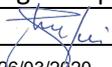


# Annual Review

## 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   | 1 <sup>st</sup> November 2015  |
| MOP end date   | 31 <sup>st</sup> October 2020  |
| Annual review start date   | 1 <sup>st</sup> January 2019   |
| Annual review end date   | 31 <sup>st</sup> December 2019   |
| <p>I, Jacques du Toit, certify that this audit report is a true and accurate record of the compliance status of Rocglen Coal Mine for the period 1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2019, and that I am authorised to make this statement on behalf of Whitehaven Coal Mining Pty Ltd.</p> <p>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.</p> <p>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</p> |  |
| Name of authorised reporting officer   | Jacques du Toit  |
| Title of authorised reporting officer  | General Manager - Open Cut Operations  |
| Signature of authorised reporting officer  |  |
| Date   | 26/03/2020   |

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## 1. STATEMENT OF COMPLIANCE

The compliance status of Rocglen Coal Mine (RCM) as at 31<sup>st</sup> December 2019 is summarised in Table 1a. Table 1b notes non-compliances that occurred during the reporting period, as well as non-compliances from previous reporting periods that still require management action.

**TABLE 1A - STATEMENT OF COMPLIANCE**

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

**TABLE 1 - NON-COMPLIANCES**

| Relevant Approval | Condition, Schedule and Number | Condition Description (summary)   | Compliance Status | Comment  | Where Addressed in Annual Review |
|-------------------|--------------------------------|---|-------------------|--|----------------------------------|
| PA 10_0015        | Schedule 2(2)                  | The proponent shall carry out the project generally in accordance with the: <ul style="list-style-type: none"> <li>- EA;</li> <li>- Statement of commitments;</li> <li>- The conditions of this approval</li> </ul> | NC                | Non-compliances with approval detailed below.  | Section 11.2                     |
|                   | Schedule 2(8)                  | Prior to the surrender of Project Approval 06_0198 the conditions of that approval will prevail to the extent of any inconsistency between the two approvals.   | NC                | Project Approval 06_0198 surrender has been submitted, but not finalised.                                      | Section 11.2                     |
|                   | Schedule 3(15)                 | In accordance with the Air Quality and Greenhouse Gas Management Plan the 'Costa Vale' HVAS is to run every 6 days for 24hrs.   | NC                | Two occasions on which the HVAS did not run.   | Section 11.2 & 6.1.2             |
|                   | Schedule 3(31)                 | Establish and maintain an effective vegetative screen along the boundary of the site that adjoins public roads.   | NC                | Existing vegetative screen has been augmented with additional planting undertaken during the reporting period. | Section 11.2                     |

| Relevant Approval | Condition, Schedule and Number | Condition Description (summary)                          | Compliance Status | Comment                                      | Where Addressed in Annual Review |
|-------------------|--------------------------------|--|-------------------|--|----------------------------------|
| EPL 12870         | A3.1                           | Works carried out in accordance with licence.            | NC                | Non-compliances with licence detailed below. | Section 11.2                     |
|                   | M2.1, M2.2                     | Requirement for PM10 monitoring at Point 10 (Costa Vale) | NC                | Two occasions on which the HVAS did not run. | Section 11.2 & 6.1.2             |

Compliance status key for Table 1

| Risk level                           | Colour code   | Description  |
|--------------------------------------|---------------|--|
| <b>High</b>                          | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence   |
| <b>Medium</b>                        | Non-compliant | Non-compliance with: <ul style="list-style-type: none"> <li>potential for serious environmental consequences, but is unlikely to occur; or</li> <li>potential for moderate environmental consequences, but is likely to occur</li> </ul> |
| <b>Low</b>                           | Non-compliant | Non-compliance with: <ul style="list-style-type: none"> <li>potential for moderate environmental consequences, but is unlikely to occur; or</li> <li>potential for low environmental consequences, but is likely to occur</li> </ul>     |
| <b>Administrative non-compliance</b> | 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 eleventh 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 1<sup>st</sup> January 2019 and the 31<sup>st</sup> December 2019. 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 15<sup>th</sup> 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 27<sup>th</sup> 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).

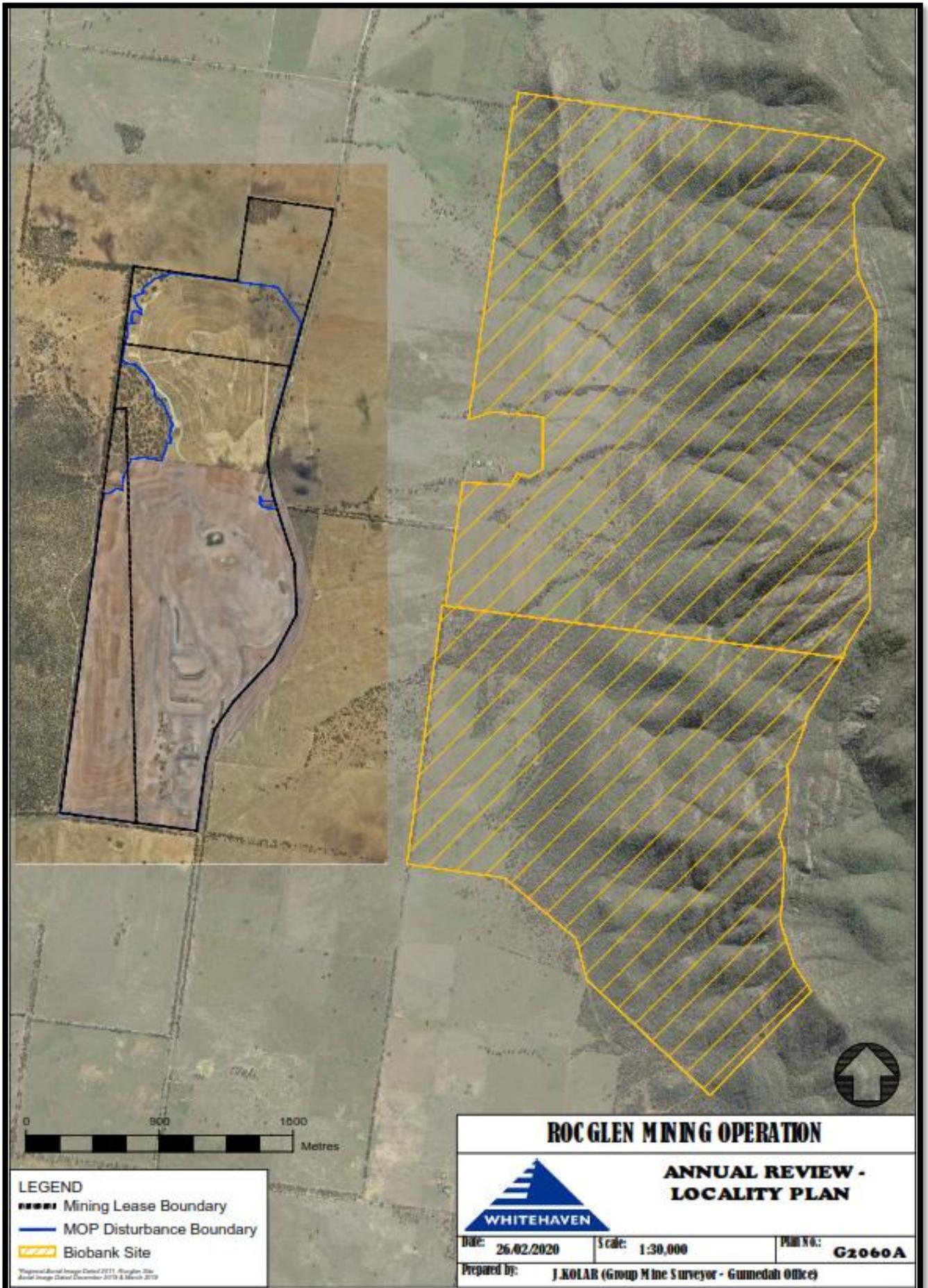
PA 10\_0015 was modified initially in November 2014 to condition cumulative coal haulage from the Tarrawonga/Vickery/Rocglen mines. In August 2015 another modification was made allowing changes to coal reject haulage to the site. During February 2017, PA10\_0015 was modified to permit increased coal 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 Jacques du Toit, Open Cut Operations - oversees Open Cut Operations for the Whitehaven Group. Contact: (02) 6741 9325.
- Mr Craig Sullivan, Operations Superintendent and Manager Mining Engineering - retains statutory responsibility for mining activities at the site. Contact: (02) 6741 9390
- Mr Andrew Raal, Mine Rehabilitation & Closure Officer – oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6741 9361

Figure 1 Site Locality showing Biobank offset areas



## 2.2 Tenements, Licences and Approvals

Table 2 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 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                      | 27 <sup>th</sup> September 2011 | 31 <sup>st</sup> December 2022                 | -   |
| Environment Protection Authority (EPA)                                 | Environment Protection Licence 12870 (EPL12870) | 31 <sup>st</sup> July 2008      | N/A<br>Anniversary Date: 31 <sup>st</sup> July | Variation to licence to remove Scheduled activities has been submitted. |
| Department of Environment – Division of Resources and Geoscience (DRG) | ML1620  | 10 <sup>th</sup> June 2008      | 10 <sup>th</sup> June 2029                     | -   |
| Department of Environment – Division of Resources and Geoscience (DRG) | ML1662  | 9 <sup>th</sup> January 2012    | 9 <sup>th</sup> January 2033                   | Variation to condition 5 made by DRG.                                   |
| Division of Resources and Geoscience (DRG)                             | Mining Operations Plan (MOP)                    | 28 <sup>th</sup> October 2015   | 30 <sup>th</sup> October 2020                  | -   |
| Department of Primary Industries – Water (DPI Water)                   | WAL 29461                                       | 25 <sup>th</sup> October 2012   | In perpetuity                                  | -   |
| Department of Primary Industries – Water (DPI Water)                   | WAL 36758                                       | 4 <sup>th</sup> September 2014  | In perpetuity                                  | -   |

### 3. OPERATIONS SUMMARY

#### 3.1 Mining Operations

TABLE 2 - PRODUCTION SUMMARY

| Material                     | Approved Limit | Previous Reporting Period (actual) | This Reporting Period (actual) | Next Reporting Period (forecast) |
|------------------------------|----------------|------------------------------------|--------------------------------|----------------------------------|
| Waste Rock/Overburden        | N/A            | 4,580,100 bcm                      | 2,283,080 bcm                  | 0                                |
| ROM Coal/Ore                 | 1,500,000 t    | 1,062,674 t                        | 470,119 t                      | 0                                |
| Reject Material <sup>1</sup> | 700,000 t      | 171,179 t                          | 313,089 t                      | 0                                |
| Saleable Product             | N/A            | 856,818 t                          | 388,989 t                      | 0                                |

<sup>1</sup>RCM does not separately record coarse and fine reject volumes.

#### 3.2 Other Operations

##### 3.2.1 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.

##### 3.2.2 Coal Haulage

For the reporting period there were 30,100 truck movements to transport 546,405t of ROM coal along the approved haulage route from RCM to the Whitehaven Gunnedah CHPP. 4,762 return truck movements to transport 140,925t of coal reject from the CHPP back to RCM also occurred.

Transport of coal from the site and/or receipt of coal reject from the Whitehaven CHPP by truck occurred only during the approved hours of:

- a) 7am to 9:15pm Monday to Friday;
- b) 7am to 5:15pm Saturday; and
- c) At no time on Sundays or public holidays.

##### 3.2.3 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.

#### 3.3 Next Reporting Period

Production has now ceased for the RCM, with no coal production in the next reporting period. 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.

## 4. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Department of Planning, Industry and Environment – Resources Regulator Department of primary industry (DPIE-RR) made the following requests for provision in future Annual Reviews:

**TABLE 3 - DPIE-RR REQUESTS**

| DP&E Request   | Adopted (Y/N) | Comment   | Relevant Section    |
|--|---------------|---|---------------------|
| Locality plans – include a “local scale” plan, showing the most recent aerial photograph overlaid with the project approval boundary, mining lease boundaries, current operational disturbance footprint and offset areas. | Y             | Site plan, with most recently available aerial photograph included. | Section 2, Figure 1 |

## 5. 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.

### 5.1 Air Quality

#### 5.1.1 Criteria

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

**TABLE 4 - AIR QUALITY CRITERIA**

| Air Quality Type   | Criteria                  |
|--|---------------------------|
| Acceptable Mean Annual Increase in Deposited Dust                                | 2 g/m <sup>2</sup> /month |
| Mean Annual Dust Deposition (all sources)  | 4 g/m <sup>2</sup> /month |
| Mean Annual Total Suspended Particulate (TSP) Matter (all sources) Concentration | 90 µg/m <sup>3</sup>      |
| Mean Annual PM <sub>10</sub> Particulate Level                                   | 30 µg/m <sup>3</sup>      |
| 24hr Average PM <sub>10</sub> Particulate Level                                  | 50 µg/m <sup>3</sup>      |

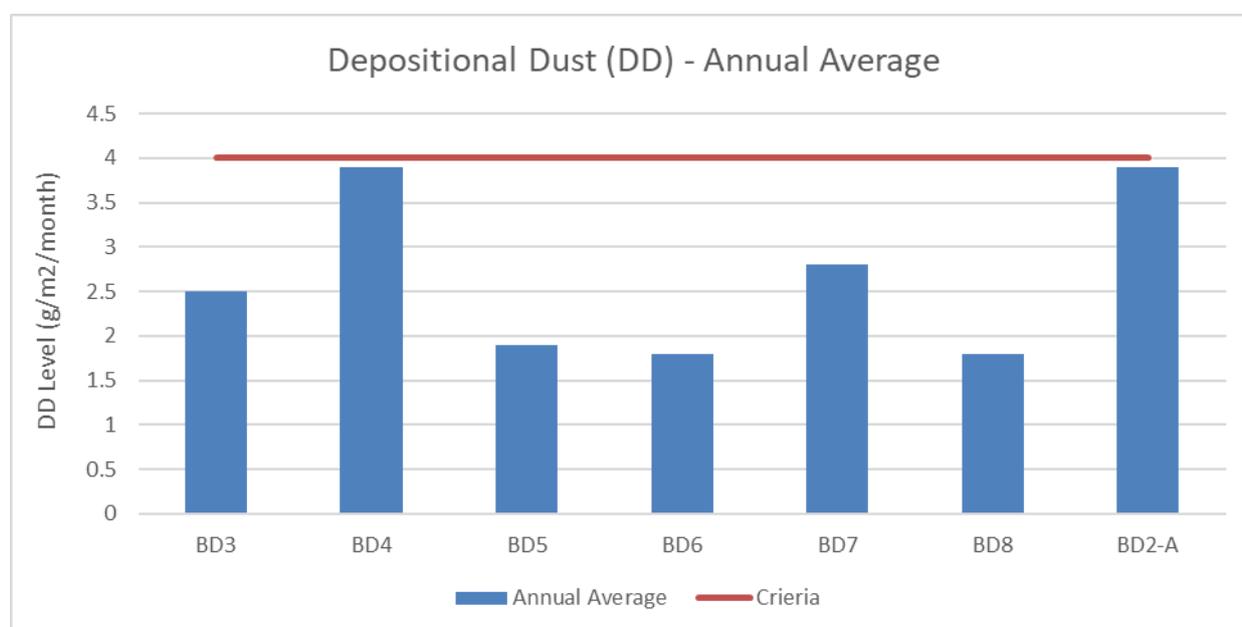


## 5.1.2 Environmental Management Measures

Monitoring of Deposited Dust is undertaken on a monthly basis, whilst PM<sub>10</sub> levels are monitored every 6 days. Table 5.1.2a and Figure 3 below present a summary of the Deposited Dust monitoring data.

**TABLE 5.1.2A - DEPOSITED DUST RESULTS**

| Site  | EPL I.D. No. | Property Name | Annual Mean Total Insoluble Solids (g/m <sup>2</sup> /month) | Annual Mean Ash (g/m <sup>2</sup> /month) | Long Term Insoluble Solids Average |
|-------|--------------|---------------|--|---|------------------------------------|
| BD3   |              | Belah         | 2.5  | 1.8                                       | 1.8                                |
| BD4   | 4            | Surrey        | 3.9  | 3.0                                       | 1.4                                |
| BD5   |              | Stratford     | 1.9  | 1.5                                       | 1.4                                |
| BD6   | 6            | Roseberry     | 1.8  | 1.4                                       | 1.2                                |
| BD7   |              | Roseglass     | 2.8  | 2.0                                       | 1.6                                |
| BD8   |              | Yarrowonga    | 1.8  | 1.3                                       | 2.2                                |
| BD2-A |              | Penryn        | 3.9  | 3.2                                       | 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 each monitoring site.

RCM also has two High Volume Air Samplers (HVAS) (PM<sub>10</sub>), one located to the north of the mine on the project related property 'Costa Vale', and the other, a licenced monitor (EPL ID - 10) to the south-east of the mine on 'Roseberry' (a privately owned property under private agreement). Figures 4 and 5 display the PM<sub>10</sub> 24hr results for 'Costa Vale' and 'Roseberry' respectively. The 'Costa Vale' HVAS recorded twenty-eight exceedances of the 24 hour criteria throughout the calendar year, while the 'Roseberry' TEOM exceeded the 24 hour criteria 12 times. Exceedances of the daily limit were communicated to DPIE and were deemed to be have been caused by regional dust storms and bushfire smoke.

DPIE advised via a letter from Heidi Watters on 12 March 2020 (letter #20955) and email from James Epstein on 13 March 2020 that 'note d' of Schedule 3, Condition 15 of the Approval, measurements taken on days of

extraordinary events can be excluded and therefore not considered in annual averaging calculations'. Further, DPIE advised that 'Figures 6 through 9 of the Rocglen Annual Review can display two datasets, one including all results and one excluding extraordinary event days for the purposes of compliance. The dates of extraordinary events should also be provided in the Annual Review'.

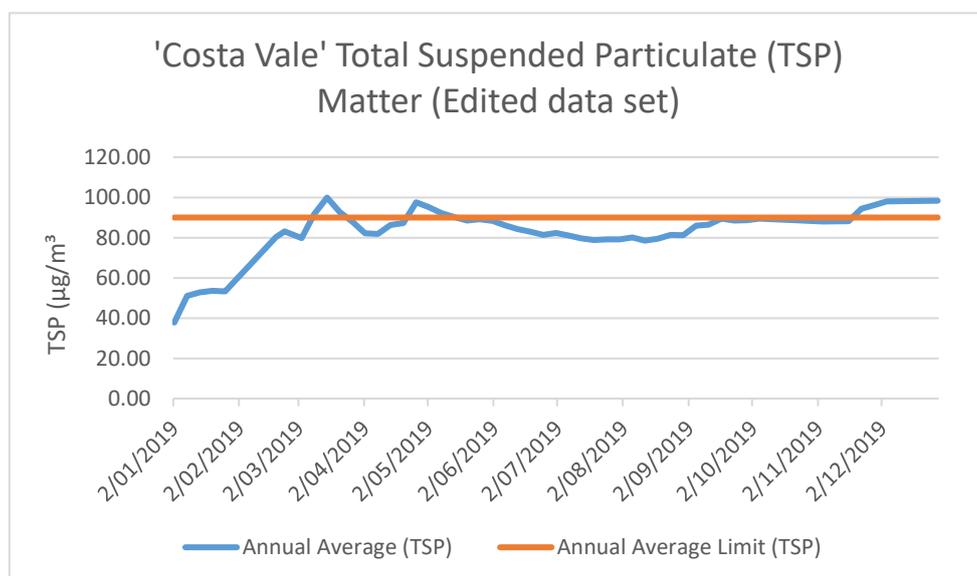
Consequently, this AR provides two datasets, one including all results and one excluding extraordinary event days for the purposes of compliance as per DPIE's advice.

The dates identified by the Namoi North West Slopes Regional reports as being extraordinary event days and therefore excluded from the data set were 16 and 19 January; 13, 14, and 21 February; 6, 12, and 31 March; 20 and 27 July; and 8 and 19 August 2019.

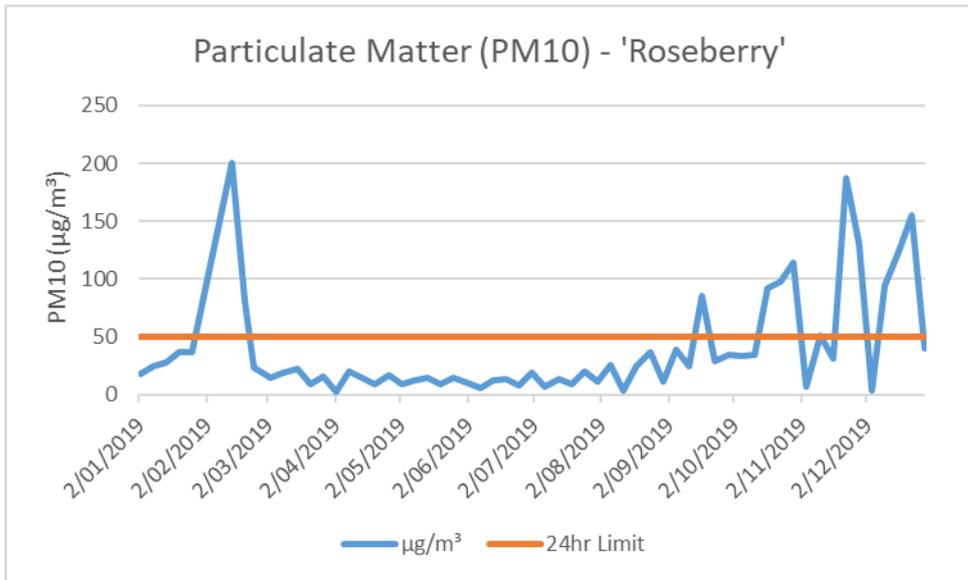
Exceedances that have been preliminarily accepted by DPIE as being impacted by an extraordinary event, but are awaiting confirmation in the regional reports, have also been excluded from annual averaging and were on the 11, 17, 23, and 29 October; 10 November; and 10, 16, and 22 December 2019.

**TABLE 5.2.1B - PM10 SUMMARY DATA**

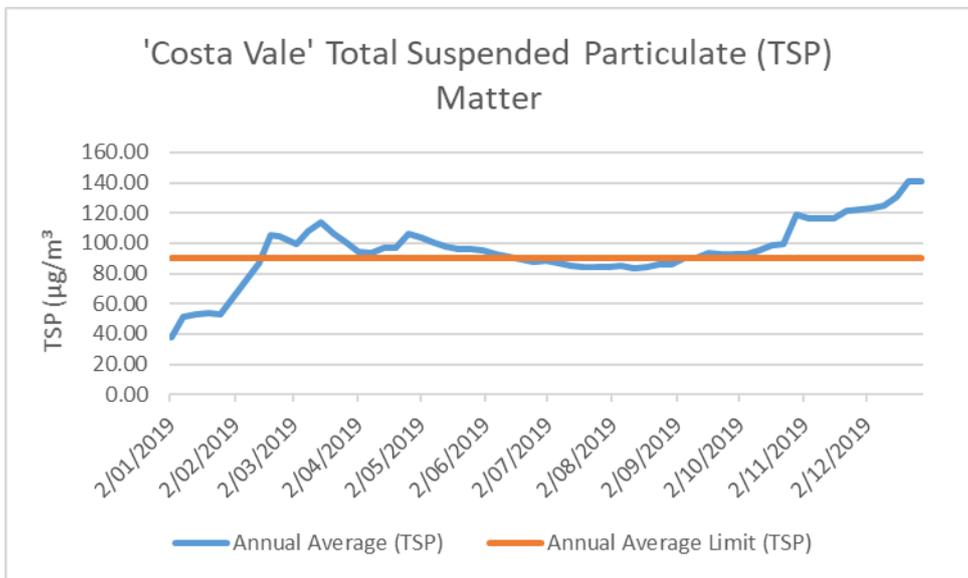
| PM10 Summary            |                           |  |                          |   |
|-------------------------|---------------------------|--|--------------------------|---|
| Sites                   | Costa Vale- Full data set | Costa Vale -excluding extraordinary events | Roseberry- Full data set | Roseberry- excluding extraordinary events |
| No. of readings         | 59                        | 50   | 59                       | 50  |
| No. days above criteria | 28                        | 19   | 12                       | 3   |
| Maximum                 | 514                       | 190  | 201                      | 155                                       |
| Minimum                 | 7                         | 7  | 3.1                      | 3.1                                       |
| Average                 | 70.4                      | 49.7                                       | 39.1                     | 24.4                                      |



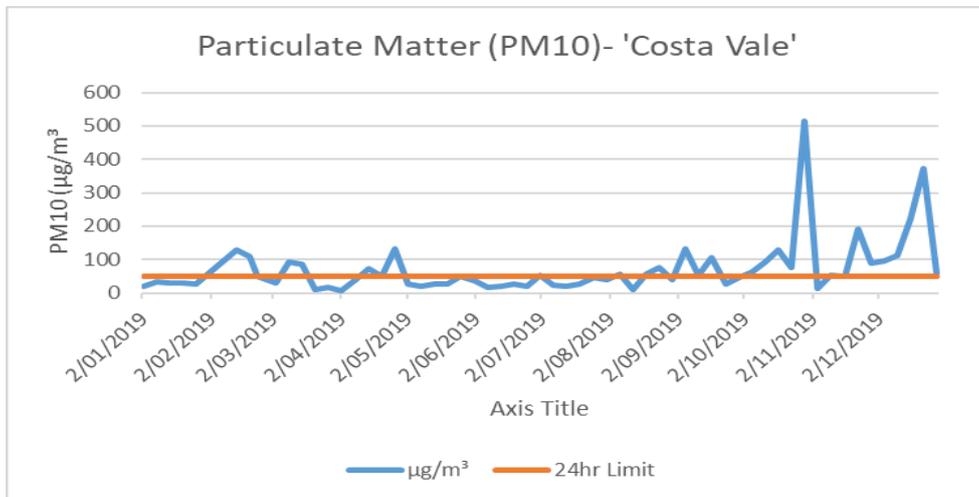
**Figure 4- 'Costa Vale' Particulate Matter (PM10)**



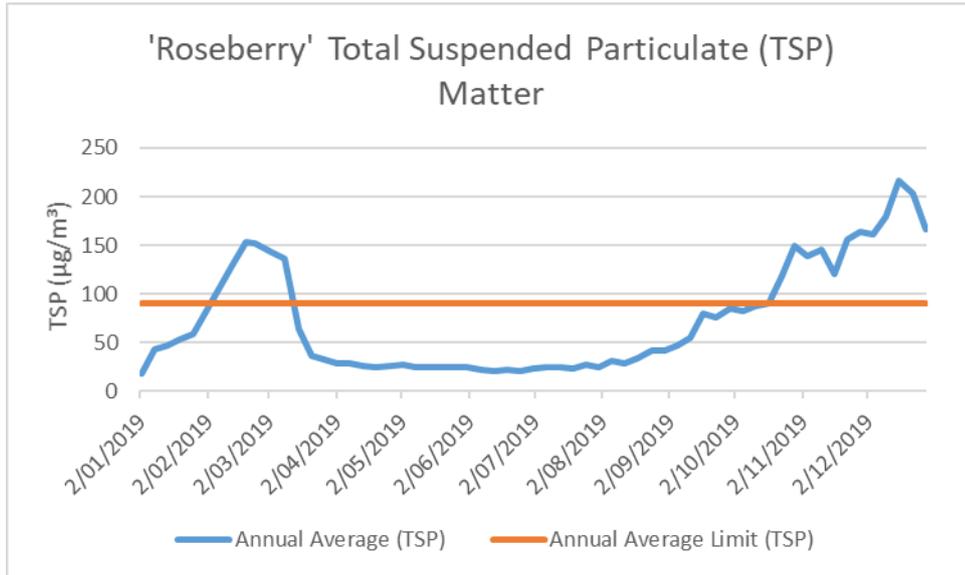
**Figure 5 – 'Roseberry' Particulate Matter (PM10)**



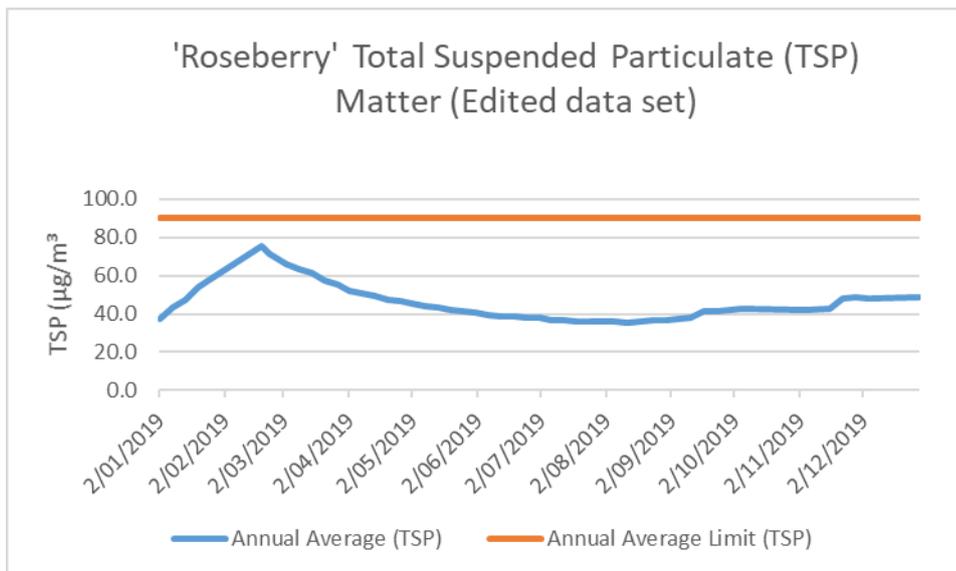
**Figure 6 - 'Costa Vale' TSP Annual Rolling Average (full data set)**



**Figure 7 - 'Costa Vale' TSP Annual Rolling Average (edited data set)**



**Figure 8 - 'Roseberry' TSP Annual Rolling Average (full data set)**



**Figure 9 – "Roseberry" TSP Annual Rolling Average (edited data set)**

The annual rolling Total Suspended Particulate (TSP) matter at both 'Roseberry' and 'Costa Vale' exceeded the Annual Average Limit with the full data set as a result of non-operational exceedances attributed to elevated regional dust levels. Once the dates of extraordinary event conditions are removed, Roseberry remains under the annual limit for the entire period, while Costa Vale daily reading was above annual limit (98.33). It is considered that this was a result of the ongoing dry conditions at the time and the occurrence of flock of over 200 sheep were placed in the paddock where the dust monitor is situated at Costa Vale.

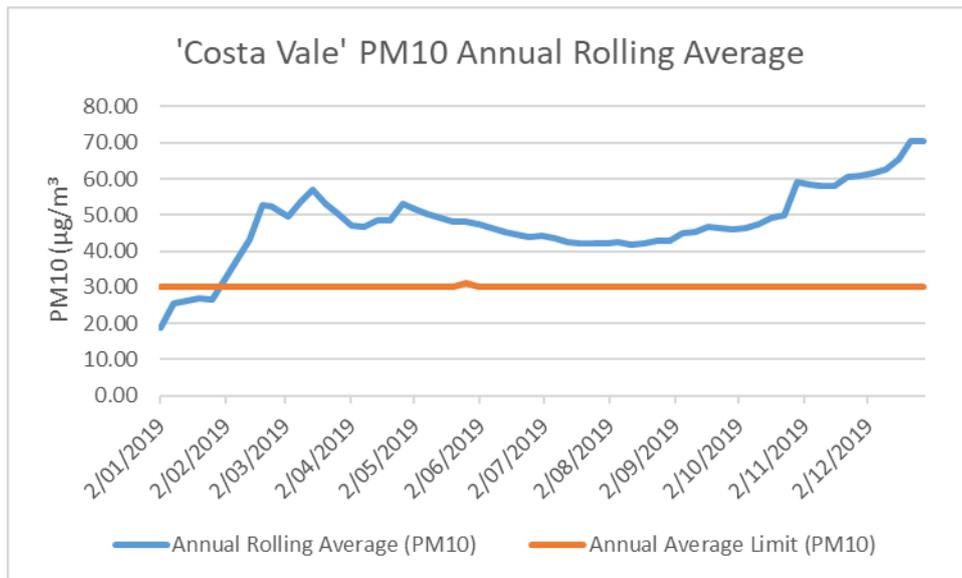


Figure 1- 'Costa Vale' PM10 Annual Rolling Average (full data set)

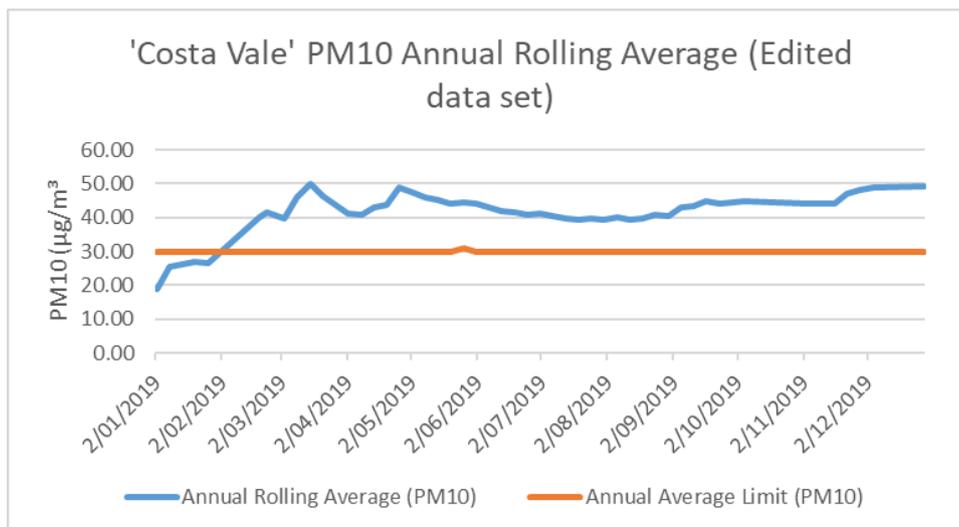
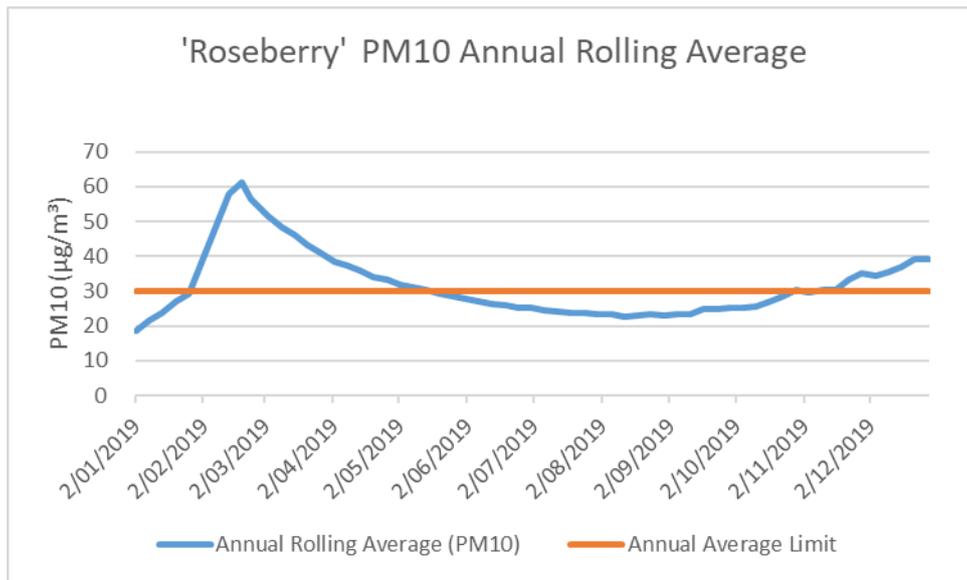
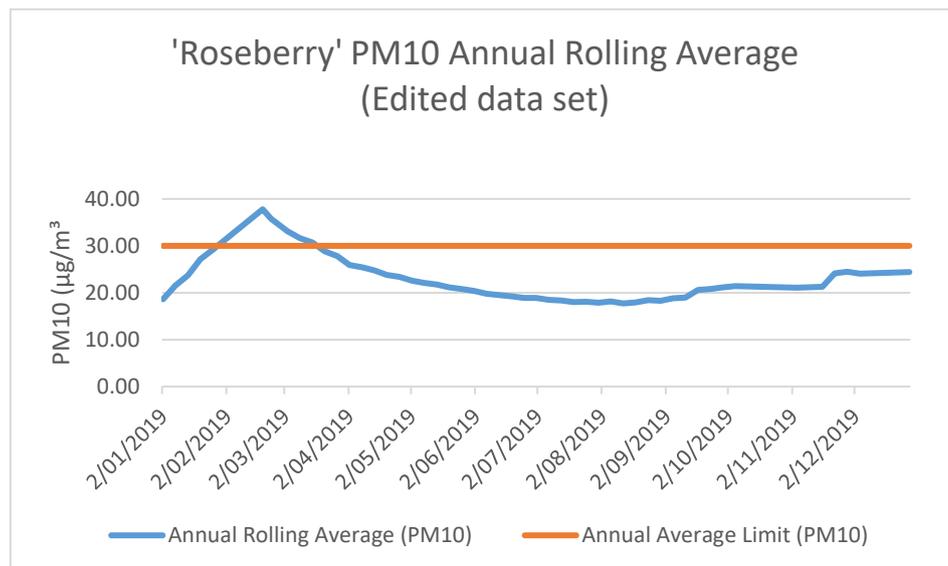


Figure 11 - 'Costa Vale' PM10 Annual Rolling Average (edited data set)



**Figure 22 - 'Roseberry' PM10 Annual Rolling Average (full data set)**



**Figure 3 'Roseberry' PM10 Annual Rolling Average (edited data set)**

The annual rolling average for PM10 at both 'Roseberry' and 'Costa Vale' exceeded the annual average criteria with the full dataset as a result of non-operational exceedances attributed to elevated regional dust levels. Once the dates of extraordinary event conditions are removed, 'Roseberry' remains below the annual criteria, while Costa Vale exceeds the annual criteria on 19 occasions. It is considered that this was a result of the ongoing dry conditions at the time and the occurrence of flock of over 200 sheep were placed in the paddock where the dust monitor is situated at Costa Vale.

### 5.1.3 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 'Yarrowonga' (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). The elevated results of this period displays the actual effects of these regional events on dust levels.

### 5.1.4 Key Environmental Performance/Management Issues

The reporting period consisted of a prolonged period of extremely dry conditions and bushfires. This caused regional air quality issues which affected air quality monitoring resulting in several exceedances of criteria. As described in Section 5.1.2 *measurements taken on days of extraordinary events can be excluded and therefore not considered in annual averaging calculations*. Monitoring results were mostly within criteria when extraordinary events were removed, however Costa Vale had ongoing exceedances of criteria which is considered to be a result of the ongoing dry conditions at the time and the occurrence of flock of over 200 sheep were placed in the paddock where the dust monitor is situated. There were 2 occasions during the reporting period that the HVAS were identified to not run and these were reported to DPIE.

### 5.1.5 Proposed Improvements to Environmental Management

In the event of short or non-runs of HVAS units in the future, RCM will endeavour to undertake additional, supplementary run's to mitigate the data loss.

## 5.2 Onsite Biodiversity

### 5.2.1 Introduction

A detailed annual ecological assessment of rehabilitated areas and analogue sites was undertaken by Aspect Ecology Pty Ltd in December 2019.

Monitoring comprised:

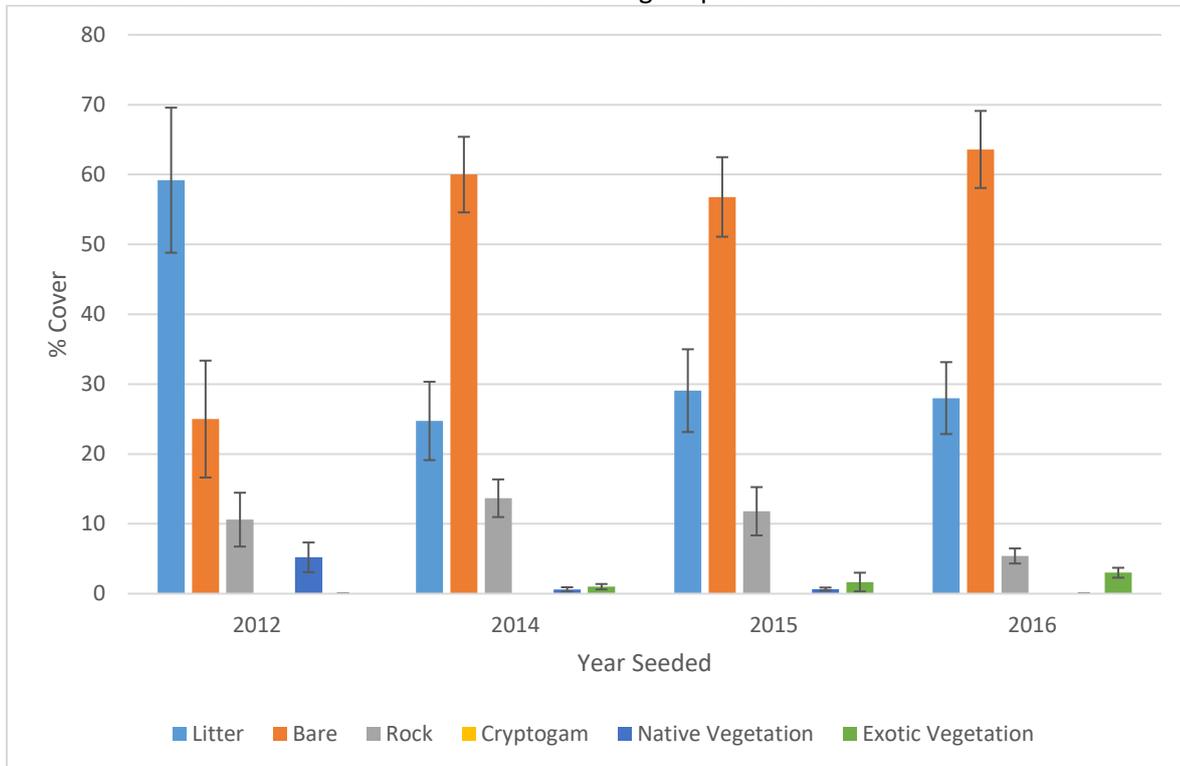
- Three newly established 'best-on-offer' (OEH 2019) local analogue sites in Vickery State Forest, situated in the target vegetation community of Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest (Plant Community Type ID 592 in the BioNet Vegetation Classification System).
- Fourteen newly established rehabilitation sites a sampling rate of one site per ten hectares of each rehabilitation year within each domain (or part thereof for the total)
  - Eight Woodland Domain Sites, capturing all years seeded (2012, 2014–16)
  - Six Pasture Domain sites capturing all years seeded 2013–16
- Twenty categorical point assessments across the rehabilitation, aimed at further improving rehabilitation data spatial coverage.

The BioBanking Assessment Methodology (BBAM—DECC 2008; OEH 2014) and also rehabilitation protocols were employed to capture data on tree densities including seedlings.

### 5.2.2 Woodland Domain

### Groundcover

Bare ground dominated the groundcover in three of the four rehabilitation (2014, 2015 and 2016), with litter dominating the 2012 rehabilitation (Figure 14). Litter was the second most abundant cover type in all other years, though proportions were significantly lower than that of bare ground. Litter was comprised primarily of dead grass material that had died and broken off during the severe drought. Rock cover was between 5–15% throughout the rehabilitation years. Vegetation cover was low at all sites, with no significant difference between the levels of exotic vs native cover according to quadrat data.



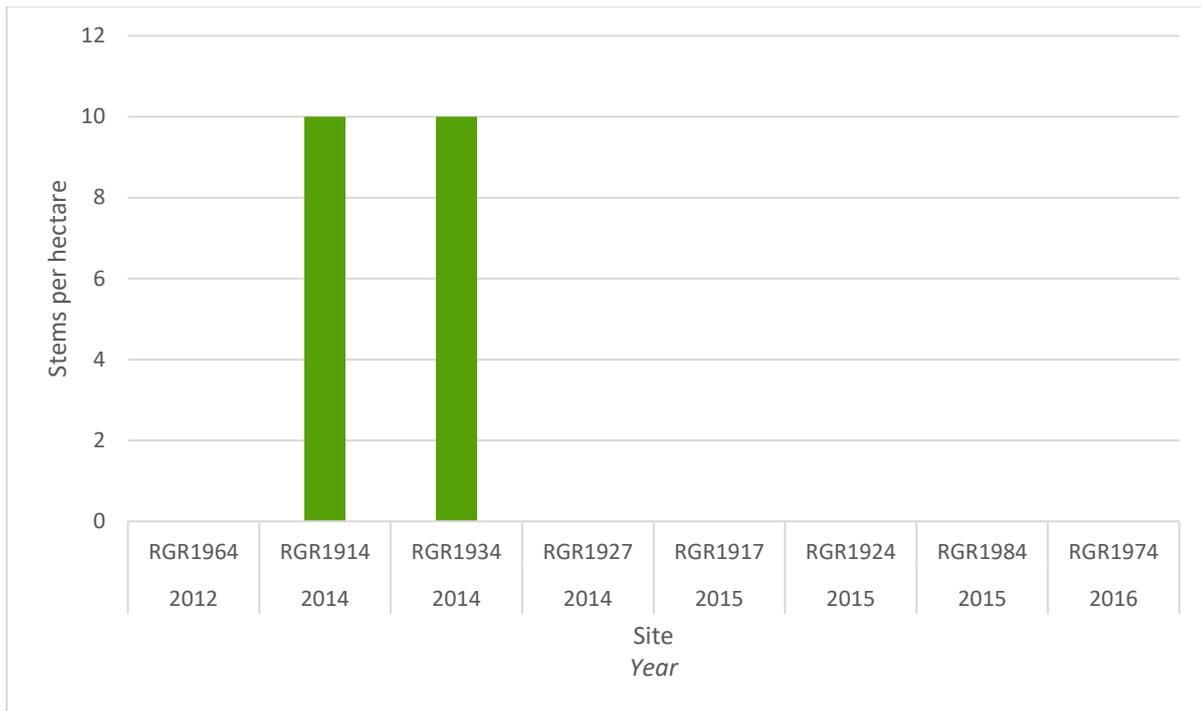
**Figure 4 Average Percentage Cover of Groundcover Components within each Woodland Domain Rehabilitation Year at Rocglen Coal Mine. Bars show standard error of the mean.**

### Species Composition

The species richness of exotic species was substantially higher than that of native species. The exotic Coolah Grass (*Panicum coloratum* var. *makarikariense*) was the most abundant species. Chenopods were the most common native species group.

### Tree density

Extensive seedling plantings have been carried out throughout the Woodland Domain rehabilitation (Error! Reference source not found.). The most recent of these was infill planting in June 2018 when records indicate that 1,939 seedlings were planted. Within the assessment sites, seedlings were absent from all rehabilitation years except for 2014, which averaged 10 stems/ha. Many dead seedlings or the stakes marking where seedlings were planted were observed. No structural sites contained any trees of sapling size or larger.



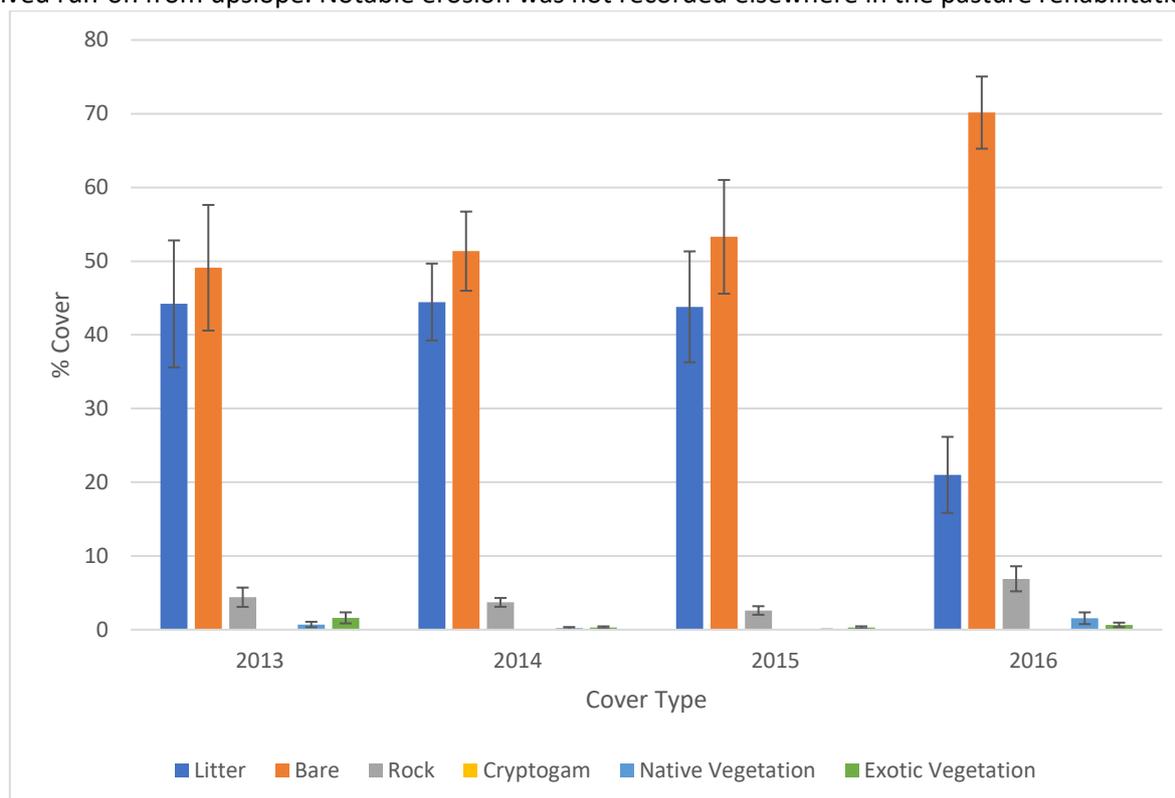
**Figure 5 Density of tree seedlings within rehabilitation sites at Rocglen Coal Mine, grouped by year seeded**

Of the 19 categorical point assessments carried out in the Woodland Domain, 12 (63%) lacked trees of any size (including seedlings), 4 (21%) had a tree abundance classified as “present”, and one sites (5%) had a density categorised as “occasional”. Only two sites had “abundant” trees, both in the southernmost portion of the 2012 rehabilitation, where there were small patches of trees 3–5 m high. No areas were categorised as being dominated by trees, and therefore Woodland Domain rehabilitation is not yet on a trajectory towards restoring ecosystem function or becoming a woodland of native species analogous to adjacent remnant vegetation communities.

### 5.2.3 Pasture Domain

#### Groundcover

Bare ground and litter exhibited approximately equal proportions in all rehabilitation years apart from 2016 where bare ground dominated. The extensive proportion of bare ground reflected the extended drought conditions. Litter comprised primarily detached exotic grass material. Rock cover was low and vegetation cover very low in all years. Averaged across all pasture areas, total groundcover including litter and rock was less than 50%, leaving topsoil exposed to potential erosion. Sheet erosion was the only type observed, minor in the 2013 rehabilitation by major and extensive in the southern 2016 rehabilitation polygon, which received run-on from upslope. Notable erosion was not recorded elsewhere in the pasture rehabilitation.



**Figure 6 Average Percentage Cover of Groundcover Components within each Pasture Domain Rehabilitation Year at Rocglen Coal Mine. Bars show standard error of the mean.**

#### Species Composition

The dominant grass was Coolah Grass (*Panicum coloratum* var. *makarikariense*) with Creeping Bluegrass (*Bothriochloa insculpta*) common. Chenopods, representing poor pasture fodder, were the most abundant non-grass group, the most frequent being Black Rolypoly (*Sclerolaena muricata*).

#### Fauna

Few fauna habitat features were noted, and the lack of trees resulted in very low vertical complexity. All sites showed traces (prints, scats) of native and feral or domestic animals.

#### Recommendations

The monitoring report recommends that weed control practices should incorporate the progressive eradication or removal exotic pasture groundcover from Woodland Domain areas. Additionally, rehabilitation retreatment and establishment efforts should focus on effective methods for establishment of the trees, shrubs and groundcover species that characterise the analogue reference sites.

To help reduce the mortality of planted species, emphasis should be placed on careful timing of replanting, the informed use of soil ameliorants and a follow-up watering regime that is informed by data.

### **5.3 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 with subsequent biobanking credits retired relating to the Rocglen Coal Mine, Canyon Coal Mine and Tarrawonga Coal Mines.

#### **5.3.1 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 (~2022/2023).

#### **5.3.2 Infrastructure Management**

During the reporting period, no new fencing was required but 1.1km of redundant fences were removed and derelict assets/infrastructure on Belah such the former homestead, cottage and associated sheds were demolished and all waste removed from site was disposed at a licenced waste management facility including appropriate treatment of previously identified hazardous materials. All Biobank BOA fences, gates and signage were maintained to continue restricting unauthorised access and prevent inadvertent livestock grazing.

#### **5.3.3 Seed Management**

Routine seed assessments completed for the Biobank BOA were impacted by the severe drought conditions that were experienced during 2019. The routine seed assessments aim 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. Because of the drought conditions, additional seed collection opportunities within the Biobank BOA were limited. 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 2019 revegetation program that was completed for the Biobank BOA.

#### **5.3.4 Revegetation Management**

In accordance with the Biobanking Agreement 43 revegetation schedule for 2019 (Year 6 - undertake revegetation between Years 4 and 6); revegetation ground preparation was completed during February and March 2019. WHC coordinated a overstorey revegetation program in April and May 2019 across the Biobank BOA was planted with 5,591 hiko seedlings of *Eucalyptus albens*, *Eucalyptus blakelyi*, *Eucalyptus melliodora* and *Angophora floribunda*. Despite the prevailing drought conditions throughout 2019; routine tree watering and maintenance activities post planting have been successful survival had been achieved by the end of the reporting period and ensuring that a better than minimum survival is achieved commensurate with the target open Box Gum Woodland vegetation structure of the Biobank BOA.

### 5.3.5 Heritage Management

During the reporting period, heritage site and fencing inspections were completed of the 34 known Aboriginal cultural heritage sites within the Biobank BOA with 1600m of demarcation fence maintained around the heritage site perimeter and signage to mitigate access and disturbance.

### 5.3.6 Habitat Management

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

### 5.3.7 Weed Management

WHC coordinated routine formal weed monitoring/inspections undertaken across Biobank BOA in February, May, August and November 2019. The priority weeds for control were noted as general broadleaf weeds (Biosecurity Act 2015 priority and general biosecurity duty species) in areas proposed for revegetation as well as legacy priority (formerly noxious) weeds inherited from previous owners management regimes such as African/Consul Lovegrass, Tiger Pear and Common Prickly Pear. The weed monitoring/inspections ensure that timely and prioritised weed control is undertaken on a seasonal basis with the spatial information directly given to spraying contractors to identify what, where, when and how to target appropriate resources across the Biobank BOA for weed control.

During the reporting period, WHC implemented a weed control program across the Biobank BOA including 184ha treated between February and November 2019 targeting primarily 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.

### 5.3.8 Feral Animals Management

WHC coordinated routine formal feral animal monitoring across Biobank BOA in February, May, August and November 2019. 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 and Goats and Hares can be medium in abundance seasonally with all other feral animal species recorded as scarce to low abundance levels across 2019. 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 (6 Foxes removed from 75 baits presented and 9 Feral Pigs trapped), June (6 Foxes removed from 75 baits presented and 2 Feral Pigs trapped), September (1 Fox removed from 100 baits presented and 2 Feral Pigs trapped) and December 2019 (7 Foxes removed from 92 baits presented and 26 Feral Pigs trapped). Night time open range shooting programs were implemented in conjunction with the other routine programs resulting in an additional 6 Foxes, 7 Hares and a Rabbit were controlled in 2019. The Feral Goat harvesting during the reporting period resulted in 38 being captured with the Feral Goats then on sold to an abattoir. Only appropriately qualified and experienced feral animal contractors (appropriate feral animal management qualifications, NSW fire arm licence and pesticide accreditation where relevant) were engaged to undertake feral animal control works for WHC.

### 5.3.9 Soil & Erosion Management

During the reporting period, no specific treatment for soil erosion mitigation works were undertaken on the BOA's.

### 5.3.10 Grazing Management

During the reporting period, the Biobank BOA was not stocked and subsequently grazing was excluded.

### 5.3.11 Bushfire Management

The Biobank BOA Biobanking Agreement 43 prohibits the use of fire onsite until Year 40 with no fire recorded on the Biobank Offset in 2019. Annual fuel load monitoring was undertaken in December 2019 as part of planning and assessment of bushfire and ecological burn strategy for the Biobank BOA in 2020. During the reporting period, no fire occurred on Biobank BOA but the average overall fuel load measured was 11-12 t/ha (moderate) and grassland fuel load was 0.8 t/ha (low). Other fire management implemented by WHC during the reporting period included the maintenance fire break tracks (27km) to a zero fuel barrier standard. WHC maintains regular communications throughout the reporting period with both the Liverpool Range and Namoi-Gwydir Zone RFS teams around planning of other WHC BOA site ecological burn programs as well as providing WHC emergency contacts. WHC maintains a specialist firefighting contractor for an on call engagement during the fire season to respond in the event of a bushfire on WHC BOAs and non-mining lands.

### 5.3.12 Monitoring Program

During the reporting period, the ecological monitoring program of the Biobank BOA included winter bird surveys that were undertaken in July 2019 and annual spring flora monitoring of 34 sites undertaken during November 2019. During the winter bird surveys, one threatened species were recorded (Turquoise Parrot). The number of sites which met or exceeded the performance criteria for species richness (75% of species richness of respective biometric vegetation type (BVT)) was 13 out of 34 sites in 2019. This is a decrease from 16 sites which met or exceeded the performance criteria in 2018. The decrease in the number of sites meeting the performance criteria for species richness is likely due to the intense drought conditions experienced in 2019. The number of sites which met or exceeded the performance criteria for overstorey cover (75% of overstorey cover of respective BVT) was 8 out of 34 sites, which has not changed since 2018. The number of sites meeting or exceeding the performance criteria for mid-storey cover (75% of mid-storey cover of respective BVT) did not change since 2018, with 29 sites recording >75% of benchmark cover in 2019. Three out of 34 sites met or exceeded the performance criteria for ground cover (75% of combined cover of grass, shrub and 'other' of respective BVT), which did not change since 2018.

### 5.3.13 Audits and Reviews

There were no biodiversity audits during the reporting period. The annual Biobanking Agreement 43 inspection was undertaken in August 2019. During 2018, WHC undertook a five year review of fire, weed and feral animal management recommending revision of the Biobanking Agreement to contemporaries the monitoring and management requirements for all three aspects and are waiting for a response from the Biodiversity Conservation Trust (BCT).

## 5.4 Blasting

### 5.4.1 Criteria

Blasting criteria for RCM are noted in PA10\_0015 and included in Table 5.4.1 below.

**TABLE 5.1.1 - 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.

### 5.4.2 Key Environmental Performance/Management Issues

RCM did not exceed the blasting criteria for any blast during the reporting period, consistent with previous years. A total of 8 blasts were undertaken during the 2019 calendar year, with results for the period shown below in Table 5.1.2. No reportable fume incidents occurred during the reporting period, and blasting is undertaken in accordance with the Blast Management Plan to minimise dust generation.

**TABLE 5.1.2 - BLAST MONITORING RESULTS**

| Location  | Parameter                             | 100 <sup>th</sup> ile Limit | Average | Maximum | 95 <sup>th</sup> ile Limit | >95 <sup>th</sup> ile |
|-----------|---------------------------------------|-----------------------------|---------|---------|----------------------------|-----------------------|
| 'Surrey'  | Air Blast Overpressure (dB(Lin Peak)) | 120                         | 98.3    | 105.5   | 115                        | 0%                    |
|           | Vibration (mm/s)                      | 10                          | 0.6     | 1.03    | 5                          | 0%                    |
| 'Retreat' | Air Blast Overpressure (dB(Lin Peak)) | 120                         | 98.8    | 105.6   | 115                        | 0%                    |
|           | Vibration (mm/s)                      | 10                          | 0.3     | 0.8     | 5                          | 0%                    |

As production has ceased there is no longer any planned blasting, blast monitors have been decommissioned and removed.

### 5.4.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

## 5.5 Operational Noise

### 5.5.1 Criteria

The operational noise criteria specified in PA10\_0015 and EPL 12870 are as follows:

**TABLE 5.5.1A - ATTENDED NOISE MONITORING CRITERIA**

| Location                 | Day                      | Evening                  | Night                    |                         |
|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------|
| All privately-owned land | L <sub>Aeq</sub> (15min) | L <sub>Aeq</sub> (15min) | L <sub>Aeq</sub> (15min) | L <sub>Aeq</sub> (1min) |
|                          | 35                       | 35                       | 35                       | 45                      |

The cumulative road noise criteria specified in PA10\_0015 (RCM) and PA11\_0047 (Tarrawonga) are below:

**TABLE 5.5.1B - CUMULATIVE ROAD NOISE CRITERIA**

| Location                       | Day L <sub>Aeq</sub> (15hour) | Evening L <sub>Aeq</sub> (15hour) | Night L <sub>Aeq</sub> (9hour) |
|--------------------------------|-------------------------------|-----------------------------------|--------------------------------|
| All privately-owned residences | 60                            | 60                                | 55                             |

### 5.5.2 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;
- Bunding close to noise sources to create obstructions to the propagation path;
- 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.

### 5.5.3 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.

Attended noise monitoring is undertaken on a quarterly basis, with results provided in Appendix 1. Cumulative road noise monitoring was also undertaken in accordance with the Road Traffic Noise Management Plan, see Table 5.5.3 below for results.

**TABLE 5.5.3 - CUMULATIVE ROAD TRAFFIC NOISE MONITORING RESULTS**

| Location   | Measured Coal Haulage LAeq(1hr) Contribution dBA |                | Noise Criteria LAeq(1hr) dBA |
|------------|--|----------------|------------------------------|
|            | Day  | Evening        | Day & Evening Criteria       |
| June 2019  |  |                |                              |
| Brooklyn 1 | - <sup>1</sup>                                   | 57             | 60                           |
| Brooklyn 2 | - <sup>1</sup>                                   | 50             | 60                           |
| Werona     | 48   | - <sup>1</sup> | 60                           |
| December   |  |                |                              |
| Brooklyn 1 | 52   | - <sup>1</sup> | 60                           |
| Brooklyn 2 | - <sup>1</sup>                                   | 45             | 60                           |
| Werona     | 40   | 40             | 60                           |

<sup>1</sup>Noise monitoring was not conducted during this period at this location.

No exceedances of the relevant attended noise criteria were recorded at either 'Surrey' or 'Retreat' for all four monitoring rounds during the calendar year. Likewise, biannual attended monitoring for the cumulative road traffic noise at 'Brooklyn 1', 'Brooklyn 2' and 'Werona', returned compliant for all three locations.

#### 5.5.4 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 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.

In the past, exceedances of noise criteria have had a tendency to occur at 'Surrey' (N2). Unlike previous calendar years however, RCM saw no exceedances of the attended noise monitoring results in 2019 at 'Surrey' or 'Retreat'.

#### 5.5.5 Proposed Improvements to Environmental Management

There are no proposed improvements to environmental noise management in the upcoming calendar year.

### 5.6 Aboriginal Heritage Management

#### 5.6.1 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.

#### 5.6.2 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.

#### 5.6.3 Key Environmental Performance/Management Issues

A review of the Heritage Management Plan was undertaken during the reporting period, with only minor changes made and accepted by DPIE. No key environmental performance/management issues were identified during the reporting period.

#### 5.6.4 Proposed Improvements to Environmental Management

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

#### 5.6.5 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 and fire 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. 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.

#### 5.6.6 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.

#### 5.6.7 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

## 5.7 Environmental Performance Summary

An environmental performance summary for RCM is presented in Table 5.7 below.

**TABLE 5.7 - 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             | Numerous exceedances of the PM10 daily limit, and exceedance of the annual average PM10 limit at both HVAS sampling sites. | 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             | 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                               | Nil  |
| Noise               | Refer to Section 6.5             | Approval criteria met.   | Nil                               | Nil  |
| Heritage            | Refer to Section 6.6 & 6.7       | Approval criteria met.   | Nil                               | Nil  |
| Bushfire Management | Refer to Section 6.8             | No bushfires on site or in biobank site during reporting period.   | Nil                               | Nil  |
| Rehabilitation      | Refer to Section 8.2             | Ongoing.   | Nil                               | Additional rehabilitation to be undertaken as per MOP.   |
| Water               | Refer to Section 7               | No wet weather discharges during reporting period.   | Nil                               | Nil  |

## 6. WATER MANAGEMENT

### 6.1 Surface Water Management

The mine lies within the catchment of the Namoi River, and in close proximity to Driggle Draggie 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).

Due to the extended dry period throughout the calendar year, water available onsite decreased significantly. As a result, to ensure availability of sufficient water for dust suppression, RCM trucked water from January till March 2019 from the Canyon Coal Mine final void, to supplement available water on site.

#### 6.1.1 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).

Results throughout the reporting period were generally consistent for each individual site, however it should be noted that there were several occasions when dams were dry, including SB19 and Dam B, and therefore no water samples were taken. Total Organic Carbon (TOC) at SD3 and Total Suspended Solids at SB19 both returned to normal levels following spikes in 2018. Results for the void remained consistent across all parameters, with the exception of pH, which dropped slightly throughout the period. Similar to the previous reporting period, there was very little water to be sampled during this reporting period.

#### 6.1.2 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 Solids (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 remained relatively consistent across all monitoring sites through 2019, taking into consideration the lack of water for sampling at particular locations at different times.

#### 6.1.3 Discharges

There are two Licenced Discharge Points (LDPs) nominated in the current EPL 12870, LDP11 to the south of the site, and LDP12 to the north of the site. No controlled or uncontrolled discharges of water from site occurred during the reporting period.

#### 6.1.4 Supplementary Water Sources

In accordance with PA 10\_0015 Schedule 3(20), RCM is to ensure that it has sufficient water for all stages of the project. Given the dry conditions and lack of adequate rainfall during the reporting period, water stocks onsite became depleted to a point at which it became necessary to source water externally. RCM transported water from the nearby Canyon Coal Mine void to supplement the lack of water available for dust suppression on site. This occurred from January to March 2019, approximately 12.1ML was transferred.

### 6.2 Groundwater Management

#### 6.2.1 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 with the Project Area and adjacent properties.

#### 6.2.2 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.

#### 6.2.3 Groundwater Levels

As reported last monitoring period, MP7 and MP8 have both continued to drop in water level, finishing the reporting period approximately 13m lower since sampling at the end of December 2017. Both of these bores are located within the Project Approval boundary and within close proximity to the open cut pit - given this, drawdown is not unexpected. Prior to the 2018 calendar year, the water level at both of these bores has remained relatively consistent.

WB5, WB11, WB13, WB14 and WB15, located on 'Roseberry', 'Brolga', 'Carlton', 'Barock' and 'Kahana' respectively, are continuing to trend down, following periods of fluctuation in the past. The abovementioned bores all have some form of pump connected to them (i.e. solar pumps or windmills), and as such, the drawdowns are deemed to be caused by the increasingly dry conditions throughout the period, and not mining related.

Water level trends in all other bores have remained relatively consistent over the past monitoring periods.

#### 6.2.4 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).

#### 6.2.5 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.

As found during the reporting period standing water levels generally have not lowered significantly at the monitoring and groundwater bores surrounding the mine, with some slight drawdowns associated with the current dry period and neighbouring water use, with the exception of MP-7 and MP-8. The hydrogeological assessment did however also predict 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.

### 6.2.6 Groundwater Management

At the end of the reporting period there was 14.5ML held in the in-pit dams (note that this is not all groundwater however). Inflows into the open cut during the period result from a combination of:

- Direct rainfall runoff and infiltration through the emplaced overburden which flows down to the open cut; and
- Inflows from the exposed coal seam.

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.

### 6.3 Water Take

The water taken by the operation is summarised in Table 6.3, and shows compliance with the licence entitlements. Following the removal of the pump in 2017 there was no pumping of pit water out of pit during the reporting period.

**TABLE 6.3 – WATER TAKE**

| Water Licence Number | Water Sharing Plan, Source and Management Zone (as applicable) | Entitlement | Passive take/inflows | Active Pumping | TOTAL |
|----------------------|--|-------------|----------------------|----------------|-------|
| WAL29461             | Gunnedah-Oxley Basin Mdb Groundwater Source                    | 120 units   | 0                    | 0              | 0     |
| WAL36758             | Gunnedah-Oxley Basin Mdb Groundwater Source                    | 700 units   | 30ML                 | 0              | 30ML  |

## 7. REHABILITATION

### 7.1 Rehabilitation Performance during the Reporting Period

#### 7.1.1 Status of Mining and Rehabilitation

The status of mining and rehabilitation at the completion of the reporting period is presented in Table 7.1.1 and Figure 17.

**TABLE 7.1.1 REHABILITATION STATUS**

| Mine Area Type                            | Previous Reporting Period (Actual) | This Reporting Period (Actual) | Next Reporting Period (Forecast) |
|---|------------------------------------|--------------------------------|----------------------------------|
|   | 2018 (ha)                          | 2019 (ha)                      | 2020 (ha)                        |
| A. Total Mine Footprint                   | 371.8                              | 374.9                          | 374.9                            |
| B. Total Active Disturbance               | 208.2                              | 218.73                         | 171                              |
| C. Land Being Prepared for Rehabilitation | 51.2                               | 53.23                          | 40                               |
| D. Land Under Active Rehabilitation       | 112.4                              | 102.94                         | 150.94                           |
| E. Completed Rehabilitation               | 0                                  | 0                              | 0                                |

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

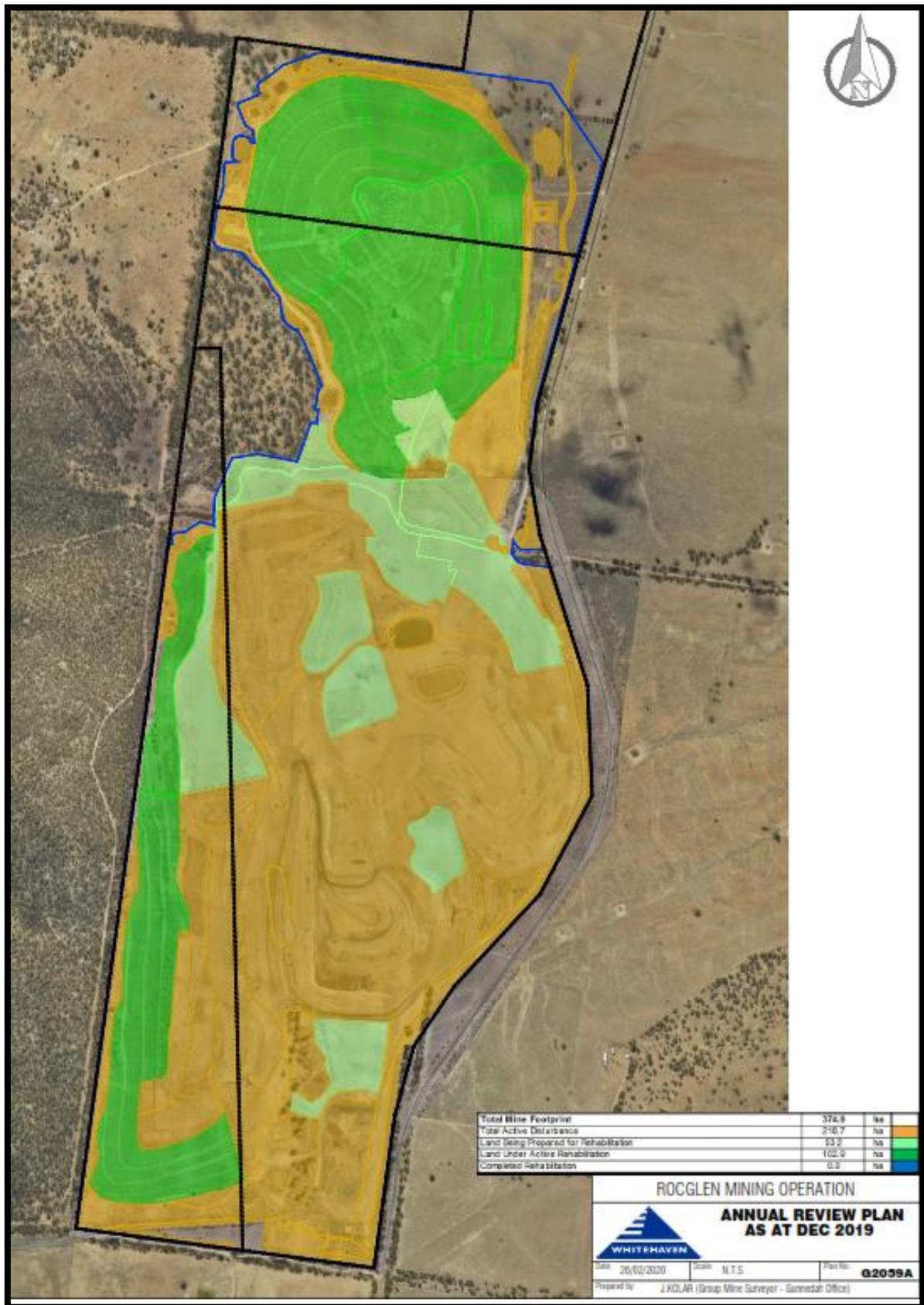


Figure 7 Annual review plan

### 7.1.2 Post Rehabilitation Land Uses

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

#### 7.1.3 Rehabilitation Monitoring

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

#### 7.1.4 Renovation or Removal of Buildings

As part of closure and decommissioning all infrastructure on the ROM pad was removed this included a portable crusher, mobile generator and associated shed, a shed that housed the loader, conveyor gantry and associated concrete footings, underground power lines, and two surface water 2 tanks.

#### 7.1.5 Other Rehabilitation Undertaken

Infill planting was undertaken on the along the Wean Rd vegetation screen. Due to drought conditions ongoing watering was required, as of December 2019 there was a 96% survival rate.

No additional rehabilitation of exploration area, infrastructure, shafts, adits, dams, fence lines or bunds occurred during the reporting period.

#### 7.1.6 Departmental Sign-off of Rehabilitated Areas

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

#### 7.1.7 Variations in Activities against MOP (RMP)

Operations and activities were undertaken in accordance with the approved modification of the RCM MOP, which was last amended in November 2016. RCM are currently in the process of preparing a Closure MOP for the site.

#### 7.1.8 Trials, Research Projects and Initiatives

Methodology for planting tube stock was reviewed, improvements made included pre preparation of the area by ripping to improve moisture ingress, using an excavator mounted auger and fortnightly watering.

#### 7.1.9 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/lack of nutrient;
- 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.

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.

## 7.2 Actions for Next Reporting Period

Ongoing bulk earthworks to progress to final landform.

Infill planting of the Northern Dump.

Test pitting to determine depth of carbonaceous material below final landform within the pit, and the northern and western overburden dumps.

## 8. COMMUNITY

### 8.1 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, two meetings were held – 13<sup>th</sup> March 2019 and the 11<sup>th</sup> September 2019 – minutes are available on the Whitehaven Coal website.

### 8.2 Community Complaints

RCM has a designated complaints line advertised on the Whitehaven Coal Website. In the event of a complaint, details pertaining to the complainant, complaint, and action taken are recorded. A complaints register is maintained on Whitehaven's website.

No complaints were received during the reporting period. A summary of the complaint is provided below.

**TABLE 8.2 - COMPLAINTS HISTORY**

| Topic         | Calendar Year |      |      |      |      |      |
|---------------|---------------|------|------|------|------|------|
|               | 2014          | 2015 | 2016 | 2017 | 2018 | 2019 |
| Air Quality   | -             | -    | -    | -    | -    | -    |
| Blasting      | 3             | -    | 3    | 1    | -    | -    |
| Noise         | -             | -    | -    | -    | -    | -    |
| Water Quality | -             | -    | -    | -    | -    | -    |
| Other         | -             | -    | -    | -    | 1    | -    |

### 8.3 Community Engagement and Contributions

Community contributions are managed in accordance with the Whitehaven Coal Donations and Sponsorship Policy, with donations targeted towards Gunnedah and regional areas. Groups which have received contributions included, but are not limited, to the following:

#### GUNNEDAH

- Role Models and Leaders Australia Ltd
- Rotary Club of Gunnedah
- Gunnedah Cycling & Triathlon Club Inc
- Gunnedah Family Support
- Black & Blue Gym
- Gunnedah Show Society
- Winanga-Li Aboriginal Child & Family Centre
- Gunnedah PCYC
- Gunnedah Ministers Fraternal
- Gunnedah & District Chamber of Commerce
- Gunnedah Eisteddfod Society
- Gunnedah West Rotary Club
- Gunnedah Multiple Sclerosis Club
- Apex Gunnedah
- Gunnedah Men of League
- Gunnedah High School
- Challenge Community Service
- Curlewis Public School
- Old Bank Galley

#### REGIONAL

- NSW Minerals Council
- Australian Indigenous Oztag
- AUSIMM
- Dorothea Mackellar Memorial Society
- Armajun Health Service Aboriginal Corporation
- Aboriginal Steel Art
- ASX Thomson Reuters Charity Foundation
- Gomeroi Elders
- Uralla Shire Council
- Wee Waa Koori Netball

## 9. 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. As the Audit

Action Plan is available on the Whitehaven Coal website, individual non-compliances have not been replicated in Table 10.2.

Provided below, is a summary of outstanding audit actions:

- *Surrender of PA 06\_0198* - Surrender has been submitted but is not yet finalised. Transfer of the property relating to the Wean Rd bypass was concluded late January 2020 which will facilitate the surrender.

All dated actions have been completed, Future Annual Reviews will include status updates until all outstanding audit actions have been addressed.

## 10. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

### 10.1 Reportable Incidents

Exceedances of the High Volume Air Sampling daily PM10 limit were communicated to the Department on numerous occasions throughout the reporting period.

### 10.2 Non-compliances

All of the non-compliances with relevant approvals have been ranked as either administrative or low, with very limited potential for environmental harm. These are addressed Table 10.2.

**TABLE 10.2 – NON-COMPLIANCE SUMMARY**

| Approval(s) | Schedule/Condition | Non-compliance  | Action(s)  |
|-------------|--------------------|---|--|
| PA10_0015   | Schedule 2(2)      | Project not carried out generally in accordance with the EA and conditions of the Project Approval. See non-compliances below.  | Refer to non-compliances below.  |
|             | Schedule 2(8)      | Surrender of PA 06_0198 not yet finalised.  | Project Approval surrender has been submitted. Transfer of property occurred in January 2020, which will now facilitate the surrender of the approval.   |
|             | Schedule 3(15)     | In accordance with the Air Quality and Greenhouse Gas Management Plan, the HVAS is required to run every six days however, there were two occasions at the 'Costa Vale' and 'Roseberry' HVAS where no run occurred. | The two missed runs were due to power outage caused by thunderstorms.  |
|             | Schedule 3(31)     | Vegetative screen along Wean Road not yet fully established and "effective".  | Infill planting was undertaken during the reporting period to enhance the screen. Trees are still too small to be effective. Maintenance planting will continue if and when required, to fully establish screen. |

|           |            |   |  |
|-----------|------------|---|--|
| EPL 12870 | A3.1       | Works were not carried out in accordance with the licence.  | See non-compliances & actions below.   |
|           | M2.1, M2.2 | Continuous PM10 monitoring was not achieved due to power outages, communication issues and planned and unplanned maintenance. | Regular maintenance continues to be undertaken on the monitor.   |
|           | M2.2       | There were two occasions during the reporting period where no HVAS run occurred.  | Regular maintenance continues to be undertaken. In future, reruns will be undertaken in the event of a short (or nil) run. |

### 10.3 Regulatory Actions

RCM received a Section 240 Notice from the Department of Planning and Environment Resource Regulator on the 18<sup>th</sup> April 2019. This notice required the submission of a Final Rocglen Coal Mine Rehabilitation Report by 29<sup>th</sup> November 2019, and detailed a number of required inclusions. Aspect Ecology was engaged to complete the report, and it was submitted on the 29<sup>th</sup> November 2019.

Rocglen Coal Mine was fined by the NSW Land and Environment Court for a blast fume event that occurred in August 2016. Blasting procedures and process were amended after the incident. As the mine is in closure there is no further blasting activities scheduled.

## 11. 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;
- The completion of all actions detailed in the Aspect Ecology Rehabilitation Report by December 2020.
- Completion of outstanding IEA actions, as per timing indicated in the Audit Action Plan, available on the Whitehaven Coal Website;
- 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.