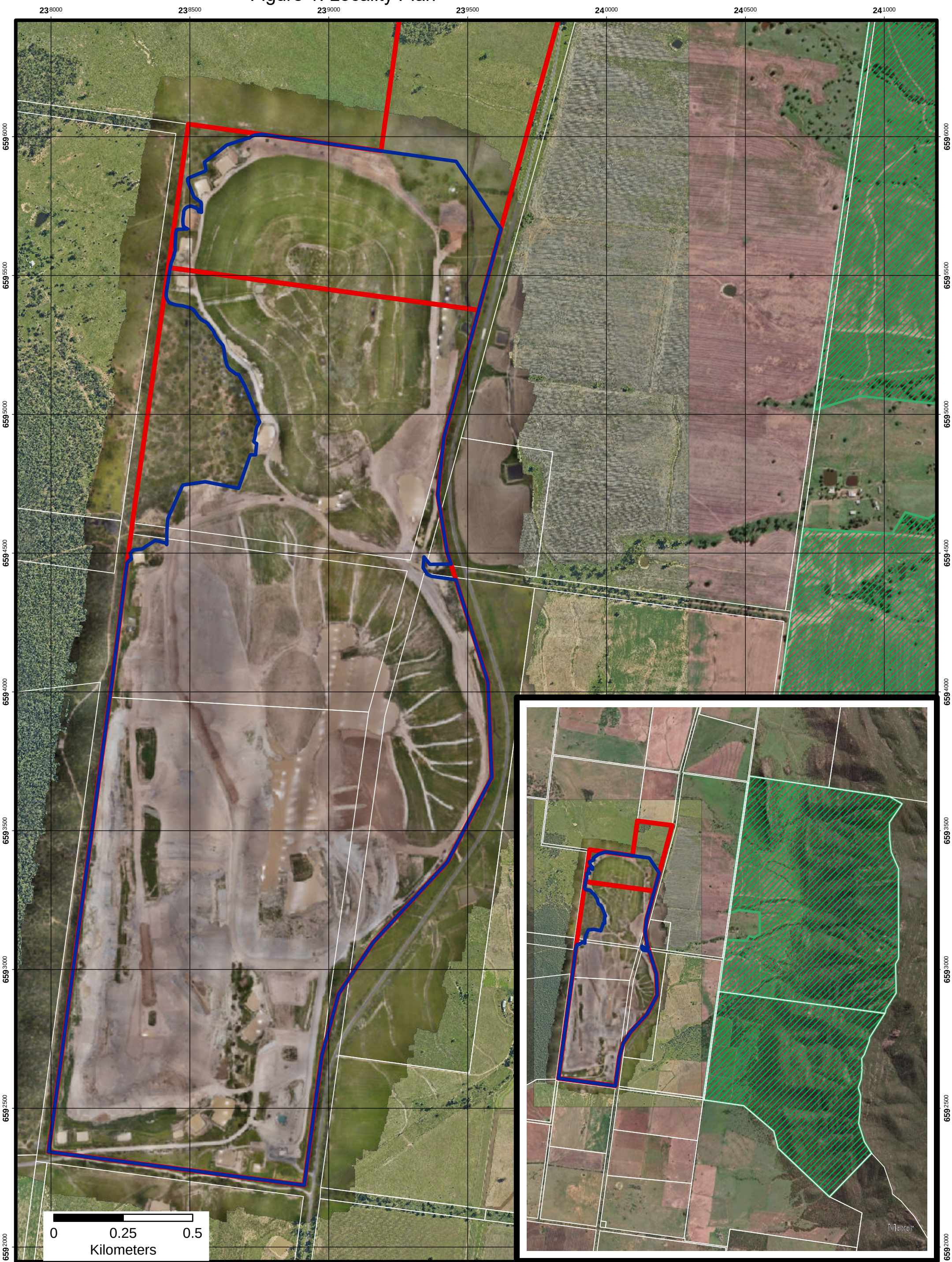
PA 10_0015 was modified initially in November 2014 to condition cumulative coal haulage from the Tarrawonga/Vickery/Rocglen mines. In August 2015 another modification was made allowing changes to coal reject haulage to the site. During February 2017, PA10_0015 was modified to permit increased coal haulage 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, Environmental and Rehabilitation Manger 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.

Figure 1: Locality Plan



WHITEHAVEN COAL

Datum: MGA Zone 56 Author: A.Raal Image: Dec 21

Date: 15 Feb 2022 Scale: 1:12,000 (A3)

Rocglen Locality Plan With Offset areas

239500 240000 240500 241000

- Disturbance Boundary
- Mining Leases
- Biodiversity Offset Areas

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	31st 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)	Mining Operations Plan (MOP)	31 March 2019	31 March 2022	Extension granted till 2 July 22.
Department of Primary Industries – Water (DPI Water)	WAL 36758	4th September 2014	In perpetuity	In process of being sold.

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	1,598,760 bcm	2,331,374 bcm	1,200,000
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 MOP and associated Management Plans.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Department of Planning, Industry and Environment – Resources Regulator Department of primary industry (DPIE-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 Average PM_{10} Particulate Level	50 $\mu g/m^3$

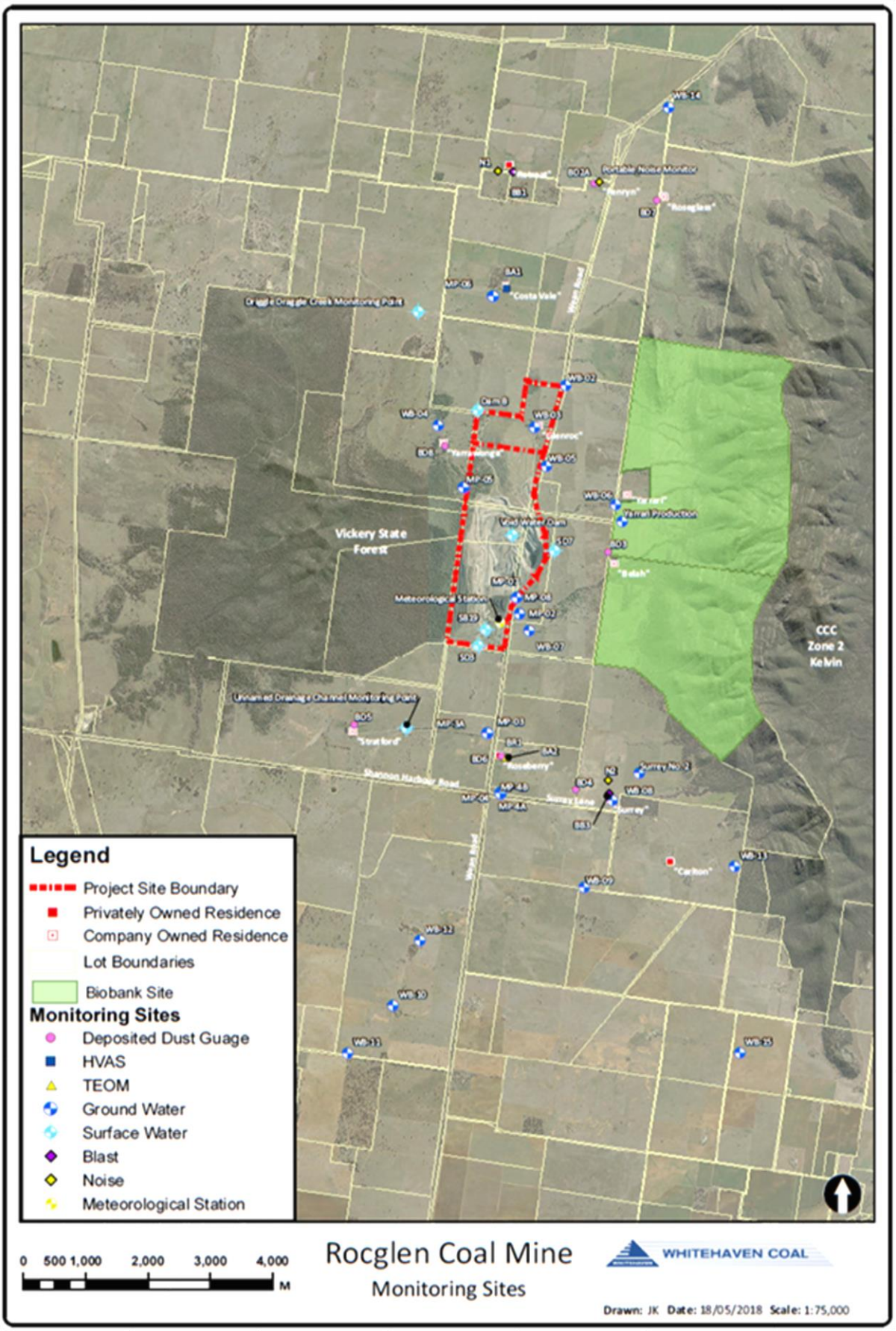


Figure 2. Monitoring Locations

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 3** below present 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/m²/month)	Annual Mean Ash %	Long Term Insoluble Solids Average
BD3		Belah	1.6	1.0	1.8
BD4	4	Surrey	2.1	1.4	1.4
BD5		Stratford	2.0	1.4	1.4
BD6	6	Roseberry	1.5	0.8	1.2
BD7		Roseglass	1.3	0.8	1.6
BD8		Yarrawonga	1.2	0.6	2.2
BD2-A		Penryn	2.4	1.7	3.5

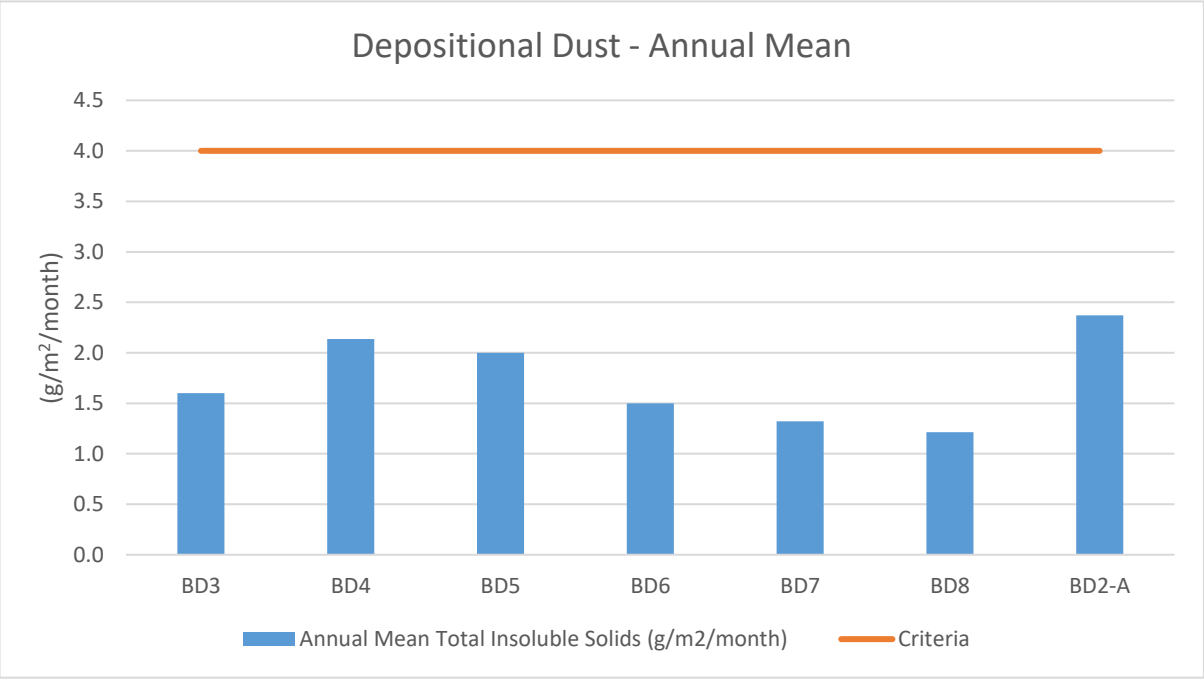


Figure 3. Annual Average Depositional Dust

A review of the above, shows that the annual average limit for deposited dust was below the set criteria at all monitoring sites.

RCM has an EPA registered High Volume Air Samplers (HVAS, PM_{10}), EPL ID - 10 to the south-east of the mine on 'Roseberry' (a privately-owned property under private agreement).

Figures 4 to 6 display the PM10 24hr results for the 'Roseberry' monitor.
The EPA monitoring location 'Roseberry' TEOM recorded no exceedances of the 24-hour criteria throughout the calendar year.

TABLE 6.1.2B - PM10 SUMMARY DATA

Site	Roseberry- Full data set
No. of readings	59
No. days above criteria	0
Maximum	24.7
Minimum	0.1
Average	6.31

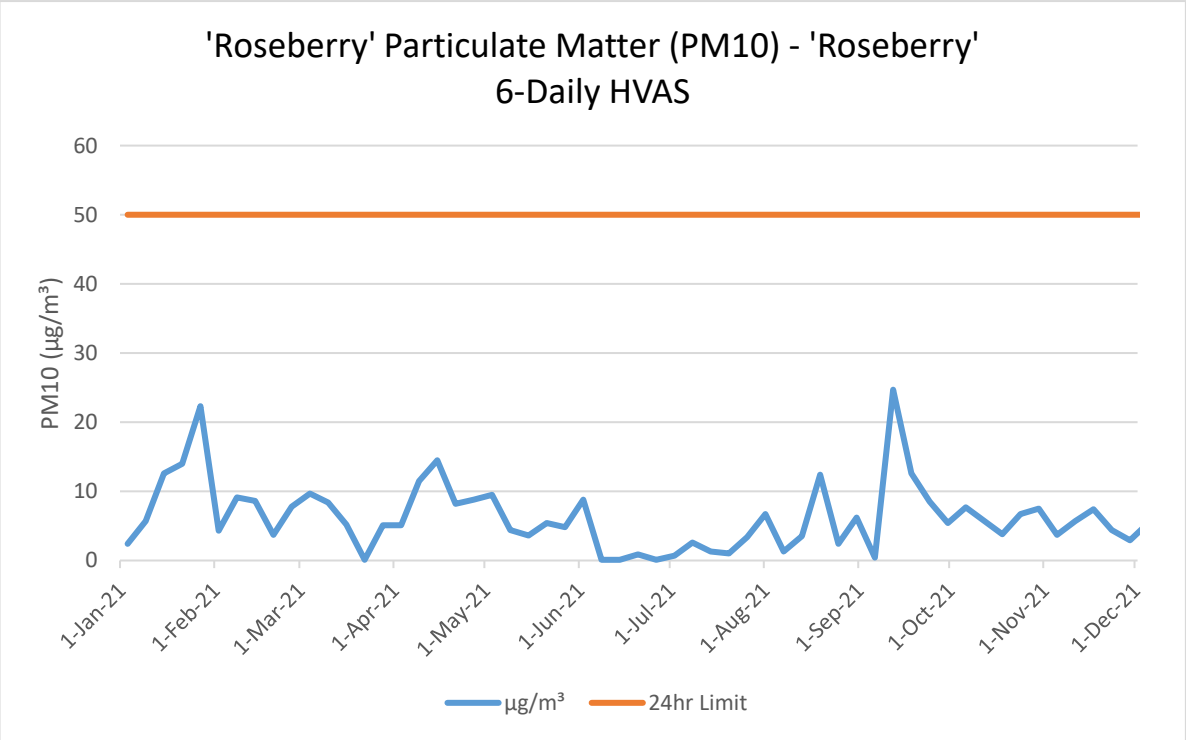


Figure 4. 'Roseberry' Particulate Matter (PM10)

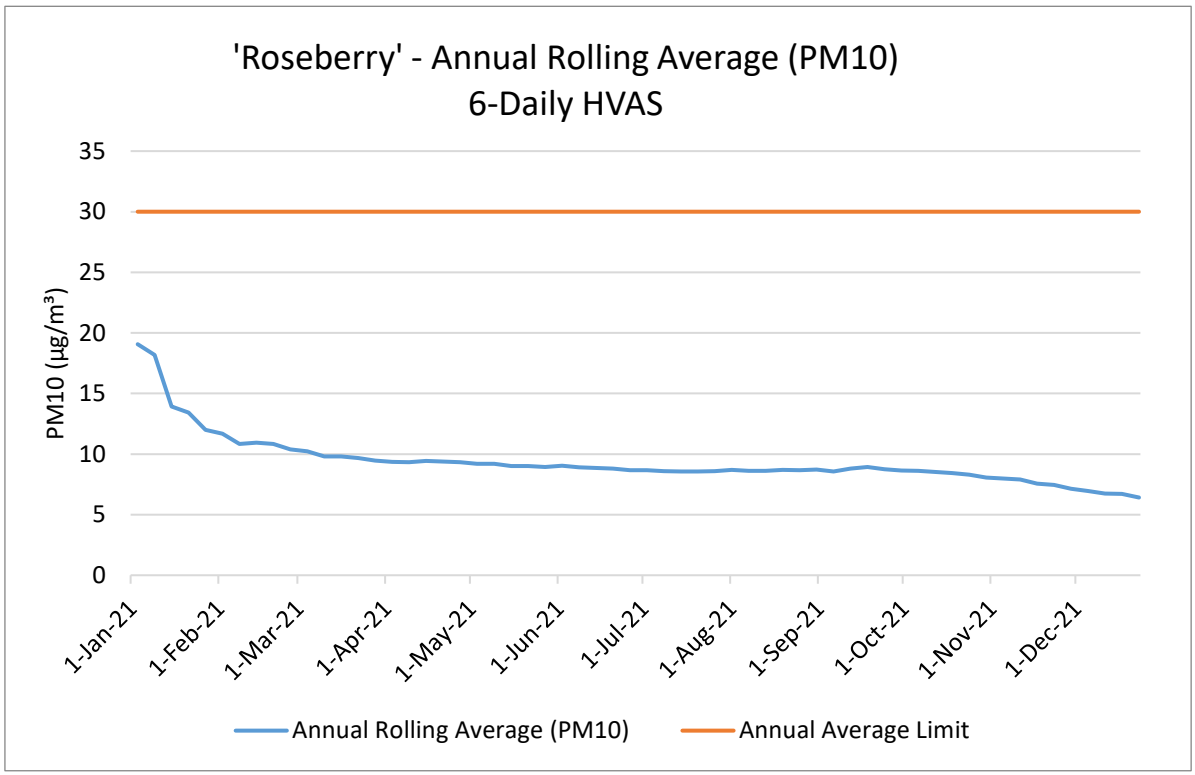


Figure 5. 'Roseberry' - Annual Rolling Average (PM10)

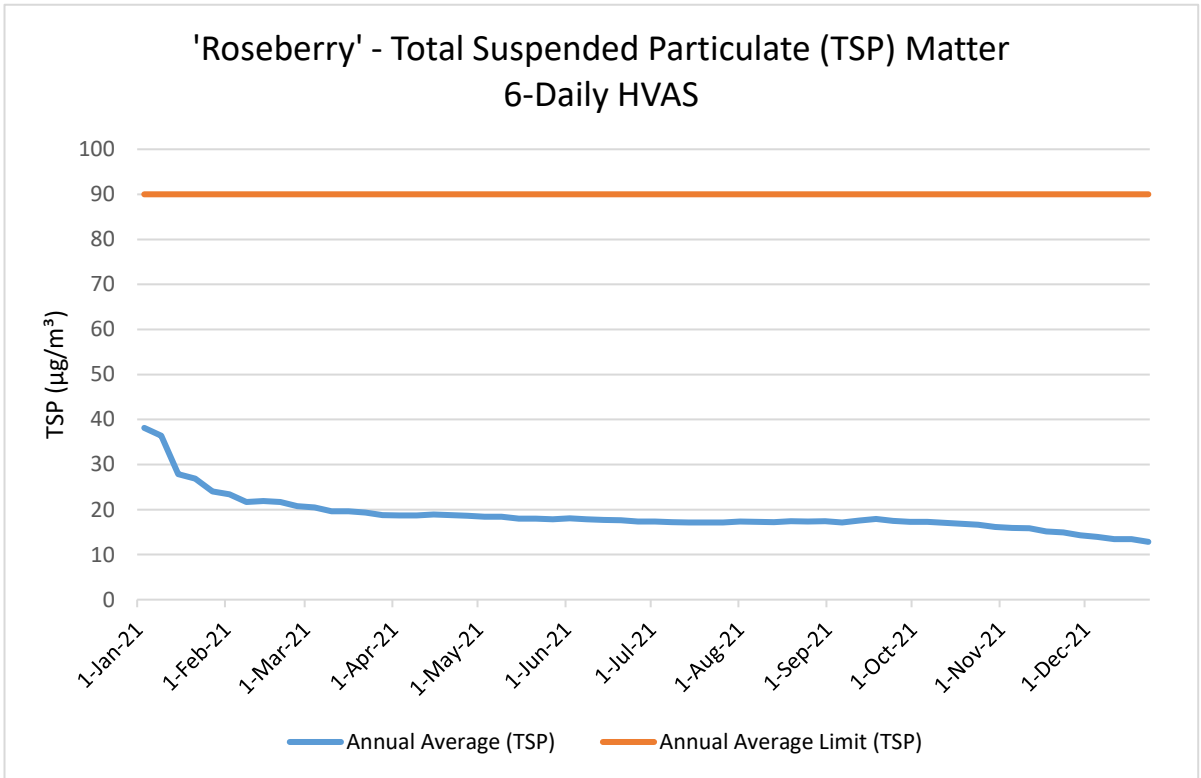


Figure 6. 'Roseberry' - Total Suspended Particulate Matter

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 in October 2021. Monitoring was undertaken using the Whitehaven Annual Rehabilitation Monitoring Methodology (WARMM—Aspect Ecology 2021). Monitoring comprised:

- repeat monitoring of one previously established 'best-on-offer' (DPIE 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);
- repeat monitoring of one Pasture site and establishment of one new Pasture reference site, which was co-located with the reference plots that used historical methodologies near Canyon mine; and
- thirteen repeat rehabilitation sites, first surveyed in 2019, comprising:
    - nine Woodland Domain sites, capturing all extant years seeded (2013–16).
    - four Pasture Domain sites capturing all years seeded 2014–16.

6.2.2 Woodland Domain

Groundcover

Native vegetation, leaf litter and mulch are collectively termed “vegetative surface cover” (CMOP tbl 18 & 26). The completion criteria for Rocglen Mine state that vegetative surface cover is to be greater than 85% (CMOP tbl 18). As exotic vegetation is at odds with the Woodland Domain objective, only the combined contribution of litter, mulch and native vegetation was assessed as contributing to the cover target. This minimum target is much higher than the average cover across the 2021 analogue sites of 60.6% (**Figure 7**).

Of the Woodland rehabilitation sites assessed at Rocglen in 2021, none achieved the completion criteria; however, one site met the analogue site minimum threshold (RGR1984). Vegetative surface cover (excluding living exotic vegetation) ranged between just 2.2% at the 2016 site RGR1974, and 67.2% at the 2015 site RGR1984 (**Figure 7**). All but one site (RGR1934) saw decreases of varying magnitudes in vegetative surface cover between 2020 and 2021. The exception saw only a very minor increase in cover, with vegetative cover of 48.6% in 2020 and 48.8% in 2021 at RGR1984. All values were below the minimum completion criteria value of 85%. The most significant decline in vegetative cover was observed at RGR1974, in which cover fell from 67.6% in 2020 to 3.4% in 2021 (**Figure 7**).

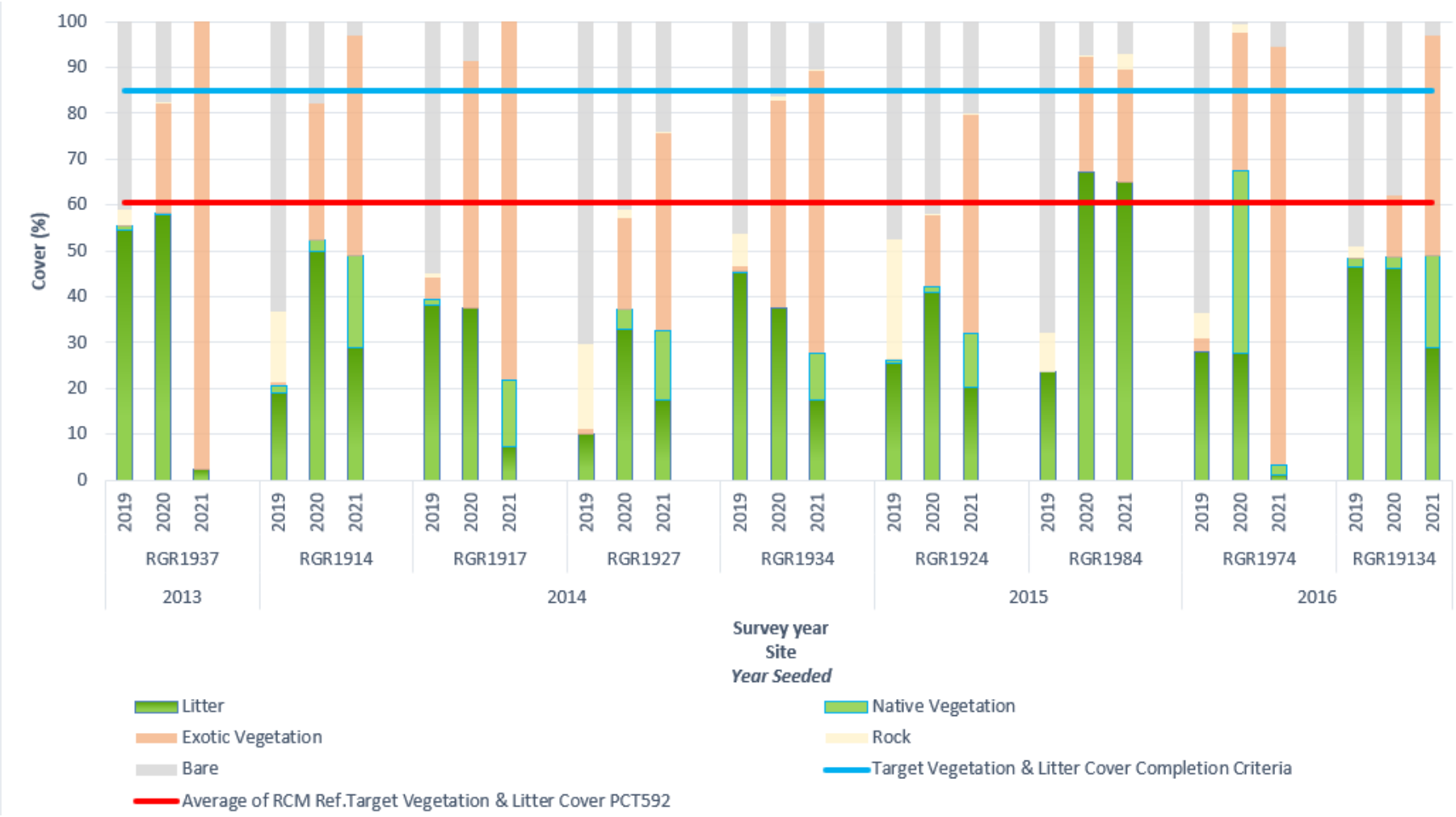


Figure 7. Average Percentage Cover of Groundcover Components within each Woodland Domain Rehabilitation Year at Rocglen Coal Mine, comparing the 2019, 2020 and 2021 Monitoring Seasons.

< 2m tall Tree density

The density of trees less than two metres tall was comprised entirely of seedlings, almost all of which were planted in 2020, with a few individuals from previous planting campaigns and further follow-up plantings in 2021. All sites except one were observed to have seedlings present (**Figure 8**). All sites exhibited declines in seedlings density since 2020, apart from RGR1934 which had a moderate increase. Seedling mortality was the sole cause of the decline at all other sites, apart from RGR1914, where 20 stems/ha of the 60 stems/ha decline can be explained by recruitment into the >2 m height class (*data not shown*). Some seedling mortality is to be expected, however declines at some sites were relatively substantial especially at RGR1974 which reduced from 220 stems/ha to 50 stems ha.

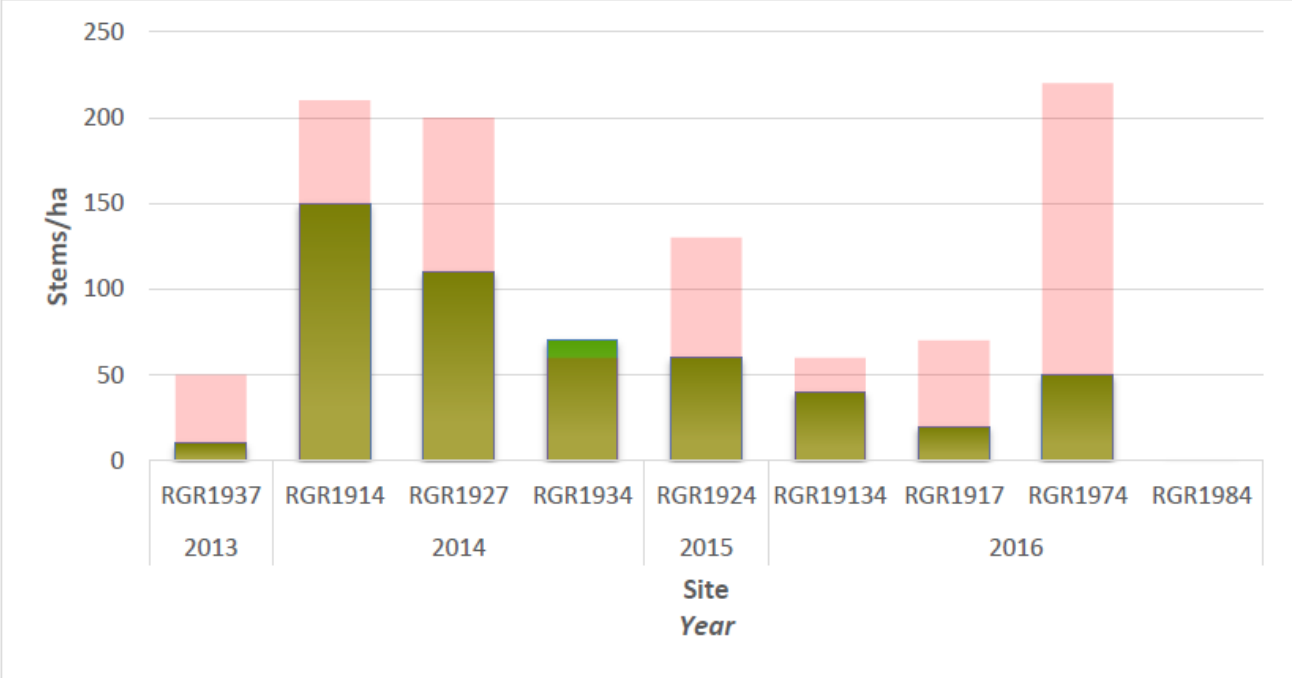


Figure 8. Density of tree seedlings within rehabilitation sites at Rocglen Coal Mine in 2020, grouped by year seeded

6.2.3 Pasture Domain

Ground cover

The average combined total of vegetation and litter exceeded the completion criteria minimum of 85% within all but one pasture rehabilitation sites surveyed at Rocglen Mine (**Figure 9**). The level of vegetative cover observed at the fourth site (RGA20218) fell just short of the 85% target value, at 83.8% cover (Error! Reference s ource not found.**9**).

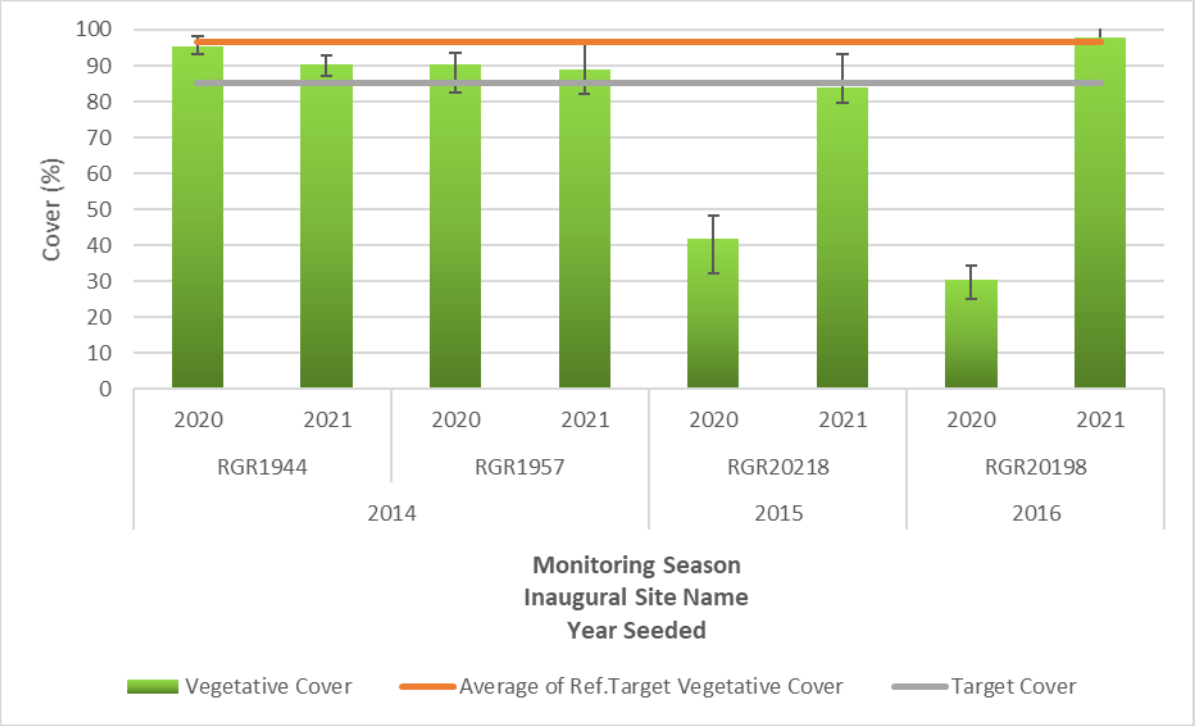


Figure 9. Combined Pasture completion criteria ground cover components (vegetation and leaf litter) at Rocglen Mine. Line shows minimum MOP completion criteria target of 85%. Bars show standard error of the mean.

6.2.4 Fauna

Fauna habitat included log piles, stag trees, and pondage areas, with two sites having minimal habitat features. A lack of maturing trees resulted in very low vertical complexity. Native animals sighted included Eastern Grey Kangaroos, Wallaroos, swifts, and other insectivorous birds. Exotic Cabbage White Butterflies were abundant around areas of the host plant *Rapistrum rugosum*. The calls of native froglets (*Crinia* spp.) were heard at two sites. Sites showed traces (prints, scats) of feral animals such as fox and hare.

6.2.5 Recommendations

It is recommended that:

- additional seedling plantings are implemented where there has been high seedling mortality, or in sections of the Woodland Domain yet to receive successful replanting.
- steps are taken to improve native groundcover diversity, using species recorded in the analogue sites once the necessary techniques are determined.

6.3 Biodiversity Offset Area (BOA) Management

The approved WHC Biobank Biodiversity Offset Management Plan (BOMP, 2013) outlines the Biodiversity Offset Strategy 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 and Tarrawonga Coal Mines.

6.3.1 Offset Security Management

The WHC Biobank BOA was secured under a NSW Biobanking Agreement (now converted to 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).

6.3.2 Weather Summary of MCCM Offset Properties

Regionally central meteorological station to the BOAs is the Gunnedah Pool site (BOM 2021) which has recorded highly variable rainfall over the last 3 years; from driest in 140 years of 237mm in 2019, followed by above average rainfall years in 2020 and 2021 of 833mm and 990mm respectively resulting in major flooding of the Namoi River in November and December 2021. WHC maintains a meteorological station adjacent to the Biobank BOA with a summary of weather conditions experienced at the Roseglass Offset property during the 2021 reporting period being annual temperature ranged between 1°C in July and 37°C in January. The total annual rainfall was 775mm with the maximum in November (171mm) and minimum in May (19mm).

6.3.3 Infrastructure Management

During the reporting period, maintenance of signage and gates undertaken as required to continue to restrict unauthorised access and minimise livestock incursion. Also, during the reporting period, 691m of redundant internal fences were deconstructed from the Yarrari Offset property and 22 redundant or derelict assets/infrastructure were removed, previously associated with the former agricultural use of Biobank BOA. Waste removed is either recycled (in the case for scrap metal) or disposed offsite (general municipal waste and tyres) at local Waste Management Facilities. Any remaining derelict assets/infrastructure items will continue to be assessed, removed and remediated as required prior to transfer of Yarrari and Belah Offset properties to National Park Estate.

6.3.4 Seed Management

The routine seed assessments on the Biobank BOA aims to identify on a seasonal basis the life cycle stage and development of native plants to identify what, where, when and how to target appropriate resources to collect seed for future revegetation programs. A total of 19 species were collected resulting in 6,093 grams of local provident seed to the Biobank BOA. As part of the WHC group wide revegetation planning; the onsite collected seed was supplemented with commercially sourced local and regional provident seed by reputable seed collectors. A local revegetation provider was engaged to propagate the seed to produce Box Gum and non-EEC/CEEC Woodland overstorey species seedlings required for the 2021 revegetation program completed as well as planning for the 2022 revegetation program for the Biobank BOA.

6.3.5 Revegetation Management

The revegetation schedule within Biobanking Agreement 43 requires enhancement planting to occur between Year 8 (2021) and 10. During the reporting period, revegetation ground preparation utilised tractors and excavators auguring holes (to a depth >0.3m) to relieve compaction, improve permeability and infiltration to increase sub-surface soil moisture for planting during May 2021. WHC coordinated an enhancement (overstorey) revegetation program in June 2021 across the Biobank BOA covering 124ha planted with 3,832 hiko seedlings of Box-Gum and other Woodland species. Combined with good seasonal conditions, routine tree watering and maintenance activities post planting have been successful to ensure that 91% survival has been achieved for the Biobank BOA which is commensurate with the target Woodland vegetation structure.

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. Each site is maintained with demarcation fencing around the heritage site perimeter and signage to mitigate access and disturbance. During this reporting period, 444m of fencing was maintained during 2021 of the total 4.3km of demarcation fencing around these heritage sites across the MCCM BOA.

6.3.7 Habitat Management

During the reporting period, no specific habitat management works were undertaken.

6.3.8 Weed Management

WHC coordinated routine formal weed monitoring/inspections undertaken across Biobank BOA in February, May, September and December 2021. The priority weeds identified included legacy weeds inherited from previous owner's management regimes such as African/Consul Lovegrass, Buffel Grass, 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 spatial 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 502ha treated between January and November 2021 targeting primarily Fleabane, African/Consul Lovegrass, Buffel Grass and Broadleaf 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 February, May, September, and November 2021. The adoption of a "monitor, measure and manage" approach to feral animal management will allow WHC to implement adaptive management in response to changes being measured through monitoring in feral animal abundance specific to the different geographical regions of the Biobank

BOA. Feral animal monitoring utilises the relevant methodologies for specific feral animals generally in accordance with the NSW DPI *Monitoring Techniques for Vertebrate Pests* so that a range of methods can be used such as transects/spotlighting and cameras traps where practicable and relevant to specific offset areas/properties. Monitoring demonstrated that certain animals like Eastern Grey Kangaroos can be high, Feral Pigs can be high in abundance seasonally with all other feral animal species recorded as scarce to low abundance levels across 2021. The feral animal monitoring ensures that timely and prioritised feral animal control is undertaken on a seasonal basis identifying what, where, when and how to target appropriate resources across the Biobank BOA for feral animal management.

During the reporting period, WHC implemented a comprehensive feral animal control program across the Biobank BOA with routine 1080 baiting and pig trapping programs undertaken in March (24 Foxes removed from 112 baits presented), June & July (33 Foxes removed from 84 baits presented and 3 Feral Pigs trapped), September (16 Foxes removed from 84 baits presented and 2 Feral Pigs trapped) and December 2021 (26 Foxes removed from 56 baits presented and 4 Feral Pigs trapped). A total of 336 baits were presented across the Biobank BOA with 29% taken by feral animals. Night time open range shooting programs were implemented in conjunction with the other routine control programs resulting in an additional 1 Feral Cat, 11 Hares, 1 Fox and 3 Feral Pigs were controlled in 2021. In addition, 369 goats were harvested from the Biobank BOA during 2021 with saleable Goats on sold to an abattoir. Only appropriately qualified and experienced feral animal contractors (appropriate feral animal management qualifications, NSW firearms licence and pesticide accreditation where relevant) were engaged to undertake feral 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)). With the above average rainfall during the reporting period; 4 locations of targeted additional maintenance was identified out of 6 observations within the Biobank BOA to mitigate further erosion and sedimentation. The remaining sites and tracks/drainage structures are maintained during routine WHC Biodiversity fire break track maintenance program.

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 was no reported stock incursion within the reporting period.

6.3.12 Bushfire Management

The Biobanking Agreement 43 prohibits the use of fire within the Biobank BOA until Year 40 with no fire recorded on the Biobank Offset in 2021. During the reporting period, no bushfires occurred and no ecological burns were undertaken.

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 August 2021 and annual spring flora monitoring of 32 sites across 5 vegetation zones (VZs) undertaken during September - October 2021. During the winter bird surveys, three threatened species (Speckled Warbler, Dusky Woodswallow and Grey-crowned Babbler) were recorded. During flora monitoring, 2 VZs (North-west Slopes Dry Sclerophyll Woodlands – Good condition, 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) was 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 2 out of 5 VZs. Native midstorey cover (NMS) completion criteria (minimum midstorey cover benchmark for relevant biometric vegetation communities) was met or exceeded at 4 out of 5 VZs. Native ground cover grass (NGCG) completion criteria (minimum groundcover benchmark for relevant biometric vegetation communities) was met or exceeded at 4 out of 5 VZs. Comparison of individual plot data shows that NPS increased from 59% last year to 81% of sites meeting or exceeding completion criteria in 2021. Native overstorey cover (NOS) increased from 21% last year to 31% of sites meeting or exceeding the completion in 2021. Native midstorey cover (NMS) decreased slightly from 79% last year to 72% of sites meeting or exceeding the completion criteria in 2021. Native ground cover grass (NGCG) increased from 44% last year to 66% of sites meeting or exceeding the completion criteria in 2021.

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

No improvements are proposed within the next reporting period.

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.

RCM utilises a mobile real-time noise monitor which is used to actively monitor noise at surrounding properties which are likely to receive the greatest impact from operations. The unit monitors operational noise levels in comparison with compliance levels and when noise levels approach criteria, an alarm system is triggered to operational personnel. Operations and environmental personnel are able to log on to a web-based platform where real-time noise and weather data are viewable. The web-based platform also has the capability to live stream from the monitor, to identify specific sources of noise which can be used to confirm if the source is mining related.

6.5.3 Key Environmental Performance/Management Issues

In accordance with Schedule 3, Condition 3(c) of PA10_0015, RCM is required to regularly assess real-time noise levels and meteorological forecasting data to ensure compliance with operational noise criteria. There were no noise alarms form the real time noise monitor.
On the 21st September 2020 RCM noise management plan update to remove the requirement to undertake attended noise monitoring was approved and no noise monitoring was undertaken for the 2021 reporting period.

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 Environmental Performance Summary

An environmental performance summary for RCM is presented in **Table 6.8** below.

TABLE 6.8 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 Rosebery 24h 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 and no coal production.
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 Closure MOP.
Water	Refer to Section 7	11 wet weather discharge and 6 controlled releases.	Nil	Nil

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 are 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	428	8.2 – 8.3	171
SD3	6	<5	393.67	8.2 – 7.51	67
SB19	4	<5	441	7.9 – 8.5	155
Dam B	4	<5	342	7.3 – 8.2	59
SD7	4	<5	88	7.3 – 7.62	35

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 12 mg/L and 144 mg/L with a mean of 67 mg/L, Dam B ranged between 45 mg/L and 81 mg/L with a mean of 59 mg/L, the Rocglen in pit Void Dam (Void) TSS levels ranged between 63 mg/L and 338 mg/L with a mean of 171 mg/L. Monitoring site SB19 recorded a maximum value of 394 mg/L in February 2021 and a minimum value of 35 mg/L in May 2021 and recorded a mean of 155 mg/L. TSS levels at Southern Discharge Dam 7 (SD7) remained below criteria for the reporting period.

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 seven uncontrolled wet weather discharges from Dam SD3 through licenced discharge point LDP11 on the 10th March 2021, 15th March 2021, 10th June 2021, 13th October 2021, 8th November 2021, 22nd November 2021 and the 8th December 2021 with respective rainfall totals for the four days leading up to the discharge day and including discharge day being 53mm, 70.8mm, 63.2mm, 41.4mm, 77.4mm, 110.4mm and 49.8mm. Water qualities were within EPA standards.

There were four controlled discharges from Dam SD3 through licenced discharge point LDP11 on the 13th April 2021, 21st April 2021, 25th October 2021 and 19th November 2021. 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.

There were four uncontrolled wet weather discharges from Dam B through licenced discharge point LDP12 on the 15th March 2021, 25th March 2021, 22nd November 2021 and 8th December 2021 with respective rainfall

totals for the four days leading up to the discharge day and including discharge day being 70.8mm, 67.2mm, 110.4mm, 49.8mm. Water qualities were within EPA standards.

There were two controlled discharges from Dam B through licenced discharge point LDP12 on the 3rd May 2021 and 17th September 2021. 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.

7.1.3 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 2**. 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 dropped around 1m during the reporting period and are starting to stabilise. Water levels in MP7 & MP8 are related to isolated perched aquifer adjoining the mine void. Bore WB-7 300m southeast of MP7 & MP8 has had over 2m rise in water level.

Groundwater levels to the north of the void continued to rise, with WB-5 rising by 6m, and WB3 increasing by 0.94m. 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 (2000) (ANZECC) guidelines for stock watering (cattle).

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 Maules 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 this prediction, though a drop of 30m has not yet been observed.

The mine void was backfilled in December 2020 above groundwater inflow level. Groundwater levels in close proximity to the void are expected to start rising as the backfilled material would be permeable.

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.

7.3 Water Take

The water taken by the operation is summarised in **Table 7.3**, and shows compliance with the licence entitlements. Groundwater take from the void seepage ceased in February 2020.

Site water usage for 2021 for dust suppression was 45.615ML, 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	5ML

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 10.**

TABLE 8.1.1 REHABILITATION STATUS

Mine Area Type	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
	2020 (ha)	2021 (ha)	2022 (ha)
A. Total Mine Footprint	374.9	374.9	374.9
B. Total Active Disturbance	159.3	67.4	67.4
C. Land Being Prepared for Rehabilitation	34	83.5	13.5
D. Land Under Active Rehabilitation	166.9	225	294
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

Infill planting was undertaken on the northern dump from late July into early August 2021.

- 28 July 2021: 1,350 Hiko seedlings planted along bunds and consisted of a mix of white box, narrow leaf ironbark and some kurrajong.
- 1 August 2021: 84 Hiko seedlings planted along bunds and consisted of a mix of white box, narrow leaf ironbark and some kurrajong. tree guards were incorporated in rehabilitation.

Rehabilitation planting was carried out on the Eastern and Southern sides of the void in October and November 2021.

- October/November 2021: 1,894 seedlings were planted across Eastern side of the void consisting of a mix of white box, narrow leaf ironbark, and some kurrajong.
- November 2021: 987 seedlings were planted across the Southern side of the void consisting of a mix of white box, narrow leaf ironbark, and some kurrajong.

Soil samples of overburden topsoil and subsoil was undertaken with a consultant to evaluate long term erosion risk. Sample results and report are in the process of being finalised.

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 MOP (RMP)

Operations and activities were undertaken in accordance with the approved modification of the Closure MOP.

8.1.8 Trials, Research Projects and Initiatives

No trials or research were undertaken at Rocglen Mine. Ongoing trials were continued at other closed mine sites managed by Whitehaven Coal Closed Mines unit.

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.

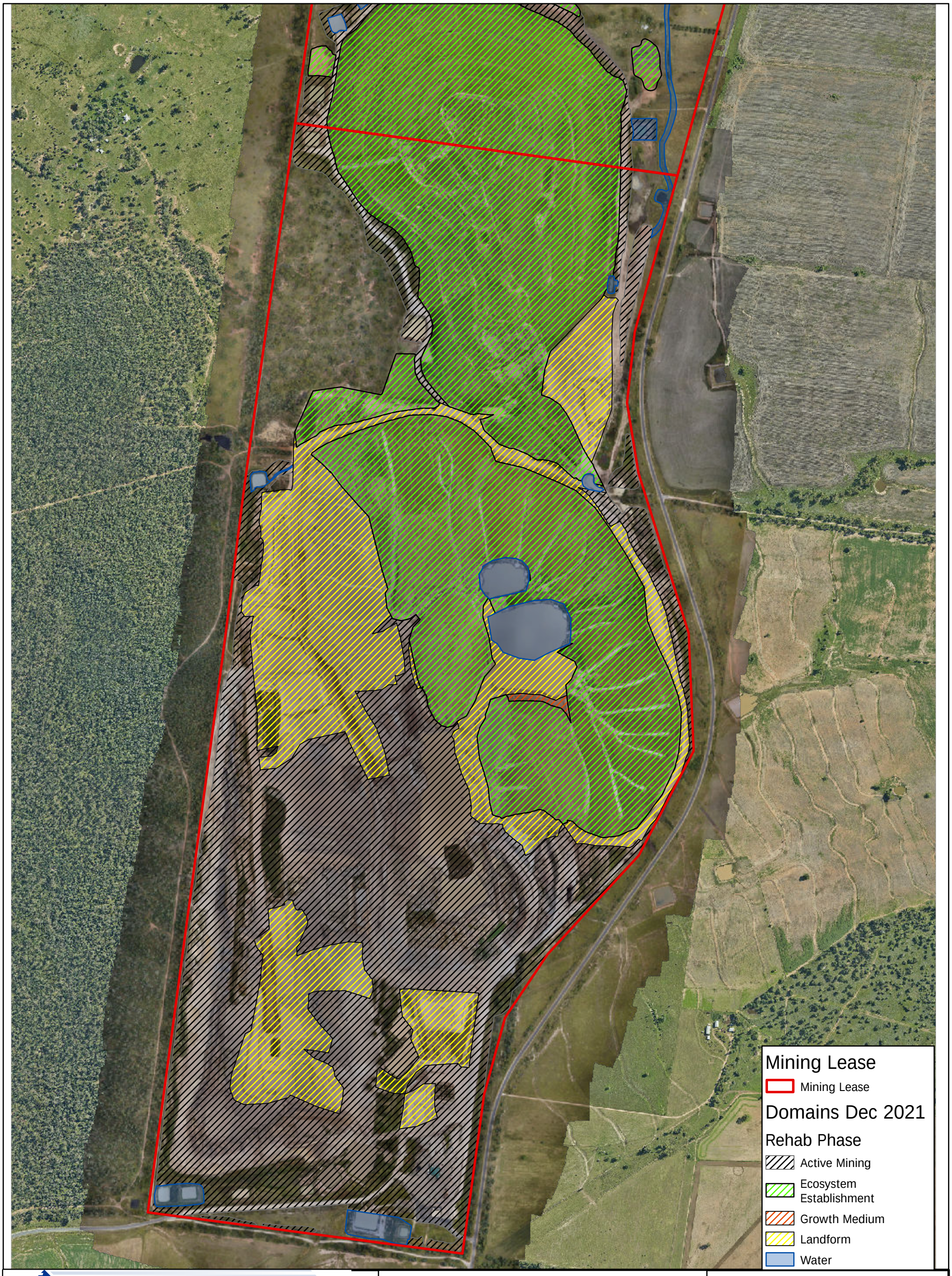
In cases where performance is sub-optimal, additional management measures will be implemented (e.g. replanting/seeding, repairing landform and water management features, additional soil amelioration, feral

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

- Ongoing bulk earthworks using dozer to shape the void and western overburden dump, rock lining designed drop structures.
- Infill planting of Hiko seedlings across site to improve tree density.
- 60ha of land planted to ecosystem establishment
- Test pitting to determine depth of carbonaceous material below final landform within the western overburden dump.

Figure10: 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. Meetings at present, are generally held every 6 months, although availability of members can result in postponement. During the reporting period, one meeting was held in February 2021. Due to the mine going into closure and Covid19 restrictions, the independent chairperson has proposed meeting frequencies will be up for review by the committee.

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.

One complaint was received during the reporting period. The complaint was made at 12:30pm on 1/03/2021, the nature of the complaint was erratic driving and tailgating and an investigation undertaken by Whitehaven Coal involved speaking to the delivery driver and complainant, followed by discussion with contract owner and complaint report submitted.

TABLE 9.2 COMPLAINTS HISTORY

Topic	Calendar Year						
	2015	2016	2017	2018	2019	2020	2021
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 $250,444.65 to local Gunnedah and Regional groups during the reporting period. Groups which received contributions included, but were not limited to the following;

Gunnedah

Gunny Munny
Gunnedah Show Society
St Marys College
Two Rivers Arts Council

Regional

The OBG Co
The OBG Co
Currabubula Red Cross
Westpac Rescue Helicopter Service

Legacy
Rotary Mental Health
Curlewis Public School
Gunnedah South Public School
Gunnedah High School
Gunnedah Public School
Gunnedah Ministers Fraternal
Gunnedah Water Tower Museum
Gunnedah PCYC
Gunnedah Shire Band Incorporated
The Gunnedah Tennis Club
Firebug Photography
Black n Blue Boxing
Gunnedah Show Society
Gunnedah Eisteddfod Society
Clontarf Foundation
Clontarf Foundation
Gunnedah Can Assist
Gunnedah Bulldogs Rugby League Club
Mary Ranken Child Care Centre
Dorothea Mackellar Poetry Awards
Gunnedah Junior Rugby League Football Club
Gunnedah Junior Rugby League Football Club
Gunnedah High School
Challenge Community Services
Rotary Club of Gunnedah West Inc
Funktionality Event Management
Gunnedah Baptist Community Preschool
Gunnedah Public School
Carroll Community Bus Incorporated
Gunnedah & district Chamber of Commerce
Winanga-Li Early Learning & care services
Gunnedah Community Carols
Lions Club Gunnedah
Gunnedah District cricket Association & gunnedah junior cricket
Gunnedah South School
Open Opportunities
Gunnedah High School
Gomeroi Roos
Clontarf Foundation
Operation Pilgrimage Group
Curlewis Pre-School
Liberty Party
West Tigers Rugby League Club
Clontarf Foundation
Operation Pilgrimage Group
Special Children's Christmas Party
Touch Rugby League
St Vincent De Paul Society
Pilliga CWA
Tamworth Family Suppot

10. INDEPENDENT AUDIT

The most recent Independent Environmental Audit (IEA) occurred during early 2019, with submission of the final report and response to Audit Recommendations submitted to the Department in June 2019. Non-compliances identified by the IEA were risk ranked by the auditor in accordance with the compliance status key for **Table 1b**. RCM subsequently developed an Audit Action Plan for these 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 March 2022.

11. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 Reportable Incidents

There were no non-conformances during the reporting period.

11.2 Non-compliances.

Outstanding action from previous Annual Review was the surrender of Approval MP06-0198. The surrender was accepted by DPIE on 01March2021.

TABLE 11.2 NON-COMPLIANCES

Approval(s)	Schedule/Condition	Non-compliance	Action(s)
None			

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 MOP timing;
- The continuation of environmental monitoring and management, as per the relevant approvals and environmental management plans;
- Planting of 60ha of disturbed area to ecosystem establishment.
- 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.
- Three Yearly Independent Environmental Audit will be undertaken.

13.APPENDICES

13.1 Appendix 1: Surface water

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	09-Feb-21	26-May-21	23-Aug-21	02-Dec-21
Rec ID	**79328**	**80544**	**82202**	**83501**
Lab Ref	**89982**	**91188**	**92187**	**93421**
Antimony (total)	<0.001	<0.001	<0.001	<0.001
Appearance	Turbid	Slight Turbid	Turbid	TURBID
Arsenic-Total (mg/L)	0.001	0.002	0.004	0.004
Colour	Green	Greenish	Brown	BROWN
EC - Field	410.	565.	340.	405.
Electrical Conductivity @ 25°C (µS/cm)	404.	544.	313.	348.
Molybdenum (total)	0.043	0.014	0.16	0.003
Odour	Nil	Nil	Nil	NIL
Oil & Grease	7.	7.	15.	<5
pH (pH Unit)	7.6	7.3	7.5	7.9
pH Value (pH Unit)	7.59	7.6	6.84	7.79
Selenium-Total (mg/L)	<0.01	<0.01	<0.01	<0.01
Temperature	20.5	15.1	14.8	22.8
Total Organic Carbon	42.	32.	248.	9.
Total Suspended Solids (TSS)	120.	261.	175.	1,910.

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	09-Feb-21	26-May-21	23-Aug-21	02-Dec-21
Rec ID	**79330**	**80541**	**82199**	**83498**
Lab Ref	**89984**	**91185**	**92184**	**93418**
Antimony (total)	<0.001	<0.001	<0.001	<0.001
Appearance	Slight Turbid	Turbid	Turbid	TURBID
Arsenic-Total (mg/L)	0.003	0.006	0.006	0.004
Colour	Brown	Brown	Brown	BROWN
EC - Field	350.	405.	405.	302.
Electrical Conductivity @ 25°C (µS/cm)	344.	383.	390.	249.
Molybdenum (total)	0.002	0.001	0.002	0.001
Odour	Nil	Nil	Nil	NIL
Oil & Grease	<5	<5	<5	<5
pH (pH Unit)	7.9	7.8	8.2	7.3
pH Value (pH Unit)	8.05	8.01	7.93	7.78
Selenium-Total (mg/L)	<0.01	<0.01	<0.01	<0.01
Temperature	22.5	13.1	12.9	24.3
Total Organic Carbon	2.	<1	4.	6.
Total Suspended Solids (TSS)	54.	45.	56.	81.

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	05-Jan-21
Rec ID	**78631**
Lab Ref	
Electrical Conductivity @ 25°C (µS/cm)	257.
Oil & Grease	5.
pH Value (pH Unit)	7.55
Total Organic Carbon	46.
Total Suspended Solids (TSS)	63.

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	05-Jan-21	02-Feb-21
Rec ID	**78633**	**79319**
Lab Ref		
Electrical Conductivity @ 25°C (µS/cm)	339.	460.
Oil & Grease	5.	5.
pH Value (pH Unit)	8.24	8.64
Total Organic Carbon	4.	18.
Total Suspended Solids (TSS)	81.	26,300.

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	09-Feb-21	26-May-21	23-Aug-21	02-Dec-21	
Rec ID	**79329**	**80540**	**82198**	**83497**	
Lab Ref	**89983**	**91184**	**92183**	**93417**	
Antimony (total)	<0.001	0.002	<0.001	<0.001	
Appearance	Turbid	Turbid	Turbid	TURBID	
Arsenic-Total (mg/L)	0.007	0.005	0.008	0.005	
Colour	Brown	Brown	Brown	BROWN	
EC - Field	395.	465.	510.	465.	
Electrical Conductivity @ 25°C (µS/cm)	391.	462.	496.	413.	440.5
Molybdenum (total)	0.001	0.002	0.002	0.001	
Odour	Nil	Nil	Nil	NIL	
Oil & Grease	<5	<5	<5	<5	<5
pH (pH Unit)	8.5	7.9	8.7	8.3	
pH Value (pH Unit)	8.63	8.13	8.14	8.11	8.2525
Selenium-Total (mg/L)	<0.01	<0.01	0.01	<0.01	
Temperature	20.8	13.6	13.2	24.7	
Total Organic Carbon	1.	<1	10.	4.	
Total Suspended Solids (TSS)	394.	35.	86.	106.	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	08-Jan-21	02-Feb-21	09-Feb-21	26-May-21	23-Aug-21	02-Dec-21	
Rec ID	**78715**	**79318**	**79332**	**80539**	**82197**	**83496**	
Lab Ref			**89986**	**91183**	**92182**	**93416**	
Antimony (total)			<0.001	<0.001	<0.001	<0.001	
Appearance			Slight Turbid	Turbid	Turbid		
Arsenic-Total (mg/L)			0.003	0.006	0.007	0.007	
Colour			Brown	Brown	Brown	BROWN	
Comments		No upstream or downstream					
EC - Field			390.	450.	470.	400.	
Electrical Conductivity @ 25°C (µS/cm)	350.	360.	381.	455.	459.	357.	393.666667
Molybdenum (total)			0.003	0.003	0.002	<0.001	
Odour			Nil	Nil	Nil	NIL	
Oil & Grease	5.	5.	<5	<5	<5	<5	<5
pH (pH Unit)			9.	8.	8.4	8.4	
pH Value (pH Unit)	8.27	8.36	8.49	7.85	7.51	7.86	8.056667
Selenium-Total (mg/L)			<0.01	<0.01	<0.01	<0.01	
Temperature			22.5	16.1	12.8	25.	
Total Organic Carbon	6.	4.	<1	<1	8.	5.	
Total Suspended Solids (TSS)	12.	102.	62.	30.	54.	144.	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	09-Feb-21	26-May-21	23-Aug-21	02-Dec-21	
Rec ID	**79331**	**80542**	**82200**	**83499**	
Lab Ref	**89985**	**91186**	**92185**	**93419**	
Antimony (total)	<0.001	<0.001	<0.001	<0.001	
Appearance	Slight Turbid	Slight Turbid	Turbid	SLIGHT TURBID	
Arsenic-Total (mg/L)	0.001	0.001	0.002	0.002	
Colour	Brown	Brown	Brown	BROWN	
EC - Field	85.	105.	110.	140.	
Electrical Conductivity @ 25°C (µS/cm)	77.	87.	87.	102.	88.25
Molybdenum (total)	<0.001	<0.001	<0.001	<0.001	
Odour	Nil	Nil	Nil	NIL	
Oil & Grease	<5	6.	<5	<5	<5
pH (pH Unit)	7.8	7.6	7.9	7.5	
pH Value (pH Unit)	7.62	7.44	7.31	7.19	7.39
Selenium-Total (mg/L)	<0.01	<0.01	<0.01	<0.01	
Temperature	21.5	14.3	13.5	27.4	
Total Organic Carbon	4.	7.	15.	16.	
Total Suspended Solids (TSS)	47.	17.	45.	32.	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	05-Jan-21
Rec ID	**78632**
Lab Ref	
Electrical Conductivity @ 25°C (µS/cm)	324.
Oil & Grease	5.
pH Value (pH Unit)	7.41
Total Organic Carbon	16.
Total Suspended Solids (TSS)	63.

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	09-Feb-21	22-Mar-21	26-May-21	23-Aug-21	02-Dec-21	
Rec ID	**79333**	**79897**	**80543**	**82201**	**83500**	
Lab Ref	**89987**		**91187**	**92186**	**93420**	
Aluminium (total) (mg/L)			26.8			
Antimony (total)		0.001				
Appearance			Turbid	Slight Turbid	TURBID	
Arsenic-Total (mg/L)		0.013	0.014			
Bicarbonate Alkalinity as CaCO3 (mg/L)			144.			
Carbonate Alkalinity as CaCO3 (mg/L)			1.			
Chloride (mg/L)			33.			
Colour			Brown	Brown	BROWN	
Comments	NO SAMPLE					
EC - Field			460.	500.	435.	
Electrical Conductivity @ 25°C (µS/cm)		396.	439.	483.	392.	427.5
Hydroxide Alkalinity as CaCO3 (mg/L)			1.			
Iron-Total (mg/L)			19.			
Manganese (total)			0.468			
Molybdenum (total)		0.003				
Odour			Nil	Nil	NIL	
Oil & Grease		5.	<5	<5	<5	<5
pH (pH Unit)			8.	8.4	8.	
pH Value (pH Unit)		8.35	8.23	8.21	8.06	8.2125
Selenium-Total (mg/L)		0.01				
Sodium			96.			
Temperature			15.4	15.7	24.	
Total Alkalinity as CaCO3 (mg/L)			144.			
Total Organic Carbon		2.	<1	6.	4.	
Total Suspended Solids (TSS)		119.	63.	338.	164.	

Outliers: 0

Field Name	Result	Outlier Comment

13.2 Appendix 2: Ground water

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	20-Apr-21	29-Jun-21	16-Sep-21	21-Dec-21
Rec ID	**80165**	**81370**	**82515**	**83892**
Lab Ref	**90809**		**92435**	
Aluminium (total) (mg/L)	0.37		0.03	
Ammonia as Nitrogen (N)	0.02		0.06	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	1.03		1.12	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	617.		613.	
Boron (total)	0.07		0.08	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	271.		267.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	1,470.		1,420.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Nil	Clear
Comments		Belmont		Belmont
Copper-Total (mg/L)	0.002		0.001	
EC - Field	4,060.	450.	5,050.	5,030.
Electrical Conductivity @ 25°C (µS/cm)	5,320.		5,230.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	1.6		2.48	
Iron-Total (mg/L)	0.59		0.31	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	164.		153.	
Manganese (total)	0.031		0.007	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		0.002	
Nitrate as N (mg/L)	0.93		1.42	
Nitrite + Nitrate as N (mg/L)	0.93		1.42	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.1	7.	6.9	6.9

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	7.1		7.01	
Potassium-Dissolved (mg/L)	7.		6.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	578.		550.	
Standing Water Level				12.35
Stick up	1.		1.	1.
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	12.		11.	
Temperature	19.1	18.5	18.5	21.9
Total Alkalinity as CaCO3 (mg/L)	617.		613.	
Total Anions	54.		52.5	
Total Cations	52.3		50.	
Total Dissolved Solids @180°C-Total (mg/L)	3,600.		3,720.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	17.12	16.78	15.49	13.35
Zinc (total)	0.053		0.011	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	10-Mar-21	29-Jun-21	16-Sep-21	21-Dec-21
Rec ID	**79619**	**81381**	**82518**	**83893**
Lab Ref	**90270**		**92438**	
Aluminium (total) (mg/L)	0.04		<0.01	
Ammonia as Nitrogen (N)	0.01		<0.01	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.003		0.003	
Barium (total)	0.69		0.659	
Beryllium (total)	0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	621.		615.	
Boron (total)	0.09		0.11	
Cadmium-Total (mg/L)	0.0001		<0.0001	
Calcium-Dissolved (mg/L)	133.		132.	
Carbonate Alkalinity as CaCO3 (mg/L)	1.		<1	
Chloride (mg/L)	657.		621.	
Chromium-Total (mg/L)	0.002		<0.001	
Cobalt	0.001		<0.001	
Colour	Clear	Clear	Nil	Clear
Comments			LOGGER DATA	Belmont - Logger
Copper-Total (mg/L)	0.194		0.039	
EC - Field	2,950.	2,600.	2,800.	2,840.
Electrical Conductivity @ 25°C (µS/cm)	2,960.		2,880.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.		<1	
Ionic Balance (%)	4.02		4.6	
Iron-Total (mg/L)	0.05		<0.05	
Lead-Total (mg/L)	0.001		<0.001	
Magnesium-Dissolved (mg/L)	60.		57.	
Manganese (total)	0.004		0.008	
Mercury-Total (mg/L)	0.0001		0.0002	
Nickel-Total (mg/L)	0.002		0.002	
Nitrate as N (mg/L)	3.97		3.79	
Nitrite + Nitrate as N (mg/L)	3.97		3.79	
Nitrite as N (mg/L)	0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.1	7.1	7.2	7.3

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	7.86		7.32	
Potassium-Dissolved (mg/L)	4.		4.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	0.01		<0.01	
Sodium-Dissolved (mg/L)	414.		390.	
Standing Water Level	17.69	16.84	15.19	13.11
Stick up	0.7		0.7	0.7
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	59.		61.	
Temperature	23.8	18.3	18.7	21.8
Total Alkalinity as CaCO3 (mg/L)	621.		615.	
Total Anions	32.2		31.1	
Total Cations	29.7		28.3	
Total Dissolved Solids @180°C-Total (mg/L)	1,750.		1,610.	
Vanadium	0.03		0.02	
Water Depth to Stand	18.39	17.54	15.89	13.81
Zinc (total)	0.031		0.04	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	14-Mar-21	24-Jun-21	29-Sep-21	14-Dec-21
Rec ID	**80122**	**81372**	**82682**	**83894**
Lab Ref	**90766**		**92602**	
Comments	DRY	Dry	DRY - NO SAMPLE	Dry - Stratford

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	10-Mar-21	24-Jun-21	16-Sep-21	14-Dec-21
Rec ID	**79620**	**81382**	**82519**	**83895**
Lab Ref	**90271**		**92439**	
Aluminium (total) (mg/L)	0.02		0.02	
Ammonia as Nitrogen (N)	0.01		<0.01	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.005		0.004	
Barium (total)	0.083		0.083	
Beryllium (total)	0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	527.		519.	
Boron (total)	0.05		0.06	
Cadmium-Total (mg/L)	0.00001		<0.0001	
Calcium-Dissolved (mg/L)	16.		20.	
Carbonate Alkalinity as CaCO3 (mg/L)	1.		<1	
Chloride (mg/L)	117.		104.	
Chromium-Total (mg/L)	0.006		<0.001	
Cobalt	0.001		<0.001	
Colour	Clear	Clear	Nil	Clear
Comments			LOGGER DATA	Stratford - Logger
Copper-Total (mg/L)	0.001		0.007	
EC - Field	1,230.	1,235.	1,180.	1,150.
Electrical Conductivity @ 25°C (µS/cm)	1,290.		1,280.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.		<1	
Ionic Balance (%)	2.47		3.97	
Iron-Total (mg/L)	0.05		<0.05	
Lead-Total (mg/L)	0.001		<0.001	
Magnesium-Dissolved (mg/L)	14.		14.	
Manganese (total)	0.001		0.002	
Mercury-Total (mg/L)	0.0001		<0.0001	
Nickel-Total (mg/L)	0.001		<0.001	
Nitrate as N (mg/L)	0.68		0.68	
Nitrite + Nitrate as N (mg/L)	0.68		0.68	
Nitrite as N (mg/L)	0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.7	7.8	7.8	7.7

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	8.26		7.6	
Potassium-Dissolved (mg/L)	2.		2.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	0.01		<0.01	
Sodium-Dissolved (mg/L)	273.		246.	
Standing Water Level	22.67	21.95	21.98	21.8
Stick up	0.6		0.8	0.6
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	36.		32.	
Temperature	24.1	20.6	19.9	22.6
Total Alkalinity as CaCO3 (mg/L)	527.		519.	
Total Anions	14.6		14.	
Total Cations	13.9		12.9	
Total Dissolved Solids @180°C-Total (mg/L)	802.		811.	
Vanadium	0.03		0.03	
Water Depth to Stand	23.27	22.55	22.58	22.4
Zinc (total)	0.005		0.008	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

Data Point: MP4; Northing: ; Easting:

	07-Apr-21	24-Jun-21	29-Sep-21	21-Dec-21
Rec ID	**79955**	**81373**	**82683**	**83896**
Lab Ref	**90599**		**92603**	
Comments	DRY	Dry	DRY - NO SAMPLE	Dry - Surrey Lane

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	07-Apr-21	24-Jun-21	29-Sep-21	21-Dec-21
Rec ID	**79953**	**81374**	**82680**	**83897**
Lab Ref	**90597**		**92600**	
Aluminium (total) (mg/L)	0.01		0.1	
Ammonia as Nitrogen (N)			0.29	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.712		0.475	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	892.		680.	
Boron (total)	0.05		<0.05	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	48.		32.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	1,020.		1,280.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Clear	Clear
Comments				Surrey Lane
Copper-Total (mg/L)	0.001		0.004	
EC - Field	5,020.	5,230.	5,370.	5,310.
Electrical Conductivity @ 25°C (µS/cm)	4,890.		5,480.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	1.95		2.1	
Iron-Total (mg/L)	<0.05		0.23	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	30.		27.	
Manganese (total)	1.2		0.68	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		0.001	
Nitrate as N (mg/L)	0.1		0.04	
Nitrite + Nitrate as N (mg/L)	0.1		0.04	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Yes	Nil	Nil	Nil
pH (pH Unit)	7.3	7.3	7.4	7.4

pH Value (pH Unit)	8.15		7.97	
Potassium-Dissolved (mg/L)	5.		2.	
Purge Type	Bail	Bail	Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	1,020.		1,050.	
Standing Water Level	29.01	28.97	28.81	28.97
Stick up	0.85		0.85	0.85
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	42.		95.	
Temperature	20.9	20.5	18.	22.3
Total Alkalinity as CaCO3 (mg/L)	892.		680.	
Total Anions	47.5		51.7	
Total Cations	49.4		49.5	
Total Dissolved Solids @180°C-Total (mg/L)	2,930.		3,240.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	29.86	29.82	29.66	29.82
Zinc (total)	0.02		0.038	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	10-Mar-21		24-Jun-21	16-Sep-21	14-Dec-21
Rec ID	**79618**	**79954**	**81375**	**82517**	**83898**
Lab Ref	**90269**	**90598**		**92437**	
Aluminium (total) (mg/L)	0.06			0.15	
Ammonia as Nitrogen (N)	0.01			<0.01	
Appearance	Clear	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.003			0.003	
Barium (total)	0.89			0.09	
Beryllium (total)	0.001			<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	684.			755.	
Boron (total)	0.05			<0.05	
Cadmium-Total (mg/L)	0.0001			<0.0001	
Calcium-Dissolved (mg/L)	9.			8.	
Carbonate Alkalinity as CaCO3 (mg/L)	27.			<1	
Chloride (mg/L)	567.			541.	
Chromium-Total (mg/L)	0.001			<0.001	
Cobalt	0.001			<0.001	
Colour	Clear	Clear	Clear	Nil	Clear
Comments				LOGGER DATA	Surrey Lane - Logger
Copper-Total (mg/L)	0.004			0.012	
EC - Field	3,060.	3,060.	3,150.	3,050.	3,050.
Electrical Conductivity @ 25°C (µS/cm)	3,090.			3,010.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.			<1	
Ionic Balance (%)	3.34			6.51	
Iron-Total (mg/L)	0.09			0.2	
Lead-Total (mg/L)	0.001			<0.001	
Magnesium-Dissolved (mg/L)	9.			9.	
Manganese (total)	0.068			0.178	
Mercury-Total (mg/L)	0.001			<0.0001	
Nickel-Total (mg/L)	0.001			0.002	
Nitrate as N (mg/L)	0.03			0.02	
Nitrite + Nitrate as N (mg/L)	0.03			0.02	
Nitrite as N (mg/L)	0.01			<0.01	
Odour	Nil	Nil	Nil	Nil	Nil
pH (pH Unit)	7.8	7.8	7.8	7.9	7.5

pH Value (pH Unit)	8.38			7.9	
Potassium-Dissolved (mg/L)	3.			2.	
Purge Type	Bail	Bail		Bail	Bail
Selenium-Total (mg/L)	0.01			<0.01	
Sodium-Dissolved (mg/L)	679.			635.	
Standing Water Level	25.69		25.93	25.62	25.66
Stick up	0.9	0.9		0.9	0.9
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	131.			119.	
Temperature	22.4	22.4	20.2	18.9	21.7
Total Alkalinity as CaCO3 (mg/L)	711.			755.	
Total Anions	32.9			32.8	
Total Cations	30.8			28.8	
Total Dissolved Solids @180°C-Total (mg/L)	1,770.			1,810.	
Vanadium	0.01			<0.01	
Water Depth to Stand	26.59		26.83	26.52	26.56
Zinc (total)	0.006			0.034	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	14-Apr-21	24-Jun-21	20-Sep-21	14-Dec-21
Rec ID	**80123**	**81365**	**82578**	**83899**
Lab Ref	**90767**		**92498**	
Comments	Dry	Dry	DRY - NO SAMPLE	Dry

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	10-Mar-21	24-Jun-21	20-Sep-21	14-Dec-21
Rec ID	**79958**	**81394**	**82580**	**83900**
Lab Ref	**90602**		**92500**	
Comments	DRY - LOGGER	Dry	DRY - UNABLE TO	Dry - Yarrawonga

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	10-Mar-21	24-Jun-21	16-Sep-21	14-Dec-21
Rec ID	**79621**	**81395**	**82520**	**83901**
Lab Ref	**90272**		**92440**	
Aluminium (total) (mg/L)	0.12		0.04	
Ammonia as Nitrogen (N)	0.84		0.84	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.004		0.003	
Barium (total)	0.195		0.176	
Beryllium (total)	0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	821.		881.	
Boron (total)	0.07		0.08	
Cadmium-Total (mg/L)	0.0001		<0.0001	
Calcium-Dissolved (mg/L)	6.		6.	
Carbonate Alkalinity as CaCO3 (mg/L)	15.		<1	
Chloride (mg/L)	146.		131.	
Chromium-Total (mg/L)	0.001		<0.001	
Cobalt	0.001		<0.001	
Colour	Clear	Clear	Nil	Clear
Comments			LOGGER DATA	Costa Vale - Logger
Copper-Total (mg/L)	0.006		0.006	
EC - Field	1,650.	1,620.	1,600.	1,520.
Electrical Conductivity @ 25°C (µS/cm)	1,780.		1,770.	
Hydroxide Alkalinity as CaCO3 (mg/L)	1.		<1	
Ionic Balance (%)	3.17		7.52	
Iron-Total (mg/L)	0.95		0.72	
Lead-Total (mg/L)	0.001		<0.001	
Magnesium-Dissolved (mg/L)	5.		6.	
Manganese (total)	0.055		0.045	
Mercury-Total (mg/L)	0.0001		0.0002	
Nickel-Total (mg/L)	0.002		0.002	
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)	7.9	7.8	7.9	7.5

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	8.32		7.8	
Potassium-Dissolved (mg/L)	5.		5.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	0.01		<0.01	
Sodium-Dissolved (mg/L)	430.		400.	
Standing Water Level	8.46	8.13	8.19	7.84
Stick up	0.65		0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	1.		<1	
Temperature	25.	20.7	19.4	21.44
Total Alkalinity as CaCO3 (mg/L)	836.		881.	
Total Anions	20.8		21.3	
Total Cations	19.5		18.3	
Total Dissolved Solids @180°C-Total (mg/L)	1,060.		1,060.	
Vanadium	0.01		<0.01	
Water Depth to Stand	9.11	8.78	8.84	8.49
Zinc (total)	0.007		0.018	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	07-Apr-21	06-Jul-21	30-Sep-21	21-Dec-21
Rec ID	**79956**	**81396**	**82685**	**83902**
Lab Ref	**90600**		**92605**	
Aluminium (total) (mg/L)	0.12		0.07	
Ammonia as Nitrogen (N)			<0.01	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.006		0.004	
Barium (total)	0.766		0.639	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	669.		708.	
Boron (total)	0.11		0.09	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	93.		84.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	522.		556.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	0.004		0.001	
Colour	Clear	Clear	Clear	Clear
Comments				Mine Site
Copper-Total (mg/L)	0.01		0.002	
EC - Field	3,090.	2,910.	2,980.	2,870.
Electrical Conductivity @ 25°C (µS/cm)	2,840.		2,850.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	2.38		4.48	
Iron-Total (mg/L)	1.37		0.45	
Lead-Total (mg/L)	0.002		<0.001	
Magnesium-Dissolved (mg/L)	51.		48.	
Manganese (total)	0.296		0.069	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	0.004		<0.001	
Nitrate as N (mg/L)	2.32		2.01	
Nitrite + Nitrate as N (mg/L)	2.32		2.01	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.2	7.	7.1	7.1

pH Value (pH Unit)	7.91		7.81	
Potassium-Dissolved (mg/L)	3.		3.	
Purge Type	Bail	Bail	Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	490.		452.	
Standing Water Level	31.13	31.5	31.67	31.73
Stick up	0.65		0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	35.		32.	
Temperature	20.2	20.1	19.7	20.3
Total Alkalinity as CaCO3 (mg/L)	669.		708.	
Total Anions	28.8		30.5	
Total Cations	30.2		27.9	
Total Dissolved Solids @180°C-Total (mg/L)	1,720.		1,710.	
Vanadium	0.04		0.03	
Water Depth to Stand	31.78	32.15	32.32	32.38
Zinc (total)	0.075		0.016	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	07-Apr-21	06-Jul-21	30-Sep-21	21-Dec-21
Rec ID	**79957**	**81397**	**82686**	**83903**
Lab Ref	**90601**		**92606**	
Aluminium (total) (mg/L)	0.04		0.14	
Ammonia as Nitrogen (N)			0.66	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	0.003		0.004	
Barium (total)	0.916		0.867	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	636.		652.	
Boron (total)	0.09		0.08	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	184.		187.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	984.		1,150.	
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)	0.001		0.004	
EC - Field	4,350.	4,280.	4,610.	4,530.
Electrical Conductivity @ 25°C (µS/cm)	4,320.		4,610.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	3.76		3.1	
Iron-Total (mg/L)	1.16		1.55	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	105.		109.	
Manganese (total)	1.62		1.81	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		<0.001	
Nitrate as N (mg/L)	0.64		<0.01	
Nitrite + Nitrate as N (mg/L)	0.64		<0.01	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.1	7.	7.	7.

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	7.74	19.8	7.59	
Potassium-Dissolved (mg/L)	5.		4.	
Purge Type	Bail	Bail	Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	597.		561.	
Standing Water Level	31.27	31.62	31.76	31.72
Stick up	0.65		0.65	0.65
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	13.		4.	
Temperature	20.4	20.7	19.5	20.1
Total Alkalinity as CaCO3 (mg/L)	636.		652.	
Total Anions	40.7		45.6	
Total Cations	43.9		42.8	
Total Dissolved Solids @180°C-Total (mg/L)	2,550.		2,850.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	31.92	32.27	32.41	32.37
Zinc (total)	0.018		0.059	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	30-Jun-21	28-Sep-21	21-Dec-21
Rec ID	**79985**	**81369**	**82672**	**83904**
Lab Ref	**90629**		**92592**	
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)	0.071		0.103	
Beryllium (total)	<0.001		0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	200.		383.	
Boron (total)	0.09		0.06	
Cadmium-Total (mg/L)	<0.0001		0.0001	
Calcium-Dissolved (mg/L)	100.		188.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		1.	
Chloride (mg/L)	910.		979.	
Chromium-Total (mg/L)	<0.001		0.001	
Cobalt	<0.001		0.001	
Colour	Clear	Clear		Clear
Comments			PUMP OVER BORE - NO	Pump Over Bore
Copper-Total (mg/L)	0.001		0.018	
EC - Field	3,310.	3,390.	1,880.	3,300.
Electrical Conductivity @ 25°C (µS/cm)	3,430.		3,820.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		1.	
Ionic Balance (%)	1.57		1.35	
Iron-Total (mg/L)	<0.05		0.05	
Lead-Total (mg/L)	<0.001		0.004	
Magnesium-Dissolved (mg/L)	38.		43.	
Manganese (total)	0.007		0.002	
Mercury-Total (mg/L)	<0.0001		0.0001	
Nickel-Total (mg/L)	<0.001		0.001	
Nitrate as N (mg/L)	0.52		0.1	
Nitrite + Nitrate as N (mg/L)	0.52		0.1	
Nitrite as N (mg/L)	<0.01		0.01	
Odour	Nil	Nil		Nil
pH (pH Unit)	8.	7.9	7.9	7.9

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	8.04		7.72	
Potassium-Dissolved (mg/L)	5.		4.	
Purge Type	Tank	Tank		Tank
Selenium-Total (mg/L)	<0.01		0.01	
Sodium-Dissolved (mg/L)	496.		515.	
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	53.		54.	
Temperature	21.1	14.1	18.2	27.9
Total Alkalinity as CaCO3 (mg/L)	200.		383.	
Total Anions	30.8		36.4	
Total Cations	29.8		35.4	
Total Dissolved Solids @180°C-Total (mg/L)	2,090.		2,400.	
Vanadium	<0.01		0.01	
Zinc (total)	<0.005		0.025	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	13-Apr-21	24-Jun-21	20-Sep-21	14-Dec-21
Rec ID	**80012**	**81379**	**82579**	**83906**
Lab Ref	**90656**		**92499**	
Comments		No sample - windmill over	SWL ONLY - UNABLE TO	Broken windmill over
Standing Water Level	8.3	7.97	8.06	7.75
Water Depth to Stand	8.7	8.37	8.46	8.15

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	29-Jul-21	22-Sep-21	22-Dec-21
Rec ID	**79980**	**81360**	**82614**	**83907**
Lab Ref	**90624**		**92534**	
Aluminium (total) (mg/L)	0.09		0.3	
Ammonia as Nitrogen (N)	1.43		0.74	
Appearance	Clear	Clear	Slight Turbid	Clear
Arsenic-Total (mg/L)	0.004		0.012	
Barium (total)	0.048		0.074	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	820.		760.	
Boron (total)	0.07		0.1	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	135.		49.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	163.		162.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Slight Brown	Clear
Comments				Brolga - Shed
Copper-Total (mg/L)	<0.001		0.009	
EC - Field	1,750.	1,550.	1,870.	1,650.
Electrical Conductivity @ 25°C (µS/cm)	2,090.		2,110.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	7.16		11.4	
Iron-Total (mg/L)	11.4		27.8	
Lead-Total (mg/L)	<0.001		0.01	
Magnesium-Dissolved (mg/L)	72.		74.	
Manganese (total)	0.082		0.187	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		0.002	
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	Sour	Nil
pH (pH Unit)	7.	7.	7.1	7.

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	7.6		7.73	
Potassium-Dissolved (mg/L)	1.		1.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	234.		230.	
Standing Water Level	141.38	14.46	14.57	14.47
Stick up	0.07		0.07	0.07
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	260.		268.	
Temperature	19.8	20.7	18.3	21.5
Total Alkalinity as CaCO3 (mg/L)	820.		760.	
Total Anions	26.4		25.3	
Total Cations	22.9		20.1	
Total Dissolved Solids @180°C-Total (mg/L)	1,320.		1,360.	
Vanadium	<0.01		0.02	
Water Depth to Stand	14.45	14.53	14.64	14.54
Zinc (total)	0.026		0.748	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	29-Jul-21	22-Sep-21
Rec ID	**79981**	**81359**	**82613**
Lab Ref	**90625**		**92533**
Aluminium (total) (mg/L)	<0.01		<0.01
Ammonia as Nitrogen (N)	<0.01		<0.01
Appearance	Clear		Clear
Arsenic-Total (mg/L)	<0.001		<0.001
Barium (total)	0.068		0.076
Beryllium (total)	<0.001		<0.001
Bicarbonate Alkalinity as CaCO3 (mg/L)	466.		434.
Boron (total)	<0.05		0.07
Cadmium-Total (mg/L)	<0.0001		<0.0001
Calcium-Dissolved (mg/L)	70.		87.
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1
Chloride (mg/L)	30.		31.
Chromium-Total (mg/L)	<0.001		<0.001
Cobalt	<0.001		<0.001
Colour	Clear		Clear
Comments		To wet to access	
Copper-Total (mg/L)	0.018		0.013
EC - Field	997.		950.
Electrical Conductivity @ 25°C (µS/cm)	997.		1,010.
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1
Ionic Balance (%)	7.42		1.56
Iron-Total (mg/L)	0.09		0.14
Lead-Total (mg/L)	0.003		0.002
Magnesium-Dissolved (mg/L)	37.		42.
Manganese (total)	0.002		0.002
Mercury-Total (mg/L)	<0.0001		<0.0001
Nickel-Total (mg/L)	<0.001		<0.001
Nitrate as N (mg/L)	0.21		0.19
Nitrite + Nitrate as N (mg/L)	0.21		0.19
Nitrite as N (mg/L)	<0.01		<0.01
Odour	Nil		Nil
pH (pH Unit)	7.3		7.4

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

pH Value (pH Unit)	7.83		8.07
Potassium-Dissolved (mg/L)	1.		1.
Purge Type	Tap		Tap
Selenium-Total (mg/L)	<0.01		<0.01
Sodium-Dissolved (mg/L)	85.		90.
Standing Water Level	18.83		18.75
Stick up	0.25		0.25
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	84.		88.
Temperature	20.2		19.7
Total Alkalinity as CaCO3 (mg/L)	466.		434.
Total Anions	11.9		11.4
Total Cations	10.3		11.7
Total Dissolved Solids @180°C-Total (mg/L)	625.		622.
Vanadium	<0.01		<0.01
Water Depth to Stand	19.08		19.
Zinc (total)	0.032		0.031

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	29-Jul-21	22-Sep-21
Rec ID	**79982**	**81361**	**82615**
Lab Ref	**90626**		**92535**
Aluminium (total) (mg/L)	0.04		0.17
Ammonia as Nitrogen (N)	12.9		3.71
Appearance	Clear		Clear
Arsenic-Total (mg/L)	<0.001		0.001
Barium (total)	0.066		0.03
Beryllium (total)	<0.001		<0.001
Bicarbonate Alkalinity as CaCO3 (mg/L)	844.		533.
Boron (total)	0.07		<0.05
Cadmium-Total (mg/L)	<0.0001		<0.0001
Calcium-Dissolved (mg/L)	28.		21.
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1
Chloride (mg/L)	241.		119.
Chromium-Total (mg/L)	<0.001		<0.001
Cobalt	<0.001		<0.001
Colour	Clear		Clear
Comments		To wet to access	
Copper-Total (mg/L)	<0.001		0.002
EC - Field	1,700.		1,160.
Electrical Conductivity @ 25°C (µS/cm)	2,010.		1,350.
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1
Ionic Balance (%)	9.31		1.34
Iron-Total (mg/L)	4.15		4.33
Lead-Total (mg/L)	<0.001		<0.001
Magnesium-Dissolved (mg/L)	72.		33.
Manganese (total)	0.201		0.161
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		<0.01
Nitrite as N (mg/L)	<0.01		<0.01
Odour	Nil		Nil
pH (pH Unit)	8.		8.

pH Value (pH Unit)	8.14		8.26
Potassium-Dissolved (mg/L)	4.		4.
Purge Type	Bail		Bail
Selenium-Total (mg/L)	<0.01		<0.01
Sodium-Dissolved (mg/L)	281.		233.
Standing Water Level	13.72		13.76
Stick up	0.22		0.22
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	1.		18.
Temperature	19.9		18.7
Total Alkalinity as CaCO3 (mg/L)	844.		533.
Total Anions	23.7		14.4
Total Cations	19.6		14.
Total Dissolved Solids @180°C-Total (mg/L)	1,070.		805.
Vanadium	<0.01		<0.01
Water Depth to Stand	13.94		13.98
Zinc (total)	0.09		0.209

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

Data Point: WB13; Northing: ; Easting:

	13-Apr-21	06-Aug-21	28-Sep-21	21-Dec-21
Rec ID	**79983**	**81380**	**82676**	**83910**
Lab Ref	**90627**		**92596**	
Aluminium (total) (mg/L)	<0.01		0.01	
Ammonia as Nitrogen (N)	<0.01		0.01	
Appearance	Clear	Clear		
Arsenic-Total (mg/L)	<0.001		0.001	
Barium (total)	0.017		0.016	
Beryllium (total)	<0.001		0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	520.		488.	
Boron (total)	0.09		0.08	
Cadmium-Total (mg/L)	<0.0001		0.0001	
Calcium-Dissolved (mg/L)	293.		280.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		1.	
Chloride (mg/L)	900.		908.	
Chromium-Total (mg/L)	<0.001		0.001	
Cobalt	<0.001		0.001	
Colour	Clear	Clear		
Comments				PUMP BROKEN /
Copper-Total (mg/L)	<0.001		0.001	
EC - Field	1,860.	3,500.	3,170.	
Electrical Conductivity @ 25°C (µS/cm)	3,870.		3,790.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		1.	
Ionic Balance (%)	0.56		0.83	
Iron-Total (mg/L)	<0.05		0.05	
Lead-Total (mg/L)	<0.001		0.001	
Magnesium			0.015	
Magnesium-Dissolved (mg/L)	83.		80.	
Manganese (total)	0.002		0.003	
Mercury-Total (mg/L)	0.0002		0.0002	
Nickel-Total (mg/L)	<0.001		0.001	
Nitrate as N (mg/L)	3.51		3.75	
Nitrite + Nitrate as N (mg/L)	3.51		3.75	
Nitrite as N (mg/L)	<0.01		0.001	
Odour	Nil	Nil		

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH (pH Unit)	7.2	7.4	7.	
pH Value (pH Unit)	7.95		7.38	
Potassium-Dissolved (mg/L)	6.		4.	
Purge Type	Tap			Tap
Selenium-Total (mg/L)	<0.01		0.01	
Sodium-Dissolved (mg/L)	397.		383.	
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	128.		124.	
Temperature	18.7	17.8	21.6	
Total Alkalinity as CaCO3 (mg/L)	520.		488.	
Total Anions	38.4		37.9	
Total Cations	38.9		37.3	
Total Dissolved Solids @180°C-Total (mg/L)	2,480.		2,690.	
Vanadium	<0.01		0.01	
Water Depth to Stand	36.04	34.64	34.18	33.17
Zinc (total)	0.012		0.05	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	13-Apr-21	30-Jun-21	29-Sep-21	21-Dec-21
Rec ID	**80011**	**81399**	**82681**	**83911**
Lab Ref	**90655**		**92601**	
Aluminium (total) (mg/L)	<0.01		<0.01	
Ammonia as Nitrogen (N)	<0.01		<0.01	
Appearance	Clear		Clear	Clear
Arsenic-Total (mg/L)	0.01		0.01	
Barium (total)	0.382		0.402	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	524.		510.	
Boron (total)	0.07		0.06	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	43.		35.	
Carbonate Alkalinity as CaCO3 (mg/L)	13.		<1	
Chloride (mg/L)	135.		139.	
Chromium-Total (mg/L)	0.005		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Clear	Clear
Comments		Clear		Solar - Pump
Copper-Total (mg/L)	0.005		0.015	
EC - Field	1,050.	1,180.	1,220.	1,180.
Electrical Conductivity @ 25°C (µS/cm)	1,320.		1,320.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	3.47		6.77	
Iron-Total (mg/L)	0.64		0.08	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	22.		19.	
Manganese (total)	<0.001		0.002	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		<0.001	
Nitrate as N (mg/L)	1.3		1.18	
Nitrite + Nitrate as N (mg/L)	1.3		1.18	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.7	7.5	7.6	7.6

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	8.31		8.01	
Potassium-Dissolved (mg/L)	3.		2.	
Purge Type	Tap	Tap	Tap	Tap
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	224.		211.	
Standing Water Level				20.44
Stick up			0.3	0.3
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	11.		12.	
Temperature	17.1	20.3	18.4	23.
Total Alkalinity as CaCO3 (mg/L)	537.		510.	
Total Anions	14.8		14.4	
Total Cations	13.8		12.5	
Total Dissolved Solids @180°C-Total (mg/L)	853.		870.	
Vanadium	0.06		0.07	
Water Depth to Stand	10.48	9.56	11.75	20.74
Zinc (total)	0.035		0.018	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	30-Jun-21	20-Sep-21	22-Dec-21
Rec ID	**79984**	**81398**	**82576**	**83912**
Lab Ref	**90628**		**92496**	
Aluminium (total) (mg/L)	0.1		<0.01	
Ammonia as Nitrogen (N)	6.93		3.15	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.183		0.174	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	784.		784.	
Boron (total)	0.05		0.06	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	167.		160.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	198.		194.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Clear	Clear
Copper-Total (mg/L)	<0.001		0.001	
EC - Field	1,530.	1,560.	1,560.	1,760.
Electrical Conductivity @ 25°C (µS/cm)	1,820.		1,740.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	9.65		8.08	
Iron-Total (mg/L)	7.97		4.86	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	52.		58.	
Manganese (total)	1.34		1.22	
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	Nil
pH (pH Unit)	7.	7.1	7.	7.
pH Value (pH Unit)	7.36		7.69	

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

Potassium-Dissolved (mg/L)	5.		3.	
Purge Type	Bail	Bail	Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	110.		119.	
Standing Water Level				28.52
Stick up	0.28		0.28	0.28
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	1.		2.	
Temperature	19.9	18.4	20.1	21.8
Total Alkalinity as CaCO3 (mg/L)	784.		784.	
Total Anions	21.3		21.2	
Total Cations	17.5		18.	
Total Dissolved Solids @180°C-Total (mg/L)	1,010.		1,040.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	28.4	28.87	28.71	28.8
Zinc (total)	0.055		0.02	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	30-Jul-21	29-Sep-21	22-Dec-21
Rec ID	**79986**	**81362**	**82677**	**83913**
Lab Ref	**90630**		**92597**	
Aluminium (total) (mg/L)	0.02		0.01	
Ammonia as Nitrogen (N)	0.04		0.02	
Appearance	Clear	Clear	Clear	Slightly turbid
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.1		0.114	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	63.		76.	
Boron (total)	0.06		<0.05	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	127.		171.	
Carbonate Alkalinity as CaCO3 (mg/L)	33.		<1	
Chloride (mg/L)	1,310.		1,640.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Clear	Green
Comments				Gate #4 - Windmill
Copper-Total (mg/L)	0.002		0.003	
EC - Field	4,100.	4,450.	5,150.	4,360.
Electrical Conductivity @ 25°C (µS/cm)	4,740.		5,440.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	6.02		1.67	
Iron-Total (mg/L)	<0.05		0.11	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	165.		158.	
Manganese (total)	0.013		0.022	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		<0.001	
Nitrate as N (mg/L)	<0.01		0.08	
Nitrite + Nitrate as N (mg/L)	<0.01		0.08	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	8.5	8.6	8.5	7.8

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	9.05		7.05	
Potassium-Dissolved (mg/L)	20.		12.	
Purge Type	Tank		Tank	Tank
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	558.		637.	
Standing Water Level	15.37	15.51	15.77	14.79
Stick up	0.38		0.38	0.38
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	36.		7.	
Temperature	22.6	13.1	14.6	24.5
Total Alkalinity as CaCO3 (mg/L)	96.		76.	
Total Anions	39.6		47.9	
Total Cations	44.7		49.6	
Total Dissolved Solids @180°C-Total (mg/L)	3,100.		3,030.	
Vanadium	<0.01		<0.01	
Water Depth to Stand	15.75	15.89	16.15	15.17
Zinc (total)	0.012		0.01	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	20-Apr-21	06-Jul-21	30-Sep-21	21-Dec-21
Rec ID	**80164**	**81363**	**82684**	**83914**
Lab Ref	**90808**		**92604**	
Aluminium (total) (mg/L)	0.07		0.01	
Ammonia as Nitrogen (N)	6.02		0.48	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.054		0.037	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	569.		255.	
Boron (total)	0.05		<0.05	
Cadmium-Total (mg/L)	<0.0001		<0.0001	
Calcium-Dissolved (mg/L)	238.		186.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	1,160.		842.	
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	3,440.	3,170.	3,160.	3,130.
Electrical Conductivity @ 25°C (µS/cm)	4,180.		3,140.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	7.34		0.26	
Iron-Total (mg/L)	0.38		0.07	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	160.		122.	
Manganese (total)	1.4		0.902	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		0.004	
Nitrate as N (mg/L)	<0.01		6.87	
Nitrite + Nitrate as N (mg/L)	<0.01		6.93	
Nitrite as N (mg/L)	<0.01		0.06	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	7.	7.	7.	7.

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	7.43		7.36	
Potassium-Dissolved (mg/L)	3.		5.	
Purge Type	Bail		Bail	Bail
Selenium-Total (mg/L)	<0.01		<0.01	
Sodium-Dissolved (mg/L)	300.		231.	
Standing Water Level	6.51	7.63	7.34	6.87
Stick up	0.58		0.58	0.58
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	6.		24.	
Temperature	18.9	18.6	19.5	20.7
Total Alkalinity as CaCO3 (mg/L)	569.		255.	
Total Anions	44.2		29.3	
Total Cations	38.2		29.5	
Total Dissolved Solids @180°C-Total (mg/L)	2,960.		2,130.	
Vanadium	0.01		0.02	
Water Depth to Stand	7.09	8.21	7.92	7.45
Zinc (total)	0.021		0.011	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	14-Apr-21	24-Jun-21	20-Sep-21	14-Dec-21
Rec ID	**80124**	**81364**	**82577**	**83915**
Lab Ref	**90768**		**92497**	
Comments	PUMP OVER BORE	Pump over bore	PUMP OVER BORE -	PUMP OVER BORE -

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	08-Apr-21	30-Jul-21	29-Sep-21	21-Dec-21
Rec ID	**79987**	**81366**	**82678**	**83916**
Lab Ref	**90631**		**92598**	
Aluminium (total) (mg/L)	0.02		<0.01	
Ammonia as Nitrogen (N)	0.01		<0.01	
Appearance	Clear	Clear	Clear	Clear
Arsenic-Total (mg/L)	<0.001		<0.001	
Barium (total)	0.075		0.11	
Beryllium (total)	<0.001		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)	328.		508.	
Boron (total)	0.05		0.07	
Cadmium-Total (mg/L)	0.0002		<0.0001	
Calcium-Dissolved (mg/L)	164.		274.	
Carbonate Alkalinity as CaCO3 (mg/L)	<1		<1	
Chloride (mg/L)	1,900.		2,320.	
Chromium-Total (mg/L)	<0.001		<0.001	
Cobalt	<0.001		<0.001	
Colour	Clear	Clear	Clear	Clear
Comments		Gate		Gate #1 Solar
Copper-Total (mg/L)	0.002		0.003	
EC - Field	6,110.	5,950.	6,890.	6,790.
Electrical Conductivity @ 25°C (µS/cm)	7,340.		7,720.	
Hydroxide Alkalinity as CaCO3 (mg/L)	<1		<1	
Ionic Balance (%)	5.3		2.3	
Iron-Total (mg/L)	0.79		0.7	
Lead-Total (mg/L)	<0.001		<0.001	
Magnesium-Dissolved (mg/L)	260.		245.	
Manganese (total)	0.016		0.072	
Mercury-Total (mg/L)	<0.0001		<0.0001	
Nickel-Total (mg/L)	<0.001		<0.001	
Nitrate as N (mg/L)	3.93		2.31	
Nitrite + Nitrate as N (mg/L)	3.93		2.31	
Nitrite as N (mg/L)	<0.01		<0.01	
Odour	Nil	Nil	Nil	Nil
pH (pH Unit)	8.1	8.	7.8	7.8

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

pH Value (pH Unit)	8.03		7.98			
Potassium-Dissolved (mg/L)	15.		7.			
Purge Type	Tank		Tank	Tank		
Selenium-Total (mg/L)	<0.01		<0.01			
Sodium-Dissolved (mg/L)	896.		912.			
Standing Water Level	12.17	10.66	9.37	5.42		
Stick up	0.4		0.4	0.4		
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)	89.		75.			
Temperature	20.2	13.8	14.3	23.6		
Total Alkalinity as CaCO3 (mg/L)	328.		508.			
Total Anions	62.		77.2			
Total Cations	68.9		73.7			
Total Dissolved Solids @180°C-Total (mg/L)	4,570.		4,450.			
Vanadium	<0.01		<0.01			
Water Depth to Stand	12.57	11.06	9.77	5.82	6.75	Increased by 6.75
Zinc (total)	0.019		0.011			

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	30-Jun-21	29-Sep-21	21-Dec-21
Rec ID	**81367**	**82679**	**83917**
Lab Ref		**92599**	
Aluminium (total) (mg/L)		0.04	
Ammonia as Nitrogen (N)		61.	
Appearance	Slightly turbit	Slight Turbid	Clear
Arsenic-Total (mg/L)		<0.001	
Barium (total)		0.549	
Beryllium (total)		<0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)		140.	
Boron (total)		<0.05	
Cadmium-Total (mg/L)		0.0003	
Calcium-Dissolved (mg/L)		241.	
Carbonate Alkalinity as CaCO3 (mg/L)		<1	
Chloride (mg/L)		811.	
Chromium-Total (mg/L)		<0.001	
Cobalt		0.002	
Colour	Brown	Brown	Clear
Comments	Windmill gone		Yarri - (Old Windmil)
Copper-Total (mg/L)		0.052	
EC - Field	3,500.	3,120.	1,020.
Electrical Conductivity @ 25°C (µS/cm)		2,920.	
Hydroxide Alkalinity as CaCO3 (mg/L)		<1	
Ionic Balance (%)		4.01	
Iron-Total (mg/L)		30.8	
Lead-Total (mg/L)		0.002	
Magnesium-Dissolved (mg/L)		51.	
Manganese (total)		4.94	
Mercury-Total (mg/L)		<0.0001	
Nickel-Total (mg/L)		0.002	
Nitrate as N (mg/L)		0.02	
Nitrite + Nitrate as N (mg/L)		0.03	
Nitrite as N (mg/L)		0.01	
Odour	Spur	Nil	Nil
pH (pH Unit)	7.	7.3	7.7

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

pH Value (pH Unit)		7.3	
Potassium-Dissolved (mg/L)		31.	
Purge Type		Bail	Bail
Selenium-Total (mg/L)		<0.01	
Sodium-Dissolved (mg/L)		154.	
Standing Water Level	22.89	21.3	20.09
Stick up		0.49	0.49
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)		1.	
Temperature	19.2	18.8	22.3
Total Alkalinity as CaCO3 (mg/L)		140.	
Total Anions		25.7	
Total Cations		23.7	
Total Dissolved Solids @180°C-Total (mg/L)		1,630.	
Vanadium		<0.01	
Water Depth to Stand	23.38	21.79	20.58
Zinc (total)		0.702	

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	20-Apr-21	29-Jun-21	16-Sep-21	21-Dec-21
Rec ID	**80166**	**81371**	**82516**	**83918**
Lab Ref	**90810**		**92436**	
Comments	BROKEN WINDMILL	Windmill over bore	WINDMILL OVER BORE -	BROKEN WINDMILL
Standing Water Level	10.8	11.35	10.57	8.7
Water Depth to Stand	11.07	11.62	10.82	8.97

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: ***Rocglen***
From Date: ***01-Jan-2021*** **To Date:** ***31-Dec-2021***
Standard: ***<Blank>***

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

	13-Apr-21	30-Jun-21	28-Sep-21	21-Dec-21
Rec ID	**80013**	**81376**	**82673**	**83919**
Lab Ref	**90657**		**92593**	
Comments	NO SAMPLE PUMP OVER	Pump over bore	SWL ONLY - UNABLE TO	PUMP OVER BORE - Surrey
Standing Water Level	30.68	30.62	30.39	29.71
Water Depth to Stand	31.18	31.12	30.89	30.21

Outliers: 0

Field Name	Result	Outlier Comment

WHITEHAVEN COAL

Area/Site: *Rocglen*
From Date: *01-Jan-2021* **To Date:** *31-Dec-2021*
Standard: *<Blank>*

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

	13-Apr-21	06-Jul-21	28-Sep-21	21-Dec-21
Rec ID	**80014**	**81377**	**82674**	**83920**
Lab Ref	**90658**		**92594**	
Aluminium (total) (mg/L)			1.12	
Ammonia as Nitrogen (N)			0.05	
Arsenic-Total (mg/L)			0.02	
Barium (total)			0.103	
Beryllium (total)			0.001	
Bicarbonate Alkalinity as CaCO3 (mg/L)			519.	
Boron (total)			0.06	
Cadmium-Total (mg/L)			0.0007	
Calcium-Dissolved (mg/L)			108.	
Carbonate Alkalinity as CaCO3 (mg/L)			1.	
Chloride (mg/L)			83.	
Chromium-Total (mg/L)			0.001	
Cobalt			0.001	
Comments		To wet to access		Carlton - Front
Copper-Total (mg/L)			0.019	
EC - Field			895.	1,020.
Electrical Conductivity @ 25°C (µS/cm)			2,620.	
Hydroxide Alkalinity as CaCO3 (mg/L)			1.	
Ionic Balance (%)			0.006	
Iron-Total (mg/L)			0.13	
Lead-Total (mg/L)			0.022	
Magnesium-Dissolved (mg/L)			46.	
Manganese (total)			0.023	
Mercury-Total (mg/L)			0.0002	
Nickel-Total (mg/L)			0.017	
Nitrate as N (mg/L)			0.1	
Nitrite + Nitrate as N (mg/L)			0.1	
Nitrite as N (mg/L)			0.01	
pH (pH Unit)			7.5	7.6
pH Value (pH Unit)			7.86	
Potassium-Dissolved (mg/L)			2.	
Purge Type				Tank

Selenium-Total (mg/L)			0.01	
Sodium-Dissolved (mg/L)			118.	
Standing Water Level	21.19		24.01	23.62
Sulfate as SO4 - Turbidimetric-Dissolved (mg/L)			80.	
Temperature			25.7	25.2
Total Alkalinity as CaCO3 (mg/L)			519.	
Total Anions			14.4	
Total Cations			14.4	
Total Dissolved Solids @180°C-Total (mg/L)			770.	
Vanadium			0.01	
Water Depth to Stand	21.5		24.32	23.93
Zinc (total)			0.022	

Outliers: 0

Field Name	Result	Outlier Comment