



***CENTENNIAL COAL
WESTERN COAL SERVICES
2020 ANNUAL REVIEW***

March 2021



Annual Review Title Block

Name of Operation	Western Coal Services (WCS)
Name of Operator	Springvale Coal Pty Ltd <i>For the purposes of this review, the acronym WCS is used to represent the operations at Western Coal Services as operated by Springvale Coal Services Operations (SCSO) on behalf of Springvale Coal Pty Ltd under relevant approvals. WCS where referenced in regulatory commentary and review information represents (SCSO) on behalf of joint venture partners Centennial Springvale Pty Ltd and Springvale Boulder Mining Pty Ltd.</i>
Development Consent	SSD-5579
Name of holder of development consent / project approval	Springvale Coal Pty Ltd
Mining Lease #	ML 204, ML 564, ML 1319, ML 1352, ML 1448, CCL 733, CL 394, CL 361, PLL 133
Name of Holder of Mining Lease	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
Water License #	-
Name of Holder of Water License	-
MOP/RMP Start Date	1 January 2020
MOP/RMP End Date	31 December 2024
Annual Review Start Date	1 January 2020
Annual Review End Date	31 December 2020
I, <i>Michael Clark</i> certify that this audit report is a true and accurate record of the compliance status of Western Coal Services for the period 2020 and that I am authorised to make this statement on behalf of Springvale Coal Pty Ltd. <i>Note:</i> a) The Annual Review is an 'environmental audit' for the purposes of s122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion) in an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000. b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both).	
Name of Authorised Reporting Officer	MICHAEL CLARK
Title of Authorised Reporting Officer	Director
Signature of Authorised Reporting Officer	<i>M Clark</i>
Date	16-08-21

¹ An **Authorised Reporting Officer** for the purposes of this Annual Review is a director of the subsidiary with the management responsibility of the operation for which this review has been generated.

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1. STATEMENT OF COMPLIANCE

Table 1-1 provides a statement of compliance with the relevant approval during the reporting period.

Table 1-1: Statement of Compliance

Approval		Were all conditions of the relevant approval(s) complied with?	
Development Consent SSD-5579		Yes	
Environmental Protection Licence 21229		Yes	
Mining Lease number			
CCL 733	CL 361	Yes	
ML 204	ML 1352	Yes	
ML 1319	ML 1448	Yes	
ML 564	PLL 133	Yes	
CL 394		Yes	
Radiation Licence		Yes	
Statement of Commitments		Yes	

Table 1-2 is used to provide a list of conditions that were not complied with during the reporting period. There were no non-compliances recorded at Western Coal Services in 2020 against any approval. Therefore, Table 1-2 has no content and the Table 1-3 key is not used in this 2020 Annual Review issue.

Table 1-2: Non-Compliances

Relevant Approval	Condition #	Condition summary	Compliance Status	Comment	Section addressed in report
-	-	-	-	-	-

Table 1-3: Compliance Status Key for Table 1-2

Risk Level	Colour Code	Description
High		Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium		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-compliance with: - Potential for moderate environmental consequences, but is unlikely to occur; or - Potential for low environmental consequences, but is likely to occur
Administrative		Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

2. INTRODUCTION

Western Coal Services (WCS) is located to the west of the Blue Mountains in the Lithgow Local Government Area in New South Wales approximately 125 kilometres (km) from Sydney, 15 km north of city of Lithgow, 5 km north-northwest from the township of Wallerawang, and 4 km northwest of the village of Lidsdale.

The operations include:

- The Springvale Coal Services Site (SCSS)
- Angus Place Colliery to Wallerawang Haul Road
- Angus Place Colliery to Mount Piper Power Station Haul Road
- Kerosene Vale Stockpile
- An Overland Conveyor System from Springvale Colliery to SCSS
- A coal handling processing plant (CHPP) and stockpiling area.

These areas and facilities, when combined, form an operational footprint known as the WCS Project Approval Area (PAA). WCS is approved to receive coal from the Springvale and Angus Place Collieries, and from other Centennial western region collieries via the Lidsdale Siding rail unloader. WCS sends washed and run of mine (ROM) coal via overland conveyor for rail to customers for domestic and export markets. WCS has existing development approvals in place enabling up to 9.5 million tonnes of coal to be received per annum and up to seven million tonnes for ROM coal to be processed per annum.

The WCS Plans (Appendix A) illustrate the following:

- The regional context of the project
- The project boundary
- Monitoring locations for:
 - o Noise
 - o Surface water, groundwater and discharge water
 - o Air quality and meteorological
 - o Aquatic ecology
 - o Rehabilitation
- Biodiversity offset areas
- Mining lease boundaries

This Annual Review relates solely to the reporting period 1 January 2020 to 31 December 2020.

Table 2-1 provides the names and contact details of the key personnel who are responsible for the environmental management of the operation.

Table 2-1: Environmental Management Contact Details

Name	Position	Email	Contact Details
Anthony Brown	Manager Springvale Coal Services	anthony.brown@centennialcoal.com.au	02 6355 9511
Neil Thompson	Environment and Community Coordinator	neil.thompson@centennialcoal.com.au	02 6355 9509
Community Contact Number	SCSO Control Room	N/A	02 6355 9500

3. APPROVALS

A summary of the environmental approvals held by WCS in 2020 is provided in Table 3-1.

Table 3-1: Western Coal Services Approvals

Approval/ Title/ Licence/ Permit	Description	Issued By	Expiry Date	Any changes during reporting period
Development Consent SSD-5579	Development Consent approval issued under the EP&A Act	DPIE	30/06/2039	No
Environment Protection Licence 21229	Environmental Protection Licence issued under the POEO Act	NSW EPA	N/A	Yes
Radiation Management Licence 5061304	Radiation Management Licence issued under the Radiation Control Act	NSW EPA	15/06/2021	Yes
CCL 733	Consolidated Coal Lease	DPIE	09/03/2025	No
ML 204	Mining Lease	DPIE	27/05/2033	No
ML 1319	Mining Lease	DPIE	05/07/2035	No
ML 564	Mining Lease	DPIE	02/05/2023	No
CL 394	Consolidated Coal Lease	DPIE	27/05/2034	No
CL 361	Consolidated Coal Lease	DPIE	16/07/2032	No
ML 1352	Mining Lease	DPIE	23/06/2036	No
ML 1448	Mining Lease	DPIE	31/05/2020	Yes
PLL 133	Private Land Lease	DPIE	10/08/2024	No

3.1 Changes Made to Approvals During the Reporting Period

During the reporting period, changes were made to approvals as detailed in Sections 3.1.1 to 3.1.3.

3.1.1 Environmental Protection Licence

EPL 21229

Environmental Protection Licence (EPL) 21229 for the WCS site was varied on 18 December 2020. The variation followed correspondence between the NSW Environmental Protection Authority (EPA) regarding conditions relating to the Pollution Study and Reduction Program (PRP).

Conditions U1.1 – U1.3 of the PRP relating to noise mitigations works were completed to the satisfaction of the EPA and were subsequently removed from EPL 21229. See Appendix D for more information regarding the Noise Reduction Study.

The EPA added a new condition U1.1 which requires Centennial to submit a Preferred Project Plan to the EPA by 31 January 2021 detailing Centennial's updated preferred option for managing water currently discharged through LDP001. Upon submission and review of the Preferred Project Plan the EPA will determine an appropriate LDP001 discharge limit and appropriate water quality discharge limits to be added to the licence. See Appendix H for more information regarding the Preferred Project Plan.

3.1.2 Mining Authorisations

Changes were made to Mining Authorisations during the reporting period as below.

ML 1448

Mining lease ML 1448 expired during the reporting on 30 May 2020. A renewal application has been submitted and is awaiting approval from NSW Department of Industry and Environment (DPIE).

3.1.3 Other Approvals

Radiation Management Licence 5061304 was renewed in the reporting period.

3.1.4 Environmental Management Plans

Consistent with the conditions of project SSD-5579, Centennial and Springvale Coal Services Operation (SCSO) have developed a number of site specific and western region documents for environmental management. These documents, including environmental management plans, strategies and programs identify potential environmental impacts and mitigation measures. A list of WCS environmental management plans and their status as of 31 December 2020 is presented in Table 3-2.

Table 3-2: Status of WCS Environmental Management Plans

Management Plan	2020 Actions	Date Provided to DPIE	Approval from DPIE
Western Region Noise Management Plan (WRNMP)	- WRNMP reviewed following the 2019 Annual Review submission. - No identified updates specific to WCS operations.	22/06/2018	Approval pending
Western Region Air Quality and Greenhouse Gas Management Plan (WRAQGGMP)	- WRAQGGMP reviewed following the 2019 Annual Review submission. - No identified updates specific to WCS operations.	22/06/2018	04/07/2018
Western Region Aboriginal Cultural Heritage Management Plan (WRACHMP)	- WRACHMP reviewed following the 2019 Annual Review submission. - No identified updates specific to WCS operations.	24/07/2017	27/10/2017
Western Region Biodiversity Offset Strategy (WRBOS)	WRBOS reviewed and updated following Carinya Lot 163 Conservation Agreement.	17/11/2020	Approval pending
Upper Coxs River Action and Management Plan (UCRAMP)	No specific changes related to WCS.	09/09/2017	Approval pending
SCSO Pollution Incident Response Management Plan (SCSO PIRMP)	SCSO PIRMP reviewed following the 2019 Annual Review submission, testing of the PIRMP, the release of EPAs revised 2020 <i>Guideline: Pollution Incident Response Management Plans</i>.	Not required	Not required
SCSO Environmental Management Strategy (SCSO EMS)	- SCSO EMS merged the Lidsdale Siding EMS and the WCS EMS. - SCSO EMS updated following feedback from DPIE.	02/03/2021	Approval pending
SCSO Waste Management System (SCSO WMS)	- SCSO WMS reviewed following the 2019 Annual Review submission. - No identified updates specific to WCS operations.	Not required	Not required
WCS Water Management Plan (WCSWMP)	- WCSWMP reviewed following the 2019 Annual Review submission. - WCSWMP updated with revised inputs to the site water and salt balance.	15/03/2019	Approval pending

Management Plan	2020 Actions	Date Provided to DPIE	Approval from DPIE
WCS Mining Operations Plan (WCSMOP)	WCSMOP reviewed and updated as "MOP Amendment A" to reflect current operations and rehabilitation.	07/04/2020	28/08/2020
WCS Construction Environmental Management Plan (WCSCEMP)	No actions for WCSCEMP as it is associated with the 2015 Stage 1 Reject Emplacement Area (REA) Upgrade for WCS (Completed).	12/08/2015	17/08/2015
Riparian Habitat and Catchment Improvement Plan (RHCIP)	No specific changes for the RCHIP	31/10/2017	Approval pending

3.2 Annual Review Requirements

The Annual Review has been developed to satisfy the reporting requirements of the approvals listed in Table 3-3.

Table 3-3: Annual Review Requirements

Approval	Condition No	Requirement	Where addressed in Annual Review
Development Consent SSD-5579	Schedule 5 Condition 4	By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Secretary. This review must:	
		(a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;	Section 7 Section 8
		(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the: i. relevant statutory requirements, limits or performance measures/criteria; ii. the monitoring results of previous years; iii. the relevant predictions in the EIS;	Section 6.3 Section 6.5 Section 6.6 Section 6.8 Section 6.14 Section 6.15 Appendix D Appendix E Appendix F Appendix H Appendix I Appendix N Appendix O Appendix S
		(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;	Appendix Q
		(d) identify any trends in the monitoring data over the life of the development;	Appendix D Appendix E Appendix F Appendix H Appendix I Appendix N Appendix O Appendix S
		(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Appendix D Appendix E
		(f) describe what measures will be implemented over the next year to improve the environmental performance of the development.	Section 8
Environmental Impact Statement	SOC No. 5.11 Surface water, groundwater,	To better understand the groundwater linkages, within 12 months of Project Approval, a baseline groundwater monitoring	Appendix S

Approval	Condition No	Requirement	Where addressed in Annual Review
– Statement of Commitments	geomorphology and aquatic	program will be established for the Springvale Coal Services Site. The baseline groundwater monitoring program will include: i. Quarterly monitoring of water levels from a network of monitoring bores following the completion of construction; ii. Six monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc; and iii. An annual review so that its capacity as an accurate predictive tool can be assessed and maintained.	
	SOC No. 10.1 Rehabilitation	Within six months of Project Approval a single Rehabilitation Plan will be prepared for the entire PAA in consultation with the Department and will include the timeframes provided within this EIS, details of the rehabilitation methods, monitoring and reporting framework. Results arising from the implementation of the program will be reported each year in the Annual Review (currently referred to as the AEMR).	Section 6.14 Appendix N
ML 1352 ML 204 ML 1319 CL 394	Condition 3 Mining Operations Plan and Annual Rehabilitation Report	(a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.	Section 6.14 Section 6.18 Appendix N Appendix R
		(b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which: i. identifies areas that will be disturbed; ii. details the staging of specific mining operations, mining purposes and prospecting; iii. identifies how the mine will be managed and rehabilitated to achieve the post mining land use; iv. identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and v. reflects the conditions of approval under: - the <i>Environmental Planning and Assessment Act 1979</i>; - the <i>Protection of the Environment Operations Act 1997</i>; and - any other approvals relevant to the development including the conditions of this mining lease.	

Approval	Condition No	Requirement	Where addressed in Annual Review
		(c) The MOP must be prepared in accordance with the <i>ESG3: Mining Operations Plan (MOP) Guidelines September 2013</i> published on the Department's website at www.resources.nsw.gov.au/environment	
		(d) The lease holder may apply to the Minister to amend an approved MOP at any time.	
		(e) It is not a breach of this condition if: i. the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the <i>Environmental Planning and Assessment Act 1979</i> , the <i>Protection of the Environment Operations Act 1997</i> , the <i>Mine Health and Safety Act 2004/Coal Mine Health and Safety Act 2002</i> and <i>Mine Health and Safety Regulation 2007/Coal Mine Health and Safety Regulation 2006</i> or the <i>Work Health and Safety Act 2011</i> ; and ii. the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.	
		(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: i. provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; ii. be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and iii. be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment	Section 6.14 Appendix N
ML 1448 ML 564	Condition 3 Annual Environmental Management Report	(1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General. (2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of: (a) the accepted Mining Operations Plan; (b) development consent requirements and conditions;	Section 6.18 Appendix R

Approval	Condition No	Requirement	Where addressed in Annual Review
		(c) Environment Protection Authority and Department of Land and Water Conservation licenses and approvals; (d) any other statutory environmental requirements; (e) details of any variations to environmental approvals applicable to the lease area; and (f) where relevant, progress towards final rehabilitation objectives. (3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure the operations on the lease area are conducted in accordance with sound mining and environmental practice. (4) The lease holder shall, as and when directed by the Minister, cooperate with the Director-General to conduct and facilitate review of the AEMR involving other government agencies.	
CCL 733 CL 361	Condition 4 Environment Management Reporting	The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.	Section 6.18 Appendix R
	Condition 5	The EMR must:	
		(a) report against compliance with the MOP;	
		(b) report on progress in respect of rehabilitation completion criteria;	
		(c) report on the extent of compliance with regulatory requirements; and	
		(d) have regard to any relevant guidelines adopted by the Director General;	
	Condition 6	Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.	

4. OPERATIONS SUMMARY

Table 4-1 provides a summary of the coal production and transport.

Table 4-1: Production Summary

Material	Approved Limit (SSD-5579) (tonnes)	Previous Reporting Period (2019) (Actual tonnes)	This Reporting Period (2020) (Actual tonnes)	Next Reporting Period (2021) (Forecast)
Waste Rock / Overburden	N/A	N/A	N/A	N/A
Total receipt of coal	9,500,000	2,248,377	3,963,823	2,912,450
Receipt of ROM coal from Springvale Mine	5,500,000	2,034,351	2,965,382	2,778,099
Receipt of ROM coal from Angus Place	4,000,000	0	0	0
Receipt of coal from sources other than Springvale Mine or Angus Place Colliery	1,500,000	0	998,441	134,351
Receipt of coal from Lidsdale Siding	1,500,000	205,564	998,441	134,351
Receipt of ROM coal from sources other than Springvale Mine or Angus Place Colliery	1,000,000	8,462	0	0
Processing of ROM coal	7,000,000	1,285,129	1,056,181	0
Coarse reject	N/A	280,937	203,243	0
Fine reject (Tailings)	N/A	280,937	203,243	0
Transport Lidsdale Siding	6,300,000	6,848	0	0
Transport other parties (Mt Piper)	N/A	1,936,399	3,551,884	2,706,287

Table 4-2 provides a summary of operations in compliance with SSD-5579 conditions.

Table 4-2: Operations Summary

Limits	Approved Limit (SSD-5579)	Previous Reporting Period (2019) (Actual)	This Reporting Period (2020) (Actual)	Comment (if applicable)
Hours of operation	24 hours per day, 7 days per week until 30/06/2039	24 hours per day, 7 days per week	24 hours per day, 7 days per week	Compliant
Transport (Wallerawang Haul Road) (SSD-5579 MOD 2 effective 15 Dec 2017)	Truck movements restricted to the day period only prior to longwall extraction at the Angus Place Colliery. Max. 3 truck operating during the evening period following commencement of longwall extraction at Angus Place Colliery. No truck movements to occur during the night period.	No haulage undertaken	No haulage undertaken	Compliant

Limits	Approved Limit (SSD-5579)	Previous Reporting Period (2019) (Actual)	This Reporting Period (2020) (Actual)	Comment (if applicable)
Transport (Mt Piper Haul Road) (SSD-5579 MOD 2 effective 15 Dec 2017)	Truck movements restricted to the day period only prior to longwall extraction at the Angus Place colliery. Max. 8 trucks operating during the evening period following the commencement of longwall extraction at Angus Place Colliery. Max. 2 trucks operating during the night period. No truck movements to occur in the night period during adverse meteorological conditions.	No haulage undertaken	No haulage undertaken	Compliant
Kerosene Vale Coal Stockpile Operations (SSD-5579 MOD 2 effective 15 Dec 2017)	During the day period only.	Stockpile management activities limited to haulage only all undertaken in day period	Stockpile management activities limited to haulage only all undertaken in day period	Compliant
Residual waste (SSD-5579 Mod 1 effective 19 Jun 2017)	Not receive or emplace more than 0.35 ML/day (annual average) or 0.43 ML/day (daily max.) of residual waste from the Springvale Water Treatment Plant	Nil activity	Annual daily average = 0.23 ML/day Daily maximum = 0.43 ML	Compliant

4.1 Exploration

Nil activity undertaken in the reporting period.

5. CHANGE MANAGEMENT

Table 5-1: Change Management

Activity with potential to impact the environment	Change Management Processes	Action Required
Exploration	Nil	Nil
Expansion/modification/intensification	Nil	Nil
Mine design/method	Nil	Nil
Introduction of new equipment	Nil	Nil
Construction	Nil	Nil
Insert any other activity with potential to impact the environment	Nil	Nil

There is no material change planned for the WCS operation for the next reporting period. Modifications to Development Consent SSD-5579 will be submitted to the DPIE in accordance with approved regulatory modification pathways required.

6. PROJECT PERFORMANCE

Table 6-1: Summary of Monitoring Requirements

Monitoring Type	Overview of Monitoring Requirements	Requirement of Approval/Management Plan	Annual Review Section
Air Quality and Greenhouse Gas	3 x dust gauges (DGs) – Monthly 1 x Real Time Tapered Element Oscillating Microbalance (TEOM) – Continuous	WRAQGGMP SSD-5579 EPL 21229	Section 6.5 and Appendix E
Biodiversity	Six-monthly inspections	WRBOS SSD-5579	Section 6.8 Appendix I
Heritage	As required	WRHHMP WRACHMP SSD-5579	Section 6.9 Appendix J
Meteorological Monitoring	1 x weather station - Continuous	SSD-5579 EPL 21229	Section 6.6 Appendix F
Noise	Monthly – Attended Continuous – Noise Compass	WRNMP SSD-5579 EPL 21229	Section 6.3 and Appendix D
Rehabilitation	Annual	SSD-5579 WCS MOP	Section 6.14 and Appendix N
Waste	Waste Stream Mass	SCSO Waste Management Plan SSD-5579 EPL 21229	Section 6.13 Appendix M
Water	Surface Water Volume and Quality – Monthly during discharge Groundwater monitoring – Monthly	WCS WMP SSD-5579 EPL 21229	Section 6.7 and Appendix G Appendix S

6.1 Acquisition on Request

During the reporting period, Acquisition on Request at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 1.

No acquisition of property was undertaken during the reporting period.

No information is presented in Appendix B.

6.2 Additional Mitigation Upon Request

During the reporting period, Additional Mitigation Upon Request at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 2.

No requests for additional mitigation were received during the reporting period.

No information is presented in Appendix C.

6.3 Noise

During the reporting period, noise at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Conditions 3-9.
- Compliant with EPL 21229, Condition L4 and M7.
- Managed in accordance with the WRNMP.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant noise information is presented in Appendix D.

6.4 Blasting

During the reporting period, blasting at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 10 and 11.

Conditions 10 and 11 of SSD-5579 relate to blasting during the construction of the Link Haul Road. No blasting was undertaken during the reporting period.

6.5 Air Quality

During the reporting period, air quality at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 12-17.
- Compliant with EPL 21229, Condition P1.1, O3 and M2.2.
- Managed in accordance with the WRAQGGMP.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant air quality information is presented in Appendix E.

6.6 Meteorological Monitoring

During the reporting period, meteorological monitoring at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 18.
- Managed in accordance with the WRAQGGMP.
- Managed in compliance with the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.

No actions undertaken during the reporting period as outlined in Section 7.

Relevant meteorological measurements are presented in Appendix F.

6.7 Soil and Water

During the reporting period, soil and water at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Conditions 19-24.
- Compliant with EPL 21229 Conditions P1.3, L2 and M2.3
- Managed in accordance with the WCSWMP.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant surface water information is presented in Appendix G. Relevant groundwater information is presented in Appendix S.

6.8 Biodiversity

During the reporting period, biodiversity at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 25-30.
- Managed in accordance with the WRBOS.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant biodiversity information is presented in Appendix I.

6.9 Heritage

During the reporting period, heritage at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 31 and 32.
- Managed in accordance with the WRACHMP and the WRHHMP.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant heritage information is presented in Appendix J.

6.10 Transport

During the reporting period, transport at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 33-39.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant transport information is presented in Section 4 and Appendix G.

6.11 Visual

During the reporting period, visual impacts at WCS were:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 40.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant visual information is presented in Appendix K.

6.12 Bushfire Management

During the reporting period, bushfire management at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 41.
- Managed in accordance with the SCSO Bushfire Management System.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant bushfire management information is presented in Appendix L.

6.13 Waste

During the reporting period, waste at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 42.
- Compliant with EPL 21229, Condition L3 and O4.
- Managed in accordance with the SCSO Waste Management System.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant waste information is presented in Appendix M.

6.14 Rehabilitation

During the reporting period, rehabilitation at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 3, Condition 43-46.
- Managed in accordance with the WCS Mining Operation Plan (WCS MOP).

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant rehabilitation information is presented in Appendix N.

6.15 Community

During the reporting period, community and social impacts at WCS were:

- Compliant with Development Consent SSD-5579, Schedule 5, Condition 6.
- Compliant with EPL 21229, Condition M4 and M5.
- Managed in accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects.
- Managed in accordance with SCSO EMS.

No actions were undertaken during the reporting period as outlined in Section 7.

Relevant community information is presented in Appendix O.

6.16 Independent Audit

During the reporting period, the requirement to undertake an Independent Environmental Audit (IEA) at WCS was:

- Compliant with Development Consent SSD-5579, Schedule 5, Condition 9-10.

Refer to Appendix P for recommendations of the 2018 IEA and current status.

6.17 Incidents and Non-Compliances

Refer to Appendix Q for a summary of incidents and non-compliances during the reporting period.

6.18 AEMR Reporting

During the reporting period, the mining authorisation conditions were:

- Complaint for mining authorisations ML 204, ML 564, PLL 133, CCL 733, CL 361, CL 394, ML 1319, ML 1448 and ML 1352.

The 2020 AEMR report is provided in Appendix R.

7. ACTIONS UNDERTAKEN DURING REPORTING PERIOD

Table 7-1 below is used to provide a summary of actions from the 2019 Annual Review, the action taken, and where it is addressed in this Annual Review. The 2019 Annual Review was submitted to DPIE on 19 March 2020, no formal response was received from DPIE regarding the 2019 Annual Review submission, therefore Table 7-1 contains no actions.

Table 7-1: Actions Undertaken During Reporting Period

Condition	Requested By	Action Required from 2019 Annual Review	Action Undertaken During Reporting Period
Noise	-	Nil	Nil
Blasting	-	Nil	Nil
Air Quality	-	Nil	Nil
Meteorological Monitoring	-	Nil	Nil
Soil and Water	-	Nil	Nil
Biodiversity	-	Nil	Nil
Heritage	-	Nil	Nil
Transport	-	Nil	Nil
Visual	-	Nil	Nil
Bushfire Management	-	Nil	Nil
Waste	-	Nil	Nil
Rehabilitation	-	Nil	Nil
Community	-	Nil	Nil
Independent Audit	-	Nil	Nil
Miscellaneous	-	Nil	Nil

8. PROPOSED ACTIONS FOR NEXT REPORTING PERIOD

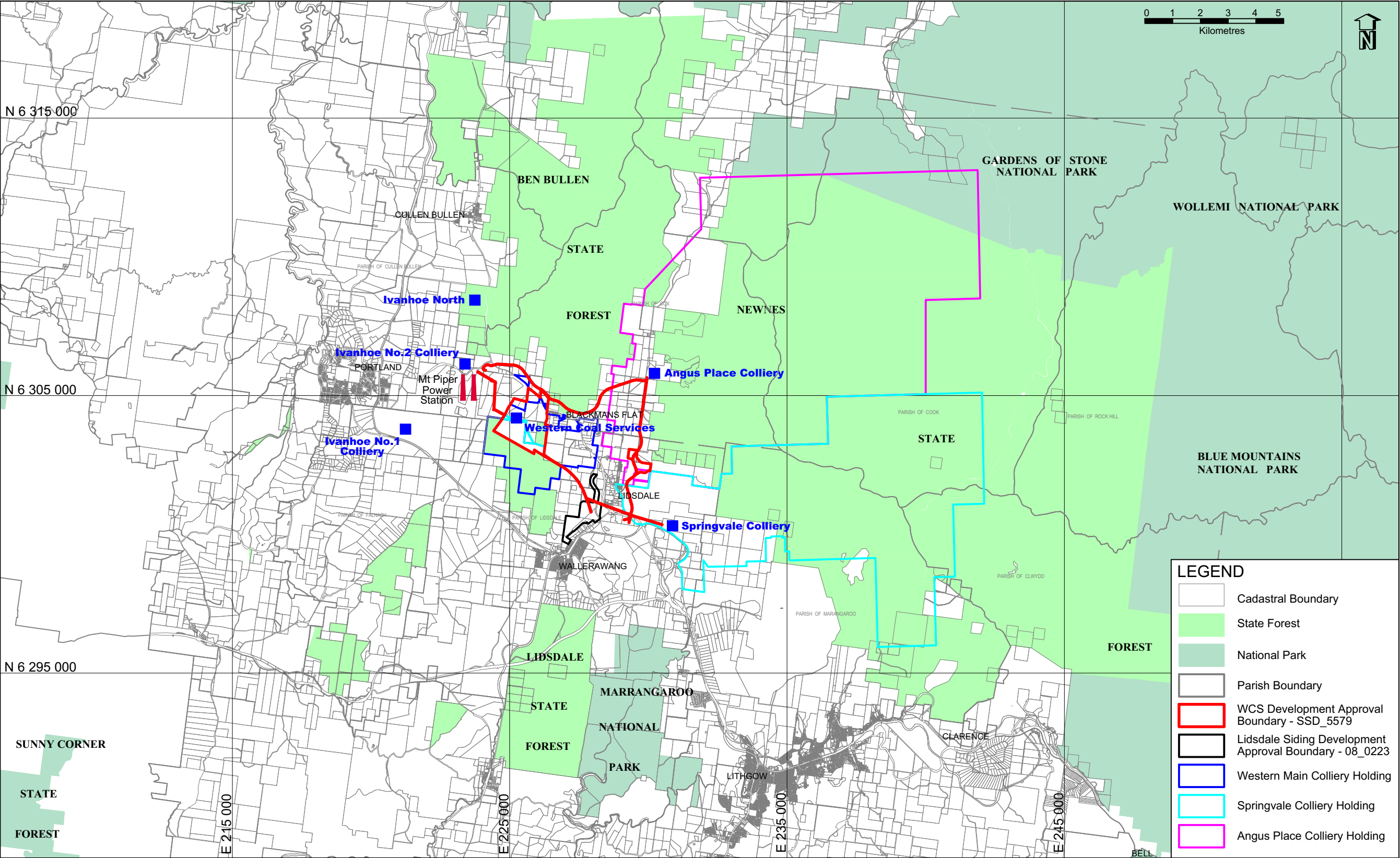
Table 8-1: Proposed Actions for Next Reporting Period

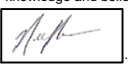
Condition	Proposed Action
Noise	• Conduct operations in accordance with the WRNMP. • Conduct operations and activities in compliance with SSD-5579, Schedule 3, Condition 3-9. • Conduct operations and activities in compliance with EPL 21229, Condition L4.
Blasting	• Conduct operations in accordance with SSD-5579, Schedule 3, Condition 10 and 11. • No blasting is proposed in 2021.
Air Quality	• Conduct operations and activities in accordance with WRAQGGMP. • Conduct operations in compliance with SSD-5579, Schedule 3, Condition 12-17. • Conduct operations undertaken in compliance with EPL 21229, Condition M2.2.
Meteorological Monitoring	• Conduct operations and activities in accordance with WRAQGGMP. • Conduct meteorological monitoring in compliance with SSD-5579, Schedule 3, Condition 18.
Soil and Water	• Conduct operations and activities in accordance with the WCS WMP. • Undertake operations in compliance with SSD-5579, Schedule 3, Condition 19-24. • Undertake operations in compliance with EPL 21229, Condition L2.4, M2.3, M6.1, and U2.
Biodiversity	• Conduct operational activities in accordance with the WRBOS. • Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 25-30.
Heritage	• Conduct operations in accordance with the WRACHMP and WRHHMP. • Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 31-32.
Transport	• Conduct operations in compliance with SSD-5579, Schedule 3, Condition 33-39.
Visual	• Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 40.
Bushfire Management	• Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 41.
Waste	• Conduct operations in accordance with the SCSO Waste Management Plan. • Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 42. • Conduct operational activities in compliance with EPL 21229, Condition L3.
Rehabilitation	• Conduct operational activities in accordance with the WCS MOP. • Conduct operational activities in compliance with SSD-5579, Schedule 3, Condition 43-46.
Community	• Conduct operations in accordance the SCSO EMS. • Conduct activities in accordance with the <i>Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects</i>. • Conduct operational activities in compliance with SSD-5579, Schedule 5, Condition 6.

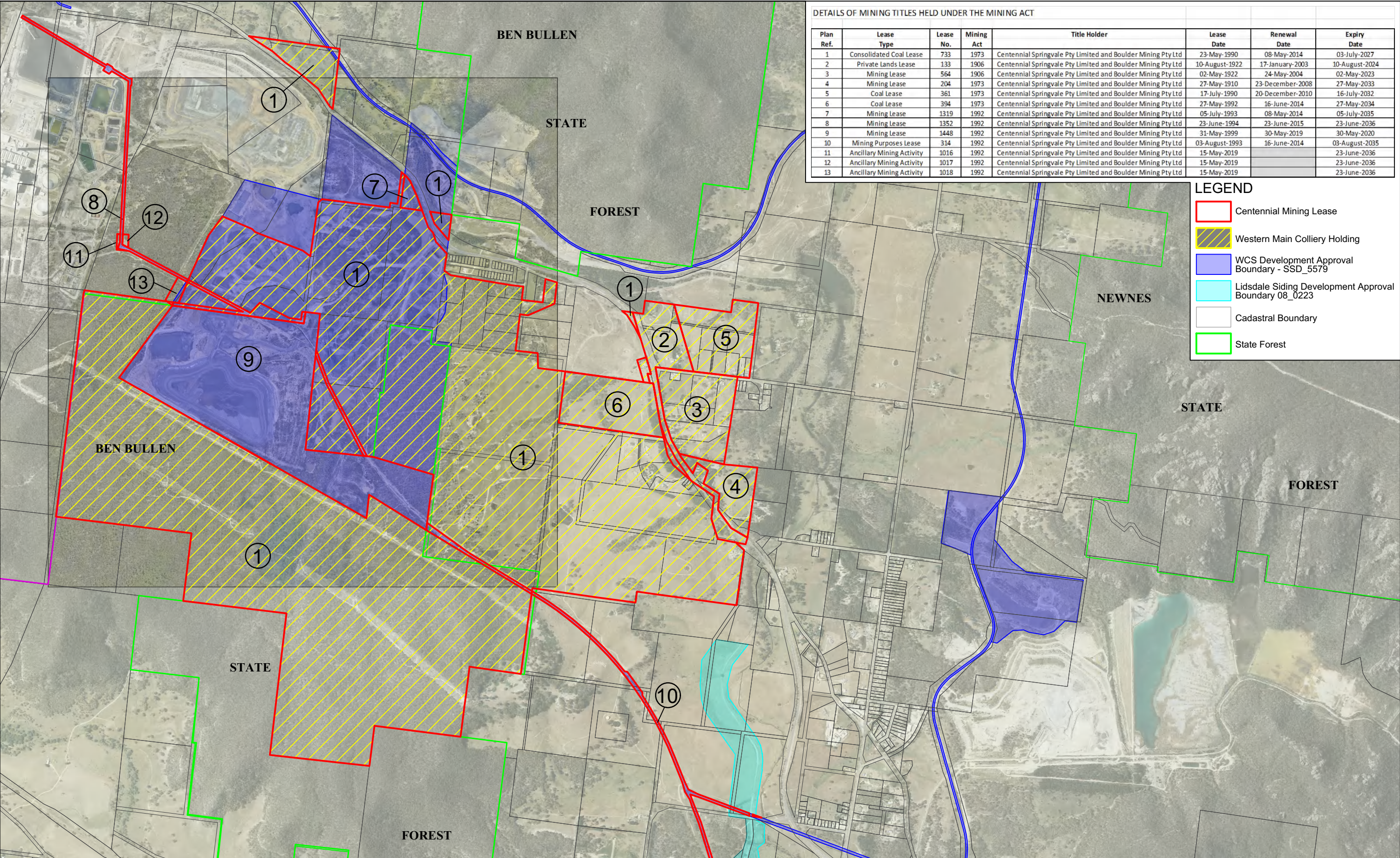
Condition	Proposed Action
	• Conduct operational activities in compliance with EPL 21229, Condition M5. • Maintain the community information line for WCS to receive calls from the local community.
Independent Audit	• Progression and completion of actions identified from 2018 audit as pertinent to disciplines identified above. • Complete three-yearly Independent Environmental Audit in accordance with SSD-5579 Schedule 5, Condition 9.
Management Plans	• Undertake a review and revise all relevant management plans as required following this Annual Review, and as identified in the 2018 IEA recommendations. • Submit all management plans as revised to DPIE for approval.
Miscellaneous	Activities proposed for 2021 are also proposed to include all management and monitoring works as identified in existing: • Voluntary undertakings; • Management plans submitted that are yet to be approved (on approval); • Management plans that are amended in the period (on approval); • Yet to be identified and documented actions and initiatives (where approval is in place), and; • EIS commitments identified for completion within the period.

Appendices

Appendix A – WCS Plans



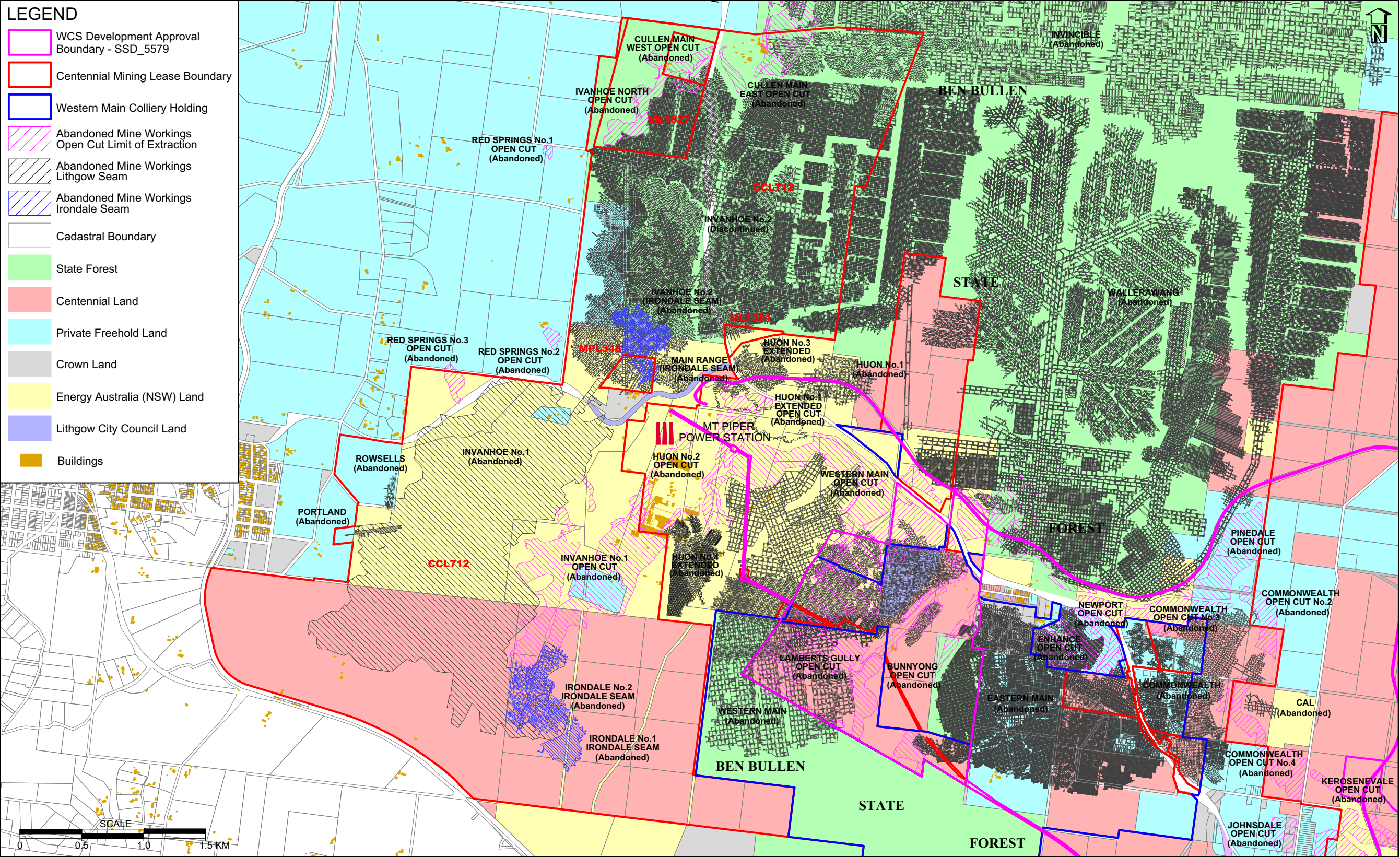
Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed:  Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations	THIS DRAWING IS COPYRIGHT. NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WESTERN COAL SERVICES ANNUAL REVIEW 2020 Plan 1A - Project Locality	MINE	WCS	 PLAN No. PC7547	
Operator: Springvale Coal Pty Limited					SEAM	N/A		
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018				DRAWN	P.J.M.		
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024				SCALE	Refer to Scale Bar		
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020 Annual Review End Date: 31-December-2020				DATE	17-February-2021		
					SHEET	A2H		



Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed: _____ Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations	THIS DRAWING IS COPYRIGHT. NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WESTERN COAL SERVICES ANNUAL REVIEW 2020 Plan 1B - Mining Leases	MINE	WCS	CENTENNIAL SPRINGVALE	
Operator: Springvale Coal Pty Limited					SEAM	N/A		
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018				DRAWN	P.J.M.		
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024				SCALE	Refer to Scale Bar		
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020				DATE	17-February-2021		
	Annual Review End Date: 31-December-2020				SHEET	A2H	PLAN No.	PC7548

LEGEND

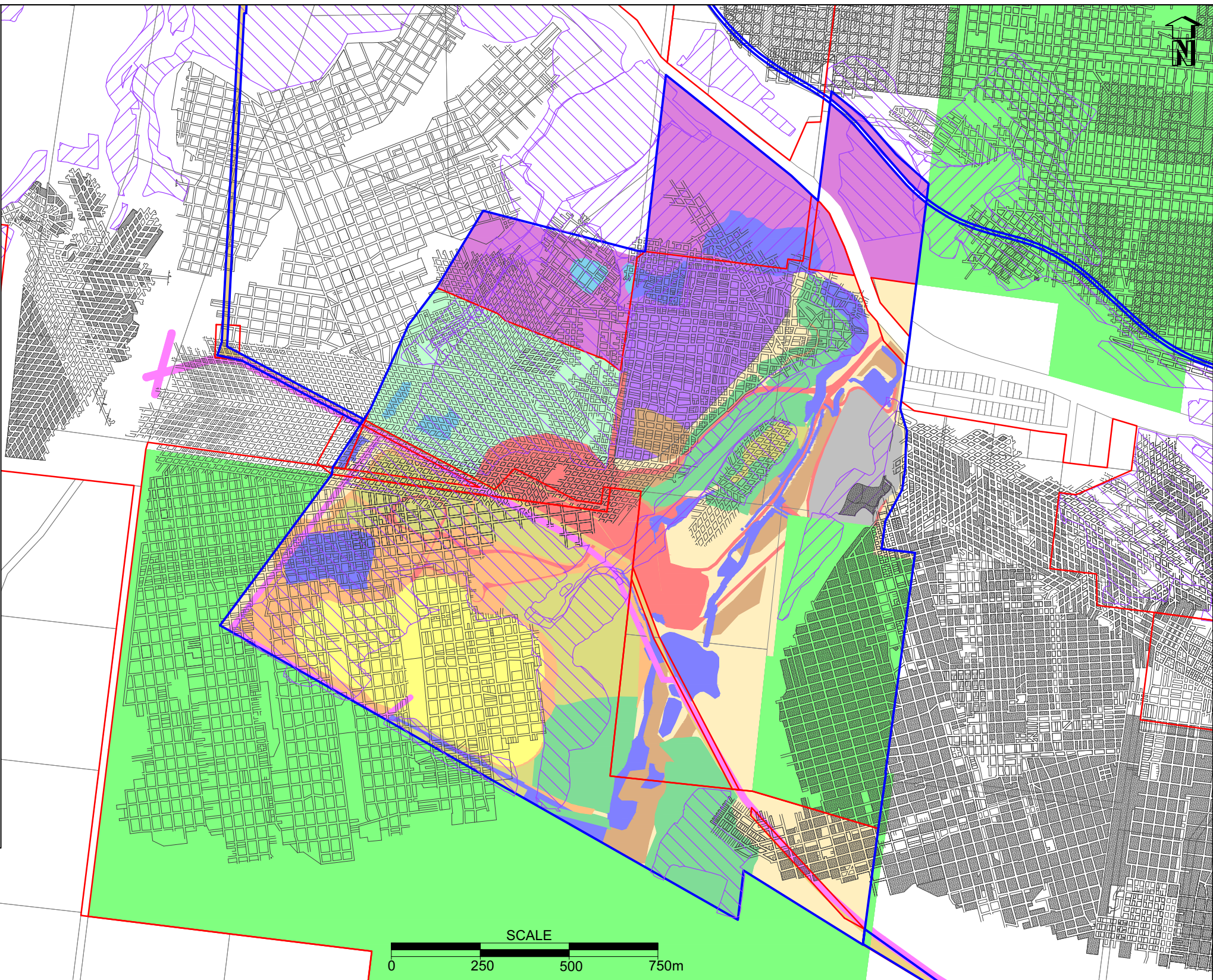
- WCS Development Approval Boundary - SSD_5579
- Centennial Mining Lease Boundary
- Western Main Colliery Holding
- Abandoned Mine Workings Open Cut Limit of Extraction
- Abandoned Mine Workings Lithgow Seam
- Abandoned Mine Workings Irondale Seam
- Cadastral Boundary
- State Forest
- Centennial Land
- Private Freehold Land
- Crown Land
- Energy Australia (NSW) Land
- Lithgow City Council Land
- Buildings



Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed: _____ Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations THIS DRAWING IS COPYRIGHT. NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WSETERN COAL SERVICES ANNUAL REVIEW 2020		MINE	WCS	CENTENNIAL SPRINGVALE PLAN No. PC7549	
Operator: Springvale Coal Pty Limited			SEAM	N/A				
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018		DRAWN	P.J.M.				
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024		SCALE	Refer to Scale Bar				
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020		DATE	17-February-2021				
	Annual Review End Date: 31-December-2020		SHEET	A2H				
Plan 1C - Built Environment								

LEGEND

- Centennial Mining Lease Boundary
- Western Coal Services Approval Boundary - SSD_5579
- Abandoned Mine Workings Open Cut Limit of Extraction
- Abandoned Mine Workings Lithgow Seam
- Abandoned Mine Workings Irondale Seam
- Ben Bullen State Forest
- Cadastral Boundary
- Primary Domain 1 - Washery, Coal Handling & Roads
- Primary Domain 2 - REA
- Primary Domain 3 - Co-Disposal REA
- Primary Domain 4 - Water Management
- Primary Domain 5 - Current Rehabilitation
- Primary Domain 6 - Overburden Emplacement
- Primary Domain 7 - Conservation Sites
- Primary Domain 8 - Sealed Haul Roads & Conveyors
- Primary Domain 9 - EA Land
- Primary Domain 10 - EA Land & Area 4D
- Primary Domain 11 - EA Ash Water Management Area
- Primary Domain 12 - Lithgow City Council Land
- Primary Domain 13 - Capping Material Stockpile
- Primary Domain 14 - SWTS Infrastructure
- Primary Domain 15 - Other Lands



Operation: Western Coal Services
Operator: Springvale Coal Pty Limited
Project Approval: SSD_5579
Proponent: Springvale Coal Pty Limited
Mining Leases: ML204, ML564, CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314

Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
MOP/RMP Start Date: 26-February-2018
MOP/RMP End Date: 31-December-2024
Annual Review Start Date: 1-January-2020
Annual Review End Date: 31-December-2020

CERTIFICATION
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Springvale Coal Services Operations

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WESTERN COAL SERVICES
ANNUAL REVIEW 2020
MINE DOMAINS

Plan 2A - Primary Domains

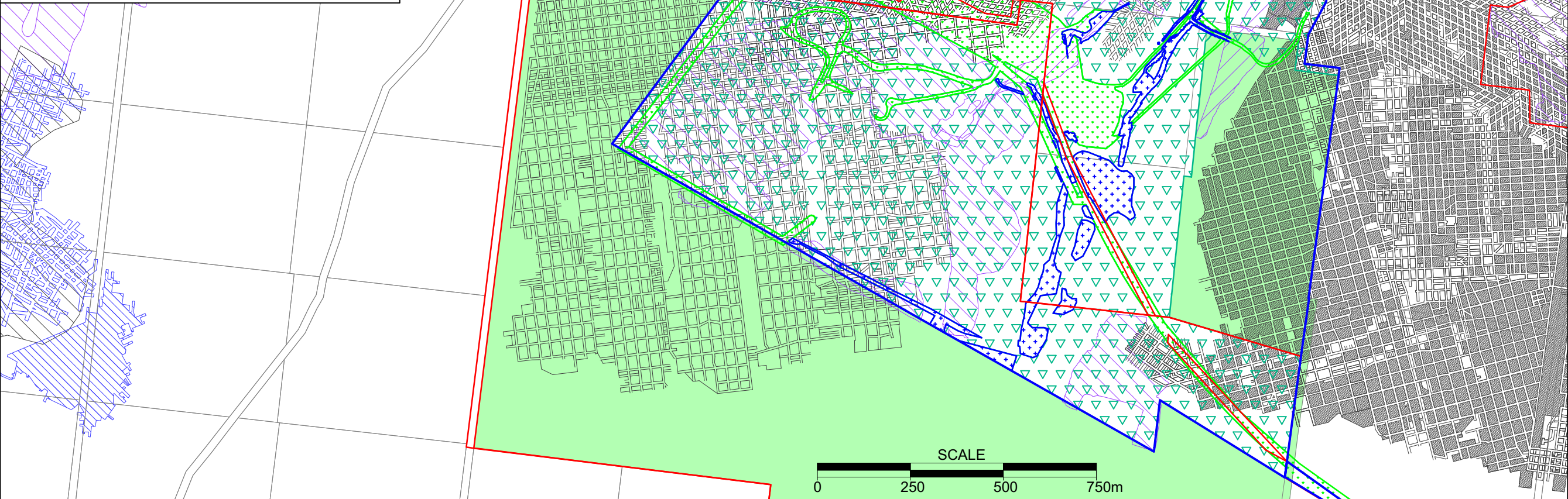
MINE	WCS
SEAM	N/A
DRAWN	P.J.M.
SCALE	Refer to Scale Bar
DATE	17-February-2021
SHEET	A2H

**CENTENNIAL
SPRINGVALE**

PLAN No. PC7552

LEGEND

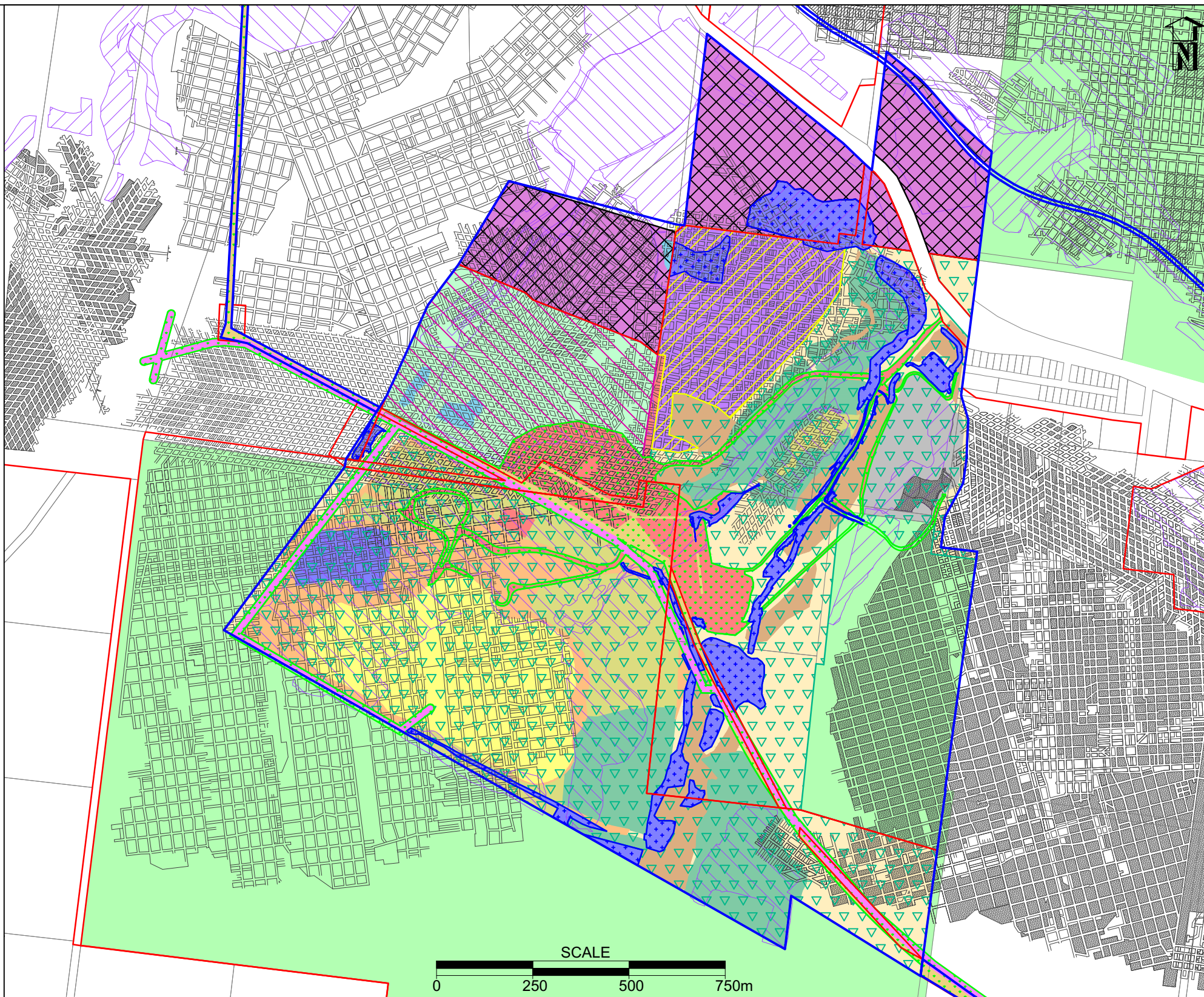
- Centennial Mining Lease Boundary
- Western Coal Services Approval Boundary - SSD_5579
- Abandoned Mine Workings Open Cut Limit of Extraction
- Abandoned Mine Workings Lithgow Seam
- Abandoned Mine Workings Irondale Seam
- Ben Bullen State Forest
- Cadastral Boundary
- Secondary Domain A - Rehabilitation Woodland
- Secondary Domain B - Rehabilitation Grassland
- Secondary Domain C - Water Management
- Secondary Domain D - Energy Australia Ash Emplacement
- Secondary Domain E - Lithgow City Council Waste Emplacement
- Secondary Domain F - Energy Australia Land Area 4D



Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed: _____ Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations THIS DRAWING IS COPYRIGHT. NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WESTERN COAL SERVICES ANNUAL REVIEW 2020 MINE DOMAINS		MINE	WCS	 CENTENNIAL SPRINGVALE
Operator: Springvale Coal Pty Limited			Plan 2B - Secondary Domains		SEAM	N/A	
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018				DRAWN	P.J.M.	
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024				SCALE	Refer to Scale Bar	
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020 Annual Review End Date: 31-December-2020				DATE	17-February-2021	
					SHEET	A2H	PLAN No.

LEGEND

- Centennial Mining Lease Boundary
- Western Coal Services Approval Boundary - SSD_5579
- Abandoned Mine Workings Open Cut Limit of Extraction
- Abandoned Mine Workings Lithgow Seam
- Abandoned Mine Workings Irondale Seam
- Ben Bullen State Forest
- Cadastral Boundary
- Primary Domain 1 - Washery, Coal Handling & Roads
- Primary Domain 2 - REA
- Primary Domain 3 - Co-Disposal REA
- Primary Domain 4 - Water Management
- Primary Domain 5 - Current Rehabilitation
- Primary Domain 6 - Overburden Emplacement
- Primary Domain 7 - Conservation Sites
- Primary Domain 8 - Sealed Haul Roads & Conveyors
- Primary Domain 9 - EA Land
- Primary Domain 10 - EA Land & Area 4D
- Primary Domain 11 - EA Ash Water Management Area
- Primary Domain 12 - Lithgow City Council Land
- Primary Domain 13 - Capping Material Stockpile
- Primary Domain 14 - SWTS Infrastructure
- Primary Domain 15 - Other Lands
- Secondary Domain A - Rehabilitation Woodland
- Secondary Domain B - Rehabilitation Grassland
- Secondary Domain C - Water Management
- Secondary Domain D - Energy Australia Ash Emplacement
- Secondary Domain E - Lithgow City Council Waste Emplacement
- Secondary Domain F - Energy Australia Land Area 4D



Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
Operator: Springvale Coal Pty Limited	
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020
	Annual Review End Date: 31-December-2020

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Date: 17-February-2021

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Springvale Coal Services Operations

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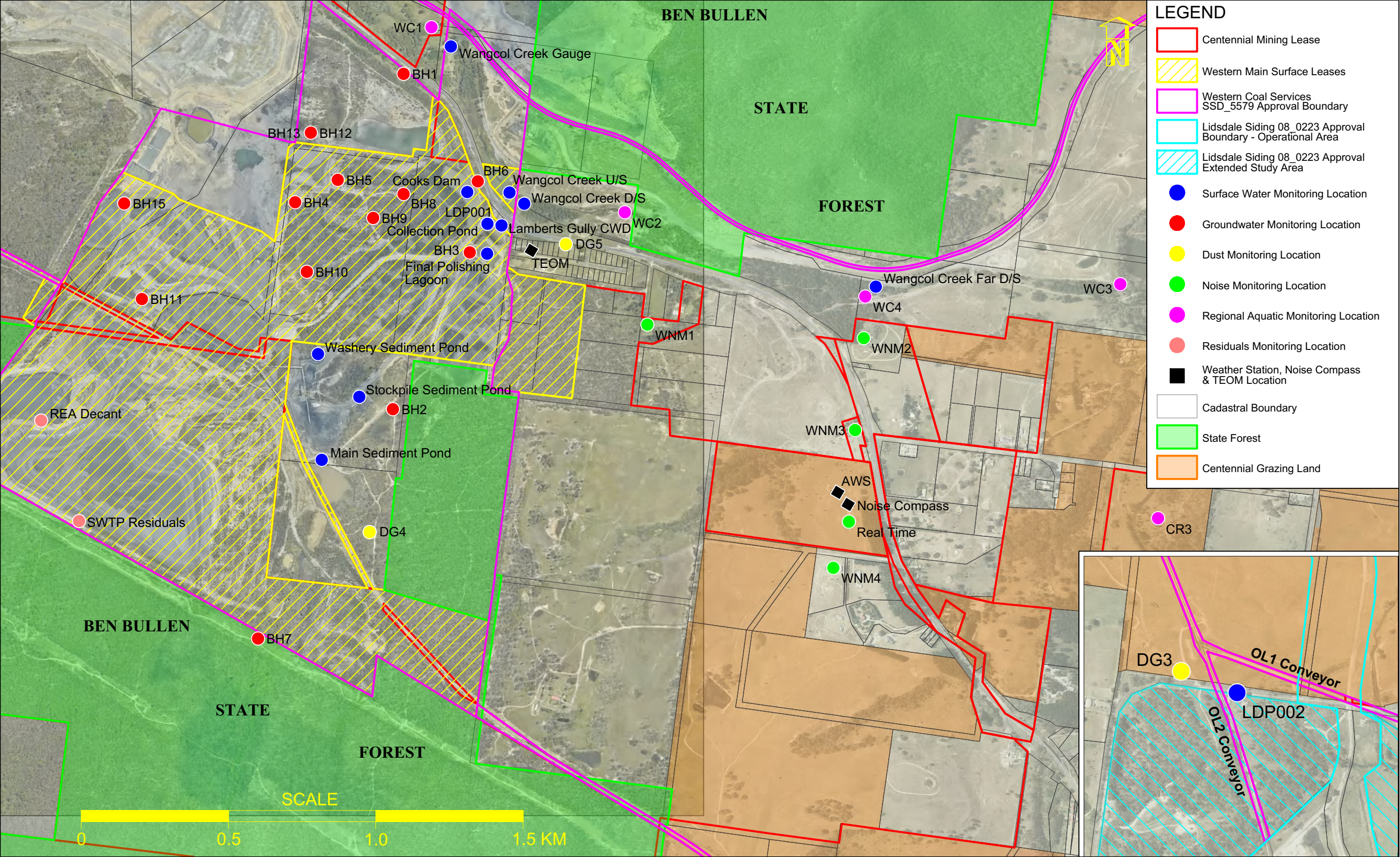
WESTERN COAL SERVICES
ANNUAL REVIEW 2020
MINE DOMAINS

Plan 2C - Primary & Secondary Domains

MINE	WCS
SEAM	N/A
DRAWN	P.J.M.
SCALE	Refer to Scale Bar
DATE	17-February-2021
SHEET	A2H

CENTENNIAL
SPRINGVALE

PLAN No. PC7567



LEGEND

Centennial Mining Lease

Western Main Surface Leases

Western Coal Services
SSD_5579 Approval Boundary

Lidsdale Siding 08_0223 Approval
Boundary - Operational Area

Lidsdale Siding 08_0223 Approval
Extended Study Area

Surface Water Monitoring Location

Groundwater Monitoring Location

Dust Monitoring Location

Noise Monitoring Location

Regional Aquatic Monitoring Location

Residuals Monitoring Location

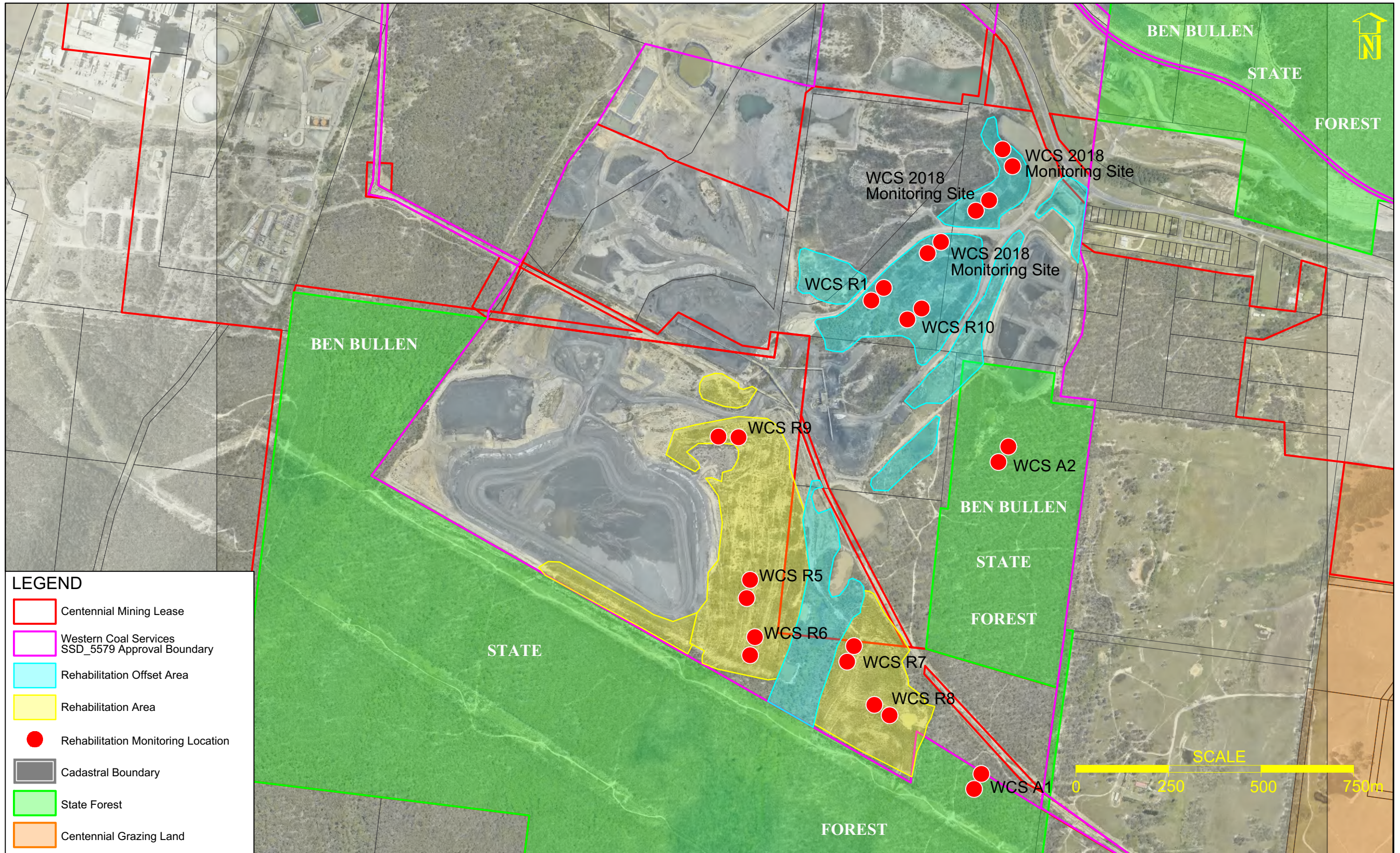
Weather Station, Noise Compass
& TEOM Location

Cadastral Boundary

State Forest

Centennial Grazing Land

Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed: _____ Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations	THIS DRAWING IS COPYRIGHT.	NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WESTERN COAL SERVICES		MINE	WCS	 CENTENNIAL SPRINGVALE
Operator: Springvale Coal Pty Limited					SEAM	N/A			
Project Approval: SSD_5579	MOP/RMP Start Date: 26-February-2018				DRAWN	P.J.M.			
Proponent: Springvale Coal Pty Limited	MOP/RMP End Date: 31-December-2024				SCALE	Refer to Scale Bar			
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020				DATE	17-February-2021	SHEET	A2H	
	Annual Review End Date: 31-December-2020	Plan 3A - Environmental Monitoring							



LEGEND

- Centennial Mining Lease
- Western Coal Services SSD_5579 Approval Boundary
- Rehabilitation Offset Area
- Rehabilitation Area
- Rehabilitation Monitoring Location
- Cadastral Boundary
- State Forest
- Centennial Grazing Land

Operation: Western Coal Services	Leaseholders: Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	CERTIFICATION I hereby certify that the information shown hereon, to the best of my knowledge and belief, is correctly represented. Signed: _____ Date: 17-February-2021 Neil Thompson Environment & Community Coordinator Springvale Coal Services Operations	THIS DRAWING IS COPYRIGHT.	NO PART OF IT MAY IN ANY FORM OR BY ANY MEANS (ELECTRONIC, MECHANICAL, MICRO-COPYING, PHOTOCOPYING, RECORDING OR OTHERWISE) BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED WITHOUT PRIOR WRITTEN PERMISSION.	WESTERN COAL SERVICES		MINE	WCS	CENTENNIAL SPRINGVALE
Operator: Springvale Coal Pty Limited					ANNUAL REVIEW 2020		SEAM	N/A	
Project Approval: SSD_5579					MINING & REHABILITATION		DRAWN	P.J.M.	
Proponent: Springvale Coal Pty Limited					MOP/RMP Start Date: 26-February-2018		SCALE	Refer to Scale Bar	
	MOP/RMP End Date: 31-December-2024		DATE	17-February-2021					
Mining Leases: ML204,ML564,CL361, PLL133, CL394, CCL733, ML1319, ML1352, ML1448, Part MPL314	Annual Review Start Date: 1-January-2020		SHEET	A2H	PLAN No.	PC7565			
	Annual Review End Date: 31-December-2020								
Plan 3B - Rehabilitation Monitoring									

Appendix B – Acquisition on Request Information

No requests for acquisition were received in the reporting period.

Appendix C – Additional Mitigation Upon Request

No requests for additional mitigation were received in the reporting period.

Appendix D – Noise Information

Performance against Environmental Assessment

The WCS Project Environmental Impact Statement (EIS) stated the Project would meet the noise criteria of other Centennial Coal project approvals at the following locations:

- Wallerawang (Lidsdale Siding Upgrade Project PA 08_0223).
- Lidsdale and Wolgan Road (Angus Place PA 06_0021).
- Springvale (Industrial Noise Policy).

WCS adopted the long-term noise monitoring program in September 2018 after previously adhering to the short-term monitoring program as per the WRNMP.

WCS attended noise monitoring sites are shown in Appendix A. The long-term program does not include the following locations due to the receptor's proximity to the overland conveyor system or disused haul roads: WNM5, WNM6, WNM7 and WNM8.

Noise predictions showed that residual noise impacts above the INP project specific noise criteria would be likely at some Blackmans Flat receptors surrounding the Project site.

There were no exceedances of the noise criteria within the approval and the WCS Project EIS assessment.

Attended Noise Monitoring

Attended noise monitoring is carried out monthly at four sensitive receivers surrounding the WCS site. Table D- 1 below provides the noise limits from SSD-5579, EPL 21229 and a comparison to Predicted Operational Noise Levels within the EIS Assessment. Noise levels (LAeq (15min)) were measured above noise limits at location WNM1 in May 2020. These are not considered non-compliances as, at the time of monitoring, temperature inversion conditions were greater than 3°C/100 m. SSD-5579 Appendix 5, Condition 1 (c) states “*The noise criteria in Table 3 in Schedule 3 are to apply under all meteorological conditions except the following: temperature inversion conditions greater than 3°C/100 m.*”.

Table D- 1: Comparison of existing noise limits against modelled pre-project approval levels and 2020 exceedances

Location	Monitoring Site	Existing Day LAeq (15min)	Existing Evening LAeq (15min)	Existing Night LAeq (15min)	Existing Night LA1 (1min)	Predicted Operational Noise Levels	Monitored range (2020) LAeq (15min)	Monitored range (2020) LA1 (1min)
B12	WNM1	40	35	35	47	32 - 40	ND - 33	ND - 38
B14	WNM2	41	35	35	55	35 - 41	ND - 33	ND - 34
B15	WNM3	36	35	35	45	<30 - 37	ND - 33	ND - 35
B16	WNM4	35	35	36	45	<30 - 36	ND - 43 ²	ND - 47 ²

ND – Not Discernible. When site only noise is noted as ND, there was no noise from the source of interest audible at the monitoring location

² SSD-5579 Appendix 5, Condition 1 (c) states “*The noise criteria in Table 3 in Schedule 3 are to apply under all meteorological conditions except the following: temperature inversion conditions greater than 3°C/100 m.*”. Therefore, this elevated noise level is not a non-compliance with the SSD-5579 and EPL 21229 noise level criteria.

Table D- 2 shows the number of noise non-compliances at attended monitoring locations since 2014. There have been no non-compliant measurements since 2018. The WCS attended noise monitoring moved to the long-term monitoring program in 2019 as per the WRNMP which requires only NM1, NM2, NM3, and NM4 to be monitored.

Table D- 2: 2014-2020 WCS attended noise monitoring exceedances

Location	2014			2015			2016			2017			2018			2019			2020		
	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N	D	E	N
NM1	0	5	5	0	1	0	0	2	2	0	2	2	0	0	0	0	0	0	0	0	0
NM2	0	3	3	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0
NM3	0	3	4	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0
NM4	0	2	2	1	1	2	0	2	1	0	1	2	0	0	0	0	0	0	0	0	0
NM5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0						
NM6	1	3	4	4	8	8	2	8	8	3	5	6	0	0	0						
NM7	1	5	3	3	6	7	2	8	6	4	6	4	0	0	0						
NM8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
NM9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
NM10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
NM11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
NM12	0	5	5	0	1	0	0	2	2	0	2	2	0	0	0						

Note for Table D- 2 and Figure D- 1:

D = Day period (The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays).

E = Evening period (The period from 6pm to 10pm).

N = Night period (The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays).

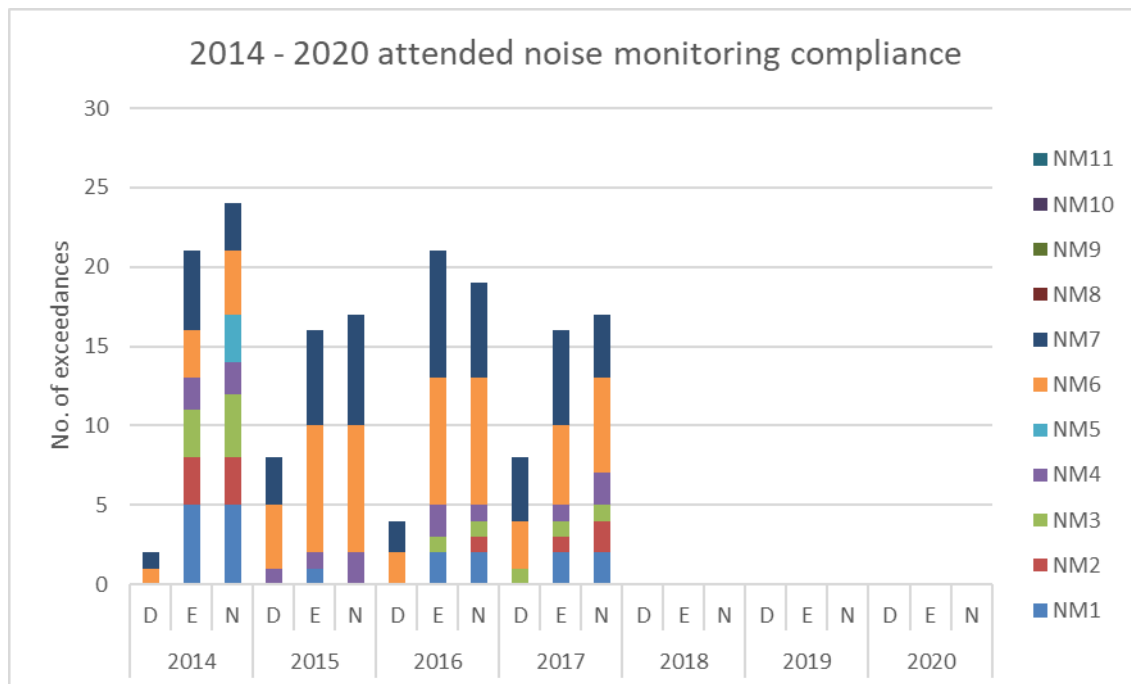


Figure D- 1: 2014-2020 WCS attended noise monitoring compliance summary

Noise Reduction Study

In 2018, a Noise Reduction Study (NRS) was implemented to satisfy the requirements of Condition 8A of the WCS SSD-5579 Development Consent.

The purpose of the NRS was to identify any noise reduction that is achieved via the reasonable and feasible measures proposed in the statement of commitments (SOC) from MOD 2. Any identified reductions would be used to inform modifications to EPL 21229 compliance conditions.

Extensive investigations have been completed to identify reasonable and feasible mitigation measures to reduce noise levels from both the Overland Conveyor Systems and the SCSS.

This NRS program commenced in early 2018 and included the noise mitigation and communication measures, which as of 31 December 2019, were completed.

In April 2020, SCSO issued the notification of completion to the community through letters to impacted residents and a classified advertisement in local newspapers.

Subsequently, Conditions U1.1 – U1.3 of the PRP relating to noise mitigations works were completed to the satisfaction of the EPA and were removed from EPL 21229.

Environmental Noise Compass

A real time noise monitor, Environmental Noise Compass (ENC) was installed for WCS operations in July 2015 to monitor noise in real time. The ENC is utilised to provide real time directional noise data and help inform operational management decisions in maintaining and reducing operational noise levels.

A program to continually improve the correlation of noise levels monitored at the ENC against noise profiles generated from operational activities has been implemented since 2015 and will continue for the life of the operations to provide accuracy for real time correlation of monitored data versus operational noise profiles.

This aims to provide improved accuracy and validity of the ENC monitored data and provides benefit for the community and surrounding noise receptors by allowing the operations to continually improve and reduce operational noise impacts where feasible.

Additional Real Time Noise Monitoring

WCS has implemented the use of unattended noise monitors that record continuous noise data on a semi-permanent basis situated at strategic locations in proximity of operational activities and noise receptors.

Data from these noise monitors is used to:

- Improve correlations of ENC data (as described above).
- Verify and monitor noise modelling predictions.
- Monitor and evaluate noise mitigation strategies.
- Aid in the assessment and improvement of operational understanding for identified and implemented noise mitigation strategies.

Sound Power Level Monitoring

Sound Power Level (SPL) monitoring of all fixed and mobile plant operating across SCS operating sites is undertaken annually to inform revision of assessed noise models and to ensure fixed and mobile noise generating equipment is operated and maintained in accordance with manufacturer's recommendations and assessed noise criteria.

Additionally, SPL monitoring is conducted prior to and post the implementation of noise mitigation measures as identified in the NRS to validate modelled mitigation levels as assessed.

Tracking and Monitoring of Haul Trucks

No coal was transported by truck via the Mount Piper or Wallerawang Haul Roads in 2020 nor is currently proposed for 2021.

Prior to the resumption of trucking coal via these haul roads, Centennial Coal has committed to implement monitoring and tracking of haulage fleet configurations and speed limits to minimise noise impacts from these activities.

Conveyor Management Actions - Low Noise Idler Installation Program

The installation of low noise idlers along Overland Conveyor (OL) 1 and OL2 sections of the OL in the vicinity of Lidsdale and Wallerawang was completed in 2018.

Monitoring data from SPL monitoring following the completion of the works program has been undertaken and will continue to be completed on a periodic basis to ensure low noise idlers continue to exhibit noise emission profiles as per modelled assessments.

Results for the noise mitigation of conveyors at WCS is presented in Table D- 3 including a comparison of pre-mitigated, estimated mitigated, and achieved mitigated noise levels for implemented low noise idlers.

Sound powers determined from measured SPL are provided in Table D- 3 and are compared to previously measured levels prior to, and following the installation of low noise idlers (LNI) on sections of zones 1, 2, 3, and 4.

Table D- 3 : Historical sound pressure level comparison of SCSO (dB)

Zone	Pre LNI		Post LNI		2018		Apr 2019		Dec 19 / Jan 20		Nov 20		Recent change	
	Linear	Awt	Linear	Awt	Linear	Awt	Linear	Awt	Linear	Awt	Linear	Awt	Linear	Awt
Zone 1	79	74	71	64	82	74	78	70	79	70	75	67	-4	-3
Zone 2	79	75	70	64	81	76	76	69	77	68	71	67	-6	-1
Zone 3	81	78	70	65	76	72	76	72	71	67	73	69	2	2
Zone 4	82	79	80	72	80	72	81	73	78	69	79	73	1	4
Zone 5	-	-	-	-	84	79	82	78	81	77	82	79	1	2
Zone 6	-	-	-	-	82	73	82	75	79	71	80	74	1	3
Zone 7	-	-	-	-	84	77	84	78	84	77	80	75	-4	-2
Zone 8	-	-	-	-	80	73	83	74	84	72	83	72	-1	0
Zone 9	-	-	-	-	85	79	81	72	82	72	82	74	0	2

Linear – Linear sound pressure level

Awt – A-weighted sound pressure level

Measured levels at zones 1, 2, 7, 8 reduced from testing in December 2019 / January 2020 potentially due to the monitoring being undertaken without coal on the conveyor belts, however conveyor belts aren't necessarily quieter with coal depending on their construction and alignment.

Zones 3, 4, 5, 6 and 9 showed slight increases from testing in December 2019 / January 2020, however levels were less than other historical levels and indicate the conveyor was operating normally.

CHPP Cladding

Noise mitigation cladding of the WCS Coal Handling and Process Plant (CHPP) was completed in May 2019 with the goal of reducing noise emissions from the CHPP on nearby sensitive receivers. An independent noise specialist conducted post-cladding attenuation noise assessment compared to measured sound power levels (SWL) taken prior to installation. The results are shown in Table D- 4.

Table D- 4: Comparison of pre- and post-mitigation SWL (dB)

	31.5	63	125	250	500	1k	2k	4k	8k	Tot-A	Tot-Lin
Pre-cladding SWL	130	120	111	114	108	105	100	93	85	110	130
Target SWL	127	114	106	102	105	104	97	90	80	107	127
2019 post-cladding SWL	131	115	109	104	104	102	98	91	79	107	131
2020 post-cladding SWL	117	111	102	101	99	99	94	86	74	107	127
Recent change in SWL	-14	-4	-7	-3	-5	-3	-4	-5	-5	0	-4
Target SWL met (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

The SWL measurements on the CHPP achieved the reduction target for all octave bands.

CHPP levels were less than 2019, likely due to mitigation works being completed, and because there was no coal being processed at the time of testing in 2020.

Mobile Plant Noise Attenuation

Sound power level testing was conducted on mobile plant including loaders and a dozer used on WCS stockpiles. Testing was completed in accordance with ISO 6393:2009 and ISO 6395:2008. Results are presented as Sound Power Levels determined in accordance with ISO 3744:2010. Sound power targets are as supplied by WCS.

Table D- 5 shows the sound power levels of mobile plant versus the WCS targets.

Table D- 5: Mobile Plant Sound Power Level Testing

Plant	L _{WA} (dB)	L _w (dB)	L _{WA} Limit (dB)	L _w Limit (dB)	L _{WA} Exceedance (dB)	L _w Exceedance (dB)
Dozers						
DZ04 stationary	102	114	108	117	Nil	Nil
DZ04 1 st gear forward	106	115	108	117	Nil	Nil
DZ04 1 st gear reverse	107	116	108	117	Nil	Nil
DZ04 2 nd gear forward	112	119	-	-	-	-
DZ04 2 nd gear reverse	116	121	-	-	-	-
DZ11 stationary	106	114	108	117	Nil	Nil
DZ11 1 st gear forward	111	117	108	117	3	Nil

Plant	L _{WA} (dB)	L _W (dB)	L _{WA} Limit (dB)	L _W Limit (dB)	L _{WA} Exceedance (dB)	L _W Exceedance (dB)
DZ11 1 st gear reverse	112	118	108	117	4	1
DZ11 2 nd gear forward	115	120	-	-	-	-
DZ11 2 nd gear reverse	120	124	-	-	-	-
Loaders						
WL04 stationary	104	109	109	113	Nil	Nil
WL04 1 st gear forward	106	110	109	113	Nil	Nil
WL04 1 st gear reverse	105	110	109	113	Nil	Nil
WL04 2 nd gear forward	106	111	-	-	-	-
WL04 2 nd gear reverse	105	111	-	-	-	-
WL09 stationary	106	113	109	113	Nil	Nil
WL09 1 st gear forward	107	114	109	113	Nil	1
WL09 1 st gear reverse	106	114	109	113	Nil	1
WL09 2 nd gear forward	106	114	-	-	-	-
WL09 2 nd gear reverse	106	115	-	-	-	-
WL10 stationary	101	108	109	113	Nil	Nil
WL10 1 st gear forward	102	108	109	113	Nil	Nil
WL10 1 st gear reverse	102	108	109	113	Nil	Nil
WL10 2 nd gear forward	102	108	-	-	-	-
WL10 2 nd gear reverse	101	108	-	-	-	-

The following is a summary of the screening results:

- The A-weighted limit was met for all tests, with the exception of DZ11. DZ11 exceeded the A - weighted limit by 3 dB for the 1st gear forward test and by 4 dB for the 1st gear reverse test. It should be noted that engine fan speed for DZ11 was left uncontrolled, which may have impacted the overall A-weighted levels;
- The linear limit was met for all tests, with the exception of DZ11 and WL09. DZ11 exceeded the linear limit by 1 dB for the 1st gear reverse test. WL09 exceeded the linear limit by 1 dB for the 1st gear forward and reverse tests.
- Tonal noise (as per the Noise Policy for Industry - 2017) was not noted in any tests.

2nd gear forward and reverse operations were not compared with supplied limits.

Appendix E – Air Quality

Performance against Environmental Assessment

The WCS EIS calculated the Predicted Annual Average concentrations at the site for depositional dust (DG3 only), total suspended particulate matter (TSP) and particulate matter < 10 µm (PM₁₀).

Table E- 1 shows a comparison of 2020 dust data against the EIS air pollutant goals.

Air quality monitoring points are located on plans in Appendix A.

Table E- 1: Comparison of 2020 dust data against modelled pre-project approval levels

Dust Monitor	Approval Criteria	Predicted cumulative range ³	Performance During Reporting Period
DG3	2 g/m ² /month Max Annual Average Increase	Not modelled	0.44 g/m ² /month
	4 g/m ² /month Total Annual Average	0.2 – 0.3	1.72 g/m ² /month
DG4	2 g/m ² /month Max Annual Average Increase	Not modelled	0.22 g/m ² /month
	4 g/m ² /month Total Annual Average	Not modelled	1.38 g/m ² /month
DG5	2 g/m ² /month Max Annual Average Increase	Not modelled	0.45 g/m ² /month
	4 g/m ² /month Total Annual Average	0.5 – 1.0	3.01 g/m ² /month
TEOM (PM₁₀)	25 µg/m ³ Annual Average (Long Term PM ₁₀)	6.0 – 11.4 µg/m ³	13.29 µg/m ³
	50 µg/m ³ 24Hr Average (Short Term PM ₁₀)	25.9 – 92.6	300 µg/m ³ (Max 24 hr result) ⁴
TSP	90 µg/m ³ Annual Average (Long term TSP)	6.8 – 18.6	Calculated at 30.91 µg/m ³ ⁵

Note that the predicted cumulative range for deposited dust and PM₁₀ relate to an annual average.

The observed range for this reporting period relates to monthly measurements for deposited dust and daily measurements for PM₁₀ so the values are not directly comparable.

Current annual averages for PM₁₀ and deposited dust are within or below the predicted ranges and remain compliant with limits in the development consent and EPL.

³ Predicted annual average for Scenario 2a (EIS) – Cumulative assessment including operations at the Springvale Coal Services site, Angus Place Colliery, Springvale Coal Mine, operations, haulage at Neubecks, haulage of 4 Mtpa of coal from Angus Place Colliery to Mt Piper Power Station and use of the preferred Link Haul Road

⁴ The maximum 24-hour average result was caused by the combination of regional dust storms from the west and bushfires burning in regional NSW.

⁵ At all surrounding sites a consistent TSP to PM₁₀ ratio has been established using HVAS data over several annual cycles. This ratio is used to estimate the TSP concentration, based on measured PM₁₀ concentrations. The ratio between TSP and PM₁₀ concentrations has been calculated from long term monitoring data:

Western Coal Services ratio = 0.43; Springvale ratio = 0.45; Angus Place ratio = 0.44; Clarence Colliery ratio = 0.40.

The measured PM₁₀ annual average would therefore be divided by 0.43 to estimate the annual average TSP concentration.

Table E- 2 compares 2020 performance against management and mitigation measures specified in the EIS.

Table E- 2: Performance against EIS Mitigation and Management Measures

EIS Mitigation and Management Measures	Performance during Reporting Period
Enclosure of the existing and proposed Washery.	The existing Washery is enclosed. The proposed Washery has not been constructed.
Enclosure of conveyor transfer points.	The conveyor transfer points are enclosed.
Loading of coal rejects from an enclosed bin.	Dust from coarse coal reject is managed through wetting of the material prior to transport to the REA. Fine coal reject is pumped as a slurry to the REA.
Majority of coal reclaimed from stockpiles via underground reclaim tunnel.	All coal reclaimed from stockpiles is via underground reclaim tunnels.
Three quarter enclosed conveyors.	Conveyors are three quarter enclosed.
Stockpile water sprays which are wind activated.	Water sprays have been installed at the transfer points.
New Link Haul Road to be fully sealed.	This item relates to the Link Haul Road which is not currently scheduled for construction.
Regular use of water carts on unsealed roads trafficked by heavy vehicles. This will include the surface of the proposed REA.	Water carts are utilised on unsealed roads onsite.
Installation of a tapered element oscillating microbalance (TEOM) continuous atmospheric dust monitoring unit within the Blackmans Flat residential area.	The TEOM was installed within the Blackmans Flat residential area in December 2015.

The worst-case scenarios for two Wolgan Road residences showed that the 50 µg/m³ criterion for 24-hour average PM₁₀ concentrations would be exceeded on two occasions each year due to haul road activity. PM₁₀ concentrations related to the haul road are not measured as the haul road has not been operational since approval of the project.

The short-term (24 hour) PM₁₀ criteria is 50 µg/m³ at any residence on private land.

The long term (annual) PM₁₀ criteria is 25 µg/m³ and TSP criteria is 90 µg/m³ at any residence on private land.

The 2020 particulate matter air quality results are summarised in Table E- 3 below.

Table E- 3: 2020 WCS Air Quality Summary

	Criteria	Maximum	Mean
24hr PM ₁₀ (Short Term PM ₁₀)	50 µg/m ³	300	-
TSP (Long Term TSP)	90 µg/m ³	-	30.91 ³
PM ₁₀ (Long Term PM ₁₀)	25 µg/m ³	-	13.29

Short Term PM₁₀

The short-term PM₁₀ mass concentration for January 2020 to December 2020 is presented in Figure E-1. Activities at WCS complied with SSD-5579 air quality assessment criteria limits during all continuous PM₁₀ monitoring undertaken.

The TEOM resulted in no monitoring data for the following dates and reasoning in 2020:

- 26 – 27 March The circuit breaker had tripped from storm activity on the TEOM causing a power outage
- 1 April The circuit breaker had tripped from storm activity on the TEOM causing a power outage

This is compliant for continuous emission monitoring systems where the minimum data capture, as per the EPA guideline, is required to be a minimum 90%.

The TEOM was recording for approximately 363 of the 366 days that equates to a 99% data capture rate.

Elevated PM₁₀ results were recorded above short-term criterion for particulate matter of 50 µg/m³ during the reporting period on the dates provided in Table E- 4. On each occasion, DPIE were notified in writing of the elevated PM₁₀ results above the 50 µg/m³ criterion.

Table E- 4: Elevated PM₁₀ results and reasoning

Date	PM ₁₀ Result (µg/m ³)	Reason
5 January 2020	126	The combined result of regional dust storms from the west and bushfires burning in regional NSW.
9 January 2020	50.5	
11 January 2020	179	
12 January 2020	69	
23 January 2020	76.5	
24 January 2020	300	
25 January 2020	63.6	
2 February 2020	60	

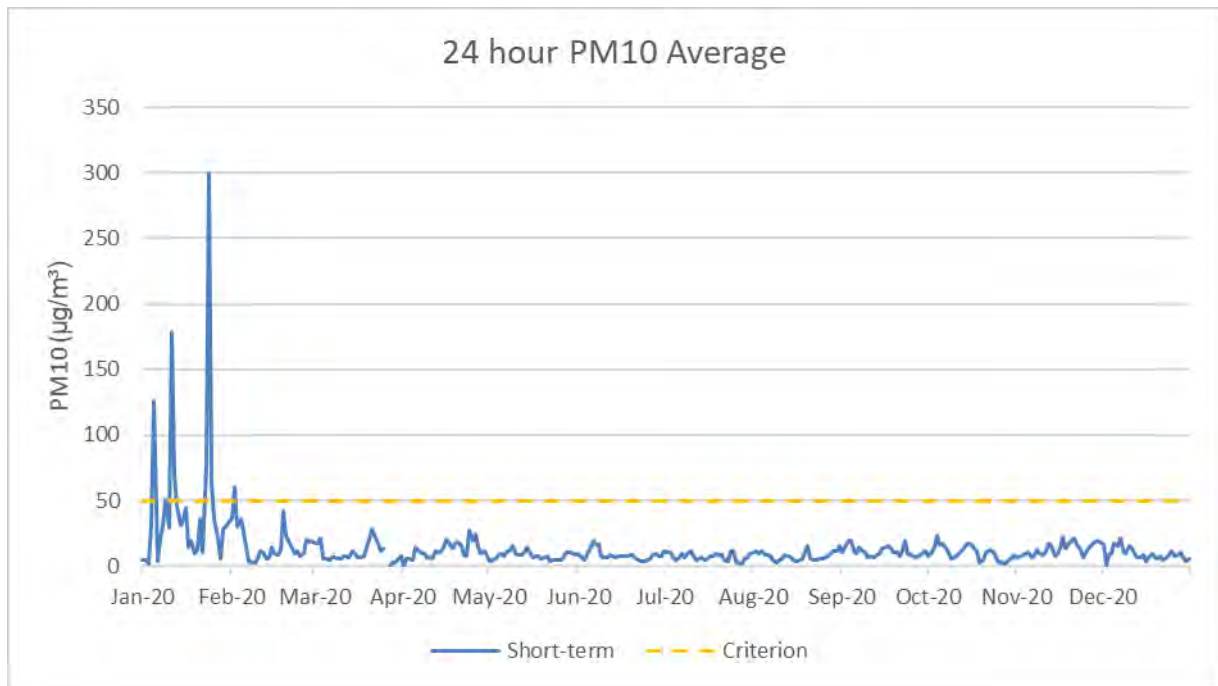


Figure E- 1: 2020 TEOM 24-hour PM₁₀ average

Long Term PM₁₀

The long-term annual average for onsite PM₁₀ was 13.29 µg/m³ in 2020, below the long-term criterion of 25 µg/m³.

Prior to commissioning of the TEOM in December 2015, dust was measured at Pine Dale Coal Mine using a high volume air sampler (HVAS). While the results are not immediately comparable to the TEOM data, the historical PM₁₀ data is presented in Figure E- 2.

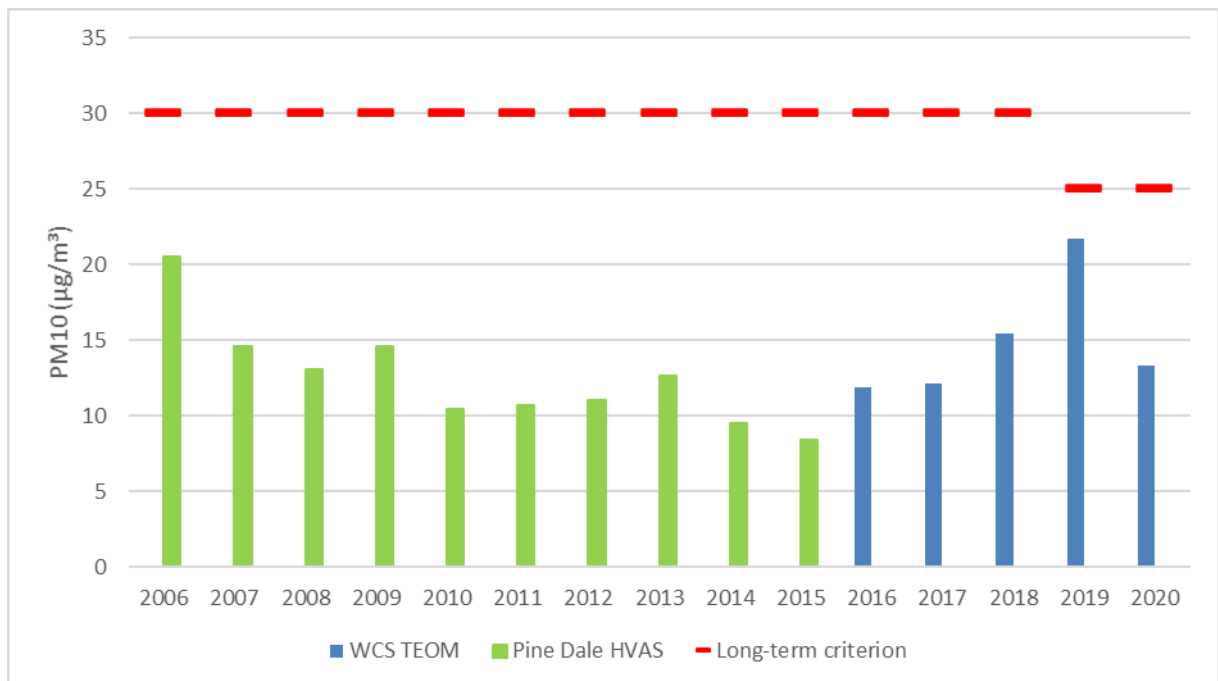


Figure E- 2: Long-term PM₁₀ average (2006–2020)⁶⁷

⁶ The long-term average is calculated using the full dataset from Pine Dale Mine (2006 to 2015).

TSP

The long-term annual average for onsite TSP was 30.91 $\mu\text{g}/\text{m}^3$ in 2020, below the long-term criterion of 90 $\mu\text{g}/\text{m}^3$. Historical results are presented in Figure E- 3. As with PM_{10} , the increase in long-term TSP was attributable to regional dust storms and bushfires experienced in 2020, and not due to particulate generating operations at WCS.

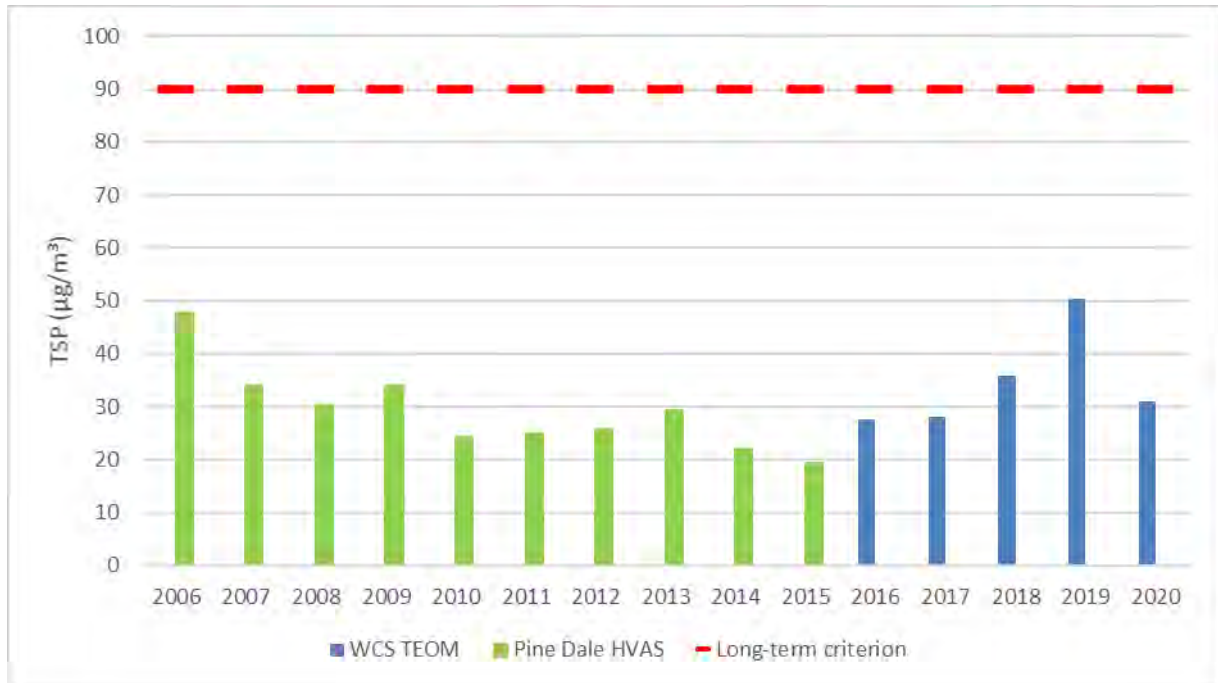


Figure E- 3: Long-term TSP Mass Concentration (2006-2020)⁷

⁷ Long term averages are taken of all data of appropriate quality between 12:00 am 1 January and 11:50 pm 31 December per calendar year period.

Depositional Dust

Depositional dust is monitored at three locations (WCSDG3, WCSDG4 and WCSDG5). These are shown in Appendix A.

The deposited dust limit is 4 g/m²/month at any residence on private land averaged annually.

- Centennial use daily dust forecast reports to determine the frequency of watering unsealed area and to schedule dust suppression activities and operational mitigation.
- Depositional dust results greater than 4 g/m²/month are sent away for fine particle analysis to determine the percentage attributable to operations at WCS.
- Any amended depositional dust results following fine particle analysis were published in WCS EPL 21229 monitoring reports on the Centennial website as corrections on receipt of modified data.

Depositional dust emissions were below the annual average trigger (4 g/m²/month) at all dust gauges (Table E- 5 and Figure E- 4).

Table E- 5: 2020 depositional dust summary

	WCSDG3	WCSDG4	WCSDG5
Min (g/m ² /month)	0.10	0.15	0.10
Max (g/m ² /month)	7.16	3.35	3.40
Average (g/m ² /month)	1.72	1.01	1.44

The summary of 2020 depositional dust monitoring is shown in Figure E- 4.

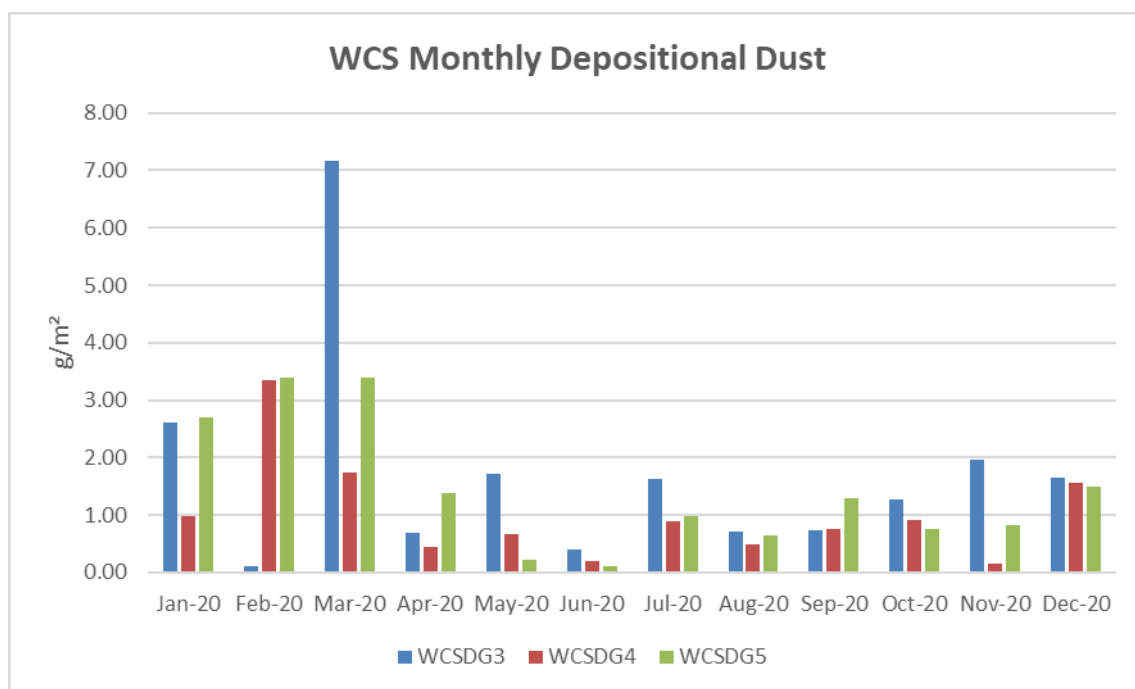


Figure E- 4: 2020 depositional dust summary

A comparison of the annual average of depositional dust for WCS from 2010 to 2020 is shown in Figure E- 5.

WCSDG3 has remained under the annual average since 2015 and WCSDG4 and WCSDG5 have remained under the annual average limit since 2010.

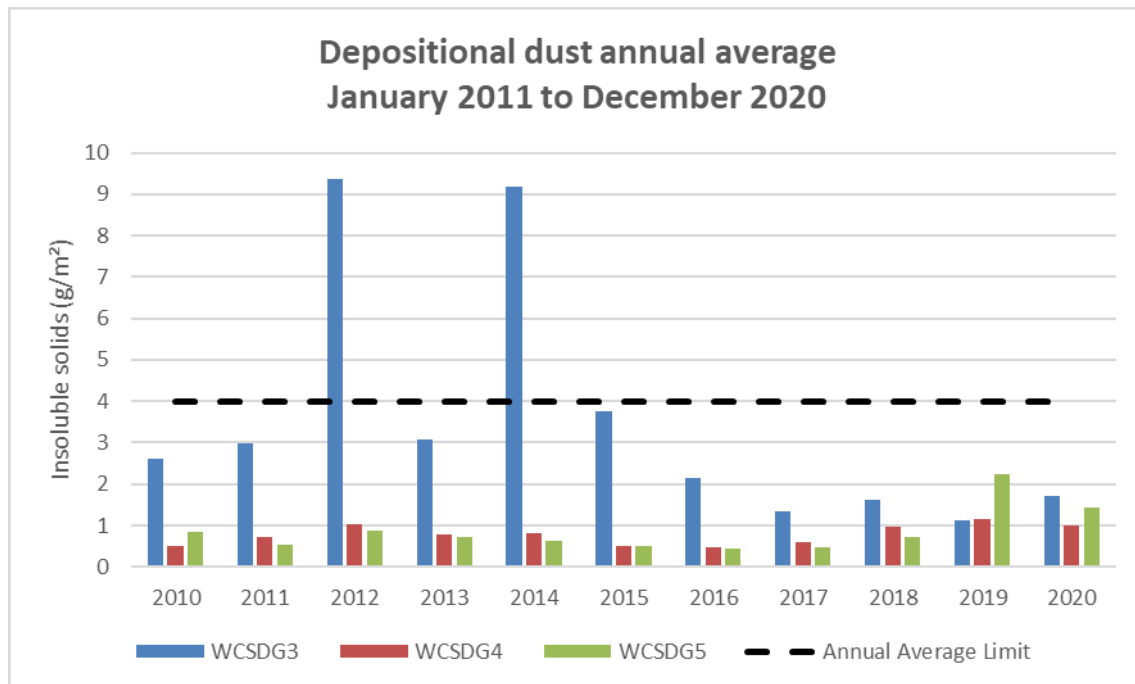


Figure E- 5: Historical depositional dust summary – January 2010 to December 2020

The rolling average for depositional dust uses 12 months of data from February 2019 to January 2020 to generate the graph commencing January 2020 as shown in Figure E- 6.

There were no exceedances of the 12-month rolling average during the reporting period.

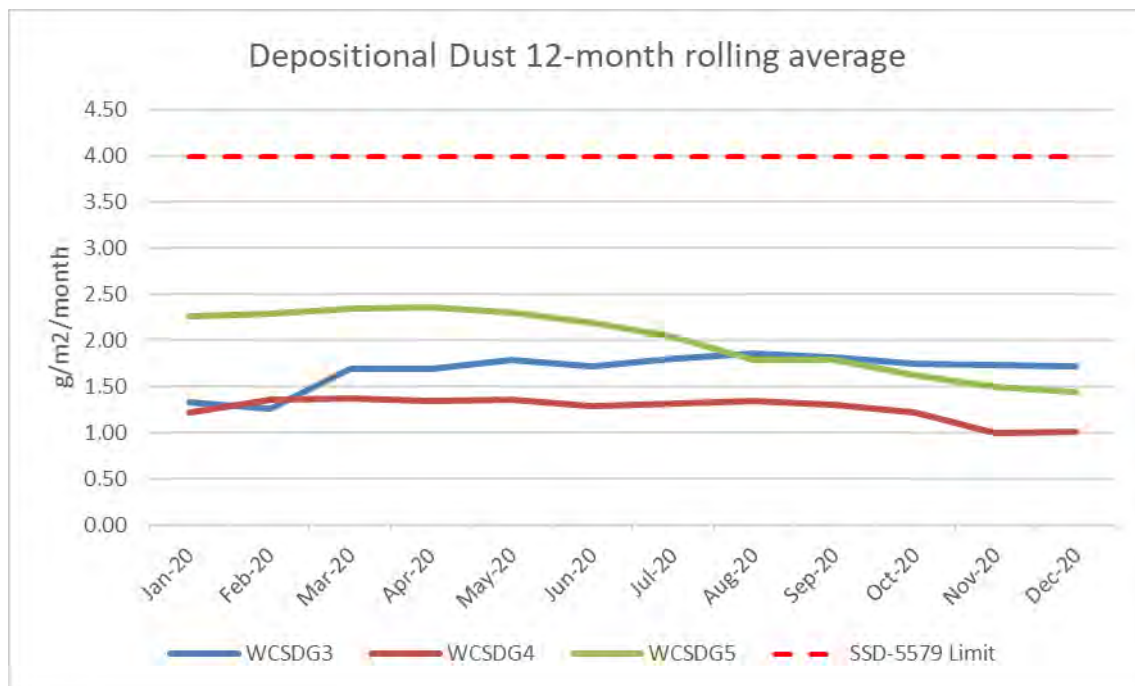


Figure E- 6: Depositional dust 12-month rolling average

The historical rolling average for depositional dust uses 12 months of data from September 2009 to generate the graph commencing October 2010 as shown in Figure E- 7.

Historically, WCSDG3 has exceeded the 12-month rolling average limit of 4 g/m²/month but has remained under the limit since June 2016. WCSDG4 and WCSDG5 have remained under the 4 g/m²/month limit.

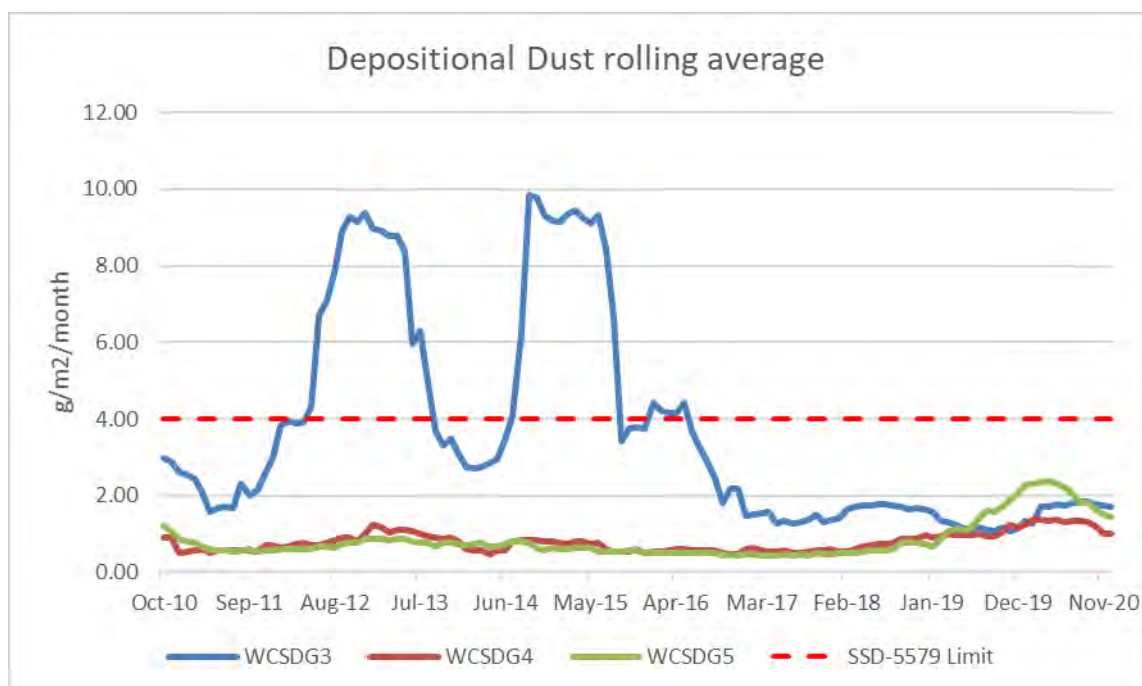


Figure E- 7: October 2010 to December 2019 depositional dust 12-month rolling average

Greenhouse Gas

Greenhouse gas emissions are calculated for the financial year from emission sources at Lidsdale Siding. Table E- 6 provides a greenhouse gas emissions summary for the 2019/20 financial year.

Table E- 6: Total GHG emissions from site

Emissions Summary (CO ₂ -Et) July 2019 to June 2020	Total
Electricity	7568.3
Diesel	1366.9
Petroleum Based Oils and Greases (PBOG)	0
SF6	0
Fugitives – CH ₄	0
Fugitives – CO ₂	0
Surface Fugitive – Post Mining	0
TOTAL	8935.2

Appendix F – Meteorological Information

Meteorological monitoring summaries for WCS are provided for rainfall and temperature for the 2020 reporting period. Other meteorological data including wind, evaporation, humidity, and barometric pressure are monitored at WCS, though summaries aren't provided due to their use as investigative tools rather than for comparative purposes.

Meteorological stations are strategically located for the WCS operations that provide continuous meteorological data. WCS obtains daily meteorological forecasts and predictions with this information reviewed by the operations daily to inform management decisions regarding specific day to day operations, and the rescheduling of specific noise generating activities in adverse meteorological or potentially noise enhancing conditions where feasible.

Rainfall

The total monthly rainfall at WCS for the 2020 reporting period is summarised in Table F- 1 and Figure F- 1.

The location of the WCS Automated Weather Station (AWS) is provided in Appendix A.

Table F- 1: Monthly Rainfall Summary

Month	Total Rainfall (mm) ⁸	Long-term average (mm) ⁹
January 2020	13.6	85.1
February 2020	121	76.8
March 2020	111	67.4
April 2020	109.2	43.2
May 2020	28.6	47.9
June 2020	37.8	49.6
July 2020	84.6	49.8
August 2020	110	63.1
September 2020	53.6	53
October 2020	73	67.1
November 2020	64.6	71.8
December 2020	116.4	73.6
Total	923.4	748.4

⁸ Monthly recorded rainfall taken from WCS AWS

⁹ Long-term monthly average from BOM station 063132 Lidsdale (Maddox Lane) 1959-2020

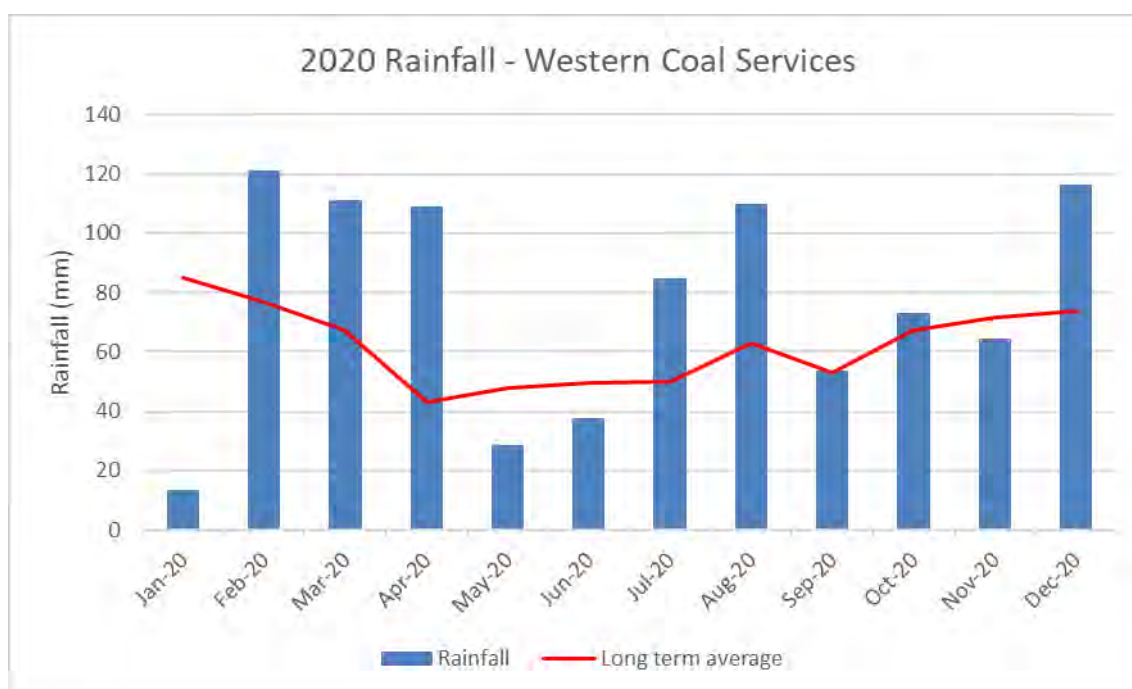


Figure F- 1: Monthly Rainfall Summary

Temperature

The minimum and maximum monthly temperature for WCS for the 2020 reporting period is summarised in Table F- 2 and Figure F- 2.

Table F- 2: Monthly Temperature Summary¹⁰

Month	Min	Max
January 2020	10.8	39.4
February 2020	7.2	37.2
March 2020	5.4	29.6
April 2020	0.4	23
May 2020	-3.2	18
June 2020	-3.8	15
July 2020	-4.2	14.2
August 2020	-4.4	17.6
September 2020	-1.9	21.5
October 2020	0	24.1
November 2020	3.9	31.2
December 2020	4.4	34

¹⁰ Monthly temperature recorded from WCS AWS

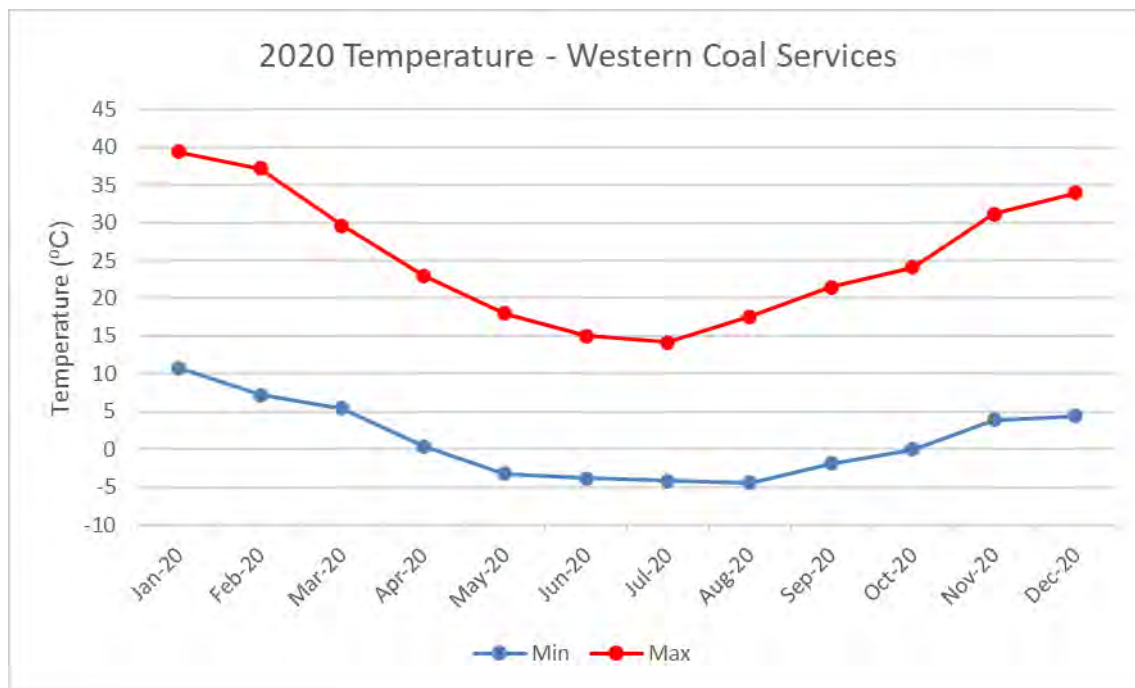


Figure F- 2: Monthly Temperature Summary

Appendix G – Transport Information

Performance against Environmental Assessment

The recommendations in the EIS refer to the construction of the Link Haul Road and the upgrade of the Springvale Coal Services intersection line marking.

- The line marking has been completed.
- The Link Haul Road is not currently scheduled for construction.
- Tonnages of transported coal is presented in Table 4-1 against limits in SSD-5579.
- No coal was transported on the public road network during the reporting period.

Appendix H – Surface Water Information

Performance against Environmental Assessment

The EIS identified that after mitigation measures had been implemented, the Project's impact on water quality would be further improved. The improvements would be progressively implemented and monitored to verify that the anticipated improvements were realised.

Table H- 1 compares performance against management and mitigation measures specified in the EIS.

Table H- 1: Performance against EIS Mitigation and Management Measures

EIS Mitigation and Management Measures	Performance for Reporting Period
A single Water Management Plan will be prepared for the entire PAA and will include operation of the new infrastructure, water recycling system, surface and groundwater monitoring including Wangcol Creek mixing zone and a staged implementation of the separation of the Lamberts Gully drainage line as it passes through the Springvale Coal Services Site, as well as the localised changes associated with the recently approved Mt Piper Power Station Ash Placement Project.	The WCS Water Management Plan (WCSWMP) has been updated to incorporate changes to site operations and the outcomes of the SSD-5579 modifications.
Separation of clean and dirty water at the Springvale Coal Services Site. The design will include the diversion of upstream catchments of Huon Gully around the new REA. The sub-catchment containing the existing A Pit REA (previously the Lambert Gully Open Cut) as well as the new REA will be diverted into the New Sediment Dam. This sub-catchment currently discharges to Huon Gully without treatment and therefore the proposed change will lead to improved water quality in Huon Gully. Following remediation of the new REA, this sub-catchment of Huon Gully will be restored. It is noted that Huon Gully does not currently discharge to Wangcol Creek, instead it is captured by Huon Dam which resides on Mt Piper Power Station land at the confluence of Huon Gully and Wangcol Creek. The recently approved Mt Piper Power Station Ash Placement Project also consists of surface water management works in the Huon Gully.	Clean and dirty water diversions are in place on-site.
Construct a pollution control pond control runoff from the new REA. This structure will have a capacity of approximately 15 ML and will be located on the north-eastern corner of the REA. The dam will have a pipe connection to the existing Washery Dam, which is connected to Cooks Dam via a pipeline. This will enable treated stormwater from the new REA to be recycled back to the Washery via Cooks Dam. This dam is to be constructed once the current A Pit REA is completed but prior to the base of the new REA being completed.	This mitigation measure is no longer relevant as it has been superseded by the approved REA design.
Provision of a belt press filter system (or equivalent) to recover water from the tailings produced from the new Washery. This water recovery system will cover tailings produced from the existing Washery but will be installed as part of the construction of the new Washery.	The new Washery has not been constructed. This mitigation measure does not apply.
Apply for a separate EPL covering the entire PAA that includes LDP003 (Kerosene Vale Stockpile Area) and LDP006 and LDP007 (conveyor at Duncan Street, Lidsdale).	Discussions with regulatory groups was undertaken in 2019. A separate EPL 21229 for WCS was granted on 17 May 2019 which includes LDP001 (formerly LDP006) and LDP002 (formerly LDP007). Responsibility and reporting for LDP003 was transferred to Angus Place Colliery given its proximity and operational relevance to the site.

EIS Mitigation and Management Measures	Performance for Reporting Period
Relocate the current LDP006 (now LDP001) to the spillway of Cooks Dam and replace the existing LDP006 (now LDP001) with a license monitoring point.	LDP001 (formerly LDP006) as a licenced discharge point remains at the existing location. Clean and dirty diversion works in Lamberts Gully (and the subsequent removal of clean water from discharge through LDP001) has superseded the requirement to relocate the discharge point to Cooks Dam spillway.
Following completion of the Link Haul Road, complete the additional riparian planting for a 100 m section of Wangcol Creek downstream of the Link Haul Road crossing. The species selection and density is to be determined in consultation with the SCA and NOW.	This item is now covered under the Riparian Habitat and Catchment Improvement Plan (SSD-5579, Schedule 3, Condition 27).
Site specific trigger values based on ANZECC 2000 Guidelines will be developed for Wangcol Creek.	The site-specific trigger values are included in the WCSWMP.
An erosion and sediment control strategy will be implemented as part of a CEMP. This strategy will incorporate specific conditions of the Project Approval, EIS commitments and requirements of the EPL.	The CEMP was developed in August 2015 and includes an erosion and sediment control strategy. ESC management on-site is covered under the WMP.
Structures will be designed to minimise erosion and disruption to current flow regime. Regular inspection of erosion and sediment control measures and inflow/outflow points will be undertaken, particularly following storm events.	As per the CEMP and the WMP, all structures have been designed to minimise erosion and disruption to current flow regime. Regular inspections are undertaken across the site.
Erosion and sediment controls will be implemented as per Managing Urban Stormwater: soils and construction (Landcom, 2004) during construction.	Erosion and sediment controls have been implemented as per Managing Urban Stormwater: soils and construction.
Contaminated water will be contained on site and channelled towards the containment ponds.	Contaminant water was controlled through the dirty water system and directed towards sediment ponds on site.
Surface water sampling and analysis will be undertaken prior to discharge in accordance with the EPL.	Monthly monitoring is undertaken in accordance with EPL 21229 and the WCSWMP.
A detailed site water management plan will be prepared prior to commissioning new infrastructure. This plan will be compliant with all applicable development consent conditions, EIS commitments, Water Licensing and EPL requirements.	The current approved WMP (August 2014) is compliant with all applicable development consent conditions, EIS commitments, Water Licensing and EPL requirements. The WMP is updated and reviewed annually to incorporate the requirements of SSD-5579.
Provision of bank stability works at the crossing of Wangcol Creek.	This item is now covered under the Riparian Habitat and Catchment Improvement Plan (SSD-5579, Schedule 3, Condition 27).
Impediment of flows will be avoided through selection of an appropriate crossing type.	This item relates to the Link Haul Road which is not currently scheduled for construction.
Concentration or redirection of flow will be avoided on the outlet of crossing. Where this is not possible, appropriate scour protection measures will be provided.	This item relates to the Link Haul Road which is not currently scheduled for construction.
The need for access of heavy machinery to the bed of the waterways will be avoided with works being undertaken from the top of the banks where possible.	This item relates to the Link Haul Road which is not currently scheduled for construction.
The disturbance of surrounding banks by machinery or other construction works will be avoided.	This item relates to the Link Haul Road which is not currently scheduled for construction.
Vegetation clearance will be avoided where possible to protect soils from erosion. If clearance cannot be avoided, the area of vegetation cleared at any one time should be minimised.	Minimal vegetation clearance was undertaken during the reporting period and completed in accordance with Centennial Surface Disturbance Permit System.
Disturbed areas will be stabilised, and vegetation reinstated.	Disturbed areas are stabilised, and vegetation reinstated in accordance with the MOP.

Surface Water Projects

TT03 Works

Planning and approval works required under a Voluntary Undertaking continued during the reporting period. Updates were provided to DPIE on a quarterly basis. Table H- 2 below summarises the status of actions as of 31 December 2020.

Table H- 2: SSD-5579 Voluntary Undertaking TT03 Works Action Plan

Item	Activity	Status	Completion Date
1	Complete and finalise 3 rd Party Options Assessment	Completed	27/09/2017
2	Submit final Options Assessment report to NSW Department Planning and Environment (DPE)	Completed	28/09/2017
3	Meet with Energy Australia to discuss Land Access Options	Completed	29/09/2017
4	Finalise meeting minutes and preliminary communications with EA	Completed	09/10/2017
5	Complete legal review to understand approval related processes and options required to complete works and permit control activity	Completed	24/10/2017
6	Acceptance of Voluntary Undertaking and submission of works plan to DPE	Completed	31/10/2017
7	Site inspection and discussion with DPE representative RE: Voluntary Undertaking and Works Plan response submission	Completed	01/11/2017
8	Final determination of approval process to follow and execute to authorise and legally permit activity	Completed	20/06/2018
9	Complete submission of a Land Use Agreement to EA	Completed	06/03/2019
10	Complete applicable mining activity approval application as determined in (8) above from options identified above which may include either - Completion of a new Mining Lease Application - Completion of an Application to attach an ancillary mining activity to the existing ML1352	Completed	03/07/2019
11	Complete budget justifications and expenditure approval for physical works	Completed	20/11/2018
12	Indigenous consultation and Due Diligence Assessment in accordance with Centennial Coal Western Region Cultural Heritage Management Plan including - Notification to Registered Aboriginal Parties (RAP's) – Completed - Confirm date for site inspection (28 days minimum notice required) – Completed - Engagement of specialist archaeologist for site inspection – Completed - Facilitation of site inspection of impacted area – Completed - Receipt of archaeologist report – Completed - Distribution of report to RAP's for review (28-day review period required) – Completed - Finalisation of report and distribution to RAP's – Completed - Completion of any actions / recommendations - Nil identified to impact proposed works via SEPP	Completed	28/02/2018

Item	Activity	Status	Completion Date
13	Complete Biodiversity Due Diligence Assessments in accordance with relevant Management Plans including - Engagement of specialist ecologist for site inspection - Facilitation of site inspection of impacted area - Receipt of archaeologist report - Distribution of report to for review - Finalisation of report - Completion of any actions / recommendations - Nil identified to impact proposed works	Completed	31/01/2018
14	Complete detailed design study for preferred option (3) as per stages below - Scope of works for design proposal finalised and distributed to supplier (GHD) - Fee proposal receipt - Acceptance of design fee and program start - - Site visit (structural, Geotech) - Civil works detailed design - Structural design complete - Preliminary drawings for review - Final drawings and design acceptance	Completed	28/02/2018
15	Granting of approval for applicable Land Use Agreement from EA as per above	Completed	21/06/2019
16	Granting of approval applicable mining activity approval completed as per above	Completed	28/08/2020
17	Complete applicable environmental activity approval as determined above from options identified Identified approval option Works proposed to be completed as "pollution control works" in accordance with Clause 6(e) of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) as a listed Pollution Reduction Program (PRP) on EPL 21229.	Completed	04/11/2019
18	Commission works package, works program, and engage suitable resources and contracted services	Completed	21/03/2019
19	Commence works program	Commenced	14/09/2020
20	Complete and execute works program in accordance with design and works program	Works program commenced	Revised Target date for completion 31/03/2021
21	Ongoing review and maintenance of controls	Ongoing	Ongoing in perpetuity of operational life
22	Complete Q4 2017 Progress Update Report to DPE	Completed	22/12/2017
23	Complete Q1 2018 Progress Update Report to DPE	Completed	29/03/2018
24	Complete Q2 2018 Progress Update Report to DPE	Completed	02/07/2018

Item	Activity	Status	Completion Date
25	Complete Q3 2018 Progress Update Report to DPE	Completed	27/09/2018
26	Complete Q4 2018 Progress Update Report to DPE	Completed	07/01/2019
27	Complete Q1 2019 Progress Update Report to DPE	Completed	21/03/2019
28	Complete Q2 2019 Progress Update Report to DPE	Completed	03/07/2019
29	Complete Q3 2019 Progress Update Report to DPE	Completed	19/09/2019
30	Complete Q4 2019 Progress Update Report to DPE	Completed	17/12/2019
31	Complete Q1 2020 Progress Update Report to DPIE	Completed	04/07/2020
32	Complete Q2 2020 Progress Update Report to DPIE	Completed	31/08/2020
33	Complete Q3 2020 Progress Update Report to DPIE	Completed	08/10/2020
35	Complete ongoing quarterly Progress Update Report to DPIE (until VU works completed)	Ongoing	As required on quarterly basis

LDP001 Pollution Reduction Program – Preferred Project Report

In 2019, Centennial completed a two staged (preliminary and final) options assessment for the long-term cessation of site discharges through LDP001 in accordance with EPL 21229 Conditions U2.1 and U2.2., and Sch. 3. C.46. of SSD-5579 with submissions completed to the NSW EPA.

The options considered as part of this assessment are outlined below:

- Option 1 – Do nothing. This option would involve maintaining the existing site water management at the SCSS described in Section 2, with discharges continuing to occur from Cooks Dam into Wangcol Creek through LDP001 without treatment.
- Option 2 – Transfer to McPhillamys Gold Project. This option would involve the transfer of raw water to the McPhillamys Gold Project, which is a proposed gold mine being developed in Blayney by Regis Resources Ltd (Regis).
- Option 3 – RO treatment and discharge of treated water through LDP001 to Wangcol Creek. This option would involve the implementation of an RO WTP to treat water to a 90th percentile EC of 350 $\mu\text{S}/\text{cm}$ and discharge through LDP001 to Wangcol Creek. Management of brine has been considered for two sub-options:
 1. On-site brine concentration to reduce brine waste, with off-site disposal.
 2. Transfer of brine waste to the SWTP brine management facility.
- Option 4 – Transfer water to Angus Place Colliery. This option would involve the transfer of water from LDP001 to Angus Place Colliery, where it would be directed to the SWTP for treatment and reuse.
- Option 5 – On-site water management works. This option would involve modifications to the water management system at the SCSS to cease the discharge of groundwater from the site.
- Option 6 – Treatment using brine concentrators (in isolation). This option would involve the implementation of brine concentrators to treat water to a 90th percentile EC of 350 $\mu\text{S}/\text{cm}$ and discharge through LDP001 to Wangcol Creek.

As indicated in correspondence to the EPA in 2020, Option 6 was defined as the second preferred option, followed by sending discharges to Regis (Option 2). All other options considered within the 2019 Options Assessment are determined to be not effective, not economically viable or not commercially possible.

It was acknowledged from a meeting with the EPA that the preferred option provided in the Options Report (Option 2) was not acceptable from the point of view of implementation timeframe and certainty (given the project was yet to be approved). Centennial indicated that Option 2 is still an ultimate strategy for managing water from SCSS.

The EPA issued SCSO with a Pollution Reduction Program (PRP) on 18 December 2020 following on from previous PRPs to evaluate options for the long-term management of groundwater being discharged from LDP001 from SCSS into Wangcol Creek.

In January 2021, Centennial submitted a Preferred Project Report in response to the PRP to divert groundwater away from LDP001 discharges. For clarity, the key milestones leading to the development of this Preferred Project Report include:

- PRP issued for a range of activities following approval of Modification 1 of WCS Project – SSD 5597.
- Creation of EPL 21229 which separated EPL requirements of Springvale Mine and WCS – May 2019.
- LDP001 Preliminary Options Report submitted – June 2019.

- Finalised LDP001 Option Report issued – December 2019.
- Draft EPL variation issued to cease discharges by 31/12/2020 – 17 July 2020.
- Centennial response to draft EPL and proposed amendments – 28 August 2020.
- Draft EPL variation issued for PRP actions – 18 December 2020.

The project to divert groundwater away from LDP001 discharges will include the following elements:

- Construction of a large upstream storage dedicated to management of stormwater runoff from the site, at times capturing dirty water from the existing coal stockpile and handling land use activities. The storage is referred to as DWP-B.
- Construction of a bidirectional pipeline between SCSS and MPPS which will include an offtake from Cooks Dam and offtake and discharge point at the MPPS Pond D.
- Connection to and use of water being transferred from Angus Place to MPPS (Pond D) for use as SCSS process water.
- Construction and use of a pipeline to the Regis SCSS Transfer Station.
- Transfer of excess water from DWP-B to Angus Place 800 area available under scenarios when the Regis Project does not require use of their pipeline (approved and assessed already under the Regis Project EIS).

The key schedule milestones are summarised below:

- Concept design of water management infrastructure – April 2021.
- Concept design of pipelines – June 2021.
- Submission of development applications – July 2021.
- Assessment and determination of development applications – January 2022.
- Expected construction start – March 2022.
- Construction complete – August 2022.
- Commissioning complete – September 2022.

Shared WCS and EA Surface/Groundwater Investigation

EnergyAustralia NSW operates the Mt Piper Power Station (MPPS) and associated ash repository and Centennial operates the Springvale Coal Services Site (SCSS) as part of the WCS Project. The ash repository and coal mining activity are located adjacent each other and share a common boundary.

In 2019, Energy Australia NSW and Centennial Coal agreed to undertake a joint groundwater assessment (the assessment) to understand the potential cumulative impacts on water resources from the MPPS operation, management of the ash repository and adjacent SCSS mining related activities. The aim of the assessment is to assist EnergyAustralia and Centennial identify, quantify and mitigate potential cumulative impacts to water resources (i.e. surface and groundwater environments) from the operation and management of the Mt Piper Ash Repository and SCSS and mining activities (inclusive of approved activities).

Through 2020 it was identified that the objectives for the groundwater models, that both organisations were preparing, would differ and occur on different schedules. However, it was determined that each individual model should share common conceptual model information. This led to an agreement to share a series of model data sets which was completed in 2020 with model development work to recommence for Centennial in 2021.

The objectives for the Centennial hydrogeology assessment remain:

- Identify the drivers for changes in groundwater quality and groundwater level specifically for the Centennial operations;
- Quantify potential cumulative impacts to water resources; and
- Identify and assess mitigation and control measures (if required) to minimise potential cumulative impacts to water resources

Status

EnergyAustralia's independent groundwater investigations remain ongoing. Centennial remain a stakeholder in this work. EnergyAustralia have been updating Centennial with copies of regulatory consultation namely, the presence of existing data sharing arrangements, and the shared history of underground and open cut mining across the two sites.

Both EnergyAustralia and Centennial are customers to the Springvale Water Treatment Facility (SWTF) and hence elements relating to the operation and performance of the system are also shared. EnergyAustralia have, as part of their involvement with the treatment facility, stated a position to shut down their existing industrial water treatment infrastructure. However, with the need for greater flexibility between our operations and to address any future unforeseen scenarios, the continued maintenance and use of the brine concentrators has a benefit to both parties and are currently the subject of ongoing discussions and assessment.

In consultation information shared with Centennial in March 2020, EnergyAustralia committed to the installation of a range of dewatering bores along a frontage of the MPPS site, between the existing ash emplacement area and Wangcol Creek.

This system, whilst extracting groundwater and drawing the groundwater level down, will predominately target the protection of groundwater seepage migrating to Wangcol Creek with groundwater flow directions from the south to south west.

The implementation of this system is unlikely to reduce groundwater management requirements (reduce discharges at LDP001) for SCSS as it is located downstream, and drawdown effects are unlikely to be significant enough to create preferential pathways away from the DML and Cooks Dam mine voids.

Over the period of 2020, the consultation has moved into focusing on specific projects where delivery of solutions is being collaboratively achieved and now not only is information being shared, but assessments are also being completed collaboratively.

The issue of groundwater quality is understood to be shared between EnergyAustralia and Centennial as beneficial re-use of water stored on-site has been used to wash coal with rejects emplaced in the reject emplacement area (REA). This is exemplified by the sharing in 2020 of critical base hydrogeology modelling information that will align the core data set of the site's two independent models.

Additionally, Centennial are working on handing back to EnergyAustralia lands as part of existing lease agreements. In this work being completed, the retrofitting of the site water management system is required. This hand back process is to be completed in late 2021 with water management upgrades to be completed in 2022. The water management upgrades are such that they consider the objectives set out by this report.

Discharge Water

Discharge water quality is monitored monthly during discharge as per the requirements of EPL 21229 and the WCS Water Management Plan (WCSWMP) at Licenced Discharge Points (LDP) LDP001 and LDP002 (see Appendix A for the location of LDPs). For compliance with EPL 21229, discharge water is tested for:

- pH, Total Suspended Solids (TSS), Electrical Conductivity (EC), Oil and Grease, Turbidity, Dissolved Iron, Dissolved Manganese, Dissolved Nickel and Dissolved Zinc at LDP001; and
- pH, Total Suspended Solids (TSS), Electrical Conductivity (EC), Oil and Grease and Turbidity at LDP002.

LDP002

- There was no discharge from LDP002 in 2020.
- Works were undertaken to formalise and improve the LDP002 discharge location.

LDP001

- LDP001 discharged monthly for 11 of the 12 calendar months during the reporting period. There were no discharges recorded in January 2020.
- LDP001 discharges in 2020 were conducted by:
 - A controlled manner using pump arrangements for discharge.
 - Gravity discharge over the installed spillway on reaching discharge level.
- These practices maximised the opportunity for water treatment prior to discharge.
- All discharge in 2020 from LDP001 was compliant with project approvals and licencing.
- Discharge water quality results from LDP001 through the period are summarised in Table H- 3.

Table H- 3: LDP001 Water Quality Summary

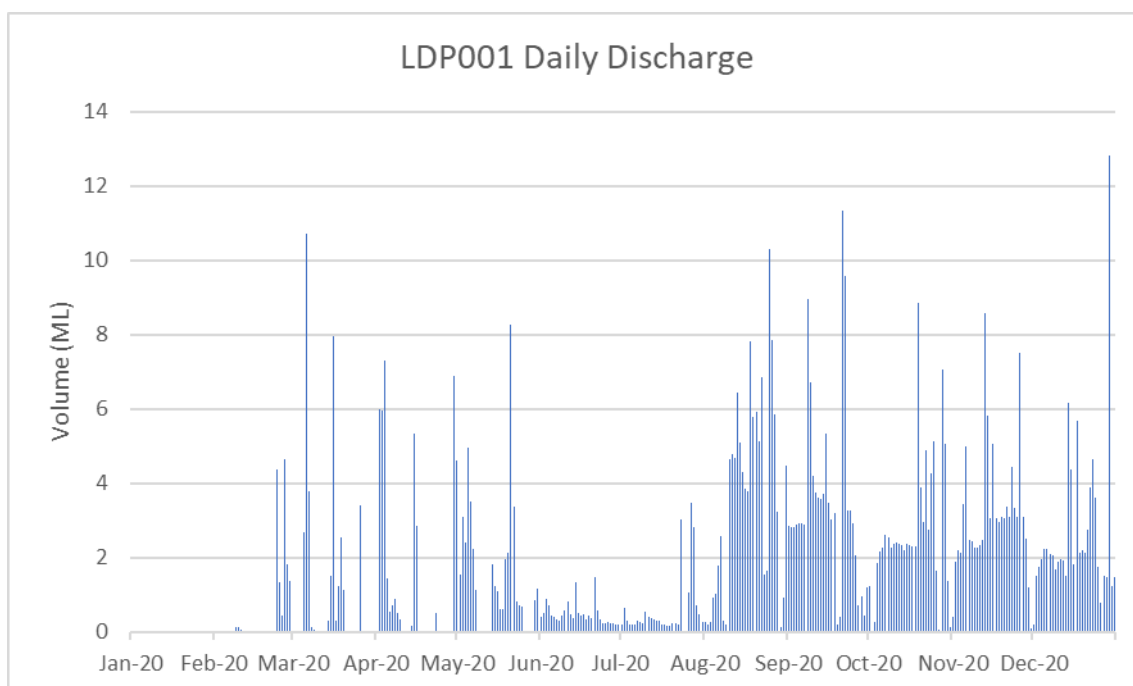
Parameter	Unit of Measure	No. of samples required by the licence	No. of samples collected	Lowest sample value	Mean of sample	Highest sample value	EPL limit
pH	pH units	11	11	6.50	6.99	7.30	6.5-8.5
TSS	mg/L	11	11	<5	4.45*	18.00	30
EC	µS/cm	11	11	3,210	4,249	5,490	-
Oil & Grease	mg/L	11	11	<5	<5	<5	10
Turbidity	NTU	11	11	5.80	11.42	26.00	50
Dissolved Iron	mg/L	11	11	<0.05	0.51*	1.82	-
Dissolved Manganese	mg/L	11	11	2.05	4.32	8.11	-
Dissolved Nickel	mg/L	11	11	0.22	0.35	0.55	-
Dissolved Zinc	mg/L	11	11	0.07	0.16	0.27	-

* For averaging purposes, when a sample result is reported below the laboratory limit of reporting (LOR), half the LOR value is used for the result where 50% of the total samples are less than the LOR. Otherwise the result is reported as zero.

The LDP001 flow summary for the 2020 reporting period is presented in Table H- 4 and Figure H- 1.

Table H- 4: LDP001 2020 Flows

Unit of Measure	Frequency	No. of measurements made	Lowest daily volume	Mean daily volume	Highest daily volume	Total annual volume
Megalitres (ML)	Daily during any discharge	366	0	1.78	12.87	652.49

**Figure H- 1: 2020 LDP001 flow summary**

Water Quality Data Representation and Analysis

- Water quality data for LDP001 in 2020 is presented graphically to show compliance with licence limits.
- The results for pH (Figure H- 2), total suspended solids (Figure H- 3), electrical conductivity (Figure H- 4), oil and grease (Figure H- 5), turbidity (Figure H- 6), dissolved iron (Figure H- 7), dissolved manganese (Figure H- 8), dissolved nickel (Figure H- 9) and dissolved zinc (Figure H- 10) were compliant with EPL limits during the 2020 reporting period.

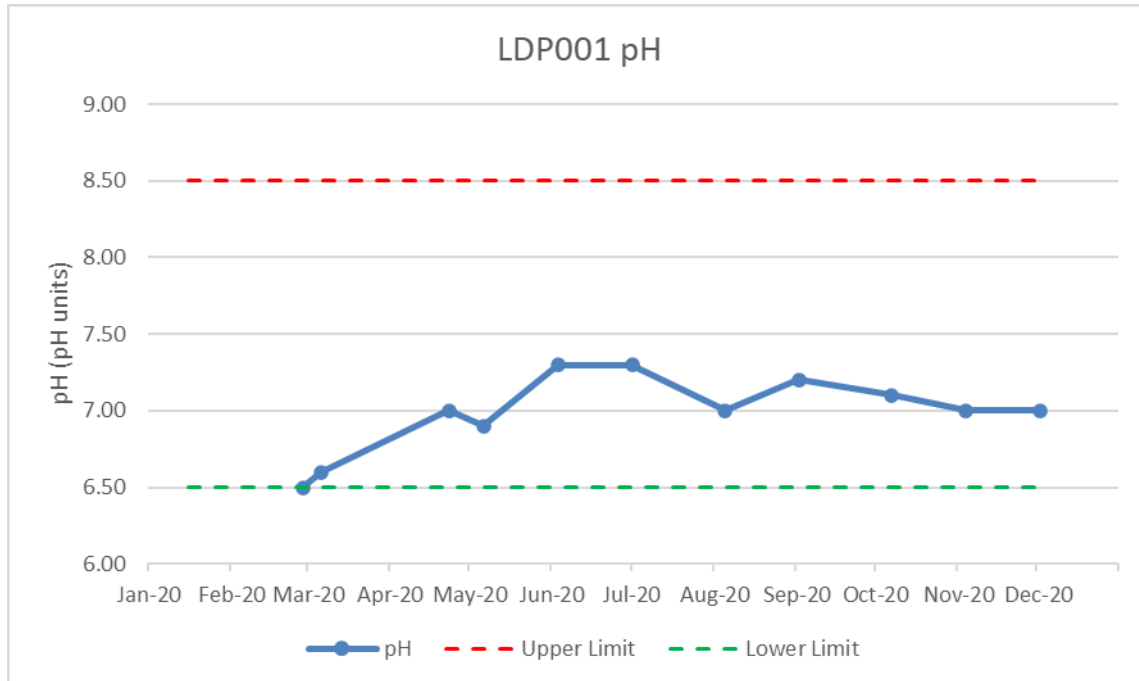


Figure H- 2: 2020 LDP001 pH

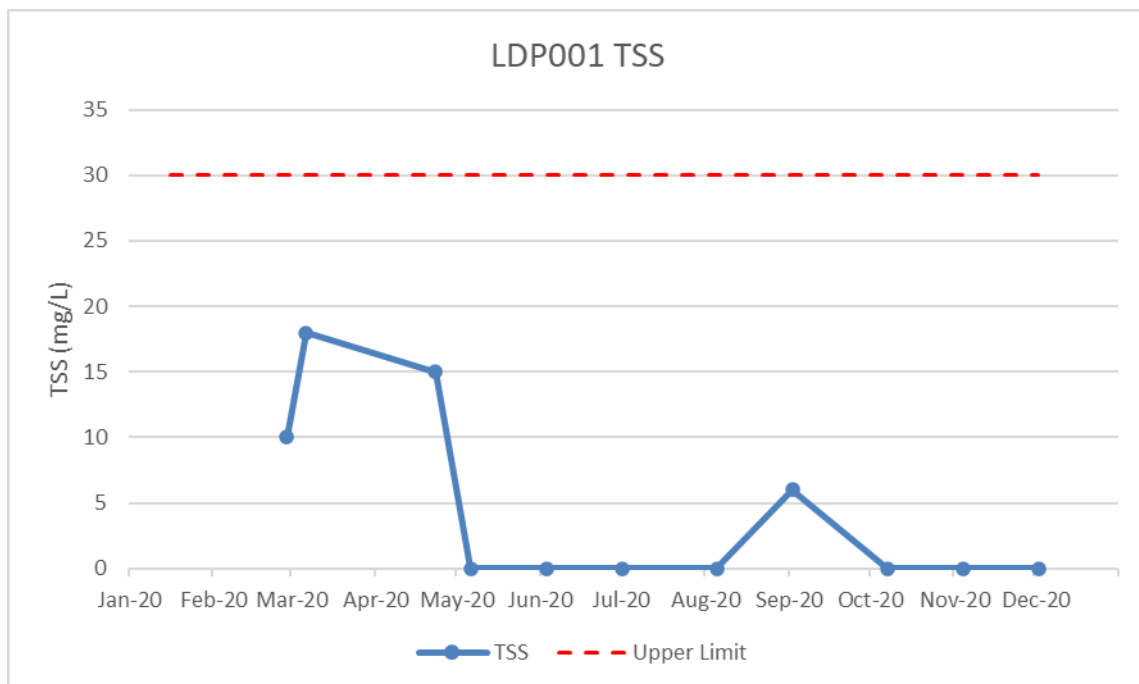


Figure H- 3: 2020 LDP001 Total Suspended Solids

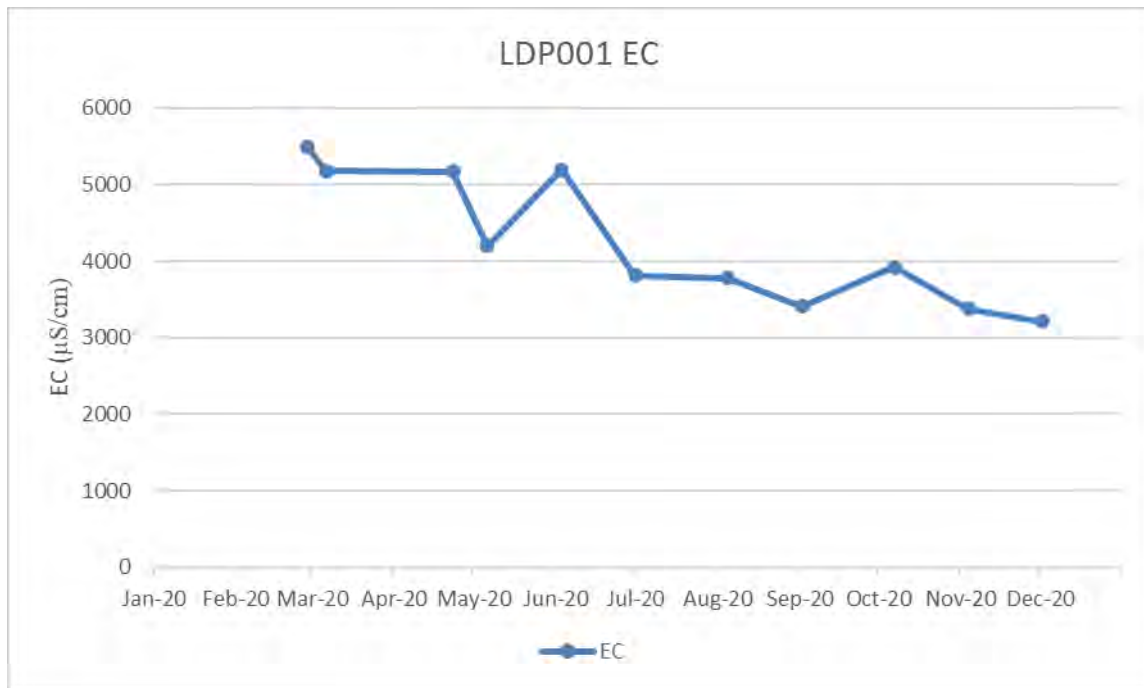


Figure H- 4: 2020 LDP001 Electrical Conductivity

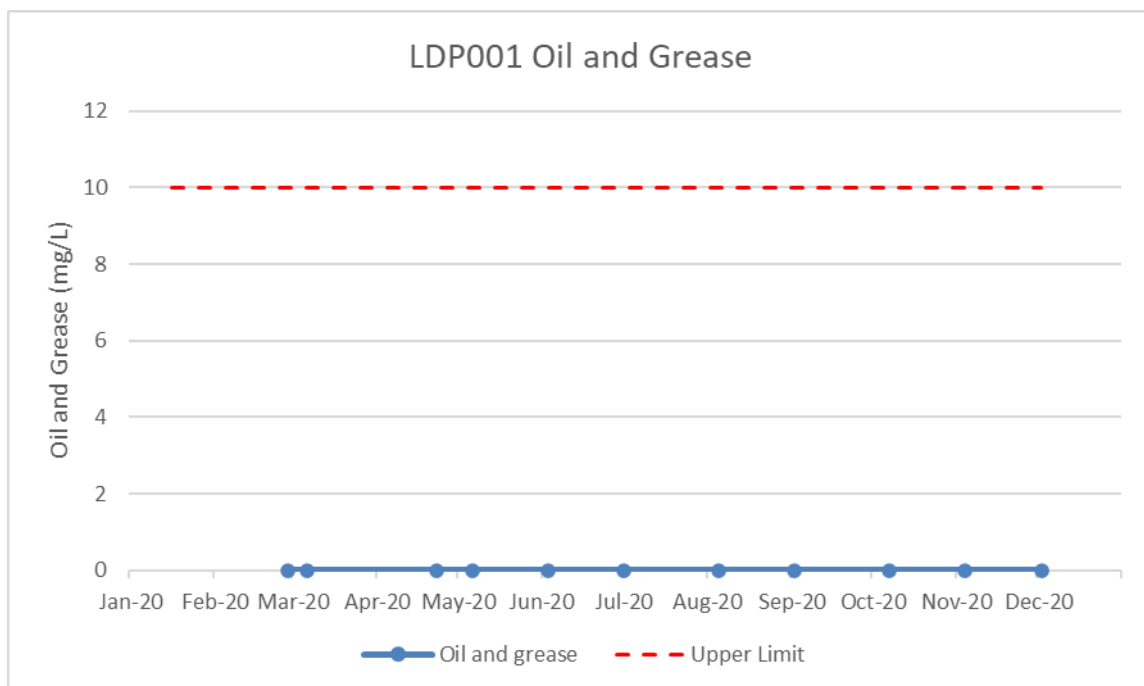


Figure H- 5: 2020 LDP001 Oil and Grease

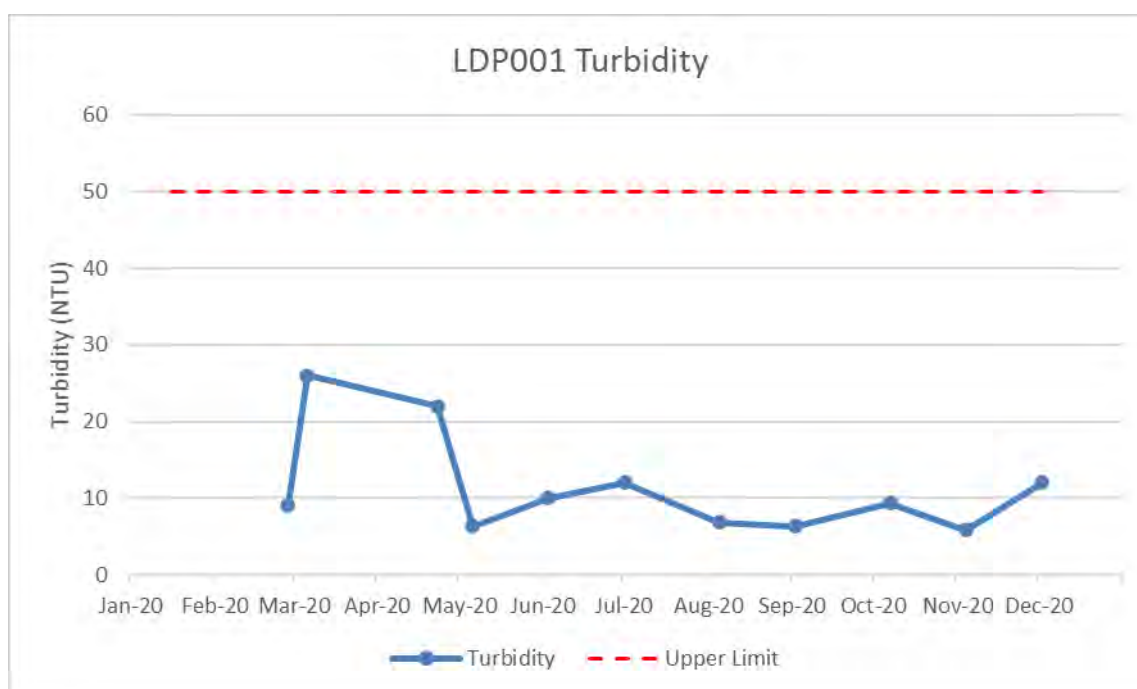


Figure H- 6: 2020 LDP001 Turbidity

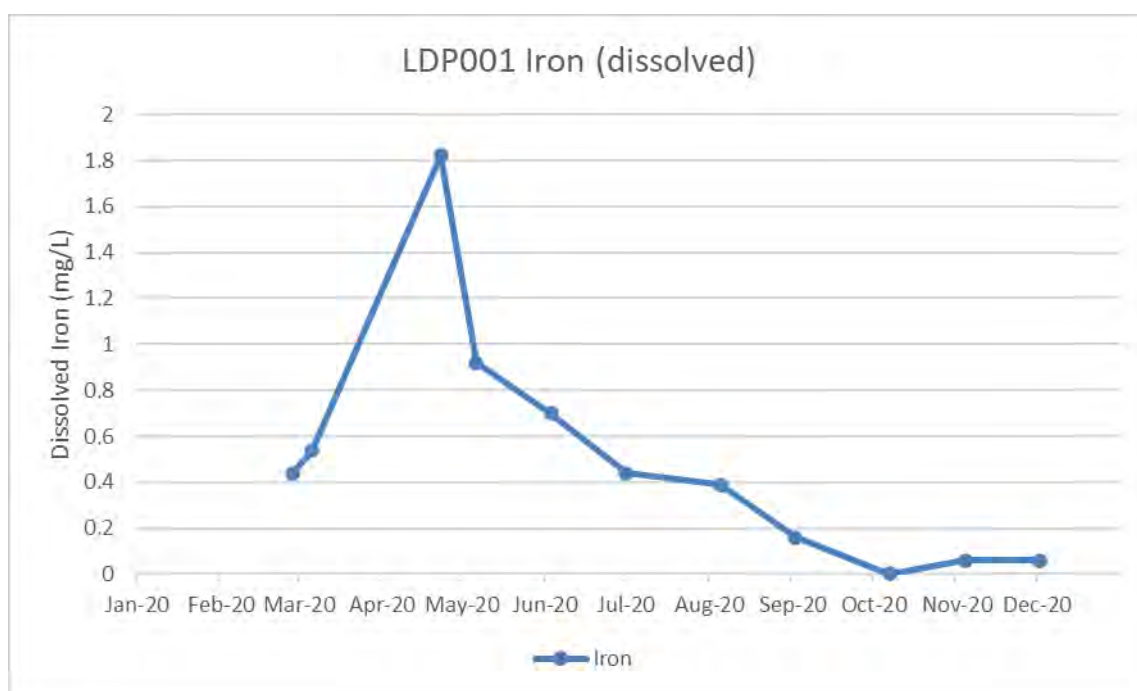


Figure H- 7: 2020 LDP001 Dissolved Iron

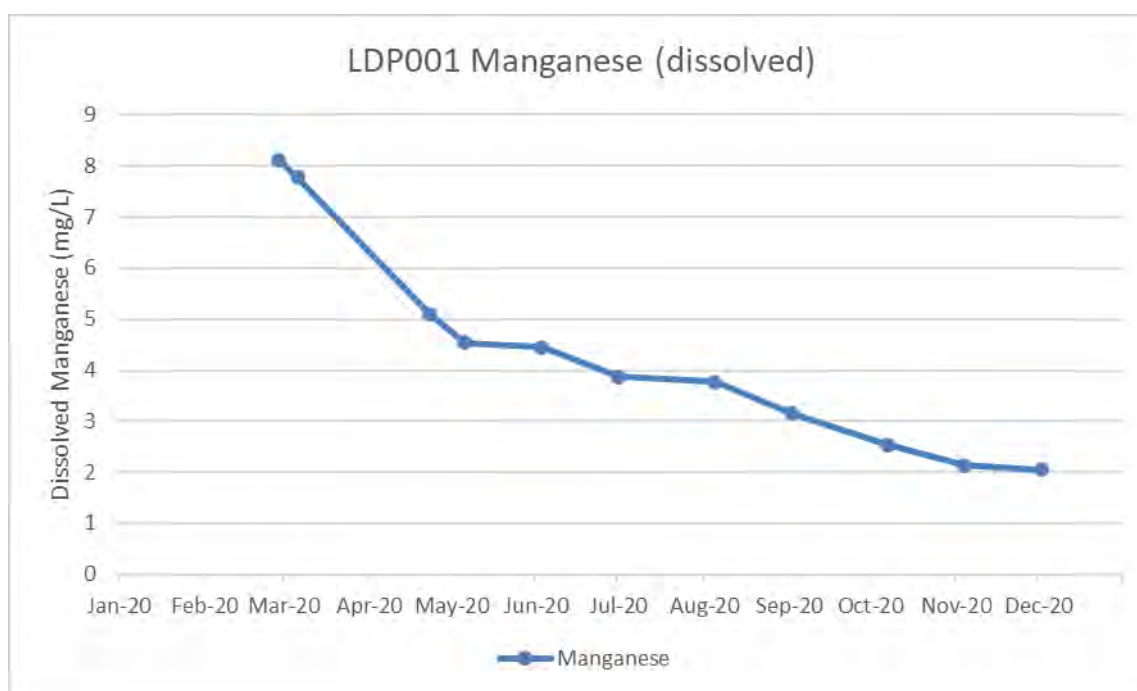


Figure H- 8: 2020 LDP001 Dissolved Manganese

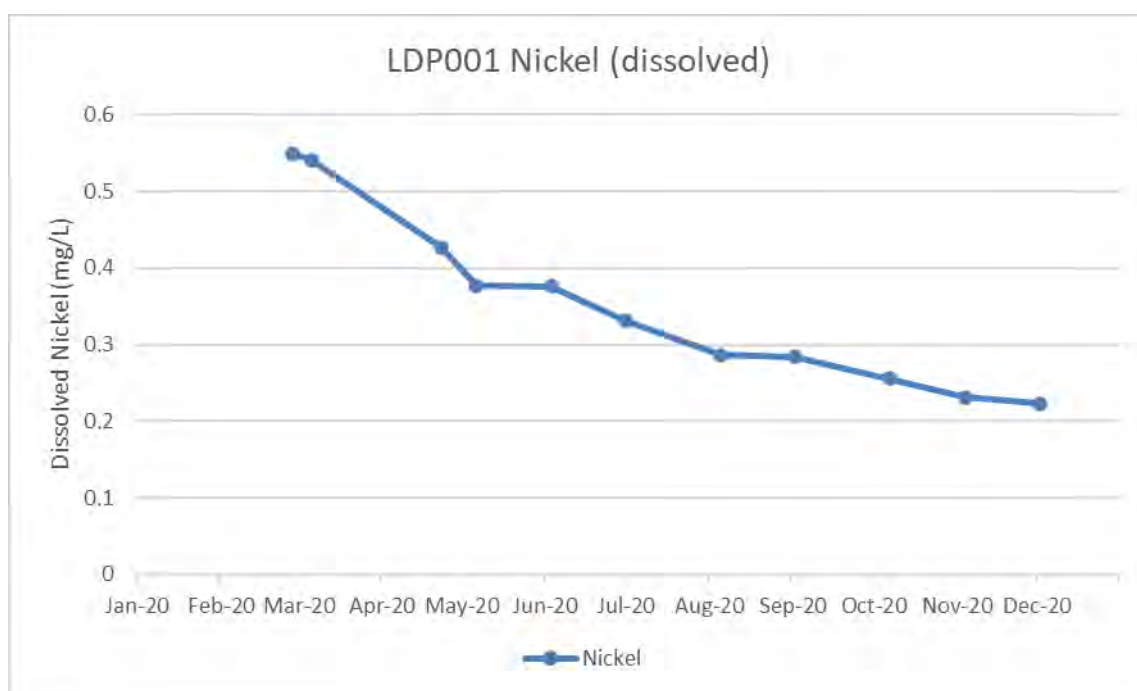


Figure H- 9: 2020 LDP001 Dissolved Nickel

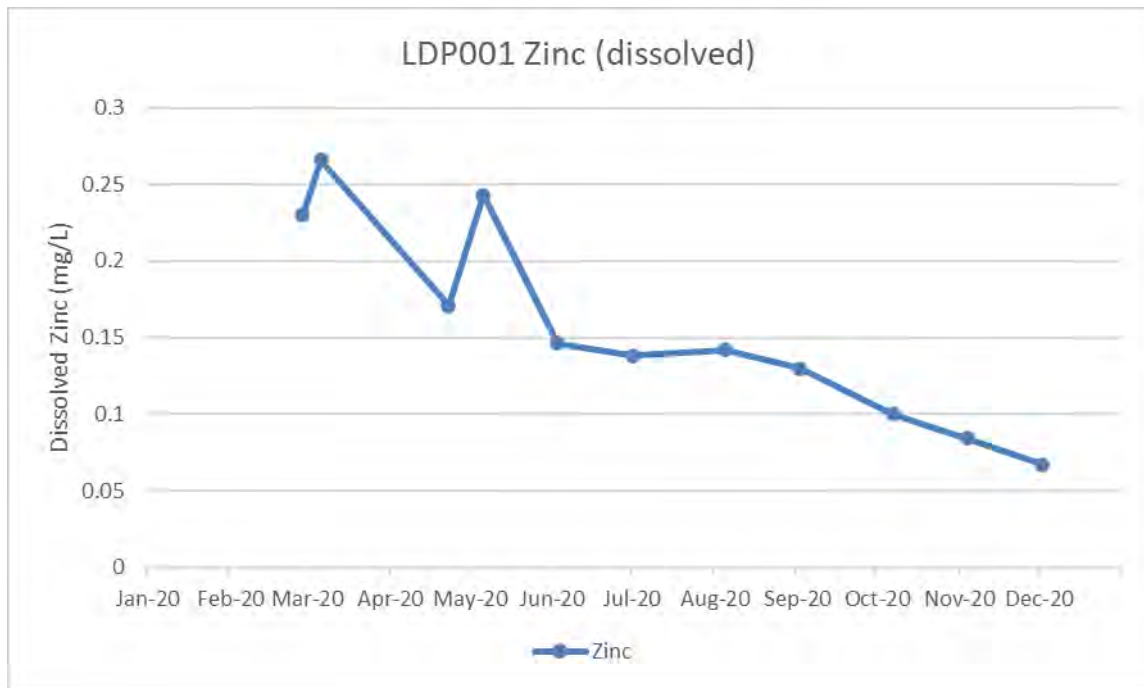


Figure H- 10: 2020 LDP001 Dissolved Zinc

Figure H- 11 to Figure H- 17 show historical results for pH, total suspended solids, electrical conductivity, oil and grease, turbidity, dissolved iron, dissolved manganese, dissolved nickel and dissolved zinc. Trends are discussed following the graphs. Data graphed is reflective of a site discharge event.

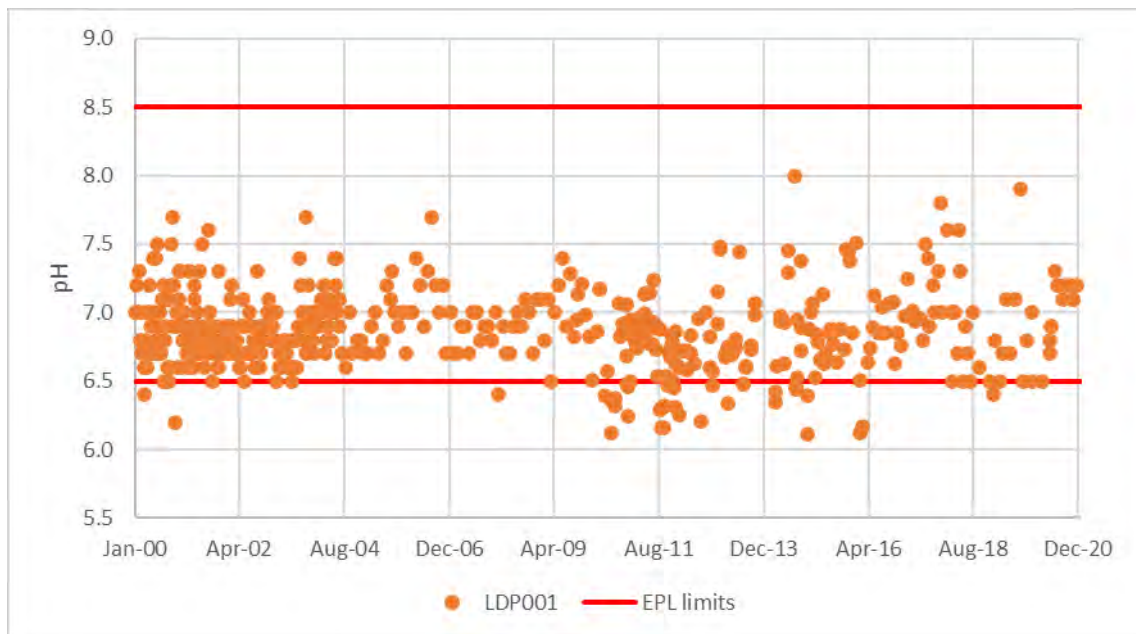


Figure H- 11: Historical LDP001 pH

pH concentrations have remained within the pH neutral range over the reporting period and remain consistent with historical bounds.

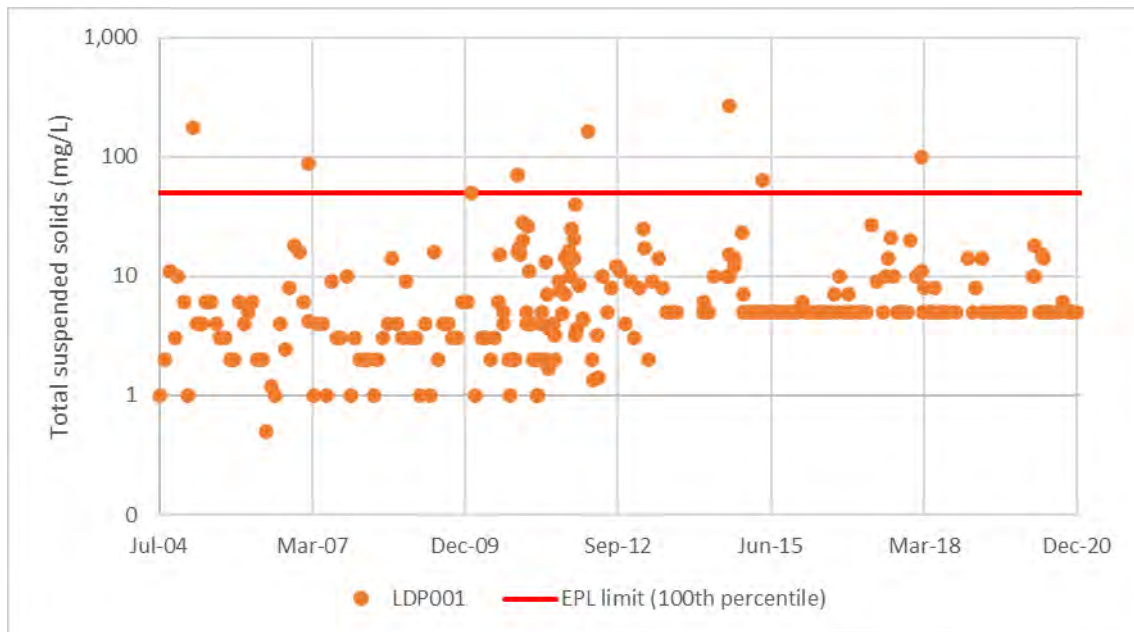


Figure H- 12: Historical LDP001 Total Suspended Solids

TSS concentrations have remained low and less than the EPL 21229 concentration limits over the reporting period.

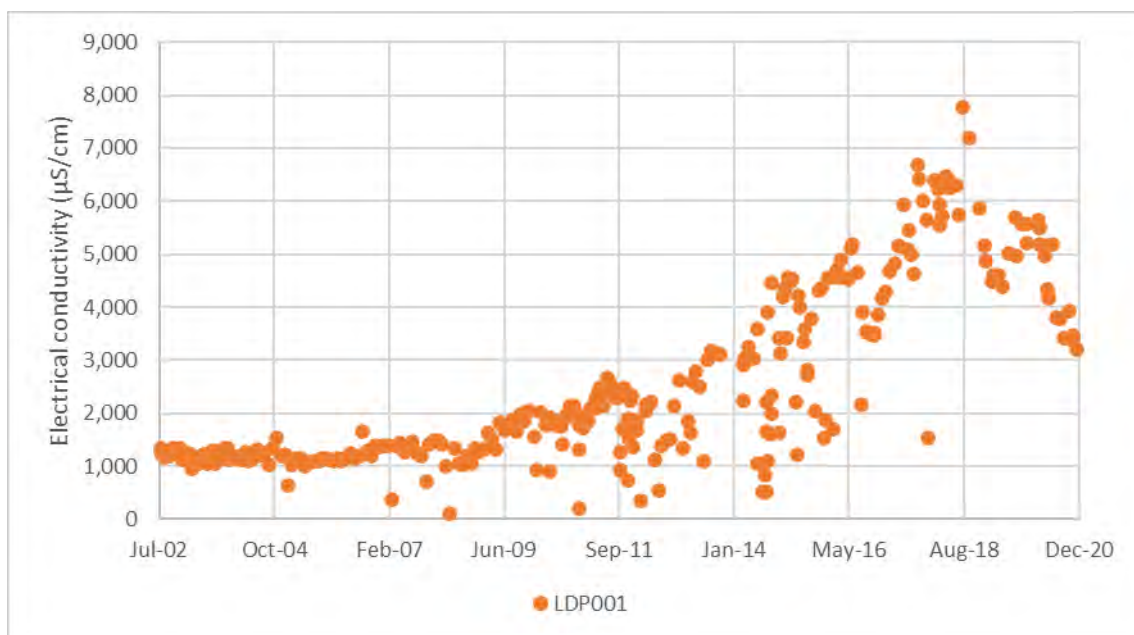


Figure H- 13 : Historical LDP001 Electrical Conductivity

EC has decreased significantly over the reporting period from historical highs recorded in 2019.

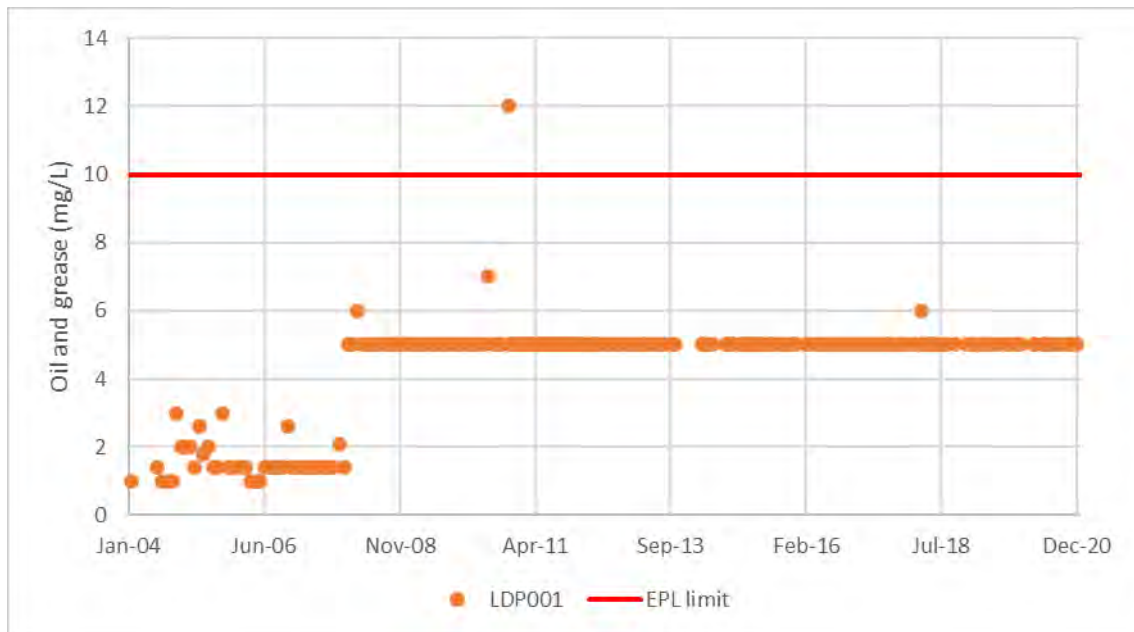


Figure H- 14: Historical LDP001 Oil and Grease

Oil and grease results are consistently below the laboratory limit of reporting of 5 mg/L and continued this trend in 2020.

Results below the laboratory limit of reporting (<5 mg/L) are shown as the limit of reporting (5 mg/L) in Figure H- 14.

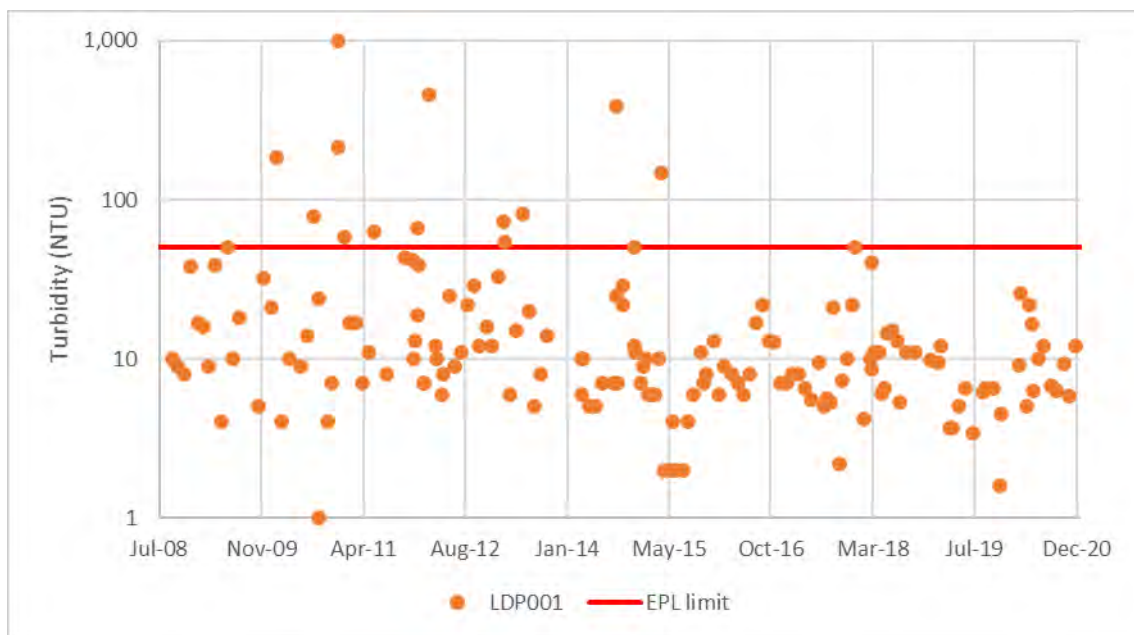


Figure H- 15: Historical LDP001 Turbidity

TSS concentrations remained low and below the EPL 21229 water quality concentration limits in 2020. Historical spikes are associated with rainfall events that increase surface water flows and hence sedimentation in the Lamberts Gully catchment.

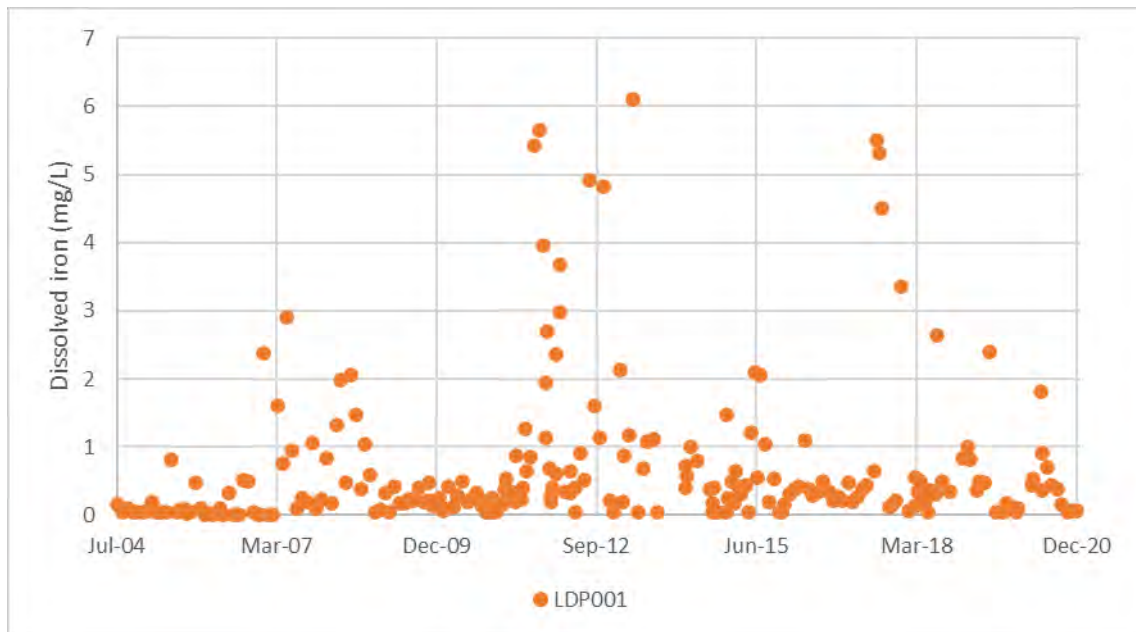


Figure H- 16: Historical LDP001 Dissolved Iron

Dissolved iron results are historically variable. More recent results are typically less than 1 mg/L and have a general decreasing trend over the reporting period.

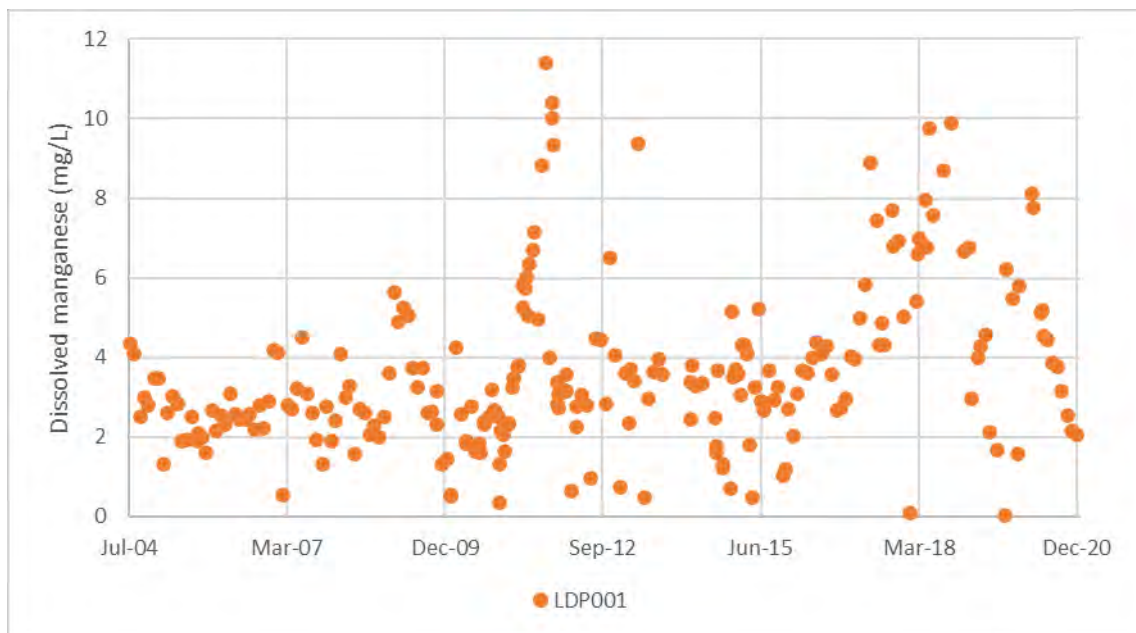


Figure H- 17: Historical LDP001 Dissolved Manganese

Dissolved manganese results are historically variable with a decreasing trend shown in 2020.

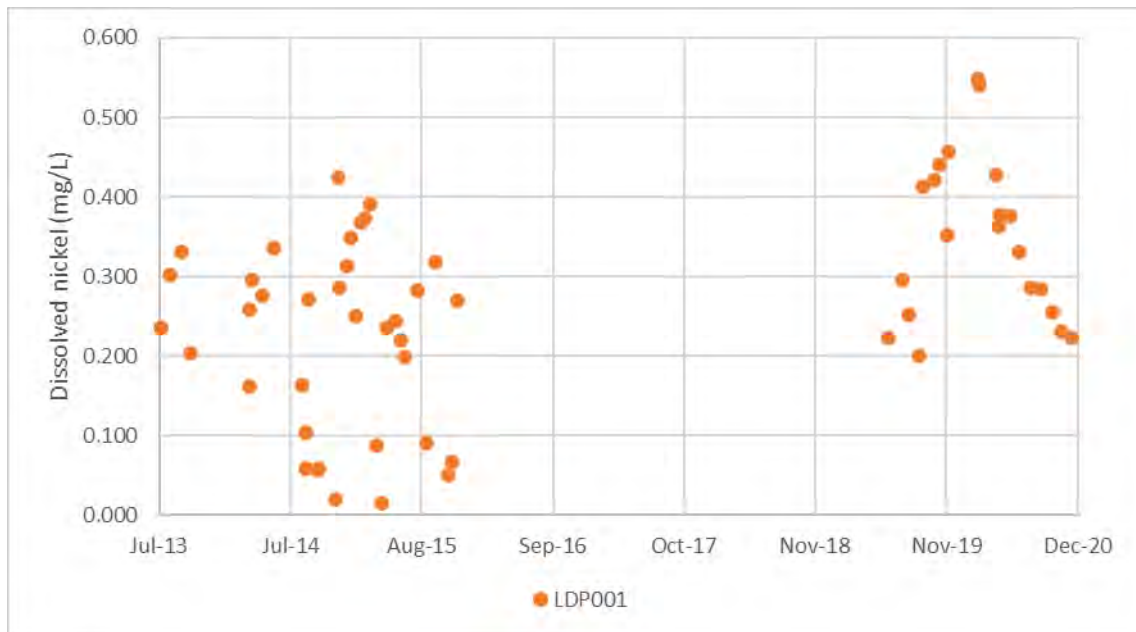


Figure H- 18: Historical LDP001 Dissolved Nickel

Historical dissolved nickel concentrations are available pre-2016 and testing was re-introduced in mid-2019 due to the requirements of EPL 21229. Results decrease over the reporting period and show a consistent trend.

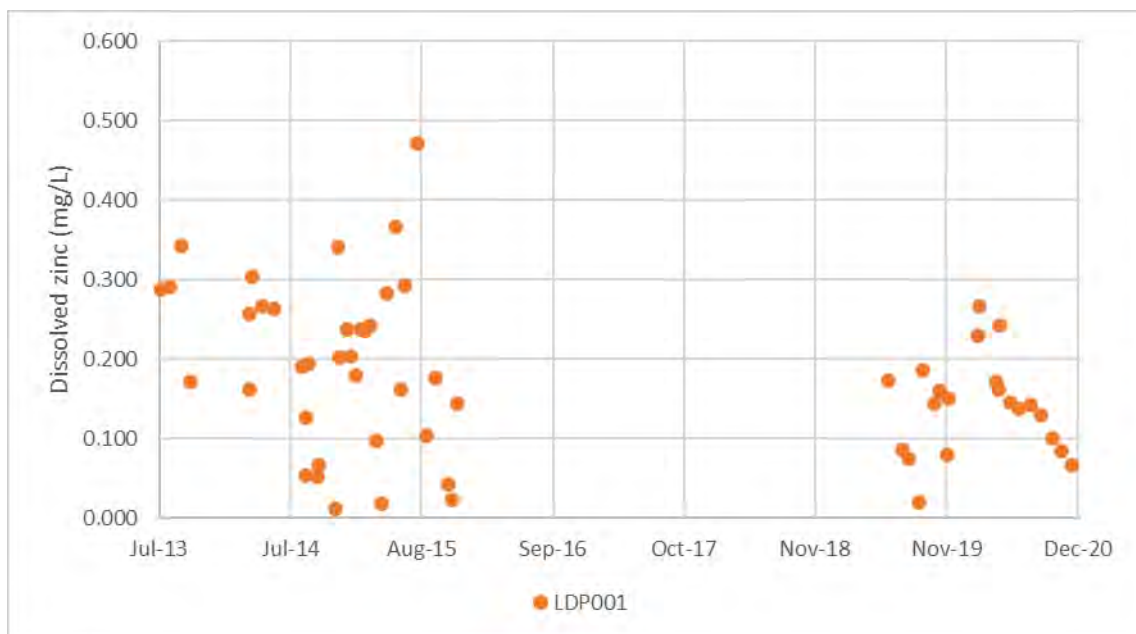


Figure H- 19: Historical LDP001 Dissolved Zinc

Historical dissolved zinc concentrations are available pre-2016 and testing was re-introduced in mid-2019 due to the requirements of EPL 21229. Results decrease over the reporting period and show a consistent trend.

Surface Water

Surface water is monitored at a number of on-site water storages and off-site receiving waters at WCS.

Monitoring locations are listed in Table H- 5 and shown in Appendix A.

A full suite of results and analysis can be found in the revised WCS WMP which can be provided to DPIE upon request.

Table H- 5 : Surface water monitoring locations

Location	Description
Cooks Dam	On site water storage. Receives dirty water surface inflows from the SCSS and groundwater inflow from historical mining voids on both the SCSS and MPPS sites. Discharges to LDP001.
Final Polishing Lagoon (Formerly – Retention Pond)	On site water storage. Receives clean water from the clean water diversion system. Discharges to the Clean Water Diversion discharge point (CWD).
Main Sediment Dam	On site water storage. Receives clean water from the REA rehabilitation areas and upstream Lamberts Gully sediment ponds. Discharges to the clean water diversion.
Stockpile Sediment Pond	On site water storage. Receives dirty water runoff from the SP02 product coal stockpile. Discharges to the dirty water diversion system.
Washery Sediment Pond	On site water storage. Receives dirty water from the CHPP and surrounding operational areas. Discharges to the dirty water diversion system.
Collection Pond	Small weir pool immediately upstream of LDP001. Receives water from Cooks Dam overflows prior to site discharge through LDP001.
Wangcol Creek Gauge	Wangcol Creek approximately 600 m upstream of LDP001 discharge from the SCSS.
Wangcol Creek U/S	Wangcol Creek immediately upstream of LDP001 discharge from the SCSS.
Wangcol Creek D/S	Wangcol Creek immediately downstream of LDP001 discharge from the SCSS.
Wangcol Creek Far D/S	Wangcol Creek approximately 1 km upstream of the confluence with the Coxs River.
SWTP Residuals	Springvale Water Treatment Plant residuals stream to WCS REA.
REA Decant	Water decanted from WCS REA to A-Pit.

SSGV Assessment

Site Specific Guidelines Values (SSGVs) have been derived in the WCS WMP from water quality data results at a location, SW1 (upstream of the LDP001 discharge point on Wangcol Creek) and upon comparison with recommended ANZECC (2000) Default Guideline Values (DGVs). Surface water SSGVs apply to the Wangcol Creek Far DS monitoring location.

Table H- 6 provides the recommended SSGVs used in this analysis.

Table H- 6: WCS Recommended SSGVs

Parameter	Units	DGV (ANZECC 2000)	SW1 80th percentile	Recommended SSGV
Physicochemical				
pH	pH units	6.5–9.0	6.4 ^a –7.1	6.5–9.0
TSS	mg/L	25	12	25
Turbidity	NTU	25	35	35
Nutrients				
Ammonia	mg/L	0.04	0.03	0.04
Total nitrogen	mg/L	0.2	0.5	0.5
Total phosphorus	mg/L	0.02	0.08	0.08
Dissolved metals				
Aluminium	mg/L	0.055	0.24	0.24
Boron	mg/L	0.37	0.05 ^c	0.37
Cadmium	mg/L	0.0026 ^b	0.0001 ^c	0.0026
Iron	mg/L	0.3	0.31	0.31
Manganese	mg/L	1.9	0.150	1.9
Nickel	mg/L	0.125 ^b	0.003	0.125
Selenium	mg/L	0.011	–	0.011
Zinc	mg/L	0.091 ^b	0.032	0.091

^a 20th percentile value.

^b Guideline value modified for hardness.

^c Limit of reporting

The following sections go through surface water monitoring points by category and identify the SSGV exceedance (trigger event) with the possible cause and management action as per the Trigger Action Response Plan (TARP) in the WCS WMP.

Wangcol Creek

Table H- 7 shows the trigger events for each parameter for Wangcol Creek Far DS with the potential reasoning.

Table H- 7: Wangcol Creek Far DS Trigger Events

Parameter	Occurrence (SSGV)	Investigation
Wangcol Creek Far DS		
pH (pH units)	February: 6.3 (6.5 – 9.0)	pH measured upstream at Wangcol Creek Gauge (5.9) and Wangcol Creek US (6.1) were more acidic than that at Wangcol Creek Far DS. Therefore, the low pH is likely caused by upstream of WCS factors.
Ammonia (mg/L)	May: 0.08 (0.04 mg/L)	Ammonia measured upstream at Wangcol Creek Gauge (0.8) had an elevated concentration of Ammonia equal to that at Wangcol Creek Far D/S. Therefore, the elevated Ammonia is likely caused by factors upstream of WCS.
	June: 0.05 mg/L (0.04 mg/L)	Ammonia values did not exceed the trigger value at any upstream location though the Wangcol Creek DS result of <0.01 mg/L suggests that the cause of the elevated result may be from influence downstream of WCS operations.
Total Nitrogen (mg/L)	September: 0.6 mg/L (0.5 mg/L)	Total nitrogen concentrations measured at all Wangcol Creek surface water monitoring locations were 0.6 mg/L. The elevated total nitrogen concentrations are attributed to either upstream source factors or naturally elevated levels influenced by surrounding environmental conditions.
Total Phosphorus (mg/L)	June: 0.14 mg/L (0.08 mg/L)	Phosphorus values did not exceed the trigger value at any upstream location though the Wangcol Creek DS result of <0.01 mg/L suggests that the cause of the elevated result may be from influence downstream of WCS operations.
Boron (mg/L)	February: 0.5 mg/L (0.37 mg/L)	Boron values did not exceed the trigger value at any upstream location suggesting that the cause of the elevated result may potentially have been influenced by WCS.

Parameter	Occurrence (SSGV)	Investigation
	March: 0.42 mg/L (0.37 mg/L)	Boron values exceeded the trigger value at upstream location Wangcol Creek US (1.16 mg/L) suggesting that the cause of the elevated result was not solely from WCS operations.
	May: 0.95 mg/L (0.37 mg/L)	Dissolved boron measured upstream at Wangcol Creek US (1.04 mg/L) had an elevated concentration of dissolved boron greater than Wangcol Creek Far D/S. Therefore, the elevated dissolved boron is likely caused by factors upstream of WCS.
	June: 0.94 mg/L (0.37 mg/L)	Dissolved boron values did not exceed the trigger value at any upstream location suggesting that the cause of the elevated result may potentially have been influenced by WCS.
	July: 1.1 mg/L (0.37 mg/L)	Dissolved boron measured upstream at Wangcol Creek US (1.16 mg/L) had an elevated concentration of dissolved boron greater than Wangcol Creek Far D/S. Therefore, the elevated dissolved boron is likely caused by factors upstream of WCS.
	October: 1.09 mg/L (0.37 mg/L)	Dissolved boron measured upstream at Wangcol Creek US (0.98 mg/L) had elevated concentrations greater than the trigger level (0.37 mg/L). Therefore, the elevated dissolved nickel is likely caused by factors upstream of WCS.
	December: 0.62 mg/L (0.37 mg/L)	Boron values did not exceed the trigger value at any upstream location suggesting that the cause of the elevated result may potentially have been influenced by WCS.
Manganese (mg/L)	March: 3.26 mg/L (1.9 mg/L)	Manganese exceeded the trigger value at upstream sampling location Wangcol Creek Gauge (8.32 mg/L) suggesting that the cause of the elevated result may have been from upstream influences.
	May 3.31 mg/L (1.9 mg/L)	Dissolved manganese measured upstream at Wangcol Creek Gauge (3.80 mg/L) had an elevated concentration of dissolved manganese greater than Wangcol Creek Far D/S.

Parameter	Occurrence (SSGV)	Investigation
		Therefore, the elevated dissolved manganese is likely caused by factors upstream of WCS.
Nickel (mg/L)	May: 0.201 mg/L (0.125 mg/L)	Dissolved nickel measured upstream at Wangcol Creek Gauge (0.203 mg/L) and Wangcol Creek US (0.204 mg/L) had elevated concentrations of dissolved nickel greater than Wangcol Creek Far D/S. Therefore, the elevated dissolved nickel is likely caused by factors upstream of WCS.
	June: 0.133 mg/L (0.125 mg/L)	Dissolved nickel values did not exceed the trigger value at any upstream location suggesting that the cause of the elevated result may potentially have been influenced by WCS.
	July: 0.136 mg/L (0.125 mg/L)	Dissolved nickel measured upstream at Wangcol Creek US (0.133 mg/L) had elevated concentrations of dissolved nickel greater than the trigger level (0.125 mg/L). Therefore, the elevated dissolved nickel is likely caused by factors upstream of WCS.
	October: 0.187 mg/L (0.125 mg/L)	Dissolved nickel measured upstream at Wangcol Creek Gauge (0.171 mg/L) and Wangcol Creek US (0.170 mg/L) also had elevated concentrations of dissolved nickel greater than the SSGV. Therefore, the elevated dissolved nickel is likely caused by factors upstream of WCS.
Zinc (mg/L)	May (0.121 mg/L) (0.125 mg/L)	Dissolved zinc measured upstream at Wangcol Creek Gauge (0.118 mg/L) and Wangcol Creek US (0.101 mg/L) had elevated concentrations of dissolved zinc greater than the SSGV. Therefore, the elevated dissolved zinc is potentially caused by factors upstream of WCS.

Onsite Surface Water Storages

Onsite surface water storages are monitored for water quality on the following frequencies for each location:

- Cooks Dam Fortnightly
- Final Polishing Lagoon Monthly¹¹
- Main Sediment Dam Quarterly
- Stockpile Sediment Pond Quarterly
- Washery Sediment Pond Quarterly
- Collection Pond Monthly
- Lamberts Gully CWD Monthly

Water quality results are presented in Figure H- 20 to Figure H- 45.

SSGVs are not applied to site surface water storages as the water in these contained and does not impact on the offsite environment.

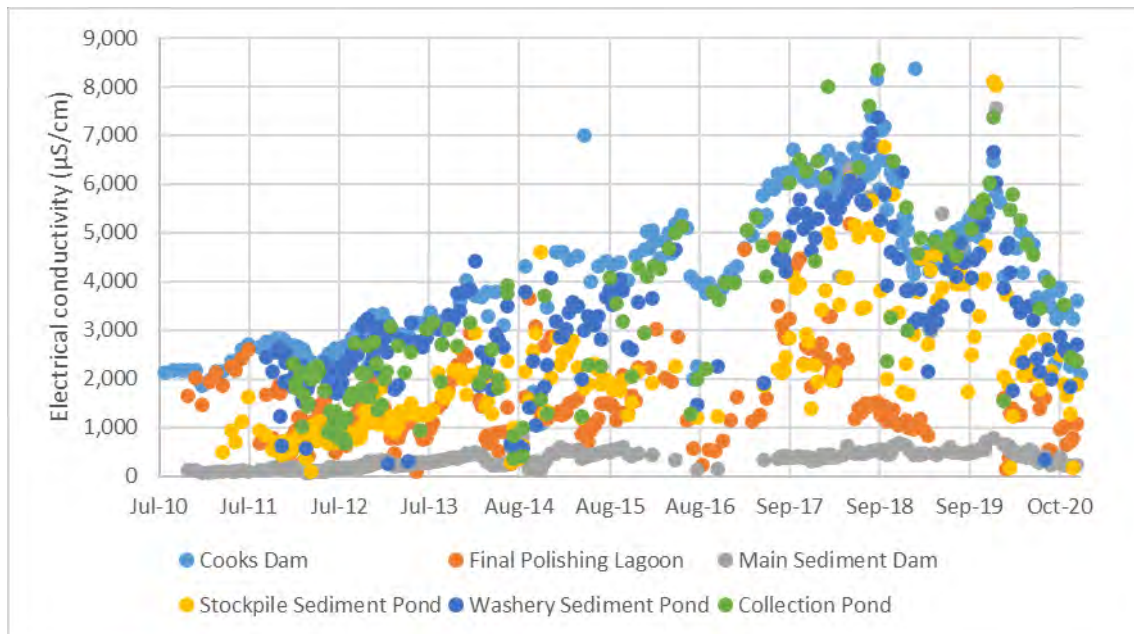


Figure H- 20: Historical Onsite Surface Water Storage EC

¹¹ Surface water sampling of Retention Pond ceased in April 2019 due to the Clean Water Diversion works taking place in Lamberts Gully. The retention pond was emptied, cleaned out in preparation for use as a final polishing lagoon for clean water discharging from site.

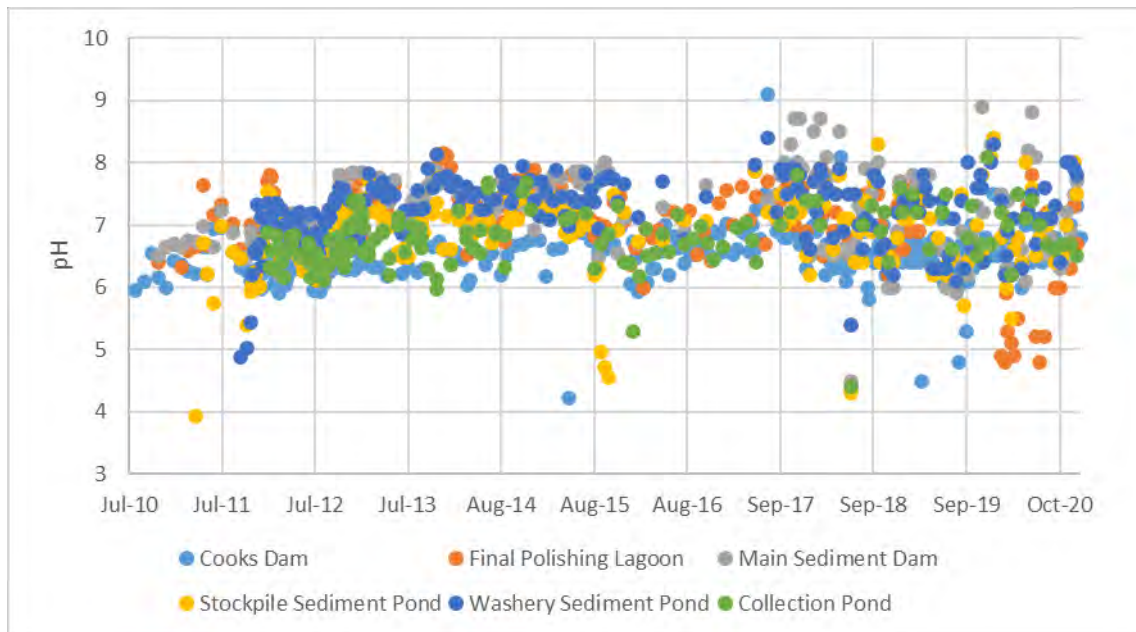


Figure H- 21: Historical Onsite Surface Water Storage pH

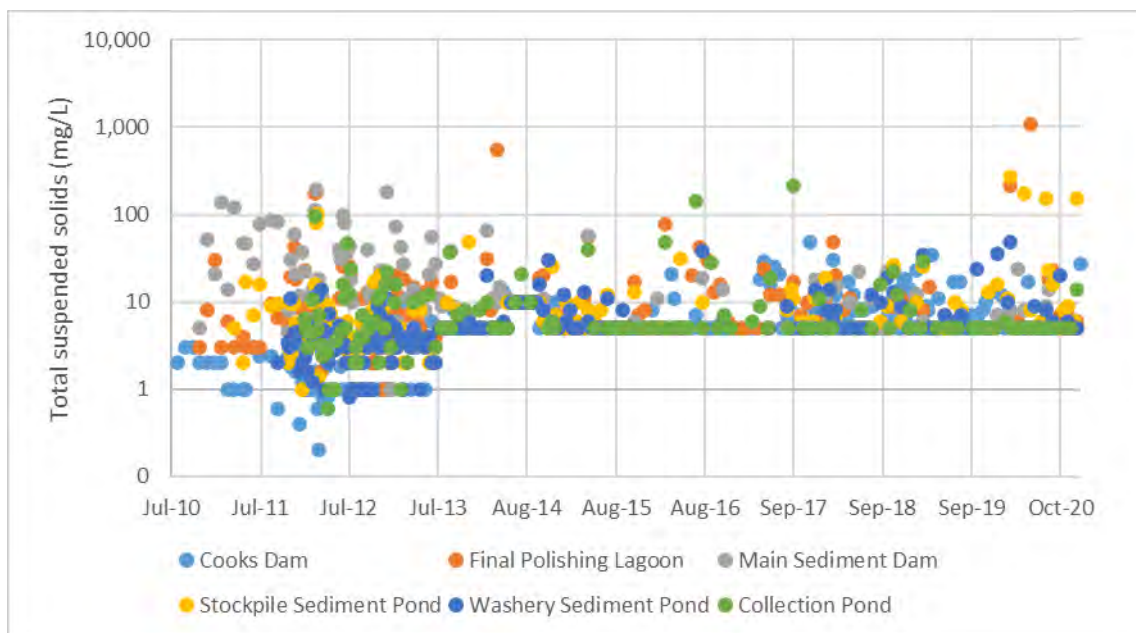


Figure H- 22: Historical Onsite Surface Water Storage TSS

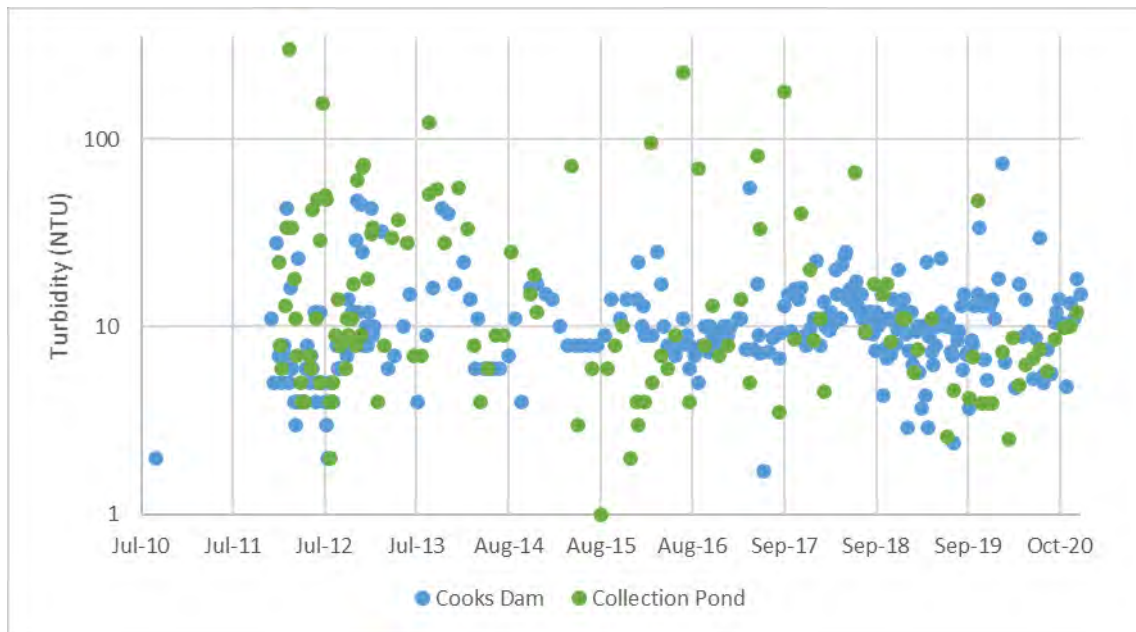


Figure H- 23: Historical Onsite Surface Water Storage Turbidity

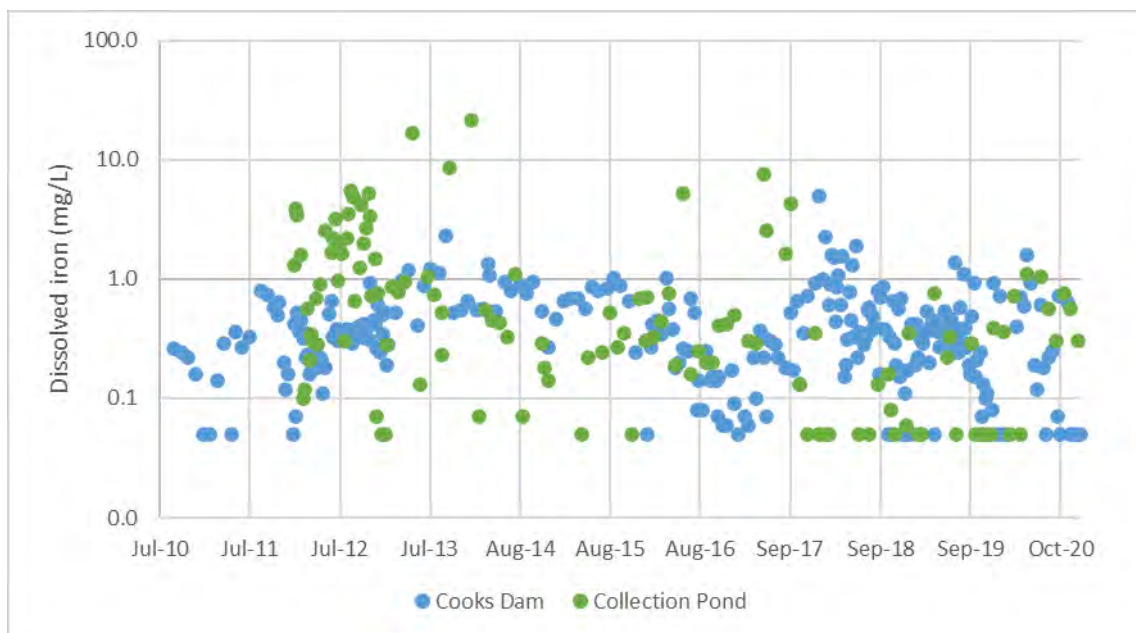


Figure H- 24: Historical Onsite Surface Water Storage Dissolved Iron

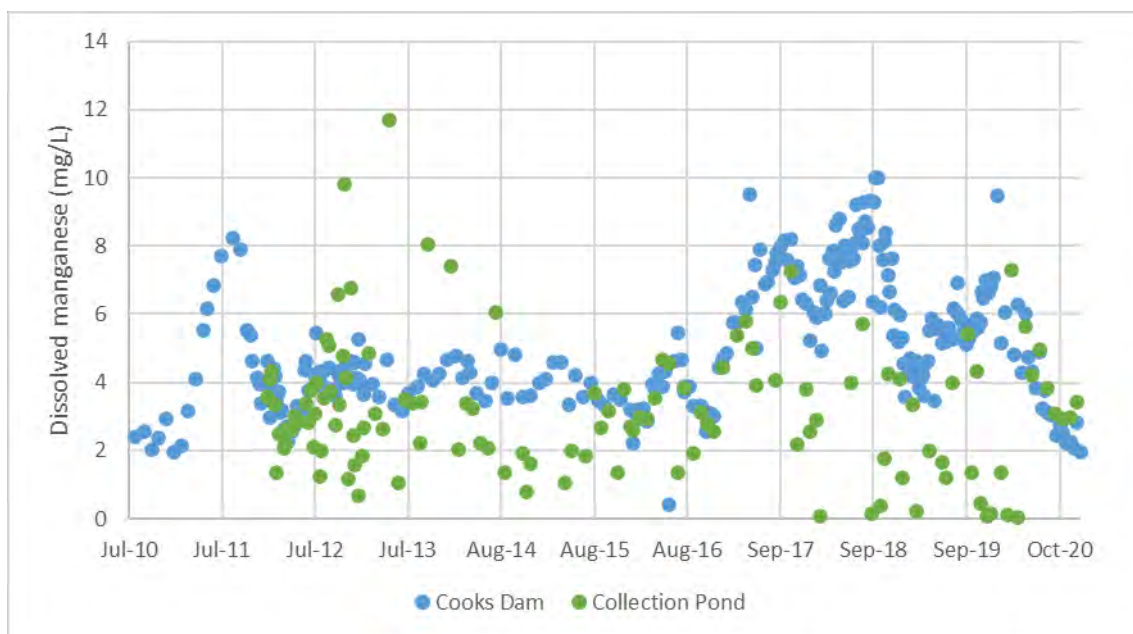


Figure H- 25: Historical Onsite Surface Water Storage Dissolved Manganese

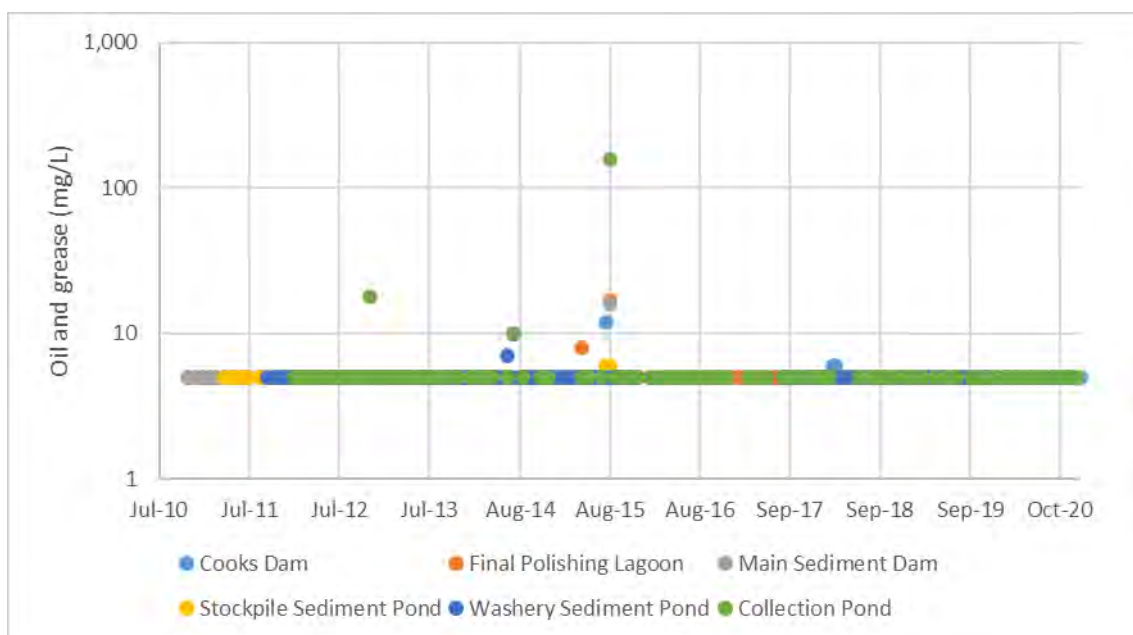


Figure H- 26: Historical Onsite Surface Water Storage Oil and Grease

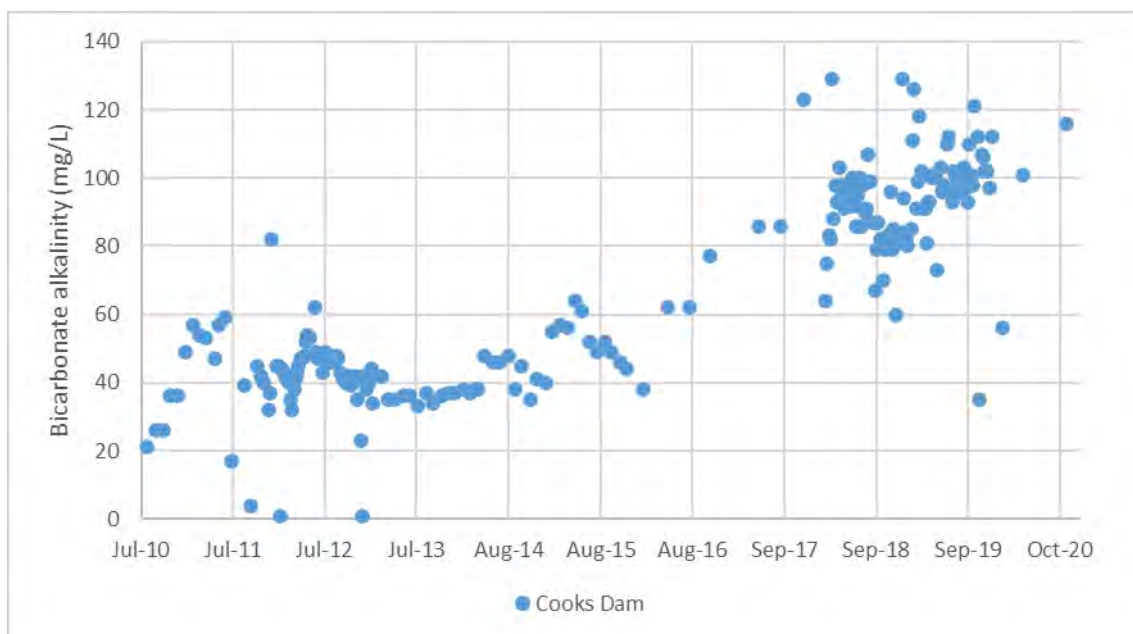


Figure H- 27: Historical Cooks Dam HCO_3^- Alkalinity

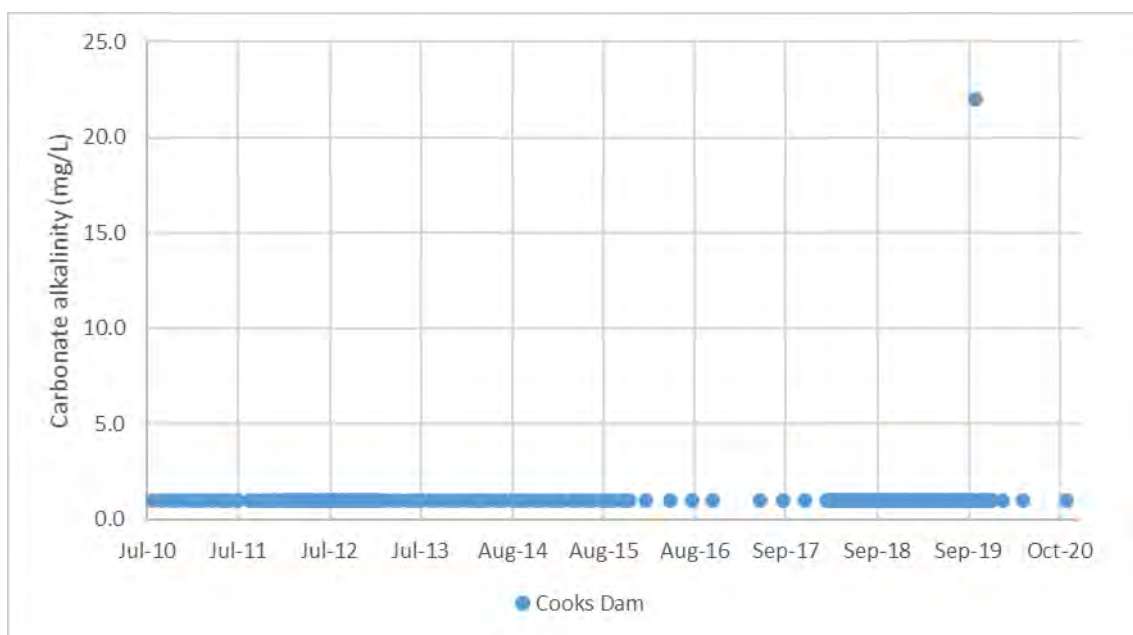


Figure H- 28: Historical Cooks Dam CO_3^{2-} Alkalinity

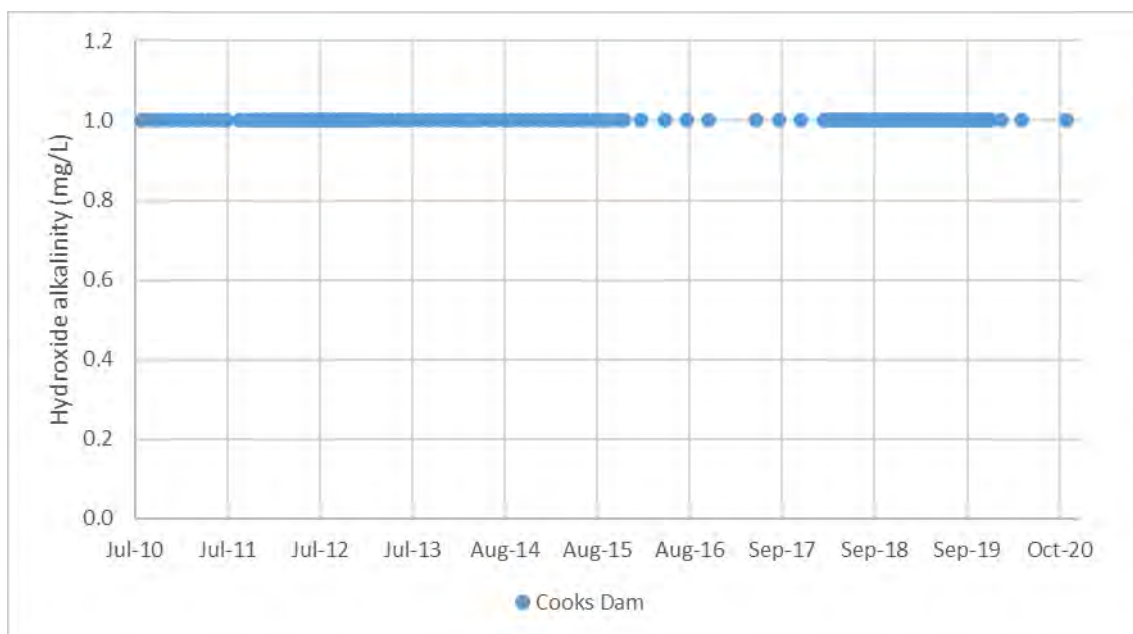


Figure H- 29: Historical Cooks Dam OH⁻ Alkalinity

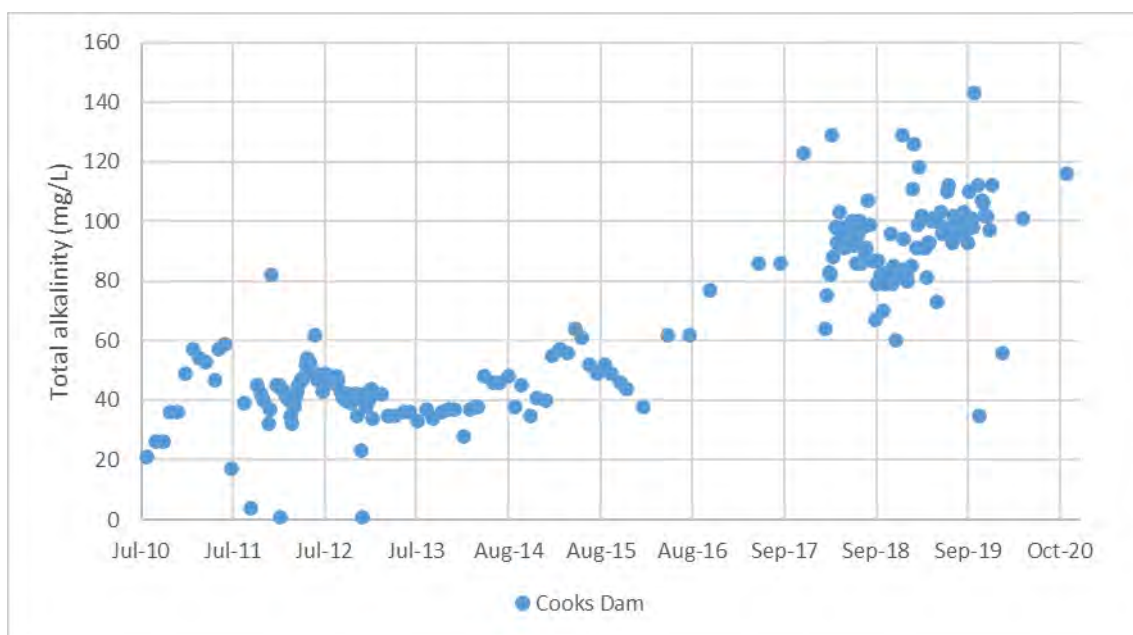


Figure H- 30: Historical Cooks Dam Total Alkalinity

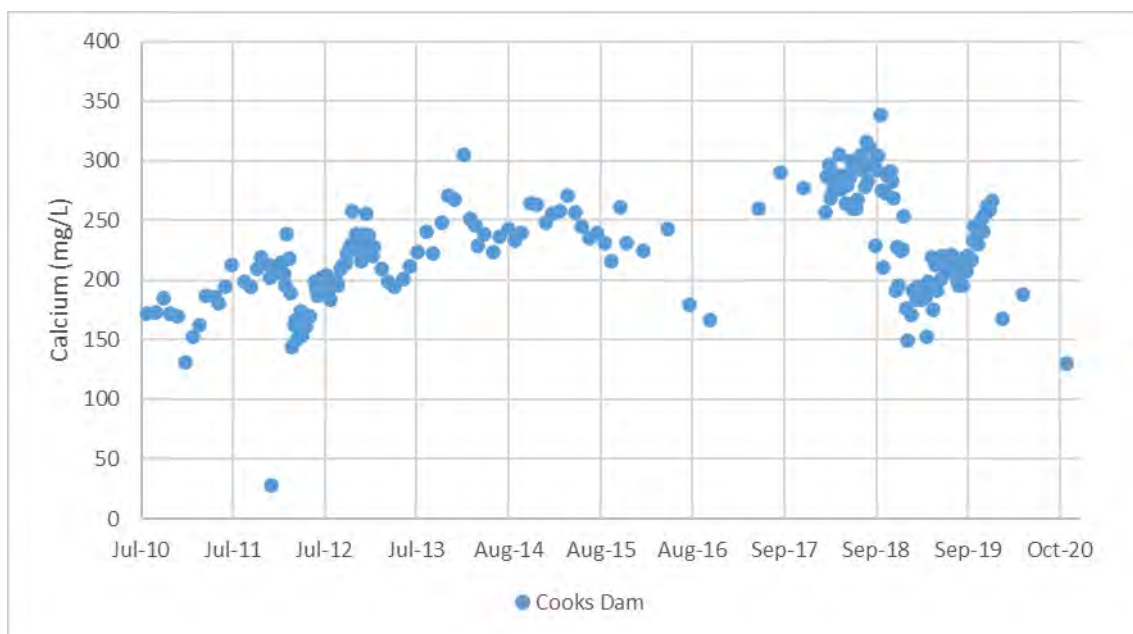


Figure H- 31: Historical Cooks Dam Calcium

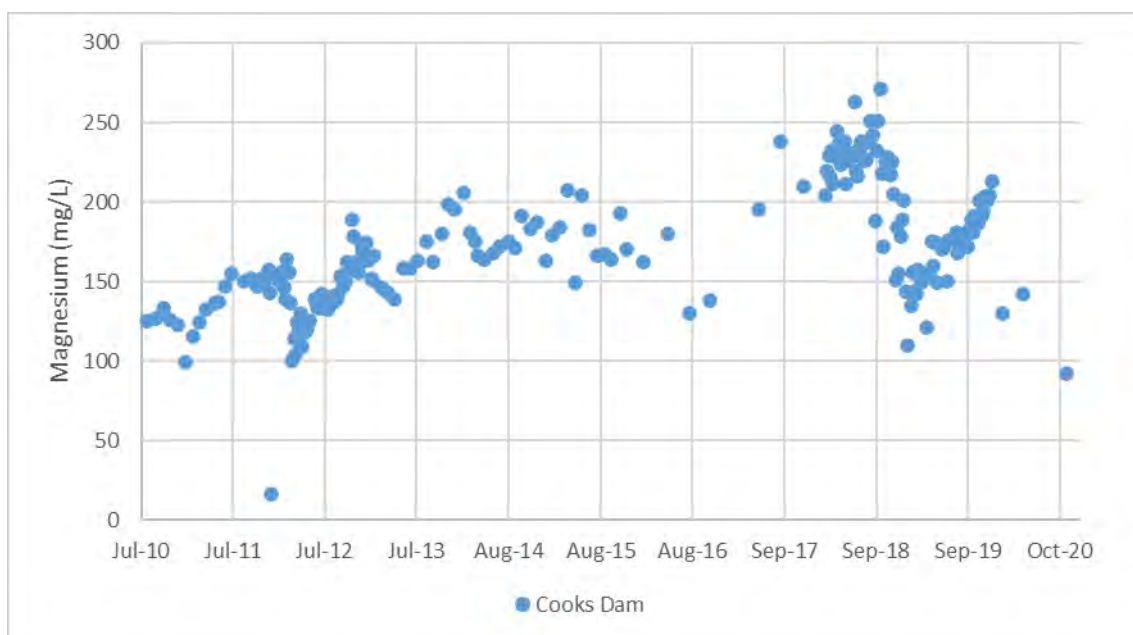


Figure H- 32: Historical Cooks Dam Magnesium

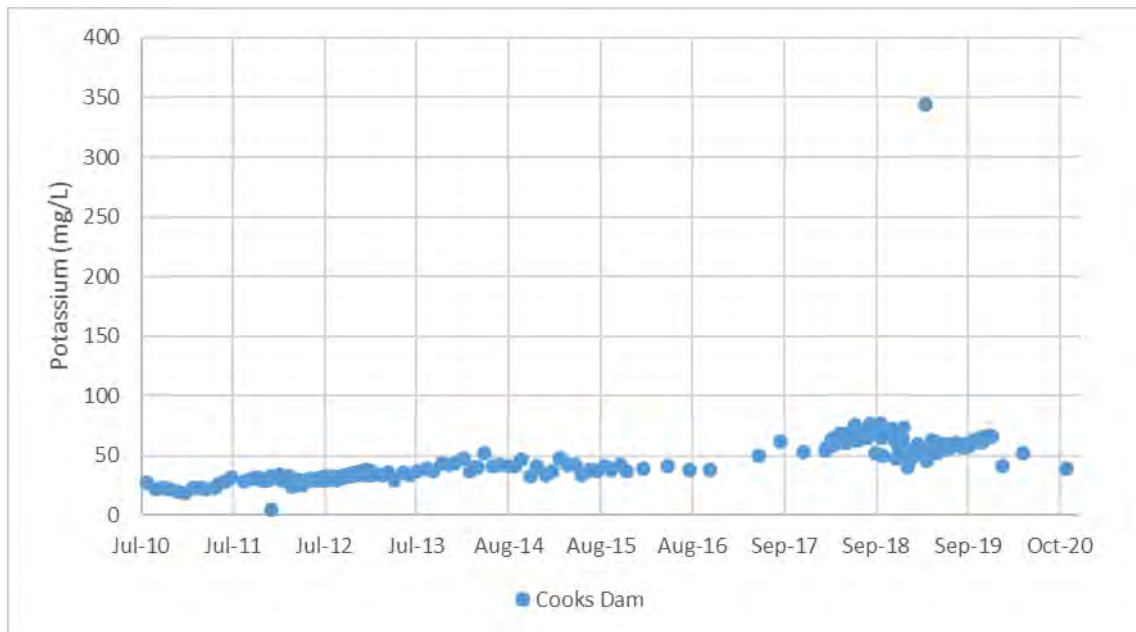


Figure H- 33: Historical Cooks Dam Potassium

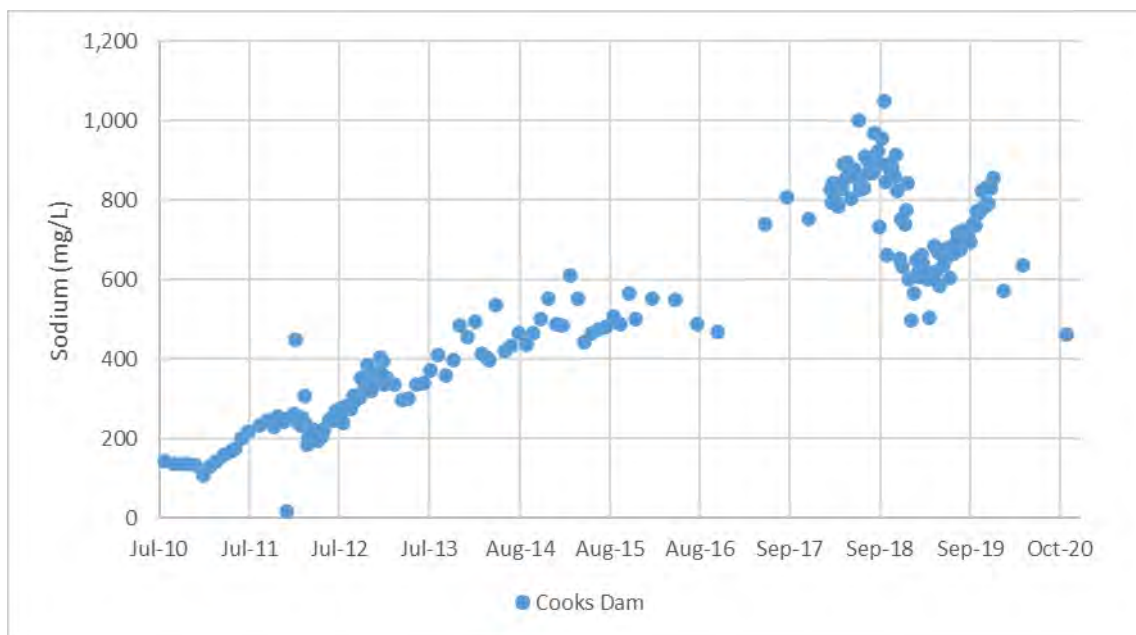


Figure H- 34: Historical Cooks Dam Sodium

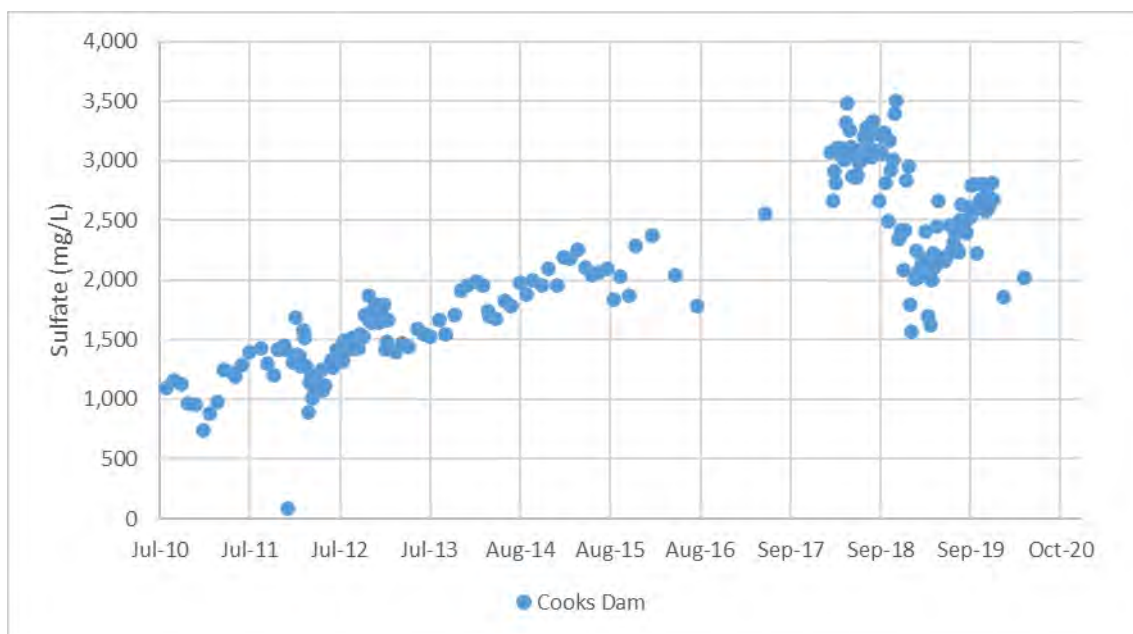


Figure H- 35: Historical Cooks Dam Sulfate

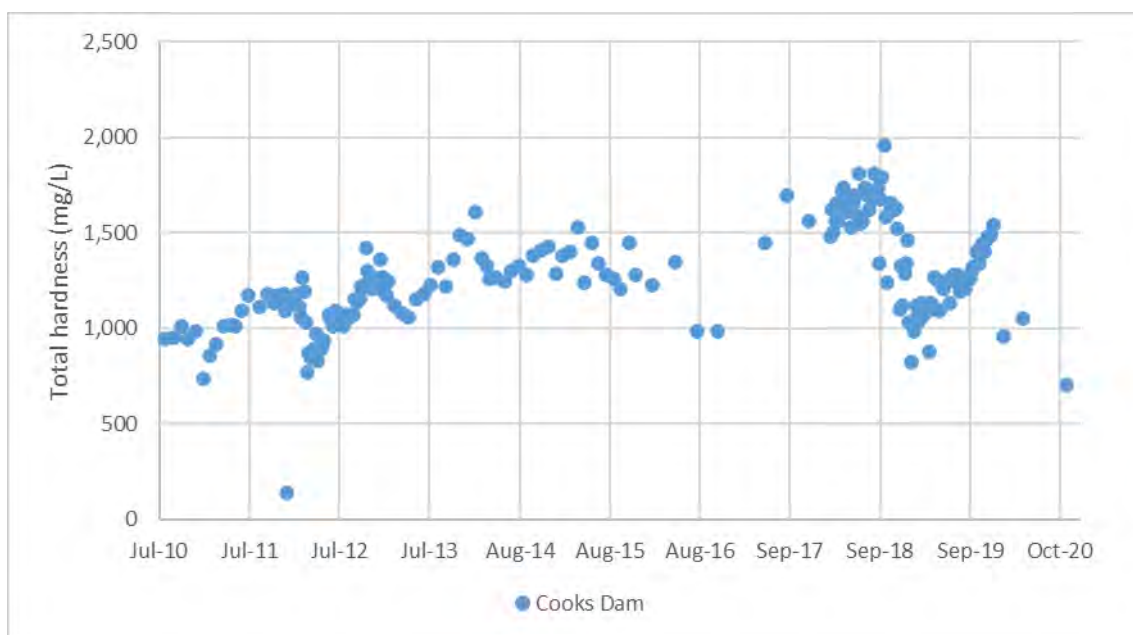


Figure H- 36: Historical Cooks Dam Hardness

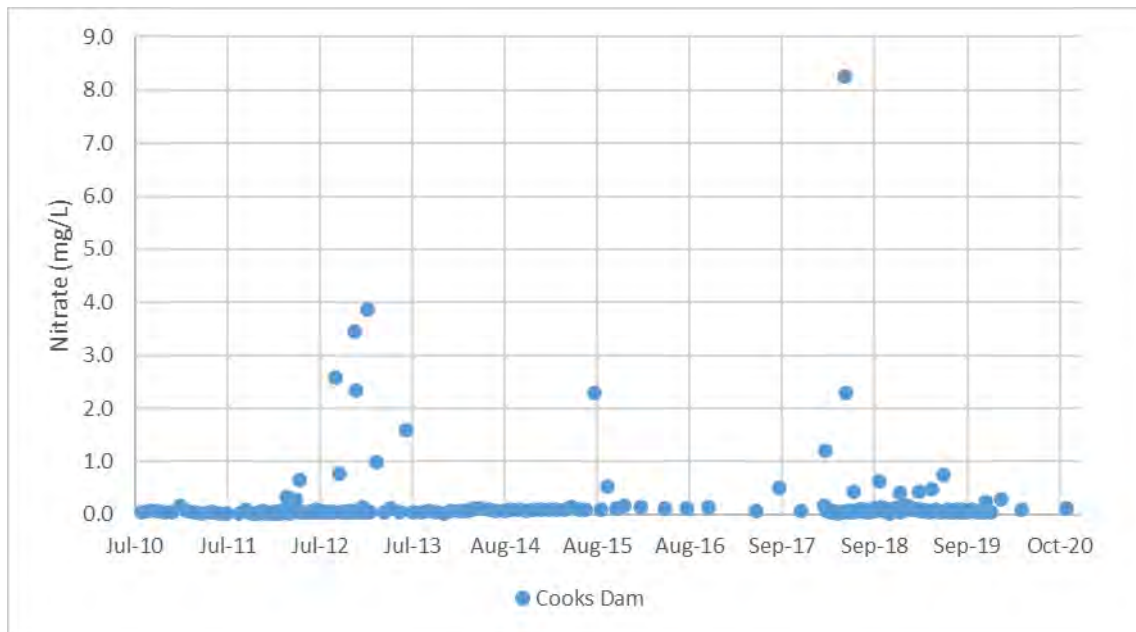


Figure H- 37: Historical Cooks Dam Nitrate

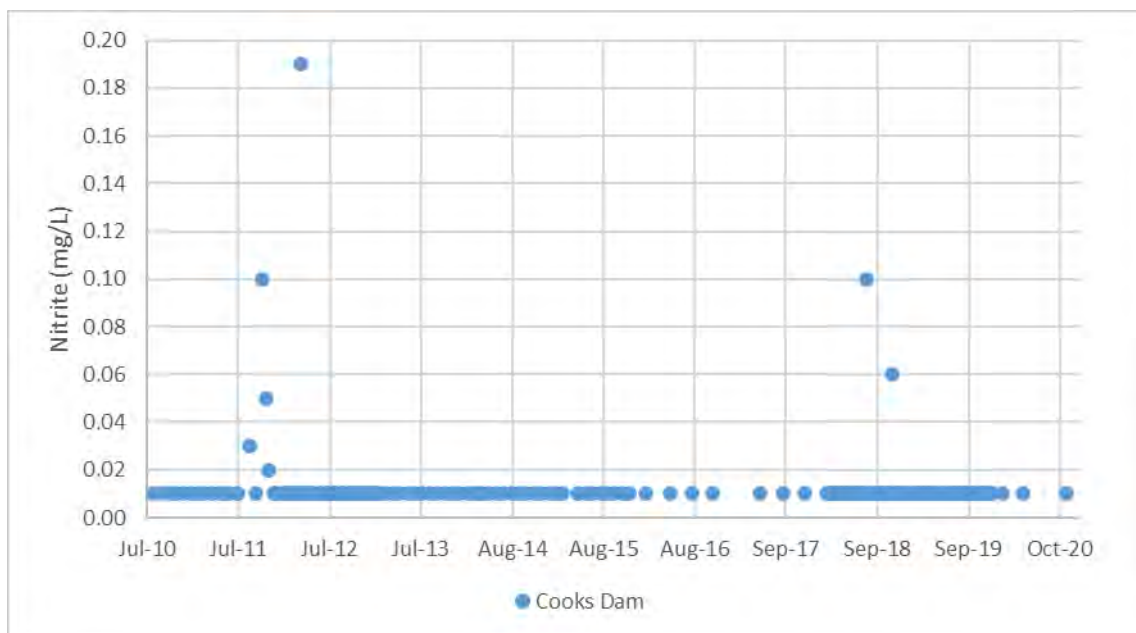


Figure H- 38: Historical Cooks Dam Nitrite

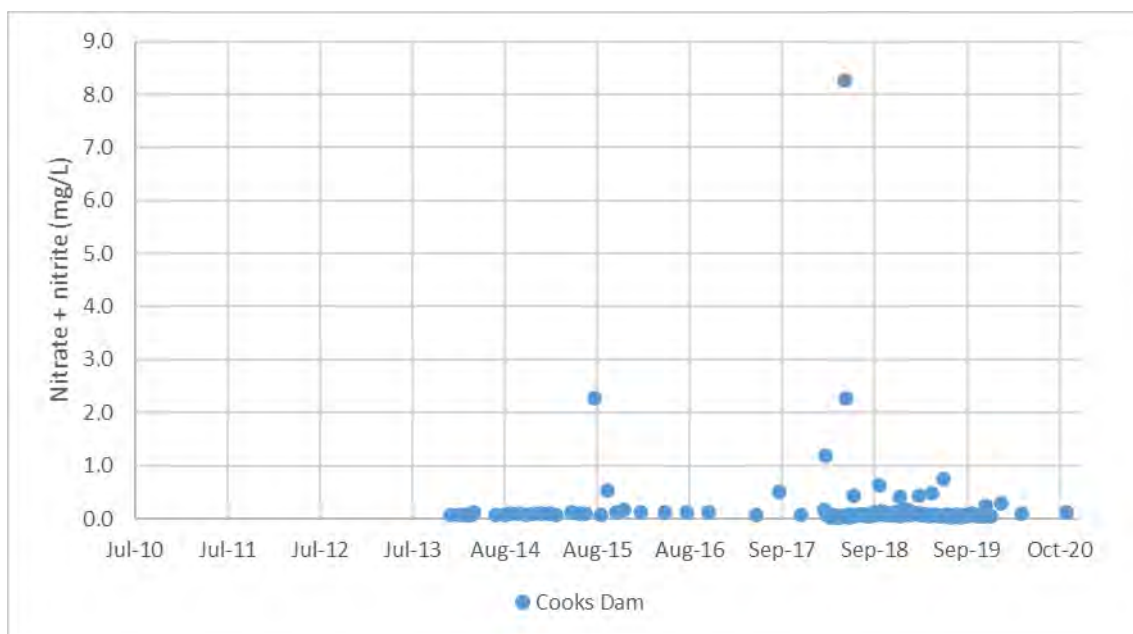


Figure H- 39: Historical Cooks Dam Nitrate + Nitrite

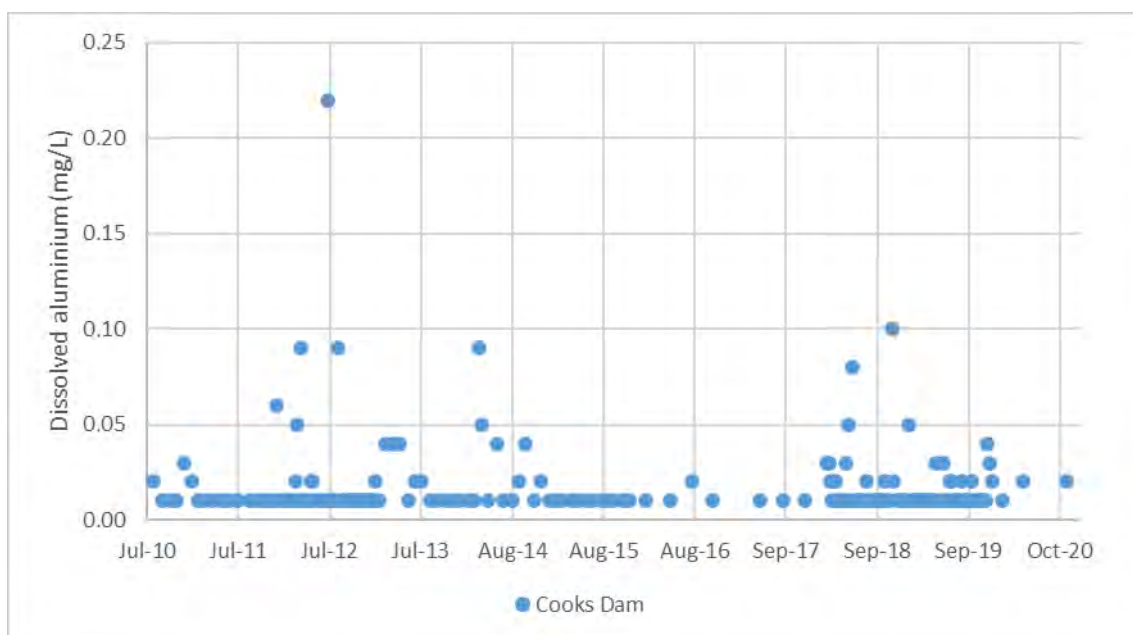


Figure H- 40: Historical Cooks Dam Dissolved Aluminium

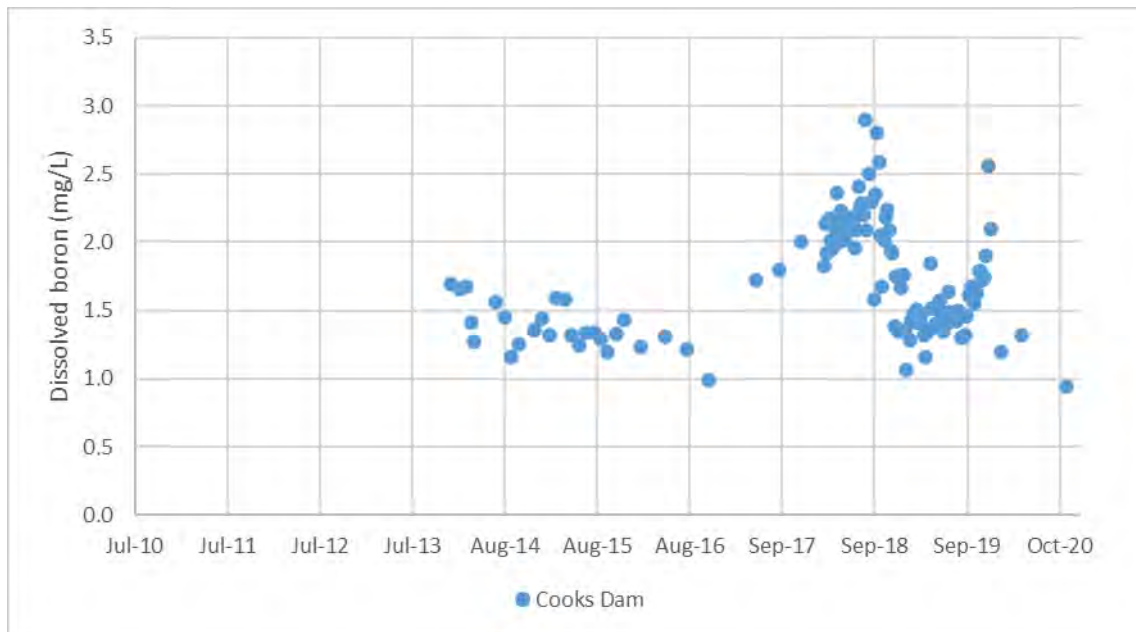


Figure H- 41: Historical Cooks Dam Dissolved Boron

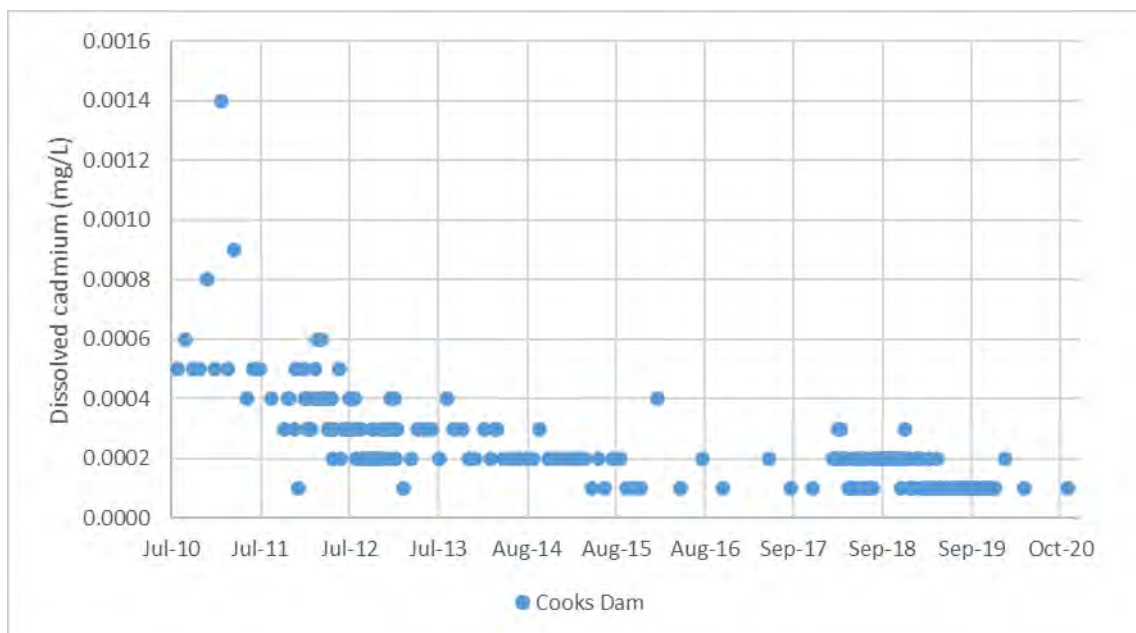


Figure H- 42: Historical Cooks Dam Dissolved Cadmium

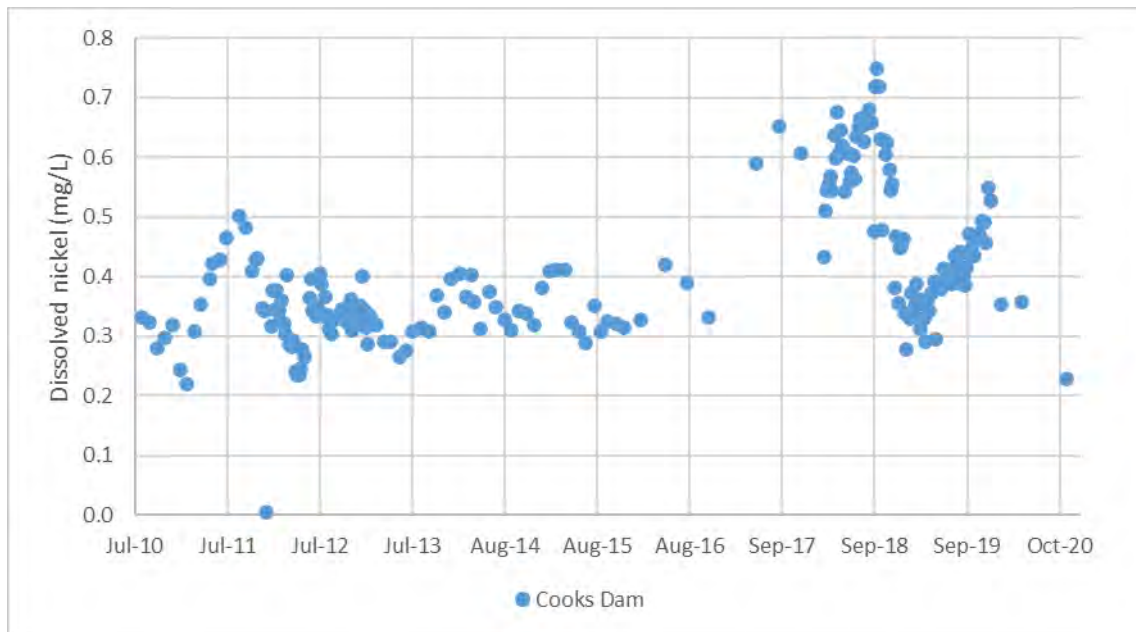


Figure H- 43: Historical Cooks Dam Dissolved Nickel

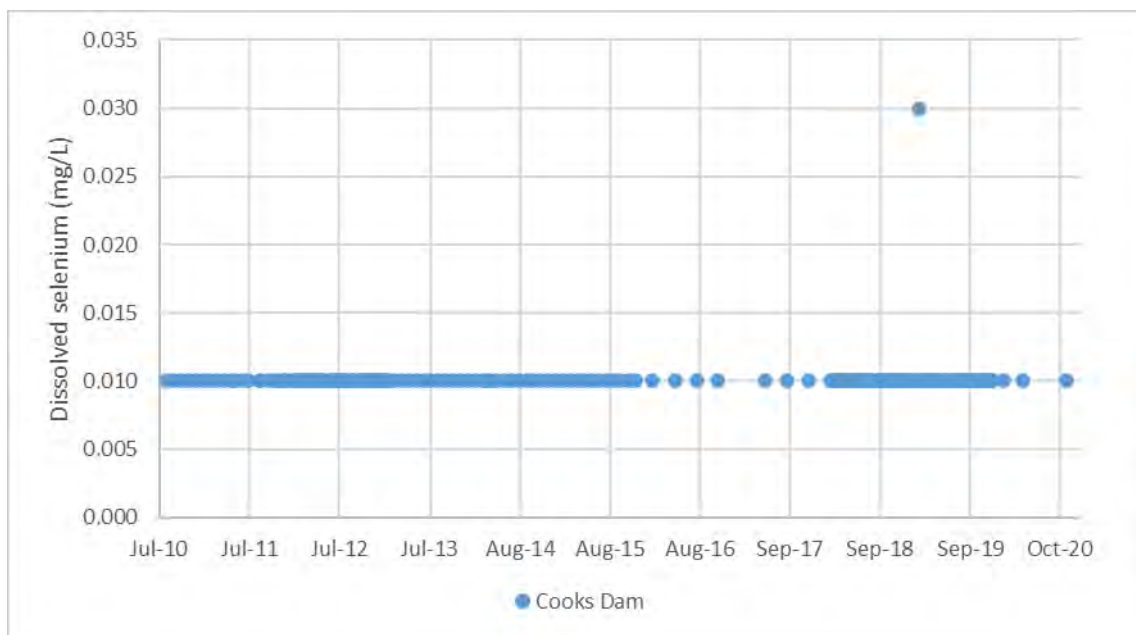


Figure H- 44: Historical Cooks Dam Dissolved Selenium

Figure H- 45: Historical Cooks Dam Dissolved Zinc

SWTP Residuals

Monitoring of decant water and residuals from the Springvale Water Treatment Plant (SWTP) commenced following the commissioning of the residuals pipeline in June 2019. With this, SWTP residuals stream to the REA and water decanted from the REA is monitored for water quality on a monthly basis. Residuals water quality results are shown in Figure H- 46 to Figure H- 74 and are assessed against trigger values (where available) established from Cooks Dam, being the assumed final receiving on-site water storage for the REA decant water.

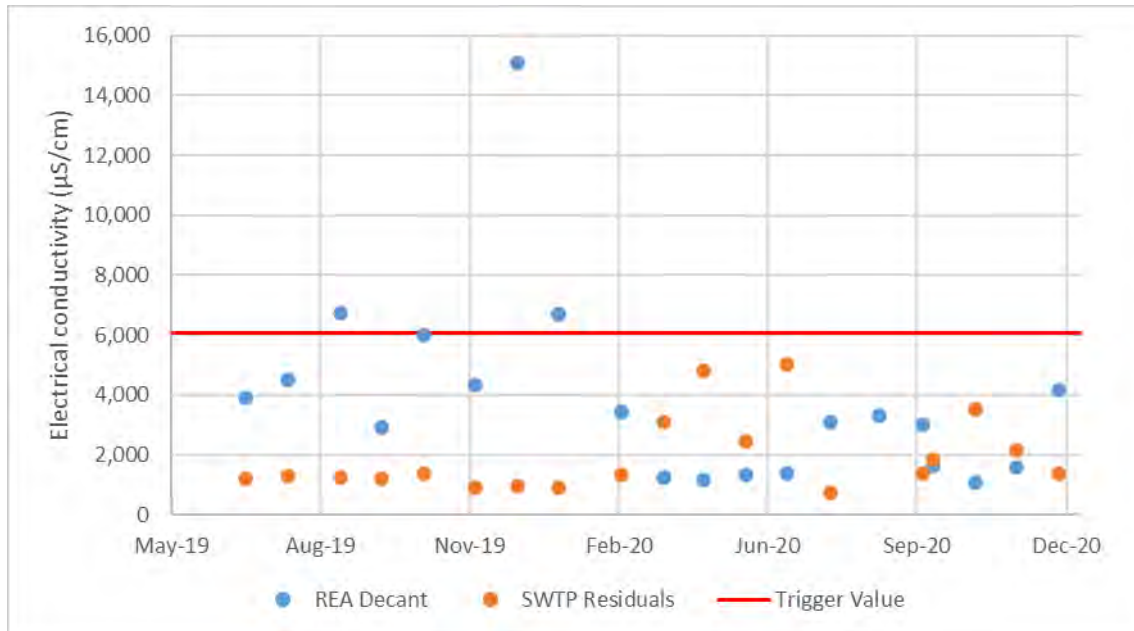


Figure H- 46: 2020 Residuals EC

One EC trigger event occurred in January 2020 for REA Decant water. This was due to the inflow of high EC coal fine slurry and process water received from coal washing processes at WCS.

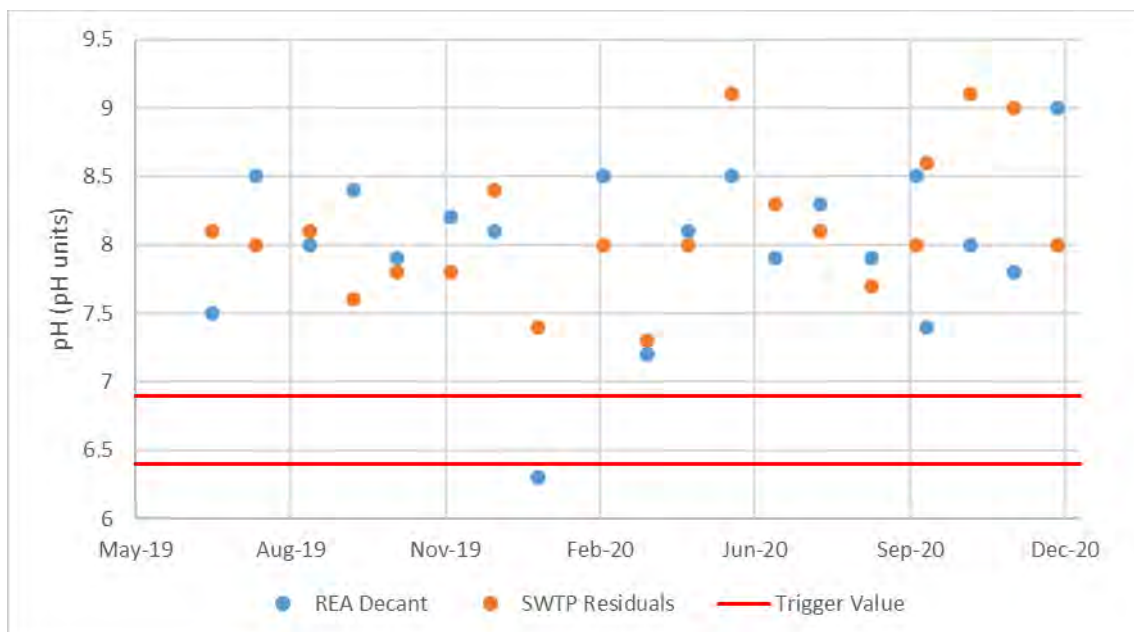


Figure H- 47: 2020 Residuals pH

pH in decant water is consistently above the pH upper limit trigger. pH still remains in the neutral range to slightly alkaline. pH at Cooks Dam is consistently neutral to slightly acidic. Mixing of these pH's may result in a more neutral pH in Cooks Dam.

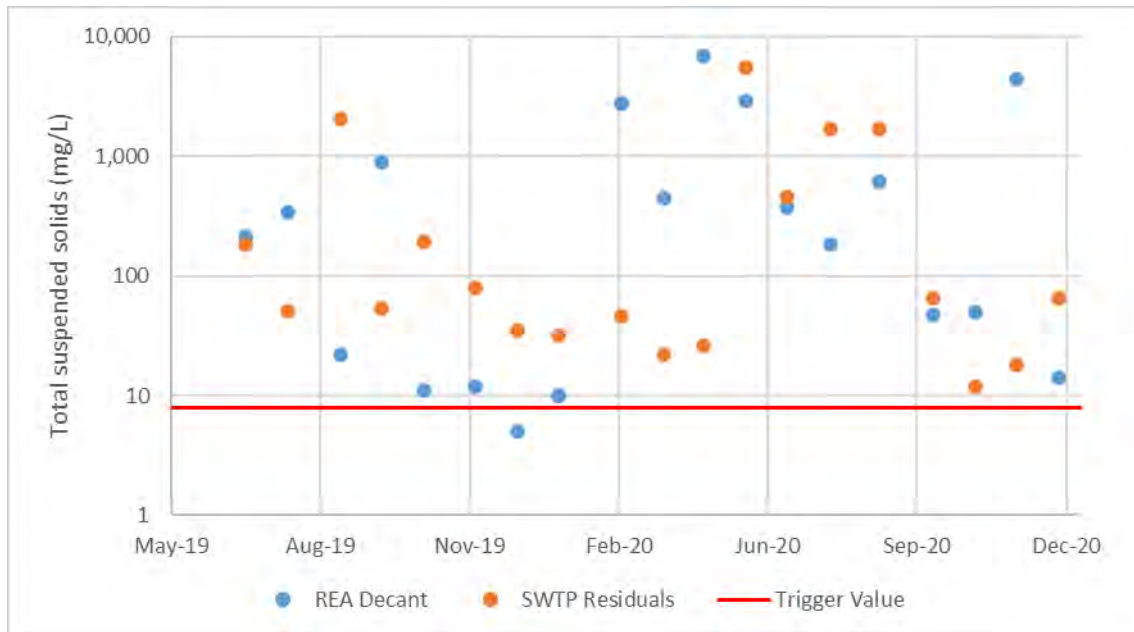


Figure H- 48: 2020 Residuals TSS

TSS from inputs to the REA (fine coal slurry and SWTP residuals) is generally greater than TSS within Cooks Dam. TSS concentrations will likely remain above the trigger value given the inputs to the REA.

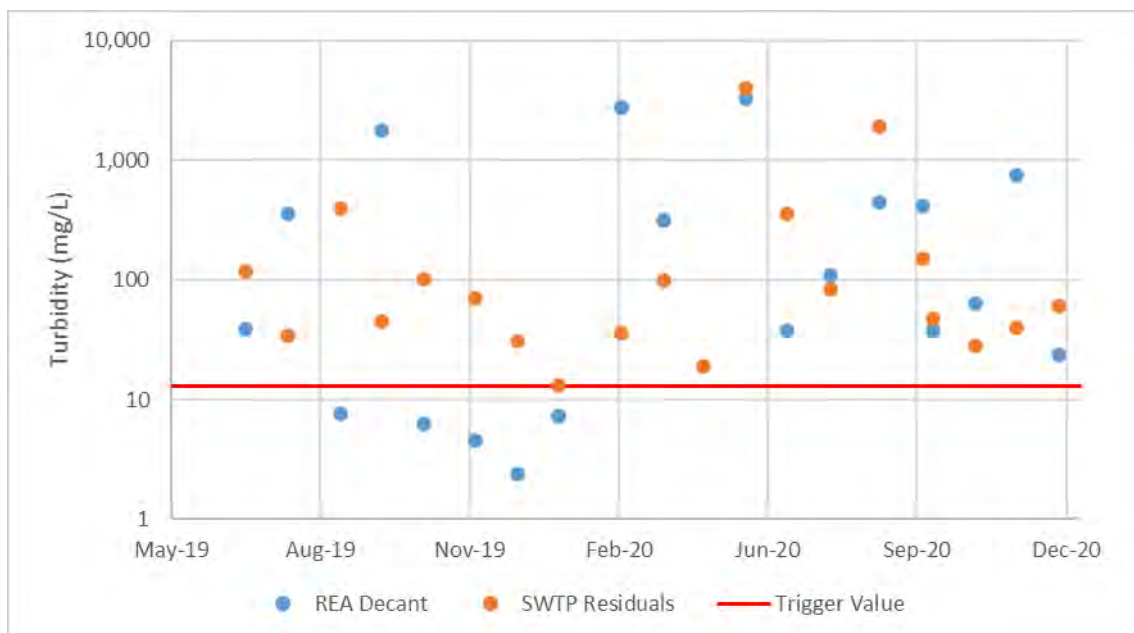


Figure H- 49: 2020 Residuals Turbidity

Turbidity concentrations from inputs to the REA (fine coal slurry and SWTP residuals) are generally greater than Turbidity within Cooks Dam.

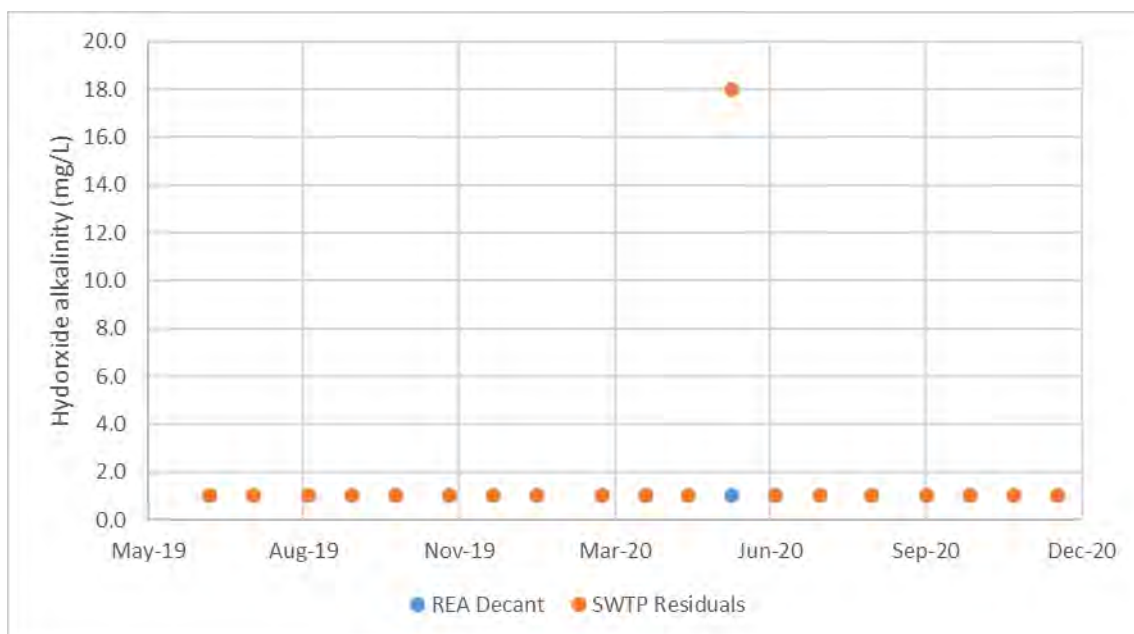


Figure H- 50: 2020 Residuals OH⁻ Alkalinity

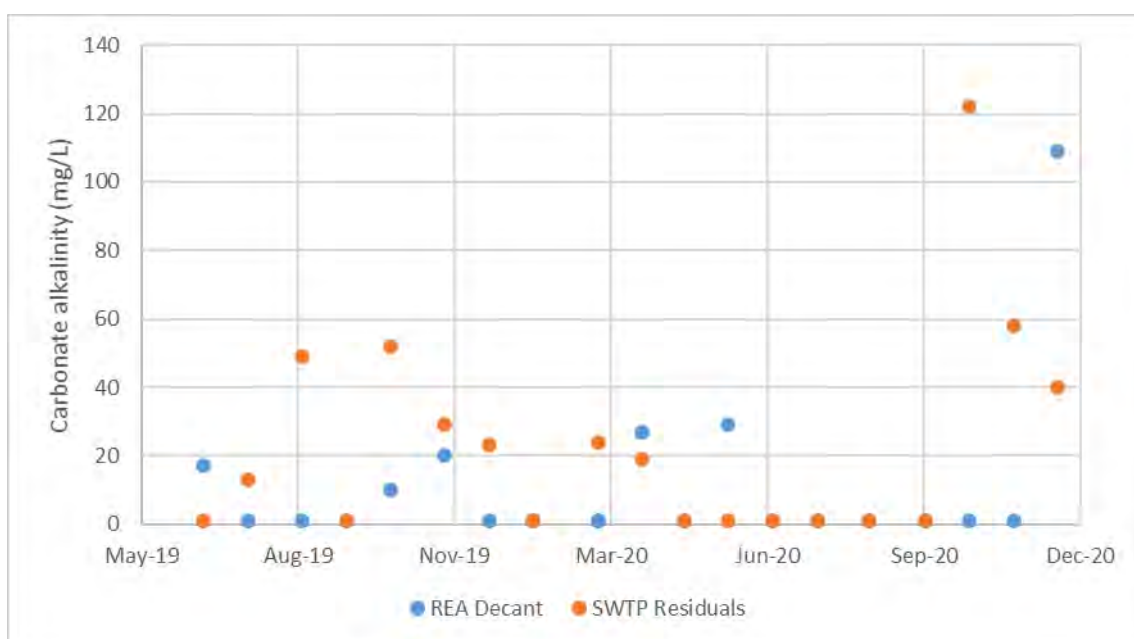


Figure H- 51: 2020 Residuals CO₃²⁻ Alkalinity

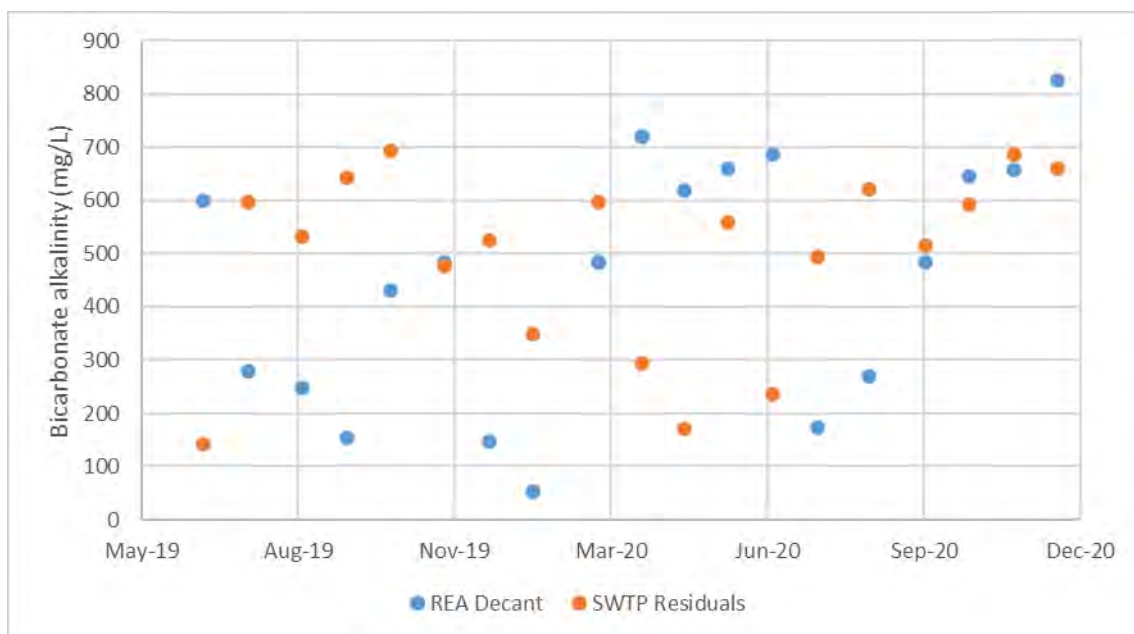


Figure H- 52: 2020 Residuals HCO_3^- Alkalinity

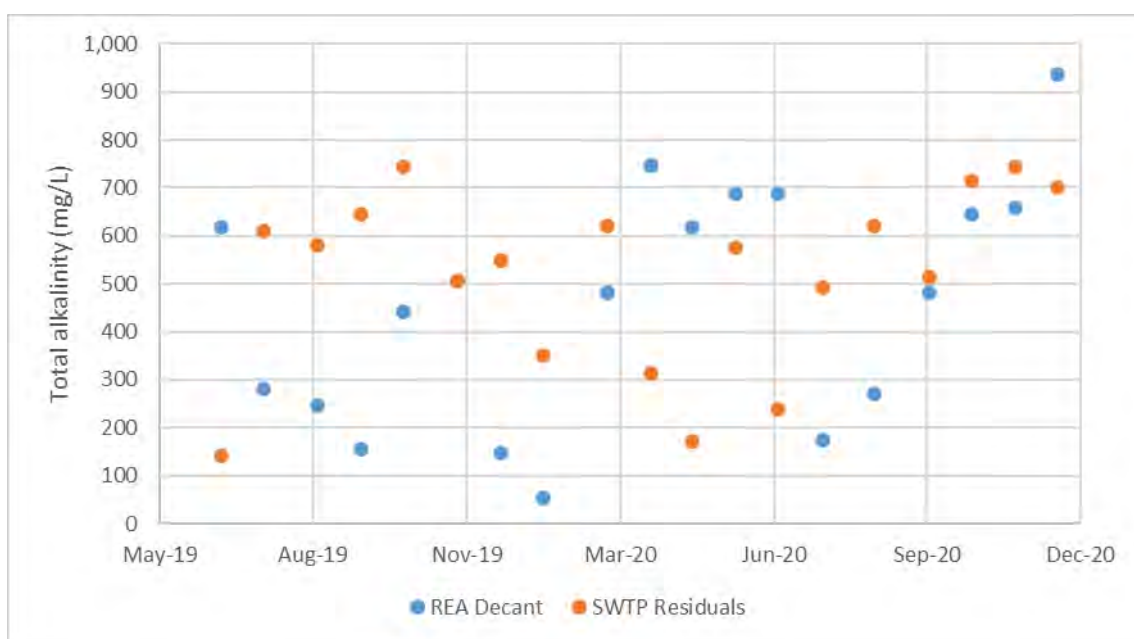


Figure H- 53: 2020 Residuals Total Alkalinity

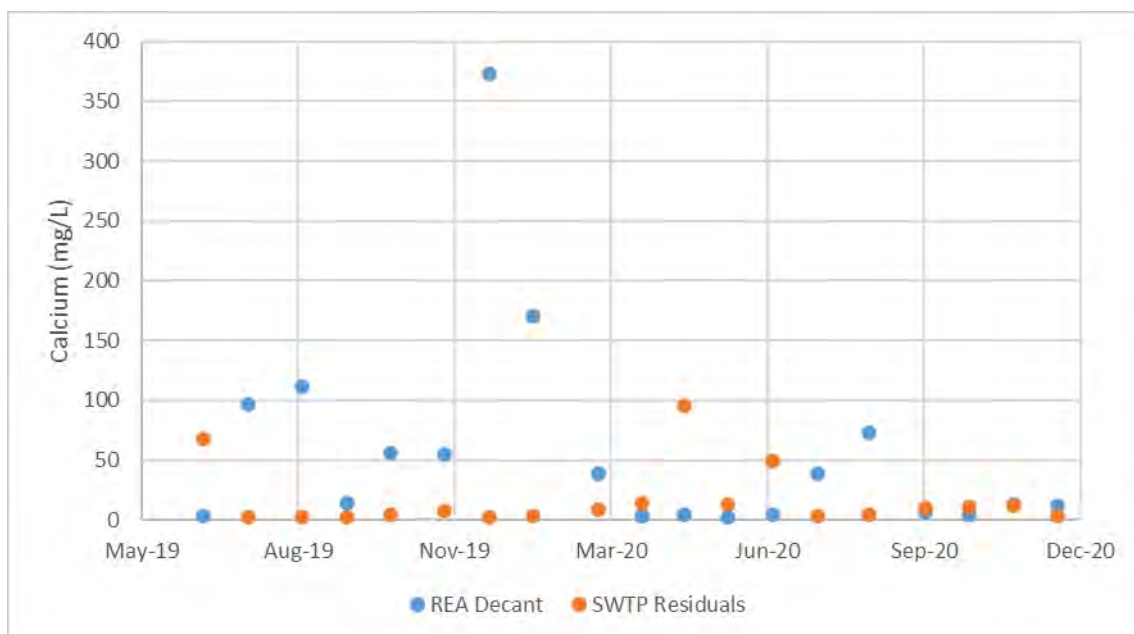


Figure H- 54: 2020 Residuals Calcium

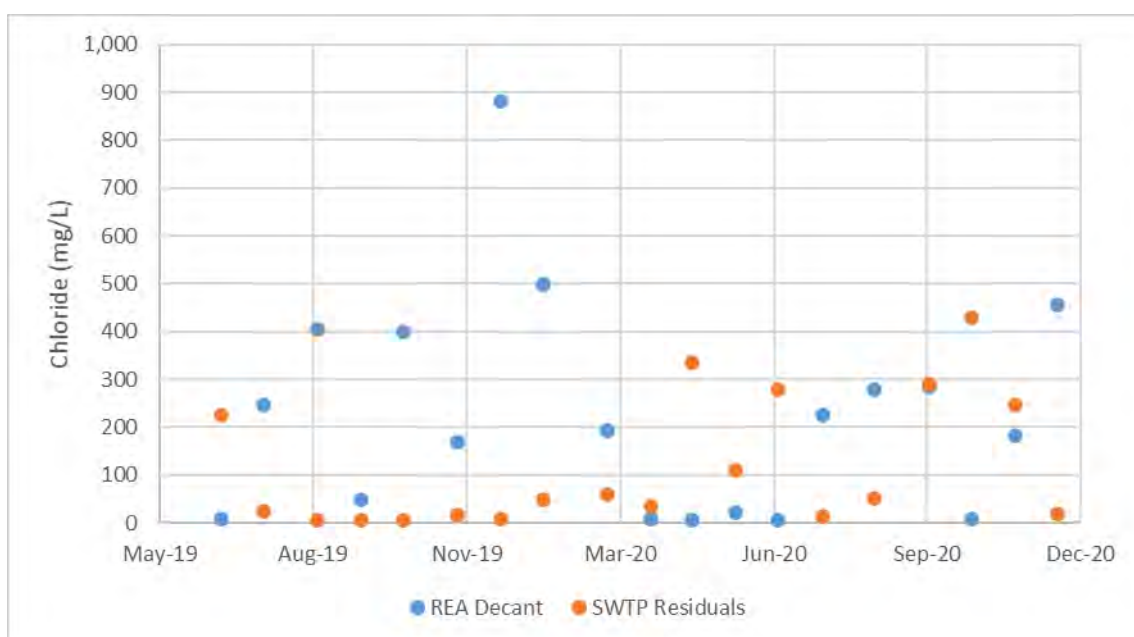


Figure H- 55: 2020 Residuals Chloride

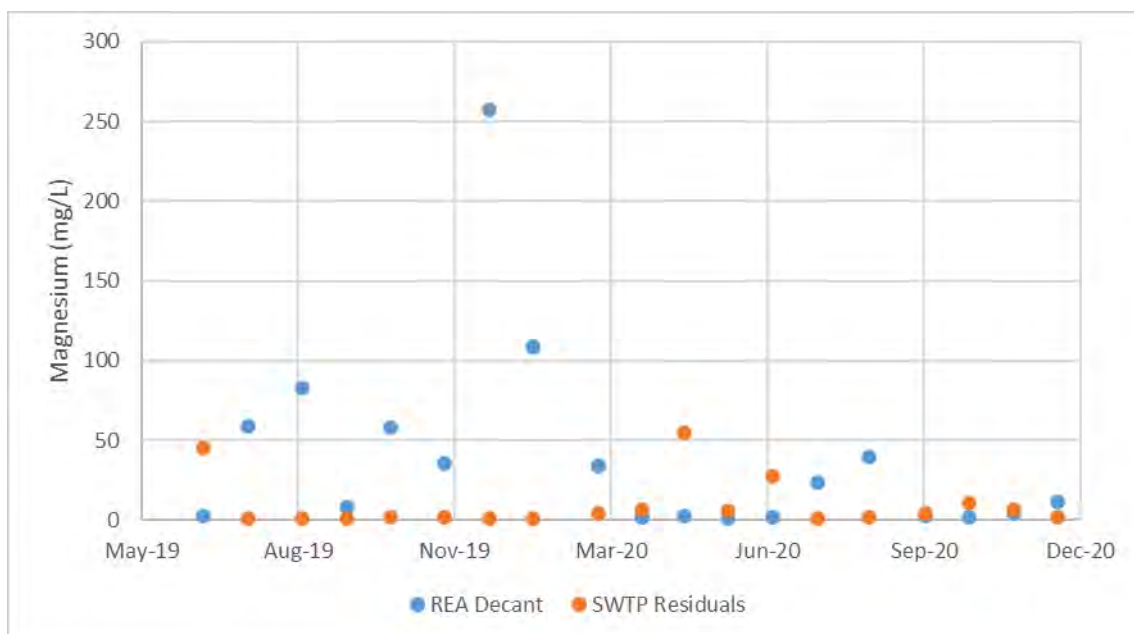


Figure H- 56: 2020 Residuals Magnesium

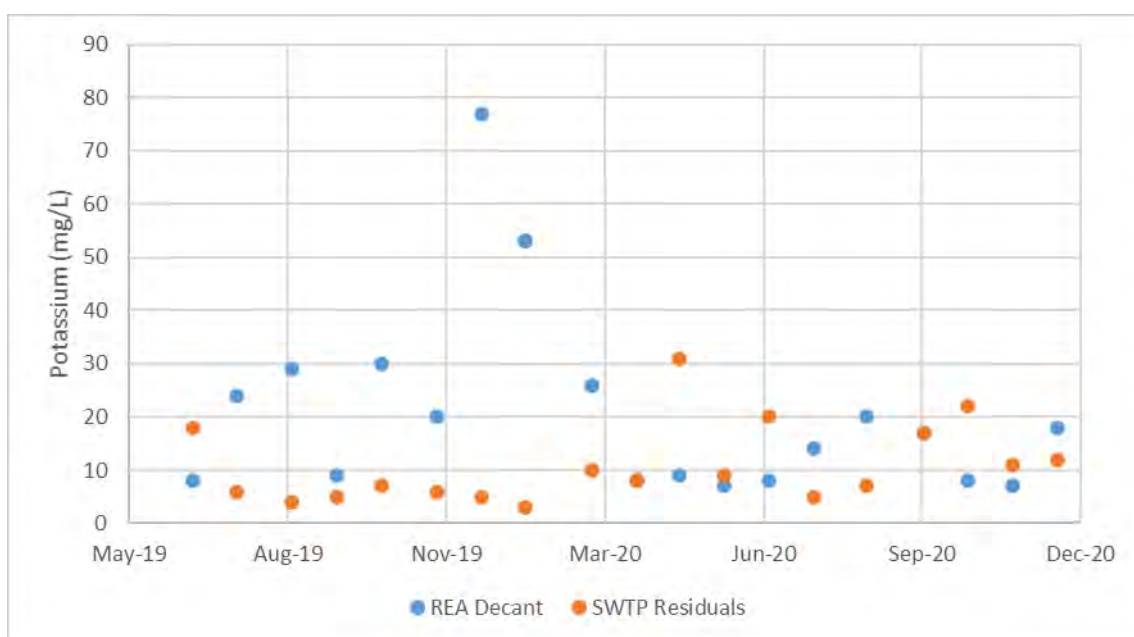


Figure H- 57: 2020 Residuals Potassium

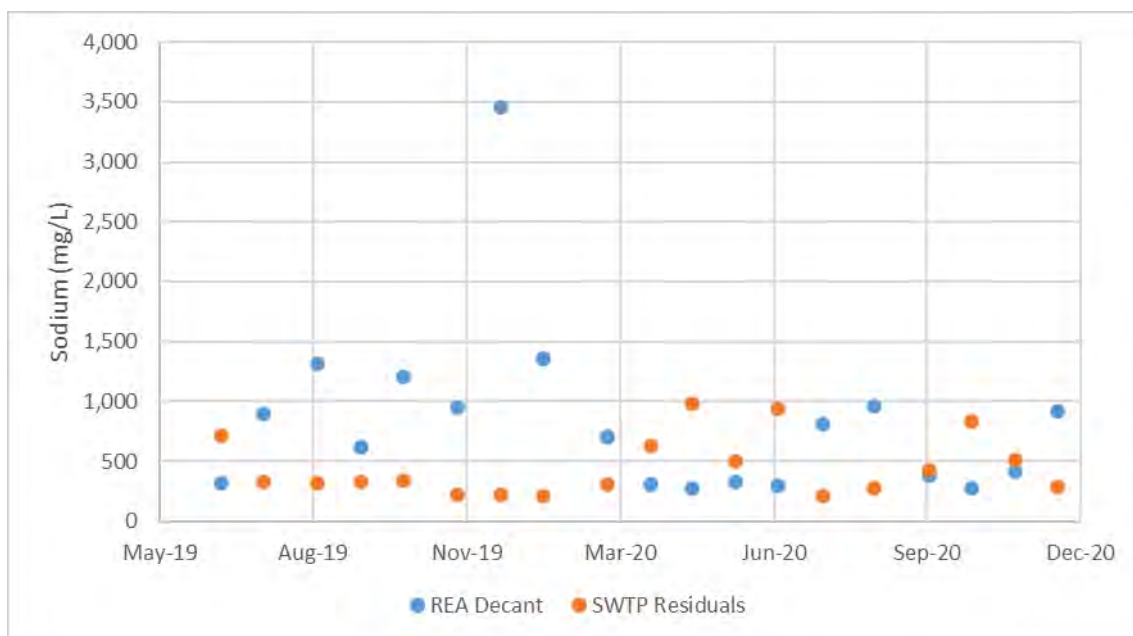


Figure H- 58: 2020 Residuals Sodium

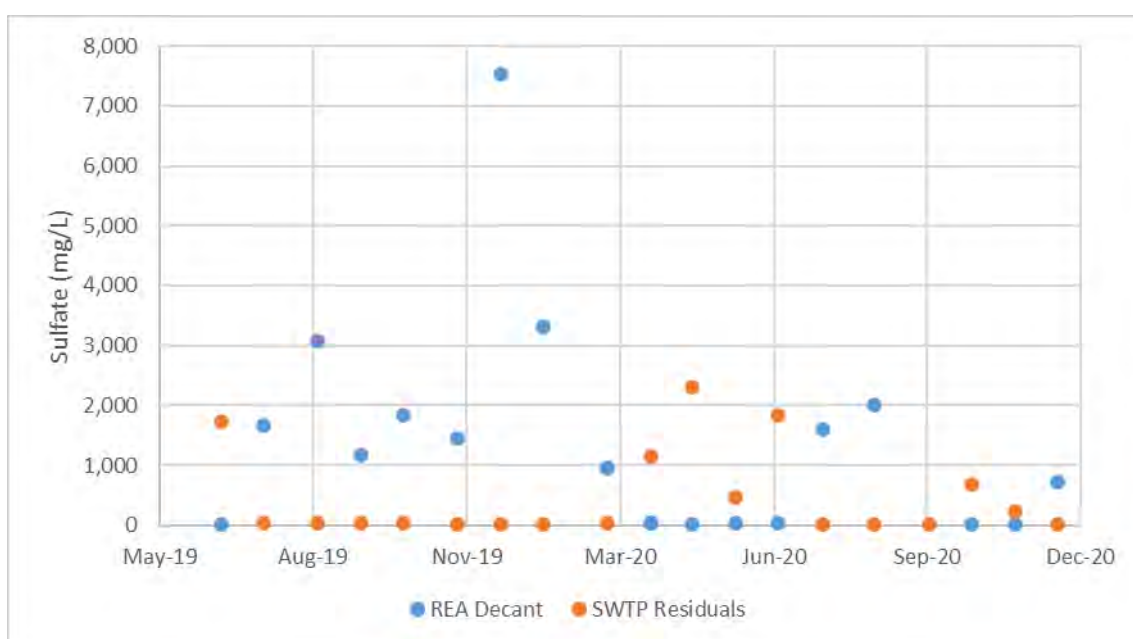


Figure H- 59: 2020 Residuals Sulfate

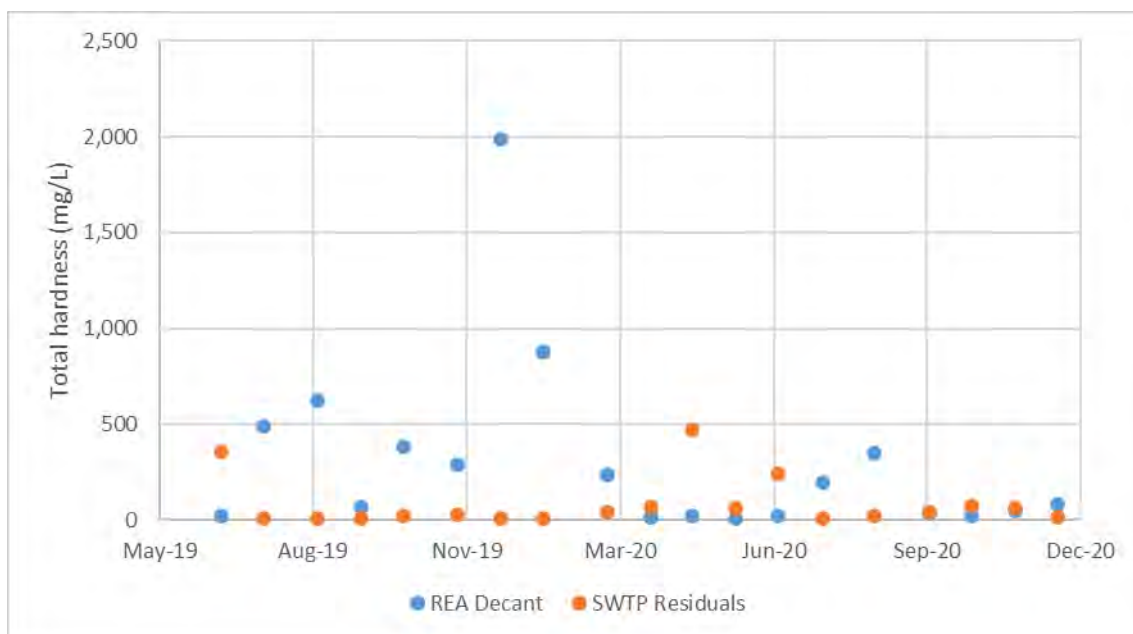


Figure H- 60: 2020 Residuals Total Hardness

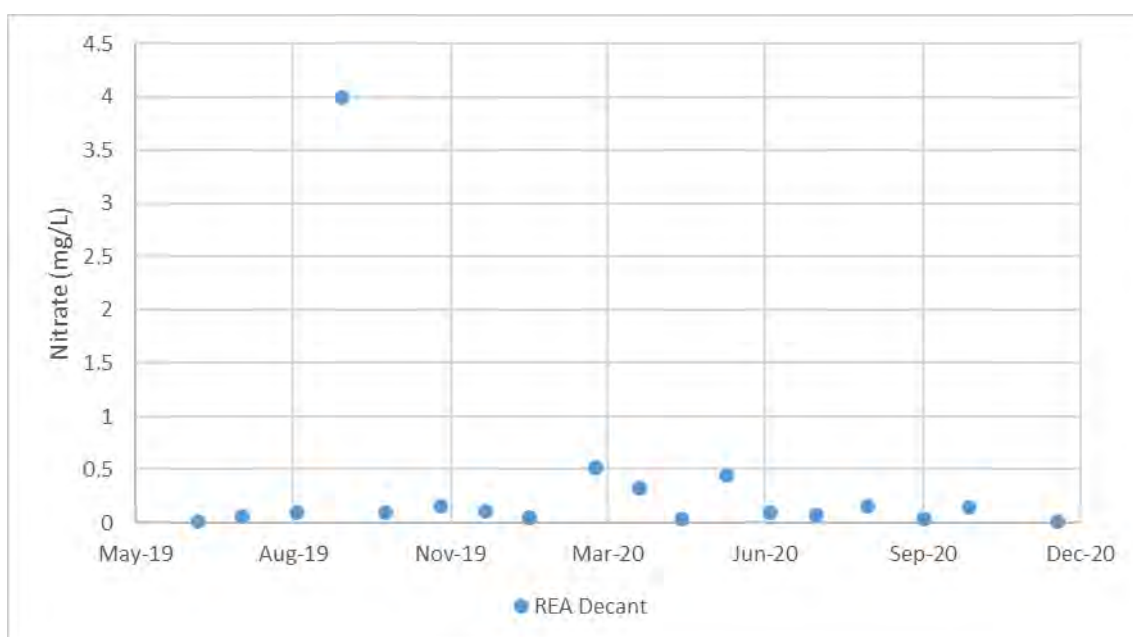


Figure H- 61: 2020 Residuals Nitrate

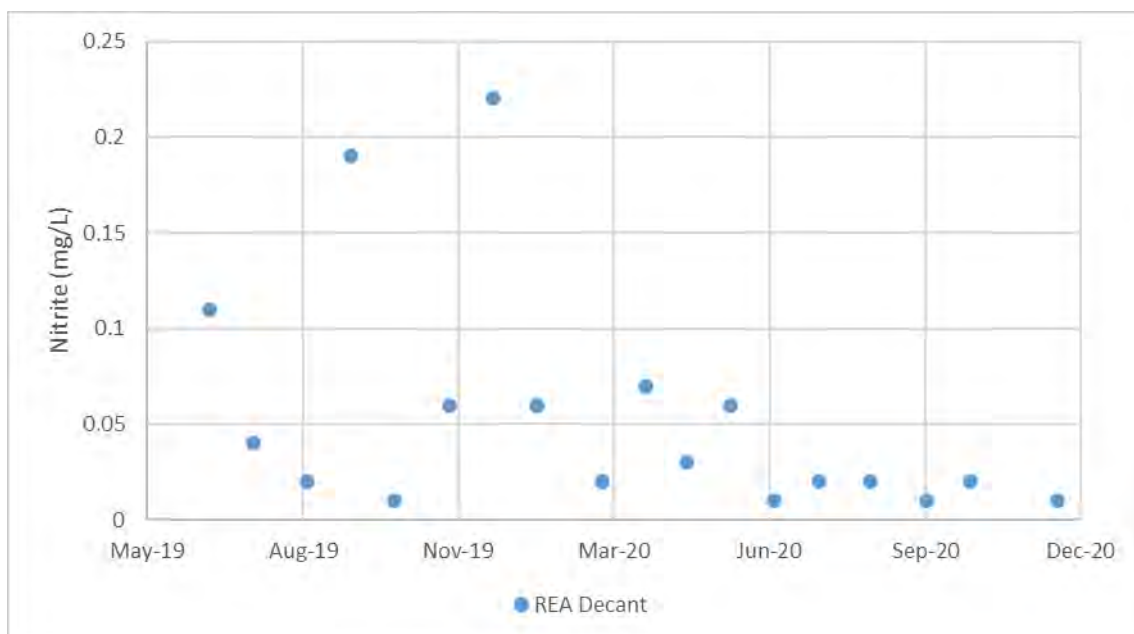


Figure H- 62: 2020 Residuals Nitrite

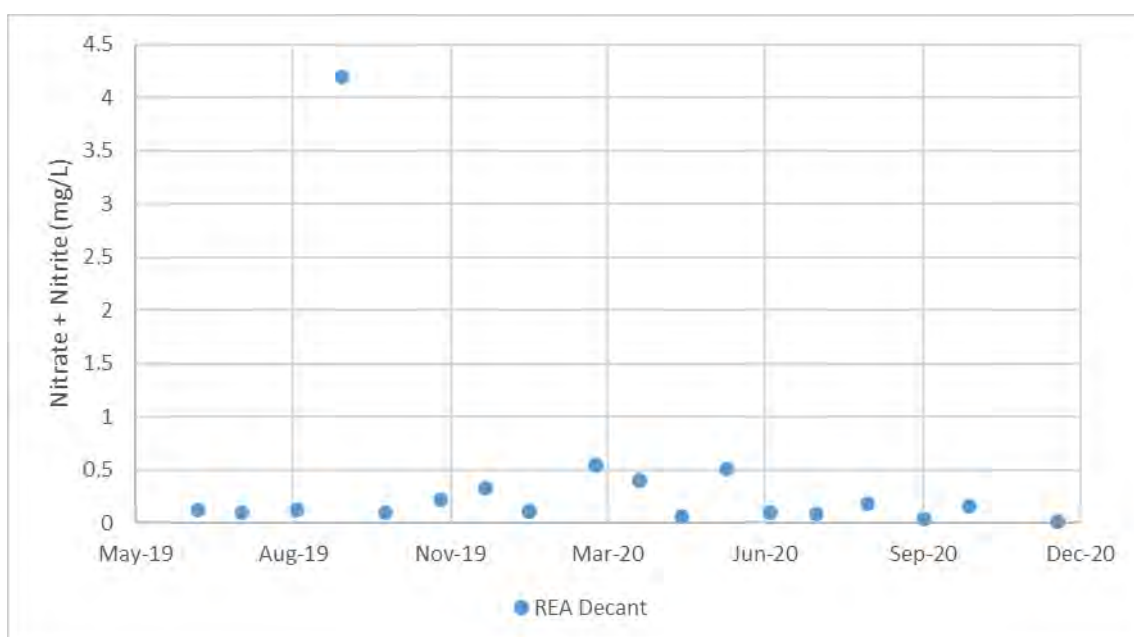


Figure H- 63: 2020 Residuals Nitrate + Nitrite

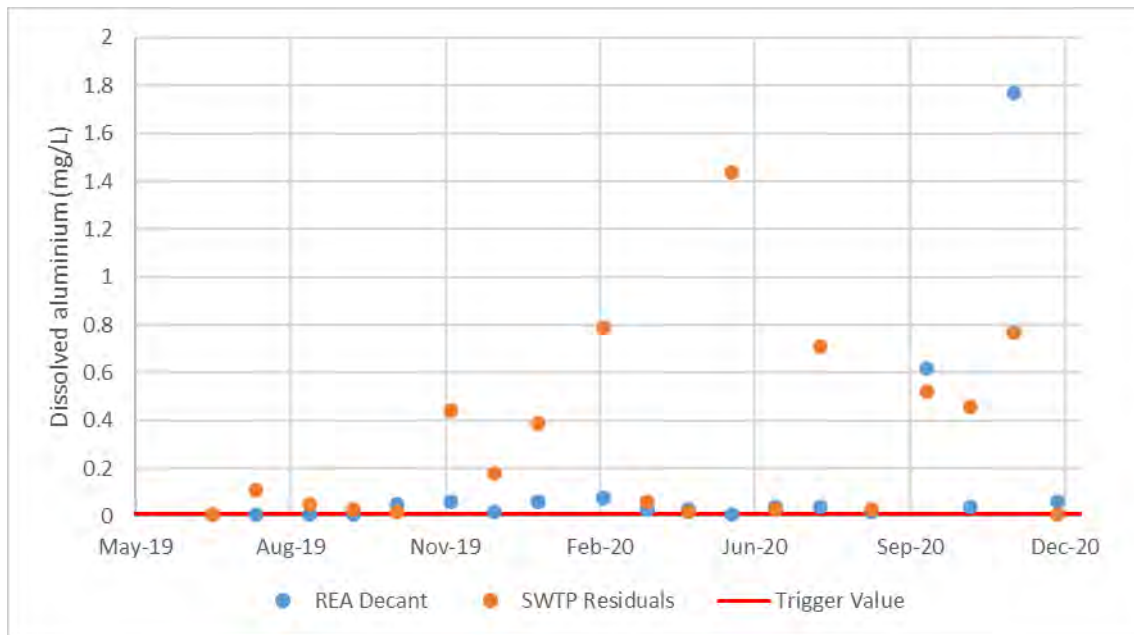


Figure H- 64: 2020 Residuals Dissolved Aluminium

The dissolved aluminium trigger is set at the limit of reporting (0.01 mg/L). Exceedances of the triggers occurred throughout 2020, likely from the influence of SWTP Residual waste given the increased dissolved aluminium concentrations for this input to the REA.

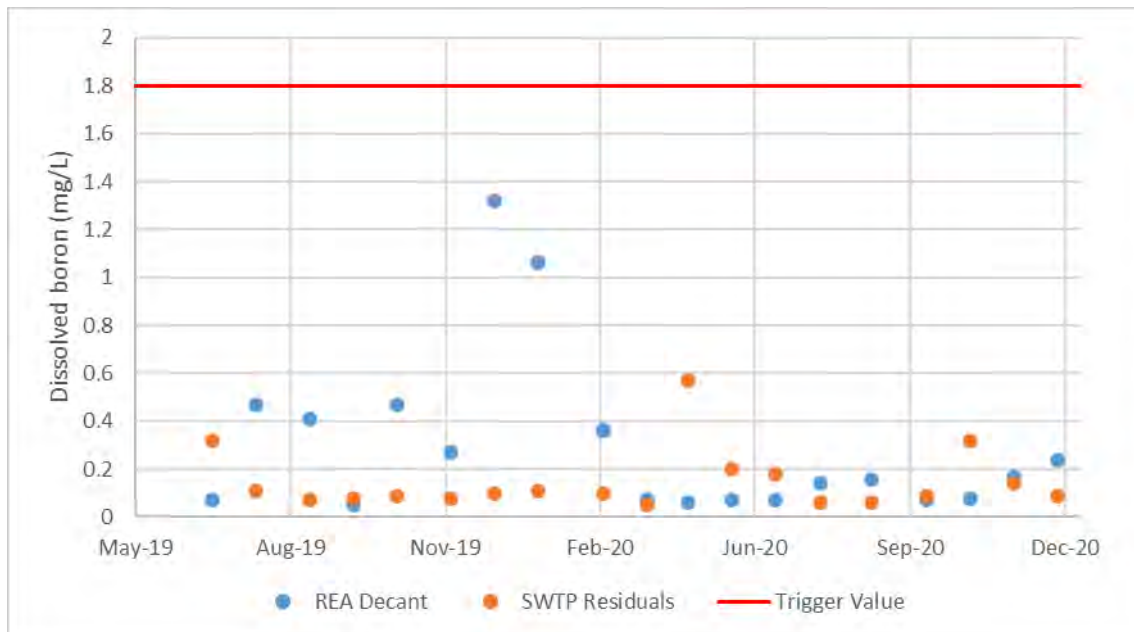


Figure H- 65: 2020 Residuals Dissolved Boron

Dissolved boron concentrations of REA Decant water remained below the trigger value in 2020.

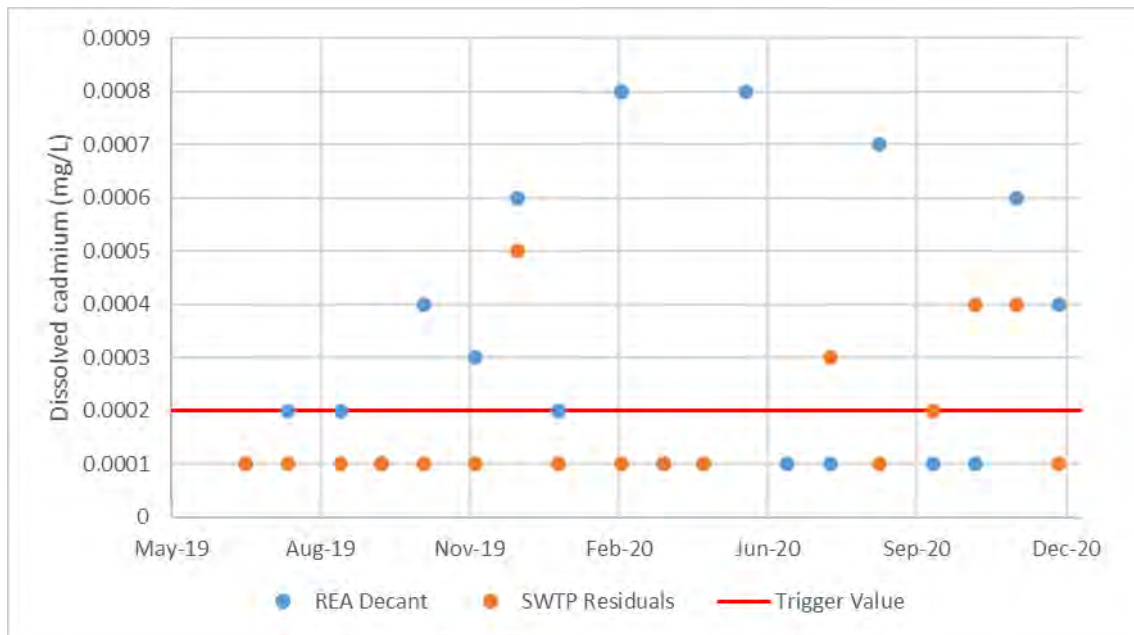


Figure H- 66: 2020 Residuals Dissolved Cadmium

Multiple dissolved cadmium concentrations were elevated above the trigger in 2020. The cadmium concentrations remain relatively low and will continue to be monitored for any gradual increases. The increase is likely due to the cadmium concentrations from both SWTP residuals and from coal reject material.

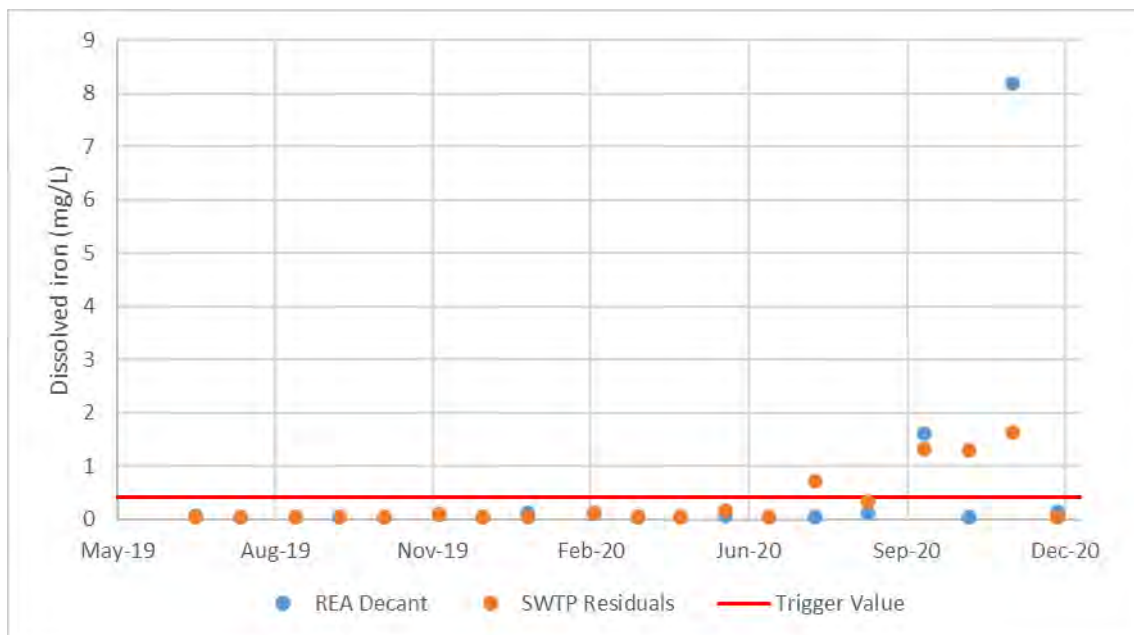


Figure H- 67: 2020 Residuals Dissolved Iron

The dissolved iron concentrations of REA Decant water showed elevated results above the trigger value with a maximum of 8.18 mg/L. Both elevated results occurred at the same time as elevated SWTP Residuals dissolved iron concentrations.

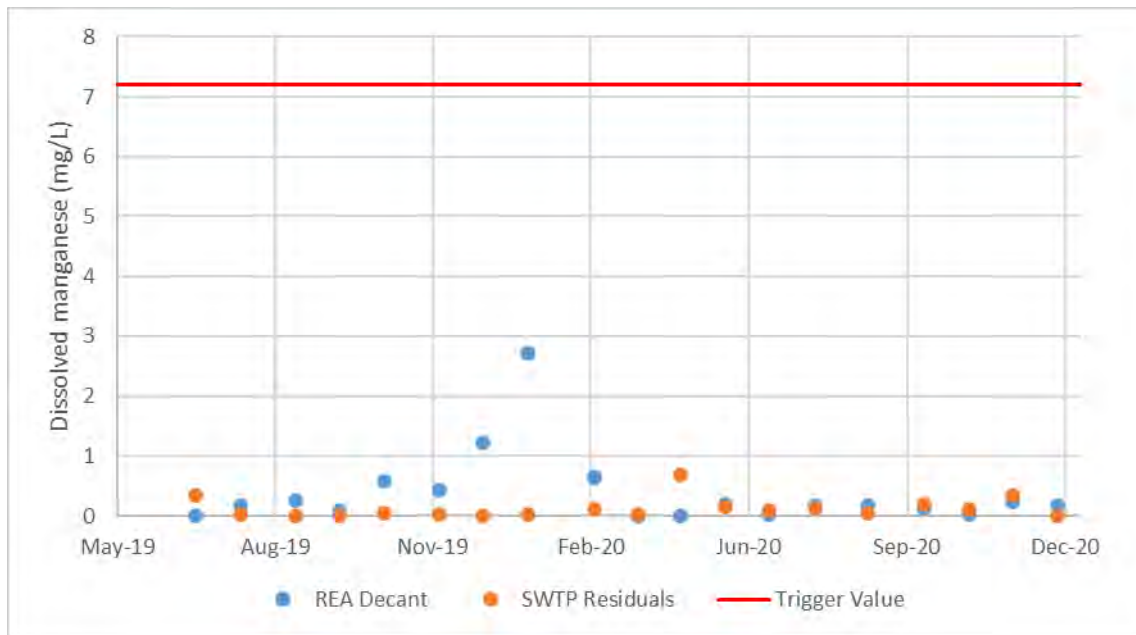


Figure H- 68: 2020 Residuals Dissolved Manganese

The dissolved manganese concentrations of REA Decant water remain well below the trigger value.

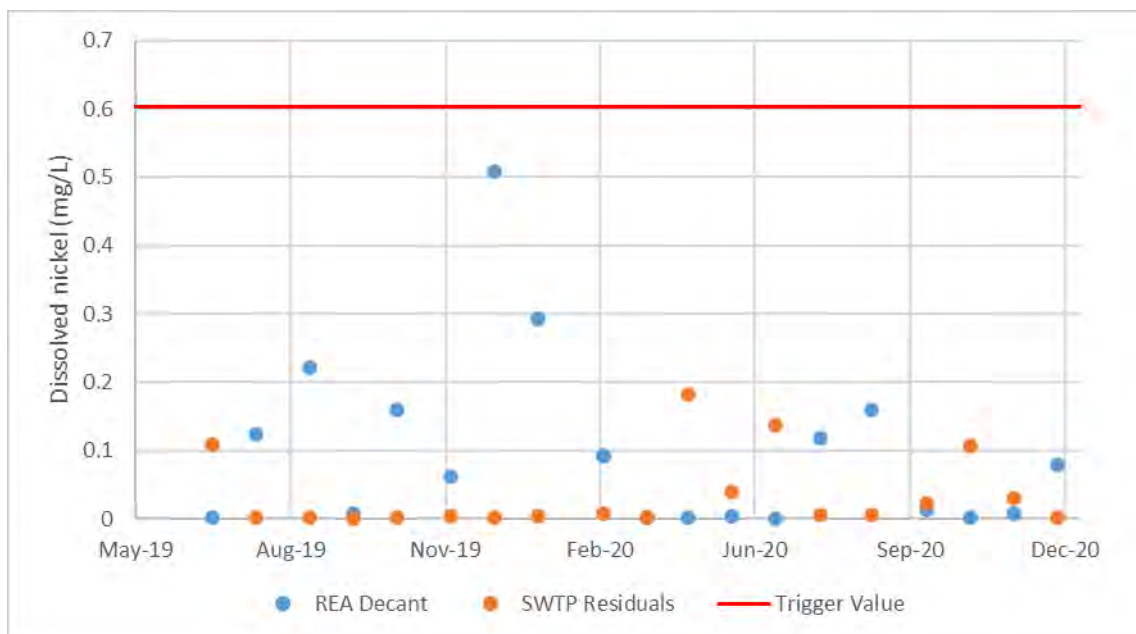


Figure H- 69: 2020 Residuals Dissolved Nickel

The dissolved nickel concentrations of REA Decant water remain well below the trigger value.

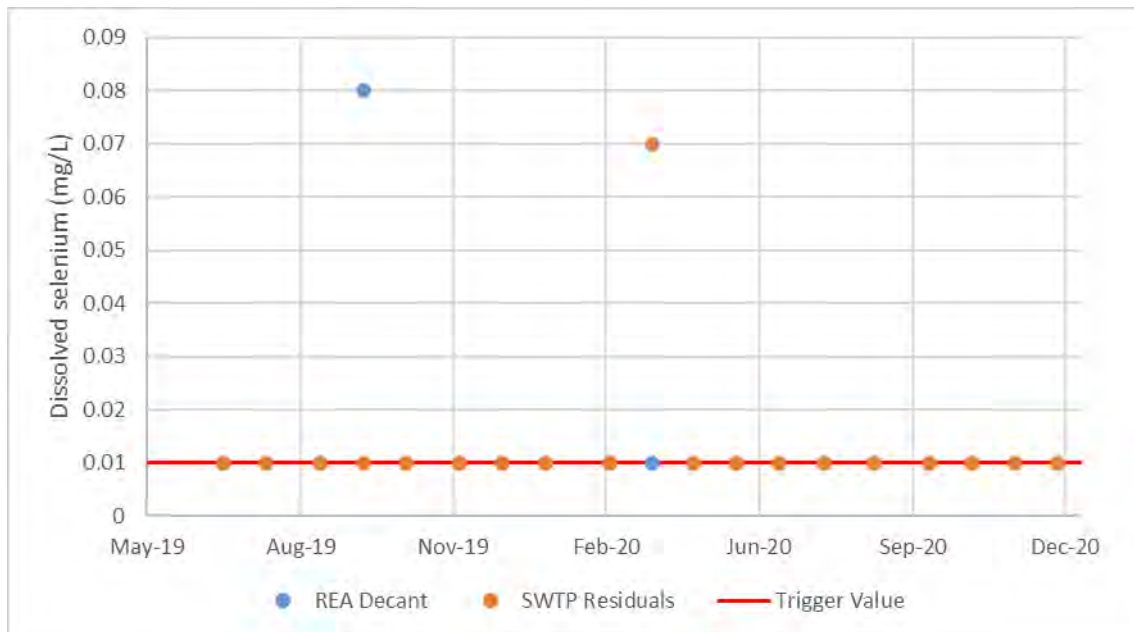


Figure H- 70: 2020 Residuals Dissolved Selenum

Dissolved selenium concentrations of REA Decant revealed concentrations less than the laboratory limit of reporting in 2020.

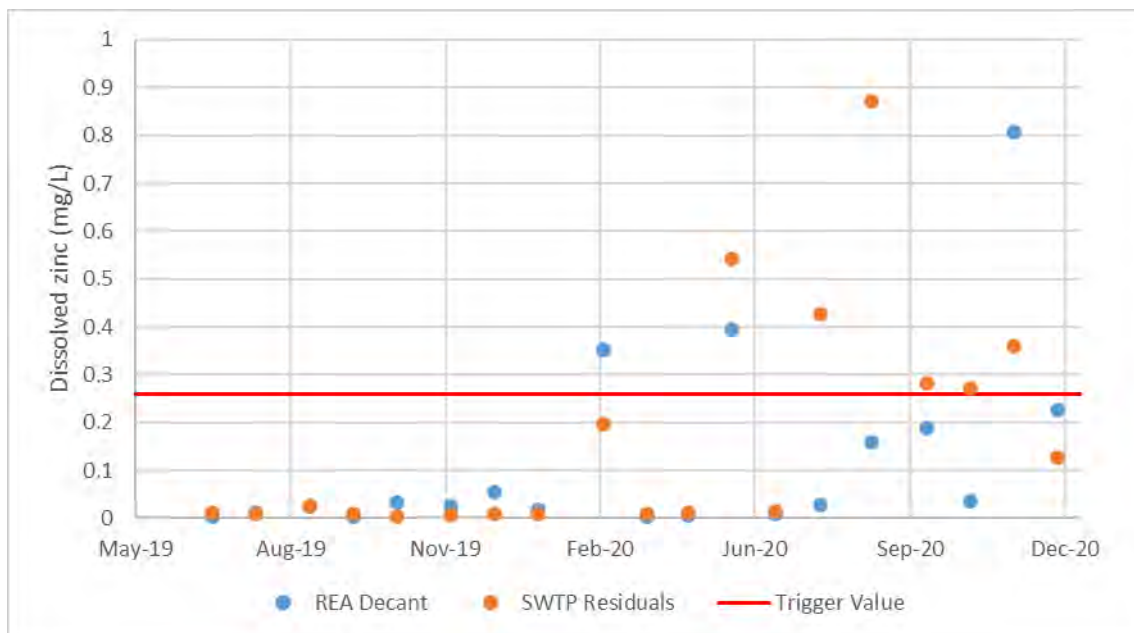


Figure H- 71: 2020 Residuals Dissolved Zinc

The dissolved zinc concentrations of REA Decant water showed three results greater than the trigger level in 2020. These elevated results occur when SWTP Residuals dissolved zinc concentrations are also above the trigger value.

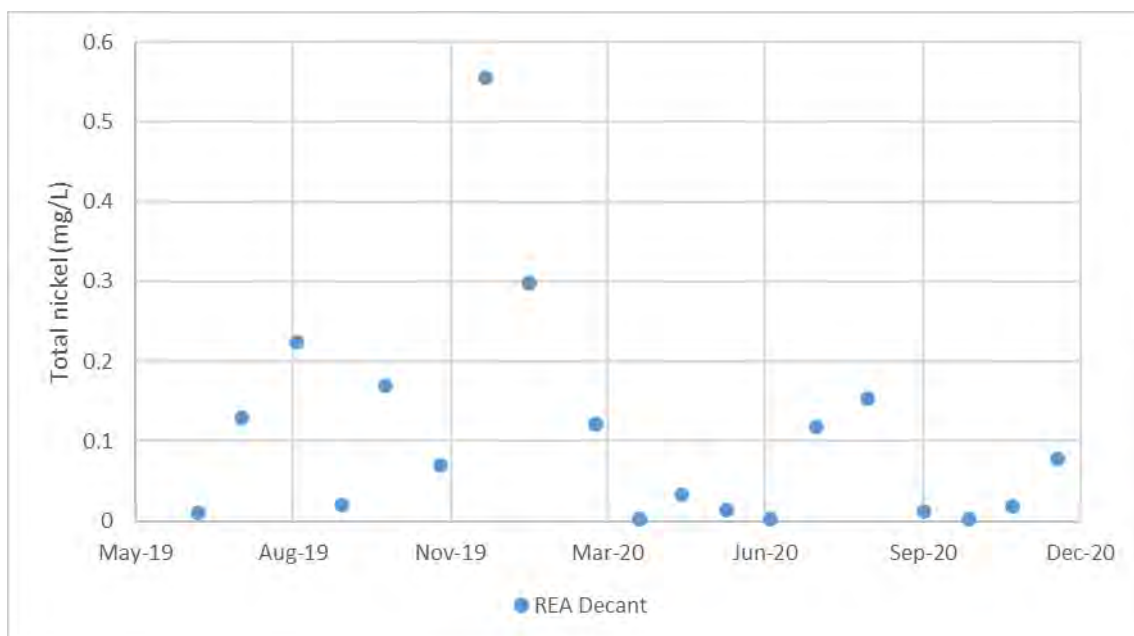


Figure H- 72: 2020 Residuals Total Nickel

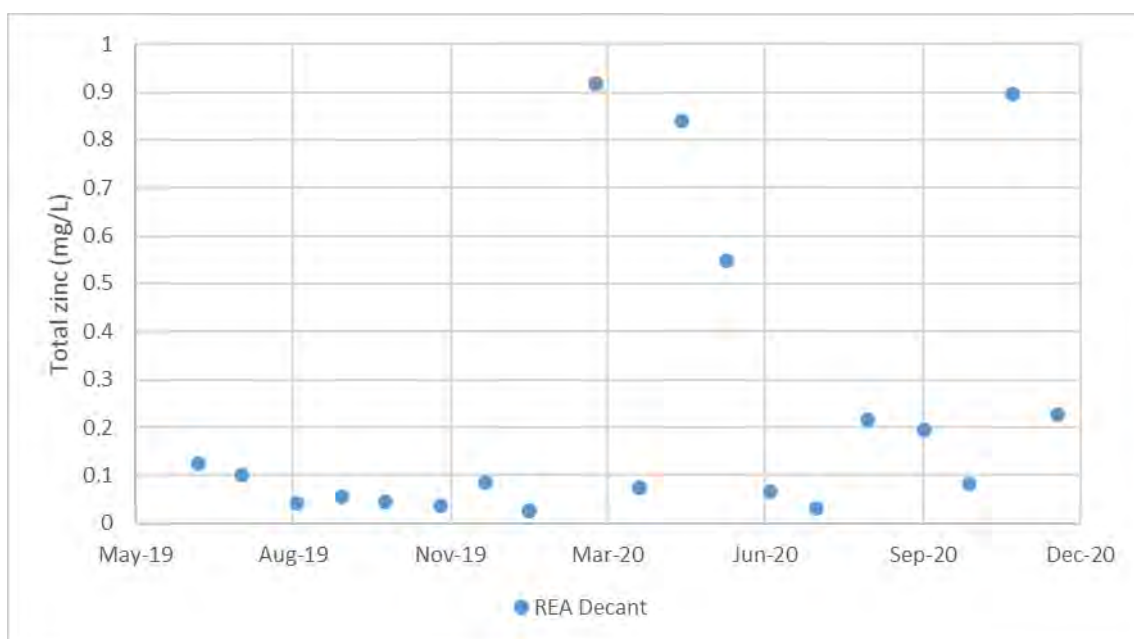


Figure H- 73: 2020 Residuals Total Zinc

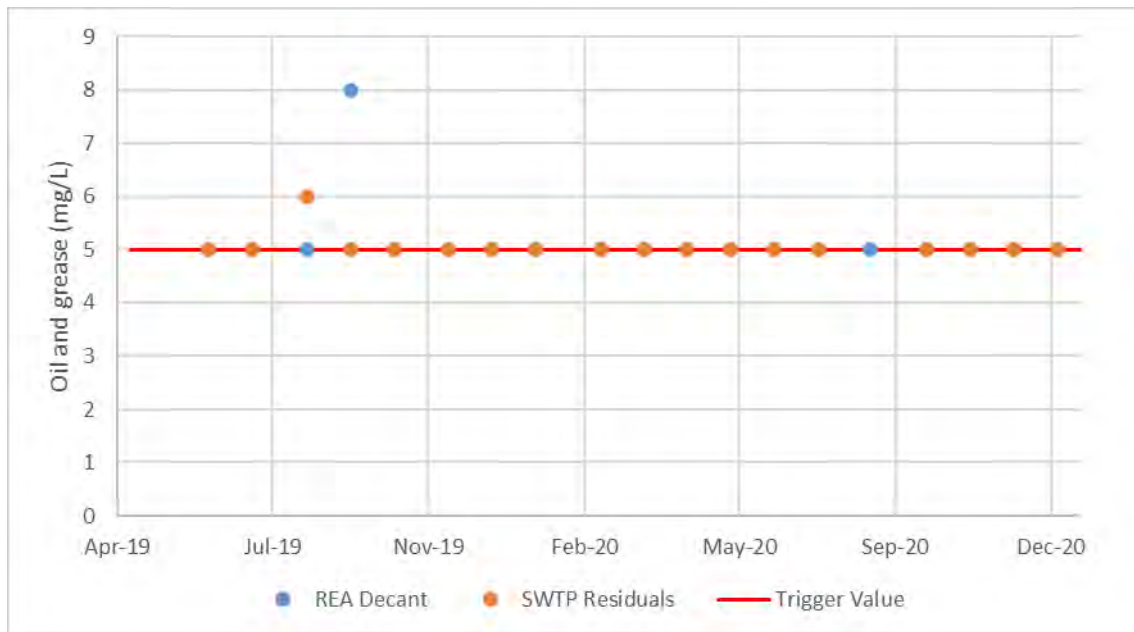


Figure H- 74: 2020 Residuals Oil and Grease

Oil and grease concentrations remained less than the trigger level, which is set at the laboratory limit of reporting in 2020.

Residuals Flow

SWTP residuals are measured for flow to the WCS REA. WCS is approved to accept a maximum of 0.43 ML/day and 0.35 ML/day annual average of SWTP under SSD-5579. These limits were not breached in 2020 with a maximum of 0.43 ML/day and 0.23 ML/day annual average, as shown in Figure H- 75.

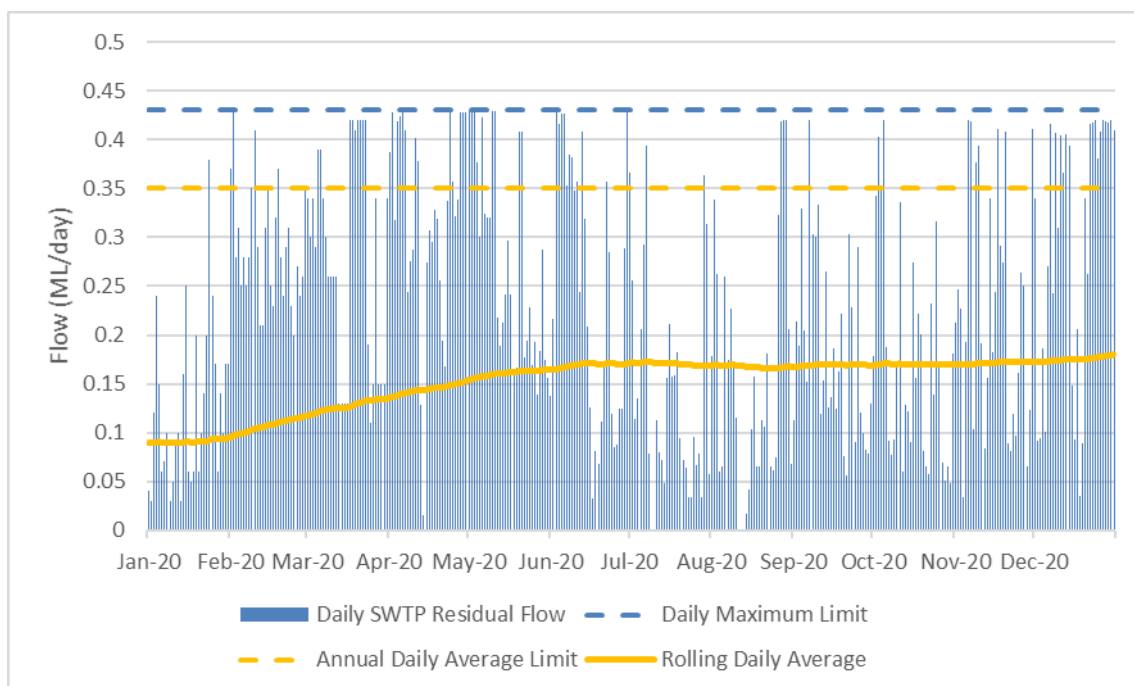


Figure H- 75: 2020 SWTP Residuals Flow to WCS REA

WCS Water Balance Model

- A site water balance was developed for WCS to quantify water transfers within the site under existing and future operational conditions using various rainfall patterns.
- The water management system for WCS was modelled for existing and future conditions.
- A schematic of the overall water management system is provided in Figure H- 76 for both existing (2020) and future (2021) conditions.
- A summary of the predicted average annual inputs and outputs for existing and future conditions is provided in Table H- 8.
- A WCS site water and salt balance can be provided upon request.

The model was used to make forecasts about the likely average and range of water and salt transfers at WCS, particularly the discharge from LDP001. The modelling forecasts that discharges from LDP001 in 2021 will range from approximately 2 to 4 ML/day, with an EC between approximately 5000 and 6000 $\mu\text{S}/\text{cm}$.

The modelling forecasts an upward trend in EC, however that result is highly sensitive to the assumed quantity and quality of potential groundwater seepage from Mount Piper Ash Repository.

Variability in coal washing rates is a major confounding factor in identifying the influence on rainfall and seepage on the shallow groundwater system. Observation during 2021 with minimal coal production is expected to provide additional information of behaviour of the shallow groundwater system.

Table H- 8: WCS Water Balance

	2020 (simulated actual conditions) (ML/year)	2021 (average forecast) (ML/year)
INPUTS		
Direct rainfall onto storages and catchment runoff	879	751
Groundwater recharge	217	289
SWTP residuals	83	122
Flocculant makeup	11	0
ROM coal moisture	76	0
Mount Piper Ash Repository	455	454
TOTAL INPUTS	1721	1627
OUTPUTS		
Evaporation	294	122
Dust suppression	56	55
Coarse coal reject moisture	20	0
Product coal moisture	51	0
Seepage from DML Dam and Cooks Dam to Wangcol Creek	192	204
Overflow from FPL to Wangcol Creek	299	403
Discharge via LDP001 to Wangcol Creek (SCSS)	710	937
Discharge via LDP002 to Coxs River (conveyor at Brays Lane)	0	0
TOTAL OUTPUTS	1622	1722
CHANGE IN STORAGE		
Surface water storages	34	-25
Underground storage	65	-81
TOTAL CHANGE IN STORAGE	99	-106
BALANCE	0	0

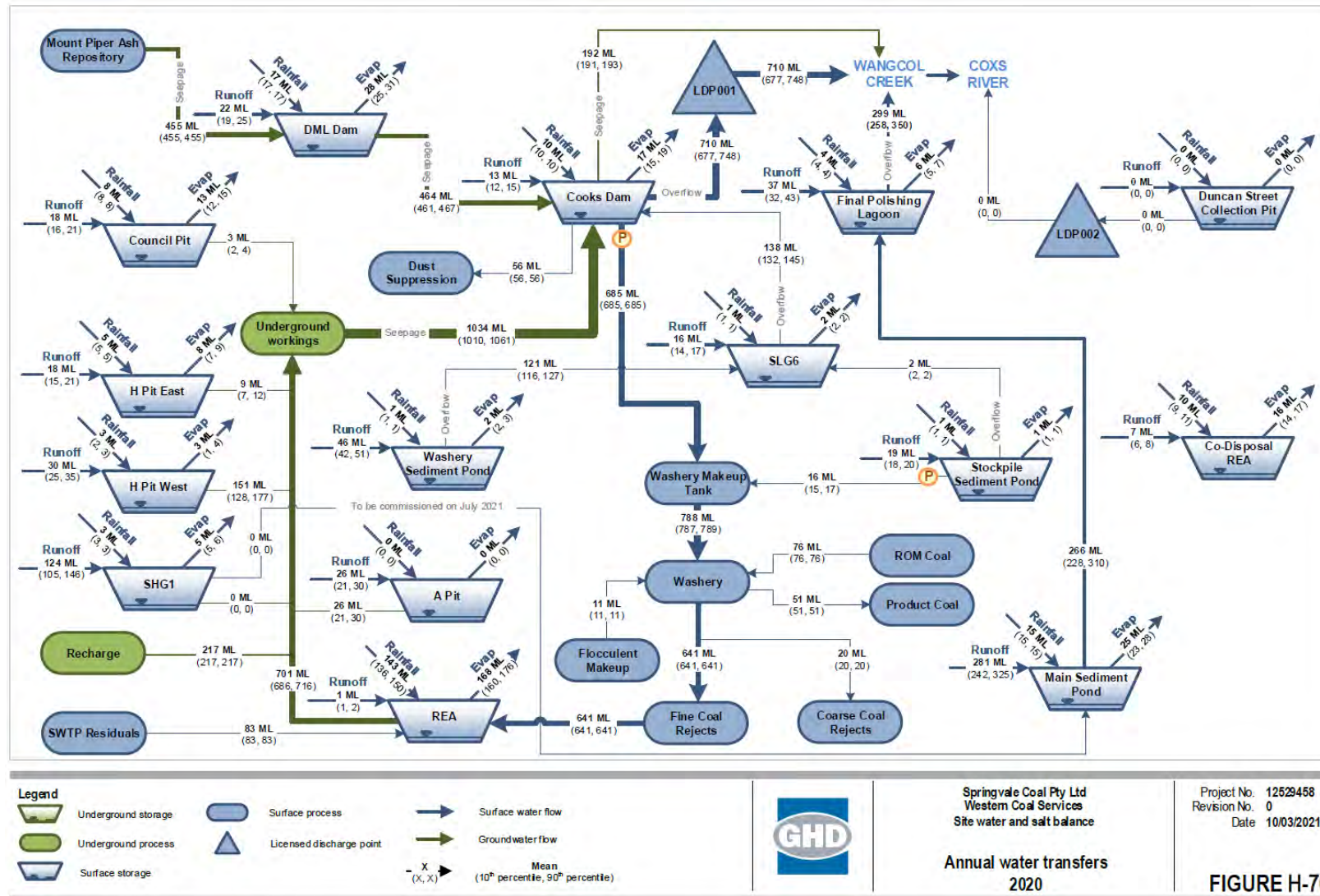


Figure H- 76: WCS 2020 Water Management System Schematic

Appendix I – Biodiversity Information

Performance against Environmental Assessment

During the reporting period, the following recommendations discussed in the EIS were complied with:

- Minimal clearing was undertaken. Any clearing was done within previously disturbed mine impact areas.
- Vegetation at WCS was cleared in accordance with the SCSS Land Disturbance Permit Management System.
- Appropriate measures were implemented to minimise erosion and sedimentation impacts upon waterways and associated vegetation. Regular monitoring was undertaken to ensure their functionality and condition.
- Weed monitoring was undertaken and potential weed infestations were appropriately managed to ensure surrounding communities were protected from invasive species.
- Aquatic ecology monitoring was undertaken.

Aquatic Ecology monitoring points are located in Appendix A.

Upper Coxs River Catchment Aquatic Ecology 2020

The Upper Coxs River catchment is a highly modified environment due to historical and current primary production and industrial activities.

In 2017, a coordinated, catchment-wide approach for aquatic ecology monitoring was implemented with the aim of understanding the overall health of the Upper Coxs River catchment (UCRC). The monitoring program, known as the UCRC Aquatic Ecology Monitoring Program (AEMP; GHD 2016), satisfies the aquatic ecology monitoring requirements of Centennial operations and the Springvale Upper Coxs River Action and Monitoring Program (UCRAMP; GHD 2017).

The UCRC AEMP allows for identification of impacts (positive and negative) within the catchment due to mine water discharge from Centennial operated LDPs on the ecosystem health of waterways in the UCRC.

Macroinvertebrate samples were collected by GHD during autumn 2020 (15/04/20-19/04/20) and spring 2020 (27/10/20-09/11/20) at the sites in Table I- 1 as part of the integrated UCRC AEMP. Water and sediment quality were tested in conjunction with macroinvertebrate monitoring.

Table I- 1: Macroinvertebrate monitoring locations

Site	Easting MGA 56H	Northing MGA 56H	Description	Site Type	Dates Sampled
Coxs River					
CR0	229753	6309404	Upstream of all Centennial LDPs	Background	16/04/20, 27/10/20
CR1	229828	6307311	Upstream of all Centennial LDPs	Background	17/04/20, 03/11/20
CR2	228767	6305326	Located at the Mount Piper Haul Road crossing, approximately 1 km downstream of Angus Place LDP1 (decommissioned). Downstream of Kangaroo Creek	Upstream	17/04/20, 09/11/20
CR3	228471	6303525	Located downstream of Wangcol Creek and upstream of Sawyers Swamp Creek confluence.	Impact	15/04/20, 09/11/20
CR6	228512	6297751	Coxs River directly downstream of Lake Wallace, on the downstream side of Rocky Waterhole Drive. Downstream of all Centennial LDPs.	Recovery	17/04/20, 04/11/20
CR7	228926	6292637	Located in the Lidsdale State Forest approximately 5 km downstream of the Lake Wallace dam wall.	Recovery	19/04/20, 27/10/20
Wangcol Creek					
WC1	226147	6305131	Located approximately 700 m upstream of SCS LDP1.	Background	20/04/20, 10/11/20
WC2	226586	6304550	Located approximately 350 m downstream of SCS LDP1.	Impact	20/04/20, 10/11/20
WC4	227548	6304294	Lower Wangcol Creek site, located between historical sites WC2 and WC3	Impact	20/04/20, 10/11/20
WC3	228325	6304303	Lower Wangcol Creek downstream of SCS LDP1. 250 m upstream of confluence with the Coxs River.	Impact	20/04/20, 10/11/20

The following macroinvertebrate metrics were calculated:

- **Taxa richness:** the number of different families/groups collected in a sample. This metric provides a measure of macroinvertebrate community diversity.
- **EPT richness:** the number of taxa belonging to the Ephemeroptera, Plecoptera and Trichoptera families. These groups of macroinvertebrates have been found to be particularly sensitive to changes in their environment (Karr and Chu 1999) and, therefore, can be used to assess impacts due to chemical and physical changes (Plafkin et al. 1989; Barbour et al. 1992).
- **SIGNAL-2 Biotic Index:** pollution sensitivity of the macroinvertebrates collected in a sample, expressed as an average (Chessman 2003). 1 = greatest pollution tolerance, 10 = greatest pollution sensitivity.

Summary of results

In Wangcol Creek, impact site WC4 contained the lowest number of taxa during both monitoring events (Figure I- 1). Taxa richness was highest during both monitoring events at the furthest downstream site WC3, where results were similar to, or higher than, those observed at background site WC1 during both seasons. At impact site WC2, taxa richness in autumn 2020 was similar to background site WC1, while in spring 2020, taxa richness at WC2 was lower than at WC1 by three taxa. Taxa richness at all Wangcol Creek sites (including WC1) was below the WCup/WC1 long-term median in 2020.

In autumn 2020, EPT richness ranged between 2 and 3 taxa, except for WC2 (Figure I- 2), at which the number of collected EPT taxa ranged from one to two. In spring 2020, EPT richness was low at WC4, with only one EPT taxon collected in each replicate. EPT richness was highest at WC1 in spring, with three and four EPT taxa collected, followed by WC3, with three EPT taxa collected in each replicate. All samples contained fewer EPT taxa than the long-term WCup/WC1 median result except for one replicate collected from WC1 in spring which had an EPT richness equal to the median.

In autumn and spring 2020, SIGNAL-2 scores were lowest at WC3 (Figure I- 3). The highest SIGNAL-2 in autumn was recorded in one replicate from WC4. In spring, SIGNAL-2 was highest in one replicate from WC1, although. Majority of the SIGNAL-2 scores in 2020 were below the long-term WCup/WC1 median except for one replicate from WC1 in autumn and one replicate from WC4 in each of autumn and spring. However, the SIGNAL-2 results observed at WC4 in spring are likely to have been skewed by the low taxa richness results at these sites.

The macroinvertebrate metrics from 2020 suggest some impairment of the macroinvertebrate community in Wangcol Creek, with WC4 demonstrating reduced diversity (taxa richness), while WC3 demonstrated fewer sensitive macroinvertebrate families, compared with results from background site WC1. There are signs of recovery in the macroinvertebrate community at the downstream end of Wangcol Creek, as evidenced by similar community health at WC3 to background site WC1.

Analysis of water quality results at Wangcol Creek sites identified sufficiently high concentrations of dissolved aluminium and cobalt concentrations to affect aquatic biota (ANZG 2018) at some sites. Dissolved aluminium concentrations were elevated at background site WC1 in spring, impact site WC2 in autumn, and impact site WC4 in spring. Cobalt concentrations exceeded the guideline value (ANZG 2018) at all sites in 2020. In autumn 2020, cobalt concentrations increased from upstream to downstream between WC1 and WC4, with reduced concentrations observed at furthest downstream site WC3. In spring 2020, cobalt concentrations were lowest at WC1 and WC2, and highest at WC4 and WC3. The elevated concentrations of these metals at background site WC1 indicate that there are influences in the catchment upstream of SCS discharges. Further, as the cobalt guideline value is currently of low reliability, the implications of elevated concentrations are less certain. The pattern in

water quality did not correspond closely to the patterns of impairment in the macroinvertebrate community.

Sediment quality was generally poorer at Wangcol Creek impact sites, with the high guideline value (GV-high; ANZG 2018) only exceeded at impact sites for nickel and zinc. There were exceedances of the default guideline value (DGV; ANZG 2018) at WC1 for nickel only. These sediment metals were observed in concentrations that are likely to cause biological effects (ANZG 2018). However, as with water quality, the pattern in sediment quality does not closely match the pattern in macroinvertebrate metrics. For example, although particularly high nickel and zinc concentrations were observed in the sediment at WC4 in autumn 2020, the poorest macroinvertebrate community health was observed at WC4 in spring 2020. However, the persistent elevated concentrations of nickel in the sediment of Wangcol Creek, including upstream of LDP1, is likely to be influencing macroinvertebrate community health through exclusion of sensitive taxa throughout the waterway.

Analysis of discharge quality of water from LDP1 will be undertaken in the UCRC aquatic ecology monitoring 2020 annual report (GHD 2021) and this will be related to results of the 2020 aquatic ecology monitoring in order to identify whether SCS discharges have contributed to the adverse water / sediment quality or macroinvertebrate impairment observed in Wangcol Creek during 2020 aquatic ecology monitoring.

The UCRC AEMP also included a site on the Coxs River upstream (CR2) and downstream (CR3) of the Wangcol Creek confluence. Taxa richness, EPT richness and SIGNAL-2 at background / upstream sites were depressed in autumn 2020, relative to spring 2020 (Figure I- 4 to Figure I- 6). These sites, located in the headwaters of the Coxs River, and upstream of Centennial discharges (since the cessation of Angus Place's LDP1), are more reliant on rainfall for instream water, than are sites downstream of licensed discharges or further downstream in the catchment. Therefore, the improvement in macroinvertebrate community condition at these sites in spring was likely due to cumulative rainfall prior to the spring sampling, and potentially, reduced influence from the bushfire damaged headwaters (CR0 and Kangaroo Creek sites), which appeared to have influenced water quality as well as the localised impacts to instream and riparian habitat that were observed.

Taxa richness was similar at the Coxs River sites upstream (CR2) and downstream (CR3) of the Wangcol Creek confluence, with the exception of higher richness in one replicate from CR3 in autumn and one replicate from CR2 in spring (Figure I- 4). EPT richness in autumn was considerably higher at CR3 than CR2, while in spring, EPT richness at CR2 had improved considerably, and was higher than at CR3 (Figure I- 5). All samples from CR2 or CR3 in 2020 contained fewer EPT taxa than the long-term CR2 median. In autumn 2020, SIGNAL-2 scores at CR3, downstream of the Wangcol Creek confluence, were much higher than those calculated for background/upstream sites, with similar results to those at recovery site CR7 (Figure I- 6). In spring 2020, SIGNAL-2 results at CR2 and CR3 and background sites were similar.

Overall, the macroinvertebrate results for the Coxs River indicated a macroinvertebrate community of similar or improved condition (depending on the season) downstream of the Wangcol Creek confluence. However, the UCRC aquatic ecology monitoring 2020 annual report (GHD 2021) will interrogate the results in greater detail, considering the volume and quality of LDP1 discharges to Wangcol Creek.

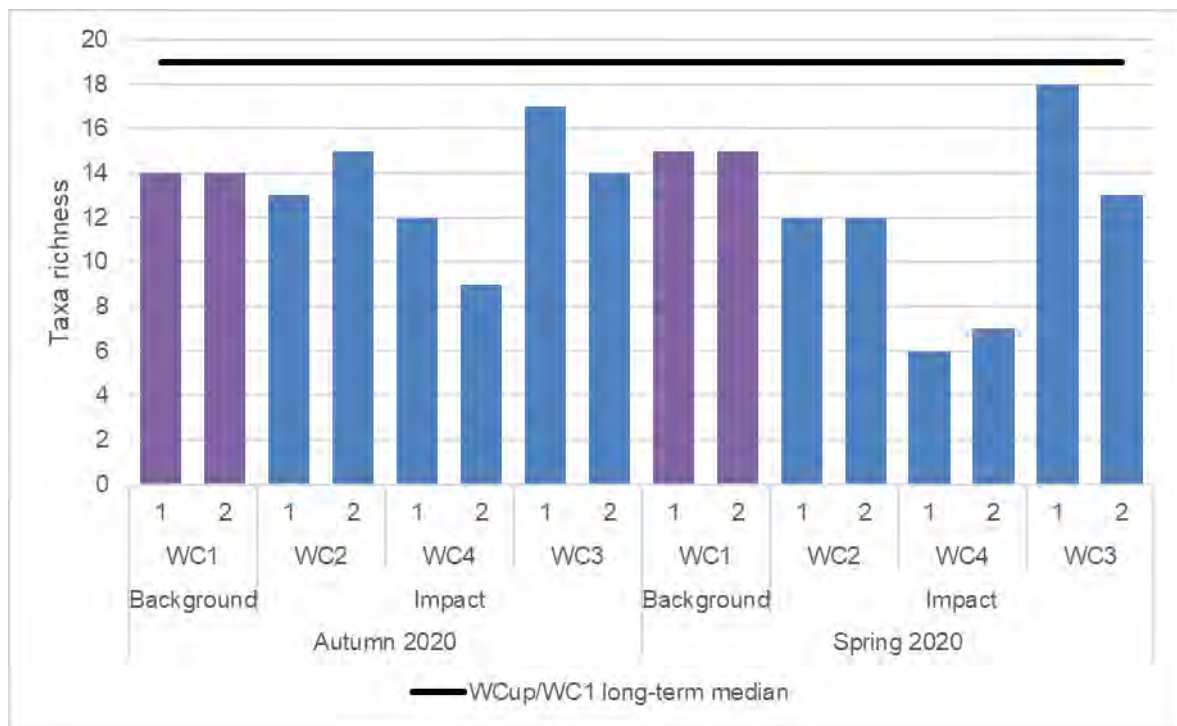


Figure I- 1: Taxa richness in Wangcol Creek samples in 2020

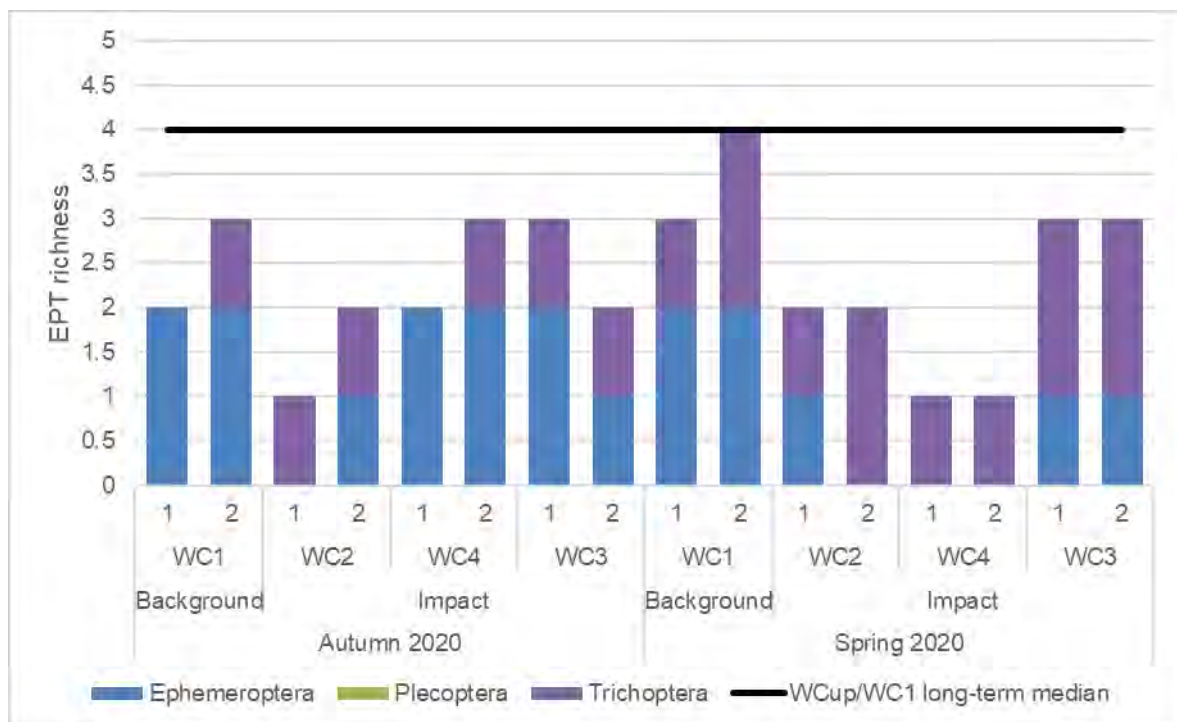


Figure I- 2: EPT richness in Wangcol Creek samples in 2020

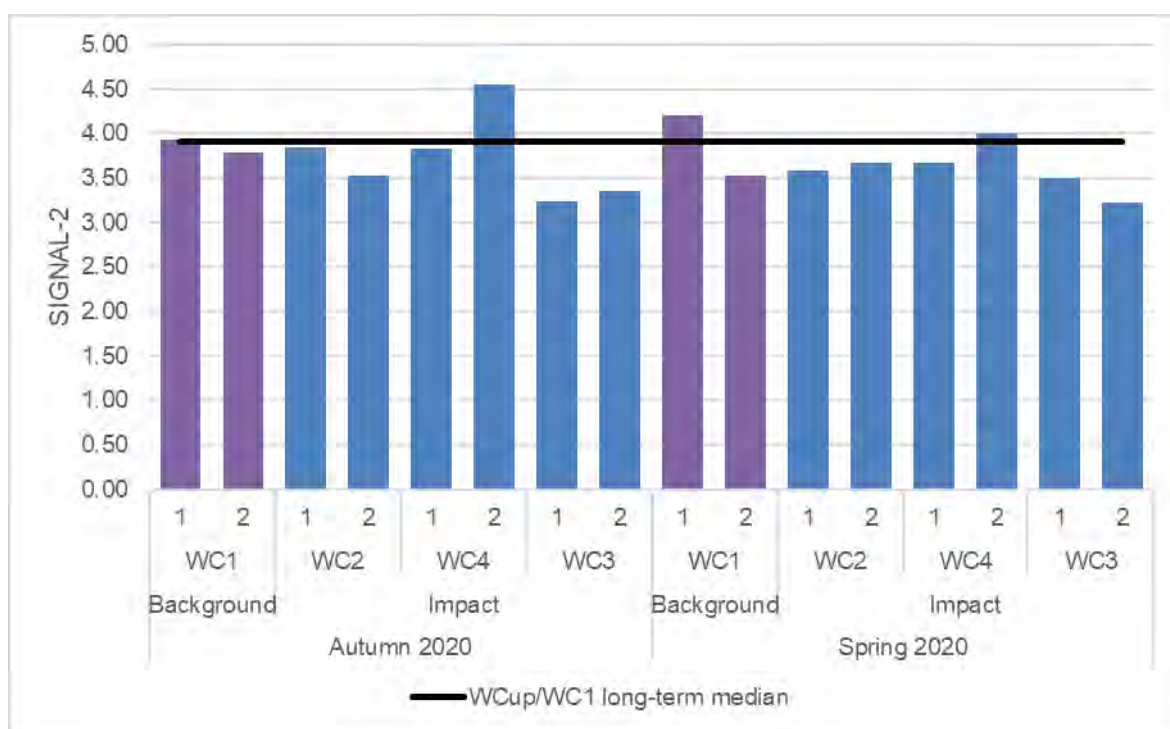


Figure I- 3: SIGNAL-2 in Wangcol Creek samples in 2020

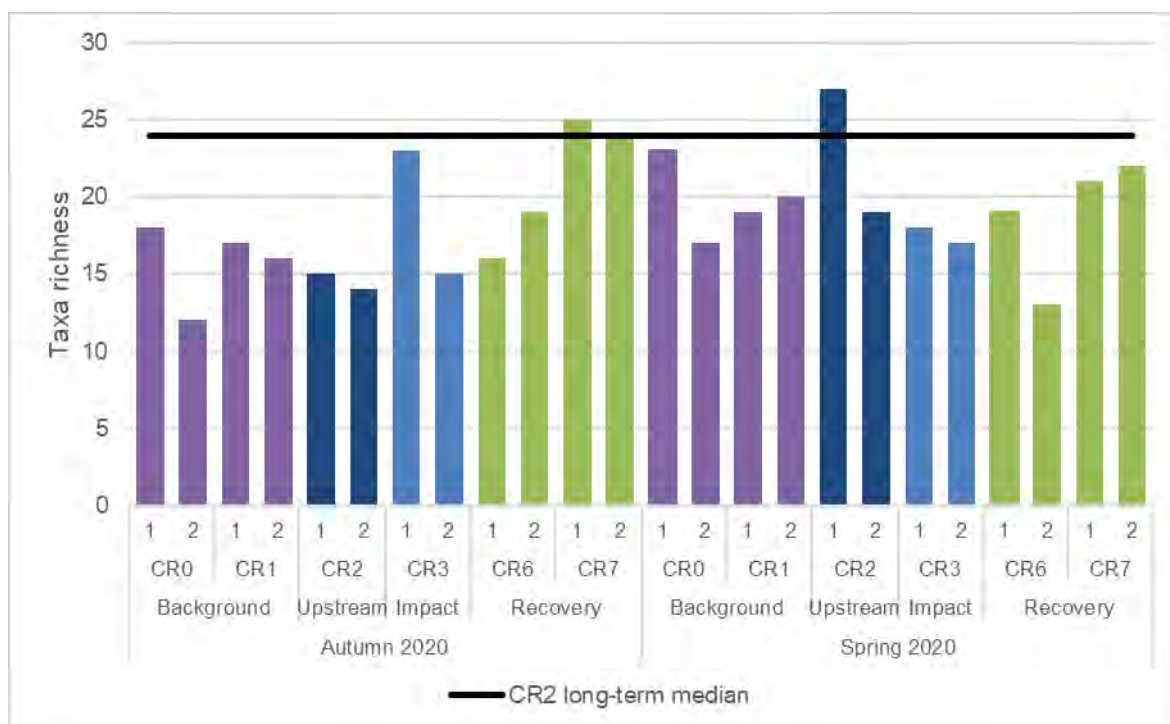


Figure I- 4: Taxa richness in Cocks River samples associated with Springvale Coal Services in 2020

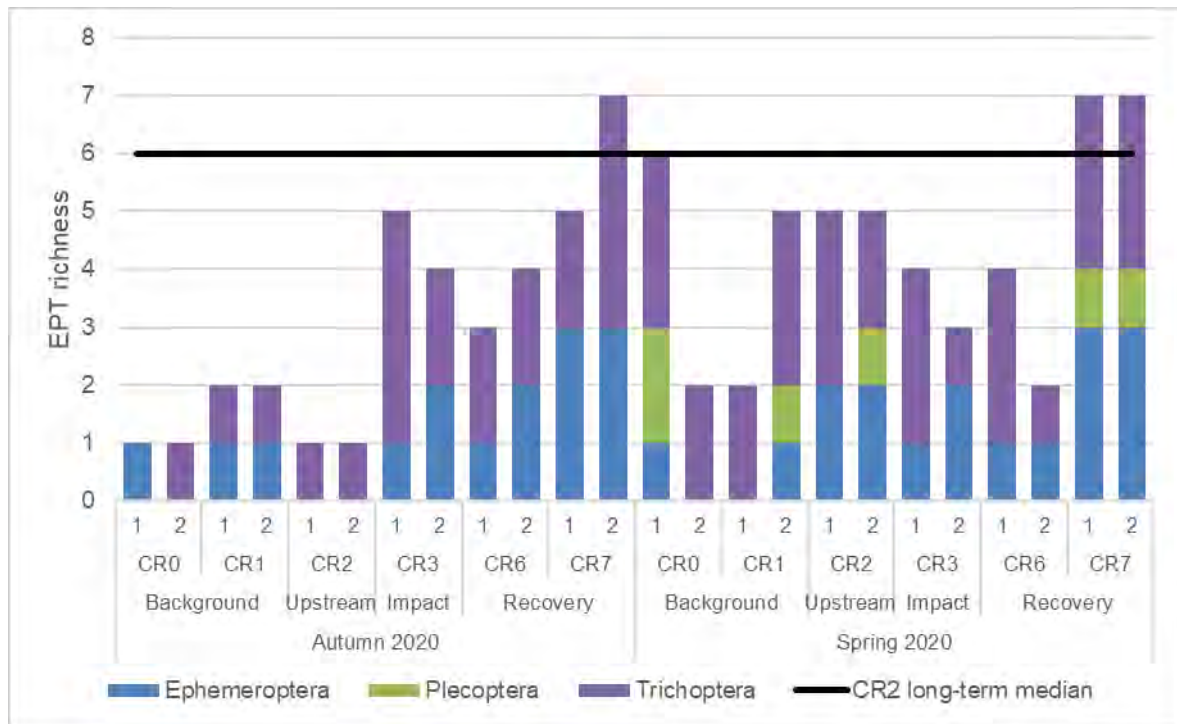


Figure I- 5: EPT richness in Coss River samples associated with Springvale Coal Services in 2020

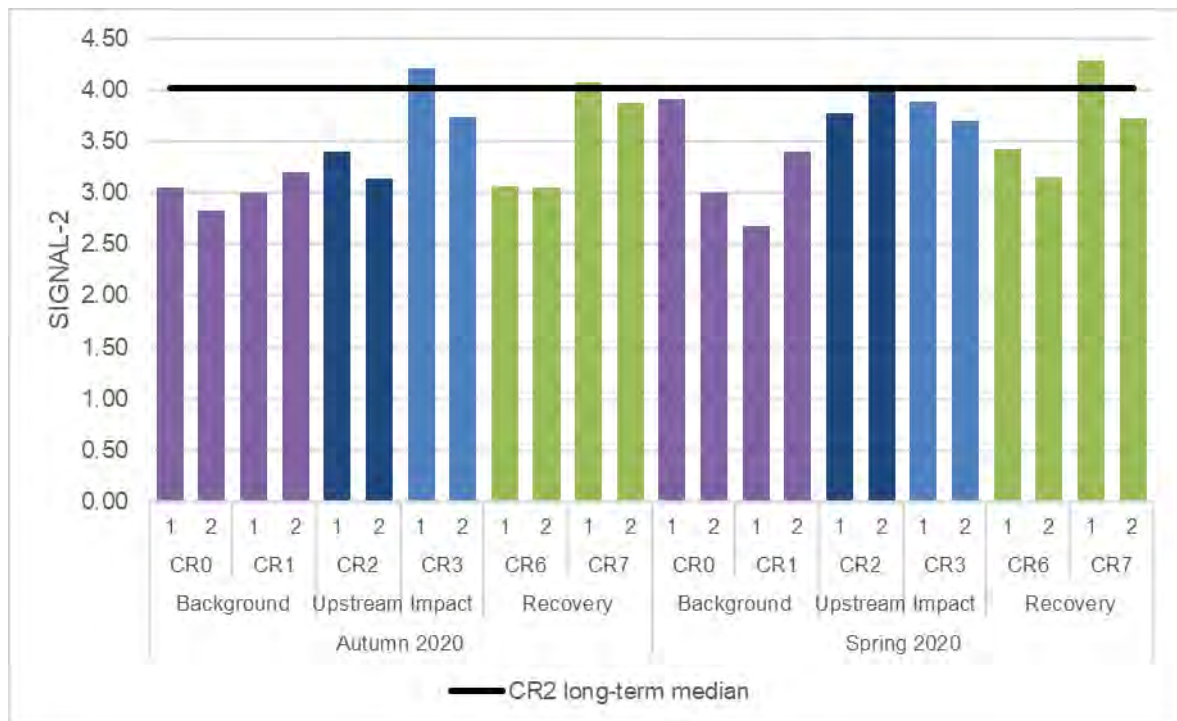


Figure I- 6: SIGNAL-2 in Coss River samples associated with Springvale Coal Services in 2020

Appendix J – Heritage Information

Performance against Environmental Assessment

During the reporting period, the following recommendations discussed in the EIS were complied with:

- Managed under the Western Region Aboriginal Cultural Heritage Management Plan and the Western Region Historic Heritage Management Plan.
- Protective buffer boundaries established for AHIMS sites.
- Personnel made aware of their statutory obligations for heritage under the NSW National Parks and Wildlife Act (1974) and the NSW Heritage Act (1977).
- Works to cease if further Aboriginal sites are identified and assessment undertaken.
- Works to cease and NSW Police contacted immediately in the event that skeletal remains are identified.

Western Region Aboriginal Cultural Heritage Committee

Centennial hosted two Western Regional Aboriginal Cultural Heritage Committee meetings in May and October 2020.

These meetings provide a forum for discussion on Indigenous heritage management that relate to the Centennial western region operations.

No specific issues or management actions were identified for WCS by the committee.

Cultural Heritage Inspections

Cultural heritage inspections were undertaken in December 2020 at WCS as part of a heritage impact assessment for a proposed modification to SSD-5579 that would disturb land surfaces to allow for additional water management infrastructure.

The heritage inspection also included an inspection of four AHIMS registered sites located outside the current operational areas being AHIMS sites 45-1-0209, 45-1-0210, 45-1-0218 and 45-1-2749 as listed in the WCS EIS as a commitment:

“WCS will undertake an initial site inspection of all sites shown on figure 44 of the EIS outside the disturbance footprint with the Registered Aboriginal Parties prior to 31 December 2014 to identify the site condition and agree on any protection and/or management measures that need to be implemented. Monitoring with, representatives from the Registered Aboriginal Parties, of these sites will be undertaken every 2 years thereafter”

As of 31 December 2020, the draft report for this inspection was still pending. On 10 March 2021 the draft report was received by Centennial with circulation and review proposed to be completed in accordance with the Western Region Aboriginal Cultural Heritage Management Plan in Q1 and Q2 2021.

Historic Heritage

There are no historic heritage items within the WCS lease boundary.

Appendix K – Visual Information

Performance against Environmental Assessment

The following visual impact management and mitigation measures outlined in the EIS were complied with during the reporting period:

- Non reflective and neutral toned materials will be utilised wherever possible to reduce visual impacts where views to the site and infrastructure are available.
- Existing best practice will ensure lighting is managed to prevent light spill and intrusion into the receiving environment.
- Neutral tones will be used for the bridge and ramping component of the Link Haul Road.
- Battered slopes to the Link Haul Road bridge will be planted with a low-maintenance hardy ground cover flowering species that may provide some visual interest.
- Minimise removal of existing vegetation surrounding the Washery wherever possible.
- Vegetation, trees and any natural topography that exists adjacent to the Link Haul Road bridge crossing should be maintained to assist with obstructing views to the haul route and bridge approaches.

During the reporting period, visual impacts at WCS complied with Development Consent SSD-5579, Schedule 3, Condition 40.

- No fixed outdoor lights or mobile lighting rigs shined above the horizontal.
- All external lighting associated with the development complied with Australian Standard AS4282.
- Ensured that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) was aimed at blending as far as possible with the surrounding landscape.

Appendix L – Bushfire Management Information

Performance against Environmental Assessment

During the reporting period, mitigation measures outlined in the EIS were complied with. These include:

- Adherence to the existing Bushfire Management Plan.
- Preparation of emergency protocols.
- Ensuring a water source is available for firefighting.

Firebreaks were maintained at WCS in 2020 as part of normal grounds maintenance activities.

Fire control equipment was inspected monthly as part of normal operational maintenance.

No fires occurred in the WCS approval boundary area that required Rural Fire Services assistance.

No other activities related to bushfire management were undertaken in the period.

Appendix M – Waste Information

Performance against Environmental Assessment

The waste management strategies for WCS include the principles of avoidance, reduction, reuse, recycle and disposal.

The following long-term waste management initiatives outlined in the EIS were complied with during the reporting period:

- Monitoring performance and reporting.
- Setting annual targets for waste reduction initiatives.
- Ongoing review waste generating processes.
- Ongoing review waste management processes.
- Assignment of responsibilities.
- Provision of effective and appropriately located waste and recycling facilities.

In 2020 WCS implemented all reasonable and feasible measures to minimise the waste (including coal reject) generated by the development.

Coal reject was utilised in the construction of the REA, and for landform completion works for Area 4 in accordance with the WCS MOP.

All waste generated by the development was appropriately stored, handled and disposed.

Springvale Water Treatment Plant residuals waste was transferred to the WCS REA. Volumes of imported residual waste is presented in Appendix H, Figure H- 75.

Offsite disposal of waste was disposed to licenced facilities as provided below.

The monthly waste graphs for WCS for the reporting period are shown in Table M- 1 and Figure M- 2 – Figure M- 5.

Table M- 1: 2020 Waste Quantities by Stream

	Hazardous Recycled				Non-hazardous Recycled		Hazardous Disposed	Non-hazardous Disposed	Totals		
	Waste oil (kL)	Oily water (kL)	Oil filters (Tonne)	Effluent (kL)	Paper & cardboard (Tonne)	Scrap steel (Tonne)	Oily rags / absorbents (Tonne)	Mixed solid waste (Tonne)	Total waste (Tonne)	Recycled waste (Tonne)	Percent recycled (%)
Jan-20	-	-	-	-	0.040	-	-	0.215	0.255	0.04	16%
Feb-20	-	-	-	-	0.065	-	-	0.195	0.260	0.07	25%
Mar-20	-	-	-	-	0.055	-	-	2.730	2.785	0.06	2%
Apr-20	1.000	-	-	-	0.045	-	-	0.490	1.535	1.05	68%
May-20	-	-	-	-	0.050	-	-	0.950	1.000	0.05	5%
Jun-20	-	-	-	-	0.070	-	-	0.915	0.985	0.07	7%
Jul-20	-	-	-	-	0.090	-	-	0.580	0.670	0.09	13%
Aug-20	-	-	-	-	0.165	-	-	0.465	0.630	0.17	26%
Sep-20	-	-	-	-	0.085	-	-	0.660	0.745	0.09	11%
Oct-20	0.800	-	-	-	0.135	-	-	0.685	1.620	0.94	58%
Nov-20	-	-	-	-	0.100	-	-	0.890	0.990	0.10	10%
Dec-20	-	-	-	-	-	-	-	0.100	0.100	-	0%

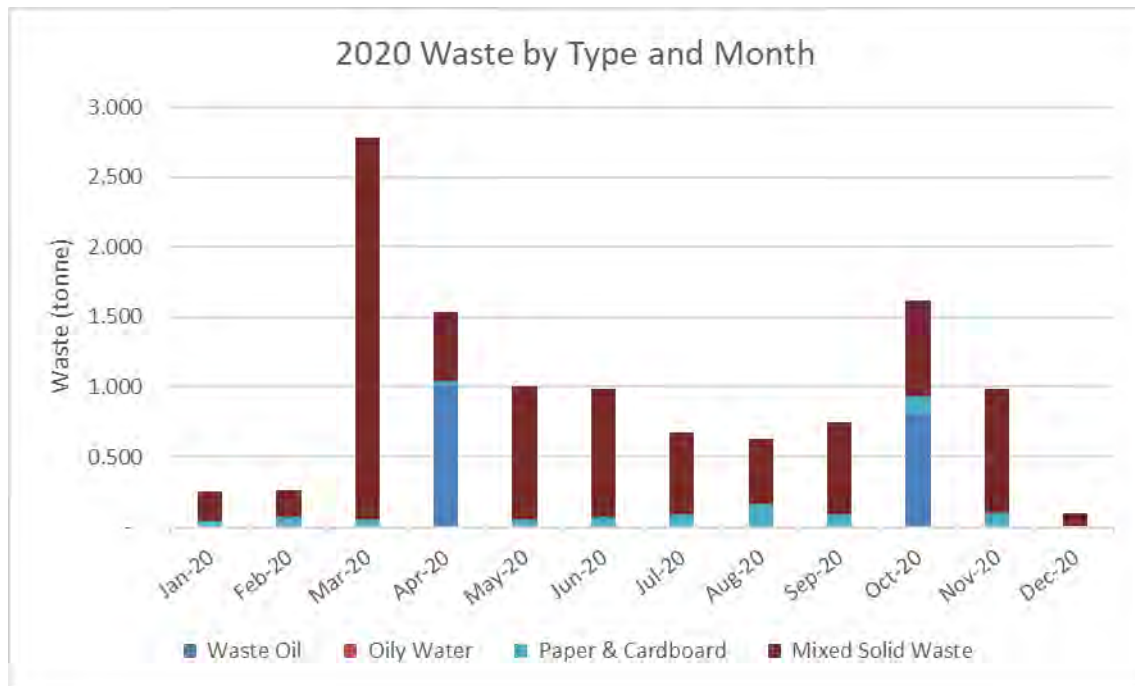


Figure M- 1: WCS Waste by Type and Month 2020

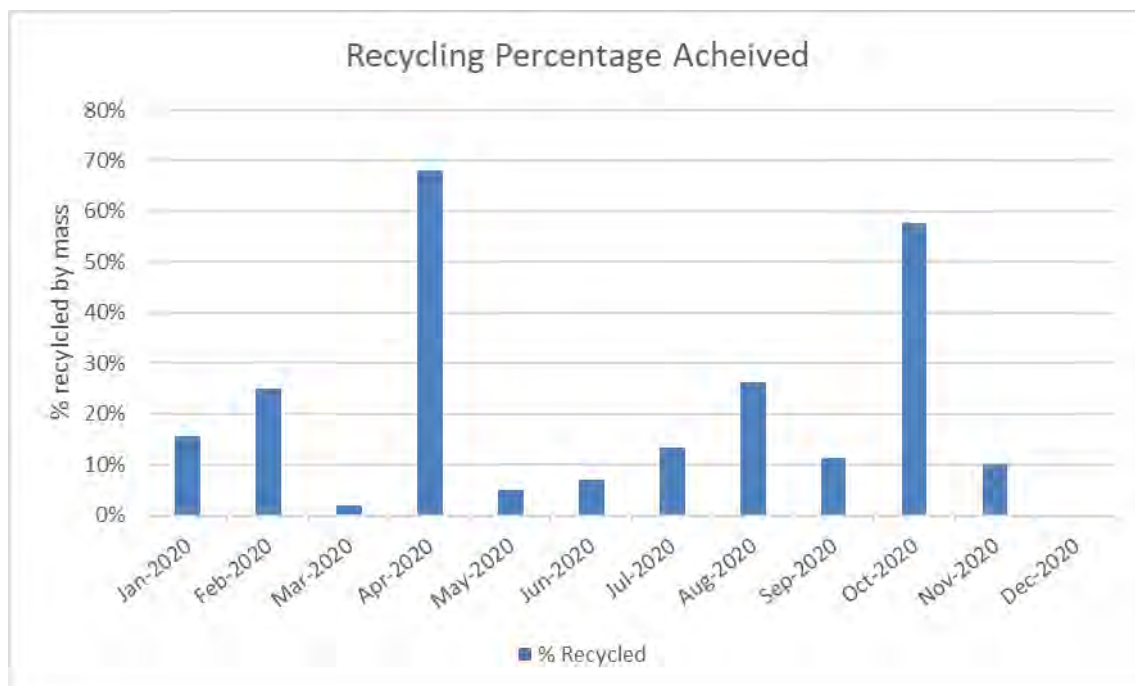


Figure M- 2: WCS Recycling Percentage for 2020

Historical waste information for WCS is shown in Table M- 2 and Figure M- 3 – Figure M- 5.

Table M- 2: 2011-2020 Waste Quantities by Stream

	Hazardous Recycled				Non-hazardous Recycled		Hazardous Disposed	Non-hazardous Disposed	Totals		
	Waste oil (kL)	Oily water (kL)	Oil filters (Tonne)	Effluent (kL)	Paper & cardboard (Tonne)	Scrap steel (Tonne)	Oily rags / absorbents (Tonne)	Mixed solid waste (Tonne)	Total waste (Tonne)	Recycled waste (Tonne)	Percent recycled (%)
2011	-	-	-	-	0.73	-	-	2.55	3.28	0.73	22%
2012	1.50	-	-	-	2.90	-	-	6.61	11.01	4.40	40%
2013	-	-	-	-	2.12	-	-	6.85	8.97	2.12	24%
2014	-	-	-	-	1.79	-	-	15.51	17.30	1.79	10%
2015	-	0.62	-	-	2.17	-	-	36.72	39.51	2.79	7%
2016	-	-	-	-	2.12	-	-	20.14	22.26	2.12	10%
2017	1.45	-	-	-	1.96	-	-	12.11	15.51	3.41	22%
2018	1.10	-	-	-	1.96	-	-	18.91	21.96	3.06	14%
2019	0.70	-	-	-	1.72	-	-	5.65	8.07	2.42	30%
2020	1.80	-	-	-	0.90	-	-	8.88	11.58	2.70	23%

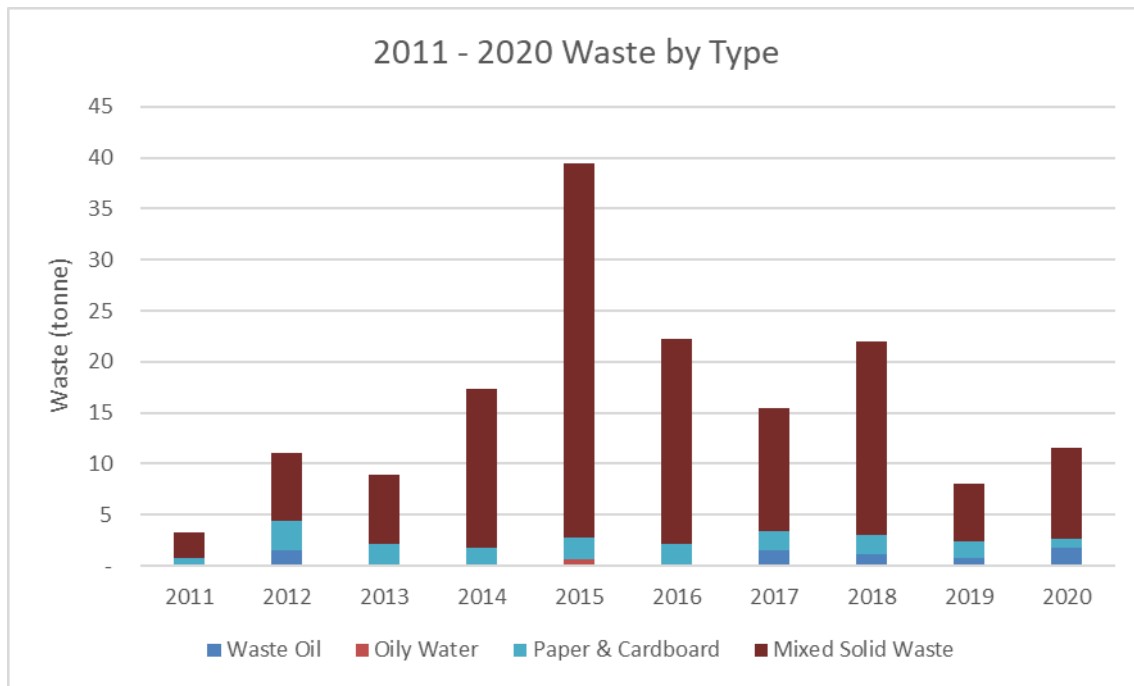


Figure M- 3: WCS Waste by Type and Year 2011-2020



Figure M- 4: WCS Recycled Waste Amount 2011-2020



Figure M- 5: WCS Recycled Waste Percentage 2011-2020

Table M- 3 outlines the Centennial Coal Western Disposal locations.

Table M- 3: Centennial Coal Western Disposal Locations

REFERENCE	WASTE TYPE	TRANSPORT / DISPOSAL/ TREATMENT FACILITY
DL01	20L and 205L Drums/Aerosol Cans	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL01	Hydraulic Hoses	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL01	Oil Rags/Absorbents	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL01	Acids/Solvents/Paints/Degreaser	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL01	Hydrocarbons (Oil / Grease)	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL01	Adhesives/Resins	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL02	Batteries	Renewable Oil Services will transport to SIM's Metal for Recycling - Transport License: 12991 - SIMS Metal Recycles Facility License: 11264
DL03	E-Waste	Matthews Metal Management - 20132
DL03	Cardboard	JR Richards & Sons - Transport License: L10415 Ophir Road Resource Recovery Centre - Facility License: 5056
DL03	Co-mingled Recyclables	JR Richards & Sons - Transport License: L10415 Ophir Road Resource Recovery Centre - Facility License: 5056
DL03	Paper	JR Richards & Sons - Transport License: L10415 Ophir Road Resource Recovery Centre - Facility License: 5056
DL03	Glass	JR Richards & Sons - Transport License: L10415 Ophir Road Resource Recovery Centre - Facility License: 5056
DL03	Plastic Packaging	JR Richards & Sons - Transport License: L10415 Ophir Road Resource Recovery Centre - Facility License: 5056
DL03	Asbestos	JR Richards & Sons - Transport License: L10415 Lithgow City Council Landfill Facility - Facility License: 6004
DL03	Contaminated Soil	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL04	Chemicals	Renewable Oil Services will transport to a licensed facility for disposal - Transport License 12991 - Hazmat Services Facility License: 13265
DL04	Radioactive Material	ANSTO - Australian Nuclear Science & Technology Organisation
DL05	Effluent	Bettergrow PTY LTD Licence: 12529
DL05	Drilling Mud	Bettergrow PTY LTD Licence: 12529
DL05	Oil Water	Bettergrow PTY LTD Licence: 12529
DL05	Wash Bay Sludge	Bettergrow PTY LTD Licence: 12529
DL05	Waste Coolant	Renewable Oil Services - Transport License: 12991 - Facility License: 13092
DL06	Green Waste	JR Richards & Sons - Transport License: L10415 Lithgow City Council Landfill Facility - Facility License: 6004
DL07	Medical/ Sanitary	ISS Washroom Facilities
DL08	Oil Filters	Renewable Oil Services - Transport License: 11399 - Facility License: 11658
DL09	Pneumatic Toner Cartridges	Close the Loop Recycling Services
DL10	Putrescible Waste	JR Richards & Sons - Transport License: L10415 Lithgow City Council Landfill Facility - Facility License: 6004
DL10	Wooden Pallets	JR Richards & Sons - Transport License: L10415 Lithgow City Council Landfill Facility - Facility License: 6004
DL11	Putrescible Waste	JR Richards & Sons - Transport License: L10415 Lithgow City Council Landfill Facility - Facility License: 6004
DL12	Scrap Metal	Sims Metal - Facility License: 11264
DL13	Secure Documents	Iron Mountain Secure Document destruction
DL14	Fume Tubes	Dalcomark Australia (Chemical) - Facility License No: 12628
DL15	Tires	C&R Tyre Recycling - Facility License No: 11666
DL16	Concrete	Dincof Sand & Soil Centre - Licence No: 20256
DL16	Conveyor Belt	Arditmoda Industries
DL16	Diesel Particulate Filter - Contaminated	JR Richards & Sons - Transport License: L10415 Suez Resource Recovery Centre Kemps Creek - Facility License: 4092

Appendix N – Rehabilitation Information

Performance against Environmental Assessment

The EIS identified that rehabilitation is to be undertaken following the decommissioning of the Reject Emplacement Area (REA). The REA is currently in operation.

Rehabilitation at WCS is managed in accordance with the approved WCS Mining Operations Plan – 2020 (MOP). No new rehabilitation was undertaken in 2020. Rehabilitation works were undertaken on previously rehabilitated areas in accordance with the Rehabilitation Improvement Plan (RIP).

Rehabilitation monitoring was undertaken with various seasonal and periodic weed control programs also completed. Rehabilitation monitoring points are located in Appendix A.

Table N- 1: WCS Rehabilitation Status

Year (End of)	Disturbance and rehabilitation at WCS		
	Total disturbance area – Per MOP year (Ha)	Total rehabilitation area – Per MOP year (Ha)	Cumulative rehabilitation areas (Ha)
Start of MOP	185.1	39.2	39.2
2019 (Previous reporting period)	185.1	39.2	39.2
2020 (Current reporting period)	180.5	39.2	39.2
2021 (Next reporting period)	180.5	21	60.2

Rehabilitation activities completed in 2020 included only monitoring and future design review. Proposed landform rehabilitation was postponed due to requirements for the prioritisation of handover of areas of EnergyAustralia land (known as Area 4D). Table N- 1 indicates the current status as of 31 December 2020. Centennial are proposing to relinquish 21 ha (Area 4D) to EnergyAustralia in 2021.

2020 WCS Rehabilitation Monitoring Program Activities

Rehabilitation monitoring in 2020 was conducted at WCS by Koru Environmental to satisfy the requirements of the MOP.

Monitoring methods strictly adhered to those defined in the current MOP (2018-2024) and included a combination of transect-based data collection (eight rehabilitation transects and two corresponding analogue sites were monitored) and a walkover inspection of all rehabilitated areas. The data collected allowed for an assessment to be undertaken of current rehabilitation performance and progress against relevant objectives and completion criteria defined in the MOP.

Field surveys were completed between 8th and 12th December 2020. Following three years of severe drought between 2016-2019, the conditions eased off during 2020 and the site received above average rainfall, which alleviated the impacts on vegetation and biophysical systems in the region. This was noted as having positively influenced the rehabilitation condition recorded in 2020, particularly in relation to vegetative ground cover levels and species diversity in the lower stratum which increased in most surveyed locations.

All monitored rehabilitation areas were assessed as stable in 2020 with no signs of active erosion processes or issues.

Ground cover protection remained excellent across all monitoring locations in 2020. Levels of live vegetative cover were measured as commensurate with analogue areas and dominated by native grasses. Average total species richness in the ground layer increased from approximately 13.3 species per site in 2019 to approximately 22.0 species per site in 2020 in the rehabilitation, and average native species richness in the rehabilitation was approximately 80% of that occurring at the analogue sites.

Vegetation communities establishing in the rehabilitation generally remained characterised by a thick mid storey of primary colonising species (mainly acacias and Sifton bush), poorly resembling the condition observed in analogue areas. However, it is expected that the mid layer should naturally and progressively reduce assuming successful tree and canopy cover establishment over time. Tree densities in 2020 remained insufficient across the older Cooks Dam and access road rehabilitation, although this should progressively improve as additional plantings are undertaken under the RIP. Conversely, locally excessive tree densities remained across the REA and Lambert's Gully rehabilitation, restricting tree growth habit and vegetation structure. Positively, all tree species establishing across WCS rehabilitation comprised local native eucalypt species naturally occurring in the Central Tablelands region.

Some tree individuals showed drought-related impacts with some dieback recorded, but tree health and tree growth were overall assessed as satisfactory in 2020. Most areas also showed signs of active natural regeneration, highlighted the potential for the established communities to be able to self-sustain.

Weed prevalence increased in 2020 across the access road and Cooks Dam rehabilitation areas, however recorded levels remained within benchmark levels defined in the MOP. Pro-active and ongoing targeted control was nonetheless recommended for potentially problematic species (including of African Lovegrass, Blackberry, Serrated Tussock and St John's Wart) to minimise the risk of further spread. Weeds remained mainly absent from the REA and Lambert's Gully rehabilitation areas in 2020.

Table N- 2: WCS Rehabilitation Objectives

Domain	Rehabilitation Objectives
Rehabilitation – Woodland	• All hazardous materials and contaminated materials removed. • Stable landform that is non-polluting. • Drainage structures will be designed and constructed where required in accordance with the Blue Book. • Class V Land and Soil Capability. • Ecosystem health satisfying completion criteria. • Ecosystem structure satisfying completion criteria.

Domain	Rehabilitation Objectives
	• Ecosystem composition satisfying completion criteria. • Woodland rehabilitation areas will provide habitat augmentation features (such as rock piles and felled logs and woody debris) for native species. • Woodland rehabilitation will be consistent with the Cox's Permian Red Stringybark – Brittle Gum Woodland vegetation community (as per DEC, 2006).
Rehabilitation – Pasture	• Stable batters of haul roads with grassland mix used. • Non-polluting. • Grass seeding completed in conveyor corridor if required.

Table N- 3: Compliance with MOP Rehabilitation Completion Criteria

Completion criteria	Rehabilitation progress	Compliance status 2020			
		Cooks Dam	Access Road	REA	Lambert's Gully
Landform					
Landform is stable with no evidence of uncontrolled erosion	Satisfactory landform stability has been achieved across all rehabilitation areas, with no recorded evidence of active erosion processes or severe impacts	Yes	Yes	Yes	Yes
Slopes are generally less than 18% and no more than 25%	Except for localised exceptions (particularly along the lower contours of the 2008 Lambert's Gully rehabilitation), established slopes are generally less than 25% across the rehabilitation. Slope as measured at the monitoring sites comprised between 9-25%.	Yes	Yes	Yes	Yes
Growing media					
Soil analysis undertaken to determine potential constraints	Soil sampling and analysis is undertaken on a three-yearly basis as part of the rehabilitation monitoring program (last implemented in 2018). Soil properties are generally conducive to the establishment and growth of native vegetation with no key constraints identified.	Yes	Yes	Yes	Yes
Topsoil or alternative spread at depth of at least 50mm	Areas of older rehabilitation (Cooks Dam and access road) were dressed with adequate amount of topsoil (~100mm). However, topsoil application was minimal and uneven across the REA and Lambert's Gully rehabilitation (<50mm) and the little topsoil used was mixed and diluted in overburden/capping material. Growth medium improvement measures were defined in the RIP for these areas in the form of successive hydro mulching campaigns but have not yet been implemented.	Yes	Yes	No	No
Ecosystem establishment and sustainability					
Minimum of 70% protective ground cover	Protective ground cover was satisfactory at all locations in 2020, comprised between 81.5-100%. Ground cover largely dominated by litter cover with limited live vegetative cover (but consistent with analogue sites).	Yes	Yes	Yes	Yes
No bare areas >200m²	Vegetation establishment and ground cover protection excellent across the Cooks Dam and access Road rehabilitation areas. Vegetation and ground cover establishment were assessed as slowly improving across the REA and Lambert's Gully rehabilitation, however several continuous bare areas >200m² remain. Ground cover improvement measures were defined in the RIP for these areas in the form of successive hydro-mulching/seeding campaigns but have not yet been implemented.	Yes	Yes	No	No
Weed cover <15%	Total weed cover recorded at the Cooks Dam and access road rehabilitation monitoring sites increased since 2019 but remained low and consistently <10% at all locations. Pro-active weed control is nonetheless recommended to minimise the risk of spread of occurring invasive weed species.	Yes	Yes	Yes	Yes

Completion criteria	Rehabilitation progress	Compliance status 2020			
		Cooks Dam	Access Road	REA	Lambert's Gully
	No weeds were recorded at the REA and Lambert's Gully monitoring sites, and weed presence across these rehabilitation areas is very limited				
Evidence of nutrient cycling (i.e. presence of litter, cryptograms, etc.)	Active nutrient cycling was evidenced at all monitored locations, including high levels of organic litter cover, abundance of nutrient fixing shrub species (acacias) and presence of cryptograms on the soil surface particularly in older rehabilitation areas.	Yes	Yes	Yes	Yes
Establishing species are consistent with a woodland community	In most rehabilitation areas a range of ground covers, shrubs and canopy eucalypts occur. Although cover levels or vegetation structure are often still developing (as a function of the young ecological age of the rehabilitated communities), the establishing species are generally consistent with local native communities. One exception is for the Cooks Dam rehabilitation where a tree layer is lacking, however improvement works under the RIP have started in this area to establish eucalypts. All planted eucalypt tubestocks consist of local species naturally occurring in the Central Tablelands. Currently, the thick shrub layer generally occurring in the rehabilitation is uncharacteristic of local native communities as observed at the analogue sites, however it is expected that shrub abundance should naturally receded with time as the tree layer further establishes and the canopy closes out.	Trending	Trending	Trending	Trending
>70% of trees are healthy and growing	Some localised drought-related impacts were noted on some tree individuals in 2020; however, tree health was overall satisfactory with ≥75.9% of trees assessed as healthy at the monitoring sites. Tree growth also evidenced at many locations (increased girth and/or height).	Yes	Yes	Yes	Yes
Dominant species aligned with those in local native communities	Although the rehabilitated communities do not perfectly align with a specific native community profile, in all vegetation layers the dominant species comprise local native species naturally occurring in the Central Tablelands region.	Yes	Yes	Yes	Yes
Presence of a range of structural habitats (eucalypts, shrubs, ground cover, developing litter layer)	With the exception of the Cooks Dam rehabilitation where the tree layer is not yet established (tree were planted in 2020 but remain at seedling growth stage), a range of structural habitat occurred in most areas including eucalypts, shrubs, ground covers and litter.	Trending	Yes	Yes	Yes
Other habitat features incorporated into rehabilitation areas (large rocks, logs, etc).	Artificial habitat features have not been incorporated throughout the rehabilitation.	No	No	No	No

Ground Cover

Trends in ground cover protection since 2018 are depicted in Figure N- 1, which shows that the 2020 results were generally consistent with those recorded last year. The 70% ground cover benchmark remained met at all locations for an overall satisfactory performance.

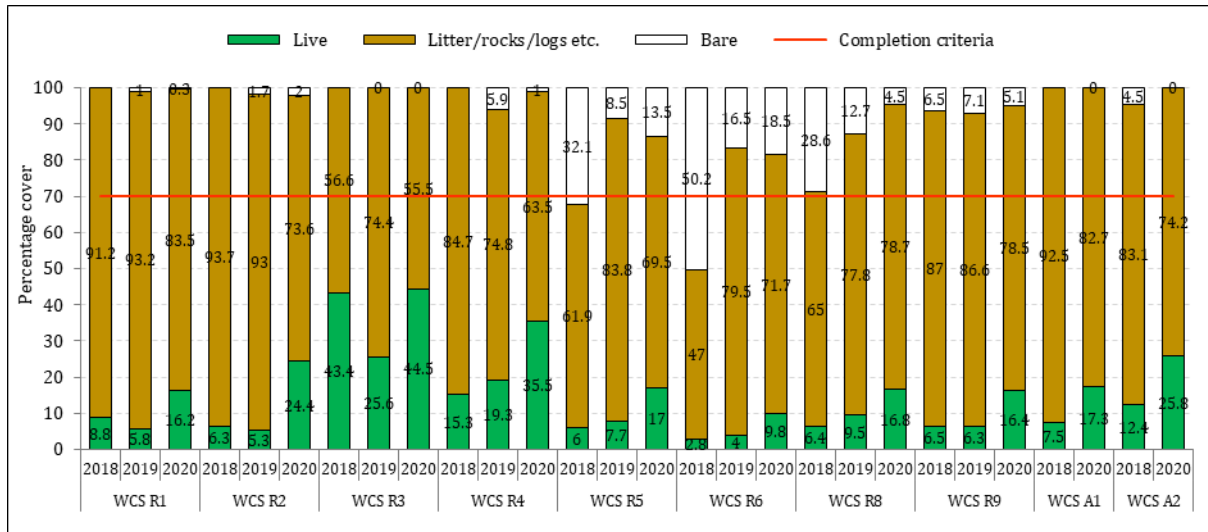


Figure N- 1: Ground Cover Protection Monitoring Results

Floristics

Figure N- 2 demonstrates the annual variations and dynamics in ground cover species assemblages and abundance patterns. Influenced by the 2020 rains (and possibly the recent hydroseeding across the Cooks Dam and access road rehabilitation), total ground cover species diversity recorded at the rehabilitation sites in 2020 (range 13-37 species; average ~22.0 species per site) was increased compared to 2019 in drought conditions (range 6-23 species; average ~13.3 species per site).

The greatest positive changes in ground layer biodiversity levels were recorded at WCS R3 (154% increase), WCR R4 (117% increase), WCS R1 (80% increase) and WCS R9 (75% increase). A total of 58 native ground covers were recorded across the rehabilitation in 2020 (comprising 15 grasses, 30 forbs, three twiners, one sedge, one fern and eight low shrubs), which was similar to the 57 native species recorded in 2019. Positively, average native species richness in the rehabilitation was approximately 80% of that occurring at the analogue sites (17.9 vs. 22.5 species per site).

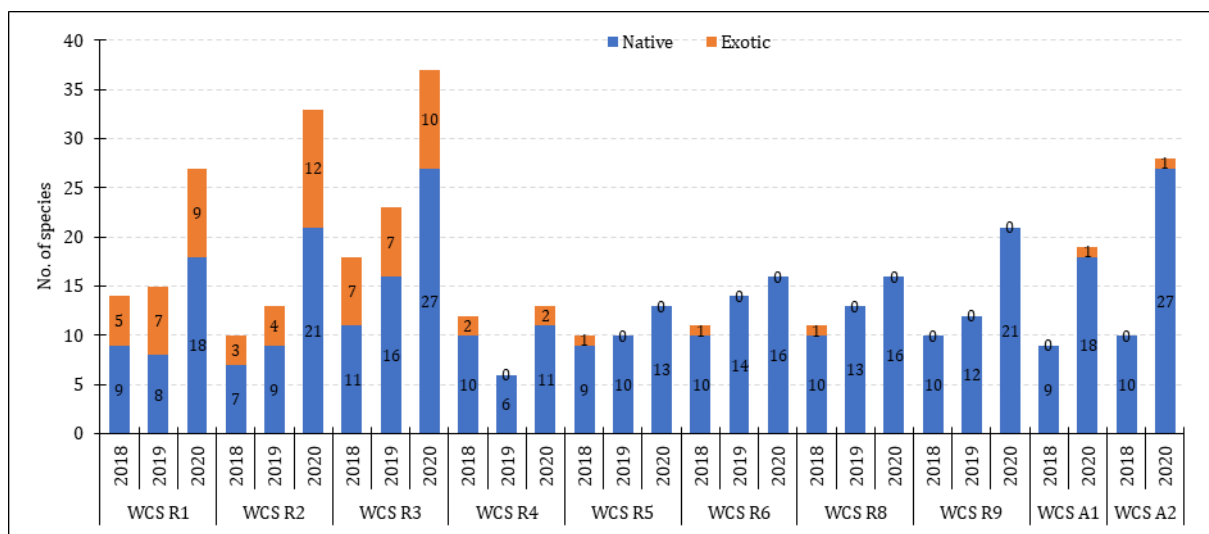


Figure N- 2: Ground Cover Species Diversity

Figure N- 3 presents the mid and upper storey species diversity monitoring results. Shrub and tree species diversity at the rehabilitation sites in 2020 was comprised between 8-16 species (average of approximately 10.1 species per site) which was much higher than at the analogue sites (4 species recorded at both sites). In total, 27 mid and upper storey species were recorded across the rehabilitation sites in 2020, comprising 12 shrubs, four small trees (mainly acacia trees) and eleven trees (eucalypts).

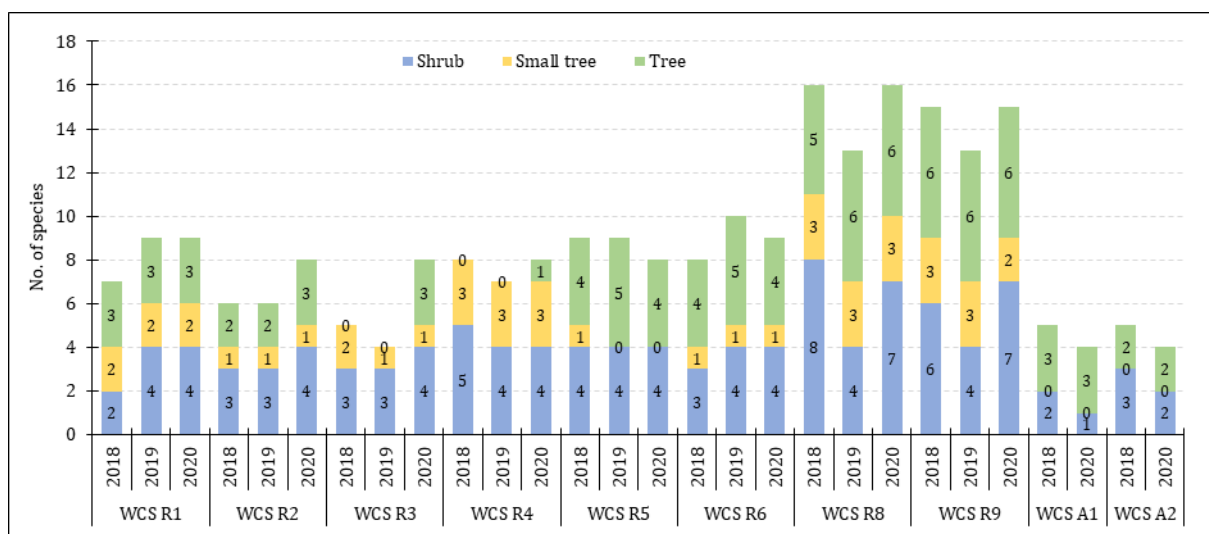


Figure N- 3: Mid and Upper Storey Species Diversity

Vegetation Structure and Function

Results for key vegetation structure monitoring metrics are presented in Table N- 4.

Table N- 4: Vegetation Structure Monitoring Results

Metric	WCS R1	WCS R2	WCS R3	WCS R4	WCS R5	WCS R6	WCS R8	WCS R9	WCS A1	WCS A2
Vegetation layers height range (m)										
Mid-storey layer	1-6	1-7	1-4	1-5	1-4	1-5	1-5	1-5	1-3	0.5-1.5
Canopy layer	10-17	12-16	5-8*	6-9*	6-10	6-10	6-10	7-12	10-18	9-15
Foliage projective cover (%)										
Mid-storey layer	15.0	11.0	19.5	19.0	22.5	27.5	28.5	28.0	1.2	2.5
Trend 2019-20 [#]	↑	↑	↑	↑	→	↑	↑	↑	↑	→
Canopy layer	18.5	24.0	0.0	4.0	10.0	9.5	1.5	5.5	33.0	31.0
Trend 2019-20 [#]	→	↑	→	↑	→	→	→	↑	↑	↓
Eucalypt stem densities recorded in 10m x 30m plot per DBH class										
<5cm DBH	1	8	7	1	5	25	36	30	48	9
5-9cm DBH	2	0	1	0	4	5	7	9	3	4
10-14cm DBH	0	0	0	0	4	1	1	5	1	1
15-19cm DBH	0	0	0	0	1	4	1	0	1	4
20-29cm DBH	1	1	0	0	1	0	0	0	2	4
30-49cm DBH	3	2	0	0	0	0	0	0	4	3
>50cm DBH	0	0	0	0	0	0	0	0	1	3

* Canopy layer at WCS R3 and WCS R4 provided by large acacia trees, not eucalypts.

Value change ≤2.0% in FPC scores defined as a stable trend.

Mid-storey foliage projective cover (FPC) increased at most monitoring sites, highlighting shrub and foliage growth in response to the favourable 2020 conditions. As discussed above, the mid-storey across the rehabilitation remained relatively dense (FPC range 11.0-28.5%, average of approximately 21.4%) and compared poorly against the condition recorded at the analogue sites (FPC range 1.2-2.5%, average of approximately 1.9%).

Canopy FPC remained stable or slightly increased at all monitoring sites in 2020. However, consistently with previous years, it remained low (≤10%) and well short of analogue values (31.0-33.0%) at WCS R3 and WCS R4 (due to low tree densities), and at WCS R5, WCS R6, WCS R8 and WCS R9 (high tree densities but poor tree growth habit with establishing trees only slowly developing girth / canopy). Tree FPC was higher at the older WCS R1 (18.5%) and WCS R2 (24.0%), but the latter was the only site comparing positively to analogue benchmarks (i.e. analogue range ±30%).

Stem size class assessments indicated that additional tree growth occurred at most locations across the REA and Lambert's Gully rehabilitation since last year, highlighting the positive response to the 2020 rain. Community structure is slowly improving across the REA rehabilitation (WCS R5 and WCS R6) with an increasing number of trees being recorded in the 10-14cm and 15-19cm DBH classes, which is encouraging. Restricted by the very high stem densities and associated high levels of competition, tree girth development remains more limited across the Lambert's Gully rehabilitation (WCS R8 and WCS R9) where the majority of trees remain in the <5cm and 5-9cm DBH size classes, however some trees are starting to appear in the 10-14cm DBH class.

Minimum additional tree growth was recorded in the access road rehabilitation (WCS R1 and WCS R2). Established trees in these areas (except for the new tubestocks) were planted in the mid-90s and

have achieved excellent growth, with mature individuals occurring in the 20-29cm and 30-49cm DBH classes.

Overall, vegetation structure in the rehabilitation remains unlike the analogue sites where greater densities of large trees occur (Table N- 4). However, and as noted in last year's report (Koru, 2020), tree stem size is recorded principally to allow an assessment of tree growth over time in the rehabilitation, and cannot be readily compared to analogue sites results having regards to the ecological timeframes required to achieve significant vegetation growth. It can be assumed that if satisfactory tree densities and tree health are maintained in the rehabilitation, and ongoing tree growth can be demonstrated, then community structure and complexity should naturally develop and improve over time.

The 2020 monitoring results for habitat value metrics have been summarised in Table N- 5.

Table N- 5: Habitat Complexity Monitoring Results

Metric	WCS R1	WCS R2	WCS R3	WCS R4	WCS R5	WCS R6	WCS R8	WCS R9	WCS A1	WCS A2
Total native species richness	27	29	35	19	21	25	32	36	22	31
Litter cover (%)	83.5	73.6	55.5	63.5	69.5	71.7	78.7	78.5	78.5	74.2
Shrub layer present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Tree layer present	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Cumulative length of log (m)	0	0	0	0	0	2	0	0	30	20
No. hollow stems	0	0	0	0	0	0	0	0	4	8

Total native species richness was satisfactory at all sites in 2020 (i.e. within 30% of analogue values), indicating that the rehabilitation provides levels of diversity, food and foraging resources commensurate with local native ecosystems. Additionally, the satisfactory litter layer also provides habitat and resources particularly for invertebrates.

The tree layer present at most locations and the (usually thick) shrub layer across the rehabilitation provide potential shelter and refuge resources for local native fauna to utilise or move across the landscape.

Overall, the habitat value provided by the rehabilitation remains limited compared to analogue areas as a function of a less developed community structure, and the absence of key ecological features such as logs, hollows, rocks, boulders, etc. However, this is a direct reflection of the young ecological age of the rehabilitated communities, and these habitat values only develop naturally over long ecological timeframes (100s years) if not artificially incorporated.

Some habitat improvement measures were included in the RIP to assist in habitat construction and improve vegetation structure and current habitat value of the rehabilitation.

Erosion

Appendix O – Community Information

Performance against Environmental Assessment

The social impacts discussed in the EIS include noise, dust and visual impacts. These are addressed in their respective sections in this report.

Community Information Line

A community information line was maintained for WCS to receive calls from the local community. The community information line (6355 9500) operates 24 hours a day, 7 days a week.

The Central Western Region Community Consultative Committee (CCC) was established in response to Project Conditions of Approval for Centennial Coal's mines and related activities in the Central West region of NSW. Since 2014, the CCC combines the previously established Angus Place, Springvale and WCS CCCs to facilitate a single channel of communication regarding current operations in the area.

The purpose of the CCC overall is to provide an independent forum for consultation between the community and mine representatives, as well as for sharing information and receiving feedback. The Committee aims to meet four times a year.

The committee is chaired by an Independent Chair. It is composed of:

- At least three representatives from the local community;
- One representative from Lithgow Council; and
- Four representatives from Centennial Coal, including the Environment and Community Officer.

CCC meetings were held in August and November 2020. The April 2020 meeting had not been held in person due to COVID-19 precautions, but presentations had been distributed electronically.

No specific issues or management actions were identified for WCS by the committee.

CCC meeting minutes for 2020 are uploaded to the Centennial Coal website and can be viewed at:

<https://data.centennialcoal.com.au/domino/centennialcoal/cc205.nsf/Published.xsp?site=Springvale%20Coal%20Services&type=Community%20Consultative%20Committee&date=All>

Community Complaints

In accordance with Schedule 5, Condition 11a, Springvale Coal Pty Ltd is required to make a complaints register available monthly on the Centennial Coal website.

- No community complaints were received in the period
- All complaint summary information was published to the Centennial web page.

Figure O- 1 graphically presents historical community complaints from April 2014 to December 2020.

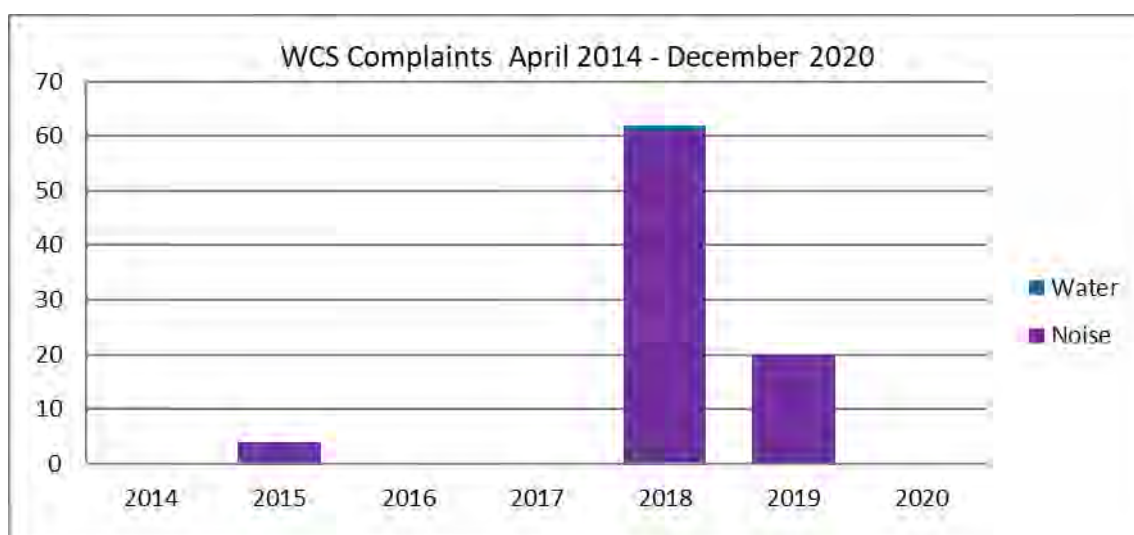


Figure O- 1: WCS Historical Complaints

The community complaints register is provided in Table O- 1 and can be viewed at <https://data.centennialcoal.com.au/domino/centennialcoal/cc205.nsf/Published.xsp?site=Springvale%20Coal%20Services&type=Community%20Complaints%20Register&date=All>.

Table O- 1: WCS Community Complaints Register

Period	Complaint Reference Number	Complaint Date	Complaint Information	Centennial Response
January 2020	-	-	Nil complaints received	-
February 2020	-	-	Nil complaints received	-
March 2020	-	-	Nil complaints received	-
April 2020	-	-	Nil complaints received	-
May 2020	-	-	Nil complaints received	-
June 2020	-	-	Nil complaints received	-
July 2020	-	-	Nil complaints received	-
August 2020	-	-	Nil complaints received	-
September 2020	-	-	Nil complaints received	-
October 2020	-	-	Nil complaints received	-
November 2020	-	-	Nil complaints received	-
December 2020	-	-	Nil complaints received	-

Appendix P – Independent Audit Information

Schedule 5, Condition 9 of SSD-5579 requires Centennial to commission an IEA within 12 months of completion of the upgrade to the coal loader, and every three years thereafter.

MCW Environmental have conducted each of the first two IEAs in accordance with Schedule 5, Condition 9 of SSD-5579. These IEAs were completed on 15 December 2015 and 19 November 2018.

The IEAs assessed compliance with statutory requirements of SSD-5579, EPL 21229, the WCS Project statement of commitments, and relevant management plans.

DPIE provided written approval of the 2018 IEA and the final audit report and Centennial response to audit recommendations were published to the internet in January 2019.

An IEA Response Action Plan was maintained in 2020 to complete/address recommendations from the 2018 IEA.

Audit recommendations and the progression of Centennial's response/action as of 31 December 2020 are provided in Table P- 1 below.

When feedback and any further actions/information from the DPIE has been finalised and returned (in 2021), Centennial will publish the approved outcomes and reports.

The next WCS IEA is planned for quarter 4 2021.

Management Plan Recommendation**Compliant****Not Verified****Non-compliant****Table P- 1: Independent Audit Summary**

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
Management Plans				
Consultation	REC-2018-93	Follow up with Forestry Corporation NSW on the land swap on CCL-733 and required Forestry Permits to ensure these are in place where required.	The land swap agreement is in its final stages with the possibility of Native Title on the Neubeck portion of the swap (Lot 64 DP751636) under assessment. The land portion in question (Part Lot 502 DP825541), which is affected by the southern tip of co-disposal area, does not have any Native Title issues. Parties agreed not to pursue an Occupation Permit for Lot 502 as FCNSW are comfortable with the fact the Land Swap was progressing. As far as the Neubeck block is concerned, we have no reason to apply for an Occupation Permit as we do not have any infrastructure on there.	This is an ongoing process that started in 2012. The decision rests with the Crown Solicitors Office at present.
EMS	REC-2018-01	Update the Environmental Management Strategy to include figures that show all current environmental monitoring locations (e.g. TEOM and dust gauges).	The approved EMS figures now show all environmental monitoring locations.	Completed
EMS	REC-2018-02	Update the Environmental Management Strategy to include current environmental management plans approved for the site.	The approved EMS includes all environmental management plans associated with SCSO	Completed
EMS	REC-2018-03	Update the Environmental Management Strategy with copies of the current EPLs for 3607 and 467.	EPL 467 is now wholly managed by Centennial Angus Place Colliery, therefore a copy is not included in the approved EMS.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
EMS	REC-2018-04	Update the Environmental Management Strategy - Appendix 4 – to replace the 2012 version of the Centennial Environment and Community Policy with the current policy as available on the Centennial website.	The approved EMS includes the current Centennial Environment and Community Policy.	Completed
Management Plans	REC-2018-05	Ensure all management plans include document control that identifies the revision number, when the plans had been updated and a summary of what was changed or reason for the update.	All management plan reviews now include document control.	Completed
Management Plans	REC-2018-06	Investigate the management plan review timeframes for the Western Region plans as outlined in the different project approvals for all the relevant sites. Identify efficiencies and develop a plan for meeting timeframes within all project approvals.	CEY has dedicated approvals team who has established joint workflow process with DPE for all CEY Management Plan Revision and submissions. WCS is included in this process.	Completed – Ongoing Annual process
Noise MP	REC-2018-07	Consider including the same monitoring locations in the monthly monitoring program as the 6 monthly Noise Reduction Study monitoring program required by Condition 8A, Schedule 3.	Monitoring points have been reviewed and reconciled in approved 2018 WRNMP.	Completed
Air quality MP	REC-2018-91	Review and consider whether the current number of dust gauges monitored provides an adequate understanding of the dust risk profile at the site.	Dust gauge monitoring network was reviewed for adequacy during 2015 by GHD in the <i>Centennial Western Region Environmental Monitoring Rationalisation, Review and Recommendations (GHD 2015)</i> . Operations at WCS have not changed significantly during this time in relation to the creation of dust. Mitigation measures have been managed on site as per the WRAQGGMP.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
Heritage MP	REC-2018-08	Update the WRACHMP to include the new site BF JN 1 identified during the RPS due diligence survey in May 2017.	WRACHMP updated to include site reference 45-1-2795.	Completed
PIRMP	REC-2018-09	Update the Plans / Figures appended to the PIRMP to clearly and legibly show the location of potential pollutants on the premises. Ensure the cross referencing of Figures correlates with those included in the PIRMP.	The approved PIRMP figures show the location of potential pollutants on site when cross referenced with Tables in Section 5.	Completed
PIRMP	REC-2018-10	Update the PIRMP to reflect roles and responsibilities.	Roles and responsibilities for SCSO staff have been tabulated in the approved PIRMP.	Completed
PIRMP	REC-2018-11	Upload the 2018 PIRMP to the Springvale Coal Services website.	The approved PIRMP is published.	Completed
PIRMP	REC-2018-12	Ensure the PIRMP lists all EPLs relevant to the site.	EPL 5129 and EPL 21229 have been listed in the approved PIRMP.	Completed
PIRMP	REC-2018-13	Ensure a pollution risk assessment is attached to the PIRMP that addresses the requirement of Condition 98C(1)(c).	A risk assessment is included in the appendices for both LS and WCS. The risk assessment was produced in collaboration with GHD in 2017 and revised in 2019 and reviewed for currency in 2020.	Completed
Site Observations	REC-2018-14	Carry out maintenance of coal spillage under conveyors and review (and address if required) the adequacy of erosion and sediment controls on steep sections along the conveyor.	Inspection and Maintenance of Coal Transport System is undertaken in a systematic manner across WCS to identify and address spillage. Inspection and Maintenance of ESC structures at WCS undertaken in a systematic manner across the operations.	Completed - Ongoing operational requirement
Site Observations	REC-2018-15	Undertake maintenance along conveyor OL1 to remove coal fines on rollers and spillage under the conveyor.	Inspection and Maintenance of Coal Transport System s undertaken in a systematic manner across WCS to identify and address spillage.	Completed - Ongoing operational requirement

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
			Inspection and Maintenance of ESC structures at WCS undertaken in a systematic manner across the operations.	
Site Observations	REC-2018-16	Inspect and maintain sediment controls at Kerosene Vale Stockpile Site, including desilting drainage structures.	Inspection and Maintenance of ESC structures at WCS undertaken in a systematic manner across the operations. A targeted maintenance project was undertaken in December 2018 for Kerosene Vale Stockpile Site and LDP003 to remove sediment build up, improve controls for drainage and water management. Kerosene Vale Stockpile Site is managed under the Angus Place MOP by the Angus Place Operation.	Completed - Ongoing operational requirement
Site Observations	REC-2018-17	Restrict access to the derelict buildings and mine entries at Kerosene Vale.	Access to Kerosene Vale is via locked gates with signage in place restricting access. Mine entries have been locked / barricaded. Kerosene Vale Stockpile Site is managed under the Angus Place MOP by the Angus Place Operation	Completed
Site Observations	REC-2018-18	Remove materials from within the drip line of trees at Kerosene Vale.	A targeted maintenance project was undertaken in December 2018 for Kerosene Vale Stockpile Site and LDP003 to remove sediment build up, improve controls for drainage and water management. Kerosene Vale Stockpile Site is managed under the Angus Place MOP by the Angus Place Operation	Completed
Site Observations	REC-2018-19	Implement measures outlined in the Rehabilitation Improvement Plan (November 2018).	The Rehabilitation Improvement Plan (RIP) integrated as an attachment to WCS MOP Amendment A. Measures from the RIP will be implemented once approved by DPIE.	Completed – ongoing for the term of the RIP
Site Observations	REC-2018-20	Investigate surface water and groundwater interactions within the Additional Rehabilitation Area west of the Co-disposal ponds to	The Rehabilitation Improvement Plan integrated as an attachment to WCS MOP Amendment A. Such	Commenced. Shared GW study with EA ongoing. LDP001 Pollution Reduction Program

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
		understand impacts of surface crusting on proposed rehabilitation plans.	issues will be identified and investigated once the RIP is implemented.	considering water management infrastructure within this area for construction in 2021.
Complaints Management	REC-2018-21	Develop a single complaints record form that meets the requirements of the development consent and EPL and include in the Environmental Management Strategy and PIRMP.	An SCSO Complaint Record Form has been included in both the approved EMS and PIRMP versions that meets the requirements of EPL 21229 and EPL 5129	Completed
Incident management	REC-2018-22	Ensure environmental incidents meeting the definition of EPL 3607 condition R2 are notified to the EPA in writing within 7 days of the incident occurring.	All incidents are reported within required timeframes (1 x non- occurrence recorded in audit period)	Completed - Ongoing operational requirement
Incident management	REC-2018-23	Ensure reporting of incidents is completed within the timeframes outlined in Condition 7, Schedule 5.	All incidents are reported within required timeframe. (1 x non- occurrence recorded in audit period)	Completed - Ongoing operational requirement
Incident management	REC-2018-24	Review and update the categorisation of incidents in ECD with respect to incidents that have been issued with Penalty Notices.	All environmental incidents are categorised and recorded in ECD in accordance with CEY process	Completed
Incident management	REC-2018-25	Ensure all 2018 incidents are recorded in ECD database including TEOM wheel theft (27 June 2018) and ruptured diesel tank (20 April 2018).	All environmental incidents are categorised and recorded in ECD in accordance with CEY process. Property damage incidents are not recorded in ECD and are recorded in PULSE.	Completed
EPLs, Section 4.3.1	REC-2018-25	Confirm if a modification to SSD-5579 is required for the transfer of commitments relating to Kerosene Vale to Angus Place (upon approval of the proposed revisions to the Mining Operations Plans).	Kerosene Vale Stockpile will be included in the Angus Place MOP in accordance with Consolidated Colliery leases associated with Angus Place. No modification is required. Kerosene Vale Stockpile Site is managed under the Angus Place MOP by the Angus Place Operation.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
Development Consent SSD-5579				
2.4	REC-2018-26	Ensure the response to recommendations for all future IEAs submitted to DPE includes a timeframe for implementation of recommendations.	Noted – timeframes provided (this document)	Completed
2.6	REC-2018-94	Ensure all material received at the site, is appropriately classified as ROM coal and does not contain other materials.	Noted	Completed - Ongoing operational requirement
2.6	REC-2018-95	Continue to review and then implement options for re-use (including removal) of coal stored at Kerosene Vale. Avoid or minimise the volume of coal received at Kerosene Vale until appropriate approvals are in place for its processing or disposal.	Internal Review Completed. Kerosene Vale Stockpile will be included in the Angus Place MOP in accordance with Consolidated Colliery leases associated with Angus Place. Kerosene Vale Stockpile Site is managed under the Angus Place MOP by the Angus Place Operation.	Completed
2.14	REC-2018-27	Review the adequacy of the frequency of conveyor and transfer station sump maintenance.	Inspection and Maintenance of Coal Transport System is undertaken in a systematic manner across WCS to identify and address spillage. Existing process is subject to Continuous Improvement assessments. IEA outcomes included in process.	Completed – ongoing operational requirement
2.17	REC-2018-28	Consider including in any future project approval modifications an adjustment of the project boundary to areas under full control of WCS.	Noted for future MODs.	Completed
2.17	REC-2018-92	Define and document the process for handover of areas of the WCS site to EA and how rehabilitation liabilities will be considered and managed. Consult with the Resources Regulator regarding this process.	A complex commercial and legal process between parties for land handover and exchanges is ongoing between CEY and EA.	Ongoing process. The consultation between EnergyAustralia and Centennial has over the last few years been focused on information sharing and reporting.

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
			Rehabilitation liabilities are assessed and documented via that process.	Over the period of 2020, the consultation has moved into focusing on specific projects where delivery of solutions is being collaboratively achieved and now not only is information being shared, but assessments are also being completed collaboratively.
3.3	REC-2018-29	Remove the Construction Environmental Management Plan from the website.	Website published documents are periodically reviewed for relativity. Web page publishing review will be undertaken in conjunction with the 2018 IEA & Annual Review processes Management Plan review. CEMP revoked from web.	Completed
3.8	REC-2018-30	Continue unattended noise monitoring at Blackmans Flat to investigate the noise complaints received between June and October 2018.	A range of noise monitoring and assessment was undertaken to investigate noise complaints at Blackmans Flat. Unattended monitoring continues.	Completed – ongoing operational requirement
3.8	REC-2018-31	Ensure coordination of noise management on site with the noise management of other approved developments and/or projects on or in the vicinity of the site to minimise cumulative noise impacts.	WCS Noise is Managed via an approved regional CEY Western Region Noise Management Plan (WRNMP). The WRNMP does not coordinate CEY noise management activities with other approved non-CEY development programs to minimise cumulative impacts. Shared noise mitigation has been tabled in CEY-EA working group / interface meetings.	Completed
3.13	REC-2018-32	Report progressive long-term PM ₁₀ and TSP results in monthly environmental monitoring data reports.	Identified reporting has commenced and formally implemented from Jan 2019	Completed – ongoing operational requirement

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
3.22	REC-2018-33	Clarify with the EPA any remediation actions required from the Phase 2 contamination assessment to address SSD 5579 Schedule 3, Condition 22.	Contact with the EPA will be sought to clarify remediation actions required	Completed
3.23	REC-2018-34	Update the Water Management Plan to include a TARP for Lamberts Gully Creek in accordance with ANZECC 2000 and Using the ANZECC Guidelines and Water Quality Objectives in NSW procedures (DECC 2006), or its latest version.	WMP updated to include TARP for Lamberts Gully in line with ANZECC guidelines	Completed
3.23	REC-2018-35	Revise the existing site inspection to verify compliance with Managing Urban Storm water: Soils and Construction – Volume 1 and Volume 2E Mines and Quarries, or its latest version.	EMS under review following 2018 IEA and Annual Review Changes will be implemented	Completed
3.23	REC-2018-87	Assess the performance of the maintenance and/or improvements to baseline channel stability.	WMP assesses the performance of baseline channel stability Further consideration will be undertaken in the 2018 IEA & Annual Review processes Management Plan review	Completed
3.23	REC-2018-88	Periodically assess compliance against the performance measures in Table 10 of Condition 23, Schedule 3. Consider engaging an independent water quality expert to conduct this assessment.	Periodic assessment is conducted. All water management design, installation and maintenance is carried out by competent persons. Consideration for engagement of an independent water quality expert to conduct assessment will undertake as part of WMP review process.	Completed
3.24	REC-2018-36	Consult DPE regarding timing for approval of the Water Management Plans.	CEY has dedicated approvals team General Manager who has established joint workflow process with DPIE for all CEY Management Plan Revision and submissions. WCS is included in this process.	Completed - Ongoing Annual process

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
			Comment is too general. DPIE are consulted with each SSD-5579 modification triggered review. DPIE (and other regulatory groups) provide consultation comments which are addressed and returned to DPIE for pending approval. This process can be lengthy.	
3.24	REC-2018-37	In the next revision of the Water Management Plan, ensure the management measures (i.e. actions and timeframes for implementation) are more integrated into the WMP.	WMP updated to ensure management measures are integrated into WMP. WMP management measures are continually implemented with each review. Timeframes for implementation of actions is not possible due to lengthy consultation and approval processes.	Completed
3.24	REC-2018-38	Ensure the Water Management Plan is prepared by persons whose appointment has been approved by the Secretary.	The WMP was prepared by Dr Stuart Gray who DPE endorsed as suitably experienced and qualified on a letter dated 20 December 2016.	Completed
3.24	REC-2018-39	Include the reporting procedures for the results of the monitoring program for the Surface Water Management Plan within the WCS Water Management Plan, rather than deferring to the broader Western Region Water Management Plan.	The surface water monitoring program is included in the WCS Water Management Plan	Completed
3.24	REC-2018-40	Review the requirement for additional operational controls to minimise coal spillage along conveyors, in consideration of projected coal qualities.	Inspection and Maintenance of Coal Transport Systems undertaken in a systematic manner across WCS to identify and address spillage. Existing process is subject to Continuous Improvement assessments. IEA outcomes included in process.	Completed – ongoing operational requirement
3.24	REC-2018-41	Monitoring data indicated that BH14 was not sampled, as outlined in the Water Management Plan. It is recommended that the WMP be updated to reflect the monitoring locations sampled.	BH14 has been removed from the groundwater monitoring program	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
3.24	REC-2018-42	Complete implementation of the TT03 Action Plan in accordance with the Voluntary Undertaking with DPE, as a priority.	A works action plan is in place with quarterly updates provided to DPIE. Works will commence once all regulatory approvals are completed (mining lease application, MOP amendment)	Completed – ongoing operational requirement
3.24	REC-2018-43	Once the water management works at TT03 are complete, update the Water Management Plan.	WMP will be updated on completion of works. CEY has dedicated approvals team who has established joint workflow process with DPIE for all CEY Management Plan Revision and submissions. WCS is included in this process.	Following completion of TT03 works
3.25	REC-2018-44	Develop a Biodiversity Offset Management Plan (as proposed in the Biodiversity Management Plan) to ensure compliance with the BOS requirements of Condition 29, Schedule 3.	The Western Region Biodiversity Offset Strategy (WRBOS) was approved by the NSW Department of Planning, Industry and Environment (DPIE) on 17 November 2020.	Completed
3.26	REC-2018-45	Monitor fauna habitat values and rehabilitation to establish and enhance locally endemic native vegetation species within the Lamberts Gully Creek catchment areas as part of Annual Rehabilitation Monitoring program.	Monitoring is conducted as per the WCS Rehabilitation Improvement Plan (Nov 2018), Monitoring is conducted annually which considers fauna habitat values and rehabilitation to establish and enhance locally endemic native vegetation species within the Lamberts Gully Creek catchment areas.	Completed – Ongoing annual monitoring
3.28	REC-2018-46	Ensure the Biodiversity Offset Strategy and Additional Rehabilitation Initiatives Areas, in combination, provide suitable habitat for threatened species recorded on the SCSS. This may include reviewing current rehabilitation strategies and/or revising monitoring programs to include fauna.	The offsets which are being provided for the WCS credit liability are located at Carinya Lot 163. The credits being utilised at Carinya Lot 163 consist of 695 formation level credits which is made up of 403 Credits of HN534 and 292 Credits of HN544. Both HN 534 and HN544 are listed on the OEH BioNET website as providing habitat for almost all the above listed threatened species, with the exception of the Brown Treecreeper. Furthermore, field validation surveys over the Carinya site recorded four of the seven species including the Brown	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
			Treecreeper. Therefore, the Carinya Lot 163 offset site provides suitable habitat for all of the listed threatened species which were recorded on the SCSS.	
3.29	REC-2018-89	Consult DPE regarding timing for approval of the Biodiversity Management Plan.	WCS (SSD-5579 Schedule 3 Condition 29) Biodiversity Management Plan (BMP) requires the development of a Biodiversity Management Plan for the site by December 2016. Centennial submitted the Western Region Biodiversity Management Plan to DPE in December 2016, and an update in April 2017 for approval. Centennial revised the Western Region Biodiversity Management Plan in accordance with its operational Annual Reviews in 2019. The WCS BMP was incorporated into the WRBOS in 2020. The WRBOS was approved by DPIE on 17 November 2020.	Completed
3.29	REC-2018-47	Ensure the Biodiversity Management Plan is sufficient to achieve biodiversity objectives for the undisturbed and rehabilitated areas given the Rehabilitation and Closure Management Plan has been superseded by the 2018 MOP.	This recommendation was incorporated into the WRBOS.	Completed
3.29	REC-2018-48	Review and if required revise the WRBMP to ensure it includes the requirements of Condition 29, Schedule 3 relating to the Biodiversity Offset Strategy that are proposed to be deferred to the Biodiversity Offset Management Plans (once approved).	The BMP was incorporated into the WRBOS.	Completed
3.29	REC-2018-49	Review the management areas mapped in the WRBMP (e.g. operational areas) to ensure they align with the areas outlined in the MOP.	MOP management areas aligned with management areas in the WRBOS.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
3.29	REC-2018-50	Improve erosion and sediment controls where minor encroachment of sediment runoff has occurred within rehabilitation areas within the approved project boundary.	Erosion and sediment controls will be implemented in impacted rehabilitation areas	Completed - Ongoing operational requirement
3.32	REC-2018-51	Ensure inspections of sites outside of the disturbance footprint are undertaken with Registered Aboriginal Parties every 2 years.	Inspections will be undertaken every two years	Completed - Ongoing operational requirement. The last inspections were completed in December 2020.
3.36	REC-2018-52	Complete a Dilapidation Report for the Haul Roads and undertake recommended maintenance to ensure compliance with Schedule 3, Condition 36 to 38 should any haulage operations commence.	Noted. Dilapidation report will be implemented if haul road usage commences.	Completed – Ongoing operational requirement
3.39	REC-2018-53	Record and report the time of each truck movement of coal to and from the site.	All coal must be transported via the SCSO overland conveyor. Movement of coal via truck movements will not be undertaken unless approved by regulatory parties. Records will be kept and are provided in WCS Annual Reviews.	Completed
3.41	REC-2018-54	Update the Bushfire Management System SCSO-MS 009 document to include the map of fire extinguishers as noted in the table of contents.	Completed.	Completed
3.42	REC-2018-55	Ensure the Annual Review reports on the on the effectiveness of waste minimisation and management measures in the Annual Review including a detailed breakdown of waste disposal. Annual Reviews should compare total waste and % recycled year to year (going forward).	The 2018 WCS Annual Review included detailed breakdown of waste disposal.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
3.43	REC-2018-56	On lands on which other approved developments exist or are proposed, the final land use is to be determined in consultation with, and the agreement of the landowner. Confirm if agreements are in place with landowners for projects such as EA Ash Emplacement and LCC waste management facility. If no agreements are in place, confirm responsibilities for rehabilitating the site to the standards required for "Remainder of the SCSS" in Table 11 of Condition 43, Schedule 3.	Noted.	Completed – Ongoing operational requirement
3.43	REC-2018-57	Review consistency of the Rehabilitation Strategy outlined in the EIS (and shown conceptually in Appendix 7 of SSD 5579) and the rehabilitation plan outlined in the 2018/2024 MOP. Consult with DPE regarding compliance with Condition 43, Schedule 7 if any inconsistencies.	The WCS MOP Amendment A includes primary and secondary rehabilitation domains. Although naming convention of domains has changed, the areas remain consistent with the EIS in terms of rehabilitation objectives.	Completed
3.44	REC-2018-58	Assess progressive rehabilitation requirements at Kerosene Vale and update the MOP to include the requirement of Condition 44, Schedule 3 and implement measures.	Kerosene Vale has been removed from the WCS MOP and is now managed under the Angus Place MOP Amendment by Angus Place Operations.	Completed
3.44	REC-2018-59	Continue progressive rehabilitation of disturbed areas to meet the condition requirements and realise environmental benefits such as minimising the total area exposed for dust.	Progressive rehabilitation is undertaken at WCS. The condition was noted as not compliant for Kerosene Vale. Kerosene Vale has been removed from the WCS MOP and is now managed under the Angus Place MOP Amendment by Angus Place Operations.	Completed – Transferred to Angus Place
3.45	REC-2018-60	Review and revise the MOP to incorporate the requirements of the BMP, detailing how rehabilitation of the site will be integrated with the BMP and include any aspects of the 2014	The requirements of the WRBOS are included in the MOP.	Completed

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
		Rehabilitation and Closure Plan not already included (as requested by DPE).		
3.45	REC-2018-61	Incorporate the requirements of the Rehabilitation Improvement Plan (November 2018) into the next revision of the MOP.	The RIP has been included as an appendix to WCS MOP Amendment A.	Completed
4.3	REC-2018-62	Ensure landholder notifications are undertaken for any future exceedances of noise and air quality criteria in accordance with PA condition 4.2.	Future exceedances will be notified to surrounding landholders.	Completed - Ongoing operational requirement.
4.5	REC-2018-63	Ensure records of offers for acquisition are based on current valuations and include details regarding costs and compensation inclusions in accordance with SSD 5579 Schedule 4, Condition 5.	Noted.	Completed - Ongoing operational requirement.
5.1	REC-2018-65	Conduct and maintain records of environmental and community awareness training specific to WCS and its environmental management plans, particularly for staff with roles and responsibilities within those plans.	Management plan summary documents or informative sessions are provided to all SCSO management staff which includes their environmental responsibilities in relation each plan.	Completed - Ongoing operational requirement.
5.1	REC-2018-66	Document annual reviews of objectives and targets as outlined in the Environmental Management Strategy.	Noted. The EMS is reviewed at least annually, where objectives and targets set out in relevant site management plans are reviewed and actioned upon.	Completed - Ongoing operational requirement.
5.4	REC-2018-67	Ensure all future Annual Reviews meet the requirements of Schedule 5, Condition 4 to the satisfaction of the Secretary. This includes items requested by DPE on 4 June 2018: - <i>Include a plan showing the offset areas;</i> - <i>Provide trends for all monitoring data and discuss these trends over the life of the development; and</i>	The 2018 WCS Annual Review included items requested by DPE on 4 June 2018.	Completed - ongoing annually

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
		- Provide a data comparison for all monitoring data between years".		
5.4	REC-2018-68	Follow up on DPE approval of the revised 2015 Annual Review submitted on 18 July 2016.	Nil actions identified.	Completed.
5.4	REC-2018-69	Upload the revised version of the 2015 Annual Review to the website.	Noted	Completed
5.5	REC-2018-70	Maintain a record of review of management plans against SSD 5579 Condition 5, Schedule 5, including the details of revisions made and timing of submission to DPE.	Register maintained by CEY Corporate.	Completed - Ongoing operational requirement.
5.6	REC-2018-71	Consult with recognised environmental groups regarding participation in the CCC.	CCC meetings are advertised in media and environmental groups are invited to participate.	Completed - Ongoing operational requirement.
5.6	REC-2018-72	Consider exploring community engagement activities in addition to the Community Consultative Committee in the Wallerawang District.	Noted	Completed - Ongoing operational requirement.
5.10	REC-2018-73	Ensure the 2018 Audit Report and response to recommendations is provided to DPE within the timeframe required by Schedule 5, Conditions 9 and 10, or as otherwise agreed with DPE.	The 2018 WCS IEA report and the initial responses to recommendations were provided to DPE within the 3-month timeframe.	Completed
Environmental Protection Licence 3607				
L2.1	REC-2018-74	Ensure all analytes required to be sampled by EPL 3607 Condition L2.4 and M2.4 are tested and reported in the Centennial Coal Environmental Monitoring Data Reports.	A corrections log was provided in the WCS Environmental monitoring report to address this recommendation.	Completed - Ongoing operational requirement.

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
			Subsequent monitoring data reports contain all EPL 3607 required monitoring data	
L2.2	REC-2018-75	Continue to implement the LDP006 Works Plan, providing periodic updates to the EPA.	An LDP001 (Formerly LDP006) options assessment was submitted to EPA on 18 December 2019. Continual consultation and future works will be ongoing.	Completed - Ongoing operational requirement.
L2.6	REC-2018-76	Ensure the EPA is advised within 3 working days of the completion of sampling and testing where TSS meets the EPL criteria outlined in L2.6.	The EPA will be notified of TSS exceedances within 3 days even if the elevated result is considered compliant under condition L2.5.	Completed - Ongoing operational requirement.
O1.1	REC-2018-77	Develop and implement a staff environmental training program that ensures roles and responsibilities outlined in environmental management plans are communicated and understood.	Each management plan review is now communicated with relevant staff on their roles and responsibilities for the plan. A separate document lists each person's roles and responsibilities and is signed off accordingly.	Completed - Ongoing operational requirement.
O6.1	REC-2018-90	Maintain records to demonstrate that basins at LDP006 (including Cooks Dam) are maintained at the design storage capacity within 5 days following rainfall.	The WCS WMP includes a controlled pump-out discharge process from Cooks Dam following a rainfall event. As Cooks Dam is recharged by groundwater, this process is problematic to manage as Cook Dams levels are dependent on CHPP operation for water use.	Completed - Ongoing operational requirement.
M2.4	REC-2018-78	Report turbidity results in NTU (not mg/L) in the Centennial Coal Environmental Monitoring Data Reports.	Item corrected in Springvale Coal Services monthly monitoring data reports.	Completed
M7.1	REC-2018-79	Ensure the volume of discharge at LDP007 is recorded and reported in the Centennial Environmental Monitoring Data Reports.	LDP007 discharge requires an estimate volume to be published. This estimate will be communicated in future instances of LDP007 discharge.	Completed - Ongoing operational requirement.
R2.2	REC-2018-22	Ensure environmental incidents meeting the definition of EPL 3607 condition R2 are notified to the EPA in writing within 7 days of the incident occurring.	Future environmental incidents will be reported in writing to the EPA within 7 days of occurrence	Completed - Ongoing operational requirement.

Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
O5.5	REC-2018-80	Undertake maintenance to desilt sediment basins at LDP003 at Kerosene Vale by end 2018 to ensure the basins design storage capacity is maintained.	Works program undertaken in 2018. LDP003 maintenance is undertaken by Angus Place Operations as managed in the Angus Place MOP and Water Management Plans.	Completed - Q4 2018

Statement of Commitments

PO SoC 3.1	REC-2018-64	Consult with relevant agencies regarding the ongoing planned use of the Co-disposal ponds and ensure appropriate approvals are gained for the relevant activities planned.	Noted. HRA process concurrent. The planned use for the Blackmans Flat Co-Disposal (BFCD) is to cap and rehabilitate the northern cells and redesign the southern cells to emplace fine coal reject for potential future resale. NSW Dams Safety has been contacted, seeking advice to whether the BFCD needs to be a Declared Dam under the Dams Safety Regulation. Consultation requests were sent to other relevant agencies including: • Industry Health and Safety Representative • Resources Regulator	Ongoing operational requirement.
PO SoC 5.3	REC-2018-81	Consult DPE regarding the proposed timeframes for implementation of water diversion works at Huon Gully with respect to the commitment of the EIS SoC 5.3.	Ongoing consultation program in place.	Completed – commitment timeframe met
PO SoC 5.11	REC-2018-82	Implement an annual review of groundwater monitoring program in accordance with SoC 5.11.	Completed annually with the annual WCS water management plan revision and the 2018 WCS Annual Review.	Completed

Consolidated Coal Lease – CCL 733

CCL-733-04	REC-2018-83	Ensure the next revision of the MOP includes current surveyed rehabilitation and disturbance	Rehabilitation areas are detailed in the WCS MOP Amendment A.	Completed
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Condition Number	REC #	Improvement Opportunity Recommendation	Response / Addressed	Timing
		area volumes are provided in the next revision of the MOP.		
CCL-733-04	REC-2018-84	Ensure all relevant Mining Leases are included in the Title Block of AEMRs.	Relevant Mining Leases are included in each WCS annual review.	Completed – Ongoing requirement
CCL-733-28	REC-2018-85	Ensure the deed of security bond deposit for the bond calculation assessed by DPE on 10 April 2018 has been paid.	Confirmed bond deposit in place	Completed - Q4 2018.
CCL-733-32	REC-2018-86	It is recommended that site review the requirements of <i>the Sydney Water Catchment Management Act 1998</i> and ensure that all conditions of the Act as relevant to operations at WCS are being complied with. Refer to other recommendations regarding water management as relevant.	Noted	Completed – Ongoing operational requirement.

Appendix Q – Incidents and Non-Compliances

There were no incidents or non-compliances at WCS in 2020.

Table Q- 1 shows that no correspondence was received from regulatory agencies in regard to regulatory compliance with approvals and what action was taken.

Table Q- 1 Summary of Regulatory Actions

Compliance Type	Agency	Number	Response
Caution Notices	-	Nil	-
Warning Letters	-	Nil	-
Penalty Notices	-	Nil	-
Prosecutions	-	Nil	-

Note: This table includes actions taken by DPIE, DRE and the EPA during the reporting period.

Appendix R – AEMR Report



**Annual Environmental Management Report
for
Western Coal Services**

Mining Titles

(ML 204, ML 564, PLL 133, CCL 733, CL 361, CL 394, ML 1319, ML 1352, ML 1448, MPL 314)

March 2021

Mining Titles

Mining Lease 204
Mining Lease 564
Private Lands Lease 133
Consolidated Coal Lease 733
Coal Lease 361
Coal Lease 394
Mining Lease 1319
Mining Lease 1352
Mining Lease 1448
Mining Purposes Licence 314

Reporting Date

March 2021

**Reporting
Period**

2020

Operation

Western Coal Services

**Mining Title by
Holder**

ML 204 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
ML 564 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
PLL 133 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
CCL 733 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
CL 361 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
CL 394 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
ML 1319 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
ML 1352 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
ML 1448 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd
MPL 314 Centennial Springvale Pty Limited and Boulder Mining Pty Ltd

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Author Signature



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EXECUTIVE SUMMARY

Western Coal Services is operated by Centennial Springvale Pty Limited (Springvale).

This report relates to the following Western Coal Services titles:

- ML 204 has been held since initial grant date on 27 May 1910
- ML 564 has been held since initial grant date on 2 May 1922
- PLL 133 has been held since initial grant date on 10 August 1922
- CCL 733 has been held since initial grant date on 23 May 1990
- CL 361 has been held since initial grant date on 17 July 1990
- CL 394 has been held since initial grant date on 27 May 1992
- ML 1319 has been held since initial grant date on 5 July 1993
- ML 1352 has been held since initial grant date on 26 May 1994
- ML 1448 has been held since initial grant date on 31 May 1999
- MPL 314 has been held since initial grant date on 15 Dec 1992.

This report has been compiled to fulfil Condition 4 of the above titles and covers the period CY2020.

The report contains a summary of compliance against conditions outlined in the renewed mining titles. For the reporting period, Springvale was compliant with all conditions of the above titles.

1. BACKGROUND

1.1 Location and Access

Western Coal Services (WCS) is located in the Western Coalfield of NSW, approximately twenty kilometres north-west of the City of Lithgow, and east of the township of Lidsdale.

1.2 Site History

Coal mining began at the Lamberts Gully site in 1942 under the name Big Spur.

The site was later named Western Main. Below the open cut mine is an extensive series of underground workings which were part of the old Western Main Colliery, which mined the Lithgow Seam for over fifty years from the 1940's to 1990's.

Open cut mining has also occurred on the site since the 1940's as an adjunct to the underground operations.

Between 1980 and 1994 the previous owners developed the following open cuts:

- Bund Cut, Road Cut and Road Cut Extension.
- Western Main Open Cut Extension.
- Knoll Cut.

The original Development Consent for the Lamberts Gully Open Cut was granted to Springvale Coal by Lithgow City Council on 14 September 1998, which approved the extension of previous open cut operations on the Western Main Colliery Holding.

Springvale Coal then prepared an Environmental Assessment for the purpose of extending the area of extraction of the Lamberts Gully Open Cut Mine and obtained Project Approval from the then Minister from Planning in April 2006.

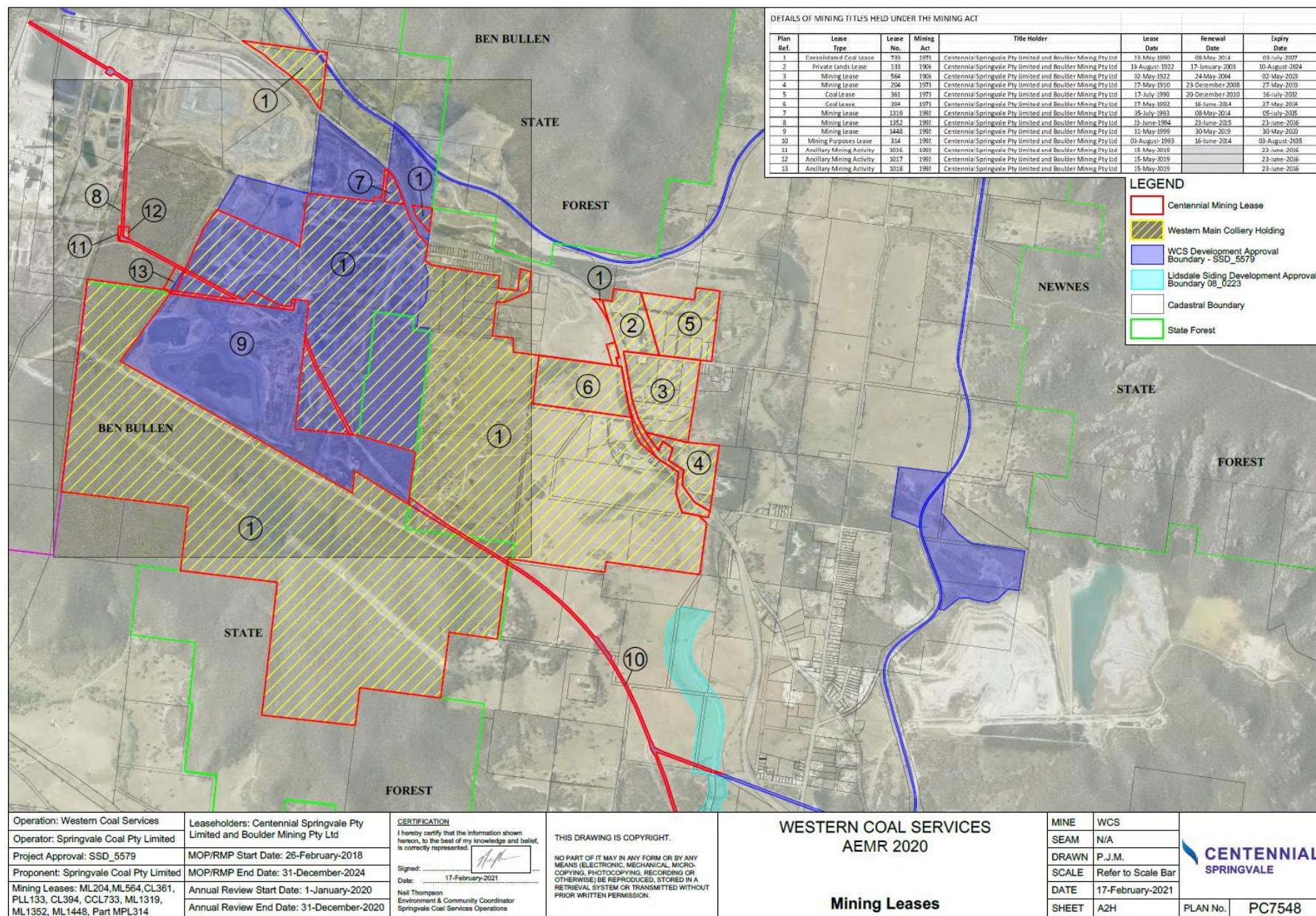
The recent open cut operation was operational from 1994 to 2010 and primarily utilised bulldozers, loaders and dump trucks.

Coal extraction activities ceased at Lamberts Gully on 30 June 2010.

An Environmental Impact Statement (EIS) was submitted to the former Department of Planning and Infrastructure (now Department of Planning, Industry and Environment – DPIE) by Springvale Coal Pty Limited (Springvale Coal) seeking approval for the expansion of existing operations at the site.

This project application was approved by the then Minister for Planning and Infrastructure on 4 April 2014, with a new Development Consent granted (SSD-5579) for WCS.

WCS Mining Leases are illustrated in Figure PC7257.



2. GENERAL STATUS

WCS operates under a variety of mining authorities consisting of mining leases, coal leases, authorisations and exploration licences.

Details of ML 204, ML 564, PLL 133, CCL 733, CL 361, CL 394, ML 1319, ML 1352, ML 1448, MPL 314 are summarised in Table 1.

Table 1 Mining Title General Details

Mining Title	Title Holder	Date Granted	Renewal Date	Expiry Date
ML 204	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	27 May 1910	08 May 2014	27 May 2033
ML 564	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	2 May 1922	17 January 2003	2 May 2023
PLL 133	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	10 August 1922	24 May 2004	10 August 2024
CCL 733	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	23 May 1990	23 December 2008	9 March 2025
CL 361	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	17 July 1990	20 December 2010	16 July 2032
CL 394	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	27 May 1992	16 June 2014	27 May 2034
ML 1319	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	5 July 1993	8 May 2014	5 July 2035
ML 1352	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	26 May 1994	23 June 2015	23 June 2036
ML 1448	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	31 May 1999	31 May 1999	31 May 2020
MPL 314	Centennial Springvale Pty Limited and Boulder Mining Pty Ltd	3 August 1993	16 June 2014	3 August 2035

In accordance with the provisions of Section 122(3) of the Mining Act 1992, the delegate of the secretary on 12 June 2020 registered Centennial Springvale Pty Limited, and Boulder Mining Pty Ltd as the holder of ML 204, ML 564, PLL 133, CCL 733, CL 361, CL 394, ML 1319, ML 1352, ML 1448, MPL 314.

No relinquishment of the above mining authorisations have been relinquished since their respective renewal dates.

ML 1448

Mining lease ML 1448 expired during the reporting on 30 May 2020. A renewal application has been submitted and is awaiting approval from the NSW Resources Regulator.

3. STATUS ON COMPLIANCE CONDITIONS

Table 2 **WCS Status of Compliance with lease conditions**

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 204 CCL 733 CL 361 CL 394 ML 1319 ML 1352 MPL 314	1	Notice to Landholders (a) Within a period of three months from the date of grant renewal of this mining lease, the lease holder must serve on each landholder a notice in writing indicating that this mining lease has been granted/renewed and whether the lease includes the surface. A plan identifying each landholder and individual land parcel subject to the lease area, and a description of the lease area must accompany the notice. (b) If there are ten or more landholders, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this mining lease has been granted/renewed; state whether the lease includes the surface and must contain a plan and description of the lease area. If a notice is made under condition 1(b), compliance with condition 1(a) is not required.	Compliant	WCS undertook no renewal of these titles in the reporting period.
ML 564 PLL 133 ML 1448	1	Extraction of coal The lease holder shall extract as large a percentage of the coal in the subject area as is practicable consistent with the provisions of the Coal Mines Regulations Act 1982 and the Regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.	Compliant	No coal was extracted from seams covered by these tenements by WCS.
ML 204 CL 394 ML 1319 ML 1352 MPL 314	2	Rehabilitation Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	Compliant	Rehabilitation activities have been undertaken on these titles within the reporting period. Further details are provided in the WCS 2020 Annual Review section 6.14 and Appendix N.
CCL 733 CL 361	2	Environmental Harm The proponent shall implement as practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or rehabilitation of the development.	Compliant	Measures for minimisation of environmental harm are addressed in the Springvale Coal Services Environmental Management System (SCSO EMS) which includes environmental management plans.
ML 564 PLL 133 ML 1448	2	Mining, Rehabilitation, Environmental Management Process (MREMP) Mining Operations Plan (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together	Compliant	WCS Mining Operations Plan (MOP) Amendment A covers the period 1 January 2018 to 31 December 2024 and was approved by the Department on 28 August 2020. The WCS MOP is available on Centennial's website through the following link: WCS MOP

Relevant Title	Condition Number	Condition Content	Status	Comment
		with environmental conditions of development consent and other approvals will form the basis for: (a) ongoing mining operations and environmental management; and (b) ongoing monitoring of the project. (2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement. (3) A Plan must be lodged with the Director-General: (a) prior to the commencement of operations (b) subsequently as appropriate prior to the expiry of any current Plan; and (c) in accordance with any direction issued by the Director-General. (4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify: (a) area(s) proposed to be disturbed under the Plan; (b) mining and rehabilitation method(s) to be used and their sequence; (c) areas to be used for disposal of tailings/waste; (d) existing and proposed surface infrastructure; (e) progressive rehabilitation schedules; (f) areas of particular environmental sensitivity; (g) water management systems (including erosion and sediment controls); (g) proposed resource recovery; and (i) where the mine will cease extraction during the term of the plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation (5) The Plan when lodged will be reviewed by the Department of Mineral Resources. (6) The Director-General may within two (2) months of the lodgement of a Plan, require modification and relodgement. (7) If requirement in accordance with clause (6) is not issued within two months of the lodgement of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgement of the required security deposit within the specified time.		Rehabilitation activities are detailed within the WCS 2020 Annual Review section 6.14 and Appendix N.

Relevant Title	Condition Number	Condition Content	Status	Comment
		(8) During the life of the Mining Operations Plan, proposed modification to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) – (7) above.		
ML 204 CL 394 ML 1319 ML 1352 MPL 314	3	Mining Operations Plan and Annual Rehabilitation report (a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting. (b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which: (i) identifies areas that will be disturbed; (ii) details the staging of specific mining operations, mining purposes and prospecting; (iii) identifies how the mine will be managed and rehabilitated to achieve the post mining land use; (iv) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and (v) reflects the conditions of approval under: - the <i>Environmental Planning and Assessment Act 1979</i>; - the <i>Protection of the Environment Operations Act 1997</i>; and - any other approvals relevant to the development including the conditions of this mining lease. (c) The MOP must be prepared in accordance with the ESG3: Mining Operations Plan (MOP) Guidelines September 2013 published on the Department's website at www.resources.nsw.gov.au/environment (d) The lease holder may apply to the Minister to amend an approved MOP at any time. (e) It is not a breach of this condition if: (i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the <i>Environmental Planning and Assessment Act 1979</i>, the <i>Protection of the Environment Operations Act 1997</i>, the <i>Mine Health and Safety Act 2004/Coal Mine Health and Safety Act 2002</i> and <i>Mine Health and Safety Regulation 2007/Coal Mine Health and Safety Regulation 2006</i> or the <i>Work Health and Safety Act 2011</i>; and	Compliant	WCS Mining Operations Plan (MOP) Amendment A covers the period 1 January 2018 to 31 December 2024 and was approved by the Department on 28 August 2020. The WCS MOP is available on Centennial's website through the following link: WCS MOP Rehabilitation activities are detailed within the WCS 2020 Annual Review section 6.14 and Appendix N.

Relevant Title	Condition Number	Condition Content	Status	Comment
		(ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out. (f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: (i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; (ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and (iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment Note: The Rehabilitation Report replaces the Annual Environmental Management Report.		
CCL 733 CL 361	3	Mining Operations Plan (a) Mining operations must not be carried out otherwise than in accordance with: a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries. b) The MOP must: i) identify areas that will be disturbed by mining operations; ii) detail the staging of specific mining operations; iii) identify how the mine will be managed to allow mine closure; iv) identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment; v) reflect the conditions of approval under: - the <i>Environmental Planning and Assessment Act 1979</i> - the <i>Protection of the Environment Operations Act 1997</i> - and any other approvals relevant to the development including the condition of this lease; and (vi) have regard to any relevant guidelines adopted by the Director-General. c) The titleholder may apply to the Director-General to amend an approved MOP at any time. d) It is not a breach of this condition if:	Compliant	WCS Mining Operations Plan (MOP) Amendment A covers the period 1 January 2018 to 31 December 2024 and was approved by the Department on 28 August 2020. The WCS MOP is available on Centennial's website through the following link: WCS MOP Rehabilitation activities are detailed within the WCS 2020 Annual Review section 6.14 and Appendix N.

Relevant Title	Condition Number	Condition Content	Status	Comment
		i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the <i>Mining Act 1992</i>, the <i>Environmental Planning and Assessment Act 1979</i>, <i>Protection of the Environment Operations Act 1997</i> or the <i>Occupational Health and Safety Act 2000</i>; and ii) the Director-General had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out. e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the Director-General. An approved amendment to the MOP under condition 5 does not constitute an approval for the purpose of this paragraph unless otherwise identified by the Director-General.		
ML 564 PLL 133 ML 1448	3	Annual Environmental Management Report (AEMR) (1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General. (2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:- (a) the approved Mining Operations Plan; (b) development consent requirements and conditions; (c) Environment Protection Authority and Department of Land and Water Conservation licences and approvals; (d) any other statutory environmental requirements; (e) details of any variations to environmental approvals applicable to the lease area. and (f) where relevant, progress towards final rehabilitation objectives. (3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice. (4) The lease holder shall, as and when directed by the Minister, co-operate with the Director-General to conduct and facilitate review of the AEMR involving other government agencies.	Compliant	This report (AEMR) has been prepared to satisfy the requirements of this condition. Additional information on compliance with this condition is provided in the WCS 2020 Annual Review.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 204 CL 394 ML 1319 ML 1352 MPL 314	4	Compliance Report (a) The lease holder must submit a Compliance Report to the satisfaction of the Minister. The report must be prepared in accordance with any relevant guidelines or requirements published by the Minister for compliance reporting. (b) The Compliance Report must include: (i) the extent to which the conditions of this mining lease or any provisions of the Act or the regulations applicable to activities under this mining lease, have or have not been complied with; (ii) particulars of any non-compliance with any such conditions or provisions, (iii) the reasons for any such non-compliance; (iv) any action taken, or to be taken, to prevent any recurrence, or to mitigate the effects, of that non-compliance. (c) The Compliance Report must be lodged with the Department annually on the grant anniversary date for the life of this mining lease. (d) In addition to annual lodgement under condition 4(c) above, a Compliance Report: (i) must accompany any application to renew this mining lease under the Act; (ii) must accompany any application to transfer this mining lease under the Act; and (iii) must accompany any application to cancel, or to partially cancel, this mining lease under the Act. (e) Despite the submission of any Compliance Report under (c) or (d) above, the titleholder must lodge a Compliance Report with the Department at any date or dates otherwise required by the Minister. (f) A Compliance Report must be submitted one month prior to the expiry of this mining lease, where the licence holder is not seeking to renew or cancel this mining lease.	Compliant	This report (AEMR) has been prepared to satisfy the requirements of this condition. Additional information on compliance with this condition is provided in the WCS 2020 Annual Review.
CCL 733 CL 361	4	Environment Management Reporting The lease holder must lodge Environmental Management Reports (EMR) with the Director-General annually or at dates otherwise directed by the Director-General.	Compliant	This report (AEMR) has been prepared to satisfy the requirements of this condition. Additional information on compliance with this condition is provided in the WCS 2020 Annual Review.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 204 CL 394 ML 1319 ML 1352 MPL 314	5	Environment Incident Report (a) The lease holder must notify the Department of all: (i) breaches of the conditions of this mining lease or breaches of the Act causing or threatening material harm to the environment; and (ii) breaches of environmental protection legislation causing or threatening material harm to the environment (as defined in the <i>Protection of the Environment Administration Act 1991</i>), arising in connection with significant surface disturbing activities, including mining operations, mining purposes and prospecting operations, under this mining lease. The notification must be given immediately after the lease holder becomes aware of the breach. Note. Refer to www.resources.nsw.gov.au/environment for notification contact details. (b) The lease holder must submit an Environmental incident Report to the Department within seven (7) days of all breaches referred to in condition 5(a) (i) and (ii). The Environmental incident Report must include: (i) the details of the mining lease; (ii) contact details for the lease holder; (iii) a map identifying the location of the incident and where material harm to the environment has or is likely to occur; (iv) a description of the nature of the incident or breach, likely causes and consequences; (v) a timetable showing actions taken or planned to address the incident and to prevent future incidents or breaches referred to in 5(a). (vi) a summary of all previous incidents or breaches which have occurred in the previous 12 months relating to significant surface disturbing activities, including mining operations, mining purposes and prospecting operations under this mining lease. Note. The lease holder should have regard to any relevant Director General's guidelines in the preparation of an Environmental incident Report. Refer to www.resources.nsw.gov.au/environment for further details. (c) In addition to the requirements set out in conditions 5(a) and (b), the lease holder must immediately advise the Department of any notification made under section 148 of the <i>Protection of the Environment Operations Act 1997</i> arising in connection with significant surface disturbing activities including mining operations, mining purposes and prospecting operations, under this mining lease.	Compliant	No environmental incidents occurred during the reporting period on any WCS mining leases.
CCL 733 CL 361	5	The EMR must:	Compliant	This report (AEMR) has been prepared to satisfy the requirements of this condition.

Relevant Title	Condition Number	Condition Content	Status	Comment
		a) report against compliance with the MOP; b) report on progress in respect of rehabilitation completion criteria; c) report on the extent of compliance with regulatory requirements; and d) have regard to any relevant guidelines adopted by the Director-General;		Additional information on compliance with this condition is provided in the WCS 2020 Annual Review. Rehabilitation activities are detailed within the WCS 2020 Annual Review section 6.14 and Appendix N.
ML 204 CL 394 ML 1319 MPL 314	6	Subsidence Management The lease holder must not commence or undertake underground mining operations that may cause subsidence of the surface other than in accordance with an Eligible Subsidence Management Plan approved by the Director-General. For the purposes of this condition, an 'Eligible Subsidence Management Plan' means: (i) A Subsidence Management Plan prepared in accordance with current government guidelines for the preparation of Subsidence Management Plans; or (ii) Those parts of an Extraction Plan or another type of plan: - prepared, either in whole or in part, with reference to current government guidelines for the preparation of a Subsidence Management Plan; and - approved for the purposes of the <i>Environmental Planning and Assessment Act 1979</i> (or any planning legislation which replaces that Act) by the Minister or Director-General of the Department of Planning & Infrastructure, or another officer of that Department authorised to approve such a plan, which relate to issues of subsidence.	Compliant	No underground mining operations that can cause subsidence have occurred within the reporting period. There is no requirement to submit a Subsidence Management Plan or Extraction Plan for these titles.
CCL 733 CL 361	6	Additional environmental reports may be required on specific surface disturbing operations or environmental incidents from time to time as directed in writing by the Director-General and must be lodged as instructed.	Compliant	No additional environmental reports were required during the reporting period.
ML 204 CL 394 ML 1319	7	Resource Recovery The lease holder must optimise recovery of the minerals that are the subject of this mining lease to the extent economically feasible.	Compliant	No resource recovery occurred on these titles in the reporting period.
CCL 733 CL 361	7	Rehabilitation Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.	Compliant	Rehabilitation activities are detailed within the WCS 2020 Annual Review section 6.14 and Appendix N.
ML 204 CL 394 ML 1319	8	Security The lease holder is required to provide and maintain a security deposit to secure funding for the fulfilment of obligations of all or any kind under the mining lease, including obligations of	Compliant	Centennial has a combined security deposit in place with the Department.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 1352		all or any kind under the mining lease that may arise in the future. The amount of the security deposit to be provided has been assessed by the Minister. The leases covered by the Group Security include: [AS REFERENCED IN EACH MINING LEASE DOCUMENT]		
CCL 733 CL 361	8	Subsidence Management (a) The lease holder shall prepare a Subsidence Management Plan prior to commencing any underground mining operations which will potentially lead to subsidence of the land surface. (b) Underground mining operations which will potentially lead to subsidence include secondary extraction panels such as longwalls or miniwalls, associated first workings (gateroads, installation roads and associated main headings, etc), and pillar extractions, and are otherwise defined by the <i>Applications for Subsidence Management Approvals guidelines (EDG17)</i> (c) The lease holder must not commence or undertake underground mining operations that will potentially lead to subsidence other than in accordance with a Subsidence Management Plan approved by the Director-General, an approval under the Mine Health & Safety Act 2004, or the document <i>New Subsidence Management Plan Approval Process - Transitional Provisions (EDP09)</i>. (d) Subsidence Management Plans are to be prepared in accordance with the <i>Guideline for Applications for Subsidence Management Approvals</i>. (e) Subsidence Management Plans as approved shall form part of the Mining Operations Plan required under Condition 3 and will be subject to the Annual Environmental Management Report process as set out under Condition 4. The SMP is also subject to the requirements for subsidence monitoring and reporting set out in the document <i>New Approval Process for Management of Coal Mining Subsidence - Policy</i>.	Compliant	No underground mining operations that can cause subsidence have occurred within the reporting period. There is no requirement to submit a Subsidence Management Plan or Extraction Plan for these titles.
ML 204 CL 394 ML 1319 ML 1352 MPL 314	9	Cooperation Agreement The lease holder must make every reasonable attempt, and be able to demonstrate its attempts, to enter into a cooperation agreement with the holder(s) of any overlapping title(s). The cooperation agreement should address but not be limited to issues such as - access arrangements - operational interaction procedures - dispute resolution - information exchange - well location - timing of drilling - potential resource extraction conflicts; and - rehabilitation issues.	Compliant	No overlapping titles held by other parties.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 564 PLL 133	9	Barriers The lease holder shall not work or cause to be worked any seam of coal within the subject area without leaving, if the Minister, so directs, a barrier of such width or a protective pillar or pillars of such size or sizes against any surface improvement of any feature whether natural or artificial.	Compliant	Not applicable. No workings undertaken in any coal seam.
ML 204 CL 394 ML 1319 ML 1352 MPL 314		Exploration Reporting The lease holder must lodge reports to the satisfaction of the Minister in accordance with section 163C of the <i>Mining Act 1992</i> and in accordance with clause 57 of the <i>Mining Regulation 2010</i>. Reports must be prepared in accordance with Exploration Reporting: A guide for reporting on exploration and prospecting in New South Wales (Department of Trade and Investment, Regional Infrastructure and Services, 2010).	Compliant	No exploration activities were undertaken during the reporting period.
ML 204	10	Special Conditions Barriers (a) The lease holder shall not work or cause to be worked any seam of coal within the subject area without leaving, if the Minister, by order, given in writing to the lease holder, so directs, a barrier of such width or a protective pillar or pillars of such size or sizes as is specified in the order, against any surface improvements or any feature whether natural or artificial. (b) Unless with the consent of the Minister and subject to such conditions as he may impose the lease holder shall not work or cause to be worked any seam of coal in the barrier of 9.144 metres in width as shown by red edging on the plan hereto.	Compliant	Not applicable. No workings undertaken in any coal seam.
CCL 733	10	Control of Operations a) If an Environmental Officer of the Department believes that the lease holder is not complying with any provision of the Act or any condition of this lease relating to the working of the lease, he may direct the lease holder to:- (i) cease working the lease; or (ii) cease that part of the operation not complying with the Act or conditions; until in the opinion of the Environmental Officer the situation is rectified. b) The lease holder must comply with any direction given. The Director-General may confirm, vary or revoke any such direction.	Compliant	No directions were received relating to control of operations during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		c) A direction referred to in this condition may be served on the Mine Manager.		
CCL 733 CL 361	11	Reports The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following: a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period; b) Details of expenditure incurred in conducting that exploration; c) A summary of all geological findings acquired through mining or development evaluation activities; d) Particulars of exploration proposed to be conducted in the next twelve months period; e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.	Compliant	No exploration activities were undertaken during the reporting period.
CCL 733 CL 361	12	Licence to Use Reports (a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright. b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.	Compliant	
CCL 733 CL 361	13	Confidentiality a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where: (i) the lease holder has agreed that specified reports may be made non-confidential. (ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease. b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated. c) The Director-General may extend the period of confidentiality.	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
CCL 733 CL 361	14	Terms of the non-exclusive licence The terms of the non-exclusive copyright licence granted under condition 12 are: a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports. b) the Minister and any sub- licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database. c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright. d) there is no royalty payable by the Minister for the licence. e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.	Compliant	
ML 1448	14	Shafts, Drifts, Adits Operations shall be conducted in such a manner as not to cause any danger to persons or stock and the lease holder shall provide and maintain adequate protection to the satisfaction of the Minister around each shaft or excavation opened up or used by the lease holder.	Compliant	Not applicable. No workings undertaken in any coal seam.
CCL 733	15	Blasting a) Ground Vibration The lease holder must ensure that the ground vibration peak particle velocity generated by any blasting within the lease area does not exceed 10 mm/second and does not exceed 5 mm/second in more than 5% of the total number of blasts over a period of 12 months at any dwelling or occupied premises as the case may be, unless determined otherwise by the Department of Environment and Climate Change. b) Blast Overpressure The lease holder must ensure that the blast overpressure noise level generated by any blasting within the lease area does not exceed 120 dB (linear) and does not exceed 115 dB (linear) in more than 5% of the total number of blasts over a period of 12 months, at any	Compliant	No blasting was undertaken during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		dwelling or occupied premises, as the case may be, unless determined otherwise by the Department of Environment and Climate Change.		
ML 1448	15	Dumps The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any dumps of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding.	Compliant	No directions were received relating to waste dumps during the reporting period.
CCL 733 CL 361	16	Safety Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.	Compliant	All operations were carried out in a safe manner during the reporting period.
ML 1448	16	The lease holder shall comply with any direction given or which may be given by the Minister regarding the spraying of coal dumps on the subject area.	Compliant	No directions were received relating to the spraying of coal dumps during the reporting period.
CCL 733 CL 361	17	Exploratory Drilling a) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Water and Energy Regional Hydrologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes. b) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:- (i) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established; (ii) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface; (iii) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters; (iv) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape; (v) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.	Compliant	No exploration activities were undertaken during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		(vi) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General. (vii) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.		
CCL 733 CL 361	18	Prevention of Soil Erosion and Pollution Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an approved Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	Compliant	Operations were carried out in a manner that did not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion during the reporting period.
ML 1448	18	Management and Rehabilitation of Lands (General) The lease holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof or the Minister and subject to such conditions as the Minister may stipulate.	Compliant	No interference with any fences on or adjacent to the subject area was undertaken during the reporting period.
CCL 733 CL 361	19	Transmission lines, Communication lines and Pipelines Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.	Compliant	No interference with the stability or efficiency of any transmission line, communication line, pipeline or any other utility was undertaken during the reporting period.
ML 564 PLL 133 ML1448	19	Management and Rehabilitation of Lands (General) The lease holder shall observe any instruction given or which may be given by the Minister with a view to minimising or prevent public inconvenience or damage to public or private property.	Compliant	
CCL 733	20	Fences, Gates (a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate. (b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.	Compliant	No interference with any fences on or adjacent to the subject area was undertaken during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 564 PLL 133 ML 1448	20	If required to do so by the Minister and within such time as may be stipulated by the Minister the lease holder shall carry out to the satisfaction of the Minister surveys of structures, building and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.	Compliant	No directions were received relating to surveys of structures, building and pipelines on adjacent landholdings during the reporting period.
CCL 733 CL 361	21	Roads and Tracks a) Operations must not affect any road unless in accordance with an approved Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate. b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.	Compliant	
ML 1448	21	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.	Compliant	Rehabilitation activities within the reporting period are addressed within the 2020 Annual Review.
CCL 733	22	Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Environment and Climate Change.	Compliant	
ML 564 PLL 133 ML 1448	22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	Compliant	
CCL 733	23	Trees and Timber a) The lease holder must not fell trees, strip bark or cut timber on the lease without the consent of the landholder who is entitled to the use of the timber, or if such a landholder refuses consent or attaches unreasonable conditions to the consent, without the approval of a warden. b) The lease holder must not cut, destroy, ringbark or remove any timber or other vegetative cover on the lease area except such as directly obstructs or prevents the carrying on of	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
		operations. Any clearing not authorised under the <i>Mining Act 1992</i> must comply with the provisions of the <i>Native Vegetation Act 2003</i> . c) The lease holder must obtain all necessary approvals or licences before using timber from any Crown land within the lease area.		
ML 564 PLL 133 ML 1448	23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations where or were not carried out by the lease holder.	Compliant	Rehabilitation activities have been undertaken on these titles within the reporting period. Further details are provided in the WCS 2020 Annual Review section 6.14 and Appendix N.
ML 1448	24	The lease holder shall take all precautions against causing outbreak of fire on the subject area.	Compliant	Precautions against causing outbreak of fire were undertaken during the reporting period.
CCL 733 CL 361	25	Resource Recovery a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals. b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery. c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area. d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder. e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992. f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.	Compliant	No resource recovery occurred on these titles in the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 1448	25	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or siltation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.	Compliant	
CCL 733 CL 361	26	Indemnity The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.	Compliant	
ML 1448	26	Blasting The lease holder shall monitor noise and vibration and institute controls, generally in accordance with the recommendations of Australian Standard AS-2187-1993 and ANZEC Guidelines. (a) Ground Vibration The lease holder shall design all blasts on the basis that the ground vibration peak particle velocity generated by any blasting within the subject area, shall not exceed the levels in or conditions of the EPA Licence for the mine, at any dwelling or occupied premises not owned by the lease holder, the holder of an authority under the Mining Act, or not subject to a valid agreement with the lease holder, with respect to the effects of blasting. (b) Blast Overpressure The lease holder shall design all blasts on the basis that the blast overpressure noise level generated by any blasting within the subject area, shall not exceed the levels in or conditions of the EPA Licence for the mine, at any dwelling or occupied premises not owned by the lease holder, the holder of an authority under the Mining Act, or not subject to valid agreement with the lease holder, with respect to the effects of blasting.	Compliant	No blasting was undertaken during the reporting period.
ML 564 PLL 133	27	Trees (Planting and Protection of) Flora and Fauna and Arboreal Screens If so directed by the Minister, the lease holder shall ensure that operations are carried out in in such manner so as to minimise disturbance to flora and fauna within the subject area.	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 1448				
CCL 733 CL 361	28	Security a) The single security given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under Mineral Leases No's. 204 and 564 and Private Lands Lease No. 133 (Act 1906), Consolidated Coal Lease No. 733 and Coal Leases No's. 361 and 394 (Act 1973) and Mining Lease No. 1319 (Act 1992) Coal Lease No. 377 and Mining Purposes Lease No. 314 (Act 1973) and Mining Leases No's 1303, 1323, 1326, 1352, 1448, 1537 and 1588 (Act, 1992) is extended to apply to the renewal of this lease. b) If the lease holder fails to fulfil any one or more of the obligations under this lease, then the security held may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of the lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder. (c) The lease holder must provide the security required by sub-clause a) in one of the following forms: (i) cash, (ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.	Compliant	Centennial has a combined security deposit in place with the Department.
ML 1448	28	Notwithstanding the provisions of Condition No 36 e (i) the lease holder shall not fell trees, strip bark or cut timber on any land within the subject area except with the approval of the owner/occupier and subject to the payment to the owner of the trees, bark or timber of compensation as agreed or as assessed by the Warden.	Compliant	
ML 1448	29	The lease holder shall maintain an arboreal screen to the satisfaction of the Minister within such parts of the subject area as may be specified by the Minister and shall plant such trees or shrubs as may be required by the Minister to preserve the arboreal screen in a condition satisfactory to the Minister.	Compliant	
CCL 733	30	Suspension of Mining Operations The holder of a consolidated mining lease may not suspend mining operations in the mining area other than in accordance with the consent of the Minister.	Compliant	Mining operations were not suspended during the reporting period.
ML 1448	30	The lease holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	Compliant	Operations were carried out in a manner that did not cause or aggravate soil erosion during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
CCL 733 CL 361	31	Cooperation Agreement The licence holder must make every reasonable attempt, and be able to demonstrate their attempts, to enter into a cooperation agreement with the holder(s) of any overlapping petroleum title(s). The cooperation agreement should address but not be limited to issues such as: - access arrangements - operational interaction procedures - dispute resolution - information exchange - well location - timing of drilling - potential resource extraction conflicts and - rehabilitation issues.	Compliant	No overlapping titles held by other parties.
ML 564 PLL 133 ML 1448	31	Roads The lease holder shall pay to Council of the City of Lithgow, Department of Land and Water Conservation or the Chief Executive, Roads and Traffic Authority the cost incurred by such Council or Department or Chief Executive of making good any damage caused by operations carried on by or under the authority of the lease holder to any road adjoining or traversing the surface or the excepted surface, as the case may be of the subject area. PROVIDED HOWEVER that the amount to be paid by the lease holder as aforesaid shall be reduced by such sum of money if any as may be paid to the said Council the Department of Land and Water Conservation or the Chief Executive, Roads and Traffic Authority as the case may be from the Mine Subsidence Compensation Fund constituted under the <i>Mine Subsidence Compensation Act 1961</i>, in settlement of claim for compensation for the same damage.	Compliant	
CCL 733 CL 361	32	Catchment Areas a) The lease holder shall carry out operations in such a way as to conform strictly to all provisions of the <i>Sydney Water Catchment Management Act 1998</i> and the regulations thereunder applying to the prevention of pollution of the Warragamba Outer Catchment Area or the preservation of the purity of the water supply provided thereby or derived therefrom or for the protection of the property of Sydney Catchment Authority [hereinafter referred to as the 'the Authority'] on the Outer/ Catchment Area and also to all requirements	Compliant	Operations conformed with the provisions of the <i>Sydney Water Catchment Management Act 1998</i> and regulations during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		of the Authority from time to time under the said Act or any of the regulations for the time being in force. b) If the lease holder shall at any time be using or about to use any process which in the opinion of the Authority is likely to pollute the Outer Catchment Area or the water supply or to endanger any property of the Authority on the Outer Catchment Area the lease holder upon service of a notice in writing under the hand of the Minister to do so shall: (i) discontinue the use of such process immediately, or (ii) thereafter refrain from adopting such process at any time, as the case may require. c) The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent the contamination, pollution, erosion or siltation of any stream or watercourse or Outer Catchment Area and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or siltation of any stream watercourse or Outer Catchment Area. d) The lease holder hereby covenants with Us Ours Heirs and Successors and as a separate covenant the lease holder hereby covenants with the Authority and its Successors that the lease holder shall at all times hereafter save harmless and keep Us and the said Authority and Our Heirs and Successors and the Successors of the said Authority indemnified from payment of compensation and from and against all actions proceedings claims and demands in respect of any injury loss of damage arising out of or in any way connected with any interference with or deprivation or loss of access to the land and premises of this authority which may occur by reason of any works or operations undertaken or carried out by the said Authority or arising out of or in any way connected with any discontinuance or alteration of any process consequent upon the service of a notice in pursuance of the provisions of Condition 32 (b) or arising out of or in any way connected with the operation of any regulations relating to Outer Catchment Areas in force at the date hereof or made by the said Authority at any time hereafter and the lease holder hereby agrees that for the purpose of this condition the said Authority shall be deemed to be a party to this authority. e) The lease holder shall: (i) Make such provisions for sanitation as may be directed by the Authority and shall at all times observe and perform any requirements of the said Authority respecting sanitation. (ii) not establish any camps or habitations within any area under the control of the Authority unless with the consent of the Authority. (iii) Not sink any drillhole within the stored waters on the subject area nor within 40 metres of the top water level thereof unless with the consent of the Authority. (iv) Not sink any drillhole within any watercourse on the Warragamba Outer Catchment Area nor within 100 metres thereof unless with the consent of the Authority.		

Relevant Title	Condition Number	Condition Content	Status	Comment
		(v) Not interfere with or impede the use of the Authority tracks of endanger their stability in any way by reason of the operations unless with the consent of the Authority. (vi) Not construct any road to the sites of any drillholes unless with the consent of the Authority to the proposed route and type of road construction. (vii) Not interfere in any way with any fences on or adjacent to the Warragamba Outer Catchment Area unless with the consent in writing of the owner thereof or the Authority. (viii) Give twenty eight days notice to the General Manager, Catchment Operations and Major Projects, Sydney Catchment Authority, Penrith, of its intention to commence drilling operations. (ix) Not cut or remove any timber except such as directly obstructs or prevents the carrying on of operations and the lease holder shall obtain the consent in writing of the Authority before making use of the timber so cut for other than in connection with operations. (x) Complete work in relation to rehabilitation within the Warragamba Outer Catchment Area before termination of the authority to the satisfaction of the Authority.		
CL 361	32	Special Condition (a) Subject to paragraph (b) of this condition coal mining operations within that part of the subject area beneath Trunk Road No. 55 shall be restricted to the driving of access headings and associated cut-throughs. (b) The Driving of any such headings and cut-throughs shall only be carried out in accordance with such plans as may be approved by the Chief Inspector of Coal Mines and subject to such conditions as he may impose.	Compliant	
ML 1448	32	In the event of operations being conducted on the surface of any road, track or firetrail traversing the subject area or in the event of such operations causing damage to or interference with any such road, track or firetrail the lease holder, at his own expense, shall if directed to do so by the Minister provide to the satisfaction of the Minister an alternate road, track or firetrail in a position as required by the Minister and shall allow free and uninterrupted access along such alternate road, track or firetrail and, if required to do so by the Minister, the lease holder shall upon completion of operations rehabilitate the surface of the original road, track or firetrail to a condition satisfactory to the Minister.	Compliant	
ML 1448	33	Catchment Areas (see also Condition numbers 56 and 57 re: Sydney Water Catchment) (a) Operations shall be carried out in such a way as not to cause any pollution of the Coxs River Catchment Area. (b) If the lease holder is using or about to use any process which in the opinion of the Minister is likely to cause contamination of the waters of the said Catchment Area the lease holder shall refrain from using or cease using as the case may require such process within	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
		twenty four (24) hours of the receipt by the lease holder of a notice in writing under the hand of the Minister requiring the lease holder to do so. (c) The lease holder shall comply with any regulations now in force or hereafter to be in force for the protection from pollution of the said Catchment Area.		
ML 564 PLL 133	34	Catchment Areas (a) The lease holder shall carry out operations in such a way as to conform strictly to all provisions of the <i>Sydney Water Catchment Management Act 1998</i> and the regulations thereunder applying to the prevention of pollution of the Warragamba Outer Catchment Area or the preservation of the purity of the water supply provided thereby or derived therefrom or for the protection of the property of Sydney Catchment Authority [hereinafter referred to as the 'the Authority'] on the Outer Catchment Area and also to all requirements of the Authority from time to time under the said Act or any of the regulations for the time being in force. (b) If the lease holder shall at any time be using or about to use any process which in the opinion of the Authority is likely to pollute the Outer Catchment Area or the water supply or to endanger any property of the Authority on the Outer Catchment Area the lease holder upon service of a notice in writing under the hand of the Minister to do so shall: (i) discontinue the use of such process immediately, or (ii) thereafter refrain from adopting such process at any time, as the case may require. (c) The lease holder shall provide and maintain to the -satisfaction of the Minister efficient means to prevent the contamination, pollution, erosion or siltation of any stream or watercourse or Outer Catchment Area and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or siltation of any stream watercourse or Outer Catchment Area. (d) The lease holder hereby covenants with Us Ours Heirs and Successors and as a separate covenant the lease holder hereby covenants with the Authority and its Successors that the lease holder shall at all times hereafter save harmless and keep Us and the said Authority and Our Heirs and Successors and the Successors of the said Authority indemnified from payment of compensation and from and against all actions proceedings claims and demands in respect of any injury loss of damage arising out of or in any way connected with any interference with or deprivation or loss of access to the land and premises of this authority which may occur by reason of any works or operations undertaken or carried out by the said Authority or arising out of or in any way connected with any discontinuance or alteration of any process consequent upon the service of a notice in pursuance of the provisions of Condition 34(b) or arising out of or in any way connected with the operation of any regulations relating to Outer Catchment Area in force at the date hereof or made by the said Authority at any time hereafter and the lease holder	Compliant	Operations conformed with the provisions of the <i>Sydney Water Catchment Management Act 1998</i> and regulations during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		hereby agrees that for the purpose of this condition the said Authority shall be deemed to be a party to this authority.		
ML 564 PLL 133	35	The lease holder shall: (a) Make such provisions for sanitation as may be directed by the Authority and shall at all times observe and perform any requirements of the said Authority respecting sanitation. (b) not establish any camps or habitations within any area under the control of the Authority unless with the consent of the Authority. (c) Not sink any drillhole within the stored waters on the subject area nor within 40 metres of the top water level thereof unless with the consent of the Authority. (d) Not sink any drillhole within any watercourse on the Warragamba Outer Catchment Area nor within 100 metres thereof unless with the consent of the Authority. (e) Not interfere with or impede the use of the Authority tracks of endanger their stability in any way by reason of the operations. (f) Not construct any road to the sites of any drillholes unless with the consent of the Authority to the proposed route and type of road construction. (g) Not interfere in any way with any fences on or adjacent to the Warragamba Outer Catchment Area unless with the consent in writing of the owner thereof or the Authority. (h) Give twenty eight days notice to the General Manager, Catchment Operations and Major Projects, Sydney Catchment Authority, Penrith, of its intention to commence drilling operations. (i) Not cut or remove any timber except such as directly obstructs or prevents the carrying on of operations and the lease holder shall obtain the consent in writing of the Authority before making use of the timber so cut for other than in connection with operations. (j) Complete work in relation to rehabilitation within the Warragamba Outer Catchment Area before termination of the authority to the satisfaction of the Corporation.	Compliant	
ML 564	35	(Additional Clauses as requested by the Sydney Catchment Authority) (k) Consult with the Authority with regards to appropriate initial survey mapping and other studies of surface features above the lease and surrounds and their condition particularly drainage lines, hanging swamps, rock pools, cliff lines, rock overhangs, fracture patterns and lineaments. The lease area and surrounds should be surveyed at appropriate intervals during mining to measure subsidence impacts on the surface. The initial survey results and reports on the continued monitoring should be sent to the General Manager Catchment Operations and Major Projects, Sydney Catchment Authority, Penrith.	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
		(l) Consult with the Authority and take account of their input in the planning phase of rehabilitation to ensure the measures to be undertaken are to the satisfaction of the Authority with regards to water quality protection and future landuse.		
ML 1448	37	Trig. Stations and Survey Marks (a) The marks in connection with any trigonometrical station, Permanent Mark or State Survey Mark (under the Survey Co-ordination Act, 1949) erected on or near the subject area shall not be interfered with and the unrestricted right of access to such station by authorised persons and also the right to clear sight lines to surrounding stations is reserved at all times. (b) The lease holder shall take all necessary precautions to preserve the trigonometrical station, Permanent Mark or State Survey Mark (under the Survey Co-ordination Act, 1949) and the cairn, mast and vanes which might be erected upon the subject area. (c) No buildings or other structures shall be erected which would make observations to and from surrounding trigonometrical stations difficult to effect. (d) In the event of operations interfering with or damaging any trigonometrical station, Permanent Mark or State Mark (under the Survey Co-ordination Act, 1949) erected on or near the subject area, or if required to do so by the Minister, the lease holder shall relocate any such trigonometrical station, Permanent Mark or State Survey Mark (under the Survey Co-ordination Act, 1949) to the satisfaction of, and in a position required by, the Department of Land and Water Conservation, the Land Information Centre, Bathurst and the Minister and, if required to do so by the Minister, and subject to such conditions as the Minister may impose, the lease holder, upon completion of operations shall relocate any such trigonometrical station, Permanent Mark or State Survey Mark (under the Survey Co-ordination Act, 1949) to its original position.	Compliant	No interference to trig stations or survey marks occurred during the reporting period.
PLL 133 ML 1448	41	Transmission Lines, Communication Lines and Pipelines The lease holder shall as far as is practicable so conduct operations as not to interfere with or impair the stability or efficiency of any transmission line, communication line or pipeline traversing the surface or the excepted surface of the subject area and shall comply with any direction given or which may be given by the Minister in this regard.	Compliant	No interference with the stability or efficiency of any transmission line, communication line, pipeline or any other utility was undertaken during the reporting period.
PLL 133 ML 1448	43	Aboriginal Object or Aboriginal Place The lease holder shall not knowingly destroy, deface or damage any Aboriginal object or Aboriginal place within the subject area except in accordance with an authority issued under the <i>National Parks and Wildlife Act, 1974</i>, and shall take every precaution in drilling, excavating or disturbing the land against any such destruction, defacement or damage.	Compliant	No Aboriginal object or Aboriginal place was destroyed, defaced or damaged during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 564 PLL 133 ML 1448	45	Additional Information The lease holder shall if directed by the Minister and within such time as the Minister may stipulate furnish to the Minister: (a) information regarding the ownership of the land within the subject area; (b) information regarding the ownership of the coal within the subject area prior to 1st January, 1982; (c) an indemnity in a form approved by the Minister indemnifying the Crown and the Minister against any wrong payment effected as a result of incorrect information furnished by the lease holder; (d) information regarding the financial viability of the lease holder and operations within and associated with the subject area; and (e) information regarding shareholdings in the lease holder.	Compliant	
ML 564 PLL 133	46	Service of Notices Within a period of three (3) months from the date of service of the notice of renewal, or within such further time as the Director General may allow, the lease holder shall serve on each landholder within the subject area a notice in writing indicating that this authority has been renewed and whether the authority includes the surface. The notice shall be accompanied by an adequate plan and description of the subject area. If there are ten (10) or more landholders affected the lease holder may serve the notice by publication in a newspaper circulating in the region where the subject area is situated. The notice shall indicate that this authority has been renewed, state whether the authority includes the surface and shall contain an adequate plan and description of the subject area.	Compliant	
ML 564 PLL 133 ML 1448	47	Inspectors (a) Where an Inspector under the <i>Mining Act 1992</i> is of the opinion that any condition of this authority relating to operations within the subject area, or any provision of the Mining Act, 1992, relating to operations within the subject area, are not being complied with by the lease holder, the Inspector may serve on the lease holder a notice stating that and give particulars of the reason why, and may in such notice direct the lease holder: (i) to cease operations within the subject area in contravention of that condition or Act; and (ii) to carry out within the specified time works necessary to rectify or remedy the situation.	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
		(b) The lease holder shall comply with the directions contained in any notice served pursuant to sub paragraph (a) of this condition. The Director General may confirm, vary or revoke any such direction. (c) A notice referred to in his condition may be served on the Colliery Manager.		
ML 564 PLL 133 ML 1448	48	Indemnities The lease holder shall indemnify and keep indemnified the Crown from and against all actions suits and claims and demands of whatsoever nature and all costs charges and expense which may be brought against the lease holder or which the lease holder may incur respect of any accident or injury to any person or property which may arise out of the construction maintenance or working of any workings now existing or to be made by the lease holder within the boundaries of the subject area or in connection with any of the operations notwithstanding that all other conditions of this authority shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease which the lease holder may be licensed or compelled to do hereunder.	Compliant	
PLL 133 ML 1448	49	The lease holder shall save harmless the Crown from payment of compensation and from and against all claims, actions, suits or demands whatsoever in the event of any damage resulting from mining operations under or near the subject area.	Compliant	
ML 564 PLL 133 ML 1448	50	Prospecting (General) (a) Where the lease holder desires to commence prospecting operations in the subject area the lease holder shall notify the Director General in writing and shall comply with such additional conditions as the Minister may impose including any condition requiring the lodgement of an additional bond or other form of security for rehabilitation of the area affected by such operations. (b) Where the lease holder notifies the Director General pursuant to sub paragraph (EI) of this condition the lease holder shall furnish with that notification details of the type of prospecting methods that would be adopted and the extent and location of the area that would be affected by thorn.	Compliant	
ML 564	51	Security Deposit (a) The lease holder shall, upon request by the Director General, lodge with the Minister the sum of \$813,000.00 as security for the fulfilment of the obligations of the lease holder under Mineral Leases No's 204 and 564 and Private Lands Lease No. 133 (Act 1906), Consolidated Coal Lease No. 733 and Coal Leases No's. 361 and 394 (Act, 1973) and Mining Lease No. 1319 (Act 1992). In the event that the lease holder fails to fulfil any of the lease holder's obligations under those authorities the said sum may be applied at the	Compliant	Centennial has a combined security deposit in place with the Department.

Relevant Title	Condition Number	Condition Content	Status	Comment
		discretion of the Minister .towards the cost of fulfilling such obligations. For the purposes of the clause a lease holder shall be deemed to have failed to fulfil the lease holder's obligations under these authorities, if the lease holder fails to comply with any condition or provision of these authorities, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a- condition or provision of these authorities or of any provision of the Act or regulations made thereunder. (b) The lease holder must provide the security required by sub-clause (a) hereof in one of the following forms: (i) cash, or (ii) a security certificate in such form and given by such surely as may from time to time be approved by the Minister. (c) The minster may at any time, vary the amount of security required in accordance with this condition.		
PLL 133	51	Security Deposit (a) The lease holder shall, upon request by the Director General, lodge with the Minister the sum of \$915,000.00 as security for the fulfilment of the obligations of the lease holder under Mineral Leases No's 204 and 564 and Private Lands Lease No. 133 (Act 1906), Consolidated Coal Lease No. 733 and Coal Leases No's. 361 and 394 (Act, 1973) and Mining Lease No. 1319 (Act 1992). In the event that the lease holder fails to fulfil any of the lease holder's obligations under those authorities the said sum may be applied at the discretion of the Minister .towards the cost of fulfilling such obligations. For the purposes of the clause a lease holder shall be deemed to have failed to fulfil the lease holder's obligations under these authorities, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a- condition or provision of these authorities or of any provision of the Act or regulations made thereunder. (b) The lease holder must provide the security required by sub-clause (a) hereof in one of the following forms: (i) cash, or (ii) a security certificate in such form and given by such surely as may from time to time be approved by the Minister. (c) The minster may at any time, vary the amount of security required in accordance with this condition.	Compliant	Centennial has a combined security deposit in place with the Department.

Relevant Title	Condition Number	Condition Content	Status	Comment
ML 1448	51	Security Deposit (a) The lease holder shall, upon request by the Director General, lodge with the Minister the sum of \$10,000.00 in accordance with Instructions for Manner of Lodgement of Security Deposits as security for the fulfilment of the obligations of the lease holder under this authority. In the event that the lease holder fails to fulfil any of the lease holder's obligations under this authority the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purposes of the clause a lease holder shall be deemed to have failed to fulfil the lease holder's obligations under this authority, if the lease holder fails to comply with any condition or provision of this authority, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision of this authority or of any provision of the Act or regulations made thereunder. (b) The Minister may at any time after the commencement of this authority or any renewal thereof, vary the amount of security required in accordance with this condition. (c) Where the amount of security has been increased pursuant to Clause (b) hereof the lease holder shall, within two (2) months of being requested by the Minister, lodge a security for the amount of security required, in which case the Minister shall refund or release to the lease holder the security previously lodged.	Compliant	Centennial has a combined security deposit in place with the Department.
ML 564 PLL 133 ML 1448	54	Royalty at Additional Rate The lease holder shall during the term of this authority pay to the Minister royalty at the additional rate as prescribed by the Regulations for coal recovered by open cut mining methods from the area.	Compliant	
ML 564	56	Special Barrier The lease holder shall not work or cause to be worked any seam of coal directly beneath the Blackmans Flat substation, unless with the consent of the Minister and subject to such conditions as he may impose.	Compliant	
ML 1448	56	(a) The lease holder shall carry out operations in such a way as to conform strictly to all provisions of the <i>Water Board (Corporatisation) Act, 1994</i>, as amended, and the regulations thereunder applying to the prevention of pollution of the Warragamba Outer Catchment Area or the preservation of the purity of the water supply provided thereby or derived therefrom or for the protection of the property of Sydney Water Corporation Limited (A.C.N. 063 279 649) [hereinafter referred to as the 'the Corporation'] on the Outer Catchment Area and also to all requirements of the Corporation from time to time under the said Act or any of the regulations for the time being in force. (b) If the lease holder shall at any time be using or about to use any process which in the opinion of the Corporation is likely to pollute the Outer Catchment Area or the water supply	Compliant	Operations conformed with the provisions of the <i>Water Board (Corporatisation) Act 1994</i> and regulations during the reporting period.

Relevant Title	Condition Number	Condition Content	Status	Comment
		or to endanger any property of the said Corporation on the Outer Catchment Area the lease holder upon service of a notice in writing under the hand of the Minister to do so shall: (i) discontinue the use of such process within twenty four (24) hours, or (ii) thereafter refrain from adopting such process at any time, as the case may require. (c) The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent the contamination, pollution, erosion or siltation of any stream or watercourse or Outer Catchment Area and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or siltation of any stream watercourse or Outer Catchment Area. (d) The lease holder hereby covenants with Us Ours Heirs and Successors and as a separate covenant the lease holder hereby covenants with the Corporation and its Successors that the lease holder shall at all times hereafter save harmless and keep Us and the said Corporation and Our Heirs and Successors and the Successors of the said Corporation indemnified from payment of compensation and from and against all actions proceedings claims and demands in respect of any injury loss of damage arising out of or in any way connected with any interference with or deprivation or loss of access to the land and premises of this authority which may occur by reason of any works or operations undertaken or carried out by the said Corporation or arising out of or in any way connected with any discontinuance or alteration of any process consequent upon the service of a notice in pursuance of the provisions of Condition [56(b)] or arising out of or in any way connected with the operation of any regulations relating to Outer Catchment Area in force at the date hereof or made by the said Corporation at any time hereafter and the lease holder hereby agrees that for the purpose of this condition the said Corporation shall be deemed to be a party to this authority.		
ML 1448	57	The lease holder shall: (a) Make such provisions for sanitation as may be directed by the Corporation and shall at all times observe and perform any requirements of the said Corporation respecting sanitation. (b) not establish any camps or habitations within any area under the control of the Corporation unless with the consent of the Corporation. (c) Not sink any drill hole within any watercourse on the Warragamba Outer Catchment Area unless with the consent of the Corporation. (d) Not interfere with or impede the use of the Corporation tracks of endanger their stability in any way by reason of the operations. (e) Not construct any road to the sites of any drill holes unless with the consent of the Corporation to the proposed route and type of road construction.	Compliant	

Relevant Title	Condition Number	Condition Content	Status	Comment
		(f) Not interfere in any way with any fences on or adjacent to the Warragamba Outer Catchment Area unless with the consent in writing of the owner thereof or the Corporation. (g) Give three (3) days notice to the Corporation's Resident Engineer, Pipe Head, Guildford of the lease holder's intention to commence drilling operations. (h) Not cut or remove any timber except such as directly obstructs or prevents the carrying on of operations and the lease holder shall obtain the consent in writing of the Corporation before making use of the timber so cut for other than in connection with operations. (i) Complete work in relation to rehabilitation within the Warragamba Outer Catchment Area before termination of the authority to the satisfaction of the Corporation.		

Appendix S – Groundwater Information

Groundwater monitoring was undertaken during 2020 in accordance with the WCSWMP, Development Consent SSD-5579 and EIS Mitigation and Management Measures listed in Table S- 1.

Table S- 1: Performance against EIS Mitigation and Management Measures

EIS Mitigation and Management Measures	Performance for Reporting Period
Quarterly monitoring of water levels from the network of monitoring bores following the completion of construction.	Monthly monitoring of water levels from the network of monitoring bores was undertaken during the reporting period. Automation of groundwater bores across the SCSS to provide an understanding of surface water and groundwater interactions was completed in the reporting period.
Six monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc.	Monthly sampling of monitoring bores for field analysis of pH, EC and temperature and laboratory analysis on major ions, pH, EC, TDS, dissolved arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel and zinc was undertaken during the reporting period.

Groundwater monitoring at WCS is undertaken monthly at locations shown in Appendix A and details are provided in Table S- 2.

Groundwater monitoring data have been presented graphically to show a comparison with historic data trends.

Table S- 2: Groundwater monitoring locations

Monitoring bore	Ground level elevation (m AHD)	Collar elevation (m AHD)	Bore depth (m bgl)	Aquifer
BH01	912.367	913.19	18.3	Lithgow Seam (unmined)
BH02	N/A	N/A	30	Marrangaroo Formation
BH03	905.16	905.98	18.57	Saturated overburden
BH04	929.98	930.71	27.51	Lithgow Seam workings (void)
BH05	928.83	929.59	30.19	Lithgow Seam (unmined pillar)
BH06	905.35	905.9	9.3	Lithgow Seam
BH07	924.24	925.16	33	Up-gradient saturated overburden
BH08	927.38	928.27	24.4	Lithgow Seam workings (void)
BH09	929.79	930.75	25.5	Lithgow Seam workings (void)
BH10	936.45	937.4	25.2	Lithgow Seam workings (void)
BH11	920.95	921.77	34.19	Marangaroo Formation
BH12	N/A	N/A	18.68	Marangaroo Formation
BH13	916.5	917.32	12.37	Backfill
BH15	940	940.82	25.5	Up-gradient Overburden

N/A denotes not available

m AHD: metres Australian Height Datum

m bgl: metres below ground level

Groundwater monitoring telemetry system

A groundwater monitoring telemetry system was installed in groundwater monitoring bores at WCS in July 2017 and has been maintained and improved.

Groundwater level loggers and associated telemetry are installed in suitable groundwater monitoring bores. The location of groundwater monitoring bores at WCS is shown in Appendix A.

Work was ongoing during 2019 to improve the reliability and coverage of the telemetry system. This work continued during 2020 with telemetry devices serviced and replaced due to environmental impacts on infrastructure.

Continuous groundwater level data obtained from the groundwater level loggers is presented below.

Groundwater telemetry device level and manually read level results are displayed in Figure S- 1 to Figure S- 12.

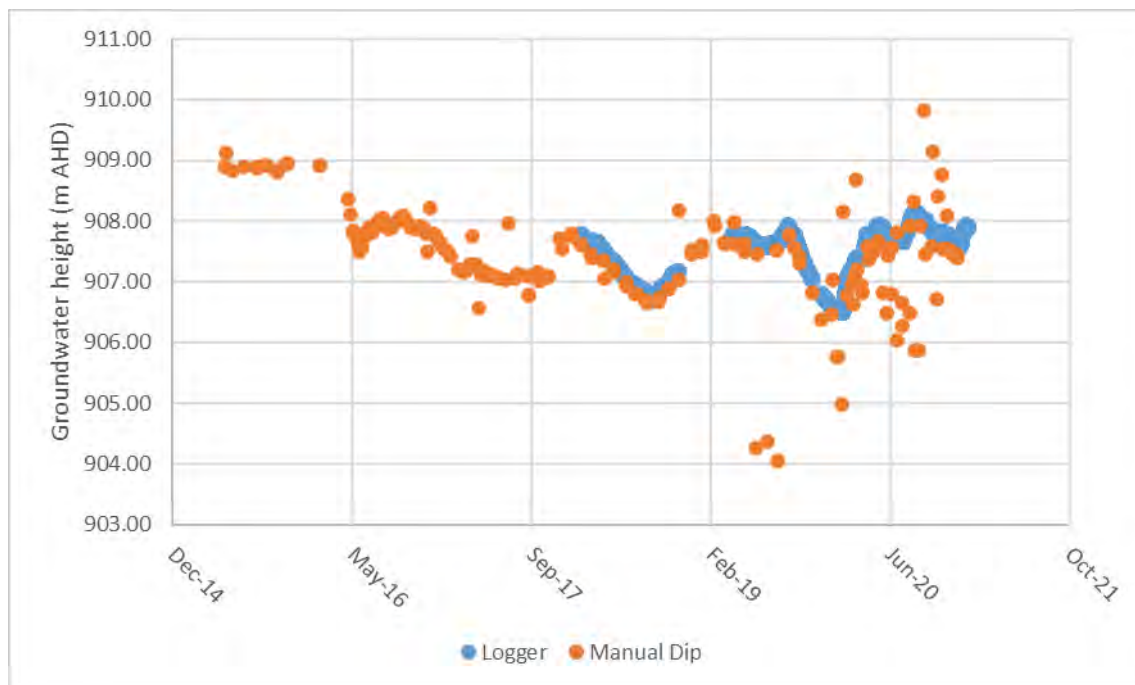


Figure S- 1: BH01 Groundwater Level

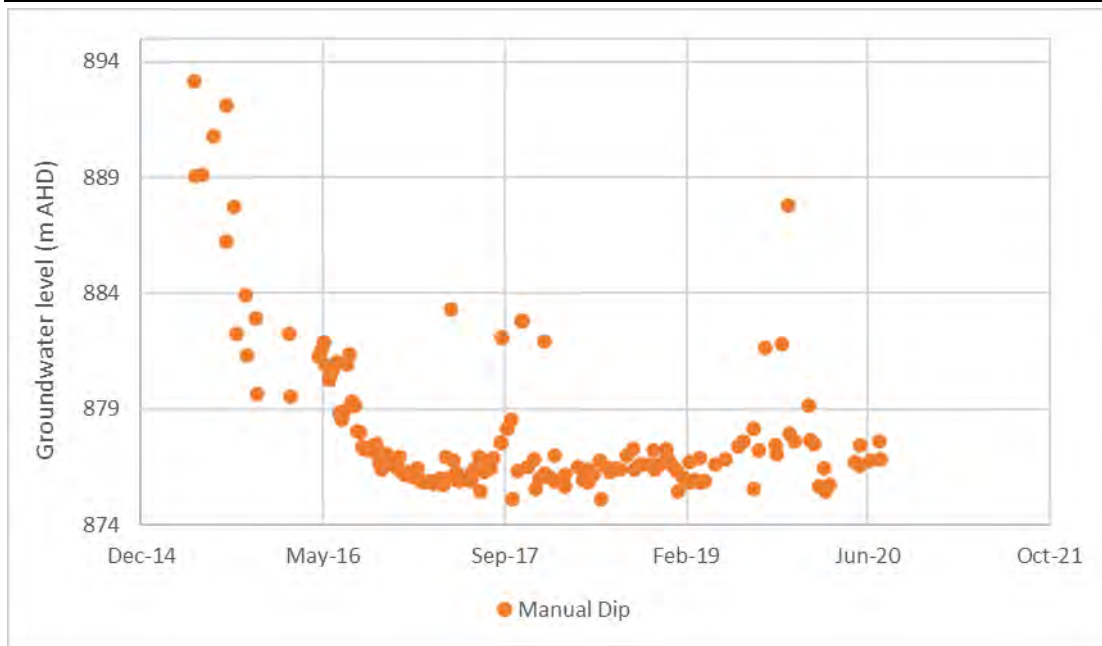


Figure S- 2: BH02 Groundwater Level

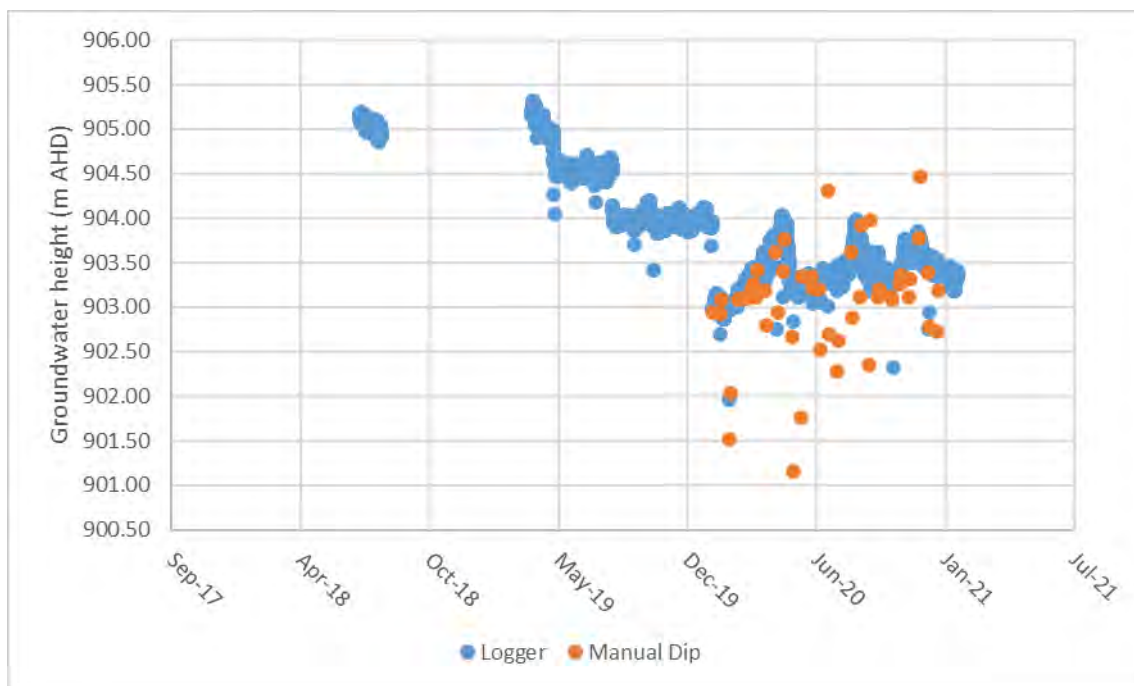
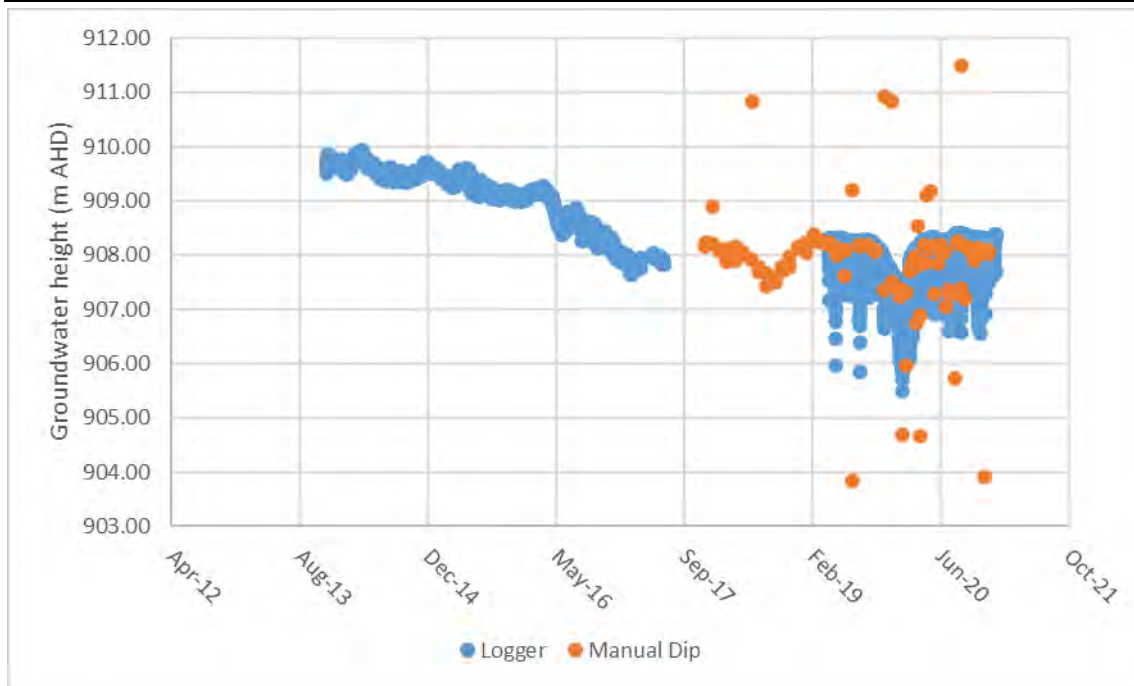
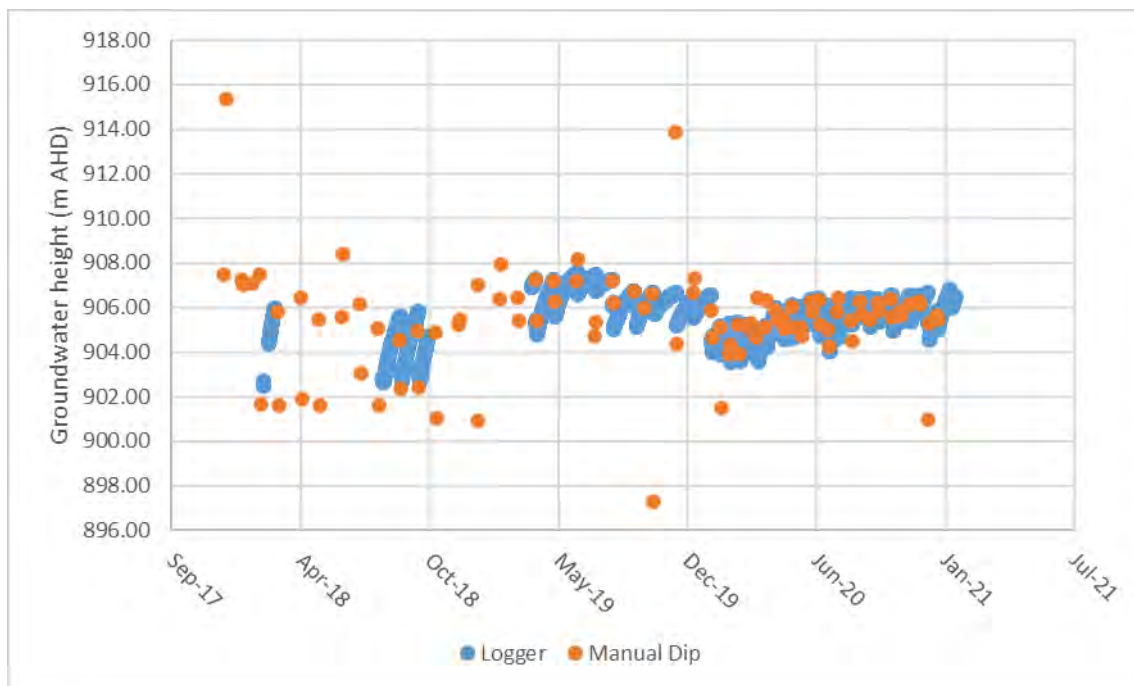


Figure S- 3: BH03 Groundwater Level

**Figure S- 4: BH04 Groundwater Level****Figure S- 5: BH05 Groundwater Level**

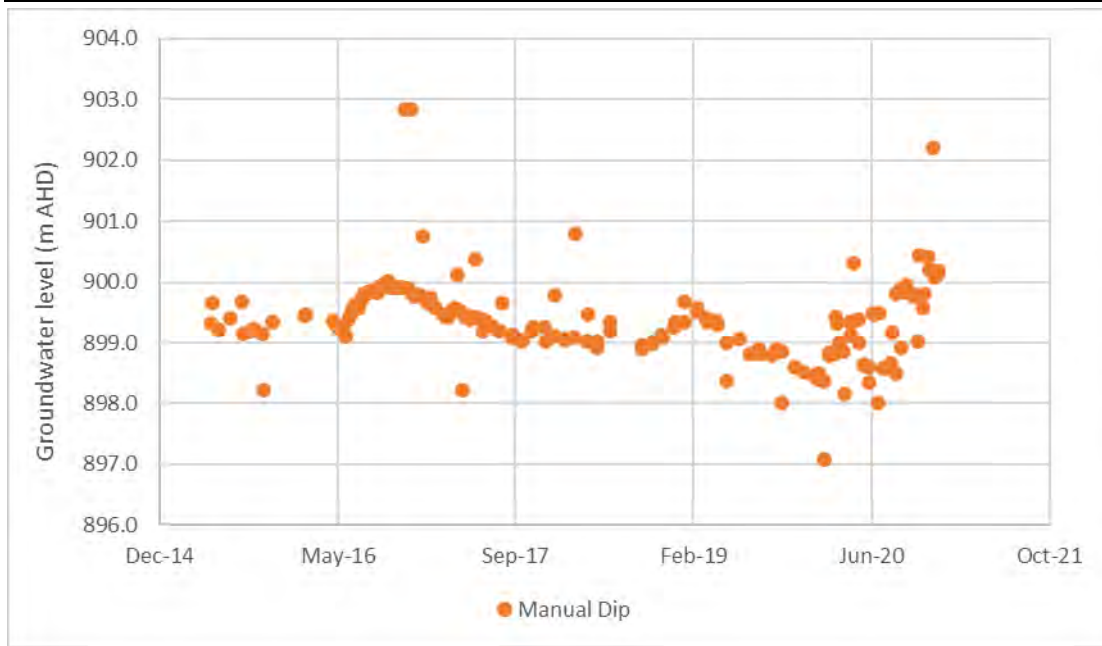


Figure S- 6: BH06 Groundwater Level

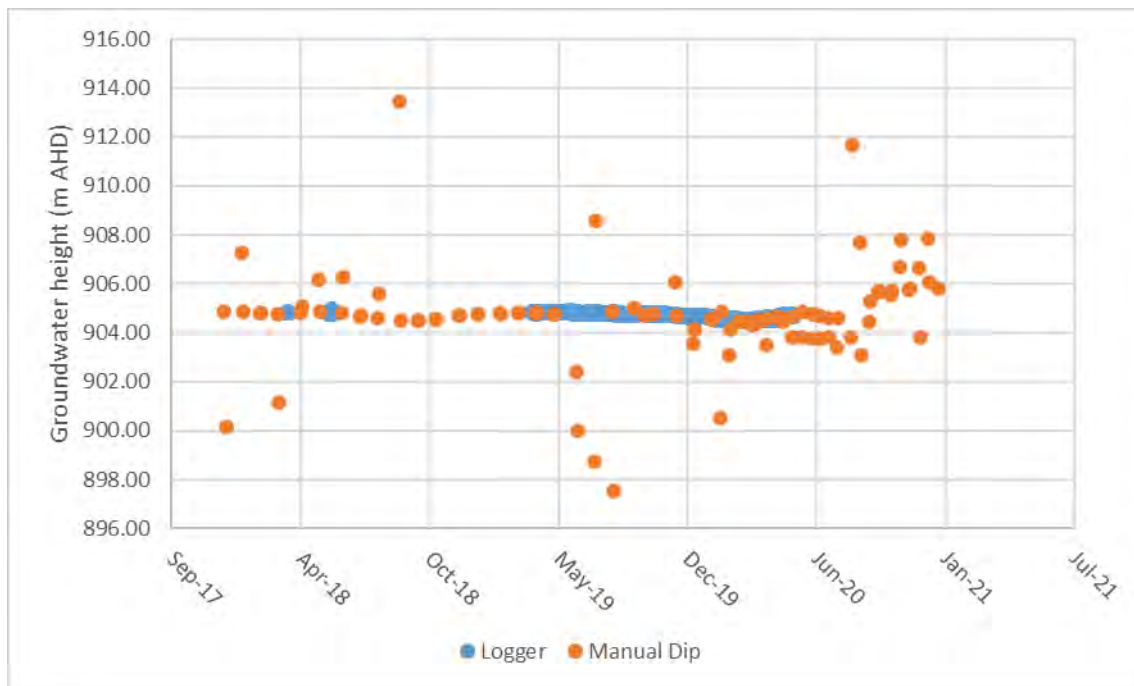


Figure S- 7: BH07 Groundwater Level

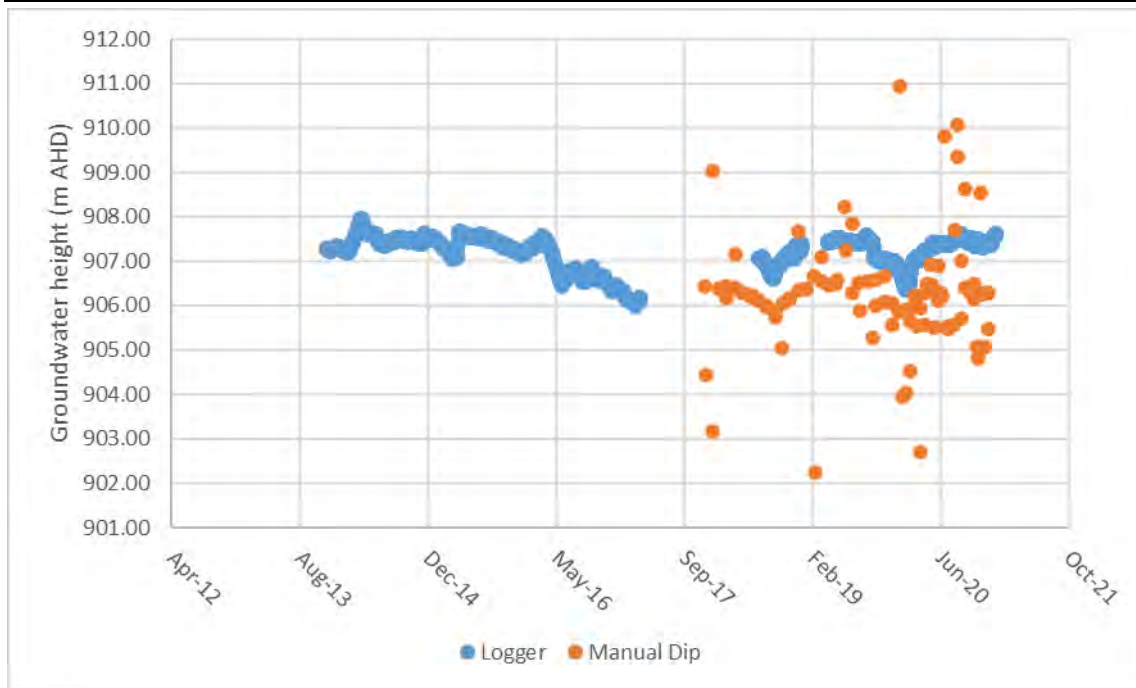


Figure S- 8: BH08 Groundwater Level

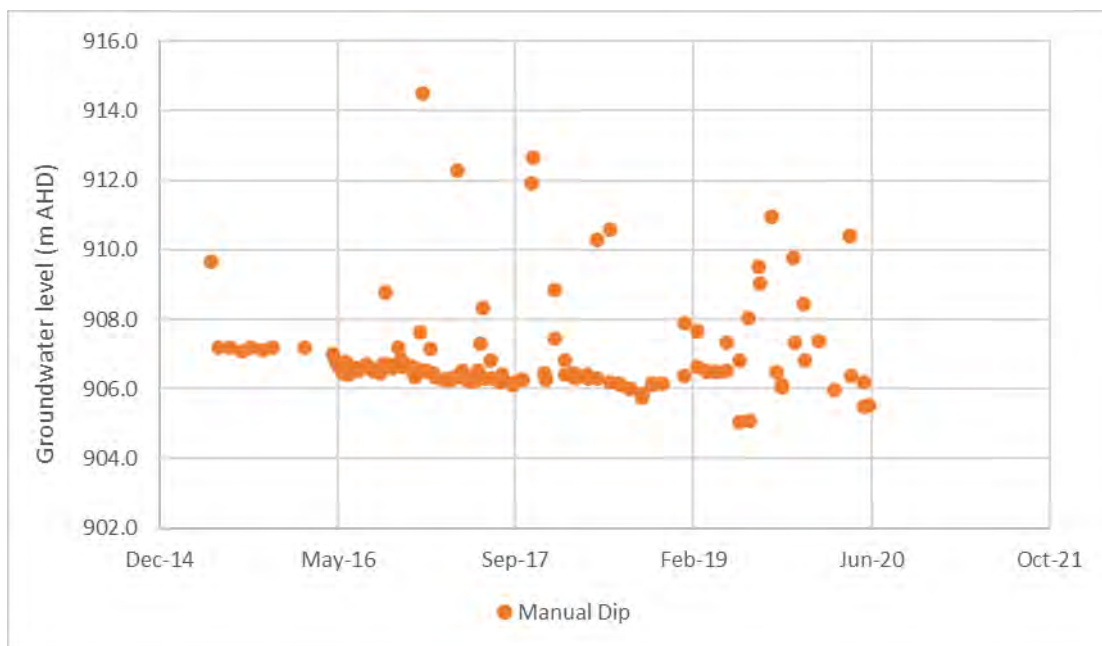


Figure S- 9: BH09 Groundwater Level

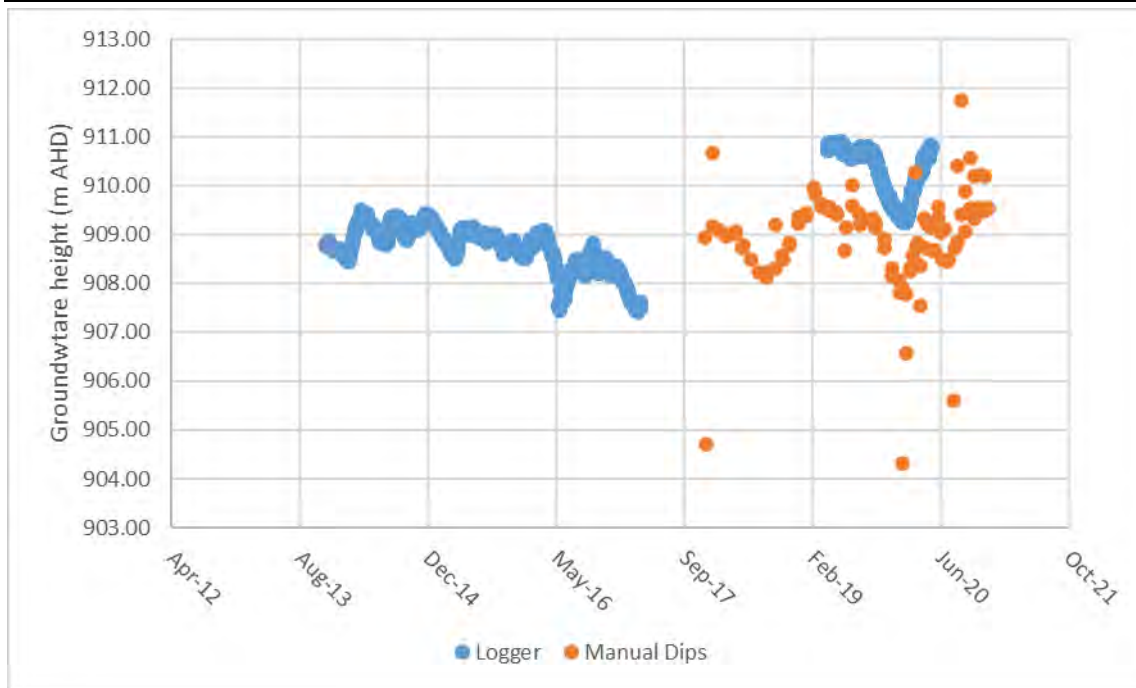


Figure S- 10: BH11 Groundwater Level

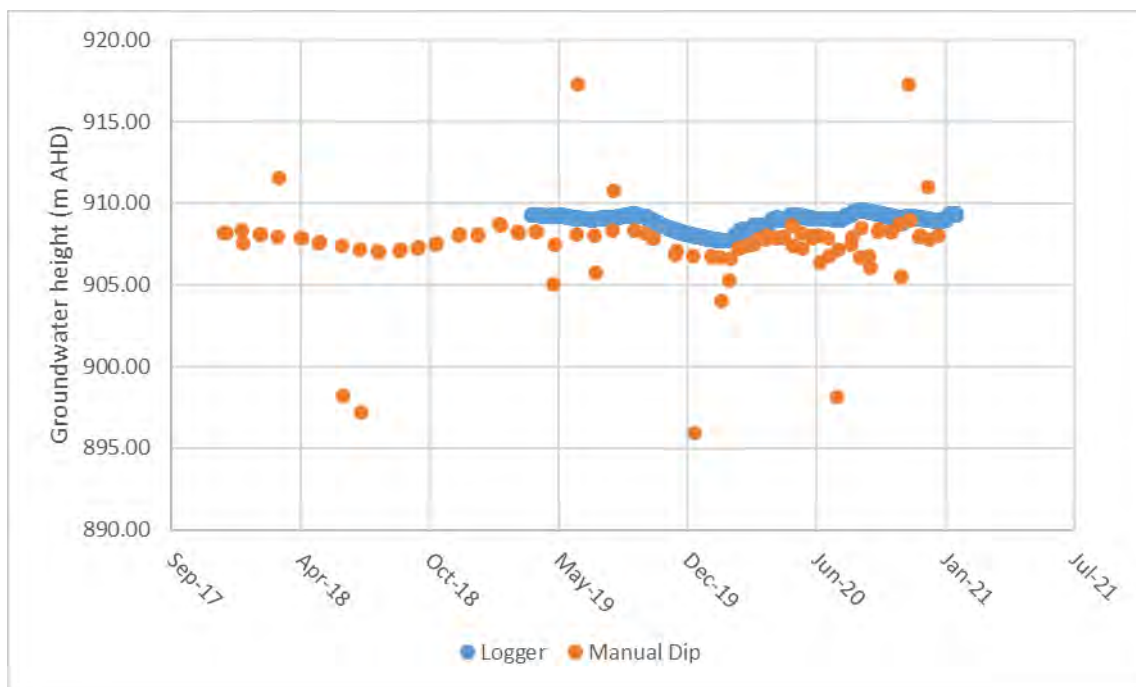


Figure S- 11: BH13 Groundwater Level

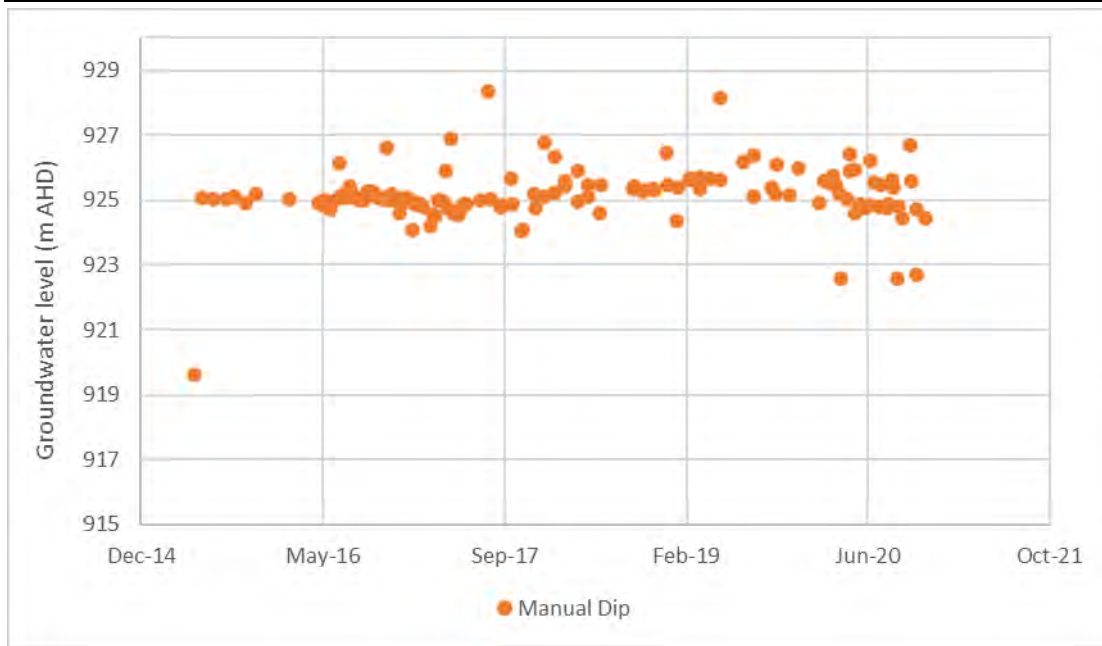


Figure S- 12: BH15 Groundwater Level

Groundwater level

Monitoring bores BH10 and BH12 have been consistently dry throughout 2020.

Review of groundwater hydrographs indicates a groundwater flow direction from the south west to the north east. Trends have been observed in bores as identified in Table S- 3.

Groundwater levels triggers are based on an exceedance of the historical maximum observed groundwater level. No groundwater level trigger events occurred during the reporting period as presented in Table S- 3.

Table S- 3: WCS groundwater levels trends

Monitoring bore	Groundwater level trigger	2020 Maximum Level	Groundwater level trend	Reference figure
BH01	910	908.2	- Level influenced by DML dam. - Increasing level during the first half of 2020, steady level during the second half of 2020.	Figure S- 1
BH02	893	890.7	Bore was dry for all of 2020 with the exception of January.	Figure S- 2
BH03	905	904.0	- Levels vary between 902 m AHD and 904 m AHD in 2020. - Levels are potentially influenced by water levels in surrounding surface water storages.	Figure S- 3
BH04	913	908.4	- Level influenced by DML dam. - Level has remained relatively constant through 2020. - Troughs and spikes are caused by groundwater purging and subsequent recovery respectively.	Figure S- 4
BH05	928	906.4	- Level is highly influenced by DML dam and Lithgow City Council void. - Levels vary between 903 m AHD and 907 m AHD in 2020.	Figure S- 5
BH06	903	902.2	Level has generally risen through 2020, likely from the influence of above average rainfall during 2020.	Figure S- 6
BH07	923	911.7	Level has remained constant through 2020.	Figure S- 7
BH08	915	907.6	Level has consistently risen through 2020, likely from the influence of above average rainfall during 2020.	Figure S- 8
BH09	928	-	BH09 was dry throughout 2020.	Figure S- 9

Monitoring bore	Groundwater level trigger	2020 Maximum Level	Groundwater level trend	Reference figure
BH10	-	-	BH10 was dry throughout 2020.	No Figure Presented
BH11	940	911.75	Level has consistently risen through 2020, likely from the influence of above average rainfall during 2020.	Figure S- 10
BH12	-	-	BH12 was dry throughout 2020.	No Figure Presented
BH13	914	909.6	Level has remained constant through 2020.	Figure S- 11
BH15	947	926.2	BH15 was dry in January, October, November and December.	Figure S- 12

Groundwater quality

Groundwater quality data are plotted in Figure S- 13 to Figure S- 37.

Groundwater quality SSGVs are presented in Table S- 4. Groundwater quality trigger events, exceeding the SSGV criteria, occurred during the reporting period. Identified trigger events are displayed in Table S- 5. For each trigger event, WCS personnel investigated the likely source of the trigger. In each case it was determined that no triggers were the result of operational activities at WCS.

Table S- 4: Groundwater quality SSGVs criteria

Monitoring bore	Parameter SSGVs							
	pH _L (pH units)	pH _U (pH units)	EC (µS/cm)	TSS (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)	Dissolved Nickel (mg/L)	Dissolved Zinc (mg/L)
BH01	5.5	5.9	4,706	354	5.53	316	1.03	0.89
BH02	6.4	6.7	1,479	23,380	0.65	73	0.06	0.098
BH03	3.6	4.8	1,270	89	61.52	59	0.31	0.971
BH04	6.3	6.7	516	148	2.34	21	0.012	0.054
BH05	6.4	6.8	745	155	0.32	34.8	0.023	0.069
BH06	6.1	6.5	2,998	83	10.7	110	0.166	0.08
BH07	5.8	6.6	3,634	220	84.2	239	0.647	2.61
BH08	5.9	6.1	6,082	56	2.49	242	0.761	0.451
BH09	5.9	6.2	6,382	260	14.72	243.6	0.752	0.521
BH11	6.5	6.8	1,644	76	1.68	79	0.016	0.072
BH13	6.1	6.5	4,676	431	14.5	257	0.539	0.32
BH15	5.9	6.1	3,990	14,332	1.78	119.6	0.468	0.419

Notes for Table S- 4: pH_L is the lower pH range limit and pH_U is the upper pH range limit

Table S- 5: Groundwater SSGV Assessment

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
BH01	pH	5.5 – 5.9	Apr	6.8	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	6.4	
			Jun	6.6	
			Aug	6.9	
			Sep	6.2	
	EC	4,706 µS/cm	Jan	4,840 µS/cm	Groundwater surrounding BH01 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH01 receives ash repository seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Feb	4,910 µS/cm	
			Apr	4,770 µS/cm	
			May	5,010 µS/cm	
			Jun	5,430 µS/cm	
			Sep	4,848 µS/cm	
	Dissolved iron	5.53 mg/L	Jan	6.25 mg/L	
			Feb	6.38 mg/L	
			Jun	6.44 mg/L	
			Aug	5.67 mg/L	
	Dissolved nickel	1.03 mg/L	Mar	1.05 mg/L	
	Dissolved zinc	0.89 mg/L	Mar	0.906 mg/L	
			Aug	0.918 mg/L	
BH02	pH	6.4 - 6.7	Jan	6.8	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
BH03	pH	3.6 – 4.8	Apr	6.9	

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Jun	5.0	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
	EC	1,270 µS/cm	Jan	1,304 µS/cm	Groundwater surrounding BH03 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH03 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. There is no increasing trend throughout 2020 with results circa 1,250 µS/cm.
			Feb	1,581 µS/cm	
			Mar	1,285 µS/cm	
			Apr	1,319 µS/cm	
			May	1,390 µS/cm	
			Jun	1,460 µS/cm	
			Aug	1,323 µS/cm	
			Sep	1,422 µS/cm	
			Oct	1,380 µS/cm	
			Nov	3,420 µS/cm	
	TSS	89 mg/L	Jan	229 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively determine the source of elevated TSS concentrations.
			Apr	90 mg/L	
			Aug	108 mg/L	
			Sep	92 mg/L	
			Dec	95 mg/L	
	Dissolved iron	61.5 mg/L	Jan	86.7 mg/L	Groundwater surrounding BH03 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH03 is influenced by seepage through historical mine workings. Elevated results are potentially a
			Feb	68.7 mg/L	
			Mar	88.1 mg/L	
			Apr	78.9 mg/L	
			May	77.1 mg/L	

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Jun	82.9 mg/L	combination of WCS and MPPS impacts. There was a decreasing trend throughout 2020 from maximum dissolved iron concentrations recorded in 2019. The 2020 mean result was 73 mg/L.
			Jul	72.2 mg/L	
			Sep	64.5 mg/L	
			Nov	78.6 mg/L	
			Dec	75.5 mg/L	
	Dissolved nickel	0.31 mg/L	Mar	0.314 mg/L	Groundwater surrounding BH03 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH03 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. There was a steady trend throughout 2020, down from maximum dissolved nickel concentrations recorded in 2019. The 2020 mean result was 0.278 mg/L.
			Dec	0.322 mg/L	
	Dissolved zinc	0.971 mg/L	Jan	0.998 mg/L	Groundwater surrounding BH03 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH03 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. There was a steady trend throughout 2020, down from maximum dissolved zinc concentrations recorded in 2019. The 2020 mean result was 0.95 mg/L.
			Feb	1.14 mg/L	
			Mar	1 mg/L	
			Nov	1.12 mg/L	
			Dec	1.02 mg/L	
BH04	pH	6.3 – 6.7	Apr	6.8	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	7.0	
			Jun	7.1	
	EC	516 µS/cm	Jan	583 µS/cm	Groundwater surrounding BH04 is under investigation in the joint EA

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Feb	553 $\mu\text{S/cm}$	and Centennial groundwater investigation.
			Mar	567 $\mu\text{S/cm}$	It is believed that groundwater near BH04 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			May	563 $\mu\text{S/cm}$	
			Jun	552 $\mu\text{S/cm}$	There was a decreasing trend throughout 2020 with a mean result of 523 $\mu\text{S/cm}$.
			Sep	1312 $\mu\text{S/cm}$	
	TSS	148 mg/L	Jun	271 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively determine the source of elevated TSS concentrations.
			Jul	159 mg/L	
			Dec	236 mg/L	
	Dissolved iron	2.34 mg/L	Jan	4.82 mg/L	Groundwater surrounding BH04 is under investigation in the joint EA and Centennial groundwater investigation.
			Jun	3.89 mg/L	
			Jul	3.81 mg/L	It is believed that groundwater near BH04 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Aug	2.57 mg/L	
			Sep	3.91 mg/L	
			Nov	2.52 mg/L	Results fluctuate greatly at BH04, ranging from 1.48 mg/L to 8.62 mg/L. There was a steady trend in 2020.
	Dissolved zinc	0.054 mg/L	Nov	0.100 mg/L	Two results in November and December were elevated above the SSGV. The mean concentration in 2020 was 0.039 mg/L with a steady trend throughout the year.
			Dec	0.074 mg/L	
BH05	pH	6.4 – 6.8	May	6.9	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			Jun	6.9	
	TSS	155 mg/L	Aug	200 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively

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Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
					determine the source of elevated TSS concentrations.
	Dissolved iron	0.32 mg/L	Nov	0.57 mg/L	One result in November was elevated above the SSGV. The mean concentration in 2020 was 0.12 mg/L with a steady trend throughout the year.
BH06	pH	6.1 – 6.5	Jun	6.9	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
	Dissolved iron	10.7 mg/L	May	11.0 mg/L	Two results in May and June were elevated above the SSGV. The mean concentration in 2020 was 6.85 mg/L with a steady trend throughout the year.
			Jun	12.8 mg/L	
	Dissolved zinc	0.08 mg/L	Nov	0.286 mg/L	One outlying result in November was elevated above the SSGV. The mean concentration in 2020 was 0.068 mg/L with a steady trend throughout the year.
BH07	pH	5.8 – 6.6	Apr	6.9	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	6.8	
			Jun	7.3	
			Sep	6.7	
			Dec	5.3	BH07 is upgradient of the WCS operational boundary and is monitored as an unimpacted background location. Therefore, impacts on groundwater here are not caused by WCS operations.
	EC	3,634	Nov	4,570 $\mu\text{S/cm}$	BH07 is upgradient of the WCS operational boundary and is monitored as an unimpacted background location. Therefore, impacts on groundwater here are not caused by WCS operations.
			Dec	4,280 $\mu\text{S/cm}$	
	TSS	220	Nov	354 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively determine the source of elevated TSS concentrations.
			Dec	396 mg/L	

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
	Dissolved iron	84.2	Dec	137 mg/L	BH07 is upgradient of the WCS operational boundary and is monitored as an unimpacted background location. Therefore, impacts on groundwater here are not caused by WCS operations.
	Dissolved nickel	0.647	Dec	2.53 mg/L	
	Dissolved zinc	2.61	Dec	11.1 mg/L	
BH08	pH	5.9 – 6.1	Apr	6.8	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	6.2	
			Jun	6.3	
			Aug	6.4	
			Sep	6.4	
			Nov	6.4	
			Dec	5.8	One result in December was outside the SSGV range though it is within the margin of measurement and/or calibration measure.
	EC	6,082 $\mu\text{S}/\text{cm}$	Jan	6,750 $\mu\text{S}/\text{cm}$	Groundwater surrounding BH08 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH08 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. There was a decreasing trend throughout 2020 with a mean result of 4,660 $\mu\text{S}/\text{cm}$.
			Feb	7,070 $\mu\text{S}/\text{cm}$	
			Mar	6,230 $\mu\text{S}/\text{cm}$	
			Sep	6,850 $\mu\text{S}/\text{cm}$	
	TSS	56 mg/L	Jan	275 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively determine the source of elevated TSS concentrations.
			Aug	95 mg/L	
			Dec	124 mg/L	
	Dissolved iron	2.49 mg/L	Jan	3.19 mg/L	Groundwater surrounding BH08 is under investigation in the joint EA and Centennial groundwater investigation.
			Feb	11.4 mg/L	
			Mar	5.74 mg/L	

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Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Apr	4.96 mg/L	It is believed that groundwater near BH08 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. Results fluctuate greatly at BH08, ranging from 3.19 mg/L to 11.4 mg/L. There was a generally decreasing trend in 2020.
			May	4.5 mg/L	
			Jan	4 mg/L	
			Jul	3.17 mg/L	
			Aug	5.68 mg/L	
			Sep	2.88 mg/L	
			Oct	3.96 mg/L	
			Nov	3.13 mg/L	
			Dec	2.87 mg/L	
	Dissolved nickel	0.761 mg/L	Feb	0.783 mg/L	One result in February was greater than the SSGV range and potentially influenced by WCS water management operations. Dissolved nickel results decreased significantly since February 2020.
BH09	pH	5.9 – 6.2	Apr	7.0	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	6.6	
BH11	pH	6.5 – 6.8	May	7.0	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			Jun	7.2	
			Aug	7.0	
			Sep	7.0	
	EC	1,644 µS/cm	Dec	6.4	One result in December was outside the SSGV range though it is within the margin of measurement and/or calibration measure.
			Jan	1,663 µS/cm	Groundwater surrounding BH11 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH11 is influenced by seepage through historical mine workings. Elevated results are potentially a
			Feb	1,667 µS/cm	
			Apr	1,762 µS/cm	

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			May	1,960 $\mu\text{S/cm}$	combination of WCS and MPPS impacts. Multiple BH11 EC results are elevated greater than the SSGV and saw an increasing trend to October 2020 and a significant decrease in November and December.
			Jun	2,030 $\mu\text{S/cm}$	
			Aug	3,200 $\mu\text{S/cm}$	
			Sep	3,787 $\mu\text{S/cm}$	
			Oct	2,300 $\mu\text{S/cm}$	
			Nov	2,120 $\mu\text{S/cm}$	
			Dec	1,645 $\mu\text{S/cm}$	
	TSS	76 mg/L	Jan	81 mg/L	As TSS is highly dependent on the sampling method and environmental influences, investigations cannot definitively determine the source of elevated TSS concentrations.
			Mar	101 mg/L	
			Aug	129 mg/L	
			Oct	80 mg/L	
			Dec	101 mg/L	
	Dissolved iron	1.68 mg/L	Jan	3.58 mg/L	One outlying result in January was elevated above the SSGV. The mean concentration in 2020 was 0.47 mg/L with a steady trend throughout the year.
	Dissolved nickel	0.016 mg/L	Jan	0.017 mg/L	Groundwater surrounding BH11 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH11 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. Multiple BH11 dissolved nickel results are elevated greater than the SSGV and saw an increasing trend to September 2020 then decreased significantly for the remainder of the year.
			Mar	0.021 mg/L	
			May	0.032 mg/L	
			Jun	0.024 mg/L	
			Jul	0.031 mg/L	
			Aug	0.057 mg/L	

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Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Sep	0.074 mg/L	
			Oct	0.043 mg/L	
			Nov	0.034 mg/L	
			Dec	0.029 mg/L	
	Dissolved zinc	0.072 mg/L	May	0.134 mg/L	Groundwater surrounding BH11 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH11 is influenced by seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts. Multiple BH11 dissolved zinc results are elevated greater than the SSGV and generally saw an increasing trend in 2020.
			Jun	0.114 mg/L	
			Jul	0.132 mg/L	
			Nov	0.082 mg/L	
BH13	pH	6.1 – 6.5	Feb	6.0	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			Apr	6.9	
			May	6.8	
	EC	4,676 µS/cm	Jan	7,730 µS/cm	The January trigger event was the maximum EC recorded in the dataset. Since January, EC has significantly decreased to a record low conductivity of 1,633 µS/cm in December. Groundwater surrounding BH13 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH13 receives ash repository seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Feb	6,570 µS/cm	
	Dissolved iron	14.5 mg/L	Jan	29.1 mg/L	The January trigger event was the maximum dissolved iron recorded in the dataset. Since January, dissolved iron has significantly
			Feb	25.7 mg/L	

Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
					decreased to a record low result less than the LOR (<0.05 mg/L) in November. Groundwater surrounding BH13 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH13 receives ash repository seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Jan	0.88 mg/L	The January trigger event was the maximum dissolved nickel recorded in the dataset. Since January, dissolved nickel has significantly decreased to a low result of 0.191 mg/L in November. Groundwater surrounding BH13 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH13 receives ash repository seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Feb	0.711 mg/L	
			Jan	0.619 mg/L	The January trigger event was the maximum dissolved zinc recorded in the dataset. Since January, dissolved zinc has significantly decreased to a low result of 0.069 mg/L in November. Groundwater surrounding BH13 is under investigation in the joint EA and Centennial groundwater investigation. It is believed that groundwater near BH13 receives ash repository seepage through historical mine workings. Elevated results are potentially a combination of WCS and MPPS impacts.
			Feb	0.453 mg/L	
BH15	pH	5.9 – 6.1	Apr	7.0	The pH result is trending toward the pH circumneutral range and therefore is not considered environmentally harmful.
			May	6.7	
			Jun	6.6	

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Monitoring bore	Parameter	SSGV	Month	Trigger event	Investigation
			Aug	6.2	
			Sep	7.2	
	EC	3,990 $\mu\text{S}/\text{cm}$	Feb	4,080 $\mu\text{S}/\text{cm}$	One trigger event was recorded in February. Since then EC results have trended downward for the remainder of 2020.

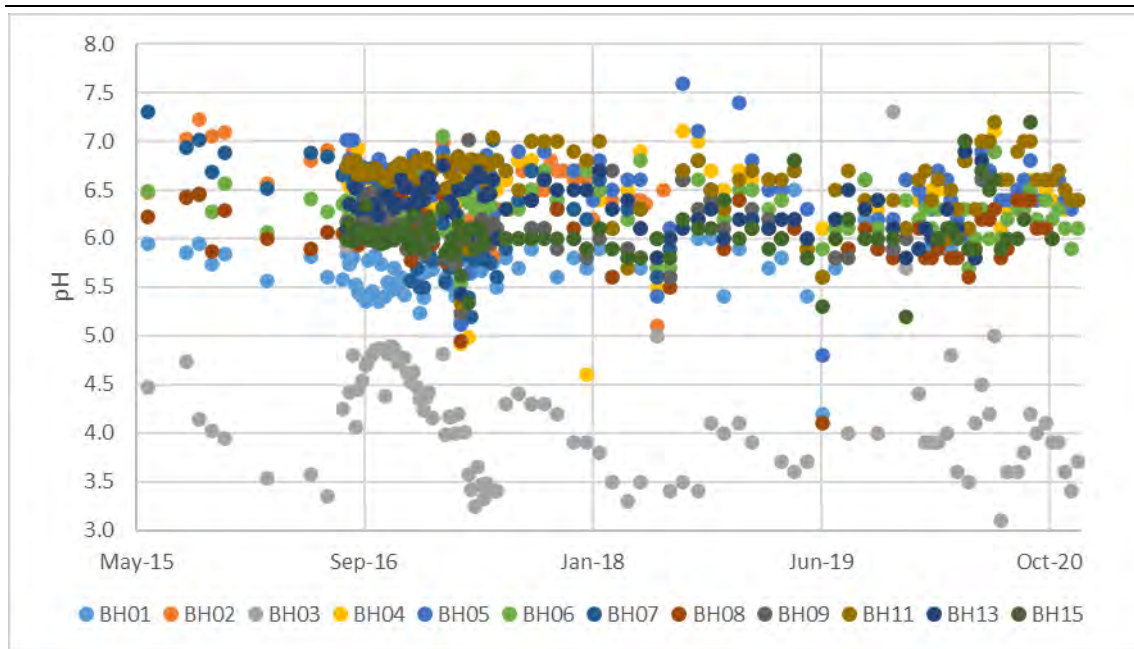


Figure S- 13: pH 2015 to 2020

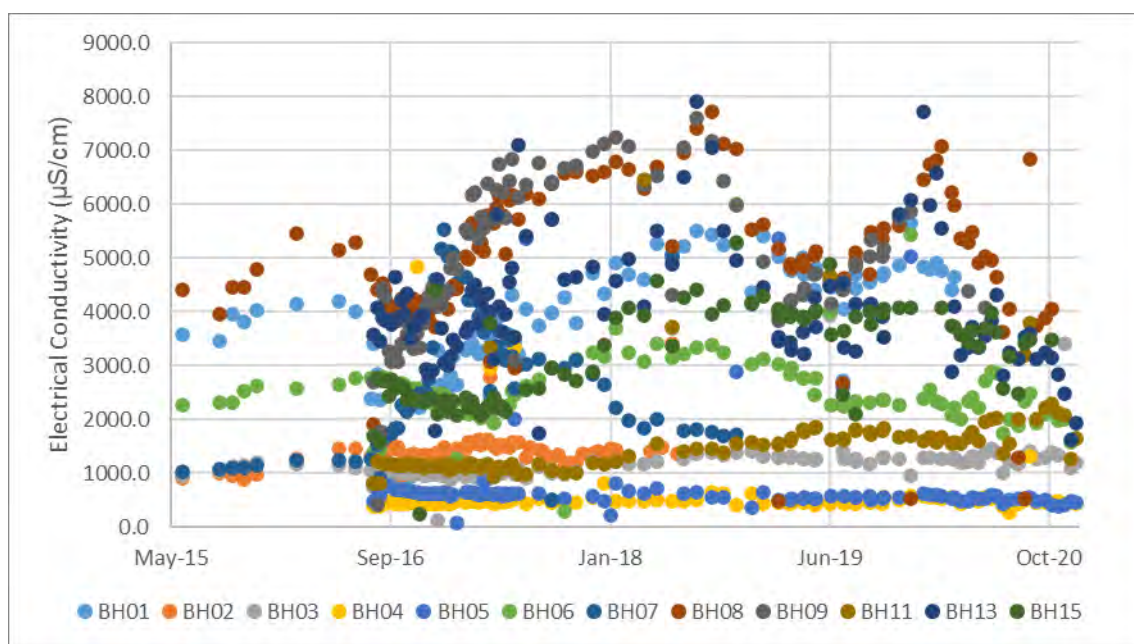


Figure S- 14: Electrical conductivity 2015 to 2020

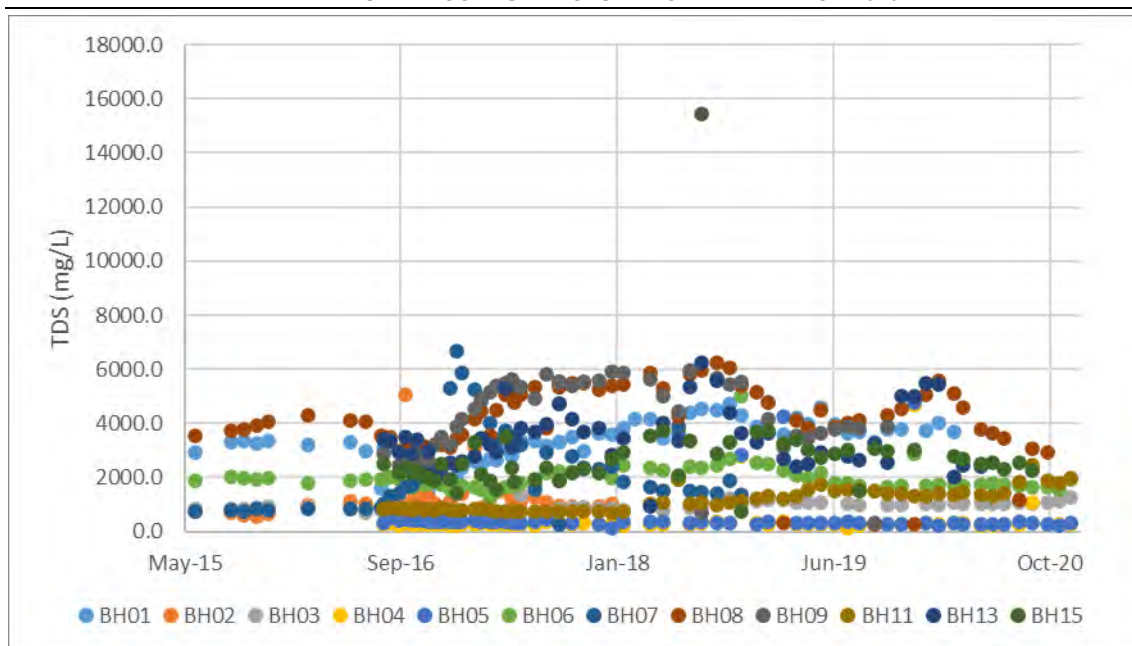


Figure S- 15: Total dissolved solids 2015 to 2020

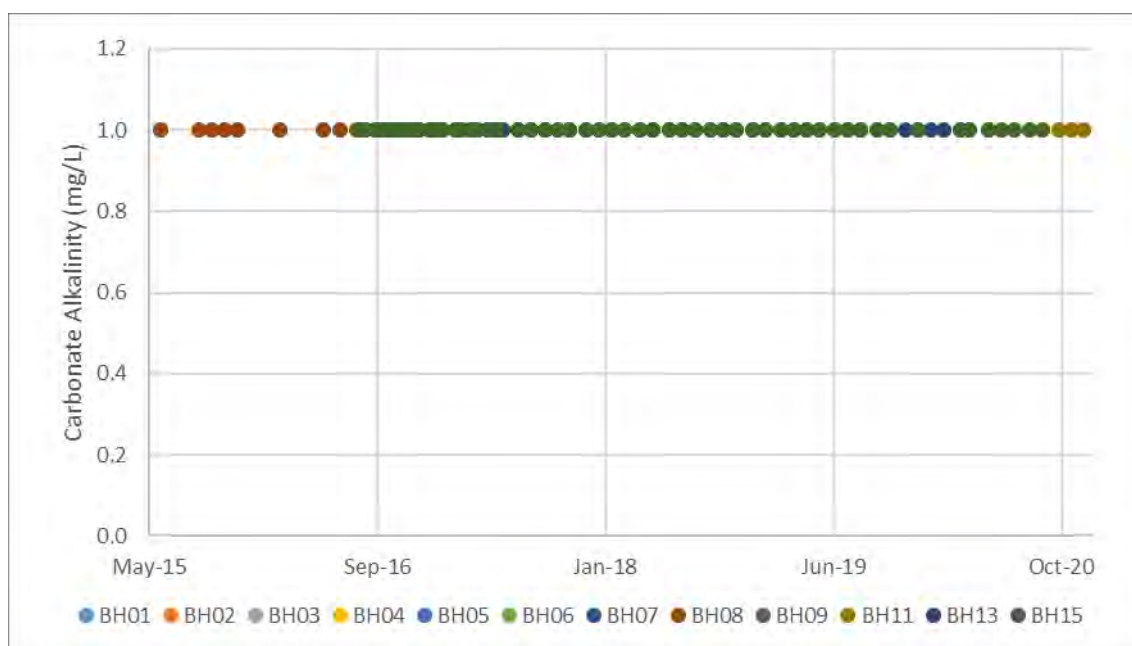


Figure S- 16: Carbonate alkalinity 2015 to 2020

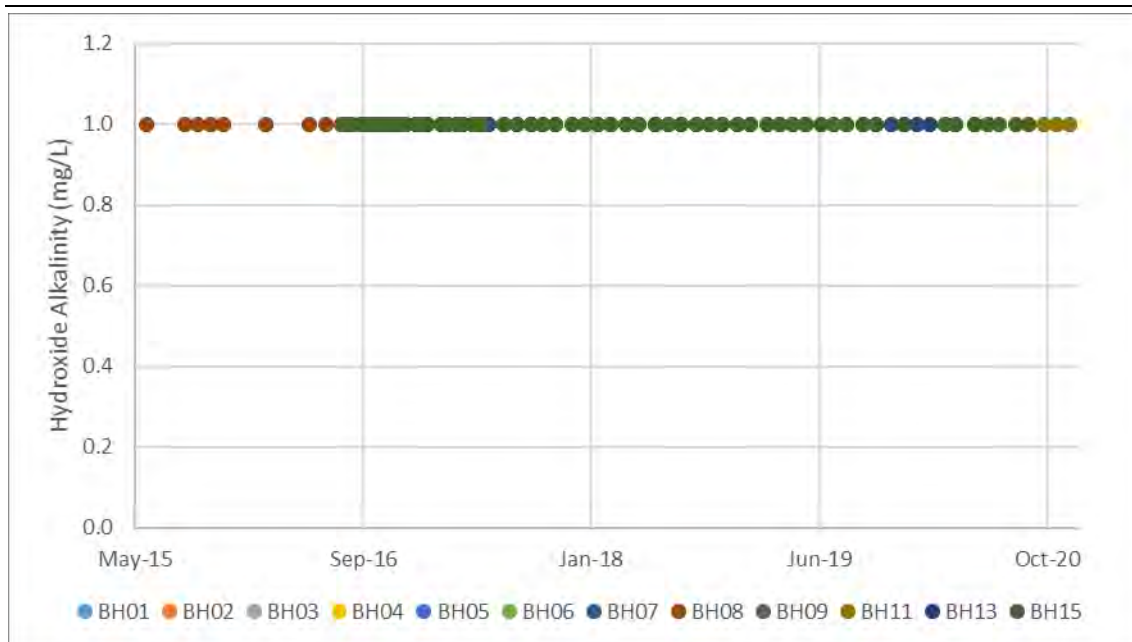


Figure S- 17: Hydroxide alkalinity 2015 to 2020

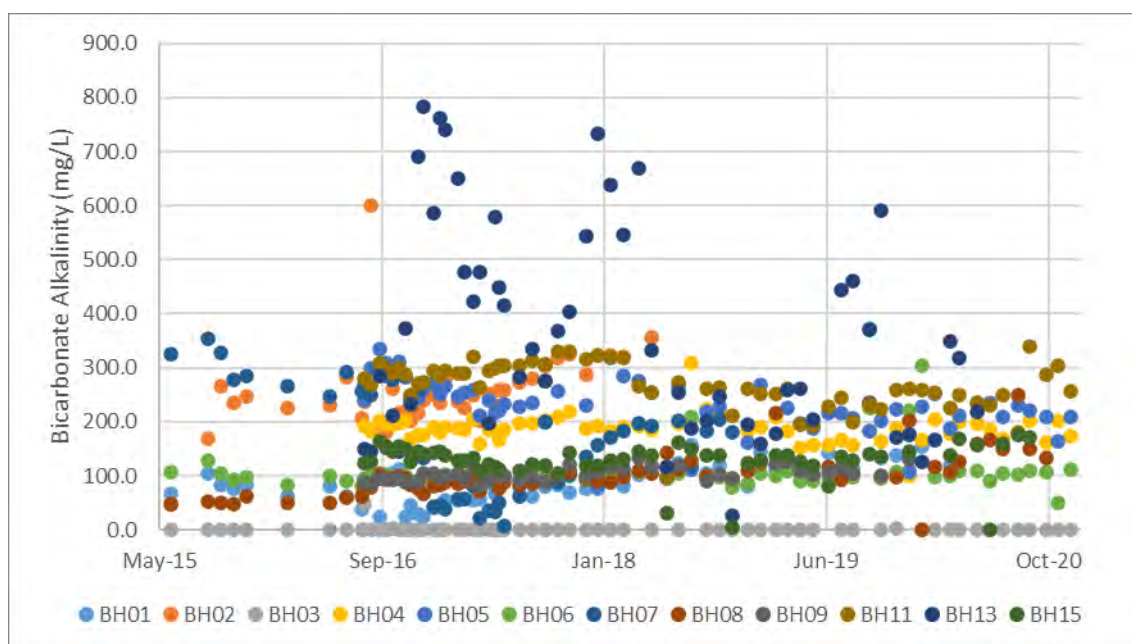


Figure S- 18: Bicarbonate alkalinity 2015 to 2020

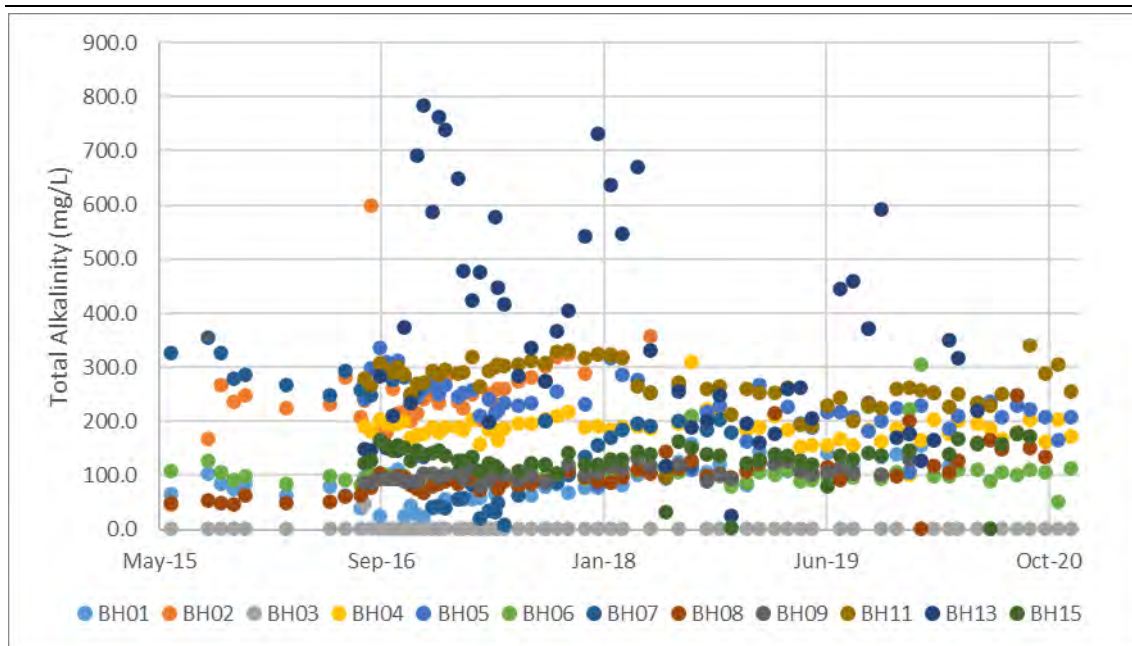


Figure S- 19: Total alkalinity 2015 to 2020

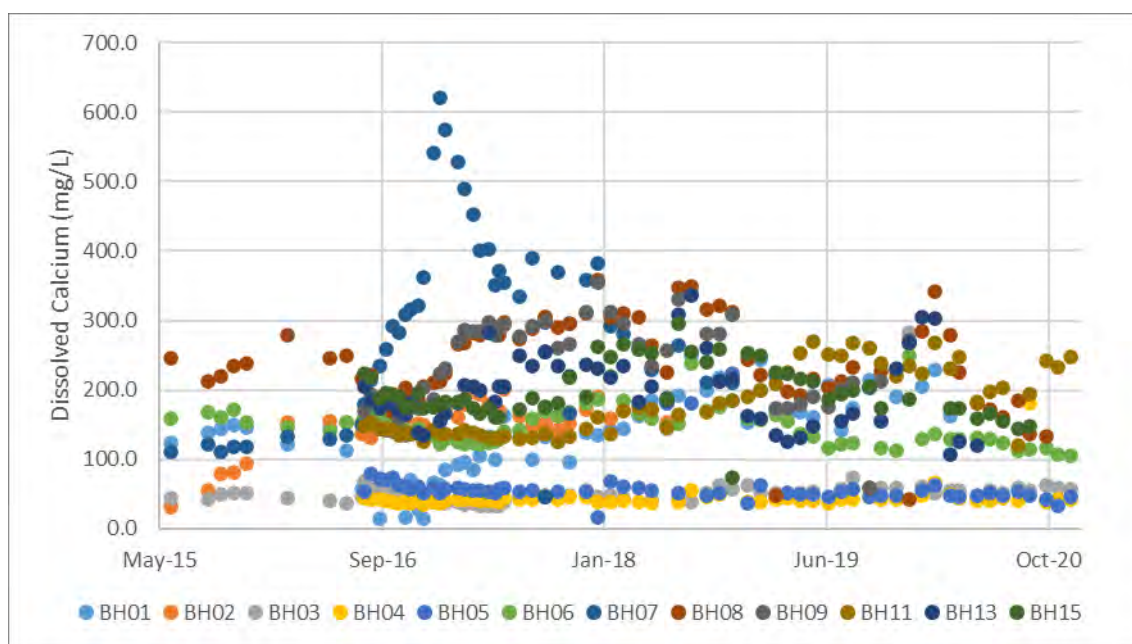


Figure S- 20: Calcium 2015 to 2020

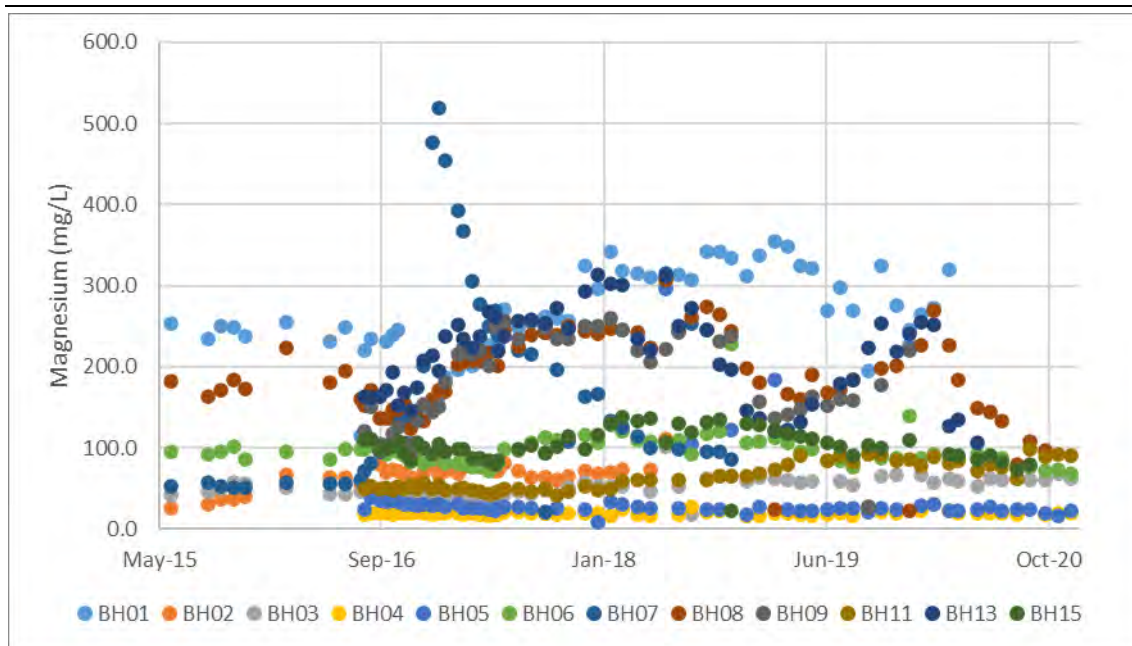


Figure S- 21: Magnesium 2015 to 2020

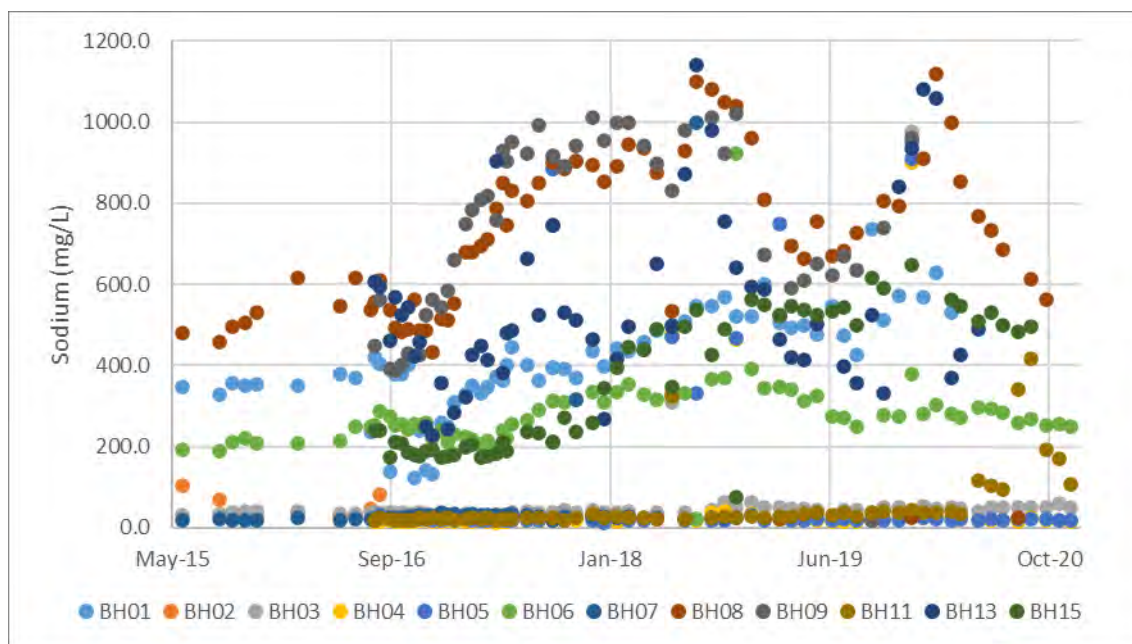


Figure S- 22: Sodium 2015 to 2020

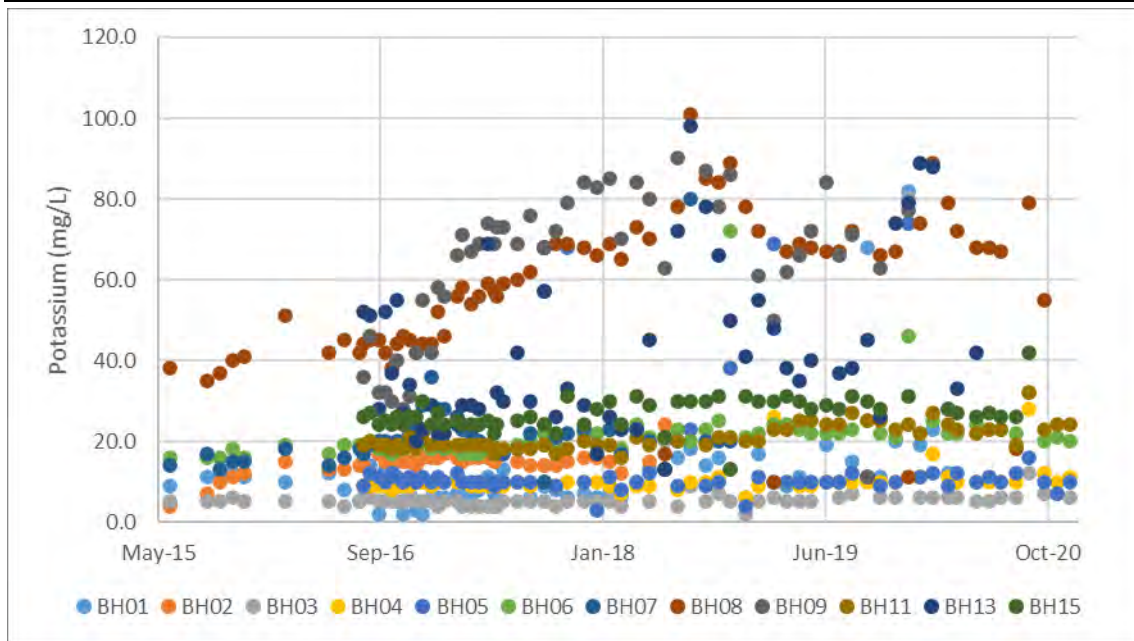


Figure S- 23: Potassium 2015 to 2020

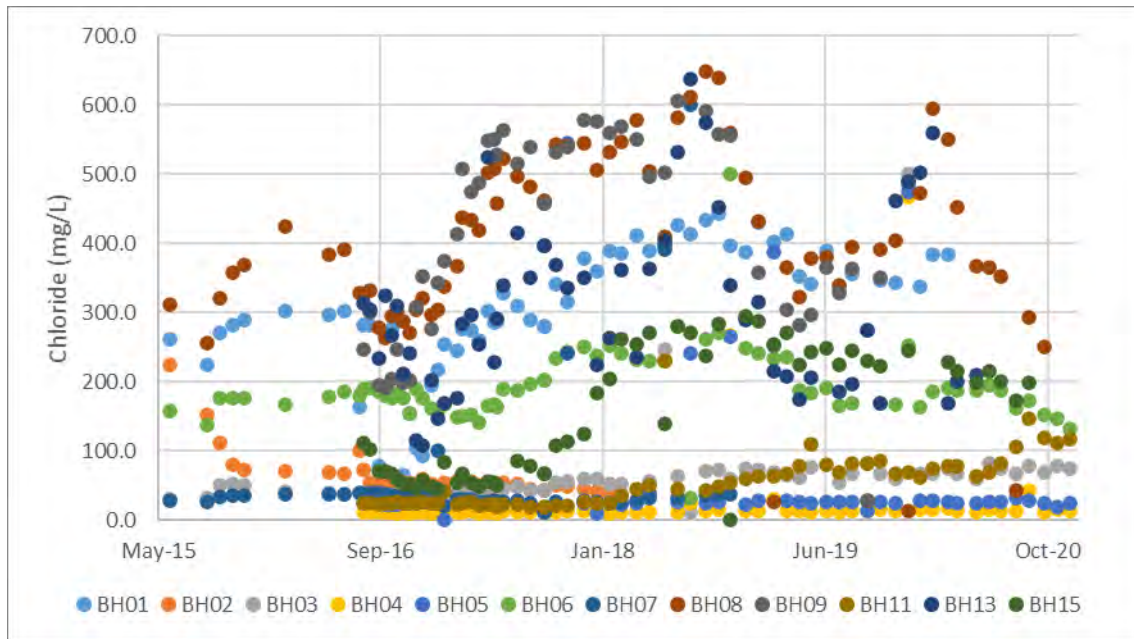


Figure S- 24: Chloride 2015 to 2020

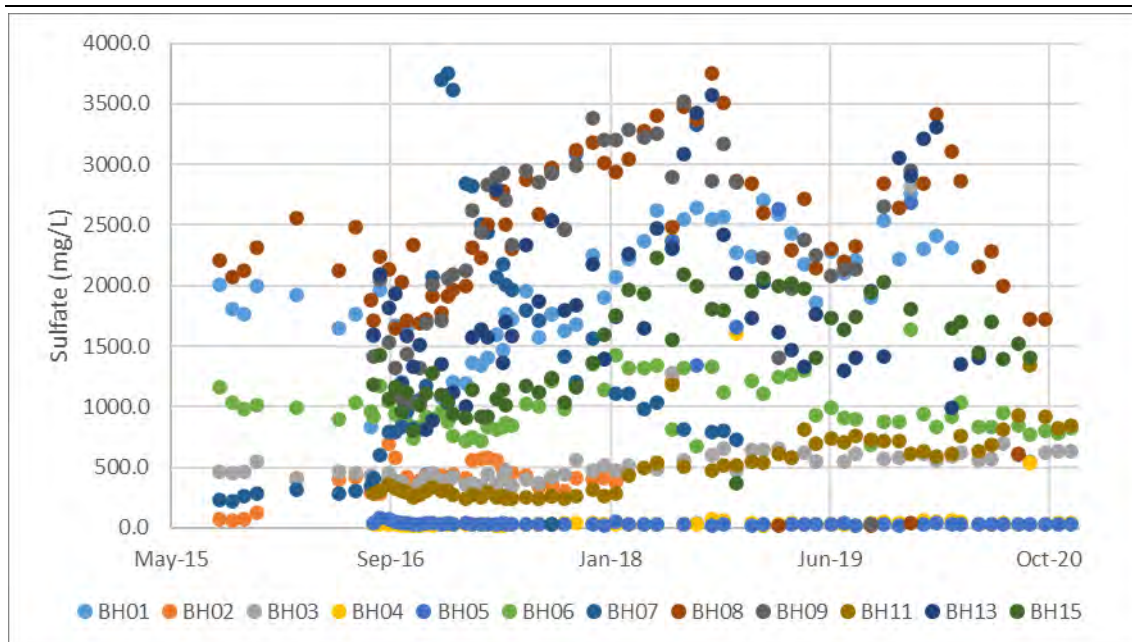


Figure S- 25: Sulfate 2015 to 2020

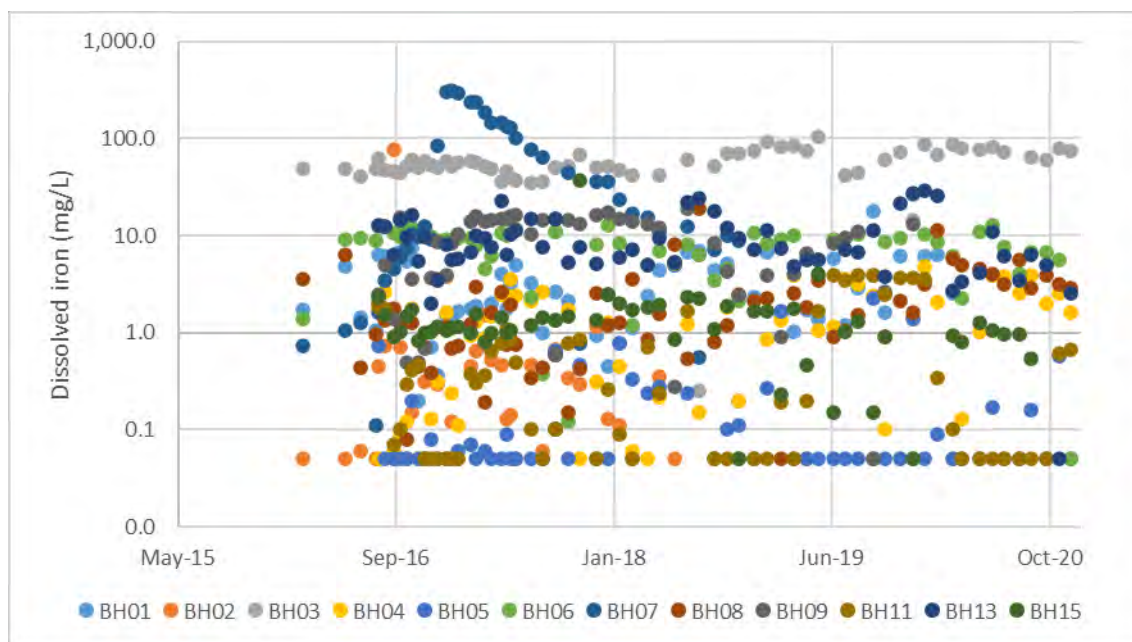


Figure S- 26: Dissolved iron 2015 to 2020

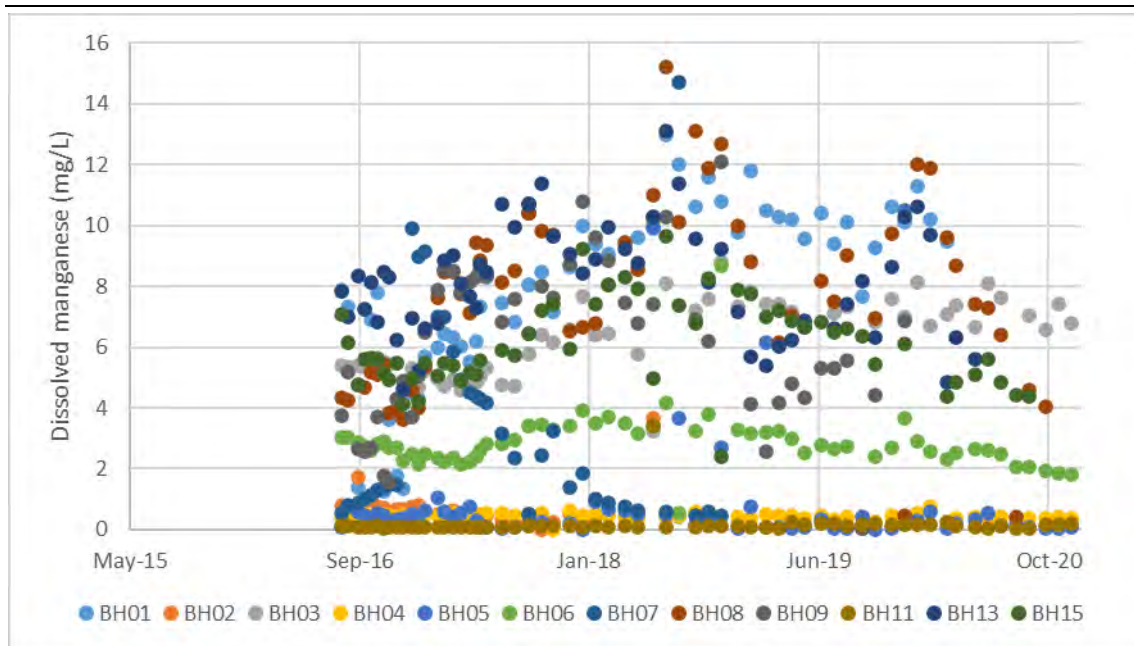


Figure S- 27: Dissolved manganese 2016 to 2020

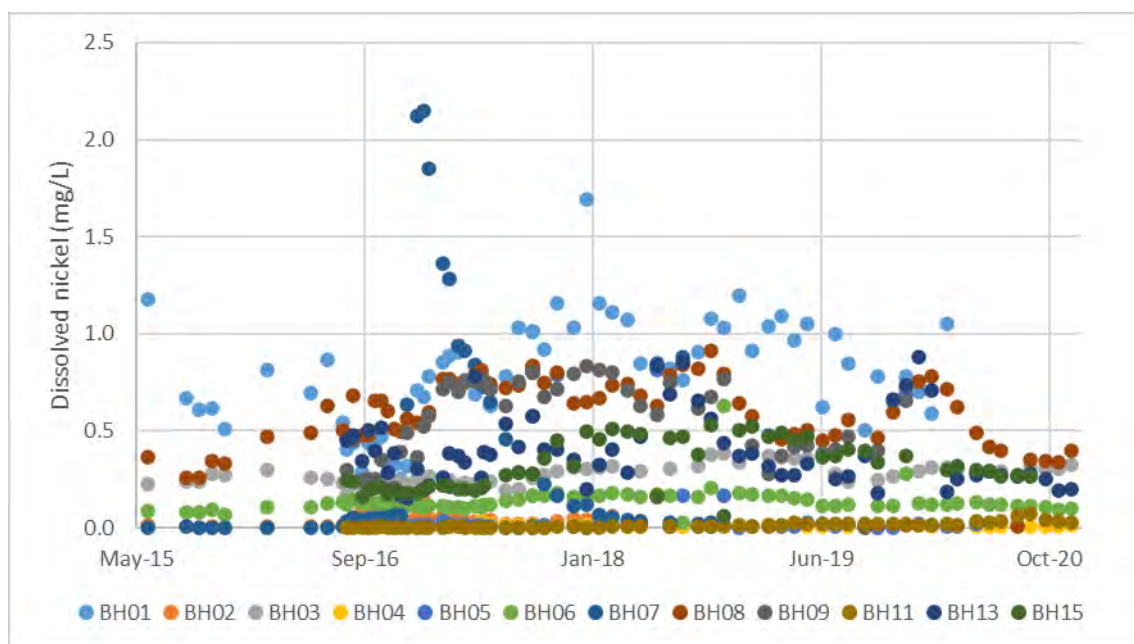


Figure S- 28: Dissolved nickel 2015 to 2020

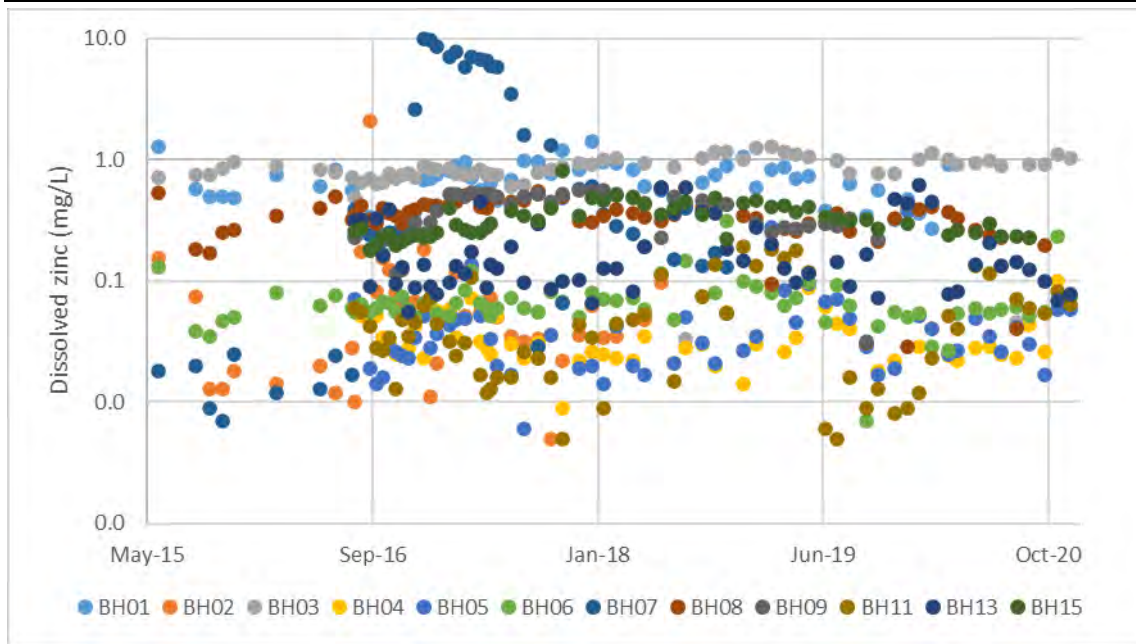


Figure S- 29: Dissolved zinc 2015 to 2020

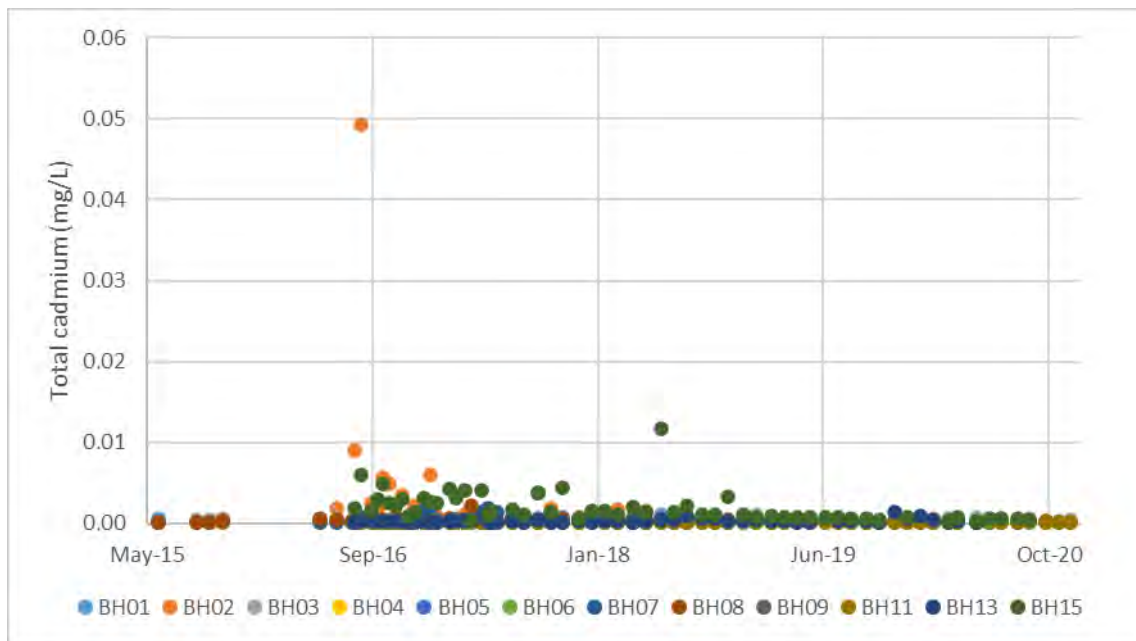


Figure S- 30: Total cadmium 2015 to 2020

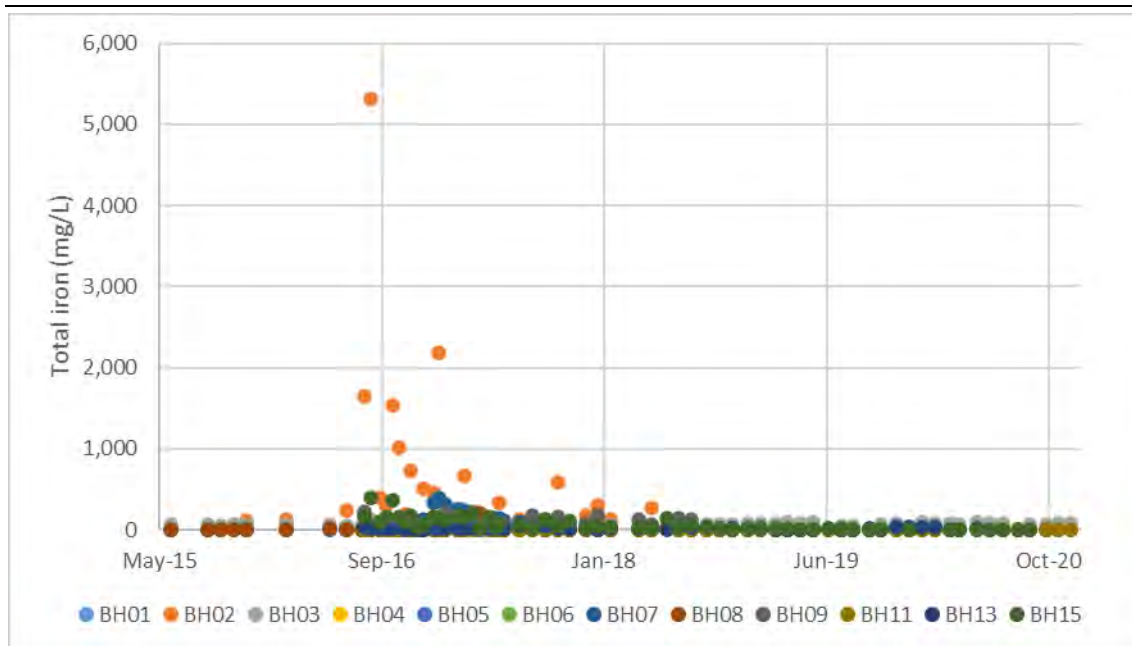


Figure S- 31: Total iron 2015 to 2020

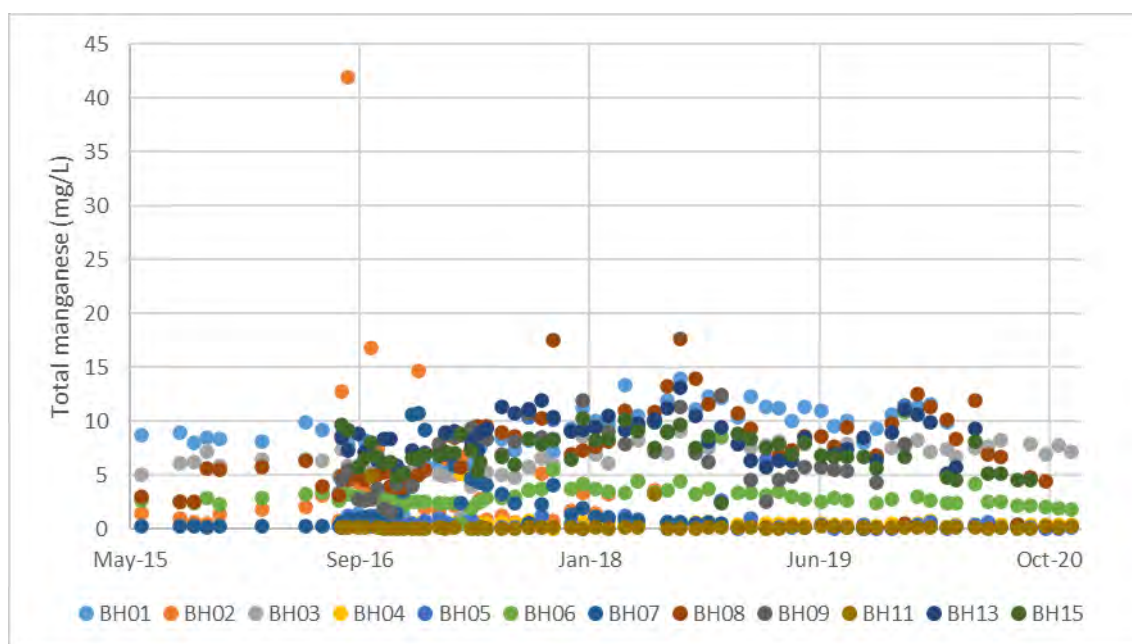


Figure S- 32: Total manganese 2015 to 2020

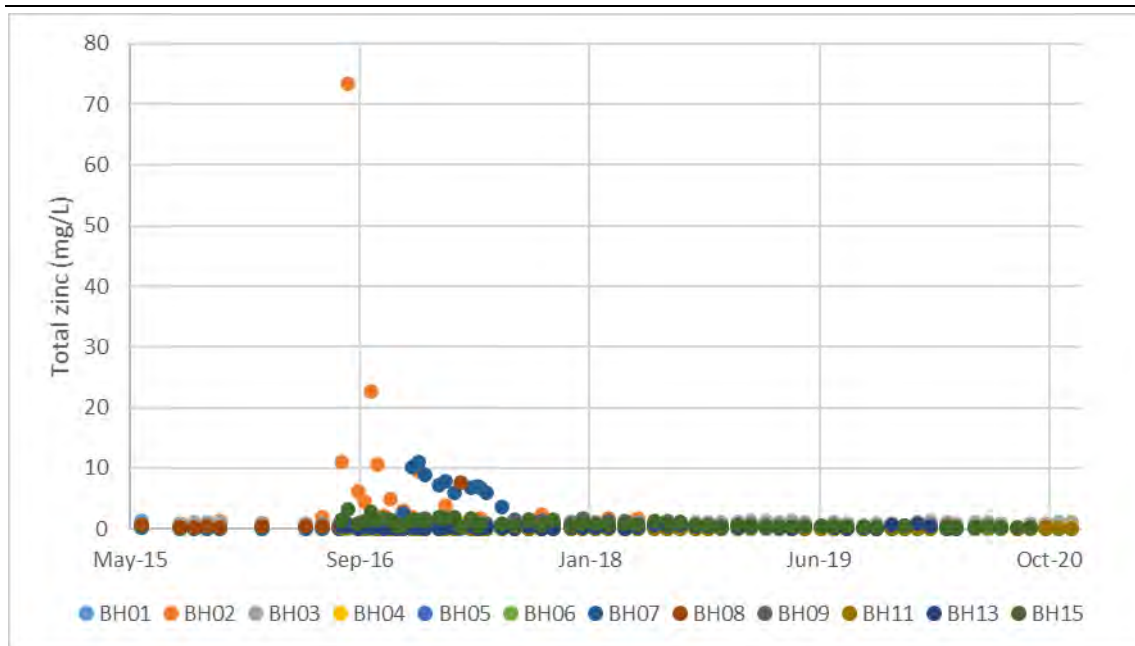


Figure S- 33: Total zinc 2015 to 2020

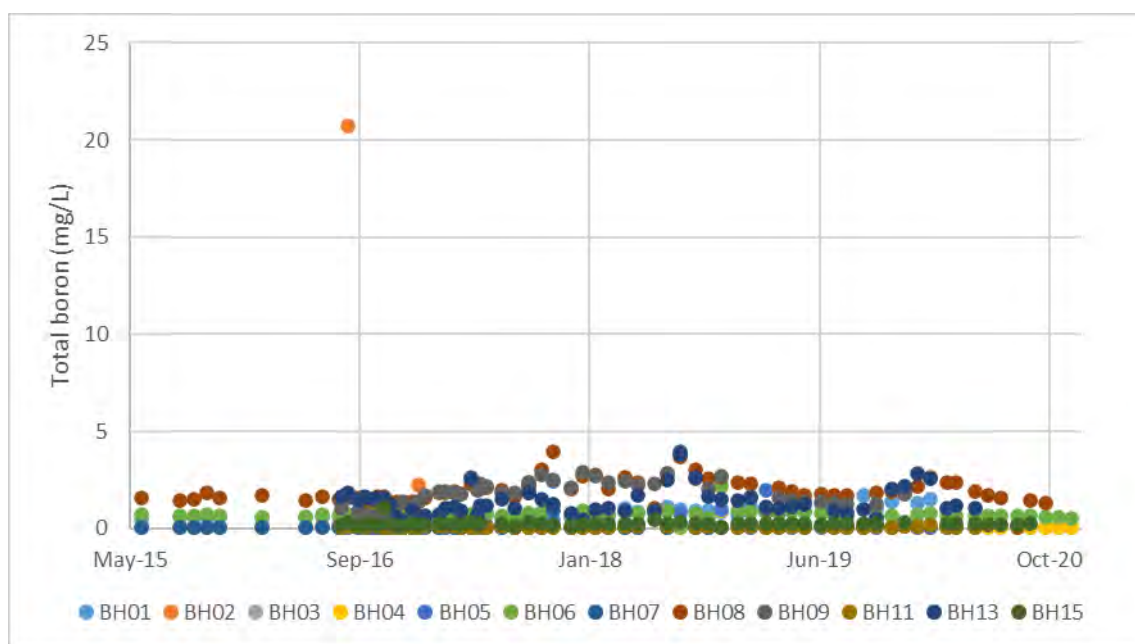


Figure S- 34: Total boron 2015 to 2020

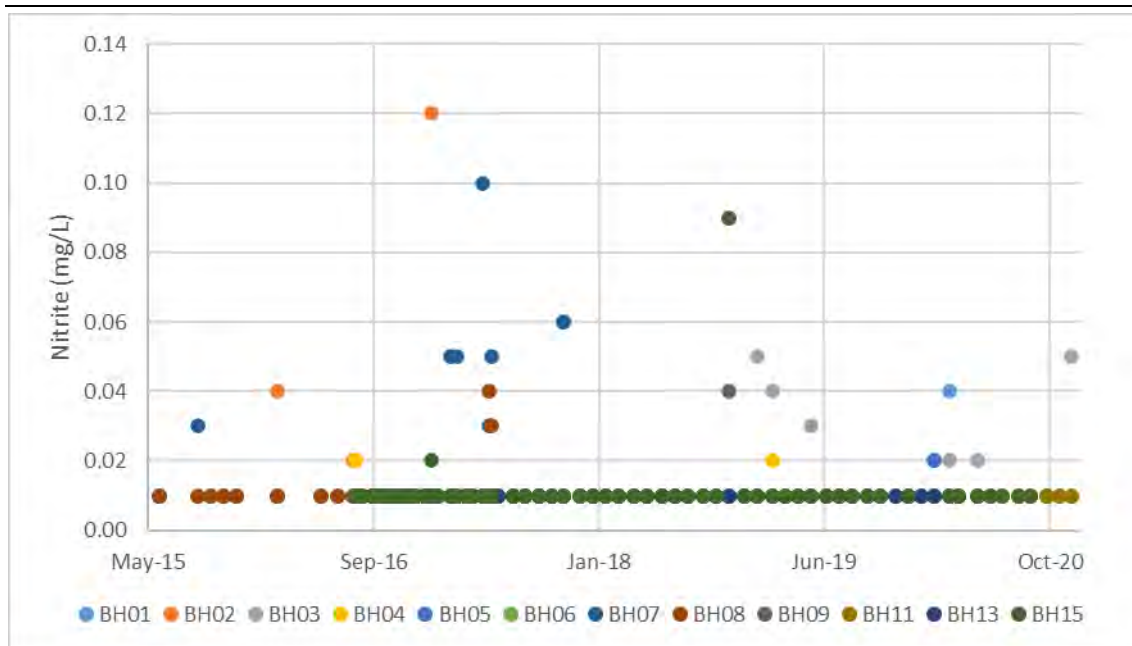


Figure S- 35: Nitrite 2015 to 2020

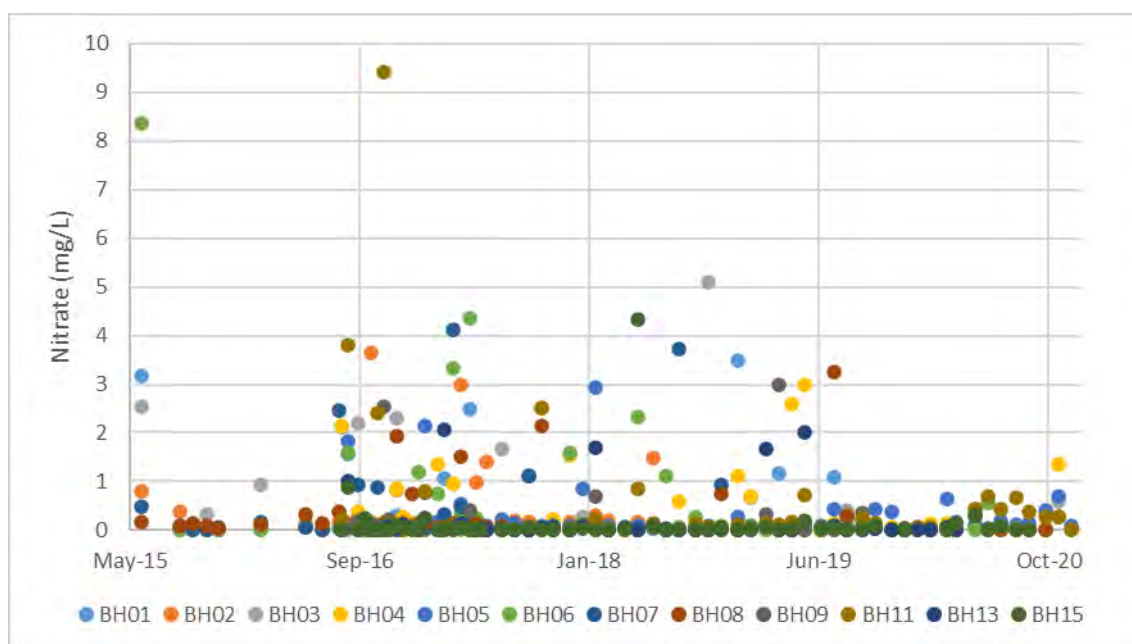


Figure S- 36: Nitrate 2015 to 2020

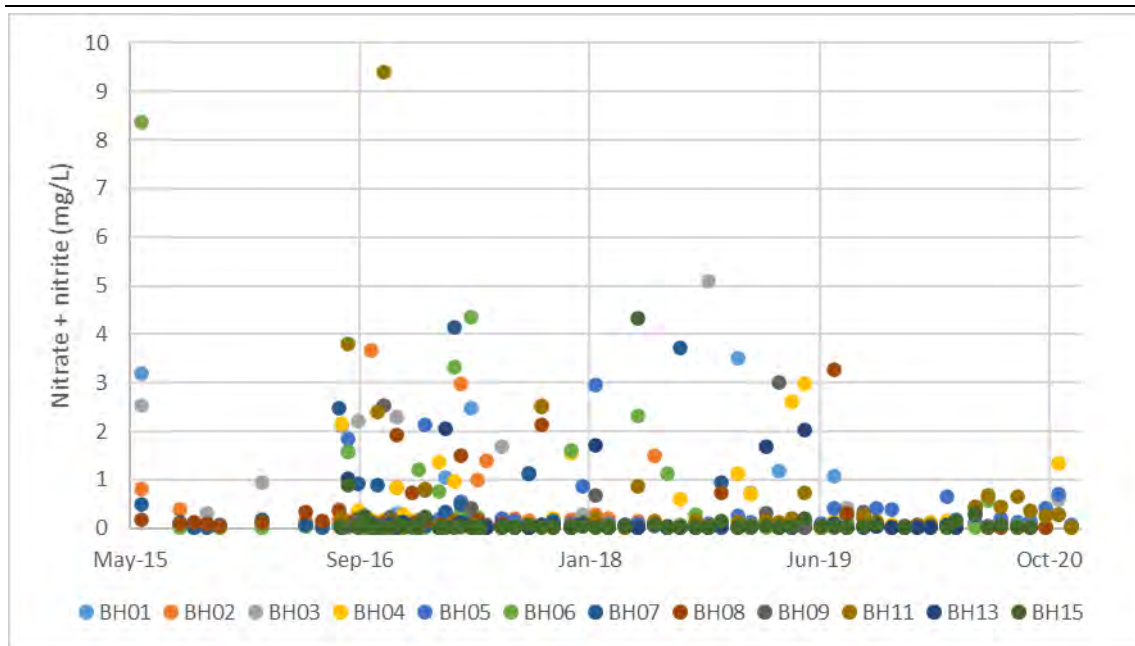


Figure S- 37: Nitrate + Nitrite 2015 to 2020

