YANCOAL
兖煤澳大利亚有限公司

# Annual Review

# 2018

STRATFORDCOAL
Part of the Yancoal Australia Group

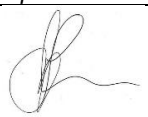
CARBON BASED
ENVIRONMENTAL

# STRATFORD MINING COMPLEX

# ANNUAL REVIEW

## Reporting Period: 1st January 2018 to 31st December 2018

**Table 1 – Annual Review Title Block**

| | |
|---|---|
| **Name of operation** | *Stratford Mining Complex* |
| **Name of operator** | *Yancoal Australia Ltd* |
| **Development consent/ project approval #** | *SSD-4966 (Stratford Extension Project)* |
| **Name of holder of Development consent/ project approval #** | *Stratford Coal Pty Limited* |
| **Mining lease #** | *ML1360, ML1409, ML1447, ML1521, ML1528, ML1538, ML1577, ML1733* |
| **Name of holder of mining lease** | *Gloucester Coal Ltd/CIM Stratford Pty Ltd/Stratford Coal Pty Ltd* |
| **Water licence #** | *WAL 41534, WAL 41535, WAL 41536, WAL 41537, WAL 41538,* |
| **Name of holder of water licence** | *Gloucester Coal Ltd/CIM Stratford Pty Ltd/Stratford Coal Pty Ltd* |
| **MOP/ RMP start date** | *1st March 2018* |
| **MOP/ RMP end date** | *1st March 2021* |
| **Annual Review start date** | *1st January 2018* |
| **Annual Review end date** | *31st December 2018* |
| **I, (John Cullen), certify this audit report is true and accurate record of the compliance status of Stratford Mining Complex for the period of 1st January 2018 to 31st December 2018 and that I am authorised to make this statement on behalf of Yancoal.**<br>*Note.*<br>*a) The Annual Review is an 'environmental audit' for the purpose 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 the corporation, $1 million and for an individual $250,000.*<br>*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** | *Mr John Cullen* |
| **Title of authorised reporting officer** | *Operation Manager – Stratford Coal* |
| **Signature of authorised reporting officer** |  |
| **Date** | *12 April 2019* |

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# 1. STATEMENT OF COMPLIANCE

This Annual Review has been prepared in accordance with Schedule 5 Condition 4 of Development Consent SSD-4966 for the Stratford Extension Project.

Development Consent for the Stratford Extension Project (SEP) (SSD-4966) was granted by the NSW Planning Assessment Commission (PAC), as delegate for the Minister for Planning, on 29 May 2015. During the reporting period Stratford Coal Pty Ltd (SCPL) submitted notice to advise the NSW Department of Planning and Environment (DP&E) that SCPL intended to commence the approved activities in accordance with the conditions of SSD-4966 on 4 April 2018.

On 11 April 2018 DP&E confirmed SCPL's application to voluntarily surrender the existing Development Consents DA 23-98/99 for the Stratford Coal Mine and DA 39-02-01 for the Bowens Road North Open Cut had been accepted.

A summary of the non-compliances with Development Consent SSD-4966 during the reporting period are included in Table 2b.

**Table 2a- Statement of Compliance**

| **Were all conditions of the relevant approval(s) complied with?** | |
|---|---|
| SSD-4966 | NO |
| ML1360, ML1409, ML1447, ML1521, ML1528, ML1538, ML1577, ML 1733 | YES |

**Table 2b- Summary of Non-Compliances**

| Condition # | Condition Description/Non-Compliance | Compliance Status/Risk | Comment | Section addressed |
|---|---|---|---|---|
| **SSD-4966 – Stratford Extension Project** | | | | |
| Schedule 2 Condition 1 and 2 | Condition: Obligation to minimise harm to the environment.<br>Non-compliance: Ground disturbance beyond approval limit impacting on biodiversity enhancement area. | Low | 16/11/2018 – Ground disturbance incident occurred and was reported in accordance with SSD-4966 and the PIRMP.<br><br>An incident report was submitted within 7 days. A Show Cause Notice was issued by DP&E on 20/12/2018 and a response was provided by SCPL on 18/01/2019.<br><br>An Official Caution was issued by DP&E on 15 February 2019. | Section 11 |

| 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 | Non-compliance which does not result in any risk of environmental harm |

# 2. INTRODUCTION

The Stratford Mining Complex (SMC) is located in the Gloucester Basin approximately 100km north of Newcastle in New South Wales. Refer **Figure 1** (**Appendix 1**).

Stratford Coal Pty Ltd (SCPL), a wholly owned subsidiary of Yancoal Australia Limited (YAL), is the owner and operator of the Stratford Mining Complex.

The SMC is located in an area of 1,500ha of cleared former grazing land owned by SCPL to the east of The Bucketts Way, between the villages of Stratford and Craven. Refer **Figure 1** (**Appendix 1**). Development Consent was approved by the NSW Minister for Planning on 19 December 1994 and Mining Lease Number 1360 was granted by the NSW Minister for Mineral Resources on 21 December 1994 with production commencing in June 1995.

SMC consists of an open-cut, truck and excavator mine producing run of mine (ROM) coal which is processed at the SMC Coal Handling and Processing Plant (CHPP) and transported via train on the North Coast Railway to the Port of Newcastle.

Mining activities approved under the Stratford Coal Mine and Bowens Road North Development Consents were suspended in mid-2014, however, processing of ROM coal from the Duralie Coal Mine (DCM), also owned by YAL, at the CHPP and the export of product coals continued during this time.

Development Consent for the Stratford Extension Project (SEP) (SSD-4966) was granted by the NSW Planning Assessment Commission (PAC), as delegate for the Minister for Planning, on 29 May 2015. The SEP provides for the continuation and extension of operations at the SMC including the mining of three new open cut areas. During the reporting period SCPL submitted notice to advise DP&E that SCPL intended to commence the approved activities in accordance with the conditions of SSD-4966 on 4 April 2018.

This Annual Review (AR) has been prepared in accordance with Schedule 5 Condition 4 of Development Consent SSD-4966 for the Stratford Extension Project. This report is also prepared in accordance with the annual reporting requirements for Mining Leases held by SCPL and in accordance with the Department of Planning and Environment (DPE) Annual Review Guidelines (October 2015).

The AR describes the environmental protection, pollution control and rehabilitation activities at the SMC for the period 1 January 2018 to 31 December 2018. As required by approved Development Consents, comparisons of environmental monitoring results have been made against relevant statutory requirements, monitoring results of previous years and relevant predictions of Environmental Assessments. Environmental management activities planned for the next 12 months are also discussed.

## 2.1 MINE CONTACTS

The SMC is an owner operated mine site by SCPL. Site personnel responsible for mining, CHPP, rehabilitation and environmental issues at the end of the reporting period are provided in Table 3.

**Table 3: SMC management contact details**

| Position | Name | Contact |
|---|---|---|
| Operations Manager, Stratford & Duralie Operations | Mr John Cullen | 02 6538 4210 |
| Environment & Community Superintendent | Mr Michael Plain | 02 6538 4203 |
| CHPP Superintendent | Mr Justin Goodreid | 02 6538 4235 |

# 3. APPROVALS

## 3.1.1 Status of Leases, Licences and Approvals

The SMC operates in accordance with the approvals provided in Table 4.

**Table 4: Stratford Mining Complex – Licences, Leases and Approvals**

| Description | Date of Grant | Duration of Approval | Comments |
|---|---|---|---|
| **NSW Project Approvals** | | | |
| Stratford Extension Project Development Consent SSD-4966 | 29 May 2015 | 31 December 2025 (mining operations) | Action commenced on 4 April 2018. |
| Stratford Coal Mine Development Consent DA 23-98/99 | 19 December 1994 (As modified) | 31 December 2019 (mining operations) | Surrendered 11 April 2018. |
| Bowens Road North Open Cut Development Consent DA 39-02-01 | 25 July 2001 | 31 December 2014 (mining operations) | Surrendered 11 April 2018. |
| **Mining Leases and Exploration Licences** | | | |
| ML 1360 | 21 December 1994 (renewed 21 December 2015) | 21 December 2036 | Variation of Conditions dated 22/06/2018 |
| ML 1409 | 7 January 1997 | 7 January 2039 | Renewed 07/03/2018 |
| ML 1447 | 1 April 1999 | 1 April 2020 | |
| ML 1521 | 24 September 2002 | 24 September 2023 | Variation of Conditions dated 08/10/2018 |
| ML 1528 | 20 January 2003 | 20 January 2024 | |
| ML 1538 | 25 June 2003 | 25 June 2024 | |
| ML 1577 | 1 March 2006 | 1 March 2027 | Variation of Conditions dated 08/10/2018 |
| ML 1733 | 8 April 2016 | 8 April 2037 | Variation of Conditions dated 19/02/2018 |
| A311 | 17 September 1982 | 28 November 2017 | Renewal lodged – pending |
| A315 | 27 December 1982 | 28 November 2017 | Renewal lodged - pending |
| EL 6904 | 9 October 2007 | 9 October 2017 | Renewal lodged - pending |
| **Environment Protection Licences** | | | |
| EPL 5161 | 1 July 2000 | Until revoked or surrendered. | As modified by subsequent variations |
| EPL 11745 | 16 December 2002 | Until revoked or surrendered. (19/06/2018) | Surrendered 19/06/2018 |
| **Commonwealth Approvals** | | | |
| EPBC 2011/6176 | 29 January 2016 | 30 November 2030 | Action commenced on 4 April 2018. |

| **Water Licences** | | | |
|---|---|---|---|
| Water Access Licences (WAL 41534, WAL 41535, WAL 41536, WAL 41537, WAL 41538) | Various | Perpetuity | Groundwater extraction – open cut dewatering. |
| Groundwater bore licences – various | Various | Perpetuity | Groundwater monitoring |
| Water Access Licences (WAL 19536, WAL 19514, WAL 19540) | Various | Perpetuity | Avon River Water Source |

***Environmental Management Plans***

Environmental Management Plans (EMPs) are also approved for the SMC. The current versions approved by DP&E are available on the Stratford Coal website.

- Environmental Management Strategy (revised). Approved 17 October 2018.
- Air Quality Management Plan (revised). Approved 17 October 2018.
- Biodiversity Management Plan (revised). Approved 19 October 2018.
- Blast Management Plan (revised). Approved 17 October 2018.
- Heritage Management Plan. Approved 17 October 2018.
- Life of Mine Rejects Disposal Plan (revised), October 2018.
- Noise Management Plan (revised). Approved 19 October 2018.
- Water Management Plan (revised). Approved 30 October 2018.
- Mining Operations Plan and Rehabilitation Management Plan (MOP) (revised). Conditional Approval 11 January 2019.
- Pollution Incident Response Management Plan (revised), November 2018.
- Squirrel Glider Management Plan (revised). Approved 19 October 2018.
- Transport Monitoring Program. Approved 8 March 2018.

### 3.1.2 Amendments to Approvals/Licences over the Reporting Period

The following amendments to approvals/licences were granted during the reporting period.

***NSW Development Consent***

- Development Consent SSD-4966 was granted by the NSW PAC, as delegate for the Minister for Planning, on 29 May 2015. SCPL commenced the approved activities in accordance with the conditions of SSD-4966 on 4 April 2018.
- On 11 April 2018 DP&E confirmed SCPL's application to voluntarily surrender the existing Development Consents DA 23-98/99 for the Stratford Coal Mine and DA 39-02-01 for the Bowens Road North Open Cut had been accepted.

***Commonwealth Project Approval***

- Commonwealth Approval EPBC 2011/6176 for the SEP was grant by the Secretary for the Department of Environment & Energy on 29 January 2016. SCPL commenced the approved activities in accordance with the conditions of EPBC 2011-6176 on 4 April 2018.

***Mining Leases***

- Mining Lease Application (MLA 552) was lodged for Stratford East area on 5 December 2017. MLA 552 is pending grant.
- Ancillary Mining Activity Application (Attached to ML1360) was lodged for Stratford East area on 15 November 2017. The ALA is pending grant.
- ML 1409 was renewed on 7 March 2018 for a further 21 years.
- Variations to the conditions of ML 1409, ML 1521, ML 1577 & ML 1733 where received during the reporting period.

***Environment Protection Licence***

- Notice of variation for EPL 5161 was received on 19 June 2018. The variation to EPL 5161 was undertaken to encompass the entire SEP boundary. The licence variation makes changes to the licence to accommodate the approval and requirements of the SSD-4966.
- EPL 11745 covering the existing Bowens Road North Project area was surrendered on 19 June 2018 as this project boundary is now incorporated into EPL 5161

***Environmental Management Plans***

- Environmental Management Plans (EMPs) required in accordance with the conditions of SSD-4966 were prepared and approved during the reporting period in advance of operations commencing for the SEP.
- A Mining Operations Plan and Rehabilitation Management Plan (MOP) was prepared for the SEP and approved by the Secretary for DRG on 9 March 2018 in advance of operations commencing. An amendment to the MOP was prepared and approved by DRG on 11 January 2019.

# 4. OPERATIONS SUMMARY

A summary of operations (production), during the preceding and current reporting period as well as a forward forecast for the next reporting period is provided below in **Table 5**.

**Table 5 - Production Summary**

| Material | Approved limit (specify source) | Previous reporting period (tonnes) | This reporting period (tonnes) | Next reporting period (tonnes) |
|---|---|---|---|---|
| Waste Rock/ Overburden (BCM) | N/A | 0 | 2,205,017 | 6,140,000 |
| ROM Coal (SMC Only) | 2.6 million tonnes per annum | 8,912 | 289,549 | 1,310,000 |
| Co-disposal Reject (Includes Duralie) | N/A | 191,354 | 250,720 | 426,000 |
| Saleable product (Includes Duralie) | N/A (Process limit of 5.6 million tonnes per annum) | 670,734 | 455,617 | 884,000 |

Total saleable product for the 12 month reporting period was 455,617 tonnes. 2,205,017 tonnes of waste was mined (BRN/Avon North) during the reporting period.

Saleable coal production by month for the reporting period is shown in **Table 6.**

**Table 6: Product Coal Produced by Month**

| MONTH | Coking Coal | Thermal Coal | Total Product Coal |
|---|---|---|---|
| January 2018 | 3,994 | 22,720 | 26,714 |
| February 2018 | 5,129 | 28,177 | 33,306 |
| March 2018 | 1,491 | 36,803 | 38,294 |
| April 2018 | 906 | 32,122 | 33,028 |
| May 2018 | 2,523 | 32,736 | 35,259 |
| June 2018 | 2,835 | 46,265 | 49,100 |
| July 2018 | 3,413 | 46,824 | 50,237 |
| August 2018 | 4,895 | 37,595 | 42,490 |
| September 2018 | 10,661 | 45,225 | 55,886 |
| October 2018 | 14,160 | 30,989 | 45,149 |
| November 2018 | 6,605 | 6,009 | 12,614 |
| December 2018 | 12,471 | 21,069 | 33,540 |
| **Total Annual** | **69,083** | **386,534** | **455,617** |

## 4.1 EXPLORATION

Exploration activities would occur within, and external to, the open cut footprints and would be used to investigate aspects such as geological features, seam structure and coal/overburden characteristics as input to detailed mine planning and feasibility studies.

During the reporting period the following exploration activities were carried out within the Stratford ML 1360, Avon North ML1733 and Authorisation 315 in the proposed Stratford East pit area currently under MLA 522:

- Drilling and borehole logging activities were conducted between August and December 2018.
- 21 holes were drilled for seam definition, geochemical, geotechnical and coal quality purposes, with some dill holes to be established as piezometers.
- All holes were geophysically logged and all but 3 were cemented to surface with rehabilitation in progress. Holes remaining open are proposed to have piezometers installed.

No exploration activities were undertaken in Authorisation 311 during the reporting period.

During the next reporting period no surface exploration activity is anticipated. Mining studies and feasibility type studies are ongoing to process the data gathered in the 2018 programme. Some drilling to establish piezometers and to complete installation of ground water monitoring points is likely to occur. Completion of the rehabilitation of the sites drilled in Stratford East during 2018 will occur. All other sites have been mined or have been rehabilitated.

Exploration activities would be undertaken in accordance with the MOP. Exploration outside the ML area would require an Exploration Activity Approval and Review of Environmental Factors prior to activities commencing.

## 4.2 ESTIMATED MINE LIFE

Mining activities approved under the SEP Development Consent (SSD-4966) were commenced on 4 April 2018 and involves the extension and continuation of mine operations at the SMC

The SEP approved activities are described in the SEP Environmental Impact Statement (EIS 2012) and includes:

- 11 years of mining;
- Up to 2.6mtpa ROM coal;
- 3 new open cut mining areas; and
- Use of existing CHPP and infrastructure.

Condition 5, Schedule 2 of SSD-4066 allows the carrying out mining operations on the site until 31 December 2025.

## 4.3 OPEN CUT MINING

SMC consists of an open-cut, truck and excavator mine producing ROM coal which is processed at the CHPP and transported via train on the North Coast Railway to the Port of Newcastle.

Mining activities approved under the Stratford Coal Mine and Bowens Road North Development Consents were suspended in mid-2014, however, processing of ROM coal from the Duralie Coal Mine (DCM) at the CHPP and the export of product coals continued during this time.

Mining activities approved under the SEP Development Consent (SSD-4966) were commenced on 4 April 2018. The following milestones were achieved during the reporting period:

- Mining in the BRN Open Cut recommenced in April 2018.
- Construction of the new Avon North Open Cut commenced in June 2018, including the construction of a new haul road, out-of-pit waste emplacement and box-cut.
- Mining in the Avon North Open Cut commenced in July 2018
- Construction of the Wenham Cox Road diversion commenced in July 2018 and was completed in September 2018.

Reprocessing of coal from both the Co-disposal area and receiving coal from Duralie Coal Mine for coal processing, handling and railing continued during the reporting period.

Mining operations are permitted 7 days per week. Operational time restrictions apply as prescribed in SSD-4966.

Mining in the approved Stratford East Open Cut and Roseville West Extension Pit are proposed in future reporting periods. The mining activities proposed for the next reporting period are described in the MOP which was conditionally approved on 9 January 2019.

### 4.3.1 Mining Equipment and Method

The mining equipment currently in use at SMC is listed in **Table 7** provided below.

**Table 7: Current Mining Equipment**

| Item | Description | Number |
|---|---|---|
| **Stratford Coal Pty Ltd** | | |
| Excavator | Hitachi 2600 | 2 |
| Excavator | Caterpillar 349 | 1 |
| Haul Trucks | Cat 785C | 9 |
| Track Dozer | Caterpillar D10T | 6 |
| Drill | Atlas Copco | 2 |
| Grader | Caterpillar 18M | 2 |
| Water Cart | Caterpillar 777F | 2 |
| Front End Loader | Caterpillar 988H | 2 |
| Ancillary Mobile Plant | Various | |
| | | |
| **Ditchfield Contracting** | | |
| Excavator | Caterpillar 6015B | 1 |
| Excavator | Komatsu PC1250 | 2 |
| Excavator | Cat 374, 349, 336 | 3 |
| Haul Trucks | Cat 775 | 8 |
| Haul Trucks | Volvo A40 | 6 |
| Track Dozer | Cat D6, D9, D10, D11 | 5 |
| Drill | Drill Atlas Copco D65 | 1 |
| Grader | Caterpillar 14M | 2 |
| Water Cart | Caterpillar 773 | 1 |

The mining sequence is summarised below and is conducted in accordance with the approved MOP and supporting approvals including relevant EMPs (refer Section 3). The mining sequence generally occurs in the following manner:

- A vegetation clearance and ground disturbance plan is prepared. This includes fauna/flora assessments and cultural heritage surveys.
- An erosion and sedimentation control plan is prepared for the area to be disturbed.
- Delineation of the proposed disturbance area is undertaken.
- Water infrastructure and sedimentation controls are implemented.
- Tree clearing is limited to the minimum area required for ongoing operations and undertaken ahead of the advancing workings.
- Topsoil is removed in accordance with a topsoil stripping plan.
- Overburden removal is undertaken by a hydraulic excavator. Generally, the first one to five metres of subsoil/overburden is ripped and/or free-dig. Deeper overburden requires blasting prior to excavation.
- Overburden waste material is deposited either in out-of-pit waste emplacements or backfilled into mining voids
- Following waste emplacement, shaping to the approved final landform in undertaken in preparation for rehabilitation works.

## 4.4 COAL HANDLING AND BENEFICIATION

### 4.4.1 CHPP Throughput

Coal is processed in a 600 tonnes per hour (tph) coal handling and processing plant (CHPP) with coarse coal (i.e. 50mm down to 1mm) treated using dense medium cyclones (50mm to 1.5mm) and "teeter bed" separator/spirals (1.5mm to 0.4mm) and fine coal using floatation (0.4mm to <0.1mm). The CHPP operates on a two shift, 5 days per week basis. Feed to the CHPP is by front end loader based on blending of coal plies from the ROM stockpile. The essential elements of the CHPP and their design capacities are as follows:

| | |
|---|---|
| ROM coal processing | 5.6 Mtpa maximum |
| CHPP feed rate | 600 tph |
| Product coal | 3.3 Mtpa |
| Train load out rate | 3,000 tph |

Reclaimed previously emplaced CHPP reject material was also used as feed for the CHPP, as an addition to SMC and DCM ROM coals during the reporting period.

### 4.4.2 Coal Stockpile Capacity (ROM & Product)

| | |
|---|---|
| ROM coal stockpile capacity | 150,000 t |
| Product coal stockpile capacity | 400,000 t |

### 4.4.3 Product Transport

All saleable coal is transported from site by rail. A total of 87 export trains were loaded during the reporting period. Condition 8, Schedule 2 of SSD-4966 permits a maximum of 6 laden trains per day and no more than 2 laden trains during night-time hours to be dispatched. SCPL were compliant during the reporting period with regard to export trains.

A summary of product coal transported during the reporting period is provided below in **Table 8**. Records of the export train movements are provided in **Appendix 8** and are also available on the Stratford Coal website.

**Table 8: Export Train Coal Transported by Month**

| MONTH | Product Coal Transported (Tonnes) |
|---|---|
| January 2018 | 24,600 |
| February 2018 | 36,900 |
| March 2018 | 61,500 |
| April 2018 | 43,050 |
| May 2018 | 49,200 |
| June 2018 | 36,900 |
| July 2018 | 65,846 |
| August 2018 | 29,930 |
| September 2018 | 59,860 |
| October 2018 | 40,819 |
| November 2018 | 23,944 |
| December 2018 | 41,902 |
| **Total Annual** | **514,451** |

### 4.4.4 CHPP Reject Management

During the reporting period the CHPP received ROM coals from the SMC and the DCM.

Reject material produced at the Stratford CHPP is disposed of in accordance with the SMC Life of Mine Rejects Disposal Plan (RDP 2018). During the reporting period the RDP was revised following the commencement of the SEP to reflect the ongoing mine operation and production schedules. Further, the RDP revision was prepared to address the outcomes of an inspection of the SMC conducted on 31 May 2018 by the NSW Resources Regulator which required SCPL to develop a strategy to assess the proposed rehabilitation methodology for the Stratford Main Pit and reject emplacement area.

Reference should be made to the RDP for a detailed description of reject management at the SMC.

In general the rejects, both coarse and fine fractions, are pumped via pipeline from the CHPP to the Stratford Main pit where they are deposited below final void ground water levels. Monitoring results for the CHPP rejects are included in **Section 6.12**.

## 4.5 WASTE MANAGEMENT AND RECYCLING

A fully accredited waste contractor was engaged during the reporting period to manage all waste streams from the Stratford operations. This contract includes general waste and recycling, scrap metal, hydrocarbons including waste grease and oil and hazardous waste.

During the reporting period a review of the waste handling/disposal requirements was undertaken with the waste management contractor following the recommencement of operations at the SMC. Waste handling facilities have been supplied around the site as required.

The waste management contractor provides monthly reporting on all waste streams disposed from the SMC. The monthly reports also provide details of recycling achieved and hazardous substances. The waste management contractor undertakes routine inspections of waste disposal facilities to identify any management actions required.

### 4.5.1 Sewerage Treatment and Disposal

Sewage treatment at the mine site consists of:

- A “Bio-Treat” tank system located at the main site office. The system works on the combined principles of primary settlement and aerobic treatment. Treated effluent is then discharged via a spray system into a grassed area near the office
- A similar primary treatment and aeration system located at the CHPP. Treated effluent is pumped onto a vegetated area south of the CHPP incorporating the CHPP noise bund;
- A septic tank system for treatment of sewage from the Training Building. Treated effluent is discharged via a spray system into a grassed area near the main site office.
- An active aeration system for treatment of sewage from the bath-house complex. Secondary stage treated effluent is discharged via the spray irrigation system servicing the main office building;
- A one (1) man septic tank system and transpiration trench located at the Rail Load-out Bin.

These sewage treatment facilities are registered with MidCoast Council and serviced on a quarterly basis by a qualified contractor.

### 4.5.2 Fuel, Oil and Grease Management and Disposal

Fuel (diesel) at the mine site is stored within a fuel farm facility (adjacent to the workshop). An “Acknowledgement of Notification of Hazardous Chemicals on Premises” (Acknowledgement Number

NDG 030521 was held for this facility during the reporting period.

No incidents or reportable spills related to this facility occurred during the reporting period. The fuel bay contains two (2) 110,000 litre above ground diesel Transtanks. A concrete bund surrounds the tanks. Rainfall and any spilt fuel within the bunded area is directed to a collection sump from where it is pumped to a reclaimer system located in the lube bay and passed through an oil water separator.
The CHPP area has two above ground tanks containing chemical reagents, a 10,000 litre tank contains diesel and a 20,000 litre tank contains a frother, "Metfroth".

Bulk oil is stored within a bunded area at the workshop. Used engine oils (lubricating oils) and hydraulic oils are recovered during plant and vehicle servicing in the workshop and in the field.

Within the workshop area, a separate bunded area holds an 18,000 litre waste oil tank and oil/grease drums. The lube bay is fitted with a silt trap and oil separator. A wash pad facility also contains a silt trap. Waste oil is removed from site by a contractor for subsequent recycling off-site on a regular basis.

Oil for gearboxes and lubrication at the CHPP is stored in drums in a concrete bunded area. Used oil filters and hydraulic hoses are stored within bins and removed from site by a suitably licensed contractor.

### 4.5.3 Rubbish Disposal

All domestic rubbish (e.g. food scraps, paper etc.) is deposited in industrial rubbish bins that are periodically emptied by a waste contractor for subsequent disposal

Scrap metal at the CHPP and workshop is collected and placed in bins that have been provided by a scrap metal merchant. The merchant collects the scrap metal following inspection by the waste contractor.

Paper and cardboard is collected for recycling from the workshop, CHPP and main office building. Mixed recycling bins are located at the main office. All contractors are responsible for the collection and removal of their own rubbish.

## 4.6 HAZARDOUS AND EXPLOSIVE MATERIALS MANAGEMENT

Hazardous materials are stored and used in accordance with relevant safety data sheets (SDS). SDS's are kept in a file inside the First Aid Room and are available from an online database on the company intranet.

Bulk explosive are approved for storage within an explosives compound at site.

All hazardous waste is appropriately disposed of by a fully accredited waste contractor and waste tracking certificates are supplied to SCPL.

### 4.6.1 Status of Hazardous Chemicals Notification

An "Acknowledgement of Notification of Hazardous Chemicals on Premises" (Acknowledgement Number NDG 030521) issued by SafeWork NSW is held by Stratford Coal Pty Ltd. This Acknowledgement addresses:

- Above-ground tanks (diesel)
- External magazine (detonators and boosters)
- Above-ground tank (oxidising liquid)
- Roofless bulk storage (ammonium nitrate)

# 5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

DP&E provided notification on 17 July 2018 that the SMC Annual Review 2017 was generally in accordance with the development consent requirements and no amendments or actions were required.

The Resource Regulator provided notification on 13 July 2018 that the SMC Annual Review 2017 was to the satisfaction of the Minister and no amendments were required. The Resource Regulator noted that following the site inspection undertaken on 31 May 2018, the Regulator's rehabilitation performance observations were communicated to SCPL in the letter advice dated 8 June 2018. The inspection outcomes and corrective actions are outlined in **Table 9**. The Regulator advised SCPL are required to report the outcomes of the assessments in the next AR for the Stratford Mining Complex.

**Table 9: Resource Regulator Observations and Actions from Site Inspection 2018**

| Observation | Description | SCPL Response |
|---|---|---|
| **Observation 1** | Rehabilitation progress is generally in accordance with the Mining Operations Plan. | Noted |
| **Observation 2** | The Regulator holds concerns regarding the level of onsite resourcing for rehabilitation at Yancoal operations including Stratford Mining Complex and Duralie Coal Mine. | Noted |
| **Observation 3** | Inspectors Cooper and Newton noted that there are opportunities to develop completion criteria to demonstrate the sustainable agricultural productivity for mature agricultural rehabilitation areas currently under agistment. The Regulator encourages lease holders to seek confirmation that rehabilitation is to the satisfaction of the Department. | In the next reporting period SCPL proposes to investigate opportunities to seek confirmation from the Department for rehabilitation which has achieved the completion criteria and would be suitable for future relinquishment. |
| **Observation 4** | It was reported by site representatives that the current Stratford Complex rejects storage facility has sufficient capacity for all rejects emplacement for the Stratford Extension Project. Site representatives commented that it is proposed to encapsulate rejects with two (2) metres of inert material following decommissioning of the facility. Site representatives were unable to reference any technical assessment or other justification for the proposed capping specification. | Noted. Refer to Corrective Action 1. |
| **Action** | **Description** | **SCPL Response** |
| **Corrective Action 1** | SMC to develop a strategy to assess the proposed rehabilitation methodology for the reject emplacement facility considering factors such as anticipated material densities and moisture content of the emplaced materials, and the approved post mining land use for the facility. Include a detailed description of the strategy in the next Annual Review. | SCPL has engaged Xenith Consulting to assist with the preparation of a detailed methodology for the rehabilitation of the Stratford Main Pit and Rejects Emplacement. Refer to details included in Section 8.5.3. |

# 6. ENVIRONMENTAL PERFORMANCE

## 6.1 REVIEW OF ENVIRONMENTAL PERFORMANCE

A brief review of environmental performance in relation to Environment Protection License (EPL) 5161, together with SMC relevant Development Consent conditions, is provided below. This performance is further discussed in the sections on environmental management activities and environmental monitoring.

### 6.1.1 Development Consent Conditions

Development Consent SSD-4966 for the SEP was granted by the NSW PAC, as delegate for the Minister for Planning, on 29 May 2015. SCPL commenced the approved activities in accordance with the conditions of SSD-4966 on 4 April 2018.

Prior to the commencement of SSD-4966, SCPL operated in accordance with the existing Development Consents DA 23-98/99 for the Stratford Coal Mine and DA 39-02-01 for the Bowens Road North Open Cut. These consents have now been surrendered.

SCPL continues to operate in accordance with the SSD-4966.

Development Consent conditions which were met during this reporting period are described in the following sections. These include administrative and reporting conditions, environmental management and monitoring conditions, community engagement and rehabilitation. Environmental monitoring data was regularly reported as required by the development consent and associated environmental management plans (EMPs).

Environmental Management Plans (EMPs) required in accordance with the conditions of SSD-4966 were prepared and approved during the reporting period in advance of operations commencing for the SEP. A Mining Operations Plan and Rehabilitation Management Plan (MOP) was prepared for the SEP and approved by the Secretary for DRG on 9 March 2018 in advance of operations commencing.

An Independent Environmental Audit of the SMC was not required during the reporting period. In correspondence from DP&E dated 30 November 2018, DP&E advised the initial Independent Environmental Audit required by SSD-4966 must be commissioned prior to 31 December 2020.

### 6.1.2 Environment Protection Licence 5161

- All monitoring has generally been carried out in accordance with licence conditions.
- Records of environmental monitoring activities have been kept.
- A record of environmental and pollution complaints has been maintained.
- Dust suppression measures are in place. Dust monitoring to date (dust deposition gauges, high volume (PM10) air samplers and real-time TEOM monitoring) shows that current dust suppression systems are effective and dust levels are generally below the conditions of consent limits. Monitoring results during the reporting period have demonstrated compliance of the SMC with the air quality management criteria.
- Quarterly noise compliance monitoring was carried out during January 2018, April 2018 and July 2018 followed by monthly compliance monitoring from August 2018 to December 2018. Noise monitoring continues to demonstrate compliance with noise criteria.
- No sediment dam spills occurred during the reporting period.
- A Pollution Incident Response Management Plan (PIRMP) is on the Stratford Coal website.
- One reportable environmental incident relating to ground disturbance occurred at the SMC during the reporting period (further information is included in Table 2b and Section 11).
- An Annual Return was prepared for EPL 5161.

EPL 11745 covering the previous Bowens Road North Project area was surrendered on 19 June 2018 as this project boundary is now incorporated into EPL 5161. An Annual Return for EPL 11745 was period for the reporting period up to the date of surrender and submitted to the EPA on 3 August 2018.

## 6.2 METEOROLOGICAL MONITORING

A meteorological station (i.e. weather station) is operated at the mine site as required by the Development Consent. The location of the meteorological station and the two inversion monitoring towers is shown on **Figure 2** (**Appendix 1**).

### 6.2.1 Rainfall

**Table 10** below summarises the rainfall record obtained from the site Weather Station (tipping bucket) rain gauge during the reporting period. The graphical representation of monthly recorded rainfall during the reporting period is provided in **Appendix 2**.

**Table 10: Stratford Mine - Monthly Rainfall Records**

| MONTH | YEAR | | | | Stratford District |
|---|---|---|---|---|---|
| | 2018 | | 2017 | | Average |
| | Monthly Total (mm) | No. of Rain Days/Month[1,2] | Monthly Total (mm) | No. of Rain Days/Month[1,2] | 1908-2007 |
| January | 43.6 | 7 | 102.4 | 11 | 113.7 |
| February | 83.2 | 9 | 98.2 | 10 | 114.8 |
| March | 227.4 | 9 | 255.6 | 23 | 129.3 |
| April | 23.8 | 13 | 75.0 | 15 | 78.2 |
| May | 11.6 | 6 | 28.2 | 10 | 71.6 |
| June | 97.2 | 17 | 67.8 | 18 | 69.4 |
| July | 10.8 | 5 | 10.6 | 4 | 52.7 |
| August | 12.4 | 4 | 13.0 | 2 | 47.1 |
| September | 36.4 | 9 | 4.0 | 1 | 50.5 |
| October | 130.8 | 21 | 126.2 | 13 | 65.5 |
| November | 76 | 10 | 68.2 | 11 | 82.7 |
| December | 94.2 | 12 | 64.4 | 9 | 102.2 |
| **Total** | **847.4** | **122** | **913.6** | **127** | **977.7** |

Notes: 1. No. of Rain Days/Month - the number of days in the month on which rain fell.
2. When tipping bucket rain gauge data used, a "rain day" by definition requires a minimum recording of >0.20mm comprising dew, heavy fog or light rain (or a combination thereof).

The 2018 calendar year rainfall total was lower than the long-term district average. Three of the twelve months in this period exceeded their respective long term average. This is the seventh consecutive year of below average rainfall.

### 6.2.2 Wind Speed and Direction

**Table 11** below indicates the monthly average and maximum wind speeds and the dominant wind directions by month for the period January 2018 to December 2018, inclusive. The graphical representations of the monthly minimum, average and maximum wind speeds recorded for each month during this period are provided in **Appendix 2**.

**Table 11: Monthly Average and Maximum Wind Speeds and Dominant Wind Directions by Month**

| MONTH | AVERAGE WIND SPEED (km/hr) | MAXIMUM WIND SPEED RECORDED (km/hr) | DOMINANT WIND DIRECTIONS |
|---|---|---|---|
| January 2018 | 10.4 | 63.5 | S |
| February 2018 | 9.0 | 57.5 | S |
| March 2018 | 7.3 | 63.5 | S |
| April 2018 | 6.6 | 56.0 | S |
| May 2018 | 7.3 | 50.1 | NE-NNE |
| June 2018 | 6.8 | 39.5 | S-SSW |
| July 2018 | 6.7 | 52.6 | NNE |
| August 2018 | 8.4 | 46.3 | NNE |
| September 2018 | 9.1 | 48.4 | NNE, SSW |
| October 2018 | 9.4 | 44.9 | NNE, SSW |
| November 2018 | 10.6 | 51.8 | NNE, SSW |
| December 2018 | 10.3 | 53.7 | NNE |

### 6.2.3 Temperature

**Table 12** summarises monthly air temperatures for the reporting period.

**Table 12: Monthly Minimum, Average and Maximum Air Temperatures**

| MONTH | MINIMUM AIR TEMP RECORDED (degC) | AVERAGE AIR TEMP (degC) | MAXIMUM AIR TEMP RECORDED (degC) |
|---|---|---|---|
| January 2018 | 7.8 | 24.2 | 42.5 |
| February 2018 | 11.8 | 22.9 | 40.4 |
| March 2018 | 12.5 | 22.4 | 38.6 |
| April 2018 | 9.3 | 19.4 | 33.9 |
| May 2018 | 1.5 | 13.1 | 26.7 |
| June 2018 | -0.2 | 10.9 | 20.4 |
| July 2018 | -4.5 | 10.2 | 25.6 |
| August 2018 | -3.8 | 10.8 | 27.0 |
| September 2018 | 0.4 | 14.6 | 32.8 |
| October 2018 | 4 | 17.4 | 32.1 |
| November 2018 | 8.8 | 20.4 | 36.4 |
| December 2018 | 10.5 | 22.7 | 38.1 |

The graphical representation of the daily minimum, average and maximum atmospheric temperatures recorded for each month during this period is provided in **Appendix 2**.

## 6.3 AIR QUALITY

### 6.3.1 Dust Control Procedures

SMC has an approved Air Quality Management Plan (AQMP) that establishes a dust management strategy which:

- Identifies air quality criteria;
- Outlines proactive and responsive dust management and control measures;
- Establishes dust management protocols;
- Formulates an air quality monitoring programme;
- Establishes data assessment protocols; and
- Details reporting and review requirements.

The following dust control procedures are used during mining operations to control dust emissions from wind erosion on exposed areas and dust generated from mining, handling and processing activities:

- Minimising topsoil stripping operations ahead of the pre-strip to minimise the area of exposed ground;
- Progressive rehabilitation including prompt reshaping, topsoiling and revegetation;
- Watering of haul roads and other trafficked areas;
- Watering dig faces prior to and during digging;
- Fitting drills with dust suppression equipment including aprons and sprays;
- Regular maintenance of hauls roads and minor roads;
- Modifying operations during adverse weather conditions;
- Watering of disturbed areas at the end of shift to help mitigate any potential dust generation when the mine is not operating (as necessary);
- Real-time monitoring with alarm triggers set to enable implementation of reactive dust control management measures; and
- A predictive meteorological forecasting system to enable implementation of proactive dust control management measures.

At the CHPP, potential dust emission sources are controlled by water sprays at a number of locations:

- Run of Mine (ROM) Coal Bin

- Crusher Station
- Stamler Feeder/Breaker
- Product Coal Stockpile (overhead sprays on the conveyor)
- Train load out

Sprays are automated in most instances by a solenoid connected to the weight of material on the conveyor belt. Sprays at the ROM Bin, Crusher Station and Stamler operate when 50t/hr of material is on the belts.

The product coal stockpile sprays are located on the overhead conveyor system. A wind speed/direction device provides information to a computer located in the CHPP control room that can electrically activate solenoids valves. The valves open and close in a programmed cycle that alternatively activates sprinkler heads above the stockpile. The dust suppression system operates when the wind speed exceeds 5m/s for >30 seconds.

### 6.3.2 Dust Monitoring and Criteria

SCPL monitors air quality (dust) surrounding the mine site by means of a network of seven (7) static dust fallout gauges, four (4) high volume $PM_{10}$ air samplers, two real-time dust monitors (TEOM) and a meteorological monitoring station (i.e. weather station). The locations of these monitoring sites are shown on **Figure 2** (**Appendix 1**).

Monthly dust deposition levels are measured so that dust deposition rates in $g/m^2$/month can be determined at or near seven (7) residences that surround the mine site. The annual average condition of consent limit for dust deposition is 4.0$g/m^2$/month.

The high-volume air samplers (HVAS) ($PM_{10}$), are located near Stratford Village, Craven Village, ex-Clarke residence and ex-Ellis residence. The HVAS results are also used for total suspended particulate (TSP) estimation,

HVAS sampling is undertaken over a 24 hour 6 day week cycle in accordance with AS 2724.3. The consent criteria for $PM_{10}$ air quality is an annual average limit of 30$ug/m^3$/day and a National Environmental Protection Measure (NEPM) 24-hour average limit of 50$ug/m^3$/day

Two Tapered Element Oscillating Microbalance (TEOM) analysers measuring $PM_{10}$ and $PM_{2.5}$ are used to continuously measure particulate matter. The TEOMs are located in close proximity to Stratford village and Craven village. Real-time air quality monitoring data is used to identify when ambient $PM_{10}$ levels in the surrounding environment are elevated and require contingency action. Real-time response triggers have been established and are designed to provide a system to warn operation personnel (via SMS) when dust levels are approaching a relevant criterion and to require management/control actions to mitigate potential impacts.

### 6.3.3 Review of Dust Monitoring Results

#### 6.3.3.1 Dust Deposition Gauges

**Table 13** shows the dust deposition results for seven (7) dust deposition gauges. **Table 14** shows the annual average dust deposition results at the end of the reporting period (December 2018).

**Table 13: Dust Deposition Gauge Results**

| | Jan-18 | Feb-18 | Mar-18 | Apr-18 | May-18 | Jun-18 | Jul-18 | Aug-18 | Sep-18 | Oct-18 | Nov-18 | Dec-18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **D5** | 0.5 | 0.5 | 1.1 | 0.4 | 15.7[I,B,V] | 0.3 | 0.3 | 0.8 | 0.5 | 0.2 | 2.6 | 1.8 |
| **D6** | 3.1[I,B] | 1.6 | 2.0 | 1.3 | 4.3[I,B,V] | 0.8 | 0.4 | 0.6 | 1.1 | 0.4 | 0.5 | 2.0 |
| **D7** | 2.1 | 0.5 | 0.8 | 0.3 | 2.9 | 0.2 | 0.4 | 0.2 | 0.7 | 0.3 | 0.5 | 2.1 |
| **D8** | 0.9 | 0.4 | 0.6 | 0.7 | 0.5 | 0.9 | 0.5 | 0.4 | 0.3 | 0.3 | 0.6 | 3.9 |
| **D9** | 4.0[I] | 0.4 | 0.6 | 2.3 | 2.7 | 0.3 | 0.4 | 0.7 | 0.7 | 0.6 | 0.4 | 2.8 |
| **D10** | 1.1 | 0.9 | 0.4 | 0.9 | 0.7 | 0.5 | 1.0 | 0.6 | 0.3 | 0.5 | 0.3 | 5.5[I,B,V] |
| **D11** | 1.6 | 2.5 | 1.2 | 0.9 | 1.7 | 0.6 | 0.7 | 1.2 | 0.8 | 0.4 | 0.8 | 1.9 |

Notes/excluded results, Visual Description Guide:
I=Insects: Whole insects e.g. spiders, ants, moths or outer parts of insects including wings, legs and exoskeletons.
V=Vegetation: Plant debris and algae including trichomes, decomposed organic matter and charred particulates showing characteristic cellular plant structures.
B=Bird droppings: The most common contamination.

Dust levels recorded had an average value of 2.0 g/m$^2$/month (contaminated results not counted). Elevated values were at times affected by various degrees of contamination from insects, bird droppings, vegetation (seeds/grasses) and algae. Gauges deemed contaminated during the reporting period were D5 in May 2018, D6 in January and May 2018, D9 in January 2018 and D10 in December 2018.

**Table 14: Annual Average Dust Deposition Gauge Results**

| D5 | D6 | D7 | D8 | D9 | D10 | D11 | EPA Limit |
|---|---|---|---|---|---|---|---|
| 0.8 | 1.1 | 0.9 | 0.8 | 1.1 | 0.7 | 1.2 | **4.0** |

Non-contaminated dust levels were all less than 4.0g/m$^2$/month. The annual average dust levels did not exceed the conditions of consent annual average limit of 4g/m$^2$/month for any deposition gauge. Graphical representation of the dust deposition results and annual averages for the seven (7) dust deposition gauges (D5-D11) are provided within **Appendix 3**.

The dust deposition monitoring results are similar to results presented in previous reports and align with predictions made in the Stratford Extension Project EIS (2012) that dust deposition levels would not exceed relevant air quality criteria at any private residence.

### 6.3.3.2 High Volume ($PM_{10}$) Air Samplers

**Table 15** shows the HVAS $PM_{10}$ monitoring results in µg/m$^3$/day (24 hours) for the monitoring sites at Stratford, Craven, Clarke and Ellis for the reporting period.

Results show that all monitoring locations (in terms of monitored days) did not exceed the consent criteria of 50 ug/m$^3$/day during the reporting period, with the exception of two monitoring results. The HVAS 24 hour criteria is to be assessed on incremental impact (i.e. increase in concentrations due to the development alone, excluding background concentrations from other sources).

The two exceedances were recorded on the 20$^{th}$ March 2018 (54 µg/m$^3$/day) and 13$^{th}$ April 2018 (67 µg/m$^3$/day) at the Ellis property. The Ellis property is owned by SCPL.

On the 20$^{th}$ March both TEOM monitors also recorded alarms and it was noted there was very hazy conditions in the valley following a southerly change with very dry conditions and not related to mining activities. Elevated results were recorded across all HVAS on 20 March 2018.

On the 13$^{th}$ April, it was noted a semi-trailer was being loaded on a nearby dirt track on the Ellis property. No mining activities were occurring during the time of the recorded exceedance. On this basis, the incremental impact at the nearest private receiver would have been below 50 µg/m$^3$/day.

**Table 15: High Volume Air Sampler ($PM_{10}$) Results**

| Date | Stratford | Craven | Ellis | Clarke |
|---|---|---|---|---|
| 1-Jan-18 | 12 | 12 | 13 | 11 |
| 7-Jan-18 | 13 | 11 | 21 | 15 |
| 13-Jan-18 | 13 | 14 | 3 | 17 |
| 19-Jan-18 | 10 | 8 | 13 | 10 |
| 25-Jan-18 | 7 | 8 | 12 | 7 |
| 31-Jan-18 | 6 | 8 | 7 | 6 |
| 6-Feb-18 | 1 | 1 | 3 | 2 |
| 12-Feb-18 | 22 | 19 | 26 | 21 |
| 18-Feb-18 | 16 | 13 | 36 | 14 |
| 24-Feb-18 | 4 | 5 | 33 | 3 |
| 2-Mar-18 | 13 | 13 | 15 | 12 |
| 8-Mar-18 | 4 | 5 | 5 | 5 |
| 14-Mar-18 | 5 | 5 | 13 | 6 |
| 20-Mar-18 | 43 | 40 | 54 | 33 |
| 26-Mar-18 | 8 | 8 | 20 | 10 |
| 1-Apr-18 | 2 | 9 | 25 | 19 |
| 7-Apr-18 | 10 | 7 | 12 | 7 |
| 13-Apr-18 | 12 | 13 | 67 | 12 |
| 19-Apr-18 | 9 | 9 | 11 | 9 |
| 25-Apr-18 | 1.0 | 3 | 4 | 2 |
| 1-May-18 | 1 | 4 | 6 | 3 |
| 7-May-18 | 2 | 1 | 2 | 1 |
| 13-May-18 | 1.0 | 3 | 6 | 1 |
| 19-May-18 | 4 | 5 | 5 | 1 |
| 25-May-18 | 7 | 13 | 14 | 1 |
| 31-May-18 | 3 | 4 | 8 | 1 |
| 6-Jun-18 | 1 | 2 | 3 | 1 |
| 12-Jun-18 | 2 | 1 | 2 | 1 |
| 18-Jun-18 | 1 | 1 | 1 | 1 |
| 24-Jun-18 | 3 | 2 | 2 | 9 |
| 30-Jun-18 | 3 | 3 | 6 | 3 |
| 6-Jul-18 | 5 | 4 | 5 | 7 |
| 12-Jul-18 | 8 | 3 | 4 | 4 |
| 18-Jul-18 | 21 | 19 | 27 | 16 |
| 24-Jul-18 | 8 | 12 | 19 | 13 |
| 30-Jul-18 | 9 | 17 | 16 | 11 |
| 5-Aug-18 | 13 | 20 | 25 | 19 |
| 11-Aug-18 | 7 | 9 | 17 | 10 |
| 17-Aug-18 | 9 | 9 | 26 | 10 |
| 23-Aug-18 | 7 | 8 | 17 | 7 |
| 29-Aug-18 | 7 | 9 | 12 | 9 |
| 4-Sep-18 | 1 | 2 | 3 | 3 |
| 10-Sep-18 | 5 | 7 | 13 | 5 |
| 16-Sep-18 | 15 | 19 | 40 | 25 |
| 22-Sep-18 | 8 | 8 | 17 | 8 |
| 28-Sep-18 | 6 | 5 | 5 | 6 |
| 4-Oct-18 | 11 | 12 | 15 | 16 |
| 10-Oct-18 | 3 | 5 | 6 | 5 |
| 16-Oct-18 | 6 | 6 | 8 | 8 |
| 22-Oct-18 | 7 | 7 | 8 | 7 |
| 28-Oct-18 | 9 | 10 | 10 | 14 |

| Date | Stratford | Craven | Ellis | Clarke |
|---|---|---|---|---|
| 3-Nov-18 | 7 | 16 | 26 | 21 |
| 9-Nov-18 | 8 | 9 | 12 | 12 |
| 15-Nov-18 | 15 | 17 | 34 | 23 |
| 21-Nov-18 | 7 | 7 | 8 | 5 |
| 27-Nov-18 | 12 | 13 | 17 | 13 |
| 3-Dec-18 | 18 | 17 | 21 | 17 |
| 9-Dec-18 | 12 | 13 | 17 | 13 |
| 15-Dec-18 | 6 | 7 | 7 | 18 |
| 21-Dec-18 | 11 | 11 | 17 | 14 |
| **Annual Rolling Average Dec 2018** | **8.3** | **9.2** | **14.9** | **9.7** |

Annual averages for all sampling locations were below the 30 µg/m$^3$/day consent criteria. The HVAS rolling averages remained generally steady throughout the reporting period. Graphical representation of the annual rolling average for the four HVAS including PM10 and TSP during the reporting period is provided in **Appendix 3**. **Figure 3-3** (**Appendix 3**) shows the HVAS monitoring results in µg/m$^3$/day (24 hours) for the monitoring sites at Stratford, Craven, Clarke and Ellis for the reporting period. **Figure 3-4** (**Appendix 3**) shows the annual rolling average for the four HVAS during the reporting period.

Results of HVAS monitoring are in concurrence with the EIS (2012), which predicts the annual average $PM_{10}$ criteria of 30µg/m$^3$ will not be exceeded at any private receiver and that project only 24 hour $PM_{10}$ concentrations will not be above the 50 µg/m$^3$ assessment criteria at any privately owned receiver. The two exceedances were attributable to external influences and were found to be unrelated to mining activities.

### 6.3.3.3 High Volume (TSP) Dust Calculation

A site-specific correlation between TSP and $PM_{10}$ concentrations was developed by SCPL, based on co-located HVASs measuring $PM_{10}$ and TSP as per the AQMP. From the monitoring, approximately 45% of TSP was $PM_{10}$, which compares well with the relationship developed by the NSW Minerals Council for the Hunter Valley (NSW Minerals Council, 2000), which found that approximately 40% of TSP is $PM_{10}$.

**Figure 3-5** (**Appendix 3**) shows the Total Suspended Particulate estimates across the four HVAS during the reporting period. The Consent Criterion of 90ug/m$^3$ was not exceeded during the reporting period.

The HVAS monitoring results are generally similar to those reported in previous ARs and align with predictions made in the EIS (2012) that particulate levels ($PM_{10}$ and TSP) would not exceed relevant air quality criteria at any residence.

### 6.3.3.4 TEOM ($PM_{10}$) Monitoring

Two TEOM dust analysers measuring $PM_{10}$ and $PM_{2.5}$ are used to continuously measure particulate matter and provide a management tool for operations to guide proactive and reactive mitigation measures. The TEOMs are located in close proximity to Stratford village and Craven village. Real-time air quality monitoring data is used to identify when ambient $PM_{10}$ levels in the surrounding environment are elevated and require contingency action. Real-time response triggers have been established and are designed to provide a system to warn operation personnel (via SMS) when dust levels are approaching a relevant criterion and to require management/control actions to mitigate potential impacts.

The Stratford Village TEOM was installed in June 2013 and the Craven Village TEOM was installed and began operation in August 2018. The annual average $PM_{10}$ for the Stratford TEOM from 1 January 2018 to 31 December 2018 is 10.3ug/$m^3$. The annual average $PM_{10}$ for the Craven TEOM from 28 August 2018 to 31 December 2018 is 12.2ug/$m^3$. The 24 hour average results for the reporting period and graphical representation of the rolling annual average of $PM_{10}$ results are provided in **Appendix 3**.

The TEOM results are generally consistent with those measured by the HVAS units. The TEOM results continue to be utilised as a management tool for operations to determine proactive and reactive dust controls.

A register of any trigger alarms from the TEOM system is maintained to record the response implemented by SCPL. All alarms during the reporting period resulted from either external events such as bushfires, regional dust storms during November 2018 or system faults such as overheating or water infiltration. The real-time dust monitoring response register for the reporting period is provided in **Appendix 3**.

### 6.3.4 Complaints

No air quality related complaints were received during the reporting period.

## 6.4 BIOREMEDIATION

Operations at the SMC are conducted with the aim of minimising the potential for land contamination. The management of hydrocarbon contaminated soils is detailed in the Stratford Coal PIRMP. SMC has previously operated an onsite bioremediation area for hydrocarbon contaminated soil where biological degradation of hydrocarbons is used to reduce the hydrocarbon concentration in the soil to an acceptable level.

Since recommencing mining operations at the SMC during 2018 the bioremediation facility has not been reconstructed. Any hydrocarbon contaminated material is recovered and stored for disposal offsite by the licenced waste contractor engaged at SMC.

## 6.5 BIODIVERSITY

In accordance with Condition 33, Schedule 3 of SSD-4966, SCPL is required to implement the Biodiversity Offset Strategy and achieve the broad completion criteria to the satisfaction of the Secretary of the DP&E.

The *Stratford Mining Complex Annual Biodiversity Report 2018* provides a review of the effectiveness of measures in the Biodiversity Management Plan (BMP) for the annual year ending 31 December 2018 in accordance with Section 8.2.1 of the BMP. The scope of the report includes the biodiversity management activities across the Mining Lease areas, the Biodiversity Offset Areas and the Biodiversity Enhancement Area.

In accordance with the BMP, the *Stratford Mining Complex Annual Biodiversity Report 2018* is included in **Appendix 9**. A summary of main biodiversity activities and conclusions are provided in the subsections below.

### 6.5.1 Vegetation Clearance Protocol

Vegetation clearance is undertaken in accordance with the BMP Section 4.1 Vegetation Clearance Protocol. Prior to any clearance operations being undertaken a Clearing Plan is prepared, and pre-clearance surveys are undertaken.

During the 2018 reporting period, vegetation clearance was undertaken in advance of mining operations in the following areas:

- BRN Cutback and BRN Waste Emplacement
- Wenham Cox Rd Diversion
- Avon North Haul Road
- Avon North Open Cut Stages 1, 2 and 3.

The area of disturbance at the end of 2018 is shown in the **Figure 3** (**Appendix 1**).

Information obtained during the preparation of the Clearing Plans and the vegetation clearance activities (i.e. habitat features, hollows cleared and fauna observed) is used to determine the requirements for nest box replacement in the Biodiversity Offset and Enhancement Areas. During the 2018 reporting period a total of six (6) habitat features and no tree hollows were removed (**Appendix 9**).

### 6.5.2 Managing Access, Fencing, Gates and Signage

Managing access, fencing, gates and signage is undertaken in accordance with the BMP Section 5.1 and 5.2.

The implementation of the BMP management measures commenced in April 2018. The BMP requires works to be undertaken to exclude livestock and control access to the Biodiversity Offset areas and Biodiversity Enhancement Areas.

During 2018 an initial review was undertaken of the existing fencing, gates and access tracks. Contractors were engaged to commence the removal of redundant fencing and install new fencing where required. Further, contractors were engaged to upgrade and maintain access tracks required for the ongoing management of the Biodiversity Areas. Fencing and access track work will continue during the next reporting period.

Notices to terminate the existing agistment arrangements were issued in July 2018 and all livestock where excluded from the Biodiversity Areas by the end of 2018. Livestock will only be permitted in the Biodiversity Areas for ‘crash grazing’ programs in preparation for revegetation activities in accordance with the BMP.

Mapping of fencing and access tracks will be completed during the next reporting period.

The installation of signage commenced during 2018. All key points of access to the Biodiversity Areas have been identified and will have signage erected.

### 6.5.3 Revegetation Management

***Seed Collection & Propagation***

Revegetation in the BMP Revegetation Areas (BMP Management Zone A) will occur via seed and tubestock. Local endemic (adapted) species are preferentially be used where a seed supply is available, however consideration will be given to the use of a high-quality seed sourced further from the site as required.

During 2018 SCPL prepared a scope and schedule for the revegetation works to be implemented. The total volume of seed required was calculated based on the floral listings for the target communities in the BMP appendices. During 2018 the majority of seed was sourced externally due to the time constraints for conducting a seed collection program and growing tube-stock prior to the first round of revegetation tube-stocking. Future seed stocks will be sourced onsite where available.

Kleinfelder and Riverdene Nursery have been engaged to assist in the propagation of native plant species with tube-stock grown under controlled nursery conditions and delivered to site as required for revegetation works.

***Revegetation & Regeneration***

Revegetation management is undertaken in accordance with the BMP Section 5.3 Revegetation Programme. The aim of revegetation is to establish a range of habitat niches including native canopy, and understorey. The Revegetation Area (Management Zone A) in the Biodiversity Areas will be revegetated to substantially increase the area of native vegetation in the area and maximise habitat diversity and a range of successional stages.

During 2018 SCPL prepared a scope and schedule for the revegetation works to be implemented. Kleinfelder have been engaged to assist with both the site planning and implementation of the revegetation works. The site planning included:

- Mapping of the priority revegetation areas to be completed in the next year
- Identification of the target vegetation communities (based on the Management Domain maps in the BMP Figure 12a-c)
- Calculation of seed and tubestock requirements based on the indicative lists of flora species in the BMP appendices.

Plans showing areas proposed for revegetation in the Biodiversity Areas in 2019 are included in **Appendix 9**.

Tubestock for the proposed revegetation work was grown during the 2018/19 summer. Revegetation ground preparation works is proposed to be undertaken during March 2019 using the techniques described in the BMP. Tubestock panting is scheduled to commence in April 2019. Details of the 2019 revegetation works will be included in the next annual biodiversity report.

### 6.5.4 Weed Control and Monitoring

The weed control program aims to manage weeds to minimise their impact on native flora and fauna.

A contractor is engaged at the SMC to undertake weed management activities on an ongoing basis and in 2018 this was extended to the Biodiversity Areas. Weed spraying commenced in September 2018 and continued through spring and summer. The initial weed control activities targeted areas of known weed infestation and the proposed revegetation areas for 2019. The key species targeted

included blackberry, lantana, privet, wild tobacco and Giant Parramatta grass.

During the reporting period weed spraying was undertaken on areas including:

- Rehabilitated waste emplacements;
- Mining Leases
- Biodiversity Enhancement Area and Biodiversity Offset Area;
- Infrastructure areas.

Weeds monitoring to evaluate the effectiveness of control measures is undertaken in conjunction with the annual vegetation monitoring and is scheduled for February 2019. A summary of the results will be included in the next annual report.

### 6.5.5 Feral Animal Control and Monitoring

The objective of feral animal control program is to manage feral animals to minimise their impact on native flora and fauna in the Biodiversity Offset and Biodiversity Enhancement Areas or the impact on agricultural production in other surrounding areas.

A feral animal survey was undertaken by AMBS Ecology & Heritage (AMBS) within the SMC Mining Lease areas during April 2017 to monitor the success of control programs and determine priorities for ongoing control measures. The feral animal survey also covered the Duralie Mining Lease and Duralie Biodiversity Offset Area although did not extend to the Stratford Biodiversity Areas as the BMP had not commenced. However, the information provided in the survey provides a good indication of the prevalence of feral species in the locality. A summary of the survey results is included in the Annual Biodiversity Report 2018 (**Appendix 9**).

MDP Vertebrate Pest Management has been engaged by SCPL since 2016 to implement wild dog and fox control programs across property owned by SCPL including both the Stratford & Duralie Mining Leases and the Stratford & Duralie Biodiversity Offset Areas. During the reporting period wild dog control was undertaken between **August 2018** to **September 2018**. The program involved a combination of trapping and shooting.

### 6.5.6 Bushfire Management

The objective of bushfire management in the Biodiversity Areas is to prevent impacts from unplanned bushfire and to use fire to promote biodiversity.

Development Consent SSD-4966 Schedule 3 Condition 51 requires SMC to be suitably equipped to respond to any fires on site and to assist the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.

The following bushfire management related activities/works are undertaken:

- Attendance at Gloucester Bush Fire Management Committee meetings as required;
- Access arrangements onto and through the mine site for RFS officers to fight bushfires and maintenance of tracks;
- SCPL have given an undertaking to GBFMC that the water cart(s) will be made available for bushfire fighting purposes where suitable access for this machinery is available and access to mine water dams will be made available;
- SCM periodically (as required) undertakes hazard reduction burns, in consultation with the local Bushfire Brigade.
- Fuel loads on cleared pasture areas on the mine site and surrounding company owned land are managed by cattle agistment and/or periodic slashing (subject to flora and fauna considerations).

During 2018 an initial review was undertaken of the existing access tracks. Contractors were engaged to upgrade and maintain access tracks required for the ongoing management of the Biodiversity Areas. Mapping of access tracks and firebreaks will be completed during the next reporting period.

Monitoring of fuel loads to evaluate bushfire risk and guide bushfire hazard reduction activities is undertaken in conjunction with the annual vegetation monitoring and is scheduled for February 2019.

### 6.5.7 Nest Box Program

Nest box management is undertaken in accordance with the BMP Section 5.10. Nest boxes will be installed to provide habitat opportunities in the short to medium-term for a number of arboreal fauna species including the Squirrel Glider.

The nest box programme consists of two main components to replace any tree hollows cleared prior to mining activities.

- Suitable nest boxes for the Squirrel Glider will be installed at a ratio of least 3:1 for each tree hollow cleared suitable for the Squirrel Glider.
- For tree hollows that provide habitat to arboreal fauna species (other than the Squirrel Glider), nest boxes will be installed at a minimum ratio of 1:1 (i.e. one nest box of appropriate size to replace one hollow of similar size and properties).

Nest boxes will be installed within the Biodiversity Offset Area and Biodiversity Enhancement Area in Existing Remnant Vegetation (Management Zone B) as well as the Revegetation Area (Management Zone A).

A summary of the vegetation cleared including habitat features and tree hollows is included in **Appendix 9**. During the 2018 reporting period a total of six (6) habitat features and no tree hollows were removed (Appendix C). As such, no nest boxes are required to be replaced at this stage.

Nest box installation requirements will continue to be recorded during the next reporting period. Nest box monitoring will commence following the first installation of nest boxes.

### 6.5.8 Squirrel Glider Management Plan

The management of Squirrel Glider populations is undertaken in accordance with the Squirrel Glider Management Plan (SQMP).

Squirrel Glider programs which commenced during the reporting period include the definition of the Squirrel Glider colonies (SQMP Section 4.1) and identification of the Squirrel Glider home ranges (SQMP 4.2). Programs proposed to commence in the next reporting period will include squirrel glider food resources (SQMP Section 6), tree hollow census and nest box program (SQMP Section 7) and vegetation pathways (SQMP Section 8.1).

***Squirrel Glider Colonies***

Kleinfelder was engaged to undertake an initial targeted Squirrel Glider survey to confirm the location of Squirrel Glider colonies including the previously identified Squirrel Glider colonies and any new colonies which have been established within the areas identified as potential habitat. The surveys will ensure that future monitoring requirements of the SQMP are being implemented at locations of known colony locations.

The surveys were undertaken during November to December 2018 and the results are provided in the *Initial Squirrel Glider survey as part of Stratford Coal's Squirrel Glider Management Plan (Kleinfelder, 2018)* (**Appendix 9**). Squirrel gliders were identified at five locations out of the 37 locations surveyed.

***Squirrel Glider Home Range***

The Squirrel Glider colony locations identified during the initial targeted survey were used to establish the Squirrel Glider home ranges. A radio tracking program was required to establish the home range of known Squirrel Glider colonies. This information will be used to define the study area for a future management of Squirrel Gliders in accordance with the SQMP within the Biodiversity Offset Areas and

Biodiversity Enhancement Areas.

Kleinfelder was engaged to undertake a radio tracking program to determine the Squirrel Glider home ranges. The radio tracking program commenced in January 2019 and the results will be included in the next annual biodiversity report

### 6.5.9 Biodiversity Offset Monitoring and Reporting

The Biodiversity Offset monitoring program is prescribed in the BMP Section 7. The program aims to monitor and report on the effectiveness of the BMP management measures and progress against the detailed performance and completion criteria.

The *Stratford Mining Complex Annual Biodiversity Report 2018* provides a review of the effectiveness of measures in the Biodiversity Management Plan (BMP) for the annual year ending 31 December 2018 in accordance with Section 8.2.1 of the BMP and is included in **Appendix 9.** The annual report includes the results of the monitoring for:

- Habitat and Vegetation monitoring, including visual and photo monitoring;
- Fauna monitoring program
- Effectiveness of weed control;
- Effectiveness of feral animal control;
- Nest box monitoring program.

Habitat and vegetation condition monitoring is undertaken to quantitatively measure the change in habitat and vegetation condition over time. The visual monitoring and photo monitoring programs are undertaken concurrently with the vegetation monitoring to provide additional information on the change of the Biodiversity Areas over time and inform maintenance requirements.

To monitor the effectiveness of revegetation in the Biodiversity Areas Kleinfelder was commissioned to undertake the baseline habitat and vegetation monitoring. The monitoring is schedule to be undertaken in February 2019 and a summary of the results will be included in the next annual report.

Monitoring of fauna usage within the Biodiversity Areas is conducted every three years to document the fauna species response to improvement in vegetation and habitat in the Biodiversity Areas and assess the performance in providing habitat for a range of vertebrate fauna. The surveys include an assessment of habitat complexity, species richness and abundance. The first round of fauna monitoring is scheduled to be undertaken in spring 2019 and the results will be included in the next annual report.

During 2018 AMBS Ecology & Heritage (AMBS) was engaged to undertake a fauna survey within the SMC native rehabilitation areas to assess the success of the rehabilitation areas in providing habitat for a range of vertebrate fauna. The fauna survey undertaken in February 2018 did not extend to the Stratford Biodiversity Areas as the BMP had not commenced, however the rehabilitation areas form part of the overarching Biodiversity Offset Strategy. A summary of the survey results is included in the Annual Biodiversity Report 2018 (**Appendix 9**).

## 6.5.10 Long-term Security and Conservation Bond

***Long-term Security***

In accordance with Condition 36, Schedule 3 of Development Consent SSD-4966, SCPL is required to make suitable arrangements for the long-term security of the Stratford Extension Project Biodiversity Offset Area. SCPL proposes to pursue the mechanisms available under section 88E(3) of the NSW Conveyancing Act, 1919, including a Public Positive Covenant and Restriction on the Use of Land.

The draft instruments were lodged with DP&E on 3 December 2018. Further chronology is included in **Appendix 9** regarding the measures required to finalise securing the offset areas.

SCPL received review comments from DP&E on 22 February 2019 and will prepare amendments to the drafts instruments in the next reporting period.

***Conservation Bond***

In accordance with Condition 40, Schedule 3 of Development Consent SSD-4966, SCPL is required to lodge a Conservation Bond with the DP&E which covers the cost of implementing the Biodiversity Offset Strategy detailed in the BMP.

The conservation bond calculation was prepared by Kleinfelder and a verification of the costs was undertaken by Rider Levett Bucknall. The conservation bond calculation was submitted in January 2019 and subsequently approved by DP&E on 15 January 2019.

The Conservation Bond in the form of a bank guarantee was executed and lodged with DP&E on 8 February 2019.

## 6.5.11 Bowens Road North Biodiversity Offset Strategy

An Offset Strategy has previously been implemented at the SMC as a requirement under the BRN Development Consent Modification (2010) (Consent surrendered during 2018). SSD-4966 Schedule 3 Condition 41 requires the ongoing implementation of the Bowens Road North Offset Strategy.

The BRN Offset Area is adjacent to the Duralie Coal Mine Biodiversity Offset and is managed under the approved Duralie Coal Mine Biodiversity Management Plan (Duralie BMP).

The Duralie Coal Mine Annual Biodiversity Report contains a review of the environmental performance and progress against the requirements of the Duralie BMP covering the biodiversity offset area including the BRN component. Refer to the Duralie Coal Mine Annual Reviews.

## 6.6 BLASTING

### 6.6.1 Blast Criteria and Control Procedures

Blasting at SMC is conducted in accordance with conditions 9-15 of Schedule 3 of the Project Approval SSD-4966 and respective EPL conditions. SMC has an approved Blast Management Plan (BLMP) that establishes a blast management strategy which:

- Identifies blasting criteria;
- Outlines blast management and control measures;
- Establishes blast management protocols;
- Formulates a blast monitoring programme;
- Details reporting and review requirements.

During the reporting period blasting activities recommenced at the SMC. Prior to blasting recommencing SCPL implemented the following measures as described in the BLMP:

- Establishment of a blast notification protocol;
- Notification to relevant local residences of their rights to baseline building inspections and blast notifications;
- Commission building inspections;
- Establish a Road Closure Protocol in consultation with MidCoast Council; and
- Install the blast monitoring network;

EPL 5161 condition L3 states that overpressure caused by blasting at monitored locations may exceed 115 dB(L) for no more than 5% of blasts during the 12 month reporting period and must not exceed 120 dB(L) at any time. Similarly, ground vibration at monitored locations caused by blasting may exceed a peak particle velocity of 5 mm/s for no more than 5% of blasts during the 12 month reporting period and not exceed 10 mm/s.

Notification of blasting is provided to emergency authorities and neighbouring landowners approximately twenty four (24) hours prior to each blast. A blasting hotline (6538 4253) is maintained to provide current scheduled blasting times for the SMC

Blasting activities are designed and managed in accordance with the BLMP.

### 6.6.2 Review of Blast Monitoring Results

Blasting activities during the reporting period where undertaken within the Bowens Road North Open Cut and Avon North Open Cut.

The locations of blast monitoring units are shown on **Figure 2 (Appendix 1)**. Blast monitors are located at the following residences:

- Isaac Property (south-west of blasting);
- Ex-Judge Property (mine owned) (west);
- Atkins Property (mine owned) (north-west);
- Woodford Property (mine owned) (north); and
- Clarke Property (mine owned) (east).

Monitoring is undertaken at the Clarke property due to restrictions with monitoring at the next closest residence on privately-owned land. Enviro Strata Consulting (ESC) has been engaged during the reporting period where required to undertake an independent assessment of blasting results to extrapolate the overpressure and ground vibration levels at private residences where monitoring is not possible.

Airblast overpressure and ground vibration results for all blasts undertaken during the reporting period

are provided in **Appendix 5** and summarised below.

#### Airblast Overpressure Results

During the reporting period (period ending 31 December 2018) all blasts were compliant with the overpressure criteria.

At the Clarke property (mine owned) there was one blast event which exceeded the overpressure criteria limit of 120 dBL. There were three additional blasts where overpressure exceeded 115 dBL. Monitoring is undertaken at the Clarke residence due to restrictions with monitoring at the next closest residence on privately-owned land (i.e. Bagnall) and the results are then used to extrapolate the results for the Bagnall residence.

Enviro Strata Consulting was engaged to prepare a site model to allow for the estimation of overpressure and ground vibration levels at the Bagnall residence. The extrapolation of blast results for the Bagnall residence identified there was one blast event which exceeded the overpressure criteria limit of 115 dBL, hence at the end of the reporting period 5.6% of blasts had exceed 115 dBL.

The Development Consent allows 5% of the total number of blasts over a period of 12 months to exceed 115 dBL. Blasting at the SMC commenced in September 2018 and the 5% exceedance allowance would be assessed after September 2019.

#### Vibration Results

During the reporting period (period ending 31 December 2018) there were no blasts where ground vibration exceeded 5 mm/s.

The EIS (2012) provides predictions on blast emissions for various residential receivers. The blasting predictions indicate that blasting emissions would generally comply with airblast criteria of 115 dBL and ground vibration of 5 mm/s at nearby private receivers. During the reporting period, predicted blast emissions were generally consistent with measured values.

#### Fume Results

The level of blast fume generation is monitored for each blast by the shotfirer as described in the BLMP. During the reporting period, no fume was recorded from any blast event.

### 6.6.3 Property Inspections & Investigations

In accordance with the Development Consent Schedule 3 Conditions 12 landowners within 2 kilometres of blasting may request a property inspections to establish the baseline condition of a building. Additionally, in accordance with Condition 13 if a landowner claims damage has been caused to a building as a result of blasting they may request a property investigation.

Prior to recommencing blasting activities at the SMC, SCPL notified all relevant landowners of their rights in accordance with the Development Consent.

During the reporting period SCPL received requests from four landowners for baseline building inspections to be undertaken. SCPL commissioned Bill Jordon as a suitably qualified, experienced and independent person to undertake the building condition inspections. The inspections were completed in July 2018 and a copy of the reports were provided to the landowners.

Building condition inspections will continue to be undertaken on request.

No requests have been received by SCPL for a property investigation due to claims of damage resulting from blasting activities.

### 6.6.4 Complaints

No blast related complaints were received during the reporting period.

## 6.7 NOISE

### 6.7.1 Noise Criteria and Control Procedures

SMC has an approved Noise Management Plan (NMP) that establishes a noise management strategy which:

- Identifies noise criteria;
- Outlines proactive and responsive noise management and control measures;
- Formulates a noise monitoring program;
- Establishes data assessment protocols; and
- Details reporting and review requirements.

A new NMP was prepared during the reporting period for the commencement of the SEP.

Noise emissions from the SMC are managed in accordance with the criteria and procedures described in the NMP. DCPL implements measures to ensure noise from the SMC is managed to approved levels, through a combination of the following:

- ensuring best management practices are implemented and reviewed;
- implementing noise controls to reduce noise from the source and attenuate noise transmission; and
- if necessary, implementing measures to control noise at sensitive receivers following a review of monitoring data.

The SMC noise monitoring program comprises attended noise surveys, real-time noise monitoring, rail noise monitoring, meteorological monitoring and sound power testing. The results of compliance attended monitoring are used to assess compliance with relevant noise impact assessment criteria in the NMP. Real-time noise monitoring results are used for ongoing performance assessment and will assist in the implementation of pre-emptive management actions to avoid potential non-compliances.

SCPL undertakes monthly attended noise monitoring surveys in accordance with the NMP in order to determine the status of compliance with noise limits provided in the Development Consent and EPLs. Prior to July 2018 attended noise monitoring was undertaken quarterly.

The Sentinex real-time noise (RTN) monitors provides a management tool for operations to measure mine contribution noise emissions and implement management controls as outlined under the approved NMP. Sentinex RTN monitors are located near Stratford Village and Craven Village.

### 6.7.2 Review of Attended Noise Monitoring Results

The locations of noise monitoring sites are shown on **Figure 2 (Appendix 1)**.

SCPL undertakes monthly attended noise monitoring surveys. During noise surveys $LA_{eq\ (15\ minute)}$ noise levels are measured and recorded then compared to the permitted day, evening and night noise limits. Monitoring results and reports are available on the Stratford Coal website.

Monitoring may be undertaken on mine owned land (i.e. Clarke property) due to restrictions with monitoring at the next closest residence on privately owned land. SLR has been engaged to undertake noise monitoring at the SMC and where required the attended noise monitoring results are used to extrapolate the noise levels at private residences where monitoring is not possible based on the noise model developed for the SEP.

Noise monitoring during the reporting period was undertaken in January 2018, April 2018, July 2018, August, September, October, November and December 2018. A summary of Noise Survey results are provided in **Tables 16 to 23**. Full noise reports are available on the Stratford Coal website (www.stratfordcoal.com.au).

## January 2018 Noise Survey

**Table 16: Stratford Mine Noise Performance Assessment – January 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | <30 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | I/A | I/A | I/A | 37 | 37 | - | Yes | Yes | N/A[3] |
| Hall | I/A | <30 | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | <30 | <30 | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | <30 | 32 | 31 | 43 | 43 | 43 | Yes | Yes | Yes |
| Ellis[2] | I/A | I/A | I/A | 35 | 35 | - | Yes | Yes | N/A[3] |
| Van der Drift[2] | 32 | <30 | I/A | 35 | 35 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible
Note 2: Owned by Stratford Coal Pty Ltd
Note 3: N/A-receiver does not have night-time criteria

Operator-attended noise monitoring was conducted at seven locations between 22 January and 23 January 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period.

## April 2018 Noise Survey

**Table 17: Stratford Mine Noise Performance Assessment – April 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | I/A | I/A | I/A | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | I/A | 29 | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | 29 | 34 | 31 | 43 | 43 | 43 | Yes | Yes | Yes |
| Ellis[2] | 25 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Van der Drift[2] | 26 | I/A | I/A | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall

Operator-attended noise monitoring was conducted at seven locations between 18 April and 20 April 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period.

## July 2018 Noise Survey

**Table 18: SMC Noise Performance Assessment – Operations – July 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | 28 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 41 | I/A | I/A | 37 | 37 | 37 | No[5] | Yes | Yes |
| Bagnall[3] | 35 | - | - | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | 30[4] | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | 37 | I/A | I/A | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift[2] | I/A | I/A | I/A | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall
Note 3: Calculated result from monitoring location Clarke
Note 4: Result of follow-up measurement
Note 5: Criteria adopted as a guide only

Operator-attended noise monitoring was conducted at six locations between 16 July and 18 July 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period.

## August 2018 Noise Survey

**Table 19: SMC Noise Performance Assessment – Operations – August 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | 35 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 45 | I/A | I/A | 37 | 37 | 37 | No[4] | Yes | Yes |
| Bagnall[3] | 34 | - | - | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | I/A | I/A | I/A | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift[2] | 34 | I/A | I/A | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall.
Note 3: Calculated result from monitoring location Clarke.
Note 4: Criteria adopted as a guide only.

Operator-attended noise monitoring was conducted at six locations between 9 August and 10 August 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period.

## September 2018 Noise Survey

**Table 20: SMC Noise Performance Assessment – Operations – September 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | 30 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 44 | 23 | 34 | 37 | 37 | 37 | No[4] | Yes | Yes |
| Bagnall[3] | 34 | <25 | <25 | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | 25 | 19 | 24 | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | <25 | 22 | 31 | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | I/A | <25 | <25 | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift[2] | I/A | 27 | 35 | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall.
Note 3: Calculated result from monitoring location Clarke.
Note 4: Criteria adopted as a guide only.

Operator-attended noise monitoring was conducted at six locations between 24 September and 25 September 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period except at the Clarke property which is owned by Stratford Coal Pty Ltd.

## October 2018 Noise Survey

**Table 21: SMC Noise Performance Assessment – Operations – October 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | 30 | <25 | 27 | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 41 | 40 | 41 | 37 | 37 | 37 | N/A[4] | N/A[4] | N/A[4] |
| Bagnall[3] | 35 | 34 | 35 | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | 26 | 28 | 28 | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | I/A | I/A | 25 | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | I/A | 32 | I/A | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift[2] | <30 | 31 | 26 | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall.
Note 3: Calculated result from monitoring location Clarke.
Note 4: Criteria adopted as a guide only.

Operator-attended noise monitoring was conducted at six locations between 25 October and 26 October 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period except at the Clarke property which is owned by Stratford Coal Pty Ltd.

## November 2018 Noise Survey

**Table 22: Noise Performance Assessment – Operations – November 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | <25 | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 49 | 49 | 49 | 37 | 37 | 37 | N/A[4] | N/A[4] | N/A[4] |
| Bagnall[3] | -[5] | 36 | 37 | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | I/A | I/A | I/A | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | I/A | I/A | <25 | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift | I/A | I/A | I/A | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall.
Note 3: Modelled results.
Note 4: Criteria adopted as a guide only.
Note 5: Noise level not predicted due to meteorological conditions outside of consent conditions.

Operator-attended noise monitoring was conducted at six residential receiver locations between 22 November and 23 November 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period except at the Clarke property which is owned by Stratford Coal Pty Ltd.

## December 2018 Noise Survey

**Table 23: Noise Performance Assessment – Operations – December 2018 Survey**

| Location | Estimated SMC LAeq(15minute) Contribution dBA | | | Noise Criteria LAeq(15minute) dBA | | | Compliance | | |
|---|---|---|---|---|---|---|---|---|---|
| | Day | Eve | Night | Day | Eve | Night | Day | Eve | Night |
| Atkins | 35 | <25 | <25 | 35 | 35 | 35 | Yes | Yes | Yes |
| Clarke[2] | 40 | 37 | 36 | 37 | 37 | 37 | N/A[4] | N/A[4] | N/A[4] |
| Bagnall[3] | 32 | 29 | 28 | 37 | 37 | 37 | Yes | Yes | Yes |
| Hall | <25 | 29 | 29 | 35 | 35 | 35 | Yes | Yes | Yes |
| Lowrey | 32 | <25 | 35 | 35 | 35 | 35 | Yes | Yes | Yes |
| Pryce Jones | 28 | 31 | 34 | 43 | 43 | 43 | Yes | Yes | Yes |
| Van der Drift | <25 | 31 | 27 | 37 | 36 | 35 | Yes | Yes | Yes |

Note 1: I/A = Inaudible.
Note 2: Owned by Stratford Coal Pty Ltd. Criteria adopted from Bagnall.
Note 3: Calculated result from monitoring location Clarke.
Note 4: Criteria adopted as a guide only.

Operator-attended noise monitoring was conducted at six residential receiver locations between 17 December and 18 December 2018 in order to determine the noise performance of the SMC operations against the Development Consent conditions which resulted in:

- Compliance with the relevant noise criteria was achieved at all noise monitoring locations during the day, evening and night periods with the exception of Clarke during the day period. Noise levels at Clarke were above the adopted noise criteria, however the Clarke property is owned by Stratford Coal Pty Ltd.
- Based on the measured SMC noise contribution, compliance with the relevant sleep disturbance noise criteria was achieved at all noise monitoring locations during the night-time noise monitoring period except at the Clarke property which is owned by Stratford Coal Pty Ltd.

### 6.7.3 Real Time Noise System

A real-time noise (RTN) monitoring system is described in the NMP. Real-time monitoring is used as a management tool to assist SCPL to take proactive management actions and implement additional noise mitigation measures to avoid potential non-compliances. A Sentinex RTN monitor is located near Craven Village and a second Sentinex unit was installed during the reporting period and is located near Stratford Village.

Noise investigation triggers have been established which send alarms when noise emissions are approaching levels which may exceed the noise criteria at privately-owned receivers. Details of any RTN alarms and the operational responses implemented by SCPL are recorded in the RTN Response Register (**Appendix 6**).

In general alarms during the reporting period related to abnormal meteorological conditions, environmental and traffic noise from the Bucketts Way. Mine was often audible, however not the dominant noise source. The RTN response register details the response actions taken by SCPL.

To address any noise alarms regardless of abnormal meteorological conditions such as inversions, SCPL continue to implement the management measures described in the NMP. Additionally, SCPL implement operational management measures in accordance with the real-time noise monitoring response protocol described in the NMP Section 7.3.4.

### 6.7.4 Rail Noise Monitoring

The Stratford export train is required to be approved to operate on the NSW rail network in accordance with the noise limits specified in ARTC's EPL 3142, as per Condition 5(d), Schedule 3 of Development Consent SSD-4966. The NMP requires rail noise monitoring to be undertaken along the North Coast railway on a quarterly basis at existing Wards River and Craven villages.

Rail noise monitoring is reported against rail noise criteria described in Section 4 of the NMP. Rail operations aim to progressively reduce noise levels to the goals of 65dB(A)Leq, (daytime from 7am – 10pm), 60dB(A)Leq (night-time from 10pm –7am) and 85dB(A) (24hr) max pass-by noise, at one metre from the façade of affected residential properties. This is consistent with the criteria in the ARTC EPL noise limits.

Rail noise monitoring was conducted during the September 2018 and December 2018 Noise Surveys (i.e. quarterly following commencement of the SEP) when export trains were operating. Rail noise survey results are included in the Noise Survey reports which are available at the Stratford Coal website. Attended noise measurements were conducted two locations; TN1 (Craven) and TN2 (Wards River Village).

During the reporting period for all rail noise monitoring undertaken the maximum SMC rail pass-by noise levels complied with the noise goal of 85 dBA at all monitoring locations, excluding the sounding of horns on approach to level crossings.

### 6.7.5 Mobile Plant Noise Assessments

The indicative mine fleet at the SMC is provided in the Stratford Extension Project Noise Impact Assessment (EIS 2012 Appendix C). The NIA provides the overall A-weighted and Linear Sound Power Levels (SWLs) for each item of plant and equipment proposed to be used at the SMC.

The current mining fleet is shown in Section 4.3.1 of this report. The SMC fleet of mobile plant are assessed annually against the target SWLs.

During 2018 mining activities at the SMC recommenced. The majority of the mobile plant fleet was relocated from the nearby Duralie Coal Mine. In addition, Ditchfield Contracting mobilised a mobile plant fleet during 2018 as shown in Table 7. New mobile plant has also been progressively added to the fleet at the SMC including the Hitachi 2600 excavators and Caterpillar D10 dozers.

Sound power testing of the plant relocated from the DCM has been previously undertaken in December 2017 and will be reassessed in the next reporting period.

Sound power testing of new mobile plant commissioned at the SMC was undertaking during the reporting period including:

- Hitachi 2600 Excavator, Unit 05
- Hitachi 2600 Excavator, Unit 06
- Caterpillar D10T Dozer, Unit 214
- Caterpillar D10T Dozer, Unit 215
- Caterpillar 18M3 Grader, Unit 304
- Caterpillar 18M3 Grader, Unit 305

The measured SWLs of all plant tested complied with both the Linear and A-weighted SWL targets from the EIS 2012.

### 6.7.6 Complaints

Four (4) noise related complaints were received during the reporting period (complaints include truck, dozer and excavator noise). A full complaints listing including the responses provide by SCPL is provided in **Appendix 7**.

## 6.8 LANDSCAPING AND VISUAL SCREENING

A visual assessment of the SMC was undertaken for the EIS 2012. The overall visual impacts of the development are generally considered to be low to moderate during operations and very low to low following final rehabilitation. Views of the SMC from the surrounding area are generally screened by topography and vegetation, except for some areas to the north and west (EIS 2012). However, some local impacts will occur and undertakings such as the following have been, and will continue to be, adopted to lessen these impacts:

- Minimising (where possible) disturbance to native vegetation, especially where such vegetation is providing visual screening;
- Progressive rehabilitation will be undertaken in order to reduce the contrast between the SMC landforms and the surrounding environment;
- Ensuring out of pit emplacement design produces a landform which integrates with the adjoining natural landform;
- The biodiversity offset strategy for the SMC includes measures such as revegetation of cleared areas; and
- Tree plantings/revegetation will progressively limit potential views of the SMC from some viewpoint locations (e.g. Glen Road, Wenham Cox Rd).

Consistent with the Development Consent visual screening has been undertaken as necessary for the

maintenance of satisfactory visual amenity. Visual screening works undertaken during the reporting period included:

- Planting of a vegetated screen with tubestock along the Glen Rd in areas with future view points of the Stratford East Open Cut.
- Construction and rehabilitation of the Avon North visual bund along Wenham Cox Road to screen direct views of the Avon North Open Cut.
- Construction and rehabilitation of the BRN visual bund along Wenham Cox Road to screen direct views of the BRN Open Cut.
- Landscaping and rehabilitation of the Wenham Cox Road Diversion.

The rehabilitation principles and objectives at the SMC are included in the Development Consent and described in the SMC Mining Operations & Rehabilitation Management Plan. This includes requirements for landscaping and visual screening to ensure the final landforms are visually consistent with the surrounding environment and Gloucester Valley landform. The rehabilitation will be generally consistent with the proposed rehabilitation strategy described in the EIS 2012

No visual amenity related complaints were received during the reporting period.

## 6.9 LIGHTING EMISSIONS

Development Consent SSD-4966 Schedule 3 condition 50 requires SCPL implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development. Additionally, SCPL is required to ensure that all external lighting associated with the development complies with Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting or its latest version.

An independent lighting assessment of the SMC was undertaken in 2012, at which time the lighting emissions from the development were deemed to be complainant with the Australian Standard. Following the recommencement of operations at the SMC in 2018 both mobile and fixed lighting sources and been re-established. This includes fixed lighting for the infrastructure areas and CHPP and mobile lighting plants for the active mining and waste dumping areas.

At the end of the reporting period SCPL were in the process of installing new LED mobile lighting plants in the active mining areas. During the next reporting period SCPL will undertake a lighting assessment to assess the lighting emissions in accordance with the Australian Standard and provide recommendations for any reasonable and feasible measures to minimise off-site lighting impacts.

No complaints regarding lighting emissions were received during the reporting period.

## 6.10 CULTURAL AND NATURAL HERITAGE CONSERVATION

Cultural and natural heritage at the SMC are managed in accordance with the approved Heritage Management Plan (HMP). The purpose of the HMP is to ensure that the development does not cause any direct or indirect impact on identified Aboriginal or Non-Aboriginal heritage sites located outside the approved disturbance area of the development on the site. The HMP has also been prepared to manage potential impacts on items of heritage significance at the SMC in the vicinity of the surface development.

The HMP establishes measures for the management of known and previously unrecorded heritage sites including:

- Protocols for the involvement of the local Aboriginal community;
- Recording and surface collection of heritage sites;
- Removal of scarred trees;
- Fencing and signage of heritage sites outside the disturbance area;
- Protocol for managing previously unrecorded heritage sites;
- Curation of aboriginal artefacts; and
- Monitoring of heritage sites

Archaeological surveys have been conducted over the life of the SMC and most recently for the EIS 2012. A detailed description of each site, is included in Kayandel Archaeological Services (Kayandel) (2012). As a result of previous assessments and archaeological survey works, 17 sites have been identified within the SMC (Kayandel, 2012) (Table 24).

Table 24 includes a description of the proposed impact on known Aboriginal heritage sites at the SMC and the status of the heritage sites at the end of the reporting period.

**Table 24: Aboriginal Heritage Sites at the SMC**

| Site Code | Site Type | Proposed Impact | Status of Management |
|---|---|---|---|
| OS-1 | Open Artefact Scatter | No (outside disturbance area) | Not disturbed |
| OS-2 | Open Artefact Scatter | No (outside disturbance area) | Archaeological survey of the approximate 20m2 area could not locate this artefact. It was determined after 20 minutes that the area was considered as having been sufficiently salvaged. |
| OS-3 | Open Artefact Scatter | Yes | Salvaged by FLALC. Archaeological survey of the approximate 20m2 area could not locate this artefact. It was determined after 20 minutes that the area was considered as having been sufficiently salvaged. |
| OS-4 | Open Artefact Scatter | Yes | Salvaged by FLALC. Archaeological survey of the approximate 20m2 area could not locate this artefact. It was determined after 20 minutes that the area was considered as having been sufficiently salvaged. |
| OS-5 | Open Artefact Scatter | Yes | Not disturbed |
| ST-1 | Scarred Tree | No (outside disturbance area) | Not disturbed |
| ST-2 | Scarred Tree | Yes | Not disturbed |
| ST-3 | Scarred Tree | No (outside disturbance area) | This scarred tree has been fenced and signed as per the HMP. |
| ST-4 | Scarred Tree | Yes | Site inspected by FLALC. Archaeological survey of the approximate area identified this scarred tree. It was determined that fencing and signage should be established around the tree to ensure that it is not impacted by the proposed works. |
| IF-1 | Isolated Find | Yes | Salvaged by FLALC. Archaeological survey of the approximate 20m2 area could not locate this artefact. It was determined after 20 minutes that the area was considered as having been sufficiently salvaged. |
| IF-2 | Isolated Find | Yes | Salvaged by FLALC. Archaeological survey of the approximate 20m2 area could not locate this artefact. It was determined after 20 minutes that the area was considered as having been sufficiently salvaged. |
| IF-3 | Isolated Find | Yes | Not disturbed |
| IF-4 | Isolated Find | Yes | Not disturbed |
| IF-5 | Isolated Find | No (outside disturbance area) | Not disturbed |
| PAD-1 | PAD | No (outside disturbance area) | Not disturbed |
| PAD-2 | PAD | No (outside disturbance area) | Not disturbed |
| CTS-1 | Cultural/Traditional Site | No (outside disturbance area) | Establishment and operation of the blast monitoring site between CTS-1 and Stratford East Pit prior to mining. |

During the reporting period Forster Local Aboriginal Land Council (FLALC) and AMBS Ecology & Heritage were engaged to undertake the salvage of known Aboriginal artefacts as described in the

HMP. FLALC and AMBS were also engagement to undertake topsoil stripping monitoring for the construction of the Wenham Cox Rd diversion in the vicinity of Dog Trap Creek as described in the HMP.

## 6.11 SPONTANEOUS COMBUSTION

Any incidences of spontaneous combustion at the SMC are managed in accordance with a Spontaneous Combustion Management Procedure. Management and mitigation practices generally involve reducing the interaction of potentially reactive materials with water and oxygen by appropriate dumping practices, profiling and capping any materials likely to heat and reducing the time coal faces are exposed prior to mining.

There were no incidences of spontaneous combustion at the SMC during the reporting period.

## 6.12 CHPP REJECT MANAGEMENT

Reject material produced at the Stratford CHPP is disposed of in accordance with the SMC Life of Mine Rejects Disposal Plan (RDP 2018). During the reporting period the RDP was revised following the commencement of the SEP to reflect the ongoing mine operation and production schedules. Further, the RDP revision was prepared to address the outcomes of an inspection of the SMC conducted on 31 May 2018 by the NSW Resources Regulator which required SCPL to develop a strategy to assess the proposed rehabilitation methodology for the Stratford Main Pit and reject emplacement area.

The NSW Development Consent Table 8 prescribes the performance criteria for CHPP rejects. Reference should be made to the RDP for a detailed description of reject management at the SMC. In general the rejects, both coarse and fine fractions, are pumped via pipeline from the CHPP to the Stratford Main pit where they are deposited below final void ground water levels.

Rejects at the SMC have been previously characterised as being PAF and the EIS 2012 geochemical assessment report concluded that implementation of appropriate management measures would be required to manage potential ARD impacts associated with the existing and proposed co-disposed CHPP rejects. Rejects management measures include placement into the Stratford Main Pit where they are progressively inundated with water to prevent significant pyrite oxidation and acid generation in the long term, with monitoring of water quality undertaken during operations and provision for lime (calcium hydroxide - Ca[OH]2) dosing and limestone (calcium carbonate - CaCO3) treatment as required.

Reject placement in the Stratford Main Pit involves a combination of sub-aqueous and sub-aerial deposition. The control of acid generation in sub-aerially deposited reject is managed by incorporating limestone into the reject stream, establishing reject beaches 2-3 m above water level such that they are significantly inundated with rising pit waters within 6-12 months, dosing the reject beach surface with lime at appropriate rates, and alternating the discharge point so that deposited reject beaches are essentially not exposed for more than 1 year.

Liming of the exposed reject beach was undertaken during the reporting period at the rates described in the RDP and records are maintained at the SMC.

Monitoring of the reject beach material is undertaken on a monthly basis to assess the performance of reject disposal and lime application rates. During the reporting period the reject beach average monthly pH results ranged from 6.7 to 7.6. Additionally, water monitoring in the Main Pit is undertaken monthly, refer to the results in Section 7 Water Management. The management measures implemented have successfully controlled the formation of acid conditions in the Stratford Main Pit, with recorded pH circum neutral.

During the reporting period the deposition of rejects in the Stratford Main Pit changed from sub-aerial deposition to sub-aqueous deposition. This was undertaken to accommodate the dewatering of the

BRN pit which raised the water level in the Main Pit and inundated the majority of the existing reject beach in accordance with the RDP.

## 6.13 AGRICULTURAL REPORT

An Agricultural Assessment for the SMC was undertaken by SCPL and is presented in the Stratford EIS (2012). Contemporary land use in the vicinity of the SMC is dominated by mining operations, agricultural production (primarily grazing for beef production) and remnant vegetation generally located along ridgelines, along watercourses and in isolated patches within the cleared landscape which includes nature reserves and national park. Settlements are located at Stratford village and Craven Village.

The Agricultural Land Use Rehabilitation Objective for the SMC is to establish a minimum of 300 hectares of land with Class 4 agricultural suitability. Class 4 Agricultural Suitability is land suitable for grazing but not for cultivation. Rehabilitation progress is discussed further in Section 8.

***Rural Land Capability***
The Rural Land Capability classification system is used to determine the various classes of rural land on the basis of the capability of the land to remain stable under particular uses. Land is allocated to one of eight classes, with emphasis on the erosion hazards in the use of the land. The pre-mining Rural Land Capability near the SMC ranged from Class IV to Class VIII, with the major factors in determining the classes being slope and soil stability in water.

The rehabilitated flat areas on the Stratford Waste Emplacement were allocated Class IV. Other rehabilitated areas (e.g. batters) on the Stratford Waste Emplacement and the Northern Waste Emplacement were allocated to Class V due to slope angle. The flat areas on the Stratford Waste Emplacement were observed to have similar, and in some cases better, soil conditions than that observed in the “natural” soil profiles under pasture on the SMC site.

***Agricultural Suitability***
The Agricultural Suitability system is used to classify land in terms of its suitability for general agricultural use. Agricultural land is classified by evaluating biophysical, social and economic factors that may constrain the use of land for agriculture. The pre-mining SMC site ranged from Class 4 to Class 5. Soil limitations included various combinations of the following factors: erosion hazards associated with steep slopes, shallowness, dispersion, acidity, nutrient deficiencies and compaction (EIS 2012).

The rehabilitated areas on the existing SMC waste rock emplacements were allocated by McKenzie Soil Management (2012) to Class 4.

Class 4 Agricultural Suitability is defined as (NSW Agriculture, 2002):
*Land suitable for grazing but not for cultivation. Agriculture is based on native pastures and improved pastures established using minimum tillage techniques. Production may be seasonally high but the overall production level is low as a result of major environmental constraints.*

Agricultural lands on and surrounding the SMC including SCPL owned land and agricultural rehabilitation continues to be managed for agricultural production. SCPL implements a property management strategy which includes grazing & pasture management and weed and pest control measures. The majority of agricultural lands are grazed under agistment/lease contracts.

There have been no changes to the agricultural land suitability during the reporting period.

# 7. WATER MANAGEMENT

Water management is undertaken in accordance with the approved Water Management Plan (WMP) and the sub-components of the plan including; surface water, ground water and site water balance.

The main objectives of the water management system on-site are:

- protect the integrity of local and regional water resources;
- operate such that there is no uncontrolled overflow of contained water storages;
- maintain separation between runoff from areas undisturbed by mining and water generated within active mining areas; and
- provide a reliable source of water to meet the requirements of the SMC.

The key principles of the water management system on-site are:

- maintain separation of undisturbed area runoff from water generated within active mining areas;
- minimise the generation of dirty water and divert clean water around disturbed areas;
- minimise storage requirements by maximising re-use of mine water for dust suppression (haul roads, mine waste emplacement surfaces), CHPP supply and irrigation;
- remove potential impacts on downstream water resources by provision of secure containment on site;
- capture and on-site containment of mine water, consisting of any groundwater inflows and/or surface water collection in the open cuts; and
- implement a fail-safe system, whereby under extreme events in excess of design capacity, dirty waters would spill to the mine pit and not to the clean water catchments; and
- not allow sediment laden water having an elevated suspended solids concentration to be discharged off site.

SCPL has investigated options for the beneficial reuse of mine water however continue to maintain zero discharge of mine water from site. The mine water balance at SMC is managed predominantly through the irrigation of excess water on rehabilitated pasture and storage within on site containment facilities. Where possible all clean water is diverted offsite.

## 7.1.1 Water Supply and Demand

The SMC water management system operates under a surplus water balance, with a trend for increasing water storage on-site over time. The majority of water used on-site is in the CHPP and recovery of water for re-use in the CHPP (i.e. recycling of CHPP process waters) is the largest component of the overall supply system

The principal water losses in the water system are:

- Water applied to land by means of irrigation;
- Water used for dust suppression;
- Evaporation from the Mine Water storages; and
- Water consumed in the CHPP.

The principal water losses in the CHPP water circuit are:

- Loss of water to co-disposal material (water locked up in rejects, pumped to main pit); and
- Water retained in product coal and railed off site.

Estimates of water losses from the CHPP circuit are in the order of 5 ML per week with plant throughput in the order of 200L/s.

Contained water storages at the SMC include:

- Stratford Main Pit which acts as both the CHPP rejects co-disposal area and contained water storage at the SMC, with significant storage capacity of approximately 25 gigalitres (GL).
- Stratford East Dam which is located on the eastern boundary of the ML and has a capacity of

up to approximately 2,872 ML.
- Return Water Dam which has a design (as-built) capacity of approximately 512 ML and is kept supplied by pumping from other contained water storages. The Return Water Dam also receives local runoff from the adjacent western co-disposal area.

The existing open cut void at Roseville West and the BRNOC until backfilled also provides significant additional on-site containment capacity if required for water storage.

The main water supply storage on-site for the CHPP is the Return Water Dam (RWD), located to the north of the Industrial Area. The RWD is one of three permanent mine water storages on-site. Water used by the CHPP is drawn from the RWD and comprises water pumped from the Co-Disposal facility, pit produced water and water from specific sediment dams. Water is also pumped directly from the Stratford Main Pit to the RWD to balance the CHPP water demand.

At the commencement of the reporting period the Main Pit, Stratford East Dam and Return Water Dam contained 11,241 ML, 1,511 ML and 314 ML (stored water only), respectively.

At the completion of the reporting period the Main Pit, Stratford East Dam and Return Water Dam contained 13,016 ML, 1,378 ML and 306 M (stored water only) respectively.

No mine water was disposed of to watercourses during the reporting period.

Mine water may be transferred between the open cut pits and the mine water storages as required for operations. Since 2014 in the BRN open Cut and Roseville West open cut water has been allowed to accumulate in these two pits. During the reporting BRNOC was dewatered to the Main Pit in preparation for mining. Dewatering in the Roseville West Pit also commenced

Irrigation of water from the Stratford East Dam over waste emplacement areas continued during the reporting period. Irrigation is governed by soil moisture, with irrigation suspended during wet weather or in periods following rain until soil moisture levels fall to levels low enough such that irrigation would not lead to direct runoff. Runoff from irrigation areas is directed to the Stratford East Dam.

Site water balance modelling has concluded that water storage capacity on site, would be sufficient to accommodate the water storage demands and disposal of CHPP reject material within the Main Pit until at least 2025.

### 7.1.2 Site Water Balance Review

The site water balance model for the SMC was developed by Gilbert & Associates in 2012 as part of the Stratford Extension Project EIS Surface Water Assessment (Gilbert & Associates, 2012). The site water balance model of the SCM water management system has been developed to simulate the behaviour of the water management system to the end of the approved mine life, i.e. 2025. More recently, the SMC water balance model was updated during 2018 as part of the WMP (refer Appendix 1 Site Water Balance, Attachment A Site Water Balance 2018-2022).

A review of the site water balance is undertaken annually and captures all inflows and outflows from the water management system. The water which accumulates in the open pits through rainfall or groundwater seepage is measured at the point of dewatering. An independent Annual Water Balance Review (Hydro Engineering & Consulting, 2018) for the SCM was conducted for the 2018 calendar year and a summary is provided below.

*Quantitative Site Water Balance Review*

The water management system at the SMC has operated under a surplus water balance, which means that over time there has been a trend for more water to report to site storages from the mine workings and associated project site catchments than is required to support processing and mining activities. The major water inflows to the site are rainfall-runoff generated from operational areas and (lesser) groundwater inflows to the current and former mine workings. The existing SMC water

management system does not release water from disturbed areas off site other than from sediment dams and rehabilitated landforms.

A mine pit water balance analysis was undertaken for the BRNOC, RWOC and ANOC using data recorded during 2018 to assess the relative contributions of surface water and groundwater sources to mine inflows (i.e. the relative contribution of rainfall runoff versus groundwater seepage into the pit).

*Bowens Road North Open Cut*

Monitored pumping volumes were provided for dewatering of the BRNOC to Stratford Main Pit totalling 1,174 ML over 2018. BRNOC was completely dewatered during 2018. The volume of groundwater calculated reporting to the open cut in 2018 was 128 ML. This compares to the SEP EIS prediction of 163 ML. The groundwater inflow rate predicted from water balance analysis has been below Bowens Road North Project EIS (2001) predictions since 2005 and the estimated rate at the end of 2018 remains below the SEP EIS (2012) prediction.

*Roseville West Open Cut*

Active mining of the RWOC ceased in 2014 and the dewatering pump was removed with water allowed to accumulate in this pit. As at December 2018, the monitored water level indicates a stored water volume of approximately 650 ML. The volume of groundwater calculated reporting to the open cut in 2018 was 27.4 ML. This compares to the SEP EIS prediction of 183 ML (Heritage Computing, 2012). The groundwater inflow rate predicted from water balance analysis is below the value predicted for the SEP EIS (2012).

*Avon North Open Cut*

Active mining of the ANOC commenced in 2018 and it was assumed that dewatering of the pit was not undertaken during this period based on pumping records provided by SCPL. The SEP EIS prediction of groundwater inflow to ANOC in the first year of mining was 68 ML (Heritage Computing, 2012). The volume of groundwater inflow reporting to the open cut in 2018 was not calculated for comparison to this predicted value due to lack of stored water volume information. However, during 2018 the water accumulating in ANOC was minimal based on site observations. As mining progresses deeper, seepage is expected to increase.

*Groundwater Licencing*

SCPL holds existing groundwater licences for dewatering issued by the NSW DPI Water that allow for the dewatering requirements from the open cut pits. The estimated groundwater inflows at the SMC during 2018 where are below the annual extraction limits as shown in Table 25.

**Table 25 – Water Take**

| Water Licence | Operation | Entitlement* | Estimated 2018 Take (ML)Total |
|---|---|---|---|
| WAL 41534 (20BL169400) | Stratford Main Pit | 500MLextraction. | 0 |
| WAL 41535 (20BL169101) | Stratford (Roseville) Pit | 20ML extraction. | 0 |
| WAL 41536 (20BL169102) | Roseville Extended and West Pit | 315MLextraction. | 27.4ML |
| WAL 41538 (20BL169103) | Bowens Road North Pit | 410ML extraction. | 128ML |
| WAL 41537 (20BL169104) | Parkers Pit | 186MLextraction. | 0 |

*Contained Water Storages*

A water balance analysis was undertaken for the Stratford Main Pit, Stratford East Dam and RWD using data recorded during 2018 to assess the relative contributions of the various sources to storage inflows (i.e. the relative contribution of rainfall runoff and groundwater versus pumped inflow).

The table below provides a summary of water stored at the beginning and end of 2018, as well as inflows to and outflows from the three monitored contained water storages as a whole (Stratford Main Pit, Stratford East Dam and Return Water Dam).

| Component | ML |
|---|---|
| Start* of Year Total Storage Volume | 12,559 |
| End** of Year Total Storage Volume | 13,496 |
| Change in Total Storage Volume | 937 |
| *Inflows* | |
| Rainfall Runoff | 1,006 |
| Pumped from Open Cut Pits | 1,133 |
| Pumped from Other Storages | 67 |
| Groundwater | 0 |
| Rejects Water | 1,335 |
| Seepage† | 0 |
| TOTAL | 3,541 |
| *Outflows* | |
| Evaporation | 808 |
| CHPP Supply | 1,338 |
| Haul Road Dust Suppression (Truckfill) | 29 |
| Irrigation | 68 |
| Entrained in Rejects | 93 |
| Seepage† | 188 |
| Loss from Evaporator Sprays | 0 |
| TOTAL | 2,524 |
| Inflow minus Outflows | 1,017 |

An increase in stored water volume was observed for Stratford Main Pit, Stratford East Dam and RWD during 2018. Monitored stored water volume has increased notably in Stratford Main Pit (by approximately 1,105 ML) hence an overall water accumulation in the contained water storages during 2018.

## 7.2 SURFACE WATER

### 7.2.1 Surface Water Management

Surface water management is managed in accordance with WMP: Appendix 2 Surface Water Management Plan (SWMP) which outlines the procedures and strategies for surface water management at the SMC to ensure compliance with NSW Development Consent SSD-4966. The SWMP includes the management of clean water and dirty water as outlined below. Dirty water comprises both mine water and sediment laden/turbid water.

### 7.2.1.1 Erosion and Sediment Control

The primary objectives of the erosion and sediment control strategy at the SMC are to:

- minimise and control soil erosion and sediment generation in areas disturbed by ongoing mining and construction activities; and
- minimise the potential for mine related activities to lower the water quality (particularly in terms of total suspended solids content) of downstream local watercourses.

Control strategies for soil erosion and sediment migration for the SMC include:

- Maximum separation of runoff from disturbed and undisturbed areas.
- Construction of sediment dams downstream of disturbed areas to contain runoff up to specified design criteria (refer Design Criteria below).
- Subsequent priority use of these waters in SMC related activities and/or natural controlled release to substantial buffer zones in a manner that minimises the potential for change to downstream turbidity.
- Selective use of benign flocculants such as gypsum to assist in the settlement of suspended solids if required.
- Construction of surface drains to facilitate the efficient transport of surface runoff.
- Construction of silt fences downslope of disturbed sites.
- Rapid and progressive stabilisation of disturbed surfaces.

SMC operate a network of sediment control structures to control sediment laden runoff from disturbed areas and active mining areas. During the reporting period mining operations at the SMC recommenced. Prior to this commencement all sediment controls structures at the SMC were reviewed and maintenance or upgrades were undertaken as required and in accordance with the SWMP. Where required in areas of approved for mining activities new sediment control structures have been constructed.

The design criteria for sediment control structures is prescribed in the SWMP Erosion and Sediment Control Strategy. Sediment control structures (i.e. sediment dams and disturbed area dams) are designed to spill if a rainfall event exceeds the specific design criteria for the structure. Where the discharge occurs solely as a result of rainfall in excess of the design criteria this is not considered a non-compliance. It should be noted that at all times pumping (where possible) of sediment dams in order to prevent or limit the amount of spilling water was undertaken. Prioritisation of pumping operations also took into account the likely quality of spilling water when a dam was considered vulnerable to spilling. The quality of water collecting within sediment dam is managed (where practicable) to minimise suspended sediment load.

All sediment dams are inspected/monitored on a minimum quarterly basis or following receipt of sufficient rain whereby such dams have the potential to spill. Maintenance activities are undertaken on sediment dams as required. Sediment dams are cleaned out when the storage volume is reduced by sediment deposition (i.e. when 30% of storage volume is lost to sediment build up) and inspected after major rainfall events. Silt fences are cleaned out and/or repaired to maintain their effectiveness.

During the reporting period there were no spills from any sediment dams or disturbed area dams at the SMC.

In addition to dedicated sediment dams, clean water is directed around disturbed areas (where practicable) using diversion drains/bunds in order to minimise sediment laden water. Areas under rehabilitation are stabilised by structural controls such as bench drains and contour banks (as required), to break up effective slope length exposed to erosion. Final slopes will generally not exceed 14 degrees in order to limit the potential for erosion and sediment generation.

Inspection of diversion structures and sediment control dams occurred during and following heavy rainfall events. The site contained all mine water on site within its water management system and control structures remained effective.

### 7.2.1.2 Clean Water Management

The key principle of clean water management is the segregation of clean water from mine/dirty water by the construction of diversion drains around disturbed areas, thereby minimising the quantity of dirty water generated.

Surface water controls aim to prevent clean runoff water from entering the open cut mining, overburden dumping areas, rejects disposal areas and infrastructure areas where practicable. The main clean water management structures are:

- Diversion drains/bunds on the eastern and western side of Stratford site, designed to divert clean water runoff around disturbed areas;
- Diversion drain around the eastern side of the Avon North Open Cut;
- Flood control embankments around the open cut voids which are designed to reduce the likelihood of floodwaters within Avondale Creek and tributaries entering either pit;
    - A 1:100yr ARI flood control bund around the north of the Strafford Main Pit
    - A 1:100yr ARI flood control bund around the northern end of the former Roseville Extension Pit and Roseville West Pit;
    - A 1:100yr ARI flood control bund around the south-western end of the Bowens Road North Pit
    - A 1:100yr ARI flood control bund around the southern end of the Avon North Pit;
- A culvert under the BRN haul road to allow for clean water runoff into Avondale Creek;
- Culverts under the haul road crossing of Avondale Creek and tributaries including Main Haul Road, BRN Haul Rd and Roseville Link Haul Road which allows Avondale Creek to flow through the site;
- Various runoff control drains/bunds about disturbed areas and overburden dumps designed to divert clean water runoff around active mine areas.

During the reporting period the Avondale Creek flood model was revised to incorporate the water control structures for Avon North. The revised flood model provided the basis for the design of the Avon North clean water drain, Avon North and Main Pit flood bunds and the BRN Haul Road culvert upgrade.

Water management control structures for the Stratford East Open Cut are planned to be constructed during the next reporting period.

Inspections of diversion structures were undertaken during and after rainfall events of >50/day or a minimum of every 6 months. Remedial and maintenance works were completed as required within the diversion drains and dams during the reporting period.

### 7.2.1.3 Mine Related Water Management

Mine related water management refers to the control, collection and re-use of water which may have become contaminated by mining operations and associated activities. Mine related water comprises mine water and sediment laden/turbid water. Mine water is water that has come into contact with mining activities. Sediment laden/turbid water has come into contact with disturbed areas but predominantly not core mining areas.

Mine waters are typically characterised by higher salinity and on occasion lower pH. Sediment laden waters are characterised by elevated suspended solids and elevated turbidity.

During the reporting period all mine water was contained on site and no spills occurred from mine water storage dams.

The main objectives of the mine related water control facilities are:

- Segregation of clean water from mine related water, to minimise the quantities of mine related water to be managed;

- Onsite storage and reuse of mine related water (washing coal); and
- Preventing the release of mine water from site.

The principal sources of mine related water are:

- Rainfall runoff in mining pits and incident rainfall;
- Groundwater seepage into mining pits;
- Rainfall induced runoff and seepage from active sections of the overburden emplacement;
- Rainfall induced runoff from the CHPP and infrastructure area;
- Rainfall runoff from haul roads;
- Runoff and seepage from co-disposal areas;
- Rainfall induced runoff from areas stripped of topsoil (typically exposing clays); and
- Rainfall induced runoff from areas yet to adequately vegetate within sediment dam catchments.

Mine related water uses and losses are:

- Co-disposal material (water locked up in rejects, lost as seepage or evaporation);
- Evaporation and seepage losses from water storages;
- Haul road dust suppression;
- Water retained in product coal and railed off site; and
- Stored water applied to land via irrigation.

The main permanent mine related water storages on site are the Stratford Main Pit, RWD, SED and Parkers Pit. The locations of mine and sediment laden water storage areas are shown in **Figure 3** (**Appendix 1**).

Due to water being in excess to site needs, management in past years has focused on maximising water use/loss. The future need to discharge waters from the SMC is expected to be limited due to the availability of the Stratford Main Pit for water storage and the installation of irrigation upon approved areas of the SCM waste emplacement.

**Haul Road Runoff Management**

Haul road runoff is generally separated from overburden dump runoff as haul road runoff tends to be more saline than dump runoff. This is likely to be due to accumulation of salts from ongoing water spraying for dust suppression and coal spillage on the haul roads.

All runoff from the haul road network at the SMC is direct to disturbed area dams. Consistent with the relevant SWMP performance measures the sediment dams designed, installed and maintained generally in accordance with the *Managing Urban Stormwater: Soils and Construction including Volume 1 (Landcom, 2004) and Volume 2E Mines and Quarries (DECC, 2008c)*. Detailed criteria for sediment dam is prescribed in the SWMP.

### 7.2.2 Surface Water Monitoring

SCPL monitors surface water quality on and surrounding the mine site by sampling from a series of selected locations. These locations comprise both streams and water storage structures. A meteorological monitoring station (i.e. weather station) provides site rainfall data. Surface water monitoring is conducted in accordance with the approved SWMP and the EPA Environment Protection Licence 5161.

The locations of surface water monitoring sites are shown on **Figure 2 (Appendix 1**). These sites are generally the same as those used during the baseline studies for the Stratford EIS 2012 (with the exception of W11 which was added to the program during 2018) and is consistent with the SEP EIS. The sites and their locations are described in Table 26.

Surface water is sampled and analysed on a monthly, event basis or following a sediment dam spill.

Water sampling is not undertaken in no-flow conditions. Collected waters are analysed for a suite of physical and chemical parameters. Results are compared with the performance indicators and measures described in the SWMP Section 9 (WMP Appendix B).

**Table 26 - Routine Surface Water Monitoring Sites**

| SITE | AREA | PROPERTY | HYDROLOGICAL LOCATION |
|---|---|---|---|
| W1 | Wenham Cox Road | GLENAVON | Avon River upstream of the mine (i.e. upstream of junction with Dog Trap Creek) |
| W2 | Marengo | BIGNALL | Avon River downstream of the mine (i.e. downstream of junction with Dog Trap Creek) |
| W3 | Dog Trap Creek | Ex-ELLIS/SCM | Upstream Dog Trap Creek (above junction with Avondale Creek) |
| W3A | Dog Trap Creek | Ex-ELLIS/SCM | Upstream Dog Trap Creek (above junction with Avondale Creek) and Upstream of BRN Operations. |
| W4 | Dog Trap Creek | Ex-ATKINS/AGL | Dog Trap Creek downstream of junction with Avondale Creek and upstream of Avon River. |
| W5 | Wenham Cox Road | SMC | Avondale Creek downstream of mine and upstream of junction with Dog Trap Creek |
| W6 | Parkers Road | SMC | Upstream of Mine on Avondale Creek |
| W8 | Bowens Road | SMC | Avondale Creek in the centre of operations |
| W9 | The Glen Road | SMC | Upper Avondale Creek |
| W10 | Lemon Tree Creek - Bowens Road | SMC | "Lemon Tree" Creek upstream of Avondale Creek junction. |
| W11 | Dog Trap Creek | Ex-Ellis | Dog Trap Creek upstream of Avon North operations. |

### 7.2.2.1 Review of Local Stream Monitoring Results

Reference should be made to accompanying surface water monitoring data tables provided in **Appendix 4**.

**pH**

**Figure 5-1** (**Appendix 4**) shows the pH results for each sampling month/event in the reporting period. Surface water pH ranges and averages by sampling site were:

| Site | pH Range | pH Average |
|---|---|---|
| Site W1: | 6.8 to 7.7 | 7.3 |
| Site W2: | 6.8 to 7.6 | 7.2 |
| Site W3: | 6.9 to 7.7 | 7.2 |
| Site W3A: | 6.7 to 7.7 | 7.1 |
| Site W4: | 6.9 to 7.5 | 7.2 |
| Site W5: | 7.3* | 7.3* |
| Site W6: | 7.4* | 7.4* |
| Site W8: | ** | ** |
| Site W9: | 6.1 to 8.1 | 7.1 |
| Site W10: | 7.1* | 7.1* |
| Site W11: | 6.5 to 6.8 | 6.7 |

Notes: *One sample only in average calculation
**No flow during reporting period

Across all sites the pH ranged from 6.1 to 8.1 with specific location averages essentially neutral. pH results were consistent with previous year's results.

The Surface Water Assessment (Gilbert & Associates, 2012) for the Stratford Extension Project EIS 2012 presents data from the Stratford Coal Surface Water Quality Monitoring Program, 1994 to 2011. Results for the reporting period are similar to pH results from the 1994 to 2011 monitoring period.

**Electrical Conductivity (EC)**

**Figure 5-2** (**Appendix 4**) shows the electrical conductivity results for each sampling month/event in the reporting period. Surface water EC ranges and averages by sampling site were:

| **Site** | **EC Range** (uS/cm) | **EC Average** (uS/cm) |
|---|---|---|
| Site W1: | 77 to 576 | 415 |
| Site W2: | 144 to 541 | 418 |
| Site W3: | 143 to 741 | 586 |
| Site W3A: | 438 to 623 | 503 |
| Site W4: | 339 to 656 | 499 |
| Site W5: | 109* | 109* |
| Site W6: | 124* | 124* |
| Site W8: | ** | ** |
| Site W9: | 182 to 210 | 196 |
| Site W10: | 675* | 675* |
| Site W11: | 415 to 462 | 439 |

Notes: *One sample only in average calculation
**No flow during reporting period

All sites had generally similar average EC values compared to previous reporting periods.

Results for the reporting period are similar to EC results from the 1994 to 2011 monitoring period as presented in the Surface Water Assessment (Gilbert & Associates, 2012).

**Total Suspended Solids (T.S.S.) & Turbidity**

**Figure 5-3** and **5-4** (**Appendix 4**) shows the total suspended solids and turbidity results for each sampling month in the reporting period. Surface water T.S.S. and turbidity ranges and averages by sampling site were:

| **Site** | **TSS Range (mg/l)** | **TSS Average (mg/l)** | **Turbidity Range (mg/l)** | **Turbidity Average (mg/l)** |
|---|---|---|---|---|
| Site W1: | 6 to 273 | 66 | 3 to 88 | 27.4 |
| Site W2: | <5 to 37 | 15 | 3 to 88 | 19.5 |
| Site W3: | <5 to 160 | 34 | 2 to 154 | 35.9 |
| Site W3A: | <5 to 37 | 14 | 10 to 72 | 29.7 |
| Site W4: | <5 to 16 | 8 | 2.8 to 17.6 | 6.9 |
| Site W5: | 71* | 71* | 95.5* | 95.5* |
| Site W6: | 22* | 22* | 40* | 40* |
| Site W8: | ** | ** | ** | ** |
| Site W9: | 8 to 19 | 14 | 54.5 to 86.9 | 70.7 |
| Site W10: | <5* | 5* | 5.6* | 5.6* |
| Site W11: | <5 to 5 | 5 | 0.4 to 0.7 | 0.6 |

Notes: *One sample only in average calculation
**No flow during reporting period

TSS and turbidity average concentrations were similar when compared with the previous reporting period. During the reporting period there were three slightly elevated TSS results recorded (W1 (upstream of operations); March and July 2018, W3; April 2018).

Results for the reporting period are similar to historical TSS and turbidity results from the 1994 to 2011 monitoring period as presented in the Surface Water Assessment (Gilbert & Associates, 2012).

**Iron [Fe]**

**Figure 5-5** (**Appendix 4**) shows the iron results for each sampling month in the reporting period**.** Iron concentration ranges and averages by sampling site were:

| Site | Range (mg/l) | Average (mg/l) |
|---|---|---|
| Site W1: | 1.00 to 5.53 | 3.16 |
| Site W2: | 0.30 to 3.84 | 1.64 |
| Site W3: | 0.23 to 3.76 | 1.64 |
| Site W3A: | 2.71 to 6.45 | 4.06 |
| Site W4: | 0.32 to 1.30 | 0.94 |
| Site W5: | 2.58* | 2.58* |
| Site W6: | 1.52* | 1.52 |
| Site W8: | ** | ** |
| Site W9: | 2.63 to 4.35 | 3.49 |
| Site W10: | 0.62* | 0.62* |
| Site W11: | <0.05 to 0.16 | 0.11 |

Notes: *One sample only in average calculation
**No flow during reporting period

Iron concentration ranges were similar to those for the previous reporting period.

**Assessment of Performance Indicators**

The surface water monitoring results are used to assess the SMC against the performance indicators and performance measures as detailed in Section 9 Table 12 of the SWMP. If data analysis indicates a performance indicator has been exceeded or is likely to be exceeded, an assessment will be made against the performance measure. If a performance measure is considered to have been exceeded, the Contingency Plan will be implemented (SWMP Section 10). If data analysis indicates that the performance measure has not been exceeded, SCPL will continue to monitor.

**Table 27** provides a summary of surface water analysis to assess against the surface water performance indicators and measures outlined in Table 12 of the SWMP.

**Table 27 - Summary of Surface Water Monitoring Results – 2018 Reporting Period**

| | | Long Term Mean | Standard Deviation | 12 Month Mean 2018 |
|---|---|---|---|---|
| W4 | pH | 7.0 | 0.5 | 7.2 |
| | EC | 595 | 393 | 500 |
| | Sulphate | 37 | 61 | 39 |
| | Iron | 0.8 | 0.8 | 0.9 |
| W3 | pH | 7.0 | 0.4 | 7.2 |
| | EC | 427 | 212 | 586 |
| | Sulphate | 11 | 11 | 4 |
| | Iron | 0.9 | 1.1 | 1.6 |
| W1 | pH | 7.1 | 0.4 | 7.3 |
| | EC | 325 | 188 | 415 |
| | Sulphate | 9 | 9 | 5 |
| | Iron | 1.8 | 2.9 | 3.2 |
| W3A | pH | 7.1 | 0.4 | 7.1 |
| | EC | 408 | 176 | 505 |
| | Sulphate | 10.3 | 13.6 | 3.0 |
| | Iron | 2.2 | 2.5 | 3.8 |
| W6 | pH | 6.7 | 0.6 | 7.4 |
| | EC | 714 | 739 | 124 |
| | Sulphate | 22 | 96 | 5 |
| | Iron | 1.4 | 1.6 | 1.5 |
| W9 | pH | 6.7 | 0.7 | 7.1 |
| | EC | 201 | 248 | 196 |
| | Sulphate | 4.6 | 4.5 | 11.0 |
| | Iron | 2.1 | 1.3 | 3.5 |

Assessment of the Performance Indicators and Performance outcomes are presented in **Table 28.**

**Table 28 - Surface Water Monitoring Performance Outcomes – 2018 Reporting Period**

| Performance Measure | Specific Performance Indicators | Data Analysis to Assess against Performance Indicators | Monitoring | | | Cascading Trigger Levels | Assessment of Performance Indicator and Performance Measure | Relevant Management and Contingency Measures |
|---|---|---|---|---|---|---|---|---|
| | | | Sites | Parameters | Frequency | | | |
| No more than a negligible impact on water quality in Avondale Creek. | No significant decline in water quality at W4 or W3 | Water quality data analysed annually:<br>- The mean and standard deviation for each water quality parameter at W4 and W3 will be calculated from the long-term monitoring data.<br>- The mean and standard deviation for each water quality parameter at upstream control sites (W1, W3A, W6 and W9) will be calculated from the long-term monitoring data. | W4 (and W3)<br><br>W1, W3A, W6 and W9 | EC, pH, $SO_4$, Iron | Monthly/Event | **Low Risk (Negligible) Outcome:**<br>The 12 month mean is within the long-term data 'mean plus 1.5 standard deviation', and the same trigger has not been exceeded at an upstream control site.<br>**Moderate Risk Trigger:**<br>The 12 month mean exceeds the long term data 'mean plus 1.5 standard deviation', and the same trigger has not been exceeded at an upstream control site.<br>**High Risk Trigger:**<br>The 12 month mean exceeds the long term data 'mean plus 2 standard deviation', and the same trigger has not been exceeded at an upstream control site. | Analysis of the monitoring data indicates no statistically significant change in the quality of water at W4 and W3 compared to the long-term data. The 12 month mean for all water quality parameters did not exceed the long-term data mean plus 1.5 standard deviation.<br><br>Additionally, a similar trend was observed at the reference sites.<br><br>No further requirement for assessment of Performance Measure. | Continue monitoring. |

Results of surface water monitoring during the reporting period are in concurrence with the EIS 2012 that concluded “mining operations at the SMC would not jeopardise local or regional water quality”.

### 7.2.2.2 Review of Mine Water Monitoring Results

**Mine Water Storages**

The management of mine related water is described in **Section 7.2.1.3** of this report. The monitoring program for the water management system is described in the SWMP Section 8.2.

The performance measure and performance indicator for the mine water storages (SWMP Table 12) states “*No discharge of mine affected water to downstream surface waters*” indicated by “*Modelled forward risk of spill from Stratford Main Pit is negligible*”.

The risk of a contained water storage overflow (i.e. spill) from the SMC was evaluated as part of the site water balance review and there were no spills simulated, which is consistent with the EIS site water balance (Gilbert and Associates, 2012). Subject to adherence with the operational protocols (including storage of water in active mine pits if required) and other assumptions inherent in the water balance modelling, the implied spill risk from the Stratford Main Pit (i.e. to Avondale Creek) is less than 1%.

No overflows or discharges of mine water occurred during the 2018 reporting period.

**Table 29** provides a summary of Stratford Main Pit surface water analysis. The full results are included in **Appendix 4**.

**Table 29 - Summary of Mine Water Storage Water Monitoring Results – 2018 Reporting Period**

| | pH | | EC (µS/cm) | | TSS (mg/L) | |
|---|---|---|---|---|---|---|
| **Site** | **Range** | **Average** | **Range** | **Average** | **Range** | **Average** |
| **Stratford Main Pit** | 7.4 - 8.4 | 8.0 | 3350 - 3910 | 3588 | <5 - 20 | 8 |
| **Stratford East Dam** | 8.0 - 9.0 | 8.5 | 853 - 966 | 907 | <5 - 8 | 6 |
| **Return Water Dam** | 7.2 - 8.4 | 8.0 | 2580 - 3690 | 3251 | <5 - 7 | 6 |
| **Parkers Pit** | 6.6 - 8.1 | 7.5 | 1231 - 2600 | 2116 | <5 - 34 | 13 |
| **Roseville West Pit** | 7.6 - 8.4 | 8.1 | 3390 - 3890 | 3624 | <5 - 19 | 7 |
| **BRN Pit** | 7.3 – 8.2 | 7.7 | 2164 - 2990 | 2787 | <5 - 80 | 18 |

The simulated water quality for the SMC water management system was prepared for the EIS 2012 including a salinity balance. Mine water pH has remained generally near neutral or slightly alkaline for the life of the project. The Mine Pit EC trend has been generally consistent with the simulated EC.

The electrical conductivity (EC) performance indicator in Table 7 of the Surface Water Management Plan (SWMP) was exceeded during the reporting period in the MWD. As a requirement of the SWMP, the increasing salinity triggered an assessment of performance measure. Hollingsworth (2014) concluded that there has been no significant detrimental effect on soil properties, or suitability of soil in irrigated areas for future agricultural use.

**Sediment Dams**

The management of sediment dams is described in **Section 7.2.1.1** of this report. The monitoring program for the water management system is described in the SWMP Section 8.2. Monitoring of sediment dams was undertaken on a monthly and rain event basis as required in the SWMP.
During the reporting period there were no spills from any sediment dams or disturbed area dams.

**Table 30 - Summary of Sediment Dam/Disturbed Area Dam Monitoring Results – 2018 Reporting Period**

| | pH | | EC (µS/cm) | | TSS (mg/L) | |
|---|---|---|---|---|---|---|
| **Site** | **Range** | **Average** | **Range** | **Average** | **Range** | **Average** |
| **SD7** | 7.0 – 8.3 | 7.5 | 89 - 395 | 252 | 33 - 87 | 57 |
| **SD12** | 7.4 – 8.5 | 7.8 | 549 - 942 | 651 | <5 - 30 | 8 |
| **SD15** | 7.3 – 8.6 | 7.9 | 1507 - 4000 | 3352 | <5 - 96 | 13 |
| **SD16** | 7.1 – 7.7 | 7.4 | 59 - 216 | 163 | <5 - 260 | 103 |
| **SD17** | 7.4 – 8.6 | 8.0 | 349 - 2260 | 1551 | <5 - 29 | 9 |
| **DAD4** | 7.6 – 9.0 | 8.2 | 521 - 2680 | 1644 | <5 - 21 | 10 |
| **DAD10** | 7.1 – 7.7 | 7.5 | 871 - 994 | 936 | <5 - 58 | 27 |
| **DAD13** | 7.9 – 8.4 | 8.1 | 980 - 1180 | 1128 | 7 - 66 | 24 |
| **DAD14** | 8.1 – 8.4 | 8.3 | 1840 - 2540 | 2185 | 6 - 100 | 35 |
| **DAD19** | 5.9 – 5.9 | 5.9 | 331 - 331 | 331 | 17 - 17 | 17 |
| **Ellis Dam*** | 7.3 | 7.3 | 571 | 571 | <5 | <5 |

*One sample only

## 7.2.3 Biological Monitoring

As part of SMC's environmental monitoring program, Invertebrate Identification Australasia was commissioned to conduct biological (aquatic ecology – macroinvertebrates) monitoring of the streams near the SMC. Biological monitoring has been conducted each year since the start of mining operations.

Two macro-invertebrate surveys were undertaken during the reporting period. The surveys occurred in February 2018 and September 2018 (Invertebrate Identification Australasia 2018). The results and conclusions of the surveys are summarised below.

Six sites were surveyed on the 13th of February 2018 and on 21st September 2018 for aquatic macro-invertebrates and water quality using rapid assessment techniques. The Avon River and Dog Trap Creek sites during the February and September surveys contained water although water levels were very low with no flow conditions. The Avondale Creek sites were dry. The sites surveyed includes two sites located on the Avon River, one above (Site W1) and one below (Site W2) the confluence of the Avon River and Avondale Creek. Two sites are located on Avondale Creek, Site W8 is at Bowens Road downstream of the Stratford Coal Handling and Preparation Plant, onsite within the mining area, and Site W5 is immediately upstream of where the Avondale Creek crosses Wenham Cox Road. One site (Site S3) is monitored for background data and is located along an unnamed creek which receives water from the clean water diversions and runoff from the rehabilitated waste dump and then feeds into Avondale Creek. Site W3 is located on Dog Trap Creek and is the control site.

During the February 2018 and September 2018 surveys a total of 20 and 38 families were recorded respectively. Four biological indices are used to determine the condition of the streams in and adjacent to the project area.

The results of the February 2018 survey indicate that the overall aquatic biodiversity across the river sites (Sites W1 and W2) showed a significant decrease in the taxa based indice compared with the last survey and are some of the lowest records of this monitoring program. The changes over the last twelve months in ecosystem condition/health appear to be the direct result of the continuation of low rainfall levels and the reduction in flow during the mid to late summer season. The lack of sufficient rainfall over winter and into summer has reduced the available habitats and impacted the water quality and the associated aquatic fauna significantly.

The results of the September 2018 survey indicate that the overall aquatic biodiversity across the river sites (Sites W1 and W2) showed an increase in the taxa based indice compared with the last survey and while these figures are still some of the lowest records of this monitoring program they have returned to similar values recorded over the last 3-4 years. The changes over the last twelve months in ecosystem condition/health appear to be the direct result of the higher rainfall occurring during the summer/autumn period. The lack of sufficient rainfall over winter and into spring has kept the available habitats reduced and impacted the water quality and the associated aquatic fauna significantly.

The results of both surveys indicate that there has not been significant changes or differences between Sites W1 and W2 either in the physicochemical or biological parameters tested as the ongoing no flow conditions has occurred across all sites. Therefore, the data indicates there is no evidence of an adverse effect from the mining operations on the ecology of the Avon River or the upper Avondale Creek sites.

Collectively, all biological monitoring reports to date have not indicated any significant adverse impact from either the general operations of the mine or the historical controlled release of mine water into the Avondale Creek and Avon River systems as per predictions made in environmental assessments that “mining operations at the Stratford Mining Complex would not jeopardise local or regional water quality”.

The SWMP performance measures states there would be no significant impact on aquatic ecosystems and biota as a result of the SMC as indicated by no significant change in biotic indices at the monitoring locations. The biological surveys indicate there have been no significant changes.
No significant change in biotic indices at M1, M2, M3, M5, M8 and S3.

### 7.2.4 Irrigation Management

Irrigation of water from the Stratford East Dam over waste emplacement areas continued during the reporting period. Irrigation is governed by soil moisture, with irrigation suspended during wet weather or in periods following rain until soil moisture levels fall to levels low enough such that irrigation would not lead to direct runoff. Runoff from irrigation areas is directed to the Stratford East Dam.

Irrigation of water from the Stratford East Dam over waste emplacement areas continued during the reporting period. Irrigation is governed by soil moisture, with irrigation suspended during wet weather or in periods following rain until soil moisture levels fall to levels low enough such that irrigation would not lead to direct runoff. Rainfall runoff from irrigation areas is directed to the Stratford East Dam. A water quality summary for the Stratford East Dam during the reporting period is provided in **Table 28** above.

#### 7.2.4.1 Irrigation Area Soil and Vegetation Monitoring

The 2018 Irrigation Area Monitoring Report (Horizon Environmental, 2018) concluded that there has been no significant detrimental effect on soil properties, pasture condition or suitability of soil in irrigated areas for future agricultural use, i.e. grazing on pasture. Irrigation area monitoring was undertaken during April 2018 and a summary from the 2018 irrigation area monitoring report is provided below:

*“Irrigation water salinity at SCM was below levels considered likely to affect the growth of sensitive crops and pastures. Current irrigation management of rehabilitated pasture on the waste rock emplacement will not have detrimental effect or off-site impact.*

*We found no detectable adverse impact from irrigation management on pasture cover or composition. Complete ground cover is being maintained on the irrigated pasture. Soil salinities in irrigation areas were comparable to respective reference sites on different geologies. The surface soils have low levels of major nutrients (extractable phosphorus and potassium) that will limit productivity. Also, soil acidification and micronutrient deficiencies including Cu and Zn may limit productivity in pastures.*

*Of the potential heavy metal and metalloid contaminants screened, the concentration of manganese in the Stratford East Dam at SCM warranted a site-based assessment of cumulative contaminant loading to the irrigation area. Manganese is a plant nutrient and there is no defined critical contaminant loading (CCL) in guidelines. Manganese loading under irrigation is not discernible from the influence of background conditions.*

*Pasture growth depends on a range of factors including grazing pressure, seasonal rainfall variation, as well as local soil conditions. There does not appear to be a detrimental effect on ground cover or pasture composition in the irrigated pastures compared with the dryland, reference sites. Annual monitoring has provided a relative assessment of pasture condition over time.'*

## 7.3 GROUNDWATER

### 7.3.1 Groundwater Management

A Groundwater Management Plan (GWMP) (WMP Appendix 2) has been prepared to control potential impacts on local and regional groundwater resources and includes and a monitoring program to validate and review the groundwater model predictions.

The groundwater systems within which the SMC lies, specifically relate to:

- Gloucester Basin Water Source (i.e. porous rock aquifer) under the Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016.
- Avon River Water Source (i.e. alluvial aquifers) under the Water Sharing Plan for the Lower North Coast Unregulated and Alluvial Water Sources 2009.

Groundwater characteristics of the mine have been studied prior to and over the life of the SMC and most recently for the Stratford Extension Project EIS. A hydrogeological characterisation of the Gloucester Basin is included in the GWMP.

The main aquifers in the Gloucester Basin are associated with the coal seams which are intersected by faults that compartmentalise groundwater flow. Groundwater is located predominantly within coal seams in the SMC area, with recharge occurring from overlying alluvium and regolith. The direction of groundwater flow is from the south-east to the north-west, and the main groundwater discharge zones are Avondale and Dog Trap Creeks, Avondale Swamp and Avon River. Further detail is included in the GWMP.

The water table approaches ground surface in the swampy northwest corner of the basin. The colluvium functions as the principal recharge to the basin. Groundwater is generally saline, highly mineralised water with slight to high acidic pH and is generally unsuitable for domestic consumption or irrigation. Baseline groundwater quality data is also included in the GWMP.

Groundwater resources within the project area were utilised in the early stages of the Stratford Project, as required, to provide make-up water for the CHPP. Since the mine start-up period, water has not been in deficit and no groundwater harvesting has occurred.

Locally there is little reliance on groundwater bores as a source of water, as agricultural enterprises predominantly rely on surface water sources which are more abundant and generally better quality. There are no high priority groundwater dependent ecosystems (GDEs) identified within the WSP as occurring in the vicinity of the SMC.

Groundwater seepage to the SMC mining areas (open cut pits and voids) is actively dewatered to the mine water storage area as required to facilitate mining activities. Groundwater may also be stored in the inactive open cut pits.

### 7.3.2 Groundwater Monitoring Results

The SMC groundwater monitoring program includes:

- groundwater inflows to the open cut mining areas (where measurable from pumping records);
- alluvial and porous rock groundwater levels and quality;
- representative private groundwater bores (e.g. Stratford Village bores).

Further detail on the groundwater monitoring program is included in the GWMP Section 7. The network of monitoring bores will be used to monitor the potential impacts on aquifers, groundwater levels and quality in the vicinity of the SMC. The general location of these bores is shown on **Figure 2** (**Appendix 1**).

The groundwater monitoring network includes:

- *Stratford Village Bores*

- *Stratford Project Bores (GW Series)*
- Roseville Series *Bores* (RB Series)
- *BRN Series Bores (MW Series)*
- *Stratford Extension Project Bores (F Series)*

***Stratford Village Bores***

Monitoring of the Stratford Village bores during the reporting period was undertaken in April 2018 and October 2018. Full results are included in **Appendix 4**. A change to the groundwater monitoring program was implemented during the reporting period. SCPL Bore, Germon and Bagnall bores will be sampled on a monthly basis going forward with Griffin added to the quarterly monitoring regime.

Sampling to date shows no significant changes in groundwater level or quality and no evidence of impacts from mining operations. The groundwater quality is highly variable, with better quality generally in the shallower bores such as Smith. It is understood that these bores are relatively shallow, and given the lower elevations of the sites are tapping into the shallower alluvial aquifers, as opposed to the deeper groundwater.

Results show that there has been no significant difference in depth to standing water level for the bores gauged to date.

***Stratford Project Bores (GW Series)***

Monitoring of the GW bores was undertaken on a quarterly basis but has been changed to 6-monthly monitoring, from August 2018, in line with the updated GWMP. Monitoring is undertaken for both groundwater depth and water quality. The locations of these bores are shown on **Figure 2** (**Appendix 1**). Full analytical results are also shown in **Appendix 4**.

A summary of monitoring results for the Stratford Project bores is provided in **Table 31**.

**Table 31 - Bores Monitored in Relation to the Stratford Project**

| Site | Average Depth to Water (m) | Average pH | Average EC (uS/cm) | Average Na (mg/l) | Average Cl (mg/l) | Average Fe (mg/l) | Average SO4 (mg/l) |
|---|---|---|---|---|---|---|---|
| **GW1** | 16.05 | * | * | * | * | * | * |
| **GW2** | 10.34 | 6.4 | 4563 | 714 | 1320 | 20.3 | 28 |
| **GW3** | 3.33 | 3.9 | 3787 | 640 | 1133 | 9.6 | 76 |
| **GW4** | 1.20 | 6.5 | 13920 | 2333 | 5003 | 3.5 | 110 |
| **GW5** | 4.11 | 7.0 | 10570 | 1797 | 3687 | 6.6 | 292 |
| **GW7** | 2.98 | 6.3 | 2521 | 368 | 772 | 12.4 | 92 |
| **GW8** | * | * | * | * | * | * | * |
| **BRWN1** | 0.67 | 6.2 | 5667 | 1093 | 1493 | 5.2 | 496 |

Notes: * Unable to retrieve sample due to dry bore

Monitoring for the GW series bores during the reporting period has indicated (when compared to historic data):

- water table levels across all bores were comparable to the previous reporting periods;
- average pH units recorded were similar to historical results across the data set with neutral pH at all bores except GW3 which has an acidic pH;
- electrical conductivities were generally similar to the historical results;
- water quality parameters had similar average levels to the previous period results and baseline data;
- GW1 and GW8 were both dry at all sampling times during the reporting period.

Groundwater monitoring data from the Stratford Project Bores during the reporting period demonstrates no significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the SMC. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the long term is likely.

***Roseville Pit Bores (RB Series)***

The RB series monitoring is undertaken on a quarterly basis for depth to water quality. The locations of these bores are shown on **Figure 2** (**Appendix 1**).

Monitoring results for the Roseville groundwater bores are provided in **Table 32** below with full analytical results within **Appendix 4**.

**Table 32 - Bores Monitored in Relation to Roseville Pit**

| Bore | Average DTW | Average pH | Average EC | Average SO4 | Average Na | Average Cl |
|---|---|---|---|---|---|---|
| **Units** | metres | | uS/cm | mg/l | mg/l | mg/l |
| **RB1** | 4.46 | 7.0 | 10,770 | 52 | 1,615 | 3,558 |
| **RB2** | 3.42 | 6.8 | 9,445 | 137 | 1,515 | 3,103 |
| **RB3*** | 13.60 | * | * | * | * | * |

Notes: * Unable to retrieve sample due to dry bore

Monitoring data recorded during the reporting period indicated:

- prevailing high water table near Avondale creek – particularly for RB1 and RB2;
- neutral pH at RB1 and RB2; this is consistent with historic monitoring results;
- electrical conductivity is consistent with historical data. Average electrical conductivity readings for RB1 and RB2 bores were similar to those of previous reporting periods;
- water quality parameters had similar average levels to the previous period results and baseline data;
- RB3 was either dry or too low to obtain a sample during each monitoring event in the reporting period.

Groundwater monitoring data from the Roseville Pit Bores during the reporting period demonstrates no significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the SMC. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the long term is likely.

***Bowens Road North Pit Bores (MW Series)***

Monitoring results for the BRN groundwater bores are provided in **Table 33** below with full analytical results within **Appendix 4**.

**Table 33 - Bores Monitored in Relation to Bowens Road North Pit**

| Bore ID | Average Depth to Water (metres) | Average pH | Average EC (uS/cm) | Average SO4 (mg/l) |
|---|---|---|---|---|
| MW3 | 5.26 | ** | ** | ** |
| MW4 | 15.75 | ** | ** | ** |
| MW6 | 8.24 | 6.3 | 405 | 32 |
| MW7 | 9.72 | 5.9 | 3873 | 265 |
| MW8 | 7.04 | 6.4* | 870* | 9* |
| MW11 | 9.53 | 7.2 | 1056 | 18 |
| MW12 | 3.53 | 6.6 | 641 | 2 |
| Griffin | 2.04 | 7.9 | 2390 | <1 |

Notes: *One sample only in average calculation
** Unable to retrieve sample due to dry bore

Monitoring data recorded during the reporting period indicated:

- depth to water measurement generally indicated a similar water table relative to results from the previous reporting periods;
- pH results were neutral across all sampled bores. Results were consistent with historical data;
- electrical conductivity was consistent with historical data and comparable with those in the previous reporting period, and

- water quality parameters had similar average levels to the previous period results and baseline data;

MW3 and MW4 were dry and unable to be sampled during the reporting period.

Groundwater monitoring data from the BRN Pit Bores during the reporting period demonstrates no significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the SMC. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the long term is likely

**Assessment of Performance Indicators**

Groundwater monitoring results are assessed against Performance Indicators and Measures as described Section 8 and Table 10 of the GWMP (2018). Monitoring data for the reporting period was in accordance with the performance measures and indicators as shown in **Table 34** below:

**Table 34 - Groundwater Monitoring Performance Outcomes – 2018 Reporting Period**

| Performance Measure | Specific Performance Indicators | Data Analysis to Assess against Performance Indicators | Monitoring | | | Cascading Trigger Levels | Assessment of Performance Indicator and Performance Measure | Relevant Management and Contingency Measures |
|---|---|---|---|---|---|---|---|---|
| | | | Sites | Parameters | Frequency | | | |
| No more than a negligible impact on water levels in groundwater bores on privately-owned land as a result of the SMC. | No groundwater related notification received | If a notification is received, an investigation will be conducted to determine if the SMC has resulted in a greater than negligible change in water levels in the Stratford Village bores. | NA | Notification | When received | Notification Received.<br><br>Investigation (monitoring) confirms that the SMC has resulted in a greater than negligible change in water levels in the Stratford Village bores (refer below).<br><br>**Low Risk (Negligible) Outcome**: No more than two successive monthly readings at MW12 or SCPL bore are below the P20 groundwater level (116.8 mAHD and 114.8m AHD, respectively).<br><br>**Moderate Risk Trigger:** More than two successive monthly readings at MW12 or SCPL bore are below the P20 groundwater level (116.8 mAHD and 114.8m AHD, respectively) and the equivalent P20 historical groundwater levels have not been exceeded at other shallow control sites (e.g. dry conditions or other anthropogenic changes are not prevalent).<br><br>**High Risk Trigger:** More than two successive monthly readings at MW12 and SCPL bore are below the P5 groundwater level (116.3 mAHD and 114.4m AHD, respectively) and the equivalent P5 historical groundwater levels have not been exceeded at control sites (e.g. dry conditions or other anthropogenic changes are not prevalent). | No notifications received.<br><br>Analysis of the monitoring data indicates no statistically significant change in water levels at MW12 and SCPL bores.<br><br>A similar trend was observed in the reference sites.<br><br>No further requirement for assessment of Performance Measure. | Continue monitoring. |
| | No significant decline in groundwater level at MW12 (Mine Site) or SCPL Bore (Stratford Village). | An investigation will be conducted to determine if the SMC has resulted in a greater than negligible change in water levels in the Stratford Village bores. | MW12 (Control Site: MW11)<br><br>SCPL Bore (Control Sites: Germon & Bagnall) | Groundwater level | Monthly (MW12, MW11 & SCPL Bore)<br><br>Monthly (Germon & Bagnall) | | | |

**Table 34 continued - Groundwater Monitoring Performance Outcomes – 2018 Reporting Period**

| Performance Measure | Specific Performance Indicators | Data Analysis to Assess against Performance Indicators | Monitoring | | | Cascading Trigger Levels | Assessment of Performance Indicator and Performance Measure | Relevant Management and Contingency Measures |
|---|---|---|---|---|---|---|---|---|
| | | | Sites | Parameters | Frequency | | | |
| No impact on regional groundwater quality that reduces the beneficial use as a result of the SMC. | No lowering of the beneficial use category (based on groundwater quality) at a groundwater production bore as a result of the SMC. | Each bore to be assigned a beneficial use category based on EC (refer Table 8 of GWMP).<br><br>If data analysis indicates the performance indicator has been exceeded, the performance measure will be assessed to determine if there has been a reduction in regional groundwater quality that has lowered the beneficial use. | SCPL Bore (Control Sites: Germon & Bagnall) | EC (field) | Monthly | **Low Risk (Negligible) Outcome**: No more than two successive monthly readings at the SCPL bore are outside the applicable beneficial use category range based on EC.<br><br>**Moderate Risk Trigger:** More than two successive monthly readings at the SCPL bore are outside the applicable beneficial use category range (based on EC) and the equivalent beneficial use categories at the control sites have not been lowered.<br><br>**High Risk Trigger:** More than two successive monthly readings at the SCPL bore are outside the applicable beneficial use category range (based on EC) and the equivalent beneficial use categories at the control sites have also been lowered. | Beneficial use categories:<br>• SCPL bore - 3 Irrigation<br>• Germon - 3 Irrigation<br>• Bagnall - 2 Marginal Potable<br><br>Analysis of the monitoring data indicates No more than two successive monthly readings at the SCPL bore are outside the applicable beneficial use category range based on EC.<br><br>A similar trend was observed in the control sites.<br><br>No further requirement for assessment of Performance Measure. | Continue monitoring. |

### 7.3.2.1 Review of Groundwater Inflows to Mining Operations

Groundwater seepage inflows to mining voids is directed and collected in pit sumps along with rainfall and surface water runoff and seepage through backfilled pit areas. Water level and water quality analysis of the pit sumps is undertaken on a monthly basis. The volumes of water extracted from the pit sumps is recorded where practicable.

The water quality monitoring results for the open cut pits during the reporting period is included in Section 7.2.2.2 of this report.

A site water balance review is undertaken on an annual basis to monitor the status of inflows (including groundwater inflows to open pits), storage and consumption. A summary of the 2018 site water balance review is included in Section 7.1.2 of this report.

# 8. REHABILITATION

Rehabilitation at the SMC is undertaken in accordance with the approved Mining Operations Plan and Rehabilitation Management Plan (MOP 2018). A new MOP was prepared for the commencement of the Stratford Extension Project during 2018. The MOP was approved by the Secretary for DRG on 9 March 2018 in advance of operations commencing. An amendment to the MOP was prepared and approved by DRG on 11 January 2019. The MOP term covers mining operations and rehabilitation activities up to March 2021. The MOP is available on the Stratford Coal website.

Condition 53 of Schedule 3 of Development Consent (SSD-4966) specifies the SMC post mining land use and rehabilitation objectives which are reproduced in Ta**ble 35** below.

**Table 35 – SMC Rehabilitation Objectives**

| Feature | Objective |
|---|---|
| Mine site (as a whole) | Safe, stable and non-polluting<br>Constructed landforms drain to the natural environment<br>Minimise visual impact of final landforms as far as is reasonable and feasible and be sympathetic to the original Gloucester valley landform |
| Final voids | Minimise the size and depth of final voids so far as is reasonable and feasible<br>Minimise the drainage catchment of final voids so far as is reasonable and feasible<br>Minimise high wall instability risk so far as is reasonable and feasible<br>The size and depth of final voids must be designed having regard to their function as long-term groundwater sinks, to maximise groundwater flows across back-filled pits to the void and to not be a source of saline groundwater for aquifers and streams<br>Designed and constructed to ensure adequate freeboard to ensure no spillage under any foreseeable conditions<br>Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood |
| Surface infrastructure | To be decommissioned and removed, unless the Deputy Secretary Resources & Energy agrees otherwise |
| Agricultural land | Establish a minimum of 300 hectares of land with Class 4 agricultural suitability |
| Other land | Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprising:<br>• a wildlife corridor (shown as Biodiversity Enhancement Area in the figure in Appendix 8);<br>• local native plant species; and<br>• a landform consistent with the surrounding environment |
| Stratford and Glen heritage railway corridors | Road and transmission alignments to avoid heritage railway corridors<br>Rehabilitation activities to avoid or minimise impacts |
| Community | Ensure public safety, with an emphasis on final voids<br>Minimise the adverse socio-economic effects associated with mine closure |

A summary of the rehabilitation objectives, performance indicators and completion criteria relevant to the SMC rehabilitation domain is provided in the MOP. Plan 4 in the MOP shows the conceptual final landform relevant primary and secondary rehabilitation domains.

## 8.1 BUILDINGS & INFRASTRUCTURE

The infrastructure areas are currently active.

The existing infrastructure and services at the SMC will continue to be utilised throughout the life of the SMC. In preparation for the recommencement of mining operations at the SMC several buildings in the infrastructure areas were replaced or upgraded as shown in the project description in the EIS 2012, including:

- New main workshop;
- New contractors workshop;
- New muster area and bathhouse;
- New field crib hut; and
- New water fill point.

No buildings or other infrastructure were demolished during the reporting period except where being replaced. No decommissioning of infrastructure is schedule during the next reporting period. This will be further addressed during the mine closure planning process.

## 8.2 REHABILITATION OF DISTURBED LAND

Rehabilitation of disturbed areas is undertaken progressively and concurrently with ongoing mining operations. Rehabilitation planning, management and implementation is described in the MOP. The overburden dump is rehabilitated in progressive increments to the final landform so the area of disturbed land is minimised and disturbed water catchment areas are reduced. Stage plans for the SMC rehabilitation are provided in the MOP Plans 3A, 3B and 3C.

Mining and rehabilitation activities follow the general progression below:

- Vegetation is cleared ahead of mine progression. Details are included in the Annual Biodiversity Report included in **Appendix 9**;
- Topsoil is removed ahead of the advancing pit or overburden dump and recovered for rehabilitation;
- Overburden and coal extraction is undertaken:
- Bulk shaping of waste emplacements, drainage works, ground preparation and topsoil placement; and
- Planting of rehabilitation areas following all preparation works (areas to be rehabilitated will comprise a combination of native forest/woodland and pasture with scattered trees as described in the MOP).

The SMC rehabilitation progress is generally in accordance with the planned activities described in the SMC MOP Plan 3A – Mining and Rehabilitation Year 1 (March 2019). The MOP makes provision for a total of 288 hectares of rehabilitated area by March 2019.

During the reporting period the total cumulative area of rehabilitation at the SMC increased slightly although this was offset by the disturbance of previously rehabilitated land approved in accordance with the Development Consent. The new disturbance areas were associated with Avon North Open Cut and the BRNOC cutback, including areas previously rehabilitated.

During the reporting period rehabilitation activities were undertaken for the BRNOC and Avon North visual screens along the northern perimeter of the operations near Wenham Cox Rd.

The MOP makes provision for 32 hectares of rehabilitation during the next reporting period mostly on the Avon North waste emplacement and Western Co-disposal. Disturbance during the next reporting period would be undertaken for the Stratford East Open Cut following the granting of the MLA 552.

**Table 36** presents a summary of the rehabilitation undertaken at the SMC site up to the current reporting period. The current mining areas and rehabilitation as of 31 December 2018 are shown in **Figure 3,** provided in **Appendix 1.**

**Table 36 – SMC Rehabilitation Status**

| Mine area type | Previous RP (actual hectares) | Current RP (actual hectares) | Next RP (forecast hectares) |
|---|---|---|---|
| Total Mining Lease | 1107 | 1192 | 1580 |
| Total mine footprint (Total Primary Domains) | 599 | 666 | 735 |
| Total active disturbance (Primary Domains less rehabilitation) | 293 | 342 | 397 |
| Land being prepared for rehabilitation (Landform Establishment) | 31 | 45 | 45 |
| Land under active rehabilitation (Growth Medium Development) | 9 | 0 | 0 |
| Completed rehabilitation (Ecosystem Establishment & Sustainability) | 266 | 279 | 293 |

Note: The rehabilitation and disturbance boundaries have been realigned and the areas recalculated. This includes the disturbance of previously rehabilitated land.
Note: The current Mining Lease area includes ML 1733 for Avon North. The forecast ML area includes MLA552 for Stratford East which has been lodged and covers an area of approximately 388Ha.

***Rehabilitation Resources***

Topsoil resources are managed in accordance with the MOP Section 3.3.4. Vegetation clearance activities are described in Section 6.5.1 of this report. A total area of 67 hectares was cleared in advance on mining activities during the reporting period. Following the clearance of vegetation all available topsoil is stripped and recovered. Topsoil resources are placed directly on rehabilitation areas if available or relocated to stockpiles for future use.

The site topsoil balance is updated annually to track the recovery and usage of topsoil and to ensure adequate resources are available for rehabilitation of disturbed areas at the SMC. The latest topsoil balance was updated in July 2018, hence any clearing activities undertaken after this date are not included. At July 2018, an estimated 185,500 cubic metres of topsoil was held in various stockpiles at the SMC. This would provide for rehabilitation of 185 hectares to the nominal topsoil depth of 100mm. The current area of disturbance which will require topsoil (i.e. not including final void areas or permanent water bodies) is 264 hectares, however this includes the area cleared for the Avon North Open Cut which is not accounted for the topsoil balance.

The SMC topsoil balance will be updated again during the next reporting period.

***Rehabilitation Maintenance***

Recommendations for maintenance activities on rehabilitated land have been included in the rehabilitation monitoring reports, refer to Section 8.3.

During the reporting period maintenance activities focussed on the improvement of pasture rehabilitation across the Stratford waste emplacement and included slashing and the removal of woody acacia regrowth. Erosion control works were completed on several areas of gully erosion identified in the Stratford and BRN rehabilitation. Weed control has been undertaken across all rehabilitation areas targeting lantana, blackberry, wild tobacco and giant parramatta grass.

Recommendations to undertake additional tubestock planting in targeted areas of the native rehabilitation to improve biodiversity and stem density as stated in Section 8.3 will be considered during the next reporting period.

## 8.3 REHABILITATION MONITORING

Monitoring of the SMC rehabilitation areas is described in Section 8 of the MOP. Rehabilitation is monitored on a regular basis to ensure vegetation is establishing in the rehabilitation areas and to determine the need for any maintenance and/or contingency measures (e.g. supplementary plantings, weed or erosion control). The monitoring also aims to demonstrate the effectiveness of the rehabilitation techniques and track the progression towards achieving the performance and completion criteria.

***Visual Monitoring***
Rehabilitation monitoring includes a visual assessment:

- monitoring of soil erosion status and the effectiveness of erosion control methods;
- assessing germination success and vegetation establishment (diversity and abundance);
- usage of habitat enhancement features;
- the presence of weeds or feral animals; and
- mine landform runoff water quality.

The visual monitoring provides an early identification of areas requiring remedial planting or other maintenance works to maintain rehabilitation progress. A report has been prepared titled *"Stratford Rehabilitation Walkover Report 2017"* and provides a list of maintenance recommendations predominantly relating to erosion control, weeds control and vegetation management and enhancement. The report can be made available on request from the Environmental Department.

***Ecosystem Function Analysis***
The assessment of rehabilitation quality and ecosystem value is conducted via the use Ecosystem Function analysis (EFA). EFA aims to measure the progression of rehabilitation towards self-sustaining ecosystems. EFA has been incorporated into the overall SMC rehabilitation monitoring program to provide an assessment of landscape functionality.

EFA Analogue Transects have been established in proximal areas to represent the varying landscapes (i.e. slopes and aspects) and target communities planned for each rehabilitation area.

In December 2013 a fixed transect-based Landscape Function Analysis (LFA) and Vegetation Structure monitoring program was established across the SMC Rehabilitation areas. These 30 transects were assessed again in June 2018 as part of the fifth annual round of monitoring in accordance with Section 8 of the MOP. A copy of the full report is available from the Stratford Coal Environmental Department.

The 2018 Survey Report concluded that the rehabilitation areas of the Stratford Mining Complex are progressing satisfactorily. The established Native Flora Rehabilitation Areas continue to show progress with LFA indices at or near analogue levels. Flora development is still dependent upon the initial seeding or planting regime and will require time for further development. The oldest native flora rehabilitation area is now 20 years old and is approaching the required vegetation structure, indicating the time scale required. More recently rehabilitated areas are still developing and may require additional planting/seeding efforts to achieve the desired vegetation structures. The Pasture Rehabilitation areas have proven capable of supporting grazing. Future actions relate to pasture management rather than active rehabilitation or remediation.

The analysis of the survey results provides the basis for the following recommendations (**Table 37**) (Kleinfelder Australia, 2018):

**Table 37: Summary of Rehabilitation Monitoring Recommendations 2018**

| Native Flora Rehabilitation | Recommendations |
|---|---|
| Bowens Road North 2014 | • Reseeding exposed soil area with grass and/or cover crop species suitable for surface stabilisation e.g. Chloris gayana (Rhodes Grass), Cenchrus clandestinum (Kikuyu) and Cynodon dactylon (Couch).<br>• Implement a tubestock planting program with canopy and "missing" shrub species to rehabilitate the area to woodland community standard. |
| Bowens Road North 2011 | • Continued monitoring to determine if canopy plantings/seeding are required |
| Roseville Waste Emplacement 2005 | • Implement a tubestock planting program with canopy and "missing" shrub species to improve biodiversity and density. |
| Bowens Road North 2006-08 | • For monitoring purposes, treating the area represented by T24 (T25) separately from the Southern BRN area.<br>• Installation of nest boxes to facilitate native fauna colonisation; and,<br>• Future monitoring in this area to take note of Eucalypt densities to determine likely future vegetation structure and whether there will be a need for supplemental planting or whether self-tinning and natural recruitment will be sufficient to achieve the rehabilitation targets. |
| Stratford Woodland Rehabilitation 1996/97 | • Continue with periodic and regular control of woody weeds that have potential to hinder revegetation effort – i.e. Araujia sericifera, Lantana camara, Lonicera japonica and S. mauritianum.<br>• Installation of nest boxes to facilitate native fauna colonization. |
| Pasture Rehabilitation | Recommendations |
| Stratford Waste Emplacement | • Continue monitoring as per consent conditions until such time as sign off and relinquishment process completed<br>• Instigate normal pasture weed management practices – suppression of native colonisers (e.g. Acacias) and pasture weeds (e.g. Cirsium vulgare). |

The outcomes and recommendations from the rehabilitation monitoring will guide the future rehabilitation efforts and maintenance works.

***Fauna Monitoring***

Fauna usage of the native woodland/forest rehabilitation areas is monitored and documented over time. Fauna surveys are conducted to assess the success of the rehabilitation and revegetation activities in providing habitat for a range of vertebrate fauna. The surveys include an assessment of habitat complexity, species richness and abundance. Fauna monitoring was undertaken during February 2018.

During 2018 AMBS Ecology & Heritage (AMBS) was engaged to undertake a fauna survey within the SMC native rehabilitation areas to assess the success of the rehabilitation areas in providing habitat for a range of vertebrate fauna. The fauna survey undertaken in February 2018 did not extend to the Stratford Biodiversity Areas, however future monitoring rounds will include the Biodiversity Offset Areas, Biodiversity Enhancement Areas and the rehabilitation areas

An extracted summary of the survey results from the *Stratford Coal Mine: Fauna Surveys of the Rehabilitation Areas (February 2018)* is provided below.

> *"Targeted fauna surveys were undertaken at two sites within the Stratford Mine Rehabilitation Area from 12 to 16 February 2018 and 26 February to 2 March 2018. At each site survey techniques included pitfall traps, funnel traps, Elliott A traps, harp traps, ultrasonic call recording, spotlighting, diurnal bird surveys and reptile searches. Opportunistic observations of signs of fauna were noted throughout the field survey period, including during transit between surveys sites.*
>
> *A total of 104 species of vertebrate were recorded, comprising 8 frogs, 10 reptiles, 56 birds and 30 mammals (Appendix A), most of which were native. Five introduced species were recorded during the surveys, including the Eurasian Skylark (Alauda arvensis), Red Fox (Vulpes vulpes), House Mouse (Mus musculus), Black Rat (Rattus rattus) and the European Rabbit / Brown Hare. Eight of the species detected are listed as threatened or migratory on the schedules of the BC Act and/or EPBC Act, including:*

- *Grey-crowned Babbler (eastern subspecies) (Pomatostomus temporalis temporalis)*
- *Black-necked Stork (Ephippiorhynchus asiaticus)*
- *Little Lorikeet (Glossopsitta pusilla)*
- *White-throated Needletail (Hirundapus caudacutus)*
- *Brush-tailed Phascogale (Phascogale tapoatafa)*
- *Little Bentwing-bat (Miniopterus australis australis)*
- *Eastern Bentwing-bat (Miniopterus schreibersii oceanensis)*
- *Eastern Freetail-bat (Mormopterus norfolkensis)*

*The fauna surveys suggest the Stratford rehabilitation areas provide habitat for a range of native vertebrate fauna, including birds, mammals, reptiles and frogs. The number of species recorded utilising the rehabilitation area is encouraging, particularly given the relatively young age of the vegetation."*

## 8.4 REHABILITATION TRIALS AND RESEARCH

SCPL has extensive experience in both native woodland/forest revegetation and agricultural pasture rehabilitation, with successful rehabilitation areas completed over the past 20 years at both the Stratford and Duralie mine sites. Learnings from the rehabilitation works undertaken onsite to date along with industry best practice guidelines are employed in the methodology for new rehabilitation areas.

Rehabilitation trials have been also undertaken in the Duralie Coal Mine Biodiversity Offset Areas. The program has trialled several methods for ground preparation, seeding and planting to determine the most suitable and cost effective methods for completing the remaining offset revegetation and mine site rehabilitation. The techniques include both direct seeding and tube stock with inoculated and un-inoculated seed. Full detail on the results of the rehabilitation trials is included in the Duralie Coal Mine Annual Review 2018.

## 8.5 DEVELOPMENT OF THE FINAL REHABILITATION PLAN

### 8.5.1 Mine Closure Planning

The current MOP (Section 10) includes a mine closure planning program, which includes a schedule of all technical and/or environmental assessments that will be required to undertake final rehabilitation and closure of the SMC. In future MOP revisions, appropriate completion dates will be inserted for each of the technical and environmental assessments and rehabilitation/closure works.

The mine closure planning program is designed to inform the preparation of a detailed Mine Closure Plan, which is required to be prepared and submitted to the DRG prior to the expiry of the MOP term. The Mine Closure Plan would include final rehabilitation measures for all areas including infrastructure areas, water management areas, waste emplacements, rejects facilities, final voids and biodiversity offsets.

The SMC MOP (2018) describes the proposed operational mining and rehabilitation activities for the currently approved SMC until 1 March 2021. Rehabilitation strategies are provided in the Environmental Assessments for the SMC. Rehabilitation will be generally consistent with the proposed rehabilitation strategy as depicted in the Development Consent SSD-4966.

The proposed final landforms for the SMC would include a combination of pasture and native woodland rehabilitation consistent with the surrounding environment. This would also include final voids and wildlife corridors.

### 8.5.2 Infrastructure Decommissioning

The mine closure planning program includes consideration for infrastructure decommissioning including:

- Identify and remove/demolish all non-active infrastructure which is not required for the remainder of processing activities.
- Undertake consultation to confirm any alternative use for retained infrastructure (i.e. rail loop, haul roads, access tracks and dams) post-mining.

These activities would be undertaken towards the end of mine life.

### 8.5.3 Waste Emplacements & Final Landforms

The rehabilitation objectives for the final landforms requires final landform designs which sustain the intended land use for the post-mining domain(s). Final landforms are to be consistent with and complement the topography of the surrounding region to minimize the visual prominence of the final landforms in the postmining landscape. Final landforms are to incorporate design relief patterns and principles consistent with natural drainage.

SCPL have continued to develop the detailed final landform designs consistent with the conceptual rehabilitation strategy in the EIS 2012 and rehabilitation objectives in the Development Consent. The MOP also includes detail regarding the rehabilitation implementation requirements and the conceptual final rehabilitated landform for the SMC.

SCPL will continue to progress the final landform designs during the next reporting period.

### 8.5.4 Stratford Main Pit & Reject Emplacement Rehabilitation

The Stratford Main Pit continues to be used for the disposal of reject material and is now envisaged that the Main Pit will effectively be filled with waste material and rejects over the life of the operation. Rehabilitation concepts for the Stratford Main Pit include profiling the backfilled pit to free-draining landforms, capping the reject material and topsoiling for revegetation with endemic woodland/open forest species.

The Resource Regulator provided advice on the rehabilitation performance observations at the SMC following a site inspection undertaken on 31 May 2018. The Regulator requested SCPL to develop a strategy to assess the proposed rehabilitation methodology for the reject emplacement facility considering factors such as anticipated material densities and moisture content of the emplaced materials, dewatering, sourcing and capping with inert material, and the approved post mining land use for the facility. The Regulator advised SCPL are required to report the outcomes of the assessments in the next AR for the SMC.

SCPL has engaged Xenith Consulting to assist with the preparation of a detailed methodology for the rehabilitation of the Stratford Main Pit and Rejects Emplacement. A summary of the *Stratford Main Pit Rehabilitation Methodology (Xenith, 2019)* will be included as an addendum to the main SMC Annual Review 2019. The detailed rehabilitation strategy will also be included in the next MOP amendment for the SMC.

The overall rehabilitation objective for the Stratford Main Pit is to create and landform which is safe, stable and non-polluting. The final landform would drain to the natural environment and minimise visual impact as far as is reasonable and feasible and be sympathetic to the original Gloucester valley landform.

To achieve the final landform in the Stratford Main Pit the void will be backfilled with co-disposed reject material and overburden spoil. The Main Pit will also be used for water storage during the life of the operation. Xenith have investigated concepts of how to undertake these activities safely and document the intended approach.

The proposed Stratford Main Pit Rehabilitation methodology includes strategies and assessments for:

- Waste emplacement and scheduling;
- Rejects emplacement and scheduling;
- Geotechnical analysis of slope stability and factors of safety during backfilling;
- Assessing reject characterisation and settling densities;
- Pit dewatering and inert material capping;
- Site water balance review; and
- Development of stage plans to achieve final landform.

### 8.5.5 Final Void & Water Management

At the completion of mining, the SMC final landform will include partially backfilled final voids located at the Roseville West Extension Pit, Avon North Open Cut and Stratford East Open Cut. The rehabilitation objectives for these final voids are to:

- Minimise the catchment area of the final voids.
- Ensure the final voids are stable and non-polluting.
- Leave the void surrounds safe (for humans and stock).

The management of final voids for the SEP is described in the EIS 2012 rehabilitation strategy and has been included in the SEP MOP. The mine closure planning program includes several components relating to water management and final voids including:

- Review the site water balance to ensure the balance incorporates the final landform design, surface water inflows and outflows to/from final voids.
- Review the site groundwater model to ensure the model is consistent with the final landform design.
- Review the post-mining drainage design to ensure comparable drainage density to local natural landforms.
- Review the medium to long term water quality predictions of the final voids against available monitoring data to determine the need for additional/alternate management.

## 8.6 REHABILITATION TARGETS

The SMC MOP Plan 3A - Mining and Rehabilitation Year 1 (March 2019) rehabilitation target is a cumulative total of 288 hectares of rehabilitation by March 2019. To date 324 hectares of rehabilitation has been completed.

The SMC MOP Plan 3B - Mining and Rehabilitation Year 2 (March 2020) rehabilitation target is a cumulative total of 320 hectares of rehabilitation.

Rehabilitation of approximately 32 hectares of waste emplacement (currently Landform Establishment Phase) is scheduled be undertaken in the next reporting period in accordance with the MOP.

# 9. COMMUNITY RELATIONS

## 9.1 COMMUNITY ENGAGEMENT ACTIVITIES

Yancoal Australia Ltd is committed to making a positive contribution in the areas in which it operates. To help facilitate this commitment Stratford Coal Pty Ltd have established the Community Support Program to provide assistance to local initiatives within the local area in which they operate. The aim of the Community Support Program is to help benefit a diverse range of community needs such as education, environment, health, infrastructure projects, arts, leisure and cultural heritage.

The Stratford Coal Community Support Program has granted over $550,000 since commencing in 2010 and during 2018 a total of $52,000 in grants was distributed between 20 community organisations for a diverse range of community projects and initiatives.

The community groups to receive grants in 2018 were:

| Community Support Program 2018 Recipients | Project Description |
|---|---|
| Pure NRG | Defibrillators for Gloucester Schools |
| Ronald McDonald House and Mark Hughes Foundation | Massive Murray River Paddle - Ronald McDonald House and Mark Hughes Foundation |
| Gloucester RSL Sub Branch | Gloucester Cemetery Memorial refurbishment |
| Stroud Road Public School P&C Association | Classroom air-conditioning |
| Stroud Neighbourhood Children's Cooperative | Air-conditioning for playroom |
| Booral Rural Fire Brigade | Fire Hose Drying Rack |
| Gloucester Country Club | Stratford Coal Super Sevens Golf Competition 2018 |
| Stroud Rodeo Association | 2018 Stroud Rodeo and Campdraft |
| Stroud Show Association Inc. | 2018 Stroud Show - Major Sponsor |
| Gloucester Mountain Man Triathlon Inc. | 2018 Gloucester Mountain Man Tri Challenge |
| Gloucester Agricultural, Horticultural & Pastoral Assoc. | Gloucester Show 2018 |
| Stroud Raiders Rugby League Club | Replacement training equipment damaged in Stroud floods |
| MidCoast Science & Engineering Challenge | MidCoast Science & Engineering Challenge 2018 |
| Stroud Community Lodge Inc | Community and Resident Entertainment Program |
| Gloucester High School P & C Ass. Inc. | Senior Common Area Upgrade - landscaping and facilities |
| Barrington Public School | Classroom reading eggs and headphones. |
| Scout Association NSW Branch | New Scout group equipment |
| Stratford Public School | Sphero SPRK + Robotics |
| Stroud Road Community Hall & Progress Assoc | Stroud Road Spring "Bash 'n Bang" 2018 |
| Stroud & District Country Club | Family Fun Day |

SCPL have also continued their commitment to education and training in the Gloucester region through Stratford Coal's Education Support Program, providing much needed funding for the next generation of young students. The Education Support Program is managed by an independent committee and the funds distributed by MidCoast Council. In 2018, $22,000 has been allocated in funding to help support local students and businesses in university degrees, TAFE courses and apprenticeships.

Since the commencement of mining in 1995, Stratford Coal has contributed more than $700,000 to locally based community and training initiatives via the Education Support Program. During that time, the funding has made a genuine difference to the lives of over 150 tertiary students, 100 apprentices and 50 businesses.

Yancoal and Stratford Coal have continued their partnership with the Clontarf Foundation Chatham Academy. During 2018 SCPL engaged in several activities with the Chatham Academy students including a site visit to the Duralie Coal mine site. The site visit provided an example of an operational mine site and what goes into running a mine including the rehabilitation of mine land. Another site visit was also arranged for the Gloucester Activity Centre Men's Group who undertook a tour of the Duralie operations.

## 9.2 COMMUNITY CONSULTATIVE COMMITTEE

The Stratford Coal Community Consultative Committee (CCC) was established in 1995 and operates under the guidance of the NSW Department of Planning & Environment. Meetings were held quarterly during 2018 and provide a forum for open discussion between the community, Council, the Company and other stakeholders on issues relating to the mine's operations, environmental performance and community engagement.

The Community Consultative Committee (CCC) for the SMC is currently comprised of:

- An independent Chairperson;
- Five (5) local community representatives;
- Two (2) local government representatives (MidCoast Council); and
- Two (2) SCPL representatives.

The CCC was formed in accordance with Schedule 5, Condition 6 of the Stratford Extension Project Development Consent. The Committee operates in such a manner as to satisfy the *Community Consultative Committees Guidelines for State Significant Projects* (Department of Planning, 2016) and to the satisfaction of the Secretary of the DP&E.

With the commencement of the SEP in April 2018, quarterly meetings were resumed during the reporting period. Four CCC meetings were held during the reporting period in February, May, August and November 2018. Items raised and/or discussed during the CCC meetings held during the reporting period include but are not limited to:

- Progress at the mine and general SEP update;
- Environmental Management Plans;
- Environmental monitoring, including air quality, noise, surface water and groundwater;
- Environmental Reporting;
- Community Complaints;
- Community engagement and Council contributions;
- Biodiversity Offset Strategy;
- Rural property management of SCPL owned land;
- Mine rehabilitation and mine closure planning; and
- Post-mining land use planning.

A site inspection was conducted following the August 2018 CCC meeting. The areas inspected included the BRN Cutback, Avon North Boxcut, Main Pit and general infrastructure/construction works. The CCC meeting agendas, presentations and minutes are available on the Stratford Coal website (www.stratfordcoal.com.au).

An Annual Report for the Stratford Coal CCC was prepared by the Chair and submitted to DP&E on 18 February 2019.

## 9.3 ENVIRONMENTAL COMPLAINTS

Complaints (by category) received by SMC over the last 4 reporting years are provided below in **Table 38**:

**Table 38: Community Complaints Summary**

| Complaint Category | 14/15 | 2015 interim (July – December 2015) | 2016 (January – December 2016) | 2017 (January – December 2017) | 2018 (January – December 2018) |
|---|---|---|---|---|---|
| Noise | 11 | 2 | 0 | 1 | 4 |
| Blasting | 0 | 0 | 0 | 0 | 0 |
| Air Quality | 0 | 0 | 0 | 1 | 0 |
| Water | 0 | 0 | 0 | 0 | 0 |
| Lighting | 0 | 0 | 0 | 0 | 0 |
| Traffic/Transport | 0 | 0 | 0 | 0 | 0 |
| Visual | 0 | 0 | 0 | 0 | 0 |
| Other | 1 | 0 | 0 | 0 | 0 |
| **Total Complaints** | **12** | **2** | **0** | **2** | **4** |

Four complaints were received during the 2018 reporting period. All complaints were related to noise.

Summary comments for complaints received during 2018:

- The total number of complaints received during the reporting period was four (4) with the total number of complainants being one (1).
- All complaints were related to noise.
- The total number of complaints increased slightly during the reporting period.

A full complaints listing is provided in **Appendix 7** and includes details of SCPL's responses to complaints. A summary of complaints by category is provided in the relevant sections of the report.

### 9.3.1 Liaison and Complaint Resolution

SCPL aims to inform the community of its activities and consult with the community in an open and honest fashion and address complaints/conflicts and consult to achieve mutually acceptable outcomes.

In accordance with the Development Consent Conditions, SCPL is required to establish and maintain a complaints handling and response procedure. SCPL operates a system to receive, handle, respond to and record complaints or information requests relating to operation of the SMC which is described in the Environmental Management Strategy.

SCPL operates dedicated community information hotline (1300 658 239) 24 hours per day. The number is advertised within the Sensis *White Pages Directory (Newcastle)*, a local telephone directory (*Pink Pages*) and in the local newspapers *(Gloucester Advocate and Dungog Chronicle)* on a six monthly basis.

Designated SCPL staff, when notified of a complaint, determines an appropriate response on the basis of the nature of the complaint during business hours. This may involve a site visit/inspection, liaison with personnel on site by telephone or other appropriate action. After business hours, all complaints and operations are reviewed as soon as practicable by the open cut examiner and responded to by SCPL staff during business hours.

All complaints received and responses taken in relation to each complaint are recorded in a Complaints Register. The Complaints Register is tabled at each Community Consultative Committee meeting for the period covered since the last Committee meeting and is included in **Appendix 7**. The complaints register is also made available on the Stratford Coal website.

## 9.4 EMPLOYMENT STATUS AND DEMOGRAPHY

At the end of the reporting period (i.e. December 2018), the total number of FTE employees/contractors employed at the SMC was **121**, including 88 SCPL employees and 33 Ditchfield contractors. During the reporting period 2 environmental representatives were employed and shared with the nearby Duralie Coal Mine.

During 2018 SCPL transitioned the workforce from DCM to the SMC to align with the completion of coal mining at the DCM and the recommencement of operations at the SMC.

In addition to direct permanent employment at the mine, on the basis of a conservative employment multiplier of one mine site job generating one job within the general community, up to 121 (full time equivalent) jobs are expected to have been provided in supporting services. On the basis of a review of employees' living location, 52% of mine employees currently resided within the greater local area (defined as being bounded by Stroud, Gloucester and Dungog).

## 9.5 EMPLOYEE ENVIRONMENTAL AWARENESS TRAINING

SCPL recognises the importance of establishing, developing and maintaining a risk-aware, trained, and competent workforce at its operations to ensure a high standard of environment and community management.

SCPL environment & community management objectives include:

- ensuring employees and contractors are informed about SCPL's policies and are made aware of their environmental and community responsibilities in relation to SCPL's activities;
- providing all employees/contractors with the knowledge, skills and equipment necessary to meet their environmental obligations; and
- promoting an awareness and concern for good environmental management amongst all employees/contractors.

New employees and contractors working at site are provided with information on environmental and community issues as part of Stratford Coal induction training which is updated periodically. This includes elements such as the Pollution Incident Response Management Plan and reporting obligations of personnel and the management of environmental incidents. Ongoing environmental awareness training is also undertaken with staff and employees periodically.

During the reporting period employee and contractor training included presentations on:

- General environmental management and awareness – Training was undertaken across four sessions during June 2018 with all employees and contractors at the Stratford & Duralie operations in preparation for the recommencement of mining at the SMC. This included information on the SMC Pollution Incident Response Management Plan and incident reporting.
- Mining Operations Plan & Rehabilitation Management Plan - A presentation was provided to the site managers and supervisor on the obligations and requirements in regard to rehabilitation and mine closure planning.
- Vegetation Clearance & Ground Disturbance – Toolbox training was undertaken in December 2018 with all employees and contractors regarding the environmental compliance requirements and procedures for vegetation clearance and ground disturbance.

## 10. INDEPENDENT ENVIRONMENTAL AUDIT

An Independent Environmental Audit of the SMC was not required during the reporting period. In correspondence from DP&E dated 30 November 2018, DP&E advised the initial Independent Environmental Audit required by SSD-4966 must be commissioned prior to 31 December 2020.

The previous Independent Environmental Audit (IEA) of the SMC was conducted during December 2017. Hansen Bailey was commissioned by SCPL to undertake the audit in accordance with the Development Consent conditions DA 23-98/99 Schedule 5 Condition 8 and DA 39-02-01 Schedule 2 Condition 8.1.

The audit team was approved by the Secretary for DP&E and included experts in the areas of rehabilitation, ecology and surface water. The final IEA report along with SCPL's responses to the recommendations was submitted to DP&E on 26 February 2018.

The IEA identified some non-compliances against conditions of Development Consent DA 23-98/99, DA 30-02-01 and other licences and approvals. The non-compliances were risk ranked and no high risks were identified during the audit. Two issues were identified as low risk and 10 issues classified as administrative in nature. The field inspection revealed that the site was generally well maintained and in good condition. Implementation of site rehabilitation is progressing generally in accordance with supporting documents of the Development Consent and Mining Operations Plan. The audit concluded that a good standard of environmental management is generally being applied at the SMC. The IEA report also provided a series of recommendations arising from a review of site documentation and identified non-compliances.

The full IEA report and responses to the recommendations are available on the Stratford Coal website at http://www.stratfordcoal.com.au.

DP&E advised in correspondence dated 19 April 2018 that the IEA 2017 and SCPL's responses meets the requirements of the Development Consents and DP&E's IEA Guidelines. Furthermore, a status update on the IEA 2017 Recommendations and Responses showing SCPL's progress against each recommendation was provided to DP&E on 11 May 2018 at DP&E's request.

## 11. INCIDENTS AND NON-COMPLIANCE

Activities at the SMC continue to be carried out in accordance with Development Consent SSD-4966 for the SEP.

On 11 April 2018 DP&E confirmed SCPL's application to voluntarily surrender the existing Development Consents DA 23-98/99 for the Stratford Coal Mine and DA 39-02-01 for the Bowens Road North Open Cut had been accepted.

A protocol for managing incidents and non-compliances is included in the SMC Environmental Management Strategy.

A statement of compliance is included in Section 1 of this report. During the reporting period there was one incident/non-compliance at the SMC. A summary of the non-compliances with Development Consent SSD-4966 during the reporting period are included in Table 2b and further detail is included below.

On 16 November 2018 SCPL notified DP&E of a ground disturbance incident which occurred at the SMC and was reported in accordance with SSD-4966 and the PIRMP. An incident report was submitted to DP&E within 7 days in accordance with Schedule 5, Condition 7 of SSD-4966.

An inspection of the incident site and remediation work was undertaken by DP&E on 20 November 2018. A Show Cause Notice was issued by DP&E on 20 December 2018 and a response with further information regarding the incident and the actions implemented by SCPL was provided on 18 January 2019. DP&E issued SCPL an Official Caution on 15 February 2019 stating SCPL failed to implement all reasonable and feasible measures to prevent and/or minimise environmental harm in accordance

with Schedule 2, Condition 1 of SSD-4966. SCPL has completed remediation of the ground disturbance site and implemented recommendations including:

- Update refresher training on vegetation clearance and ground disturbance protocols.
- Install additional signage/delineation in areas in close proximity to disturbance limits or environmentally sensitive areas.

## 12. ACTIVITIES PROPOSED IN THE NEXT REPORTING PERIOD

SCPL will continue mining operations in accordance with Development Consent SSD-4966 for the Stratford Extension Project during 2019.

A Mining Lease Application (MLA552) for the Stratford East Open Cut was lodged in December 2017. SCPL received and accepted the draft ML conditions in September 2018. Following the granting of the Stratford East ML SCPL intend to commence construction and mining activities.

In preparation for mining in Stratford East SCPL will prepare a MOP amendment to include the proposed mining activities in accordance with the ML conditions Additionally, SCPL will prepare a revision of the Environmental Management Plans as relevant and in accordance with the Development Consent.

The following environmental targets have been set for the next 12 months:

- Mining and rehabilitation activities will be implemented in accordance with the timing in stage plans in the SMC MOP.

- Review and update the Environmental Management Plans to the satisfaction of the Secretary of DPE to ensure suitable management plans are in place for the SEP;

- Continue to meet the environmental management, monitoring and reporting requirements in accordance with the Development Consents conditions.

## 13. REFERENCES


- Gilbert and Associates (2012). *Stratford Extension Project Surface Water Assessment for Stratford Coal Pty Ltd,* Gloucester.
- Greening Australia (2017). *Duralie Coal Biodiversity Management Plan.*
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- Hydro Engineering & Consulting (2018). *Stratford Mining Complex 2018 Annual Water Balance Review for Stratford Coal Pty Ltd,* Gloucester.
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- Resource Strategies (2001a). *Bowens Road North Project Environmental Impact Statement*
- SLR global environmental solutions (2017). *Duralie Coal Mine Mobile Plant Survey 2018 Sound Power Level Assessment*
- Stratford Coal Pty Ltd (2018) *Stratford Coal Mine Pollution Incident Response Management Plan*
- Stratford Coal Pty Ltd (2018a). *Stratford Mining Complex (Stratford Extension Project) Air Quality Management Plan*
- Stratford Coal Pty Ltd (2018b). *Stratford Mining Complex (Stratford Extension Project) Biodiversity Management Plan*
- Stratford Coal Pty Ltd (2018c). *Stratford Mining Complex (Stratford Extension Project) Blast Management Plan*
- Stratford Coal Pty Ltd (2018d). *Stratford Mining Complex (Stratford Extension Project) Heritage Management Plan*
- Stratford Coal Pty Ltd (2018e). *Stratford Mining Complex (Stratford Extension Project) Life of Mine Rejects Disposal Plan*
- Stratford Coal Pty Ltd (2018f) *Stratford Mining Complex Mining Operations Plan and Rehabilitation Management Plan*
- Stratford Coal Pty Ltd (2018g). *Stratford Mining Complex (Stratford Extension Project) Noise Management Plan*
- Stratford Coal Pty Ltd (2018h). *Stratford Mining Complex (Stratford Extension Project) Water Management Plan*
- Stratford Coal Pty Ltd (2018i). *Stratford Mining Complex (Stratford Extension Project) Squirrel Glider Management Plan*
- Stratford Coal Pty Ltd (2018j). *Stratford Mining Complex Annual Biodiversity Report 2018*
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- Stratford Coal Pty Ltd (2012) *Stratford Extension Project Environmental Impact Statement*