



Doc Owner: **Environmental Compliance Coordinator**

Doc No:

CHAIN VALLEY COLLIERY
Annual Review 2021
1 January 2021 – 31 December 2021

Author:	Lachlan McWha Delta Coal Environmental Compliance Coordinator
Authorised by:	
Date:	31 March 2022

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Chain Valley Colliery – Annual Review (AEMR) 2021

Table 1 - Annual Review title block

Name of operation	Chain Valley Colliery
Name of operator	Great Southern Energy Pty Ltd trading as Delta Coal
Project Approval #	SSD 5465
Name of Project Approval holder	Delta Coal
Titles/Mining Leases #	Consolidated Coal Lease 707, Consolidated Coal Lease 706 (part), Mining Lease 1051, Mining Lease 1052, Mining Lease 1308, Mining Lease 1784, Mining Lease 1785, Mining Purposes Lease 1349, Mining Purposes Lease 337, Mining Purposes Lease 1389, Mining Purposes Lease 1400, Mining Lease 1781, Mining Lease 1782, Consolidated Coal Lease 722.
Name of holder of mining leases	Great Southern Energy Pty Ltd
Water License #	WAL41508 / Work Approval 20MW065025
MOP Commencement Date	1 st August 2020
MOP Completion Date	31 st December 2023
Annual Review start date	1 January 2021
Annual Review end date	31 December 2021
<p>I, Lachlan McWha, certify that this audit report is a true and accurate record of the compliance status of Chain Valley Colliery for the period 1 January 2021 to 31 December 2021 and that I am authorised to make this statement on behalf of Great Southern Energy Pty Ltd (trading as Delta Coal Pty Ltd).</p> <p><i>Note.</i></p> <p>a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</p> <p>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</p>	
Reporting Officer	<p>Name: Lachlan McWha</p> <p>Title: Environmental Compliance Coordinator</p> <p>Date: 31st March 2022</p> <p>Signature:</p>

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Executive Summary

Below details a summary of the key performance indicators for Chain Valley Colliery.

Indicator	Value
Total full-time employees (at 31 December 2021)	194
ROM coal produced on site (million tonnes)	1.25
Product coal transported from site via Mannering Colliery (million tonnes)	1.25
Total ROM coal to export market (million tonnes)	0
Total ROM coal to domestic market (million tonnes)	1.25
Total Coal Haulage on public roads (tonnes)	643.5
Total waste disposed (tonnes)	218.61
Total waste recycled (tonnes)	91.25
Waste recycling % achieved (%)	29.45
Potable water consumed (ML)	152.74
Total water discharged from the operation (ML)	2,211.34
Total number of community complaints received	1
Total number of reportable environmental incidents (including approvals non-compliances) for the period	10
Total funding accrued for the Voluntary Planning Agreement with Council in reporting period	\$52,360
Number of Community Consultative Committee (CCC) meetings undertaken	4
Total Scope 1 greenhouse gas emissions (CO ₂ equivalent tonnes) 1 st July 2020 – 30 th June 2021	447,364 t CO ₂ -e

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1 Statement of Compliance

Summary of Non-compliances (2021 Reporting Period):

The **nine** reportable environmental incidents during the reporting period were air quality or water related exceedances. These are summarised in **Table 2** and **Table 3**.

Table 2 - Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
SSD 5465	No
EPL 1770	No
Consolidated Coal Lease 707, Consolidated Coal Lease 706 (part), Mining Lease 1051, Mining Lease 1052, Mining Lease 1308, Mining Lease 1784, Mining Lease 1785, Mining Purposes Lease 1349, Mining Purposes Lease 337, Mining Purposes Lease 1389, Mining Purposes Lease 1400, Mining Lease 1781, Mining Lease 1782, Consolidated Coal Lease 722.	Yes
Water Access Licence 41508 / Work Approval 20MW065025	Yes

Table 3 - Non-compliances

Relevant Approval	Condition No.	Condition Description (summary)	Compliance Status	Comment	Where addressed in Annual Review
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG005 –dust gauge contamination unrelated to site operations.	Non-compliant	18/02/2021	Section 6.1.1 and Section 11
EPL 1770	L3.2	Daily Volume Discharge Limit Exceedance – LDP1 and LDP27 combined discharge.	Non-compliant	18/03/2021	Section 7.1.2 and Section 11
EPL 1770	L2.4	Faecal Coliform and Total Suspended Solids Exceedance at EPA 27 discharge point.	Non-compliant	18/03/2021	Section 7.4 and Section 11

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Relevant Approval	Condition No.	Condition Description (summary)	Compliance Status	Comment	Where addressed in Annual Review
EPL 1770	L2.4	Faecal Coliform and Total Suspended Solids Exceedance at EPA 27 discharge point.	Non-compliant	21/03/2021	Section 7.4 and Section 11
EPL 1770	L3.2	Daily Volume Discharge Limit Exceedance – LDP1 and LDP27 combined discharge.	Non-compliant	21/03/2021	Section 7.1.2 and Section 11
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG005 –dust gauge contamination unrelated to site operations.	Non-compliant	21/04/2021	Section 6.1.1 and Section 11
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG002 –dust gauge contamination unrelated to site operations.	Non-compliant	25/06/2021	Section 6.1.1 and Section 11
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG005 –dust gauge contamination unrelated to site operations.	Non-compliant	25/08/2021	Section 6.1.1 and Section 11
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG005 –dust gauge contamination unrelated to site operations.	Non-compliant	20/09/2021	Section 6.1.1 and Section 11
Development Consent- SSD 5465	Schedule 3- Condition 11	Depositional Dust Exceedance at DDG005 –dust gauge contamination unrelated to site operations.	Non-compliant	22/12/2021	Section 6.1.1 and Section 11

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Relevant Approval	Condition No.	Condition Description (summary)	Compliance Status	Comment	Where addressed in Annual Review
EPL 1770	L3.2	Volumetric Discharge Monitoring Ceased due to vandalism and damage sustained to discharge flow meter.	Non-Compliant	24/12/2021	Section 7.1.2 and Section 11
Development Consent- SSD 5465 (Mod 3)	Schedule 3- Condition 11	Depositional Dust Annual Average Exceedance at DDG005 –dust gauge.	Non-compliant	31/12/2021	Section 6.1.1 and Section 11

Compliance status key for Table 3

Risk Level	Colour Code	Description
High	Non-Compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-Compliant	Non-compliance with potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-Compliant	Non-compliance with potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-Compliant	Non-compliance which does not result in any risk of environmental harm

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2 Introduction

2.1 Background

Chain Valley Colliery (CVC) is an underground coal mine located on the southern end of Lake Macquarie approximately 60 km south of Newcastle, 80 km north of Sydney and adjacent to Vales Point Power Station (VPPS). The pit-top is located 1 km south-east of the township of Mannering Park. The sites locality and approved boundary are shown on **Figure 1**.

CVC operates under Development Consent SSD-5465 which was most recently modified (Modification 4) in August 2021. The modification included an extension of the sites approved mining boundary, shown on **Figure 1**.

Underground mining at CVC commenced in 1962 and since that time has extracted coal from three seams; namely, the Wallarah Seam, the Great Northern Seam and the Fassifern Seam, using a combination of bord and pillar and miniwall mining methods. Current mining activities are within the Fassifern Seam. CVC completed its final planned miniwall in 2021 as it converts to a bord and pillar herringbone extraction method.

Delta Coal is currently undertaking the mine closure/rehabilitation process for the Moonee Colliery and completed the rehabilitation of the Catherine Hill Bay Coal Preparation Plant, relinquishing part of Consolidated Coal Lease 706 in the reporting period.

CVC peaked with a workforce of approximately 380 personnel in the mid 1980's. At the end of the reporting period, CVC had a workforce of 216 personnel.

2.2 Mine Contacts

The Colliery contacts as at the end of the reporting period were:

Chief Executive Officer: Mal Yule
Telephone: 02 4358 0800
Email: myule@deltacoal.com.au

Environmental Compliance Coordinator: Lachlan McWha
Telephone: 02 4358 0883
Email: lmcwha@deltacoal.com.au

Postal Address: Delta Coal
P.O Box 7115
Mannering Park NSW 2259

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Figure 1 - Chain Valley Colliery site boundary and regional locality



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3 Approvals

This Annual Review has been completed in compliance with Condition 8 of Schedule 6 within SSD-5465. A copy of the modified Development Consent is attached as **Appendix 1**.

3.1 Development Consent SSD-5465

CVC commenced mining operations in 1962 and the mine had been operating under existing use rights until 23 January 2012 at which time major project approval (MP 10_0161) was issued under Section 75J of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The project approval permitted secondary extraction within domains referred to as Domain 1 and Domain 2, along with first workings within an area identified as Parcel A. The approval also permitted the continuation of mining within the Fassifern Seam until 31 December 2016.

The approval was subsequently modified on 30 August 2012, following approval of a Section 75W modification, to permit a revised mine layout associated with the introduction of wider miniwalls within the Domain 1 and 2 areas.

In 2013 the mine lodged an application for the Chain Valley Colliery Mining Extension 1 Project (SSD-5465) under Part 4 of the EP&A Act. The Mining Extension 1 Project sought approval for:

- an extension of the approved extraction area to allow underground mining to continue within the Fassifern Seam;
- the increase of the approved maximum rate of production from 1.2 million tonnes per annum (Mtpa) to 1.5 Mtpa of run-of-mine (ROM) coal;
- an increase in the approved hours for haulage of coal from the Colliery on private roads to Delta Electricity's VPPS;
- minor upgrades and modifications to existing approved infrastructure;
- an extension of the approved mining by a period of approximately 14 years, i.e., to around 2027; and
- the consolidation of the above with all the operations and environmental activities currently approved under MP10_0161, as modified, within a single development consent.

Development Consent for the Mining Extension 1 Project was subsequently issued under Section 89E of the EP&A Act on 23 December 2013.

On 24 April 2014 a modification (Mod 1) was sought for SSD-5465, which related to the development of an underground linkage between Chain Valley Colliery and Mannering Colliery. Concurrently, a modification (Mod 2) to Mannering Colliery's Project Approval (MP 06_0311) was sought to permit coal to be received from Chain Valley Colliery and transported via existing facilities to VPPS. The modification application was approved on the 27 November 2014.

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On the 15 July 2015 an additional modification (Mod 2) was sought for SSD-5465. The Department of Planning and Environment (DP&E) approved the modification on 16 December 2015. The modification approved the following changes to the CVC operations:

- an increase in the maximum rate of ROM coal extraction at the mine from 1.5 Mtpa to 2.1 Mtpa;
- mine design changes, primarily the re-orientation of miniwall panels in the mine's northern area;
- an increase in full-time personnel from approximately 160 to approximately 220; and
- construction of asset protection zones (APZs) around critical infrastructure to protect from bushfires.

In May 2019 a Statement of Environmental Effects was submitted to support an additional modification (Mod 3) being sought for SSD-5465. The Department of Planning, Industry and Environment (DPIE) approved the modification on the 26th June 2020, the modification approved the following changes to the CVC operations:

- the use of alternate bord and pillar mine designs and
- an extension of allowed operations until 31 December 2027.

On the 25th August 2021 a further modification to SSD-5465 (Mod 4) was approved by the DPIE. The modification approved the following changes to the CVC operations:

- extend the boundary of the Northern Mining Area approved for extraction under the Chain Valley Colliery consent into a mining lease area partially transferred from Centennial Myuna Colliery (Part ML1632 transferred to ML1785), as shown on **Figure 1**;
- increase the maximum employee numbers permitted at Chain Valley Colliery to approximately 330 full-time equivalent employees.

3.2 Extraction Plans

The Miniwall S1/N1 Extraction plan was granted prior to Miniwalls S1 and N1 of which part of N1 was extracted during 2019. The extraction plan to support Miniwall mining of S2 and S3 was submitted by Delta Coal and approved by DPIE-Resource Assessment prior to the commencement of mining of Miniwall S2.

Delta Coal submitted an extraction plan to facilitate mining of Miniwall S4 on 11th March 2020, the Planning Secretary approved the Miniwall S4 Extraction Plan (Revision 1, dated 12 May 2020) on the 22nd June 2020.

Delta Coal submitted an extraction plan to facilitate the mining of Miniwall S5 and pillar extraction in the northern mining area, which was approved by the Planning Secretary on 6th April 2021.

3.3 Mining Operations Plan

The 2018 to 2020 Mining Operations Plan (MOP) and associated MOP Amendment submitted in December 2019, covered extraction of N1 and Miniwalls S1, S2, S3 as well as associated first workings and mains headings.

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A 2020-2023 MOP was submitted to the NSW Resources Regulator on the 21st of July 2020 and was approved on the 5 August, the revised MOP addressed extraction of Miniwalls S4 and S5 and continued operations to 30 April 2021. In February 2021 an amendment (Amendment 1) was submitted to the 2020-2023 MOP and was subsequently approved on 22 April 2021, the purpose of this amendment was to extend mining approval to December 2023. In August 2021 a second amendment (Amendment 2) was submitted to the 2020-2023 MOP and was approved on 30 August 2021, the purpose of this amendment was to include the Mining Lease transfer ML1632 (Centennial) to ML1735 (Great Southern Energy) Northern Mining Area Extension.

3.4 Leases

The surface areas occupied by CVC lie within the Central Coast local government area (LGA). The facilities include the pit top area at Mannering Park and ventilation shaft site at Summerland Point.

All secondary extraction during the reporting period was undertaken beneath Lake Macquarie, i.e. part of the Lake Macquarie LGA.

The Colliery holdings are shown on **Figure 2** and the applicable mining tenements are listed in **Table 4**.

Table 4 - Mining Tenements

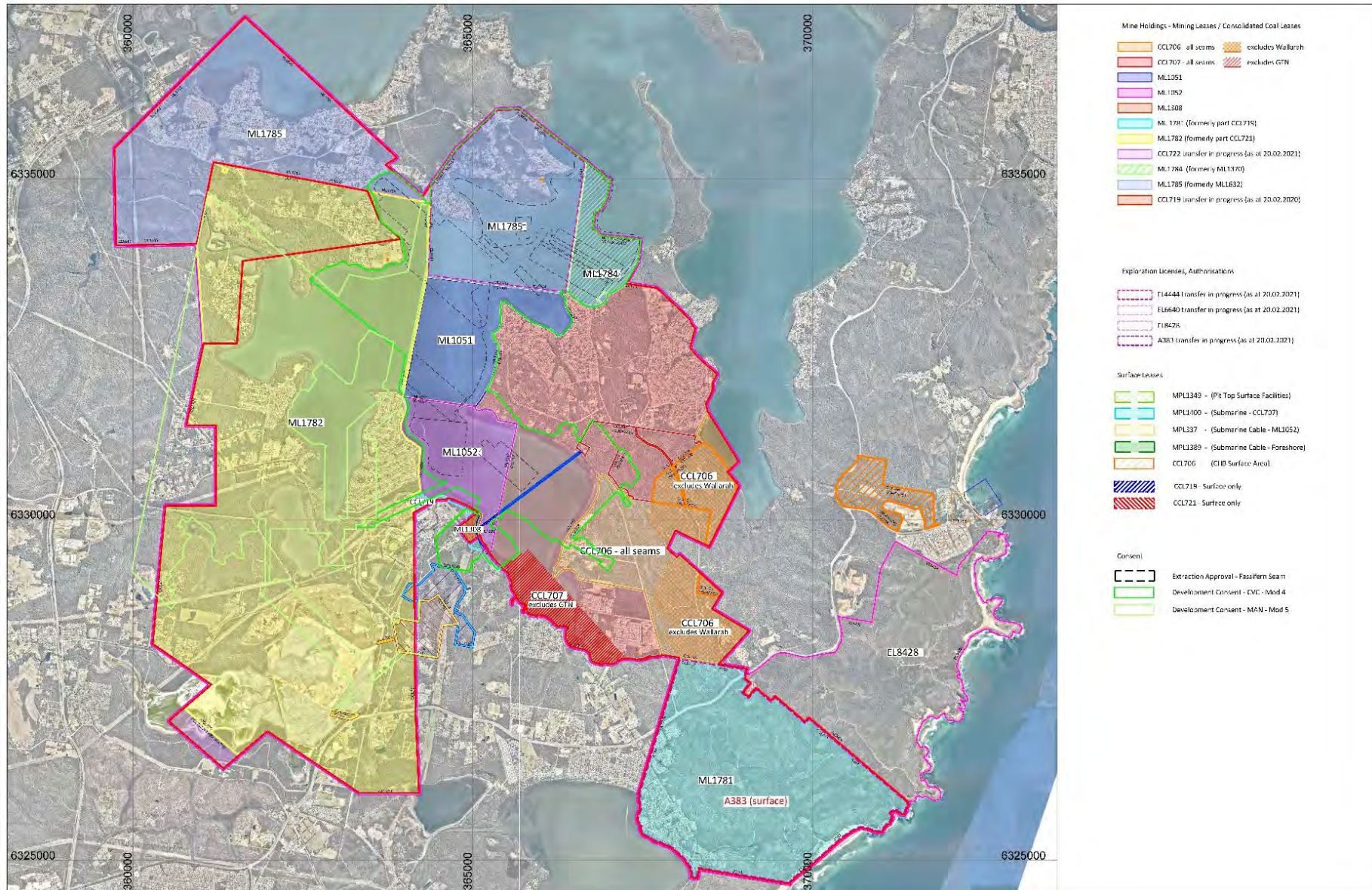
Current Mining tenement	Holder	Grant date / Renewal date	Lease expiry date	Applicability
CCL 706	Great Southern Energy	24 January 1990	29 April 2022	Incorporates historical workings within the Fassifern, Wallarah and Great Northern Seams which are, and would continue to be utilised for passive operational activities.
CCL 707	Great Southern Energy	3 July 1989	30 Dec 2023	Incorporates historical workings within the Fassifern, Wallarah and Great Northern seams which are, and would continue to be, utilised for passive operational activities and the Summerland Point ventilation shaft site.
EL8428	Great Southern Energy	8 November 2021	7 Dec 2025	Future mine extension area.
ML 1051	Great Southern Energy	7 July 1941	7 July 2022	Part of the area approved under SSD-5465.
ML 1052	Great Southern Energy	7 July 1941	7 July 2022	Part of the area approved under SSD-5465.
ML 1308	Great Southern Energy	4 May 1965	4 May 2022	Mining lease for the mine drift entries.

Current Mining tenement	Holder	Grant date / Renewal date	Lease expiry date	Applicability
ML 1785	Great Southern Energy	28 April 2021	13 Oct 2022	Partial transfer of previous subleased area of ML1632 from Centennial Coal to GSE.
CCL719 (sublease)	Centennial Mannering	3 July 1989	11 Dec 2029	Part CCL 719 subleased to Lakecoal (novated to Delta Coal). Incorporates historic workings within the Wallarah and Great Northern Seams utilised for passive operational activities.
ML1782	Great Southern Energy	1 November 2021	29 July 2026	Partial Transfer of previous sublease area of CCL721 from Centennial coal to GSE.
CCL722 (sublease) Awaiting p/transfer	Centennial Munmorah	28 June 1989	05 July 2019 (Renewal Sought)	Part CCL 721 subleased to Lakecoal (novated to Delta Coal). Incorporates part of the proposed mining area, refer Plan 1A. Partial transfer of sublease area pending.
ML 1784	Great Southern Energy	14 May 2021	7 Mar 2033	Partial Transfer of previous sublease area of ML1370 from Centennial coal to GSE.
MPL 337	Great Southern Energy	30 January 2016	30 January 2037	Mining purposes lease for a portion of the electricity cable on the bed of Chain Valley Bay connecting the pit top switchyard to the ventilation shaft site at Summerland Point.
MPL 1349	Great Southern Energy	5 Oct 1967	5 Oct 2028	Mining purposes lease for the Chain Valley pit top area.
MPL 1389	Great Southern Energy	14 May 1970	14 May 2031	Mining purposes lease for a portion of the electricity cable on the bed of Chain Valley Bay connecting the pit top switchyard to the ventilation shaft site at Summerland Point.
MPL 1400	Great Southern Energy	6 Nov 1970	6 Nov 2031	Mining purposes lease for a portion of the electricity cable on the bed of Chain Valley Bay connecting the pit top switchyard to the ventilation fan at Summerland Point.

Blue = Change within the reporting period

It is noted that while the CVC holding boundary now incorporates a significant portion of what was the Mannering Colliery holding, Annual Reviews for the two Collieries remain separate and relate specifically to the activities occurring within the relevant approval instrument boundaries.

Figure 2 - Delta Coal Tenement Holdings



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3.5 Licences

Environment Protection Licence (EPL) No. 1770 issued by the Environment Protection Authority (EPA) under the Protection of the Environment Operations Act 1997 covers the Collieries activities / premises.

EPL 1770 also includes the licenced daily discharge volume for mine water from the pit top settling ponds into Lake Macquarie at a maximum rate of 12,161 kL per day. EPL 1770 was last varied on 24th February 2022.

A copy of EPL 1770 is posted on the Delta Coal website, www.deltacoal.com.au or via the EPA website, <http://www.environment.nsw.gov.au/licensing/> and is also provided in **Appendix 2**.

Monitoring results obtained in accordance with the license conditions are made available on the Delta Coal website (updated monthly), under the environmental reporting page: <https://www.deltacoal.com.au/environment/chain-valley-colliery/chain-valley-colliery-environmental-reporting>

Delta Coal also holds WAL41508 issued under the *Water Act 1912* and permits the extraction of 4443 ML per annum.

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4 Operations

4.1 Exploration

There was no surface exploration drilling undertaken during the reporting period.

4.2 Land Preparation

There was no land preparation undertaken during the reporting period, as a result the surface disturbance footprint remains unchanged.

4.3 Construction/Demolition

There were no construction or demolition works undertaken during the reporting period. In the previous reporting period Delta Coal amended the 2018-2020 MOP to allow for demolition of on-site structures. Delta Coal undertook demolition of legacy infrastructure in the 2020.

4.4 Mining

In August 2021, CVC completed its final forecasted miniwall (S5), with mining operations continuing with bord and pillar extraction methods comprising first workings within the consent area and with secondary pillar extraction approved beneath Lake Macquarie.

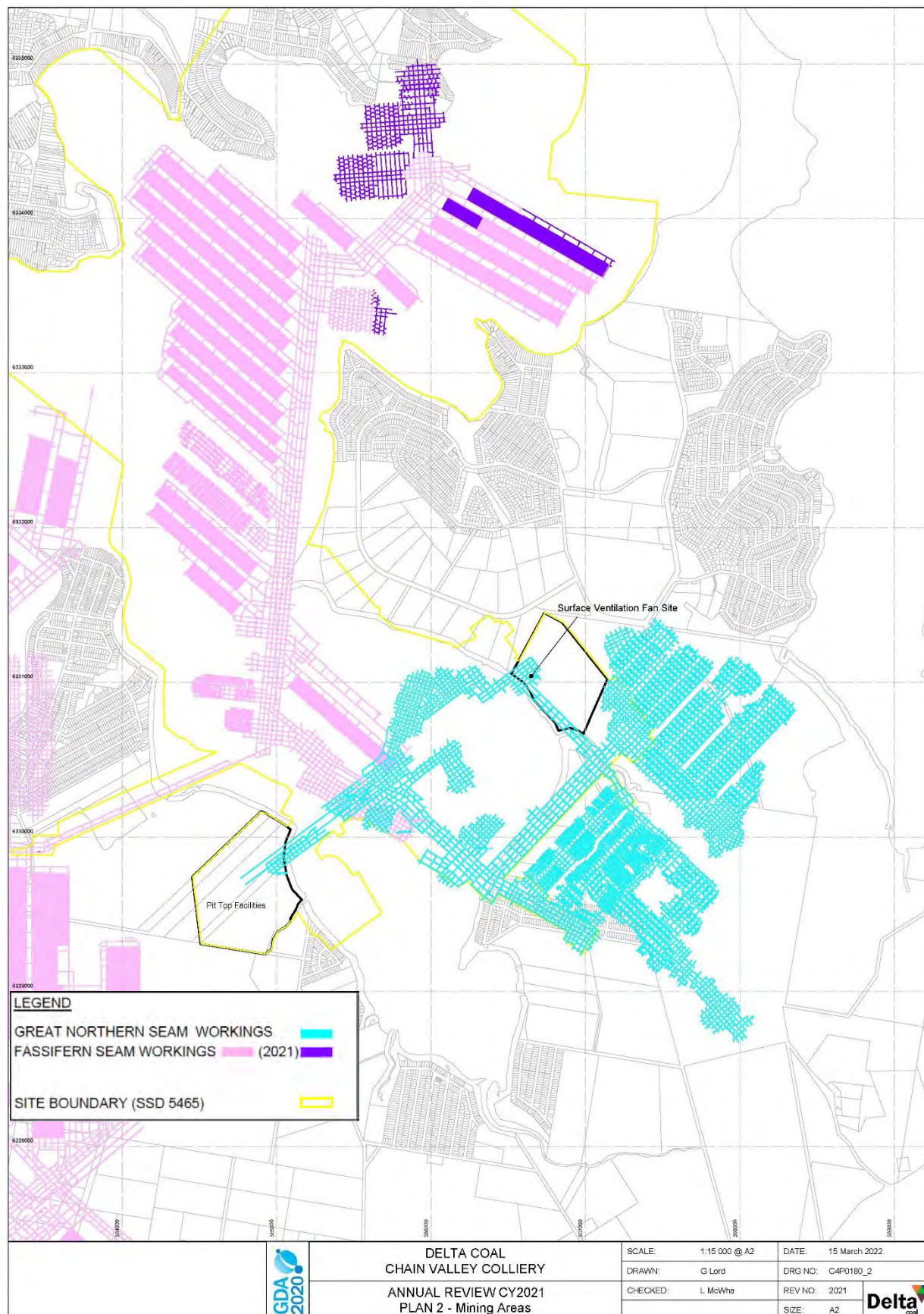
Total production for 2021 was 1.25 Mt, which comprised:

- 585,200 tonnes of ROM coal from Miniwall extraction; and
- 661,471 tonnes of ROM coal from roadway development and herringbone first workings.

CVC's existing underground workings and mining undertaken in the reporting period is shown on **Figure 3**.

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Figure 3 - CVC Underground Workings (2021 workings in purple)



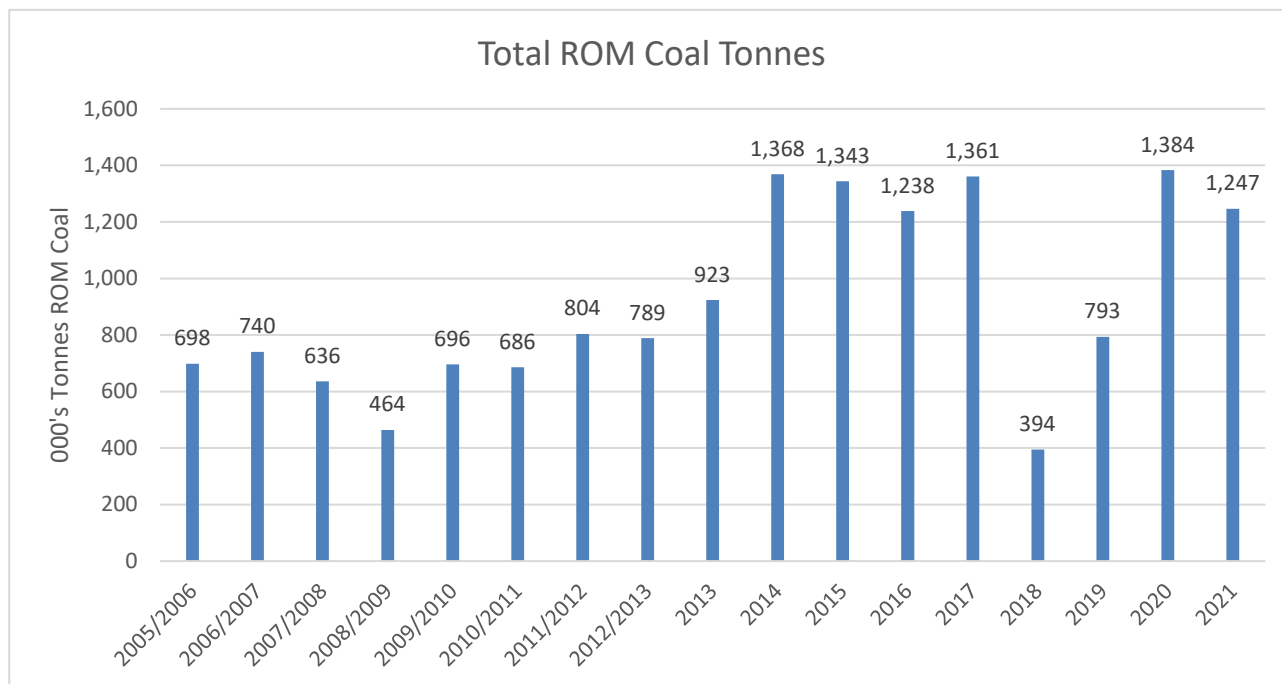
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A production summary for the reporting period is provided in **Table 5**. **Figure 4** shows the past 15 years of annual ROM production, including that for the current reporting period. Note that prior to 2013 the reporting period was on a financial year basis, however, to align reporting with Development Consent requirements, this has now been moved to a calendar year basis. All coal produced was dispatched to VPPS via conveyor from Mannering Colliery, with exception to a total of 643.5 tonnes of ROM coal reclaimed during clean-up works undertaken at the CVC coal stockpiling pad discussed in **Section 4.7**. Which was transported via public roads for sale to VPPS. During the reporting period a total of 1,246,671 tonnes was dispatched to VPPS (domestic market). No coal was sold for export in the reporting period.

Table 5 - Production Summary

Material	Approved Limit (Mt)	Previous Reporting Period (Actual)	This Reporting Period (Actual)	Next Reporting Period (Forecast)
Waste Rock / Overburden	n/a	n/a	n/a	n/a
ROM Coal	2.1 Mt	1.38 Mt	1.25 Mt	1.5 Mt
Coarse Reject	n/a	n/a	n/a	n/a
Fine Reject	n/a	n/a	n/a	n/a
Saleable Product (Same as ROM)	2.1 Mt	1.38 Mt	1.25 Mt	1.5 Mt

Figure 4 - Annual ROM Production Levels



4.4.1 Mine Geology

The Fassifern seams have been mined at CVC to produce a raw, crushed thermal coal with low sulphur, which is suitable for both export and domestic markets.

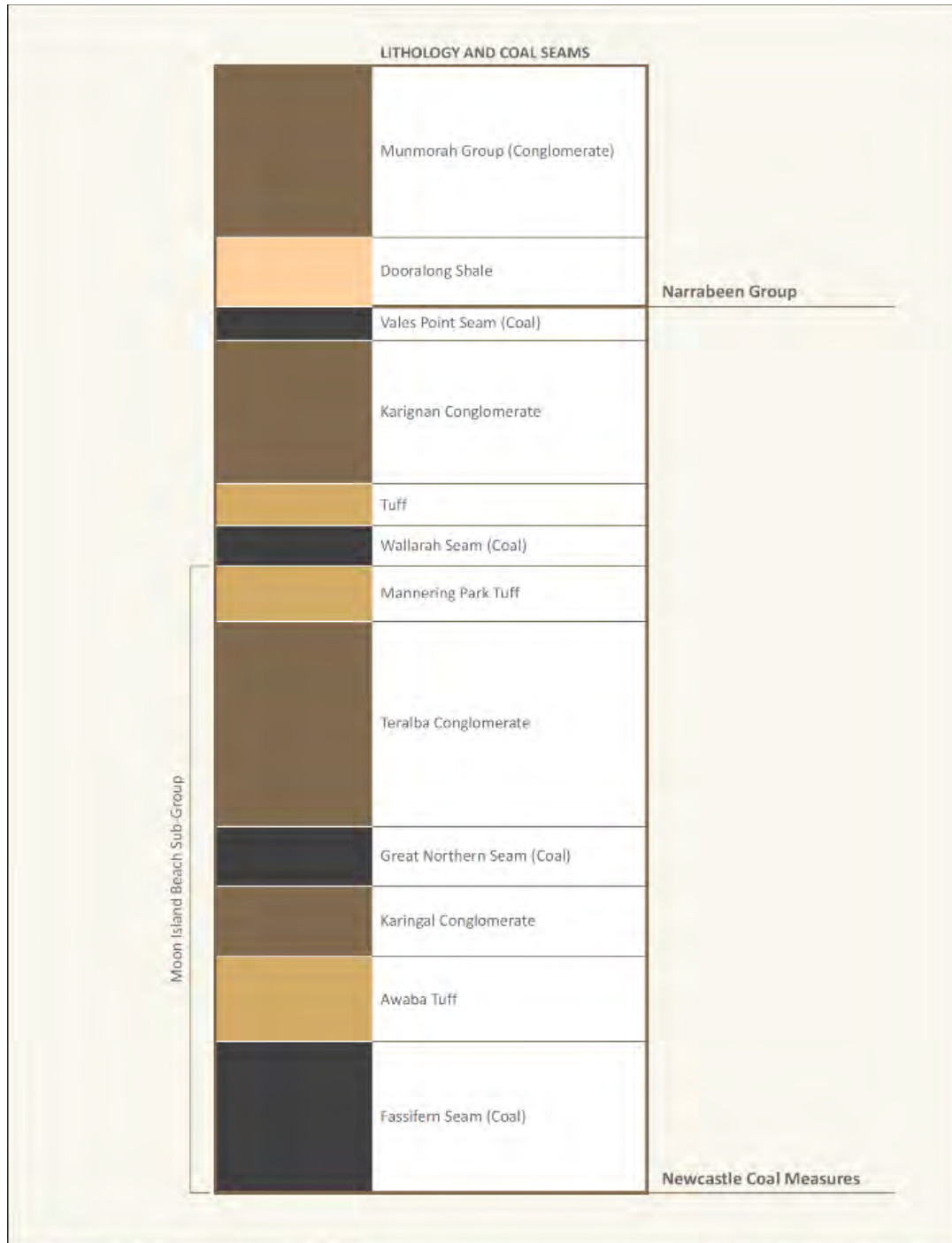
The Fassifern Seam is mined at a depth of approximately 160 to 200 m, approximately 30 m deeper than the Great Northern Seam, which underlies the Wallarah Seam by approximately 30 m also. **Figure 5** shows the typical stratigraphy at CVC including the Wallarah, Great Northern and Fassifern seams.

The Fassifern Seam is overlain by a tuffaceous claystone material which varies in thickness between 20 and 30 metres. The Fassifern Seam measures up to 5 metres in thickness with roadway development carrying a coal roof and floor.

Mining in the Wallarah Seam is complete in the Colliery holding area and mining was discontinued in the late 1990's. There is still some remaining resource within the Great Northern and Fassifern seams. Current operations and development consent only permits mining within the Fassifern Seam.

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Figure 5 - Typical Stratigraphy at Chain Valley Colliery



Source: Modified by AFCCOM (2011) from Sedexmin Geotechnics Pty Ltd (2010).



Typical stratigraphy at the Site

Chain Valley Colliery Mining Extension I Project - Environmental Impact Statement

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4.5 Coal Processing

CVC produces a raw, crushed thermal coal which is suitable for both export and domestic markets. In 2020 Mannering Colliery's above ground rotary breaker was decommissioned. Since the rotary breaker was decommissioned initial crushing and sizing occurs underground before being conveyed to Mannering Colliery pit-top for further sizing and screening in the coal handling and preparation plant (CHPP). Coal is transferred from the CHPP to either the YE1 conveyor for transport directly to VPPS or for storage on the Mannering Coal Stockpile where coal transport to VPPS is offline or limited.

4.6 Waste Management

Delta Coal continued to implement a total waste management system for the site during the reporting period. The waste streams currently provided for include:

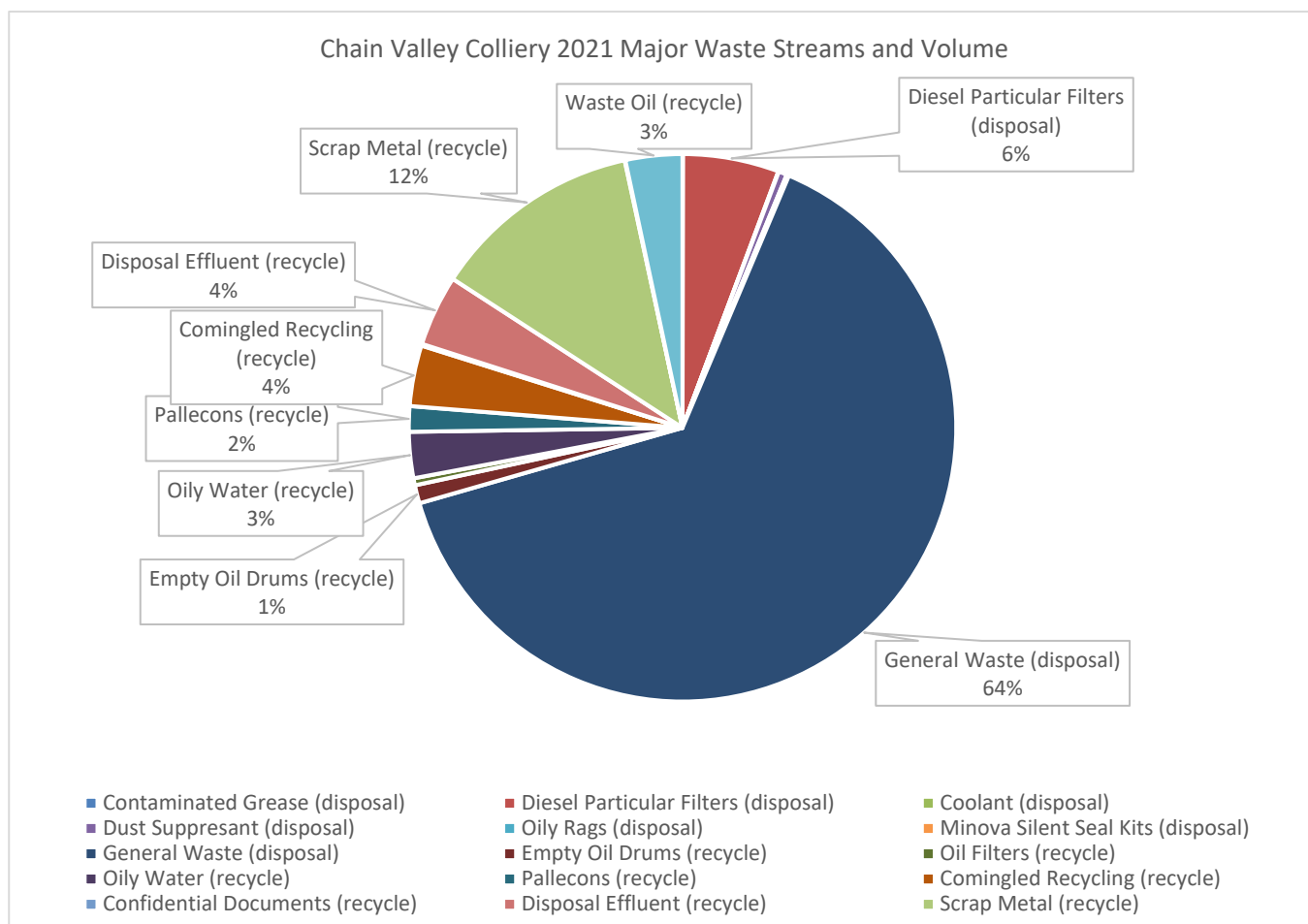
- general waste (disposal), 198.9 tonne (t) (64.2 %);
- scrap metal (recycle), 38.6 t (12.5 %);
- diesel particulate filters (disposal), 17.5 t (5.7 %);
- Effluent (recycle), 13 t (4.2 %);
- comingled recycling (recycle), 11.1 t (3.6 %);
- waste oil (recycle), 8.3 t (3.4 %);
- oily water (recycle), 10.4 t (2.7 %);
- pallets (recycle), 4.7 t (1.5 %);
- empty oil drums (recycle), 3.3 t (1.1 %);
- dust suppressant (disposal), 1.5 t (0.5%);
- oil filters (recycle), 1.3 t (0.4 %);
- confidential documents (recycle), 0.3 t (0.1 %);
- silent seal kit waste (disposal), 0.3 t (0.1 %);
- oily rags (disposal), 0.2 t (0.1 %); and
- waste batteries (recycle), 0.1 t (0.05 %).

The total waste management system also involves weekly site inspections by the waste management contractor to facilitate effective waste management and continual improvement along with monthly reporting, with data from key waste streams presented in **Figure 6**.

During the reporting period there was a continued focus on recycling with a large amount of scrap metal removed from site. The total waste management system will continue during the next reporting period.

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Figure 6 – Chain Valley Colliery Waste Streams



4.7 Stockpiles

The CVC stockpile does not receive product coal following the linkage of CVC and MC underground. Clean-up works on the stockpile in 2020 generated product coal with general non-coal material present. The material was transferred to Minion Enterprises throughout 2020 for processing and transport of processed (cleaned) product to VPPS. The final deliveries of the product coal from the CVC stockpile pad clean-up works were transported from Minion Enterprises, Carrington NSW, in February 2021. Non-coal material separated from the stockpile product was disposed of as General Waste to an appropriately licensed landfill facility. Following the works, CVC is investigating sediment and erosion control measures to further implement on the CVC stockpile pad, considering its lack of operation.

4.8 Hazardous Materials Management

Bulk storage of hazardous materials and dangerous goods occurs in the stores area adjacent to the workshop. The primary hazardous chemicals storage locations are:

- a 15,900 L above ground diesel tank;
- a covered, bunded area for storage of pallets of oils, and bulk fluid containers;
- 31.4 kL self-bunded diesel tank (compliant with both AS1692 and AS1940) moved from the coal stockpile area to the workshop area; and
- three 210kg LPG bottles.

There have been no significant changes made to the management of hazardous materials during the 2021 reporting period.

4.9 Other Infrastructure Management

No significant changes have been made to other infrastructure during the reporting period. Some minor changes were made to the site buildings and general maintenance was undertaken.

4.10 Proposed Changes

Forecast changes for CVC that are likely to occur in the next reporting period include:

- complete construction of a sewage pump station (following Development Application approval by Central Coast Council in December 2020) at CVC adjacent to the bathhouse and a sewer pipeline to Tall Timbers Road for connection to Central Coast Council sewage system, in order to satisfy Pollution Reduction Program 8 (EPL 1770);
- complete the connection of administration building septic to the sewage pump station to be constructed on site, in order to satisfy Pollution Reduction Program 9 (EPL 1770);

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- submission of Consent Consolidation Project Environmental and Social Impact Statements to DPIE, allowing for the consolidation of CVC and MC approvals, as well as Response to Submissions in relation to the Consent Consolidation Project; and
- If the CVC and MC Consent Consolidation Project is approved, request to consolidate EPL 1770 and EPL 191 to one license.

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5 Actions Required from Previous Annual Review

5.1 Actions required from 2020 Annual Review

As detailed in **Table 6**, correspondence was received from DPIE on 7 July 2021, noting that the CVC Annual Return 2020 generally satisfied reporting requirements.

Table 6 - Actions requiring updating in 2020 Annual Review

Item	Section	Action	Status
-	-	Nil – the CVC AR 2020 was reviewed by the Department and was considered to generally satisfy the reporting requirements of the consent and the Departments <i>Annual Review Guideline</i> (October 2015).	N/A

5.2 Delta Coal Environmental Management System

Environmental management at CVC is structured through the environmental management system based on the company's Environmental Policy. The site risk assessment of environmental aspects at CVC forms the basis of environmental impact mitigation and control and will be reviewed throughout the life of the Colliery.

The Environmental Management Strategy provides the overview of the environmental management system which has been visually presented in **Figure 7**. Modification 3 to SSD-5465 was granted in June 2020 and allowed the combination of CVC and Mannering Colliery management plans where practicable, a summary of combined environmental management plans is detailed below, as of the end of the reporting period all combined management plans were pending approval with exception to the Environmental Management Strategy, approved in March 2021.

- Delta Coal Environmental Management Strategy (incorporating Environmental Monitoring Program);
- Delta Coal Noise Management Plan (combining the Mannering Colliery Noise Management Plan and Noise Monitoring Program and CVC Noise Management Plan);
- Delta Coal Air Quality and Greenhouse Gas Management Plan (combining CVC Air Quality Management Plan and Mannering Colliery Air Quality and Greenhouse Gas Management Plan);
- Delta Coal Heritage Management Plan (combining CVC Heritage Management Plan, Mannering Colliery Aboriginal Cultural Heritage Management Plan and Mannering Colliery Non-indigenous Management Plan); and
- Delta Coal Land Management Plan (includes Mannering Colliery Land Management and now incorporates CVC land management requirements).

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Table 7 provides the status of CVC's Environmental Management Plans.

Figure 7 - Environmental Management Strategy Summary

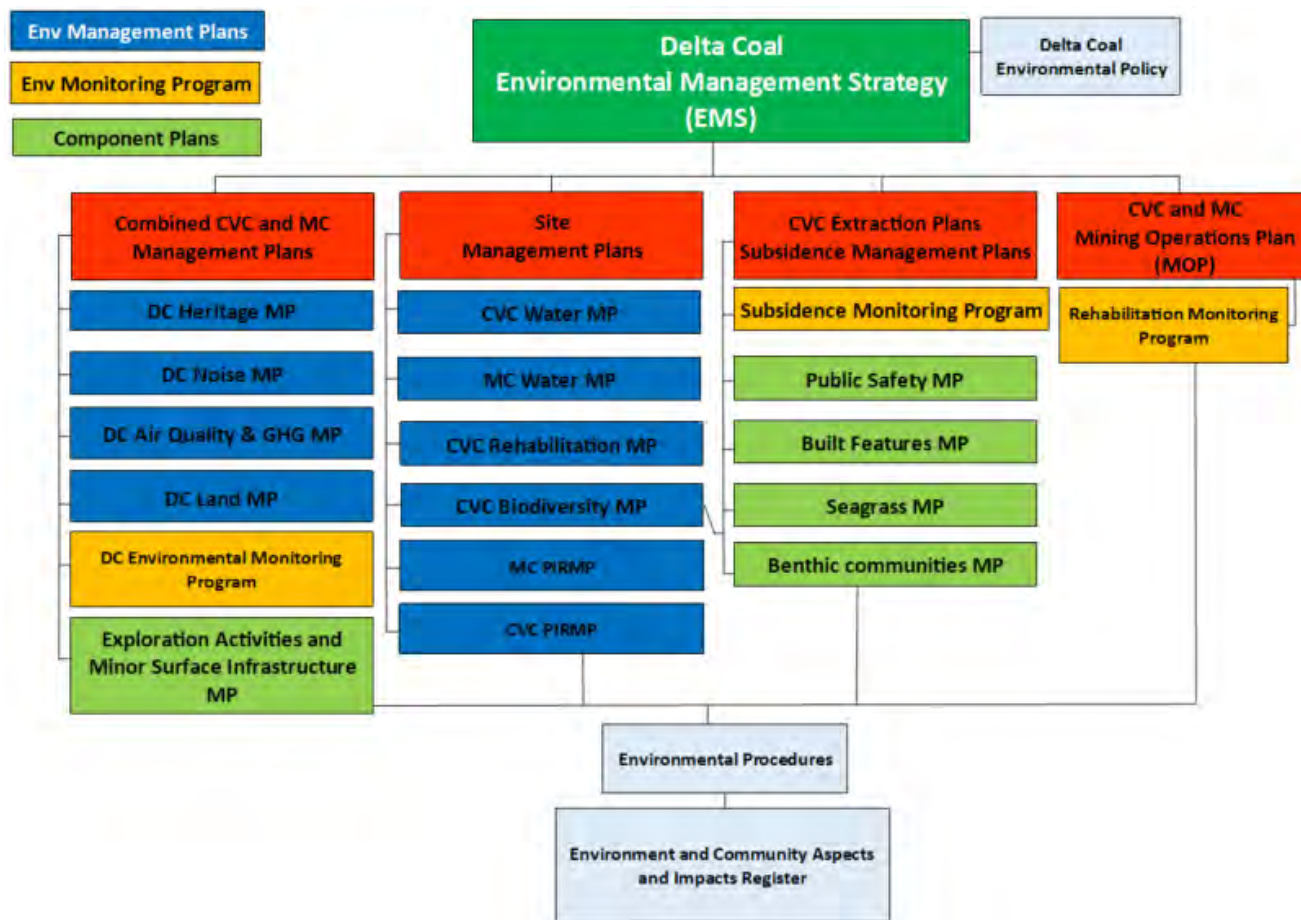


Table 7 - Primary Elements of the Environmental Management System

Document Title	Last Approved / Reviewed	Status as of 31 December 2021
Delta Coal Environment Policy	21 st September 2020	Current
Delta Coal Environmental Management Strategy	March 2021	Being revised in 2022 prior to submission to DPIE for CVC MOD 4.
Delta Coal Environmental Monitoring Program	N/A	Incorporated into combined Delta Coal EMS
Environmental Risk Assessment	December 2019	Final
CVC Water Management Plan	August 2021	Approved and current
Delta Coal Air Quality and Greenhouse Gas Management Plan	January 2022	Second revision of Delta Coal AQGHGMP submitted to DPIE for Planning Secretary approval on 24/01/2022 – pending approval.
Delta Coal Noise Management Plan	September 2021	Second revision of the Delta Coal NMP submitted to DPIE for Planning Secretary

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Document Title	Last Approved / Reviewed	Status as of 31 December 2021
		approval on 03/09/2021 – pending approval.
Delta Coal Heritage Management Plan	November 2020	Being revised in 2022 prior to submission to DPIE for CVC MOD 4.
Biodiversity Management Plan	December 2020	Being revised in 2022 prior to submission to DPIE for CVC MOD 4.
Road Transport Protocol (Traffic Management Plan) and Coal Haulage Drivers Code of Conduct	December 2019	Being revised in 2022 prior to submission to DPIE for CVC MOD 4.
Seagrass Management Plan	April 2021 (Extraction Plan S5 and NMA)	Final
Benthic Communities Management Plan	April 2021 (Extraction Plan S5 and NMA)	Final
Groundwater Management Plan	December 2020	Approved with Miniwall S5 and NMA Extraction Plan April 2021, as well as the Water Management Plan incl. Groundwater Management Plan August 2021.
Built Features Management Plan	April 2021	Approved with Miniwall S5 and NMA Extraction Plan.
Public Safety Management Plan	April 2021	Approved with Miniwall S5 and NMA Extraction Plan.
Rehabilitation Management Plan	April 2021	Approved with Miniwall S5 and NMA Extraction Plan.
Subsidence Monitoring Program – Northern Mining Area First Workings and Lake Macquarie Extraction	August 2021	Approved with Delta Coal Mining Operations Plan Amendment 2.
Subsidence Monitoring Program – Miniwall S5 and Northern Mining Area Pillar Extraction	November 2020	Approved with Miniwall S5 and NMA Extraction Plan.
Pollution Incident Response Management Plan (PIRMP)	December 2021	Final
Environmental Inspection	April 2021	Final
Complaints Register	December 2021	Updated monthly on www.deltacoal.com.au

6 Environmental Performance

6.1 Air Pollution

6.1.1 Depositional Dust

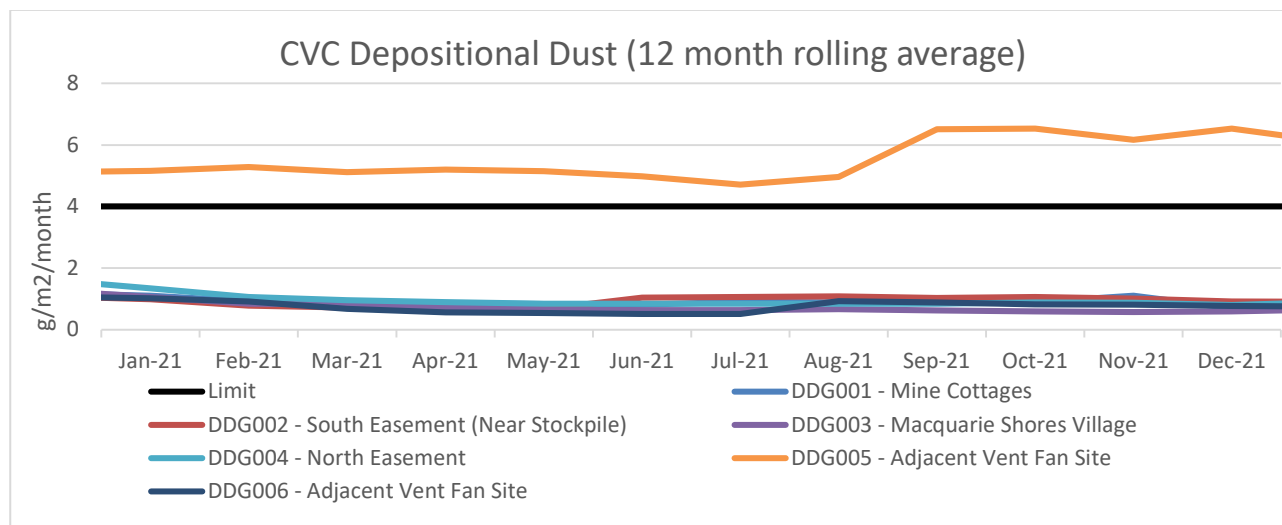
During the reporting period monitoring in accordance with the approved Air Quality Management Plan continued. Depositional dust monitoring results are shown in **Table 8** and the year-to-date averages are presented in **Figure 8**. In addition to the results during the reporting period, long term data showing the annual average depositional dust results trend from the commencement of monitoring are shown on **Figure 9**.

Table 8 - 2021 CVC Depositional Dust Monitoring (red – exceedance of 4g/m²/month, purple = increase greater than 2

Dep Dust	Limit	DDG001 - Mine Cottages	DDG002 - South Easement	DDG003 - Macquarie Shores	DDG004 - North Easement	DDG005 - Adjacent Vent Site	DDG006 - Adjacent Vent Site
Month		Insoluble Solids	Insoluble Solids	Insoluble Solids	Insoluble Solids	Insoluble Solids	Insoluble Solids
Jan-21	4	0.50	0.50	0.40	0.30	5.60	0.50
Feb-21	4	0.40	0.70	0.50	0.60	4.80	0.30
Mar-21	4	0.40	0.60	0.60	1.10	0.20	0.40
Apr-21	4	0.50	0.60	0.70	0.60	8.60	0.40
May-21	4	0.30	0.30	0.30	0.40	1.50	0.30
Jun-21	4	0.30	5.00	0.30	0.50	3.60	0.10
Jul-21	4	1.30	0.50	0.30	0.40	3.00	0.50
Aug-21	4	0.30	0.50	0.70	0.60	6.80	5.40
Sep-21	4	0.40	0.50	0.50	0.60	26.80	0.10
Oct-21	4	0.60	1.00	0.50	2.70	1.00	0.40
Nov-21	4	3.10	0.20	0.70	0.70	2.20	0.50
Dec-21	4	0.30	0.60	1.60	1.10	14.30	0.40
2021 AVG	4	0.70	0.92	0.59	0.80	6.53	0.78

Notes: 1) For site locations refer **Figure 11**. 2) red – exceedance of 4g/m²/month 3) purple – increase >2g/m²/month

Figure 8 - CVC 2021 Rolling Annual Average Depositional Dust



There was an exceedance of the annual maximum criteria for deposited dust ($4\text{g/m}^2\text{/month/annual average}$) at point DDG005 which recorded an annual average value of $6.53\text{ g/m}^2\text{/month}$ of insoluble solids for the 2021 reporting period. As described within post approval matter SSD-5465-PA-71 "DDG005 Notification 2021 – Delta Coal" (annual criteria exceedance report), the elevated results were due to dust gauge contamination (organic matter) on 6 of 12 monitoring instances during the 2021 reporting period.

An additional dust gauge (DDG006) was installed at an alternative location nearby in January 2020 and was noted to be considered more representative of potential emissions from the Chain Valley Colliery Ventilation site than DDG005. Monitoring at DDG005 continued to take place at the current location in accordance with the approved Air Quality Management Plan, however samples were also collected at DDG006 for comparison. DDG005 is proposed for removal (and substitution with DDG006) in the revised Delta Coal Air Quality and Greenhouse Gas Management Plan, currently pending Planning Secretary approval. Mining activities were not considered the cause of elevated deposited dust levels at DDG005 given the localised nature of the contamination and laboratory analysis indicating the contents of the gauge to be organic/dirt contamination with no or minimal presence of coal grains.

For the period of 13 May 2021 to 11 June 2021 DDG002 exceeded the $4\text{g/m}^2\text{/month}$ limit. Laboratory analysis indicated that the sample comprised approximately 35% polysaccharide slime, 30% dirt, 20% vegetation, 10% insects and 5 % coal. The exceedance was notified to stakeholders including DPIE on 29 June 2021 following receipt of laboratory analysis. DPIE representatives noted that the deposited dust criteria are an annual criteria and that significant sample contamination appeared to have occurred, it was requested that the exceedance be discussed in the 2021 Annual Review. It is noted that the elevated results were anomalous within the reporting period at gauge DDG002.

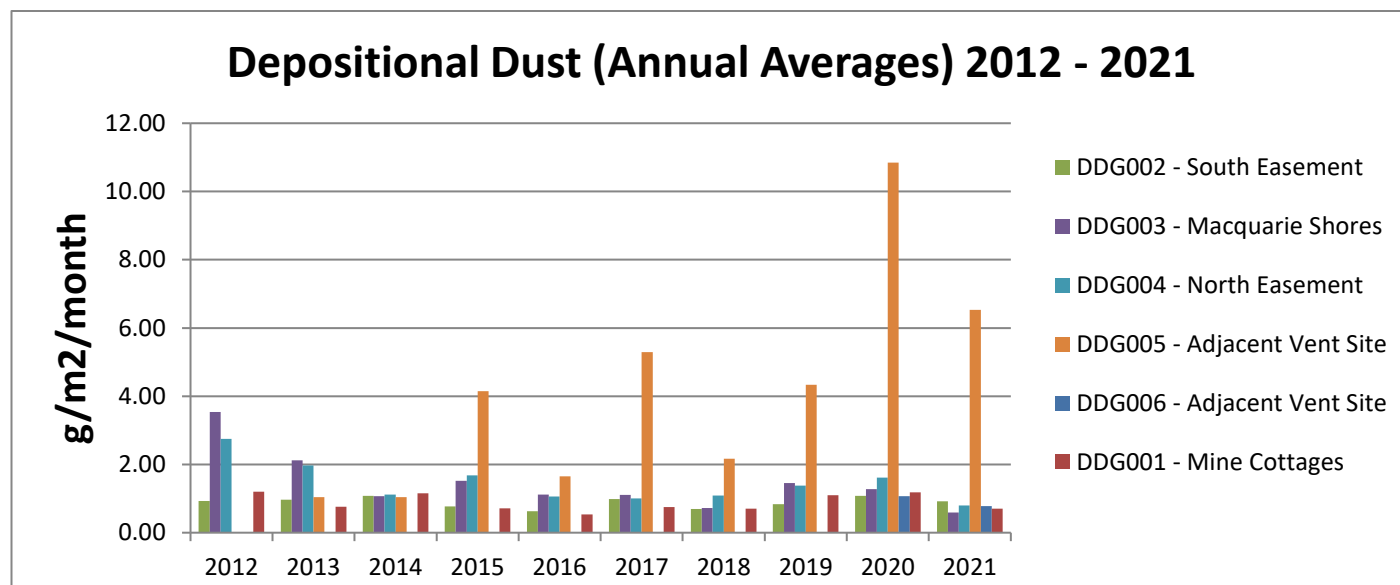
Excluding DDG005 and DDG002 (13 May – 11 June 2021), deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of $4\text{ g/m}^2\text{/month}$ at all sites. There were 3 instances where a $2\text{ g/m}^2\text{/month}$ increase was observed, DDG001 (October 2021 to November 2021 result), DDG004 (September 2021 to October 2021 result) and DDG005 (May 2021 to June 2021), the increases were 2.5, 2.1

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and also 2.1 g/m²/month respectively. The rises in deposited material were anomalous to other gauge readings located around the site.

Annual averages were similar to the maximum predicted cumulative air quality impacts identified in the EIS (May 2013) as presented in Table 7 of the Air Quality Management Plan. Deposited dust averages for CVC were lower in 2021 than in 2020 and 2019, shown on **Figure 9**.

Figure 9 - Annual Average Depositional Dust Trend



6.1.2 PM₁₀ Monitoring

The real-time air quality monitor was installed in late 2013 within the Mannering Park Wastewater Treatment Plant site. The site is identified as RTD001 with the location shown on **Figure 10**. The real-time monitor measures particulate matter less than 10 microns (µm) in size (PM₁₀).

Data capture from the real time monitor for the 2021 period was 98.4% with 359 days monitored of 365 available days. There were no exceedances of the EPA short-term 24hr average criteria (50 µg/m³) during the reporting period.

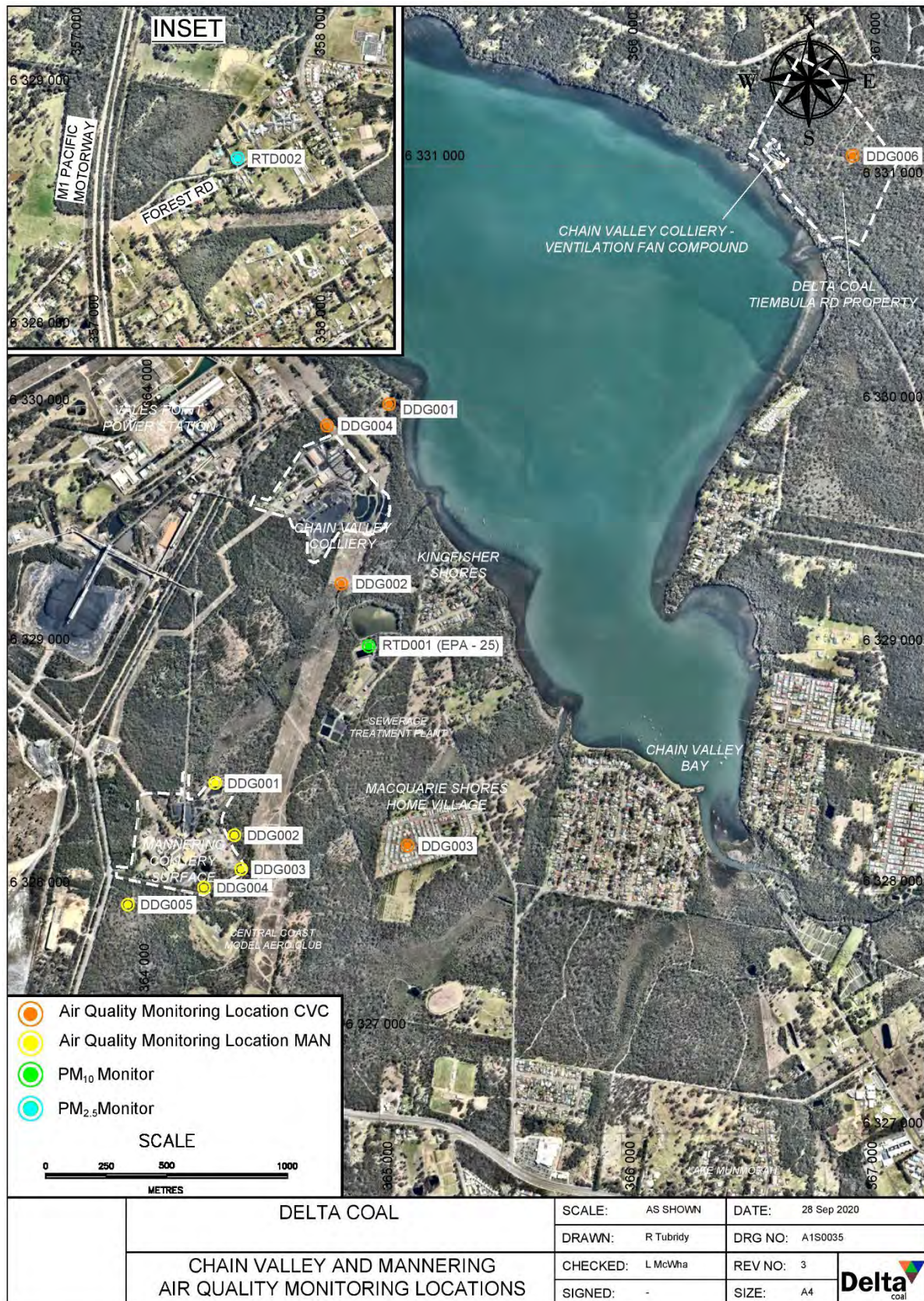
The annual average criterion (25 µg/m³) was not exceeded during the 2021 period. Daily results, the rolling average and relevant limits are shown on **Figure 11**.

Daily (24-hour) results ranged from a minimum of 2.3 µg/m³ to a maximum of 32.5 µg/m³ during 2021. The 2021 annual average of 24hr PM₁₀ results was 13.3 µg/m³. The most comparative locations from the EIS where PM₁₀ air quality modelling was completed relate to receptors R12 and R15, with cumulative PM₁₀ annual average predictions of 22 µg/m³ and 20 µg/m³ respectively. The actual location of real time PM₁₀ monitoring is in between these two receivers, as such, a result of 13.3 µg/m³ is below modelled values.

Monitoring of the PM₁₀ via the TEOM unit commenced in late December 2013. When comparing the 2021 annual results to the previous year, the data capture rate was similar to 2020. Data from the commencement of monitoring through to the end of the reporting period is shown on **Figure 12**.

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Figure 10 - Delta Coal Air Quality Monitoring Locations



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Figure 11 - CVC 2021 PM₁₀ Particulate Monitoring

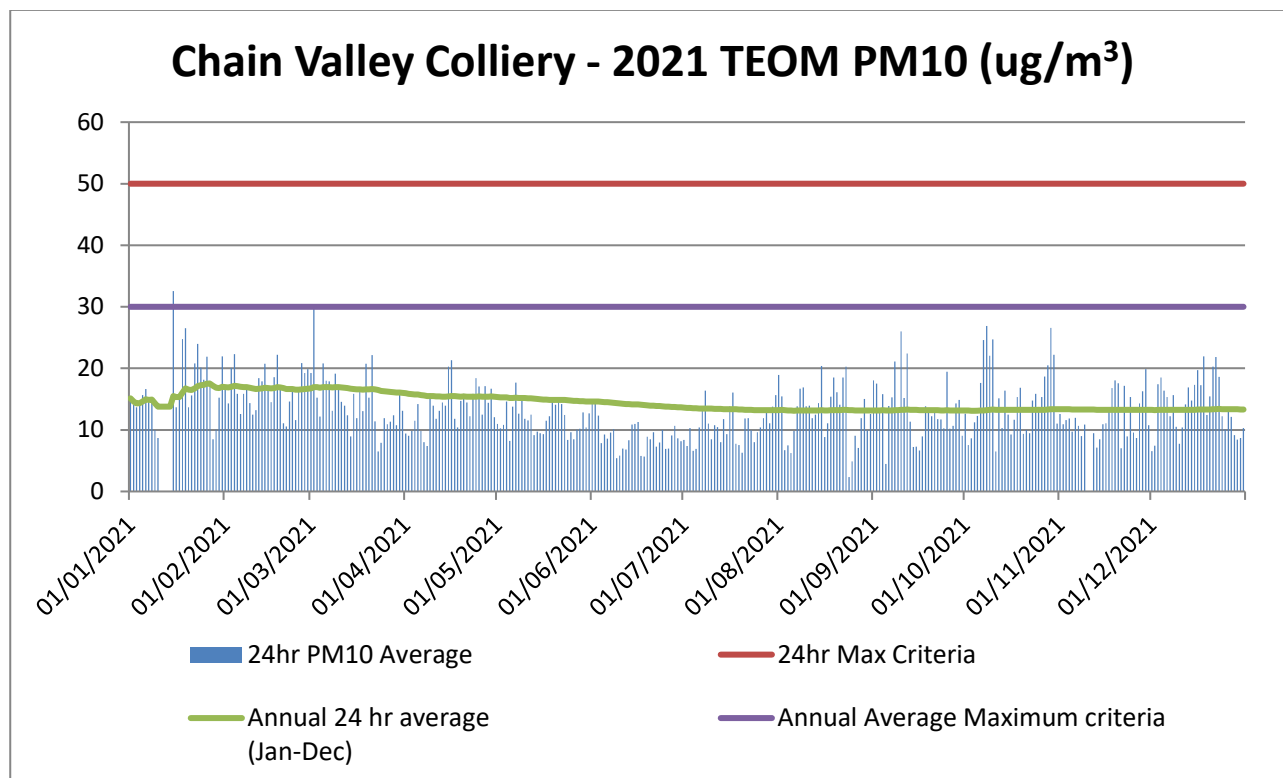
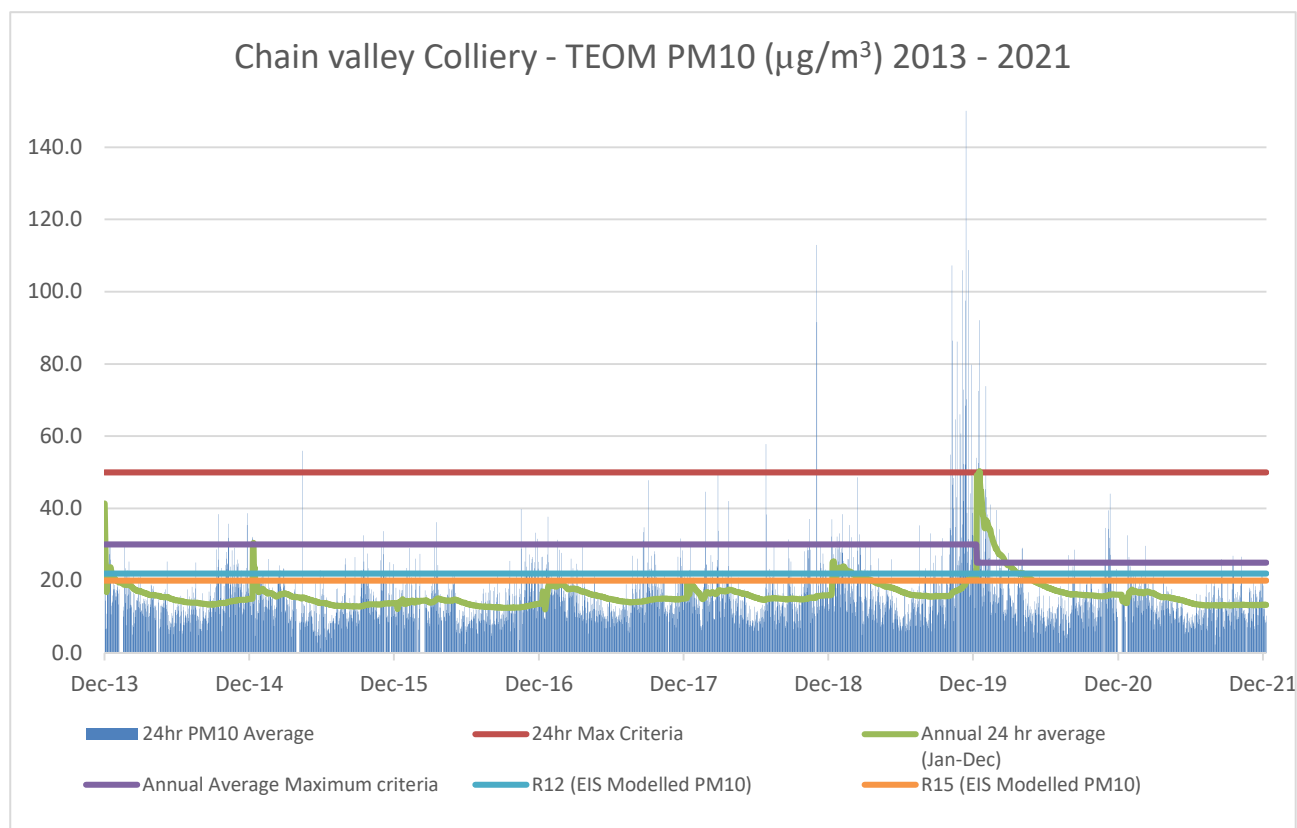


Figure 12 - Long term PM₁₀ data compared against criteria and EIS predictions



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In relation to **Figure 12**, note that the apparent yearly spikes in the rolling annual averages are associated with the commencement of a new calendar year when the annual average “resets”, and is not reflective of significant air quality changes. Additionally, seasonal variations in concentrations, particularly increases in PM₁₀ load during summer, impacts the long-term data as evident in **Figure 12**.

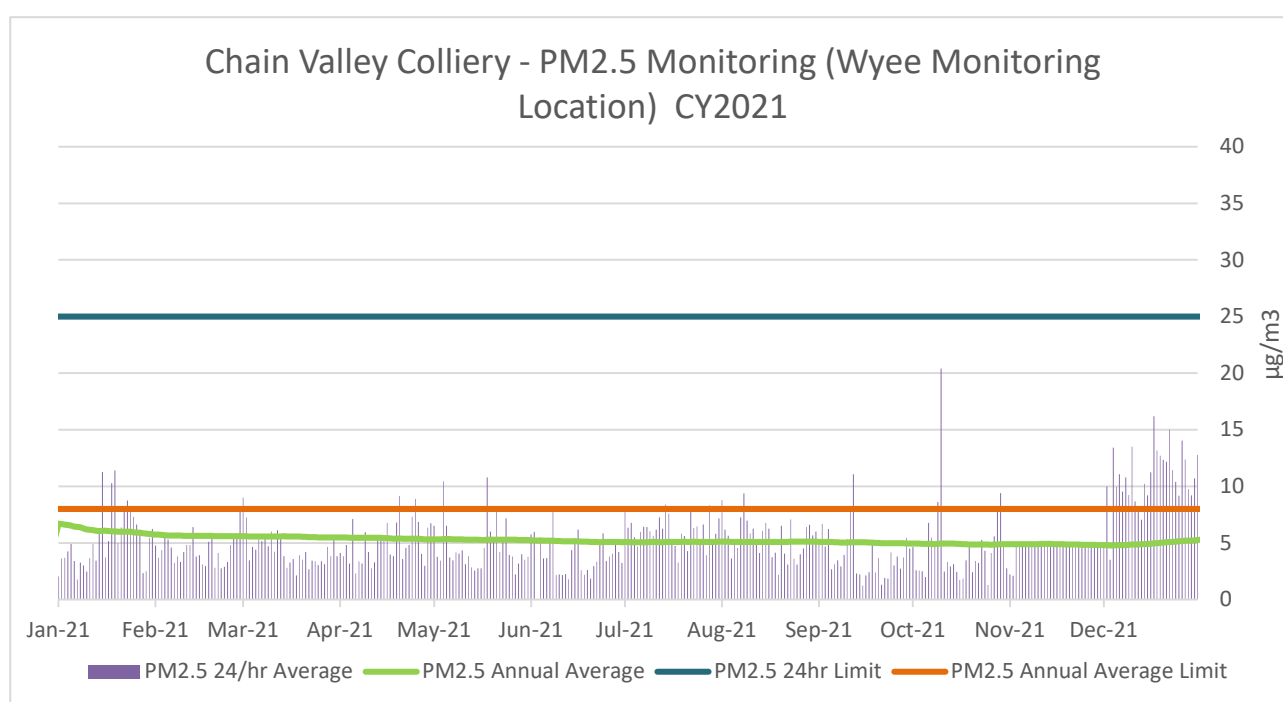
The operation of a water cart continued throughout the current reporting period. The water cart operates around the unsealed surface areas, including hardstands, roads, coal stockpile and handling area as well as the car park. There were no complaints received or environmental incidents unrelated to dust gauge contamination during the reporting period relating to dust.

6.1.3 PM_{2.5}

In accordance with Table 3, Condition 11 of Schedule 3 SSD-5465 (as modified), Delta Coal commenced monitoring of PM_{2.5} concentrations following the approval of Modification 3 to SSD-5465 in June 2020. PM_{2.5} monitoring for the 2021 period utilised Delta Electricity’s PM_{2.5} Beta-attenuation monitor (BAM) located at Tingley Road, Wyee as shown on the inset on **Figure 10**. Delta Coal’s current arrangement to monitor PM_{2.5} has been proposed in the Delta Coal Air Quality and Greenhouse Gas Management Plan, with the second revision of this plan submitted in January 2022 and pending Planning Secretary approval at the time of preparing this Annual Review (March 2022). PM_{2.5} concentrations for the 2021 reporting period have been displayed on **Figure 13**.

No exceedances of PM_{2.5} criteria were observed in the 2021 reporting period. The average PM_{2.5} concentration for the period of 1 January 2021 to 31 December 2021 was 5.26 µg/m³ with 24-hour averages between 0.0 and 20.38 µg/m³.

Figure 13 – CVC PM2.5 Monitoring 2021



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The air quality monitoring program, including depositional dust, PM₁₀ and PM_{2.5} monitoring will continue into the 2022 reporting period.

6.2 Contaminated Land

There were no significant spills during the reporting period or reports of polluted land.

There is no known contaminated land at CVC, however it is expected that a detailed contamination study, such as an environmental site assessment would be completed at a time closer to mine closure as part of the operational rehabilitation requirements.

6.3 Threatened Flora

6.3.1 Aquatic Flora

Seagrass communities are a major feature of Lake Macquarie, which have the potential to be affected by subsidence as a result of mining activities under the Lake. To ensure protection of the seagrass communities from mining related impacts a Seagrass Protection Barrier was placed around the mapped seagrass communities, with the barrier extending out to the 26.5° angle of draw to the Colliery workings. Only first workings are permitted in the Seagrass Protection Barrier, which will result in negligible subsidence (<20 mm).

Seagrass monitoring occurred during the reporting period in accordance with the 2021 seagrass monitoring report reproduced in **Appendix 3**. Seagrass transect locations are shown in the report.

The discussion from the report (Laxton, June 2021) related to the results obtained during the reporting period highlighted the following:

- In June 2021, two sea bed elevation had changed by more than 150mm from the initial sea bed height recorded. This was transects E9 outer and E16 inner. These transects are in the Chain Valley Bay where no mining has occurred since December 2017. Seagrass coverage at these transects were 100% and 98.75% respectively, indicating the change in elevation had not had tangible impact;
- In June 2021 seagrass cover ranged from 91 to 100 percent (increase from 75-100% in 2020). The health and condition of the seagrasses were fair, with most seagrasses either lightly to moderately fouled with epiphytic algae. Nine out of the fifty transects had quadrants with seagrass fouled by a heavy amount of algae. Algae coverage of the seagrasses had worsened to the prior year;
- Since 2008 seagrass coverage has been increasing throughout the study area, and percentage cover has been consistent since 2012. At transects where the percentage area of substratum covered was relatively low, such as Transects E6 (17.74%), T3 (46.20%) and T6 (53.82%). In June 2021 seagrass coverage has increased to 99.78% (E6), 98% (T3) and 25% respectively; and
- During the survey no significant subsidence was detected along the seagrass permanent transects. There were also no reductions in seagrass cover.

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Figures 10.1 to 10.6 in the June 2021 Seagrass Annual report (**Appendix 3**) details percentage changes in of seagrass coverage in the study area.

6.3.2 Terrestrial Flora

Potential impacts to threatened flora would arise from either impact or clearing of vegetation communities surrounding the pit top and ventilation shaft site which have been classified as the following communities:

Surrounding the pit top area:

- Coastal Open Woodland;
- Swamp Oak Forest; and
- Swamp Sclerophyll Forest.

Surrounding the ventilation shaft site:

- Coastal Open Woodland;
- Grassy Open Woodland and
- Swamp Sclerophyll forest.

Figure 14 and **Figure 15** identify the approximate boundaries of the communities surrounding the surface infrastructure.

A Biodiversity Management Plan was previously completed and approved in 2014. A review and update of management plans, including the CVC Biodiversity Management Plan, was completed in 2019. The latest approved version of this document is available from the Delta Coal website, the Biodiversity Management Plan is anticipated to be updated in the 2022 reporting period for Modification 4 to SSD-5465.

Annual biodiversity monitoring was undertaken by EMM Consulting in accordance with the Biodiversity Management Plan was continued during the reporting period. Due to COVID-19 impacts to both the Delta Coal and the biodiversity monitoring consultant, fieldwork was carried out in February 2022 for the 2021 reporting period, the impact of this delay to the validity and representativeness of the annual biodiversity monitoring is considered to be insignificant. The 2021 annual biodiversity monitoring report is provided as **Appendix 5**.

The annual biodiversity monitoring specifically monitors:

- the Swamp Oak Floodplain Forest condition below the sediment dams;
- Vegetation community condition at the ventilation shaft site;
- weeds (both at the pit top area and ventilation shaft site); and
- feral animal activity.

The monitoring results were assessed against the criteria and triggers within the Biodiversity Management Plan with no trigger levels being reached. Specifically, monitoring of the two established plots within the Swamp Oak Floodplain Forest, recorded a total weighted score of 68.1% which is higher than the established trigger

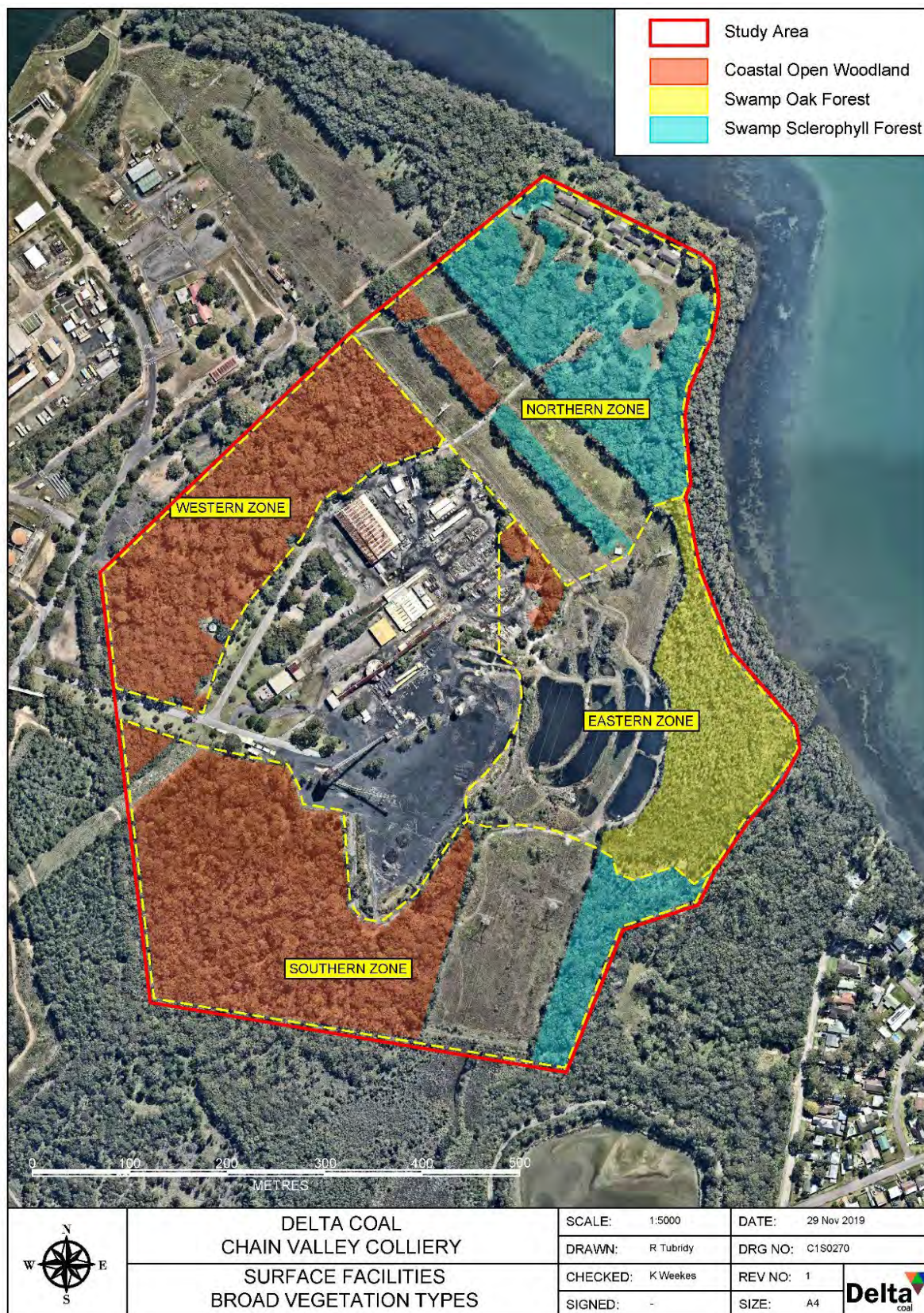
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value of 60% (refer to the Biodiversity Management Plan for details on site attributes and methodology for determining the weighted score) and consistent with the score from the previous year (2020).

No evidence of feral animals had been detected in the 2017-2019 period, however in 2020 two feral animal species were recorded using the presence of scat indicators and in 2021 one scat indicator of the European fox was identified in the Swamp Oak Forest. Weed monitoring and management is discussed in **Section 6.5**.

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Figure 14 - Vegetation Communities around the CVC Pit Top Area



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Figure 15 - Vegetation Communities around the Ventilation Shaft Site



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6.4 Threatened Fauna

6.4.1 Terrestrial Fauna

No clearing works were undertaken during the reporting period and as a result potential to impact threatened fauna or other native fauna was minimised. During annual biodiversity monitoring within the Swamp Oak Forest, one Red-necked Wallaby (*Notamacropus rufogriseus*) was observed. The annual biodiversity report for the 2021 reporting period is provided as **Appendix 5**.

6.4.2 Aquatic Fauna

In 2021 Delta Coal undertook seasonal benthic communities monitoring within the sediment of Lake Macquarie, the surveys were completed in March 2021 (autumn) and September 2021 (spring) in accordance with the approved Benthic Communities Management Plan. The spring and autumn monitoring undertaken in 2021 sampled 22 benthic stations, benthic sampling locations are shown on **Figure 16**. The March 2021 and September 2021 benthic communities monitoring reports are provided in **Appendix 4**.

In monitoring undertaken between 2012 and 2021 the mud basins off Summerland Point, in Chain Valley Bay and Bardens Bay, were found to be inhabited by 27 species of organisms greater than 1 mm in size. This list was derived from the 20 samplings undertaken between February 2012 and September 2021 (3 new species identified in 2021). Polychaete worms and bivalve molluscs were the most frequently encountered fauna.

The 22 samples of the benthos undertaken at six monthly intervals between February 2012 and September 2021 revealed the following:

- the same suite of organisms dominated each of the 22 sample stations. These were polychaete worms and bivalves;
- stations were distinguished by the relative abundance of the dominant species;
- water depth was not in any way important in determining the species composition at a station; and
- Physical variables such as salinity, conductivity and turbidity of the bottom water had little influence on the species composition of the benthos. Dissolved oxygen concentration, however, can have a major effect on abundance. Major extinction events have occurred in the mud basin of Lake Macquarie. The evidence for this lies in the presence of large numbers of intact but dead bivalve shells entombed in the mud. The cause of extinction events appears to be prolonged dissolved oxygen depletion of bottom water. Prolonged dissolved oxygen depletion of the bottom water was measured during the water quality study conducted by Laxton and Laxton (1983 to 1997). Low concentrations of dissolved oxygen in the bottom water were also recorded during the March 2020 sampling period. Stations with low abundance of organisms correlated with low concentrations in the bottom waters. Water temperature, salinity, conductivity, dissolved oxygen and pH were found to be uniform from surface to bottom. During the March 2021 sampling period, water temperature throughout the water column ranged from 24.18oC to 27.04oC; conductivity ranged from 51.68 ms/cm to 52.04 ms/cm; salinity ranged from 33.96 parts per thousand to 34.23 parts per thousand; turbidity ranged from 1.40

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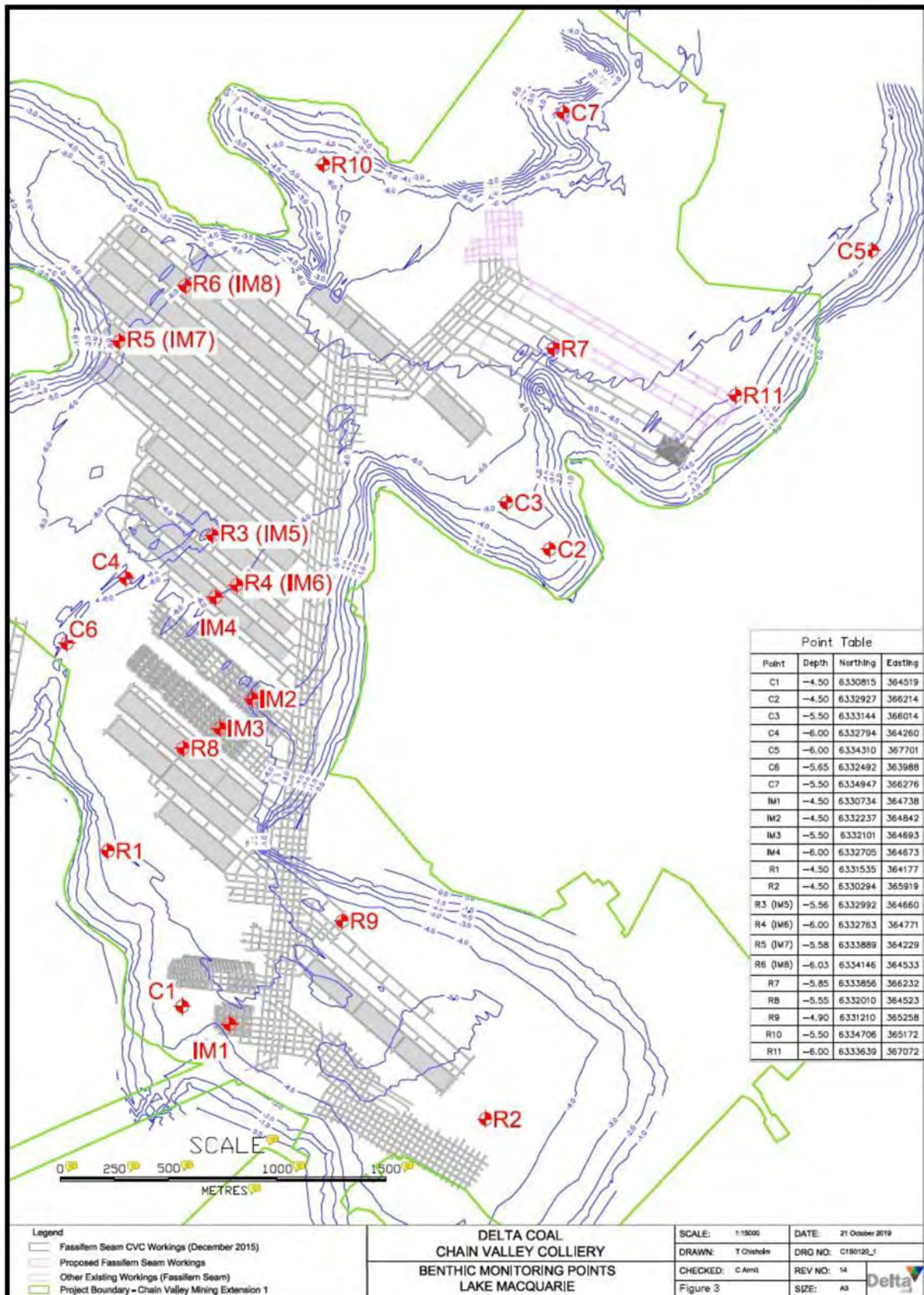
NTU to 23.40 NTU; pH ranged from 7.90 to 8.06; and dissolved oxygen concentrations ranged from 73.80% to 103.40% saturation.

- In March and September 2021, the total number of organisms found in sediment from the 22 stations were 797 and 2096 organisms collected respectively. There was a suspected extinction event observed in 2019 with recovery observed throughout 2020. The reduced number of organisms in the March 2021 was considered to be attributed to seasonal impact as opposed to an extinction event, with significant recovery observed in September 2021.

The results appear to support the notion that increasing the water depth by the predicted 0.8 m subsidence has, to date, had no discernible effect on the composition and abundance of organisms making up the benthos of the mud basin.

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Figure 16 - Benthic Sampling Locations



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Identification, treatment and ongoing monitoring are the key steps in managing weeds that surround the surface infrastructure areas (pit top area and ventilation shaft site).

During the reporting period Delta Coal engaged a land-care contractor to undertake a weed control campaign across its operational areas. The main weeds targeted included Lantana, Bitou Bush, Crofton Weed and Pampas Grass. See **Appendix 6** for the Weed Action Plan. Delta Coal will be continuing the weed control program in the 2022 reporting period. The 2021 annual biodiversity monitoring report (**Appendix 5**) noted the following regarding weed control at CVC:

“Whilst evidence of successful weed control was observed in several areas, ongoing control is recommended to suppress those weeds still present and to prevent re-establishment in treated areas.”

In the previous reporting period, Delta Coal submitted a short-term license application to Crown Lands to conduct works for the purpose of weed management and environmental restoration works on the foreshore of Lake Macquarie adjacent the development consent SSD-5465 boundary as shown in **Figure 17**. It is noted that as of June 2021 the access license ceased and Delta Coal would need to re-apply to undertake any future works.

Figure 17 - short-term license (expired July 2021) area for weed management works on Crown Lands undertaken in 2020



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6.6 Blasting

No surface blasting activities were undertaken during the reporting period at CVC. From time to time, small amounts of explosives are used underground to remove geological intrusions into the coal seam to create overcasts or inter-seam shafts. This blasting is imperceptible from an environmental impact point of view.

6.7 Operational Noise

Relevant noise criteria from SSD-5465 (Mod 4) and EPL 1770 (September 2021 variation) are provided in **Table 9**. Attended noise monitoring locations are shown on **Figure 18**.

Table 9 - CVC Noise Criteria dB(A)

Location	NMP ID	Day	Evening	Night	
		L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{A1} (1 min)
R8 (EPL Point 9)	ATN001	38	38	38	45
R11 (EPL Point 12)	ATN002	49	49	49	54
R12 (EPL Point 13)	R12	49	49	49	53
R13 (EPL Point 14)	R13	43	43	43	49
R15 (EPL Point 16)	ATN003	36	36	36	45
R19 (EPL Point 20)	ATN006	37	37	37	45
R22 (EPL Point 23)	ATN007	46	46	46	46
All other privately-owned land	-	35	35	35	45

EPL 1770 was varied in September 2021, the variation included a correction of a previous typographical error developed in the 2015 review of the EPL, being that noise criteria for EPL Point 23 were not consistent with Receiver 22 criteria in Development Consent SSD-5465, accordingly both approvals now outline the applicable criteria to be 46 dB(A) for all periods including 15 minute and 1 minute weightings.

The long-term noise goals are reproduced in **Table 10**. Mechanisms that will be used to achieve these goals are detailed in Section 4 of the Noise Management Plan.

Table 10: CVC Long-term Noise Goals dB(A)

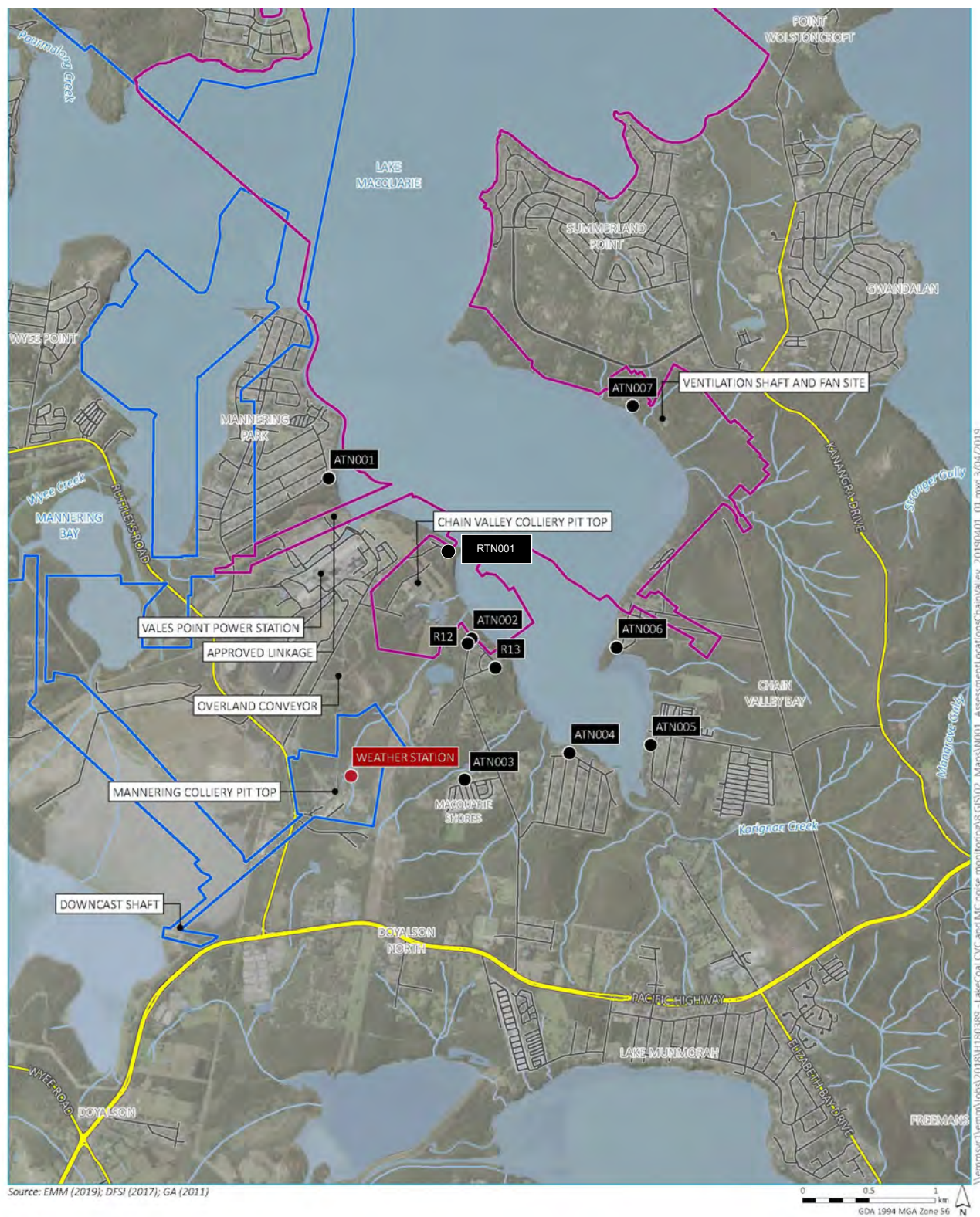
Location	Day	Evening	Night
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)
R11-13	41	41	41
R22	40	40	40

During the reporting period, quarterly environmental noise monitoring was undertaken on 24 and 25 March (Quarter 1), 15 and 16 June (Quarter 2), 17, 23 and 24 September (Quarter 3) and 16 and 17 December (Quarter 4) 2021.

Attended noise monitoring during the 2021 reporting period was undertaken in accordance with the methodologies described in the approved CVC Noise Management Plan and the Delta Coal Noise Management Plan pending DPIE approval. Attended noise monitoring results for the reporting period are provided in **Appendix 7**. CVC was compliant with the relevant limits during 2021 noise monitoring. The Delta Coal Noise Management Plan was revised and submitted to DPIE for approval during the reporting period, however is not yet approved at the time of preparing this report.

The real-time noise monitor located at site RTN001 is located adjacent the former mine cottages as shown on **Figure 18** and was re-established in October 2019. The noise logger has been functional throughout the 2021 reporting period, data is available to Delta Coal via a website interface. The Delta Coal Noise Management Plan proposes the removal of RTN001 considering the demolition of the mine cottages in 2020, with correspondence from DPIE in the initial review agreeing that RTN001 is not necessary considering the demolition of the cottages and no-nearby receivers to the monitoring location.

Figure 18 - CVC Noise Monitoring Locations



KEY

- Chain Valley Colliery development consent boundary
- Mannerling Colliery project approval boundary
- Noise monitoring location
- Weather station
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

Site boundary and noise monitoring locations

Chain Valley Colliery noise monitoring

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6.8 Visual, Stray Light

The pit top area and ventilation shaft site are not dominant features of the landscape. The pit top area is somewhat overshadowed by the adjacent power station. The ventilation fans were also designed to maintain a relatively low profile, below the surrounding vegetation to ensure amenity and lighting impacts were minimised.

There have been no significant changes to surface lighting during the reporting period and no visual amenity or lighting complaints were received in 2021.

A lighting and visual review was completed in 2019 as per the project approval conditions and the findings detailed in the most recent independent environmental audit (IEA). A letter was received from DPIE on 17th February 2020 noting that “no lighting complaints have been received by the site in 2018 or 2019. As such, future lighting survey reports are not considered necessary, unless otherwise directed by the Secretary”.

In accordance with the relevant Australian standard, no lights are directed offsite or installed to shine above the horizontal. Additionally, the nearest residents to CVC sites are approximately 300 m away.

6.9 Aboriginal Heritage

Chain Valley Colliery has a total of 3 heritage sites registered with AHIMS within the surface footprint. Two midden sites were identified in 2020 during demolition of the former mine cottages, and a known flake site adjacent the CVC pollution control dams. During 2021 no aboriginal heritage sites were identified nor were known sites disturbed, all sites within the surface foot print are fenced off-with high visibility fencing to prevent access or accidental disturbance.

The development of a Heritage Management Plan was completed during 2012 following consultation with Aboriginal stakeholders. This plan was updated and approved during 2014, the update was again completed in consultation with Aboriginal stakeholders. The primary update of the management plan was to include additional monitoring sites associated with proposed mining activities. However, mining is not scheduled to be undertaken in these areas for a number of years.

The Heritage Management Plan was updated and submitted to DPIE for approval during the 2020 reporting period, a review of the combined Delta Coal Heritage Management Plan to incorporate modification 4 to SSD-5465 is anticipated within the 2022 reporting period.

6.10 Natural Heritage

There are no sites or items of historic heritage within the pit top area and ventilation shaft site as determined by both the Environmental Assessment completed in 2011 and the Environmental Impact Statement that was prepared to support the Mining Extension 1 Project.

Accordingly, no ongoing monitoring or management actions were required and none have been undertaken within the reporting period.

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6.11 Spontaneous Combustion

The R_{70} self-heating rate value recorded for a sample from the middle of the Fassifern Seam is 3.03 °C/h. This rates the coal as having medium intrinsic spontaneous combustion reactivity for New South Wales conditions. This value is consistent with the rank and type of coal and agrees with previous test results obtained for the Fassifern Seam at CVC. The self-heating rates of the samples from the CVC are significantly lower than coals from the Hunter Valley, and are also lower than Spring Creek Mine in New Zealand and San Juan Mine in New Mexico.

Moist adiabatic benchmark tests of the samples from CVC indicate that self-heating is controlled by the moisture in the coal and the initial start temperature. Heating development to thermal runaway would take in the order of 48 to 72 days for the middle of the Fassifern Seam, but the top and bottom of the seam show self-heating over a protracted period, before any possible thermal runaway could take place. Similarly, the higher ash content Chain Valley Rider Seam also shows a protracted delay in self-heating due to its lower intrinsic reactivity.

While the laboratory R_{70} analysis of the Fassifern Seam coal at CVC indicates a medium propensity for spontaneous combustion, propensity to spontaneously combust is only one factor in a complex chain of conditions that can create spontaneous combustion in underground coalmines. There have been no known underground spontaneous combustion incidences in the Fassifern Seam at CVC. Accordingly, the risk of spontaneous combustion is considered to be low. Coal stockpiling is kept to a minimum and is managed in such a way as to limit risk of combustion.

Controls in place to mitigate the risk from spontaneous combustion include:

- sealing of extracted panels;
- consideration of spontaneous combustion issues within the mine design and utilisation of an Authority to Mine Permit;
- the development of Trigger Action Response Plans (TARP) for Spontaneous Combustion;
- segregation of extraction panels by an inter panel pillar; and
- monitoring of mine gases using a multipoint tube bundle gas analysis system and a real time gas monitoring system.

There were no incidents of spontaneous combustion at CVC during the reporting period.

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6.12 Bushfire

The pit top area contains vegetation which is considered to be bushfire prone land (Category 1) as shown on **Figure 19**. The ventilation shaft area has also been identified as containing Category 1 vegetation as shown on **Figure 20**.

As the project site is not a residential development, there are no strict requirements for fire management, with the exception of preventing fires within the project area and their spread to surrounding land.

To manage bushfire risk Delta Coal have the following management measures in place:

- a high capability for firefighting purposes through the 100 mm diameter mine water reticulation line and the mine Emergency Management System;
- firebreaks and fire trails in the vicinity of the pit top area and ventilation shaft site;
- fire hydrants and depots placed in strategic positions around the pit top area; and
- regular training of mine firefighting crews and liaison with local rural firefighting brigades.

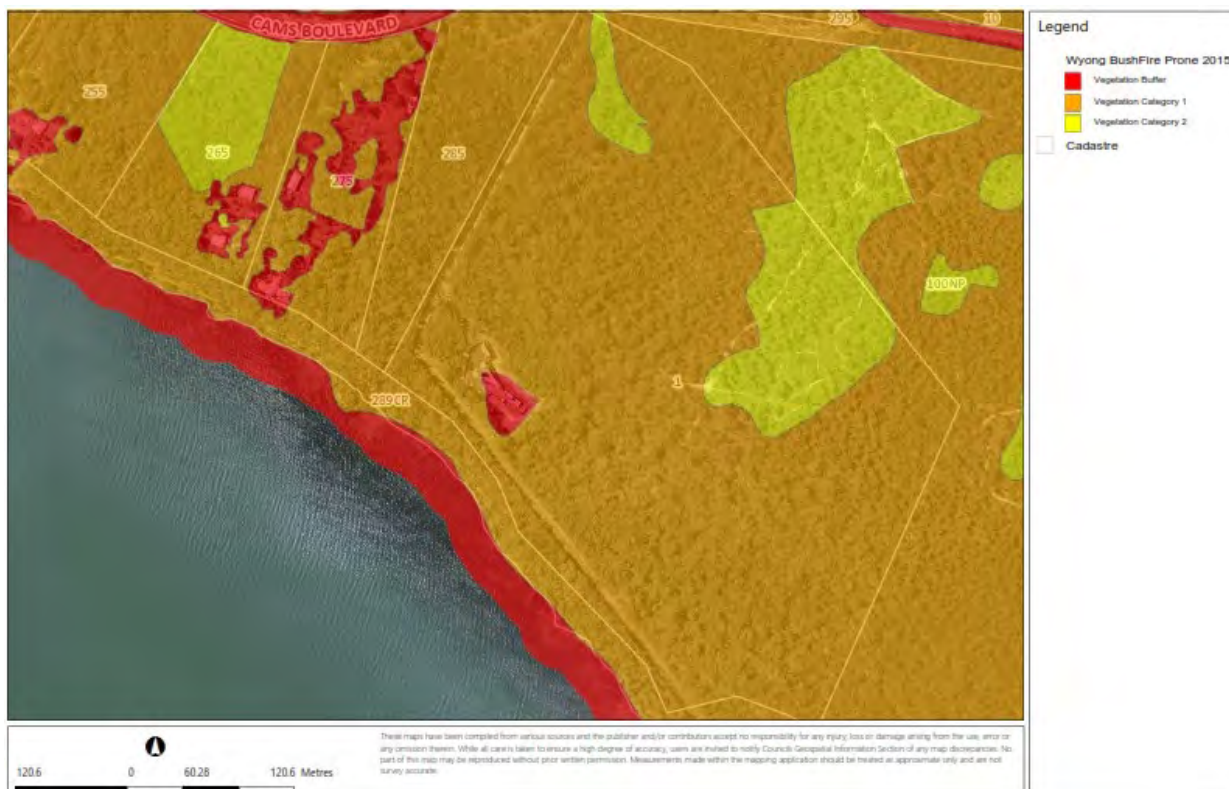
Figure 21 shows the approved Asset Protection Zone (APZ) area. The establishment of the APZ's was undertaken during the 2017 reporting period to improve its bushfire protection zones. As detailed in the Biodiversity Management Plan, fire trails are inspected annually prior to the start of the Bushfire Danger Period. This inspection is scheduled via the Work Order system. An inspection was undertaken in August 2021 with follow-up slashing and clearing as required.

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Figure 19 - Bushfire Prone Land Map for CVC Pit Top Area (Source: Wyong Council, 2015)



Figure 20 - Bushfire Prone Land Map for Ventilation Shaft Area (Wyong Council, 2015)



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Figure 21 - Chain Valley Colliery Approved APZ's and Fire Trails



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6.13 Mine Subsidence

The Annual Subsidence Report as required by SSD-5465 (Statement of Commitments) is provided in **Appendix 8** of this report, this section provides a summary of subsidence monitoring at Chain Valley Colliery.

6.13.1 Overview of Mining Progress

Please refer to **Section 4.4** for details of the mining activities undertaken during the 2021 reporting period.

6.13.2 Approvals

During the reporting period Delta Coal undertook its mining activities in accordance with its extraction plan approvals for and Miniwall S4 and Miniwall S5.

In accordance with Schedule 4 of SSD-5465, no secondary extraction was undertaken within the High-Water Mark Subsidence Barrier (HWMSB) or within 26.5 degree angle of draw to the mapped seagrass extents.

6.13.3 Subsidence Surveys

Subsidence surveys are required to be undertaken annually as a minimum, with reference monitoring points located on shorelines nearby any mining activities. Shoreline surveys are also undertaken at intervals corresponding with key Miniwall retreat milestones.

Bathymetric surveys are also undertaken each year to gauge subsidence levels over the area of secondary extraction undertaken beneath Lake Macquarie, where land-based surveys are not possible.

Delta Coals subsidence monitoring commitments are presented in **Table 12**.

Table 11 - Delta Coal Subsidence Monitoring Commitments

Type of monitoring	Pre-extraction requirements	During extraction requirements	Post extraction requirements
Secondary Extraction			
Bathymetric surveys	Single baseline survey prior to extraction	End of panel (of relevance to S2, S3, S4 and S5) Annual surveys over areas of pillar extraction (not commenced)	Annual for three years unless TARP triggered
Foreshore monitoring	Baseline survey prior to commencement of extraction	Monthly intervals	Annual for three years unless TARP triggered
Pelican Rock Navigation Marker	Baseline RL and tilt measurements	End of panel (of relevance to S2 and S3)	Visual inspection and confirmation from RMS of nil impacts
Seagrass survey points	Survey of concrete monitoring points during regular seagrass monitoring		
First Workings			
Terrestrial based subsidence monitoring (foreshore)	Baseline prior to extraction	Annual surveys during extraction unless TARP triggered	Annual surveys ongoing unless TARP triggered

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Type of monitoring	Pre-extraction requirements	During extraction requirements	Post extraction requirements
Terrestrial based subsidence monitoring (along main roads in suburbs of Brightwaters, Mirrabooka and Sunshine)	Baseline prior to extraction	Annual surveys during extraction unless TARP triggered	Annual surveys ongoing unless TARP triggered

6.13.4 Performance Measures

Performance measures summarised from SSD-5465 are detailed in **Table 13**.

Table 12 - SSD-5465 Summary of Subsidence Performance Measures

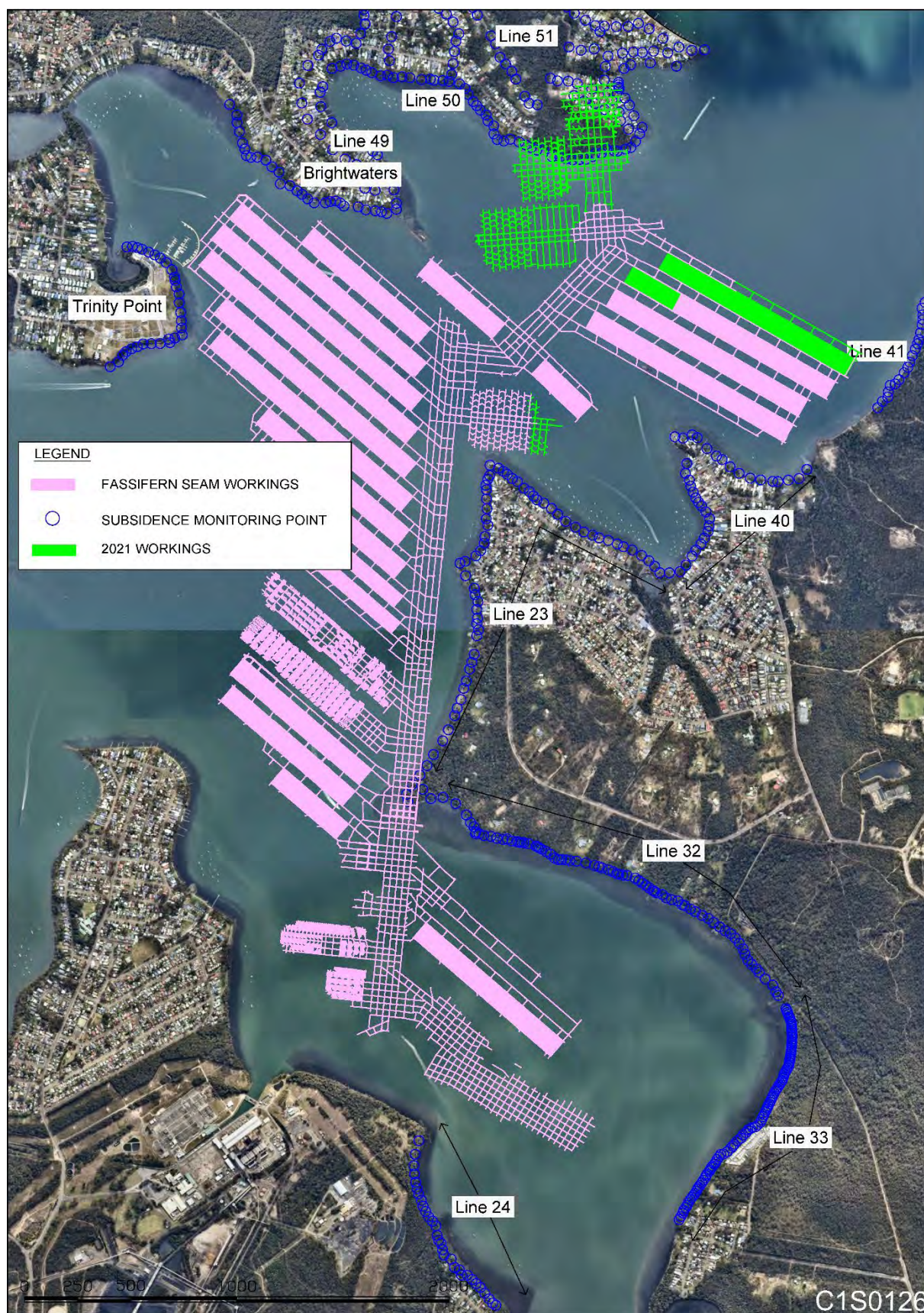
Condition No.	Condition
Schedule 4, Condition 1	The Applicant must ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within seagrass beds is limited to a maximum of 20 millimetres (mm). If at any stage predicted subsidence levels are exceeded within these areas, an ecological monitoring program shall be initiated to assess the impacts to ecological communities and threatened species and if appropriate, offsets are to be provided for any impacts detected.
Schedule 4, Condition 2	The Applicant must ensure that the development does not cause any exceedance of the performance measures in Table 6 to the satisfaction of the Planning Secretary.
Schedule 4, Table 6: Subsidence Impact Performance Measures - Natural and Heritage Features	First Workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences. They are to remain long term stable and non-subsiding
Schedule 4, Condition 4	The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 7, to the satisfaction of the Planning Secretary.
Table 7, Schedule 4: Subsidence Impact Performance Measures - Built Features	Trinity Point Marina Development and other built features. They are to remain: <ul style="list-style-type: none"> Always safe; Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated; Damage must be fully compensated.

6.13.5 Foreshore Monitoring

Delta Coal completes subsidence monitoring around Trinity Point, Brightwaters, Mirrabooka, Sunshine Frying Pan Bay, Summerland Point, Chain Valley Bay (**Figure 23**). Monitoring points occur along the foreshore at approximately 20 m – 30 m intervals where practicable / achievable with a slightly wider distribution of monitoring points in the Northern Mining Area (50 – 80 m in some areas). The results are issued to the Resources Regulator within 14 days of survey. In addition, observations are made where required to report on visual impacts or changes to public safety risk. A Subsidence Inspection Proforma is completed with each survey. The proforma includes visual inspection of steep slopes, boulder or tree instability, ponding and other potential effects of mine subsidence. Annual foreshore surveying was undertaken in January and February 2022, subsidence monitoring results are graphically presented in the 2021 Annual Subsidence Report (**Appendix 8**).

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Figure 22 - Foreshore Subsidence Monitoring Points



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Line 49, 50 and 51

Foreshore monitoring lines 49, 50 and 51 were installed with baseline levels recorded in 2021 for the purpose of monitoring potential subsidence associated with future northern mining area workings. An annual survey for areas of extraction is scheduled in 2022.

Brightwaters Monitoring Line

Monitoring points were installed along the Brightwaters peninsula in June 2016 to monitor the effects of Miniwall 11 and 12 extraction. Nil subsidence movement has been detected along the monitoring line.

Trinity Point

Monitoring points were installed in the area in 2014 for shoreline monitoring during extraction of Miniwalls 7-12 panels. A number of marks have been disturbed / destroyed due to development / construction works along the foreshore in the area, however nil movement attributable to subsidence has been detected.

Summerland Point, Lines 23, 32, 40 and 41

The foreshore along Summerland Point has been monitored since 1994, after secondary extraction was undertaken in the Wallarah beneath the south-western point (corresponding to mark S63 – 74). A maximum of 145mm of subsidence was measured (Point S71) since 1994.

Line 23 was not included and limited monitoring points were surveyed from Line 32 in the 2021 annual subsidence monitoring.

Monitoring points along Line 40 were established in 2018 to monitor the shoreline adjacent to Miniwall S1. This line was extended in 2019 as part of the subsidence monitoring program for Miniwall S2 and S3. Minor ground movement along the line is limited to $\pm 5\text{mm}$ and appears seasonal, subsidence appears to be limited to negligible subsidence ($< 20\text{mm}$). Monitoring of Line 40 was undertaken monthly during MWS2 – MWS4 extraction.

Line 41 was established in July 2020 to monitor the shoreline adjacent Miniwall S4. Monitoring was undertaken monthly during extraction and as part of annual monitoring, surveying has indicated to date nil to negligible subsidence ($< 20\text{mm}$).

Chain Valley Bay, Lines 24 and 33A

Surveys of the existing monitoring points along the foreshore of Chain Valley Bay (many of which had experienced 40-60mm of subsidence) were ongoing during the reporting period, and where required additional monitoring locations were installed. Similarly to the Summerland Point monitoring, many of the historically monitored subsidence marks have experienced greater than negligible subsidence (20mm), however no additional subsidence movement was detected during the miniwall extraction in CVB.

Monitoring results for Line 24 shows potential minor changes in level in the reporting period from points L24A-03 to L24A-17, however any identified vertical movement was negligible ($< 20\text{mm}$). No additional subsidence was observed at Line 33A within the reporting period.

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As the area where Line 33A monitoring marks are located is along a public reserve where regular slashing / brush-cutting activities are carried out, a number of monitoring points have been disturbed / moved over time. Where this type of movement occurs, the new RL point is adopted and monitoring continues (i.e. Point 62A).

Pelican Rock Navigational Marker

As described in CVC's Subsidence Monitoring Program, Pelican Rock Navigation Marker is expected to be impacted by approximately 130 mm of subsidence from mining within Miniwall panels S2 and S3.

NSW Roads and Maritime Services (RMS) has indicated a functional impact on the marker is likely to occur at 500 mm of subsidence and 5° or 87 mm/m of tilt.

A survey for RL and tilt was conducted on 10 July 2019 by Daly Smith Surveyors prior to mining and measured Pelican Rock Navigation Marker was 1.14 mm Australian Height Datum (AHD) and the navigational pole was vertical. A survey for RL and tilt was conducted on 10 July 2019 by Daly Smith Surveyors.

The following surveys were undertaken by Daly Smith after Miniwall S2 extraction in March 2020 recording the level at 1.13 m AHD and following Miniwall S3 extraction in August 2020 recording the height at 1.11 m AHD. The August 2020 measurement of the Pelican Rock Navigational Marker commented that the pole was found to be vertical and its metal base to be level. No further monitoring of the marker is considered to be required following the completion of Miniwall S3 extraction indicated approximately 300 mm of subsidence, within a range not considered to have an effect of the functionality of the marker.

6.13.6 Lake Floor Bathymetric Survey / Scanning

Chain Valley Colliery's Secondary Extraction subsidence monitoring requirements are presented in **Table 11**.

Table 13 - Chain Valley Colliery Secondary Extraction Subsidence Monitoring Commitments

Secondary Extraction Panel	Approved S_{max}(mm)	Predicted S_{max} (mm)	Measured S_{max} (mm)	Extraction Completion date	Post Extraction Monitoring Commitment
CVB1	760	440	500-550	December 2017	Annual for 3 years unless TARP triggered
Miniwall S1	780	420	<200	September 2018	Annual for 3 years unless TARP triggered
Miniwall N1	780	410	<200	February 2019	Annual for 3 years unless TARP triggered
Miniwall S2	780	300	350-450	March 2020	Annual for 3 years unless TARP triggered
Miniwall S3	780	300	350-450	July 2020	Annual for 3 years unless TARP triggered
Miniwall S4	780	300	350-450	February 2021	Annual for 3 years unless TARP triggered
Miniwall S5	780	500	350-450	August 2021	Annual for 3 years unless TARP triggered

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Secondary Extraction Panel	Approved S_{\max} (mm)	Predicted S_{\max} (mm)	Measured S_{\max} (mm)	Extraction Completion date	Post Extraction Monitoring Commitment
NMA Pillar Extraction	780	500	n/a	Not commenced in 2021.	Annual for 3 years unless TARP triggered

Bathymetric scans undertaken in the 2021 reporting period have been provided as Figure 2 to Figure 6 in the 2021 Annual Subsidence Monitoring Report (**Appendix 8**):

- MWS2 – MWS4 (monthly survey to substitute foreshore surveying) undertaken in January 2021
- CVB1 (final scan following 3 years since completion of extraction) undertaken in March 2021
- MWS2 – MWS4 (completion of extraction survey for MWS4) undertaken in March 2021
- MWN1, MWS1, MWS2, MWS3, MWS4, MWS5, NMA First Workings (annual survey and completion of extraction survey for MWS5) undertaken in September 2021.

Bathymetric surveys over the Chain Valley bay mining area have indicated subsidence of up to 500-550 mm directly over the extracted area. An increased angle of draw of surface subsidence has been detected, however, measured subsidence is within modelled predictions.

Figure 3 of **Appendix 8** compares the difference between April 2020 and March 2021 bathymetric scanning of the CVB1 area indicating nil change in detected subsidence.

Subsidence between Miniwalls MWS2-MWS4 and the Lake Macquarie foreshore was monitored via bathymetric scanning, as required to substitute foreshore monitoring, with negligible subsidence observed to the foreshore and seagrass protection zone.

Following completion of extraction in MWS4 the March 2021 detected subsidence within modelled predictions.

Subsidence over Miniwalls N1, S1, S2, S3, S4 and S5 were measured at 350-450 mm in line with predicted subsidence of approximately 400 mm.

6.14 Hydrocarbon Contamination

Hydrocarbons are managed in accordance with the site Storage of Fuel and Chemical Standard.

Suitable bunding has been installed around all liquid storage areas with an oil separator installed on the wash down sump which treats water prior to transfer of the treated water to the site sediment dams. Spill kits are also located at hydrocarbon storage areas. All waste oil is taken off site by an external licensed waste collection company. A weekly inspection regime is in place to check waste oil levels and arrange disposal on an as required basis.

During the reporting period all contaminated material encountered on site was disposed of at a licensed waste facility by the site's approved waste management contractor.

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6.15 Methane Drainage and Greenhouse Gases

Methane levels in the Fassifern seam of approximately 2 – 4 m³/t is not at a level that allows pre or post gas drainage, and as such all methane from the mining operations are ventilated from the via the main fans at Summerland Point.

The methane levels in the return are low enough to ensure operations are not adversely affected by the gas levels.

Methane levels are manageable with the existing ventilation system there are no plans to install pre or post gas drainage infrastructure at this time.

Methane emissions from CVC are reported annually to the Clean Energy Regulator in accordance with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act).

For the Financial Year 2020-2021 period (NGER reporting period) CVC emitted approximately 467,650 tonnes of CO₂-e as Scope 1 and Scope 2 emissions.

6.16 Public Safety

Public safety is primarily a concern around the surface facilities at CVC being both the pit top area and the ventilation shaft site.

The public safety around the ventilation shaft site is afforded by:

- restricting access to the site by utilising a locked access gate across the access road;
- provision of a security fence around the entire perimeter of the compound, with locked access gates; and
- security monitoring.

In relation to the pit top area, there is one sealed access road into the site which has a set of lockable gates present, which can be closed should the need arise to stop access to the site. These gates may be closed and locked at times of no expected traffic, such as during the night time period but would otherwise remain open for deliveries, employee and authorised visitor access. A security firm is also engaged to undertake scheduled site security checks and remote alarm monitoring and reporting. The security checks are random, but typically undertaken at times of higher unauthorised access risk such as nights, public holidays and weekends.

Public access will be monitored and managed during operation of the mine through the standard incident reporting process which would include reporting of unauthorised access.

A visitor login system onsite ensures that authorised visiting members of the public are assigned a site contact and that upon login the site contact is notified immediately by email of the visitors' presence onsite.

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A Built Features Management Plan was developed for the Extraction Plan associated with Miniwall S4 as well as the Extraction Plan for Miniwall S5 and Northern Pillar Extraction. This included subsidence monitoring for foreshore infrastructure.

Public safety is also a consideration in the road coal haulage operations; this is discussed in **Section 6.17**.

During the reporting period there were no incidents of injury to the public as a result of Delta Coal's operations.

6.17 Other Issues and Risks

For the review period of January 1st to December 31st 2021 approximately 640 tonnes of coal transported from the Chain Valley Colliery on the public road network to Minion Enterprises' processing plant in Carrington. The processed coal was then returned to Vales Point Power Station with a minor amount of separated contamination (i.e. stone and wood posts) sent to landfill by Minion Enterprises. As a reflection of the low truck haulage activity for the review period, no public complaints or traffic accidents/incidents were received in relation to truck haulage operations. In addition, and as part of this audit, GHD undertook a review of the Chain Valley Colliery Road Transport Protocol, which consists of the Chain Valley Colliery Drivers Code of Conduct and Coal Haulage Traffic Management Plan. GHD found no departure from the procedural requirements set out in the Protocol documents during the audit.

6.18 Summary of Environmental Performance

In summary, environmental performance during the reporting period for CVC is detailed in **Table 13**.

Table 13 - Environmental Performance

Aspect	Approved criteria/ EIS prediction	Performance during the reporting period	Trend/ key management implications	Implemented/ proposed management actions
Noise	Chapter 9 Noise (EIS, EMGA Mitchell McLennan 2013)	In accordance with approved criteria.	<p>Main trend (attended noise monitoring during 2021):</p> <p>Quarterly noise monitoring results from the AR reporting period indicate that CVC is operating within relevant limits and is not the dominant source of environmental noise within the vicinity. VPPS is audible to receivers to the north and the Pacific Highway is also audible from the south.</p> <p>The EIS predicted that that CVC will operate within acceptable noise limits.</p>	<p>There were no exceedances during 2021 quarterly attended noise monitoring (see Appendix 7 for results).</p> <p>Noise management will continue to be monitored in an effective manner.</p>
Blasting	n/a	n/a	n/a	n/a

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Aspect	Approved criteria/ EIS prediction	Performance during the reporting period	Trend/ key management implications	Implemented/ proposed management actions
Air Quality	Chapter 10 Quality and Greenhouse Gases (<i>EIS, EMGA Mitchell McLennan 2013</i>)	In accordance with approved criteria and EIS predictions	<p>Main trend (depositional dust results 2021):</p> <p>Based on modelling in the EIS, total dust emissions from CVC are expected to be minor, at less than 2 grams/m²/month. No exceedances of depositional dust limits were attributed to mining operations during the reporting period.</p> <p>The depositional dust PM10 and PM2.5 results for 2021 reflect CVC's compliance to air quality criteria, remaining minor at most locations for the reporting period.</p>	<p>The air quality monitoring program, in accordance with the approved management plan, was ongoing at the end of the reporting period. Results are detailed in Section 5.1.</p> <p>Management of air quality will continue to be monitored in an effective manner.</p>
Biodiversity	Chapter 14 Terrestrial Ecology (<i>EIS, EMGA Mitchell McLennan 2013</i>)	In accordance with approved criteria and EIS predictions/surveys.	<p>Main trend:</p> <p>Vegetation and habitat values broadly similar to previous years.</p>	<p>The biodiversity monitoring program, in accordance with the approved management plan, was ongoing at the end of the reporting period. See Appendix 5 for results.</p> <p>Biodiversity will continue to be monitored.</p>
Heritage	Chapter 15 Heritage (<i>EIS, EMGA Mitchell McLennan 2013</i>)	No predicted impact on aboriginal or non-aboriginal heritage items was identified in the EIS.	<p>Main Trend:</p> <p>No aboriginal heritage incidents within the reporting period, with 3 identified Aboriginal Heritage sites within CVC pit-top boundaries. All locations are fenced off with restricted public access to prevent disturbance.</p>	<p>Ongoing diligence and monitoring of ground disturbance activities.</p> <p>Heritage Management Plan updated in prior reporting period, revision anticipated in 2022 reporting period.</p> <p>Ongoing consultation with RAPs.</p>

7 Water Management

7.1 Water Management

7.1.1 Licenced Mine Dewatering

Delta Coal holds a groundwater bore license WAL41508 under the *Water Act, 1912*, which permits the industrial dewatering of groundwater up to volume of 4443 megalitres (ML) per year. The following details groundwater extraction volumes during the reporting period.

During the 2021 reporting period, approximately 5,735 kL of mine water was extracted per day from within the mine workings, before being pumped to the CVC surface facilities, where it is discharged into sediment dams, prior to being discharged into Lake Macquarie under NSW Environment Protection Authority (EPA) EPL No.1770 granted under the POEO Act 1997. This daily average has decreased somewhat over the reporting period when compared with 2020 daily average of 6205 kL (refer to **Section 7.1.4 Water Balance** for long term water data).

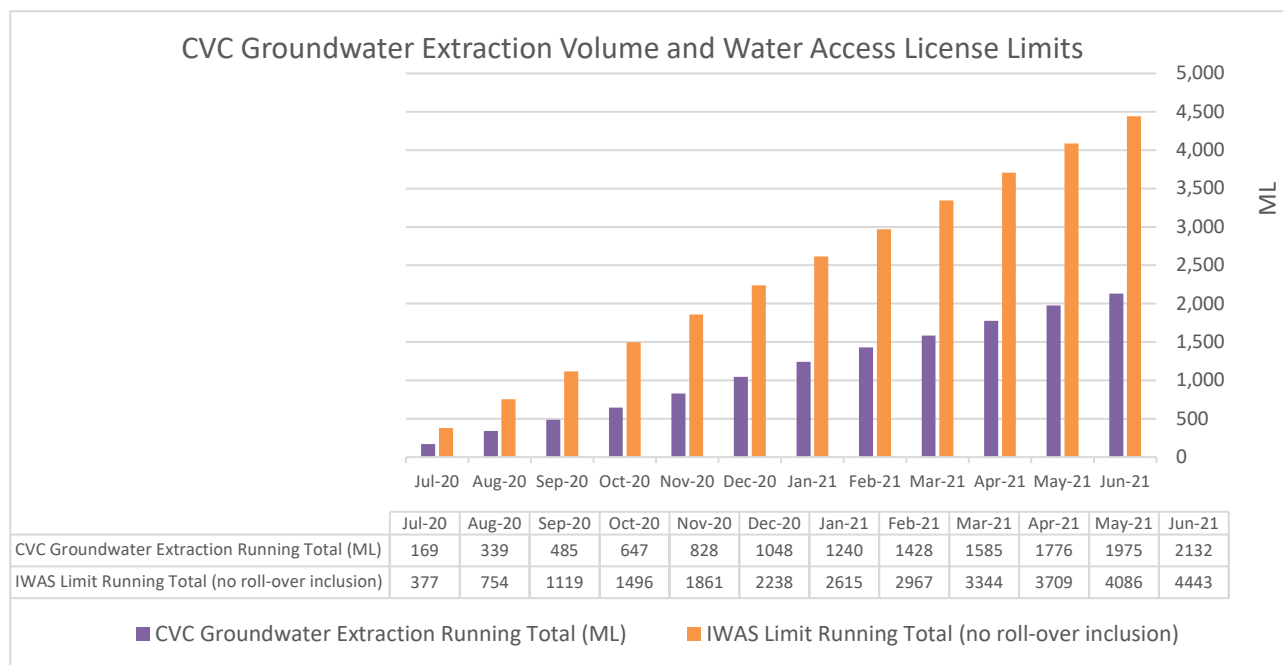
The maximum groundwater extraction on any day during 2021 peaked at 10,500 kL, which reflects the automated control of pumping limits (10.5 ML) implemented on site as committed to by Delta Coal within the Environmental Impact Statement (EIS) for the current mining operations.

Delta Coal operated well within the groundwater extraction limits prescribed by license WAL41508 as shown in **Figure 24**. Groundwater extraction data is summarised in **Table 14**.

Table 14 - CVC Groundwater Extraction, 2021

Water Access Licence	Water sharing plan, source and management zone (as applicable)	Entitlement	Passive Take / inflows	Active pumping	TOTAL
WAL41508	Sydney Basin North Coast Groundwater Source	4443 ML	N/A	2093 ML	2093 ML

Figure 23 – CVC Groundwater Extraction Volume and Water Access License Limits (WAL reporting period FY20-21)



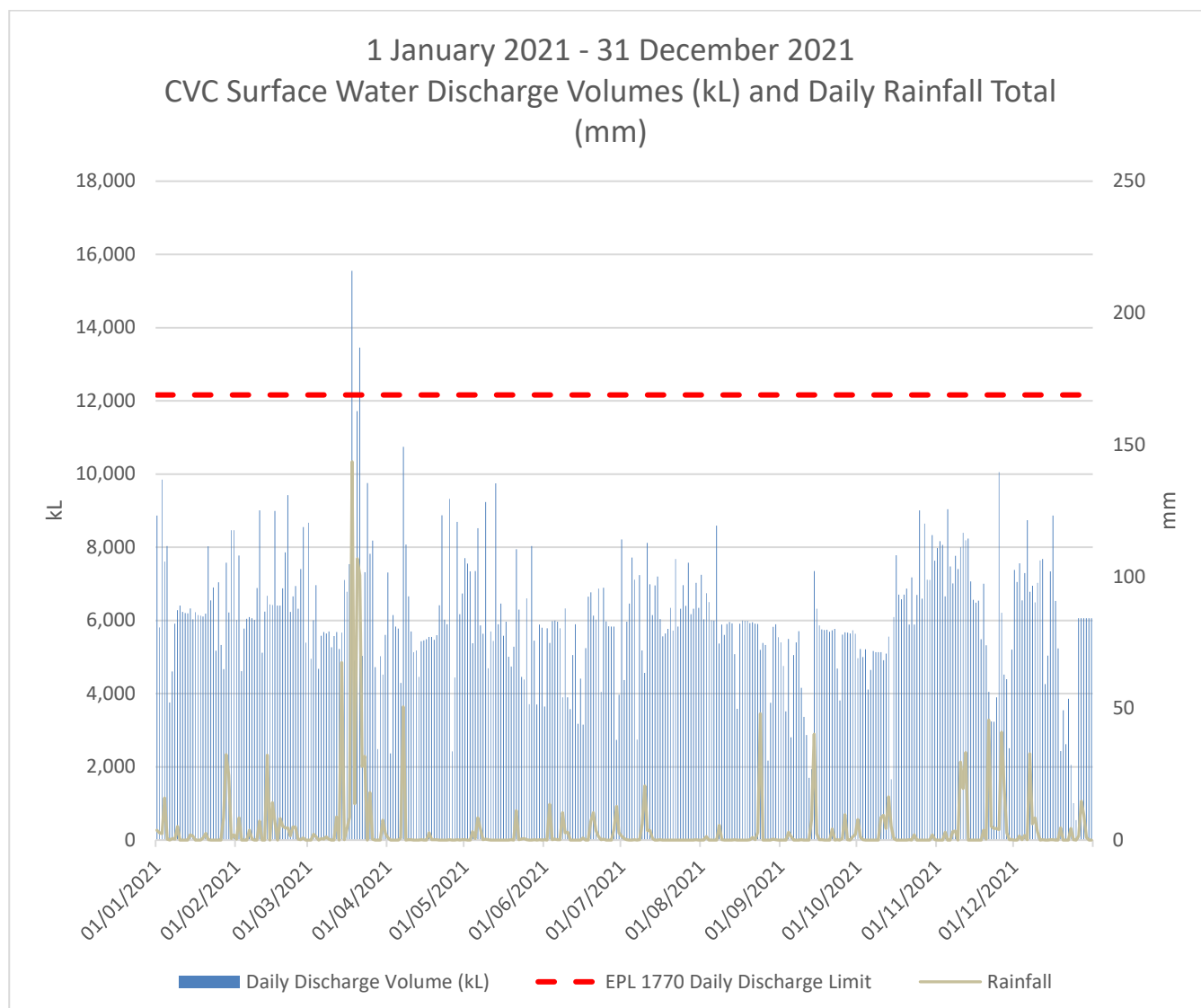
7.1.2 Licenced Discharge under EPL 1770

Delta Coal holds EPL 1770, which licences the discharge of up to 12,161 kL per day from the site. During the 2021 reporting period the daily average discharges were 6058.46 kL with a maximum of 15,555 kL and a minimum of 546 kL.

Figure 25 shows the daily discharge volumes over the reporting period. Note that discharge limits applied under EPL 1770 relate to both licenced discharge points 1 and 27 which reflect the low and high (emergency) flow discharge points at the final sediment dam. As shown in **Figure 25**, there were two exceedances of the daily volumetric limit (12,161 kL) during the reporting period on 18 March 2021 and 21 March 2021. Further detail of the volumetric exceedance is provided in **Section 7.4**.

There were two discharges via Point 27 in the reporting period on 18 March 2021 and 21 March 2021 following a severe rainfall event with high rainfall intensities. As required under EPL 1770, sampling of discharge from LDP27 is undertaken daily during periods of discharge, on both days of the volumetric discharge exceedance, LDP27 water quality limits were also exceeded. Further detail of LDP27 water quality non-compliances is provided in **Section 7.4**.

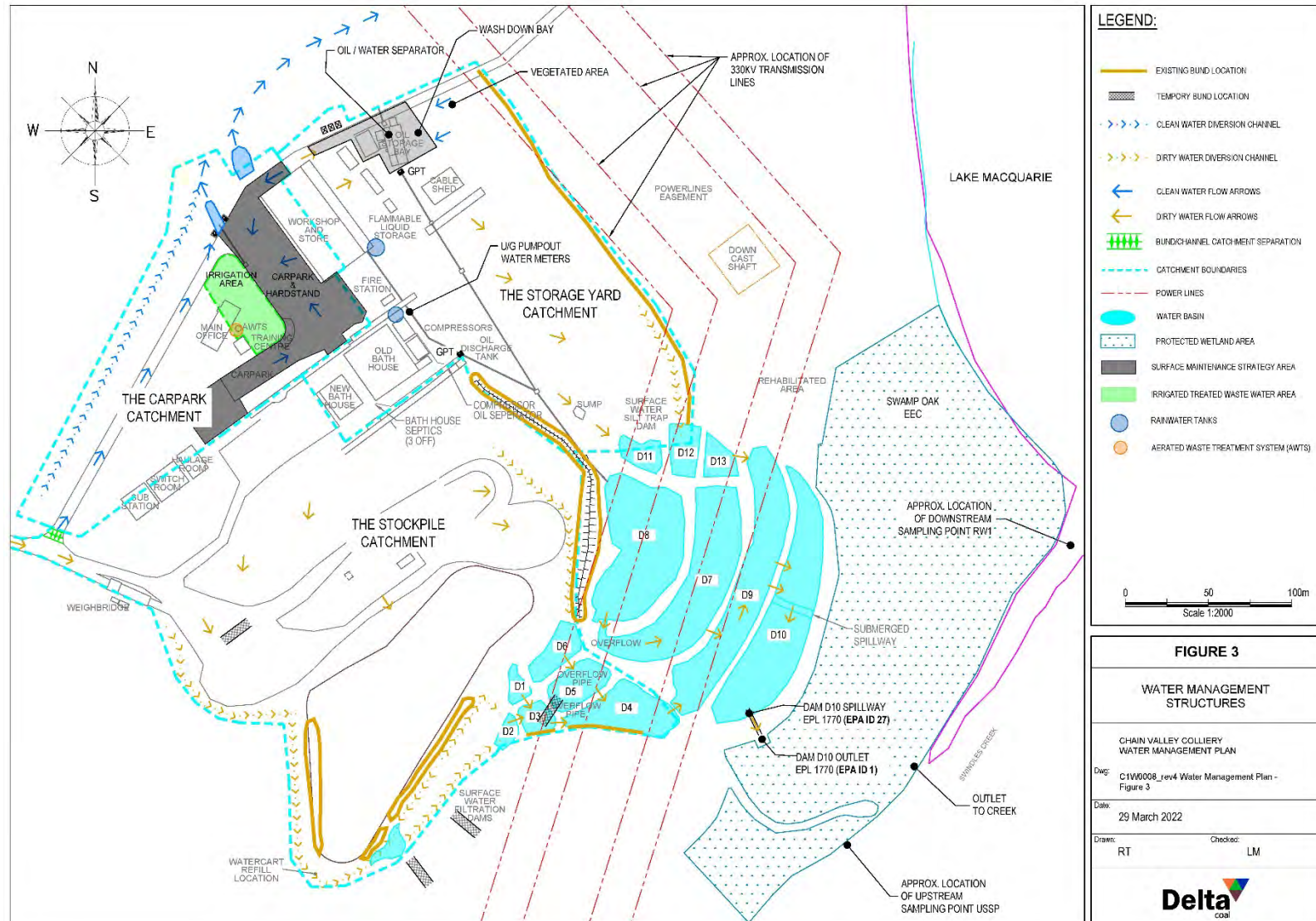
Figure 24 - Chain Valley Colliery, LDP1 Discharge Volume (2021 Period)



Water quality monitoring is required, and undertaken, at the licensed discharge point (LDP1) with sampling undertaken on a monthly basis, Delta Coal also collects water quality samples from additional locations to obtain data from receiving environments, water quality monitoring locations are detailed in **Figure 26**. Results for pH, EC, TSS and faecal coliforms are compared against the compliance limits specified in EPL 1770 are presented in **Figure 27**, **Figure 28**, **Figure 29** and **Figure 30**, respectively.

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Figure 25 - Chain Valley Colliery Water Management Structures



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Figure 26 - pH Monitoring Results at LDP1

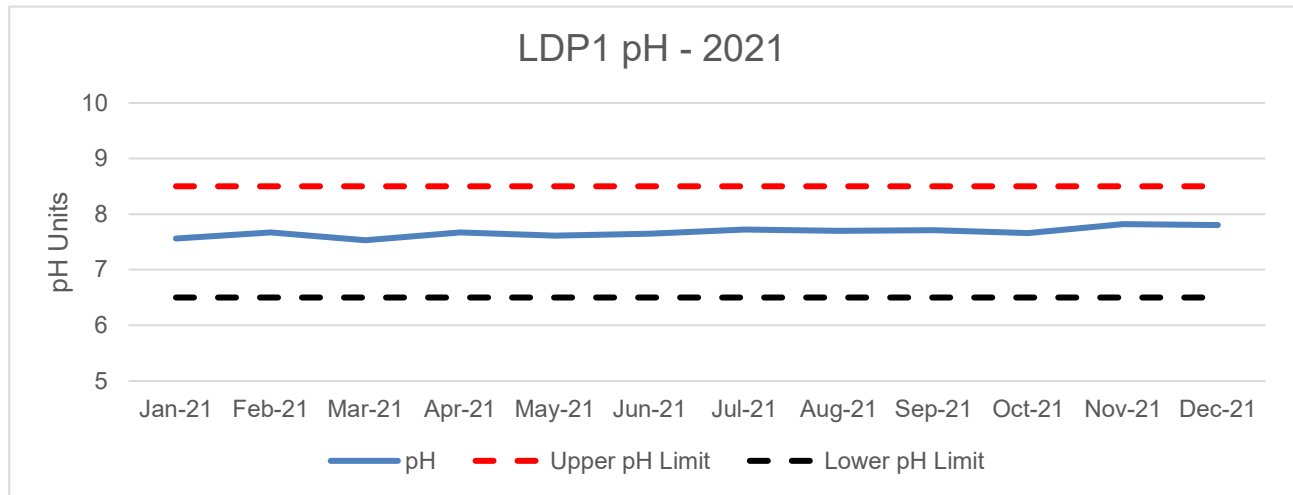


Figure 27 - Electrical Conductivity Monitoring Results at LDP1

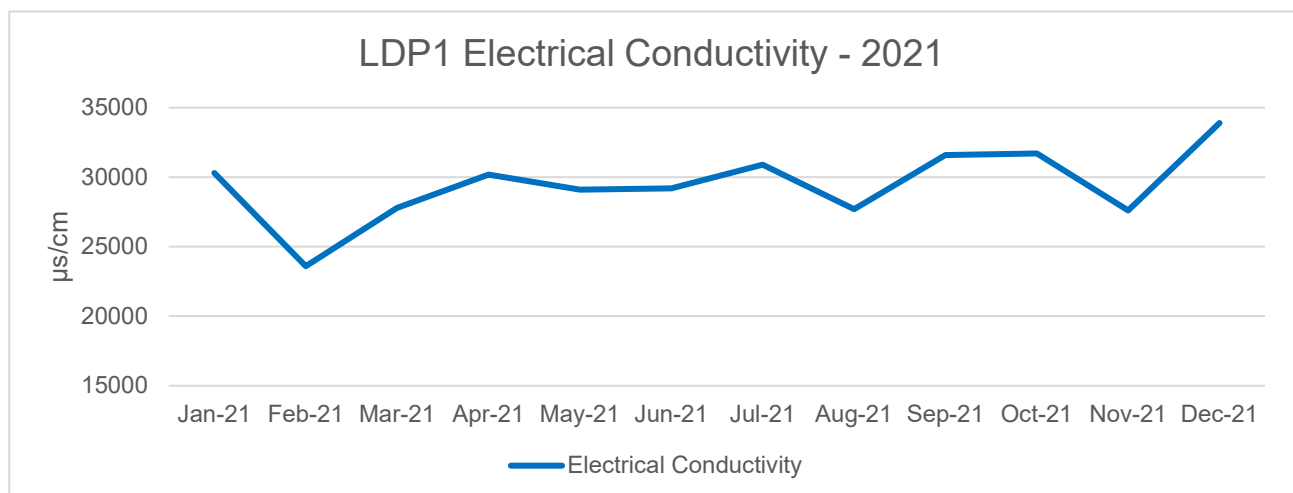
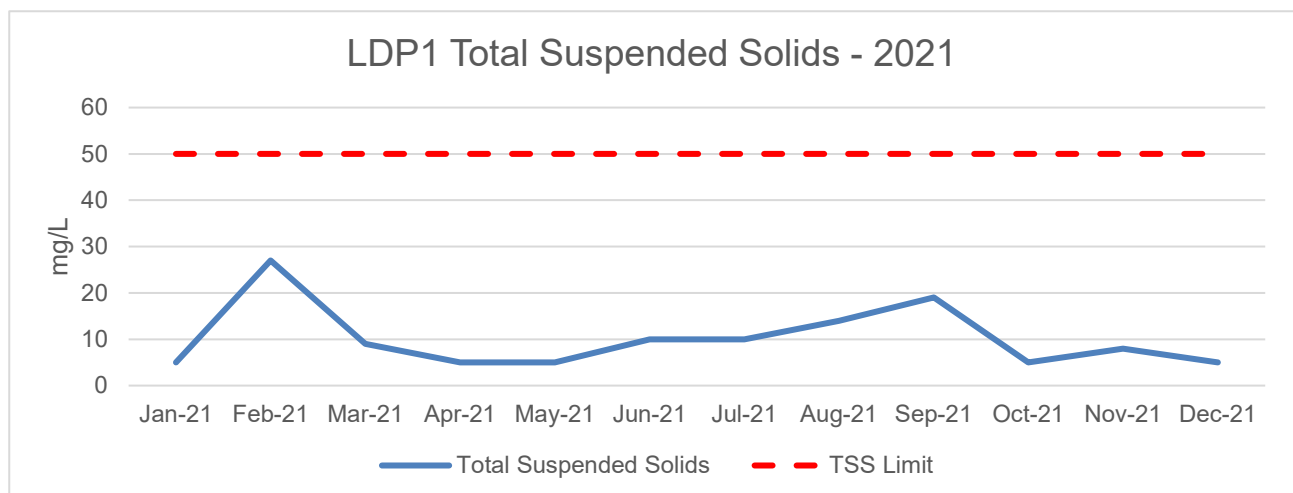


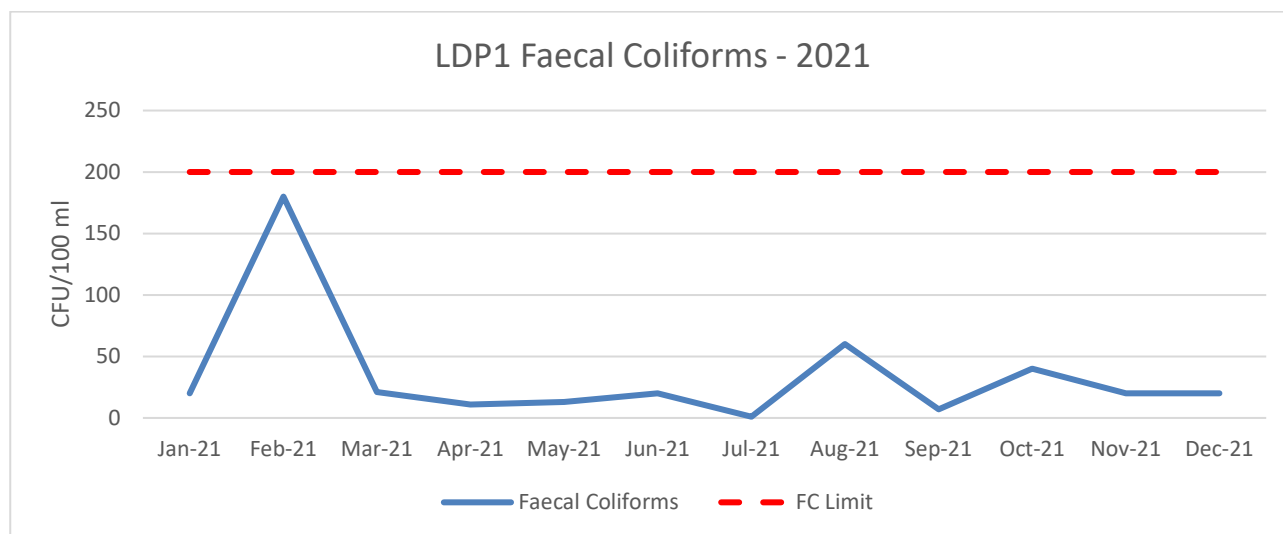
Figure 28 - Total Suspended Solids Monitoring Results at LDP1



Notes: 1. TSS results that were below the limit of reporting (<5 mg/L) have been coinservatively presented as 5 mg/L.

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Figure 29 - Faecal Coliform Monitoring Results at LDP1



7.1.3 Long Term Water Management

To assess any long-term trends in both water quality and quantity, ten years of monthly sampling data (2012 to 2021 inclusive) is presented for pH (**Figure 31**), electrical conductivity (**Figure 32**), total suspended solids (**Figure 33**) and faecal coliforms from LDP1 (**Figure 34**).

The annual average of mine dewatering volumes for the past twelve years is also presented in **Figure 35**. Note that prior to 2013, average mine dewatering volumes were calculated using the EPL 1770 reporting period (April – March), but since this time have reflected the calendar year period consistent with Annual Review requirements.

From the below figures, there are no significant trends in the water quality parameters, with infrequent spikes in faecal coliforms and total suspended solids concentrations and dips in electrical conductivity. minor trends observed are a reduction in faecal coliform concentrations, electrical conductivity and mine dewatering volumes over the period of 2012-2021.

There is no obvious increase in mine dewatering volumes over the last six or seven years, however, it is expected that this will occur over time consistent with the groundwater modelling within the Chain Valley Colliery EIS that predicts an increase in groundwater make will occur to an annual average of 10.5 ML/day (at the end of mine life). The current mine dewatering levels (approximately 5.7 ML/day during 2019) are still significantly below this level.

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Figure 30 - Long term pH monitoring results at LDP1

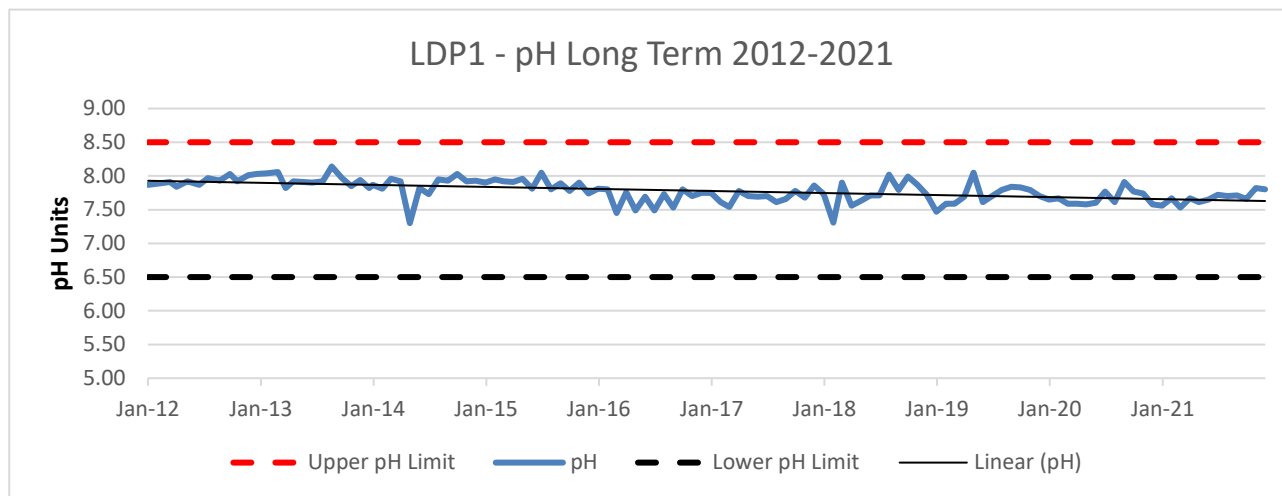


Figure 31 - Long term electrical conductivity monitoring results at LDP1

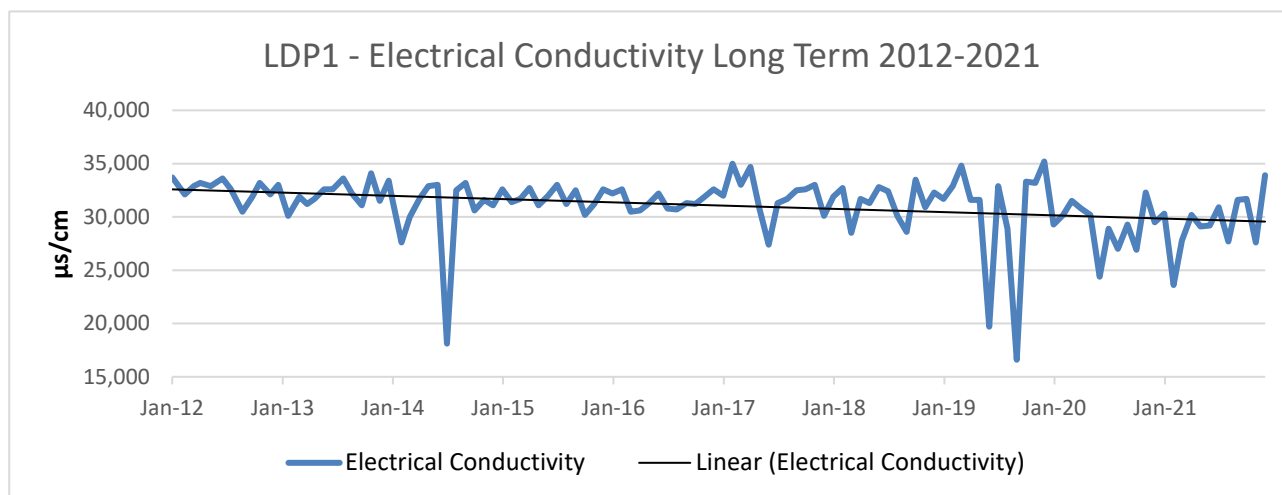
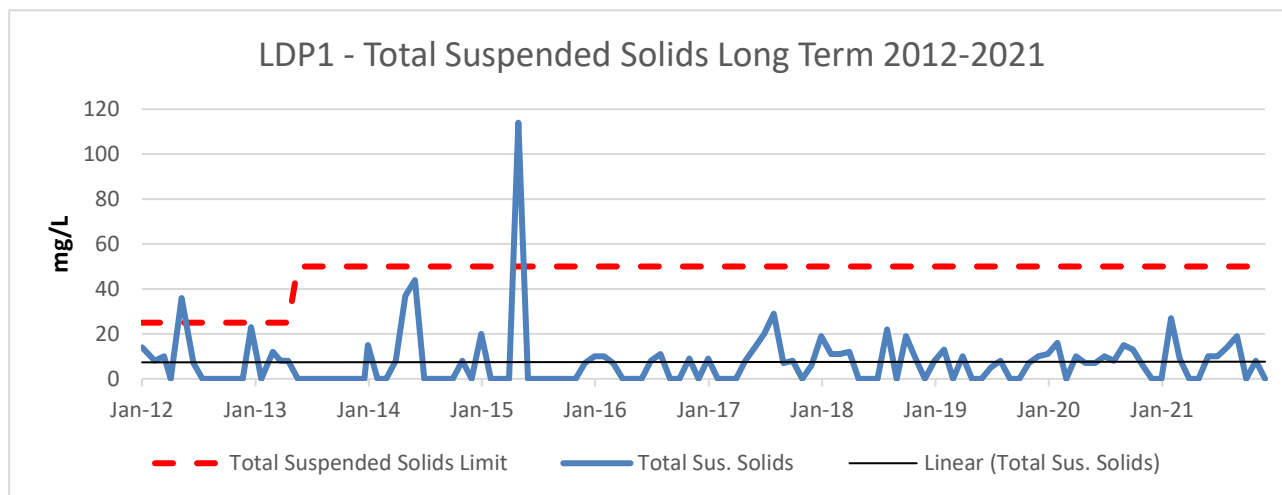


Figure 32 - Long term total suspended solids monitoring results at LDP1



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Figure 33 - Long term faecal coliform monitoring results LDP1

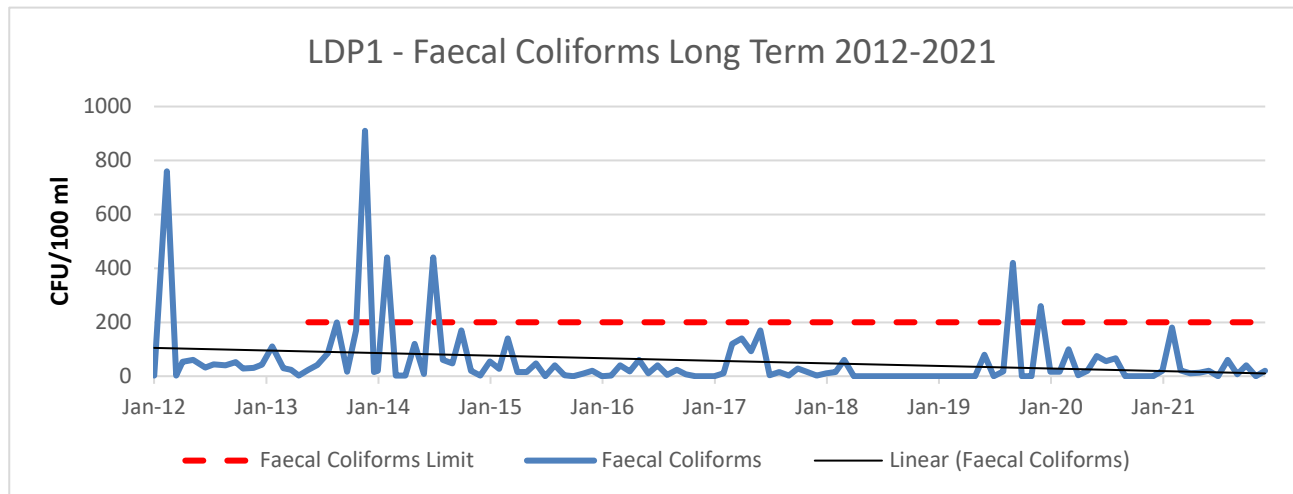
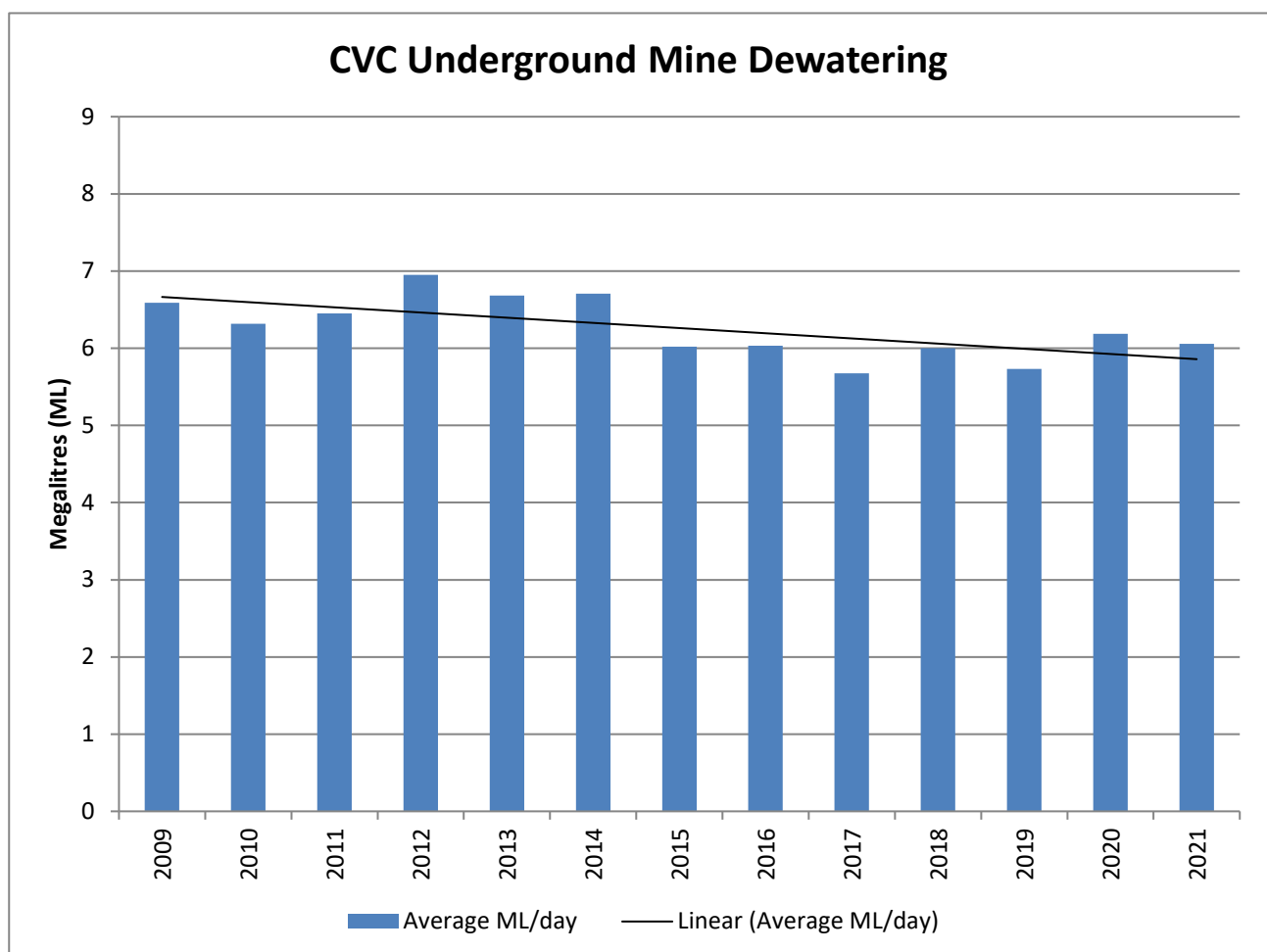


Figure 34 - Long term mine dewatering volumes



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7.1.4 Water Balance

A summary of the key water balance model predictions from the EIS compared with actual results over the reporting period are provided in **Table 15**.

Table 15 - Key Water Balance Predictions and Actual Results - 2021

Water Balance Results (from EIS)	2021 Reporting Period Result	Comment
Daily average discharge through the LDP1 of 10.716 ML	Daily annual average discharge of 6.05 ML/day	The water balance used the groundwater model end of mine life groundwater make to ensure model was conservative over the life of the mine. Result is significantly below the water balance prediction but not unexpected due to the assumptions used in the water balance.
Maximum discharge through LDP1 of 30.52 ML/day	Maximum discharge of 15.4 ML/day	While the maximum discharge is greater than the EPL volumetric limit, the result is significantly lower than water balance prediction as water balance was conducted using a daily time step model over a 100-year period, as a maximum result would not be expected except in the event of a 1:100 ARI rainfall event. It is noted that in the March 2021 rainfall event (18 th -23 rd) in NSW many Bureau of Meteorology sites had their highest daily rainfall total recorded since commencement of monitoring (>20 years) including nearby sites such as: <ul style="list-style-type: none"> • Swansea • Wyong • Dora Creek
Likelihood of LDP1 volumetric limit exceedance on any given day of 4% (or approximately 15 times per year)	Two exceedances of the EPL volumetric limit at LDP1 and LDP27 (combined volume).	Result reflects significance of rainfall events in March 2021 and improvements made to both the surface and underground water management system subsequent to the EIS modelling.
Average annual rainfall 1206 mm	1470 mm (Mannering Colliery Meteorological Station)	Similar to previous year and slightly greater than anticipated annual average.
Potable water use of 161.9 ML/yr	152.7 ML	Potable water increased to previous year due to Miniwall mining in the reporting period, however, potable water use remains below EIS predictions.

7.2 Erosion and Sediment

Mining operations and related activities that have the potential to cause erosion and/or generate sediment and impact on the surrounding catchment areas were unchanged during the reporting period and consist of:

- the exposed areas of the car park, workshop, laydown and internal access tracks;
- coal stockpiling area (not utilised for coal storage in 2021 reporting period) and coal handling equipment areas;
- vehicle and equipment movements; and
- erosion of drainage structures.

Water draining from the access road on the western side of the site runs via a number of small drainage channels through dry basins, swales or silt fencing.

The water draining from the hardstand catchment area reports to the pollution control ponds D11, D12 and D13. D13 overflows in to D9 which then flows into D10 prior to being discharged from site via the gravity fed discharge point (LDP1), or, if over-loaded via the concrete spill-way (LDP27). The pollution control ponds (sediment dams) and the location of the monitoring points are show on **Figure 26**.

Runoff from the coal handling and stockpile area is contained by two main drainage channels that surround the stockpile and report to a number of sediment dams below the stockpile. Runoff from this area can contain a significant amount of coal fines due to the nature of the activities. In the 2020 residual coal stockpiles at CVC were removed and processed off-site by a contractor for domestic sale, reducing the potential and volume of coal fines reporting to the sediment dams. The majority of the runoff from this catchment area reports to D1, D2 and D6. These dams also function as primary settling ponds before discharging into dams further downstream. Both D1 and D2 report to D3 and then into D4 while D6 reports to D5 and then into D4. Once in D4 all the water flows into D9, water from D9 flows into D10 prior to discharge.

7.3 Stream monitoring

One of the recommendations from the IEA included a requirement for reporting of stream health, channel flow and riparian vegetation monitoring of the unnamed creek. The monitoring inspections involve undertaking a visual assessment and photographs of the creek on a 6-monthly basis to identify any potential instabilities that may form as a result of operations. The results of the visual inspection of watercourse stability are recorded on a pro-forma field inspection sheet.

Monitoring has been undertaken at four locations along the unnamed creek since 2014. There has been no noticeable degradation of stream and riparian health during the reporting period, with inspections undertaken on a quarterly basis in the 2021 reporting period.

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7.4 Surface Water Pollution

There were two exceedances of the volumetric limit and two discharges via the spillway (LDP27) in the reporting period, comprising:

- 18 March 2021 – 77 kL discharged via LDP27 where 144 mm of rainfall was recorded in the 24/hr period at Mannering Colliery's meteorological station. Total daily discharge via LDP1 (gravity fed discharge pipe) and LDP27 (D10 spillway) was 15,418 kL. Groundwater discharge ceased on the morning of the event with a total of 372 kL discharge to surface dams. A sample was collected from LDP27 discharge waters as required by EPL 1770. The sample was analysed for pH (7.73 pH units), electrical conductivity (8,990 μ S/cm), total suspended solids (TSS) (158 mg/L), Enterococci (1,100 CFU/100ml) and Faecal Coliforms (~4000 CFU/100ml), the sample exceeded EPL 1770 TSS and Faecal Coliform concentration limits of 50 mg/L and 200 CFU/100ml respectively;
- 21 March 2021 – 26 kL discharged via LDP27 where 101 mm of rainfall was recorded in the 24/hr period at Mannering Colliery's meteorological station, total combined LDP1 and LDP27 discharge was 13,411 kL. A sample was collected of LDP 27 discharge waters and analysed for pH (7.8 pH units), electrical conductivity (1,500 μ S/cm), TSS (478 mg/L), Faecal Coliforms (~730 CFU/100ml) and Enterococci (860 CFU/100ml). The sample exceeded EPL 1770 TSS and Faecal Coliform limits. Groundwater discharge to the sediment dams had ceased two days prior to the exceedance.

There were no exceedances of pH water quality criteria during water quality monitoring within the reporting period. Notably all exceedances of water quality limits recorded within the reporting period were in relation to significant rainfall events, all greater than 100 mm/24hr. Septic systems are maintained with a weekly inspection undertaken by the waste management contractor and vacuum pumping as required.

7.5 Groundwater Pollution

There was no evidence of groundwater pollution detected during the 2021 reporting period, and there has been no groundwater pollution previously identified at CVC.

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8 Rehabilitation

8.1 Buildings

There were no changes to the site infrastructure in the 2021 reporting period.

8.2 Rehabilitation of Disturbed Land

There were no significant rehabilitation works on disturbed lands during the reporting period.

Infrastructure pertaining to coal conveyors and ROM coal handling facilities were demolished on site in the previous reporting period (2020). Former mine cottages and the land they occupied adjacent Lake Macquarie were demolished in 2020 with the rehabilitation of the land ongoing within the 2021 reporting period. The area is being rehabilitated to an open grasslands land use scenario through the collection and chemical analysis of representative soil samples and active spreading of native grass seed and fertiliser. At the completion of the 2021 annual reporting period, the site has returned to open grassland, with active noxious and priority weed management ongoing in the 2021 reporting period. It is not anticipated that the rehabilitated area will be relinquished from the mining lease.

A summary of the rehabilitation statistics for Chain Valley Colliery is provided in **Table 16** and **Table 17**. The sites layout as current is presented as **Figure 36**.

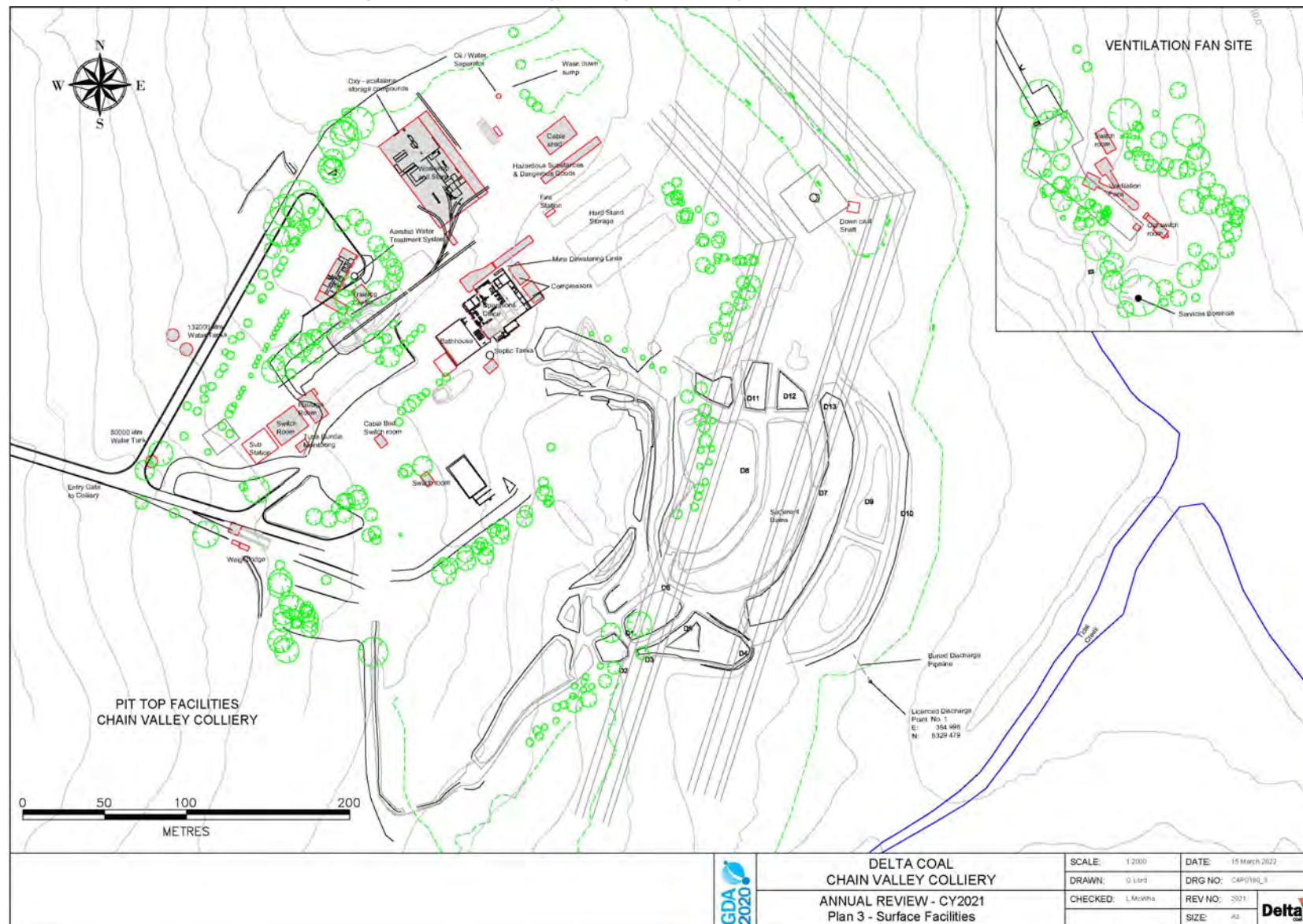
Table 16 - Summary of rehabilitation at CVC

	Last period (2020)	This period (2021)	Next period (2022)
A Total mine footprint (managed by Delta Coal)	Approximately 14.70 ha	Approximately 14.70 ha	Approximately 14.70 ha
B Total active disturbance	14.70 ha	14.70 ha	14.70 ha
C Land being prepared for rehabilitation	Nil	nil	Nil
D Land under active rehabilitation	Nil	Nil	Nil
E Completed rehabilitation	Nil	Nil	Approximately 0.69 h (with ongoing land management)

Table 17 - Maintenance activities on rehabilitated land at CVC

NATURE OF TREATMENT	Area Treated (Ha)		Comment/Control Strategies/Treatment Detail
	This period (2021)	Next period (2022)	
Additional erosion control works (drains re-contouring, rock protection)	0	0	No additional works required.
Re-covering (further topsoil, subsoil sealing etc.)	0	0	n/a
Soil treatment (fertiliser, lime, gypsum etc.)	0	0	n/a
Treatment/management (grazing, cropping, slashing etc.)		0	n/a
Re-seeding/replanting (species density, season etc.)		0	n/a
Adversely affected by weeds (type and treatment)	Approx 7	7	Ongoing implementation of a weed management program of noxious weeds including but not limited to lantana, bitou bush, asparagus fern and pampas grass, physical removal and poisoning of stems as appropriate.
Feral animal control (additional fencing, trapping, baiting etc.)	0	0	No feral animal control undertaken during the reporting period.

Figure 35 - Chain Valley Colliery Surface Layout and Landscape - 2021



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8.3 Rehabilitation Trials and Research

No rehabilitation trials or research was undertaken during the reporting period.

8.4 Further Development of the Final Rehabilitation Plan

The current approved Rehabilitation Management Plan was updated in April 2021, it was provided to regulators and stakeholders as required by Condition 27, Schedule 3 of SSD-5465. The updated management plan was approved with the approval for CVC's Miniwall S5 and Northern Pillar Extraction Plan.

The contents of the plan were used to form the basis of the Mining Operations Plan for CVC which is current until 31 December 2023. The proposed final rehabilitation landforms, consistent with both the Rehabilitation Management Plan and Mining Operations Plan is presented as **Figure 37**.

8.5 Post Rehabilitation Land Use(s)

As identified in the current 2020-2023 Mining Operations Plan (Amendment 2) the post mining land uses for CVC is to revegetate the surface facilities areas to a near-native ecosystem compatible with the surrounding vegetation communities. As the goal is to return the areas of disturbance to a native plant community (or communities) aligned with the surrounding bushland, no introduced species (e.g., *Melaleuca armillaris*, *Pinus radiata* and non-endemic eucalypts) would be used in the revegetation program. The focus of the works would be the use of locally occurring species plant preferentially grown from locally sourced seeds. CVC is on land owned by Delta Electricity who will, therefore, be a key stakeholder in determining the vegetation selection and landform of the area.

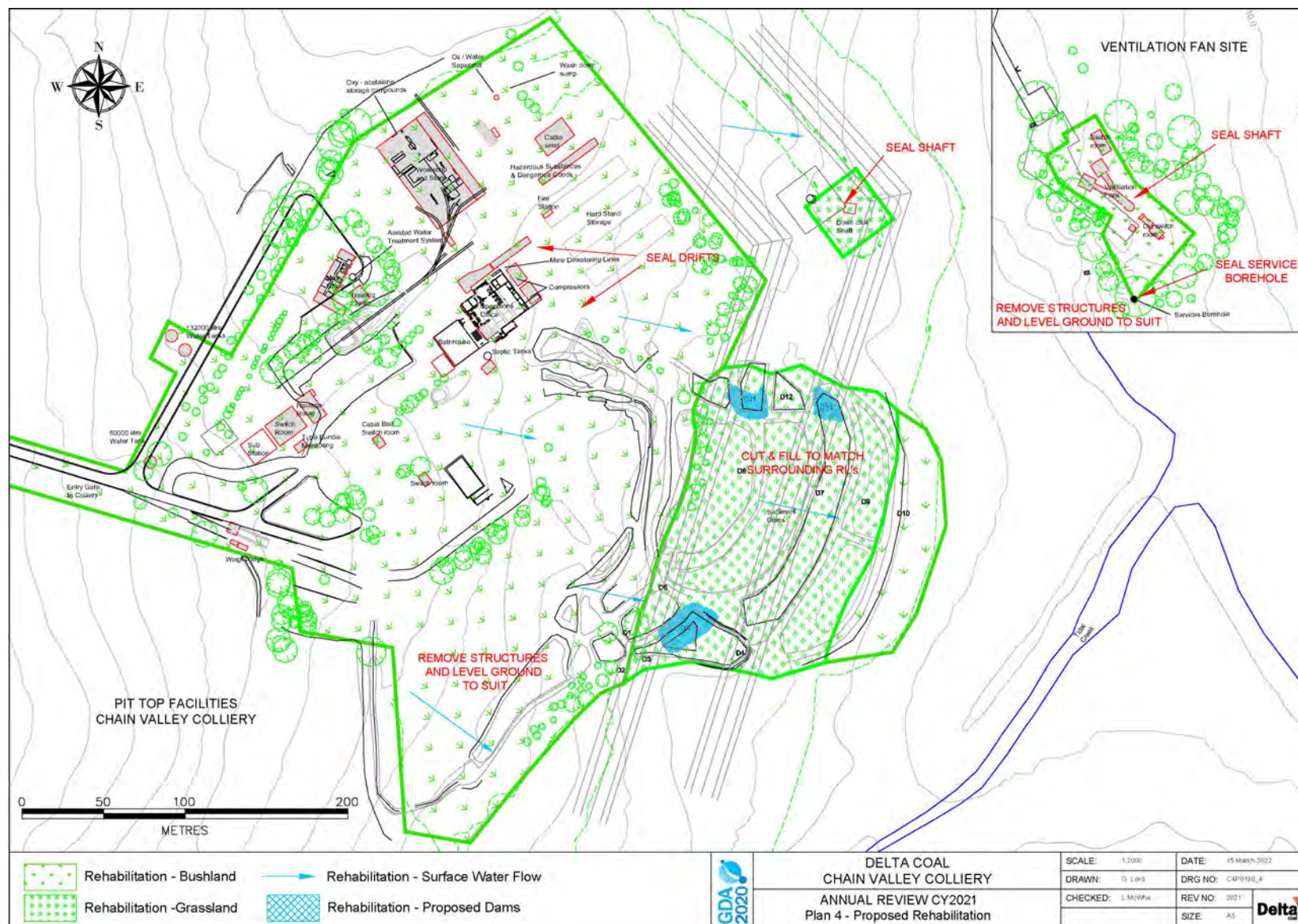
Some areas will be revegetated to grassland where this is consistent with the final land use and surrounds. This applies to the areas within existing high voltage power line easements, where the existing grassland vegetation communities are actively managed to ensure they have no impact to the transmission of electricity for the state. Accordingly, a grassland community is both consistent with other areas within the easement and considerate of future management requirements (as the high voltage power lines will remain following mine closure).

The final land use for each of the secondary domains is:

- Domain A - Establishment of a native bushland ecosystem compatible with the surrounding vegetation communities, which includes targeting a final vegetation community comparable to:
 - Coastal Open Woodland (for majority of Chain Valley pit top);
 - Swamp Sclerophyll Forest (for Chain Valley upcast shaft).
- Domain B - Establishment of grass cover consistent with surrounding grass species for the:
 - Areas of the Chain Valley site that are within existing high voltage power line easements;
- Domain C – Retention of water management structures.

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Figure 36 - Chain Valley Colliery Proposed Rehabilitation and Final Landform



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8.6 Decommissioning

During mine closure the following actions will be taken with respect to the buildings and structures associated with the mining, preparation and transport of the coal:

- any plant, structures, buildings or conveyors would be preferentially sold and/or relocated for reuse at another mining operation
- the remaining surface conveyor plant, buildings and built structures will be demolished or removed. All demolition is to occur in accordance with AS 2601-2001: The Demolition of Structures (or its latest version at the time)
- concrete pads and footings will be either completely removed or removed to a minimum 1 m below surface levels and disposed of at an appropriate place or recycled, and following removal will be covered with at least 300 mm of growth medium
- roadways not required for access to the mine site or other areas for purposes such as bushfire management will be rehabilitated
- asphalt hardstand will be removed
- all services not required following mine closure will be disconnected and any stored energy dissipated;
- mining related power lines within the domains will be removed
- mining related surface services will be removed
- buried services encountered during civil works will either be completely removed or removed to 300 mm below the final landform level and remain buried. As mentioned above, all services, including buried services will be safely disconnected and have any stored energy dissipated.

These proposed actions could be subject to change during the mine closure process depending on requests by the landowner for infrastructure to be left in accordance with alternative future land use options. Additionally, it is noted that while services will be disconnected to the majority of the site during decommissioning activities, services may remain connected to a portion of the site for beneficial use during the later rehabilitation phases (such as watering tube stock) and subsequently would be disconnected following ecosystem establishment.

The decommissioning phase will also address the following:

- risks associated with any remaining combustible materials. An assessment of combustion risk will be undertaken and specific controls implemented based on report findings
- completion of Environmental Site Assessments, with specific focus on areas around storage tanks, oil storage areas, fuel dispensing locations, service areas, buildings housing powered plant and known locations of hazardous materials
- undertaking any necessary contamination remediation, if required, to ensure the land is suitable for use as buffer land for the Vales Point Power Station. As the lands will not be used as “recreation/public space”, nor is it planned to be used for “commercial/industrial” purposes which are land use scenarios

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within the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as modified in 2013)*, it is proposed that a combination of health-based investigation criteria applicable to either of these classifications will be adopted as the rehabilitation criteria should contamination requiring remediation be identified

- heritage sites, which are not anticipated to be impacted during decommissioning
- asbestos, a hazardous building material register was completed in February 2020 for the CVC pit top area.

8.7 Objectives

The rehabilitation objectives below have been compiled from Condition 25 within Schedule 3 of SSD-5465 and are listed in **Table 18**.

Table 18: Rehabilitation objectives

Feature	Objective
Mine site (as a whole of disturbed land and water)	<ul style="list-style-type: none"> • Safe, stable and non-polluting. • Final land use compatible with surrounding land use.
Surface Infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless agreed otherwise with relevant regulatory authority and landowner.
Portals and ventilation shafts	<ul style="list-style-type: none"> • To be decommissioned and made safe and stable. • Retain habitat for threatened species (e.g. bats), where practicable (Chain Valley pit top facilities only).
Other land affected by the development	<ul style="list-style-type: none"> • Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems: <ul style="list-style-type: none"> - local native plant species (unless agreed otherwise with relevant regulatory authority and landowner); and - a landform consistent with the surrounding environment.
Built features damaged by mining operations	<ul style="list-style-type: none"> • Repair to pre-mining condition or equivalent unless: <ul style="list-style-type: none"> - the owners agrees otherwise; or - the damage is fully restored, repaired or compensated under the <i>Mine Subsidence Compensation Act 2017</i>.
Community	<ul style="list-style-type: none"> • Ensure public safety. • Minimise the adverse socio-economic effects associated with mine closure.

8.8 Other Infrastructure

There was no other rehabilitation works completed during the reporting period.

9 Community

9.1 Community Complaints

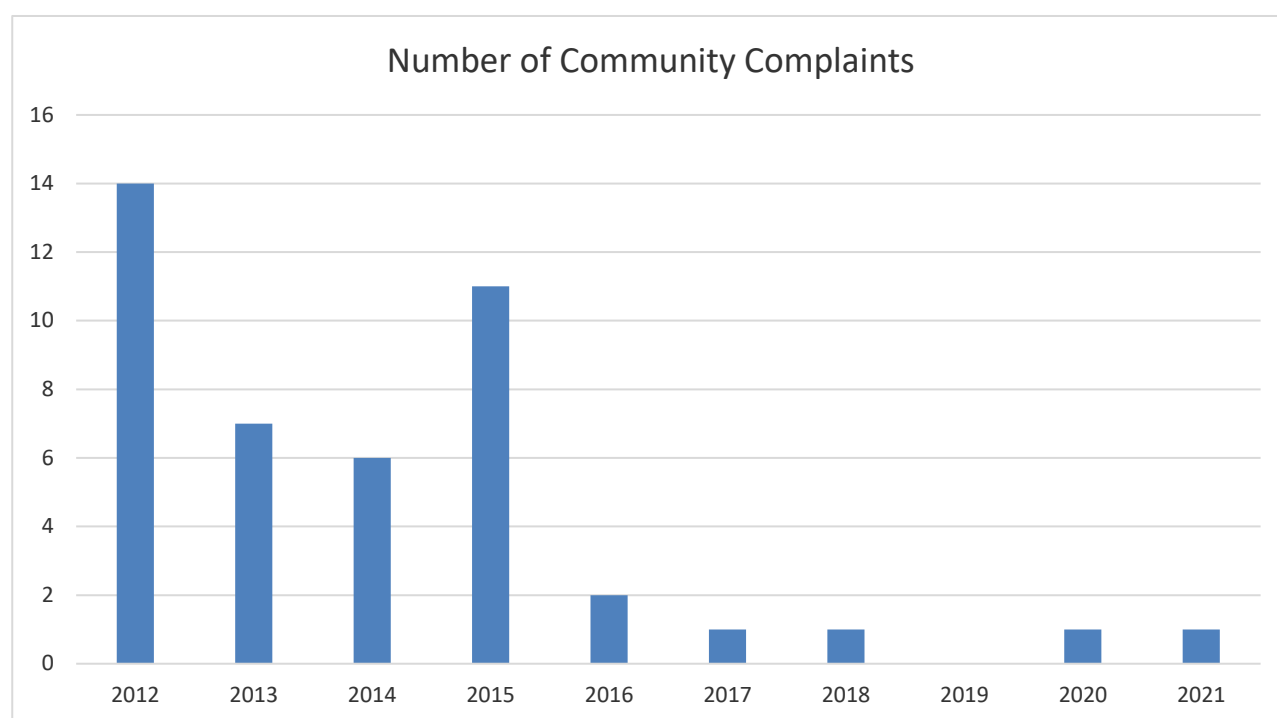
There was one community complaint received during the reporting period. The complaint was made on 6 June 2021 and related to suspected subsidence in the suburb of Gwandalan. The residence of the complainant was not located within current active workings, review of Wallarah Colliery records indicated first-workings exist beneath the property, extracted circa 1970's. The complainant was issued a letter detailing the outcomes of Delta Coals investigation and provided details of NSW Subsidence Advisory to contact if there were suspected damages due to subsidence. The complaint was recorded, however, unrelated to current Delta Coal operations.

A copy of the Complaints Register is provided on the Delta Coal website. This register includes:

- the date and time of the complaint;
- the method by which the complaint was made;
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- the nature of the complaint;
- the action taken in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken, the reasons why no action was taken.

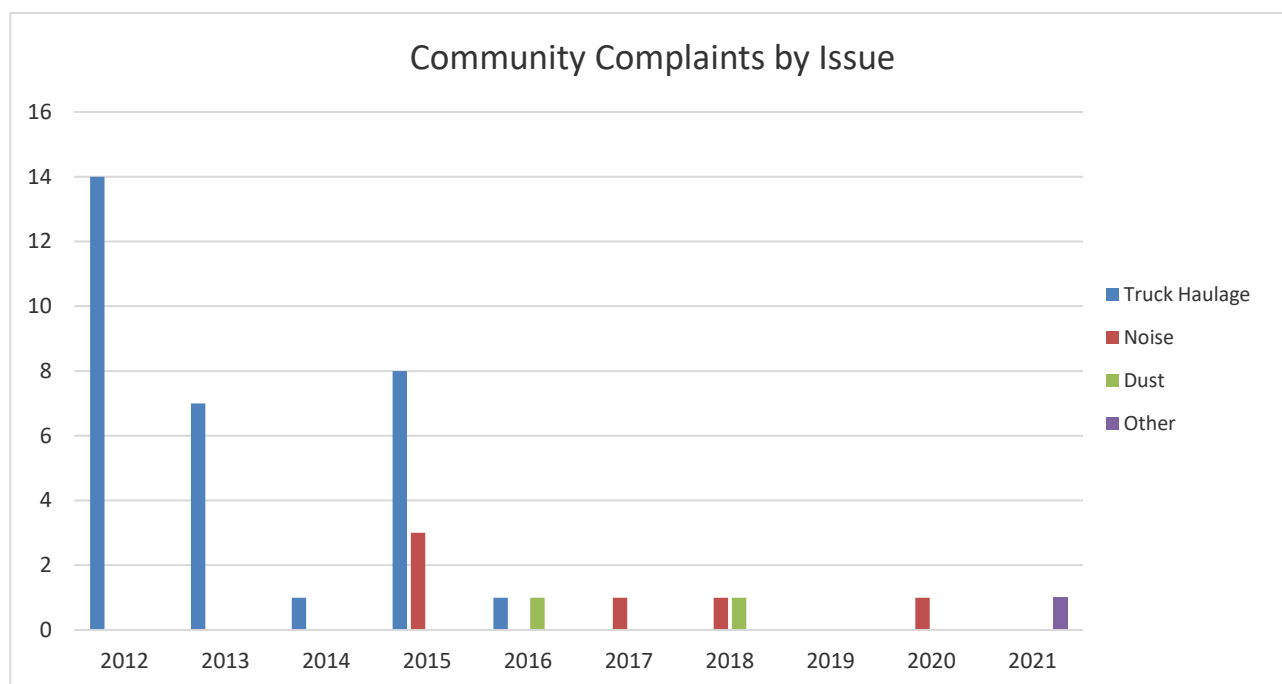
The Annual total complaints and complaints by subject type trends are **Figure 38** and **Figure 39**.

Figure 37 - Total community complaints by year



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Figure 38 - Annual Community Complaints by Issue



9.2 Community Liaison

The Chain Valley Colliery and Mannering Colliery combined Community Consultative Committee (CCC) continued to operate in accordance with the *Community Consultative Guidelines for State Significant Development* (January 2019) during the reporting period.

There were four CCC meetings held during the reporting period on the 17 February 2021, 19 May 2021, 18 August 2021 and 17 November 2021. Minutes for each of the committee meetings are available on the Delta Coal website <https://www.deltacoal.com.au/community/community-consultative-committee>.

In addition, the Delta Coal website was updated on a monthly basis with monitoring data, management plans, reports, audits and complaint details among other items.

The community hotline number (1800 687 260) also remained in place during the reporting period and is displayed prominently and permanently on the website.

9.3 Voluntary Planning Agreement

A Voluntary Planning Agreement (VPA) with Central Coast Council was successfully established during 2017. Following extensive consultation with Central Coast Council, the Community Advisory Panel was established and met to plan and coordinate the framework for the VPA funding. The Chain Valley Colliery VPA fund was launched during September 2017 via the Council grants and sponsorship scheme.

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The Delta Coal Community funding program was established as a joint initiative between Delta Coal and Central Coast Council to provide funding for organisations to deliver projects that improve community infrastructure and services in the following communities:

- Summerland Point
- Gwandalan
- Chain Valley Bay; and
- Mannering Park.

The VPA is subject to indexation and in the 2021 reporting period was \$0.041 per tonne of ROM coal sold, which started at \$0.035 in 2017. In the 2021 reporting period, Delta Coal generated and paid \$52,360 to the Central Coast Council, Voluntary Planning Agreement. Correspondence with the Central Coast Council in November 2021 indicated the successful projects/application that have been finalised from the years community grant funding program were:

- Mannering Park Tidy Towns Group Inc- Hedging for an Easier Cut
- Manno Mens Shed Inc- Dust Extraction Unity Supply and Install

9.4 Community Support / Engagement

Delta Coal is committed to supporting and engaging with the local communities which surround its operations. While Delta Coal provides a monetary offsets associated with its VPA under its operating approvals, Delta Coal also supports the local community through a variety of additional avenues. This support is provided through in kind support, cash donations, staff time, and charitable donations.

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10 Independent Audit

An independent environmental audit (IEA) was undertaken by SLR in 2019. The updated Response to Audit Recommendations was submitted to DPIE on 25 June 2019 and accepted on 21 October 2019. An update was provided to DPIE on 31 December 2019. The IEA is provided in **Appendix 9** and a current IEA Action Plan is provided as **Appendix 10**.

Throughout the 2019-2021 period, Delta Coal have completed recommendations from the 2019 IEA that were achievable (i.e. not ongoing recommendations).

10.1 Key Audit Outcomes

Recommendations with respect to the annual review are summarised in **Table 19**.

Table 19 - Actions required from IEA

Item	Issue / Observation	Action	Status
1	Transport	REC3: Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.	See DC website and Appendix 11 .
2	Noise	REC7: Ensure accurate / consistent monitoring results are presented in Annual Reviews.	See Section 6.7 and Appendix 7
3	Air	REC9: Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.	See Section 6.1
4	Sewage management	REC10: Include an update of sewage system during the audit period in the Annual Review.	See Section 4.10 .
5	Biodiversity management plan	REC12: Include the biodiversity monitoring reports as appendices to the Annual Review.	See Appendix 5
6	Annual Review	REC19: The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.	This document
8	IEA	Include an update on Audit Action Plan.	See Appendix 10
9	Revision of strategies, plans and programs	REC20: Include statement in future Annual Reviews stating that Management Plans have been reviewed and state which management plans will or will not be updated within 3 months.	See Section 5.2
Statement of Commitments			

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Item	Issue / Observation	Action	Status
10	Surface water	REC24: A separate report should be completed for Stream Health Channel Flow and Riparian Vegetation Monitoring. This should compare results from previous inspections. Information to be included in the Annual Review.	See Section 7.3
CCL 721			
11	Condition 5	REC33: Report against compliance with the MOP in future Annual Reviews.	See Section 8.
Additional Recommendations			
12	Surface Water Discharges	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.	See Section 7.4
13	Subsidence	A separate subsidence impact assessment report should be prepared annually and appended to the Annual Review. Presentation of all future survey data in Annual Reviews would benefit from a thorough and comprehensive analysis of the subsidence monitoring being undertaken by an external consultant so that the data can be meaningfully interpreted and is comprehensible by anyone with an interest in the outcomes.	See Appendix 8
14	Subsidence	The report should assess performance against subsidence impact performance measures from the Development Consent as well as any other commitments, triggers and management measures from Extraction Plans. This report should assess how the Extraction Plans tracked against Trigger Action Response Plan (TARP's).	See Appendix 8
14		Include how the site is tracking against subsidence performance criteria (Schedule 4, Condition 4) in the Biodiversity Monitoring Reports, Annual Seagrass Monitoring Report and the Annual Review. This should include a table outlining if performance criteria have been met and where further information can be found.	See Section 6.13, Appendix 3, Appendix 4

10.2 Action Plan

The IEA Action Plan has been included in **Appendix 10**.

10.3 Future Audit

The next Independent Environmental Compliance Audit is scheduled to commence in Quarter 2 2022, Delta Coal has commissioned an audit team endorsed by the Planning Secretary to undertake the 2022 IEA.

An updated table of compliance with the 2019 Independent Environmental Audit will be completed as part of that audit.

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11 Incidents and non-compliances during the reporting period

All non-compliances, exceedance, and reportable incidents relating to the site's licences and approvals are summarised below in **Table 19**.

Table 20 - Summary of reportable incidents/non-compliances for 2020

Date	Description of Incident	Approval / Condition / Clause	Actions taken to address incident
Thursday, 18 February 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG005 during the reporting period 08/01/2021 - 08/02/2021.	Schedule 3 Condition 11 SSD-5465	<p>Results were received on the 18th February 2021. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was heavy and comprised approximately:</p> <p>Dirt – 70 %; Polysaccharide Slime – 20 %; Insects – 10 %; Vegetation – < 5 %; and Coal – < 5 %</p> <p>based on the laboratory results, it is considered that contamination of the dust gauge due to non-mining related activities (such as dust generating grounds maintenance, animal droppings and insects). DDG005 is proposed for replacement in a combined Delta Coal Air Quality and Greenhouse Gas Management Plan due to frequent contamination, submitted for planning secretary approval in November 2020. A dust gauge more representative of CVCs ventilation fan site was installed in February, DDG006, and has consistently recorded compliant results.</p>
Thursday, 18 March 2021	Non compliance - Exceedance of: EPL 1770 - Volumetric Discharge Limit EPL 1770 - TSS Concentration Limit EPL 1770 - Faecal Coliform Concentration Limit The exceedances were recorded during significant rainfall event (101 mm/24hr)	L3.1 and L2.4 EPL 1770	<p>The NSW EPA, Department of Planning, Industry and Environment and resources regulator were notified of the exceedances immediately upon Delta Coal becoming aware of the incidents, with formal incident reports also provided within 7 days of notification.</p> <p>A combined discharge from LDP1 (gravity fed discharge pipe) and LDP27 (final dam spillway) of 15,418kL was recorded, exceeding CVC's 12,161kL limit, a surface water sample was collected from LDP27 as required daily during LDP27 discharge (EPL 1770). Severe rainfall intensities contributed to sediment laden run-off entering CVC's retention ponds, and in-turn limited settling time within the ponds led to discharge water exceeding total suspended solid (TSS), contouring of the CVC stockpiling area has been prioritised following the event.</p> <p>In December 2020, Delta Coal received approval of its Development Application with Central Coast Council to construct a sewage pump station and connect CVC to sewer mains and Delta Coal is committed to undertaking and completing the project as soon as practicably achievable.</p>

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Date	Description of Incident	Approval / Condition / Clause	Actions taken to address incident
Sunday, 21 March 2021	Exceedance of: EPL 1770 - Volumetric Discharge Limit EPL 1770 - TSS Concentration Limit EPL 1770 - Faecal Coliform Concentration Limit The were exceedances recorded during significant rainfall event (101 mm/24hr)	L3.1 and L2.4 EPL 1770	<p>The NSW EPA, Department of Planning, Industry and Environment and resources regulator were notified of the exceedances immediately upon Delta Coal becoming aware of the incidents, with formal incident reports also provided. A total of 368mm of rain was recorded between 18/03/2021 and 21/03/2021.</p> <p>A combined discharge between LDP1 (gravity fed discharge pipe) and LDP27 (spillway) of 13,411kL was recorded, exceeding CVC's 12,161kL limit, a surface water sample was collected from LDP27 as required daily during LDP27 discharge (EPL 1770). Severe rainfall intensities contributed to sediment laden run-off entering CVC's retention ponds, and in-turn limited settling time within the ponds led to discharge water exceeding total suspended solid (TSS), contouring of the CVC stockpiling area has been prioritised following the event.</p> <p>In December 2020, Delta Coal received approval of it's Development Application with Central Coast Council to construct a sewage pump station and connect CVC to sewer mains and Delta Coal is committed to undertaking and completing the project as soon as practicably achievable.</p>
Wednesday, 21 April 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG005 during the reporting period 12/03/2021 - 12/04/2021.	Schedule 3- Condition 11 SSD 5465	Results were received on the 21st April 2021. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was heavy and comprised approximately: Dirt – 45 %; Vegetation - 35 % Polysaccharide Slime – 10 %; Insects – <5 %; Coal – < 10 % based on the laboratory results, it is considered that contamination of the dust gauge due to non-mining related activities (such as dust and vegetation generating grounds maintenance, animal droppings and insects). DDG005 is proposed for replacement in a combined Delta Coal Air Quality and Greenhouse Gas Management Plan due to frequent contamination and was submitted for planning secretary approval in November 2020 (resubmitted in November 2021 following initial RFI). A dust gauge more representative of CVCs ventilation fan site was installed in February, DDG006, and has consistently recorded compliant results.
Friday, 25 June 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG002 during the May-June reporting period.	Schedule 3- Condition 11 SSD 5465	Results were received on the 24th June 2021, with DDG002 reporting 5g/m2/month, exceeding the 4g/m2/month annual average limit. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was heavy and comprised approximately: Dirt – 30 %; Vegetation - 20 % Polysaccharide Slime – 35 %; Insects – 10 %; Coal – 5 %

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Date	Description of Incident	Approval / Condition / Clause	Actions taken to address incident
			based on the laboratory results, it is considered that contamination of the dust gauge due to non-mining related activities (such as dust, slime growth in the gauge, vegetation, grounds maintenance, animal droppings and insects). The event was considered an anomaly.
Wednesday, 25 August 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG005 and DDG006 during the 13th July - 12th August 2021 reporting period.	Schedule 3-Condition 11 SSD 5465	<p>Results were received on the 25 August 2021. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was heavy and comprised approximately:</p> <p>DDG005:</p> <ul style="list-style-type: none"> • Total insoluble matter – 6.8 g/m2/month • Combustible matter – 1.5 g/m2/month • Ash content – 5.3 g/m2/month o Polysaccharide Slime – 60 % o Dirt – 10 % o Vegetation – 10 % o Sand – 10% o Insects – 10 % o Coal – <5 % <p>DDG006:</p> <ul style="list-style-type: none"> • Total insoluble matter – 5.4 g/m2/month • Combustible matter – 0.4 g/m2/month • Ash content – 5.0 g/m2/month o Glass – 70% o Polysaccharide Slime – 5 % o Dirt – 5 % o Insects – 15 % o Coal – 5 % <p>Based on this assessment it is considered that contamination of dust gauges DDG005 and DDG006 have occurred due to non-mining related activities. Contamination of DDG006 was considered an anomaly, while DDG005 is proposed for replacement (by DDG0006) in the revised Delta Coal Air Quality and Greenhouse Gas Management Plan.</p>
Monday, 20 September 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG005 during the 12th August 2021 - 9th September 2021 reporting period.	Schedule 3-Condition 11 SSD 5465	<p>Results were received on the 20 September 2021. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was 'very heavy' and comprised approximately:</p> <p>DDG005:</p> <ul style="list-style-type: none"> • Total insoluble matter – 26.8 g/m2/month • Combustible matter – 5.4 g/m2/month • Ash content – 21.4 g/m2/month o Polysaccharide Slime – 5 % o Dirt – 70 % o Sand – 20% o Insects – 5 % <p>Based on this assessment it is considered that contamination of dust gauges DDG005 and DDG006 have occurred due to non-mining related activities. DDG005 is proposed for removal in the revised Delta</p>

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Date	Description of Incident	Approval / Condition / Clause	Actions taken to address incident
			Coal Air Quality and Greenhouse Gas Management Plan.
Wednesday, 22 December 2021	Exceedance of depositional dust limit at the Chain Valley Colliery depositional dust gauge DDG005 during the 10 November - 10 December 2021 reporting period.	Schedule 3-Condition 11 SSD 5465	<p>Results were received on the 22 December 2021. DPIE-Compliance, RR and NSW EPA were notified of the non-compliance. The analysing laboratory noted that deposition in the gauge was 'very heavy' and comprised approximately:</p> <p>DDG005:</p> <ul style="list-style-type: none"> • Total insoluble matter – 14.3 g/m2/month • Combustible matter – 3.5 g/m2/month • Ash content – 10.8 g/m2/month o Polysaccharide Slime – 40 % o Sand – 20% o Vegetation – 20% o Insects – 10% o Dirt – 10 % o Coal – <5 % <p>Based on this assessment it is considered that contamination of dust gauges DDG005 and DDG006 have occurred due to non-mining related activities. DDG005 is proposed for removal in the revised Delta Coal Air Quality and Greenhouse Gas Management Plan.</p>
Friday, 24 December 2021	On the 24/12/2021, telemetry for LDP1 went offline, inspection indicated vandalism of the meter, damaging the MACE FloPro unit and solar panel.	L3.1 EPL 1770	The incident was reported to the NSW EPA, Department of Planning, Industry and Environment and the Resources Regulator. Repairs were undertaken to the unit on the 10th January 2022 when replacement parts became available. The unit resumed functionality on the date of repairs.
31 December 2021	Depositional Dust Exceedance – Annual Average Limit at monitoring location DDG005.	Schedule 3-Condition 11 SSD 5465	This event was reported to DPIE and EPA and is detailed in Section 6.1.1. DDG005 is proposed for removal in the revised Delta Coal Air Quality and Greenhouse Gas Management Plan.

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12 Activities to be Completed in the Next Reporting Period

12.1 Activities Proposed for 2021 Reporting period

A summary of the activities that were proposed to be undertaken during the 2020 reporting period and current status is provided in **Table 20**.

Table 21: Status Update to 2020 Proposed Activities

Activity Proposed in 2020 Annual Report	Status Update	31 December 2021 update, percentage complete
Reconsider use of chemical dust suppressant on un-sealed access roads.	<p>Not considered to be required during the period, noting visual dust onsite was generated predominately from vehicle traffic on trafficked roads which would reduce the effectiveness of the chemical dust suppressant.</p> <p>Dust managed with watercart application on un-sealed access roads and street sweeper on sealed access roads.</p>	<p>100% - The use of chemical dust suppressant at CVC on un-sealed and access roads was reconsidered in the reporting period.</p> <p>CVC has limited un-sealed access roads on site, and notably, the roads are frequently trafficked for site deliveries etc. CVC utilises a watercart for wetting unsealed roads during dust generating conditions, it was considered that due to frequent and heavy traffic, dust generating unsealed roads would not receive significant benefit from chemical suppressant, nor would the suppressant be proposed as a substitute for the watercart.</p>
Ongoing weed management in 2021 period	Ongoing weed management was undertaken on a routine basis with land maintenance contractors in 2021.	Ongoing

Activity Proposed in 2020 Annual Report	Status Update	31 December 2021 update, percentage complete
Rehabilitation monitoring as per the requirements of the rehabilitation monitoring program to be completed in Q2 2021.	Rehabilitation Monitoring undertaken within CVC 2021 Annual Biodiversity Monitoring.	100%
Review land contouring and erosion and sediment controls at the former coal stockpiling area in relation to final landform contours presented in the MOP.	External consultant engaged with a sediment erosion design of the CVC stockpile to plan contour and drop structure design in 2021. No progress in 2021 on implementing a sediment control design on the CVC stockpile area, due to development of risk assessments and securing capital for the works.	50%
Submission of Extraction Plan for Miniwall S5 panel in Q1 2021.	Completed and approved in 2021.	100%
Response to submissions for CVC Mod 4.	Completed and MOD 4 to SSD-5465 granted in 2021.	100%
Submission of Amendment 1 to the MOP for extension of approval period and Northern Mining Area pillar extraction and Miniwall S5 works.	Completed.	100%
Submission of an Environmental and Social Impact Statement to facilitate consent consolidation.	Not completed in 2021, intent to submit Q2 2022 for a consolidated consent. Change in proposed scope of Eastern Mining Area has led to delay in submission.	80%
Continued non-intrusive exploration (i.e. drone magnetometer surveys) of the Munmorah SCA / Moonee area.	No surface exploration was undertaken in the 2021 period due to changes in site management and Life of Mine planning.	0% - changes in Life of Mine planning.

Activity Proposed in 2020 Annual Report	Status Update	31 December 2021 update, percentage complete
Continued land-maintenance works along the land adjacent to the foreshore in the 2021 reporting period.	Land access agreement expired in 2021, Delta Coal did not pursue further access following a successful weed removal campaign.	100% - further weed management works in the land adjacent to the foreshore owned by Crown Lands was not considered to be required in Q1 and Q2 2021, with the license expiring Q3 2021.
Decommissioning of chlorine dosing pump following completion of the CVC sewer connection.	CVC Sewer connection not completed in 2021. Contractor awarded tender to install a sewage pump station and rising main as approved within Development Application DA/845/2020. EPL 1770 due date for PRP 8 (sewer connection) extended to 25 August 2021.	60%
Sewage pump station and connection to Central Coast Council sewer, construction is anticipated to commence in Q3 2021.	CVC Sewer connection not completed in 2021. Contractor awarded tender to install a sewage pump station and rising main as approved within Development Application DA/845/2020. EPL 1770 due date for PRP 8 (sewer connection) extended to 25 August 2021. Construction anticipated Q2 2022.	60%
If CVC Mod 4 is approved a second amendment of the 2020-2023 MOP will be provided to RR	Completed	100%
Variation of EPL1770 for CVC Modification 3 changes	Completed, EPL 1770 varied in September 2021	100%
if CVC Mod 4 is approved variation of EPL1770 to include underground premises extension	Completed, EPL 1770 varied in September 2021	100%
Ongoing house keeping activities throughout the 2021 period.	ongoing	ongoing

12.2 Activities Proposed to be Completed in 2022 Reporting Period

Table 22 - Activities Proposed for the 2022 Period

Activity Proposed in 2020 Annual Report for the 2021 period	2021 Activity Status	Proposed Activities for 2022
Ongoing weed management as per Weed Action Plan	Completed in 2021	Annual weed management in 2022 period
Ongoing rehabilitation monitoring following development of a rehabilitation monitoring program and baseline monitoring.	Completed during biodiversity monitoring in 2021	Rehabilitation monitoring as per the requirements of the rehabilitation monitoring program to be completed in Q4 2022.
Review land contouring and erosion and sediment controls at the former coal stockpiling area in relation to final landform contours presented in the MOP.	Design completed in 2021	Undertake sediment and erosion control works on the former CVC stockpile area. Implementing Drop structures and run-off speed reduction measures (i.e. rock armouring and profile contouring) to reduce sediment erosion from the stockpile area to the sedimentation dams, as designed by SLR Consulting in 2021.
Submission of an Environmental and Social Impact Statement to facilitate consent consolidation.	EIS and SIA studies completed in 2021 for consent consolidation, amendments being made with submission anticipated late Q2 2022.	Submission of an Environmental and Social Impact Statement to facilitate consent consolidation.
Decommissioning of chlorine dosing pump following completion of the CVC sewer connection.	A chlorine dosing pump was installed and commissioned for operation in June 2020. The dosing pump is installed directly to the CVC bathhouse septic tank and was in operation	Completion of effluent connection to the Central Coast sewer system prior to 25 August 2022. Allowing for the removal of the chlorine dosing pump.

Activity Proposed in 2020 Annual Report for the 2021 period	2021 Activity Status	Proposed Activities for 2022
	throughout 2021. Sewer connection due date within EPL 1770 (PRP 8) extended to 25 August 2022.	
Sewage pump station and connection to Central Coast Council sewer, construction is anticipated to commence in Q3 2021.	Construction delayed, contractor awarded project through tender process in 2021. construction anticipate to commence Q2 2022 and be completed prior to 25 August 2021.	Development of CVC bathhouse sewer connection anticipated to commence Q2 2022 and be completed prior to 25 August 2021.
N/A	N/A	Connection of the administration building septic tank to the on-site sewage pump station and Council sewer (EPL 1770 - PRP 9) and be completed prior to 25 August 2021.
N/A	N/A	Upon completion of PRP 8 and PRP 9, submission to EPA to vary EPL 1770 to remove biological monitoring requirements at the CVC Licensed Discharge Points.

13 References

Documents used in the preparation of this report are detailed in **Table 22**.

Table 23: References

Reference	Title
Legislation and Regulations	<p>Development consent SSD-5465 (as modified)</p> <p>Environment Protection Licence (EPL) 1770</p> <p><i>Mining Act 1992</i></p> <p><i>Protection of the Environment Operations Act, 1997</i></p>
External documents	<p>AECOM, 2011 – <i>Environmental Assessment Chain Valley Colliery Domains 1 & 2 Continuation Project</i>. Prepared for LakeCoal Pty Ltd.</p> <p>EMGA Mitchell McLennan, 2013 – <i>Environmental Impact Statement, Chain Valley Colliery Mining Extension 1 Project</i>. Prepared for LakeCoal Pty Ltd.</p> <p>EMM Consulting (March 2022) Biodiversity Monitoring 2021 Chain Valley Colliery.</p> <p>Laxton, E. S., 2021 – <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW (Results for 2008 to 2021)</i></p> <p>Laxton, E. S. 2020 – <i>Lake Macquarie Benthos Survey Results No. 20 (September 2021)</i></p> <p>NSW DPIE (January 2019) <i>Community Consultative Guidelines for State Significant Development</i></p> <p>Total Earth Care Pty Ltd (January 2020) Weed Action Plan Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft.</p> <p>Total Earth Care Pty Ltd (August 2020) Weed Action Plan – Addendum 1, Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft.</p>

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14 Acronyms / Definitions

AEMR	Annual Environmental Management Report, now known as the Annual Review
Annual Review	The annual environmental report compiled for CVC, the Annual Review also fulfills the requirement for an Annual Environmental Report or an Annual Environmental Management Report required by mining leases.
CCC	Community Consultative Committee
CVC	Chain Valley Colliery
DP&E	Department of Planning & Environment (former)
DPIE	Department of Planning, Industry and Environment
EA	Environmental Assessment
EMS	Environmental Management System
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environmental Protection License kL Kilolitre
LDP1	Licensed Discharge Point 1 (per EPL 1770)
MC	Mannering Colliery
NGER	National Greenhouse and Energy Reporting
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PM₁₀	Particulate matter less than 10 microns in size
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
ROM	Run of mine
Secretary	Secretary of the Department, or nominee
TEOM	Tapered element oscillating microbalance
t - CO₂-e	Tonnes of carbon dioxide equivalent
The website	The website of Delta Coal - Chain Valley Colliery, which is www.deltacoal.com.au
MP10_0161	Project approval MP 10_0161, as modified, issued under Section 75J of the Environmental Planning and Assessment Act 1979 for the Chain Valley Colliery Domains 1 & 2 Continuation Project.
SSD 5465	Development Consent SSD 5465, as modified, issued under Section 89E of the Environmental Planning and Assessment Act 1979 for the Chain Valley Colliery Mining Extension 1 Project.

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VPPS Vales Point Power Station

WCJV Wallarah Coal Joint Venture

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15 Appendices

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Appendix 1: Development Consent SSD-5465

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Development Consent

Section 89E of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, I approve the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 6.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

Chris Wilson
Executive Director
Development Assessment Systems and Approvals

Sydney

2013

SCHEDULE 1

Application Number:

SSD-5465

Applicant:

Great Southern Energy Pty Limited

Consent Authority:

Minister for Planning and Infrastructure

Land:

See Appendix 1

Development:

Chain Valley Extension Project

Red type represents November 2014 Modification (SSD_5465 MOD 1)

Blue type represents December 2015 Modification (SSD_5465 MOD 2)

Green type represents June 2020 Modification (SSD-5465 MOD 3)

Purple type represents July 2021 Modification (SSD-5465 MOD 4)

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DEFINITIONS

Aboriginal Object / Place	Has the same meaning as the definition of the term in section 5 of the NP&W Act
Adaptive management	Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and designated ranges and in compliance with the conditions of this consent
Affected Councils	LMCC and/or CC Council
Annual Review	The review required by Condition 4 of Schedule 6
Applicant	Great Southern Energy Pty Limited, or any person carrying out development under this consent
Approved mine plan	The mine plan shown in Appendix 3, as varied by any Extraction Plan approved under this consent
APZs	The asset protection zones shown in Appendix 7A
BCA	Building Code of Australia
BCD	Biodiversity and Conservation Division within the Department
BMP	Biodiversity Management Plan
Built features	Any building or work erected or constructed on land or water, and includes dwellings and infrastructure such as any formed road, street, path, walk, marina or driveway; any pipeline, water, sewer, telephone, gas or other service main
Calendar Year	A period of 12 months from 1 January to 31 December
CCC	Community Consultative Committee
CC Council	Central Coast Council
Coal haulage route	The route proposed in the EIS for haulage of coal by trucks between the site and the Port of Newcastle (as shown in Appendix 5)
Conditions of this consent	Conditions contained in Schedules 2 to 6 inclusive
Construction	The demolition of buildings or works, carrying out of works and erection of buildings covered by this consent
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Delta Electricity	Delta Electricity, or subsequent owners of the Vales Point Power Station
Department	Department of Planning, Industry and Environment
Development	The development described in the EIS, as amended by the SEE (Mod 1), SEE (Mod 2) and SEE (Mod 3)
DPIE Crown Lands	Crown Lands Group within the Department
DPIE Water	Water Group within the Department
EIS	Environmental Impact Statement titled 'Chain Valley Colliery Mining Extension 1 Project' dated 28 May 2013, as modified by the response to submissions, titled 'Chain Valley Colliery Mining Extension 1 Project Response to Submissions', dated August 2013, and the letter by EMM to the Applicant, dated 29 October 2013
Endangered population	As defined under the <i>Fisheries Management Act 1994</i>
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
Environmental consequences	The environmental consequences of subsidence impacts, including: damage to built features; loss of surface water flows to the subsurface; loss of standing pools; slope changes to streams; adverse water quality impacts; development of iron bacterial mats; landslides; damage to Aboriginal heritage sites; impacts on aquatic ecology; and ponding.
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence issued under the POEO Act
Evening	The period from 6pm to 10pm
Feasible	Means what is possible and practicable in the circumstances
First Workings	The extraction of coal from underground workings by bord and pillar mining methods (including herringbone pattern workings) and from main headings, gateroads and cut-throughs and the like, provided that such workings are long-term stable and do not generate more than 20 mm of vertical subsidence at the surface
Fisheries NSW	Fisheries Branch of the Primary Industries Group within the Department
Ha	Hectare
Heritage Item	An Aboriginal object, an Aboriginal place, or a place, building, work, relic, moveable object, tree or precinct of heritage significance, that is listed under any of the following: <ul style="list-style-type: none"> the State Heritage Register under the <i>Heritage Act 1977</i>; a state agency heritage and conservation register under section 170 of the <i>Heritage Act 1977</i>;

	<ul style="list-style-type: none"> a Local Environmental Plan under the EP&A Act; the World Heritage List; the National Heritage List or Commonwealth Heritage List under the EPBC Act; or anything identified as a heritage item under the conditions of this consent.
High Water Mark Subsidence Barrier	<p>The area of land defined:</p> <p>a) on the surface by the highwater level of Lake Macquarie and a point 2.44 metres in elevation above that highwater level; and</p> <p>b) in the seam, where it is intersected by lines:</p> <ul style="list-style-type: none"> drawn landwards from all points 2.44 metres elevation above the highwater level of Lake Macquarie; and drawn lakewards from the highwater level of Lake Macquarie, at an angle of 35 degrees from the vertical.
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm that may or may not be or cause a non-compliance
Land	Has the same meaning as the definition of the term in section 1.4 of the EP&A Act, except where the term is used in the noise and air quality conditions in Schedules 3 and 5 of this consent where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at NSW Land Registry Services at the date of this consent
LMCC	Lake Macquarie City Council
Material harm	<p>Is harm to the environment that:</p> <ul style="list-style-type: none"> involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
MEG	Regional NSW – Mining, Exploration and Geoscience
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the development
Mining operations	The carrying out of underground mining, including the extraction, processing, stockpiling and transportation of coal on the site and the emplacement of coarse/fine reject material resulting from underground mining
Minister	Minister for Planning and Public Spaces, or delegate
Minor	Not very large, important or serious
Mitigation	Activities associated with reducing the impacts of the development
Modification 1	The modification to the development as described in SEE (Mod 1)
Modification 2	The modification to the development as described in SEE (Mod 2)
Modification 3	The modification to the development as described in SEE (Mod 3)
Modification 4	The modification to the development as described in SEE (Mod 4)
NCC	Newcastle City Council
Negligible	Small and unimportant, such as to be not worth considering
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Non-compliance	An occurrence, set of circumstances or development that is in breach of this consent
NP&W Act	<i>National Parks and Wildlife Act 1974</i>
Peak hour periods	7 am to 9 am and 4:30 pm to 6 pm weekdays
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Privately-owned land	Land that is not owned by a public agency, Delta Electricity (or its subsidiary) or a mining company (or its subsidiary)
Public infrastructure	Linear and related infrastructure that provides services to the general public such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc.
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Reasonable costs	The costs agreed between the Department and the Applicant for obtaining independent experts to review the adequacy of any aspects of the Extraction Plan, or where such costs cannot be agreed, the costs determined by a dispute resolution process
Registered Aboriginal Parties	As described in the <i>National Parks and Wildlife Regulation 2009</i>
Rehabilitation	The restoration of land disturbed by a development to a good condition, to ensure it is safe, stable and non-polluting
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the

	development or controlling the environmental consequences of this impact
RFS	NSW Rural Fire Service
Road Maintenance Agreement	The document prepared by McCullough Robertson Lawyers and titled 'Road Maintenance Agreement', signed by CC Council on 1 July 2013 and by LakeCoal on 5 July 2013
ROM	Run-of-mine
RR	Regional NSW - Resources Regulator
SA NSW	Subsidence Advisory NSW
Safe, serviceable & repairable	Safe means no danger to users who are present; serviceable means available for its intended use; and repairable means damaged components can be repaired economically
Second Workings	Extraction of coal by longwall, miniwall, pillar extraction, pillar splitting or pillar reduction methods, and inclusive of any first workings methods that would generate more than 20 mm of vertical subsidence at the surface
SEE Mod 1	Statement of Environmental Effects titled 'Chain Valley Colliery – Modification 1, Statement of Environmental Effects, Section 96 Modification to SSD-5465' dated April 2014, as modified by the associated Response to Submissions dated 15 September 2014.
SEE Mod 2	Statement of Environmental Effects titled 'Chain Valley Colliery – Modification 2, Statement of Environmental Effects, Section 96 Modification to SSD-5465' dated 29 June 2015, including the associated Response to Submissions dated 16 September 2015.
SEE (Mod 3)	Statement of Environmental Effects titled 'Statement of Environmental Effects, Chain Valley Colliery – Modification 3', dated May 2019, prepared by EMM Consulting, including the associated Response to Submissions dated August 2019 and prepared by EMM Consulting
SEE (Mod 4)	Statement of Environmental Effects titled 'Statement of Environmental Effects, Chain Valley Colliery Modification 4' dated November 2020, prepared by Umwelt Consulting, including the associated Response to Submissions, dated April 2021 and prepared by Umwelt Consulting.
Site	All land within the Development Area (see Appendices 1 and 2)
SPB	Seagrass Protection Barrier is the area of land defined by: (a) on the surface by the extent of the seagrass beds; and (b) in the seam, where the seam is intersected by the lines drawn: <ul style="list-style-type: none"> landwards from the landwards boundary of the seagrass beds; and lakewards from the lakewards boundary of the seagrass beds, at an angle of 26.5 degrees from the vertical as illustrated in Figure 1A in Appendix 3
Statement of commitments	The Applicant's commitments in Appendix 9
Subsidence	The totality of subsidence effects, subsidence impacts and environmental consequences of subsidence impacts
Subsidence effects	Deformation of the ground mass due to mining, including all mining-induced ground movements, such as vertical and horizontal displacement, tilt, strain and curvature
Subsidence impacts	Physical changes to the ground and its surface caused by subsidence effects, including tensile and shear cracking of the rock mass, localised buckling of strata caused by valley closure and upsidence and surface depressions or troughs
Subsidence Zone A	The area shown as Zone A in Figure 1 in Appendix 3 in which long-term stable mining systems generating no more than 20 mm of surface subsidence may be utilised
Subsidence Zone B	The area shown as Zone B in Figure 1 in Appendix 3 in which mining systems generating no more than 780 mm of surface subsidence may be utilised
Surface facilities sites	The Chain Valley Colliery surface facilities site; the Summerland Point ventilation shaft site; and any other site subject to existing or proposed surface disturbance associated with the development
TfNSW	Transport for NSW
Threatened Species	As defined under the <i>Threatened Species Conservation Act 1995</i> and the <i>Environment Protection and Biodiversity Conservation Act 1999</i>

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance measures and criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.

TERMS OF CONSENT

2. The development may only be carried out:
 - (a) in compliance with the conditions of this consent;
 - (b) in accordance with the statement of commitments in Appendix 9;
 - (c) in accordance with the Subsidence Zones in Appendix 3;
 - (d) in accordance with all written directions of the Planning Secretary; and
 - (e) generally in accordance with the EIS, SEE (Mod 1), SEE (Mod 2), SEE (Mod 3) and SEE (Mod 4).
3. Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to:
 - (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and
 - (b) the implementation of any actions or measures contained in any such document referred to in condition 3(a).
4. The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document/s listed in condition 2(e). In the event of an inconsistency, ambiguity or conflict between any of the document/s listed in condition 2(e), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.

LIMITS ON CONSENT

Mining Operations

5. The Applicant may carry out mining operations on the site until 31 December 2027.

Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of either the Planning Secretary or the RR. Consequently, this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Extraction

6. The Applicant must not extract more than 2.1 million tonnes of ROM coal from the site in any calendar year.

Coal Transport – Public Roads

7. The Applicant must ensure that no laden coal trucks are dispatched from the site to public roads outside of the hours of 5:30 am to 5:30 pm, Monday to Friday, and not at all on Saturdays, Sundays or public holidays.
8. The Applicant must not dispatch from the site more than:
 - (a) 660,000 tonnes of product coal in any calendar year to the Port of Newcastle for export;
 - (b) 180,000 tonnes of product coal in any calendar year to domestic customers other than Vales Point Power Station;
 - (c) a total of 270 laden coal trucks per day by public roads;
 - (d) a total of 32 laden coal trucks per hour; and
 - (e) an average of 16 laden coal trucks per hour by public roads during peak hour periods, calculated monthly, until the intersection of M1 Motorway and Sparks Road Interchange (East Side - unsignalised with stop sign) is upgraded to a signalised intersection.

Coal Transport – Vales Point Power Station

9. The Applicant must ensure that only private roads are used for the transport of coal by truck to Vales Point Power Station, except in an emergency. In an emergency, product coal may be transported by public roads,

with the prior written approval of the **Planning Secretary**, and subject to any restrictions that the **Planning Secretary** may impose.

10. The Applicant **must** restrict the transport of coal by truck to the Vales Point Power Station between 10 pm and 5:30 am to:
 - (a) 16 laden trucks per hour for the Spring and Autumn months; and
 - (b) zero during Winter months.

PLANNING AGREEMENT

11. Within 12 months of the date of this consent, unless otherwise agreed by the **Planning Secretary**, the Applicant **must** enter into a planning agreement with the **CC Council** in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the **CC Council** for community enhancement purposes.

The agreement must include provision for those matters set out in condition 12 below.

If there is any dispute between the Applicant and **CC Council** relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the **Planning Secretary** for resolution.

COMMUNITY ENHANCEMENT

12. The Applicant **must** pay **CC Council** \$0.035 for each tonne of product coal produced by the development for the purposes of improving public infrastructure and providing community projects for the communities of Summerland Point, Gwandalan, Chain Valley Bay and Mannering Park. Payments from the approval date of project approval 10_0161 must be:
 - (a) made by the end of March, for coal produced in the previous calendar year;
 - (b) made for each year that coal is produced by the colliery; and
 - (c) subject to indexation in accordance with the Australian Bureau of Statistics Consumer Price Index.
13. Deleted.
14. Deleted.

STRUCTURAL ADEQUACY

15. The Applicant **must** ensure that all new buildings and structures, and any alterations or additions to existing buildings and structure, that are part of the development are constructed in accordance with:
 - (a) the relevant requirements of the BCA; and
 - (b) any additional requirements of the **SA NSW** where the building or structure is located on land within declared Mine Subsidence Districts.

Notes:

- Under **Part 8 of the EP&A Act**, the Applicant is required to obtain construction and occupation certificates for the proposed building works;
- Part 8 of the EP&A Regulation sets out the requirements for the certification of the development; and
- Under **section 21 of the Coal Mine Subsidence Compensation Act 2017**, the Applicant is required to obtain the **SA NSW's** approval before constructing any improvements in a Mine Subsidence District.

DEMOLITION

16. The Applicant **must** ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

OPERATION OF PLANT AND EQUIPMENT

17. All plant and equipment used on site, or to monitor the performance of the development must be:
 - (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.
18. Deleted

ROAD MAINTENANCE CONTRIBUTION

19. The Applicant must pay Road Maintenance Fees to **CC Council** in accordance with its Road Maintenance Agreement with **CC Council**.

COMMUNITY CONSULTATIVE COMMITTEE

20. A Community Consultative Committee (CCC) must continue to operate for the development in accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects (2019)*. The CCC must continue to operate during the life of the development, or other timeframe agreed by the Planning Secretary.

Notes:

- *The CCC is an advisory committee only.*
- *In accordance with the Guidelines, the Committee should comprise an independent chair and appropriate representation from the Applicant, Affected Councils and the local community.*

21. With the approval of the Planning Secretary, the Applicant may combine the CCC required by this consent with any similar CCC required by a consent or approval for any adjoining mine subject to common, shared or related ownership or management.

EVIDENCE OF CONSULTATION

22. Where conditions of this consent require consultation with an identified party, the Applicant must:
- (a) consult with the relevant party prior to submitting the subject document;
 - (b) provide details of the consultation undertaken including:
 - i. the outcome of that consultation, matters resolved and unresolved; and
 - ii. details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

STAGING, COMBINING AND UPDATING STRATEGIES, PLANS OR PROGRAMS

23. With the approval of the Planning Secretary, the Applicant may:
- (a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);
 - (b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined);
 - (c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development); and
 - (d) combine any strategy, plan or program required by this consent with any similar strategy, plan or program required by an adjoining mining consent or approval, in common ownership or management.
24. If the Planning Secretary agrees, a strategy, plan or program may be staged or updated without consultation being undertaken with all parties required to be consulted in the relevant condition in this consent.
25. If the Planning Secretary agrees, a strategy, plan or program may be staged without addressing particular requirements of the relevant condition of this consent if those requirements are not applicable to the particular stage.

APPLICATION OF EXISTING STRATEGIES, PLANS OR PROGRAMS

26. The Applicant must continue to apply existing management strategies, plans or monitoring programs approved prior to the approval of Modification 3, until the approval of a similar plan, strategy or program following the approval of Modification 3.

PROTECTION OF PUBLIC INFRASTRUCTURE

27. Unless the Applicant and the applicable authority agree otherwise, the Applicant must:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure^a that is damaged by carrying out the development; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure^a that needs to be relocated as a result of the development.

^a This condition does not apply to any damage to roads caused as a result of general road usage or to damage that has been compensated under the Mining Act 1992.

COMPLIANCE

28. The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.

APPLICABILITY OF GUIDELINES

29. References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of inclusion (or later update) in the condition.
 30. However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, in respect of ongoing monitoring and management obligations, agree to or require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.
-

SCHEDULE 3 ENVIRONMENTAL CONDITIONS – GENERAL

TRANSPORT

Monitoring of Coal Transport

1. The Applicant **must**:
 - (a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and
 - (b) make these records publicly available on its website at the end of each calendar quarter.

Road Works

2. The Applicant **must** upgrade the Ruttleys Road and Construction Road intersection within 6 months of the date of this consent, unless the **Planning Secretary** directs otherwise, by:
 - (a) installing additional signage on and adjacent to Construction Road prior to the intersection;
 - (b) repairing the surface of Construction Road as required and ensuring the edge seal of the left turn lane is of sufficient width to accommodate coal trucks;
 - (c) installing or replacing “Stop” signs in accordance with Austroads guidelines;
 - (d) repainting road line markings and raised pavements associated with this intersection; and
 - (e) installing barriers to prevent trucks parking on the gravel area adjacent to the intersection and the electricity substation located in the vicinity of this intersection.

The design and construction of these works must be undertaken in consultation with, and to the relevant satisfaction of, **CC Council**, **TfNSW** and Delta Electricity and to the satisfaction of the **Planning Secretary**.

Road Transport Protocol

3. The Applicant **must** prepare a Road Transport Protocol to the satisfaction of the **Planning Secretary**. This protocol **must**:
 - (a) be prepared in consultation with **TfNSW**, **NCC**, **CC Council** and **CCC** and submitted to the **Planning Secretary** for approval within 6 months of the date of this consent;
 - (b) describe the designated haulage routes to be used (as shown in Appendix 5); the maximum number of road movements proposed and the haulage hours permitted under this consent;
 - (c) include a Traffic Management Plan, which includes:
 - procedures to ensure that drivers adhere to the designated haulage routes;
 - measures to maximise the use of a low frequency (regular) trucking schedule rather than an intermittently-high frequency (campaign) trucking schedule, especially during the morning peak hour;
 - contingency plans to apply when (for example) the designated haulage route is disrupted, including procedures for notifying relevant agencies and affected communities of the need to implement such contingency plans;
 - procedures to ensure that all haulage vehicles associated with the development are clearly distinguishable as Chain Valley Colliery coal haulage trucks;
 - details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site;
 - measures to ensure that the provisions of the Traffic Management Plan are implemented, eg driver training in the heavy vehicle driver's Code of Conduct and contractual agreements with heavy vehicle operators; and
 - procedures for ensuring compliance with and enforcement of the heavy vehicle driver's Code of Conduct;
 - (d) include a Code of Conduct for heavy vehicle drivers that addresses:
 - travelling speeds;
 - instructions to avoid grouping or convoying of trucks;
 - instructions to drivers not to overtake each other on the haulage route, as far as practicable, and to maintain appropriate distances between vehicles;
 - instruction to drivers to adhere to the designated haulage routes;
 - instruction to drivers to be properly safety conscious and to strictly obey all traffic regulations; and
 - appropriate penalties for infringements of the Code.

The Applicant **must** implement the approved Road Transport Protocol as approved from time to time by the **Planning Secretary**.

Independent Traffic Audit

4. Prior to 31 March 2014, and every 12 months thereafter for each calendar year in which coal haulage from the site is undertaken utilising public roads, unless the Planning Secretary directs otherwise, the Applicant must commission a suitably qualified person, whose appointment has been approved by the Planning Secretary at least one month prior to undertaking the audit, to conduct an Independent Traffic Audit of the development. This audit must:
 - (a) be undertaken without prior notice to the Applicant, and in consultation with TfNSW, NCC, CC Council and the CCC;
 - (b) assess the impact of the development on the performance and safety of the road network, including a review of:
 - haulage records;
 - accident records on the haulage route, infringements relating to the code of conduct and any incidents involving haulage vehicles;
 - community complaints register; and
 - (c) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts.
5. Within 1 month of receiving the audit report, or as otherwise agreed by the Planning Secretary, the Applicant must submit a copy of the report to the Planning Secretary, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report.

A summary of the audit report must be included in the Annual Review.

Alternative Coal Transport Options

6. Prior to 31 December 2014, and every three years thereafter, the Applicant must prepare and submit to the Planning Secretary for approval, a study of the reasonable and feasible options to reduce or eliminate the use of public roads to transport coal from the development, unless otherwise agreed by the Planning Secretary. The assessment must include:
 - (a) an analysis of the capital, construction and operating costs of the alternative transport options; and
 - (b) quantified social and environmental impacts associated with road and rail transport.

NOISE

Noise Impact Assessment Criteria

7. The Applicant must ensure that the noise generated by the development at any residence on privately-owned land does not exceed the criteria for the location in Table 1 nearest to that residence.

Table 1: Noise Criteria dB(A)

Location	Day	Evening	Night	
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{A1} (1 min)
R8	38	38	38	45
R11	49	49	49	54
R12	49	49	49	53
R13	43	43	43	49
R15	36	36	36	45
R19	37	37	37	45
R22	46	46	46	46
all other privately-owned land	35	35	35	45

Notes:

- To interpret the locations referred to in Table 1, see Appendix 6 and the EIS; and
- Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

8. The Applicant **must**:
- implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;
 - regularly assess the noise monitoring and meteorological data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;
 - minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);
 - use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;
 - carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and
 - prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit;
- to the satisfaction of the **Planning Secretary**.

Table 2: Long-term Noise Goals dB(A)

Location	Day	Evening	Night
	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>
R11 – R13	41	41	41
R22	40	40	40

Notes:

- To interpret the locations referred to in Table 2, see Appendix 6 and the EIS; and
- Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

Noise Management Plan

9. The Applicant **must** prepare a Noise Management Plan for the development to the satisfaction of the **Planning Secretary**. This plan must:
- be prepared in consultation with the EPA and submitted to the **Planning Secretary** for approval within 4 months of the date of this consent, unless otherwise agreed by the **Planning Secretary**;
 - describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;
 - describe the proposed noise management system in detail including the mitigation measures that would be implemented to minimise noise during construction and operations, including on and off site road noise generated by vehicles associated with the development; and
 - include a monitoring program that:
 - uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent;
 - evaluates and reports on:
 - the effectiveness of the on-site noise management system; and
 - compliance against the noise operating conditions; and
 - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

The Applicant must implement the Noise Management Plan as approved by the Planning Secretary.

AIR QUALITY

Odour

10. The Applicant **must** ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

Air Quality Criteria

11. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause **exceedances** of the criteria listed in **Table 3** at any residence on privately-owned land.

Table 3: Air quality criteria

Pollutant	Averaging period	Criterion	
Particulate matter < 2.5 µm (PM _{2.5})	Annual	^{a, c} 8 µg/m ³	
	24 hour	^b 25 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	Annual	^{a, c} 25 µg/m ³	
	24 hour	^b 50 µg/m ³	
Total suspended particulate (TSP) matter	Annual	^{a, c} 90 µg/m ³	
^d Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Notes:

^a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

^b Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

^c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

^d Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

- 11A. The air quality criteria in Table 3 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

12. The Applicant **must**:
- implement best practice air quality management at the site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the development;
 - implement best practice management to minimise the risk of spontaneous combustion and related emissions;
 - implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site;
 - operate an air quality management system on site to ensure compliance with the relevant conditions of this consent;
 - minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see **note c to Table 3** above);
 - regularly assess the air quality monitoring data, and modify operations on site to ensure compliance with the relevant conditions of this consent,
- to the satisfaction of the **Planning Secretary**.

Air Quality Management Plan

13. The Applicant **must** prepare an Air Quality Management Plan for the development to the satisfaction of the **Planning Secretary**. This plan must:
- (a) be prepared in consultation with the EPA, and submitted to the **Planning Secretary** for approval within 6 months of the date of this consent;
 - (b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;
 - (c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site;
 - (d) describe the proposed on-site air quality management system; and
 - (e) include an air quality monitoring program that:
 - is capable of evaluating the operating conditions of this consent;
 - evaluates and reports on:
 - the effectiveness of the air quality management system; and
 - compliance against the air quality operating conditions;
 - defines what constitutes an air quality incident and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.

The Applicant must implement the Air Quality Management Plan as approved by the Planning Secretary.

METEOROLOGICAL MONITORING

14. During the life of the development, the Applicant **must** ensure that there is a suitable meteorological station operating in the vicinity of the site that:
- (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
 - (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the **Planning Secretary** following consultation with the EPA.

SOIL & WATER

Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.

Water Supply

15. The Applicant **must** ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of mining operations to match its available water supply, to the satisfaction of the **Planning Secretary**.

Water Pollution

16. Unless an EPL authorises otherwise, the Applicant **must** comply with Section 120 of the POEO Act.

Sewage Management

17. The Applicant must manage sewage generated by the development in accordance with the requirements of an EPL.

Water Management Plan

18. The Applicant **must** prepare a Water Management Plan for the surface facilities sites to the satisfaction of the **Planning Secretary**. This plan must be prepared in consultation with **DPIE Water** and EPA, by suitably qualified and experienced persons whose appointment has been endorsed by the **Planning Secretary** and submitted to the **Planning Secretary** for approval within 6 months of the date of this consent. This plan must include:
- (a) a comprehensive water balance for the development that includes details of:
 - sources and security of water supply;
 - water make in the underground workings;
 - water transfers from the underground operations to the surface;
 - water use; and
 - any water discharges;
 - (b) management plans for the surface facilities sites, that include:
 - a detailed description of water management systems for each site, including:
 - clean water diversion systems;

- erosion and sediment controls; and
 - any water storages;
 - measures to minimise potable water use and to reuse and recycle water;
 - measures to manage acid sulphate soils, if encountered;
 - activities that would involve ground disturbance at the site; and
 - monitoring and reporting procedures.
- (c) a Surface Water Management Plan which:
- includes baseline data on surface water flows and quality of Swindles Creek;
 - details surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on surface water resources or surface water quality;
 - provides a program to monitor:
 - surface water discharges;
 - surface water flows and quality; and
 - channel stability;
- (d) a Ground Water Monitoring Program which includes a program to:
- monitor and report groundwater inflows to underground workings;
 - predict, manage and monitor impacts to nearby groundwater bores on privately-owned land that may be impacted by the development; and
- (e) a detailed review of surface water management at the site, with particular reference to the water storages within the dirty water management system, to:
- determine whether the capacity, integrity, retention time and management of the dirty water storages (particularly the final Pollution Control Dam) are sufficient to ensure that water discharged from the site meets the EPL limits and surface water impact assessment criteria within the Surface Water Management Plan; and
 - propose any appropriate changes to the surface water management system.

The Applicant must implement the Water Management Plan as approved by the Planning Secretary.

Note: The Planning Secretary may require the Applicant to implement upgrades and other changes identified under paragraph (e), in accordance with condition 3 of Schedule 2.

BIODIVERSITY

Biodiversity Enhancement Strategy

19. The Applicant **must** implement a Biodiversity Enhancement Strategy as described in the EIS and summarised in Table 4, in consultation with BCD, and to the satisfaction of the Planning Secretary.

Table 4: Summary of the Biodiversity Enhancement Strategy

Area	Offset Type	Minimum Size/Amount
Biodiversity Enhancement Area	Enhancement and restoration measures, including weed and rubbish removal, return of natural hydrological regime and regeneration with native endemic species.	3 ha (in total) of Swamp Sclerophyll Floodplain Forest and Swamp Oak Floodplain Forest endangered ecological communities within the surface facilities sites

Note: To identify the Biodiversity Enhancement Area referred to in Table 4 see the applicable figures in Appendix 7.

The Applicant **must** implement its preferred option of the three options set out in new dot point 1 of the Terrestrial Ecology section of its Statement of Commitments by 1 December 2016, following consultation with BCD and to the satisfaction of the Planning Secretary.

Biodiversity Management Plan

20. The Applicant **must** prepare a Biodiversity Management Plan for the surface facilities sites, for all areas that are not, or will not, be subject to condition 7 of schedule 4, to the satisfaction of the Planning Secretary. This plan must:
- (a) be prepared by a suitably qualified person approved by the Planning Secretary; in consultation with BCD, and submitted to the Planning Secretary within 6 months of the date of this consent;
 - (b) establish baseline data for the existing habitat in the Biodiversity Enhancement Area and elsewhere on the site;
 - (c) describe the short, medium, and long term measures that would be implemented to:
 - manage the impacts of clearing vegetation;

- manage the remnant vegetation and habitat in the Biodiversity Enhancement Area and elsewhere on the site; and
 - implement the Biodiversity Enhancement Strategy, including detailed performance and completion criteria;
- (d) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;
- (e) identify the potential risks to the successful implementation of the Biodiversity Enhancement Strategy, and the contingency measures that would be implemented to mitigate these risks; and
- (f) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

The Applicant must implement the Biodiversity Management Plan as approved by the Planning Secretary.

- 20A. Within 3 months of the approval of MOD 2, the Applicant must revise the Biodiversity Management Plan to incorporate the measures required to implement its commitments described in new dot point 2 of the Terrestrial Ecology section of its Statement of Commitments, and submit it to the Planning Secretary for approval.

HERITAGE

Protection of Aboriginal Heritage

21. The Applicant must ensure that the development does not cause any direct or indirect impact on any identified heritage item located outside the approved disturbance area, beyond those predicted in the documents listed in condition 2(e) of Schedule 2.

Heritage Management Plan

- 21A. The Applicant must prepare a Heritage Management Plan for the development to the satisfaction of the Planning Secretary. This Plan must:
- (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Planning Secretary;
 - (b) be prepared in consultation with BCD and Registered Aboriginal Parties;
 - (c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;
 - (d) describe the procedures and management measures to be implemented on the site or within any offset area to:
 - i. ensure all workers receive suitable Aboriginal cultural heritage inductions prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal places, and that suitable records are kept of these inductions;
 - ii. protect, monitor and manage identified non-Aboriginal heritage, Aboriginal objects and Aboriginal places (including any proposed archaeological investigations of potential subsurface objects and salvage of objects within the approved disturbance area) in accordance with the commitments made in the document/s listed in condition 2(e) of Schedule 2 and including the ongoing monitoring of site 45-7-0189 at Summerland Point;
 - iii. protect non-Aboriginal heritage, Aboriginal objects and Aboriginal places located outside the approved disturbance area from impacts of the development;
 - iv. manage the discovery of suspected human remains and any new Aboriginal objects or Aboriginal places, including provisions for burials, over the life of the development;
 - v. maintain and manage reasonable access for relevant Aboriginal stakeholders to Aboriginal objects and Aboriginal places (outside of the approved disturbance area); and
 - vi. facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site; and
 - (e) include a strategy for the care, control and storage of Aboriginal objects salvaged on site, both during the life of the development and in the long term.

The Applicant must implement the Heritage Management Plan approved by the Planning Secretary.

VISUAL

Visual Amenity and Lighting

22. The Applicant must:
- (a) minimise visual impacts, and particularly the off-site lighting impacts, of the Surface facilities sites;
 - (b) take all reasonable and feasible measures to further mitigate off-site lighting impacts from the development; and

- (c) ensure that all external lighting associated on site complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*, to the satisfaction of the [Planning Secretary](#).

WASTE

23. The Applicant [must](#):
- (a) minimise and monitor the waste generated by the development;
 - (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and
 - (c) report on waste management and minimisation in the Annual Review, to the satisfaction of the [Planning Secretary](#).

BUSHFIRE MANAGEMENT

24. The Applicant [must](#):
- (a) ensure that the development is suitably equipped to respond to any fires on site; and
 - (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the Surface facilities sites.

REHABILITATION

Rehabilitation Objectives

25. The Applicant [must](#) rehabilitate the site [in accordance with the conditions imposed on the mining lease\(s\) associated with the development under the Mining Act 1992](#). This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS, and comply with the objectives in [Table 5](#).

Table 5: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	<ul style="list-style-type: none"> Safe, stable and non-polluting. Final land use compatible with surrounding land uses.
Surface infrastructure	<ul style="list-style-type: none"> To be decommissioned and removed, unless the RR agrees otherwise.
Portals and ventilation shafts	<ul style="list-style-type: none"> To be decommissioned and made safe and stable. Retain habitat for threatened species (eg bats), where practicable.
Other land affected by the development	<ul style="list-style-type: none"> Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: <ul style="list-style-type: none"> local native plant species (unless the RR agrees otherwise); and a landform consistent with the surrounding environment.
Built features damaged by mining operations	<ul style="list-style-type: none"> Repair to pre-mining condition or equivalent unless: <ul style="list-style-type: none"> the owner agrees otherwise; or the damage is fully restored, repaired or compensated under the Coal Mine Subsidence Compensation Act 2017.
Community	<ul style="list-style-type: none"> Ensure public safety. Minimise the adverse socio-economic effects associated with mine closure.

Notes:

- These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by underground mining taking place after the granting of project approval MP 10_0161, and to all development surface infrastructure that is part of the development, whether constructed prior to or following the date of this consent.
- Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of project approval (MP 10_0161) may be subject to the requirements of other approvals (eg under a mining lease or a Subsidence Management Plan approval).

Progressive Rehabilitation

26. The Applicant [must](#) carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.

Rehabilitation Management Plan

27. The Applicant [must](#) prepare a Rehabilitation Management Plan for the development, [in accordance with the conditions imposed on the mining lease\(s\) associated with the development under the Mining Act 1992](#). This plan must:

- (a) be prepared in consultation with BCD, DPIE Water, CC Council, LMCC and the CCC;
- (b) be submitted to the RR within 12 months of the date of approval of this development consent;
- (c) be prepared in accordance with any relevant RR guideline and be consistent with the rehabilitation objectives in the EIS and in Table 5;
- (d) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 5;
- (e) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved;
- (f) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and
- (g) be integrated with the other management plans required under this consent.

Note: The Rehabilitation Management Plan should address all land impacted by the development whether prior to, or following, the date of this consent.

EXPLORATION ACTIVITIES AND SURFACE INFRASTRUCTURE

Exploration Activities and Minor Surface Infrastructure Management Plan

28. Prior to carrying out exploration activities on the site under this consent that would cause temporary surface disturbance, or exploration activities within the waters or lake bed of Lake Macquarie, or the construction and/or upgrade of minor surface infrastructure on the site, the Applicant must prepare an Exploration Activities and Minor Surface Infrastructure Management Plan for the development to the satisfaction of the Planning Secretary. This Plan must:
 - (a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;
 - (b) be prepared in consultation with MEG, NSW Maritime Division of TfNSW, NSW Fisheries and BCD;
 - (c) include a description of the measures to be implemented for:
 - i. managing exploration activities;
 - ii. managing construction and operation of minor surface infrastructure and associated access tracks;
 - iii. consulting with and if necessary compensating affected landowners;
 - iv. assessing noise, air quality, traffic, biodiversity, heritage, public safety and other impacts;
 - v. beneficial re-use or flaring of drained hydrocarbon gases, wherever practicable;
 - vi. avoiding significant impacts and minimisation of impacts generally;
 - vii. avoiding or minimising impacts on threatened species, populations or their habitats and EECs;
 - viii. minimising clearance and disturbance of native vegetation (including seagrasses);
 - ix. minimising and managing erosion and sedimentation; and
 - x. rehabilitating disturbed areas.

The Applicant must implement the Exploration Activities and Minor Surface Infrastructure Management Plan as approved by the Planning Secretary.

SCHEDULE 4 ENVIRONMENTAL CONDITIONS – UNDERGROUND MINING

SUBSIDENCE

- The Applicant **must** ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within seagrass beds is limited to a maximum of 20 millimetres (mm). **If at any stage predicted subsidence levels are exceeded within these areas, an ecological monitoring program shall be initiated to assess the impacts to ecological communities and threatened species and if appropriate, offsets are to be provided for any impacts detected.**

Performance Measures – Natural Environment

- The Applicant **must** ensure that the development does not cause any exceedance of the performance measures in Table 6 to the satisfaction of the Planning Secretary.

Table 6: Subsidence Impact Performance Measures – Natural and Heritage Features

Biodiversity	
Threatened species or endangered populations	Negligible environmental consequences
Seagrass beds	Negligible environmental consequences including: <ul style="list-style-type: none"> • negligible change in the size and distribution of seagrass beds; • negligible change in the functioning of seagrass beds; and • negligible change to the composition or distribution of seagrass species within seagrass beds.
Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.
Mine workings	
First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	To remain long-term stable and non-subsiding.
Second workings	To be carried out only in accordance with an approved Extraction Plan.

Notes:

- The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see Condition 7 below).
- Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Planning Secretary will be the final arbiter.
- The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of approval of this consent.

Offsets

- If the Applicant exceeds the performance measures in Table 6 and the Planning Secretary determines that:
 - it is not reasonable or feasible to remediate the impact or environmental consequence; or
 - the remediation measures implemented by the Applicant have failed to satisfactorily remediate the impact or environmental consequence;
then the Applicant **must** provide a suitable offset to compensate for the impact or environmental consequence to the satisfaction of the Planning Secretary.

Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.

Performance Measures – Built Features

- The Applicant **must** ensure that the development does not cause any exceedances of the performance measures in Table 7, to the satisfaction of the Planning Secretary.

Table 7: Subsidence Impact Performance Measures – Built Features

Built Features	Performance Measure
Trinity Point Marina Development Other built features	<ul style="list-style-type: none"> Always safe. Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated. Damage must be fully repaired, replaced or fully compensated.
Public Safety	
Public Safety.	Negligible additional risk.

Notes:

- The Applicant will be required to define more detailed performance indicators for each of these performance measures in Built Features Management Plans or a Public Safety Management Plan (see Condition 7 below).
- Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the [Planning Secretary](#) will be the final arbiter.
- The requirements of this condition only apply to the impacts and consequences of mining operations undertaken following the date of this development consent.
- Requirements regarding safety or serviceability do not preclude preventative actions or mitigation being taken prior to or during mining in order to achieve or maintain these outcomes.
- Requirements under this condition may be met by measures undertaken in accordance with the [Coal Mine Subsidence Compensation Act 2017](#).

- Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the subsidence performance measures in [Table 7](#) is to be settled by the [Planning Secretary](#), following consultation with the [SA NSW](#) and [MEG](#). Any decision by the [Planning Secretary](#) shall be final and not subject to further dispute resolution under this consent.

Multi-Seam Mining Feasibility Investigation

- Prior to the submission of an Extraction Plan [related to the Chain Valley Bay mining area as shown in Appendix 3](#), the Applicant must prepare a detailed Multi-Seam Mining Feasibility Investigation to the satisfaction of the [Planning Secretary](#). This plan must:
 - be prepared in consultation with [MEG](#) by suitably qualified and experienced persons whose appointment has been endorsed by the [Planning Secretary](#);
 - assess the extent of the soft claystone floor/roof conditions within former workings in the Great Northern and Wallarah Seams;
 - assess the stability of remnant coal pillars within former workings in the Great Northern and Wallarah Seams;
 - give particular consideration to the risks of irregular subsidence, pillar run and long-term subsidence leading to subsidence outside of the predicted angle of draw;
 - include revised multi-seam subsidence predictions for the proposed second workings; and
 - recommend final design of the second workings and any necessary adaptive management measures.

Extraction Plan

- The Applicant [must](#) prepare an Extraction Plan for all second workings on site, to the satisfaction of the [Planning Secretary](#). Each Extraction Plan must:
 - be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the [Planning Secretary](#);
 - be approved by the [Planning Secretary](#) before the Applicant carries out any second workings covered by the plan;
 - include detailed plans of existing and proposed first and second workings and any associated surface development, including any applicable adaptive management measures;
 - include detailed performance indicators for each of the performance measures in [Tables 6 and 7](#);
 - provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;
 - describe the measures that would be implemented to ensure compliance with the performance measures in [Tables 6 and 7](#), and manage or remediate any impacts and/or environmental consequences;
 - include a Built Features Management Plan, which has been prepared in consultation with [RR](#) and the owners of affected public infrastructure, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, and which

- addresses in appropriate detail all items of public infrastructure and all classes of other built features;
 - has been prepared following appropriate consultation with the owner/s of potentially affected feature/s;
 - recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate all predicted impacts on potentially affected built features in a timely manner; and;
- (h) include a Benthic Communities Management Plan, which has been prepared in consultation with BCD, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities, and which includes:
- surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured;
 - benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities;
 - a program of ongoing seasonal monitoring of benthic species in both control and impact sites;
 - development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the monitoring and survey data collected; and
 - updating the model every 2 years using the most recent monitoring and survey data;
- (i) include a Seagrass Management Plan, which has been prepared in consultation with BCD, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on seagrass beds, and which includes:
- a program of ongoing monitoring of seagrasses in both control and impact sites; and
 - a program to predict and manage subsidence impacts and environmental consequences to seagrass beds to ensure the performance measures in Table 6 are met;
- (j) include a Public Safety Management Plan, which has been prepared in consultation with RR, to ensure public safety;
- (k) include a Subsidence Monitoring Program which has been prepared in consultation with RR, to:
- provide data to assist with the management of the risks associated with subsidence;
 - validates the subsidence predictions;
 - analyses the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and
 - informs the contingency plan and adaptive management process;
- (l) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 6 and 7, or where any such exceedance appears likely;
- (m) include appropriate revisions to the Rehabilitation Management Plan required under Condition 27 of Schedule 3; and
- (n) include a program to collect sufficient baseline data for future Extraction Plans.

The Applicant must implement the Extraction Plan as approved by the Planning Secretary.

8. The Applicant must ensure that the management plans required under conditions 7(g)-(j) above include:
- (a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent; and
 - (b) a detailed description of the measures that would be implemented to remediate predicted impacts.

First Workings

9. The Applicant may carry out first workings within Subsidence Zones A and B as shown in Appendix 3, other than in accordance with an approved Extraction Plan, provided that the first workings are designed to remain stable and non-subsiding in the long-term and do not generate more than 20 mm of vertical subsidence at the surface, except insofar as they may be impacted by approved second workings.

Note: The intent of this condition is to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long-term stability, with negligible direct subsidence impacts.

- 9A. Within 3 months of the approval of MOD 1, the Applicant must produce and subsequently implement a Built Features Management Plan that considers surface infrastructure potentially affected by the first workings of the Underground Linkage between Chain Valley Colliery and Mannering Colliery, including WCS's MP01 sewer rising main, TransGrid's electricity transmission assets and infrastructure associated with the Vales Point Power Station, to the satisfaction of the Planning Secretary.

Payment of Reasonable Costs

10. The Applicant **must** pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to review the adequacy of any aspect of an Extraction Plan.
-

SCHEDULE 5 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable after obtaining monitoring results showing:
 - (a) an exceedance of any relevant criteria in Schedule 3, the Applicant **must** notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and
 - (b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant **must** send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (*NSW Health, 2017*) (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

2. If an owner of privately-owned land considers the development to be exceeding the relevant criteria in Schedule 3, then he/she may ask the **Planning Secretary** in writing for an independent review of the impacts of the development on his/her land.

If the **Planning Secretary** is satisfied that an independent review is warranted, then within 2 months of the **Planning Secretary's** decision the Applicant **must**:

- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the **Planning Secretary**, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and
 - if the development is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and
 - (b) give the **Planning Secretary** and landowner a copy of the independent review.
-

SCHEDULE 6

ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant must prepare an Environmental Management Strategy for the development to the satisfaction of the Planning Secretary. This strategy must:
 - (a) provide the strategic framework for environmental management of the development;
 - (b) identify the statutory approvals that apply to the development;
 - (c) set out the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
 - (d) set out the procedures to be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
 - receive record, handle and respond to complaints;
 - resolve any disputes that may arise during the course of the development;
 - respond to any non-compliance and any incident;
 - respond to emergencies; and
 - (e) include:
 - references to any strategies, plans and programs approved under the conditions of this consent; and
 - a clear plan depicting all the monitoring to be carried out under the conditions of this consent.

The Applicant must implement the Environmental Management Strategy as approved by the Planning Secretary.

Adaptive Management

2. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and performance measures in this consent. Any exceedance of these criteria or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedance of these criteria or performance measures has occurred, the Applicant must, at the earliest opportunity:

- (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;
- (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
- (c) implement reasonable remediation measures as directed by the Planning Secretary.

Management Plan Requirements

3. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:
 - (a) a summary of relevant background or baseline data;
 - (b) details of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures and criteria; and
 - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
 - (c) any relevant commitments or recommendations identified in the document/s listed in condition 2(e) of Schedule 2;
 - (d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;
 - (e) a program to monitor and report on the:
 - impacts and environmental performance of the development; and
 - effectiveness of the management measures set out pursuant to condition 2(e) of Schedule 2;
 - (f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
 - (g) a program to investigate and implement ways to improve the environmental performance of the development over time;
 - (h) a protocol for managing and reporting any:
 - incident, non-compliance or exceedance of any impact assessment criterion or performance criterion;

- complaint; or
 - failure to comply with other statutory requirements;
- (i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and
 - (j) a protocol for periodic review of the plan.

Note: *The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*

4. The Applicant must ensure that management plans prepared for the development are consistent with the conditions of this consent and any EPL issued for the site.

REVISION OF STRATEGIES, PLANS AND PROGRAMS

5. Within three months of:
 - (a) the submission of an incident report under condition 6;
 - (b) the submission of an Annual Review under condition 8;
 - (c) the submission of an Independent Environmental Audit under condition 9; or
 - (d) the approval of any modification of the conditions of this consent (unless the conditions require otherwise),

the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.

If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review.

Note: *This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*

REPORTING AND AUDITING

Incident Notification

6. The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing [via the Department's Major Projects website](#) and identify the development (including the development application number and name) and set out the location and nature of the incident.

Non-Compliance Notification

7. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing [via the Department's Major Projects website](#) and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: *A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*

Annual Review

8. By the end of March in each year after the commencement of the development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:
 - (a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
 - (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - requirements of any plan or program required under this consent;
 - monitoring results of previous years; and
 - relevant predictions in the document/s listed in condition 2(e) of Schedule 2;
 - (c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;
 - (d) evaluate and report on:
 - the effectiveness of the noise and air quality management systems; and
 - compliance with the performance measures, criteria and operating conditions of this consent;
 - (e) identify any trends in the monitoring data over the life of the development;
 - (f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

- (g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.

Copies of the Annual Review must be submitted to the Affected Councils and made available to the CCC and any interested person upon request.

Independent Environmental Audit

9. By the end of February 2022, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. The audit must:
- (a) led by a suitably qualified, experienced and independent auditor whose appointment has been endorsed by the Planning Secretary;
 - (b) be led and conducted by a suitably qualified, experienced and independent team of experts (including any be expert in field/s specified by the Planning Secretary) whose appointment has been endorsed by the Planning Secretary;
 - (c) be carried out in consultation with the relevant agencies and the CCC;
 - (d) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent, water licences and mining leases for the development (including any assessment, strategy, plan or program required under these approvals);
 - (e) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals and this consent;
 - (f) recommend appropriate measures or actions to improve the environmental performance of the development and any assessment, strategy, plan or program required under the abovementioned approvals and this consent; and
 - (g) be conducted and reported to the satisfaction of the Planning Secretary.
10. Within three months of commencing an Independent Environmental Audit, or other timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.

Monitoring and Environmental Audits

11. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.
- For the purposes of the condition, as set out in the EP&A Act, “monitoring” is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an “environmental audit” is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.
12. Noise and/or air quality monitoring under this consent may be undertaken at suitable representative monitoring locations instead of at privately-owned residences or other locations listed in Schedule 3, providing that these representative monitoring locations are set out in the respective management plan/s.

ACCESS TO INFORMATION

13. Until the completion of all rehabilitation required under this consent, the Applicant must:
- (a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website:
 - the documents referred to in condition 2(e) of Schedule 2 of this consent;
 - all current statutory approvals for the development;
 - all approved strategies, plans and programs required under the conditions of this consent;
 - the proposed staging plans for the development if the construction, operation or decommissioning of the development is to be staged;
 - minutes of CCC meetings;
 - regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent;
 - a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
 - a summary of the current progress of the development;
 - contact details to enquire about the development or to make a complaint;

- a complaints register, updated monthly;
 - the Annual Reviews of the development;
 - audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; and
 - any other matter required by the Planning Secretary; and
- (b) keep such information up to date, to the satisfaction of the Planning Secretary.
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**APPENDIX 1
SCHEDULE OF LAND**

Notes:	
1.	All proposed secondary extraction for the Project (Mining Extension 1) is to occur under Lake Macquarie.
2.	The surface facilities for the Colliery are limited to "pit top area" adjacent to Vales Point Power Station, and the "ventilation shaft site" at Summerland Point.
3.	Refer to Figure 1 of Appendix 2 for the Site.

Project Related Surface Facilities			
Pit Top Area		Ventilation shaft site	
Lot	Deposited Plan	Lot	Deposited Plan
A	379918	1	226133
B	379918		
C	349733		
A	187570		
1B	339441		

All other areas within the Site				
Lot	Deposited Plan		Lot	Deposited Plan
7339	1167067		20	708344
7330	1148105		19	708344
593	727722		18	708344
594	727722		17	708344
D	349733		34	714879
1	410653		33	714879
23	708344		32	714879
21	708344		31	714879
2	1043151		64	31306
426	755266		65	31306
427	755266		66	31306
136	755266		67	31306
2	515214		68	31306
1	515214		69	31306
1	214300		70	31306
2	214300		71	31306
167	755266		72	31306
1	388154		73	31306
144	661695		74	31306
19	25593		75	31306
20	25593		76	31306
21	25593		77	31306
22	25593		78	31306
23	25593		79	31306
24	25593		139	31306
25	25593		140	31306
26	25593		141	31306
27	25593		142	31306
58	31306		143	31306
59	31306		144	31306
60	31306		145	31306
61	31306		146	31306
62	31306		147	31306
63	31306		148	31306
149	31306		175	31306
150	31306		176	31306
151	31306		177	31306
152	31306		178	31306
153	31306		179	31306
154	31306		180	31306

155	31306		181	31306
156	31306		187	31306
157	31306		188	31306
158	31306		189	31306
159	31306		190	31306
160	31306		191	31306
161	31306		192	31306
162	31306		193	31306
163	31306		194	31306
164	31306		195	31306
165	31306		238	31306
166	31306		239	31306
167	31306		240	31306
168	31306		241	31306
169	31306		242	31306
170	31306		46	31322
171	31306		47	31322
172	31306		48	31322
173	31306		78	31322
174	31306		4	981106
243	31306		3	981104
244	31306		11	13120
245	31306		12	13120
246	31306		13	13120
247	31306		14	13120
248	31306		15	13120
249	31306		16	13120
250	31306		17	13120
251	31306		18	13120
252	31306		19	13120
253	31306		20	13120
254	31306		21	13120
255	31306		22	13120
256	31306		23	13120
257	31306		24	13120
258	31306		60	13120
259	31306		30	13123
37	31322		31	13123
38	31322		A	368634
39	31322		100	1065718
40	31322		102	1065718
41	31322		20	1113256
42	31322		7329	1148149
43	31322		5	981103
44	31322		9	13120
45	31322		100	713777
32	13123		25	13120
33	13123		26	13120
34	13123		27	13120
35	13123		28	13120
36	13123		29	13120
37	13123		1	1221849
38	13123		2	1221849
39	13123		3	1221849
40	13123		4	1074358
41	13123			93941
168	13123			93945
182	31306		10	1235493
183	31306		11	1235493
184	31306		9	1235493
185	31306		189	8055
186	31306		252	8055

78	13123		186	8055
119	13123		127	13123
103	13123		47	13120
15	13123		2	806513
2	204202		135	8055
105	13123		117	8055
122	13123		2	551787
109	13123		45	15556
6	519261		71	15556
1	621171		100	790729
2	1013763		1	551787
111	13123		69	27749
69	13123		87	8055
13	13123		39	15556
3	250973		76	15556
124	13123		202	8055
23	13123		104	8055
802	1038413		197	8055
721	537942		101	790729
116	13123		53	27749
191	880592		49	27749
126	13123		254	8055
131	13123		81	8055
822	588493		199	8055
3	621171		138	8055
772	619779		41	15556
7	13120		12	15556
91	880881		44	27749
45	13120		25	27749
41	872109		54	15556
3	13120		126	8055
99	13123		1482	562711
42	872109		52	15556
37	13120		208	8055
2	621171		113	8055
39	13120		70	27749
49	13120		56	27749
153	17367		24	15556
773	619779		228	8055
771	619779		88	8055
112	13123		132	8055
82	13123		60	15556
43	13123		17	28068
141	13123		56	13123
120	13123		20	13123
108	13123		76	13123
5	981103		72	13123
66	13123		152	17367
14	28068		5	519261
106	13123		205	1017819
45	13123		92	13123
50	13123		522	543408
3	981104		80	13123
1	542486		521	543408
44	13123		30	13120

862	557889		83	13123
2	542486		34	13120
75	13123		36	13120
49	13123		351	840188
73	13123		32	13120
56	13120		101	558722
58	13120		8	524374
147	13123		102	558722
1	806513		86	13123
35	13120		821	588493
43	13120		6	13120
5	13120		2	579042
42	13120		2	270423
8	13120		6	270423
1	13120		1	270423
33	13120		4	270423
31	13120		1	1107356
46	13120		2	1107356
18	527120		1691	1110053
145	13123		1693	1110053
55	13120		1692	1110053
54	13120		2144	1124129
9	13120		7311	1141467
28	13120		7306	1146817
2	13120		101	1165194
450	818534		154	17367
3	579042		5	270423
48	13120		42	1073017
44	13120		60	1074161
84	13123		872	733417
29	13120		51	27749
52	13120		103	15556
100	713777		11	13123
4	13120		12	13123
1	579042		21	13123
51	13120		43	1073017
146	13123		41	1073017
38	13120		61	1074161
155	17367		63	1074161
57	13120		62	1074161
50	13120		3	270423
7	524374		1	1088536
861	557889		202	1093288
40	13120		201	1093288
144	13123		139	8055
911	747550		14	538780
53	13120		46	15556
912	747550		113	15556
352	840188		21	1029069
41	13120		119	8055
4	981106		230	8055
13	15556		25	15556
260	8055		211	8055
124	8055		112	8055
38	27749		142	8055

157	8055		227	8055
48	15556		28	15556
27	27749		109	15556
198	8055		142	15556
195	8055		223	8055
782	1060935		77	15556
812	816616		215	8055
32	15556		2	375836
155	8055		31	27749
134	8055		43	15556
130	8055		59	27749
75	15556		224	8055
15	15556		53	15556
3	15556		107	8055
256	8055		117	15556
26	27749		88	15556
51	15556		202	1020262
232	8055		236	8055
205	8055		19	15556
164	8055		1	250973
10	15556		47	27749
128	8055		115	8055
136	8055		89	8055
86	15556		106	8055
201	843074		35	27749
38	15556		133	8055
1	561577		34	27749
833	598304		154	8055
235	8055		42	27749
112	15556		72	15556
220	8055		21	15556
40	27749		207	8055
65	15556		98	8055
225	8055		127	8055
125	8055		120	8055
65	27749		48	27749
226	8055		101	15556
194	8055		101	8055
192	8055		234	8055
57	15556		33	524726
209	8055		832	598304
36	15556		156	8055
2061	1011261		191	1046133
121	8055		111	8055
147	8055		42	15556
115	15556		237	8055
871	733417		219	8055
47	15556		57	27749
39	27749		34	15556
40	15556		222	8055
52	27749		196	8055
28	27749		3	375836
97	8055		212	8055
200	843074		811	816616
67	27749		73	15556

58	15556		90	8055
23	15556		26	15556
120	15556		28	13123
129	13123		25	13123
1	505798		24	13123
18	28068		36	13123
10	13123		31	13123
155	13123		94	13123
97	13123		35	13123
8	13123		26	13123
113	13123		30	13123
41	13123		38	13123
118	13123		29	13123
39	13123		168	13123
801	1038413		27	13123
85	13123		37	13123
167	13123		185	15556
55	13123		134	15556
81	13123		102	844302
128	13123		136	15556
91	13123		139	15556
40	13123		125	15556
107	13123		101	844302
203	1020262		137	15556
79	13123		131	859693
15	28068		126	15556
70	13123		187	15556
100	13123		6	251160
95	13123		3	13123
148	13123		55	17367
63	13123		95	17367
5	250973		2	13123
11	15556		77	17367
22	27749		116	17367
64	27749		79	15556
16	15556		66	17367
55	27749		140	15556
103	8055		132	859693
88	13123		2	634668
631	872639		130	15556
110	8055		123	15556
200	8055		206	15556
99	8055		128	15556
109	8055		135	15556
106	15556		124	15556
140	8055		186	15556
56	15556		127	15556
2	28068		179	15556
4	13123		201	700345
46	654032		158	17367
123	17367		163	17367
140	13123		49	17367
3	251160		147	17367
159	13123		149	17367
138	13123		142	852383

80	17367		92	17367
4	251160		94	17367
394	755242		72	17367
398	755242		164	17367
396	755242		58	17367
25	17367		64	17367
67	17367		43	17367
5	251160		76	17367
65	17367		139	17367
93	17367		97	17367
96	17367		11	17367
21	17367		14	17367
106	17367		150	17367
151	854877		145A	17367
162	17367		78	17367
82	17367		115	17367
126	17367		140	17367
118	17367		131	17367
57	17367		107	17367
89	17367		129	17367
122	17367		1	251160
164	13123		52	17367
10	17367		133	17367
63	17367		53	17367
146	17367		166	13123
36	17367		388	755242
120	17367		390	755242
113	17367		389	755242
142	17367		68	17367
41	17367		125	17367
137	17367		38	17367
117	17367		143	17367
152	854877		141	852383
98	17367		160	13123
121	17367		75	17367
151	17367		161	13123
119	17367		114	17367
B	365476		71	17367
128	17367		132	17367
5	13123		163	13123
99	17367		56	17367
165	17367		166	17367
61	17367		159	17367
135	17367		104	17367
165	13123		42	17367
7	1228566		79	17367
6	1228566		1572	1043970
5	1228566		10	1071069
4	1228566		3991	1136246
3	1228566		7322	1141840
2	1228566		243	8055
1	1228566		241	8055
8	1228566		172	8055
4	28068		2	803077
71	13123		3	568311

74	13123		242	8055
59	13120		244	8055
1001	1253581		179	8055
1002	1253581		250	8055
99	15556		185	8055
1	1185308		180	8055
2	1185308		183	8055
249	8055		93	13123
240	8055		152	13123
178	8055		192	880592
2	568311		115	13123
181	8055		18	13123
C	25385		4	250973
191	8055		87	13123
B	25385		157	13123
245	8055		51	13123
175	8055		54	13123
78	8055		9	13123
173	8055		77	13123
176	8055		149	13123
76	8055		19	13123
177	8055		48	13123
251	8055		102	13123
248	8055		67	13123
246	8055		156	13123
3	803077		114	13123
1	568311		89	13123
184	8055		91	8055
4	568311		46	13123
174	8055		831	598304
247	8055		121	15556
D	25385		6	15556
190	8055		158	8055
E	25385		69	15556
1	803077		92	8055
1	204202		3	561577
1	551113		218	8055
1	1074358		210	8055
3	1074358		193	8055
2	1074358		30	15556
751	1099436		66	27749
752	1099436		63	27749
753	1099436		9	15556
7309	1141468		14	15556
20	1075811		31	15556
21	1075811		781	1060935
722	537942		54	27749
5	1074358		105	8055
121	13123		123	8055
10	28068		58	27749
143	13123		74	15556
154	13123		50	27749
47	13123		61	15556
98	13123		233	8055
104	13123		110	15556

125	13123		43	27749
65	13123		102	8055
22	13123		2	15556
14	13123		46	27749
3	28068		17	15556
151	13123		60	27749
110	13123		41	27749
16	13123		29	15556
117	13123		36	27749
156	17367		20	15556
204	1017819		8	15556
68	13123		203	8055
142	13123		68	27749
96	13123		49	15556
64	13123		93	8055
123	13123		1	15556
15	538780		67	15556
873	733417		151	734618
150	13123		22	15556
90	13123		62	15556
130	13123		23	27749
13	28068		21	27749
22	1029069		122	8055
42	13123		96	8055
7	13123		137	8055
153	13123		105	15556
255	8055		116	15556
114	15556		192	1046133
37	27749		50	15556
61	27749		100	8055
44	15556		32	524726
66	15556		27	15556
231	8055		201	8055
216	8055		159	8055
70	15556		107	15556
108	8055		64	15556
217	8055		33	15556
116	8055		95	8055
229	8055		24	27749
129	8055		114	8055
29	27749		111	15556
238	8055		7	15556
2	561577		204	8055
5	15556		259	8055
30	27749		118	15556
239	8055		632	872639
55	15556		1	13123
59	15556		148	17367
4	15556		161	17367
82	740968		6	13123
37	15556		158	13123
18	15556		222	833454
221	8055		105	17367
68	15556		12	17367
253	8055		395	755242

131	8055		A	365476
62	27749		69	17367
2062	1011261		50	17367
141	15556		162	13123
138	15556		70	17367
133	15556		48	17367
45	654334		81	17367
132	15556		387	755242
129	15556		54	17367
131	15556		160	17367
98	15556		144	17367
130	17367		124	17367
59	17367		74	17367
134	17367		112	17367
37	17367		102	17367
127	17367		139	13123
73	17367		51	17367
24	17367		40	17367
103	17367		101	17367
13	17367		2	251160
397	755242		109	17367
7015	1119454		223	833454
470	1118245		141	17367
7323	1141840		138	17367
102	1165194		9	28068
60	17367		500	755242
35	17367		145	17367
39	17367		62	17367
7074	1029683		44	17367
111	17367		110	17367
108	17367			
100	17367			
136	17367			

umwelt



38

APPENDIX 3 DEVELOPMENT LAYOUT

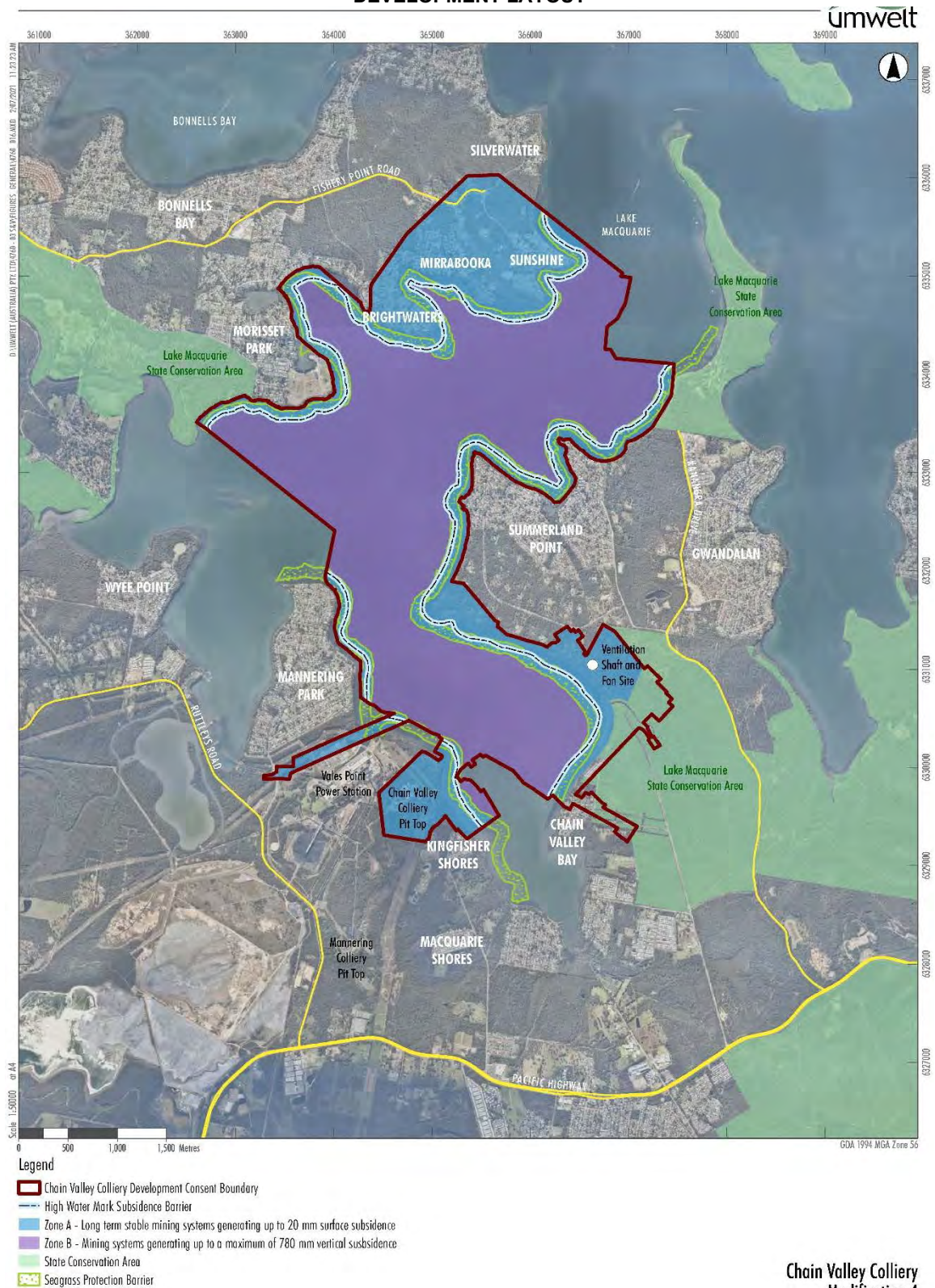


Figure 1: Mining Areas Subsidence Management Zones

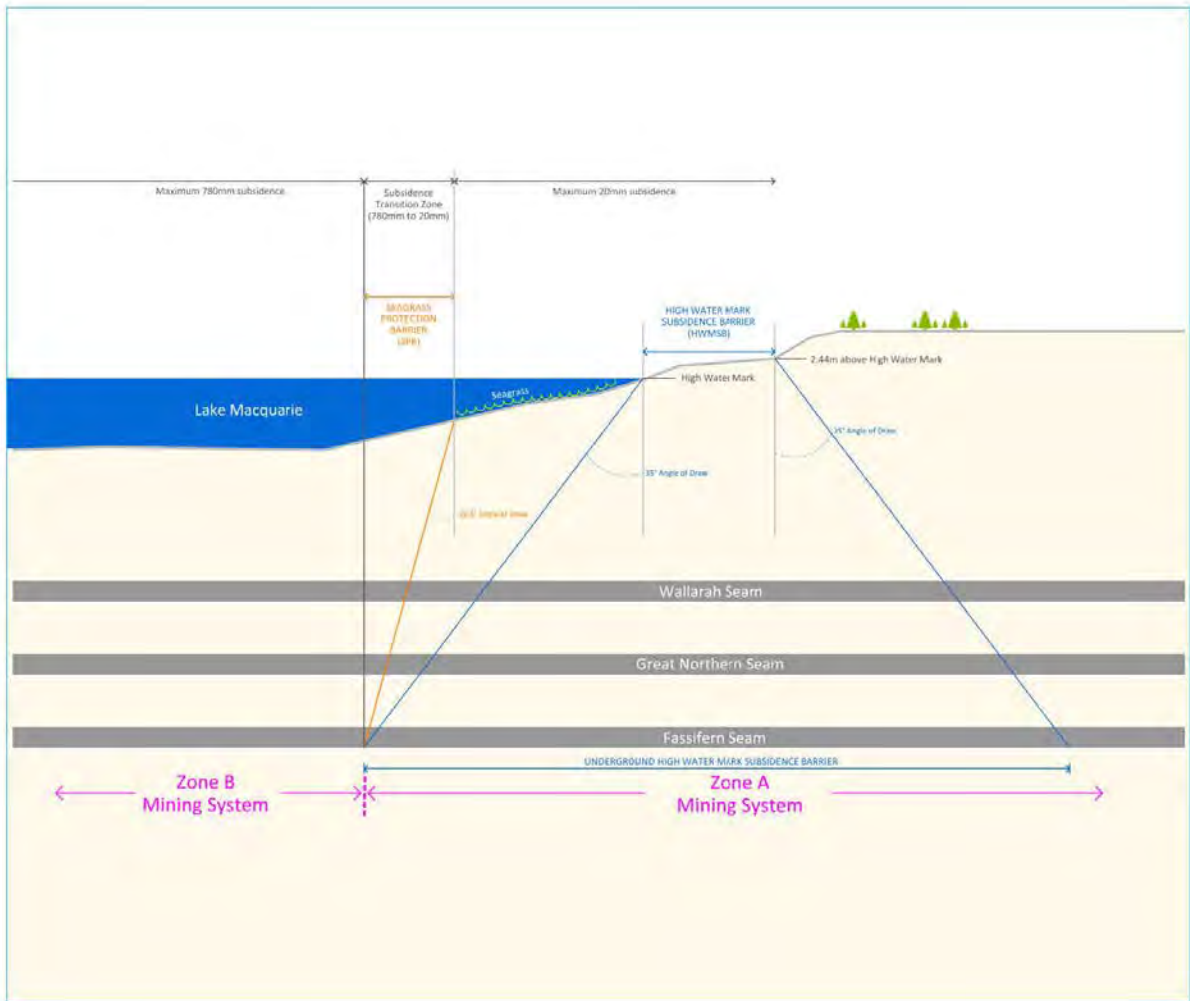


Figure 1A: High Water Mark Subsidence Barrier and Seagrass Protection Barrier

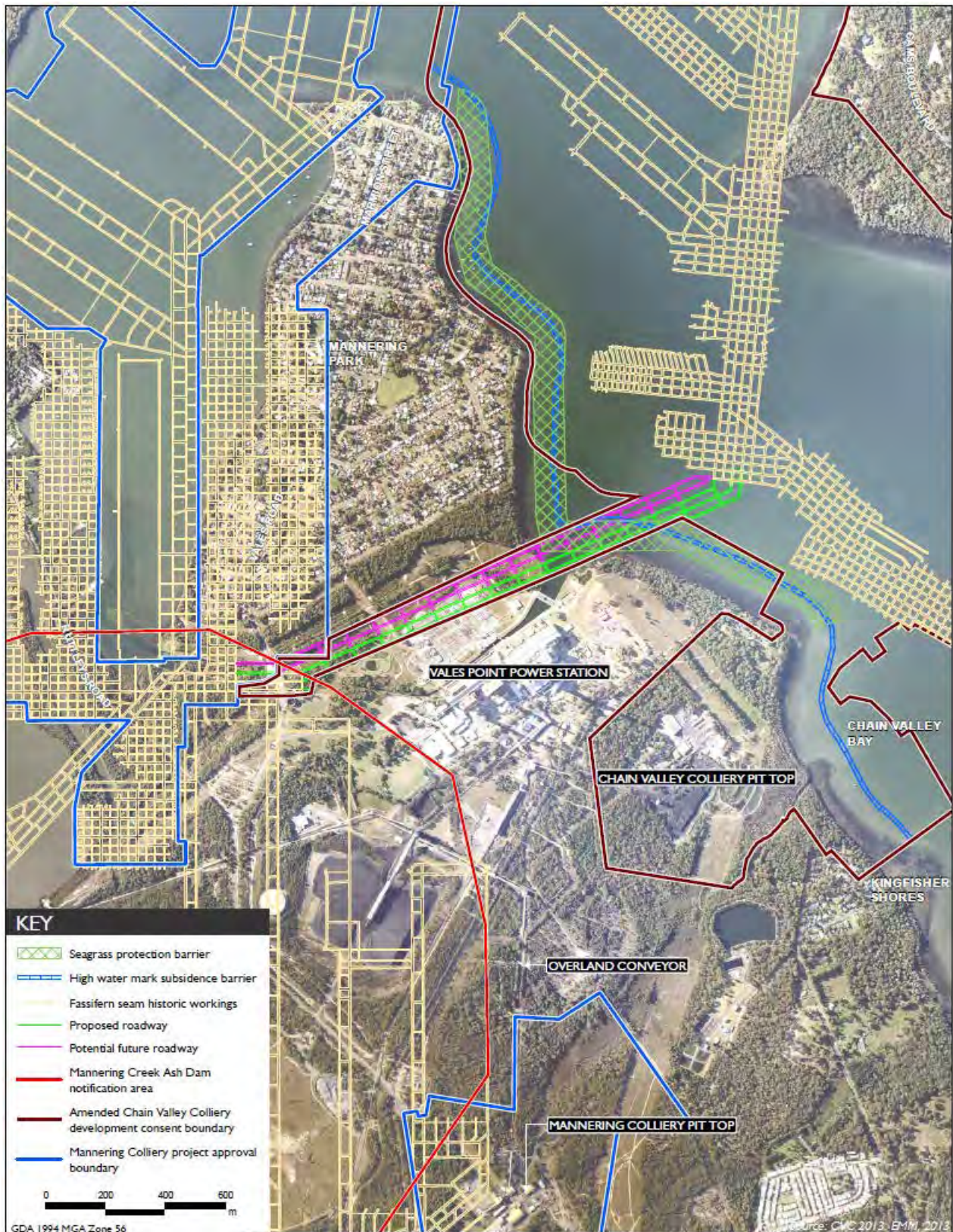


Figure 2: Location of the underground linkage to Mannering Colliery

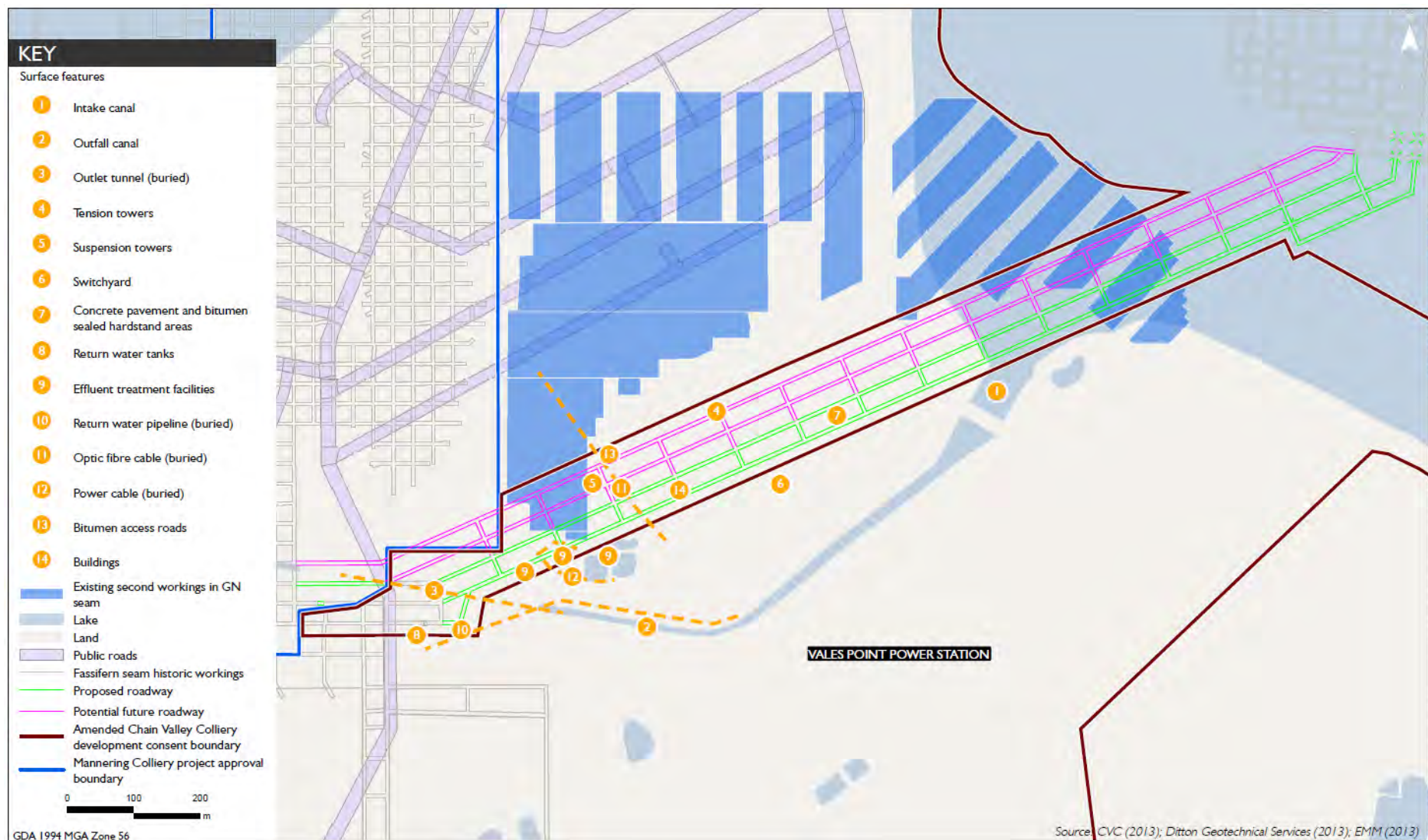
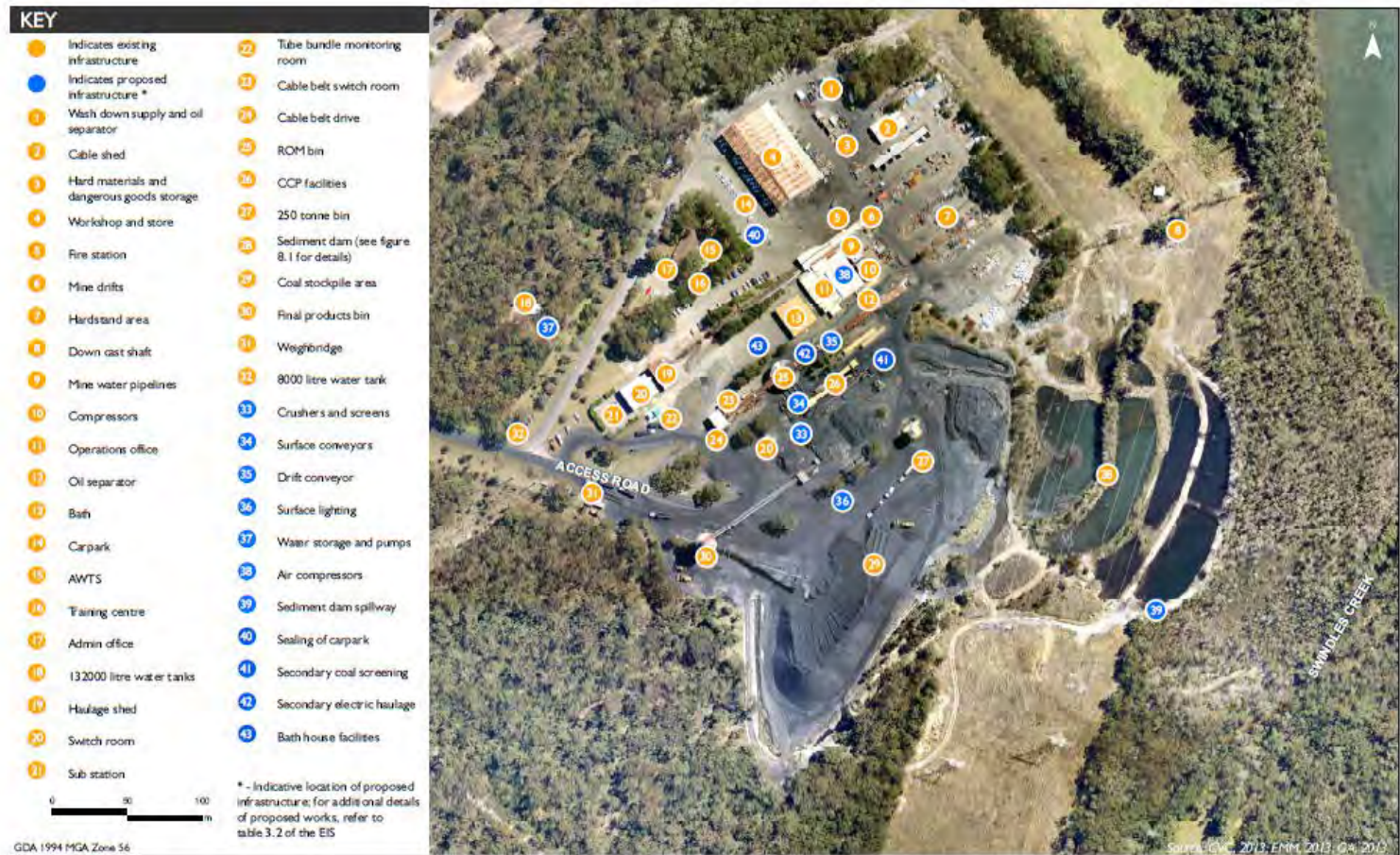


Figure 3: Location of the underground linkage and surface infrastructure

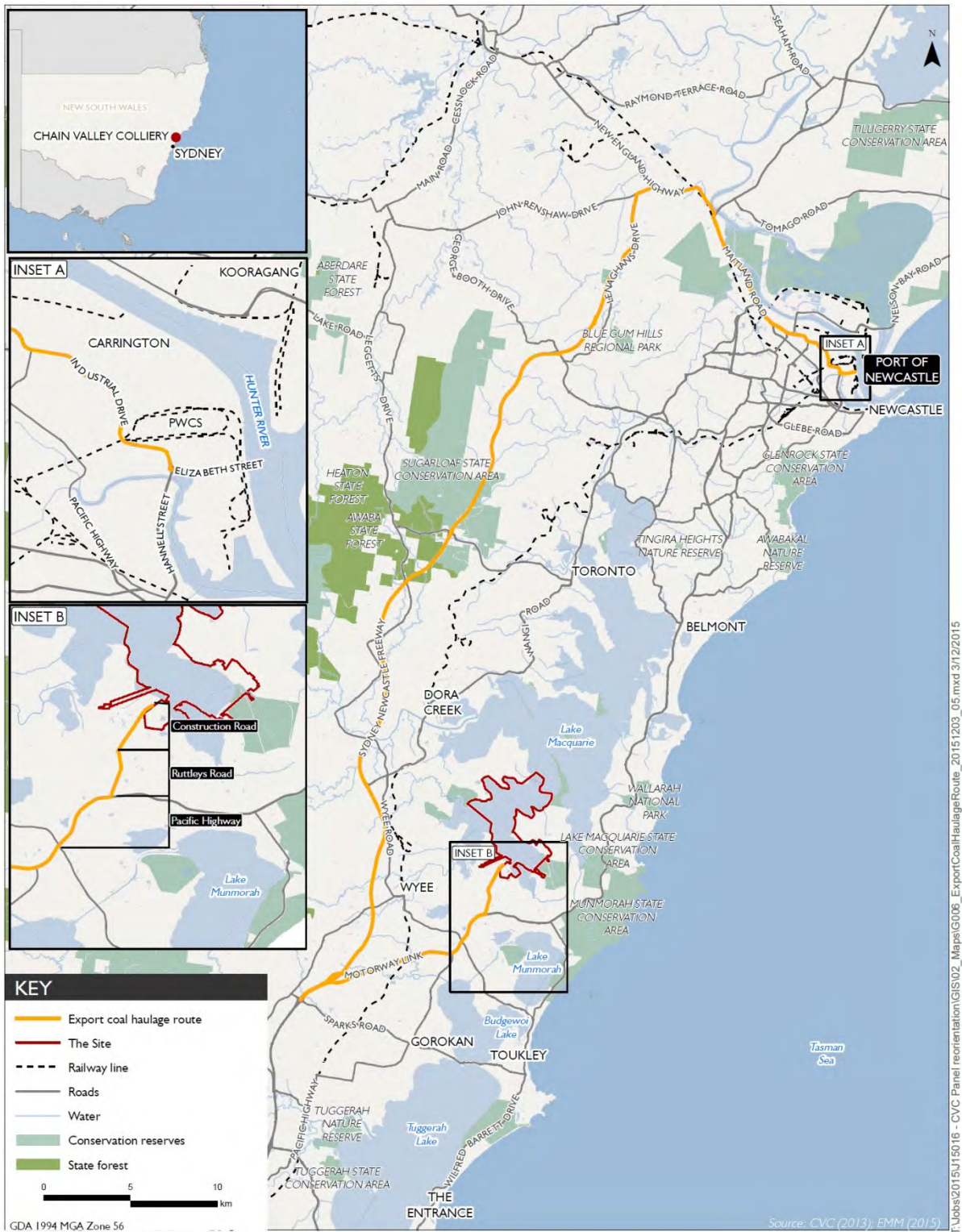
APPENDIX 4 KEY SURFACE FACILITIES



Mine pit top infrastructure elements
Chain Valley Colliery Mining Extension I Project - Environmental Impact Statement
Figure 2.4

Figure 1 : General Arrangement of the Chain Valley Colliery surface facilities site

APPENDIX 5 COAL HAULAGE ROUTE – PUBLIC ROADS



Export coal haulage route



Figure 1: Export Coal Haulage Route

APPENDIX 6

NOISE RECEIVER LOCATIONS

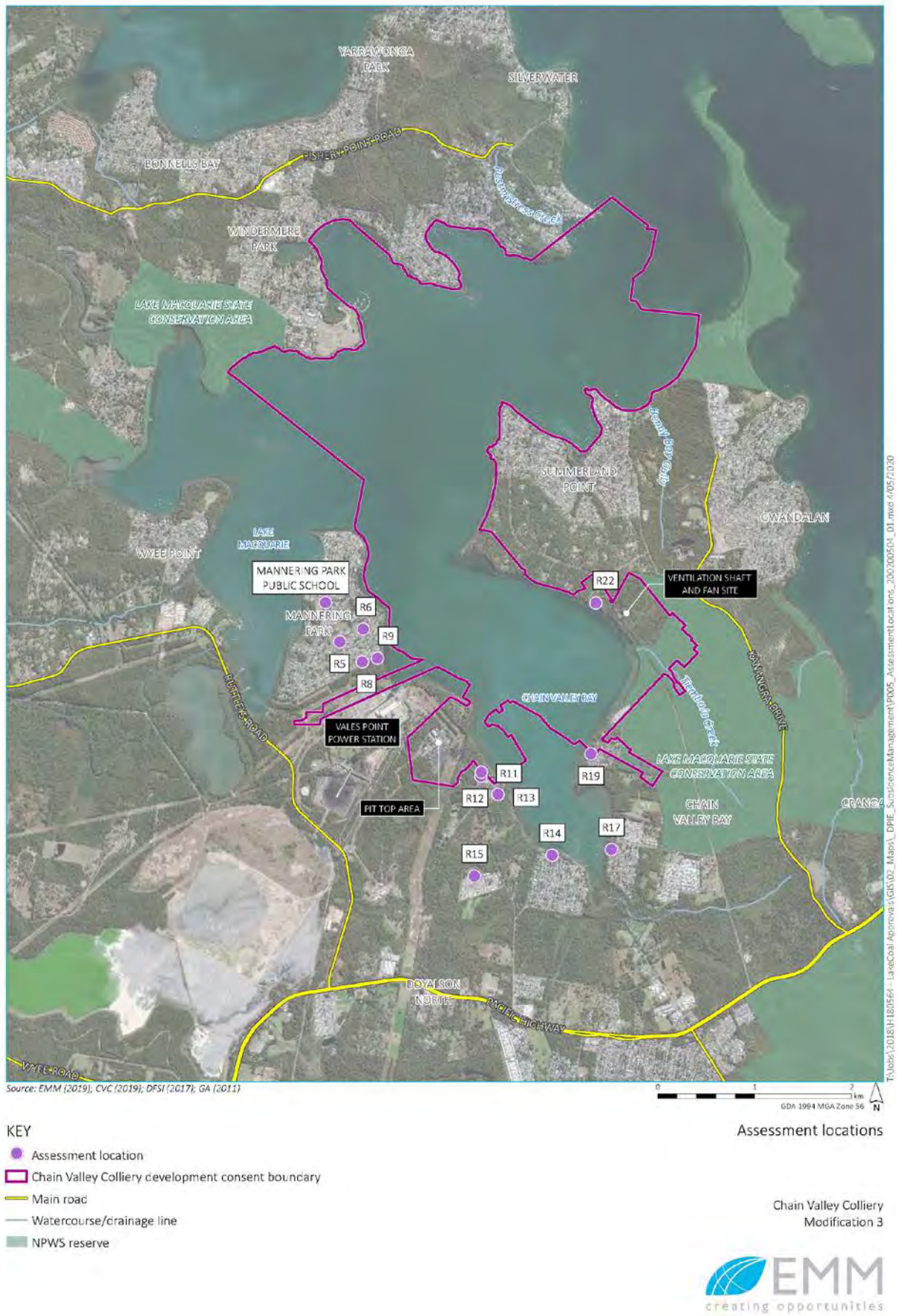
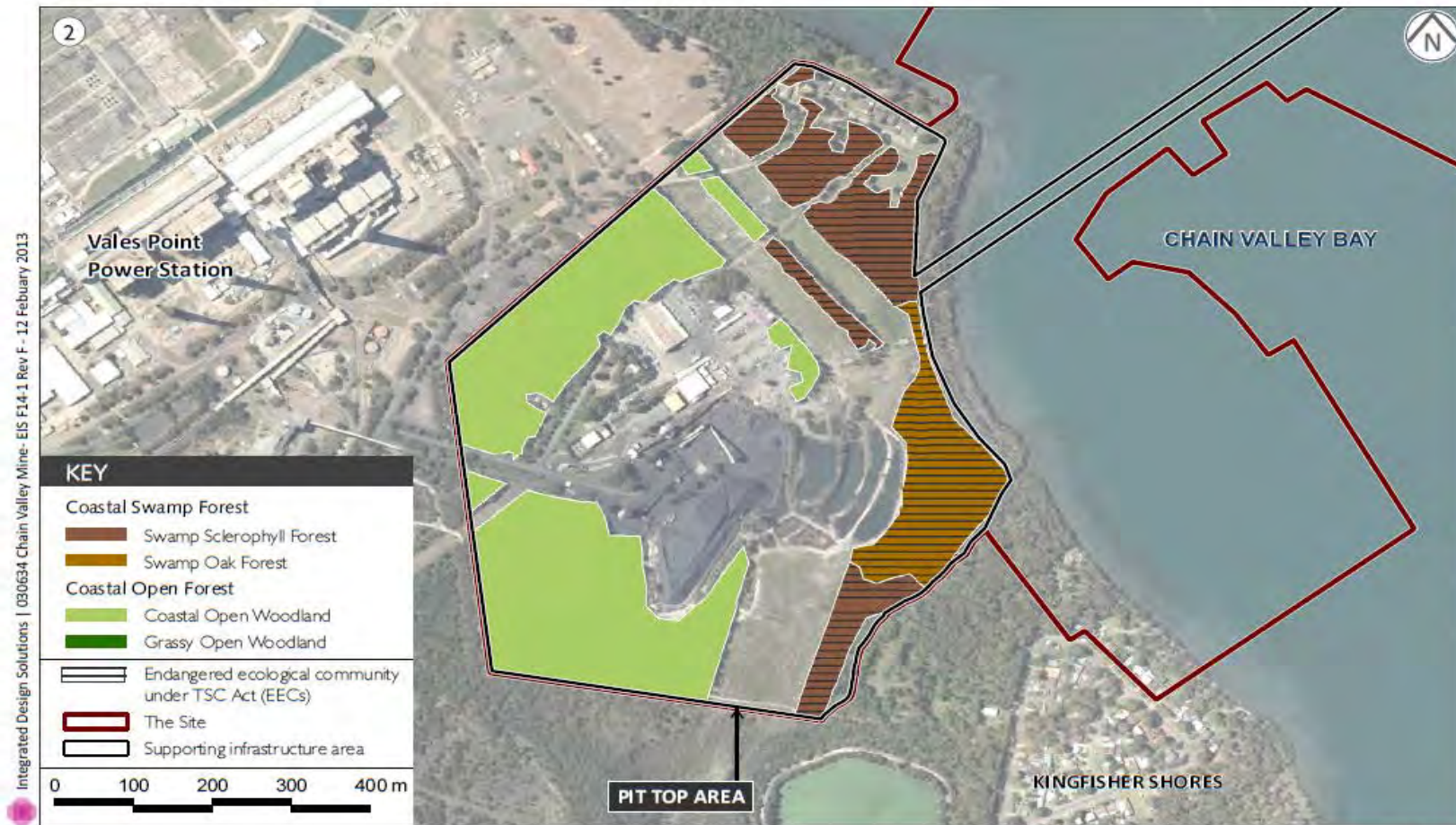


Figure 1: Noise Receiver Locations

APPENDIX 7 BIODIVERSITY ENHANCEMENT AREA



Terrestrial vegetation communities and EECs
within the Colliery's supporting infrastructure areas

Chain Valley Colliery Mining Extension | Project - Environmental Impact Statement

Figure 1: Location of the Biodiversity Enhancement Area, shown in red and orange hatching

APPENDIX 7A ASSET PROTECTION ZONES



Figure 1. Location of asset protection zones

APPENDIX 8 NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 1 of the conditions are to apply under all meteorological conditions except the following:
 - (a) during periods of rain or hail;
 - (b) average wind speed at microphone height exceeds 5 m/s;
 - (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or
 - (d) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions **must** be that recorded by the meteorological station described in **condition 14** of schedule 3.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.
4. This monitoring must be carried out at least 4 times in each calendar year (ie at least once every 3 months), unless the **Planning Secretary** directs otherwise.
5. Unless otherwise agreed with the **Planning Secretary**, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
 - (a) monitoring locations for the collection of representative noise data;
 - (b) meteorological conditions during which collection of noise data is not appropriate;
 - (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
 - (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

APPENDIX 9 STATEMENT OF COMMITMENTS

Item	Commitment
Groundwater	<p>In addition to the management and mitigation measures undertaken at the Colliery for groundwater as described in the WMP, the following commitments specific to the Proposal will be undertaken. Some commitments are already undertaken under the WMP. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • assess whether abnormal or significant groundwater inflow changes occur in the active panels; • maintain the water flow monitoring appliances used to measure pumped water volumes to and from the Colliery in good working order; • maintain and plot records of daily total Colliery water pumping and annually communicate an interpretation of the findings within the Annual Review. A copy of the Annual Review will be supplied to DPIE Water; • measure water levels and quality within private bores, where access is possible, in relevant areas to assess if any adverse effects occur due to subsidence from the Proposal; and • develop groundwater assessment criteria and triggers, response protocols and contingency measures. <p>Although it is not anticipated that private bore yields would be impacted due to subsidence, should such a situation arise, Great Southern Energy Pty Limited would provide an alternative water supply until the impacted bore recovers.</p> <p>Any monitored or reported adverse impacts on the yield, saturated thickness or quality of a private registered bore will be investigated by Great Southern Energy Pty Limited. In the event of a groundwater level drop of over 2 m for a period of two months or more, a notable increase in iron hydroxide, or an adverse change in salinity as a consequence of subsidence, Great Southern Energy Pty Limited will enter into negotiations with the affected landowners and SA NSW with the intent of formulating an agreement which provides for one, or a combination of:</p> <ul style="list-style-type: none"> • re-establishment of saturated thickness in the affected bore(s) through bore deepening; • establishment of additional bores to provide a yield at least equivalent to the affected bore prior to mining; • provision of access to alternative sources of water; and/or • compensation to reflect increased water extraction costs (eg. due to lowering pumps or installation of additional or alternative pumping equipment).
Surface water	<p>Management and monitoring of surface water will continue to be undertaken in accordance with the Colliery's WMP, which will be reviewed and updated as required to include the commitments made below. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • update the WMP to include any changes as a result of all modifications; • limit the main underground pumps to a maximum pump out rate of 10.5 ML/day within 12 months of approval; • request an amendment of EPL1770 to include a condition on the daily discharge volume limit stating that "Exceedance of the volume limit for Point 1 is permitted only if the discharge from Point 1 occurs solely as a result of rainfall at the premises exceeding 10 mm during the 24 hours immediately prior to commencement of the discharge"; • undertake daily measurements of discharge volumes and report publicly on a monthly basis via Great Southern Energy Pty Limited's website; • continue collection of baseline water quality data to aid in the development of appropriate discharge water quality trigger values; • engage suitably qualified expert to conduct an assessment of the metals contained within discharge water in accordance with the ANZECC water quality guidelines and provide this assessment to the EPA by 31 December 2013; • investigate water saving measures to minimise the amount of potable water required from CC Council for Colliery operations; • quantify the groundwater storage capacity in the Great Northern and Wallarah Seams; • continue effluent monitoring regime of receiving soils from the AWTs in accordance with the parameters and testing frequencies identified in the Colliery's WMP. The

	<p>results of this monitoring program will be reviewed by a suitably qualified expert and used to determine the appropriateness of the existing irrigation area to receive this effluent;</p> <ul style="list-style-type: none"> develop a program to monitor creek line channel stability and the health of riparian vegetation within Swindles Creek. Monitoring will be undertaken in accordance with Section 8.5.2 of the Surface Water Impact Assessment (EIS Appendix E) and incorporated into the Colliery's WMP or Biodiversity Management Plan; and record monitoring data in accordance with the Colliery's WMP and EPL 1770. Monitoring data will be interpreted as it is received to ensure appropriate operational guidance on monitoring water quality within desired parameters. Results of water quality monitoring will be reported in the Annual Review and made available to the CCC, as well as CC Council and LMCC.
Noise	<p>Management and monitoring of noise will continue to be undertaken in accordance with the Colliery's NMP, which will be reviewed and updated as required to include the commitments made below. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> continue attended compliance monitoring on site which will be used to identify potential hot spots and primary noise sources; continue real-time noise monitoring alerts to site personnel to enable implementation of any required rapid noise management initiatives; manage potential non-compliance through a noise complaint handling and response system, including the identification of responsible sources to enable targeted remedial action; assess if further noise mitigation options for the ventilation fans are reasonable and feasible following the receipt of attenuation proposals; and discuss potential management measures or agreement options with the landowner at 275 Cams Boulevard, following receipt of proposals from acoustics specialists. <p>In addition to the above, Great Southern Energy Pty Limited is committed to the progressive implementation of feasible measures to target long-term noise goals which are designed to reduce noise emissions from the Colliery. Long-term options for investigation include:</p> <ul style="list-style-type: none"> modification to belt/movement alarms; investigation of surface conveyer and coal preparation equipment, to determine if noise reductions are possible; identifying sound attenuation options for the surface bulldozer and front-end loader; strategic placement of acoustic barriers; attenuation for the surface screener/shaker; installation of quiet rollers for surface conveyor belts; acoustic treatments around compressors; and the use of a conveyor stacker for product coal stockpiling.
Air Quality and greenhouse gases	<p>Management and monitoring of air quality and greenhouse gases will continue to be undertaken in accordance with the Colliery's AQGHGMP, which will be reviewed and updated as required to include the commitments made below Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> investigate the use of a stacker to replace hauling between current conveyor system and stockpiles; undertake GHG monitoring comprising measurement of carbon dioxide and methane at the ventilation shaft and fan sites; and record and report annual diesel, oil, grease, acetylene and electricity use to fulfil National Greenhouse and Energy Reporting Scheme requirements.
Traffic and transport	<p>Management and monitoring of traffic and transport will continue to be undertaken in accordance with the Colliery's RTP. In addition, Great Southern Energy Pty Limited will continue to investigate alternative options for transporting export coal to the Port of Newcastle, specifically the preferred rail transport option, requiring the construction of a private haul road to the VPPS coal unloading facility and associated infrastructure upgrades. In addition, Great Southern Energy Pty Limited will investigate options to reduce peak hour traffic would be investigated including potentially limiting the peak hourly volumes of the Colliery truck traffic which would be permitted to travel via this intersection should the Colliery not be using rail transport for export coal by five years from the granting of development consent. Alternatively, a pro-rata financial contribution to the cost of installing traffic signals at the southbound intersection of the F3 and Sparks Road interchange could be made commensurate with the percentage of Colliery generated traffic using the intersection.</p>
Subsidence	<p>Management and monitoring of subsidence will continue to be undertaken in accordance with the Colliery's SMP or Extraction Plans, which will be reviewed and</p>

	<p>updated as required to include the commitments made below. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • provide raw subsidence survey data to BCD within 7 days of completion; • undertake six-monthly bathymetric surveys of the lake bed to determine actual subsidence and undertake a comparison with predicted levels. Should measured subsidence significantly exceed predicted levels, Great Southern Energy Pty Limited will review future secondary extraction designs to limit future impacts to acceptable levels; • install a new foreshore survey line above the first and second workings panels where the underground linkage passes beneath them and possibly extending from the foreshore to the point of connection with the MC workings; • inspect existing conditions in the Fassifern Seam and undertake geotechnical and geological mapping in the roadways proximate to the proposed linkage in both CVC and MC workings; • complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB. Development below the foreshore will be limited to two headings only until floor conditions can be confirmed; • develop infrastructure monitoring and management plans in consultation with infrastructure owners and other relevant stakeholders; • re-establish and re-survey Survey Line 24; • install a suitable survey line at the starting end above Great Northern Seam first workings to provide early warning monitoring data for the tension towers and switchyard structures; • monitor tension and suspension towers and switchyard conductor suspension frames directly above the panels, foreshore and adjacent inlet canal wall; • ensure that a monitoring and management plan for the MP01 sewer rising main is in place prior to commencement of mining that may impact CC Council's infrastructure; and • complete an annual subsidence report and make this report publicly available on the Colliery's website.
Marine ecology	<p>Management and monitoring of marine ecology will continue to be undertaken in accordance with the Colliery's BCMP and SGMP, which will be reviewed and updated as required to include the commitments made below. Great Southern Energy Pty Limited will</p> <ul style="list-style-type: none"> • revise the BCMP to include the sampling locations in the assessment of the Proposal; • undertake annual benthic surveys for the Site, or as required under the BCMP; • commission additional independent sampling and analysis to validate results obtained during monitoring, and review future panel design if impacts due to subsidence are determined to be moderate or greater; • revise the SGMP to include the transect locations utilised in the assessment of the Proposal; • continue annual seagrass surveys/monitoring; • continue six-monthly subsidence surveys (bathymetric surveys) and land-based surveys; • include results from the BCMP and SGMP within the Colliery's Annual Review; and • make the Annual Review and annual subsidence surveys available on the Colliery's website.
Terrestrial ecology	<p>In addition to the management and mitigation measures undertaken at the Colliery for terrestrial ecology as described in the BMP, the following commitments specific to the Proposal will be undertaken. Some commitments are already undertaken under the BMP. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • investigate one of the following options in consultation with BCD to offset the biodiversity impacts arising from the proposed modification: <ul style="list-style-type: none"> ○ provide \$10,000 of funding, which is equivalent to the biodiversity being lost (i.e. 5 credits x \$2,000 per credit) to existing environmental programs at the site which benefits the Swamp Sclerophyll EEC; or ○ consult with BCD to identify a suitable conservation program and provide \$10,000 of funding; or ○ purchase and retire 5 credits on the Biobanking register. • update the BMP to include the following: <ul style="list-style-type: none"> ○ the completion of pre-disturbance surveys in the survey area for Black-eyed Susan, Leafless Tongue Orchid and Variable Midge Orchid during their flowering periods (July to December, November to February and September to October, respectively);

-
- pre-disturbance surveys by an ecologist to determine the important components of vegetation communities and fauna habitats that should be preferentially retained in the APZs;
 - installation of delineation fencing around threatened flora populations (if found) to ensure their protection during development and maintenance of the APZs;
 - condition monitoring for threatened flora populations (if found);
 - retention of hollow-bearing trees in the APZs, where possible, with details to be included in a hollow tree register;
 - installation of nest boxes (or salvaged hollows) within the APZs under the supervision of a suitably qualified ecologist or wildlife carer to replace hollows where hollow-bearing trees cannot be retained;
 - measures for APZ maintenance that include weed control;
 - clearing of hollow-bearing trees (if required) under the supervision of a suitably qualified ecologist;
 - any injured fauna would be taken to the nearest veterinary hospital for treatment before release; and
 - relocation of suitable hollow-bearing felled trees adjacent to the APZs to create additional fauna habitat;
- undertake the design of the dam embankment and spillway works in consultation with an ecologist to minimise potential impacts on the Swamp Oak Floodplain Forest EEC;
 - ensure pre-clearing surveys are undertaken by an ecologist to minimise the potential impact to fauna and significant vegetation prior to clearing works being undertaken within the embankment and spillway area;
 - clearly delineate the clearing footprint and cordon off surrounding vegetation as a 'no go' zone during works to the dam embankment and spillway;
 - minimise disturbance areas where possible by ensuring all stockpiling of materials, parking of machinery etc, is undertaken in previously cleared areas;
 - ensure that, wherever possible, dead standing timber and fallen timber will be avoided by any clearing works, or if required to be removed, be relocated into suitable habitat areas nearby;
 - ensure all equipment used for the earthworks associated with the dam embankment and spillway will be cleaned of excess soil potentially containing pathogens and weed seeds prior to entering the Site;
 - install sediment fencing surrounding the proposed earthwork areas, in accordance with a site-specific erosion and sediment control plan for the works;
 - ensure that in the event that sedimentation dam water is released from Dam 10 prior to the works being undertaken, it will be undertaken in a controlled manner over a number of days to ensure that the release does not result in significant erosion and sedimentation to the Swamp Oak Floodplain Forest;
 - continue the management and monitoring of flora and fauna in accordance with the BMP for the life of the mine, including:
 - the condition and composition of the Swamp Oak Floodplain Forest area;
 - the condition of vegetation adjacent to the ventilation shaft and fans;
 - the location and distribution of weed infestations; and
 - the abundance and distribution of feral animal use.
 - noxious weeds will be removed and continually controlled from the pit top area, allowing for natural regeneration of vegetation;
 - weed invasion will be monitored as part of the Colliery's BMP; and
 - the condition of the EEC areas will be monitored through the Colliery's BMP.
-

Heritage

Management and monitoring of heritage will continue to be undertaken in accordance with the Colliery's HMP, which will be reviewed and updated as required to

include the commitments made below. **Great Southern Energy Pty Limited** will:

- review and revise the HMP to remove site #45-7-0154 and incorporate any other changes as a result of the proposed modification;
 - update the HMP following approval of the Proposal to include the extended area to which it relates;
 - ensure that should unanticipated Aboriginal or historic heritage artefacts be found during dam embankment and diversion works, work will cease and the site assessed by an archaeologist; and
 - ensure that in the unlikely event that skeletal remains are found during dam embankment and diversion works, work will cease immediately in the area and the NSW Police Coroner called to determine if the material is of Aboriginal origin. **BCD** and relevant Aboriginal community stakeholders will be notified if the remains are positively identified as being of Aboriginal origin to determine their appropriate
-

	management prior to works recommencing.
Wastes	Management and monitoring of waste will continue to be undertaken in accordance with the Colliery's Waste Management Standard. In addition, Great Southern Energy Pty Limited will continue to try and improve its waste volumes and waste management practices in line with its objective for 60% of all wastes generated at the Colliery (excluding wastewater) to be recyclable or reusable.
Hazards	Management and monitoring of hazards will continue in accordance with the Colliery's existing hazard management measures. Periodic review of the effectiveness of existing measures will occur in accordance with the Colliery's safety management system and additional measures implemented as warranted.
Visual	Management and monitoring of visual impacts will continue to be undertaken in accordance with the Colliery's existing commitment. In addition, Great Southern Energy Pty Limited will: ensure additional surface lighting at the Colliery complies with AS4282 (INT) 1995 – <i>Control of Obtrusive Effects of Outdoor Lighting</i> .
Soil	<p>Management and monitoring of soils will continue to be undertaken in accordance with the Colliery's WMP, which will be reviewed and updated as required to include the commitments made below. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • prevent disturbance of ASS where practicable during any construction activities; • prepare an ASSMP where there is potential that ASS will be disturbed; • test and handle any ASS disturbed in accordance with the ASSMP and treat or dispose of to an appropriately licensed facility; • limit the area of any disturbance at the surface infrastructure sites and period of exposure; • implement site management procedures such as watering of disturbed areas and unsecured stockpiles; • ensure relevant licences and management plans are in place for the correct storage and handling of hydrocarbons; • maintain suitable bunding around all hazardous liquid storage areas; • maintain oil separation facilities on the wash down sump for the treatment of oily water; and • remove all waste oil from site and dispose via a licensed external waste collection company.
Rehabilitation and mine closure	Rehabilitation will be undertaken in accordance with the Colliery's RMP and the MOP in force at the time. Detailed management and monitoring proposals for final rehabilitation will be included within a Mine Closure Plan to be prepared at least two years prior to cessation of mining activities.
Economic	Great Southern Energy Pty Limited will contribute \$0.035/t of coal from the Colliery into a dedicated community fund to improve public infrastructure and for the provision of community projects in the surrounding communities of Chain Valley Bay, Mannering Park, Summerland Point and Gwandalan.
Social	<p>Great Southern Energy Pty Limited will continue to implement management measures and monitoring programs to prevent or minimise negative impacts and enhance positive impacts in accordance with its Environment and Community Policy. Great Southern Energy Pty Limited will:</p> <ul style="list-style-type: none"> • maintain open and constructive communication with affected individuals and groups; • participate in the CCC; • provide environmental monitoring data and other relevant information in a timely manner via the Great Southern Energy Pty Limited website; • be responsive to community issues and actual and/or perceived impacts from the Colliery's activities; • work in partnership with stakeholders to address community needs; • ensure effective management of Great Southern Energy Pty Limited's social impacts; • liaise regularly with relevant government agencies and councils; • provide regular Colliery updates with landowners and local residents through the CCC; • continue payments, throughout the life of the Proposal, to the community fund established; and • consider individual sponsorship opportunities throughout the life of the Proposal.
Other	Great Southern Energy Pty Limited will commit to only carrying out mining operations consistent with the development consent granted pursuant to this Proposal.

**Modification 3
Commitments**

Great Southern Energy Pty Limited will undertake environmental management incorporating the requirements of any modification and in accordance with the existing environmental management processes of the various approvals, licences and management plans that apply to the development.

Great Southern Energy Pty Limited will apply to the EPA to vary EPL 1770 to reflect the corresponding development consent tonnage limits within EPL 1770's Mining for Coal and Coal Works activities tonnage ranges.

Great Southern Energy Pty Limited will commission and undertake detailed geotechnical assessments by a suitably qualified geotechnical engineer as part of the company's detailed mine plan design process.

Appendix 2: EPL 1770

Review Date	Next Review Date	Revision No	Document Owner	Page
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DOCUMENT UNCONTROLLED WHEN PRINTED				



Environment Protection Licence

Licence - 1770

Licence Details	
Number:	1770
Anniversary Date:	01-April

Licensee
GREAT SOUTHERN ENERGY PTY LTD
PO BOX 7115
MANNERING PARK NSW 2259

Premises
CHAIN VALLEY COLLIERY
CONSTRUCTION ROAD
CHAIN VALLEY BAY NSW 2259

Scheduled Activity
Coal works
Mining for coal

Fee Based Activity	Scale
Coal works	> 2000000-5000000 T annual handling capacity
Mining for coal	> 2000000-3500000 T annual production capacity

Contact Us
NSW EPA
4 Parramatta Square
12 Darcy Street
PARRAMATTA NSW 2150
Phone: 131 555
Email: info@epa.nsw.gov.au
Locked Bag 5022
PARRAMATTA NSW 2124



Environment Protection Licence

Licence - 1770

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Environment Protection Licence

Licence - 1770

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).



Environment Protection Licence

Licence - 1770

The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

GREAT SOUTHERN ENERGY PTY LTD
PO BOX 7115
MANNERING PARK NSW 2259

subject to the conditions which follow.



Environment Protection Licence

Licence - 1770

1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Coal works	Coal works	> 2000000 - 5000000 T annual handing capacity
Mining for coal	Mining for coal	> 2000000 - 3500000 T annual production capacity

A1.2 The licensee must not extract by mining activities more than 2.1 million tonnes of ROM coal from the premises in any calendar year in line with Development Consent SSD5465 MOD 4.

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
CHAIN VALLEY COLLIERY
CONSTRUCTION ROAD
CHAIN VALLEY BAY
NSW 2259
THE LICENSED PREMISES IS AS DEFINED IN THE FOLLOWING PLANS, "DELTA COAL CHAIN VALLEY COLLIERY, SURFACE EPA PREMISES PLAN, DRG NO:C1S0165_2, 10 AUGUST 2021" AND "DELTA COAL CHAIN VALLEY COLLIERY, FIGURE 1 PROJECT OVERVIEW, DRG NO:C1S0165_1, 10 AUGUST 2021", WHICH SHOWS THE UNDERGROUND COAL WORKINGS PREMISES BOUNDARIES VIA A LIME GREEN LINE ALONG WITH THE EASTINGS AND NORTHINGS AT "TURNAROUND" LOCATIONS. THESE PLANS ARE SAVED AS EPA DOCUMENT NO. DOC21/691135.

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:



Environment Protection Licence

Licence - 1770

Ancillary Activity
Sewage Treatment Systems

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air			
EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
25	Air Monitoring Point Particulate Matter PM10 Thermo Fisher Scientific TEOM 1405		TEOM Monitor located on the site of the Mannering Park Sewage Treatment Plant, shown as "EPA25" on the plan titled "Delta Coal - Chain Valley Colliery - Figure 1 - Project Overview", which as been filed as EPA document DOC21/691135

P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land			
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description

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1	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters and monitoring from final settlement pond, gravity fed discharge pipe as identified in plan titled "Delta Coal Chain Valley Colliery, Surface EPA Premises Plan, DRG No: C1S0165_2" 10 August 2021 and saved as EPA Document DOC21/691135.
27	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters via dam spillway from final settlement pond adjacent to EPA Point 1 as identified in plan titled "Delta Coal Chain Valley Colliery, Surface EPA Premises Plan, DRG No: C1S0165_2" 10 August 2021 and saved as EPA Document DOC21/691135.

P1.4 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
9	Noise monitoring	Noise monitoring site R8 as defined in Development Consent SSD-5465 (MOD 3), located at 109 Griffith Street, MANNERING PARK, 2259
12	Noise monitoring	Noise monitoring site R11 as defined in Development Consent SSD-5465 (MOD 3), located at 35 Lakeshore Avenue, CHAIN VALLEY BAY, 2259
13	Noise monitoring	Noise monitoring site R12 as defined in Development Consent SSD-5465 (MOD 3), located at 20 Lakeshore Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259
14	Noise monitoring	Noise monitoring site R13 as defined in Development Consent SSD-5465 (MOD 3), located at 33 Karoola Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259
16	Noise monitoring	Noise monitoring site R15 as defined in Development Consent SSD-5465 (MOD 3), located at Short Street, Macquarie Shores, CHAIN VALLEY BAY, 2259
20	Noise monitoring	Noise monitoring site R19 as defined in Development Consent SSD-5465 (MOD 3), located at 2 Sunset Parade, CHAIN VALLEY BAY, 2259

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23	Noise monitoring	Noise monitoring site R22 as defined in Development Consent SSD-5465 (MOD 3), located at 275a Cams Boulevard, CHAIN VALLEY BAY, 2259
26	Meteorological Station	Mannering Colliery Meteorological Station, Ruttleys Road, Doyalson 2259.

3 Limit Conditions

L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

- L2.1 For each monitoring/discharge point or utilisation area specified in the table\ below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.
- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.
- L2.4 Water and/or Land Concentration Limits

POINT 1,27

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Faecal Coliforms	colony forming units per 100 millilitres				200
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50



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L3 Volume and mass limits

- L3.1 For each discharge point or utilisation area specified below (by a point number), the volume/mass of:
- a) liquids discharged to water; or;
 - b) solids or liquids applied to the area;
- must not exceed the volume/mass limit specified for that discharge point or area.
- | Point | Unit of Measure | Volume/Mass Limit |
|-------|--------------------|-------------------|
| 1 | kilolitres per day | 12161 |
| 27 | kilolitres per day | 12161 |
- L3.2 The volumetric daily discharge limit for the premises is the combined discharge measured at EPA discharge points 1 and 27 and must not exceed 12161 kilolitres per day.

L4 Waste

- L4.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.
- Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.
- Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.
- This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource exemption under Clause 92 of the Protection of the Environment Operations (Waste) Regulation 2014.	As specified in each particular resource recovery exemption	NA

L5 Noise limits

- L5.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 12

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
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Day	Day-LAeq (15 minute)	-	49
Evening	Evening-LAeq (15 minute)	-	49
Night	Night-LAeq (15 minute)	-	49
Night	Night-LA1 (1 minute)	-	54

POINT 13

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	49
Evening	Evening-LAeq (15 minute)	-	49
Night	Night-LAeq (15 minute)	-	49
Night	Night-LA1 (1 minute)	-	53

POINT 14

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	43
Evening	Evening-LAeq (15 minute)	-	43
Night	Night-LAeq (15 minute)	-	43
Night	Night-LA1 (1 minute)	-	49

POINT 16

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	36
Evening	Evening-LAeq (15 minute)	-	36
Night	Night-LAeq (15 minute)	-	36
Night	Night-LA1 (1 minute)	-	45

POINT 20

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	37
Evening	Evening-LAeq (15 minute)	-	37
Night	Night-LAeq (15 minute)	-	37

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Night	Night-LA1 (1 minute)	-	45
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POINT 23

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	46
Evening	Evening-LAeq (15 minute)	-	46
Night	Night-LAeq (15 minute)	-	46
Night	Night-LA1 (1 minute)	-	46

POINT 9

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	38
Evening	Evening-LAeq (15 minute)	-	38
Night	Night-LAeq (15 minute)	-	38
Night	Night-LA1 (1 minute)	-	45

L5.2 The licensee must ensure that noise generated on the premises does not exceed:

- a) 35 LAeq(15min) during the day, evening or night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1; and
- b) 45 LA1(1min) during the night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1.

Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above tables.

L5.3 For the purpose of condition L5.1 and condition L5.2:

- (a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and public holidays;
- (b) Evening is defined as the period 6pm to 10pm, and
- (c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

L5.4 The noise limits set out in condition L5.1 and condition L5.2 apply under all meteorological conditions except for any one of the following:

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- (a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- (b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- (c) Stability category G temperature inversion conditions.
- (d) Or as defined under the NSW EPA Noise Policy for Industry 2017.

L5.5 For the purpose of condition L5.4:

- (a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point 26.
- (b) Stability category temperature inversion conditions are to be determined in accordance with the NSW EPA Noise Policy for Industry 2017.

Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.

L5.6 For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.

L5.7 To determine compliance:

1. With the $L_{Aeq(15\text{ min})}$ noise limits in condition L5.1 and condition L5.2, the licensee must locate noise monitoring equipment;

(a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;

(b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable,

(c) within approximately 50 metres if the boundary of a national park or nature reserve.

2. With the $LA1(1\text{ minute})$ noise limits in condition L5.1 and L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.

3. With the noise limits in condition L5.1 and condition L5.2, the noise monitoring equipment must be located;

(a) at the most affected point at a location where there is no dwelling at the location, or

(b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).

L5.8 A non-compliance of condition L5.1 or condition L5.2 will still occur where noise generated from the premises in excess of the appropriate limit is measured;

a) at a location other than an area prescribed by conditions L5.7 1(a) and L5.7 1(b), and /or

b) at a point other than the most affected point at a location.

L5.9 For the purposes of determining the noise generated at the premises all applicable modification factors as described in the NSW EPA Noise Policy for Industry 2017 must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

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4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

O3 Dust

- O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust on or from the premises.
- O3.2 Activities occurring in or on the premises must be carried out in a manner that will minimise the generation of wind-blown or traffic generated dust.
- O3.3 All trafficable areas, coal stockpile(s) and storage areas, and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the generation of dust.

O3.4 All vehicles transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage.

Note: Vehicles transporting coal on the private haul road from Chain Valley Colliery to Vales Point Power station are exempt from covering their load if surface coal moisture is above 8%.

O3.5 Activities occurring in or on the premises must be carried out in a manner that will minimise the tracking of dust from the premises.

O4 Effluent application to land

- O4.1 An area must be provided for the use of effluent from the office building sewage treatment system. The design of the effluent irrigation area must be in accordance with the EPA's Environmental Guideline: Use of Effluent by Irrigation.
- O4.2 The quantity of wastewater applied to the utilisation area(s) must not exceed the capacity of the utilisation area(s) to effectively utilise the effluent.

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For the purpose of this condition, "effectively utilise" includes the ability of the soil to absorb the nutrient, salt and hydraulic loads and the applied organic material without causing harm to the environment.

O5 Emergency response

Note: The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The PIRMP must be developed in accordance with the requirements in Part 5.7A of the *Protection of the Environment Operations* (POEO) Act 1997 and POEO Regulations. The licensee must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. The PIRMP must be tested annually or following a pollution incident.

O6 Processes and management

Bunding

O6.1 All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

O6.2 Bunds must:

- a) have walls and floors constructed of impervious materials;
- b) be of sufficient capacity to contain 110% of the volume of the tank (or 110% volume of the largest tank where a group of tanks are installed);
- c) have floors graded to a collection sump; and
- d) not have a drain valve incorporated in the bund structure,

or be constructed and operated in a manner that achieves the same environmental outcome.

O7 Waste management

O7.1 The licensee must ensure that any liquid and/or non liquid waste generated and/or stored at the premises is assessed in accordance with the EPA Waste Classification Guidelines as in force from time to time.

O7.2 The licensee must ensure that waste identified for recycling is stored separately from other waste.

O8 Other operating conditions

Sewage Treatment

O8.1 All sewage generated on the premises must be directed, collected and treated by the sewage treatment system(s).

O8.2 The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.



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- O8.3 Correct operation involves regular supervision and system maintenance. The licensee must be aware of the system requirements and must ensure that the necessary service contracts are in place.
- O8.4 The sewage treatment system(s) must be serviced by a suitably qualified and experienced waste water technician at least once each quarterly period and a minimum of four times per year.
- O8.5 The licensee must record each inspection and any actions required or recommended by the technician; including all results from tests performed on the sewage treatment system(s) by the technician as defined in Condition O8.4.
- O8.6 All treated sewage that is discharged from the premises must be discharged through licensed discharge point "EPA Identification no. 1", as defined in condition P1.3.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
 - a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
 - a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

- M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:
- M2.2 Air Monitoring Requirements

POINT 25

Pollutant	Units of measure	Frequency	Sampling Method
Particulate matter	micrograms per cubic metre	Continuous	AM-22

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M2.3 Water and/ or Land Monitoring Requirements

POINT 1

Pollutant	Units of measure	Frequency	Sampling Method
Biochemical oxygen demand	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample
Enterococci	colony forming units per 100 millilitres	Once a month (min. of 4 weeks)	Grab sample
Faecal Coliforms	colony forming units per 100 millilitres	Once a month (min. of 4 weeks)	Grab sample
pH	pH	Once a month (min. of 4 weeks)	Grab sample
Total suspended solids	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample

POINT 27

Pollutant	Units of measure	Frequency	Sampling Method
Enterococci	colony forming units per 100 millilitres	Daily during any discharge	Grab sample
Faecal Coliforms	colony forming units per 100 millilitres	Daily during any discharge	Grab sample
pH	pH	Daily during any discharge	Grab sample
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2021* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

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- M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Environmental monitoring

Requirement to monitor noise

- M4.1 To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.7 and L5.8, and
- (a) at each one of the locations listed in condition L5.1;
 - (b) occur quarterly within the reporting period of the Environment Protection Licence with at least 2 months between monitoring periods;
 - (c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters;
 - (d) the night time 15 minute attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;
 - (e) the night time LA1 (1 min) attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;
 - (f) one quarterly monitoring must occur during each day, evening and night period as defined in the NSW EPA Noise Policy for Industry 2017 for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hour during the night, and
 - (g) each quarterly monitoring must be undertaken on a different day(s) of the week not including Saturdays, Sundays and public holidays; and
 - (h) these monitoring conditions take effect in the 2015 Reporting period.

Note: The intention of this condition is that quarterly monitoring be undertaken at each sensitive receiver. That at each sensitive receiver monitoring is undertaken over a range of different days excluding weekends and public holidays during the reporting period so as to be representative of operating hours. That night time 15 minute attended monitoring and the LA1 (1min) monitoring for three of the quarters be undertaken at worst case being the most stable atmospheric conditions and when noise would be most intrusive to sleep. All of the sensitive receivers do not have to be monitored on the same day, evening and night for sub condition f.

- M4.2 For the Annual Reporting Period ending March 2015 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this licence, as a single report attached to the Annual Return for the premises.

M5 Weather monitoring

- M5.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

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POINT 26

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Rainfall	AM-4	millimetres	24 hours	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	1 hour	Continuous
Wind Speed	AM-2 & AM-4	metres per second	1 hour	Continuous
Temperature at 10 metres	AM-4	degrees Celsius	1 hour	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Relative humidity	AM-4	percent	1 hour	Continuous

M5.2 The licensee may use the Vales Point Power Station Meteorological Station to determine compliance with condition M5.1, provided the licensee has authority from Sunset Power International Pty Ltd to access meteorological data at all times.

M6 Recording of pollution complaints

M6.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M6.2 The record must include details of the following:

- the date and time of the complaint;
- the method by which the complaint was made;
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- the nature of the complaint;
- the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by the licensee, the reasons why no action was taken.

M6.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M6.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M7 Telephone complaints line

M7.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M7.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.



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- M7.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.
- M7.4 The licensee must notify the EPA with contact details of personnel capable of a timely response to emergencies or any other exigent circumstances.
- (a) the nominated contact must be available at all times.
 - (b) contact details must include a telephone number and must be current.
 - (c) such notification must be made within 14 days of receiving this licence.

M8 Requirement to monitor volume or mass

- M8.1 For each discharge point or utilisation area specified below, the licensee must monitor:
- a) the volume of liquids discharged to water or applied to the area;
 - b) the mass of solids applied to the area;
 - c) the mass of pollutants emitted to the air;
- at the frequency and using the method and units of measure, specified below.

POINT 1

Frequency	Unit of Measure	Sampling Method
Continuous during discharge	kilolitres per day	In line instrumentation

POINT 27

Frequency	Unit of Measure	Sampling Method
Continuous during discharge	kilolitres per day	In line instrumentation

6 Reporting Conditions

R1 Annual return documents

- R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
- 1. a Statement of Compliance,
 - 2. a Monitoring and Complaints Summary,
 - 3. a Statement of Compliance - Licence Conditions,
 - 4. a Statement of Compliance - Load based Fee,
 - 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
 - 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
 - 7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.



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R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

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a) where this licence applies to premises, an event has occurred at the premises; or
 b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
 and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

- a) the cause, time and duration of the event;
- b) the type, volume and concentration of every pollutant discharged as a result of the event;
- c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
- d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

Noise Monitoring Report

R4.1 The licensee must submit to the EPA a noise compliance assessment report at the end of each reporting period. The report must be submitted with the Environment Protection Licence Annual Return. The report must be prepared by a suitably qualified and experienced acoustical consultant which:

- (a) details the noise monitoring undertaken in accordance with condition M4;
- (b) assesses compliance with noise limits presented in condition L5.1 and condition 5.2; and
- (c) outlines any management actions taken within the monitoring period to address any exceedences of limits contained in condition L5.1 and condition L5.2.

Note: The licensee must provide the EPA with one report, but this report may be a combination of the monitoring undertaken by the licensee as part of their quarterly monitoring program as required by the Project Approval SSD-5456 and must include LA1(1min).

7 General Conditions

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G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Contact number for incidents and responsible employees

G2.1 The licensee must operate 24-hour telephone contact lines for the purpose of enabling the EPA to directly contact one or more representatives of the licensee who can:

- a) respond at all times to incidents relating to the premises; and
- b) contact the licensee's senior employees or agents authorised at all times to:
 - i) speak on behalf of the licensee; and
 - ii) provide any information or document required under this licence.

G2.2 The licensee is to inform the EPA in writing of the appointment of any subsequent contact persons, or changes to the person's contact details as soon as practicable and in any event within fourteen days of the appointment or change.

G3 Other general conditions

G3.1 Completed Programs

Program	Description	Completed Date
Coal Mine Particulate Matter Control Best Practice	Requires licensee to conduct a site specific Best Management Practice (BMP) determination to identify ways to reduce particle emissions.	28-September-2012
Assessment of Potential Impacts of Metals in wastewater	The licensee must conduct an assessment of metals detected in wastewater discharges from the mine in accordance with the ANZECC water quality guidelines. To obtain a greater understanding of the type and concentration of metals discharged in mine water and entering the receiving waters. To limit the concentration of metals discharged in mine water within ANZECC guidelines.	23-October-2013
Air Quality Monitoring	The licensee must evaluate best locations and install monitoring devices as defined in Project Approval MP10_0161 under the Environment Planning & Assessment Act 1979.	31-December-2013
PRP4 - Upgrade to Clean and Dirty Water Management System	The licensee must review and upgrade separation of the Clean and Dirty Water Management System and review and upgrade bunding.	14-August-2015

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PRP5 - Remediation of Dam Wall and Spillway formalisation	The licensee must design and remediate the dam wall on the final control pond and formalise a spillway to prevent dam seepage and to ensure that volumetric discharge can be monitored	27-February-2015
PRP 6 Upgrade to Sewage Treatment Systems	Assessment of options for improved disinfection of effluent from STP on licenced premises.	06-January-2015
PRP7 Sewage Treatment System Concept Design	Provide the EPA with a Concept Design and Timetable for Implementation of Upgrade to the Sewage Treatment System	19-February-2016

8 Pollution Studies and Reduction Programs

U1 PRP 8 - Connection of Bathhouse Wastewater to Sewer

U1.1 Background

The licensee has historically treated and disposed of effluent and grey water generated by activities at the premises through the surface water management system. The licensee has committed to undertaking scoping works and planning pathways to enable the connection of the bathhouse wastewater at the premises to the Central Coast Council sewer. The EPA understands that in 2021 the licensee was granted approval by Central Coast Council to undertake the necessary works to discharge effluent and grey water generated at the bathhouse to sewer.

Deliverables

The licensee must undertake all works proposed and specified under the planning approval by Central Coast Council to enable all bathhouse effluent and greywater to be disposed to the Central Coast Council sewerage network by no later than Friday 26 August 2022.

Upon completion of the sewerage connection the licensee must provide the EPA with a letter report identifying all works completed under this PRP.

U2 PRP 9 - Office Area Wastewater Sytem Upgrades to Best Practice

U2.1 Background

Wastewater from the premises office is currently managed by a sewage treatment system that employs surface irrigation of effluent via an above ground sprinkler system. The EPA understand that the sewage treatment system services around four office staff. The EPA understand that the effluent currently irrigated is not disinfected. The EPA considers that the current effluent irrigation system is in need of upgrades to reduce any potential impact to public health and the environment.

Deliverables

The licensee must gain any necessary approvals and upgrade the current sewage management system servicing the office building to a current best practice sewage management system. This may include

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upgrades to the effluent irrigation system to sub-surface irrigation or other best practice methods. The licensee must upgrade the current wastewater management system servicing the office building to best practice by no later than Friday 26 August 2022.

Upon completion of all works required by this PRP the licensee must supply the EPA with a letter report identifying all works and actions taken to upgrade the office building sewage management system.



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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .



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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Ms Debbie Maddison

Environment Protection Authority

(By Delegation)

Date of this edition: 10-November-2000



Environment Protection Licence

Licence - 1770

End Notes	
1	Licence varied by notice 1008662, issued on 24-Oct-2001, which came into effect on 24-Oct-2001.
2	Licence transferred through application 141163, approved on 24-Apr-2002, which came into effect on 20-Apr-2002.
3	Licence varied by notice 1026573, issued on 16-Apr-2003, which came into effect on 11-May-2003.
4	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
5	Licence varied by notice 1104492, issued on 11-Dec-2009, which came into effect on 11-Dec-2009.
6	Licence varied by notice 1502571 issued on 21-Dec-2011
7	Licence varied by notice 1504446 issued on 15-Apr-2013
8	Licence varied by notice 1516485 issued on 20-Aug-2013
9	Licence varied by notice 1519380 issued on 26-Sep-2014
10	Licence varied by notice 1527706 issued on 15-May-2015
11	Licence varied by notice 1535160 issued on 30-Oct-2015
12	Licence varied by notice 1540199 issued on 08-Jun-2016
13	Licence transferred through application 1578021 approved on 01-Apr-2019 , which came into effect on 02-Apr-2019
14	Licence varied by notice 1593319 issued on 30-Sep-2021

Appendix 3: Seagrass Monitoring Report (2021)

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 99 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

**Great Southern Energy Pty Ltd
(T/A Delta Coal)
Mannering & Chain Valley Collieries**

**Seagrass Survey of Chain Valley Bay, Summerland
Point, Bardens Bay and Crangan Bay, Lake
Macquarie, NSW**



by Dr Emma Laxton

June 2021

J.H. & E.S. Laxton - Environmental Consultants P/L

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Summary

From 2011, fourteen stations in Chain Valley Bay, ten off Summerland Point and four in Crangan Bay were surveyed for seagrass cover. In 2014 six stations in Bardens Bay were added to the sampling schedule, and by 2018, 50 seagrass transects were being surveyed.

The average length of transects in Chain Valley Bay, Summerland Point and Brightwaters was 56.9m, 59.9m and 55.1m respectively. The average length of transect in Bardens Bay was 26.6m. The transects with the greatest length were Transects E9 (152m), F2 (131m) and S4 (105m). The transects with the shortest lengths were Transects T2, C6 and A6, all approximately 14m in length.

In June 2021, two seabed elevations had changed by more than 150mm from the initial seabed heights recorded. These were E9 outer and E16 inner. These transects are in the Chain Valley Bay region where no mining has occurred since 24 December 2017. Seagrass coverage at these transects were 100% and 98.75% respectively.

Water Temperature ranged from 13.63°C to 17.18°C, with a mean water temperature of 17.18°C. Conductivity ranged from 50.02 mS/cm to 52.03 mS/cm. Mean conductivity was 50.91 mS/cm. Salinity ranged from 32.7 ppt to 34.23 ppt. Mean salinity was 33.39 ppt. Turbidity ranged from 0.3 NTU to 7.8 NTU, with a mean of 4.22 NTU. pH ranged from 7.94 to 8.13. Mean pH was 8.03. Dissolved oxygen (% saturation) ranged from 82.6% to 141.1%. Mean dissolved oxygen was 102.3% saturation. Super saturation of dissolved oxygen was the result of oxygen production by the seagrass and epiphytic algae.

The growth form of *Zostera capricorni* in the Summerland Point, Frying Pan Bay and Sugar Bay region and the Crangan Bay region was predominantly short leaved. The growth form of *Z. capricorni* in Chain Valley Bay and Bardens Bay was long leaved.

Since 2008, seagrass coverage has been increasing throughout the study area, and percentage cover has been consistent since 2012. Initial seagrass coverage at transect E6 was 17.74% in 2008. In 2021, percent seagrass cover had risen to 99.78%. Initial seagrass cover at transect T3 was 46.2%. Coverage has now increased to 98%. In June 2021, seagrass cover ranged from 91.0 percent to 100 percent. The health and condition of the seagrasses were fair, with most seagrasses lightly to moderately fouled with epiphytic algae. Nine out of the fifty transects had quadrats with heavily fouled seagrass.

The increase in percent cover of seagrasses marks the decrease in bare ground in the study area:

- from 38.13 percent in 2011 to 2 percent in 2021 in the Summerland Point, Frying Pan Bay and Sugar Bay region
- from 13.32 percent in 2011 to 0.26 percent in 2021 in the Chain Valley Bay region
- a decrease of bare ground in the Crangan Bay region from 26.98 percent in 2011 to 1.32 percent in 2021
- Seagrass cover in Bardens Bay has been around 95 percent since 2011.

The brown seaweed *Cystophyllum onustum* was observed at Transects E2, E4, E6, T1, T6, C1, C5, F1, F2, S1, S5, S6 and L1. The bivalve mollusc *Pinna menkei* was observed at transects C1-C4, C6, F2-F4, F6 and S6.

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1. Introduction

Lake Macquarie is the largest saline lake in New South Wales. It lies on the central coast between Sydney and Newcastle within the local government areas of Wyong Shire and Lake Macquarie City. Lake Macquarie has a catchment of 700 square kilometers and a water surface area of 125 square kilometers (Bell & Edwards, 1980). The lake has a permanent entrance to coastal waters at Swansea and has an average depth of around 6 meters (Laxton, 2005).

The catchment of Lake Macquarie is largely rural with large areas of bushland and grazing land. The shoreline of Lake Macquarie is heavily urbanized, especially the eastern, western and northern shorelines. The region has a relatively long history of coal mining and power generation, with mining occurring since the late 1800s and the first power station at Lake Macquarie commencing operations in 1958.

Chain Valley Colliery is situated on the southern shores of Lake Macquarie near Mannering Park, NSW. The mine has been operating since 1963. Mining is continuing within the Chain Valley Coal Lease Area using the miniwall method. Prior to mining, there were three economically viable seams in the lease area, namely the Wallarah seam (mined completely of coal by 1997); the Great Northern seam, and the Fassifern seam. In 2018 Chain Valley Colliery went into voluntary receivership and was taken over by Delta Coal to provide coal for Vales Point Power Station.

Delta Coal is mining the Fassifern Seam beneath Lake Macquarie. As part of the protection of the lake foreshore, the mining leases require a protection zone. This zone, known as the High Water Mark (HWM) Subsidence Barrier, was calculated using a 35° angle of draw from the depth of mining. The zone is approximately 130 meters wide. J.H. & E.S. Laxton – Environmental Consultants P/L was engaged by Mr. Keith Harris of Chain Valley Colliery in 2007 to assess the potential effects of pillar extraction mining beneath Lake Macquarie on seagrasses, benthic fauna and bathymetry. The studies were supervised by:

- Mr Chris Ellis of LDO Group from 2012 to 2015
- Mr Wade Covey from 2016 to 2018
- Mr Chris Armit from 2019 to 2020, and
- Mr Lachlan McWha in 2021.

2. Previous surveys

J.H. & E.S. Laxton – Environmental Consultants P/L was engaged in 2007 to provide the following:

- a bathymetric survey of the study area
- a soft bottom benthic survey of the study area and
- a seagrass survey of the western and eastern shorelines in the area proposed for underground mining.

The bathymetric and benthic surveys were conducted on 30th and 31st July 2007 by Dr John H. Laxton and Dr Emma Laxton of J.H. & E.S. Laxton – Environmental Consultants P/L and Mr Robert Payne of Ecological Surveys & Management, and the seagrass survey was conducted by John Laxton and Emma Laxton on 27th August 2007. A report entitled:

Peabody/Lake Coal. Chain Valley Colliery. *Aquatic Biology of Chain Valley Bay Lake Macquarie, NSW* by Emma Laxton and John H. Laxton. August 2007 was prepared.

This report drew attention to the following:

- There was only one species of seagrass present in the lease area of Chain Valley Bay in 2007. It was *Zostera capricorni*. (Later surveys in 2010, 2013-2015, 2017 and 2020 found the small seagrass *Halophila ovalis* also in the study area.)
- There could be changes to the distribution and density of seagrass beds in Chain Valley Bay that were unrelated to underground coal mining.
- It was recommended that an annual survey of seagrass beds in Chain Valley Bay be carried out over the life of the current proposal to mine the Fassifern seam.
- A pre-mining survey carried out in June/July 2008 would establish baseline conditions of seagrass beds in Chain Valley Bay.

NSW Department of Industry and Investment and Fisheries Divisions both accepted this recommendation.

A meeting was held on 17th April 2008 attended by Mine Environment Manager Mr Shaun McDonnell (Contact: 02 43580880), Mr Owen Farrugia (a former Manager of Mining Engineering Chain Valley Colliery), Mr James Sakker of NSW Department of Primary Industries, Fisheries Division (contact: 02 49163955) and Drs John and Emma Laxton of J.H. & E.S. Laxton – Environmental Consultants P/L (contact: 0429 855891).

At this meeting, and at subsequent discussions between NSW Government Departments and the mine management, the following programme was agreed upon:

- Ten experimental transects through the seagrass beds were to be established in the area to be mined in Chain Valley Bay. Four control transects were to be established in Crangan Bay, Lake Macquarie.
- The outer ends of the transects were to be marked by cast concrete blocks fitted with subsurface buoys.
- Differential GPS survey methods were to be used to establish the precise location and height of the lakebed at the inner and outer ends of each transect in Chain Valley Bay. This procedure was used to establish the baseline to detect any subsidence of the lakebed due to underground mining.
- Seagrass distribution, density, and condition along each transect was to be recorded using a video camera enclosed within a waterproof housing and mounted on a floating platform.

The work was supervised by Mr Keith Harris of Lake Coal. A report entitled:

Chain Valley Colliery. *Seagrass survey of Chain Valley Bay, Lake Macquarie, NSW* by Dr John H. Laxton and Dr Emma Laxton. July 2008. was produced.

In 2009, a further survey of the Lake along Summerland Point (Domain No. 2) was carried out. The following aspects were investigated:

- a bathymetric survey of the study area was undertaken,
- a soft bottom benthic survey of the study area was carried out,

- a survey to determine the maximum seaward extent of the seagrass beds and the maximum depth at which they occurred was undertaken,
- a photographic seagrass survey of the shoreline of Summerland Point in the area proposed for underground mining was carried out (the original ten experimental stations and four control stations). In addition, eight new permanent transects (T1 to T8) were established and surveyed using the underwater video camera.

A report entitled: Peabody Energy – Chain Valley Colliery. *Aquatic Biology of Domain No. 2 off Summerland Point, Lake Macquarie, NSW*. Emma and John H. Laxton. July 2009 was prepared.

In June 2010 a survey of all 22 permanent seagrass transects was carried out, including a survey, using differential GPS, to determine the elevation and location of the inner and outer ends of each transect (by Pearson & Associates Pty. Ltd.).

In June 2011, along with the 22 permanent seagrass transects, a further 6 transects were surveyed along the eastern shoreline of Chain Valley Bay (**Figure 4.1**).

In June 2012 and June 2013, 28 transects were surveyed using the underwater video camera mounted on the floating platform. The lakebed heights of the inner and outer ends of each transect (excluding the control transects in Crangan Bay) were measured by Pearson and Associates Pty. Ltd.

In 2014, LDO Lake Coal had new plans to mine coal beneath Bardens Bay. Mr Chris Ellis required the 2014 seagrass survey to be brought forward to April so that baseline data on seagrasses and lakebed levels in Bardens Bay were available before mining commenced. Six new seagrass transects were established in Bardens Bay (A1 to A6 - **Figure 4.2**). Documents were required for submission by 23rd June 2014. It was found that Bardens Bay around Trinity Point on the southern side had deep water. Seagrasses consequently only occupied a narrow band along the shoreline. At the tip of Trinity Point, rocks outcrop at the shoreline leaving no room for seagrasses.

In 2015, the seagrass survey was conducted between 24th and 26th May. It was instructed that transects E10 to E16, located in Chain Valley Bay, were not to be surveyed as mining was not to occur in that area. A new Transect L1 was established and photographed.

The seagrass survey in 2016 was undertaken between 14th and 16th June. Very rough weather with heavy rainfall preceded the survey.

In June 2017, all established seagrass transects (35) were re-photographed. The weather prior to sampling included a period of heavy rain which caused the water transparency in the lake to deteriorate. Seagrass photography was delayed until the lake water cleared.

In 2018 the seagrass survey was carried out between 18th and 19th May. Fifteen new seagrass transects were added to the sampling schedule, bringing the total number of transects sampled to 50.

The 2019 seagrass survey was carried out between June 25th and June 27th, and the 2020 survey was conducted between 18th and 20th May.

3. Seagrass survey - June 2021

The determination of the elevations of the inner and outer ends of the transects by differential GPS was undertaken on 25 June 2021. This phase of the work was carried out by Mr Samuel Booth of Daly.Smith Pty Ltd (02 4973 2745) of Morisset.

The seagrass survey was conducted on the 15th, 16th and 23rd June 2021 (purchase order No. D123619).

Methods

Surveying Methods

Daly.Smith P/L established base stations for their differential GPS equipment along the shore of Chain Valley Bay. A measured carbon fibre staff fitted with a 110mm diameter aluminium base plate (to prevent penetration into the sediment) was attached to the end of the staff. Survey data (x, y & z coordinates) were recorded on a separate hand piece. Communication between the GPS receiver, the base stations and the hand piece was by coded radio signals.

The boat was maneuvered into position at the inshore end of each transect. The staff was placed on the lakebed and held vertically until the observation was made and recorded. Next, the boat was moved outwards from the shore where intermediate points along the transect were established and recorded. When the outer end of the transect was reached, the staff was placed on the exact coordinates and the position and height of the lakebed were recorded.

The memory of the handheld computer was downloaded, and the following plots were made:

- A map of the position of transects in Chain Valley Bay, Summerland Point, Bardens Bay, Sugar Bay and Frying Pan Bay.
- A table of the coordinates of the inner and outer ends of each transect and the coordinates of the base stations.
- The elevations of the seabed at the inner and outer ends of each transect, relative to AHD, were established and tabulated.

Seagrass photography

A Sony Handycam 6.1 megapixel video camera (DCR-SR300E) with 40 GB hard drive fitted with a wide conversion X0.7 lens (VCL-HG737C) was inserted into an underwater housing. The underwater housing was mounted vertically in the centre of a 1m long surfboard. This rig was towed alongside a work boat. Best photographic results were obtained when the boat and photographic rig were poled very slowly along the transect line on windless days.

The water depth along most of the transect lines ranged from around 0.5 to 1.2m (depending upon the lake water level). At the end of the transect line the water depth could be around 1.8m. Transect lines were photographed from the outer end to the inner end.

The hard drive of the video camera was downloaded to a desk top computer. The videos were played using VLC Media Player. The film was paused at around 1m intervals along the transect line. Each still frame was examined, and the following information recorded into an Excel spreadsheet:

1. The transect number and the date the video was taken.
2. The percentage areas occupied by the following plants and animals in each still photograph or quadrat:
 - (a) % area occupied by long leaved seagrass *Zostera capricorni*;
 - (b) % area occupied by short leaved seagrass *Zostera capricorni*;
 - (c) % area occupied by the small seagrass *Halophila ovalis*;
 - (d) degree of fouling of the seagrass leaves by algae 1=no fouling, 2=light fouling, 3=heavy fouling;
 - (e) % area occupied by the large brown alga (*Sargassum* sp., *Hormosira banksii* or *Cystoseira trinodis*);
 - (f) % area occupied by filamentous and thallosal algae (green or brown algae);
 - (g) Number of the large bivalve *Pinna menkei*;
 - (h) % area of uncolonised ground (bare ground, no macroscopic epibenthos).

4. Locations of permanent seagrass transects

Figures 4.1, 4.2 and 4.3 show the location of seagrass transects in Chain Valley Bay, Summerland Point, Bardens Bay, Brightwaters and Crangan Bay. From 2018 to 2021, a total of 50 transects were photographed annually:

- Transects E1 to E16 are established experimental transects in Chain Valley Bay and Summerland Point (**Figure 4.1**)
- Transects T1 to T8 are established experimental transects along Summerland Point (**Figure 4.1**)
- Transects C1 to C4 are established control stations in Crangan Bay (**Figure 4.1**)
- Transect L1 was established in Chain Valley Bay in 2015 (**Figure 4.1**)
- Transects A1 to A6 are established experimental stations in Bardens Bay. They were first surveyed in 2014 (**Figure 4.2**)
- Transects C5 to C6 were established in 2018 (**Figure 4.3**)
- Transects F1 to F7 in Brightwaters Bay were established in 2018 (**Figure 4.3**), and
- Transects S1 to S6 were established in Sugar Bay in 2018 (**Figure 4.3**).



Figure 4.1 Locations of Transects in Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie.



Figure 4.2 Locations of Transects A1 to A6 in Bardens Bay, Lake Macquarie established in 2014.

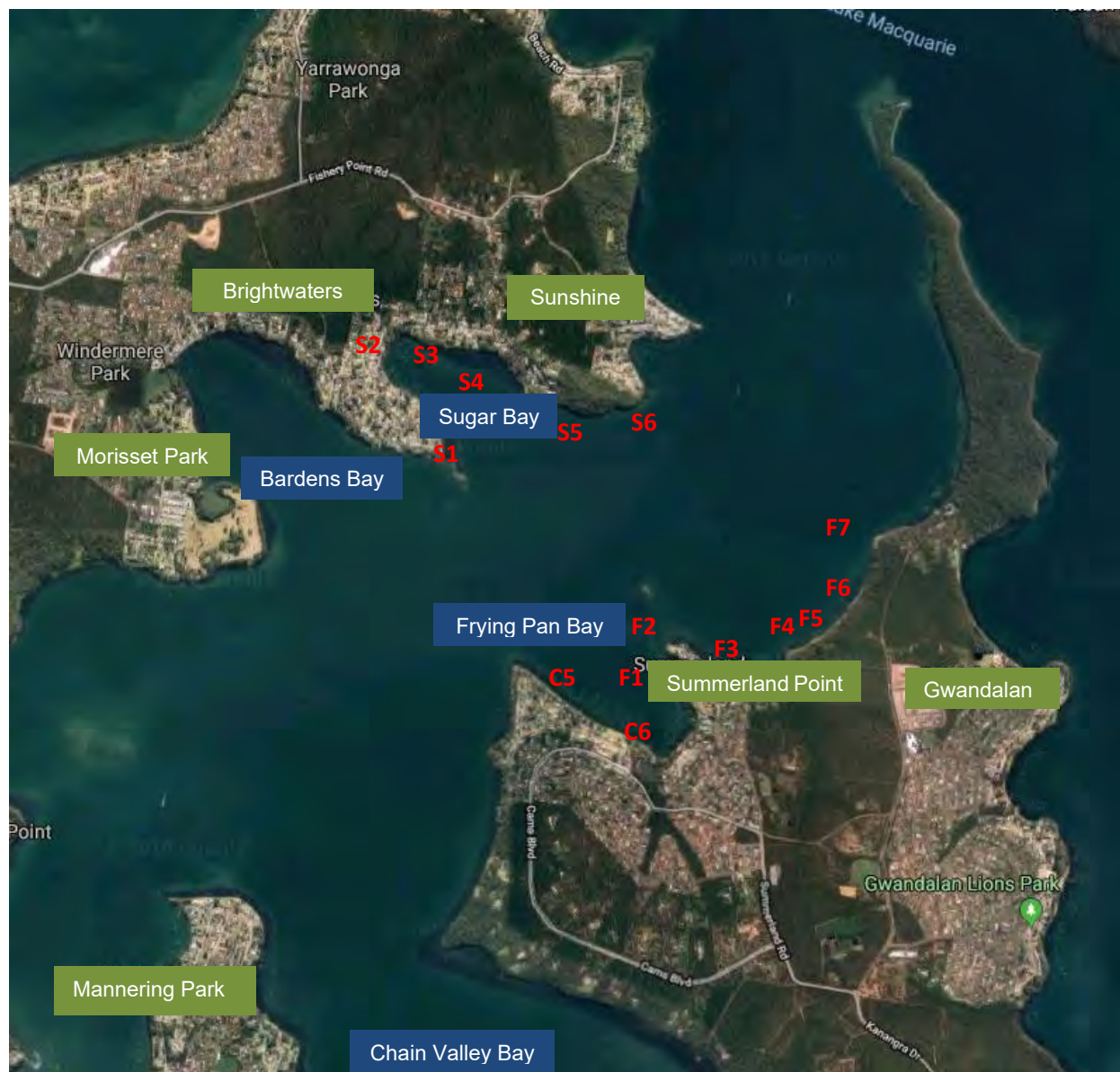


Figure 4.3 Location of transects C5-C6, F1-F7 and S1-S6 in Lake Macquarie established in 2018.

Tables 4.1 to 4.5 show the precise locations of the inner and outer ends of the permanent seagrass monitoring transects in Chain Valley Bay, Summerland Point, Bardens Bay, Crangan Bay and Brightwaters as determined by differential GPS.

Transects in Crangan Bay were for biological purposes only and did not require precise locations (handheld GPS coordinates were sufficient to re-locate them).

Table 4.1 Coordinates of inner and outer ends of permanent seagrass transects in Chain Valley Bay

Transect No.	Easting	Northing	Transect No.	Easting	Northing
E1 Inner	56363985.56	6331796.12	E1 Outer	56364003.66	6331816.06
E2 Inner	56364035.74	6331701.21	E2 Outer	56364076.97	6331716.45
E3 Inner	56363953.19	6331404.63	E3 Outer	56364027.57	6331417.71
E4 Inner	56364220.41	6331078.04	E4 Outer	56364259.92	6331122.01
E5 Inner	56365005.52	6330163.60	E5 Outer	56365034.44	6330225.24
E6 Inner	56365118.34	6329788.72	E6 Outer	56365174.56	6329802.58
E7 Inner	56385350.74	6332350.32	E7 Outer	56365297.96	6332344.97
E8 Inner	56365128.31	6331795.44	E8 Outer	56365096.58	6331811.56
E9 Inner	56365040.02	6331607.80	E9 Outer	56364913.26	6331523.98
E10 Inner	56365422.82	6331427.70	E10 Outer	56365394.86	6331361.84
E11 Inner	56365554.10	6331410.24	E11 Outer	56365524.31	6331343.51
E12 Inner	56365749.60	6331328.35	E12 Outer	56365735.31	6331284.62
E13 Inner	56365990.71	6331278.46	E13 Outer	56365970.44	6331190.80
E14 Inner	56366447.51	6331046.57	E14 Outer	56366370.49	6330984.28
E15 Inner	56366657.26	6330098.71	E15 Outer	56366610.88	6330167.27
E16 Inner	56366310.52	6329644.48	E16 Outer	56366272.93	6329666.33
T1 inner	56365439.70	6333217.30	T1 outer	56365442.62	6333264.67
T2 inner	56365402.69	6333100.83	T2 outer	56365388.27	6333100.67
T3 inner	56365400.34	6332951.79	T3 outer	56365384.15	6332949.28
T4 inner	56365377.42	6332816.19	T4 outer	56365357.10	6332831.62
T5 inner	56365350.31	6332990.09	T5 outer	56365309.37	6332575.63
T6 inner	56365347.91	6332380.19	T6 outer	56365300.00	6332337.91
T7 inner	56365320.68	6332207.46	T7 outer	56365267.96	6332206.74
T8 inner	56365336.86	6332262.46	T8 outer	56365295.11	6332270.42
L1 inner	56364292.62	6330367.65	L1 outer	56364304.40	6330399.71

Table 4.2 Coordinates of inner and outer ends of permanent seagrass transects off Summerland Point

Transect No.	Easting	Northing	Transect No.	Easting	Northing
C5 inner	56365676.16	6333038.68	C5 outer	56365702.98	6333084.58
C6 inner	56366045.20	6332831.77	C6 outer	56366058.95	6332870.63
F1 inner	56366320.96	6333281.31	F1 outer	56366285.58	6333249.79
F2 inner	56366342.19	6333330.55	F2 outer	56366290.92	6333450.31
F3 inner	56366611.11	6333163.11	F3 outer	56366621.00	6333228.01
F4 inner	56366968.01	6333242.46	F4 outer	56366918.81	6333285.18
F5 inner	56367106.95	6333361.98	F5 outer	56367068.97	6333421.28

F6 inner	56367271.10	6333493.19	F6 outer	56367202.42	6333522.83
F7 inner	56367402.36	6333682.09	F7 outer	56367374.73	6333694.93

Table 4.3 Coordinates of inner and outer ends of permanent seagrass transects in Bardens Bay.

Transect No.	Easting	Northing	Transect No.	Easting	Northing
A1 inner	56364006.28	6333892.16	A1 outer	56364048.43	6333899.34
A2 inner	56363979.36	6334006.51	A2 outer	56364002.16	6334013.22
A3 inner	56363918.06	6334157.90	A3 outer	56363927.53	6334165.80
A4 inner	56363633.48	6334426.20	A4 outer	56363660.06	6334425.14
A5 inner	56363686.18	6335068.50	A5 outer	56363688.41	6335049.82
A6 inner	56364434.63	6334566.67	A6 outer	56364422.84	6334560.15

Table 4.4 Coordinates of inner and outer ends of permanent seagrass transects in Crangan Bay.

Transect No.	Easting	Northing	Transect No.	Easting	Northing
C1 Inner	56368596	6332235	C1 Outer	56368616	6332250
C2 Inner	56368619	6332147	C2 Outer	56368658	6332151
C3 Inner	56368524	6331811	C3 Outer	56368538	6331806
C4 Inner	56368467	6331435	C4 Outer	56368486	6331421

Table 4.5 Coordinates of inner and outer ends of permanent seagrass monitoring transects off Brightwaters.

Transect No.	Easting	Northing	Transect No.	Easting	Northing
S1 inner	56365009.02	6334470.41	S1 outer	56365077.72	6334481.77
S2 inner	5636642.29	6334943.57	S2 outer	56364673.53	6334939.82
S3 inner	56365017.76	6335008.93	S3 outer	56365041.97	6334932.70
S4 inner	56365235.10	6334992.86	S4 outer	56365217.43	6334889.31
S5 inner	56365575.20	6334709.08	S5 outer	56365569.66	6334693.44
S6 inner	56366144.58	6334765.21	S6 outer	56366172.04	6334761.92

The outer end of Transect A3 was relocated in July 2015. It had initially been placed in water so deep the survey staff and GPS unit could not reach the lakebed. The end of the transect was therefore moved inshore to coincide with the outer edge of the seagrass bed.

5. Transect lengths

The length of each permanent transect is shown in **Table 5.1**.

Table 5.1 Transect lengths in Chain Valley Bay, Summerland Point, Bardens Bay and Brightwaters

Chain Valley Bay

Transect Number	Length (m)	Transect Number	Length (m)
Transect E1	26.25	Transect E2	44.60
Transect E3	75.09	Transect E4	59.30
Transect E5	67.45	Transect E6	57.97
Transect E7	52.44	Transect E8	35.36
Transect E9	152.68	Transect E10	71.01
Transect E11	73.21	Transect E12	46.22
Transect E13	89.54	Transect E14	98.63
Transect E15	82.85	Transect E16	44.26
Transect T1	47.48	Transect T2	14.39
Transect T3	16.32	Transect T4	25.14
Transect T5	49.14	Transect T6	63.53
Transect T7	52.90	Transect T8	42.36
Transect L1	20.00		

Summerland Point

Transect Number	Length (m)	Transect Number	Length (m)
Transect C5	41.57	Transect C6	13.67
Transect F1	47.11	Transect F2	130.55
Transect F3	65.64	Transect F4	65.04
Transect F5	70.46	Transect F6	74.81
Transect F7	30.47		

Bardens Bay

Transect Number	Length (m)	Transect Number	Length (m)
Transect A1	42.60	Transect A2	24.00
Transect A3	34.80	Transect A4	26.30
Transect A5	18.30	Transect A6	13.70

Brightwaters

Transect Number	Length (m)	Transect Number	Length (m)
Transect S1	69.64	Transect S2	31.46
Transect S3	79.98	Transect S4	105.05
Transect S5	16.60	Transect S6	27.67

The average length of transects in Chain Valley Bay, Summerland Point and Brightwaters was 56.9m, 59.9m and 55.1m respectively. The average length of transect in Bardens Bay was 26.6m. The transects with the greatest lengths were Transects E9 (152m), F2 (131m) and S4 (105m) (**Table 5.1**). The transects with the shortest lengths were Transects T2, C6 and A6, all approximately 14m in length (**Table 5.1**).

6. Changes in Elevation of the Lakebed

Table 6.1 shows the seabed heights at each permanent transect in Chain Valley Bay between the period 2013 to 2021. For Transects E1 to E10, the difference between seabed heights were calculated by subtracting the height gained in 2021 from the initial seabed heights recorded in 2008 (**Table 6.1**). Difference between seabed elevation for Transects E11 to E16 and T1 to T8 were calculated using the initial seabed height data from 2011 (**Table 6.1**) and 2010 respectively. Transect L1 calculations were determined by subtracting height data collected in 2021 from initial seabed height data collected in 2015 (not shown).

Table 6.1 Seabed heights at each transect for Chain Valley Bay (2008-2021)

Transect	2008	2011	2016	2017	2018	2019	2020	2021	Diff.
E1 Inner	-0.68	-0.75	-0.69	-0.70	-0.68	-0.66	-0.67	-0.691	0.01
E1 Outer	-1.00	-1.07	-1.02	-1.02	-1.05	-0.99	-0.98	-1.019	0.02
E2 Inner	-0.64	-0.75	-0.67	-0.67	-0.69	-0.63	-0.67	-0.659	0.02
E2 Outer	-1.78	-1.64	-1.84	-1.85	-1.80	-1.76	-1.84	-1.788	0.01
E3 Inner	-0.32	-0.31	-0.33	-0.33	-0.31	-0.30	-0.35	-0.308	-0.01
E3 Outer	-2.34	-2.22	-2.33	-2.34	-2.38	-2.34	-2.33	-2.412	0.07
E4 Inner	-0.46	-0.52	-0.47	-0.46	-0.47	-0.46	-0.47	-0.429	-0.03
E4 Outer	-1.69	-1.72	-1.67	-1.66	-1.67	-1.56	-1.69	-1.642	-0.05
E5 Inner	-0.46	-0.53	-0.38	-0.39	-0.43	-0.35	-0.46	-0.354	-0.11
E5 Outer	-1.68	-1.72	-1.56	-1.57	-1.60	-1.53	-1.64	-1.592	-0.09
E6 Inner	-0.48	-0.53	-0.48	-0.44	-0.44	-0.48	-0.48	-0.411	-0.07
E6 Outer	-1.21	-1.27	-1.16	-1.16	-1.16	-1.14	-1.17	-1.156	-0.05
E7 Inner	-0.24	-0.24	-0.16	-0.19	-0.22	-0.22	-0.21	-0.212	-0.03
E7 Outer	-1.68	-1.77	-1.72	-1.77	-1.69	-1.66	-1.72	-1.751	0.07
E8 Inner	-0.27	-0.32	-0.31	-0.25	-0.34	-0.38	-0.34	-0.342	0.07
E8 Outer	-0.99	-1.13	-1.10	-1.00	-1.04	-1.01	-0.98	-0.989	0.00
E9 Inner	-0.19	-0.30	-0.30	-0.25	-0.29	-0.30	-0.27	-0.241	0.05
E9 Outer	-1.07	-1.10	-1.21	-1.17	-1.20	-1.31	-1.15	-1.287	0.22
E10 Inner	-0.45	-0.52	-0.43	-0.42	-0.43	-0.49	-0.48	-0.456	0.01
E10 Outer	-1.73	-1.89	-1.69	-1.70	-1.79	-1.80	-1.73	-1.699	-0.03
E11 Inner		-0.46	-0.37	-0.35	-0.37	-0.41	-0.37	-0.357	-0.10
E11 Outer		-1.12	-1.09	-1.08	-1.10	-1.14	-1.23	-1.104	-0.02
E12 Inner		-0.66	-0.59	-0.55	-0.56	-0.59	-0.58	-0.521	-0.14
E12 Outer		-1.50	-1.44	-1.41	-1.44	-1.53	-1.46	-1.498	0.00
E13 Inner		-0.64	-0.58	-0.58	-0.58	-0.65	-0.60	-0.531	-0.11
E13 Outer		-1.48	-1.39	-1.44	-1.42	-1.46	-1.44	-1.418	-0.06
E14 Inner		-0.58	-0.45	-0.45	-0.45	-0.54	-0.50	-0.504	-0.08
E14 Outer		-1.40	-1.31	-1.32	-1.34	-1.38	-1.35	-1.314	-0.09
E15 Inner		-0.37	-0.33	-0.31	-0.32	-0.36	-0.36	-0.305	-0.07
E15 Outer		-1.11	-1.18	-1.12	-1.16	-1.17	-1.16	-1.163	-0.11
E16 Inner		-0.44	-0.46	-0.45	-0.48	-0.47	-0.42	-0.428	-0.17
E16 Outer		-0.96	-0.98	-0.98	-1.01	-0.99	-0.98	-0.928	-0.03

T1 inner		-0.44	-0.46	-0.45	-0.48	-0.37	-0.48	-0.442	0.04
T1 outer		-1.21	-1.20	-1.21	-1.20	-1.17	-1.28	-1.142	-0.01
T2 inner		-0.73	-0.72	-0.72	-0.74	-0.83	-0.71	-0.722	0.02
T2 outer		-1.35	-1.35	-1.37	-1.36	-1.35	-1.39	-1.339	0.03
T3 inner		-0.34	-0.38	-0.35	-0.38	-0.37	-0.34	-0.302	0.01
T3 outer		-1.08	-1.03	-1.04	-1.06	-1.11	-1.08	-1.054	0.04
T4 inner		-0.49	-0.49	-0.50	-0.50	-0.38	-0.45	-0.488	0.03
T4 outer		-1.14	-1.15	-1.16	-1.15	-1.16	-1.15	-1.142	0.02
T5 inner		-0.49	-0.46	-0.47	-0.52	-0.50	-0.52	-0.501	0.08
T5 outer		-1.62	-1.44	-1.46	-1.47	-1.50	-1.49	-1.431	0.05
T6 inner		-0.46	-0.42	-0.41	-0.42	-0.39	-0.40	-0.417	-0.05
T6 outer		-1.64	-1.63	-1.64	-1.64	-1.64	-1.64	-1.668	0.06
T7 inner		-0.20	-0.20	-0.12	-0.22	-0.26	-0.23	-0.194	0.02
T7 outer		-1.78	-1.67	-1.67	-1.69	-1.69	-1.66	-1.659	0.02
T8 inner		-0.24	-0.27	-0.18	-0.27	-0.15	-0.17	-0.19	-0.01
T8 outer		-1.27	-1.18	-1.18	-1.24	-1.20	-1.24	-1.204	0.06
L1 inner			-1.14	-1.11	-1.12	-1.07	-1.11	-1.044	-0.08
L1 outer			-1.66	-1.70	-1.63	-1.68	-1.66	-1.649	0.02

In June 2021, two seabed elevations in Chain Valley Bay had changed by more than 150mm from the initial seabed heights recorded. The transect points were E9 outer and E16 inner (**Table 6.1**).

Table 6.2 shows the seabed heights at each permanent transect for Summerland Point for the period 2018 to 2021. The difference between seabed heights was calculated by subtracting the height gained in 2021 from the seabed heights recorded in 2018.

Table 6.2 Seabed heights at each transect for Summerland Point (2018-2021)

Transect	2018	2019	2020	2021					Diff.
C5 inner	-0.09	-0.03	-0.12	-0.014					-0.08
C5 outer	-2.18	-2.17	-2.18	-2.167					-0.01
C6 inner	-0.08	0.01	-0.08	-0.042					-0.04
C6 outer	-2.06	-1.82	-2.02	-2.133					0.07
F1 inner	-0.23	-0.30	-0.27	-0.26					0.03
F1 outer	-1.28	-1.22	-1.25	-1.232					-0.05
F2 inner	-0.25	-0.19	-0.20	-0.227					-0.02
F2 outer	-1.96	-1.94	-2.01	-1.883					-0.08
F3 inner	-0.11	-0.12	-0.05	0.032					-0.14
F3 outer	-1.86	-1.70	-1.87	-1.779					-0.08
F4 inner	-0.09	-0.10	-0.12	-0.104					0.01
F4 outer	-2.45	-2.44	-2.39	-2.373					-0.08
F5 inner	-0.31	-0.29	-0.30	-0.213					-0.10
F5 outer	-2.45	-2.48	-2.44	-2.485					0.03
F6 inner	-0.33	-0.28	-0.33	-0.274					-0.06
F6 outer	-2.78	-2.75	-2.80	-2.825					0.05
F7 inner	-0.47	-0.45	-0.50	-0.388					-0.08
F7 outer	-1.46	-1.47	-1.45	-1.42					-0.04

In June 2021, no seabed elevations off Summerland Point had changed by more than 150mm from the initial seabed heights recorded (**Table 6.2**).

Table 6.3 shows the seabed heights at each permanent transect in Bardens Bay for the period 2014 to 2021. The difference between seabed heights were calculated by subtracting the height gained in 2021 from the initial seabed height recorded in 2014 for each transect.

Table 6.3 Seabed heights at each transect for Bardens Bay (2014-2021)

Transect	2014	2015	2016	2017	2018	2019	2020	2021	Diff.
A1 inner	-0.51	-0.57	-0.56	-0.59	-0.58	-0.52	-0.57	-0.567	0.06
A1 outer	-1.19	-1.20	-1.24	-1.25	-1.25	-1.32	-1.27	-1.251	0.06
A2 inner	-0.39	-0.44	-0.42	-0.45	-0.46	-0.45	-0.40	-0.401	0.01
A2 outer	-0.81	-0.87	-0.86	-0.86	-0.89	-0.91	-0.88	-0.868	0.06
A3 inner	-0.33	-0.34	-0.31	-0.30	-0.35	-0.25	-0.34	-0.35	0.02
A3 outer	-3.44	-1.38	-1.42	-1.43	-1.44	-1.24	-1.41	-1.421	-0.02
A4 inner	-0.16	-0.19	-0.16	-0.16	-0.17	-0.17	-0.21	-0.176	0.02
A4 outer	-0.72	-0.73	-0.73	-0.71	-0.71	-0.68	-0.70	-0.685	-0.03
A5 inner	-0.30	-0.32	-0.33	-0.30	-0.32	-0.36	-0.32	-0.321	0.02
A5 outer	-0.96	-0.95	-0.95	-0.95	-0.98	-1.01	-0.98	-1.012	0.05
A6 inner	-0.14	-0.16	-0.14	-0.14	-0.15	-0.20	-0.13	-0.116	-0.02
A6 outer	-0.68	-0.69	-0.68	-0.68	-0.73	-0.76	-0.72	-0.749	0.07

In June 2021, no seabed elevations in Bardens Bay had changed by more than 150mm from the initial seabed heights recorded in 2014 (**Table 6.3**).

Table 6.4 shows the seabed heights at each permanent transect off Brightwaters for the period 2018 to 2021. The difference between seabed heights were calculated by subtracting the height gained in 2021 from the seabed height recorded in 2018.

In June 2021, no seabed elevations off Brightwaters had changed by more than 150mm from the initial seabed heights recorded in 2018 (**Table 6.4**).

Table 6.4 Seabed heights at each transect for Brightwaters (2018-2021)

Transect	2018	2019	2020	2021					Diff.
S1 inner	-0.61	-0.56	-0.57	-0.539					-0.07
S1 outer	-1.75	-1.71	-1.77	-1.746					-0.02
S2 inner	-0.25	-0.23	-0.21	-0.208					-0.04
S2 outer	-1.56	-1.51	-1.54	-1.531					-0.03
S3 inner	-0.08	-0.15	-0.09	-0.022					-0.03
S3 outer	-1.84	-1.94	-1.84	-1.844					0.00
S4 inner	-0.08	-0.14	-0.09	-0.076					0.05
S4 outer	-1.70	-1.74	-1.76	-1.686					-0.02
S5 inner	-0.66	-0.66	-0.65	-0.597					-0.06
S5 outer	-1.36	-1.40	-1.39	-1.417					0.06
S6 inner	-0.07	-0.06	-0.06	-0.003					-0.06
S6 outer	-0.89	-0.89	-0.889	-0.892					0.00

7. Physical characteristics of bottom water in Lake Macquarie – June 2021

The physical characteristics of the bottom waters in Lake Macquarie were tested between 15th and 23rd June 2021 at each transect using a calibrated Yeo-Kal 618RU Analyser. Units of measurement were Temperature (TEMP) - degrees Celsius; Conductivity (COND) - mS/cm; Salinity (SAL) - parts per thousand; pH; Dissolved Oxygen - % saturation and mg/L; and Turbidity (TURB) - NTU.

The physical characteristics of the bottom water at each transect in Lake Macquarie are shown in **Table 7** and were as follows:

- Water Temperature ranged from 13.63°C at Transect L1 to 17.18°C at Transect C6. Mean water temperature was 17.18°C.
- Conductivity ranged from 50.02 mS/cm at Transect A1 to 52.03 mS/cm at Transect C4. Mean conductivity was 50.91 mS/cm.
- Salinity ranged from 32.7 ppt at Transect E4 to 34.23 ppt at Transect C4. Mean salinity was 33.39 ppt.
- Turbidity ranged from 0.3 NTU at Transect E8 to 7.8 NTU at Transect C1. Mean turbidity was 4.22 NTU.
- pH ranged from 7.94 at Transect S2 to 8.13 at Transect C3. Mean pH was 8.03.
- Dissolved oxygen (% saturation) ranged from 82.6% at Transect T2 to 141.1% at Transect C1. Mean dissolved oxygen was 102.3% saturation. Super saturation of dissolved oxygen was the result of oxygen production by the seagrass and epiphytic

algae.

Table 7.1 Physical characteristics of bottom waters of Lake Macquarie - June 2021**Chain Valley Bay**

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
E1	14.28	50.65	33.21	85.9	6.81	7.97	7.5
E2	14.27	50.60	33.16	87.7	6.88	7.98	6.7
E3	14.45	50.60	33.16	88.9	6.95	8.00	6.5
E4	13.71	50.03	32.70	100.2	8.18	8.07	5.6
E5	14.02	50.15	32.83	95.8	7.78	8.04	6.0
E6	14.22	50.17	32.78	89.3	7.01	7.99	5.6
E7	15.40	51.03	33.44	97.3	7.94	8.01	2.2
E8	15.61	51.03	33.47	101.3	8.22	8.05	0.3
E9	15.23	50.43	33.04	118.1	9.50	8.08	6.1
E10	14.89	50.27	32.92	102.9	8.41	8.03	5.7
E11	14.77	50.45	33.05	102.0	8.40	8.01	5.7
E12	14.88	50.50	33.09	102.1	8.35	8.00	5.8
E13	14.72	50.51	33.10	100.7	8.19	8.00	5.9
E14	14.42	50.53	33.11	98.7	8.05	8.03	5.7
E15	14.21	50.38	33.02	89.6	6.98	7.98	5.7
E16	14.17	50.19	32.88	101.0	8.20	8.05	6.0
T1	16.77	51.08	33.40	111.5	8.82	8.01	1.0
T2	15.11	51.12	33.54	82.6	6.78	8.01	3.2
T3	15.20	51.07	33.52	88.5	7.26	8.00	2.4
T4	15.31	51.02	33.46	92.3	7.54	8.01	1.9
T5	15.34	51.06	33.48	94.4	7.71	8.01	1.0
T6	15.41	51.04	33.47	96.6	7.89	8.01	1.0
T7	15.42	50.99	33.45	102.5	8.38	8.03	0.7
T8	15.38	50.92	33.36	98.7	8.05	8.02	0.7
L1	13.63	50.04	32.74	99.6	7.98	8.08	5.9

Frying Pan Bay/ Summerland Point

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
C5	17.09	51.07	33.52	123.5	9.72	8.08	0.6
C6	17.18	51.30	33.54	133.7	10.64	8.11	1.8
F1	16.70	51.01	33.46	103.7	8.21	7.96	2.6
F2	16.82	51.01	33.49	103.6	8.24	7.96	3.1
F3	16.38	51.21	33.64	118.7	9.50	8.07	2.4
F4	16.45	51.18	33.59	107.2	8.61	8.02	2.1
F5	16.55	51.14	33.57	104.0	8.28	7.98	2.1
F6	16.31	51.25	33.62	107.9	8.63	8.02	1.9
F7	16.21	51.23	33.62	102.1	8.19	7.96	3.8

Bardens Bay

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
A1	15.98	50.02	33.44	91.4	7.38	8.00	3.1
A2	15.78	50.97	33.42	96.6	7.84	8.01	2.9
A3	16.22	51.02	33.51	106.0	8.53	8.07	3.1
A4	15.69	51.06	33.45	113.0	9.34	8.13	2.3
A5	15.32	51.08	33.57	99.7	8.13	8.02	3.8
A6	16.00	51.05	33.49	99.5	8.00	7.99	3.3

Crangan Bay

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
C1	17.00	51.75	33.80	141.1	9.78	8.02	7.8
C2	16.12	52.01	34.19	112.3	9.30	8.06	6.9
C3	16.28	52.02	34.16	122.0	9.58	8.13	6.5
C4	16.35	52.03	34.23	121.4	9.52	8.12	6.6

Sugar Bay Brightwaters

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
S1	15.13	50.84	33.30	97.2	7.99	8.08	6.8
S2	16.15	50.84	33.35	102.5	8.19	7.94	6.2
S3	14.79	51.20	33.51	90.4	7.43	8.01	7.2
S4	15.30	51.05	33.50	95.0	7.77	8.02	6.4
S5	15.25	51.03	33.49	96.7	7.93	8.03	6.5
S6	15.35	51.05	33.50	97.5	7.96	8.04	6.5

8. Plant and animal species monitored in the study area

Plate 8.1 provides information about the plants monitored in the seagrass surveys of Lake Macquarie, NSW. **Plate 8.2** provides information about the bivalve *Pinna menkei*.

Plate 8.1 Plant species found in the study area of Lake Macquarie (2007 - 2021).



Kingdom: Plantae
Phylum: Magnoliophyta
Class: Liliopsida
Order: Potamogetonales
Family: Zosteraceae
Genus: *Zostera*
Species: *Z. capricorni*

Remarks: *Zostera capricorni* is a species of eelgrass native to the seacoasts of New Guinea, Queensland, New South Wales, Victoria, South Australia, Norfolk Island and the North Island of New Zealand. It was first discovered at Moreton Bay in Queensland in 1875.



Kingdom: Plantae
Phylum: Magnoliophyta
Class: Liliopsida
Order: Hydrocharitales
Family: Hydrocharitaceae
Genus: *Halophila*
Species: *H. ovalis*

Remarks: *Halophila ovalis* commonly known as paddle weed, spoon grass or dugong grass, is a seagrass in the family Hydrocharitaceae. It is a small herbaceous plant that occurs in seabeds and other saltwater environments in the Indo-Pacific. First seen at Transect E6 in Chain Valley Bay on 12th June 2010.



Kingdom: Plantae
Phylum: Phaeophyta
Class: Phaeophyceae
Order: Fucales
Family: Hormosiraceae
Genus: *Hormosira*
Species: *H. banksii*

Remarks: *Hormosira banksii*, also known as Neptune's necklace, Neptune's pearls, sea grapes, or bubbleweed is a species of brown alga native to Australia and New Zealand. It is abundant on low-energy rocky reefs at midtide levels, where it outcompetes other algal species due to its high tolerance to desiccation. First recorded at Transect C1 in Crangan Bay on 12th June 2010.



Kingdom: Plantae
Phylum: Phaeophyta
Class: Phaeophyceae
Order: Fucales
Family: Sargassaceae
Genus: *Sargassum*

Remarks: *Sargassum* is a genus of brown macroalgae in the order Fucales. Numerous species are distributed throughout the temperate and tropical oceans of the world, where they generally inhabit shallow water and coral reefs, and the genus is widely known for its planktonic species.



Kingdom: Plantae
Phylum: Phaeophyta
Class: Phaeophyceae
Order: Fucales
Family: Cystoseiraceae
Genus: *Cystoseira*
Species: *C. trinodis*
Synonym: *Cystophyllum onustum*

Remarks: A macroalgae widespread in Australia and the Indo-Pacific region. The plants vary considerably in size and form, with tall thin plants up to 1.5m high in very sheltered and estuarine waters, or more compact thicker-stemmed plants up to 30cm high in oceanic reef pools. Characterised by small peg-like projections on the lower parts of the main branches.



Kingdom: Plantae

Green filamentous algae

Remarks: Filamentous algae are colonies of microscopic plants that link together to form threads or mesh-like filaments. These primitive plants normally grow on the surface of hard objects or other substrates under the water but they can break loose and form floating mats.

Plate 8.2. *Pinna menkei* are found amongst the seagrass beds of Lake Macquarie, NSW.



Kingdom: Animalia

Phylum: Mollusca

Class: Bivalvia

Order: Pteriida

Family: Pinnidae

Genus: *Pinna*

Species: *P. menkei*

Remarks: Bivalve mollusc characterised by thin, elongated, wedge-shaped and almost triangular shells with long, toothless edges. The genus is ancient, going back to the Carboniferous period.

9. Seagrass characteristics and fouling levels measured in surveys

The following plates show the various growth characteristics of the seagrass *Zostera capricorni* in regard to leaf length. In the study area, due to environmental factors, *Zostera capricorni* either had short leaf growth (**Plate 9.1**) or was long leaved (**Plate 9.4**). The plates also show the levels of fouling of seagrass beds by filamentous algae and other algal species. In this study, fouling is described as No (Level 1), Low (Level 2) or Heavy (Level 3) (**Plates 9.1- 9.6**).



Plate 9.1 Short leaved sea grass with level 1 fouling (no fouling).



Plate 9.2 Short leaved seagrass with level 2 fouling (low fouling).



Plate 9.3 Short leaved seagrass with level 3 fouling (heavy fouling)

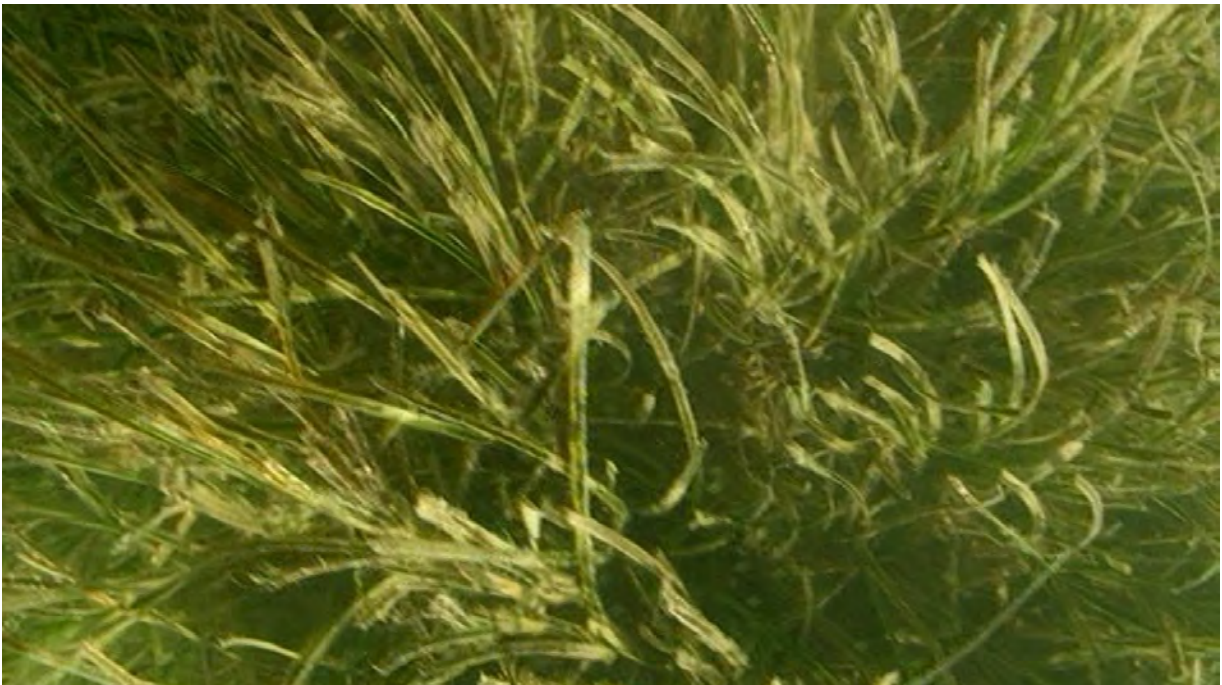


Plate 9.4 Long leaved seagrass with level 1 fouling (no fouling).



Plate 9.5 Long leaved seagrass with level 2 fouling (low fouling).

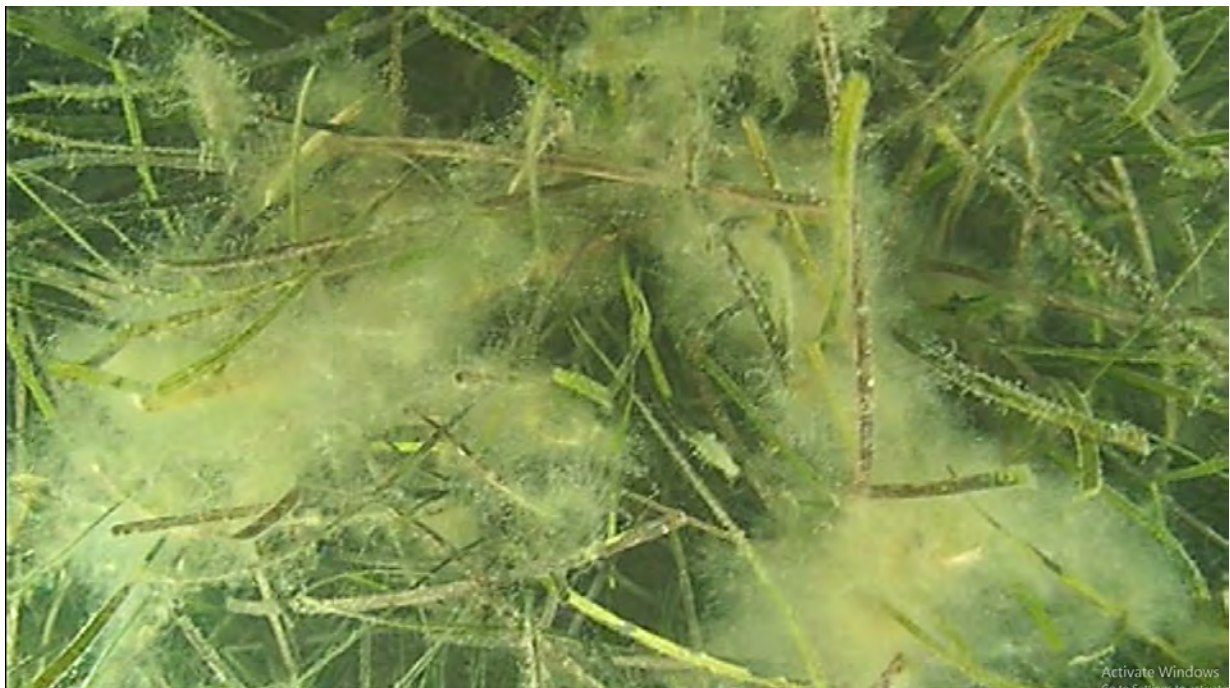


Plate 9.6 Long leaved seagrass with level 3 fouling (heavy fouling)

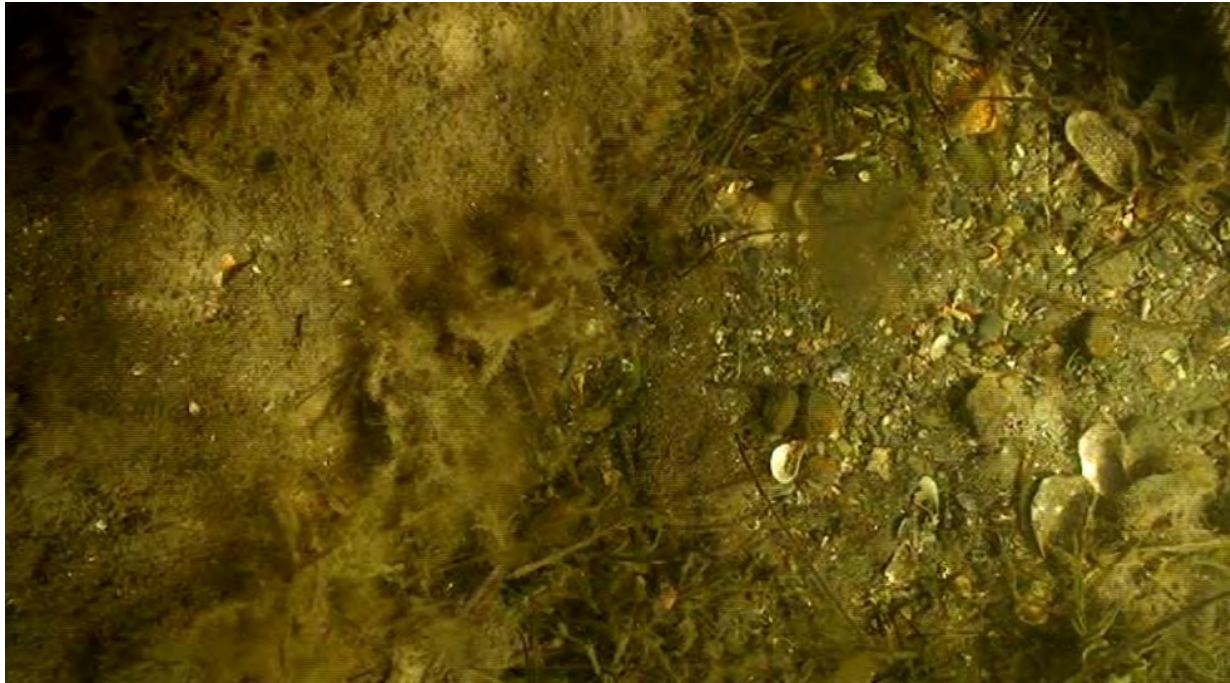


Plate 9.7 Algal mat and bareground.

10. Analysis of quadrats along permanent transects

Figures 10.1 to 10.6 show annual changes in the percentage cover of seagrass in the Chain Valley Bay, Summerland, Bardens Bay, Crangan Bay and Sugar Bay regions. In June 2019, seagrass cover at the transects ranged from 24.7 percent at transect S1 to 100 percent at transects C5 and F1 (**Table 10.1, Figures 10.6 and 10.3**). By June 2021, seagrass cover ranged from 91 percent at transect A3 to 100 percent at transects E5, E10-E12, T7, A4, C3, S3 and S4 (**Table 10.1**).

In June 2021, the condition of the seagrasses was fair, with most seagrasses lightly to heavily fouled with epiphytic algae (**Appendix 1**). Seagrass transects with particularly high levels of fouling included E4-E6, E9 and S1.

The brown seaweed *Cystophyllum onustum* (**Plate 8.1**) was observed at transects E2, E4, E6, T1, T6, C1, C5, F1, F2, S1, S5, S6 and L1. The bivalve mollusc *Pinna menkei* (**Plate 8.2**) was observed at transects C1-C4, C6, F2-F4, F6 and S6.

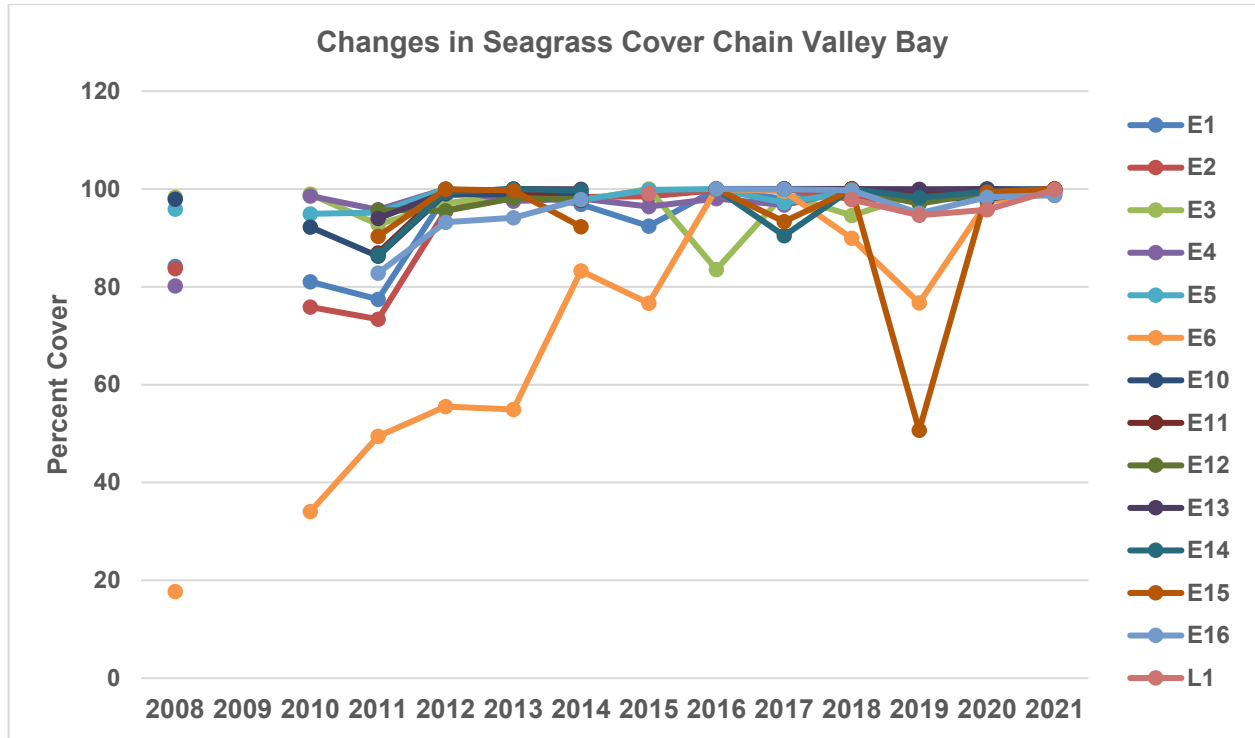


Figure 10.1 Changes in percent cover of seagrass in Chain Valley Bay (2008-2021)

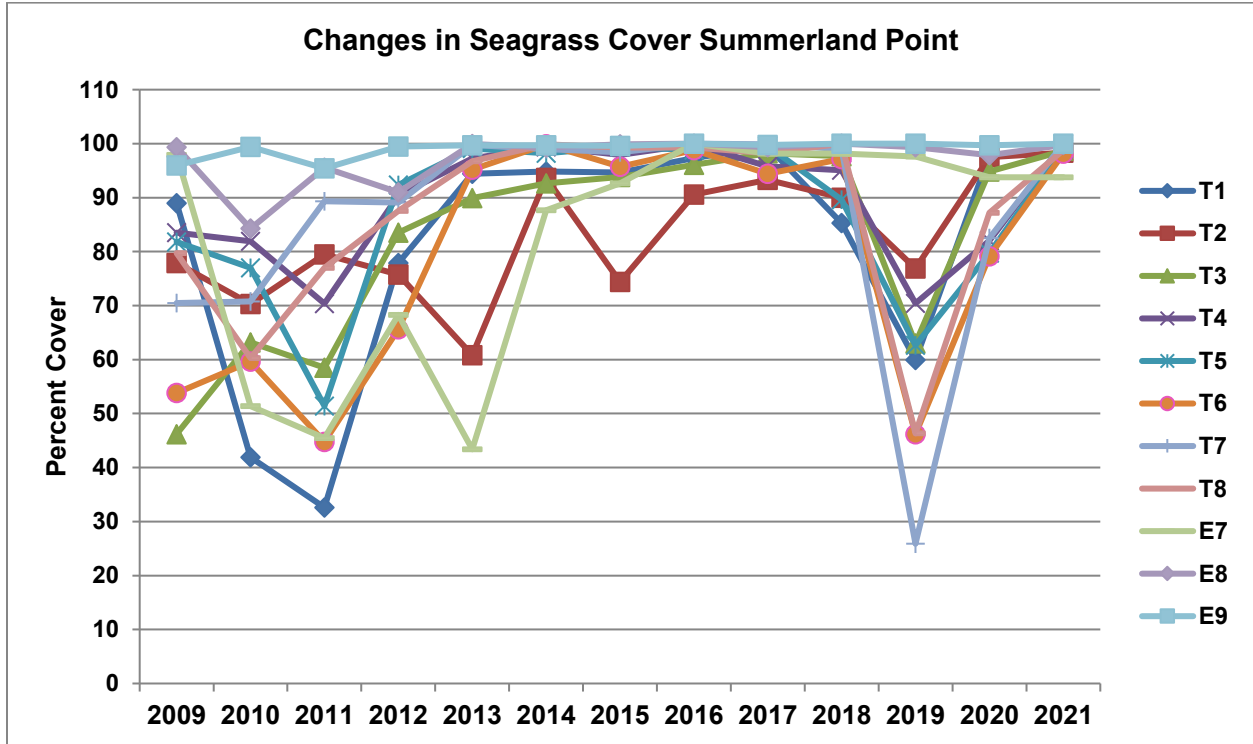


Figure 10.2 Changes in percent cover of seagrass along Summerland Point (2009-2021)

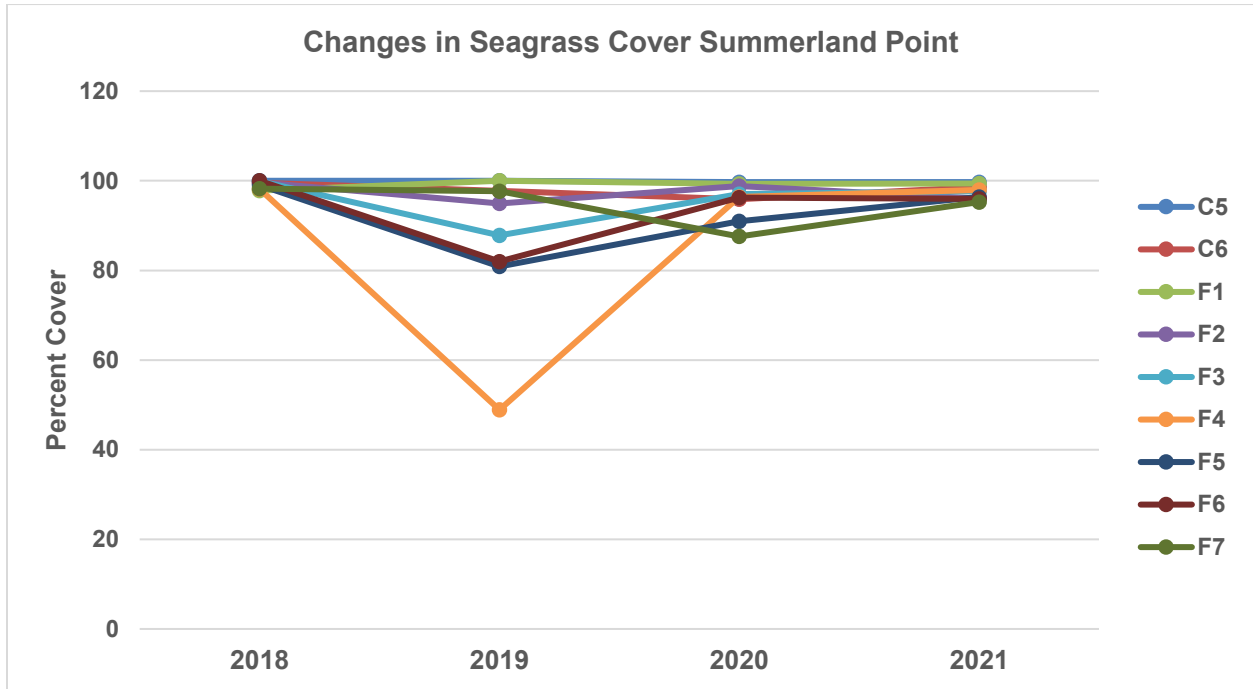


Figure 10.3 Changes in percent cover of seagrass along Frying Pan Bay Summerland Point (2018-2021)

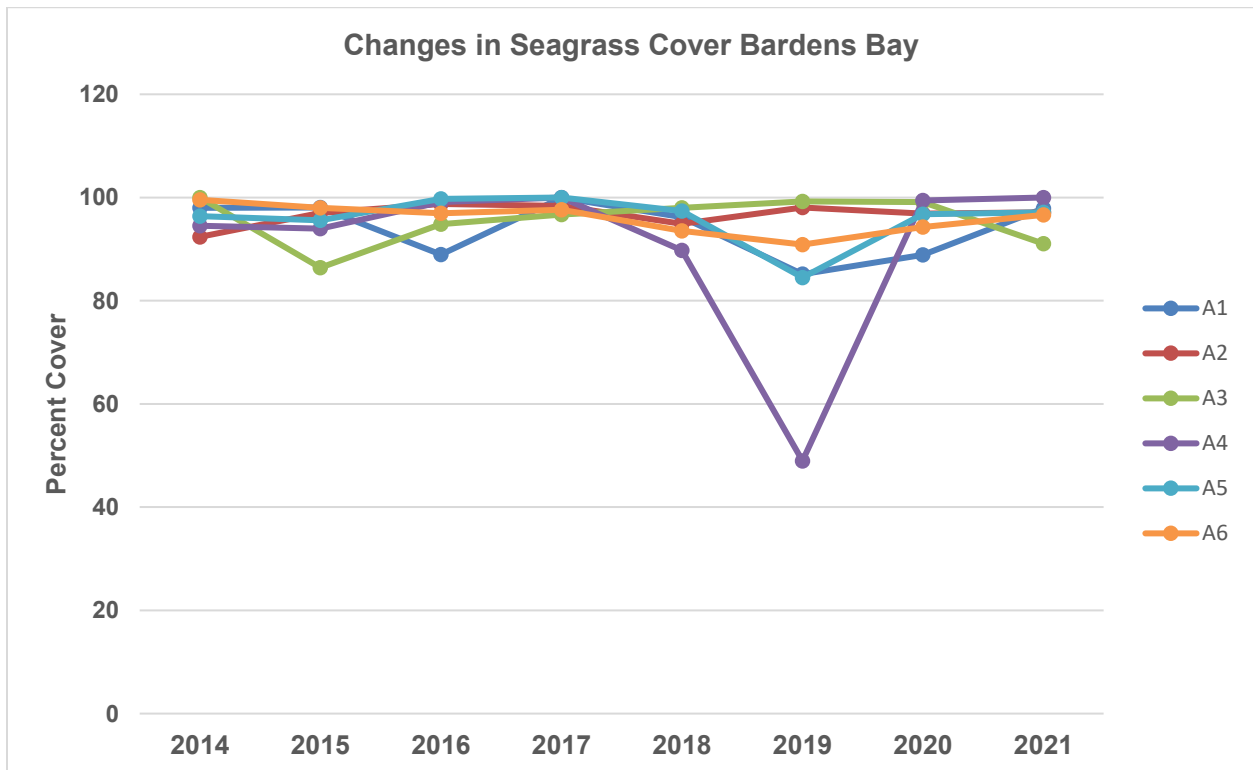


Figure 10.4 Changes in percent cover of seagrass in Bardens Bay (2014-2021)

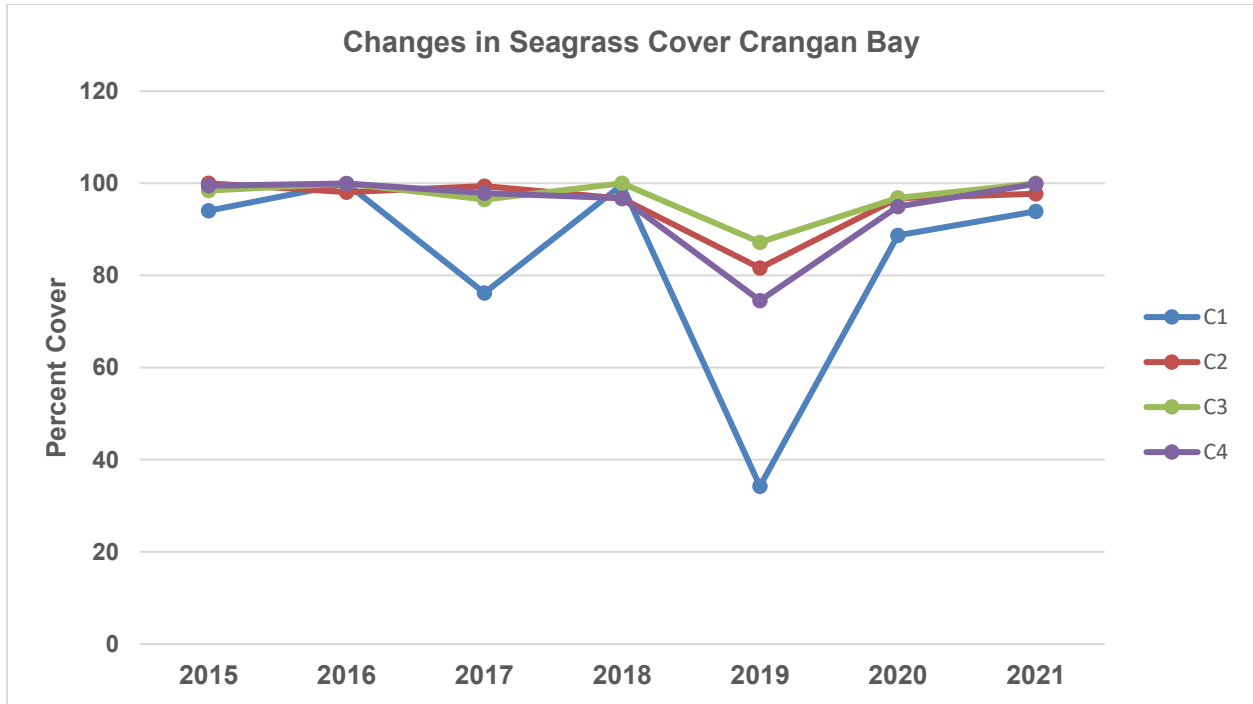


Figure 10.5 Changes in percent cover of seagrass in Crangan Bay (2015-2021)

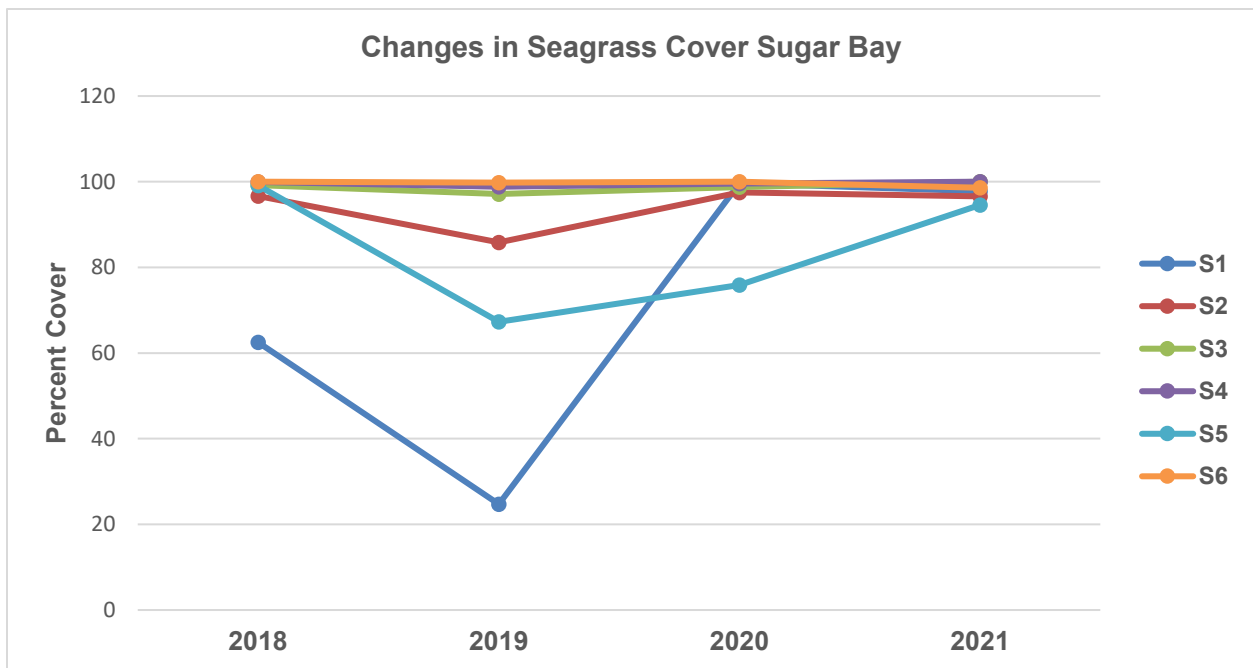


Figure 10.6 Changes in percent cover of seagrass in Sugar Bay (2018-2021)

Changes in the percentage area of the substratum covered by seagrasses in the study area in 2010 to 2021, compared with the 2008 values are shown in **Table 10.1**. The table shows that since 2008, seagrass coverage has been increasing throughout the study area, and percentage cover has been consistent since 2012. At transects where the percentage area of substratum covered was relatively low, such as Transects E6 (17.74%), T3 (46.20%) and T6 (53.82%), seagrass coverage has increased by about 82%, 52% and 44% respectively.

Table 10.1 Changes in percent cover of the substratum by seagrasses in Lake Macquarie (2008-2021)

Chain Valley Bay 2008 to 2020

Transect E1	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	84.15	81.01	77.75	98.62	99.44	92.44	99.88	97.96	97.87	99.12	99.04	99.34
% no seagrass	15.85	18.99	22.25	1.38	0.56	7.56	0.12	2.04	2.13	0.88	0.96	0.66
Transect E2	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	83.72	75.87	73.38	95.49	99.09	98.49	99.71	100.0	97.94	97.94	98.53	99.26
% no seagrass	16.28	24.13	26.62	4.49	0.91	1.51	0.29	0.00	2.06	2.06	1.47	0.37
Transect E3	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	98.29	98.97	92.76	96.97	99.16	100.0	83.53	98.90	94.56	98.97	100.0	99.93
% no seagrass	1.71	1.03	7.24	1.54	0.84	0.00	16.47	1.10	5.44	1.03	0.00	0.66
Transect E4	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	80.16	98.54	95.74	100.0	97.50	96.43	98.01	96.76	99.71	99.85	98.82	98.68
% no seagrass	19.84	1.46	4.26	0.00	2.50	3.57	1.99	3.24	0.29	0.15	1.18	0.88
Transect E5	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	95.88	94.93	95.19	100.0	98.82	99.82	100.0	97.22	99.41	98.97	100.0	100.0
% no seagrass	4.12	5.07	4.81	0.00	1.18	0.18	0.00	2.78	0.59	1.03	0.00	0.00
Transect E6	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	17.74	34.06	49.56	55.51	54.93	76.62	100.0	99.56	89.91	76.69	97.35	99.78
% no seagrass	82.16	65.94	50.44	44.49	45.07	23.38	0.00	0.44	10.09	23.31	2.65	0.00
Transect E7	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	97.93	51.40	45.47	68.31	43.38	92.65	100.0	98.16	98.16	97.65	93.75	93.75
% no seagrass	2.07	48.60	54.53	31.69	56.62	7.35	0.00	1.84	1.84	2.35	6.25	6.18
Transect E8	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	99.32	84.26	95.56	90.96	99.93	99.85	100.0	99.34	100.0	99.34	97.87	99.78
% no seagrass	0.68	15.74	4.44	9.04	0.07	0.15	0.00	0.66	0.00	0.66	2.13	0.00
Transect E9	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	95.94	99.39	95.51	99.49	99.71	99.56	100.0	99.78	100.0	100.0	99.71	100.0
% no seagrass	4.06	0.61	4.49	0.51	0.29	0.44	0.00	0.22	0.00	0.00	0.29	0.00
Transect E10	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	97.94	92.21	86.25	98.99	98.82	NS	100.0	100.0	100.0	98.21	97.94	100.0
% no seagrass	2.06	7.79	13.75	1.01	1.18		0.00	0.00	0.00	1.79	2.06	0.00
Transect E11	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			86.93	99.85	99.49	NS	100.0	100.0	100.0	98.94	99.63	100.0
% no seagrass			13.07	0.15	0.51		0.00	0.00	0.00	1.06	0.37	0.00

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

Transect E12	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			95.68	95.53	98.09	NS	100.0	100.0	100.0	97.0	99.26	100.0
% no seagrass			7.32	4.47	1.91		0.00	0.00	0.00	3.0	0.74	0.00
Transect E13	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			93.97	99.26	100.0	NS	100.0	100.0	100.0	99.95	100	99.71
% no seagrass			6.03	0.74	0.00		0.00	0.00	0.00	0.05	0.00	0.29
Transect E14	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			86.54	99.34	100.0	NS	100.0	90.44	100.0	98.24	99.41	99.78
% no seagrass			13.46	0.56	0.00		0.00	9.56	0.00	1.76	0.59	0.22
Transect E15	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			90.29	99.93	99.66	NS	100.0	93.31	99.85	50.66	99.34	100.0
% no seagrass			9.71	0.07	0.34		0.00	6.69	0.15	49.34	0.66	0.00
Transect E16	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass			82.79	93.22	94.12	NS	100.0	99.94	99.71	95.0	98.31	98.75
% no seagrass			17.21	6.78	5.88		0.00	0.06	0.29	5.0	1.69	1.25
Transect T1	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	88.94	41.90	32.60	77.91	94.41	94.65	97.35	99.47	85.29	59.92	97.87	90.96
% no seagrass	11.06	58.10	67.40	22.09	5.59	5.35	2.65	0.53	14.71	40.08	2.13	7.06
Transect T2	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	77.91	70.29	7.95	75.74	60.83	74.41	90.59	93.31	90.00	76.87	97.50	98.31
% no seagrass	22.09	29.71	92.05	24.26	39.17	25.59	9.41	6.69	10.00	23.13	2.5	1.32
Transect T3	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	46.20	63.16	58.53	83.53	89.93	93.82	96.10	98.19	97.57	63.01	94.85	98.68
% no seagrass	53.80	36.84	41.47	16.47	10.07	6.18	3.90	1.81	2.43	36.99	5.14	1.32
Transect T4	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	83.51	81.89	70.37	90.37	97.28	97.94	99.85	95.76	95.07	70.44	82.06	99.93
% no seagrass	16.49	18.01	29.63	9.63	2.72	2.06	0.15	4.24	4.93	29.56	17.94	0.07
Transect T5	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	81.78	77.00	51.40	92.35	99.12	99.41	98.82	99.56	89.63	62.65	79.71	98.97
% no seagrass	18.22	23.00	48.60	7.65	0.88	0.59	1.18	0.44	10.37	37.35	20.29	1.03
Transect T6	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	53.82	59.63	44.77	65.59	95.22	95.74	98.82	94.41	97.13	46.18	79.12	98.16
% no seagrass	46.18	40.37	53.23	34.41	4.78	4.26	1.18	5.59	2.87	53.82	20.88	1.84
Transect T7	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	97.93	70.79	89.34	89.09	99.78	98.38	100.0	99.85	98.97	25.88	82.50	100.0
% no seagrass	2.07	29.51	10.66	10.91	0.22	1.62	0.00	0.15	1.03	74.12	17.50	0.00
Transect T8	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	95.94	60.29	76.99	87.64	96.76	99.26	99.26	98.24	100.0	46.32	87.21	98.82
% no seagrass	4.06	39.71	23.01	13.26	3.24	0.74	0.74	1.76	0.00	53.68	12.79	1.18
Transect L1	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass						99.12	99.71	97.87	97.87	94.63	95.74	99.85
% no seagrass						0.88	0.29	2.13	2.13	5.37	4.26	0.00

Summerland Point 2018-2020

Transect C5	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								100.0	100.0	99.71	99.71	
% no seagrass								0.00	0.00	0.29	0.00	
Transect C6	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.56	97.76	95.88	98.60	
% no seagrass								0.44	2.24	4.11	1.25	
Transect F1	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								97.81	100.0	99.34	99.41	
% no seagrass								2.19	0.00	0.66	0.59	
Transect F2	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.63	94.93	98.82	96.03	
% no seagrass								0.37	5.07	1.18	2.13	
Transect F3	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.93	87.82	97.06	97.65	
% no seagrass								0.07	12.18	2.94	2.35	
Transect F4	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								98.16	48.90	96.40	97.94	
% no seagrass								1.84	51.1	3.60	2.06	
Transect F5	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.04	80.80	90.96	96.40	
% no seagrass								0.96	19.2	9.04	3.53	
Transect F6	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								100.0	81.99	96.25	95.96	
% no seagrass								10.00	18.01	3.75	3.97	
Transect F7	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								98.24	97.65	87.57	95.22	
% no seagrass								1.76	2.35	12.43	4.78	

Bardens Bay 2014 to 2020

Transect A1	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass				97.97	98.09	88.97	99.85	96.18	85.15	88.88	97.87	
% no seagrass				2.03	1.91	11.03	0.15	3.82	14.85	11.10	1.91	
Transect A2	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass				92.38	96.99	98.75	98.38	94.93	98.09	96.91	97.13	
% no seagrass				7.62	3.01	1.25	1.62	5.07	1.91	3.09	2.28	
Transect A3	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass				100.0	86.40	94.85	96.69	98.01	99.26	99.12	91.03	
% no seagrass				0.00	13.60	5.15	3.31	1.99	0.74	0.88	8.97	
Transect A4	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass				94.51	93.97	99.12	100.0	89.78	48.98	99.41	100.0	
% no seagrass				5.49	6.03	0.88	0.00	10.22	51.02	0.59	0.00	
Transect A5	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

% seagrass				96.37	95.59	99.71	100.0	97.35	84.50	96.76	97.13	
% no seagrass				3.63	4.41	0.29	0.00	2.65	15.50	3.24	2.87	
Transect A6	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass				99.56	98.01	96.97	97.65	93.53	90.88	94.26	96.62	
% no seagrass				0.44	1.99	3.03	2.35	6.47	9.12	5.74	3.38	

Crangan Bay 2008 to 2020

Transect C1	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	48.60	80.53	68.71	85.38	99.31	94.04	99.94	76.18	99.68	34.26	88.68	93.90
% no seagrass	51.40	19.47	31.29	14.62	0.69	5.96	0.06	23.82	0.32	65.74	11.32	3.90
Transect C2	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	93.09	98.03	67.79	95.21	97.24	100.0	98.09	99.40	96.69	81.62	96.76	97.72
% no seagrass	6.91	1.97	32.21	4.79	2.76	0.00	1.91	0.60	3.31	18.38	3.24	1.25
Transect C3	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	95.59	88.75	94.41	97.16	99.93	98.46	99.90	96.47	100.0	87.21	96.84	100.0
% no seagrass	4.41	11.25	5.59	2.84	0.07	1.54	0.10	3.53	0.00	12.79	3.16	0.00
Transect C4	2008	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021
% seagrass	87.25	86.56	58.09	90.40	100.0	99.49	99.96	96.47	96.76	74.56	94.93	99.85
% no seagrass	12.75	13.44	41.91	9.60	0.00	0.51	0.04	3.53	3.24	25.44	5.07	0.15

Sugar Bay Brightwaters 2018 to 2020

Transect S1	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								62.50	24.71	99.63	97.79	
% no seagrass								37.50	75.29	0.37	0.74	
Transect S2	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								96.62	85.83	97.50	96.54	
% no seagrass								3.38	14.17	2.50	3.46	
Transect S3	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.19	97.13	98.75	100.0	
% no seagrass								0.81	2.87	1.25	0.00	
Transect S4	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.97	98.82	99.56	100.0	
% no seagrass								0.03	1.18	0.44	0.00	
Transect S5	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								99.12	67.08	75.88	94.56	
% no seagrass								0.88	32.92	24.11	5.37	
Transect S6	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
% seagrass								100.0	99.78	100.0	98.57	
% no seagrass								0.00	0.22	0.00	1.32	

Table 10.2 shows the average composition, percent cover and condition of seagrass beds in the four regions of Lake Macquarie under investigation for the years 2011 to 2021. It shows that the

growth form of *Zostera capricorni* in the Summerland Point, Frying Pan Bay and Sugar Bay region and the Crangan Bay region is predominantly short leaved. Alternatively, the growth form of *Z. capricorni* in Chain Valley Bay and Bardens Bay is long leaved.

Table 10.2 Average composition, % cover and condition of seagrass beds in the four regions of Lake Macquarie under investigation for the years 2011 to 2021.

Year	Total SG	% long	% short	% long 1	% long 2	% short 1	% short 2	algae	bare gr.
Summerland Point, Frying Pan Bay and Sugar Bay									
2011	61.74	9.88	51.86	9.98	0.00	51.86	0.00	0.27	38.13
2012	82.18	38.03	44.15	38.03	0.00	44.15	0.00	0.00	17.85
2013	90.92	25.19	65.88	25.03	0.32	64.92	0.80	0.82	8.26
2014	96.74	19.73	80.27	19.93	0.00	80.27	0.00	0.00	3.26
2015	95.06	17.31	69.33	17.31	0.00	77.75	0.00	0.00	4.93
2016	98.15	20.82	77.64	28.32	0.00	77.66	0.00	0.00	1.30
2017	97.92	17.05	80.63	14.61	2.50	65.14	15.63	0.24	1.35
2018	96.22	28.00	66.03	25.44	5.36	67.00	0.91	1.31	2.28
2019	77.37	32.99	40.16	36.46	0.00	44.00	0.00	2.11	20.51
2020	93.29	35.89	57.40	33.99	1.67	56.91	0.49	0.03	6.64
2021	97.76	48.55	48.14	17.35	26.98	11.33	33.43	0.52	2.00
Chain Valley Bay									
2011	85.44	41.75	43.68	40.28	1.47	43.68	0.00	0.99	13.32
2012	95.26	89.97	5.28	89.97	0.00	5.28	0.00	2.89	1.92
2013	95.63	62.25	35.84	55.83	1.06	35.84	0.00	0.25	4.00
2014	96.57	34.15	65.85	34.14	0.64	65.85	0.00	0.69	2.74
2015	94.70	70.26	18.80	58.28	11.97	24.45	0.00	1.02	5.06
2016	98.65	74.52	27.13	71.30	0.00	27.13	0.00	1.20	0.15
2017	97.63	52.60	42.79	36.35	18.19	49.82	0.11	0.60	1.62
2018	98.46	72.25	25.48	66.32	5.88	23.48	1.79	0.83	0.71
2019	93.15	84.48	8.64	84.48	0.00	15.66	0.00	0.39	6.72
2020	98.82	94.53	4.29	91.70	2.84	4.29	0.00	0.21	0.92
2021	99.65	95.35	4.30	2.84	74.63	0.21	2.51	0.00	0.26
Crangan Bay									
2011	72.52	28.47	44.05	28.47	0.00	43.31	0.74	0.87	26.98
2012	92.38	0.00	92.38	0.00	0.00	92.38	0.00	0.01	7.99
2013	98.82	13.79	85.52	10.84	2.96	85.52	0.00	0.02	1.02
2014	97.94	23.23	76.77	23.23	0.00	76.77	0.00	0.06	2.02
2015	98.00	23.53	74.47	23.53	0.00	74.47	0.00	0.00	2.01
2016	99.47	15.90	83.30	6.99	9.18	55.37	27.93	0.13	0.49
2017	92.48	16.73	75.75	15.99	3.20	74.71	1.05	0.02	7.57
2018	98.28	46.25	52.03	5.48	89.13	49.09	2.94	0.01	1.74
2019	69.39	39.56	29.95	39.56	0.00	29.95	0.00	0.00	30.40
2020	94.30	25.40	68.90	25.40	0.70	59.12	7.06	0.57	4.01
2021	97.87	67.28	30.59	16.54	50.74	20.66	9.93	0.00	1.32
Bardens Bay									
2014	96.87	54.20	45.80	54.20	0.00	45.80	0.00	1.20	2.03
2015	94.84	68.18	26.67	68.18	0.00	26.67	0.00	0.00	2.92
2016	96.40	63.48	33.01	63.98	0.00	33.01	0.00	0.00	3.61
2017	98.78	76.02	22.75	51.51	24.51	20.59	3.78	0.03	1.23
2018	94.96	55.58	39.39	38.78	16.80	37.67	2.45	2.19	2.68
2019	84.48	73.08	6.40	73.03	11.40	11.40	0.00	0.00	15.52
2020	95.89	81.08	16.04	63.26	1.69	14.60	0.22	0.00	4.11
2021	96.63	96.63	0.00	12.41	78.48	0.00	0.00	3.79	3.24

Table 10.2 also shows in greater detail the increase in percent cover of seagrasses, with bare ground decreasing from 38.13 percent in 2011 to 2 percent in 2021 in the Summerland Point, Frying Pan Bay and Sugar Bay region. In the Chain Valley Bay region, bare ground decreased from 13.32 percent in 2011 to 0.26 percent in 2021. In the Crangan Bay region, bare ground decreased from 26.98 percent in 2011 to 1.32 percent in 2021. Seagrass cover in Bardens Bay has mostly been around 95 percent since 2014.

Plate 10.1 shows sand deposited on seagrasses along Summerland Point after strong onshore winds in June 2011. This event demonstrated how climatic conditions can affect seagrass coverage. It also shows how the movement of sand from deeper waters due to strong winds can increase water depth in some areas whilst decreasing water depth closer to shore as sediment is deposited.

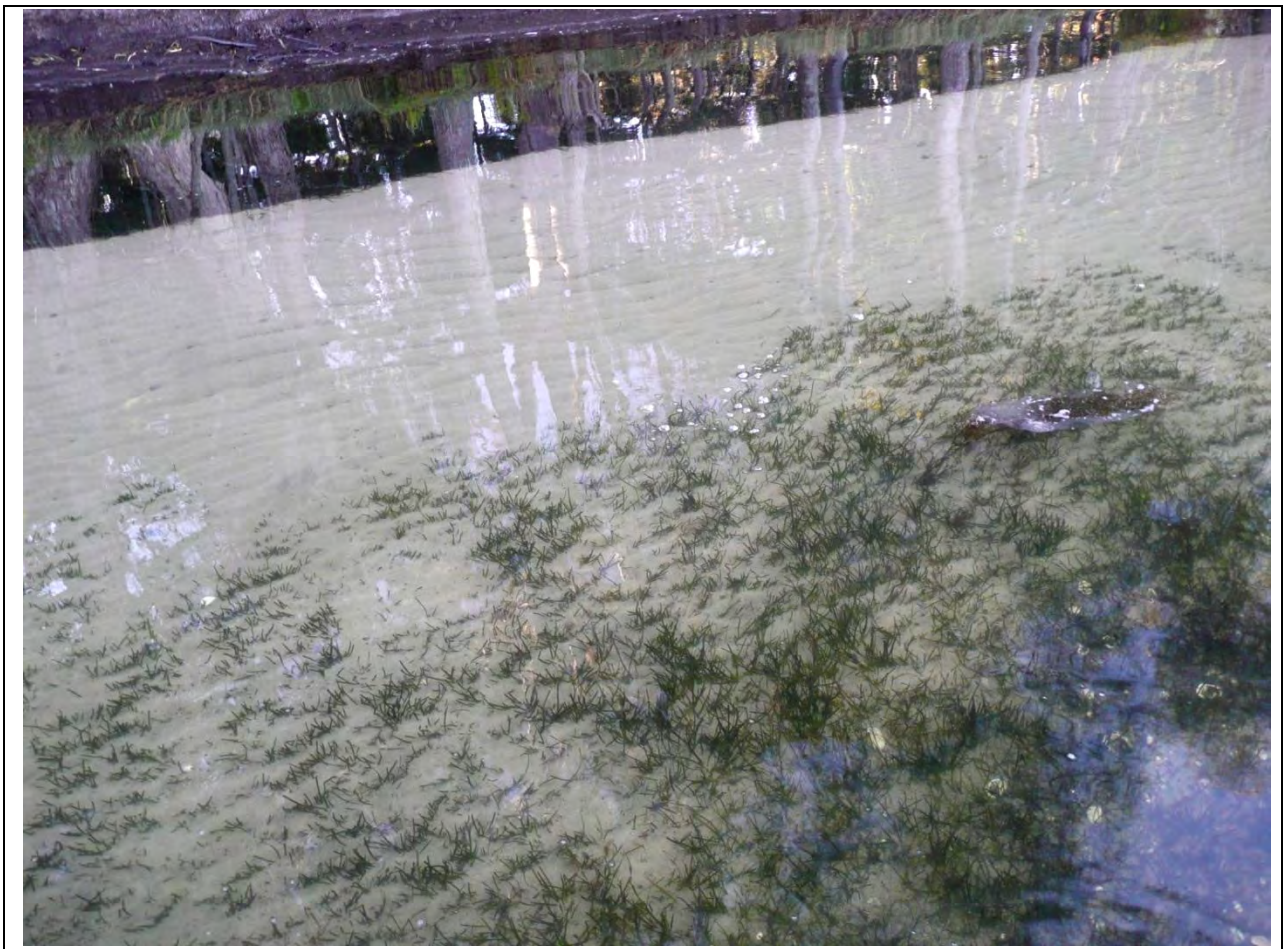


Plate 10.1 *Zostera capricorni* covered by sand along Summerland Point after strong southwesterly winds in 2011.

11. Extent of Coal Mining

Figure 11.1 shows the extent of mining up to June 2021. Mining of the Fassifern seam is currently underway in the Brightwaters and Summerland Point regions. Mining ceased in the Chain Valley Bay region on 24 December 2017.

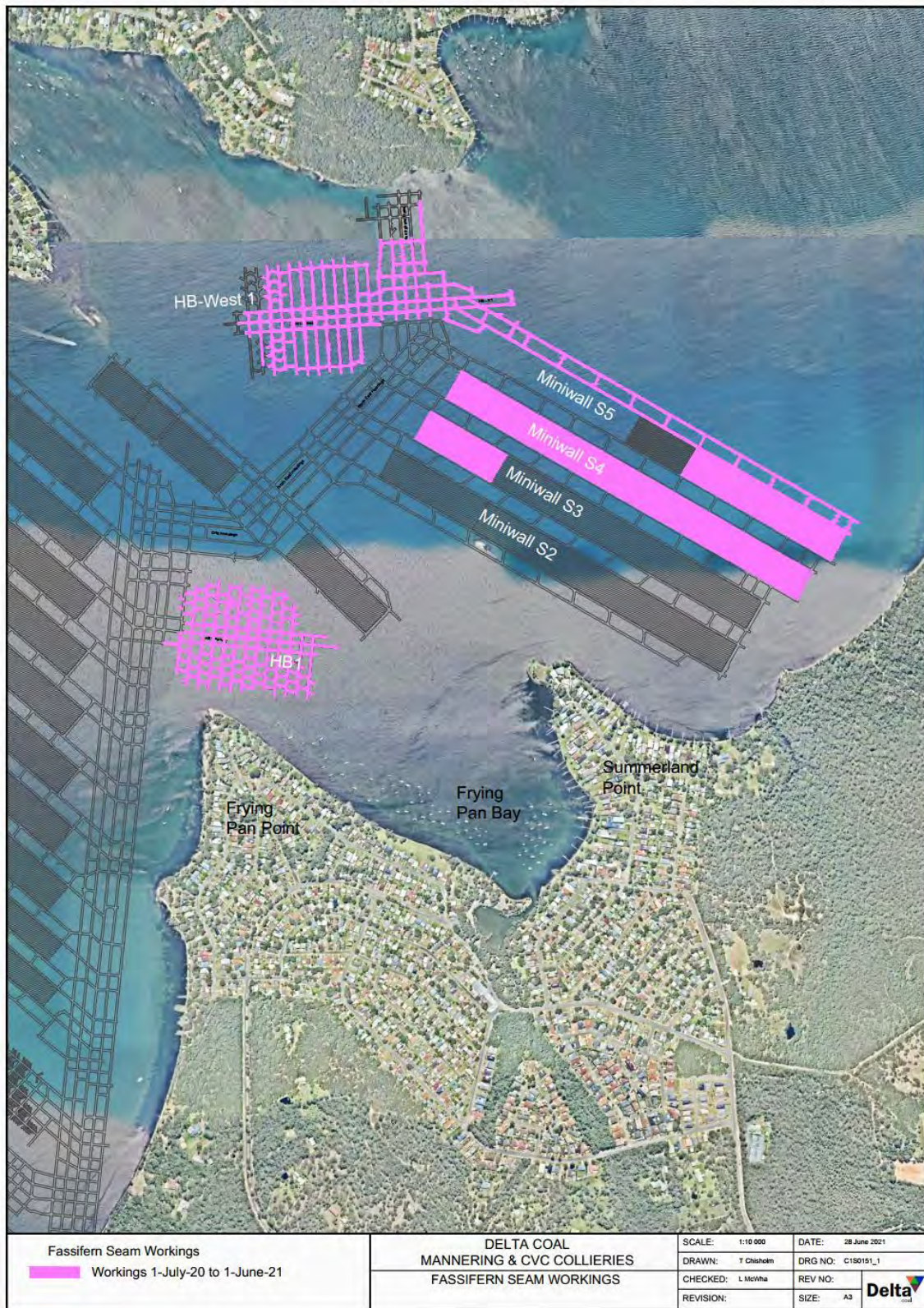


Figure 11.1 Extent of Fassifern Seam Workings from July 2020 – June 2021 (pink)

12. Seagrass Management Plan

The mine, in conjunction with the relevant stake holders, has developed a Seagrass Management Plan. While the colliery is not mining beneath the seagrass beds, the purpose of the plan is to monitor any changes and identify if subsidence is the cause.

Elements of the plan require:

- That the July 2008 survey is to act as a baseline of seagrass distribution, density and condition. Since this time new seagrass transects have been added to the sampling schedule (now 50 transects in 2018-2021).
- Annual re-surveys of the permanent transect lines will be carried out.
- If, during the annual re-surveys, either:
 - Subsidence along the seagrass permanent transects greater than 150mm is detected, or
 - There are reductions in seagrass cover of 20% or more (compared to 2008 values),

then Mine Management will notify the relevant stakeholders of the event and convene a meeting to discuss the implications.

13. Discussion

In June 2021 the seagrasses in the study area were lightly to moderately fouled with epiphytic algae. Seagrass cover along the transects ranged from 91% to 100% of the substratum. Since 2011 seagrass cover has increased progressively. This annual increase in seagrass cover was treated with some suspicion until it was realized that almost all of the beaches in the study area were used by commercial fishermen as net landing grounds. Nets up the 2-3 km in length were drawn across the lake and hauled up on beaches to extract and sort the various fish species. This fishing effort caused minor damage to seagrass beds over the 150 years of commercial fishing in Lake Macquarie. Netting was stopped eventually and the minor damage to seagrass beds began to recover. This recovery process took place over the period of this study and is almost complete in most areas.

In June 2021, two seabed elevations had changed by more than 150mm from the initial seabed heights recorded. These were E9 outer and E16 inner. These transects are in the Chain Valley Bay region where no mining has occurred since 24 December 2017. Seagrass coverage at these transects were 100% and 98.75% respectively.

The results from the June 2021 seagrass monitoring programme show compliance to the Schedule 4 Environmental Conditions - underground mining of SSD5465 - Modification 3 in the Performance Measures table with respect to the Subsidence Impact Performance Measure for Natural Environment Biodiversity - Seagrass which display nil to minor environmental consequences due to underground mining.

The below summary of findings outline the historical basis for this compliance statement and the compliance is detailed in the table below.

Condition from SSD5465 - Mod 3	Compliance Status and Comments
Schedule 4 Environmental Conditions - underground mining Performance Measures - Natural Environment Biodiversity - Benthic Communities.	Compliant - See section 16 - Conclusions
Subsidence Impact Performance Measure - Minor environmental consequences, including minor changes composition and/or distribution.	
Measurements undertaken by generally accepted methods.	Compliant - See section 4 and 5
Measurements Methods fully described.	Compliant - See section 4 and 5

14. References

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Mr Stewart Ambridge	Delta Coal
Mr Samuel Booth	Daly.Smith Pty. Ltd., Surveyors.

Chain Valley Bay

ng=1 Fou

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Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	90	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	90	0	0	0
1	2	100	0	0	0
1	2	95	5	0	0
1	2	100	0	0	0
1	2	90	10	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	95	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	95	5	0	0
1	2	100	0	0	0
1	2	100	0	0	0
1	2	100	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect E3

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Transect E4

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	85	0	0	0	15
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	5	0	0	0
1	2	95	5	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	5	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

[illegible]

1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0

Transect E6

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0

1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0

Transect E10

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect E12

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0

Transect E13

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

[illegible]

Transect E14

[illegible]

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect E16

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	90	0	0	0	10

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1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10

Transect L1

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	5	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Bardens Bay

Transect A1

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	90	0	0	0	10
1	1	90	0	5	0	5
1	1	100	0	0	0	0
1	1	100	0	5	0	0
1	1	100	0	25	0	0
1	1	100	0	5	0	0
1	1	100	0	10	0	0
1	1	100	0	5	0	0
1	1	100	0	10	0	0
1	1	100	0	10	0	0
1	1	100	0	5	0	0
1	1	100	0	15	0	0
1	1	100	0	40	0	0
1	1	100	0	25	0	0
1	1	100	0	15	0	0
1	1	100	0	15	0	0
1	1	100	0	5	0	0
1	1	100	0	5	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	5	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	5	0	0
1	2	100	0	0	0	0
1	2	100	0	10	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	10	0	0
1	2	100	0	0	0	0
1	2	100	0	15	0	0
1	2	100	0	0	0	0
1	2	100	0	10	0	0
1	2	100	0	5	0	0
1	2	100	0	30	0	0
1	2	100	0	35	0	0
1	2	100	0	25	0	0
1	2	100	0	15	0	0
1	2	100	0	15	0	0
1	2	100	0	20	0	0
1	2	100	0	10	0	0
1	2	100	0	10	0	0
1	2	50	0	0	0	50
1	2	65	0	0	0	35
1	2	100	0	25	0	0
1	2	100	0	0	0	0
1	2	100	0	10	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	10	0	0
1	2	100	0	0	0	0
1	2	100	0	5	0	0
1	2	95	0	5	0	5
1	2	100	0	5	0	0
1	2	100	0	15	0	0
1	2	100	0	5	0	0
1	2	100	0	0	1	0
1	2	100	0	0	0	0
1	2	90	0	5	0	5
1	2	100	0	20	0	0
1	2	100	0	0	0	0
1	2	85	0	0	0	15
1	2	100	0	0	0	0
1	2	95	0	5	0	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Transect A2

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

1	1	85	0	0	0	15
1	2	100	0	10	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	90	0	10	0	10
1	2	80	0	5	0	20
1	2	100	0	15	0	0
1	2	100	0	0	0	0
1	2	100	0	5	0	0
1	2	100	0	0	0	0
1	2	100	0	20	0	0
1	2	90	0	5	0	10
1	2	100	0	0	0	0
1	2	85	0	5	0	10
1	2	100	0	10	0	0
1	2	100	0	10	0	0
1	2	100	0	20	0	0
1	2	100	0	25	0	0
1	2	85	0	0	0	15
1	2	100	0	5	0	0
1	2	95	0	10	0	5
1	2	95	0	5	0	5
1	2	100	0	0	0	0
1	2	90	0	5	0	5
1	2	100	0	10	0	0
1	2	100	0	5	0	0
1	2	90	0	5	0	5
1	2	90	0	5	0	5
1	2	100	0	5	0	0
1	2	100	0	5	0	0
1	2	100	0	10	0	0
1	2	100	0	0	0	0
1	2	100	0	5	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	10	0	5
1	2	100	0	30	0	0
1	2	100	0	20	0	0
1	2	100	0	5	0	0
1	2	100	0	15	0	0
1	2	95	0	5	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	5	0	0
1	3	100	0	10	0	0
1	3	75	0	20	0	5
1	3	100	0	50	0	0
1	3	100	0	15	0	0
1	3	100	0	15	0	0
1	3	100	0	75	0	0
1	3	90	0	25	0	10
1	3	100	0	20	0	0
1	3	100	0	15	0	0
1	3	100	0	30	0	0
1	3	100	0	15	0	0
1	3	85	0	45	0	15
1	3	100	0	30	0	0
1	3	100	0	20	0	0
1	3	100	0	25	0	0
1	3	100	0	30	0	0
1	3	100	0	75	0	0
1	3	100	0	20	0	0
1	3	100	0	35	0	0
1	3	90	0	15	0	10
1	3	100	0	20	0	0
1	3	100	0	50	0	0
1	3	100	0	30	0	0
1	3	100	0	25	0	0

Transect A3

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
0	0	0	0	0	0	100
0	0	0	0	0	0	100
1	1	30	0	0	0	70
1	1	80	0	0	0	20
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	50	0	0	0	50
1	2	80	0	0	0	20
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	20	0	0	0	80
1	2	50	0	0	0	50
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	70	0	0	0	30
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect A4

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect A6

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	90	0	0	0	10

[illegible]

1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Crangan Bay

Transect C1

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
0	0	0	0	0	0	100
0	0	0	0	0	0	100
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	100	0	0	1	0
1	2	50	0	0	1	0
1	2	80	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	1	0
1	2	90	0	0	0	0
1	2	50	50	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	80	20	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	90	0	0	0	10
2	1	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect C2

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect C4

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	1	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	2	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Summerland Point, Frying Pan Bay, Sugar Bay

Transect C5

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	10	0	0	0

[illegible]

Transect C6

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	3	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	75	0	0	0	25
2	2	85	0	15	0	15
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	1	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	95	0	0	0	5

Transect F1

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	1	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	5	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	5	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	10	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	10	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	10	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect F2

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	2	90	0	0	0	10
1	2	95	0	0	0	5
1	2	65	0	0	1	35
1	2	85	0	0	0	15
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	80	0	0	0	20
1	2	95	0	0	0	5
1	2	95	0	0	1	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	5	0	0	0
2	1	95	5	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	5	0	0	0
2	1	90	10	0	0	0
2	1	85	15	0	0	0
2	1	95	5	0	0	0
2	1	85	15	0	0	0
2	1	50	50	0	0	0
2	1	100	0	0	0	0
2	1	95	5	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	1	0
2	2	100	0	0	0	0
2	2	90	10	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Transect F3

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	80	0	0	0	20
1	1	80	0	0	0	20
1	1	85	0	0	0	15
1	1	90	0	0	0	10
1	1	80	0	0	0	20
1	1	90	0	0	0	10
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	1	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
Transect F4						
Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	2	75	0	0	0	25
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	90	0	0	0	10
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	1	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	2	85	0	0	0	15
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	90	0	0	0	10

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	90	0	0	0	10

Transect F5

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	85	0	0	0	15
2	1	85	0	0	0	10
2	1	90	0	0	0	10
2	1	80	0	0	0	20
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	5	0	0	5

Transect F6

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	1	5
2	1	90	0	0	0	5
2	1	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5

2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	90	0	0	0	10
2	2	85	0	0	0	15
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5

Transect F7

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	85	0	0	0	15
1	1	90	0	0	0	10
1	1	85	0	0	0	15
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	90	0	0	0	10
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	85	0	0	0	15

Transect S1

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	10	0	0	0
1	2	100	0	0	0	0
1	2	95	0	10	0	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	3	100	10	0	0	0
1	3	100	0	60	0	0
1	3	100	0	60	0	0
1	3	100	0	70	0	0
1	3	90	10	25	0	0
1	3	100	0	35	0	0
1	3	100	0	60	0	0
1	3	100	0	50	0	0
1	3	100	0	30	0	0
1	3	100	0	25	0	0
1	3	65	0	15	0	20
1	3	100	0	15	0	0
1	3	100	0	85	0	0
1	3	100	0	50	0	0
1	3	95	0	10	0	5
1	3	95	0	5	0	5
1	3	95	0	5	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	3	100	0	15	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	95	0	0	0	5
1	3	100	0	2	0	0
1	3	30	0	80	0	0
1	3	100	0	2	0	0
1	3	100	0	2	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	95	0	5	0	0
1	3	100	0	0	0	0
1	3	100	0	80	0	0
1	3	100	0	30	0	0
1	3	100	0	15	0	0
1	3	100	0	15	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0

Transect S2

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	3	100	0	0	0	0

Transect S3

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect S5

107

1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	85	0	0	0	15
1	1	90	0	0	0	10
1	1	85	0	0	0	15
1	1	75	0	0	0	25
1	1	85	0	0	0	15
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	90	0	0	0	10
1	1	90	5	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	85	0	0	0	15
1	1	85	0	0	0	15
1	1	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0

Transect S6

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	1	100	0	0	0	0
1	1	85	0	0	0	15
1	1	85	0	0	0	15
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	100	0	1	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	90	0	0	0	10
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0

Transect E7

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	1	90	0	0	0	10
2	1	80	0	0	0	20
2	1	80	0	0	0	20
2	1	70	0	0	0	30
2	1	80	0	0	0	20
2	1	80	0	0	0	20
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	80	0	0	0	20
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	100	0	0	0	0
2	1	90	0	0	0	10
2	1	85	0	0	0	15
2	1	80	0	0	0	20
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	90	0	0	0	10
2	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	90	0	0	0	10
2	1	95	0	0	0	5
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	5	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0

Transect E8

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect E9

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0

Transect T1

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
0	0	0	0	0	0	0
0	0	0	0	0	0	100
1	1	90	0	0	0	10
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	90	0	0	0	10
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	95	0	0	0	5
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	5	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	95	0	0	0	5
1	2	100	0	0	0	0
1	2	80	0	0	0	20
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	80	0	0	0	20
1	2	95	0	0	0	5
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	85	0	0	0	15
1	2	95	0	0	0	5
1	2	75	5	0	0	20
1	2	65	5	0	0	30
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	90	0	0	0	10
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	95	0	0	0	5
1	2	100	0	0	0	0
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	90	5	0	0	5
1	2	80	0	0	0	20
1	2	100	0	0	0	0
1	2	95	0	0	0	5
2	2	80	0	0	0	20
2	2	80	15	0	0	5
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	75	0	0	0	25
2	2	90	0	0	0	10
Transect T2						
Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	95	0	0	0	5
1	2	90	0	0	0	10
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	90	0	0	0	10
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	50	0	0	0	50
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Transect T3

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
2	1	100	0	0	0	0
2	1	95	0	0	0	5
2	1	95	0	5	0	5
2	1	100	0	0	0	0
2	1	100	0	0	0	0
2	1	100	0	0	0	0

[illegible]

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	3	100	0	0	0	0

Transect T4

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
1	3	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

[illegible]

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

[illegible]

Transect T5

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	1	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	85	0	0	0	15
2	3	90	0	0	0	10
2	3	100	0	0	0	0
2	3	100	0	0	0	0
2	3	100	0	0	0	0

Transect T6

Long=1	Fouling	Zostera	Cystophyllum	% algae	Pinna	% Bare
Short=2	1,2,3	% cover	% cover	filamentous	Number	Ground

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	90	0	0	0	10
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	90	10	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0

Transect T7

Long=1 Short=2	Fouling 1,2,3	Zostera % cover	Cystophyllum % cover	% algae filamentous	Pinna Number	% Bare Ground
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0
1	2	100	0	0	0	0

[illegible]

Transect T8

128

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	90	0	0	0	10
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5
2	2	95	0	0	0	5
2	2	100	0	0	0	0
2	2	100	0	0	0	0
2	2	95	0	0	0	5

Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay (2021)

2	2	95	0	0	0	5
2	2	100	0	0	0	0

Appendix 4: Benthic Communities Monitoring Report (September 2021)

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		1	Environmental Compliance Coordinator	Page 100 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

Delta Coal
Mannering & CVC Collieries

Lake Macquarie Benthos Survey

Results No. 20



By Dr Emma Laxton

September 2021

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Summary of survey findings

In September 2021, 22 benthic stations were sampled. The following is a history of benthos sampling from 2014 to 2021:

- By March 2014, mining beneath Lake Macquarie had proceeded so that two Reference stations (R) had been re-designated Impact Stations (IM), namely:

R3 became IM5

R4 became IM6.

- By September 2014, Station R5 had become the impact station IM7.
- In March 2016 two more stations were added to the sampling schedule. They were:

C5 GR 367701 6334310

R7 GR 366232 6333856.

- In September 2016, difficult geology beneath Bardens Bay and along parts of Summerland Point led Lake Coal to begin mining beneath Chain Valley Bay. To accommodate this change in mining direction, three additional benthos sampling stations were added. They were C6, R8 and R9.

C6 GR 363988 6332492

R8 GR 364523 6332010

R9 GR 365258 6331210

- The total number of Stations sampled in September 2017 was 19.
- In March 2018, three new stations were added to the sampling programme. They were:

C7 GR 366276 6334947

R10 GR 365172 6334706

R11 GR 367072 6333639

- The mud basin off Summerland Point, in Chain Valley Bay and Bardens Bay, was found to be inhabited by 27 species of organisms greater than 1mm in size. This list was derived from the 20 samplings undertaken between February 2012 and September 2021. Polychaete worms and bivalve molluscs were the most frequently encountered animals.
- Bottom sediment in the study area was composed of fine black mud with varying proportions of black sand and shell fragments.

Water levels in Lake Macquarie can vary by as much as 1.3m over the course of a year due to combinations of the following phenomena:

- Diurnal tidal changes (around 0.05m)
- Changes in atmospheric pressure (up to 0.4m)
- Wave set up at the entrance to Lake Macquarie
- Inflow of water from the catchment during major rainfall events.

Light attenuation through the water column of Lake Macquarie, measured off Wyee Point, between 1983 and 1985, showed that only 14% of the photosynthetically active radiation (PAR) reached the lakebed at 2m depth (the growth limit of seagrasses and macroscopic algae in the Delta Coal study area). At 6m depth, between 2% and 4% of the surface PAR reached the lakebed, not enough light to support the growth of seagrasses or benthic algae.

The 20 samplings of the benthos undertaken at six monthly intervals between February 2012 and September 2021 revealed the following:

- The same suite of organisms dominated each of the 22 sample stations. These were polychaete worms and bivalves.
- Stations were distinguished by the relative abundance of the dominant species.
- Water depth was not in any way important in determining the species composition at a station.
- Physical variables such as salinity, conductivity and turbidity of the bottom water had little influence on the species composition of the benthos. Dissolved oxygen concentration, however, can have a major effect on abundance. Major extinction events have occurred in the mud basin of Lake Macquarie. The evidence for this lies in the presence of large numbers of intact but dead bivalve shells entombed in the mud. The cause of extinction events appears to be prolonged dissolved oxygen depletion of bottom water. Prolonged dissolved oxygen depletion of the bottom water was measured during the water quality study conducted by Laxton and Laxton (1983 to 1997). Low concentrations of dissolved oxygen in the bottom water were also recorded during the March 2020 sampling period. Stations with low abundance of organisms correlated with low concentrations in the bottom waters.
- Water depth was not in any way important in determining the species composition at a station.
- In the September 2021 survey species diversity or composition was consistent with previous years. A total of 2096 organisms greater than 1mm in size were found, comprising 13 species. This compares with the results from September 2018, September 2019 and September 2020 where

1576, 815 and 1367 organisms respectively were recorded representing approximately twelve species.

- As in previous years, polychaete worms and bivalve molluscs were the most frequently encountered animals in the September 2021 survey. Stations were distinguished by the relative abundance of the dominant species.

These results appear to support the notion that increasing the water depth by the predicted 0.8m subsidence has, to date, had little to no discernible effect on the composition and abundance of organisms making up the benthos of the mud basin.

Annual rainfall in the Cooranbong (Lake Macquarie AWS) region was 839.8 mm in 2017; 859.8 mm in 2018; 763.4 mm in 2019; and 1496.4 mm in 2020 (BOM Station Number 061412). A lack of rainfall in the Lake Macquarie catchment has the effect of raising the concentration of salinity in the water column of Lake Macquarie. In March 2019, for instance, salinity was over 39 parts per thousand and almost uniform from surface to bottom. The Lake Macquarie region received relatively heavy rainfall in August (111.2 mm) and September (64.8 mm) 2019; and January (79.6 mm), February (335.4 mm), March (173.0 mm), July (184.0 mm), October (150.8 mm) and December (220.6 mm) 2020. The catchment also received rainfall in January (104.8 mm) and February (155.8 mm) of this year (BOM Station Number 061412). This rainfall lowered the salinity of water in the lake to around 36 parts per thousand in 2019, 33 parts per thousand in March 2020, and 32 parts per thousand in August 2020. Rainfall for July, August and September 2021 was 29.2 mm, 64.8 mm and 19.2 mm respectively. During the September 2021 survey, mean salinity was 35.44 parts per thousand.

Lack of rainfall also influences water clarity. The water of the lake became very clear for long periods. This high water clarity led to some interesting effects on the benthos of the study area. First, the small seagrass, *Halophila sp.* became established as a dense bed in 6m of water at Station R10 (Brightwaters Bay) in September 2018. *Halophila sp.* was not recorded at Station R10 in March 2019 but in September 2019 a healthy plant of *Zostera capricorni* was found at this station. Second, red and brown algae were found on mussels at depths between 4.5 and 6 m of water in September 2018 at stations C4 and IM2, and on mussels at stations R3 and IM2 in March 2021.

Water temperature, salinity, conductivity, dissolved oxygen and pH were found to be uniform from surface to bottom. During the March 2021 sampling period, water temperature throughout the water column ranged from 24.18°C to 27.04°C; conductivity ranged from 51.68 ms/cm to 52.04 ms/cm; salinity ranged from 33.96 parts per thousand to 34.23 parts per thousand; turbidity ranged from 1.40 NTU to 23.40 NTU; pH ranged from 7.90 to 8.06; and dissolved oxygen concentrations ranged from 73.80% to 103.40% saturation.

In September 2019 some changes to the composition of the upper 100mm of the bottom sediments were detected. At Stations C1-C4 and C6-C7 no sand was present, just fine black silt. This indicated that these

sediments had been reworked since March 2019. Sediments at Stations R5, R6 R8 and R9 also appeared to have been reworked. In March 2020, changes were again detected. Sediments at stations C5 and C7 comprised mostly of course black sand. In August 2020, sediment was mostly fine grey/black silt. The sediment collected during the March 2021 and September 2021 surveys was largely fine grey silty mud with some shell fragments.

Note: AWS - Automatic Weather Station

Introduction

In 2012 Lake Coal P/L was seeking a variation to its mining agreement because of proposed changes to its mining methods. They were planning on increasing miniwall panel widths to 85m wide, 97m total extraction, which will result in some additional subsidence above that currently approved. As such, a modification and supporting EA was prepared. The predicted subsidence agreed to by the NSW Government was around 0.406m. The method now proposed will increase subsidence to around 0.468m.

NSW Department of Planning and Infrastructure raised concerns that this increase in depth of water over the existing benthic community of the mud basin of Lake Macquarie may alter the species composition and relative abundances of organisms within that community.

To address these concerns, Lake Coal decided to conduct a benthic survey of the mud basin community to attempt to answer the following questions.

- What is the structure of the benthic community of the mud basin off Summerland Point and in Chain Valley Bay?
- What changes to the benthic community, if any, have taken place in areas of the lake mud basin that have been subjected to subsidence from previous mining activity?
- What changes to the benthic community, if any, may be expected in the mud basin community from the proposed variation to the mining method?

This study had a seasonal component and the benthos could change from year to year without the influence of any subsidence due to mining.

Ms Jemma Sargent of JSA Environmental prepared a formal document entitled:

Benthic Communities Management Plan. Chain Valley Colliery Domains 1 & 2 Continuation. Project (10_0161). 25 June 2012.

The extraction plan required under Condition 6 of Schedule 3 within Project approval (10_0161) requires that a Benthic Communities Management Plan (BCMP) be developed. This BCMP was prepared to provide for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities and includes:

- surveys of the lakebed to enable contours to be produced and changes in depth following subsidence to be accurately measured
- benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species

numbers and composition within the communities

- a program of ongoing seasonal monitoring of benthic species in both control and impact sites
- development of a model to predict the likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the survey data collected.

Three types of station were sampled. They were:

- Control stations – C, areas of lakebed sufficiently remote from previous or proposed mining.
- Reference stations – R, areas of lakebed above subsidence areas of previous mining.
- Impact stations – IM, areas of lakebed where subsidence is expected from future mining.

Two depth zones within the mud basin were sampled, -4.5m AHD and -5.5 to -6.0m AHD. The locations of the sampling stations were specified by Mr Chris Ellis and Mr Wade Covey, using the results of a bathymetric survey of the lake and the known locations of past and proposed mining.

In November 2014, project consent 10_0161 was surrendered. It was replaced by consent SSD-5465 as modified. The remodeled subsidence values were 0.62m for the single seam extraction area (everywhere that is currently being mined) and up to 0.886m for areas where multiseam mining will occur (near Site R2).

This report (September 2021) presents the results of the just completed 20th sampling of the now 22 (previously 19, 16, 14 and 12) stations off Summerland Point, in Chain Valley Bay, Bardens Bay and Sugar Bay. These results will be compared with those obtained from the previous nineteen surveys (February 2012 to March 2021). The benthic survey was conducted between the 9th and 11th September 2021. Water quality variables were measured on 9th and 11th September 2021. The work in September 2021 was supervised by Mr Lachlan McWha of Delta Coal.

Location of Sampling Stations

Figure 1 shows the location of sampling stations, depth contours of the lake, and the locations of existing and proposed underground mine workings prepared by Mr Chris Armit and the LDO team in February 2017 and updated in October 2019. **Table 1** provides the exact location of each sampling station by latitude and longitude and by eastings and northings using WGS84 datum. **Figure 2** shows the extent of mining from July 2020 to June 2021.

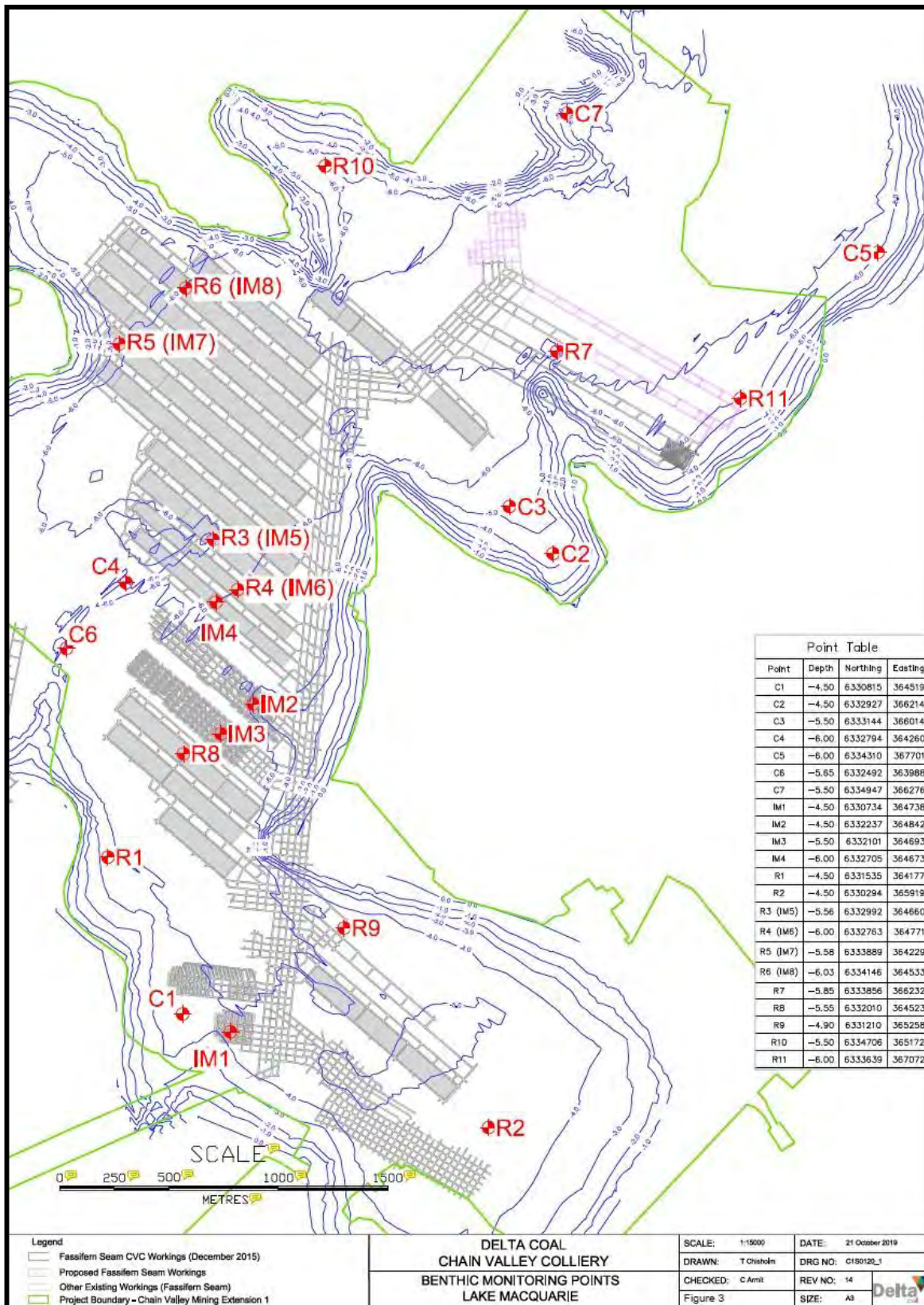


Figure 1. Location of Benthos Sampling Stations (September 2021).

Table 1. Co-ordinates of Benthos Sampling Stations prepared by the LDO team.

Station	Sample depth (m) AHD	Latitude	Longitude	MG-56 Easting	MG56 Northing
C1	-4.50	S33° 09' 10.69"	E151° 32' 50.11"	364519	6330815
C2	-4.50	S33° 08' 02.89"	E151° 33' 56.65"	366214	6332927
C3	-5.50	S33° 07' 55.78"	E151° 33' 49.05"	366014	6333144
C4	-6.00	S33° 08' 06.35"	E151° 32' 41.17"	364260	6332794
C5	-6.00			367701	6334310
C6	-5.50			363988	6332492
C7	-5.50			366276	6334947
IM1	-4.50	S33° 09' 13.44"	E151° 32' 58.51"	364738	6330734
IM2	-4.50	S33° 08' 24.67"	E151° 33' 03.34"	364842	6332237
IM3	-5.50	S33° 08' 29.02"	E151° 32' 57.52"	364693	6332101
IM4	-6.00	S33° 08' 09.42"	E151° 32' 57.04"	364873	6332705
R1	-4.50	S33° 08' 47.18"	E151° 32' 37.31"	364177	6331535
R2	-4.50	S33° 09' 28.23"	E151° 33' 43.87"	365919	6330294
R3 (IM5)	-5.50	S33° 08' 00.10"	E151° 32' 56.72"	364660	6332992
R4 (IM6)	-6.00	S33° 08' 07.58"	E151° 33' 00.88"	364771	6332763
R5(IM7)	-5.50	S33° 07' 30.78"	E151° 32' 40.55"	364229	6333889
R6 (IM8)	-6.00	S33° 07' 22.56"	E151° 32' 52.42"	364533	6334146
R7	-6.00			366232	6333856
R8	-5.50			364523	6332010
R9	-4.50			365258	6331210
R10	-5.50			365172	6334706
R11	-6.00			367072	6333639

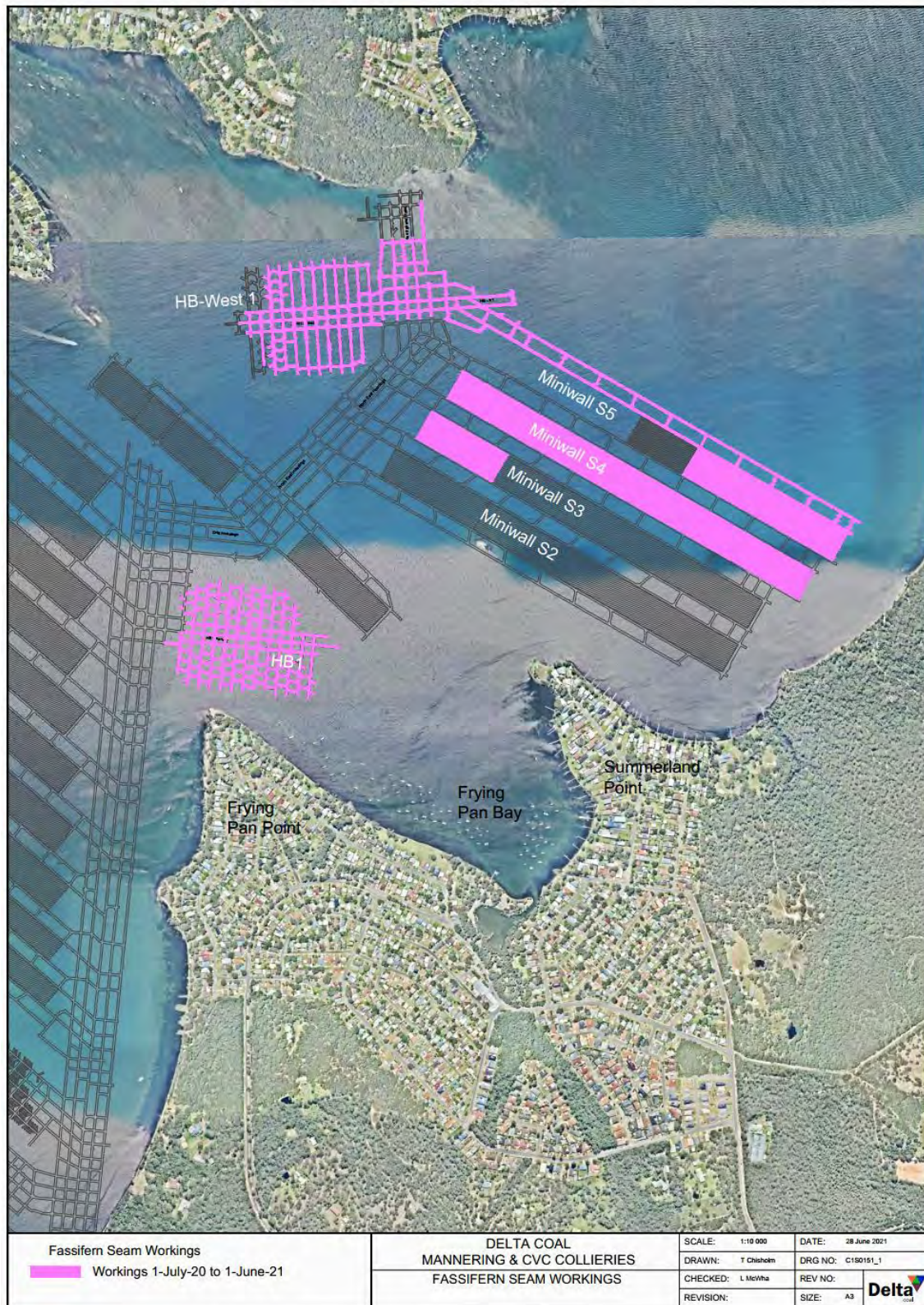


Figure 2. Extent of Fassifern Seam Workings from July 2020 – June 2021 (pink)

Selection and Evaluation of the Sampling Method

Methods for sampling benthos of sedimentary bottoms of oceans, coastal waters and saline and freshwater lakes must fulfill the following criteria:

- The area of bottom collected by the sampling device must be appropriate to the types and sizes of organisms inhabiting the substratum.
- The depth that the sampler penetrates the sediment must be sufficient to capture infauna or identifiable parts of more deeply buried species.
- Sufficient samples must be taken within the benthic environment to be certain that more than 95% of the component species of the ecosystem are collected.
- Sufficient samples must be taken to permit the population densities of component species to be calculated.

In 1971, Dr John Laxton was appointed by Dr Frank Talbot, Director of the Australian Museum, to lead a team of scientists to undertake the Shelf Benthic Survey. The purpose of the Shelf Benthic Survey was to provide baseline biological data on the benthos, fish and birds of the Continental Shelf adjacent to Sydney. Baseline oceanographic and biological data for coastal waters adjacent to Sydney were required to evaluate the effects of the proposed deep water ocean outfalls planned by the Metropolitan Water Sewerage and Drainage Board to replace the existing shoreline sewage outfalls. Both rocky bottoms and sedimentary bottoms were present in the study area and water depths ranged from the intertidal zone out to 200m.

At first, a Shipek grab was employed to collect samples of sediment. The Shipek grab used a spring loaded hemi-cylindrical bucket that rotated through 180° to collect a half cylinder of sediment nominally 200 x 200 mm in area and cut to a maximum depth of 100mm. On gravel bottoms, the Shipek grab worked consistently to collect 200 x 200 x 100mm samples. On sandy bottoms the grab, when triggered, penetrated the bottom to varying depths, collecting half cylinders of sediment that could range in depth from the full 100mm to as little as 25mm. This meant that the area of the seabed sampled varied greatly between samples taken at the same station and the depth of some samples was so shallow that many species of infauna were not collected. On muddy bottoms the heavy Shipek grab could plunge into the soft mud and emerge untriggered.

The Shipek grab was safe to use from a pitching and rolling vessel but as a scientific sampling device, it had serious deficiencies.

The Shelf Benthic Survey then obtained a Smith-MacIntyre (S-M) grab for evaluation. The Smith-MacIntyre grab used two spring operated clam-shells which swung inwards towards the midline to gather 200 x 200 x 100mm samples of sediment. This grab also had similar limitations to the Shipek grab when used to sample various sediment types. The worst feature of the S-M grab was that the two springs had to be tensioned by

a lever separately and then a keeper was placed in position to stop it triggering while on deck or while being lowered to the seabed. To position the keeper, the operator had to reach in between the two cocked spring loaded clam-shells. These clam-shell jaws were sharp and the action was violent enough to remove a hand. The Captain of the vessel banned its use on the project and undoubtedly saved someone's hand.

Following completion of the Shelf Benthic Survey, John Laxton joined an engineering firm that was commissioned to design wastewater outfalls for Gosford City, Wyong Shire and the Hunter Area. Baseline data on water quality and biology were again required and the seabed in the discharge and mixing zones was either rocky or sedimentary. As the maximum water depth in sedimentary areas was 30m, diver operated sample collection devices could be used to sample sedimentary bottoms. It was decided to build a diver operated benthic sampler that would overcome the difficulties and deficiencies of the available grab samplers. It should collect a 200 x 200 x 100mm section of sediment consistently and be easy to operate in conditions of zero underwater visibility.

To collect a 200 x 200 x 100mm sample of sediment consistently an aluminium box was designed that could be slid sideways into the sediment, whether gravel, sand or mud, and be filled completely before it was lifted clear of the bottom and the door closed and locked to retain the sediment. The top of the box included a panel of 1.0mm stainless steel mesh. Thus each box contained its own sieve to permit particles less than 1mm in size to be removed from the box leaving only large particles and organisms.

Tests of this box revealed that in all sediments (gravel, sand and mud) between 3 and 5 replicate samples were required to capture 95% of the species present. Once the maximum number of replicates required had been determined, five sieve boxes were manufactured along with a carry case to contain the boxes on the journey between the surface and the bottom and back. These devices permitted samples of consistent area and depth to be collected. Five replicates were always collected regardless of the sediment type or the environment being studied so that individual species/area curves were not required for each new area being investigated.

Five sieve boxes sample an area of 0.20 m². This sampling device has been used in all J.H. & E.S. Laxton - Environmental Consultants P/L benthos studies since 1980.

In an attempt to make the Summerland Point/Chain Valley Bay study results comparable with other studies, the BCMP required two cores of 100mm diameter and 200mm depth to be taken along with the 5 sieve box samples. These two cores covered an area of 0.015 m². There was no requirement in the BCMP to determine how many cores of these dimensions were needed to capture 95% of the benthic species inhabiting the lakebed. However, it is unlikely that sampling 0.015 m² of bottom sediment will provide a more realistic picture of the structure of the benthic community than sampling 0.20 m² of bottom sediment.

Sampling Procedure

Between September 2012 and September 2021, five replicate samples of basin mud were collected at each station using 200 x 200 x 100mm sieve boxes (1mm mesh). Two 100 x 200mm core samples were also collected at each station on each date sampled.

Twenty-two stations were sampled in September 2021. At each station the following procedure was carried out:

- A GPS unit was used to locate the sampling station. The boat was positioned upwind of the station and was then allowed to drift back to the exact location. When the wind strength was 0- 5km/h, the boat stayed on position. When the wind strength increased from 5 to 25km/h, the boat yawed on its anchor warp, causing the distance from the boat to the station to vary greatly and the sampling difficulty to increase. This was mitigated by working in calm conditions only.
- A line with five sieve boxes, two 100 x 200mm core samplers and a mesh bag containing a 250mL jar for whole sediment was cast overboard as the boat drifted into position.
- The diver descended to the lakebed to fill the 250mL jar, the two core samplers and five sieve boxes with sediment.
- The samplers were then hauled to the surface, and the contents of each sampler placed in a clean, labeled zip-lock plastic bag.
- Processing of samples occurred in the laboratory.
- A water quality profile from surface to bottom (at 0.5m depth intervals) was taken using a calibrated Yeo-Kal 618 Water Quality Analyser. Water temperature, conductivity, salinity, pH, dissolved oxygen, turbidity and depth were measured. Each line of data was stored in the memory of the machine.

In the laboratory the marine benthic samples were treated in the following way:

- Each sample was tipped into a 1 mm mesh sieve and washed free of mud.
- The washed material from each sample was then placed into an enamel dish and sorted for animals.
- Organisms and parts of organisms were removed, counted, identified and the results entered into a spread sheet. This process was repeated until the debris of the entire sample had been examined.
- Sorted organisms were preserved in formaldehyde solution.
- All shell remaining in the sample was kept for later examination.

The 250mL samples of whole sediment were treated in the following way:

- Each sample was tipped into a 1L clear glass measuring cylinder and the volume made up to 600mL with freshwater.
- The cylinders were stoppered and shaken vigorously to suspend the sediment in the freshwater.
- The cylinders were then placed on the laboratory bench to allow the fractions of the sediment to settle.
- Once settled the volumes of each fraction (shell and coarse sand, fine sand, mud and fine silt) were calculated and recorded. Results were displayed relative to the final volume of sediment collected.

Factors Affecting the Depth of Water in Lake Macquarie

The bathymetric chart of Lake Macquarie shows water depths relative to AHD. The actual depth of water above the lakebed varied greatly (**Figure 3**).

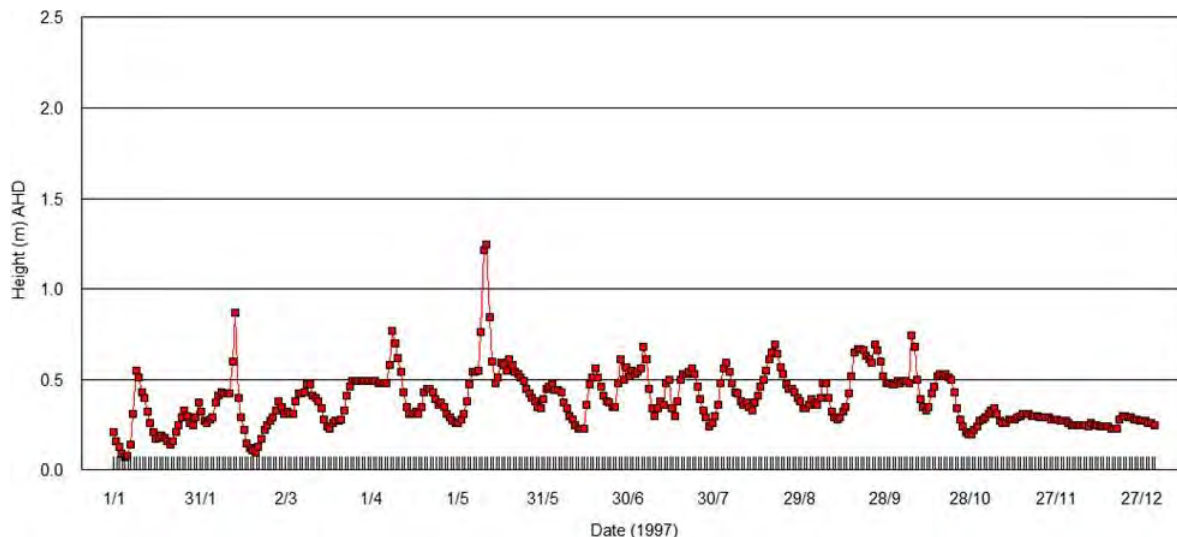


Figure 3. Water level changes in a coastal lagoon with an entrance open to coastal waters.

The actual water depth above the lakebed varied between 0 and 1.3m above AHD over a year. Water depths in coastal saline lakes with an open entrance to coastal waters vary due to combinations of the following factors:

- The body of Lake Macquarie is subject to tidal influence. The height of the tidal prism at Swansea Head may reach almost 2m (during spring tides) but by the time the body of the lake is reached, the tidal prism has been reduced to around 0.05m.
- The height of coastal waters and coastal lakes are influenced by changes in atmospheric pressure.

The Tasman Sea acts as a huge barometer. When the atmospheric pressure is high the sea surface is depressed. This causes water to drain from Lake Macquarie causing the depth of water in the body of the lake to decrease. When the atmospheric pressure over the Tasman Sea is low, the surface of the sea bulges upwards. This raising of sea level causes water to flow into Lake Macquarie, increasing the water depth.

- Low pressure systems in the Tasman Sea almost always generate strong winds and coastal rainfall. The strong winds cause large swells to form that impact the coast. Wave setup at the entrance to Lake Macquarie causes the water level in the lake to rise as large volumes of seawater enter the system.
- Rainfall during a period of low atmospheric pressure causes runoff into catchment rivers and streams to increase. When this extra water reaches the body of Lake Macquarie, the water level rises in proportion to the runoff volume. This water is prevented from exiting the lake by wave setup at the entrance and the state of the tide. Under these circumstances, the level of the lake can rise to heights of a meter or more above AHD (**Figure 3**).

Water Quality of Lake Macquarie (April 1983 – March 1997)

In 1983 the Hunter District Water Board (later Hunter Water Corporation) commissioned J.H. & E.S. Laxton – Environmental Consultants P/L to carry out a water quality study of Lake Macquarie in conjunction with their plans to sewer the western shore of the lake. The study commenced in April 1983 with monthly sampling of the lake and ended in March 1997. The water quality results for the body of Lake Macquarie (as opposed to the creeks) are summarized and presented in **Table 2**.

Table 2. Water Quality of the body of Lake Macquarie (1983-1997)

Variable		Mean	Maximum	Minimum
Water Temperature (oC)	Surface	20.56	33.77	10.95
	Bottom	20.06	29.17	11.45
Water Salinity (ppt)	Surface	32.61	37.96	1.00
	Bottom	33.92	37.95	21.06
pH	Surface	8.28	9.28	7.19
	Bottom	8.26	8.90	7.55
Dissolved Oxygen (% saturation)	Surface	101.6	177.7	71.9

	Bottom	89.5	147.0	0.9
Turbidity (NTU)	Surface	3.0	32.8	0.0
	Bottom	5.1	77.7	0.0
Transmission of light through water (%)	Surface	94.2	99.9	7.3
	Bottom	88.1	99.4	2.0
Total Suspended Solids (mg/L)	Surface	4.8	123.5	0.5
Chlorophyll-a (µg/L)	Surface	2.953	112.900	0.000
Ammonia-nitrogen (mg-N/L)	Surface	0.071	1.500	0.006
	Bottom	0.075	0.813	0.010
Organic-nitrogen (mg-N/L)	Surface	0.355	9.691	0.000
	Bottom	0.361	3.357	0.002
Oxidized-nitrogen (mg-N/L)	Surface	0.10	0.459	0.000
	Bottom	0.008	0.142	0.000
Total-nitrogen (mg-N/L)	Surface	0.436	9.749	0.033
	Bottom	0.445	3.918	0.027
Orthophosphate phosphorus (mg-P/L)	Surface	0.0191	0.4148	0.0006
	Bottom	0.0188	0.1386	0.0003
Total phosphorus (mg-P/L)	Surface	0.0450	0.8922	0.0025
	Bottom	0.0489	0.3534	0.0022
Faecal coliform bacteria (no./100mL)				

Blue shading in Table 2 indicates variables of interest to this study of the benthos of Lake Macquarie.

Light attenuation in Lake Macquarie (1983 – 1997)

Observations made over many years (Laxton, 2007) show that photosynthetic benthic organisms (seagrasses and algae) are confined to the shallow water areas around the perimeter of Lake Macquarie. In Chain Valley Bay, Bardens Bay and off Summerland Point, seagrasses and benthic algae grow between 0 and -1.89m below AHD (except in September 2018 when *Halophila* and some algae were found in 4.5 to 6m of water at some stations due to low rainfall and clear water).

The water quality study of Lake Macquarie, carried out between 1983 and 1997, measured Photosynthetically Active Radiation (PAR) changes with depth monthly at twelve stations throughout the lake during the years 1983 to 1985. Data for Station 1 off Wyee Point are presented in **Figure 4** and **Figure 5**.

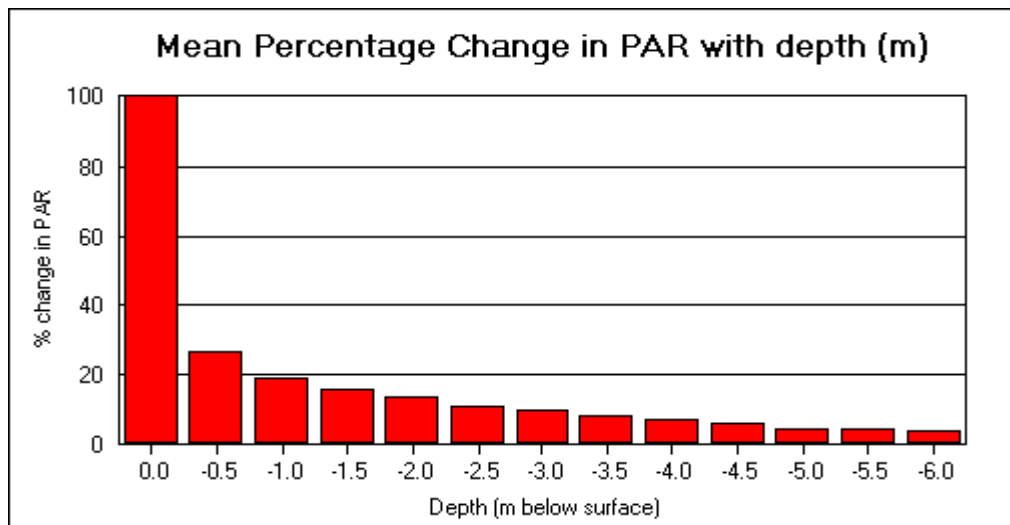


Figure 4. Mean percentage changes in PAR with depth at Station 1 - Wyee Point over 12 months.

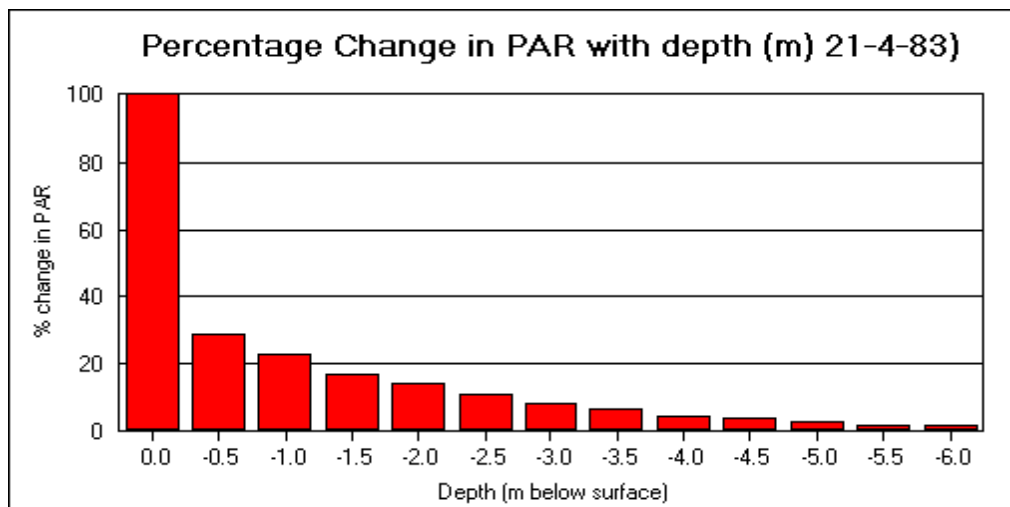


Figure 5. Actual percentage changes in PAR at Station 1 - Wyee Point on the morning of 21-4- 83.

It was found that only 14% of the light present at the surface reached a depth of 2.0m below the surface. By 6m below the surface only between 2% and 4% of PAR remained. Seagrasses and algae just manage to survive at 14% of the surface radiation but have no chance of survival at 6m below the surface. The mud basin of Lake Macquarie was devoid of macroscopic benthic algae and seagrasses except at some stations in September 2018.

Results

Benthos of the Study Area – February 2012 to September 2021

The following organisms were found in the sediment samples collected off Summerland Point and in Chain Valley Bay between February 2012 and September 2021:

Designated name	Family or Species	Comments
Anemone	Coelenterata	Found associated with mussel shells.
Planaria (Flat worm)	Platyhelminthes	2 specimens found in 2017.
Polychaete thin	<i>Sthenelais pettiboneae</i>	Most common polychaete present.
Polychaete (thick)	Cirratulidae	Present in small numbers.
Polychaete (mud tube)	Not yet identified	Present in small numbers.
Polychaete	Terebellidae	Present at Stations C1, C6, R1 and IM2.
<i>Pectinaria sp.</i> Polychaete	Terebellidae	First found in March 2019
Gastropod	<i>Nassarius jonasii</i>	Present in small numbers.
Gastropod	<i>Lepsiella (Bedeva) hanleyi</i>	Present in small numbers.
Gastropod	Bullimorph slug	One specimen found in August 2014.
Bivalve	<i>Corbula truncata</i>	Common as live animals and dead shells.
Bivalve	<i>Soletellina alba</i>	Common
Bivalve	<i>Paphia undulata</i>	Uncommon as live animals. Common as dead shells.
Bivalve	<i>Cyamiomactra mactroides</i>	Uncommon. (Brown or pink bivalve)
Bivalve	<i>Anadara trapezia</i>	Uncommon.
Bivalve	<i>Dosinia sculpta</i>	Many juveniles found in sandy sediment in September 2019.
Bivalve	<i>Trichomya hirsuta</i>	Common as dead shells. Found in large clumps at C2, C6, R3, R7, IM2 and IM3.
Bivalve	<i>Saccostrea glomerata</i>	Found on mussels at C4 and C6 in 2021.
Ophuroid	Brittle star	Uncommon. Found amongst mussel clumps and on mud.
Echinoid	Sea urchin	Uncommon. Found at C5 and C7 in 2021.
Sponge	White calcareous sponge	Specimen found associated with mussels.
	Pink sponge	Small species found on mud surface.
	Red sponge	Several specimens found in 2019.
Crabs	Small	Uncommon.
Prawn	Small	One specimen taken in March 2013 at R3 and one specimen in September 2013 at C4.

Shrimp	Small	Found at IM2 in March 2014.
Fish	Small (35mm)	One specimen taken at C3 (September 2012), at R1 (September 2013) and at IM4 in March 2017. 1 specimen in C6 in 2019.

Plates 1a to 1f provide information about the benthic organisms present in the basin mud of Lake Macquarie, NSW.

Plate 1a. Annelid species found in the benthos of Lake Macquarie (February 2012 – September 2021).



Phylum: Annelida
Class: Polychaeta
Subclass: Errantia
Order: Phyllodocida
Family: Sigalionidae
Genus: *Sthenelais*
Species: *Sthenelais pettiboneae*

Remarks: Found in marine environments.



Phylum: Annelida
Class: Polychaeta
Subclass: Canalipalpata
Order: Terebellida
Family: Cirratulidae

Remarks: Cirratulids vary in size from 1-20 cm long. They are mostly burrowers in soft sediments but some live in rock crevices. The head is conical or wedge-shaped and has no antennae. The body is generally cylindrical, tapering at both ends. Cirratulids are characterised by many simple elongate filaments along the body. The genera are poorly defined.

Plate 1b. Gastropod species found in the benthos of Lake Macquarie (February 2012–September 2021).



Phylum: Mollusca
Class: Gastropoda
Superfamily: Buccinoidea
Family: Nassariidae
Genus: *Nassarius*
Species: *Nassarius jonasii*

Remarks: Endemic to Australia; Noosa Heads, Qld, to SA. Inhabit sand and mud flats in estuaries and lagoons, intertidal down to 100 m. Most *Nassarius* species are very active scavengers. They often burrow into marine substrates and then wait with only their siphon protruding, until they smell nearby food.



Phylum: Mollusca
Class: Gastropoda
Order: Neogastropoda
Family: Muricidae
Genus: *Lepsiella* (*Bedevea*)
Species: *Lepsiella hanleyi*

Remarks: Common name mussel drill. Shell up to 32 mm, with angulated whorls, a high spire and moderately long anterior canal and with both spiral threads and axial ribs. Endemic to Australia. Found in temperate and southern parts of tropical Australia. Lives mainly on sheltered shores, including estuaries and often in association with mangroves. Feeds by drilling holes in bivalves. Lays lens-shaped capsules and development is direct.

Plate 1c. Bivalve species found in the benthos of Lake Macquarie (February 2012 – September 2021).



Phylum: Mollusca
Class: Bivalvia
Order: Myoida
Family: Corbulidae
Genus: *Corbula*
Species: *Corbula truncata*

Remarks: Marine bivalve mollusc.



Phylum: Mollusca
Class: Bivalvia
Order: Veneroida
Family: Psammobiidae
Genus: *Soletellina*
Species: *Soletellina alba*

Remarks: Posterior and anterior margins almost parallel. Shell thin and normally bluish, rarely white. Lives intertidally and subtidally in sand and mud, especially in sheltered environments. Occurs all around Australia; not recorded elsewhere.



Phylum: Mollusca
Class: Bivalvia
Order: Veneroida
Family: Veneridae
Genus: *Paphia*
Species: *Paphia undulata*

Remarks: Saltwater clam, marine bivalve mollusc. Inhabits inshore shallow sandy seabeds.



Phylum: Mollusca
Class: Bivalvia
Order: Veneroida
Family: Veneridae
Genus: *Dosinia*
Species: *Dosinia sculpta*

Remarks: *Dosinia* is a genus of saltwater clams, marine bivalve molluscs in the family Veneridae, (subfamily Dosiniinae). The shell of *Dosinia* species is disc-like in shape, usually white, and therefore is reminiscent of the shells of Lucinid bivalves.

Typically found in the intertidal zone at the water's edge at a mean distance from sea level of -15 meters (-50 feet).



Phylum: Mollusca
Class: Bivalvia
Order: Veneroida
Family: Cyamiidae
Genus: *Cyamimactra*
Species: *Cyamimactra mactroides*



Phylum: Mollusca

Class: Bivalvia

Order: Arcoida

Family: Arcidae

Genus: *Anadara*

Species: *Anadara trapezia*

Remarks: Sydney cockle, or ark cockle is an estuarine filter-feeding bivalve. Its calcareous, heavily-ribbed, shell can grow to approximately 7 to 8 cm across. Its current range is along the east coast of Australia, from Queensland to Victoria. It has been used as an indicator species to study levels of the metals selenium, copper and cadmium.



Phylum: Mollusca

Class: Bivalvia

Order: Mytiloida

Family: Mytilidae

Genus: *Trichomya*

Species: *Trichomya hirsuta*

Remarks: The hairy mussel is a major part of the megafauna of Lake Macquarie. It is tolerant of low oxygen levels in the water and its temperature tolerance range has been researched in connection with using the waters of the lake for cooling power stations.

Hairy mussels have been used as bioindicators to monitor concentrations of heavy metals (namely Pb, Cd, Cu, Zn, Co, Ni, and Ag) in marine environments.

Plate 1d. Brittle stars found amongst the mussel beds of Lake Macquarie, NSW.



Phylum: Echinodermata

Class: Ophiuroidea

Order: Ophiurida

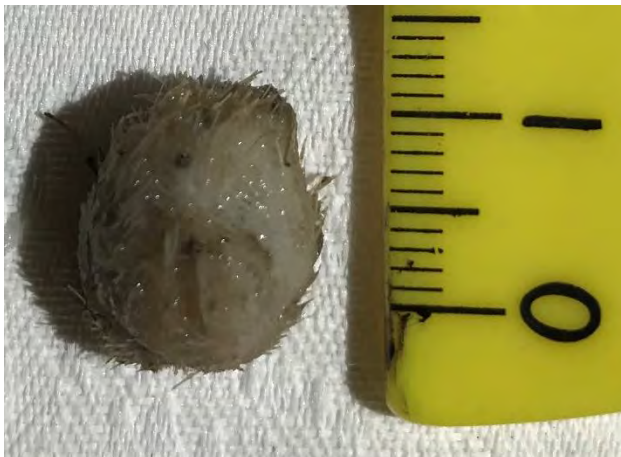
Family: Ophionereididae

Genus: *Ophionereis*

Species: *Ophionereis schayeri*

Remarks: Largest and most common brittle star found in Sydney waters. Brittle stars have five long, slender arms which radiate out from a central disc. The mouth is located in the centre of the underside of the disc. There is no anus. Offshore, brittle stars form dense aggregations. In intertidal zones, they are typically found as single individuals in crevices, under stones and amongst seaweed. They feed by raising their arms above the substrate; extending tube-feet; and removing particles from the water. They pass food along the arms to the mouth. They also scavenge on decaying matter. They inhabit the hairy mussel beds of Lake Macquarie.

Plate 1e Sand dollar sea urchins found in Lake Macquarie, NSW



Phylum: Echinodermata

Class: Echinoidea

Order: Clypeasteroidea

Remarks: Sand dollars are small in size. They possess a rigid skeleton called a test. The test consists of calcium carbonate plates arranged in a fivefold symmetric pattern.

Plate 1f Crab species found in Lake Macquarie, NSW



Phylum: Arthropoda

Class: Malacostraca

Order: Decapoda

Molluscs found as dead shells

Benthic organism samples collected between February 2012 and September 2021 included a large component of shell. **Plates 2a** and **2b** show the mass of shell obtained from the sixty 200x200x100mm samples of sediment taken in February 2012. **Plate 2c** and **Plate 2d** show the mass of shell collected in September 2012 and **Plates 2e** and **2f** show the mass of shells collected in March 2013.



Plate 2a. Large shell removed from samples during sorting process - February 2012 survey.



Plate 2b. Small shells removed from samples during sorting process - February 2012 survey.



Plate 2c. Large shells removed from samples - September 2012 survey.



Plate 2d. Small shells removed from samples during sorting in September 2012.



Plate 2e. Large shells removed from samples during sorting in March 2013.



Plate 2f. Small shells removed from samples during sorting in March 2013.

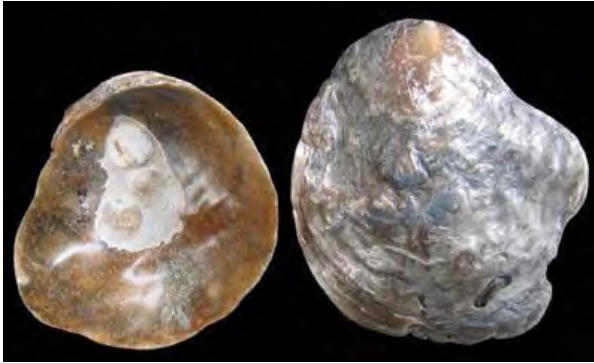
Similar masses of shell were found in the samples of the September 2013 to September 2021 surveys. These masses of shell were photographed for the record but were not included in this report.

The following molluscs were found in the large volume of shell collected during the sampling periods between February 2012 and September 2021:

- | | |
|---------------------------------|--|
| 1. <i>Paphia undulata</i> | 7. <i>Chlamys</i> sp. |
| 2. <i>Anomia</i> sp. | 8. <i>Saccostrea glomerata</i> |
| 3. <i>Dosinia sculpta</i> | 9. <i>Corbula truncata</i> |
| 4. <i>Trichomya hirsuta</i> | 10. <i>Batillaria (Velacumantis) australis</i> |
| 5. <i>Katelsysia rhytiphora</i> | 11. <i>Conuber</i> sp. |
| 6. <i>Pecten</i> sp. | 12. <i>Anadara trapezia</i> |

Plates 3a and **3b** provide information about bivalve mollusc and gastropod species found as dead shells in the basin mud of Lake Macquarie, New South Wales during the periods of sampling.

Plate 3a. Mollusc species found as dead shells in the benthos of Lake Macquarie, NSW.



Phylum: Mollusca

Class: Bivalvia

Order: Ostreoida

Family: Anomiidae

Genus: *Anomia*

Remarks: Genus of saltwater clam, marine bivalve mollusc. Known as "jingle shells". Common in both tropical and temperate oceans and live primarily attached to rock or other shells via a calcified byssus that extends through the lower valve. *Anomia* shells tend to take on the surface shape of what they are attached to; thus if an *Anomia* is attached to a scallop shell, the shell of the *Anomia* will also show ribbing.



Phylum: Mollusca

Class: Bivalvia

Order: Veneroida

Family: Veneridae

Genus: *Katelaysia*

Species: *Katelaysia rhytiphora*

Remarks: Commonly known as mud cockles, this group of commercially important bivalves often represents a major faunal component of shallow estuarine and marine embayments. *K. rhytiphora* is broadly distributed around Australia's temperate coastline from Augusta, Western Australia to Port Jackson, NSW.



Phylum: Mollusca

Class: Bivalvia

Order: Ostreoida

Family: Pectinidae

Genus: *Pecten*

Remarks: Genus of large saltwater clams or scallops. Marine bivalve mollusc.



Phylum: Mollusca

Class: Bivalvia

Order: Ostreoida

Family: Pectinidae

Genus: *Chlamys*

Remarks: Genus of saltwater clams or scallops. Marine bivalve mollusc.



Phylum: Mollusca

Class: Bivalvia

Order: Ostreoida

Family: Pectinidae

Genus: *Saccostrea*

Species: *Saccostrea glomerata*

Remarks: Sydney rock oysters are endemic to Australia and New Zealand. In Australia it is found in bays, inlets and sheltered estuaries from Wingan Inlet in eastern Victoria, along the east coast of NSW and up to Hervey Bay QLD, around northern Australia and down the west coast to Shark Bay in WA. Sydney rock oysters are capable of tolerating a wide range of salinities (halotolerant). They are usually found in the intertidal zone to 3 metres (9.8 ft) below the low water mark.

Plate 3b. Gastropod species found as dead shells in the benthos of Lake Macquarie, NSW.



Phylum: Mollusca

Class: Gastropoda

Family: Naticidae

Genus: *Conuber*

Species: *Conuber sordidum*

Remarks: Species of predatory sea snail. A marine gastropod mollusc known commonly as the moon snail. Lives on intertidal muddy sand flats near mangroves or sea weed.



Phylum: Mollusca

Class: Gastropoda

Family: Batillariidae

Genus: *Batillaria* (*Velacumantis*)

Species: *Batillaria australis*

Remarks: The Australian Mud Whelk is a marine gastropod found on mud flats in estuaries, river mouths and mangrove swamps. The snail has a high resistance to predation and environmental tolerance, which may partially explain its success as an invasive species. This species is one of the hosts for the flatworm parasite *Austrobilharzia*. Larvae of the flatworm are discharged from the snail into the surrounding water. They normally burrow into the legs of wading birds and complete their life cycle, but may burrow through the skin of humans, causing "bathers itch".

Benthic organisms in the Study Area - September 2021

The organisms found living in the sediments of the mud basin off Summerland Point and in Chain Valley Bay and Bardens Bay were entered into an Excel worksheet. **Table 3** shows the organisms found in each replicate at each station sampled in September 2021. Data for sieve box samples were separated from data obtained from core samples.

Table 3. Organisms found at Sampling Stations on 9th to 11th September 2021.

Control Station C1		Depth -4.50m AHD		56 364519 6330815		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Crab
C1.1	20	0	0	0	0	2	6	0	0	0	0	0	0	0	0
C1.2	25	0	0	0	0	3	2	0	0	0	0	0	0	0	0
C1.3	14	0	0	0	0	3	4	0	0	0	0	0	0	0	0
C1.4	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0
C1.5	12	0	0	0	0	6	6	0	0	0	0	0	0	0	0
C1.6	8	0	0	0	0	3	0	0	0	0	0	0	0	0	0
C1.7	2	0	0	0	0	0	5	0	0	0	0	0	0	0	0
Mean/station (boxes)	15.0	0.2	0.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	5.0	0.0	0.0	0.0	0.0	1.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	375	5	0	0	0	75	90	0	0	0	0	0	0	0	0
no./m2 (core)	100	0	0	0	0	30	50	0	0	0	0	0	0	0	0
No. species (box)	4														
No. species (core)	3														
Total Organisms at Station															109
Control Station C2		Depth -4.50m AHD		56 366214 6332927		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Planaria
C2.1	12	2	0	0	0	2	3	0	0	0	0	0	0	0	0
C2.2	3	3	0	0	0	6	1	0	0	0	0	0	0	0	0
C2.3	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0
C2.4	6	1	0	0	0	0	3	0	0	0	0	0	0	0	0
C2.5	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0
C2.6	0	0	0	0	0	3	2	0	0	1	0	0	0	0	0
C2.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	6.8	1.2	0.0	0.0	0.0	2.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	0.5	0.0	0.0	0.0	0.0	1.5	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	170	30	0	0	0	55	40	0	0	0	0	0	0	0	0
no./m2 (core)	10	0	0	0	0	30	20	0	0	10	0	0	0	0	0
No. species (box)	4														
No. species (core)	4														
Total Organisms at Station															59
Control Station C3		Depth -5.50m AHD		56 366014 6333144		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Planaria	Sponge
C3.1	10	0	0	0	0	0	3	0	0	0	0	0	0	0	0
C3.2	17	2	0	0	0	1	4	0	0	0	0	0	0	0	0
C3.3	0	1	0	0	0	0	2	1	0	3	0	0	0	0	0
C3.4	7	0	0	0	0	1	2	0	0	0	0	0	0	0	0
C3.5	4	2	1	0	0	1	2	0	0	0	0	0	0	0	0
C3.6	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
C3.7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	7.6	1.0	0.2	0.0	0.0	0.6	2.6	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Mean cores	0.5	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	190	25	5	0	0	15	65	5	0	15	0	0	0	0	0
no./m2 (core)	10	10	0	0	0	0	10	0	0	0	0	0	0	0	0
No. species (box)	7														
No. species (core)	3														
Total Organisms at Station															64

Control Station C4		Depth -5.50m AHD		56 364260 6332794		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Oyster <i>Saccostrea</i>	Ophuroid	Fish
C4.1	26	0	0	0	0	2	2	0	0	0	43	3	2	0	0
C4.2	55	0	0	0	0	1	8	0	0	0	10	0	0	0	0
C4.3	16	0	0	0	0	2	2	0	0	0	10	1	0	0	0
C4.4	15	0	0	0	0	0	3	0	0	0	5	0	0	0	0
C4.5	31	0	0	0	0	1	3	0	0	0	25	0	0	0	0
C4.6	11	0	0	0	0	0	0	0	0	0	5	0	0	0	1
C4.7	9	0	0	0	0	1	1	0	0	0	5	0	0	0	0
Mean/station (boxes)	28.6	0.0	0.0	0.0	0.0	1.2	3.6	0.0	0.0	0.0	18.6	0.8	0.4	0.0	0.0
Mean cores	10.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.5
no./m2 (box)	715	0	0	0	0	30	90	0	0	0	465	20	10	0	0
no./m2 (core)	200	0	0	0	0	10	10	0	0	0	100	0	0	0	10
No. species (box)	6														
No. species (core)	5														
Total Organisms at Station															266

Control Station C5		Depth -5.50m AHD		56 367701 6334510		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Echinoid	Fish
C5.1	0	5	1	0	0	0	1	0	0	2	0	0	6	0	0
C5.2	4	2	0	0	0	0	2	0	0	0	0	0	1	0	0
C5.3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
C5.4	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0
C5.5	1	2	2	0	0	0	4	0	0	4	0	0	0	1	0
C5.6	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
C5.7	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0
Mean/station (boxes)	1.6	2.2	1.0	0.0	0.0	0.0	1.6	0.0	0.0	1.2	0.0	0.0	1.4	0.2	0.0
Mean cores	0.0	1.5	1.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	40	55	25	0	0	0	40	0	0	30	0	0	35	5	0
no./m2 (core)	0	30	20	0	0	0	10	0	0	0	0	0	0	0	0
No. species (box)	7														
No. species (core)	3														
Total Organisms at Station															46

Control Station C6		Depth -5.50m AHD		56 363988 6332492		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Oyster <i>Saccostrea</i>	Ophuroid	Barnacle
C6.1	26	0	0	0	0	0	2	0	0	0	14	0	1	0	0
C6.2	41	0	0	0	0	1	6	0	0	0	9	0	0	0	0
C6.3	23	1	0	0	0	0	6	0	0	0	10	0	0	0	0
C6.4	15	2	0	0	0	1	4	0	0	0	10	0	0	0	0
C6.5	21	0	0	0	0	0	3	0	0	0	17	1	1	0	0
C6.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	25.2	0.6	0.0	0.0	0.0	0.4	4.2	0.0	0.0	0.0	12.0	0.2	0.4	0.0	0.0
Mean cores	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	630	15	0	0	0	10	105	0	0	0	300	5	10	0	0
no./m2 (core)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. species (box)	7														
No. species (core)	0														
Total Organisms at Station															215

Control Station C7		Depth -5.50m AHD		56 364736 6334947		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Echinoid	Barnacle
C7.1	4	2	0	0	0	0	0	0	0	0	0	1	0	1	0
C7.2	4	3	1	0	0	1	0	0	0	0	0	0	0	0	0
C7.3	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0
C7.4	2	5	0	0	0	1	0	0	0	0	0	4	0	0	0
C7.5	6	3	0	0	0	0	0	0	0	0	0	0	0	1	0
C7.6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
C7.7	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Mean/station (boxes)	3.2	3.4	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.4	0.0
Mean cores	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.4	0.0
no./m2 (box)	80	85	5	0	0	10	0	0	0	0	0	40	0	10	0
no./m2 (core)	0	10	0	0	0	0	0	0	0	0	0	32	0	8	0
No. species (box)	6														
No. species (core)	2														
Total Organisms at Station															46

Station R1		Depth -4.50m AHD		56 364177 6331535		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Crab
R1.1	6	0	0	0	0	2	5	0	0	0	0	0	0	0	0
R1.2	5	1	0	0	0	5	6	0	0	0	0	0	0	0	0
R1.3	10	0	0	0	0	1	10	1	0	0	0	0	0	0	0
R1.4	8	0	0	0	0	2	2	0	0	0	0	0	0	0	0
R1.5	15	0	0	0	0	0	8	0	0	0	0	0	0	0	0
R1.6	3	0	0	0	0	0	5	0	0	0	0	0	0	0	0
R1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	8.8	0.2	0.0	0.0	0.0	2.0	6.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	1.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	220	5	0	0	0	50	155	5	0	0	0	0	0	0	0
Mean cores	30	0	0	0	0	0	50	0	0	0	0	0	0	0	0
No. species (box)	5														
No. species (core)	2														
Total Organisms at Station															87

Station R2		Depth -4.50m AHD		56 365919 6330294		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Barnacle	Fish
R2.1	14	0	0	0	0	2	7	0	0	0	0	0	0	0	0
R2.2	5	0	0	0	0	2	2	0	0	0	0	2	0	0	0
R2.3	13	0	0	0	0	1	5	0	0	0	0	0	0	0	0
R2.4	17	0	0	0	0	1	7	0	0	0	0	0	0	0	0
R2.5	21	0	0	0	0	1	6	0	0	0	0	0	0	0	0
R2.6	5	0	0	0	0	0	3	0	0	0	0	0	0	0	0
R2.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	14.0	0.0	0.0	0.0	0.0	1.4	5.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Mean cores	2.5	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	350	0	0	0	0	35	135	0	0	0	0	10	0	0	0
no./m2 (core)	50	0	0	0	0	0	30	0	0	0	0	0	0	0	0
No. species (box)	4														
No. species (core)	2														
Total Organisms at Station															106

Station R3 (now IM5)	Depth -5.50m AHD			56 364660		6332992		Sampled 9th and 11th September 2021								
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Fish	Crab	
R3.1	7	0	1	0	0	0	0	0	0	0	15	0	0	0	0	
R3.2	18	2	0	0	0	0	5	0	0	0	15	0	0	0	0	
R3.3	12	0	0	0	0	3	1	0	0	3	38	0	0	0	0	
R3.4	9	2	0	0	0	0	0	0	0	0	40	1	0	0	0	
R3.5	14	0	1	0	0	1	4	0	0	11	24	0	0	0	0	
R3.6	3	0	0	0	0	0	1	0	0	0	3	0	0	0	0	
R3.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mean/station (boxes)	12.0	0.8	0.4	0.0	0.0	0.8	2.0	0.0	0.0	2.8	26.4	0.2	0.0	0.0	0.0	
Mean cores	1.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	
no./m2 (box)	300	20	10	0	0	20	50	0	0	70	660	5	0	0	0	
no./m2 (core)	30	0	0	0	0	0	10	0	0	0	30	0	0	0	0	
No. species (box)	8														Total Organisms at Station	234
No. species (core)	3															

Station R4 (now IM6)		Depth -6.00m AHD			56 364771		6332763		Sampled 9th and 11th September 2021							
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Crab	
R4.1	2	0	0	0	0	3	3	0	0	0	0	0	0	0	0	
R4.2	0	0	0	0	0	3	7	0	0	0	0	0	0	0	0	
R4.3	0	0	0	0	0	4	8	0	0	0	0	0	0	0	0	
R4.4	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
R4.5	3	0	0	0	0	1	2	0	0	0	0	0	0	0	0	
R4.6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
R4.7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mean/station (boxes)	1.6	0.0	0.0	0.0	0.0	2.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Mean cores	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
no./m2 (box)	40	0	0	0	0	55	105	0	0	0	0	0	0	0	0	
no./m2 (core)	190	0	0	0	0	0	63	0	0	0	0	0	0	0	0	
No. species (box)	3															
No. species (core)	2															
Total Organisms at Station															40	

Station R5 (now IM7)		Depth -6.00m AHD			56 364229		6333889		Sampled 9th and 11th September 2021						
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Crab
R5.1	5	0	0	0	0	3	2	0	0	0	0	0	0	0	0
R5.2	8	0	0	0	0	1	2	0	0	0	0	0	0	0	0
R5.3	8	0	0	0	0	0	3	0	0	0	0	0	0	0	0
R5.4	6	0	0	0	0	1	2	0	0	0	0	0	0	0	0
R5.5	1	0	0	0	0	3	1	1	0	0	0	0	0	0	0
R5.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R5.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	5.6	0.0	0.0	0.0	0.0	1.6	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	140	0	0	0	0	40	50	5	0	0	0	0	0	0	0
no./m2 (core)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. species (box)	4														Total Organisms at Station
No. species (core)	0														
															47

Station R6 (now IM8)		Depth -6.00m AHD		56 364533 6334146		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod Nassarius	Gastropod Bedeva	Bivalve Corbula	Bivalve Soletellina	Bivalve Paphia	Bivalve Anadara	Bivalve Cyamiomactra	Bivalve Trichomya	Ophuroid	Barnacle	Fish	Crab
R6.1	3	1	0	0	0	4	1	0	0	0	0	0	0	0	0
R6.2	4	0	0	0	0	3	2	0	0	0	0	0	0	0	0
R6.3	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0
R6.4	2	0	0	0	0	3	4	0	0	0	0	0	0	0	0
R6.5	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0
R6.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	2.2	0.6	0.0	0.0	0.0	3.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	55	15	0	0	0	75	40	0	0	0	0	0	0	0	0
no./m2 (core)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. species (box)	4														
No. species (core)	0														
Total Organisms at Station															37

Station R7		Depth -6.00m AHD		56 366232 6333856		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod Nassarius	Gastropod Bedeva	Bivalve Corbula	Bivalve Soletellina	Bivalve Paphia	Bivalve Anadara	Bivalve Cyamiomactra	Bivalve Trichomya	Ophuroid	Barnacle	Fish	Crab
R7.1															
R7.2	6	1	1	0	0	0	1	0	0	5	18	0	0	0	1
R7.3	4	0	0	0	0	0	1	0	0	0	15	0	0	0	0
R7.4	1	0	0	0	0	0	0	0	0	1	15	0	0	0	0
R7.5	0	1	1	0	0	0	0	0	0	0	5	0	0	0	0
R7.6	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0
R7.7	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Mean/station (boxes)	2.8	0.5	0.5	0.0	0.0	0.0	0.5	0.0	0.0	1.5	13.3	0.0	0.0	0.0	0.3
Mean cores	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
no./m2 (box)	69	13	13	0	0	0	13	0	0	38	331	0	0	0	6
no./m2 (core)	40	0	0	0	0	0	0	0	0	0	40	0	0	0	0
No. species (box)	7														
No. species (core)	2														
Total Organisms at Station															77

Station R8		Depth -6.00m AHD		56 364323 63322010		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod Nassarius	Gastropod Bedeva	Bivalve Corbula	Bivalve Soletellina	Bivalve Paphia	Bivalve Anadara	Bivalve Cyamiomactra	Bivalve Trichomya	Bivalve Dosinia	Ophuroid	Barnacle	Fish
R8.1	2	0	0	0	0	1	2	0	0	0	0	0	0	0	0
R8.2	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0
R8.3	3	0	0	0	0	0	4	0	0	0	0	0	0	0	0
R8.4	6	0	0	0	0	2	11	0	0	0	0	0	0	0	0
R8.5	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0
R8.6	2	0	0	0	0	3	1	0	0	0	0	0	0	0	0
R8.7	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0
Mean/station (boxes)	3.0	0.0	0.0	0.0	0.0	0.8	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	1.5	0.0	0.0	0.0	0.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	75	0	0	0	0	20	130	0	0	0	0	0	0	0	0
no./m2 (core)	30	0	0	0	0	30	30	0	0	0	0	0	0	0	0
No. species (box)	3														
No. species (core)	3														
Total Organisms at Station															45

Station R9	Depth -6.00m AHD			56 366232		6331210		Sampled 9th and 11th September 2021							
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Barnacle	Fish
R9.1	10	0	0	0	0	3	2	0	0	0	0	0	0	0	0
R9.2	6	0	0	0	0	1	6	0	0	0	0	0	0	0	0
R9.3	2	0	0	0	0	4	2	0	0	0	0	0	0	0	0
R9.4	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0
R9.5	3	1	0	0	0	1	2	0	0	0	0	0	0	0	0
R9.6	8	0	0	0	0	0	1	0	0	0	0	0	0	0	0
R9.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	4.2	0.2	0.0	0.0	0.0	2.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	4.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	105	5	0	0	0	60	70	0	0	0	0	0	0	0	0
no./m2 (core)	90	0	0	0	0	0	10	0	0	0	0	0	0	0	0
No. species (box)	4														
No. species (core)	2														Total Organisms at Station
															48

Station R10	Depth -6.00m AHD			56 365172		6334708		Sampled 9th and 11th September 2021							
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Barnacle	Fish
R10.1	8	1	1	0	0	1	6	0	0	0	0	0	0	0	0
R10.2	4	0	0	0	0	1	6	0	0	0	0	0	0	0	0
R10.3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
R10.4	10	1	0	0	0	1	7	0	0	0	0	0	0	0	0
R10.5	4	0	0	0	0	3	5	0	0	1	0	0	0	0	0
R10.6	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
R10.7	1	0	0	0	0	0	6	1	0	0	0	0	0	0	0
Mean/station (boxes)	5.6	0.6	0.2	0.0	0.0	1.2	4.8	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Mean cores	0.5	0.0	0.0	0.0	0.0	0.0	5.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	140	15	5	0	0	30	120	0	0	5	0	0	0	0	0
no./m2 (core)	10	0	0	0	0	0	110	10	0	0	0	0	0	0	0
No. species (box)	6														
No. species (core)	3														Total Organisms at Station
															63

Station R11		Depth -6.00m AHD			56 367072		6333638		Sampled 9th and 11th September 2021						
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Barnacle	Fish
R11.1	0	3	1	0	0	1	3	0	0	0	0	0	0	0	0
R11.2	0	4	0	0	0	0	2	1	0	2	0	0	0	0	0
R11.3	0	9	0	0	0	0	8	0	0	5	0	0	0	0	0
R11.4	1	5	0	0	0	1	8	0	0	7	0	0	0	0	0
R11.5	0	16	0	0	0	1	3	0	0	0	0	0	0	0	0
R11.6	0	2	0	0	0	0	1	0	0	0	0	0	1	0	0
R11.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	0.2	7.4	0.2	0.0	0.0	0.6	4.8	0.2	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Mean cores	0.0	1.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
no./m2 (box)	5	185	5	0	0	15	120	5	0	70	0	0	0	0	0
no./m2 (core)	0	20	0	0	0	0	10	0	0	0	0	0	10	0	0
No. species (box)	7														
No. species (core)	3														Total Organisms at Station
															81

Station IM1		Depth -4.50m AHD		56 364738 6330734		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Ophuroid	Barnacle	Sponge
IM1.1	15	0	0	0	0	3	7	0	0	0	0	0	0	0	0
IM1.2	11	0	0	0	0	1	4	0	0	0	0	0	0	0	0
IM1.3	15	0	0	0	0	5	7	0	0	0	0	0	0	0	0
IM1.4	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0
IM1.5	12	0	0	0	0	1	6	0	0	0	0	0	0	0	0
IM1.6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IM1.7	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	11.4	0.0	0.0	0.0	0.0	2.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	2.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	285	0	0	0	0	50	125	0	0	0	0	0	0	0	0
no./m2 (core)	40	0	0	0	0	10	0	0	0	0	0	0	0	0	0
No. species (box)	3														
No. species (core)	2														
Total Organisms at Station															92

Station IM2		Depth -4.50m AHD		56 364842 6332237		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Saccostrea</i>	Ophuroid	Sponge	Crab
IM2.1	2	1	0	0	0	0	0	0	0	0	25	0	0	0	0
IM2.2	10	0	1	0	0	0	0	0	0	0	50	0	0	0	0
IM2.3	9	0	0	0	0	0	3	0	0	0	13	0	0	0	0
IM2.4	25	0	0	0	0	0	1	0	0	5	20	0	0	0	0
IM2.5	24	0	0	0	0	2	1	0	0	0	20	0	0	0	0
IM2.6	11	0	0	0	0	0	0	0	0	0	3	0	0	0	0
IM2.7	8	1	0	0	0	0	0	0	0	0	5	0	0	0	0
Mean/station (boxes)	14.0	0.2	0.2	0.0	0.0	0.4	1.0	0.0	0.0	1.0	25.6	0.0	0.0	0.0	0.0
Mean cores	9.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
no./m2 (box)	350	5	5	0	0	10	25	0	0	25	640	0	0	0	0
no./m2 (core)	190	10	0	0	0	0	0	0	0	0	80	0	0	0	0
No. species (box)	7														
No. species (core)	3														
Total Organisms at Station															212

Station IM3		Depth -5.50m AHD		56 364693 6332101		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevea</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Ophuroid	Barnacle	Fish	Crab
IM3.1	11	0	0	0	0	2	10	0	0	0	0	0	0	0	0
IM3.2	8	0	0	0	0	2	4	0	0	0	0	0	0	0	0
IM3.3	9	0	0	0	0	2	2	1	0	0	0	0	0	0	0
IM3.4	9	0	0	0	0	0	4	0	0	0	0	0	0	0	0
IM3.5	1	0	0	0	0	2	5	0	0	0	0	0	0	0	0
IM3.6	3	1	0	0	0	0	2	0	0	0	0	0	0	0	0
IM3.7	9	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Mean/station (boxes)	7.6	0.0	0.0	0.0	0.0	1.6	5.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	6.0	0.5	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	190	0	0	0	0	40	125	5	0	0	0	0	0	0	0
no./m2 (core)	120	10	0	0	0	0	20	0	0	10	0	0	0	0	0
No. species (box)	4														
No. species (core)	4														
Total Organisms at Station															72

Station IM4		Depth -6.00m AHD		56 364673 6332705		Sampled 9th and 11th September 2021									
Replicates	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod Nassarius	Gastropod Bedeva	Bivalve Corbula	Bivalve Soletellina	Bivalve Dosinia	Bivalve Anadara	Bivalve Cyamiomactra	Bivalve Trichomya	Bivalve Paphia	Ophuroid	Barnacle	Fish
IM4.1	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
IM4.2	3	0	0	0	0	1	13	0	0	0	0	0	0	0	0
IM4.3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IM4.4	1	1	0	0	0	0	7	0	0	0	0	0	0	0	0
IM4.5	8	0	0	0	0	2	4	0	0	0	0	0	0	0	0
IM4.6	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0
IM4.7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean/station (boxes)	4.2	0.2	0.0	0.0	0.0	0.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mean cores	2.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
no./m2 (box)	105	5	0	0	0	20	120	0	0	0	0	0	0	0	0
no./m2 (core)	40	0	0	0	0	0	10	0	0	0	0	0	0	0	0
No. species (box)	4														
No. species (core)	2														
Total Organisms at Station															50
Total organisms															2096

A total of 2096 benthic marine organisms greater than 1 mm in size were captured in the study area of Lake Macquarie during the September 2021 survey of 22 stations (**Table 3**). Thirteen species of benthic marine organisms were found in the samples. The fauna included three species of polychaete worm (**Plate 1a**); seven species of bivalve (**Plate 1c**); one species of brittle star (**Plate 1d**); one species of sea urchin (**Plate 1e**), and one crab species (**Plate 1f**).

In September 2021, the greatest numbers of organisms were collected at stations C4 (266 organisms), R3 now IM5 (234 organisms), C6 (215 organisms), IM2 (212 organisms), C1 (109 organisms), and R2 (106 organisation). The stations with the least numbers of organisms were R6 (37 organisms), R4 now IM6 (40 total), R8 (45 total), C5 (46 total), C7 (46 total), R5 now IM7 (47 total), and R6 now IM8 (47 total) (**Table 3**).

Polychaete worms were common and abundant in the benthos, with means ranging from 0.2 to 28.6 organisms in each sample. *Soletellina alba*, *Corbula truncata* and *Cyamiomactra mactriodes* were the most commonly occurring bivalves in the benthic muds during the September 2021 survey (**Plate 1c**, **Table 3**). Small numbers of the bivalves *Dosinia sculpta* and *Paphia undulata* were also collected at several stations. The mussel *Trichomya hirsuta* was found at stations R3 (now IM5), R7, IM2 and C6 in relatively large numbers (**Table 3**). The brittle star *Ophionereis schayeri*, sand dollar sea urchin and a crab species were also found during the survey (**Table 3**).

Table 4 shows the number of species found at each station between February 2012 and September 2021. It shows diversity has not changed significantly compared to previous years, and that diversity between Control, Reference and Impact stations do not vary greatly.

Table 4. Number of species found at each Station from February 2012 to September 2021

Station	C1	C2	C3	C4	C5	C6	C7	R1	R2	R3	R4
Feb 2012	10	5	5	7				8	8	5	5
Sept 2012	3	6	4	4				6	3	4	5
March 2013	4	5	7	7				6	5	6	5
Sept 2013	6	6	3	7				5	6	5	4
March 2014	4	3	5	5				6	4	5	3
Sept 2014	3	4	4	8				6	5	6	6
March 2015	3	3	5	3				5	3	6	5
Sept 2015	5	4	4	3				5	3	4	6
March 2016	6	4	5	5	5			6	5	6	4
Sept 2016	7	3	6	5	4	8		8	4	5	6
March 2017	2	4	5	3	5	5		4	5	4	5
Sept 2017	4	4	4	4	4	5		4	3	6	5
March 2018	4	4	8	4	4	3	5	7	8	5	4
Sept 2018	3	4	4	6	5	5	5	4	4	5	5
March 2019	6	3	4	4	6	5	3	4	5	7	3
Sept 2019	5	6	5	5	4	5	6	4	3	7	4
March 2020	5	6	6	4	7	3	6	6	6	7	4
August 2020	6	5	4	4	3	5	5	4	5	7	4
March 2021	5	6	3	4	5	2	2	5	4	7	4
Sept 2021	4	4	7	6	7	7	6	5	4	8	3
Station	R5	R6	R7	R8	R9	R10	R11	IM1	IM2	IM3	IM4
Feb 2012								7	4	4	5
Sept 2012								4	4	3	5
March 2013								7	5	5	5
Sept 2013								4	3	4	5
March 2014	4	3						5	9	4	5
Sept 2014	3	3						5	6	3	6
March 2015	3	3						5	4	4	5
Sept 2015	5	4						5	5	4	4
March 2016	4	4	8					6	6	3	4
Sept 2016	6	7	7	5	8			6	4	6	3
March 2017	4	4	4	3	5			3	4	3	4
Sept 2017	4	4	4	5	4			5	5	5	5
March 2018	6	3	4	3	4	4	4	5	7	3	4
Sept 2018	5	4	6	4	5	4	4	4	8	4	4
March 2019	5	4	4	4	4	6	6	5	5	2	4
Sept 2019	4	4	5	4	4	4	3	6	5	7	5
March 2020	4	4	8	3	4	4	4	7	7	4	4
August 2020	7	5	8	4	5	5	4	5	6	4	6
March 2021	5	5	5	4	6	5	8	7	7	5	7
Sept 2021	4	4	7	3	4	6	7	3	7	4	4

Table 5 shows the mean number of marine benthic organisms for each station and species sampled in September 2021 (Sieve boxes only). The table includes depths relative to AHD for each station.

Table 5 Mean number of marine benthic organisms at Control (C), Reference (R) and Impact Stations (IM)

	Depth (m)	Polychaete thin	Polychaete mud	Polychaete thick	Gastropod <i>Nassarius</i>	Gastropod <i>Bedevela</i>	Bivalve <i>Corbula</i>	Bivalve <i>Soletellina</i>	Bivalve <i>Paphia</i>	Bivalve <i>Anadara</i>	Bivalve <i>Cyamiomactra</i>	Bivalve <i>Trichomya</i>	Bivalve <i>Dosinia</i>	Bivalve <i>Saccostrea</i>	Ophuroid	Echinoid	Fish	Crab
C1	-4.5	15.0	0.2	0.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C2	-4.5	6.8	1.2	0.0	0.0	0.0	2.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C3	-5.5	7.6	1.0	0.2	0.0	0.0	0.6	2.6	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C4	-6.0	28.6	0.0	0.0	0.0	0.0	1.2	3.6	0.0	0.0	0.0	18.6	0.8	0.4	0.0	0.0	0.0	0.0
C5	-6.0	1.6	2.2	1.0	0.0	0.0	0.0	1.6	0.0	0.0	1.2	0.0	0.0	0.0	1.4	0.2	0.0	0.0
C6	-5.5	25.2	0.6	0.0	0.0	0.0	0.4	4.2	0.0	0.0	0.0	12.0	0.2	0.4	0.0	0.0	0.0	0.0
C7	-5.5	3.2	3.4	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.4	0.0	0.0
R1	-4.5	8.8	0.2	0.0	0.0	0.0	2.0	6.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R2	-4.5	14.0	0.0	0.0	0.0	0.0	1.4	5.4	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
R3 (IM5)	-5.5	12.0	0.8	0.4	0.0	0.0	0.8	2.0	0.0	0.0	2.8	26.4	0.2	0.0	0.0	0.0	0.0	0.0
R4 (IM6)	-6.0	1.6	0.0	0.0	0.0	0.0	2.2	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R5 (IM7)	-5.5	5.6	0.0	0.0	0.0	0.0	1.6	2.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R6	-6.0	2.2	0.6	0.0	0.0	0.0	3.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R7	-6.0	2.8	0.5	0.5	0.0	0.0	0.0	0.5	0.0	0.0	1.5	13.3	0.0	0.0	0.0	0.0	0.0	0.3
R8	-5.5	3.0	0.0	0.0	0.0	0.0	0.8	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R9	-4.5	4.2	0.2	0.0	0.0	0.0	2.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R10	-5.5	5.6	0.6	0.2	0.0	0.0	1.2	4.8	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R11	-6.0	0.2	7.4	0.2	0.0	0.0	0.6	4.8	0.2	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IM1	-4.5	11.4	0.0	0.0	0.0	0.0	2.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IM2	-4.5	14.0	0.2	0.2	0.0	0.0	0.4	1.0	0.0	0.0	1.0	25.6	0.0	0.0	0.0	0.0	0.0	0.0
IM3	-5.5	7.6	0.0	0.0	0.0	0.0	1.6	5.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IM4	-6.0	4.2	0.2	0.0	0.0	0.0	0.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

September 2021

Analysis of Data

Statistics

Principal component (PC) biplots or multivariate scatterplots produced by the R-statistical program were used to explore the relationship between benthos study sites, animal species found in the sediment, and water quality variables at the lake bed. Points in the matrix were obtained by standardizing the data by subtracting the variable (column) mean from the species (cell) mean and dividing the subsequent value by the variable or column mean (Gabriel, 1971; Gabriel and Odoroff, 1990).

Biplots

A biplot is a particular kind of scatterplot used for displaying multivariate data which results from mapping a matrix of field observations, \mathbf{X} , into a 2-dimensional graphical display. The name derives from the fact that this is a *joint* display of the rows and columns of \mathbf{X} . Sample units (rows) are shown by points and variables (columns) by arrows. Biplots have several appealing properties. Firstly, they are capable of presenting graphically large amounts of information on composition, structure and relationships with surpassing ease and efficiency. It enables a truly global look at the data.

Interpretation of Biplots

Sample Points

- The proximity of any pair of sample points is directly proportional to their resemblance with respect to all the variables studied, the closer the points the greater the resemblance;
- Points close to the origin tend to be representative of the sample as a whole, that is, they tend to be average samples,
- Points far from the origin are atypical in that they possess usually large or small values of one or more variables.

Variable Arrows

- The origin of the configuration of arrows marks the mean value of each variable, an important reference point.
- Arrows can be extended through the origin (by eye) in either direction to any desired extent.
- With increasing distance from the origin along an arrow in the direction of an arrow, the value of the variable increases steadily above its mean; similarly, with increasing distance from the origin along an arrow extended by eye in the opposite direction, the value of a variable falls increasingly below its mean.
- Arrow length is directly proportional to the correlation coefficient, r , between the two variables. The smaller the angle the stronger the correlation. Variables x and y with arrows subtending an angle of:
 1. 0° are perfectly correlated $r_{xy} = 1$
 2. 90° are strictly uncorrelated $r_{xy} = 0$
 3. $0^\circ \leq \text{Angle} < 90^\circ$ $0 \leq r_{xy} < 1$
 4. $90^\circ \leq \text{Angle} \leq 180^\circ$ $0 < r_{xy} < -1$

From 3 it follows that variables whose arrows subtend angles less than 90° are positively correlated, and from 4, that variables whose arrows subtend angles greater than 90° are negatively correlated; in particular, where the angle is 180° , $r_{xy} = -1$.

In general, long arrows can be regarded as more useful in interpretation than short arrows. They have greater influence in differentiating sites.

Relationship between benthic organisms and stations

Figure 6 shows a biplot representing the relationship between marine benthic organisms and stations for the September 2021 survey.

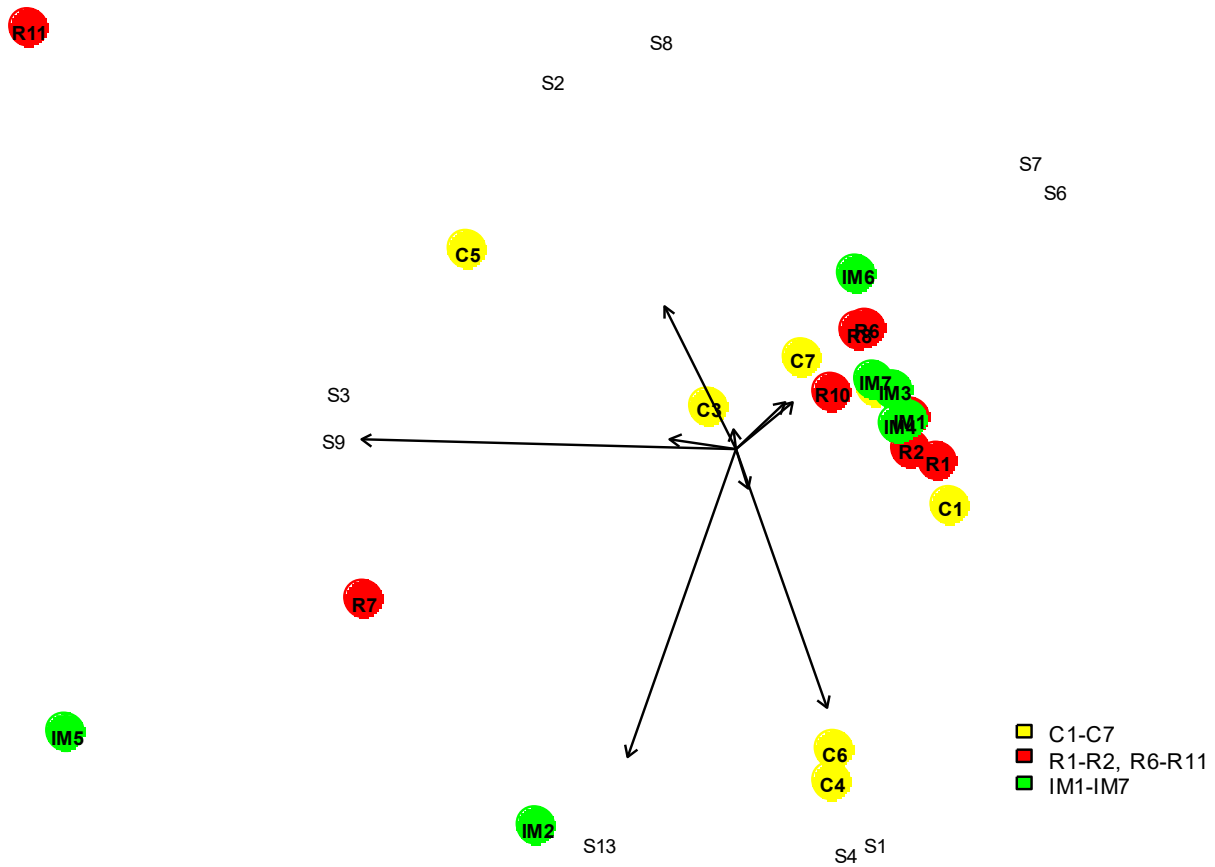


Figure 6. Relationship between benthic organisms and sampling stations – Lake Macquarie benthos survey September 2021 (PC biplot goodness-of-fit: 74.56%)

Station		Organism
C1 – Control Station C1	R8 – Reference Station R8	S1 <i>Sthenelais pettiboneae</i>
C2 – Control Station C2	R9 – Reference Station R9	S2 Polychaete mud
C3 – Control Station C3	R10 – Reference Station R10	S3 Polychaete thick
C4 – Control Station C4	R11 – Reference Station R11	S4 <i>Dosinia sculpta</i>
C5 – Control Station C5	IM1 – Impact Station IM1	S6 <i>Corbula truncata</i>
C6 – Control Station C6	IM2 – Impact Station IM2	S7 <i>Soletellina alba</i>
C7 – Control Station C7	IM3 – Impact Station IM3	S8 <i>Paphia undulata</i>
R1 – Reference Station R1	IM4 – Impact Station IM4	S9 <i>Cyamiomactra mactriodes</i>
R2 – Reference Station R2	IM5 – Impact Station IM5	S13 <i>Trichomya hirsuta</i> (mussels)
R6 – Reference Station R6	IM6 – Impact Station IM6	
R7 – Reference Station R7	IM7 – Impact Station IM7	

Six species differentiated sampling stations during the September 2021 sampling period (**Figure 6**):

- The Polychaete *Sthenelais pettiboneae* (S1) characterised the Control Stations C4 and C6.
- The Polychaete mud worm designated S2 characterised stations C5 and R11.
- The bivalves *Soletellina alba* (S7) and *Corbula truncata* (S6) defined the Control Stations C1, C2, C7; the Reference Stations R1, R2, R6, R8, R9, R10; and the Impact Stations IM1, IM3, IM4, IM6, and IM7.
- The bivalve *Trichomya hirsuta* differentiated the Reference Station R7; the Impact Stations IM2, IM5; and the Control Stations C4 and C6.
- The bivalve *Cyamiomactra mactriodes* (S9) defined station R7, IM2 and IM5.

Sediment Analysis

The sediment in the mud basin of Lake Macquarie off Summerland Point, in Chain Valley Bay and Bardens Bay was largely composed of fine grey/ black silty mud that was mildly plastic in nature (able to be molded into a coherent shape) or was very fine and fluid. Shell fragments were present in the sediment at most stations. The sediment at C5 consisted of fine to medium black sand.

A description of the sediment samples collected in September 2021 is shown in **Table 6**.

Table 6. Description of Sediment collected from Sampling Stations in September 2021.

Station	Description	Volume (mL)
C1	Fine grey silty mud	250
C2	Fine grey silty mud with shell fragments	250
C3	Fine grey silty mud	250
C4	Fine grey silty mud	250
C5	Grey sand and silt	250
C6	Fine grey silty mud	250
C7	Fine grey silty mud	250
R1	Fine grey silty mud	250
R2	Fine grey silty mud with shell fragments	250
R3 (IM5)	Fine grey silty mud with some shell fragments	250
R4 (IM6)	Fine grey silty mud with some shell fragments	250
R5 (IM7)	Fine grey silty mud with some shell fragments	250
R6	Fine grey silty mud with some shell fragments	250
R7	Fine grey silty mud with some shell fragments	250
R8	Fine grey silty mud	250
R9	Fine grey silty mud with some shell fragments	250
R10	Fine grey silty mud with some shell fragments	250
R11	Fine grey silty mud with some shell fragments	250
IM1	Fine grey silty mud with some shell fragments	250
IM2	Fine grey silty mud with some shell fragments	250
IM3	Fine grey silty mud with some large shell fragments	250
IM4	Fine grey silty mud with some shell fragments	250

Table 7 shows the percentage of silt in the sediment at each station from February 2012 to September 2021.

Table 7. Percent mud in sediment from each station – February 2012 to September 2021

	Sep-16	Mar-17	Sep-17	Mar-18	Sep-18	Mar-19	Sep-19	Mar-20	Aug-20	Mar-21	Sep-21
	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud	% Mud
C1	90	68	94	80	80	80	100	94	90	75	95
C2	80	92	80	80	64	70	100	86	95	94	95
C3	90	80	100	92	80	100	100	96	100	82	100
C4	75	98	100	80	40	80	100	92	100	60	95
C5	90	92	80	92	64	60	80	29	80	35	70
C6	80	92	100	84	60	70	100	100	95	75	98
C7				80	60	80	100	29	90	61	80
R1	70	96	100	80	80	80	96	96	70	55	100
R2	90	80	92	80	84	84	80	80	80	60	90
R3 (IM5)	90	96	100	80	96	92	80	92	95	60	52
R4 (IM6)	90	96	100	78	92	80	84	98	75	79	95
R5 (IM7)	90	88	100	70	80	80	100	94	100	95	95
R6	98	98	80	80	78	96	100	92	85	95	85
R7	90	94	92	50	80	98	84	92	95	94	90
R8	80	98	100	80	82	92	100	92	90	95	95
R9				80	84	70	100	80	95	60	90
R10				80	96	80	84	80	80	75	85
R11				80	30	50	92	100	90	75	98
IM1	90	76	96	80	60	80	80	70	95	90	70
IM2	98	98	98	92	70	60	80	80	80	95	95
IM3	99	96	100	92	96	80	92	90	95	95	98
IM4	99	84	92	100	80	80	92	92	90	95	98

Water Quality Profiles – September 2021

At each station, a water quality profile was taken using a calibrated Yeo-Kal 618RU Analyser. Measurements were taken at the surface and at 0.5m intervals to the lakebed. Units of measurement were: Temperature (TEMP) - degrees Celsius; Conductivity (COND) - mS/cm; Salinity (SAL) - parts per thousand; pH; Dissolved Oxygen - % saturation and mg/L; and Turbidity (TURB) - NTU (**Table 8**).

Up until recently, little significant rain has fallen in the catchments of Lake Macquarie. Annual rainfall in the Cooranbong (Lake Macquarie AWS) region was 839.8 mm in 2017; 859.8 mm in 2018 and 763.4 mm in 2019 (BOM Station Number 061412). The lack of rainfall caused the salinity of the water column to become very high (over 39 parts per thousand by March 2019) and almost uniform from surface to bottom. The Lake Macquarie region has since received relatively heavy rainfall in August (111.2 mm) 2019; February (335.4 mm), March (173.0 mm), July (184.0 mm), October (150.8 mm) and December (220.6 mm) 2020 (BOM Station Number 061412); and January (104.8 mm), February (155.8 mm) and March (421.6 mm) 2021. This rainfall lowered the salinity of water in the lake to around 36 parts per thousand in 2019, 33 parts per thousand in March 2020, and 32 parts per thousand in August 2020. Since March 2021, total monthly rainfall has been low, ranging from 26 mm in May 2021 to 64.8 mm in August 2021. Only 19.2 mm has fallen in the Cooranbong catchment in September 2021. Salinity of water in Lake Macquarie is consequently becoming more saline and is currently around 35 parts per thousand (**Table 8**).

The physical characteristics of the bottom waters of Lake Macquarie in September 2021 were as follows:

- Water Temperature ranged from 17.49°C to 18.76°C. Mean water temperature was 18.05°C.
- Conductivity ranged from 53.59 mS/cm to 53.82 mS/cm. Mean conductivity was 53.69 mS/cm.
- Salinity ranged from 35.35 ppt to 35.52 ppt. Mean salinity was 35.44 ppt.
- Turbidity ranged from 7.1 NTU to 25.8 NTU. Mean turbidity was 11.65 NTU.
- pH ranged from 7.90 and 8.06. Mean pH was 7.98.
- Dissolved oxygen (% saturation) ranged from 84.6% to 101.0%. Mean dissolved oxygen was 91.40% saturation.
- Dissolved oxygen (mg/L) ranged from 6.41 mg/L to 7.71 mg/L. Mean dissolved oxygen was 6.97 mg/L (**Appendix 1**).

The physical characteristics of the bottom water are shown in **Table 8**.

Table 8 Physical characteristics of the bottom water - 9th to 11th September 2021

Station	Temperature °C	Conductivity mS/cm	Salinity ppt	Dissolved Oxygen % sat	Dissolved Oxygen mg/L	pH	Turbidity NTU
C1	18.38	53.63	35.40	84.60	6.41	8.07	10.6
C2	17.88	53.65	35.41	89.90	6.90	8.10	15.4
C3	17.66	53.69	35.45	92.90	7.17	8.12	25.8
C4	17.99	53.73	35.47	86.20	6.61	8.10	9.4
C5	17.58	53.77	35.50	93.00	7.16	8.12	7.4
C6	18.23	53.73	35.47	92.10	7.02	8.11	9.3
C7	18.03	53.82	35.35	94.70	7.27	8.13	9.1
R1	18.22	53.70	35.45	85.80	6.57	8.09	10.1
R2	18.76	53.60	35.39	87.50	6.62	8.08	10.1
R3 (IM5)	18.00	53.63	35.40	97.40	7.45	8.13	7.1
R4 (IM6)	17.97	53.65	35.43	97.00	7.41	8.13	7.4
R5 (IM7)	17.99	53.71	35.46	87.80	6.73	8.12	9.0
R6	18.08	53.68	35.44	85.00	6.50	8.09	11.7
R7	17.49	53.73	35.48	92.80	7.17	8.14	14.5
R8	18.13	53.73	35.48	87.00	6.65	8.09	9.9
R9	18.35	53.73	35.49	91.10	6.93	8.10	8.3
R10	18.02	53.75	35.50	87.00	6.64	8.10	12.3
R11	17.60	53.79	35.52	93.70	7.23	8.13	13.0
IM1	18.60	53.63	35.41	91.00	6.50	8.11	10.1
IM2	18.29	53.60	35.39	101.00	7.71	8.12	10.8
IM3	18.24	53.59	35.38	100.50	7.60	8.11	16.1
IM4	17.81	53.63	35.41	92.70	7.16	8.10	18.8

Conclusions

The results from the September 2021 benthic communities monitoring results show compliance to the Schedule 4 Environmental Conditions - underground mining of SSD5465 - Modification 2 in the Performance Measures table with respect to the Subsidence Impact Performance Measure for Benthic communities which display nil to minor environmental consequences due to underground mining.

The below summary of findings outlines the historical basis for this compliance statement and the compliance is detailed in the table below.

Conditions from SSD-5465 – Mod 4	Compliance Status and Comments
Schedule 4 Environmental Conditions – underground mining Performance Measures – Natural Environment Biodiversity – Benthic Communities Subsidence Impact Performance Measure – Minor environmental consequences, including minor changes composition and/or distribution.	Compliant – See section 16 - Conclusions
Measurements undertaken by generally accepted methods.	Compliant – See section 4 and 5
Measures Methods fully described.	Compliant – See section 4 and 5

In September 2021, 22 benthic stations were sampled in the study area. A total of 2096 organisms greater than 1mm in size were found, comprising 13 species. This compares with the results from September 2019 and September 2020 where 815 and 1367 organisms respectively were recorded representing approximately twelve species. As in previous years, polychaete worms and bivalve molluscs were the most frequently encountered animals. Stations were distinguished by the relative abundance of the dominant species. Water depth was not in any way important in determining the species composition at a station.

Physical variables such as salinity, conductivity and turbidity of the bottom water had little influence on the species composition of the benthos. Dissolved oxygen concentration, however, can have a major effect on abundance. Major extinction events have occurred in the mud basin of Lake Macquarie. The evidence for this lies in the presence of large numbers of intact but dead bivalve shells entombed in the mud. The cause of extinction events appears to be prolonged dissolved oxygen depletion of bottom water. Prolonged dissolved oxygen depletion of the bottom water was measured during the water quality study conducted by Laxton and Laxton (1983 to 1997). Low concentrations of dissolved oxygen in the bottom water were also recorded during the March 2020 sampling period. In September 2021, dissolved oxygen levels of the bottom waters of Lake Macquarie ranged from 84.6% saturation to 101.0% saturation.

Bottom sediment in the study area was composed of fine black mud with varying proportions of black sand and shell fragments. In March 2020 some changes to the composition of the upper 100mm of the bottom sediments were detected. At Stations C5 and C7 the sediment comprised mostly sand where previously it was fine black silt. In September 2021, sediment comprised mostly of fine grey/black silty mud with some

shell.

These results appear to support the notion that increasing the water depth by the predicted 0.8m subsidence has, to date, had little to no discernible effect on the composition and abundance of organisms making up the benthos of the mud basin.

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Appendix 5: Biodiversity Monitoring Report

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		1	Environmental Compliance Coordinator	Page 101 of 108
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Biodiversity monitoring 2021

Chain Valley Colliery

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1 Introduction

1.1 Rehabilitation monitoring plan requirements

Chain Valley Colliery (CVC) and Mannering Colliery (MC) are underground coal mines located at the southern extent of Lake Macquarie, approximately 60 km south of Newcastle. Both sites are operated by Great Southern Energy Pty T/a Delta Coal (Delta Coal) and produce thermal coal for the domestic and export markets.

CVC and MC operate in accordance with Development Consent SSD-5465 and Project Approval MP06_0311 respectively. SSD-5465 required the preparation of Chain Valley Colliery Biodiversity Management Plan (BMP, EMGA 2012). The original BMP prepared in 2013 has since had multiple revisions. The monitoring surveys conducted within this monitoring period and referenced throughout the report are in accordance with the revised 2019 BMP (EMM 2019).

The BMP (EMM 2019) includes an annual terrestrial biodiversity monitoring program comprising of:

- condition and composition of an area of Swamp Oak Forest;
- condition of vegetation adjacent to the ventilation shafts and fans;
- mapping the location and distribution of weeds; and
- abundance and distribution of feral animal use.

This report aims to detail the annual monitoring results which will be reviewed and assessed against trigger values and condition criteria identified in the BMP (EMM 2019).

2 Methods

2.1 Condition and composition of Swamp Oak Forest

The condition and composition of an area of Swamp Oak Forest adjacent to the sediment ponds in the pit top area (Figure 2.1) and downstream of the D10 discharge was monitored in line with the method set out in the BMP (EMGA 2016), including:

- completion of two biobanking plots as per Section 11.2 of the BMP (EMM 2019) and the proforma in Appendix 1 of the 2014 BMP (EMGA 2014); and
- a comparison of the collected plot data against the previous years' data, specifically to monitor dieback of Broad-leaved Paperbark (*Melaleuca quinquenervia*) observed in Plot 1 during the 2017 monitoring, as well as to determine the total weighted scores for both plots to assess any other change in condition and against the trigger value identified within the BMP (EMM 2019).

2.2 Condition of vegetation adjacent to the ventilation shafts and fans

Condition monitoring of vegetation surrounding the ventilation shaft area includes (Figure 2.2):

- Observation of two Rough-barked Apple (*Angophora floribunda*) trees directly adjacent to the Ventilation Shaft, as shown in Figure 9 of the BMP (EMGA 2016), or assessment of condition and health due to their proximity to the ventilation shaft;
- the completion of four photo points, as per Figure 9 of the BMP (EMGA 2016) and assessment of any change in vegetation condition from 2017; and
- the recording of dominant species (canopy, mid-storey, understorey and ground layers) around the periphery of each side of the Ventilation Shaft area.

2.3 Location and distribution of weeds

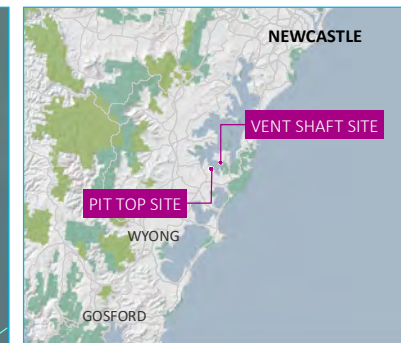
Weed monitoring targets existing locations and significant new weed occurrences in the eastern management zone (within the Swamp Oak Forest) as well as at the ventilation shaft area.

2.4 Abundance and distribution of feral animal use

The monitoring of feral animals is undertaken in conjunction with the weed monitoring and as per the proforma in Appendix 1 of the BMP (EMGA 2014) and includes recording of activity of feral species by searching for tracks, diggings, burrows and sighting of individuals.

2.5 Limitations

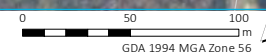
The surveys completed within this report were conducted during February 2022. However, it should be noted these surveys were completed for the 2021 monitoring period.



- KEY**
- FDI100
 - Plot (20x20 m) and transect (20x50 m)
 - Local road
 - Vehicular track
- Weed monitoring**
- Ground Asparagus (*Asparagus aethiopicus*)
 - Pampas Grass (*Cortaderia selloana*)
 - Patch 1
 - Patch 2
- Strahler stream order**
- 1st order
 - 2nd order
- INSET KEY**
- Main road
 - NPWS reserve
 - State forest

Pit top monitoring eastern zone

Source: EMM (2022); DFSI (2017); DPI (2013); GA (2011); ASGC (2006)



Chain Valley Colliery
Biodiversity monitoring 2021
Figure 2.1





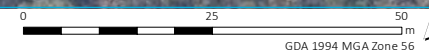
- KEY**
- FDI100
 - Photo point
 - Vehicular track
 - Weed monitoring**
 - Lantana (*Lantana camara*)
 - Lantana (*Lantana camara*) plant plus seedlings
 - Patch of Fishbone fern (*Nephrolepis cordifolia*)
 - Senna pendula - patch with larger plants and seedlings, plus Lantana
 - Senna pendula - patch with larger plants and seedlings, plus one Lantana plant
 - Senna pendula patch plus Bitou bush seedlings
 - Strahler stream order**
 - 1st order
 - 2nd order

Ventilation shaft monitoring

Chain Valley Colliery
Biodiversity monitoring 2021
Figure 2.2



Source: EMM (2022); DFSI (2017); DPI (2013)



3 Results

3.1 Condition and composition of Swamp Oak Forest

The detailed monitoring results are provided in Appendix A, with the location of monitoring plots provided in Appendix B and detailed descriptions of the findings for each plot provided below. The weighted score for the combination of the two plots is 68.1%, this is consistent with the score of the previous year (2020), and an increase compared to 65% (EMM 2021). No remedial actions are required as the score is above the minimum trigger of 60% (EMM 2019).

3.1.1 Plot 1

The condition and composition of the vegetation within Plot 1 was comparable with the monitoring results from the previous year (EMM 2021). The Swamp Oak has had a slight decrease in coverage from 21.5 % to 21%. The ground cover was largely unchanged with the addition of one native species; Broad-leaved Paperbark, which was a small seedling. Two weed species, a *Senecio sp.* and Rhodes grass (*Chloris gayana*) that were identified during the 2020 monitoring were absent. The cover percentage of exotics within the plot has decreased by 0.1% from the previous year. Weeds are more prevalent adjacent the plot, alongside the access track. The community appears to have reach an equilibrium with the Swamp Oak forest persisting in the same condition.

3.1.2 Plot 2

The condition and composition of the vegetation within Plot 2 was broadly comparable with the 2020 monitoring (EMM 2021). The Swamp Oak has had a slight decrease in coverage from 23.5 % to 23%, however Swamp Oak recruitment was observed. The ground cover was largely unchanged with one additional native species recorded; Broad-leaved Paperbark and one less weed species recorded (*Senecio sp.*) compared to 2020 (EMM 2021). The cover percentage of exotics remains unchanged from 2020 monitoring, however no Bitou Bush (*Chrysanthemoides monilifera*) or Cassia (*Senna pendula var. glabra*) were recorded and only two Ground Asparagus (*Asparagus aethiopicus*) plant observed. Weeds were frequently recorded outside of the plot. These will require ongoing management, to prevent them increasing in prevalence at the expense of native species.

3.2 Condition of vegetation adjacent to the ventilation shafts and fans

A photolog of the photo monitoring points and tree monitoring points are provided in Appendix B, with a summary of observations provided in Table 3.1.

Vegetation around the ventilation shaft compound was cleared for an asset protection zone (APZ) prior to the 2017 monitoring. This did not affect any of the tree monitoring points, however has affected the photo point monitoring, with obvious clearance of shrubs and regenerating small trees close compound.

When clearance for the APZ is taken into account, vegetation condition was broadly similar to previous years, with no observable negative impact from the vent shaft. Ground cover and mid-storey cover appeared to be regenerating well, with increased height and density of native species during this monitoring periods surveys compared to the previous year (EMM 2021). Canopy species around the APZ appeared particularly healthy with dense new growth. The most likely explanation for this, is the regular rainfall for the last year to two years. In contrast, dieback observed during 2019 (EMM 2020) was following two year of less than average rainfall.

Table 3.1 Monitoring point observations

Monitoring point	2021 monitoring observations
1	Vegetation appears healthy with slight growth of canopy species and midstorey species. Not comparable with the 2016 monitoring given the clearing for an APZ.
2	Vegetation appears healthy with observable growth of canopy species and midstorey species compared to previous monitoring events.
3	Vegetation has slightly increased in height and density with native midstorey species growth particularly prevalent.
4	Vegetation appears healthy with slight observable growth of canopy species and midstorey species. Not comparable with the 2016 monitoring given the clearing for an APZ.
Tree 1	Tree appears healthy with new growth observed, dense foliage within the crown and no dieback observed.
Tree 2	Tree appears healthy with new growth observed and dense foliage within the crown. Small area of dieback that was recorded in the previous year has mostly regrown into dense foliage, very small patch of dieback remains. The tree has increase foliage cover compared to the 2016 BMP photograph (EMM 2017).

3.3 Location and distribution of weeds

Weed prevalence has been documented in Appendix C, with a list of recommended control measures provided for each area. Locations of the weeds are provided in Appendix C.

3.4 Abundance and distribution of feral animal use

In the 2020 monitoring four feral animal species were recorded using the presence of scats as indicators. Seven scats from the European Fox (*Vulpes vulpes*) and one scat from the Domestic Dog (*Canis lupus*) were recorded (Appendix D). There was a decrease in the amount of feral animal species recorded during the 2021 monitoring period with only one scat from the European Fox observed.

4 Summary

The 2021 biodiversity monitoring period established that the vegetation and habitat values within the subject areas was broadly similar to the 2020 monitoring.

Observations and photo monitoring at the vent shaft area demonstrated increased growth of native vegetation, particularly observable in the regeneration of the canopy dieback recorded in 2020 in photo point 2 and tree 2. No remedial actions are required as the condition score remained above the trigger threshold as per the BMP (EMM 2019).

Whilst evidence of successful weed control was observed in several areas, ongoing control is recommended to suppress those weeds still present and to prevent reestablishment in treated areas.

References

EMGA 2012, Chain Valley Colliery Biodiversity Management Plan Environmental Management Plan, prepared for Lake Coal Pty Ltd by EMGA Mitchell McLennan Pty Limited.

EMGA 2014, Chain Valley Colliery Biodiversity Management Plan Environmental Management Plan, prepared for Lake Coal Pty Ltd by EMGA Mitchell McLennan Pty Limited.

EMGA 2016, Chain Valley Colliery Biodiversity Management Plan Environmental Management Plan, prepared for Lake Coal Pty Ltd by EMGA Mitchell McLennan Pty Limited.

EMM 2017, *Biodiversity monitoring 2016 Chain Valley Colliery*, prepared for Delta Coal by EMM Consulting Pty Ltd.

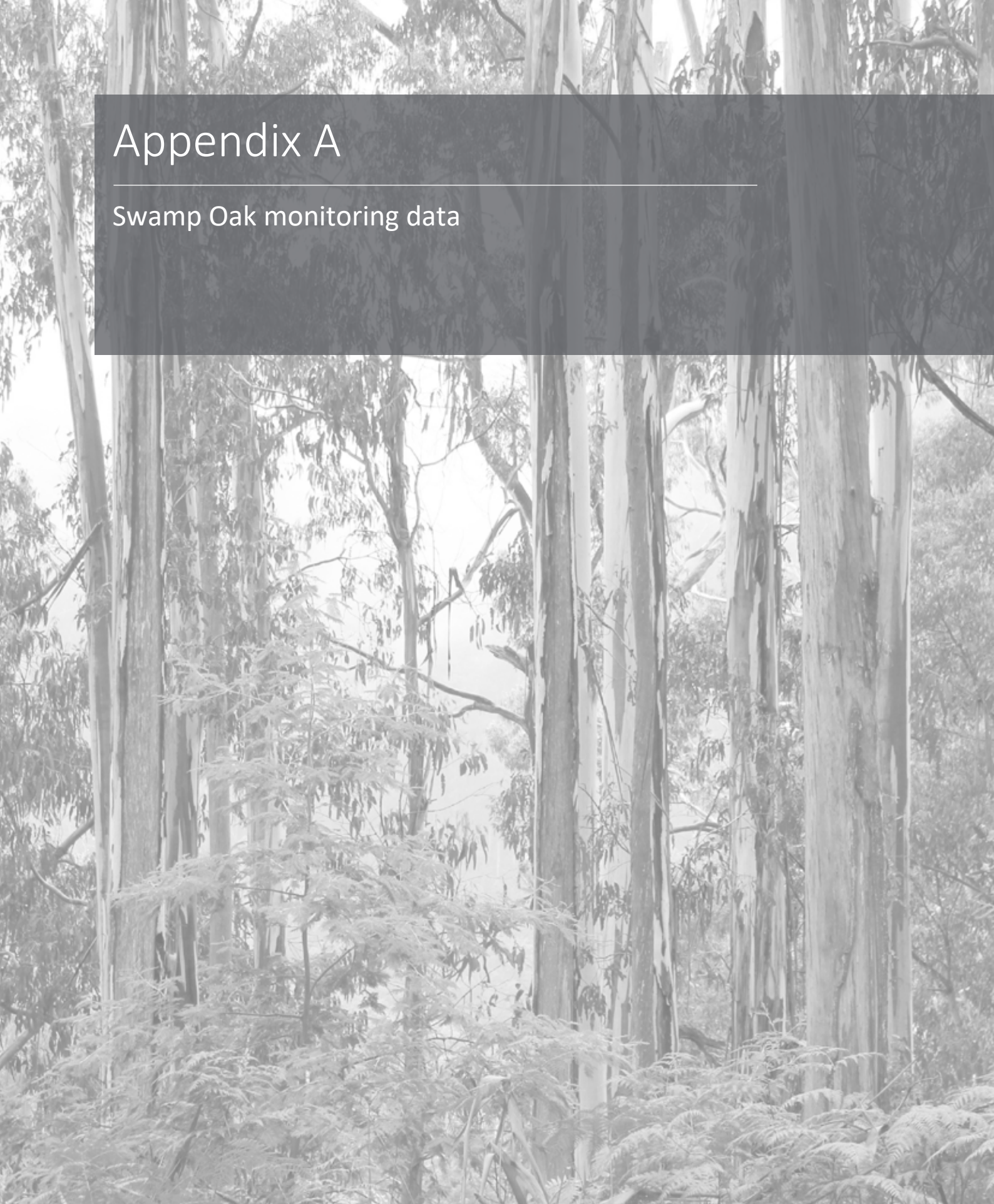
EMM 2019, Chain Valley Colliery Biodiversity Management Plan Environmental Management Plan, prepared for Lake Coal Pty Ltd by EMM Consulting Pty Ltd.

EMM 2020, *Biodiversity monitoring 2019 Chain Valley Colliery*, prepared for Delta Coal by EMM Consulting Pty Ltd.

EMM 2021, *Biodiversity monitoring 2020 Chain Valley Colliery*, prepared for Delta Coal by EMM Consulting Pty Ltd.

Appendix A

Swamp Oak monitoring data



Plot 1 Swamp Oak Floodplain Forest

Photo no: Plot 1

Date: 11/02/2022

Data collectors:
E. Dodd

Plot/transect: 1

Coordinates start transect

Easting: 365034.00 m E
Northing: 6329516.00 m S

Coordinates finish transect

Easting: 365012.00 m E
Northing: 6329471.00 m S

**Native overstorey cover %
(every 5m)**

1	30
2	20
3	20
4	10
5	20
6	25
7	35
8	15
9	25
10	10
AVG	21

Species	Common Name	Native
<i>Asparagus aethiopicus</i>	Ground asparagus	n
<i>Baumea juncea</i>	Twig-rush	y
<i>Casuarina glauca</i>	Swamp Oak	y
<i>Fimbristylis ferruginea</i>	Rusty Sedge	y
<i>Gahnia clarkei</i>	Tall Saw-sedge	y
<i>Juncus kraussii</i>	Sea Rush	y
<i>Selliera radicans</i>	Creeping Brookweed	y
<i>Sarcocornia quinqueflora</i>	Samphire	y
<i>Sporobolus virginicus</i>	Marine Couch	y
<i>Melaleuca quinquinervia</i>	Broad-leaved Paperbark	y

Native plant species (#) (plot): 9

Regeneration (%) (plot): 1

Trees with Hollows (#) (plot): 0

Total length of fallen logs (m) (plot): 5

Layer	Cover in 20x20m plot (%)
Native midstorey	0
Native ground (grasses)	8
Native ground (shrubs)	0
Native ground (other)	100.3
Exotics	0.2

Weeds

Weeds were largely limited to one Ground Asparagus plant. Weeds are more prevalent adjacent the plot, alongside the access track.

Dieback of canopy

No additional dieback of canopy species from the last monitoring period. Individual Swamp Oak trees appear to be stable.

Water

Soils were heavily waterlogged with ponding areas and channels containing flowing waters.

Comments

A shoal of juvenile Mullet (*Mugil* sp.) were observed in the channels within the plot. One Red necked Wallaby was observed (*Notamacropus rufogriseus*) outside of the plot in less mesic vegetation. One Broad-leaved Paperbark seedling was observed.

Plot 2 Swamp Oak Floodplain Forest

Photo no: Plot 2

Date: 11/02/2022

Data collectors:
E. Dodd

Plot/transect: 2

Coordinates start transect

Easting: 365085

Northing: 6329629

Coordinates finish transect

Easting: 365084

Northing: 6329580

**Native overstorey cover %
(every 5m)**

1	35	
2	20	
3	20	
4	30	
5	25	
6	20	
7	30	
8	15	
9	15	
10	20	
AVG	23	

Native plant species (#) (plot):

10

Regeneration (%) (plot):

1

Trees with Hollows (#) (plot):

0

Total length of fallen logs (m) (plot):

19

Layer	Cover in 20x20m plot (%)
Native midstorey	0
Native ground (grasses)	6
Native ground (shrubs)	0
Native ground (other)	98
Exotics	0.1

Species	Common Name	Native
<i>Asparagus aethiopicus</i>	Ground asparagus	n
<i>Baumea juncea</i>	Twig-rush	y
<i>Casuarina glauca</i>	Swamp Oak	y
<i>Fimbristylis ferruginea</i>	Rusty Sedge	y
<i>Gahnia clarkei</i>	Tall Saw-sedge	y
<i>Juncus kraussii</i>	Sea Rush	y
<i>Samolus repens</i>	Creeping Brookweed	y
<i>Selliera radicans</i>	Swamp Weed	y
<i>Sporobolus virginicus</i>	Marine Couch	y
<i>Sarcocornia quinqueflora</i> su	Samphire	y
<i>Melaleuca quinquinervia</i>	Broad-leaved Paperbark	y

Weeds

No Bitou Bush or Cassia was recorded within the plots and only two Ground Asparagus were recorded. Weeds were frequently recorded outside of the plot.

Dieback of canopy

No additional dieback of canopy species from the last monitoring period. Individual Swamp Oak appear to have a stable coverage.

Water Soils waterlogged throughout majority of area, occasional areas of shallow pooled water.

Comments

Swamp Oak recruitment observed. One Red-necked Wallaby was observed.

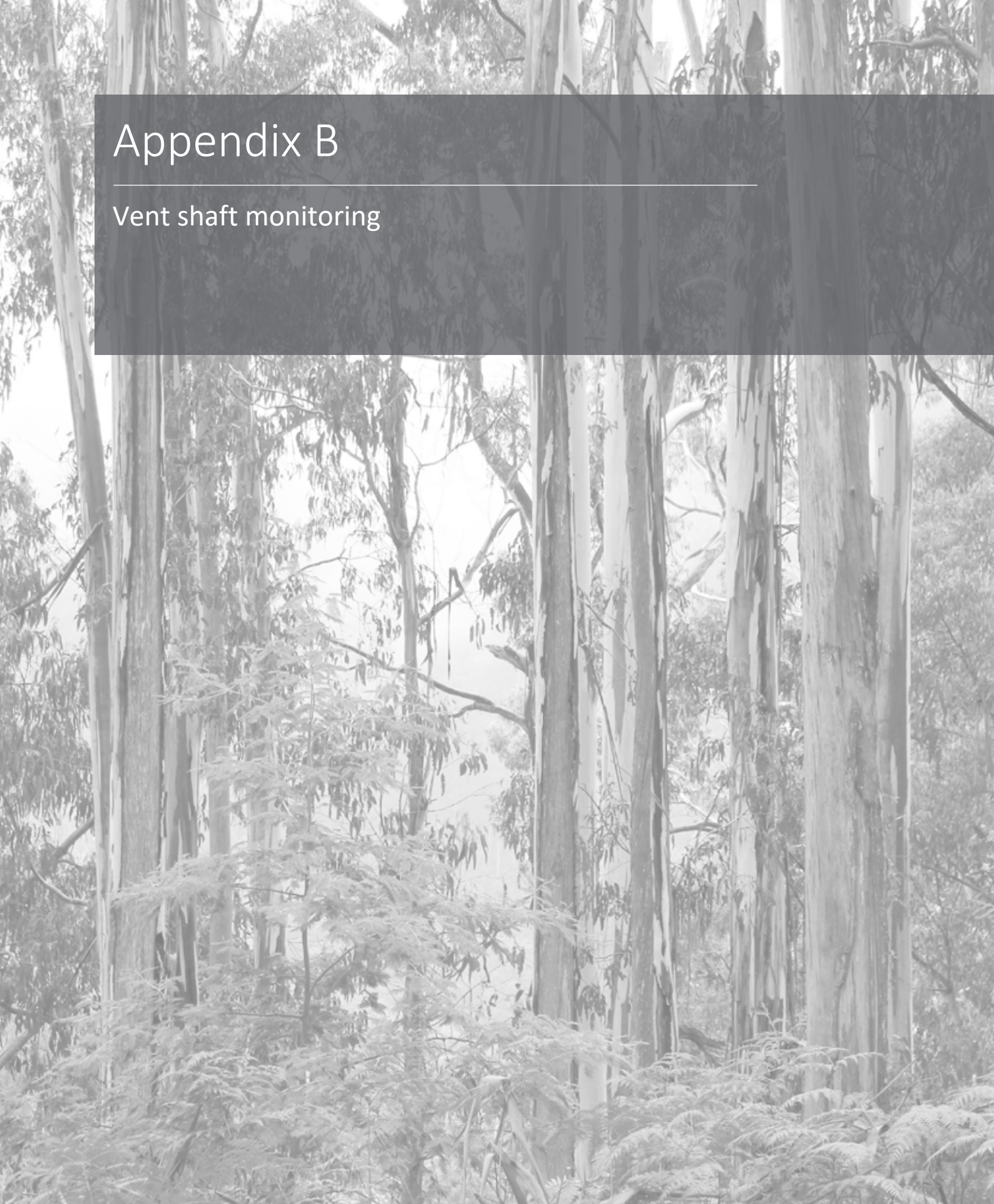
Site attribute	Benchmark	Plot 1 data	Plot 1 score	Plot 2 data	Plot 2 score	Average	Weighting %	Calculation	Weighted score %
A	>6	9	4	10	4	4	25	25	25.0
B	5 to 18	21	3	23	3	3	10	7.5	7.5
C	36 to 48	0	1	0	1	1	10	2.5	2.5
D	3 to 21	8	4	6	4	4	2.5	2.5	2.5
E	0 to 0	0	4	0	4	4	2.5	2.5	2.5
F	1 to 13	100.3	1	98	1	1	2.5	0.625	0.6
G		0.3	4	0.1	4	4	5	5	5.0
H	> 0	0	1	0	1	1	20	5	5.0
I		1	4	1	4	4	12.5	12.5	12.5
J	> 20	5	2	19	4	2	10	5	5.0
Total						28	100		68.1

trigger is <60%

Site attribute		Site attribute score				Weighting for site
		1	2	3	4	
A	Native plant species richness	0	0-<50% of benchmark	50-<100% of benchmark	≥ benchmark	25%
B	Native over-storey cover	0-10% or >200% of benchmark	10-<50% or >150-200% of benchmark	50-<100% or >100-150% of benchmark	Within benchmark	10%
C	Native mid-storey cover	0-10% or >200% of benchmark	0-<50% or >150-200% of benchmark	50-<100% or >100-150% of benchmark	Within benchmark	10%
D	Native ground-cover (grasses)	0-10% or >200% of benchmark	0-<50% or >150-200% of benchmark	50-<100% or >100-150% of benchmark	Within benchmark	2.50%
E	Native groundcover (shrubs)	0-10% or >200% of benchmark	0-<50% or >150-200% of benchmark	50-<100% or >100-150% of benchmark	Within benchmark	2.50%
F	Native groundcover (other)	0-10% or >200% of benchmark	0-<50% or >150-200% of benchmark	50-<100% or >100-150% of benchmark	Within benchmark	2.50%
G	Exotic plant cover (all strata)	>66%	>33-66%	>5-33%	0-5%	5%
H	Number of trees with hollows	0 (unless benchmark includes 0)	0-<50% of benchmark	50-<100% of benchmark	≥ benchmark	20%
I	Proportion of over-storey species occurring as regeneration	0	>0-<50%	50-<100%	100%	12.50%
J	Total length of fallen logs	0-10% of benchmark	>10-<50% of benchmark	50-<100% of benchmark	≥ benchmark	10%
Total weighted score						100%

Appendix B

Vent shaft monitoring



B.1 Vent shaft photolog



Photograph B.1 **Photo point 1**



Photograph B.2 **Photo point 2**



Photograph B.3 **Photo point 3**



Photograph B.4 Photo point 4



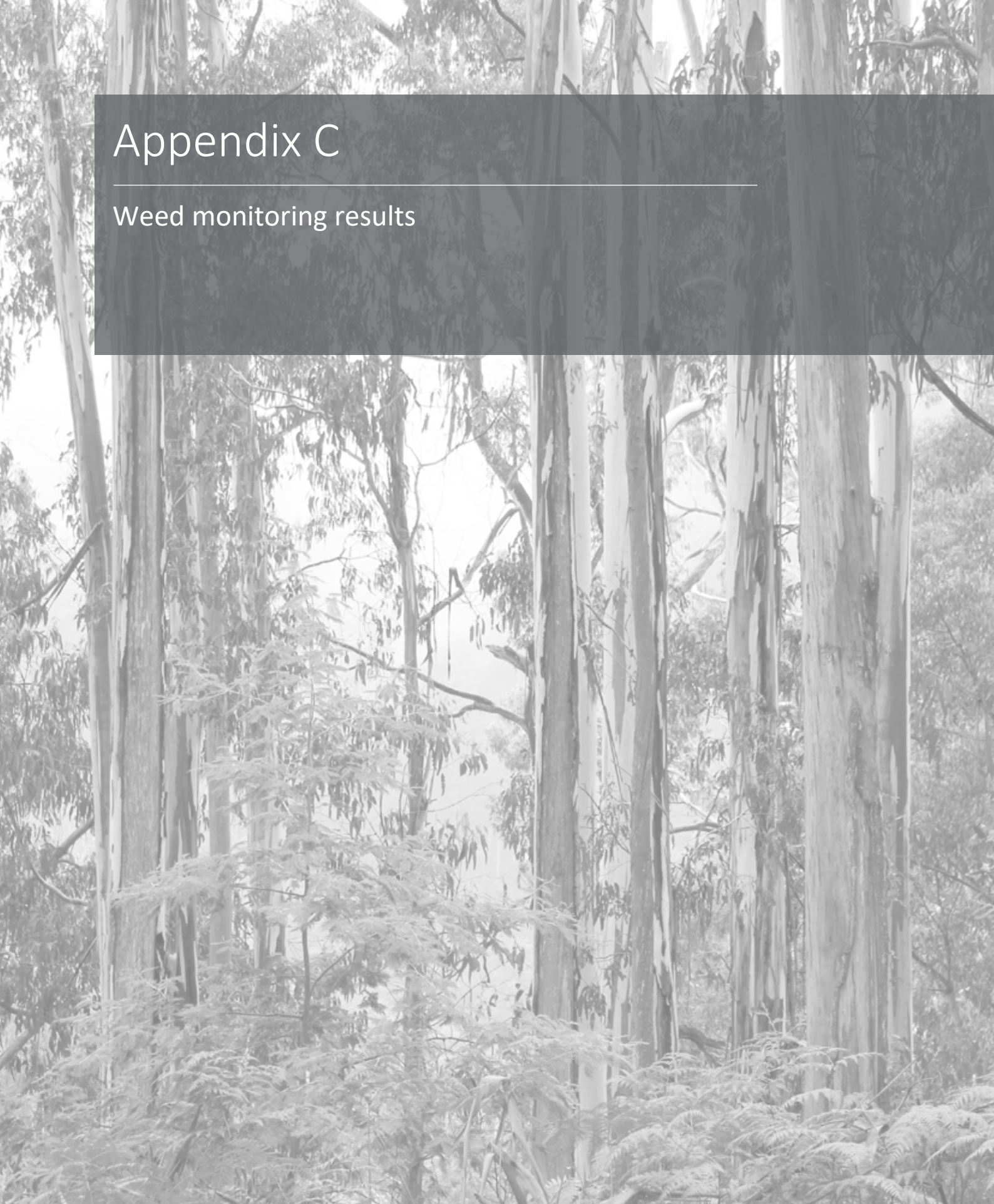
Photograph B.5 **Tree monitoring point 1**



Photograph B.6 **Tree monitoring point 2**

Appendix C

Weed monitoring results



Weed Monitoring Proforma

Date:	11/02/2022
Management zone:	Pit top.
Data collectors:	Eugene Dodd

Location ID (see Figure 3.1)	Weed species	Location		# plants	Area (m2)	Distance to native vegetation (m)	Recommended control measures
		Easting	Northing				
	Ground Asparagus (<i>Asparagus aethiopicus</i>)	365027	6329499	2	0.5	1	As per BMP
	Pampas Grass (<i>Cortaderia selloana</i>)	364991	6329489	1	0.5	0	As per BMP
	Ground Asparagus (<i>Asparagus aethiopicus</i>)	364979	6329482	4	1	0.5	As per BMP
Patch 1	Sharp Rush (<i>Juncus acutus</i>)	See Figure 2.1		~300	100 m ²	0	Mechanical removal most effective. Also se BMP
Patch 2	Ground Asparagus (<i>Asparagus aethiopicus</i>) prevelant, also Bitou Bush (<i>Chrysanthemoides monilifera subsp. rotundata</i>), Lantana (<i>Lantana camara</i>) and Easter Cassia (<i>Senna pendula</i>)	See Figure 2.1		~20	5,500 m ²	0	As per BMP

Comments:

The extent of weeds such as Pampas Grass and Asparagus fern had reduced in several areas, especially adjacent to the access track, with successful weed control observed in several area. The exeption is a patch of mature Sharp Rush, adjacent to the access track, where mechanical removal is likely to be most effective. Note that the superficially similar, and native Sea Rush (*Juncus kraussii*) is also present in the vicinity. There is also a large patch (Figure

Weed Monitoring Proforma

Date:	11/02/2022
Management zone:	Vent shaft - Sumerland point
Data collectors:	Eugene Dodd

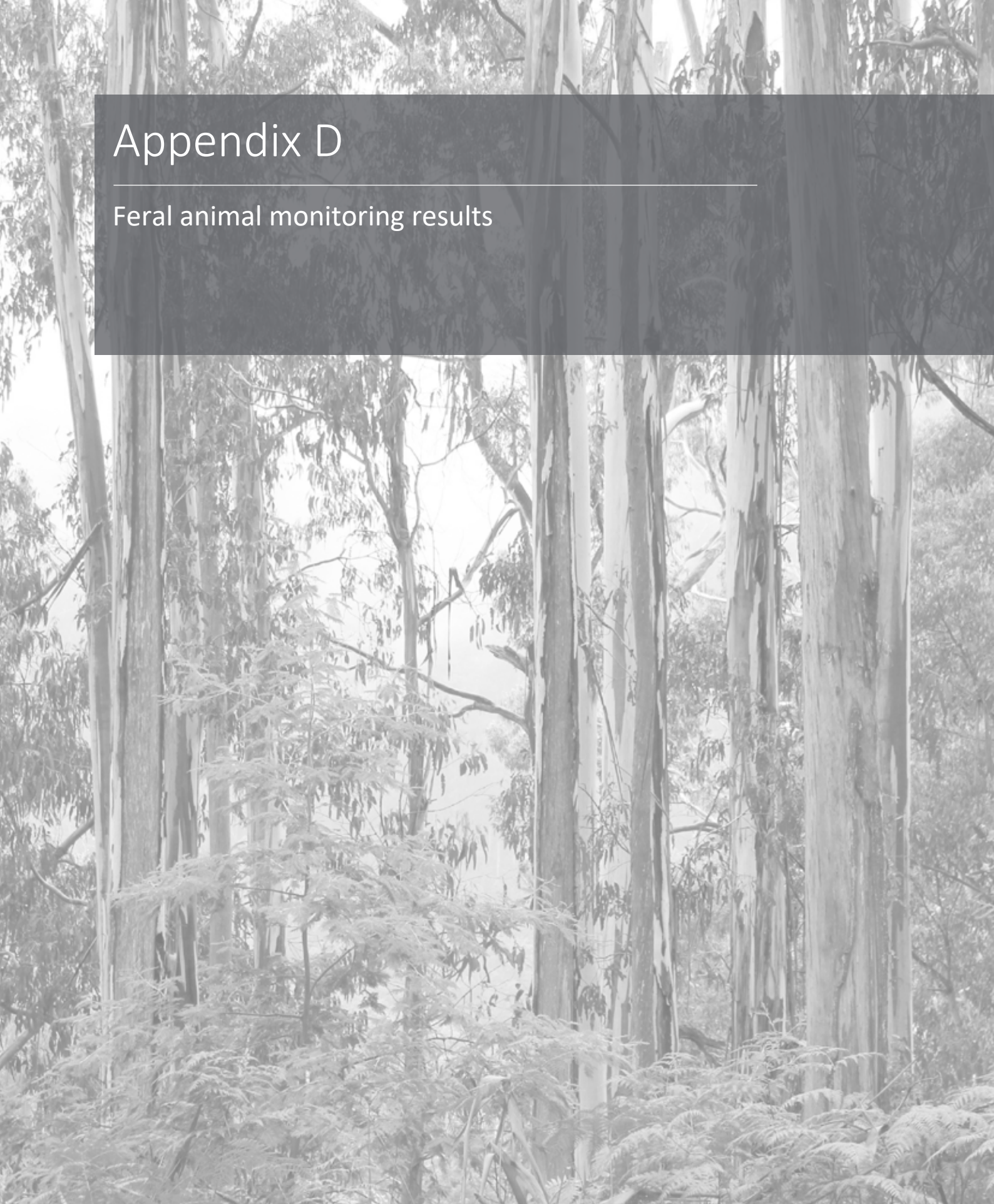
Location ID (see Figure 3.2)	Weed species	Location		# plants	Area (m2)	Distance to native	Recommended control measures
		Easting	Northing				
2	Lantana (<i>Lantana camara</i>)	366605.2	6331111.13	1	1	0	As per BMP
3	Lantana (<i>Lantana camara</i>)	366665.29	6331055.5	1	2	0	As per BMP
4	Lantana (<i>Lantana camara</i>)	366688.34	6331013.45	3	1	0	As per BMP
5	Lantana (<i>Lantana camara</i>)	366688.33	6331007.24	3	4	0	As per BMP
6	Lantana (<i>Lantana camara</i>)	366657.91	6330974.11	4	2	0	As per BMP
7	Senna pendula - patch with larger plants and seedlings, plus one Lantana plant	366634.47	6331010.17	multiple	3	2	As per BMP, handpull if small enough
8	Senna pendula - patch with larger plants and seedlings, plus one Lantana plant	366625.83	6331020.92	multiple	3	2	As per BMP
9	Senna pendula - patch with larger plants and seedlings, plus Lantana	366625.28	6331027.56	multiple	4	1	As per BMP
10	Senna pendula - patch with larger plants and seedlings, plus one Lantana plant	366615.18	6331036.19	multiple	5	2	As per BMP
11	Senna pendula patch plus Bitou bush seedlings	366610.47	6331039.12	multiple	25	0	As per BMP
12	Senna pendula patch plus Bitou bush seedlings	366603.93	6331067.2	multiple	20	0	As per BMP
13	Lantana (<i>Lantana camara</i>) plant plus seedlings	366610.11	6331079.59	multiple	5	0	As per BMP
14	Patch of Fishbone fern (<i>Nephrolepis cordifolia</i>)	366605.11	6331083.62	multiple	25	0	As per BMP
15	Patch of Fishbone fern (<i>Nephrolepis cordifolia</i>)	366597.92	6331117.68	multiple	25	0	As per BMP

Comments:

The majority of the weeds are easily accessible and small to medium in size. Most could be controlled with spot herbicide spray or cut and paint methods. Many of the Senna pendula patched have few large plant and a large number of seedlings which are easily hand pulled. Care should be taken not to impact the native Coffee Bush (*Breynia oblongifolia*) which has superficially similar leaves, especially as a seedling.

Appendix D

Feral animal monitoring results



Feral Animal Monitoring Proforma**Date:** 11/02/2022**Data collectors:**

E. Dodd

Management zone: Eastern Zone

Feral animal species	Location (MGA 94)		Activity level	Recommended control measures
	Easting	Northing		
European Fox (Vulpes vulpes)	365085	6329629	1 scat recorded	

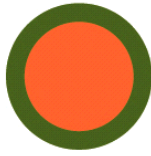
Record types: O - observed, S - scats, T - tracks, D - diggings, B - burrows





Appendix 6: Weed Action Plan

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 102 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				



total earth care



Weed Action Plan

**Chain Valley Colliery, Mannering Colliery and
Summerland Point Ventilation Shaft**

Total Earth Care Pty Ltd
January 20



total earth care

Weed Action Plan

Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft

January 20

Quality Control	© Total Earth Care Pty Ltd 2019		
Revision/Version No.	Final	Date of revision	17 January 2020
Prepared by:	G Teear		
Approved by	G Barron, W Thurston		
Prepared for:	Delta Coal		
TEC Job No.	C11483		

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1 INTRODUCTION

1.1 Background

Total Earth Care (TEC) has been commissioned by Delta Coal to prepare this update for the Weed Action Plan for the three (3) Delta Coal sites: Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft. The site is within the Central Coast LGA (formerly Wyong LGA).

A Weed Action Plan was developed for Lake Coal in 2016 to guide weed management of the aforementioned sites in a consolidated report. The sites are now managed by Delta Coal and an updated Weed Action Plan is required to assess the current weed densities on the site and provide relevant management actions that will assist in the development of updated Biodiversity Management Plans for each site. The Weed Action Plan will guide on ground weed management and assist in tracking the progress of since the previous Weed Action Plan developed in 2016.

1.2 Subject Sites and Study Area

The "Study Area" has been defined as each of the three (3) sites: Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft. Management Zones have previously been defined for these sites. Please see the Maps 1 to 3 below which indicate the boundaries of the Project Area and the existing management zones.

All three (3) sites fall within the Local Land Services Greater Sydney Region, bordering on the Hunter Region.

1.3 Goals and Objectives

The objectives of this management program are to:

- Describe the existing flora and fauna within the subject site based on current survey effort and database searches of the subject site and surveys of the wider study area.
- Provide ground-truthed weed density maps, highlighting priority weeds under the *NSW Biosecurity Act 2015*.
- Report any threats to Endangered Ecological Communities.
- Provide a program for ongoing weed management and/or eradication.

Title: Chain Valley Colliery:
Subject Site & Survey Effort

Map No: 1

Site: Chain Valley Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483


Author: G Barron

Legend

 Management Zones

 Road

 Creek

 Survey Effort

EEC under BC Act 2016

 Swamp Oak Floodplain Forest

 Swamp Sclerophyll Forest on
Coastal Floodplains EEC

0 50 100 200 Meters



Data Source:
Total Earth Care
Nearmap
Wyong ELA 2016 v2



total earth care

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Tel: 02 9913 1432 Fax: 02 9913 1434



Title: Mannering Colliery:
Subject Site & Survey Effort

Map No: 2

Site: Mannering Colliery


Client: Delta Coal

Date: November 2019

Project No: 11483


Author: G Barron

Legend

 Management Zones

 Road

 Creek

 Survey Effort

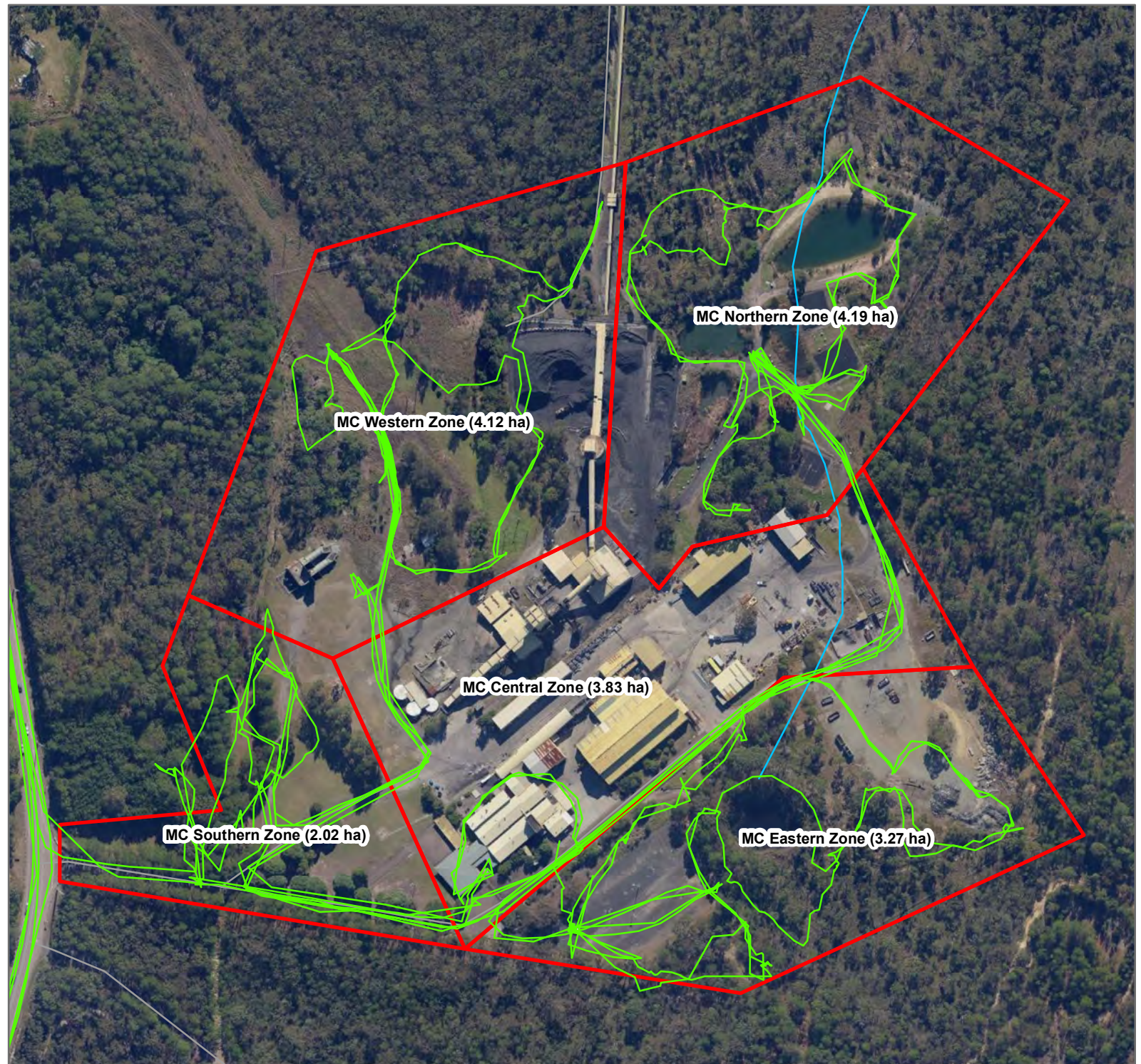
0 25 50 100 Meters



Data Source:
Total Earth Care
Nearmap



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Tel: 02 9913 1432 Fax: 02 9913 1434



Title: Summerland Point Ventilation
Shaft: Subject Site, EECs &
Survey Effort

Map No: 3

Site: Summerland Point Ventilation Shaft


Client: Delta Coal

Date: November 2019

Project No: 11483


Author: G Barron

Legend


 Summerland Point


 Road

 Creek

 Survey Effort

EEC under BC Act 2016

 Subtropical Coastal Floodplain
Forest of the New South Wales
North Coast Bioregion

 Swamp Sclerophyll Forest on
Coastal Floodplains EEC

0 25 50 100 Meters

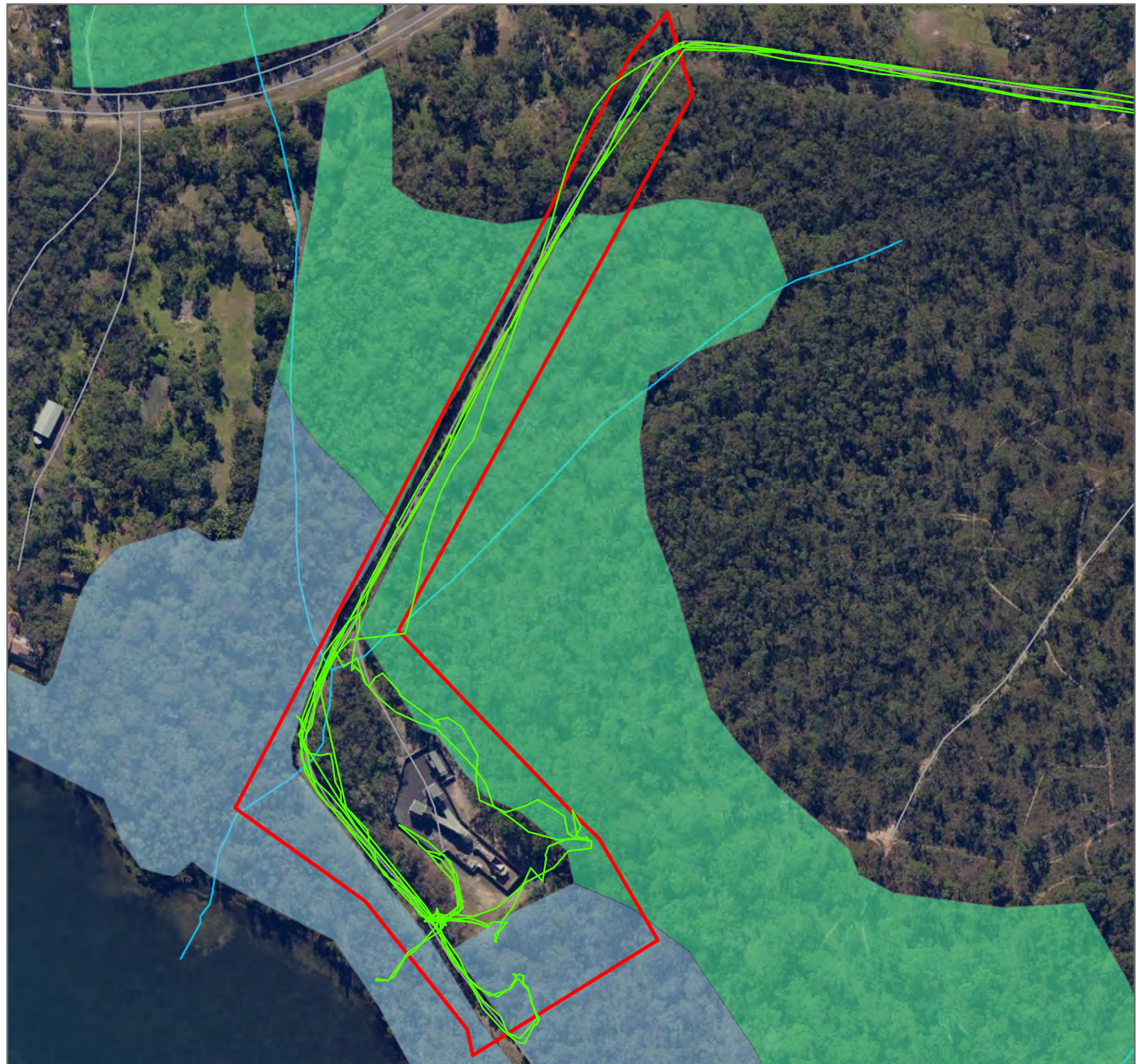


Data Source:
Total Earth Care
SIX Maps
Wyong ELA 2016 v2



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1.4 Relevant Legislation and Strategies

This Weed Action Plan will be written in accordance with:

- 1 Commonwealth laws including:
 - a. *Environment Protection and Biodiversity Conservation Act 1999*
- 2 NSW laws including:
 - a. *Biodiversity Conservation Act 2016*
 - b. *Biosecurity Act 2015*
- 3 Local laws LGA:
 - a. *Wyong Local Environment Plan 2013*
 - b. *Wyong Development Control Plan 2013*
- 4 Weed Strategies
 - a. *Australian Weeds Strategy 2017-2027*
 - b. *Greater Sydney Regional Strategic Management Plan*

1.4.1 NSW Biosecurity Act 2015 – Weeds

The NSW *Biosecurity Act 2015*, repealed the NSW *Noxious Weeds Act 1993* on the 1st of July 2017.

The purpose of the NSW *Biosecurity Act 2015* is to provide framework for risk-based prevention, elimination and minimisation of biosecurity risks. These include pests, diseases, contaminants, non-indigenous animals, bees, weeds and other biosecurity matter. One of the main objectives of the *Biosecurity Act 2015* is to promote biosecurity issues as a shared responsibility between government, industry, and communities, i.e. private and public land managers have the same obligations under the Act. Local Council is the control authority who enforces this Act. A State Weeds Committee has been established, as well as eleven (11) Regional Weeds Committees who will provide guidance and facilitate community and stake holder input into weed management.

Under the *Biosecurity Act 2015*, the definition of a weed is a plant that is a pest, and the definition of a pest is a plant or animal (other than a human) that has an adverse effect on, or is suspected of having an adverse effect on, the environment, the economy or the community.

Schedule 1 describes the special provisions relating to weeds. Under this Schedule, land occupiers have a duty to:

- control weeds on roads which bound their occupied land;
- control aquatic weeds along a watercourse, river, or inland water which bound their occupied land; and
- control weeds on land extended from their occupied land if that land is an irrigation area forming any part of a public road, public reserve or public channel, or watercourse, river or inland water.

Regional Strategic Weed Management Plans have been developed which describe the land occupier's expectations for managing weeds and form the basis for an enforceable general biosecurity duty. The three (3) Delta Coal sites fall within the Greater Sydney Local Land Services area, therefore the *Greater Sydney Regional Strategic Management Plan* applies to these sites.

1.4.2 Australian Weeds Strategy – Weeds of National Significance (WoNS)

Australian Weeds Strategy provides a national framework for addressing weed issues. It lists thirty-two (32) weed species or genera that are required to be managed under state legislation. These are Weeds of National Significance (WoNS). Five (5) of these have been identified on site and are listed in Section 3 of this management plan.

1.4.3 NSW Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act), with associated regulations and maps, repealed the *Threatened Species Conservation Act 1995* on the 25th of August 2017. The BC Act is now the key piece of legislation protecting threatened species, populations and ecological communities within NSW.

There are a number of Endangered Ecological Communities (EEC) mapped on the Delta Coal sites (ELA 2016). These include;

- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions;*
- *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions; and*

- *Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion.*

Refer to Maps 1, 2 and 3 for mapped EECs. The Mannering Colliery does not contain any EECs.

One aim of the BC Act is to eliminate or manage certain Key Threatening Processes (KTPs) that threaten the survival or evolutionary development of threatened species, populations and ecological communities.

KTPs listed by the BC Act are identified as having significant impacts on the conservation of native flora and fauna. There are currently thirty-seven (37) KTPs listed under the BC Act including:

- i. Invasion and establishment of exotic vines and scramblers.
- ii. Invasion, establishment and spread of *Lantana camara*.
- iii. Invasion of native plant communities by *Chrysanthemoides monilifera* (Bitou Bush and Boneseed).
- iv. Invasion of native plant communities by exotic perennial grasses.
- v. Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants.

2 METHODS

2.1 Desktop Research

A preliminary desktop study was conducted to assess the previously mapped weed locations (Kleinfelder 2016) and existing plant community types using the Wyong ELA 2016 PCT (ELA, 2016) mapping.

2.2 Site Survey

A site survey was conducted over two (2) days on the 15th and 16th October 2019. Weather conditions were clear with maximum temperatures of approximately 25°C on the 15th and 24°C on the 16th. See Maps 1, 2 and 3 for survey effort.

A general weed survey was conducted using random meanders. Edges of bushland, creek lines, disturbed areas and any other areas likely to contain weeds were targeted as were areas where weeds were previously identified in the 2016 Weed Action Plan.

- The identification of native and exotic plant species according to *Field Guide to the Native Plants of Sydney* (Robinson, 2003), *Flora of NSW, Volumes 1-4* (Harden 1992, 1993, 2000, 2002), *Weeds of the south-east: an identification guide for Australia* (Richardson et al, 2006) and PlantNET (2019), with reference to recent taxonomic changes;

Any “weed infestations” found during survey were recorded using a hand held GPS. Weed infestations are defined as:

- Areas where weeds make up >80% percentage foliage cover.
- Weeds of national significance
- Priority weeds and other weeds of regional concern as listed in the Greater Sydney Regional Strategic Weed Management Plan

Any WoNS and/or any priority weeds for the Greater Sydney Region which were identified on site, are listed in Appendix A which includes their biosecurity status under the *Biosecurity Act 2015*.

2.3 Weed Density Mapping

Weed density maps were developed for each zone. All weeds present were considered when determining the weed densities for each area.

GPS locations were mapped to provide clear locations for WoNS, significant weed infestation and Priority Weeds.

2.4 Priorities

The priorities of targeted weed work detailed in Section 4 - Management Zones, were determined by the species listing and the landholder's obligations under the *Biosecurity Act 2015* and the Greater Sydney Regional Strategic Weed Management Plan. Species listed as WoNS are considered a high priority. Other weeds that were deemed to have the potential to significantly impact biodiversity were also included as Priority Weeds.

Priority areas were determined by the resilience and condition of existing bushland and the location of weed infestations. Infestation or small outbreaks of weeds in high quality, undisturbed or resilient bushland are considered a high priority to conserve the existing biodiversity values and to prevent further spread which could become more costly to address in the future. Infestations along property boundaries, creek lines and waterways are considered high priority as weeds are more susceptible to spread onto neighbouring properties downstream or across boundary edges.

2.5 Limitations

The diurnal field survey was conducted over two (2) days during October 2019. Random meanders were conducted across the site and targeted searches for weeds along creek line, bushland edges and disturbed areas where weeds are likely to occur. Some areas were not searched due to access issues and time constraints. The central zones mainly consist of infrastructure and planted species and were not surveyed for this report.

When reviewing maps please note that the hand-held GPS equipment used is only accurate to 3 metres.

3 RESULTS

The weed survey identified thirty-six (36) weed species under the *Biosecurity Act 2015*. These are listed in Appendix A along with the land holder's obligations under the Act. Of these, five (5) are WoNS. These are:

- Asparagus Fern (*Asparagus aethiopicus*)
- Bitou Bush (*Chrysanthemoides monilifera subsp rotundata*)
- Lantana (*Lantana camara*)
- Blackberry (*Rubus fruticosus* aggregate)
- Fireweed (*Senecio madagascariensis*)

Bitou Bush, Lantana and Fireweed are also listed as State Priority Weeds. Six (6) weeds are listed as Priority Weeds under the Greater Sydney Regional Strategic Weed Management Plan. These include Giant Reed (*Arundo donax*), Pampas Grass (*Cortaderia jubata*) and the above mentioned WoNS.

Weeds are mostly contained to disturbed areas, bushland edges, tracks and riparian areas across all three (3) sites. There are some small outbreaks within large resilient bushland areas which have been prioritised within this Plan. Many of these have been treated as part of primary bush regeneration efforts and require follow up treatment of new shoots.

Two (2) areas with two (2) to three (3) individual orchids of the genus *Microtis* were identified. One (1) area is located in the easement of the eastern zone of Chain Valley Colliery and another along the disturbed edges of the eastern zone at Mannering Colliery. These have been mapped in Map 7 and Map 11.

The current condition, locations of weed infestation and weed densities have been discussed in detail within Section 4 - Management Zones.

4 MANAGEMENT ZONES

TEC have based the management zones on those created for the 2016 Weed Action Plan (Kleinfelder, 2016). The boundaries have been adjusted slightly to follow existing structural boundaries such as roads, tracks, clearings, easements and fences to allow for clearer delineation of management zones during on ground works.

The Central Zone of both the Chain Valley Colliery and Mannering Park Colliery are entirely disturbed and contain the site infrastructure. The zones are mostly void of native vegetation except for remnant canopy trees and planted native and ornamental species, as such these zones were not included in the weed survey.

4.1 Chain Valley Colliery

The Chain Valley Colliery site is made up of the following EECs:

- *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions;* and
- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*

See Map 1 for EEC locations.

Chain Valley Colliery contains high quality resilient bushland in most zones. Managing weed outbreaks in these areas is a high priority to prevent degradation and further encroachment on bushland areas. Most weed outbreaks occur in the disturbed areas including cleared easements, easement edges, along tracks, creek lines and dam edges. These outbreaks are small and in their early stages of growth and therefore should be targeted before they progress any further. Bush regeneration efforts targeting Lantana and Pampas Grass (*Cortaderia selloana*) are evident throughout the site but now require follow up treatment. The following maps and tables provide further details on each management zone including priority weeds and management issues.



Figure 1. Eastern Zone of Chain Valley Colliery along creek line.



Figure 2. Treated Lantana and Blackberry in Northern Zone of Chain Valley Colliery near cottages.



Figure 3. Fishbone Fern and Crofton Weed in Western Zone Area B of Chain Valley Colliery along drainage area.

4.1.1 Chain Valley Colliery – Northern Zone

Table 1. Chain Valley Colliery – Northern Zone Area Descriptions

Description	<p>This zone is approximately 8.2 ha and includes cleared powerline easements and modified areas surrounding the cottages and bushland.</p> <p>Area A – <5% weed cover</p> <p>The most resilient area of the zone with low weed densities. Some weed encroachments on the edges of the bushland. A small area of treated Lantana and Blackberry is located to the south-east of this zone.</p> <p>Area B – 5-25% weed cover</p> <p>Highest weed densities are found along the edge of the bushland and species present include Blackberry, Asparagus Fern, Fishbone Fern (<i>Nephrolepis cordifolia</i>), <i>Monstera deliciosa</i> and <i>Senna pendula</i> var. <i>glabrata</i>.</p> <p>Area C – 25-50% weed cover</p> <p>Dense area of Blackberry, Lantana, Ochna serrulata, Wild Tobacco (<i>Solanum mauritianum</i>) and herbaceous weeds. Evidence of Blackberry and Pampas Grass being treated. Appears to have been the focus area of Bush Regeneration efforts.</p> <p>Area D – 5-25% weed cover</p> <p>Mostly ornamental exotic plant species in front of houses.</p> <p>Area E – 5-25% weed cover</p> <p>Dense patch of <i>Monstera deliciosa</i>.</p> <p>Area F – 5-25% weed cover</p> <p>Patch of Camphor Laurel (<i>Cinnamomum camphora</i>) and Coral trees (<i>Erythrina x sykesii</i>) including several saplings.</p> <p>Area G – 5-25% weed cover</p> <p>Bushland strip between powerline easements containing scattered small outbreaks of weeds including <i>Senna pendula</i> var. <i>glabrata</i> and Lantana.</p> <p>Area H – 5-25% weed cover</p> <p>Powerline easement with scattered Fireweed and Purple Top (<i>Verbena bonariensis</i>).</p>
Priority Weeds	Lantana, Blackberry, Pampas Grass and Asparagus Fern
Priority Areas	Area A and B has the most resilience and is connected to larger tracts of bushland. Weeds should be controlled to prevent further spread.
Key Management Issues	<ul style="list-style-type: none"> Follow up treatment of Lantana, Blackberry, <i>Senna pendula</i> var. <i>glabrata</i> in Areas A and C. Primary treatment of Asparagus Fern particularly along edges in Area B. Primary treatment of <i>Senna pendula</i> var. <i>glabrata</i> and <i>Monstera deliciosa</i>, and untreated areas of Lantana and Pampas Grass.
Notes	Access to this zone via dirt road from near CVC site entry. Key required. Caution to be taken driving around cottages due to rubbish and debris hidden by long grass.

Title: Chain Valley Northern Zone
Weed Density

Map No: 4

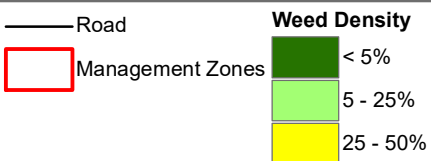
Site: Chain Valley Colliery

Client: Delta Coal













Date: November 2019

Project No: 11483

Author: G Barron



Key Points

-  Blackberry
-  Blackberry & Lantana camara - treated
-  Blackberry, Lantana camara & Pampas Grass - treated
-  Blackberry, Lantana camara, Senna pendula var. glabrata & Wild Tobacco
-  Camphor Laurel
-  Coral Tree
-  Coral Tree - treated
-  Coral Tree, Lantana camara & Senna pendula var. glabrata
-  Coral Tree, Ochna serrulata & Senna pendula var. glabrata
-  Lantana camara
-  Lantana camara & Senna pendula var. glabrata
-  Lantana camara - treated

0 20 40 80 Meters



Data Source:
Total Earth Care
Nearmap



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4.1.2 Chain Valley Colliery – Western Zone

Table 2. Chain Valley Colliery – Western Zone Area Descriptions

Description	<p>This zone is approximate 6.4 ha of highly resilient bushland with predominantly low weed densities. Evidence throughout of bush regeneration efforts.</p> <p>Area A – <5% weed cover</p> <p>Highly resilient bushland with a very low weed density. Scattered outbreaks of Blackberry and Lantana on the side of the road that runs along the north-west boundary. All identified scattered Lantana thickets in the south-east part of the area have been treated. Some juvenile Lantana coming up in these treated areas.</p> <p>Area B – 5-25% weed cover</p> <p>Damp drainage areas in some places have encourage weed growth. Lantana, Crofton Weed, Asparagus Fern, Fishbone Fern and herbaceous weed species scattered throughout this zones (see Figure 3). All identified Lantana patches have been treated. Some juvenile Lantana coming up in these treated areas. Pampas Grass and some Fishbone Fern has been treated but requiring follow up treatment.</p>
Priority Weeds	Lantana, Blackberry, Pampas Grass, Asparagus Fern and Crofton Weed.
Priority Areas	Both Area A and B. The surrounding bushland is highly resilient and further weed outbreaks should be prevented.
Key Management Issues	<ul style="list-style-type: none"> • Follow up treatment of Lantana and Pampas Grass. • Primary treatment of Crofton Weed and Fishbone Fern. • Hand weeding and spraying. • Priority zone. Edges and tracks should be monitored regularly.
Notes	Access to the track along the north-west boundary of this zone via dirt road from near CVC site entry. Key required.

Title: Chain Valley Western Zone
Weed Density

Map No: 5

Site: Chain Valley Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron

— Road

Management Zones

Weed Density

< 5%

5 - 25%

25 - 50%

Key Points

- Asparagus Fern
- Blackberry & Fireweed
- Crofton Weed
- Crofton Weed & Lantana camara
- Lantana camara
- Lantana camara - treated
- Pampas Grass & Lantana camara - treated and Asparagus Fern & Crofton Weed
- Senna pendula var. glabrata

0 20 40 80 Meters



Data Source:
Total Earth Care
Nearmap



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4.1.3 Chain Valley Colliery – Southern Zone

Table 3. Chain Valley Colliery – Southern Zone Area Descriptions

Description	<p>This zone is approximate 7.2 ha of highly resilient and mostly undisturbed bushland with predominantly low weed densities.</p> <p>Area A – 5-25% weed cover</p> <p>Scattered small outbreaks of <i>Senna pendula</i> var. <i>glabrata</i>, Blackberry, Bitou Bush, Ochna and Lantana, Lantana has been treated but some small shoots are coming up. Most weeds are along the track edge to the north and the eastern boundary of the bush and powerline easement.</p> <p>Area B – <5% weed cover</p> <p>Highly resilient bushland. Some <i>Pinus radiata</i> saplings coming up adjacent to the track that runs along the southern part of the area.</p> <p>Area C – 5-25% weed cover</p> <p>Powerline easement containing scattered <i>Pinus radiata</i> saplings, herbaceous weeds and Oleander.</p> <p>Area D – <5% weed cover</p> <p>Resilient bushland with scattered <i>Pinus radiata</i> saplings along easement edge.</p> <p>Area E – 5-25% weed cover</p> <p>Mostly managed lawn along driveway. Scattered <i>Pinus radiata</i> saplings, African Lovegrass (<i>Eragrostis curvula</i>) and Oleander (<i>Nerium oleander</i>) on bushland edges.</p> <p>Area F – 25-50% weed cover</p> <p>Disturbed bushland edges with scattered small outbreaks of Bitou Bush, Lantana, Pampas Grass, Banana Trees and African Love Grass. Most Pampas Grass in this area has been treated.</p>
Priority Weeds	Lantana, Pampas Grass, Bitou Bush and <i>Pinus radiata</i> saplings
Priority Areas	Area B is highly resilient and has very few weed outbreaks. All other areas of this management zone should be managed to prevent further spread of weeds into Area B.
Key Management Issues	<ul style="list-style-type: none"> • Follow up treatment of Pampas Grass • Follow up and primary treatment of Lantana. Small shoots can be hand pulled. • Primary treatment of Bitou Bush. Most can be hand pulled. • Primary treatment of <i>Pinus radiata</i> saplings particularly along the track in Area B. This is a highly resilient area and invasion of Pines in this area should be prevented. • High priority zone. Monitor tracks for any weed out breaks.
Notes	Access to the track within this zone is via a locked gate or through powerline easement.

Title: Chain Valley Southern Zone
Weed Density

Map No: 6

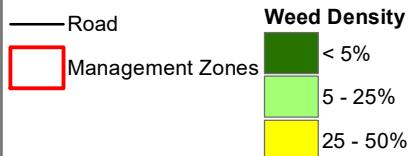
Site: Chain Valley Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron



Key points

- African Lovegrass & Pampas Grass
- African Lovegrass & Pinus radiata
- Asparagus Fern & Lantana camara
- Asparagus Fern, Senna pendula var. glabrata & Bitou Bush
- Bitou Bush
- Bitou Bush & Lantana camara
- Bitou Bush & Senna pendula var. glabrata
- Bitou Bush - removed
- Lantana camara
- Lantana camara & Senna pendula var. glabrata
- Lantana camara (treated), African Lovegrass & Bitou Bush
- Lantana camara - treated
- Ochna serrulata
- Ochna serrulata & Senna pendula var. glabrata
- Pampas Grass (treated) & Lantana camara
- Pampas Grass (treated)
- Pinus radiata
- Senna pendula var. glabrata
- Senna pendula var. glabrata - removed

0 15 30 60 Meters



Data Source:

Total Earth Care
Nearmap



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4.1.4 Chain Valley Colliery – Eastern Zone

Table 4. Chain Valley Colliery – Eastern Zone Area Descriptions

Description	<p>This zone is approximate 11.17 ha of bushland cleared powerline easements and sediment ponds. These ponds consistently discharge across the bushland in Area H and into the lake to the north-east.</p> <p>Area A – <5% weed cover</p> <p>Small occurrences of Caster Oil and Lantana on dam walls. Scattered occurrences of <i>Senna pendula</i> var. <i>glabrata</i> and Narrow-leafed Cotton Bush (<i>Gomphocarpus fruticosus</i>) in the easements to the north.</p> <p>Area B – 5-25% weed cover</p> <p>Small amounts of scattered Whiskey Grass (<i>Andropogon virginicus</i>), Pampas Grass and Bitou Bush on easement edges and damp areas.</p> <p>Area C – <5% weed cover</p> <p>Small amounts of scattered Whiskey Grass, Pampas Grass, Bitou Bush and other herbaceous weeds on easement edges.</p> <p>Area D – 5-25% weed cover</p> <p>Encroachments of weeds from the track to the south of the area and the easement edges. Scattered small outbreaks of Asparagus Fern, <i>Senna pendula</i> var. <i>glabrata</i>, Lantana, African Love Grass, Blackberry Nightshade and Bitou Bush. A small Lantana thicket has been treated.</p> <p>Area E – 5-25% weed cover</p> <p>Dense areas of Pampas Grass in this area and across property boundary. Scattered occurrences of Crofton Weed, Lantana and Bitou Bush.</p> <p>Area F – 5-25% weed cover</p> <p>Cleared powerline easement containing scattered Whiskey Grass, Cotton Bush, Fireweed and herbaceous weeds. Small lantana thicket and Pampas Grass under powerline pylon.</p> <p>Area G – 25-50% weed cover</p> <p>Dense stand of Wild Tobacco. Asparagus Fern starting to come up. Scattered small occurrences of Bitou Bush, Lantana, Ginger Lily, Ochna, Inkweed, Crofton and <i>Senna pendula</i> var. <i>glabrata</i>. Large stands of Lantana have been treated. Coral trees, Fishbone Fern, <i>Monstera deliciosa</i>, <i>Senna pendula</i> var. <i>glabrata</i> and Ginger Lily along creek line in southern corner.</p> <p>Area H – <5% weed cover</p> <p>Parts of this area have been recently burnt and are coming up with early successional native species such as <i>Dodonaea triquetra</i>. Track edges south-east of the dam have scattered small occurrences of Bitou Bush, Asparagus Fern, Lantana, Crofton Weed and Fireweed. Some sporadic occurrences of Lantana, Bitou Bush and <i>Senna pendula</i> var. <i>glabrata</i> along the edges of the easement in the north of this area.</p>
Priority Weeds	Lantana, Asparagus Fern, Bitou Bush, Pampas Grass and <i>Senna pendula</i> var. <i>glabrata</i> .
Priority Areas	<p>Area G along creek line should be targeted to prevent weed propagules travelling downstream.</p> <p>Area H is mostly resilient bushland that has been mapped as two EECs (see Map 1).</p>

Key Management Issues	<ul style="list-style-type: none">• Prioritise treating weeds in the southern half of this zone.• Follow up treatment of Lantana. Small shoots can be hand pulled.• Primary treatment of Bitou Bush, Asparagus Fern, <i>Senna pendula</i> var. <i>glabrata</i> and Pampas Grass along track and easement edges.
Notes	Vehicle access via the tracks near the sediment ponds and via the track through the south-west corner of the zone.

Title: Chain Valley Eastern Zone
Weed Density

Map No: 7

Site: Chain Valley Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron

— Road
— Creek
Management Zones

Weed Density

< 5%
5 - 25%
25 - 50%

Key Points

- Asparagus Fern
- Asparagus Fern, Crofton Weed, Lantana Camara, Ochna serrulata, Senna pendula var. glabrata & Wild Tobacco
- Bitou Bush
- Bitou Bush & Lantana camara
- Bitou Bush & Senna pendula var. glabrata
- Fireweed, Crofton Weed & Asparagus Fern
- Orchid - Microtis sp.
- Pampas Grass
- Pampas Grass, Lantana camara & Fireweed

0 25 50 100 Meters



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4.2 Mannering Colliery

Mannering Colliery has more disturbed areas and fewer large tracts of undisturbed bushland than the Chain Valley Colliery. However, the site is surrounded by bushland and therefore it is imperative that weeds are prevented from spreading into neighbouring resilient areas. Most outbreaks are small and should be targeted before they progress any further. Bush regeneration efforts targeting Lantana and Pampas Grass are evident throughout the site but now require follow up treatment. This site does not contain any EECs.

The following maps and tables provide further details on each management zone including priority weeds, priority areas and management issues.



Figure 4. Resilient bushland in Eastern Zone Area D of Mannering Colliery.



Figure 5. Bamboo and Crofton Weed in Western Zone Area F of Mannering Colliery.



Figure 6. Crofton Weed and *Juncus acutus* in wetland area of Northern Zone Area B of Mannering Colliery.

4.2.1 Mannering Colliery – Northern Zone

Table 5. Mannering Colliery – Northern Zone Area Descriptions

Description	<p>This zone is approximate 4.24 ha and consists of four (4) dams, access tracks and some patches of disturbed bushland. Water is discharged from the ponds across Area A, B and G.</p> <p>Area A – 5-25% weed cover</p> <p><i>Pinus radiata</i> saplings, Whiskey Grass and Fireweed along track edges. Treated <i>Acacia saligna</i>. Dense stands of <i>Juncus acutus</i> in low lying areas.</p> <p>Area B – 50-75% weed cover</p> <p>Dense area of weeds including Lantana, Bitou Bush, Crofton Weed, Pampas Grass, Senna and <i>Juncus acutus</i>. Lantana and some Pampas Grass has been treated.</p> <p>Area C – 25-50% weed cover</p> <p>High density of herbaceous weeds. <i>Acacia saligna</i> present, most of which has been treated. <i>Juncus acutus</i> present. Pampas Grass present most of which has been treated. Whiskey Grass along track edges.</p> <p>Area D – 25-50% weed cover</p> <p>High density of herbaceous weeds across disturbed area.</p> <p>Area E – 5-25% weed cover</p> <p>Hydrocotyl is scattered along the dam edges and Typha within the dam.</p> <p>Area F – 5-25% weed cover</p> <p>Typha within the dam.</p> <p>Area G – 5-25% weed cover</p> <p>The edges of Area G contains <i>Pinus radiata</i> saplings. Within the low lying damp wetland areas Large stands of Lantana and Pampas Grass have been treated.</p> <p>Area H – <5% weed cover</p> <p>Limited access due to fencing. Scattered Crofton Weed, Lantana, Bitou Bush, Camphor Laurel trees and mature and sapling <i>Pinus radiata</i>.</p> <p>A Resource Regulator identified Coolatai Grass (<i>Hyparrhenia hirta</i>) present on the western wall of the largest dam. EMM consultants confirmed the species ID.</p> <p>Area I – <5% weed cover</p> <p>Mostly disturbed and cleared areas. Herbaceous weeds, Whiskey Grass and Fireweed along track edges.</p> <p>Area J – 50-75% weed cover</p> <p>Dense and scattered stands of Bitou Bush, Lantana, Crofton and Senna. Lantana has been treated but new young shoots are coming up. Large and sapling <i>Pinus radiata</i> present. Scattered herbaceous weeds including <i>Bidens pilosa</i>, Fleabane (<i>Conyza sp.</i>) and Purple Top.</p>
Priority Weeds	Lantana, Bitou Bush, Pampas Grass, Crofton Weed, Fireweed, Senna, <i>Pinus radiata</i> , <i>Juncus acutus</i> , <i>Coolatai Grass</i> and Senna
Priority Areas	<p>Area J to follow up from primary weed treatment in this area.</p> <p>Area B to follow up primary treatment of Lantana and Pampas Grass and prevent propagules form spreading downstream.</p>

Key Management Issues	<ul style="list-style-type: none">• Follow up treatment of Lantana. Young, small shoots can be hand pulled.• Follow up treatment for Pampas Grass and Crofton Weed using cut/paint, hand removal and spraying.• Primary treatment of <i>Juncus acutus</i>• Hand pull Fireweed opportunistically.• Prioritise areas A, E, G and J.
Notes	Easy vehicle access to most areas. No obvious access to Area H due to fence.

Title: Mannering Colliery
Northern Zone Weed Density

Map No: 8

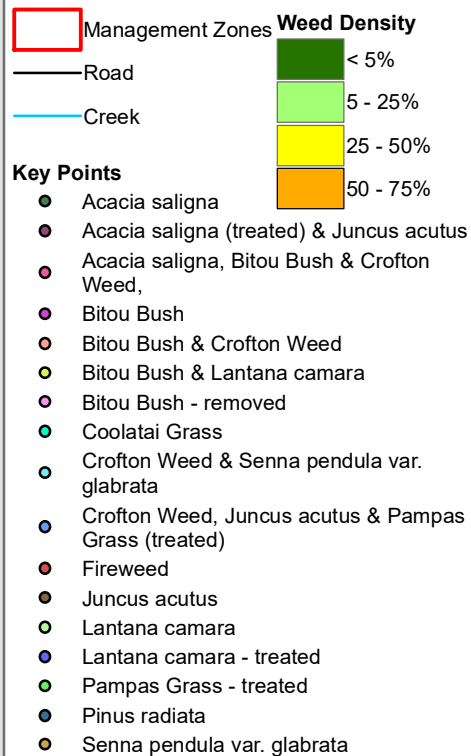
Site: Mannering Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

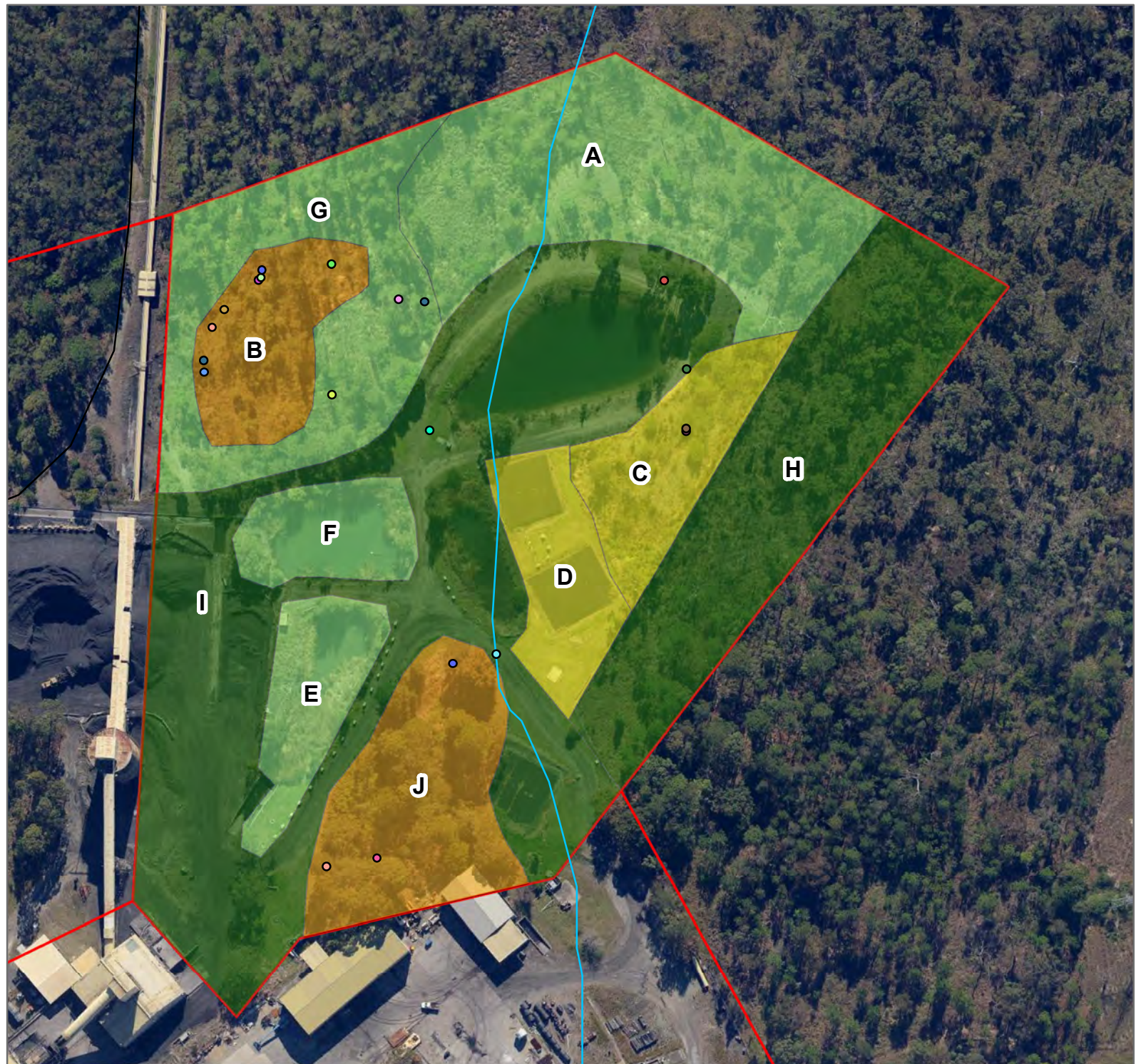
Author: G Barron



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Nearmap



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4.2.2 Mannering Colliery – Western Zone

Table 6. Mannering Colliery – Western Zone Area Descriptions

Description	<p>This zone is approximately 4.12 ha including cleared powerline easements, a dam, and disturbed patches of remnant bushland some of which connect to greater bushland extents.</p> <p>Area A – 5-25% weed cover</p> <p>Scattered herbaceous weeds and exotic grasses. Small scattered patches of Asparagus Fern.</p> <p>Area B – 5-25% weed cover</p> <p>Powerline easements mostly consisting of exotic grasses, some Lantana patches, <i>Senna pendula</i> var. <i>glabrata</i> and Fireweed, particularly closer to the dam edges.</p> <p>Area C – 5-25% weed cover</p> <p>Small scattered outbreaks of Crofton Weed, Pampas Grass, Bitou Bush, Whiskey Grass and African Love Grass throughout this area.</p> <p>Area D – 25-50% weed cover</p> <p>Scattered outbreaks of Lantana, Crofton Weed, Bitou Bush, Whiskey Grass and herbaceous weeds. Lantana thickets have been treated. New shoots are coming requiring treatment.</p> <p>Area E – <5% weed cover</p> <p>Isolated patch of vegetation containing a small thicket of Lantana.</p> <p>Area F – 25-50% weed cover</p> <p>Lantana, Crofton Weed, Bitou Bush, and a large outbreak of Bamboo are dominating this area.</p> <p>Area G – 5-25% weed cover</p> <p>A fence divides this area from the rest of the western zone. A large area of Lantana is located in the northern part of this area.</p>
Priority Weeds	Asparagus Fern, Lantana, Senna, Crofton Weed, Bitou Bush and Bamboo.
Priority Areas	Areas C, F and G are a priority within this zone due to their proximity to remnant bushland and potential for WoNS and Priority Weeds under the Biosecurity Act to spread.
Key Management Issues	<ul style="list-style-type: none"> • Follow up and primary treatment of Lantana. • Primary treatment of Bamboo, Crofton Weed, Asparagus Fern. • Opportunistic hand pulling of Fireweed.
Notes	Easy vehicle access to most areas. Area G is separated from the rest of the zone by a fence so vehicle access is limited. On foot access is possible by following the fence from the main driveway entrance to the south.

Title: Mannering Colliery
Western Zone Weed Density

Map No: 9

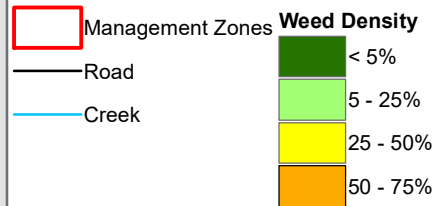
Site: Mannering Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron



Key Points

-  African Lovegrass & Bitou Bush
-  Asparagus Fern
-  Bamboo
-  Bamboo, Lantana camara & Pampas Grass
-  Bitou Bush
-  Bitou Bush & Lantana camara
-  Crofton Weed
-  Crofton Weed & Pampas Grass
-  Crofton Weed, Fireweed, Lantana camara & Senna pendula var. glabrata
-  Crofton Weed, Lantana camara & Senna pendula var. glabrata
-  Lantana camara
-  Lantana camara - treated
-  Pinus radiata
-  Senna pendula var. glabrata

0 12.5 25 50 Meters



Data Source:
Total Earth Care
Nearmap



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4.2.3 Mannering Colliery – Southern Zone

Table 7. Mannering Colliery – Southern Zone Area Descriptions

Description	<p>This zone is approximately 2.02 ha. It is mostly dominated by mature <i>Pinus radiata</i> and Bamboo. This zone is a low priority due to the lack of remnant bushland and the extent of the pine forest.</p> <p>Area A – 50-75% weed cover</p> <p>Mature and sapling <i>Pinus radiata</i> lining the driveways.</p> <p>Area B – 25-50% weed cover</p> <p>High densities of mature <i>Pinus radiata</i> and Bamboo on western side of fence. Other exotic ornamental species including Oleander and Agave. Camphor Laurel trees on western side of fence. Whiskey Grass and Fireweed across managed lawn. Low priority area as dominated by <i>Pinus radiata</i>.</p> <p>Area C – 5-25% weed cover</p> <p>Mostly herbaceous weeds and exotic grasses.</p>
Priority Weeds	Bamboo, Fireweed, Camphor Laurel trees.
Priority Areas	All areas within this zone are low priority. Other zones of the Mannering Colliery are to be prioritised over this one.
Key Management Issues	<ul style="list-style-type: none"> Primary treatment of Fireweed and <i>Pinus radiata</i> saplings in Area C
Notes	Fence divides Area B. Western side of Area B can be accessed from southern end near driveway.

Title: Mannering Colliery
Southern Zone Weed Density

Map No: 10

Site: Mannering Colliery


Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron

 Management Zones

 Road

 Creek

Weed Density


 < 5%

 5 - 25%


 25 - 50%

 50 - 75%


Key points

 African Lovegrass

 Bamboo

 Bamboo & Coral Tree

 Fireweed

 Senna pendula var. glabrata

0 10 20 40 Meters



Data Source:
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Nearmap



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4.2.4 Mannering Colliery – Eastern Zone

Table 8. Mannering Colliery – Eastern Zone Area Descriptions

Description	<p>This zone is approximately 3.29 ha. This zone contains a carpark, cleared stockpile areas and dam, all bordered by bushland. The bushland is contiguous with adjacent bushland beyond the property boundary to the south. Weeds are generally confined to the bushland edges and disturbed areas.</p> <p>Area A – 5-25% weed cover</p> <p>Mostly planted ornamental exotics and some natives. Herbaceous weeds, exotic grasses and Fireweed across lawn.</p> <p>Area B – 25-50% weed cover</p> <p>Scattered herbaceous weeds, exotic and weedy grasses around edges of disturbed area.</p> <p>Area C – 5-25% weed cover</p> <p>Small area of weed encroachment including Crofton Weed. Evidence of treated Pampas Grass. Small outbreaks of Crofton Weed and Lantana present.</p> <p>Area D – <5% weed cover</p> <p>Mostly weed free bushland with some <i>Pinus radiata</i> saplings and African Lovegrass in the south-west corner of the area.</p> <p>Area E – 25-50% weed cover</p> <p>Dominated by mature and sapling <i>Pinus radiata</i>.</p>
Priority Weeds	Crofton Weed, Lantana, Pampas Grass, <i>Pinus radiata</i> and Fireweed.
Priority Areas	Area C and D. These areas are highly resilient and connected to bushland to the south.
Key Management Issues	<ul style="list-style-type: none"> Follow up treatment of Pampas Grass. Primary treatment of Lantana and Crofton Weed.
Notes	Site easily accessible.

Title: Mannering Colliery
Eastern Zone Weed Density

Map No: 11

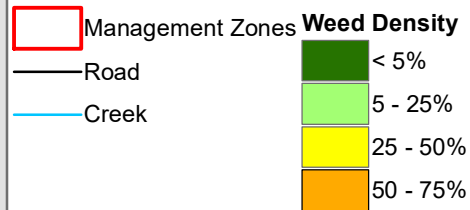
Site: Mannering Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron



Key Points

-  *Acacia saligna*
-  *African Lovegrass*
-  *African Lovegrass & Senna pendula*
var. *glabrata*
-  *Bitou Bush*
-  *Crofton Weed*
-  *Fireweed*
-  *Lantana camara*
-  *Orchid - Microtis* sp.
-  *Pampas Grass*
-  *Pinus radiata*
-  *Senna pendula* var. *glabrata*



Data Source:
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Nearmap



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4.3 Summerland Point Ventilation Shaft

The Summerland Point Ventilation Shaft site is made up of the following EECs:

- *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*; and
- *Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregions*.

See Map 3 for EEC locations.

The site contains an unsealed road that provides access to a cleared area where the ventilation shaft infrastructure sits. The areas surrounding the ventilation shaft have been cleared and contain most of the weed species identified on the site. The site is surrounded by highly resilient bushland. Areas along the unsealed road have also been subject to some weed invasion.



Figure 7. Giant Reed within bushland at the Summerland Ventilation Shaft site. .



Figure 8. Unsealed road and easement within the Summerland Ventilation Shaft site.



Figure 9. Vegetation adjacent to road on the Summerland Ventilation Shaft site.

Table 9. Summerland Point Ventilation Shaft – Area Descriptions

Description	<p>This zone is approximately 3.73 ha. This zone contains an unsealed road, a cleared area for the ventilation shaft infrastructure and remnant adjacent bushland. Weeds are generally confined to the bushland edges and disturbed areas.</p> <p>Area A – 5-25% weed cover</p> <p>Mostly bushland and road edges effected by weeds. Lantana thickets have been treated but required follow up treatment. Scattered small shoots of Lantana and Bitou Bush and herbaceous weeds.</p>
Priority Weeds	Lantana, Giant Reed, Bitou Bush
Priority areas	Entire site – small weeds outbreaks on edges of highly resilient bushland must be targeted to prevent further spread.
Key Management Issues	<ul style="list-style-type: none"> • Follow up treatment of Lantana and Bitou Bush. Small shoots can be hand pulled. • Primary treatment of a small area of Giant Reed. • Monitor bushland edges and road edges for new outbreaks.
Notes	<p>Easy vehicle access. Key required.</p> <p>Red-bellied black snake observed on site.</p>

Title: Summerland Point Ventilation
Shaft Weed Density

Map No: 12


Site: Summerland Point Ventilation Shaft


Client: Delta Coal

Date: November 2019

Project No: 11483

Author: G Barron

 Summerland Point











 Road

 Creek

Weed Density

 5 - 25%

Key Points

-  Arundo donax & Lantana camara
-  Bitou Bush
-  Bitou Bush - removed
-  Crofton Weed
-  Fireweed
-  Lantana camara
-  Lantana camara & Senna pendula
var. glabrata
-  Lantana camara (treated) & Senna
pendula var. glabrata
-  Lantana camara - treated
-  Senna pendula var. glabrata

0 25 50 100 Meters

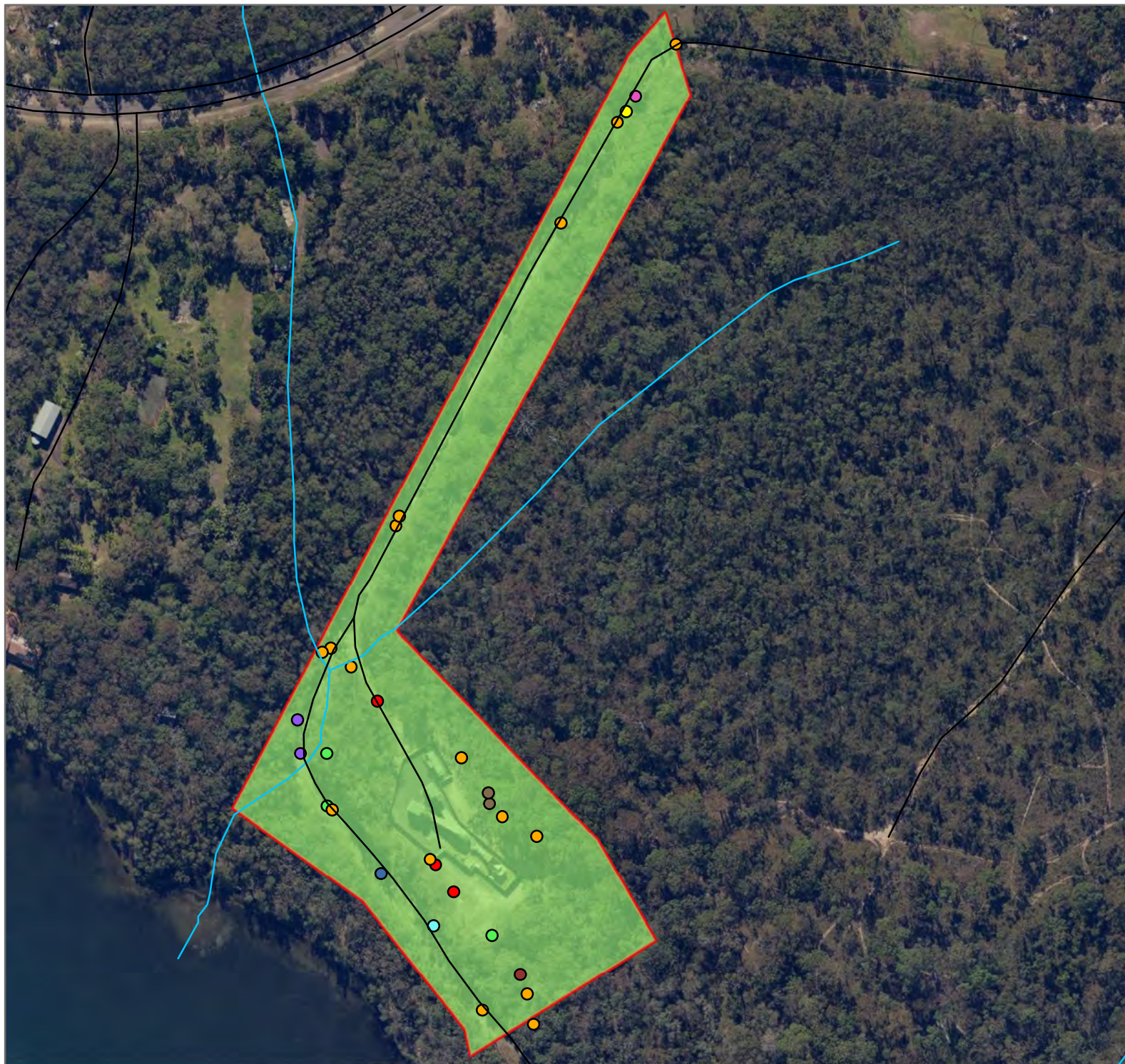


Data Source:
Total Earth Care
SIX Maps



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5 WEED MANAGEMENT

Species specific recommended weeding techniques including recommended herbicides and ratios are included Appendix B.

Weed recruitment and outbreaks are often triggered by disturbance or clearing. Weed management is a form of disturbance that can trigger additional recruitment of weeds as areas are cleared. Therefore secondary treatment is essential to successful weeding and bush regeneration methods.

All weeding management actions on these sites must be carried out by trained bush regenerators. Bush Regeneration contractors must comply with the *Pesticides Act 1999 and the Pesticides Regulation 2017*.

7 MONITORING GUIDELINES

Monitoring is required to assess the outcomes of the weed management work and help determine if management strategies should be amended. Monitoring should be completed every six (6) months by a qualified ecologist or bush regeneration supervisor using the following methods:

- Assessment of weed control works, native regeneration and revegetation success via permanent repeatable photographic monitoring points; and
- Mapping of weed density per zone to assess the progress of the work. The mapping included in this report can assist in the development of baseline data.

Monitoring reports must include:

- Details of the work carried out including weed management techniques and herbicide used;
- Photo monitoring points – baseline and follow up photos; and
- Recommendations for corrective measures and/or specific vegetation management required.

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Appendix A. Weed Species listed as a Biosecurity Risk

Table 10. Categories of Management under the Greater Sydney Regional Strategic Weed Management Plan 2017-2022 under the NSW Biosecurity Act 2015

Category	Management Action
Prevention (Prevent)	To prevent the weed species arriving and establishing in the Region.
Eradication (Eliminate)	To permanently remove the species and its propagules from the Region, OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.
Containment (Minimise)	To prevent the ongoing spread of the species in all or part of the Region.
Asset Protection (Manage)	To prevent the spread of weeds to key sites/ assets of high economic, environmental and social value, or to reduce their impact on these sites if spread.
GBD (General Biosecurity Duty)	All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable."
RRM (Regional Recommended Measure)	Specific details for each species included in table.
PoD (Prohibition on Dealings)	Must not be imported into the State or sold.
B Zone (Biosecurity Zone)	Specific details for each species included in table.
PM (Prohibited Matter)	A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries.

Table 11. Weeds under the Biosecurity Act recorded within the subject site listed as State or Regional Priority Weeds in the Greater Sydney Regional Strategic Weed Management Plan 2017-2022

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Golden Wreath Wattle	<i>Acacia saligna</i>				Environment	
Crofton Weed	<i>Ageratina adenophora</i>				Environment, Agriculture	
Scarlet Pimpernel	<i>Anagallis arvensis</i>					
Whisky Grass	<i>Andropogon virginicus</i>				Environment	
Giant Reed	<i>Arundo donax</i>			Asset Protection		RRM; Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment.
Asparagus Fern	<i>Asparagus aethiopicus</i>	Yes				PoD
Cobblers Pegs	<i>Bidens pilosa</i>					
Buffalo Grass	<i>Bouteloua dactyloides</i>					
Bitou Bush	<i>Chrysanthemoides monilifera subsp rotundata</i>	Yes	Containment			PoD, B Zone; The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south.
Camphor Laurel	<i>Cinnamomum camphora</i>				Environment, Agriculture, Human health	

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Spear Thistle	<i>Cirsium vulgare</i>					
Fleabane	<i>Conyza bonariensis</i>					
Pampas Grass	<i>Cortaderia jubata</i>			Asset Protection		RRM: Land managers mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. The plant should not be bought, sold, grown, carried or released into the environment. This Regional Recommended Measure applies to Cortaderia jubata (pink pampas grass)
Panic Veldgrass	<i>Ehrharta erecta</i>					
African Lovegrass	<i>Eragrostis curvula</i>				Environment	
Coral Tree, Common Coral Tree	<i>Erythrina x sykesii</i>				Environment	
Fennel	<i>Foeniculum vulgare</i>					
Narrow-Leaf Cotton Bush / Swan Plant	<i>Gomphocarpus fruticosus</i>					
Ginger Lily	<i>Hedychium gardnerianum</i>				Environment	
Pennywort	<i>Hydrocotyle bonariensis</i>					
Coolatai Grass	<i>Hyparrhenia hirta</i>				Environment, Agriculture	
Spiny Rush, Spike Rush, Sharp Rush	<i>Juncus acutus</i>				Environment	

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Lantana	<i>Lantana camara</i>	Yes	Asset Protection			PoD
Fishbone Fern	<i>Nephrolepis cordifolia</i>				Environment	
Ochna	<i>Ochna serrulata</i>				Environment	
Bamboo, Black Bamboo, Rhizomatous Bamboo,	<i>Phyllostachys nigra</i>				Environment	
Inkweed	<i>Phytolacca octandra</i>					
Radiata Pine, Pine Wildings	<i>Pinus radiata</i>				Environment	
Plantain	<i>Plantago lanceolata</i>					
Castor Oil Plant	<i>Ricinus communis</i>					
Blackberry	<i>Rubus fruticosus aggregate</i>	Yes				PoD; All species in the Rubus fruticosus species aggregate have this requirement, except for the varieties Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree
Fireweed	<i>Senecio madagascariensis</i>	Yes	Asset Protection			PoD
Senna / Cassia	<i>Senna pendula</i>				Environment	
Paddy's Lucerne	<i>Sida rhombifolia</i>					
Tobacco Bush/ Wild Tobacco	<i>Solanum mauritianum</i>				Environment, Agriculture	

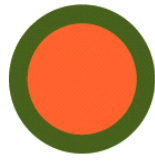
Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Blackberry Night Shade	<i>Solanum nigrum</i>					
Purpletop	<i>Verbena bonarensis</i>					

Appendix B. Species Specific Weeding Techniques

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
Golden Wreath Wattle	<i>Acacia saligna</i>	Chainsaw and paint with neat Glyphosate.	All year round	Glyphosate 360g/L	M	Neat
Crofton Weed	<i>Ageratina adenophora</i>	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Scarlet Pimpernel	<i>Anagallis arvensis</i>	Hand removal, spot spraying with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Whisky Grass	<i>Andropogon virginicus</i>	Remove seed and crown out with knife or spot spray	Prior to flowering in March to May	Glyphosate 360g/L	M	1/100
Giant Reed	<i>Arundo donax</i>	Cut and paint with neat Glyphosate.	All year round	Glyphosate 360g/L	M	Neat
Asparagus Fern	<i>Asparagus aethiopicus</i>	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	All year round	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	M & B	1/100 & 1g/10L
Cobblers Pegs	<i>Bidens pilosa</i>	Foliar spraying using Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Buffalo Grass	<i>Bouteloua dactyloides</i>	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Bitou Bush	<i>Chrysanthemoides monilifera subsp rotundata</i>	Small single specimens hand pulled or larger shrubs cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Camphor Laurel	<i>Cinnamomum camphora</i>	Scrape and paint or drill and fill with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Spear Thistle	<i>Cirsium vulgare</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Fleabane	<i>Conyza bonariensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Pampas Grass	<i>Cortaderia jubata</i>	Foliar spraying or cut/paint with Glyphosate or hand removed.	Prior to flowering in March to May	Glyphosate 360g/L	M	1/100 & Neat
Panic Veldgrass	<i>Ehrharta erecta</i>	Foliar spraying with Glyphosate	All year round	Glyphosate 360g/L	M	1/100

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
African Lovegrass	<i>Eragrostis curvula</i>	Hand pulled or brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Coral Tree, Common Coral Tree	<i>Erythrina x sykesii</i>	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Fennel	<i>Foeniculum vulgare</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Narrow-Leaf Cotton Bush / Swan Plant	<i>Gomphocarpus fruticosus</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100 & Neat
Ginger Lily	<i>Hedychium gardnerianum</i>	Physical removal. Large stands cut and painted with Glyphosate/Metsulfuron-Methyl.	All year round	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	M & B	Neat
Pennywort	<i>Hydrocotyle bonariensis</i>	Hand pulled or spot sprayed with Dicamba	All year round			
Coolatai Grass	<i>Hyparrhenia hirta</i>	Hand pulled or brush cut and foliar sprayed with Glyphosate. Up to three applications of Glyphosate in the same growing season will be required.	All year round	Glyphosate 360g/L	M	200ml/10l
Spiny Rush, Spike Rush, Sharp Rush	<i>Juncus acutus</i>	Juvenile single specimens to be dug out. Large infestations foliar spraying with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Lantana	<i>Lantana camara</i>	Cut and paint, sprayed or splattered with Glyphosate. Hand pull small shoots.	All year round	Glyphosate 360g/L	M	Neat
Fishbone Fern	<i>Nephrolepis cordifolia</i>	Hand removal. Brush cut then sprayed with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Ochna	<i>Ochna serrulata</i>	Double side scrape and paint all stems to 75% coverage.	All year round	Glyphosate 360g/L	M	Neat
Bamboo, Black Bamboo, Rhizomatous Bamboo,	<i>Phyllostachys nigra</i>	Chainsaw/cut close to base. Allow new shoots to return. Cut and paint new shoots with neat Glyphosate.	All year round	Glyphosate 360g/L	M	Neat
Inkweed	<i>Phytolacca octandra</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Radiata Pine, Pine Wildings	<i>Pinus radiata</i>	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
Plantain	<i>Plantago lanceolata</i>	Foliar spraying with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Castor Oil Plant	<i>Ricinus communis</i>	Hand pulled and cut & painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Blackberry	<i>Rubus fruticosus aggregate</i>	Brush cut, crowned and scraped & painted with neat Glyphosate	Between flowering and fruiting from November to January	Glyphosate 360g/L	M	Neat
Fireweed	<i>Senecio madagascariensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Senna / Cassia	<i>Senna pendula</i>	Small individuals hand removed, larger plants cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Paddy's Lucerne	<i>Sida rhombifolia</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Tobacco Bush/ Wild Tobacco	<i>Solanum mauritianum</i>	Cut & paint with Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Blackberry Night Shade	<i>Solanum nigrum</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Purpletop	<i>Verbena bonarensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100



total earth care



Weed Action Plan – Addendum

**Chain Valley Colliery, Mannering Colliery and
Summerland Point Ventilation Shaft**

Total Earth Care Pty Ltd

August 2020



total earth care

Weed Action Plan - Addendum

Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft

August 2020

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Revision/Version No.	Addendum 1	Date of revision	28 August 2020
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Prepared for:	Delta Coal		
TEC Job No.	C11483/J4925		

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1 INTRODUCTION

1.1 Background

Total Earth Care (TEC) previously prepared the Weed Action Plan (WAP) in January 2020 for the three (3) Delta Coal sites: Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft. This Addendum is developed to incorporate an additional area on the Lake Macquarie foreshore at the Chain Valley Colliery in the WAP. Delta Coal was granted a licence by the Minister for Water, Property & Housing on 11th June 2020 under Section 2.20 of the Crown Land Management Act 2016 for the use of the licensed area for *Environmental Rehabilitation – Vegetation Management*.

This Addendum provides guidance for managing the weeds within the licence's foreshore area. Current weed densities of the licence's area are provided as well as the relevant management actions.

1.2 Subject Sites and Study Area

The "Study Area" for this Addendum includes the licensed area of Crown Land (Lot 2, DP1198253) that abuts the Chain Valley Colliery site managed by Delta Coal. This will be referred to as the "Foreshore Zone". The area included in the license extends along the foreshore of the neighbouring Delta Electricity site to the north-west, but this area was not part of the scope of this project. Please see the Map 1 below which indicates the boundaries of the Study Area. The site falls within the Local Land Services Greater Sydney Region, bordering on the Hunter Region.

2 METHODS

2.1 Desktop Research

A preliminary desktop study was conducted to assess the previously mapped weed locations (Kleinfelder 2016) and existing plant community types using the Wyong ELA 2016 PCT (ELA, 2016) mapping.

2.2 Site Survey

A site survey was conducted over one (1) day on the 4th August 2020. Weather conditions were clear with maximum temperatures of approximately 18°C. See Map 1 for survey effort. Survey methodology followed that outlined in the WAP 2020.

3 RESULTS

The weed survey identified twenty-five (25) weed species under the *Biosecurity Act 2015*. These are listed in Appendix A along with the landholder's obligations under the Act. Of these, four (4) are listed as Weeds of National Significance (WoNS). These are:

- Asparagus Fern (*Asparagus aethiopicus*);
- Bitou Bush (*Chrysanthemoides monilifera subsp rotundata*);
- Lantana (*Lantana camara*); and
- Fireweed (*Senecio madagascariensis*).

Bitou Bush, Lantana and Fireweed are also listed as State Priority Weeds. The above listed weeds are also listed as Priority Weeds under the Greater Sydney Regional Strategic Weed Management Plan.

Weeds are mostly encroaching from the lot boundaries of the land, which is managed by Delta Coal. There are some small outbreaks within large resilient bushland areas which have been prioritised within this Plan.

Approximately six (6) *Dendrobium teretifolium*, an epiphytic orchid, were recorded at the southern end of this zone attached to the trunks of Casuarinas. These have been mapped in Map 2 of this Addendum.

The current condition, locations of weed infestations and weed densities have been discussed in detail within Section 4 - Management Zones.

Title: Chain Valley Colliery:
Subject Site & Survey Effort

Map No: Addendum Map 1

Site: Chain Valley Colliery

Client: Delta Coal


Date: August 2020

Project No: J4925

Author: G Tear

Legend

 Management Zones


 Survey Track

 Road

 Creek

EEC under BC Act 2016

 Swamp Oak Floodplain Forest

 Swamp Sclerophyll Forest on
Coastal Floodplains EEC

0 30 60 120 Meters



Data Source:
Total Earth Care
Nearmap
Wyong ELA 2016 v2



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4 MANAGEMENT ZONE

The Foreshore Area is the Crown Land foreshore of the southern end of Lake Macquarie. The Foreshore area forms an additional management zone to those outlined in the WAP 2020. A detailed description of the zone and the weed presence is included in Table 1.

4.1.1 Chain Valley Colliery – Foreshore Area

Table 1. Chain Valley Colliery – Foreshore Area Description

Description	<p>This zone is approximately 2.7 ha and runs along the foreshore of Lake Macquarie abutting the north-east boundary of the Chain Valley Colliery.</p> <p>Area A – <5% weed cover</p> <p>The most resilient area of this zone with low weed densities. Scattered occurrences of Bitou Bush (<i>Chrysanthemoides monilifera</i>) and Asparagus Fern (<i>Asparagus aethiopicus</i>), mostly along the lake edge. Approximately six (6) <i>Dendrobium teretifolium</i>, an epiphytic orchid, were recorded at the southern end of this zone attached to the trunks of Casuarinas.</p> <p>Area B – 50 – 75% weed cover</p> <p>Area with the highest weed density within this zone, which is mostly within the ground and shrub layer. Weed occurrences in this area mostly consist of <i>Lantana camara</i>, <i>Ochna serrulata</i>, Wild Tobacco (<i>Solanum mauritianum</i>), Bitou Bush (<i>Chrysanthemoides monilifera</i>), <i>Tradescantia fluminensis</i> and Asparagus Fern (<i>Asparagus aethiopicus</i>). The areas of densest weeds are along the western boundary of Area B.</p> <p>Area C – 50 – 75% weed cover</p> <p>Weeds are mostly within the ground layer which consists of exotic grasses, <i>Watsonia</i> (<i>Watsonia meriana</i> var. <i>bulbillifera</i>), Fireweed (<i>Senecio madagascariensis</i>), Asparagus Fern (<i>Asparagus aethiopicus</i>) and herbaceous weeds. Scattered occurrences and small patches of <i>Senna pendula</i> var. <i>glabrata</i>, Fishbone Fern (<i>Nephrolepis cordifolia</i>), <i>Ochna serrulata</i>, Coolatai Grass (<i>Hyparrhenia hirta</i>), <i>Lantana camara</i>, Rhodes Grass (<i>Chloris gayana</i>) and Crofton Weed (<i>Ageratina adenophora</i>) occur along the front of the cottages. Other ornamental exotic plant species are present here, most likely as plantings installed by previous residents of the cottages.</p> <p>Area D – 5-25% weed cover</p> <p>Scattered occurrences of <i>Lantana camara</i>, <i>Ochna serrulata</i>, and Asparagus Fern (<i>Asparagus aethiopicus</i>).</p>
Priority Weeds	<i>Lantana camara</i> , Bitou Bush (<i>Chrysanthemoides monilifera</i>), Fireweed (<i>Senecio madagascariensis</i>) and Asparagus Fern (<i>Asparagus aethiopicus</i>).
Priority Areas	Area A and B has the most resilience. Weeds should be controlled to prevent further spread. Working from the lake edge towards the Chain Valley Colliery lot boundaries will help in containing weeds within the Delta Coal's land and follow best practice of working from areas of highest resilience to lowest.
Key Management Issues	<ul style="list-style-type: none"> Targeted treatment of Bitou Bush (<i>Chrysanthemoides monilifera</i>) and Asparagus Fern (<i>Asparagus aethiopicus</i>) particularly along lake edges in Areas A and B. Primary and targeted treatment of <i>Senna pendula</i> var. <i>glabrata</i>, Fishbone Fern (<i>Nephrolepis cordifolia</i>), <i>Ochna serrulata</i>, Coolatai Grass (<i>Hyparrhenia hirta</i>), <i>Lantana camara</i>, Rhodes Grass (<i>Chloris gayana</i>) and Crofton Weed (<i>Ageratina adenophora</i>).
Notes	Access to this zone via dirt road from near the Chain Valley Colliery site entry. Key required. Caution to be taken driving around cottages due to rubbish and debris hidden by long grass.



Figure 1. Area C showing the small patch of Coolatai Grass present.



Figure 2. Boundary of Area B and D.

Title: Chain Valley Colliery:
Foreshore Zone Weeds

Map No: Addendum Map 2

Site: Chain Valley Colliery

Client: Delta Coal

Date: August 2020

Project No: J4925

Author: G Tear

Legend

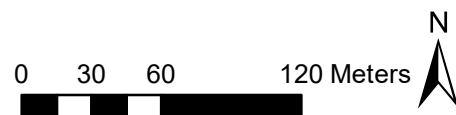
- Management Zones
- Road
- Creek

Weed Density

- < 5%
- 5 - 25%
- 25 - 50%
- 50 - 75%

Key Points

- Asparagus Fern
- Asparagus Fern, Senna, Coral Trees
- Asparagus fern
- Bitou Bush
- Bitou Bush, Asparagus Fern, Senna
- Coolatai Grass
- Dendrobium teretifolium
- Easter Daisy, Bitou Bush, Asparagus Fern
- Fishbone Fern, Buffalo, Couch
- Grevellia robusta
- Lantana Thicket
- Lantana camara, Asparagus Fern, Senna, Buffalo
- Lantana, Crofton Weed, Bidens, Watsonia, Senna
- Narrow-leaved Cotton Bush
- Ochna
- Ochna, Lantana, Asparagus Fern
- Ochna, Roads Grass
- Spear Thistle, Lantana
- Treated Bitou Bush
- Wild Tobacco, Senna



Data Source:
Total Earth Care
Nearmap



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5 MONITORING GUIDELINES

Monitoring is required to assess the outcomes of the weed management work and help determine if management strategies should be amended. Monitoring should be completed every six (6) months by a qualified ecologist or bush regeneration supervisor using the following methods:

- Assessment of weed control works, native regeneration and revegetation success via permanent repeatable photographic monitoring points; and
- Mapping of weed density per zone to assess the progress of the work. The mapping included in this report can assist in the development of baseline data.

Monitoring reports must include:

- Details of the work carried out including weed management techniques and herbicide used;
- Photo monitoring points – baseline and follow up photos; and
- Recommendations for corrective measures and/or specific vegetation management required.

Appendix A. Weed Species listed as a Biosecurity Risk

Table 2. Categories of Management under the Greater Sydney Regional Strategic Weed Management Plan 2017-2022 under the NSW Biosecurity Act 2015

Category	Management Action
Prevention (Prevent)	To prevent the weed species arriving and establishing in the Region.
Eradication (Eliminate)	To permanently remove the species and its propagules from the Region, OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.
Containment (Minimise)	To prevent the ongoing spread of the species in all or part of the Region.
Asset Protection (Manage)	To prevent the spread of weeds to key sites/ assets of high economic, environmental and social value, or to reduce their impact on these sites if spread.
GBD (General Biosecurity Duty)	All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable."
RRM (Regional Recommended Measure)	Specific details for each species included in table.
PoD (Prohibition on Dealings)	Must not be imported into the State or sold.
B Zone (Biosecurity Zone)	Specific details for each species included in table.
PM (Prohibited Matter)	A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries.

Table 3. Weeds recorded within the subject site with respective categories listed in the Greater Sydney Regional Strategic Weed Management Plan 2017-2022

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Crofton Weed	<i>Ageratina adenophora</i>				Environment, Agriculture Environment	
Whisky Grass	<i>Andropogon virginicus</i>					
Asparagus Fern	<i>Asparagus aethiopicus</i>	Yes				PoD
Cobblers Pegs	<i>Bidens pilosa</i>					
Buffalo Grass	<i>Bouteloua dactyloides</i>					
Bitou Bush	<i>Chrysanthemoides monilifera subsp rotundata</i>	Yes	Containment			PoD, B Zone; The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south.
Spear Thistle	<i>Cirsium vulgare</i>					
Fleabane	<i>Conyza bonariensis</i>					
Panic Veldgrass	<i>Ehrharta erecta</i>					
African Lovegrass	<i>Eragrostis curvula</i>				Environment	
Coral Tree, Common Coral Tree	<i>Erythrina x sykesii</i>				Environment	
Narrow-Leaf Cotton Bush / Swan Plant	<i>Gomphocarpus fruticosus</i>					
Pennywort	<i>Hydrocotyle bonariensis</i>					

Common Name	Botanical Name	WONS	State Priority Weed-Mgmt. Actions	Regional Priority Weeds-Mgmt. Actions	Other Regional Weeds-Asset/value at risk	Duties for Priority Weeds of Greater Sydney
Coolatai Grass	<i>Hyparrhenia hirta</i>				Environment, Agriculture	
Lantana	<i>Lantana camara</i>	Yes	Asset Protection			PoD
Fishbone Fern	<i>Nephrolepis cordifolia</i>				Environment	
Ochna	<i>Ochna serrulata</i>				Environment	
Fireweed	<i>Senecio madagascariensis</i>	Yes	Asset Protection			PoD
Senna / Cassia	<i>Senna pendula</i>				Environment	
Paddy's Lucerne	<i>Sida rhombifolia</i>					
Tobacco Bush/ Wild Tobacco	<i>Solanum mauritianum</i>				Environment, Agriculture	
Blackberry Night Shade	<i>Solanum nigrum</i>					
Purpletop	<i>Verbena bonarensis</i>					

Appendix B. Species Specific Weeding Techniques

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
Crofton Weed	<i>Ageratina adenophora</i>	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Whisky Grass	<i>Andropogon virginicus</i>	Remove seed and crown out with knife or spot spray	Prior to flowering in March to May	Glyphosate 360g/L	M	1/100
Asparagus Fern	<i>Asparagus aethiopicus</i>	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	All year round	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	M & B	1/100 & 1g/10L
Cobblers Pegs	<i>Bidens pilosa</i>	Foliar spraying using Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Buffalo Grass	<i>Bouteloua dactyloides</i>	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Bitou Bush	<i>Chrysanthemoides monilifera subsp rotundata</i>	Small single specimens hand pulled or larger shrubs cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Spear Thistle	<i>Cirsium vulgare</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Fleabane	<i>Conyza bonariensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Panic Veldgrass	<i>Ehrharta erecta</i>	Foliar spraying with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
African Lovegrass	<i>Eragrostis curvula</i>	Hand pulled or brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Coral Tree, Common Coral Tree	<i>Erythrina x sykesii</i>	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Narrow-Leaf Cotton Bush / Swan Plant	<i>Gomphocarpus fruticosus</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100 & Neat
Pennywort	<i>Hydrocotyle bonariensis</i>	Hand pulled or spot sprayed with Dicamba	All year round			
Coolatai Grass	<i>Hyparrhenia hirta</i>	Hand pulled or brush cut and foliar sprayed with Glyphosate. Up to three applications of Glyphosate in the same growing season will be required.	All year round	Glyphosate 360g/L	M	200ml/10l

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
Lantana	<i>Lantana camara</i>	Cut and paint, sprayed or splattered with Glyphosate. Hand pull small shoots.	All year round	Glyphosate 360g/L	M	Neat
Fishbone Fern	<i>Nephrolepis cordifolia</i>	Hand removal. Brush cut then sprayed with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Ochna	<i>Ochna serrulata</i>	Double side scrape and paint all stems to 75% coverage.	All year round	Glyphosate 360g/L	M	Neat
Fireweed	<i>Senecio madagascariensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Senna / Cassia	<i>Senna pendula</i>	Small individuals hand removed, larger plants cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Paddy's Lucerne	<i>Sida rhombifolia</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Tobacco Bush/ Wild Tobacco	<i>Solanum mauritianum</i>	Cut & paint with Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Blackberry Night Shade	<i>Solanum nigrum</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Purpletop	<i>Verbena bonariensis</i>	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100

Appendix 7: Noise Monitoring Results

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 103 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN001	24/3	16:11 (Day)	44	46	55	57	66	80	70	Nil	IA	N/A	38	N/A	3.9 m/s @ 290° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Wind in foliage and resident noise frequently audible. Distant traffic, car passbys and dogs barking occasionally audible.
ATN001	24/3	19:49 (Eve.)	44	48	53	55	60	70	64	Nil	IA	N/A	38	N/A	1.0 m/s @ 304° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic, dogs barking, resident noise, wind in foliage and car passbys occasionally audible.
ATN001	25/3	01:00 (Night)	40	42	43	44	45	55	64	Nil	IA	IA	38	45	0.7 m/s @ 281° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic frequently audible.
ATN002	24/3	15:04 (Day)	44	46	49	52	55	58	68	Nil	IA	N/A	49	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible.
ATN002	24/3	20:17 (Eve.)	43	45	48	47	57	69	69	Nil	IA	N/A	49	N/A	0.4 m/s @ 292° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic and passbys audible once. Distant dog barking briefly audible.
ATN002	25/3	01:34 (Night)	43	44	46	48	49	52	70	Nil	<44	<44	49	54	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC forklift occasionally audible. VPPS hum and insects consistently audible.
ATN003	24/3	14:45 (Day)	40	42	48	50	59	66	65	Nil	IA	N/A	36	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible. Local noise from village including traffic. Distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN003	24/3	21:00 (Eve.)	46	48	49	49	50	60	66	Nil	IA	N/A	36	N/A	0.7 m/s @ 336° E class stability Y/Y	Nil / Nil	CVC inaudible. MC just audible to inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic audible on occasion.
ATN003	25/3	02:00 (Night)	40	42	43	44	45	51	66	Nil	<40	44	36	45	0.9 m/s @ 269° E class stability Y/Y	Nil / Nil	CVC forklift occasionally audible. MC plant noise occasionally inaudible. VPPS hum, insects and frogs consistently audible.
ATN004	24/3	16:35 (Day)	36	40	58	60	70	78	65	Nil	IA	N/A	35	N/A	2.6 m/s @ 285° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Bird noise frequently audible. Wind in foliage, distant traffic, car passbys and dogs barking occasionally audible.
ATN004	24/3	19:04 (Eve.)	39	42	50	54	61	66	62	Nil	IA	N/A	35	N/A	1.1 m/s @ 305° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Bird noise frequently audible. Distant traffic occasionally audible.
ATN004	24/3	23:03 (Night)	39	42	43	44	46	51	61	Nil	IA	IA	35	45	0.6 m/s @ 346° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and insects consistently audible.
ATN005	24/3	16:59 (Day)	40	44	48	51	54	60	62	Nil	IA	N/A	35	N/A	2.5 m/s @ 284° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and lapping water consistently audible. Bird noise and wind in foliage frequently audible.
ATN005	24/3	18:20 (Eve.)	40	43	48	51	56	63	62	Nil	IA	N/A	35	N/A	1.5 m/s @ 304° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Bird noise and wind in foliage frequently audible. Local traffic, distant traffic and dogs barking occasionally audible.
ATN005	24/3	23:28 (Night)	39	41	43	44	46	57	62	Nil	IA	IA	35	45	0.8 m/s @ 334° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum and insects consistently audible. Distant traffic briefly audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN006	24/3	17:20 (Day)	37	39	43	45	52	59	60	Nil	IA	N/A	37	N/A	2.2 m/s @ 284° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and nearby pump (unrelated to CVC) consistently audible. Bird noise frequently audible. Wind in foliage, resident noise and distant traffic occasionally audible.
ATN006	24/3	18:00 (Eve.)	37	39	41	43	50	64	59	Nil	IA	N/A	37	N/A	1.3 m/s @ 297° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum and nearby pump (unrelated to CVC) consistently audible. Bird noise frequently audible. Distant traffic occasionally audible.
ATN006	25/3	01:51 (Night)	37	39	42	44	46	48	65	Nil	IA	IA	37	45	1.2 m/s @ 259° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, nearby pump (unrelated to CVC) insects and frogs consistently audible. Bird noise and fish jumping occasionally audible.
ATN007 ⁴	24/3	14:09 (Day)	49	50	51	52	54	61	71	Nil	41	N/A	46 ⁵	N/A	4.3 m/s @ 280° A class stability N/N	'N/A' / 'N/A'	CVC vent fan consistently audible and dominant. Birds and wind in trees consistently audible.
ATN007 ⁴	24/3	21:48 (Eve.)	48	49	50	51	51	57	72	2 dB	43 (41+2)	N/A	46 ⁵	N/A	0.8 m/s @ 355° F class stability N/Y	'N/A' / Nil	CVC vent fan consistently audible and dominant. VPPS hum consistently audible in the background. Insects consistently audible.
ATN007 ⁴	25/3	01:00 (Night)	48	49	50	51	51	55	72	2 dB	43 (41+2)	42	46 ⁵	46	0.7 m/s @ 281° E class stability Y/Y	Nil / Nil	CVC vent fan consistently audible and dominant. Insects consistently audible.
R12	24/3	15:04 (Day)	44	46	49	52	55	58	68	Nil	IA	N/A	49	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
R12	24/3	20:17 (Eve.)	43	45	48	47	57	69	69	Nil	IA	N/A	49	N/A	0.4 m/s @ 292° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic and passbys audible once. Distant dog barking briefly audible.
R12	25/3	01:34 (Night)	43	44	46	48	49	52	70	Nil	<44	<44	49	53	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC forklift occasionally audible. VPPS hum and insects consistently audible.
R13	24/3	15:21 (Day)	44	48	56	59	63	75	67	Nil	IA	N/A	43	N/A	4.1 m/s @ 277° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible. Local traffic and passbys frequently audible.
R13	24/3	20:35 (Eve.)	42	45	47	48	49	51	61	Nil	IA	N/A	43	N/A	0.5 m/s @ 333° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Distant dog barking briefly audible.
R13	25/3	01:26 (Night)	44	46	55	57	66	80	70	Nil	IA	N/A	43	49	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Wind in foliage and resident noise frequently audible. Distant traffic, car passbys and dogs barking occasionally audible.

- Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfl (refer to Section 2.2).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 5.1).
 4. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location. Total noise levels shown were measured at the alternative location and site contributions were calculated back to ATN007 (R22/EPL Point 23).
 5. For the purposes of this assessment, the noise limits specified in the DC have been used for assessing compliance at monitoring location ATN007 (R22/EPL Point 23).
 6. Modifying factor adjustments for low frequency noise only apply under the standard and/or noise-enhancing meteorological conditions in accordance with Fact Sheet C of the NPfl (refer to Section 2.2).
 7. IA = inaudible, N/A = not applicable.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q2 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN001	15/6	16:59 (Day)	43	44	48	48	54	78	63	Nil	IA	N/A	38	N/A	0.3 m/s @ 176° B class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Bird noise frequently audible. Traffic passbys, resident noise and dogs barking occasionally audible.
ATN001	15/6	20:03 (Eve.)	40	41	51	44	62	75	63	Nil	IA	N/A	38	N/A	0.4 m/s @ 263° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Traffic passbys, distant traffic, bird/bat noise and resident noise occasionally audible.
ATN001	16/6	01:00 (Night)	40	41	42	43	44	59	62	Nil	IA	IA	38	45	0.2 m/s @ 202° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic occasionally audible.
ATN002	15/6	14:04 (Day)	33	37	48	50	61	67	59	Nil	IA	N/A	49	N/A	1.2 m/s @ 172° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and birds consistently audible. Occasional noise from local traffic, dog barking and plane flying above.
ATN002	15/6	21:40 (Eve.)	40	41	42	43	44	55	65	Nil	≤32	N/A	49	N/A	0.1 m/s @ 99° F class stability N/Y	'N/A' / Nil	CVC alarm sound just audible. VPPS hum consistently audible. Occasional noise from birds and local traffic.
ATN002	16/6	02:05 (Night)	41	42	44	45	46	53	65	Nil	<44	48	49	54	0.3 m/s @ 186° F class stability N/Y	'N/A' / Nil	CVC forklift occasional audible. VPPS hum consistently audible. Occasional noise from birds and fruit bats.
ATN003	15/6	13:45 (Day)	29	33	45	45	56	69	56	Nil	IA	N/A	36	N/A	1.2 m/s @ 185° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum just audible on occasion. Insects and birds consistently audible. Occasional noise from local traffic, domestic activities, dog barking and planes flying above. Nearby resident talking for a brief moment.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q2 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN003	15/6	21:00 (Eve.)	36	38	40	41	43	59	61	Nil	IA	N/A	36	N/A	0.4 m/s @ 286° F class stability N/Y	'N/A' / Nil	CVC inaudible. MC CHPP noise consistently audible. VPPS hum consistently audible. Birds occasionally audible. Occasional noise from distant traffic.
ATN003	16/6	01:45 (Night)	39	40	41	42	44	55	62	Nil	IA	IA	36	45	0.3 m/s @ 168° F class stability N/Y	'N/A' / Nil	CVC inaudible. MC CHPP and overland conveyor noise consistently audible. VPPS hum consistently audible. Birds and fruit bats frequently audible. Noise from plane flying above audible once.
ATN004	15/6	14:41 (Day)	28	33	51	51	63	73	60	Nil	IA	N/A	35	N/A	0.9 m/s @ 165° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum just audible on occasion. Birds consistently audible. Occasional noise from local traffic, dog barking and helicopter flying above.
ATN004	15/6	19:20 (Eve.)	31	35	42	42	54	62	57	Nil	IA	N/A	35	N/A	0.7 m/s @ 249° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Traffic passbys, bird/bat noise, resident noise and dogs barking occasionally audible.
ATN004	15/6	22:21 (Night)	32	34	37	38	42	66	55	Nil	IA	IA	35	45	0.5 m/s @ 319° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Birds frequently audible. Occasional noise from distant traffic.
ATN005	15/6	17:27 (Day)	33	36	42	43	50	62	56	Nil	IA	N/A	35	N/A	0.1 m/s @ 162° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Bird noise and distant dogs barking occasionally audible.
ATN005	15/6	18:23 (Eve.)	33	35	44	46	55	60	58	Nil	IA	N/A	35	N/A	0.4 m/s @ 231° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Resident noise, local traffic and aircraft noise occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q2 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN005	16/6	01:49 (Night)	36	37	38	39	42	48	57	Nil	IA	IA	35	45	0.3 m/s @ 168° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic, bird/bat noise, aircraft noise and distant dogs barking occasionally audible.
ATN006	15/6	17:47 (Day)	32	34	39	41	46	56	56	Nil	IA	N/A	37	N/A	0.3 m/s @ 209° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible.
ATN006	15/6	18:02 (Eve.)	30	33	37	40	48	53	56	Nil	IA	N/A	37	N/A	0.4 m/s @ 264° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Bird noise and aircraft noise occasionally audible.
ATN006	16/6	02:10 (Night)	33	34	36	37	39	57	57	Nil	IA	IA	37	45	0.4 m/s @ 228° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Bird/bat noise and distant dogs barking occasionally audible.
ATN007 ⁴	15/6	15:12 (Day)	45	46	47	48	50	60	68	Nil	38	N/A	46 ⁵	N/A	0.9 m/s @ 110° A class stability Y/Y	Nil / Nil	CVC vent fan consistently audible. Birds consistently audible.
ATN007 ⁴	15/6	20:11 (Eve.)	45	46	47	47	48	62	68	2 dB	40 (38+2)	N/A	46 ⁵	N/A	0.5 m/s @ 321° F class stability N/Y	'N/A' / Nil	CVC vent fan consistently audible. Birds consistently audible. Distant traffic occasionally audible.
ATN007 ⁴	16/6	01:04 (Night)	46	47	47	48	49	62	69	2 dB	41 (39+2)	47	46 ⁵	46	0.2 m/s @ 202° F class stability N/Y	'N/A' / Nil	CVC vent fan consistently audible. Birds and fruit bats occasionally audible.
R12	15/6	14:04 (Day)	33	37	48	50	61	67	59	Nil	IA	N/A	49	N/A	1.2 m/s @ 172° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and birds consistently audible. Occasional noise from local traffic, dog barking and plane flying above.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q2 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
R12	15/6	21:40 (Eve.)	40	41	42	43	44	55	65	Nil	≤32	N/A	49	N/A	0.1 m/s @ 99° F class stability N/Y	'N/A' / Nil	CVC alarm sound just audible. VPPS hum consistently audible. Occasional noise from birds and local traffic.
R12	16/6	02:05 (Night)	41	42	44	45	46	53	65	Nil	<44	48	49	53	0.3 m/s @ 186° F class stability N/Y	'N/A' / Nil	CVC forklift occasional audible. VPPS hum consistently audible. Occasional noise from birds and fruit bats.
R13	15/6	14:21 (Day)	30	34	48	50	61	67	57	Nil	IA	N/A	43	N/A	1.7 m/s @ 172° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and birds consistently audible. Occasional noise from local traffic, dog barking, plane flying above and resident working nearby.
R13	15/6	19:00 (Eve.)	34	36	38	39	44	52	55	Nil	IA	N/A	43	N/A	0.7 m/s @ 255° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Bird/bat noise occasionally audible.
R13	16/6	01:25 (Night)	42	43	44	45	45	57	58	Nil	IA	IA	43	49	0.3 m/s @ 137° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, distant traffic, insects and frogs consistently audible. Bird/bat noise occasionally audible.

- Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfl (refer to Section 2.2).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 5.1).
 4. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location. Total noise levels shown were measured at the alternative location and site contributions were calculated back to ATN007 (R22/EPL Point 23).
 5. For the purposes of this assessment, the noise limits specified in the DC have been used for assessing compliance at monitoring location ATN007 (R22/EPL Point 23).
 6. Modifying factor adjustments for low frequency noise only apply under the standard and/or noise-enhancing meteorological conditions in accordance with Fact Sheet C of the NPfl (refer to Section 2.2).
 7. IA = inaudible, N/A = not applicable.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN001	17/9	13:54 (Day)	41	43	57	52	71	81	68	Nil	IA	N/A	3.4 m/s @ 57° SC A Yes	43 ⁴ (38+5)	N/A	Nil	CVC inaudible. Insects and frogs consistently audible. VPPS hum consistently audible. Distant traffic, local traffic, wind in foliage and birds frequently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible. Car passbys and noise from nearby residents occasionally audible.
ATN001	17/9	14:09 (Day)	40	42	55	53	69	76	64	Nil	IA	N/A	3.0 m/s @ 74° SC A No	38	N/A	Nil	CVC inaudible. Insects and frogs consistently audible. VPPS hum consistently audible. Distant traffic, local traffic, wind in foliage and birds frequently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible. Car passbys and noise from nearby residents occasionally audible.
ATN001	17/9	14:24 (Day)	40	42	56	52	69	80	64	Nil	IA	N/A	3.2 m/s @ 55° SC A Yes	43 ⁴ (38+5)	N/A	Nil	CVC inaudible. Insects and frogs consistently audible. VPPS hum consistently audible. Distant traffic, local traffic, wind in foliage and birds frequently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible. Car passbys and noise from nearby residents occasionally audible.
ATN001	17/9	14:39 (Day)	40	42	54	48	67	81	65	Nil	IA	N/A	2.6 m/s @ 52° SC A No	38	N/A	Nil	CVC inaudible. Insects and frogs consistently audible. VPPS hum consistently audible. Distant traffic, local traffic, wind in foliage and birds frequently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible. Car passbys and noise from nearby residents occasionally audible.
ATN001	23/9	17:10 (Day)	40	42	62	55	74	88	71	Nil	IA	N/A	1.9 m/s @ 60° SC B No	38	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Noise from nearby resident frequently audible. Traffic passby, distant traffic and wind in foliage occasionally audible.
ATN001	23/9	17:25 (Day)	41	42	56	51	64	84	66	Nil	IA	N/A	1.7 m/s @ 59° SC B No	38	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Noise from nearby resident frequently audible. Traffic passby, distant traffic and wind in foliage occasionally audible.
ATN001	23/9	18:00 (Eve.)	41	42	54	51	69	77	64	Nil	IA	N/A	1.4 m/s @ 41° SC E No	38	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Noise from nearby resident frequently audible. Traffic passby occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN001	23/9	18:15 (Eve.)	41	42	56	54	70	81	66	Nil	IA	N/A	1.2 m/s @ 56° SC D No	38	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Noise from nearby resident frequently audible. Traffic passby occasionally audible.
ATN001	24/9	0:43 (Night)	38	39	40	41	42	61	58	Nil	IA	IA	0.8 m/s @ 337° SC F No	38	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
ATN001	24/9	0:58 (Night)	37	39	40	40	41	42	58	Nil	IA	IA	0.9 m/s @ 340° SC E No	38	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
ATN001	24/9	1:13 (Night)	38	39	40	41	44	55	58	Nil	IA	IA	0.9 m/s @ 342° SC E No	38	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
ATN001	24/9	1:28 (Night)	38	39	40	41	42	60	58	Nil	IA	IA	0.7 m/s @ 334° SC F No	38	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
ATN002	17/9	7:37 (Day)	37	39	50	50	60	74	69	Nil	IA	N/A	0.4 m/s @ 24° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby and distant traffic occasionally audible. Reverse alarm from the east-north-east (unrelated to Delta Coal) frequently audible. Dog barking briefly audible.
ATN002	17/9	7:52 (Day)	37	40	51	53	65	70	64	Nil	IA	N/A	0.5 m/s @ 5° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Nearby residents talking. Reverse alarm from the east-north-east (unrelated to Delta Coal) frequently audible. Dog barking briefly audible on occasions.
ATN002	17/9	8:07 (Day)	38	40	54	52	65	78	68	Nil	IA	N/A	1.2 m/s @ 32° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Nearby residents talking. Dog barking briefly audible.
ATN002	17/9	8:22 (Day)	37	39	45	47	56	64	62	Nil	IA	N/A	1.6 m/s @ 19° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN002	17/9	8:38 (Day)	36	39	48	48	60	70	63	Nil	IA	N/A	2.0 m/s @ 1° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Aircraft noise briefly audible. Delivery truck parking nearby and idling.
ATN002	17/9	8:53 (Day)	36	39	51	48	66	69	62	Nil	IA	N/A	2.0 m/s @ 10° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Delivery truck nearby idling then leaving. Dog barking briefly audible.
ATN002	23/9	20:05 (Eve.)	40	42	43	44	45	47	64	Nil	IA	N/A	0.4 m/s @ 234° SC F No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Insects just audible. Local traffic briefly audible.
ATN002	23/9	20:20 (Eve.)	40	42	43	44	45	48	64	Nil	IA	N/A	0.4 m/s @ 352° SC F No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Insects just audible. Local traffic briefly audible on two occasions.
ATN002	23/9	23:30 (Night)	41	42	45	45	54	60	64	Nil	<40	<40	0.8 m/s @ 311° SC E No	49	54	Nil	CVC drift lift alarm noise briefly audible. VPPS hum consistently audible (dominant). Traffic passby and distant traffic occasionally audible.
ATN002	23/9	23:46 (Night)	40	42	43	44	46	51	63	Nil	IA	IA	0.8 m/s @ 312° SC E No	49	54	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Nearby resident arriving by car.
ATN002	24/9	0:01 (Night)	40	42	43	44	45	47	64	Nil	IA	IA	0.7 m/s @ 284° SC F No	49	54	Nil	CVC inaudible. VPPS hum consistently audible (dominant).
ATN002	24/9	0:16 (Night)	39	41	43	44	45	48	64	Nil	IA	IA	0.6 m/s @ 330° SC F No	49	54	Nil	CVC inaudible. VPPS hum consistently audible (dominant).
ATN003	17/9	9:15 (Day)	35	39	44	44	53	68	60	Nil	IA	N/A	2.4 m/s @ 33° SC A No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Mowing nearby consistently audible. Birds, insects and frogs consistently audible. Local traffic and distant traffic occasionally audible. Noise from nearby residents occasionally audible.
ATN003	17/9	9:31 (Day)	34	36	41	43	49	63	60	Nil	IA	N/A	2.6 m/s @ 31° SC A No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Mowing and leaf blower nearby audible. Birds consistently audible. Local traffic and distant traffic frequently audible. Noise from nearby residents occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN003	17/9	9:46 (Day)	34	36	47	46	60	71	61	Nil	IA	N/A	3.0 m/s @ 27° SC A No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Car passby, local traffic and distant traffic occasionally audible. Noise from nearby residents occasionally audible.
ATN003	17/9	10:01 (Day)	33	36	42	44	51	64	60	Nil	IA	N/A	3.2 m/s @ 17° SC A Yes	41 ⁴ (36+5)	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Local traffic and distant traffic occasionally audible. Noise from nearby residents occasionally audible. Wind in foliage occasionally audible.
ATN003	17/9	10:17 (Day)	33	35	40	42	49	60	60	Nil	IA	N/A	2.9 m/s @ 29° SC A No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Birds consistently audible. Local traffic and distant traffic occasionally audible. Noise from nearby residents occasionally audible.
ATN003	17/9	10:33 (Day)	34	37	42	43	51	66	61	Nil	<36	N/A	3.1 m/s @ 12° SC A Yes	41 ⁴ (36+5)	N/A	Nil	CVC forklift 'bang' noise occasionally audible. VPPS hum consistently audible. Birds consistently audible. Local traffic and distant traffic occasionally audible. Noise from nearby residents occasionally audible. Wind in foliage occasionally audible.
ATN003	23/9	19:30 (Eve.)	39	40	42	44	45	48	59	Nil	IA	N/A	0.4 m/s @ 20° SC F No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Distant traffic occasionally audible. Noise from nearby air-conditioning unit just audible. Residents talking nearby.
ATN003	23/9	19:45 (Eve.)	36	38	41	43	45	54	59	Nil	IA	N/A	0.6 m/s @ 236° SC F No	36	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Local and distant traffic occasionally audible. Noise from nearby air-conditioning unit just audible. Residents talking nearby.
ATN003	23/9	3:00 (Night)	40	42	44	45	46	56	60	Nil	IA	IA	0.3 m/s @ 179° SC F No	36	45	Nil	CVC inaudible. MC CHP noise consistently audible. VPPS hum consistently audible (dominant most of the time). Distant traffic audible on one occasion.
ATN003	23/9	4:00 (Night)	38	41	45	46	55	62	60	Nil	IA	IA	0.2 m/s @ 153° SC F No	36	45	Nil	CVC inaudible. MC CHP noise consistently audible. VPPS hum consistently audible (dominant most of the time). Distant traffic audible on one occasion. Birds occasionally audible.
ATN003	23/9	5:00 (Night)	38	41	50	54	61	65	60	Nil	IA	IA	0.7 m/s @ 333° SC F No	36	45	Nil	CVC inaudible. MC CHP noise audible to inaudible. VPPS hum consistently audible (dominant). Distant traffic audible on occasion. Birds frequently audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN003	23/9	6:00 (Night)	38	40	44	45	52	67	59	Nil	IA	IA	0.2 m/s @ 318° SC F No	36	45	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Alarm sound briefly audible from the south-west (unrelated to Delta Coal). Distant traffic consistently audible. Birds and insects consistently audible.
ATN004	17/9	7:15 (Day)	40	45	53	53	63	78	61	Nil	IA	N/A	0.4 m/s @ 12° SC A No	35	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Car passby on two occasions. Aircraft noise briefly audible.
ATN004	23/9	20:45 (Eve.)	36	38	42	44	46	58	57	Nil	IA	N/A	1.0 m/s @ 350° SC D No	35	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Insects frequently audible. Birds and dog barking briefly audible.
ATN004	23/9	5:30 (Night)	39	43	54	56	63	77	64	Nil	IA	IA	0.4 m/s @ 318° SC D No	35	45	Nil	CVC inaudible. Local and distant traffic frequently audible. VPPS hum consistently audible. Birds consistently audible.
ATN005	17/9	11:50 (Day)	36	41	50	53	59	64	60	Nil	IA	N/A	2.7 m/s @ 33° SC A No	35	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. VPPS hum consistently audible. Local traffic and nearby pedestrians frequently audible. Noise from nearby residents frequently audible. Car passby. Aircraft noise audible.
ATN005	23/9	20:02 (Eve.)	37	38	41	43	45	64	60	Nil	IA	N/A	0.4 m/s @ 234° SC F No	35	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident frequently audible. Distant traffic occasionally audible.
ATN005	23/9	23:06 (Night)	35	37	39	40	42	55	58	Nil	IA	IA	0.3 m/s @ 189° SC F No	35	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
ATN006	17/9	12:10 (Day)	35	38	48	48	61	70	61	Nil	IA	N/A	2.6 m/s @ 46° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.
ATN006	17/9	12:25 (Day)	34	37	42	44	49	61	58	Nil	IA	N/A	3.0 m/s @ 52° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN006	17/9	12:40 (Day)	33	36	41	43	48	61	57	Nil	IA	N/A	2.7 m/s @ 59° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.
ATN006	17/9	12:55 (Day)	35	37	43	46	51	68	58	Nil	IA	N/A	2.6 m/s @ 60° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.
ATN006	17/9	13:10 (Day)	35	38	46	45	58	69	57	Nil	IA	N/A	2.8 m/s @ 59° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.
ATN006	17/9	13:25 (Day)	37	41	47	48	57	67	59	Nil	IA	N/A	2.7 m/s @ 72° SC A No	37	N/A	Nil	CVC inaudible. Insects, frogs and birds consistently audible. Distant traffic frequently audible. Local traffic, wind in foliage, aircraft noise and dog barking occasionally audible.
ATN006	23/9	20:22 (Eve.)	34	36	38	39	40	63	59	Nil	IA	N/A	0.4 m/s @ 352° SC F No	37	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident and distant traffic occasionally audible.
ATN006	23/9	20:37 (Eve.)	35	36	37	38	39	62	59	Nil	IA	N/A	0.9 m/s @ 2° SC D No	37	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident and distant traffic occasionally audible.
ATN006	23/9	22:00 (Night)	37	39	41	42	46	54	60	Nil	IA	IA	0.5 m/s @ 311° SC E No	37	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident, birds, unidentified fauna and distant traffic occasionally audible.
ATN006	23/9	22:15 (Night)	36	38	40	41	42	65	60	Nil	IA	IA	0.4 m/s @ 281° SC F No	37	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident, birds, unidentified fauna and distant traffic occasionally audible.
ATN006	23/9	22:30 (Night)	36	38	39	40	42	53	60	Nil	IA	IA	0.6 m/s @ 295° SC E No	37	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident, birds, unidentified fauna and distant traffic occasionally audible.
ATN006	23/9	22:45 (Night)	35	37	39	40	42	46	59	Nil	IA	IA	0.6 m/s @ 28° SC F No	37	45	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Noise from nearby resident, birds, unidentified fauna and distant traffic occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN007 ⁵	17/9	11:40 (Day)	45	47	47	48	49	55	69	Nil	40	N/A	2.7 m/s @ 33° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds consistently audible. Distant traffic occasionally audible. Wind in foliage occasionally audible.
ATN007 ⁵	17/9	11:55 (Day)	46	47	48	48	57	65	69	Nil	40	N/A	2.7 m/s @ 39° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds consistently audible. Distant traffic occasionally audible. Aircraft noise briefly audible. Wind in foliage occasionally audible.
ATN007 ⁵	17/9	12:11 (Day)	45	47	50	48	61	68	69	Nil	40	N/A	2.6 m/s @ 46° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds consistently audible. Distant traffic occasionally audible. Aircraft noise briefly audible. Wind in foliage occasionally audible.
ATN007 ⁵	17/9	12:26 (Day)	45	47	47	48	49	52	69	Nil	40	N/A	3.0 m/s @ 52° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds consistently audible. Distant traffic occasionally audible. Wind in foliage occasionally audible.
ATN007 ⁵	17/9	12:41 (Day)	45	47	47	48	49	56	69	Nil	40	N/A	2.7 m/s @ 59° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds consistently audible. Distant traffic occasionally audible. Wind in foliage occasionally audible.
ATN007 ⁵	17/9	12:57 (Day)	46	47	48	48	49	55	69	Nil	40	N/A	2.6 m/s @ 60° SC A No	46	N/A	Nil	CVC vent fans consistently audible. Birds frequently audible. Distant traffic occasionally audible. Wind in foliage frequently audible.
ATN007 ⁵	23/9	21:30 (Eve.)	47	48	49	49	50	52	70	2	43 (41+2)	N/A	0.6 m/s @ 315° SC F No	46	N/A	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.
ATN007 ⁵	23/9	21:45 (Eve.)	47	48	48	49	50	54	69	2	43 (41+2)	N/A	0.5 m/s @ 320° SC F No	46	N/A	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.
ATN007 ⁵	23/9	22:00 (Night)	47	48	48	49	50	54	70	2	43 (41+2)	41	0.5 m/s @ 311° SC E No	46	46	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.
ATN007 ⁵	23/9	22:16 (Night)	47	48	48	49	49	52	70	2	43 (41+2)	41	0.4 m/s @ 281° SC F No	46	46	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
ATN007 ⁵	23/9	22:31 (Night)	46	47	48	49	49	52	70	2	43 (41+2)	41	0.6 m/s @ 295° SC E No	46	46	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.
ATN007 ⁵	23/9	22:46 (Night)	46	48	48	49	50	53	70	2	43 (41+2)	41	0.6 m/s @ 28° SC F No	46	46	Nil	CVC vent fans consistently audible. VPPS hum just audible and consistent. Birds and distant traffic occasionally audible.
R12	17/9	7:37 (Day)	37	39	50	50	60	74	69	Nil	IA	N/A	0.4 m/s @ 24° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby and distant traffic occasionally audible. Reverse alarm from the east-north-east (unrelated to Delta Coal) frequently audible. Dog barking briefly audible.
R12	17/9	7:52 (Day)	37	40	51	53	65	70	64	Nil	IA	N/A	0.5 m/s @ 5° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Nearby residents talking. Reverse alarm from the east-north-east (unrelated to Delta Coal) frequently audible. Dog barking briefly audible on occasions.
R12	17/9	8:07 (Day)	38	40	54	52	65	78	68	Nil	IA	N/A	1.2 m/s @ 32° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Nearby residents talking. Dog barking briefly audible.
R12	17/9	8:22 (Day)	37	39	45	47	56	64	62	Nil	IA	N/A	1.6 m/s @ 19° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible.
R12	17/9	8:38 (Day)	36	39	48	48	60	70	63	Nil	IA	N/A	2.0 m/s @ 1° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Aircraft noise briefly audible. Delivery truck parking nearby and idling.
R12	17/9	8:53 (Day)	36	39	51	48	66	69	62	Nil	IA	N/A	2.0 m/s @ 10° SC A No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Birds consistently audible. Traffic passby, local traffic and distant traffic occasionally audible. Delivery truck nearby idling then leaving. Dog barking briefly audible.
R12	23/9	20:05 (Eve.)	40	42	43	44	45	47	64	Nil	IA	N/A	0.4 m/s @ 234° SC F No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Insects just audible. Local traffic briefly audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
R12	23/9	20:20 (Eve.)	40	42	43	44	45	48	64	Nil	IA	N/A	0.4 m/s @ 352° SC F No	49	N/A	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Insects just audible. Local traffic briefly audible on two occasions.
R12	23/9	23:30 (Night)	41	42	45	45	54	60	64	Nil	<40	<40	0.8 m/s @ 311° SC E No	49	53	Nil	CVC drift lift alarm noise briefly audible. VPPS hum consistently audible (dominant). Traffic passby and distant traffic occasionally audible.
R12	23/9	23:46 (Night)	40	42	43	44	46	51	63	Nil	IA	IA	0.8 m/s @ 312° SC E No	49	53	Nil	CVC inaudible. VPPS hum consistently audible (dominant). Nearby resident arriving by car.
R12	24/9	0:01 (Night)	40	42	43	44	45	47	64	Nil	IA	IA	0.7 m/s @ 284° SC F No	49	53	Nil	CVC inaudible. VPPS hum consistently audible (dominant).
R12	24/9	0:16 (Night)	39	41	43	44	45	48	64	Nil	IA	IA	0.6 m/s @ 330° SC F No	49	53	Nil	CVC inaudible. VPPS hum consistently audible (dominant).
R13	17/9	10:11 (Day)	38	45	57	62	65	73	60	Nil	IA	N/A	2.9 m/s @ 29° SC A No	43	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible.
R13	17/9	10:26 (Day)	37	42	52	55	63	72	62	Nil	IA	N/A	3.1 m/s @ 12° SC A Yes	48 ⁴ (43+5)	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible.
R13	17/9	10:41 (Day)	38	41	53	54	65	77	59	Nil	IA	N/A	2.4 m/s @ 34° SC A No	43	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible.
R13	17/9	10:56 (Day)	36	39	54	55	68	79	61	Nil	IA	N/A	2.7 m/s @ 34° SC A No	43	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
R13	17/9	11:11 (Day)	37	41	57	59	69	77	61	Nil	IA	N/A	3.1 m/s @ 34° SC A Yes	48 ⁴ (43+5)	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible. Nearby residents talking.
R13	17/9	11:26 (Day)	39	43	62	60	74	87	65	Nil	IA	N/A	2.4 m/s @ 32° SC A No	43	N/A	Nil	CVC inaudible. Consistent insects, frogs and birds. VPPS hum consistently audible. Noise from nearby resident gardening occasionally audible. Local and distant traffic occasionally audible. Dogs barking occasionally audible. Nearby residents talking.
R13	23/9	19:14 (Eve.)	36	38	41	43	46	54	57	Nil	IA	N/A	0.7 m/s @ 1° SC E No	43	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic and birds occasionally audible.
R13	23/9	19:29 (Eve.)	37	39	41	42	49	53	58	Nil	IA	N/A	0.4 m/s @ 20° SC F No	43	N/A	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic and birds occasionally audible.
R13	23/9	23:30 (Night)	39	41	43	44	45	55	60	Nil	IA	IA	0.8 m/s @ 311° SC E No	43	49	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
R13	23/9	23:45 (Night)	38	40	42	43	44	51	59	Nil	IA	IA	0.8 m/s @ 312° SC E No	43	49	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.
R13	24/9	0:00 (Night)	38	40	42	43	44	47	59	Nil	IA	IA	0.7 m/s @ 284° SC F No	43	49	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.

Table 4.1 CVC attended noise monitoring results – Q3 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ Very noise-enhancing?	Noise limits, dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
R13	24/9	0:15 (Night)	38	40	42	44	46	55	58	Nil	IA	IA	0.6 m/s @ 330° SC F No	43	49	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Birds and distant traffic occasionally audible.

- Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfI (refer to Section 2.3).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data including wind speed, wind direction and stability category (SC) were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 3.3).
 4. A positive adjustment of 5 dB to the noise limit(s) was applicable due to the presence of 'very noise-enhancing' meteorological conditions as per the revised NMP and NPfI.
 5. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location. Total noise levels shown were measured at the alternative location and site contributions were calculated back to R22/EPL Point 23.
 6. IA = inaudible.
 7. N/A = not applicable.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ Very noise-enhancing?	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN001	6/12	15:14 (Day)	41	43	56	52	70	79	68	Nil	IA	N/A	38	N/A	1.6 m/s @ 63° A class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Resident noise frequently audible. Dogs barking, bird noise and traffic passbys occasionally audible.
ATN001	6/12	20:02 (Eve.)	41	43	50	50	62	74	65	Nil	IA	N/A	38	N/A	1.1 m/s @ 39° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Resident noise frequently audible. Dogs barking, bird noise, aircraft noise, wind in foliage and traffic passbys occasionally audible.
ATN001	8/12	01:19 (Night)	41	42	44	45	45	62	63	Nil	IA	IA	38	45	0.5 m/s @ 262° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN002	6/12	15:57 (Day)	38	42	52	52	64	73	68	Nil	IA	N/A	54 (49+5)	N/A	3.9 m/s @ 61° A class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Bird noise, resident noise, insects and frogs consistently audible. Dogs barking and traffic passbys occasionally audible.
ATN002	6/12	21:16 (Eve.)	35	37	39	40	42	49	59	Nil	IA	N/A	49	N/A	0.7 m/s @ 46° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. People at nearby residence frequently audible. Distant traffic and dogs barking occasionally audible.
ATN002	8/12	02:06 (Night)	39	41	43	46	48	49	65	Nil	IA	IA	49	54	1.0 m/s @ 229° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN003	6/12	15:39 (Day)	31	38	52	58	62	70	57	Nil	IA	N/A	36	N/A	1.6 m/s @ 69° A class stability No	Nil	CVC inaudible. Nearby residential construction, insects and frogs consistently audible. Distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ Very noise-enhancing?	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN003	6/12	20:45 (Eve.)	38	40	42	43	46	63	58	Nil	IA	N/A	36	N/A	1.6 m/s @ 57° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic occasionally audible.
ATN003	8/12	01:45 (Night)	36	38	39	40	42	50	62	Nil	IA	IA	36	45	0.2 m/s @ 198° F class stability No	Nil	CVC inaudible. MC CHP noise consistently audible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic and birds occasionally audible.
ATN004	6/12	16:33 (Day)	32	35	45	48	57	64	58	Nil	IA	N/A	35	N/A	1.7 m/s @ 53° A class stability No	Nil	CVC inaudible. Bird noise, insects and frogs consistently audible. Dogs barking, aircraft noise, wind in foliage and traffic passbys occasionally audible.
ATN004	6/12	19:37 (Eve.)	29	31	41	44	53	59	54	Nil	IA	N/A	35	N/A	1.7 m/s @ 41° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Traffic passbys occasionally audible.
ATN004	6/12	22:31 (Night)	32	35	36	38	39	45	53	Nil	IA	IA	35	45	1.3 m/s @ 37° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN005	6/12	16:56 (Day)	29	32	38	40	48	58	53	Nil	IA	N/A	35	N/A	1.7 m/s @ 61° A class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Resident noise occasionally audible.
ATN005	6/12	18:47 (Eve.)	29	33	40	44	50	59	52	Nil	IA	N/A	35	N/A	1.2 m/s @ 54° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise frequently audible. Resident noise, dogs barking and distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ Very noise-enhancing?	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
ATN005	6/12	23:04 (Night)	30	33	37	39	46	49	52	Nil	IA	IA	35	45	1.9 m/s @ 23° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible.
ATN006	6/12	17:16 (Day)	30	33	45	43	58	72	53	Nil	IA	N/A	37	N/A	1.8 m/s @ 57° A class stability No	Nil	CVC inaudible. Insects and frogs consistently audible. Bird noise, resident noise and distant traffic frequently audible. Aircraft noise occasionally audible.
ATN006	6/12	18:27 (Eve.)	29	31	42	43	55	67	50	Nil	IA	N/A	42 (37+5)	N/A	2.5 m/s @ 65° F class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Resident noise occasionally audible.
ATN006	8/12	02:53 (Night)	36	38	43	44	54	59	61	Nil	IA	IA	37	45	2.2 m/s @ 178° D class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Birds occasionally audible. Aircraft flying above audible on one occasion.
ATN007 ⁴	6/12	17:43 (Day)	47	49	50	51	52	54	70	Nil	42	N/A	46 ⁵	N/A	1.4 m/s @ 63° F class stability No	Nil	CVC vent fan consistently audible. Insects and frogs consistently audible. Bird noise frequently audible. Distant traffic and wind in foliage occasionally audible.
ATN007 ⁴	6/12	18:00 (Eve.)	47	49	50	51	52	61	70	2 dB	44 (42+2)	N/A	46 ⁵	N/A	1.4 m/s @ 73° F class stability No	Nil	CVC vent fan consistently audible. Insects and frogs consistently audible. Bird noise, distant traffic and wind in foliage occasionally audible.
ATN007 ⁴	8/12	03:28 (Night)	48	49	50	50	51	52	71	2 dB	44 (42+2)	42	46 ⁵	46	1.1 m/s @ 187° F class stability No	Nil	CVC vent fan consistently audible. VPPS hum consistently audible in the background. Insects consistently audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ Very noise-enhancing?	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
R12	6/12	15:57 (Day)	38	42	52	52	64	73	68	Nil	IA	N/A	54 (49+5)	N/A	3.9 m/s @ 61° A class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Bird noise, resident noise, insects and frogs consistently audible. Dogs barking and traffic passbys occasionally audible.
R12	6/12	21:16 (Eve.)	35	37	39	40	42	49	59	Nil	IA	N/A	49	N/A	0.7 m/s @ 46° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. People at nearby residence frequently audible. Distant traffic and dogs barking occasionally audible.
R12	8/12	02:06 (Night)	39	41	43	46	48	49	65	Nil	IA	IA	49	53	1.0 m/s @ 229° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
R13	6/12	16:14 (Day)	32	36	46	50	57	63	57	Nil	IA	N/A	48 (43+5)	N/A	3.2 m/s @ 75° A class stability Yes	Nil	CVC inaudible. Bird noise, insects and frogs consistently audible. Dogs barking, wind in foliage and traffic passbys occasionally audible.
R13	6/12	21:33 (Eve.)	35	37	46	51	54	67	54	Nil	IA	N/A	43	N/A	1.3 m/s @ 41° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Distant traffic, wind in tree foliage and dog barking occasionally audible.
R13	8/12	02:24 (Night)	41	43	48	51	52	53	60	Nil	IA	IA	43	49	0.5 m/s @ 197° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic briefly audible.

- Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfI (refer to Section 0).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data including wind speed, wind direction and stability category (SC) were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 3.3).
 4. A positive adjustment of 5 dB to the noise limit(s) was applicable due to the presence of 'very noise-enhancing' meteorological conditions as per the revised NMP and NPfI.
 5. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location. Total noise levels shown were measured at the alternative location and site contributions were calculated back to R22/EPL Point 23.
 6. IA = inaudible, N/A = not applicable.

Appendix 8: Annual Subsidence Report

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 104 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				



SITE:	Chain Valley Colliery and Mannering Colliery
Department:	Technical Services
REPORT TITLE:	2021 Annual Subsidence Report
Prepared by:	Lachlan McWha
Report Date:	31 st March 2022
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1 Introduction

1.1 Background

Chain Valley Colliery (CVC) and Mannering Colliery (MC) are underground coal mines on the southern side of Lake Macquarie, approximately 60 kilometres (km) south of Newcastle and 80 km north of Sydney.

CVC operates under Development Consent SSD-5465, as modified, which was originally granted on 23 December 2013 by the then Minister for Planning and Infrastructure under Part 4, Division 4.1 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), which relates to State significant development (SSD). The consent permits underground bord and pillar mining as well as Miniwall mining in the Fassifern Seam at a maximum rate of 2.1 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal, with all secondary extraction confined to areas under the Lake Macquarie water body.

MC was granted Project Approval (MP06_0311) under Part 3A of the EP&A Act on 12 March 2008 and, as modified, permits the extraction of up to 1.1 Mtpa of ROM coal until 30 June 2022. It also permits the handling of up to 2.1 Mtpa ROM coal with that coal transported via a dedicated overland conveyor to Delta Electricity's Vales Point Power Station (VPPS) for domestic energy generation.

1.2 Purpose

This Annual Subsidence Report (ASR) provides an overview of subsidence monitoring data and management performance for CVC and MC in the 2021 calendar year and has been prepared as an appendix to the Chain Valley Colliery and Mannering Colliery Annual reviews. Subsidence at CVC and MC is documented, regulated, controlled and measured consistent with the relevant conditions of SSD-5465 and MP06_0311. In addition, this ASR:

- provides data to assist with the management of the risks associated with subsidence at CVC and MC
- compares observed subsidence against predictions in CVC's and MC's environmental assessment and approval documentation and summarises the results of subsidence monitoring activities performed in 2021.

1.3 Scope

This ASR relates specifically to underground mining undertaken at CVC and MC in the period 1 January 2021 to 31 December 2021. Within this period, no mining was undertaken at MC. First workings and secondary extraction were undertaken at CVC and included:

First Workings:

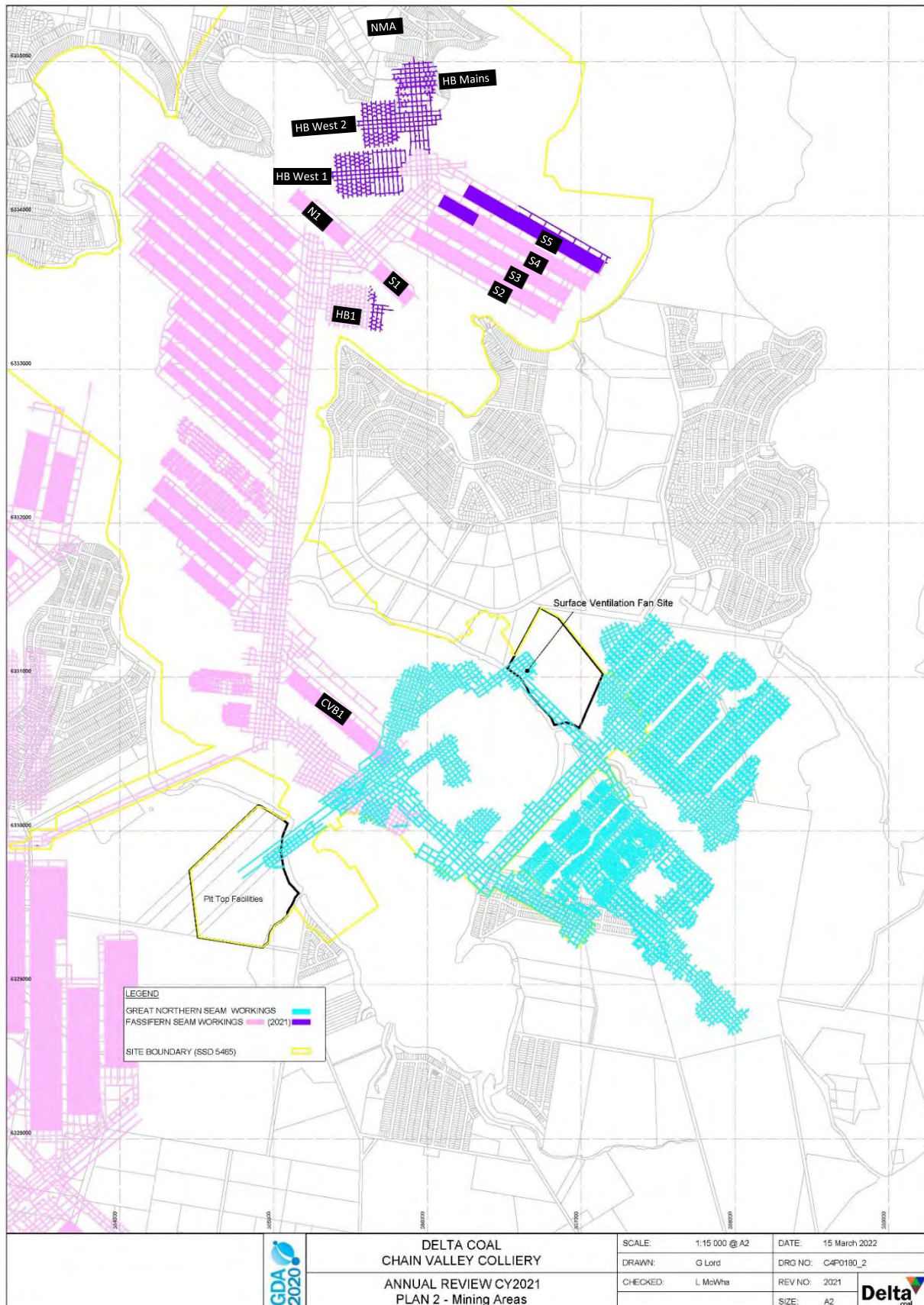
- 661,471 tonnes of ROM coal from development drivage and bord and pillar first workings which occurred in HB1, HB Mains, HB West 1, HB West 2, tailgate S5

Secondary Extraction

- 661,471 tonnes of ROM coal from Miniwall S4 and Miniwall S5 (completed in August 2021).

Mining areas in 2021 are shown in **Figure 1**.

Figure 1 - CVC Fassifern Workings (dark purple represents 2021 extraction)



1.4 Approval and Legislative Requirements

1.4.1 Chain Valley Colliery

In addition to carrying out the works in accordance with the conditions of SSD-5465, as modified (Schedule 2, condition 2A), DC carries out works generally in accordance with the Environmental Impact Statement (EIS); Statement of Environmental Effects (SEE) (Mod 1); SEE (Mod 2); SEE (Mod 3); SEE (Mod 4) project layout plans and Statement of Commitments. Within the 2021 reporting period, Chain Valley Colliery's development consent was modified (Mod 4) to include an extension of the northern consent boundary, allowing mining in the Northern Mining Area (NMA).

An ecological and archaeological assessment was conducted in August 2019 and a Conservation Risk Assessment Approval from National Parks and Wildlife Service (NPWS) Miniwall S4 and S5 was granted in October 2019 to allow access and foreshore subsidence monitoring activities for Miniwalls S4 and S5.

In 2021 Delta Coal sought land-owner consent for the installation and routine monitoring of surveying pins at foreshore properties in the NMA including the suburbs of Brightwaters, Mirrabooka and Sunshine. In addition to foreshore properties, where the land-owner was Lake Macquarie City Council or crown land (operated by Council) an ecological and archaeological Conservation Risk Assessment (CRA) was undertaken of the proposed monitoring point installation locations and submitted to Council. Foreshore properties are modelled to experience negligible subsidence (<20 mm) from first workings mining only.

Subsidence monitoring is undertaken in accordance with Chain Valley Colliery's approved Subsidence Monitoring Programs (SMP):

- Chain Valley Colliery, Subsidence Monitoring Program, Northern Mining Area First Workings and Lake Macquarie Extraction, August 2021 (forms part of the approved CVC Mining Operations Plan 2020-2023 Amendment 2)
- Chain Valley Colliery, Subsidence Monitoring Program, Miniwall S5 and Northern Mining Area Pillar Extraction, November 2020 (forms part of the approved CVC MWS5 and NMA Extraction Plan).

1.4.2 Mannering Colliery

In accordance with Schedule 2, Condition 2 and 2A of MP06_0311 (as modified), in addition to carrying out the works in accordance with the conditions of MP06_0311, DC carries out works generally in accordance with the Environmental Assessment (EA); EA (Mod 1); EA (Mod 2); EA (Mod 3); EA (Mod 4); SEE (Mod 5); project layout plans and Statement of Commitments.

1.5 Stakeholder Engagement

Delta Coal has consulted with the local community via the CVC and MC Community Consultative Committee (CCC) on subsidence results at the four quarterly meetings undertaken in 2021. This report is appended to the 2021 Mannering Colliery and Chain Valley Colliery Annual Reviews and will be provided to the CCC and applicable stakeholders as well as being made publicly available on the Delta Coal website.

1.6 Supporting Documentation

This ASR has included a review of relevant sections of the following documentation:

- March 2021, Lake Macquarie Benthos Survey Report No. 19. Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Delta Coal
- June 2021, Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW (Results for 2008 to 2021). Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Delta Coal
- E. Laxton, September 2021, *Lake Macquarie Benthos Survey Report No. 20*. Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Delta Coal
- August 2020, Daly Smith Pelican Rock Navigational Marker (final proposed monitoring)
- 2021 Benthic Communities Management Plan, Delta Coal
- 2021 Seagrass Management Plan, Delta Coal
- 2021 Subsidence Monitoring Program, Delta Coal (Extraction Plan Miniwall S5 and Northern Pillar Extraction)
- 2021 Subsidence Monitoring Program, Delta Coal (Northern Mining Area First Workings and Lake Macquarie Pillar Extraction)
- Subsidence Monitoring TARP (Delta Coal Extraction Plan and Mining Operations Plan)
- 2021 Built Features Management Plan, Delta Coal
- 2021 Public Safety Management Plan, Delta Coal
- March 2021, Daly Smith Bathymetric Survey (S2 – S5)
- March 2021, Daly Smith Bathymetric Survey (Chain Valley Bay [MW-CVB1])
- September 2021, Daly Smith Bathymetric Survey (S2 – S5)
- Daly Smith Foreshore Surveys
- Feb, May, August, November Delta Coal Quarterly Combined CCC Chain Valley Colliery and Mannering Colliery Community Consultative Committee Meeting minutes and presentations.

- April 2020, Benthic Communities Monitoring Statistical Analysis Report prepared by EMM Consulting for Delta Coal

2 Monitoring and Comparison

2.1 Chain Valley Colliery

2.1.1 Monitoring Overview

As detailed in Section 1.4.1, CVC has a two actively approved *Subsidence Monitoring Programs*, with one program addressing Miniwall S5 and pillar extraction in Lake Macquarie and the other addressing first-workings in the Northern Mining Area and Pillar Extraction in Lake Macquarie. The purpose of these programs is to:

- define the subsidence monitoring scope;
- outline subsidence predictions
- outline the methodology to be used to monitor subsidence impacts
- identify subsidence monitoring locations
- identify reporting requirements
- analyse the relationship between predicted and resulting subsidence effects and
- identify the requirements for incident or exceedances reporting.
- Subsidence monitoring at MC is restricted to an annual survey to assess potential subsidence impacts associated with the link road project. Annual surveys assess potential impacts at a number of monitoring locations within proximity of VPPS including:
 - early warning line one;
 - early warning line two;
 - TransGrid fence line;
 - VPPS foreshore line and
 - sewage treatment plant.

2.1.2 Scope of Subsidence Monitoring

2.1.2.1 Shoreline (High Water Mark)

The shoreline of Lake Macquarie is protected under Mining Lease Conditions requiring Ministerial Approval to carry out mining operations within the HighWater Mark Subsidence Barrier (HWMSB). The HWMSB is defined in the seam by a line defined by an angle of draw of 35° drawn lakeward from the high-

water level of Lake Macquarie, and on the land side, a line drawn from the 2.44 m contour at 35° towards the land.

In accordance with Condition 1, Schedule 4 of SSD-5465, vertical subsidence within the HWMSB is limited to a maximum subsidence (S_{\max}) of 20 mm.

A key objective of the mine design at CVC is to minimise vertical subsidence within the HWMSB and prevent >20mm subsidence above the high-water mark. To ensure effectiveness of the mine design, monitoring of the shoreline is carried out at fixed reference marks surveyed at regular intervals.

2.1.2.2 Seagrass

Seagrass distribution within estuaries is naturally influenced by light penetration, depth, salinity, nutrient status, bed stability, wave energy, estuary type and the evolutionary stage of the estuary.

Condition 2, Schedule 4 of SSD-5465 specifies negligible environmental impacts on the species of seagrass found within the current area of mining operations as a condition of approval. Surveys of the seagrass extents are undertaken in order to monitor impacts on the seagrass population.

Delta Coal's *Seagrass Management Plan* (2021) outlines the methodology used to determine changes to composition and quantity of seagrass populations in Lake Macquarie as a result of mining activities at CVC.

Subsidence monitoring of the lakebed is undertaken via bathymetric survey over CVC's current mining area in order to validate subsidence predictions.

2.1.2.3 Benthic Communities

Lake Macquarie is inhabited by a diverse number of marine organisms.

Condition 2, Schedule 4 of SSD-5465 specifies minor environmental consequences on benthic communities, including minor changes to species composition and/or distribution as a condition of approval. Regular surveys of the lake bed are undertaken in order to monitor variations in the composition and density of benthos due to mining, environmental and/or other seasonal factors.

Delta Coal's *Benthic Communities Management Plan* (Delta Coal 2021) outlines the methodology used to determine changes to species diversity and abundance.

Subsidence monitoring of the lakebed is undertaken via bathymetric survey over CVC's current mining area in order to validate subsidence predictions and to determine approximate levels of subsidence on specific benthic sample locations.

2.1.2.4 Threatened Species and endangered populations

Condition 2, Schedule 4 of SSD-5465 specifies negligible environmental consequences on threatened or endangered populations as a condition of approval.

Subsidence monitoring of the lakebed is undertaken via bathymetric survey over CVC's current mining area in order to validate subsidence predictions and to determine approximate levels of subsidence are within limits.

2.1.3 Methods of Subsidence Monitoring

2.1.3.1 Overview

Subsidence monitoring at CVC includes a combination of bathymetric surveys and foreshore level monitoring. Results can be used to validate model outcomes; enable early detection of subsidence trending to increased impact levels over that predicted; and allow early application of containment, adaptive and contingency measures to prevent impacts outside approved (particularly increased impacts to the foreshore).

2.1.3.2 Bathymetric Surveys

Previous mine operators, LakeCoal, commissioned Astute Surveying in 2012 to undertake a bathymetric survey over the areas of current and proposed workings at CVC. The primary purpose of this survey was to obtain accurate baseline data for future subsidence assessments and to enable comparison with the bathymetric data provided by NSW Office of Environment and Heritage (OEH) in 2010.

The multi-beam echo sounder used during bathymetric surveys for CVC captures data at approximately ± 0.1 m resolution. The survey vessel captures a swathe of data (down to sub-metre resolution), which is used to produce a 10 m x 10 m grid. In addition, the dynamic nature of lake bed sediment movement and change has and will affect the depth of the lake bed over time. As a result, the collected data is not considered as accurate as land-based surveys and should be viewed in consideration of these constraints.

Since 2012, bathymetric surveys have been completed on at least an annual basis with ongoing surveys providing accurate details of the lake depth within CVC's mining areas. Future surveys can also utilise the data that has been collected to monitor subsidence levels as a result of future mining activities.

From 2013 to 2018 these surveys were carried out on an annual basis over the mining area and the results compared to the original survey. During the 2017 survey it was identified that the site had exceeded vertical subsidence predictions over the MW7-12 mining area by approximately 370mm. LakeCoal notified the relevant authorities of the exceedance and submitted an incident report on 11 November 2017.

Subsidence associated with MW7-12 has proven to have stabilised since, with no discernible affect identified within seagrass and benthic communities monitoring.

In September 2020, monitoring of subsidence results for Miniwalls S4 was required to be undertaken on a monthly basis to substitute monthly foreshore monitoring as land access adjacent Miniwall S4 was not achievable.

Table 1 - Chain Valley Colliery Secondary Extraction Subsidence Monitoring Commitments

Secondary Extraction Panel	Approved S_{\max} (mm)	Predicted S_{\max} (mm)	Measured S_{\max} (mm)	Extraction Completion date	Post Extraction Bathymetric Scanning Commitment
CVB1	760	440	500-550	December 2017	Annual for 3 years unless TARP triggered
Miniwall S1	780	420	<200	September 2018	Annual for 3 years unless TARP triggered
Miniwall N1	780	410	<200	February 2019	Annual for 3 years unless TARP triggered
Miniwall S2	780	300	350-450	March 2020	Annual for 3 years unless TARP triggered
Miniwall S3	780	300	350-450	July 2020	Annual for 3 years unless TARP triggered
Miniwall S4	780	300	350-450	February 2021	Annual for 3 years unless TARP triggered
Miniwall S5	780	500	350-450	August 2021	Annual for 3 years unless TARP triggered
NMA Pillar Extraction	780	500	n/a	Not commenced in 2021.	Annual for 3 years unless TARP triggered

Monitoring will continue in accordance with the approved *Miniwall S5 and Northern Pillar Extraction Plan* and the 2020-2023 Mining Operations Plan (Amendment 2) in the 2022 period.

As all of Chain Valley Colliery's secondary extraction is located beneath the lakebed bathymetric surveys are used to determine the levels of subsidence that are seen across its mining areas. A baseline bathymetric survey of Domains 1 and 2 was commissioned by LakeCoal in March 2012, the baseline survey

was compared to a bathymetric survey of Lake Macquarie undertaken by OEH in 2010, to determine the subsidence which had occurred between the periods.

2.1.4 Bathymetric Monitoring

Bathymetric scans undertaken in the 2021 reporting period have been provided as **Figure 2** to **Figure 6** and includes:

- MWS2 – MWS4 (monthly survey to substitute foreshore surveying) undertaken in January 2021
- CVB1 (final scan following 3 years since completion of extraction) undertaken in March 2021
- MWS2 – MWS4 (completion of extraction survey for MWS4) undertaken in March 2021
- MWN1, MWS1, MWS2, MWS3, MWS4, MWS5, NMA First Workings (annual survey and completion of extraction survey for MWS5) undertaken in September 2021.

Figure 2 presents Bathymetric surveys over the Chain Valley bay mining area which have indicated subsidence of up to 500-550 mm directly over the extracted area. An increased angle of draw of surface subsidence has been detected, however, measured subsidence is within modelled predictions.

Figure 3 compares the difference between April 2020 and March 2021 bathymetric scanning of the CVB1 area indicating nil change in detected subsidence.

Figure 4 presents subsidence between Miniwalls MWS2-MWS4 and the Lake Macquarie foreshore, as required to substitute foreshore monitoring, with negligible subsidence observed to the foreshore and seagrass protection zone.

Figure 5 presents observed subsidence following completion of extraction in MWS4, with detected subsidence within modelled predictions.

Figure 6 depicts subsidence over Miniwalls N1, S1, S2, S3, S4, S5 as well as first workings in the NMA. The S_{max} for Miniwall panels S2 – S5 was measured at 350-450 mm in line with predicted subsidence of approximately 400 mm.

Within **Figure 6** there appears to be a measured difference of ~300mm in the lake bed over the mains area to the N/East of the page compared to the baseline. This appears unrelated to mining, given nil extraction in this area, with the roadways accessible and in good condition as per routine inspections. Rock head surveys in this area indicated the silt/sediments are in the order of 20m thick, and there may be gradual changes to the lake bed over time relating to sediment movement.

Figure 2 - Chain Valley Bay (MW-CVB1) Bathymetric Monitoring, March 2021

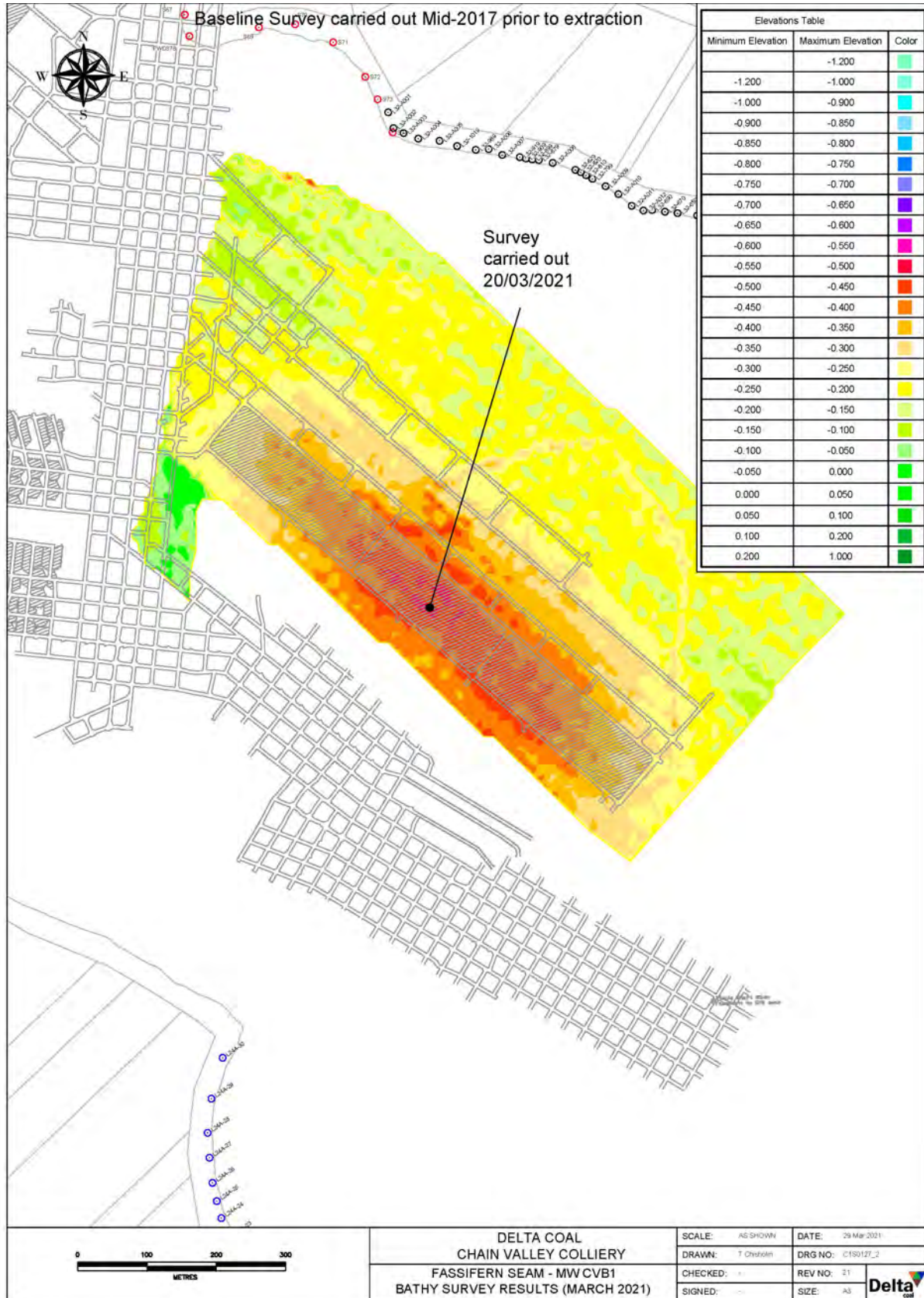


Figure 3 – CVB1 Subsidence Difference, April 2020 to March 2021

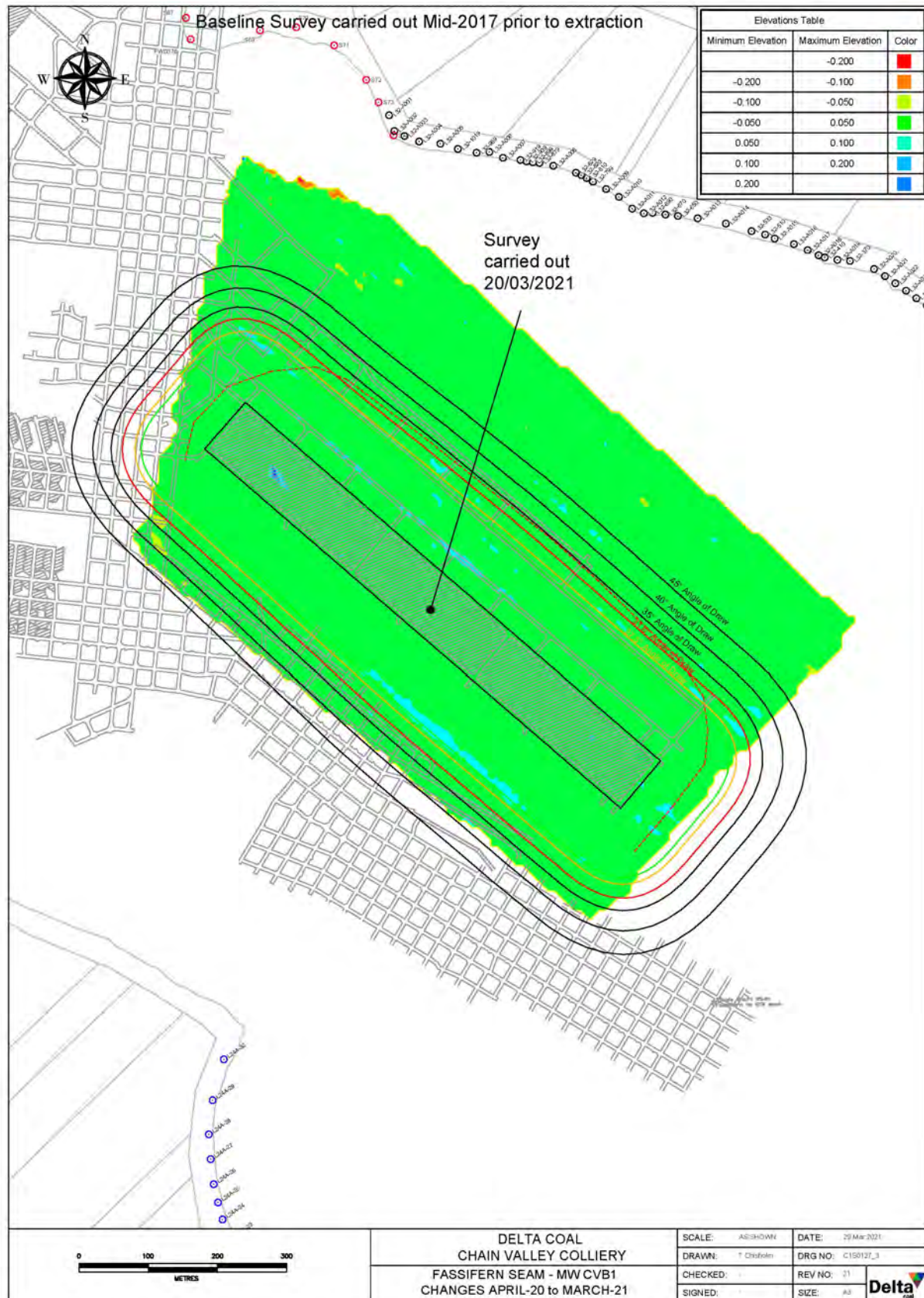


Figure 4 - Miniwalls S2 -S4 Foreshore Bathymetric Monitoring, January 2021

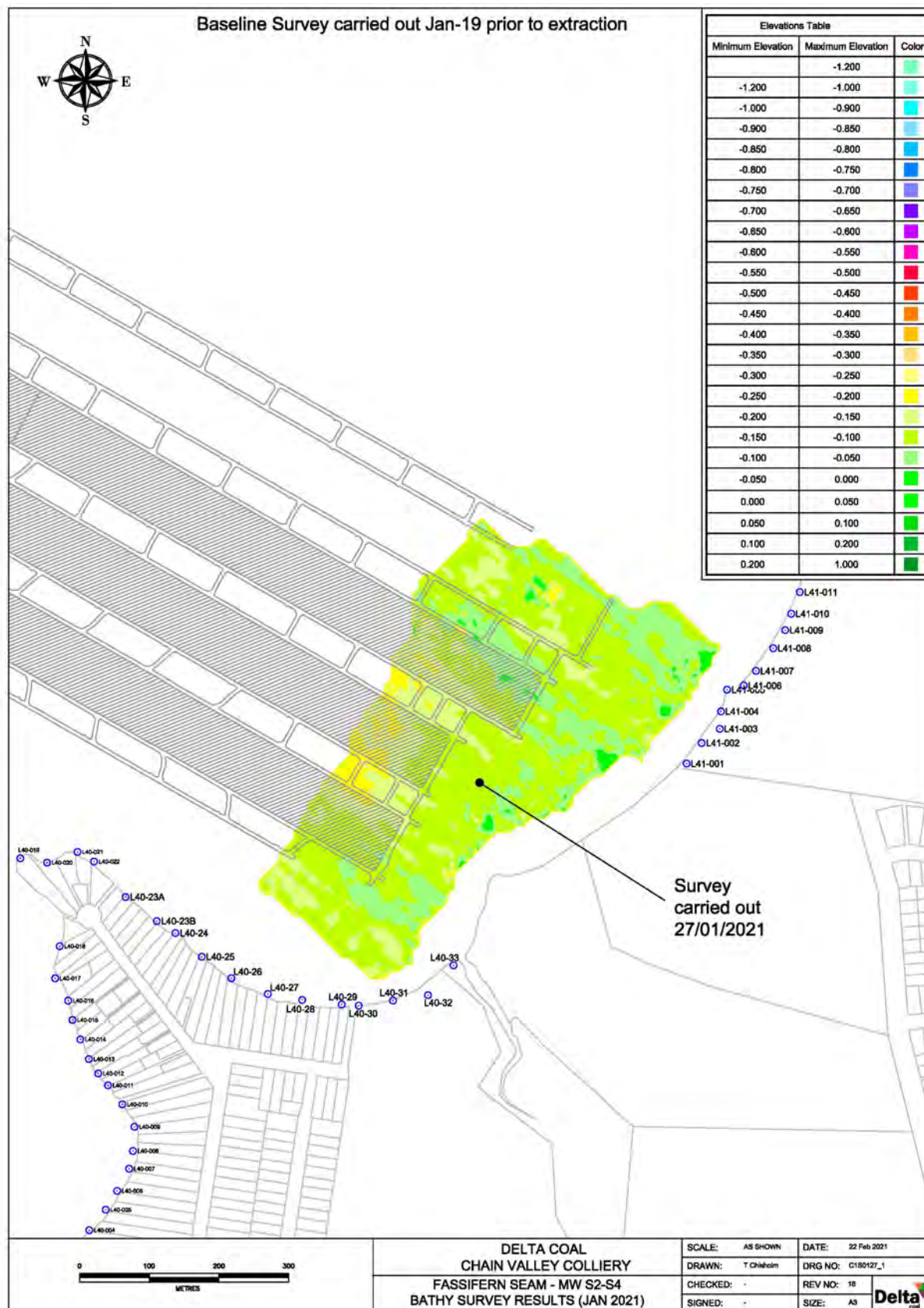


Figure 5 - Miniwalls S2-S4 Bathymetric Monitoring, March 2021

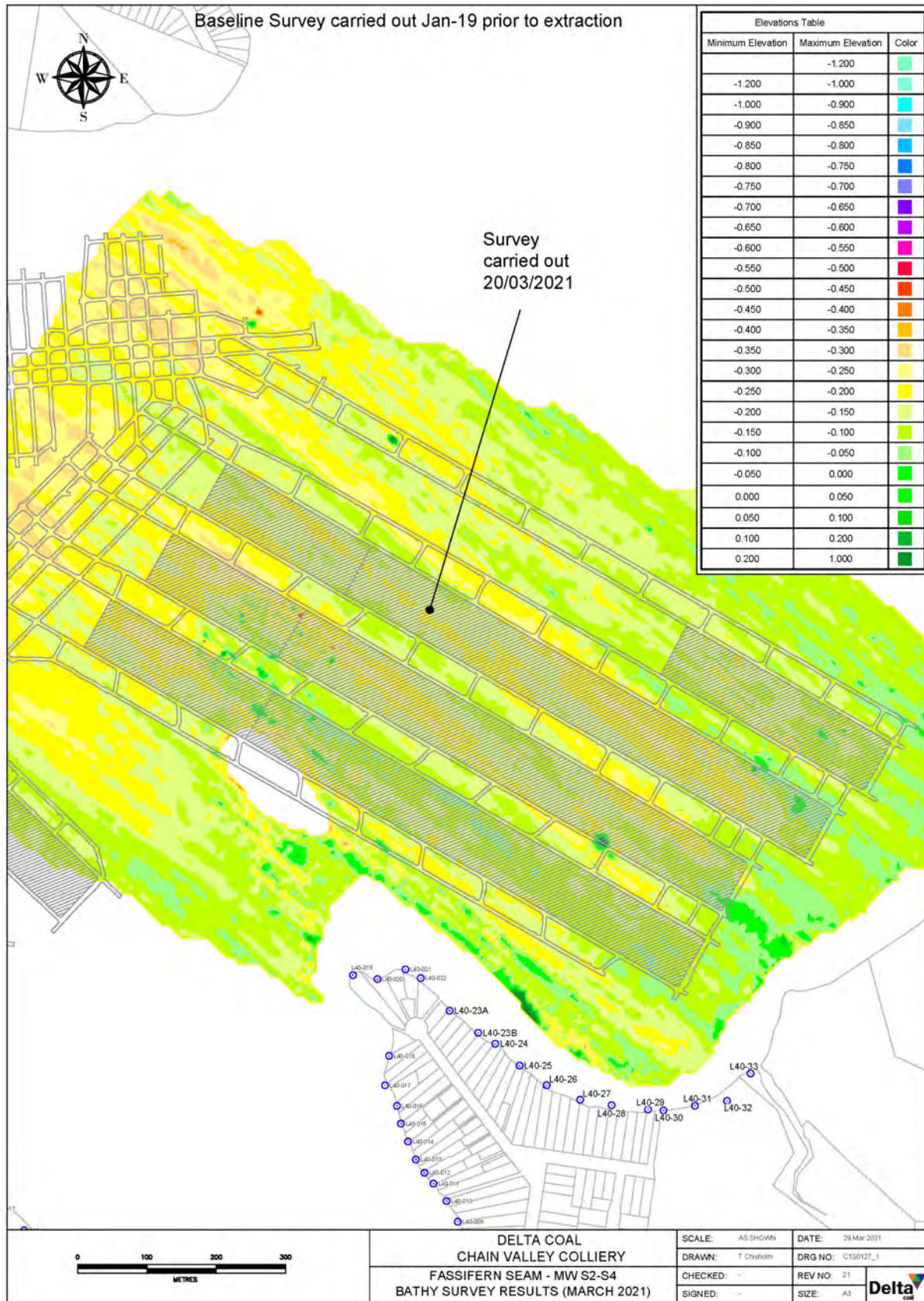
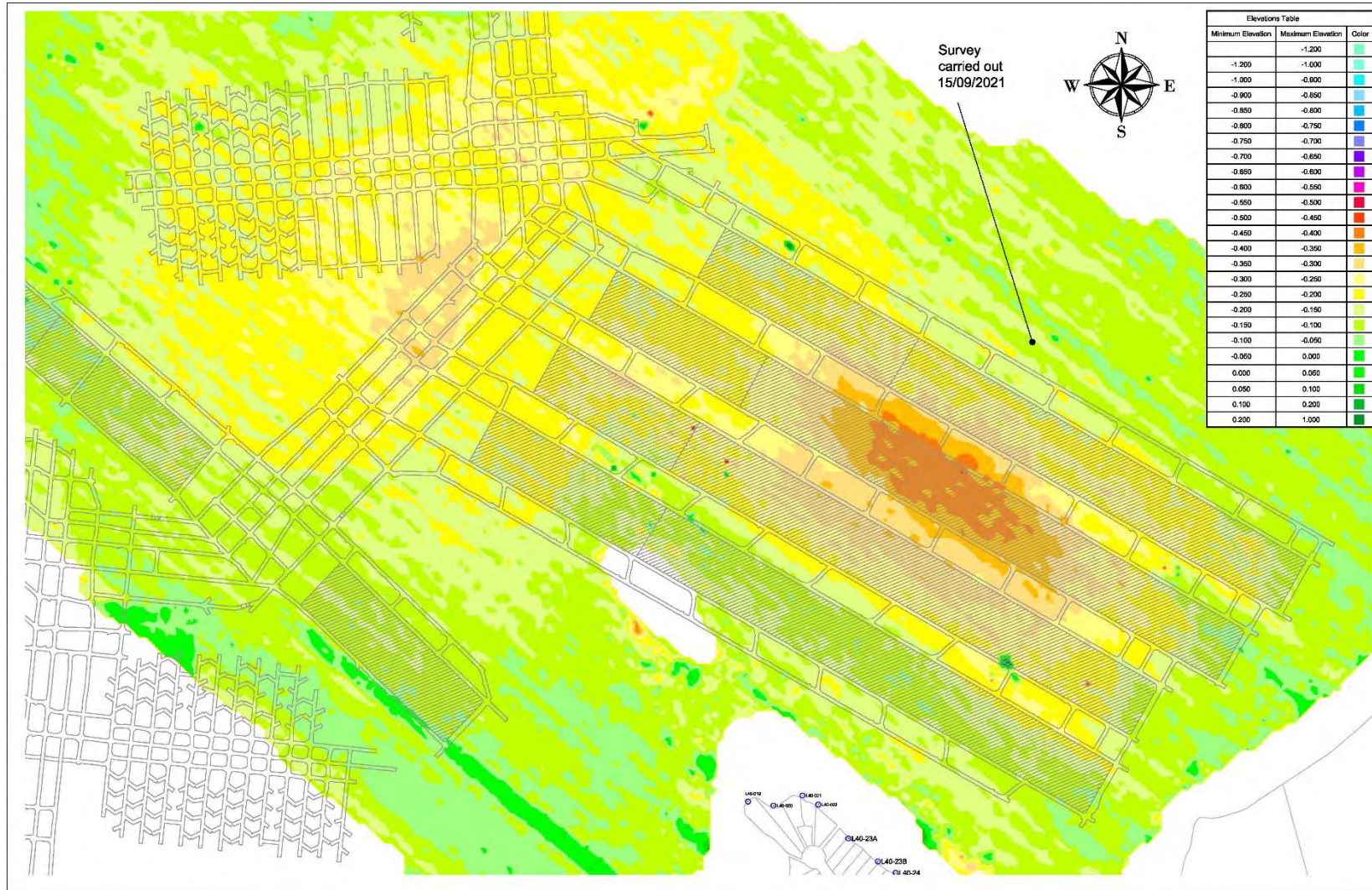


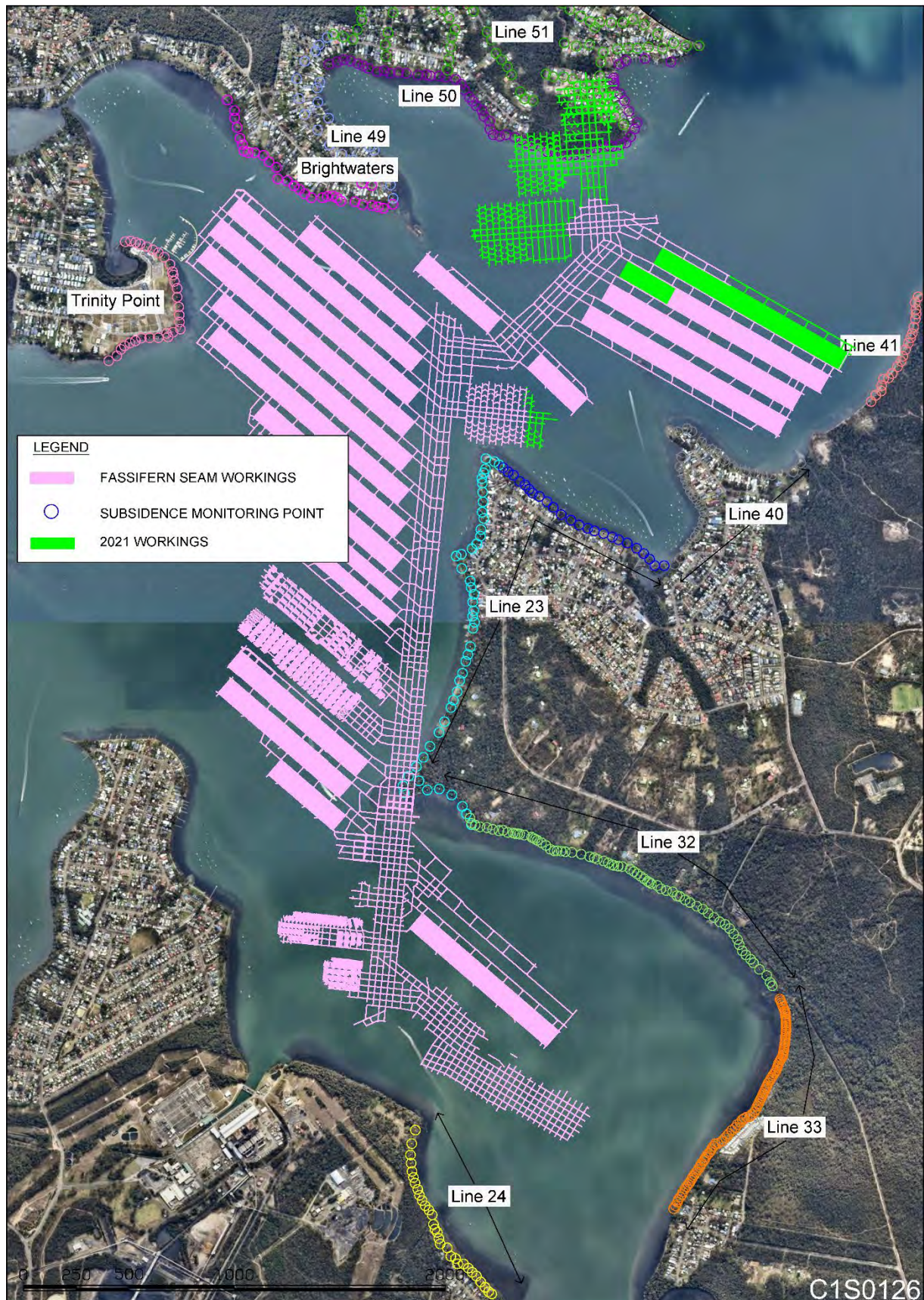
Figure 6 - Miniwalls N1, S1, S2, S3, S4, S5 and NMA first workings Bathymetric Scan - September 2021



2.1.5 Foreshore Monitoring

Delta Coal completes subsidence monitoring around Trinity Point, Brightwaters, Mirrabooka, Sunshine Frying Pan Bay, Summerland Point, Chain Valley Bay (**Figure 7**). Monitoring points occur along the foreshore at approximately 20 m – 30 m intervals where practicable / achievable. The results are issued to the Resources Regulator within 14 days of survey. In addition, observations are made where required to report on visual impacts or changes to public safety risk. A Subsidence Inspection Proforma is completed with each survey. The proforma includes visual inspection of steep slopes, boulder or tree instability, ponding and other potential effects of mine subsidence. Annual foreshore surveying was undertaken in January and February 2022.

Figure 7 - Foreshore Subsidence Monitoring Points



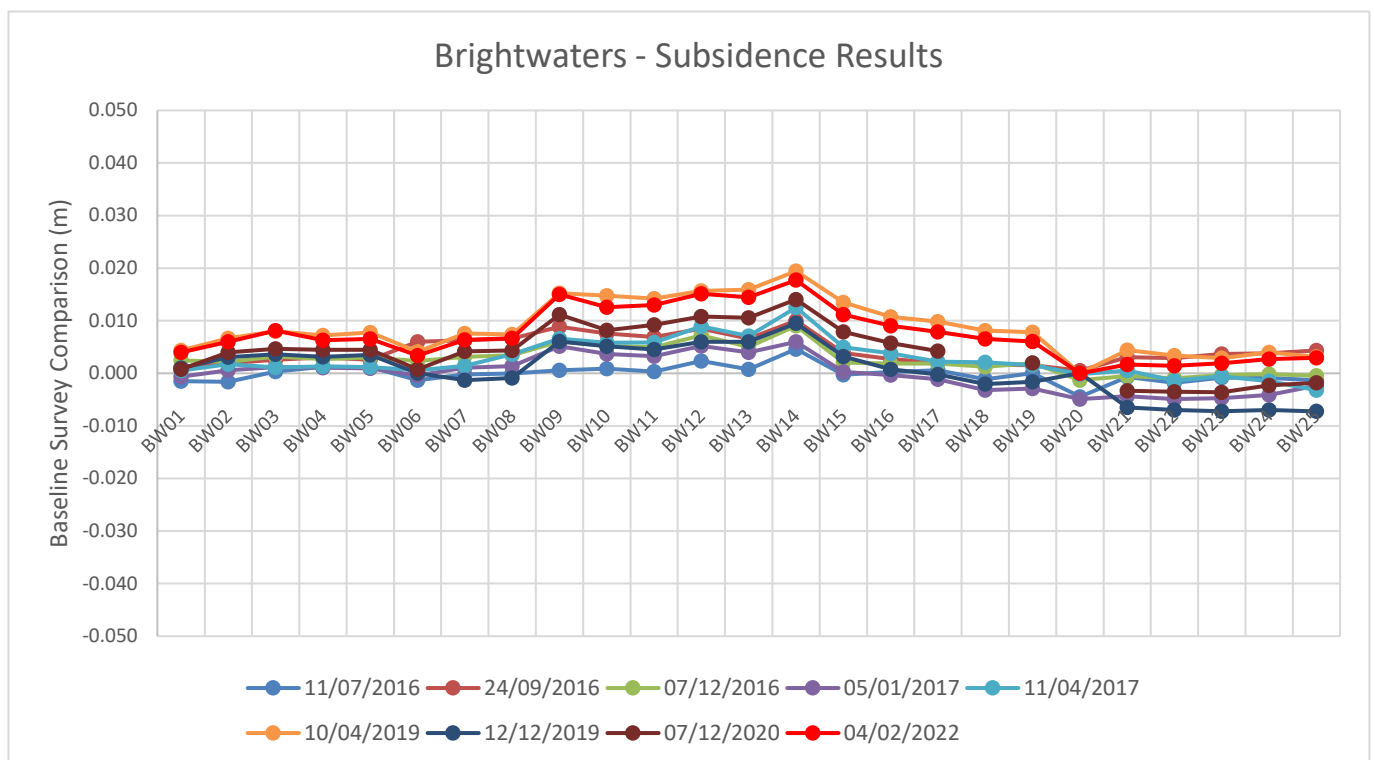
2.1.5.1 Morisset Peninsula Line 49, 50 and 51

Foreshore monitoring lines 49, 50 and 51 were installed in 2021 for the purpose of monitoring potential subsidence associated with future northern mining area workings. An annual survey for areas of extraction is scheduled in 2022.

2.1.5.2 Brightwaters

Monitoring points were installed along the Brightwaters peninsula in June 2016 to monitor the effects of Miniwall 11 and 12 extraction. Results for the reporting period are shown in **Figure 8**. Nil subsidence movement has been detected along the monitoring line.

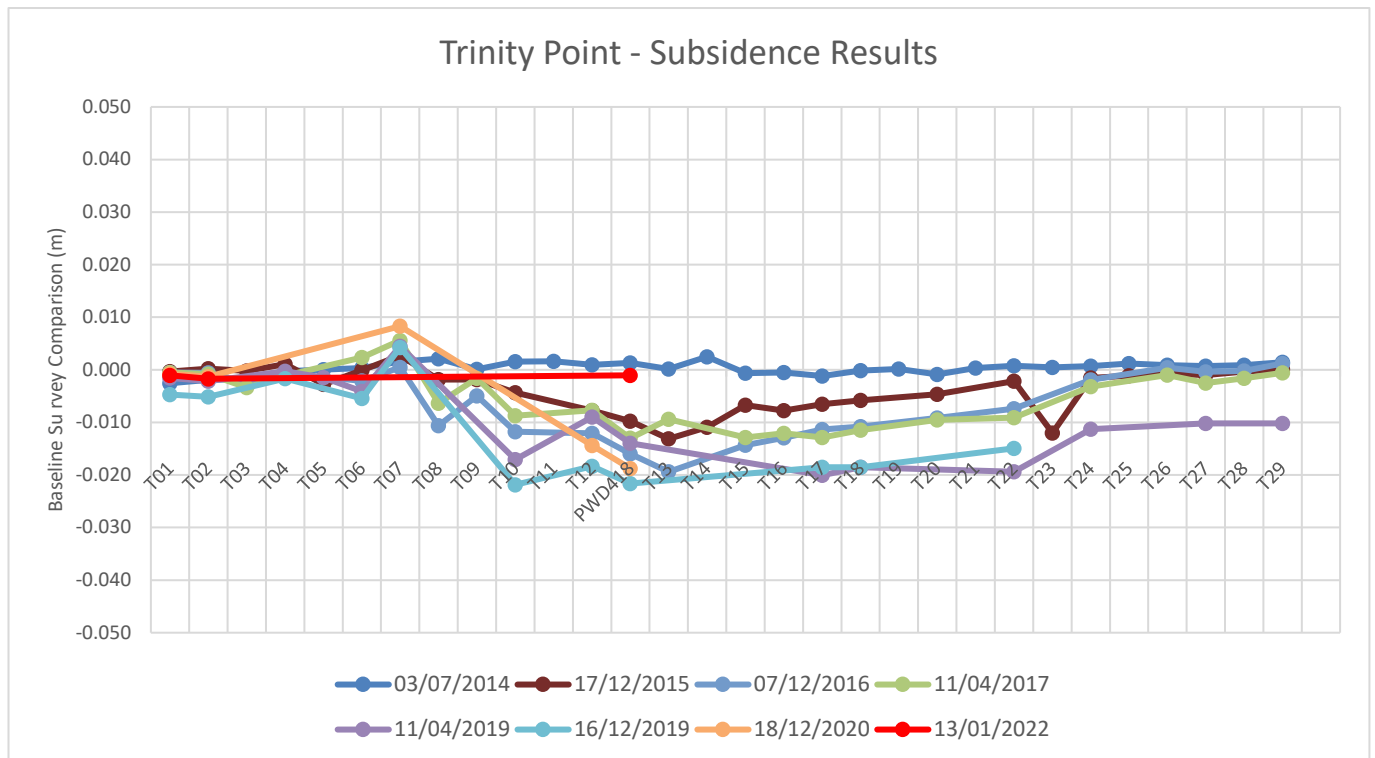
Figure 8 - Brightwaters Subsidence Results



2.1.5.3 Trinity Point

Figure 9 shows the subsidence monitoring results for the reporting period at Trinity Point. Monitoring points were installed in the area in 2014 for shoreline monitoring during extraction of Miniwalls 7-12 panels. A number of marks have been disturbed / destroyed due to development / construction works along the foreshore in the area, this was particularly obvious in the 04/02/2022 survey where only 3 marks were able to be identified, however nil movement attributable to subsidence has been detected.

Figure 9 - Trinity Point Subsidence Results



2.1.5.4 Summerland Point, Lines 32, 23, 40 and 41

The foreshore along Summerland Point has been monitored since 1994, after secondary extraction was undertaken in the Wallarah beneath the south-western point (corresponding to mark S63 – 74 of Line 23). Approximately 130mm to 150mm of subsidence was measured (Point S71 - Line 23) since 1994, surveying in 2022 indicated stability of the workings, observable from 2008 datasets to current. In general, suspected ground-swelling was observed in foreshore monitoring undertaken on 18/01/2022.

Figure 10 - Line 32 Subsidence Monitoring Results

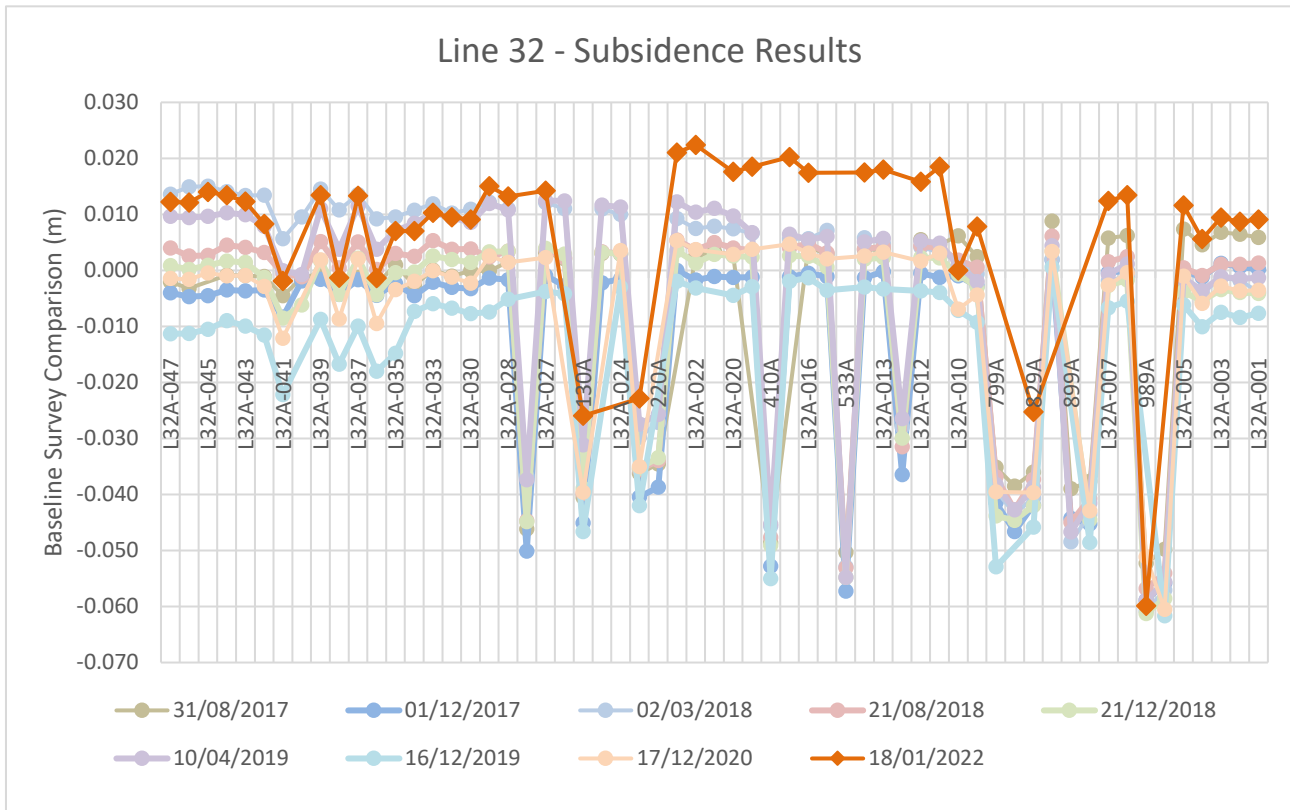
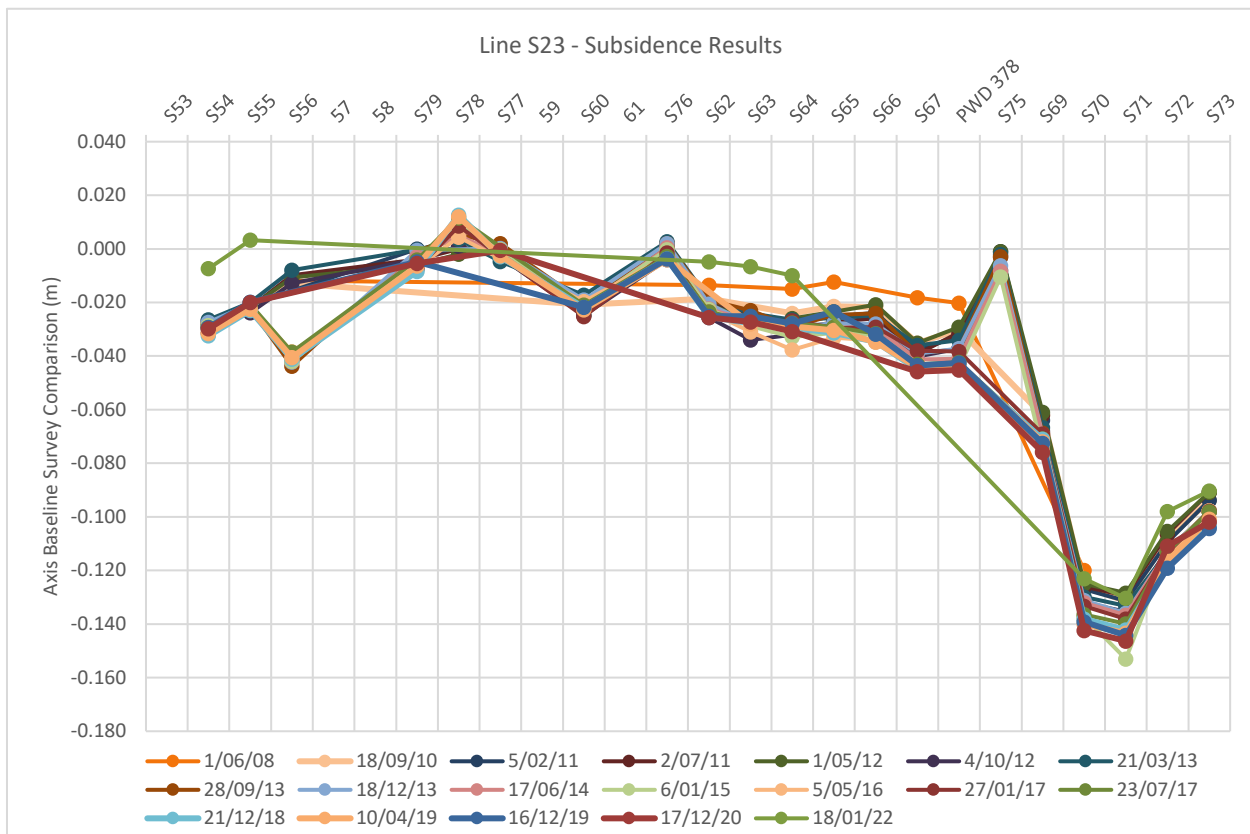
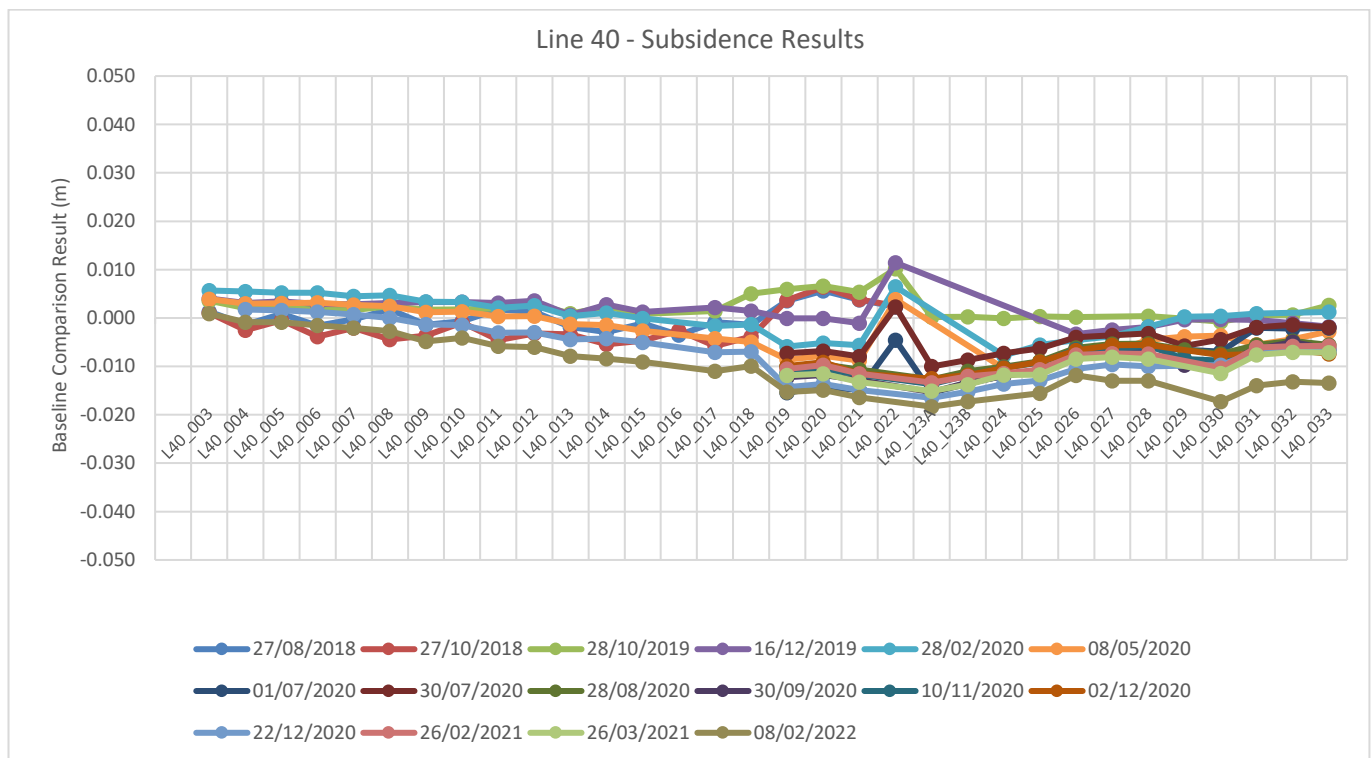


Figure 11 - Summerland Point, Line 23 Subsidence Results



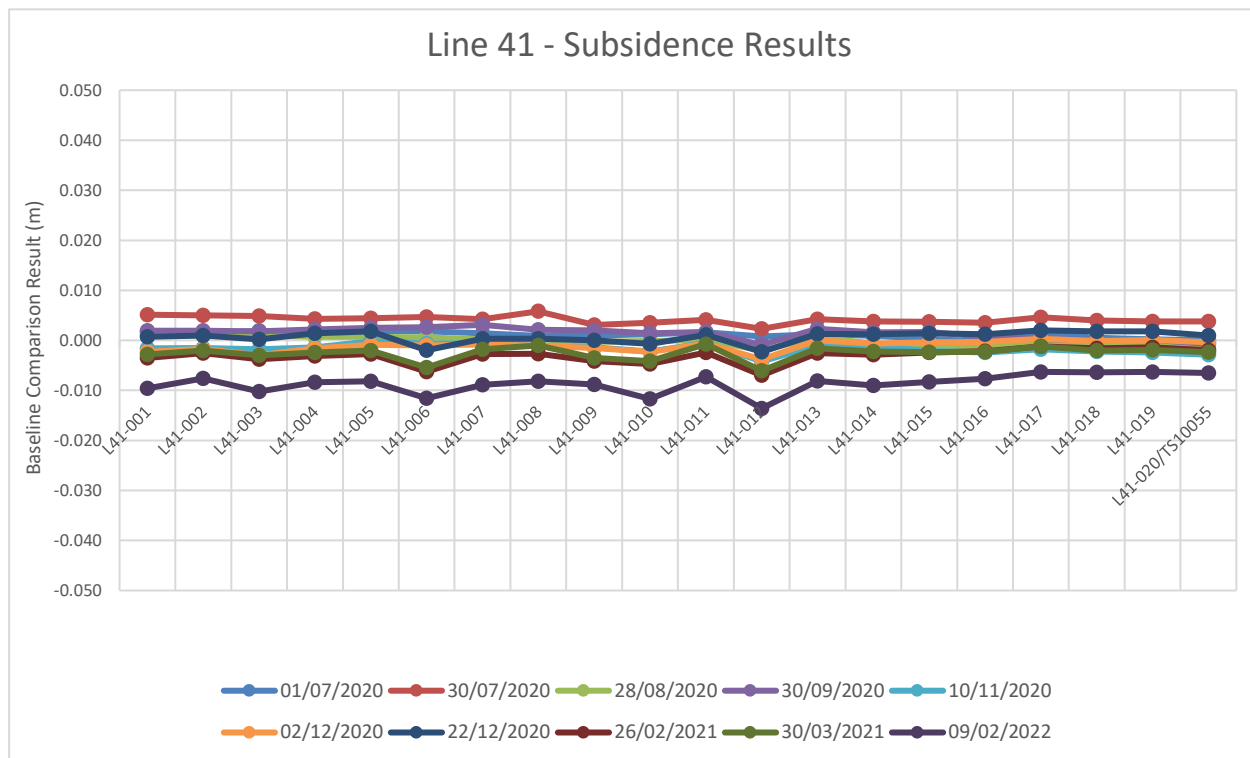
Monitoring points along Line 40 were established in 2018 to monitor the shoreline adjacent to Miniwall S1. This line was extended in 2019 as part of the subsidence monitoring program for Miniwalls S2 and S3. Minor ground movement along the line is limited to $\pm 5\text{mm}$ and appears seasonal, subsidence appears to be limited to negligible subsidence ($<20\text{mm}$). **Figure 12** shows the reporting period subsidence results for Line 40. Monitoring of Line 40 was undertaken monthly during MWS2 – MWS4 extraction.

Figure 12 - Line 40 Subsidence Results



Line 41 was established in July 2020 to monitor the shoreline adjacent Miniwall S4. Monitoring was undertaken monthly during extraction and as part of annual monitoring, surveying has indicated to date nil to negligible subsidence ($<20\text{mm}$). Line 41 subsidence monitoring results are shown on **Figure 13**.

Figure 13 - Line 41 Subsidence Monitoring Results



2.1.5.5 Chain Valley Bay, Lines 24 and 33A

Surveys of the existing monitoring points (many of which had experienced 40-60mm of subsidence) were ongoing during the reporting period, and where required additional monitoring locations were installed. Similarly to the Summerland Point monitoring, many of the historically monitored subsidence marks have experienced greater than negligible subsidence (20mm), however no additional subsidence movement was detected during the miniwall extraction in CVB. **Figure 14** and **Figure 15** show the subsidence monitoring results for the reporting period.

Monitoring results for Line 24 shows potential minor changes in level in the reporting period from points L24A-03 to L24A-17, however any identified vertical movement was negligible (< 20mm). No additional subsidence was observed at Line 33A within the reporting period.

As the area where Line 33A monitoring marks are located is along a public reserve where regular slashing / brushcutting activities are carried out, a number of monitoring points have been disturbed / moved over time. Where this type of movement occurs, the new RL point is adopted and monitoring continues (i.e. Point 62A).

Figure 14 - Line 24 Subsidence Results

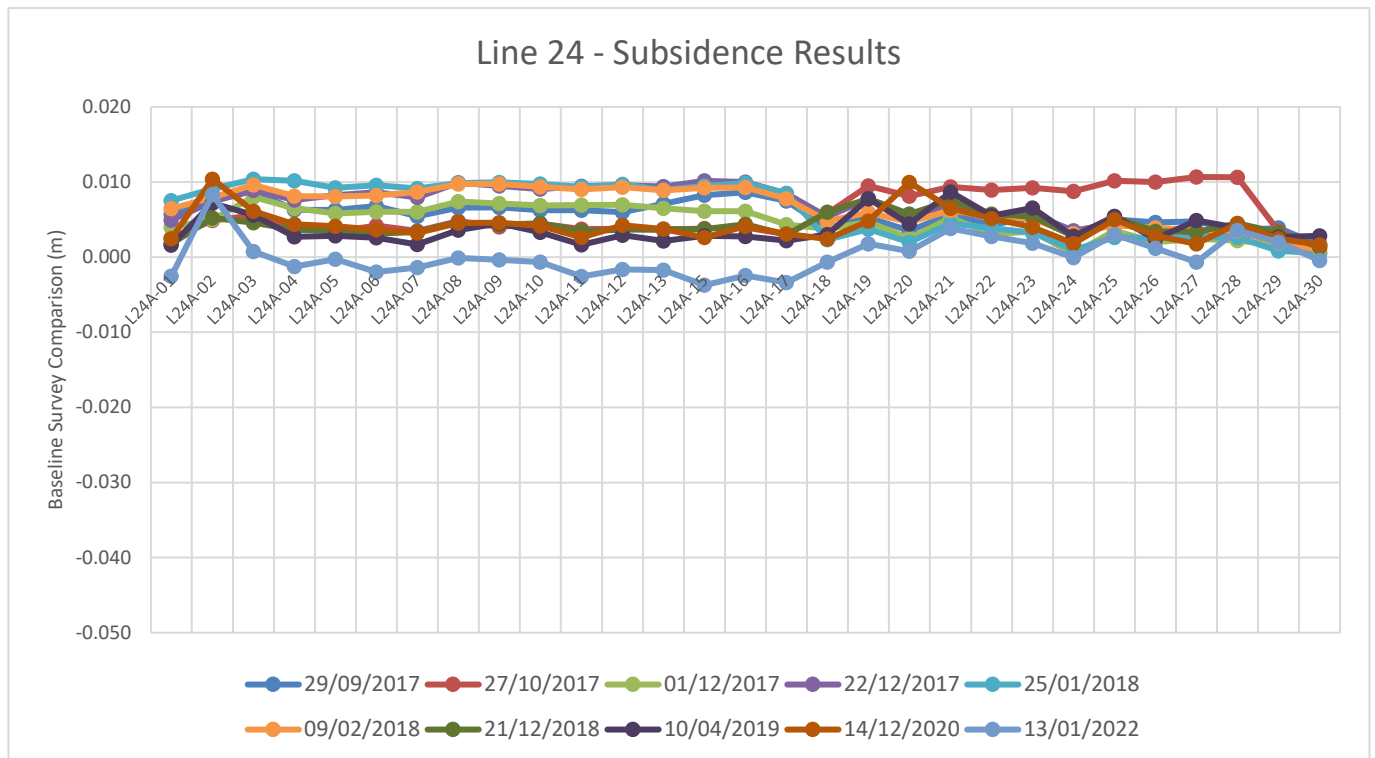
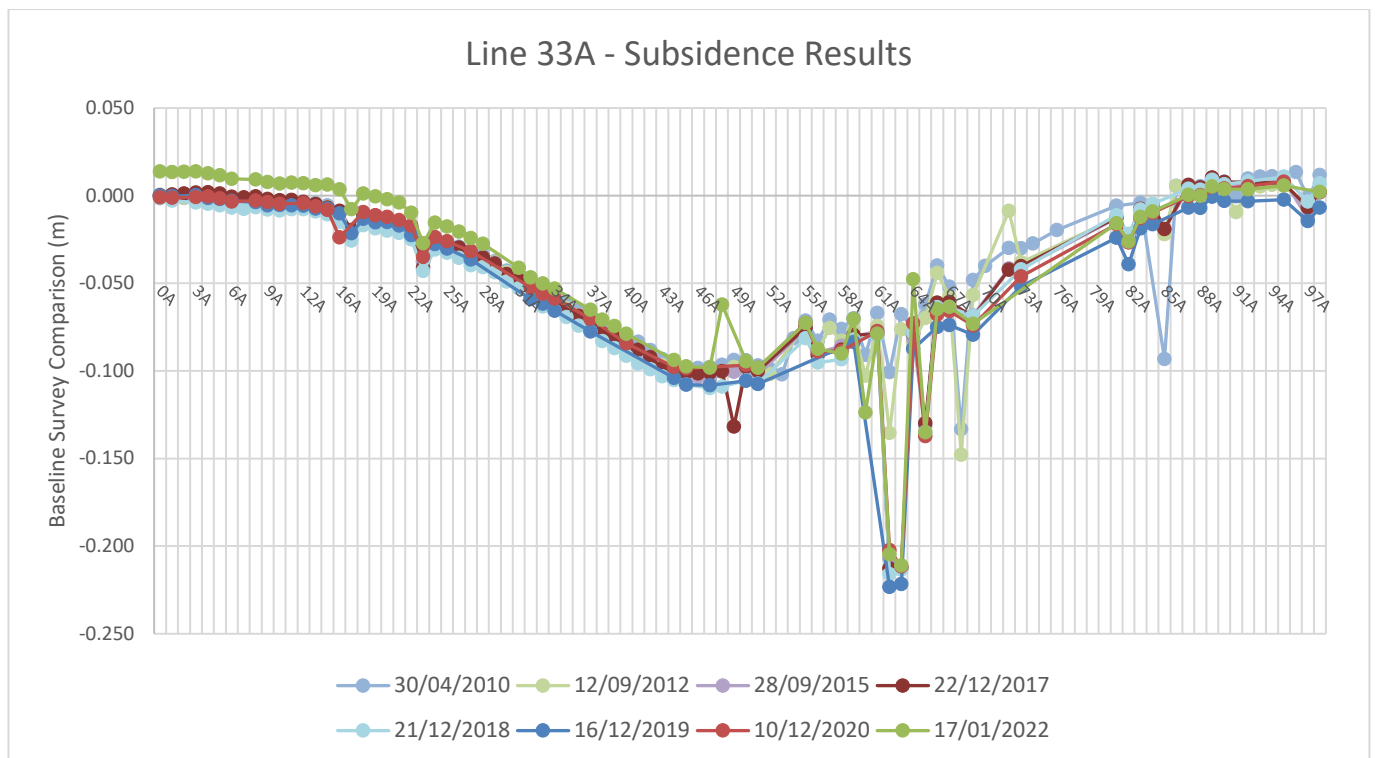


Figure 15 - Line 33A Subsidence Results



2.1.6 Timing of Subsidence Monitoring

Timing of subsidence monitoring at CVC is defined in approved extraction plans and is summarised in **Table 2**. CVC has also made subsidence monitoring commitments to first-workings associated with the 2020-2023 Mining Operations Plan (Amendment 2), also presented in **Table 2**.

Table 2 - Frequency of Subsidence Monitoring for Secondary Extraction

Type of monitoring	Pre-extraction requirements	During extraction requirements	Post extraction requirements
Secondary Extraction			
Bathymetric surveys	Single baseline survey prior to extraction	End of panel (of relevance to S2, S3, S4 and S5) Annual surveys over areas of pillar extraction (not commenced)	Annual for three years unless TARP triggered
Foreshore monitoring	Baseline survey prior to commencement of extraction	Monthly intervals	Annual for three years unless TARP triggered
Pelican Rock Navigation Marker	Baseline RL and tilt measurements	End of panel (of relevance to S2 and S3)	Visual inspection and confirmation from RMS of nil impacts
Seagrass survey points	Survey of concrete monitoring points during regular seagrass monitoring		
First Workings			
Terrestrial based subsidence monitoring (foreshore)	Baseline prior to extraction	Annual surveys during extraction unless TARP triggered	Annual surveys ongoing unless TARP triggered
Terrestrial based subsidence monitoring (along main roads in suburbs of Brightwaters, Mirrabooka and Sunshine)	Baseline prior to extraction	Annual surveys during extraction unless TARP triggered	Annual surveys ongoing unless TARP triggered

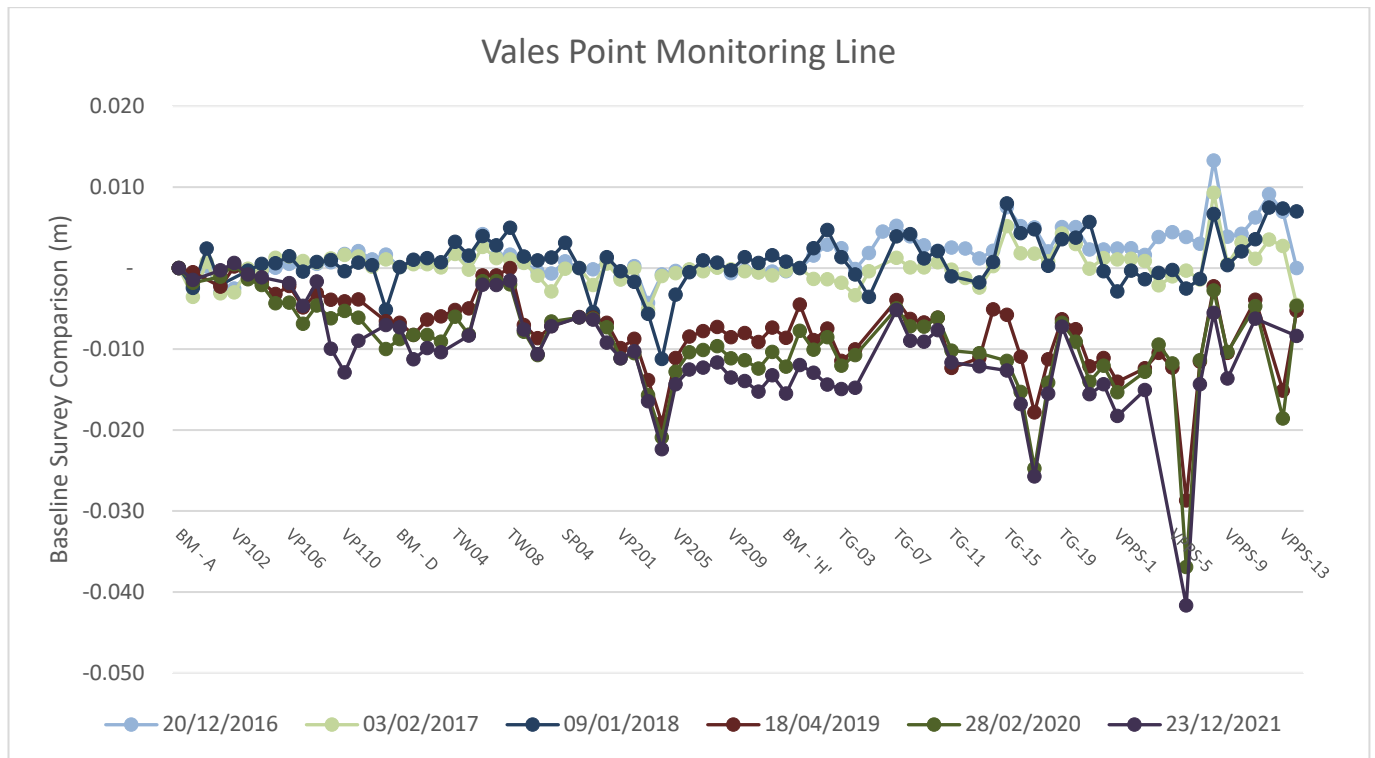
2.2 Mannering Colliery

2.2.1 Monitoring Overview

At the commencement of mining operations associated with the link road project between CVC and MC, a subsidence monitoring program was implemented. Due to the sensitive nature of the infrastructure being undermined (ie VPPS), subsidence monitoring was undertaken on a weekly basis within a 250 m radius of the mining activity. At the completion of mining, the frequency of subsidence monitoring of the link road development was reduced to an annual survey. Monitoring results have been presented in **Figure 16** and indicate <30 mm subsidence recorded to date, with anomalous readings recorded at monitoring point VPPS-6 from 18/04/2019.

There was no mining undertaken at Mannering Colliery during 2020. Mining is approved in the Mannering Colliery project Approval (MP06_0311) but is not approved in the combined CVC and MC 2020-2023 Mining Operations Plan.

Figure 16 - Vales Point Power Station Subsidence Results



3 Impacts to Built Features from 2021 Mining Activities

3.1 Chain Valley Colliery

3.1.1 Pelican Rock Navigational Marker

No built features have been identified as requiring direct subsidence management from mining activities undertaken at CVC during 2021.

All secondary extraction activities at CVC during 2021 occurred beneath Lake Macquarie and had no subsidence impacts on surface facilities or infrastructure. First-workings were undertaken beneath the Morisset Peninsula within the NNMA with no subsidence impacts to surface facilities or infrastructure reported to date.

As described in CVC's Subsidence Monitoring Program, Pelican Rock Navigation Marker is expected to be impacted by approximately 130 mm of subsidence from mining within Miniwall panels S2 and S3.

NSW Roads and Maritime Services (RMS) has indicated a functional impact on the marker is likely to occur at 500 mm of subsidence and 5° or 87 mm/m of tilt.

A survey for RL and tilt was conducted on 10 July 2019 by Daly Smith Surveyors prior to mining and measured Pelican Rock Navigation Marker was 1.14 m Australian Height Datum (AHD) and the navigational pole was vertical.

The following surveys were undertaken by Daly Smith after Miniwall S2 extraction in March 2020 recording the level at 1.13 m AHD and following Miniwall S3 extraction in August 2020 recording the height at 1.11 m AHD. The August 2020 measurement of the Pelican Rock Navigational Marker commented that the pole was found to be vertical and its metal base to be level. A final survey was undertaken on the 25th June 2021, after the completion of MWS4 recording the level at 1.10 m AHD. No further monitoring of the marker is considered to be required following the completion of Miniwall S4 extraction indicated approximately 300 mm of subsidence, within a range not considered to have an effect of the functionality of the marker.

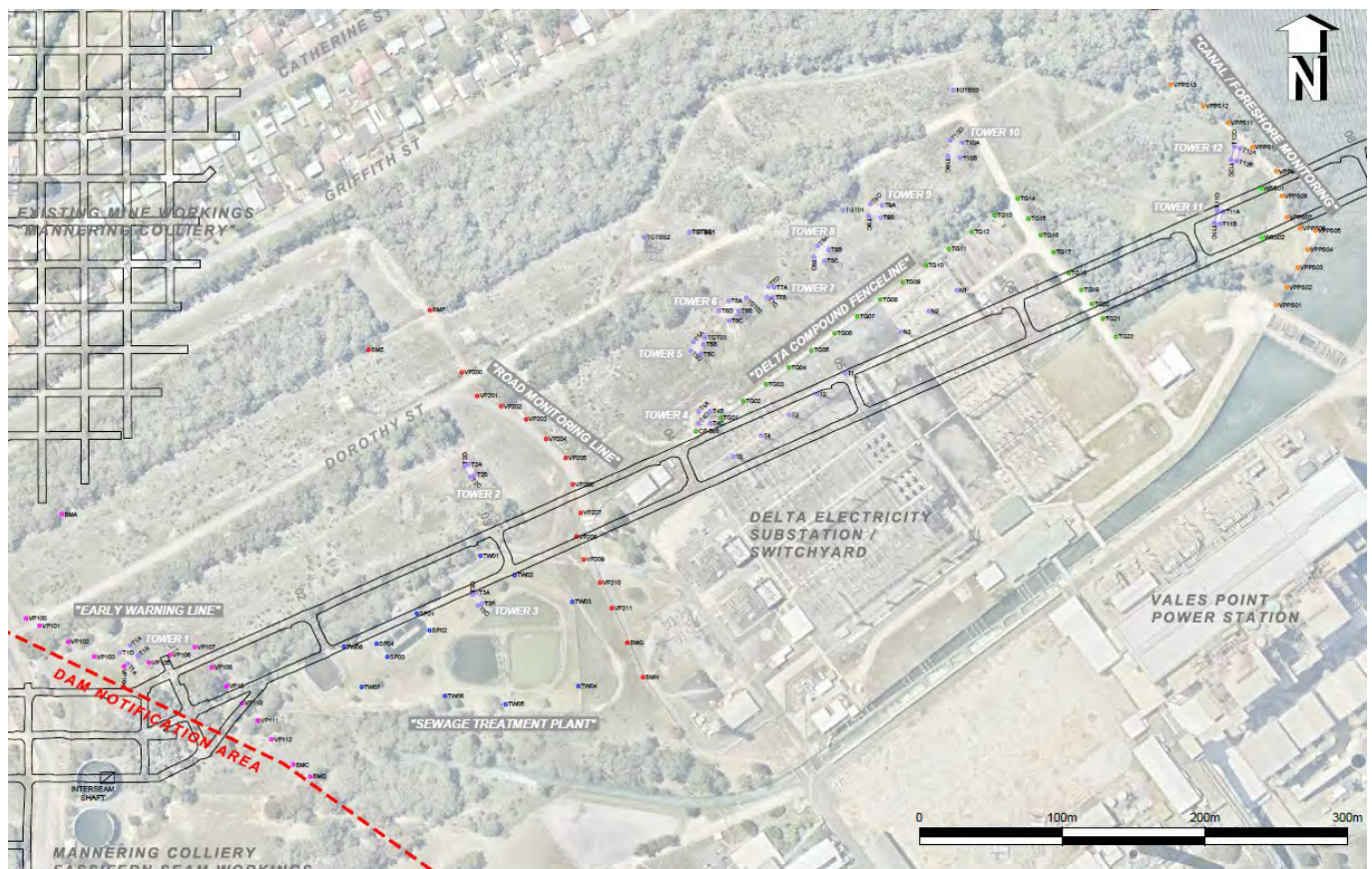


3.2 Mannering Colliery

No mining extraction activities occurred at MC during 2020. There were no built features identified as requiring direct subsidence management as a result of MC former workings during 2021.

No discernible subsidence impact from the Linkage Road Project workings was observed in 2021.

Figure 17 – Vales Point Power Station Monitoring Locations



4 Impacts to Natural Features

4.1 Chain Valley Colliery

Subsidence impact performance measures to natural and heritage features are detailed in SSD-5465 Modification 4, Table 6 as below.

Biodiversity	
Threatened species or endangered populations	Negligible environmental consequences
Seagrass beds	Negligible environmental consequences including: <ul style="list-style-type: none"> • <i>negligible</i> change in the size and distribution of seagrass beds; • <i>negligible</i> change in the functioning of seagrass beds; and • <i>negligible</i> change to the composition or distribution of seagrass species within seagrass beds.
Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.

4.1.1 Seagrass Bed Monitoring

Annual seagrass bed monitoring was undertaken in June 2021 as per the approved Seagrass Management Plan. The Seagrass monitoring report is publicly available at www.deltacoal.com.au. **Table 3** is taken from the report and displays compliance to the subsidence impact performance measures table for 2021.

Table 3 - Seagrass Monitoring Compliance

Condition from SSD5465 - Mod 3	Compliance Status and Comments
Schedule 4 Environmental Conditions - underground mining Performance Measures - Natural Environment Biodiversity - Benthic Communities.	Compliant - See section 16 - Conclusions
Subsidence Impact Performance Measure - Minor environmental consequences, including minor changes composition and/or distribution.	
Measurements undertaken by generally accepted methods.	Compliant - See section 4 and 5
Measurements Methods fully described.	Compliant - See section 4 and 5

4.1.2 Benthic Communities Monitoring

Benthic monitoring was undertaken in March 2021 and September 2021. The Benthic Communities reports are publicly available at www.deltacoal.com.au. The below table is taken from the September 2021 report and displays compliance to the subsidence impact performance measures table for 2020.

The results from the September 2021 benthic communities monitoring show compliance to SSD5465 (Mod 4) with respect to the Subsidence Impact Performance Measures for Benthic communities, which display nil to minor environmental consequences due to underground mining.

Table 4 - Benthic Communities Compliance

Conditions from SSD-5465 – Mod 4	Compliance Status and Comments
Schedule 4 Environmental Conditions – underground mining Performance Measures – Natural Environment Biodiversity – Benthic Communities Subsidence Impact Performance Measure – Minor environmental consequences, including minor changes composition and/or distribution.	Compliant – See section 16 - Conclusions
Measurements undertaken by generally accepted methods.	Compliant – See section 4 and 5
Measures Methods fully described.	Compliant – See section 4 and 5

In April 2020, EMM Consulting Pty Ltd were engaged by Delta Coal to undertake statistical analysis of Benthic communities datasets recorded to date. The report concluded the following:

“Importantly, the statistical analysis of CVC’s benthic monitoring data, primarily undertaken for the period September 2016 to March 2020, has not identified any statistical differences between the benthic assemblages evident at sites designated as Impact, Reference and Control. The reported changes in bed levels associated with CVC underground working also do not correlate with detectable changes in the benthic communities above.

In conclusion, the results of statistical analysis of CVC’s benthic monitoring data indicate that no exceedance of the BCMP (CVC 2019) subsidence impact performance measure of “minor environmental consequences, including minor changes to species composition and/or distribution” has occurred. Consequently, CVC is not required to implement any additional investigations of benthic communities within the project study area at this time and should continue the routine monitoring of benthic assemblages.”

The report also recommended the reduction in frequency of Benthic communities monitoring for CVC from 6-monthly to annually.

5 Adaptive Management – Subsidence Management Trigger Action Response Plan (TARP) Implementation and Remediation

5.1 Chain Valley Colliery

Adaptive management includes monitoring subsidence impacts and subsidence effects and, based on the results, modifying the mining plan as mining proceeds to ensure that the effects, impacts and/or associated environmental consequences remain within predicted and designated ranges and in compliance with the conditions of this consent. The subsidence Monitoring TARPs for Miniwall S5 and Northern Pillar Extraction has been provided as **Figure 18**.

Triggers and performance indicators (including measured subsidence and inspections for environmental impact) are provided across a number of different management plans at CVC and include specific information regarding:

- subsidence monitoring requirements (including baseline monitoring)
- remediation
- adaptive management techniques and
- contingency plans.

A summary of these is provided in CVC's Subsidence Management TARP which aims to consolidate all subsidence management requirements into a central location, triggering a response or set of responses commensurate with the nature of the measurement or the impact that has been identified.

CVC's Subsidence Management TARP was not triggered in 2021.

There was no subsidence related remediation activities undertaken during 2021 as a result of mining activities at CVC.

5.2 Mannering Colliery

There is no subsidence management TARP at MC.

There was no subsidence related remediation activities undertaken during 2021 as associated with Mannering Colliery.

Chain Valley Colliery and Mannering Colliery



Annual Subsidence Report 2021

Figure 18 - CVC Subsidence Management TARP

CHAIN VALLEY COLLIERY- SUBSIDENCE MANAGEMENT TRIGGER ACTION RESPONSE PLAN (TARP 00136)					
SUBSIDENCE MANAGEMENT NORTHERN MINING AREA DOMAIN (S5 and Northern Pillar Area)					
		DETAILED PERFORMANCE INDICATORS	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES
					CONTINGENCY PLANS
	SUBSIDENCE PARAMETERS (Bathymetric Survey)	Normal Subsidence ≤ 500mm	As per Subsidence Monitoring (SM) Program		
		Trigger Level 1 Subsidence > 500mm to ≤ 780mm	6 monthly surveys until subsidence stabilises, then as per SM Program	Update subsidence predictions based on monitoring data Identify controlling mechanisms	Review ability to limit further increases based on understood mechanisms including: Extraction heights, panel widths, panel recovery
		Trigger Level 2 Subsidence > 780mm	6 monthly until subsidence stabilises then as per SM Program	Review if increase likely to create impact at foreshore/seagrass or exceed final subsidence prediction Notify immediately DPIE if incident and within 7 days for non-compliance Notify RR, BCD, affected landholders or infrastructure owner	Immediately review mine plan including panel width, pillar widths, extraction height and panel length Consult with DPIE and RR
	SUBSIDENCE PARAMETERS (Foreshore / Land Based Survey over minimum of 2 adjacent pegs)	Normal <20mm recorded movement	Monitoring as per SM Program		
		Trigger Level 1 <20mm recorded movement with slow (3-5mm/month) creep	Validate increase with additional monthly survey/s then as per SM program	Update subsidence predictions based on monitoring data Identify controlling mechanisms	
		Trigger Level 2 >20mm recorded movement (associated with mining)	Implement Ecological Monitoring program for HWMBSB exceedance Increase frequency of subsidence parameter monitoring to until rates stabilises. Then as per SM program	Cease extraction in panel in question until review conducted in consultation with DPIE and DRE Notify immediately DPIE if incident and within 7 days for non-compliance Notify RR, OEH, affected landholders or infrastructure owner	Investigate cause of exceedance (ie validate impact due to FAS extraction or not) Update subsidence predictions based on monitoring data Update impact assessment on natural and built features
	BUILT FEATURES	Normal No damage requiring remediation	Monitoring as per Subsidence Monitoring Program		
		Trigger Level 1 Subsidence parameters exceeded such that Fassfern workings indicated to have potential impact on foreshore Private bore capacity reduced	RMS routine monitoring navigation markers Monitoring as per BFMP (Built Feature Management Plan)	Review navigational marker freeboard and notify Transport for NSW if impacted Notify immediately DPIE if incident and within 7 days for non-compliance Notify RR and potentially affected landholders or infrastructure owner. Provide temporary water if required.	Develop BFMP in conjunction with owner for built features surrounding potential impact area
		Trigger Level 2 Impact to built feature	Monitoring as per BFMP	Cease extraction in panel in question until review conducted in consultation with DPIE and RR Assist owner with information to aid in Subsidence Advisory NSW claim in accordance with BFMP	Update impact assessment based on observed damage Immediately review mine plan including panel width, pillar widths Consult with DPIE and RR Review and update Extraction Plan

CHAIN VALLEY COLLIERY - SUBSIDENCE MANAGEMENT TRIGGER ACTION RESPONSE PLAN (TARP 00136)					
SUBSIDENCE MANAGEMENT NORTHERN MINING AREA DOMAIN (\$5 and Northern Pillar Area)					
		DETAILED PERFORMANCE INDICATORS	MONITORING REQUIREMENTS	CONTAINMENT / REMEDIATION MEASURES	ADAPTIVE MANAGEMENT MEASURES
					CONTINGENCY PLANS
Triggers	PUBLIC SAFETY (Foreshore / Land Based areas and steep slopes)	Normal No impact	Monitoring as per SM Program and Public Safety MP		
		Trigger Level 1 Subsidence parameters exceeded such that Fassfern workings indicated to have potential impact on foreshore / land based areas	Increase visual inspection of foreshore to daily until public safety risk quantified as low Inspect Foreshore / Land Based areas in vicinity of steep slopes and retaining walls for signs of movement ASAP. Implement TARP as required		Review potential of flooding and drainage impacts about foreshore or Land Based areas or stability concerns at steep slopes/ retaining walls. Undertake appropriate risk assessments
		Trigger Level 2 Area around foreshore or other land based areas becomes unstable or shows signs of mining induced impact Flooding or drainage impacts considered likely as result of Fassfern extraction	Visual inspections frequency to be commensurate with level of risk (ie increase until controls put in place) Inspect Foreshore / Land Based areas in vicinity of other steep slopes and retaining walls for signs of movement ASAP. Implement TARP as required	Cease extraction in panel in question until review conducted in consultation with DPIE and RR Immediately implement temporary safety controls (barricades and signage available from mine site). Arrange for assistance and stay at site if immediate risk to public exists Inform ECC as to result of inspection Geotechnical Engineer to inspect area immediately Notify LMCC and Transport for NSW Notify BCD, DPIE and RR	Implement longer term safety controls Foreshore / Land based area stabilisation of unsafe areas in consultation with LMCC/CC Council and RR as soon as possible Flooding and drainage rectification works in consultation with infrastructure owner as soon as possible
		Normal ANOVA/ANOSIM <5%	Monitoring as per Berthic MP		
	BENTHIC COMMUNITIES	Trigger Level 1 ANOVA/ANOSIM level is approaching 5%	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining Arrange a peer review of the monitoring results and statistical analysis		
		Trigger Level 2 ANOVA/ANOSIM <5%	Unwarranted follow up monitoring at specific sites to obtain confirmation of impacts Incident Report to be completed and distributed to relevant agencies	Notify DPIE, Fisheries, LMCC and DPIE Notify immediately DPIE if incident and within 7 days for non-compliance	Consult with relevant authorities about monitoring and management controls Consult with relevant authorities to identify if offsets are required and how these are to be implemented
		Normal Negligible impact	Monitoring as per Seagrass MP		
	SEAGRASS	Trigger Level 1 Approaching 20% decline in condition Approaching 20mm of additional mine induced subsidence within mapped seagrass	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining		Review if variation is within broader background variation range for the site
		Trigger Level 2 >20% decline in conditions from year baseline survey ≥150mm of additional mine induced subsidence at survey location	Incident Report to be completed and distributed to relevant agencies	Notify immediately DPIE if incident and within 7 days for non-compliance Notify DPIE, Fisheries and LMCC	Consult with relevant authorities about monitoring and management controls Consult with relevant authorities to identify if offsets are required and how these are to be implemented
	THREATENED SPECIES AND ENDANGERED POPULATIONS	Normal Negligible environmental consequences	Monitoring as per Subsidence Monitoring Program, Benthic Communities Management Plan and Seagrass Management Plan		
		Trigger Level 1 As per Seagrass and Benthic Community Management Plans Monitoring Level 1 triggers	Liaise with monitoring consultant & undertake internal review to determine if impacts are related to mining and greater than negligible environmental consequences		Review if variation is within broader background variation range for the site
		Trigger Level 2 As per Seagrass and Benthic Community Management Plans Monitoring Level 2 triggers ≥750mm subsidence	Incident Report to be completed and distributed to relevant agencies	Notify immediately DPIE if incident and within 7 days for non-compliance Notify DPIE, Fisheries and LMCC	Initiate ecological monitoring program to assess the impacts to ecological communities and threatened species Consult with relevant authorities about monitoring and management controls Consult with relevant authorities to identify if offsets or rehabilitation is required and how this is to be implemented
	WATER INFLOW	Ongoing monitoring of water inflows and site water management through operational Water Management and Monitoring TARP process			

		CHAIN VALLEY COLLIERY- SUBSIDENCE MANAGEMENT TRIGGER ACTION RESPONSE PLAN (TARP 00136) SUBSIDENCE MANAGEMENT NORTHERN MINING AREA DOMAIN (S5 and Northern Pillar Area)	Revision 4 - 10/08/2021
Responsibilities	Environment Compliance Coordinator	Coordinate and undertake all environmental monitoring as outlined in TARP Implement TARP actions in consultation with regulatory agencies as/required Notify the relevant Government agencies and other affected parties of exceedance of performance measures Coordinate Subsidence Review as a part of Annual Environmental Reporting Arrange for subsidence prediction and impact updates as required Update Extraction Plan as required Audit public safety controls regularly	
	Mine Surveyor	Coordinate subsidence monitoring as outlined in TARP Review subsidence monitoring results against TARP triggers Inform relevant stakeholders as to subsidence monitoring trends and exceedances	
	Mine Manager	Ensure adequate financial and personnel resources are made available for implementation of this plan Review and approve required mine plan changes	

Appendix 9: Chain Valley Colliery Independent Environmental Audit

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 105 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

INDEPENDENT ENVIRONMENTAL AUDIT 2019

Chain Valley Colliery

Prepared for:

Delta Coal
Off Construction Road
Vales Point NSW 2259

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Delta Coal (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
630.12751-R01-v0.1	24 June 2019	Chris Jones	Tracey Ball	Chris Jones

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1 Introduction

1.1 Background

The Chain Valley Colliery (CVC) is an underground coal mine located at the southern end of Lake Macquarie, approximately 60 km south of Newcastle (see **Figure 1**) which is now operated by Delta Coal. For the majority of the Independent Environmental Audit period LakeCoal Pty Ltd (LakeCoal) operated the site on behalf of Wallarah Coal Joint Venture (WCJV).

Underground mining has occurred at the Colliery since 1962 extracting coal from three seams – the Wallarah Seam, the Great Northern Seam and the Fassifern Seam, with current mining activities limited to the Fassifern Seam. The Colliery is located in the Swansea North Entrance Mine Subsidence District. Historically, underground mining was undertaken using the bord and pillar method; however in September 2011 miniwall mining was introduced.

In August 1960, J&A Brown and Abermain Seaham Collieries Ltd commenced clearing the present site with drift and shaft sinking starting a few months later. Production of coal from the Wallarah seam, commenced with the first delivery to the adjacent Delta Electricity's Vales Point power station in April 1963.

The prior owners LakeCoal were a producer of thermal coal. The company was formed in 2001 to acquire BHP Billiton's 80% share in the Wallarah Coal Joint Venture (WCJV), the remaining 20% share was owned by Sojitz. In October 2006, Peabody Energy, a US listed company acquired LakeCoal.

In November 2009 LDO Coal Pty Limited purchased LakeCoal and in March 2011 the 20% share in the WCJV which Sojitz held was acquired by LDO Coal shareholders through the entity Fassi Coal Pty Ltd. In November 2016, LakeCoal finalised commercial arrangements with investor into the business (RWE).

The WCJV had operated the Wallarah, Moonee and CVC underground coal mines and the Catherine Hill Bay Coal Preparation Plant, all located at the southern end of Lake Macquarie. At the time of LakeCoal's acquisition by LDO Coal, both the Wallarah and Moonee mines were closed.

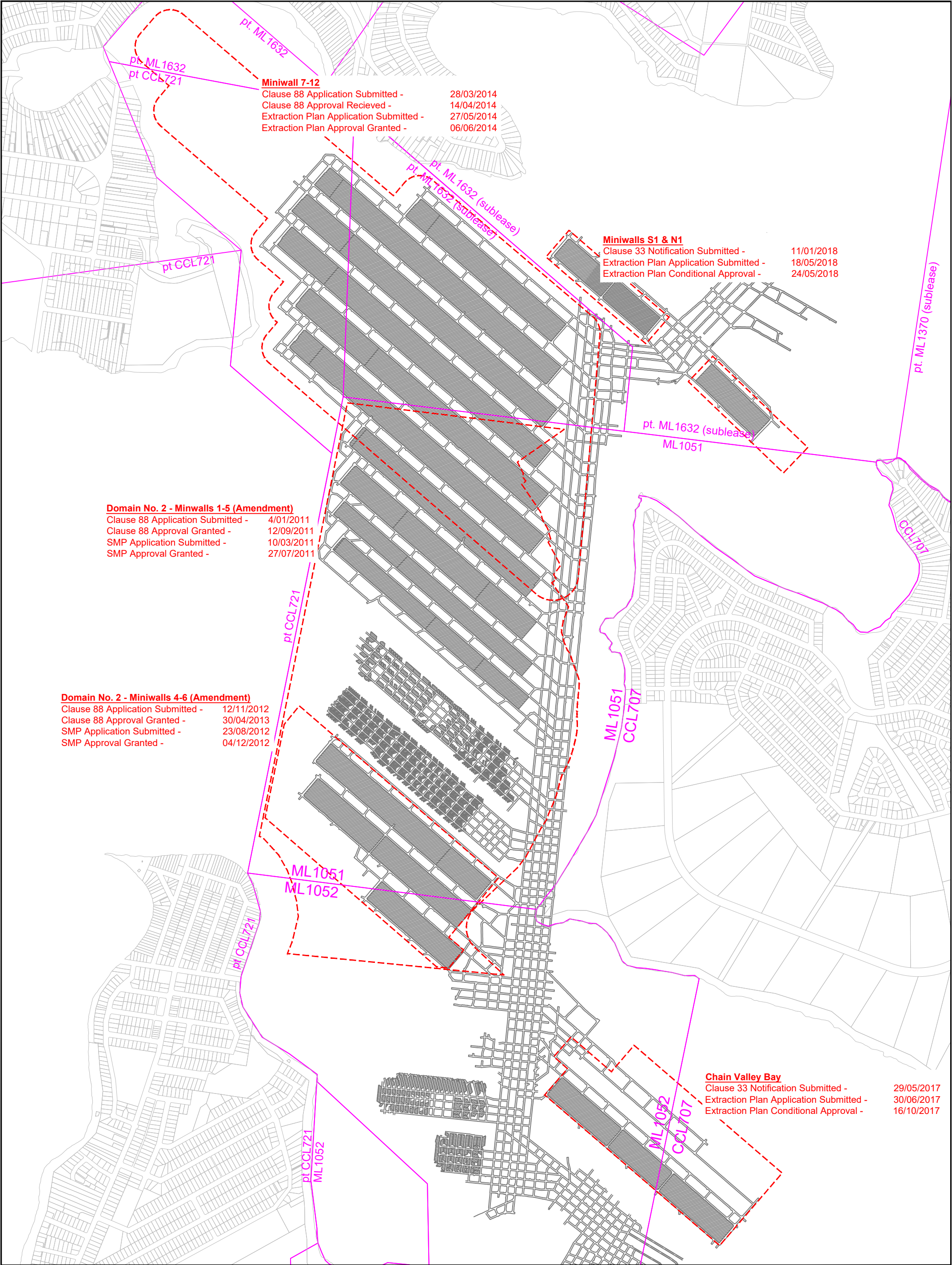
LakeCoal is currently undertaking the mine closure/rehabilitation process for the Moonee Colliery and the Catherine Hill Bay Coal Preparation Plant. The rehabilitation process for Wallarah Colliery has been completed and the lease in that area relinquished.

CVC peaked with a workforce of approximately 380 personnel in the mid 1980's. At the end of 2018, CVC had a workforce of 209 personnel.

LakeCoal went into receivership on 3 October 2018, however has maintained coal conveyance and processing operations. Delta Coal are now the current owners and operators of the site. The transfer occurred on the 31 March 2019 with Great Southern Energy (trading as Delta Coal) being the owner and operator of Mannering Colliery and CVC. **Figure 2** has been prepared by Delta Coal outlining the mining areas and relevant Extraction Plans within the audit period.



Figure 1 Locality – CVC (Prepared by EMM)



DELTA COAL CHAIN VALLEY COLLIERY FASSIFERN SEAM APPROVALS 2011 - 2019		SCALE:	1:12500	DATE:	15 April 2019
		DRAWN:	T Chisholm	DRG NO:	C4P0089
		CHECKED:	C Armit	REV NO:	0
		SIGNED:	-	SIZE:	A3

1.2 Audit Scope

This Independent Environmental Audit (Audit) covers the period from 1 January 2016 (day after previous 2015 Independent Environmental Audit) to the end of the auditing onsite (10 April 2019).

The scope of the Audit is outlined in Schedule 6, Condition 9 and 10 of Development Consent SSD 5465 (as modified), and includes:

By the end of February 2016 (or other such timing as agreed by the Secretary), and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:

- a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;*
- b) include consultation with the relevant agencies;*
- c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);*
- d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and*
- e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under the abovementioned approvals.*

Note: This audit team must be led by a suitably qualified auditor and include experts in any field specified by the Secretary.

10. Within 6 weeks of the completion of this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

The Audit has assessed the key approvals and documentation outlined in **Section 4**, including:

- SSD 5465 and Statement of Commitments;
- Environment Protection Licence (EPL) 1770; and
- Consolidated Coal Leases (CCL) 707 and 721.

1.3 Key Site Contacts

Contact details for key Delta Coal contact for this audit is outlined below:

Chris Armit

Environmental and Community Coordinator

Phone: 02 4358 0800

Mobile: 0409 070 233

Email: CArmit@deltacoal.com.au

1.4 Audit Methodology

The Audit was undertaken onsite by Chris Jones (Lead Auditor), Tracey Ball (Assistant Auditor) and Martin Davenport (Mine Site Noise Specialist) of SLR.

SLR was assisted by subsidence specialist Ken Mills of SCT during the Audit.

The SLR Audit team are independent of CVC as defined under Section 3.3 of the Department of Planning and Environment's (DPE) *Independent Environmental Audit Guidelines* (October 2015).

Information was provided by CVC during and following the Audit. SLR also sourced a large amount of information from the CVC/Delta Coal website.

The methodology for the Audit consisted of the following key steps:

- Introductory and close out meetings;
- Reviewing key documents provided by CVC prior to the Audit;
- Consultation with relevant government agencies as per the Independent Environmental Audit Guideline requirements prior to the site component;
- Preparation of draft Audit Tables provided to CVC prior to the site Audit;
- Site component of the Audit, including inspections and discussions with key CVC operational personnel;
- Review of additional relevant documentation obtained while onsite during the inspection or provided by CVC operations after the site inspection; and
- Client review and comment on the draft Audit report.

The site component was completed on the following days:

- 2 and 3 April 2019 – including opening meeting, inspection, determination of compliance;
- 10 April 2019 – On site determining compliance;
- 7 June 2019 – Meeting at SLR offices to obtain further evidence to determine compliance.

Photographs taken during the site inspection is included in **Appendix A**. A large amount of evidence was viewed and collected as part of the Audit, including monitoring records, reports, and correspondence. While this key evidence has been referenced in **Section 2**, it has not been attached to this Audit report.

The Audit has been completed as per the *Independent Environmental Audit Guidelines* (DPE October 2015).

The Audit team assessed the approvals and documentation outlined in **Section 4**.

1.4.1 Introductory and Close out Meetings

Introductory and close out meetings were held for the Audit. At the opening meeting introductions were made by each of the meeting attendees and CVC personnel provided background details regarding the site to SLR. During the close out meeting a general discussion about compliance and areas for improvement was undertaken. **Table 1** lists those present at these meetings.

Table 1 Meeting Attendees

Name	Role	Comment
Chris Armit	Delta Coal Environment and Community Co-ordinator	Present at opening meeting. Main contact for the audit.
Chris Jones	SLR Lead Auditor	Present at opening and closing meeting
Tracey Ball	SLR Assistant Auditor	Present at opening and closing meeting
Martin Davenport	SLR Noise Specialist	Present at opening meeting
Ken Mills	SCT Subsidence Specialist	Present at opening meeting

1.5 Consultation Requirements

Table 2 outlines the stakeholder consultation completed for CVC, undertaken in accordance with the Audit Guidelines.

Table 2 Stakeholder Consultation for the Audit

Regulatory Authority	Contact Details	Comment
DPE	Joel Curran Compliance Officer Northern Region NSW Department of Planning and Environment PO Box 1226 NEWCASTLE NSW 2300 P 02 4904 2702 E joel.curran@planning.nsw.gov.au	Email sent to DPE contact from SLR on 20 March 2019. A response was provided by the DPE on 25 March 2019 <i>The Department sees noise and general monitoring and reporting obligations as key issues for CVC and Mannering Collieries at this time.</i>
Environment Protection Authority (EPA)	Matthew Corradin A/Unit Head Hunter North NSW Environment Protection Authority – North Branch Landline (02) 4908 6830	Email sent to EPA contact from SLR on 20 March 2019. No response provided to SLR.
Department of Planning and Environment – Resources Regulator (DPE-RR)	Catherine Lewis Senior Inspector Environment Resources Regulator 516 High Street Maitland NSW 2320 T 02 4063 6619 E Catherine.lewis@planning.nsw.gov.au Lands Ministerial Unit NSW Department of Industry - Crown Lands Level 4, 437 Hunter Street, NEWCASTLE NSW 2300 E: lands.ministerials@industry.nsw.gov.au	Email sent to DPE-RR contact from SLR on 20 March 2019. No response provided to SLR from the RR, however a response was provided from Crown Lands. <i>The only feedback from Crown Lands, is that SLR should consider to what extent Crown Land is involved in either project, and if so whether Access Agreements (where required) are in place in accordance with the Mining Act 1992.</i> Crown Land is within the previous and current underground mining areas. There are recommendations to improve subsidence reporting in the future and impacts to crown lands should be highlighted when applicable.
Department of Industry – Water (DOI Water)	Mitchell Isaacs Manager Strategic Stakeholder Liaison Department of Primary Industries NSW Office of Water Level 11, 10 Valentine Ave Parramatta NSW 2124 PO Box 3720 Parramatta NSW 2124 T: 02 8838 7529 E: mitchell.isaacs@dpi.nsw.gov.au	Email sent to DOI Water contact from SLR on 20 March 2019. No response provided to SLR.

Regulatory Authority	Contact Details	Comment
Lake Macquarie City Council (LMCC)	Emma Graham (LMCC) egraham@lakemac.nsw.gov.au	Email sent to LMCC contact from SLR on 20 March 2019. No response provided to SLR.
Community Consultative Committee (CCC) Chairperson	Margaret MacDonald-Hill mmacdonald-hill@bigpond.com	<p>Email sent to contact from SLR on 20 March 2019.</p> <p>The CCC Chairperson sent an email to the CCC requesting any comments.</p> <p>A response was provided by the CCC chairperson based on 25 March.</p> <p><i>I have reviewed the file for the audit period and other than the long delay with the implementation of the Voluntary Planning Agreement and Community Advisory Panel (condition for CVC) with the former Wyong Council (now Central Coast Council) caused by the Council itself and now satisfactorily resolved, there are no specific issues. The committee met quarterly for the entire audit period.</i></p> <p>One of the members of the CCC stated in an email to the CCC Chairperson on 25 March 2019:</p> <p><i>There have been a series of noise complaints from a fellow resident of mine. But only one person – no one else seems to hear what he hears. The colliery have taken a great deal of remedial actions.</i></p>
Central Coast Council	Julie Vaughan Central Coast Council - Julie.Vaughan@centralcoast.nsw.gov.au	Email sent to contact from SLR on 20 March 2019. No response provided to SLR.

1.6 Statement of Independence

We can confirm independence based on the following:

- No one from SLR or the proposed audit team is related to any proponent, owner, operator or other entity involved in the delivery of the project. Such a relationship includes that of employer/employee, a business partnership, sharing a common employer, a contractual arrangement outside an Independent Audit, or that of a spouse, partner, sibling, parent, or child.
- No one from SLR or the proposed audit team has any pecuniary interest in the project, proponent or related entities. Such an interest includes where there is a reasonable likelihood or expectation of financial gain (other than being reimbursed for performing the audit) or loss to the auditor, or their spouse, partner, sibling, parent, or child.
- No one from SLR or the proposed audit team have provided services (not including independent reviews or auditing) to the current project with the result that the audit work performed by themselves or their company, except as otherwise declared to the Department prior to the audit.
- No one from SLR or the proposed audit team is an Environmental Representative for the Project.
- No one from the proposed audit team can or will accept any inducement, commission, gift or any other benefit from auditee organisations, their employees or any interested party, or knowingly allow colleagues to do so.

2 Documents Reviewed and Referenced

Key documentation reviewed as part of the Audit includes:

- SSD 5465;
- EPL 1770;
- CCL 707 and 721;
- Bore Licence 20BL173107;
- Annual Reviews – 2016, 2017 and 2018;
- Monitoring results for meteorological, noise, air, water and blasting;
- Rehabilitation Monitoring Reports;
- Biodiversity Monitoring Spreadsheets;
- Transport Summary Spreadsheet;
- Environmental Management Plans – as per approval conditions;
- Mining Operations Plans (MOPs);
- Extraction Plans;
- Annual Returns – across the Audit period;
- Complaints log;
- Voluntary Planning Agreements (VPA) - Payments
- Evidence of maintenance and calibration;
- CCC Meeting Minutes – across the Audit period; and
- Key consultation with government – including consultation and approval letters.

3 Assessment of Compliance

The terms used in the Audit to describe the level of compliance of the site with the relevant approval documentation are outlined in **Table 3** and **Table 4**. These are requirements of the DPE's *Independent Environmental Audit Guidelines* (October 2015).

Table 3 Compliance Assessment Criteria

Assessment	Criteria
Compliant	Where the Auditor has collected sufficient verifiable evidence to demonstrate that the intent and all elements of the requirement of the regulatory approval have been complied with within the scope of the Audit.
Not Verified	Where the Auditor has not been able to collect sufficient verifiable evidence to demonstrate that the intent and all elements of the requirement of the regulatory approval have been complied with within the scope of the Audit. In the absence of sufficient verification, the Auditor may in some instances be able to verify by other means (visual inspection, personal communication, etc.) that a requirement has been met. In such a situation, the requirement should still be assessed as not verified. However, the Auditor could note in the report that they have no reasons to believe that the operation is non-compliant with that requirement.
Non-Complaint	Where the Auditor has collected sufficient verifiable evidence to demonstrate that the intent of one or more specific elements of the regulatory approval have not been complied with within the scope of the Audit.
Administrative Non - compliance	A technical non - compliance with a regulatory approval that would not impact on performance and that is considered minor in nature (e.g. report submitted but not on the due date, failed monitor or late monitoring session). This would not apply to performance-related aspects (e.g. exceedance of a noise limit) or where a requirement had not been met at all (e.g. noise management plan not prepared and submitted for approval).
Not triggered	A regulatory approval requirement has an activation or timing trigger that had not been met at the time of the Audit inspection; therefore, a determination of compliance could not be made.
Observation	Observations are recorded where the Audit identified issues of concern which do not strictly relate to the scope of the Audit or assessment of compliance. Further observations are considered to be indicators of potential non - compliances or areas where performance may be improved.
Note	A statement or fact, where no assessment of compliance is required.

Table 4 Risk Levels for Non - compliances

Risk Level	Colour Code	Description
High		Non - compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.
Medium		Non - compliance with: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Potential for moderate environmental consequences, but is unlikely to occur; or Potential for low environmental consequences but is likely to occur.
Administrative Non - Compliance		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).

4 Approvals and Documentation Assessed

Audit findings and recommendations relating to key approvals are outlined in **Section 6** and **7** of this report.

4.1 Previous Audit Recommendations

The previous Audit was completed by Hansen Bailey, with the site Audit completed in May 2016 and the final Audit Report dated 22 July 2016.

The previous Audit covered the period of 1 November 2012 to 31 December 2015. Appendix 4 of the 2016 Annual Review provides an update on the 2016 Independent Environmental Audit, with several recommendations committing to a 30 June 2017 completion date. There is no update on Independent Environmental Audit actions within the 2017 AEMR, therefore it is not possible to fully determine compliance against the previous actions. Independent Environmental Audit Actions Plans should be included in every Annual Review going forward.

The requirement to review Environmental Management Plans has not been completed with this referenced numerous times in the Independent Environmental Audit Action Plan (Appendix 4 of 2016 Annual Review). There was also a commitment to improve reporting of incidents/non – compliances during the future, with some non – compliances identified as part of this 2019 Independent Environmental Audit.

4.2 Development Consent SSD 5465

The conditions relating to SSD 5465 were assessed as part of this Audit. The Development Consent was first granted on 23 December 2013. SSD 5465 has been modified two times including:

- Mod 1 – approved 27 November 2014;
- Mod 2 – approved 16 December 2015; and
- Mod 3 – pending approval.

The site had a moderate level of compliance against Development Consent conditions.

4.2.1 Development Consent SSD 5465 Statement of Commitments

There is a Statement of Commitments relating to SSD 5465 which contains numerous commitments relating to environmental management, monitoring and reporting. The site had a moderate level of compliance against the Statement of Commitments during this audit period.

4.3 Environment Protection Licence 1770

SLR assessed compliance against the EPL 1770 which has an anniversary date of 1 April. Conditions relate to limit conditions, operating conditions, monitoring and reporting. The site had a moderate level of compliance against the EPL during this audit period.

4.4 Management Plans and Programs

The following management plans were assessed as part of the Audit. All the management plans reviewed are required according to SSD 5465 consent conditions with these documents placed on the CVC website. Some management plans with more recent dates were provided to SLR by Delta Coal, however there was no evidence of submission of these plans to the DPE and no evidence of approval of these plans by DPE. SLR only audited management plans on the CVC website with these outlined in the table below.

Table 5 Management Plans

Management Plan	Requirement	Comment
Road Transport Protocol	SSD 5465 Schedule 3, Condition 3	Road Transport Protocol, which includes; MSP-D-14559 – Coal Haulage Traffic Management Plan and POL-D-14926 Coal Haulage Driver Code of Conduct. Coal Haulage Traffic Management System Plan on the CVC website is dated 18/03/14. Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012.
Noise Management Plan	SSD 5465 Schedule 3, Condition 9	The management plan on the CVC website is dated 12/03/2014.
Air Quality Management Plan	SSD 5465 Schedule 3, Condition 13	The management plan on the CVC website is dated 18/07/2014.
Water Management Plan including a Surface Water Management Plan and Ground Water Monitoring Program	SSD 5465 Schedule 3, Condition 18	The management plan on the CVC website is dated 21/07/2015.
Biodiversity Management Plan	SSD 5465 Schedule 3, Condition 20	The management plan on the CVC website is dated 09/03/16.
Heritage Management Plan	SSD 5465 Schedule 3, Condition 21	The management plan on the CVC website is dated 23/06/14.
Rehabilitation Management Plan	SSD 5465 Schedule 3, Condition 27	The management plan is dated 1 March 2019. A copy of this management plan is not on the CVC website. No evidence of approval of 2019 management plan.
Extraction Plan	SSD 5465 Schedule 4, Condition 7	The management plan on the CVC website is dated 28/03/2013.
Seagrass Management Plan	SSD 5465 Schedule 4, Condition 7(i)	The management plan on the CVC website is dated 09/04/2014.
Environmental Management Strategy	SSD 5465 Schedule 6, Condition 1	The management plan on the CVC website is dated 12/10/2012.
Pollution Incident Response Management Plan	EPL 1770	The management plan on the CVC website is dated 21/09/2018.

4.5 Mining Leases

As part of this Audit, SLR assessed the two consolidated coal leases which is applicable to the Project Approval Area including CCL 721 and 707. This lease includes conditions relating to mining, rehabilitation, MOPs and group security deposits.

4.6 Water Licences

CVC has one current Groundwater Extraction Licence – Bore Licence 20BL173107. This licence is a production bore and has an annual limit of 4,443 ML. There was also a licence for Bore Licence 20BL111869 which operated during the 2015 and 2016 Annual Review periods and had an entitlement limit of 402ML.

The Water Licence for Bore Licence 20BL171958 has a condition stating:

The volume of groundwater extracted from the works authorized by this licence shall not exceed 985 megalitres in any 12 month period commencing 1st July.

Based on the information in the 2016, 2017 and 2018 Annual Reviews the site was well below the extraction licence limits during the Audit period.

4.7 Complaints

Complaints were recorded within the 2016, 2017 and 2018 Annual Reviews, with 2019 complaints provided by Site. Complaints have remaining low during the Audit period:

- Two complaints received in 2016 relating to dust;
- One complaint received in 2017 relating to noise;
- One complaint received in 2018 relating to dust, noise and vibration; and
- No complaints received in 2019 reporting period relating to start of April, as provided by Delta Coal.

4.8 Incidents and Non - compliances

There were 13 incidents and non - compliances provided to SLR during the Audit period. These are summarised in **Table 6**.

This information was provided in the Annual Reviews for 2016 - 2018.

Table 6 Summary of Incidents and Non - compliances

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
2016			
6 January 2016	Daily discharge volume exceedances from EPA Point 1 (LDP1) as a result of significant rainfall.	EPL 1770 - L3.1 – Volume and mass limits	During the 2015 reporting period the then LakeCoal completed extensive upgrades to its water management system to improve its ability to handle rainfall events. LakeCoal also restricted its underground pumping to reduce the potential for the exceedance in accordance with its approved water management plan. LakeCoal will continue to implement its approved site water management plan in the next reporting period.
11-13 January 2016	Missed data capture as a result of a power outage/trip at the Wyong waste treatment plant associated with storm activity.	EPL 1770 - M2.2 Air Monitoring Requirements	Power was restored to the unit on the next available working day (13 January 2016).
18-22 January 2016	Missed data capture as a result of a power outage /trip at the Wyong waste treatment plant.	EPL 1770 - M2.2 Air Monitoring Requirements	An electrical inspection was undertaken by the sites electrical contractor on the 24 and 25 February. The inspection identified a significant ant infestation in the circuit breaker. New circuit breakers were installed on 25 February and the area pest sprayed to try and reduce any trips of the system.
27 February - 8 March 2016	Missed data capture for the period as a result of the failure of the TEOM air conditioner.	EPL 1770 - M2.2 Air Monitoring Requirements	A new air conditioner was installed at the site on 3 March 2016. Commissioning of the new unit was undertaken from 3-8 April 2016.
22-24 April 2016	Missed data capture for the period as a result of some temperature regulation issues and water condensate blocking the filter in the unit.	EPL 1770 - M2.2 Air Monitoring Requirements	The unit was inspected and repaired on the next available working day (24 April 2016).
1 June 2016	Missed data capture on 1 June 2016 as a result of a power outage at the Wyong Treatment Plant	EPL 1770 - M2.2 Air Monitoring Requirements	An inspection of the unit was undertaken on 2 June 2016 and power was subsequently restored.

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
5 June 2016	Daily discharge volume exceedances from EPA Point 1 (LDP1) as a result of significant rainfall.	EPL 1770 - L3.1 – Volume and mass limits	During the 2015 reporting period LakeCoal completed extensive upgrades to its water management system to improve its ability to handle rainfall events. LakeCoal also restricted its underground pumping to reduce the potential for the exceedance in accordance with its approved water management plan. LakeCoal will continue to implement its approved site water management plan.
28 June 2016	6dB and 7dB exceedances of LA1, 1 minute Noise Criteria at R13 and ATN004 receivers respectively during Q2 2016 monitoring.	SSD 5465 Schedule 3, Condition 7	<p>During the night time Q2 monitoring on 28 June 2016, LA1,1minute readings recorded at locations R13 and ATN004 with did not comply with the noise criteria in SSD 5465. Exceedances of 6 and 7dB respectively were recorded at each location. During the monitoring Global Acoustics (the sites principle noise monitoring consultant) identified that the elevated levels were attributed to dozer noise, specifically “track slap” which appeared to be coming from the CVClery’s product coal stockpiling activities.</p> <p>Following the identification of the exceedances LakeCoal notified the relevant authorities of the exceedances on 29 June 2016. The following actions were also undertaken by LakeCoal as a result of noise exceedances:</p> <ul style="list-style-type: none"> • A review of the sites night time operational activities were undertaken on 29 June 2016 which confirmed that the CVC product coal dozer was operating on the site product coal stockpile at the time the exceedances were recorded. • Discussions with operational personnel, ME Transport (the contracting company who manage the product coal dozer) and the dozer operator were undertaken on 29 June 2016 and it was agreed that a revised operating protocol (which involved the dozer being restricted to second gear in reverse with a maximum speed of 5km/h) would be adopted for night time activities on 29 June 2016. • Follow up noise monitoring was undertaken at the R13 and ATN004 receiver locations during the night time period on 29 June 2016. During the monitoring the CVC product coal dozer was in use utilising the restricted operating protocol. • The results from the follow up night time monitoring undertaken at both receivers on 29 June indicated that the noise levels from the operation were within the noise criteria limits as specified within EPL 1770 and the sites Development Consent. A summary of the follow up noise monitoring results is provided below:

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance																								
			<p><i>Table 1.2 :L_{A1,1minute} GENERATED BY CVC AGAINST IMPACT ASSESSMENT CRITERIA</i></p> <table><tr><th>Location</th><th>Date and Time</th><th>Wind Speed (m/s)</th><th>VTG (deg/C per 100m)¹</th><th>L_{A1,1min} Criterion dB</th><th>Criterion Applies?^{2,3}</th><th>CVC L_{A1,1min} dB⁴</th><th>Exceedance</th></tr><tr><td>ATN4</td><td>29/06/16 2302</td><td>0.3</td><td>3</td><td>45</td><td>Yes</td><td>45</td><td>Nil</td></tr><tr><td>R13</td><td>29/06/16 2226</td><td>0.2</td><td>0.5</td><td>49</td><td>Yes</td><td>40</td><td>Nil</td></tr></table> <p>Notes:</p> <ol style="list-style-type: none">1. Sigma theta data used to calculate Vertical Temperature Gradient (VTG) in accordance with procedures detailed in the INP;2. Noise emission limits do not apply for winds greater than 3 metres per second (at a height of 10 metres); or temperature inversion conditions greater than 4°C/100m;3. These are results for Chain Valley Colliery (CVC) in the absence of all other noise sources; and4. Bolded results in red are those greater than the relevant criterion (if applicable). <p>It should also be noted that there were no community complaints received as a result of the noise exceedances recorded on 28 June 2016.</p>	Location	Date and Time	Wind Speed (m/s)	VTG (deg/C per 100m) ¹	L _{A1,1min} Criterion dB	Criterion Applies? ^{2,3}	CVC L _{A1,1min} dB ⁴	Exceedance	ATN4	29/06/16 2302	0.3	3	45	Yes	45	Nil	R13	29/06/16 2226	0.2	0.5	49	Yes	40	Nil
Location	Date and Time	Wind Speed (m/s)	VTG (deg/C per 100m) ¹	L _{A1,1min} Criterion dB	Criterion Applies? ^{2,3}	CVC L _{A1,1min} dB ⁴	Exceedance																				
ATN4	29/06/16 2302	0.3	3	45	Yes	45	Nil																				
R13	29/06/16 2226	0.2	0.5	49	Yes	40	Nil																				
2017																											
24 October 2017	1dB exceedance of night time LAeq15 min criteria at ATN007.	SSD 5465 Schedule 3, Condition 7	<p>Follow up noise monitoring undertaken by site confirmed that noise levels were back within compliance.</p> <p>LakeCoal has committed to replacing the inlet and outlet silencers at the fan site location in the 2018 reporting period in an attempt to reduce the low frequency noise impacts at this location.</p> <p>LakeCoal has engaged an external noise specialist to assist with identifying further noise mitigation options for this location and will report these findings in the next reporting period.</p>																								

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
9 November 2017	Exceedance of the site's approved subsidence values over the miniwall 7-12 mining area.	SSD 5465 Schedule 2, Condition 2 Statement of Commitments	LakeCoal engaged experts to undertake a detailed review of the exceedance during the reporting period. This report is expected to be finalised in Q1 2018. A preliminary review of both Bethic and Seagrass monitoring locations indicated no discernible impacts as a result of the exceedance. LakeCoal has committed to implementing any findings from this report into its proposed mine design for its northern mining area. Further detail is provided in Section 5.2 .
2018			
3 April 2018	PM ₁₀ 24 Hour Average Exceedance (RTD 001) - Kingfisher Shores	SSD 5465 Schedule 3, Condition 11	As outlined in the initial notification, the TEOM recorded a 24 hour PM ₁₀ value of 50.2ug/m ³ against the 24 hour average criterion of 50ug/m ³ on the 19 March. A copy of the TEOM Data recorded for the month of March is provided in Attachment 2. Following a preliminary investigation of the exceedance, a follow-up phone call was made to DPE in which LakeCoal advised that it was of the opinion that the exceedance was not a direct result of its mining activities and was more likely a result of a regional dust event which was occurring at the time, noting that on 19 March, it had received automatic notifications from OEH (via oeh.airquality@environment.nsw.gov.au) that both the Central Coast and Lower Hunter Central Coast PM ₁₀ levels exceeded national air quality standards (copies attached). Notwithstanding, it was agreed that LakeCoal would submit an incident report on the event. As previously advised, based on the results of the preliminary and subsequent investigations, LakeCoal remains of the opinion that the minor exceedance of the 24 hour PM ₁₀ value of 50.2ug/m ³ recorded on 19 March 2018 was not as a consequence of its activities and, in the absence of any other known local sources and the warnings received from OEH, was firmly of the opinion that the exclusion nominated in the footnote to Table 4 in SSD 5465 applies and consequently the exceedance did not represent a non-compliance with the consent. Accordingly LakeCoal did not intend to undertake any further actions as a result of the minor exceedance and request the Secretary's agreement that it did not constitute a non - compliance for the purpose of SSD 5465 for its internal compliance records.
18 July 2018	PM ₁₀ 24 Hour Average Exceedance (RTD 001)- Kingfisher Shores	SSD 5465 Schedule 3,	As outlined in the initial notification, the TEOM recorded a 24 hour PM ₁₀ value of 57.82ug/m ³ against the 24 hour average criterion of 50ug/m ³ on 18 July 2018. Following a preliminary investigation of the exceedance, a follow-up phone call was made to

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
		Condition 11	<p>DPE in which LakeCoal advised that it was of the opinion that the exceedance was not a direct result of its mining activities and was more likely a result of a regional dust event which was occurring at the time, noting that on 18 July 2018, it had received automatic notifications from OEH (via oeh.airquality@environment.nsw.gov.au) that both the Central Coast and Lower Hunter Central Coast PM₁₀ levels exceeded national air quality standards (copies attached). Notwithstanding, it was agreed that LakeCoal would submit an incident report on the event.</p> <p>As outlined in SSD 5465, LakeCoal is required to ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause an exceedance of the criteria listed in Tables 3, 4 and 5 at any residence on privately-owned land. Table 4, "Short-term criterion for (PM₁₀) nominates a 24 hour PM₁₀ criterion of 50µg/m³ as:</p> <ul style="list-style-type: none"> • Applying to total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources); and • Excluding extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary. <p>Based on the results of the preliminary and subsequent investigations, LakeCoal remains of the opinion that the minor exceedance of the 24 hour PM₁₀ value of 57.82µg/m³ recorded on 18 July 2018 was not as a consequence of its activities and, in the absence of any other known local sources and the warnings received from OEH, was firmly of the opinion that the exclusion nominated in the footnote to Table 4 in SSD 5465 applies and consequently the exceedance did not represent a non - compliance with the consent.</p> <p>Accordingly LakeCoal did not intend to undertake any further actions as a result of the minor exceedance and would like to request the Secretary's agreement that it does not constitute a non - compliance for the purpose of SSD 5465 for its internal compliance records.</p>
4 December 2018	PM ₁₀ 24 Hour Average Exceedance (RTD 001)- Kingfisher Shores	SSD 5465 Schedule 3, Condition 11	<p>The TEOM recorded a 24 hour PM₁₀ value of 112.98 µg/m³ and 91.59 µg/m³ against the 24 hour average criterion of 50µg/m³ on the 22 and 23 November respectively.</p> <p>Following a preliminary investigation of the exceedance, a follow-up phone call was made to DPE in which LakeCoal advised that it was of the opinion that the exceedance was not a direct result of its mining activities and was more likely a result of a regional dust event which was occurring at the time, noting that on 22 and 23 November 2018, it had received automatic</p>

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
			<p>notifications from OEH (oeh.airquality@environment.nsw.gov.au) that both the Central Coast and Lower Hunter Central Coast PM₁₀ levels exceeded national air quality standards (copies attached). Notwithstanding, it was agreed that LakeCoal would submit an incident report on the event.</p> <p>As outlined in SSD 5465, LakeCoal is required to ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause an exceedance of the criteria listed in Tables 3, 4 and 5 at any residence on privately-owned land. Table 4, "Short-term criterion for (PM₁₀) nominates a 24 hour PM₁₀ criterion of 50µg/m³ as:</p> <ul style="list-style-type: none"> • Applying to total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources); and • Excluding extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary. <p>As previously advised, based on the results of the preliminary and subsequent investigations, LakeCoal was of the opinion that the exceedance of the 24 hour PM₁₀ value of 112.98µg/m³ and 91.59 µg/m³ recorded on the 22 and 23 November 2018 respectively was not as a consequence of its activities and, in the absence of any other known local sources and the warnings received from OEH, was of the opinion that the exclusion nominated in the footnote to Table 4 in SSD 5465 applies and consequently the exceedance does not represent a non-compliance with the consent.</p> <p>Accordingly LakeCoal did not intend to undertake any further actions as a result of the exceedance and requested the Secretary's agreement that it did not constitute a non - compliance for the purpose of SSD 5465 for its internal compliance records.</p>

5 Environmental Management – Specialist Assessments

5.1 Noise

The audit required the input of a noise specialist as per the request from DPE to CVC.

5.1.1 SLR Findings – Noise

The noise conditions associated with the CVC were assessed as part of the Independent Environmental Audit. Recommendations relating to noise conditions are outlined in **Section 6** of this document. The Independent Environmental Audit identified the following:

- Noise monitoring has been completed by independent noise consultants;
- The *Noise Management Plan* and all other management plans are out of date and not reflective of current operations;
- There were some noise exceedances during the Independent Environmental Audit period, with evidence provided of noise investigation;
- The CVC real - time noise monitoring was removed in January 2019. This should have been operational during the entire Independent Environmental Audit period; and
- There were few noise complaints associated with CVC operations.

5.1.2 Noise Recommendations

Recommendations relating to noise conditions are outlined in **Section 6** of this document and are repeated below:

- Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures;
- Ensure accurate/consistent monitoring results are presented in Annual Reviews;
- The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal;
- Update the Noise Management Plan; and
- There are also some recommendations relating to all management plans outlined in **Section 6**.

5.2 Subsidence

5.2.1 Mining Areas during Audit Period

Following discussions with Delta Coal the following mining areas were determined from the audit.

Table 7 Summary of Mining Areas and Extraction Plans

Year	Longwalls	Extraction Plan Reference
2016	MW10-11-12	MW 7-12 Extraction Plan
2017	MW12	MW 7-12 Extraction Plan
	MW5A	MW 7-12 Extraction Plan – MW5A Mod
	MW CVB1	MW CVB 1-3 Extraction Plan
2018	N1/S1	Miniwalls S1/N1
2019	N1/S1	Miniwalls S1/N1

5.2.2 Summary of Subsidence Performance

SLR and Ken Mills (Subsidence Specialist) from SCT have assessed the subsidence impacts relating to the CVC Mine. Details of subsidence performance is outlined in **Appendix E**. In summary:

- The site visit was successful and informative. It was difficult to gain access to much of the foreshore areas, but the site inspection provided context for the audit.
- The issues identified in the consent conditions and repeated in the Environmental Assessment, various Extraction Plans and Subsidence Management Plans (SMPs) as requiring management of potential subsidence impacts include:
 - Trinity Point Marina Development;
 - Benthic communities on the floor of Lake Macquarie;
 - Seagrass communities along the shore of Lake Macquarie;
 - A requirement for long-term stable, non-subsiding first workings below any features requiring negligible environmental consequences;
 - Second workings to be carried out in accordance with an approved Extraction Plans;
 - Other unspecified built features;
 - Other unspecified threatened species or endangered populations; and
 - Negligible additional risk to public safety.
- The Independent Environmental Audit review indicates that all the second workings undertaken during the review period were carried out under approved Extraction Plans. The review further indicates that the subsidence related components have been carried out in general accordance with the processes described in the Environmental Assessments and Extraction Plans

- The 2015 MOD2 subsidence assessment notes that the May 2015 bathymetric survey showed maximum subsidence of 570mm above Miniwalls 3-6. The MOD2 subsidence assessment updates the maximum subsidence predictions from 0.62m to 0.78m. The earlier 2013 predictions for Miniwalls 7-12 were 0.44m. These were updated to 0.72m. The associated assessments that rely on maximum predicated subsidence are considered in the MOD2 assessment.
- Miniwall 12 was completed early in 2017. The 2017 Annual Review reports maximum subsidence of 800-1100mm indicated by the bathymetric survey conducted in October 2017. The reference to subsidence exceeding predictions by approximately 430mm is not clear given that maximum subsidence of 1100mm exceeding predictions by 430mm would imply a prediction of 670mm. Nevertheless, maximum subsidence is significantly (250%) greater than the 440mm maximum subsidence predicted in the 2013 EA and 50% higher than the 720mm maximum subsidence predicted in the 2015 MOD2 assessment for the area above Miniwalls 7-12 (as per Figure 3a in DgS (2017)).
- There are several recommendations relating to monitoring, developing Extraction Plans and reporting within **Section 5.2.3**.

5.2.3 Subsidence Recommendations

Recommendations relating to subsidence are outlined within **Appendix E** Subsidence Review (SCT 2019) as well as some additional recommendations from the Lead Environmental Auditor. Recommendations regarding subsidence are outlined below:

Subsidence Predictions

- A more conservative approach to assessing future impacts from further mining is recommended to build confidence that the subsidence processes in play are understood and impacts that rely on the subsidence impacts can be suitably assessed prior to mining.

Subsidence Monitoring

- A significant upgrade of subsidence monitoring systems and reporting protocols at CVC is recommended.
- The use of three dimensional surveying with total station survey and high quality global positioning system (GPS) control is recommended. This technology is readily available and widely used for subsidence monitoring in NSW.
- For sensitive high value features such as the marina or similar features, real-time continuous GNSS monitoring is available at relatively low cost and can be used to provide high confidence subsidence monitoring in three dimensions.
- A thorough review of the survey data and monitoring approach for Line 23 along the northern lakeshore of CVC Bay is recommended.
- A review of benthic and seagrass community monitoring systems is recommended to confirm that the monitoring is capable of discriminating minor and negligible impacts as required by the development consent conditions.

Subsidence Reporting

- A separate subsidence impact assessment report should be prepared annually and appended to the Annual Review. Presentation of all future survey data in Annual Reviews would benefit from a thorough and comprehensive analysis of the subsidence monitoring being undertaken by an external consultant so that the data can be meaningfully interpreted and is comprehensible by anyone with an interest in the outcomes; and
- The report should assess performance against subsidence impact performance measures from the Development Consent as well as any other commitments, triggers and management measures from Extraction Plans. This report should assess how the Extraction Plans tracked against Trigger Action Response Plan (TARP's).

Biodiversity and Annual Reporting

- Include how the site is tracking against subsidence performance criteria (Schedule 4 Condition 4) in the Biodiversity Monitoring Reports, Annual Seagrass Monitoring Report and the Annual Review. This should include a table outlining if performance criteria have been met and where further information can be found.

Benthic Community Management Plan

- Develop a TARP when updating the Benthic Communities Management Plan. This should address the wording of Schedule 4 Condition 2 SSD 5465. A series of triggers should be developed based on quantitative data and this should be reported in the bi - annual monitoring reports and the Annual Review. An example of a trigger would be '% change in organisms between monitoring events'.
- Assess the triggers from the Extraction Plans eg. ANOVA/ANOSIM level is approaching 5% in the bi-annual monitoring reports.

6 Audit Findings – Summary of Non - compliances

Table 8 outlines the summary of non - compliances relating to the statutory conditions of CVC and the proposed recommendation.

Table 8 Summary of Non - compliances

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
SSD 5465 (as modified)				
Schedule 2 Condition 7	The Applicant shall ensure that no laden coal trucks are dispatched from the site to public roads outside of the hours of 5:30 am to 5:30 pm, Monday to Friday, and not at all on Saturdays, Sundays or public holidays	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	REC 1 <ul style="list-style-type: none"> Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.
Schedule 2 Condition 8	The Applicant shall not dispatch from the site more than: <ul style="list-style-type: none"> (a) 660,000 tonnes of product coal in any calendar year to Port Waratah Coal Services for export; (b) 180,000 tonnes of product coal in any calendar year to domestic customers other than Vales Point Power Station; (c) a total of 270 laden coal trucks per day by public roads; (d) a total of 32 laden coal trucks per hour; and (e) an average of 16 laden coal trucks per hour by public roads during peak hour periods, calculated monthly, until the intersection of M1 Motorway and Sparks Road Interchange (East Side - unsignalised with stop sign) is upgraded to a signalised intersection. 	Non-Compliant (Low Risk)	2018 Annual Review - 394,213 tonnes transported, but 0 t from public roads. 2017 Annual Review- 1,378,996 tonnes transported to power station. 254 tonnes on public roads. 2016 Annual Review - 1,175,523 tonnes to domestic market. 2,414 tonnes on public roads. a) Within this limit; b) Within this limit; c) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date; d) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date; e) Based on the Annual Review data this has been met.	As per REC 1 <ul style="list-style-type: none"> Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
			Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), WeatherTex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition.	
Schedule 2 Condition 10	The Applicant shall restrict the transport of coal by truck to the Vales Point Power Station between 10 pm and 5:30 am to: (a) 16 laden trucks per hour for the Spring and Autumn months; and (b) zero during Winter months.	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), WeatherTex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition.	As per REC 1 <ul style="list-style-type: none"> Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.
Schedule 2 Condition 11	Planning Agreement Within 12 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant shall enter into a planning agreement with the WSC in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the WSC for community enhancement purposes. The agreement must include provision for those matters set out in condition 12 below. If there is any dispute between the Applicant and WSC relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the Secretary for resolution.	Administrative Non - Compliance	<u>Administrative non - compliance</u> prior to this audit period. The VPA was not executed with the WSC within the required date - 23 December 2014. There were numerous attempts between 2013 to 2016 to execute this agreement (based on evidence from the prior audit). The VPA was executed on 1 September 2016. Evidence of payment in the 2016, 2017 and 2018 Annual Reviews. Evidence of receipts from 19 March 2018 and 23 March 2017. Historical <u>Admin - Non - Compliance</u> for not meeting 12 month date. No further action proposed	Nil Action
Schedule 2 Condition 18	The Applicant must regularly review the strategies, plans and programs required under this consent and ensure that these documents are updated to incorporate measures to improve the environmental performance of the development and reflect current best practice in the mining industry. To facilitate these updates, the Applicant may at any time submit revised strategies, plans or	Administrative Non - Compliance	The following Management Plans are applicable to CVC and outlined on the CVC website: Water Management Plan - July 2015; Air Quality Management Plan - July 2014; Noise Management Plan - March 2014:	REC 2 <ul style="list-style-type: none"> All management plans require updating due to the length of time since the previous reviews. All should in a Delta Coal template.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.</p> <p>With the agreement of the Secretary, the Applicant may prepare a revision or stage of any strategy, plan or program required under this consent without undertaking consultation with all parties nominated under the applicable condition in this consent.</p> <p>Notes:</p> <ul style="list-style-type: none"> • While any strategy, plan or program may be submitted on a staged basis, the Applicant must ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times. • If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program. 		<p>Heritage - June 2014; Biodiversity Management Plan - 16 March 2016; Seagrass Management Plan - April 2014; and Environmental Management System - 2012.</p> <p><u>Admin Non - Compliance</u>: This condition is non - compliant as plans have not been 'regularly' updated.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p>	<ul style="list-style-type: none"> • Ensure there is a cross referencing table covering this condition in management plans. • Additional detail including Trigger, Action, Response Tables (contingency plan) should be developed in the next round of management plan updates.
Schedule 3 Condition 1	<p>Monitoring of Coal Transport</p> <p>The Applicant shall:</p> <p>(a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and</p> <p>(b) make these records publicly available on its website at the end of each calendar quarter.</p>	Non – Compliant (Low Risk)	<p>a) Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided on the spreadsheet provided. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition.</p> <p>b) Evidence of publically available information regarding transport. However this information showed most quarters in 2016 and 2017. However no coal records on the website in 2018 or 2019. <u>Admin Non - Compliance</u>.</p>	<p>As per REC 1</p> <ul style="list-style-type: none"> • Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent. <p>REC 3</p> <ul style="list-style-type: none"> • Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Schedule 3 Condition 2	<p>Road Works</p> <p>The Applicant shall upgrade the Ruttleys Road and Construction Road intersection within 6 months of the date of this consent, unless the Secretary directs otherwise, by:</p> <p>(a) installing additional signage on and adjacent to Construction Road prior to the intersection;</p> <p>(b) repairing the surface of Construction Road as required and ensuring the edge seal of the left turn lane is of sufficient width to accommodate coal trucks;</p> <p>(c) installing or replacing “Stop” signs in accordance with Austroads guidelines;</p> <p>(d) repainting road line markings and raised pavements associated with this intersection; and</p> <p>(e) installing barriers to prevent trucks parking on the gravel area adjacent to the intersection and the electricity substation located in the vicinity of this intersection.</p> <p>The design and construction of these works must be undertaken in consultation with, and to the relevant satisfaction of, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.</p>	Administrative Non - Compliance	<p>'Based on site communications with Environment and Community Co-ordinator. No upgrades completed during this audit period. However there is a historical <u>Admin Non - Compliance</u> from the previous audit period, with these details noted by Hansen Bailey (2016).</p> <p>- WSC Civil Design Approval SCC11-2013 dated 1/04/14 and WSC invoice for construction assessment and certificate dated 17/07/13;</p> <p>- Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and</p> <p>- Email from LC to Delta Electricity dated 29/01/14 and response from Delta Electricity dated 11/02/14 confirming approval of the proposed works.</p> <p>No evidence that the required Ruttleys Road and Construction Road intersection upgrade was to the satisfaction of RMS and DPE.</p> <p>Construction works for the intersection upgrade were completed on 14/08/2014, which is outside of 6 months of the date of approval of SSD-5465 (i.e. 23/06/2014). Historical admin non - compliance with no further action.</p>	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Schedule 3 Condition 3	<p>Road Transport Protocol</p> <p>The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall:</p> <p>(a) be prepared in consultation with RMS, NCC, WSC, DRE and CCC and submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(b) describe the designated haulage routes to be used (as shown in Appendix 5); the maximum number of road movements proposed and the haulage hours permitted under this consent;</p> <p>(c) include a Traffic Management Plan, which includes:</p> <ul style="list-style-type: none"> procedures to ensure that drivers adhere to the designated haulage routes; measures to maximise the use of a low frequency (regular) trucking schedule rather than an intermittently-high frequency (campaign) trucking schedule, especially during the morning peak hour; contingency plans to apply when (for example) the designated haulage route is disrupted, including procedures for notifying relevant agencies and affected communities of the need to implement such contingency plans; procedures to ensure that all haulage vehicles associated with the development are clearly distinguishable as CVC Colliery coal haulage trucks; details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site; measures to ensure that the provisions of the Traffic Management Plan are implemented, eg driver training in the heavy vehicle driver's Code of Conduct and contractual agreements with heavy vehicle operators; and procedures for ensuring compliance with and enforcement of the heavy vehicle driver's Code of Conduct; <p>(d) include a Code of Conduct for heavy vehicle drivers that addresses:</p> <ul style="list-style-type: none"> travelling speeds; instructions to avoid grouping or convoying of trucks; instructions to drivers not to overtake each other on the haulage route, as far as practicable, and to maintain appropriate distances between vehicles; instruction to drivers to adhere to the designated haulage routes; instruction to drivers to be properly safety conscious and to strictly obey all traffic regulations; and appropriate penalties for infringements of the Code. <p>The Applicant shall implement the approved Road Transport Protocol</p>	Administrative Non - Compliance	<p>Evidence of Road Transport Protocol. Road Transport Protocol, which includes; MSP-D-14559 – Coal Haulage Traffic Management Plan and POL-D-14926 Coal Haulage Driver Code of Conduct.</p> <p>Coal Haulage Traffic Management System Plan on the CVC website is dated 18/03/14. This plan has not been updated since the previous audit.</p> <p>Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012.</p> <p><u>Preparation:</u></p> <p>a) Evidence of consultation from 2014;</p> <p>b) Section 8.3;</p> <p>c) Overall document. Covered in Section 8;</p> <p>d) Code of conduct discussed in Section 8.11. Not attached to the document.</p> <p><u>Implementation:</u></p> <p>Records and training.</p> <p>Section 12 of this plan states - "The Manager of Mining Engineering or his representative shall formerly review this document every three years". No evidence of any review in 2017, therefore <u>Admin Non - Compliant</u>.</p>	<p>REC 4</p> <ul style="list-style-type: none"> Ensure Coal Haulage Traffic Management Plan is reviewed as per the requirements of the consent and commitments in the management plan. Attach Driver Code of Conduct to the management plan.
			Page 33	SLR

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Schedule 3 Condition 4	<p>Independent Traffic Audit</p> <p>Prior to 31 March 2014, and every 12 months thereafter, unless the Secretary directs otherwise, the Applicant shall commission a suitably qualified person, whose appointment has been approved by the Secretary, to conduct an Independent Traffic Audit of the development. This audit must:</p> <p>(a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC and the CCC;</p> <p>(b) assess the impact of the development on the performance and safety of the road network, including a review of:</p> <ul style="list-style-type: none"> • haulage records; • accident records on the haulage route, infringements relating to the code of conduct and any incidents involving haulage vehicles; • community complaints register; and <p>(c) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts.</p>	Administrative Non - Compliance	<u>Admin Non - Compliance</u> : No evidence provided by site indicating Traffic Audits were completed annually.	<p>REC 5</p> <ul style="list-style-type: none"> • Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.
Schedule 3 Condition 5	<p>Within 1 month of receiving the audit report, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the report to the Secretary, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report.</p> <p>A summary of the audit report must be included in the Annual Review.</p>	Administrative Non - Compliance	<u>Admin Non - Compliance</u> : No evidence provided by site indicating Traffic Audits were completed annually.	<p>As per REC 5</p> <ul style="list-style-type: none"> • Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.
Schedule 3 Condition 6	<p>Alternative Coal Transport Options</p> <p>Prior to 31 December 2014, and every three years thereafter, the Applicant shall prepare and submit to the Secretary for approval, a study of the reasonable and feasible options to reduce or eliminate the use of public roads to transport coal from the development. The assessment must include:</p> <p>(a) an analysis of the capital, construction and operating costs of the alternative transport options; and</p> <p>(b) quantified social and environmental impacts associated with road</p>	Administrative Non - Compliance	Evidence provided of 2014 study with the letter dated 10 December 2014. The condition requires an audit every three years which would be in late 2017. No evidence of 2017 report provided to SLR, therefore <u>Admin Non - Compliance</u> .	<p>REC 6</p> <ul style="list-style-type: none"> • Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations																																													
	and rail transport.																																																
Schedule 3 Condition 7	<p>Noise Impact Assessment Criteria</p> <p>The Applicant shall ensure that the noise generated by the development at any residence on privately- owned land does not exceed the criteria for the location in Table 1 nearest to that residence.</p> <p><i>Table 1: Noise Criteria dB(A)</i></p> <table> <tr> <th>Location</th><th>Day LAeq(15 min)</th><th>Evening LAeq(15 min)</th><th>Night LAeq(15 min)</th><th>LA1(1 min)</th></tr> <tr> <td>R8</td><td>38</td><td>38</td><td>38</td><td>45</td></tr> <tr> <td>R11</td><td>49</td><td>49</td><td>49</td><td>54</td></tr> <tr> <td>R12</td><td>49</td><td>49</td><td>49</td><td>53</td></tr> <tr> <td>R13</td><td>43</td><td>43</td><td>43</td><td>49</td></tr> <tr> <td>R15</td><td>36</td><td>36</td><td>36</td><td>45</td></tr> <tr> <td>R19</td><td>37</td><td>37</td><td>37</td><td>45</td></tr> <tr> <td>R22</td><td>46</td><td>46</td><td>46</td><td>46</td></tr> <tr> <td>all other privately-owned land</td><td>35</td><td>35</td><td>35</td><td>45</td></tr> </table>	Location	Day LAeq(15 min)	Evening LAeq(15 min)	Night LAeq(15 min)	LA1(1 min)	R8	38	38	38	45	R11	49	49	49	54	R12	49	49	49	53	R13	43	43	43	49	R15	36	36	36	45	R19	37	37	37	45	R22	46	46	46	46	all other privately-owned land	35	35	35	45	Non – Compliant (Low Risk)	<p>- Exceedance of LA1(1minute) criteria of 6dB and 7dB at ATN4 and R13 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016.</p> <p>- 1dB exceedance of LAeq(15minute) criteria at ATN007 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded.</p> <p>- No exceedances recorded during 2018 period.</p> <p>- No exceedances recorded during the 2019 audit period (January - April 2019).</p>	<p>REC 7</p> <ul style="list-style-type: none"> Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures. Ensure accurate/consistent monitoring results are presented in Annual Reviews.
Location	Day LAeq(15 min)	Evening LAeq(15 min)	Night LAeq(15 min)	LA1(1 min)																																													
R8	38	38	38	45																																													
R11	49	49	49	54																																													
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R15	36	36	36	45																																													
R19	37	37	37	45																																													
R22	46	46	46	46																																													
all other privately-owned land	35	35	35	45																																													
Schedule 3 Condition 8	<p>Operating Conditions</p> <p>The Applicant shall:</p> <p>(a) implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;</p> <p>(b) regularly assess the noise monitoring and meteorological data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;</p> <p>(c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);</p> <p>(d) use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;</p> <p>(e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and</p> <p>(f) prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit; to</p>	Administrative Non - Compliance	<p>a) The 2016 Annual Review documented an investigation into repairs/maintenance of ventilation fan silencers. No further evidence during audit period. Therefore no continued implementation. <u>Admin Non - Compliance.</u></p> <p>b) Evidence of real time noise monitoring conducted throughout 2016, 2017 and 2018 where no triggers were reported. During audit site inspection the real-time noise monitor was not in operation and has been removed from site. The Environment and Community Co-ordinator stated the real - time noise monitoring was removed in January 2019. <u>Admin - Non Compliance</u> as the monitor should have been active the entire IEA period.</p> <p>c) No evidence of reduced operations during adverse meteorological conditions.</p> <p>d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period.</p> <p>e) Conducted as part of this Independent Audit. Note that no noise monitoring of site plant/equipment and operations was</p>	<p>REC 8</p> <ul style="list-style-type: none"> The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan. 																																													

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations															
	<p>the satisfaction of the Secretary.</p> <p><i>Table 2: Long-term Noise Goals dB(A)</i></p> <table><tr><th rowspan="2">Location</th><th>Day</th><th>Evening</th><th>Night</th></tr><tr><th>L_{Aeq}(15 min)</th><th>L_{Aeq}(15 min)</th><th>L_{Aeq}(15 min)</th></tr><tr><td>R11 – R13</td><td>41</td><td>41</td><td>41</td></tr><tr><td>R22</td><td>40</td><td>40</td><td>40</td></tr></table>	Location	Day	Evening	Night	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	R11 – R13	41	41	41	R22	40	40	40		<p>conducted as part of the audit.</p> <p>f) No evidence of action plan. <u>Admin Non - Compliance</u>.</p> <p>Exceedances of long term noise goals occurred during the monitoring period. However these are longterm noise goals, not criteria.</p>	
Location	Day		Evening	Night															
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)																
R11 – R13	41	41	41																
R22	40	40	40																
Schedule 3 Condition 9	<p>Noise Management Plan</p> <p>The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the EPA and submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary;</p> <p>(b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;</p> <p>(c) describe the proposed noise management system in detail including the mitigation measures that would be implemented to minimise noise during construction and operations, including on and off site road noise generated by vehicles associated with the development; and</p> <p>(d) include a monitoring program that:</p> <ul style="list-style-type: none">• uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent;• evaluates and reports on:• the effectiveness of the on-site noise management system; and• compliance against the noise operating conditions; and• defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non - Compliance	<p>Current plan dated 12 March 2014.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p><u>Preparation:</u></p> <p>a) Compliant. Evidence from 2014;</p> <p>b) Compliant - Section 4;</p> <p>c) Compliant - Section 4;</p> <p>d) Compliant - Section 5 and 6</p> <p><u>Implementation:</u></p> <p>No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance.</p> <p>No notification to residents following recorded exceedances in accordance with Section 6.2. <u>Admin Non - Compliance</u>.</p> <p>Real time noise monitor removed from site. <u>Admin Non - Compliance</u>.</p>	<p>Nil.</p> <p>Previous recommendations relate to updating all management plans.</p>															
Schedule 3	The Applicant shall ensure that all reasonable and feasible avoidance	Non –	2019 - no longterm data for annual averages.	REC 9															

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations																							
Condition 11	<p>and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedance of the criteria listed in Tables 3, 4 and 5 at any residence on privately-owned land.</p> <p><i>Table 3: Long-term criteria for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>^d Criterion</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>^a 90 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td><td>^a 30 µg/m³</td></tr></table> <p><i>Table 4: Short-term criterion for particulate matter</i></p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>^d Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>^a 50 µg/m³</td></tr></table> <p><i>Table 5: Long-term criteria for deposited dust</i></p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr><tr><td>^c Deposited dust</td><td>Annual</td><td>^b 2 g/m²/month</td><td>^a 4 g/m²/month</td></tr></table>	Pollutant	Averaging period	^d Criterion	Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³	Pollutant	Averaging period	^d Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month	Compliant (Low Risk)	<p>Annual Review 2018 - Depositional dust gauges were below criteria.</p> <p>Short term PM₁₀ non-compliances on 3 April 2018, 18 July 2018 and 4 December 2018. The 2018 annual average of 24hr PM₁₀ results was 16.1 µg/m³. Daily (24-hour) results ranged from a minimum of 6.13 µg/m³ to a maximum of 112.98 µg/m³ during 2018. There were some data capture issues in 2018 relating to the TEOM. These were not reported as non-compliances in Section 1 or 7 of the Annual Review. <u>Non-Compliance (Low Risk)</u> for exceeding criteria.</p> <p>Annual Review 2017 - Excluding DDG005, deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m²/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m²/month during the reporting period. Note, the depositional dust gauge exceedance was not recorded as an exceedance in Section 1 or 7 of the Annual Review. <u>Non-compliance</u> relating to exceedance of DDG5 and also not reporting in Section 1 or 7 of the Annual Review.</p> <p>The EPA long-term annual average criteria (30 µg/m³) for PM₁₀ was not exceeded during the 2017 period. Daily (24-hour) results ranged from a minimum of 5.39 µg/m³ to a maximum of 47.78 µg/m³ during 2017. The 2017 annual average of 24hr PM₁₀ results was 15.1 µg/m³. Within short term criteria. It was noted there was some data capture issues The 2017 Annual Review states that 'When comparing the 2017 annual results to the previous year, the data capture rate was slightly higher in 2017. This was primarily due to power outages associated with electrical storms in 2016 and a failed air conditioner during the 2016 reporting period'. Data capture issues were not reported as <u>non-compliances</u> in Section 1 or 7 of the Annual Review.</p> <p>Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual</p>	<ul style="list-style-type: none">Update the Air Quality Management Plan following this audit.Improve data capture for PM10. Review possibilities of backup power supply.Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.
Pollutant	Averaging period	^d Criterion																									
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³																									
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 30 µg/m ³																									
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Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level																								
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month																								

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
			<p>maximum level of 4 g/m²/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m²/month.</p> <p>Daily (24-hour) results ranged from a minimum of 2.1 µg/m³ to a maximum of 39.8 µg/m³ during 2016.</p> <p>For PM₁₀ data capture - When comparing the 2016 annual results to the previous year, the data capture rate was slightly lower in 2016. This was primarily due to power outages associated with electrical storms, a failed air conditioner unit in February 2016 and a pest infestation in the units electrical circuit. <u>Non - compliance</u> relating to data capture.</p> <p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust. It is highly likely that other sources contribute to dust levels.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. However there is often a delay in identifying short term criterion exceedances.</p>	
Schedule 3 Condition 12	<p>Operating Conditions</p> <p>The Applicant shall:</p> <p>(a) implement best practice air quality management at the site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the development;</p> <p>(b) implement best practice management to minimise the risk of spontaneous combustion and related emissions;</p> <p>(c) implement all reasonable and feasible measures to minimise the</p>	Administrative Non - Compliance	<p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA.</p>	<p>As per REC 9</p> <ul style="list-style-type: none"> Update the Air Quality Management Plan following this audit. Improve data capture for PM₁₀. Review possibilities of backup power supply. Ensure issues with data capture are

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>release of greenhouse gas emissions from the site;</p> <p>(d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent;</p> <p>(e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above);</p> <p>(f) regularly assess the air quality monitoring data, and modify operations on site to ensure compliance with the relevant conditions of this consent,</p> <p>to the satisfaction of the Secretary.</p>		<p>Sighted by the audit team.</p> <p>a) Evidence of dust monitoring and watercart use;</p> <p>b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion;</p> <p>c) Monitoring of fuel and energy usage;</p> <p>d) Air quality management system - for monitoring continues to be undertaken;</p> <p>e) Based on discussions with Environment and Community Co-ordinator water carts are used on exposed surfaces. Product is generally a wet product, therefore no water sprays required;</p> <p>f) The real time air quality monitor is not being used as a management tool. During the audit period there was no system to notify persons of when the TEOM identified short term impact assessment <u>non - compliances</u>. <u>Non - compliances</u> are only identified during the monthly download. <u>Admin non - compliance</u> relating to not determining TEOM exceedances as soon as they occur.</p>	<p>reported in Section 1 and 7 of the Annual Review.</p> <ul style="list-style-type: none"> Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.
Schedule 3 Condition 13	<p>Air Quality Management Plan</p> <p>The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the EPA, and submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;</p> <p>(c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site;</p> <p>(d) describe the proposed on-site air quality management system; and</p> <p>(e) include an air quality monitoring program that:</p> <ul style="list-style-type: none"> is capable of evaluating the operating conditions of this consent; evaluates and reports on: 	Administrative Non - Compliance	<p><u>Preparation:</u></p> <p>Evidence of Air Quality Management Plan dated 15 January 2016. The Air Quality Management Plan on the website 18 July 2014, with this approved on 24 July 2014. No evidence of approval provided by Delta Coal for 2016 Management Plan, therefore 2014 plan reviewed for adequacy.</p> <p>a) Section 1.4;</p> <p>b) Section 3;</p> <p>c) Section 4;</p> <p>d) and e) - Section 5</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p>	<p>As per REC 9</p> <ul style="list-style-type: none"> Update the Air Quality Management Plan following this audit. Improve data capture for PM₁₀. Review possibilities of backup power supply. Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review. Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> the effectiveness of the air quality management system; and compliance against the air quality operating conditions; defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>		<p><u>Implementation:</u></p> <p>Evidence of monitoring;</p> <p>Minimal issues observed with dust management; and</p> <p>The real time air quality monitor is not being used as a management tool.</p> <p>Section 5.3 of 2014 Air Quality Management Plan states: <i>Every 30 minutes the real time data from the monitor is sent via wireless (Next-G) connection to a web based data management system (Vista Data Vision) which is also used for the Company's real time noise monitoring system. A web based interface then allows the data to be viewed or downloaded, reports to be created and automated alarm generation when the predefined triggers are reached.</i></p> <p><u>Admin Non - Compliance</u> as no alarm was set up. The only way exceedances could be determine during the audit period was by manual download or viewing of results. This generally occurred every month.</p>	<p>particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>
Schedule 3 Condition 17	<p>Sewage Management</p> <p>The Applicant shall manage on-site sewage in accordance with NSW Environmental Guidelines: Use of Effluent by Irrigation (DEC 2004) and the National Guidelines for Sewerage Systems - Effluent Management (ANZECC 1997) or its latest version, to the satisfaction of EPA.</p>	Administrative Non - Compliance	<p>Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite.</p> <p>There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. <u>Admin Non - Compliant</u>. Evidence of testing of wastewater through lab results.</p>	<p>REC 10</p> <ul style="list-style-type: none"> Include additional detail in the Water Management Plan regarding sewage management. Include an update of sewage system during the audit period in the Annual Review. Ensure servicing is completed and records kept onsite.
Schedule 3 Condition 18	<p>Water Management Plan</p> <p>The Applicant shall prepare a Water Management Plan for the surface facilities sites to the satisfaction of the Secretary. This plan must be prepared in consultation with DPI Water and EPA, by suitably qualified</p>	Administrative Non - Compliance	<p>The current Water Management Plan is dated July 2015. This plan was approved by the DPE on 21 July 2015. This plan is out of date due to the age of the plan and also does not cover MOD 2. Evidence of letter to DPE from LakeCoal dated</p>	<p>REC 11</p> <ul style="list-style-type: none"> Update the water balance or justify why the current water balance is still

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>and experienced persons whose appointment has been endorsed by the Secretary, and submitted to the Secretary for approval within 6 months of the date of this consent. This plan must include:</p> <p>(a) a comprehensive water balance for the development that includes details of:</p> <ul style="list-style-type: none"> • sources and security of water supply; • water make in the underground workings; • water transfers from the underground operations to the surface; • water use; and • any water discharges; <p>(b) management plans for the surface facilities sites, that include:</p> <ul style="list-style-type: none"> • a detailed description of water management systems for each site, including: • clean water diversion systems; • erosion and sediment controls; and • any water storages; • measures to minimise potable water use and to reuse and recycle water; • measures to manage acid sulphate soils, if encountered; • activities that would involve ground disturbance at the site; and • monitoring and reporting procedures. <p>(c) a Surface Water Management Plan which:</p> <ul style="list-style-type: none"> • includes baseline data on surface water flows and quality of Swindles Creek; • details surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on surface water resources or surface water quality; • provides a program to monitor: • surface water discharges; • surface water flows and quality; and • channel stability; <p>(d) a Ground Water Monitoring Program which includes a program to:</p>		<p>28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>The Plan outlines several activities which are planned to be undertaken in 2015. Evidence of consultation in 2015 update with this outlined in Section 1.2.</p> <p><u>Preparation:</u></p> <p>a) Section 3 of the report. Most of the information of the Water Balance is from 2013 and should be reviewed;</p> <p>b) Section 4. Includes details of mitigation measures. Figure 4 is a detailed figure, but may require some updating based on minor changes at the pit top. Monitoring information outlined in Section 5;</p> <p>c) Covered in Section 4;</p> <p>d) Covered in Appendix B; and</p> <p>e) Covered in several sections.</p> <p><u>Implementation:</u></p> <ul style="list-style-type: none"> - The plan is a little out of date - from 2015, with some information dating back to 2013; - Evidence of surface water and groundwater monitoring in Annual Review; - Water management sighted in the field. Separation of water streams. Dams are stable; and - Some desilting of a drainage line is required. 	<p>applicable to the current operations.</p> <ul style="list-style-type: none"> • Ensure dams and drainage lines are free on silt. Establish a maintenance schedule.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> • monitor and report groundwater inflows to underground workings; • predict, manage and monitor impacts to nearby groundwater bores on privately-owned land that may be impacted by the development; and <p>(e) a detailed review of surface water management at the site, with particular reference to the water storages within the dirty water management system, to:</p> <ul style="list-style-type: none"> • determine whether the capacity, integrity, retention time and management of the dirty water storages (particularly the final Pollution Control Dam) are sufficient to ensure that water discharged from the site meets the EPL limits and surface water impact assessment criteria within the Surface Water Management Plan; and • propose any appropriate changes to the surface water management system. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Note: The Secretary may require the Applicant to implement upgrades and other changes identified under paragraph (e), in accordance with condition 4 of schedule 2.</p>			
Schedule Condition 20	<p>Biodiversity Management Plan</p> <p>The Applicant shall prepare a Biodiversity Management Plan for the surface facilities sites, for all areas that are not, or will not, be subject to condition 7 of schedule 4, to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared by a suitably qualified person approved by the Secretary; in consultation with OEH, and submitted to the Secretary within 6 months of the date of this consent;</p> <p>(b) establish baseline data for the existing habitat in the Biodiversity Enhancement Area and elsewhere on the site;</p> <p>(c) describe the short, medium, and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> • manage the impacts of clearing vegetation; 	Administrative Non - Compliance	<p>The Biodiversity Management Plan is dated 16 March 2016. This was approved by the DPE on 20 April 2016. Covers pit top and fan sites. Seagrass management covered under a separate plan. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p><u>Preparation:</u></p> <p>a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe;</p> <p>b) Baseline data in Section 3.2;</p> <p>c) Mostly covered in Section 4 and 5, but not split into short,</p>	<p>REC 12</p> <ul style="list-style-type: none"> • Include the biodiversity monitoring reports as appendices to the Annual Review. • The current monitoring is provided in a spreadsheet with an email summary. Prepare a small report outlining results, a comparison against trigger levels and potential reasons for changes. • Prepare a separate section with short, medium and longterm measures in the Biodiversity Management Plan.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> manage the remnant vegetation and habitat in the Biodiversity Enhancement Area and elsewhere on the site; and implement the Biodiversity Enhancement Strategy, including detailed performance and completion criteria; <p>(d) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;</p> <p>(e) identify the potential risks to the successful implementation of the Biodiversity Enhancement Strategy, and the contingency measures that would be implemented to mitigate these risks; and</p> <p>(f) include details of who would be responsible for monitoring, reviewing, and implementing the plan.</p> <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>		<p>medium and longterm measures;</p> <p>d) Section 11;</p> <p>e) See Table 11;</p> <p>f) Section 13.</p> <p><u>Implementation:</u></p> <p>Section 14 refers to the resubmission of this management plan within three months of submitting the Independent Environmental Audit. The previous audit is dated July 2016.</p> <p>Evidence of biodiversity monitoring reports.</p>	
Schedule 3 Condition 21	<p>Heritage Management Plan</p> <p>The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must:</p> <p>(a) be prepared in consultation with any relevant Aboriginal stakeholders;</p> <p>(b) be submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;</p> <p>(d) detail the responsibilities of all stakeholders; and</p> <p>(e) include programs/procedures and management measures for:</p> <ul style="list-style-type: none"> the ongoing monitoring of site 45-7-0189 at Summerland Point; managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols; ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage within the site; (including procedures for keeping records of this); 	Administrative Non - Compliance	<p><u>Preparation:</u></p> <p>Plan dated 23/6/2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>a) Section 4.4 and 4.5;</p> <p>b) Condition outside of audit period;</p> <p>c) Section 4;</p> <p>d) Section 11;</p> <p>e) In various sections.</p> <p><u>Implementation:</u></p> <p>Evidence of some monitoring of shell midden site #45-7-0189 in Annual Reviews. Monitoring every 2 years until Year 5 (Year 1, 3 and 5). 2017 was the fifth year, hence no further monitoring required.</p> <p>Section 12 of the Heritage Management Plan refers to the resubmission of this management plan within three months</p>	<p>REC 13</p> <ul style="list-style-type: none"> Update the Heritage Management Plan, including the removal of Site #45-7-0154.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> • appropriate identification, management, conservation and protection of both Aboriginal and non-Aboriginal heritage items identified on the site; and • ensuring relevant workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>		of submitting the Independent Environmental Audit. This was not completed.	
Schedule 3 Condition 22	<p>Visual Amenity and Lighting</p> <p>The Applicant shall:</p> <p>(a) minimise visual impacts, and particularly the off-site lighting impacts, of the Surface facilities sites;</p> <p>(b) take all reasonable and feasible measures to further mitigate off-site lighting impacts from the development; and</p> <p>(c) ensure that all external lighting associated on site complies with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting, to the satisfaction of the Secretary.</p>	Administrative Non - Compliance	<p>The most recent lighting audit for CVC is from 2013. Prepared by Wadco May 2013.</p> <p>a) and b) The pit top area and ventilation shaft site are not dominant features of the landscape the pit top area is somewhat overshadowed by the adjacent power station. The ventilation fans were designed to maintain a relatively low profile, below the surrounding vegetation to ensure amenity and lighting impacts were minimised. Some lights have been removed, including those at the stockpile. There were no complaints to visual or lighting during the audit period.</p> <p>c) Compliance with this requirement could not be determined due to the date of the previous Visual and Lighting audit. Therefore <u>Admin - Non - Compliance</u>.</p>	<p>REC 14</p> <ul style="list-style-type: none"> • Complete a visual and lighting assessment against the Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.
Schedule 3 Condition 27	<p>Rehabilitation</p> <p>The Applicant shall prepare a Rehabilitation Management Plan for the development, in consultation with OEH, DPI Water, WSC, LMCC, and the CCC, and to the satisfaction of the DRE. This plan must:</p> <p>(a) be submitted to the Secretary and the DRE for approval within 12 months of the date of approval of this development consent;</p> <p>(b) be prepared in accordance with any relevant DRE guideline and be consistent with the rehabilitation objectives in the EIS and in Table 7;</p> <p>(c) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 7;</p> <p>(d) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved;</p> <p>(e) provide for detailed mine closure planning, including measures to</p>	Administrative Non - Compliance	<p>Evidence of Rehabilitation Management Plan. Update dated 1 March 2019. This plan appears unapproved and no evidence of this plan being sent to the DPE. Current approved Rehabilitation Management Plan is from December 2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p><u>Preparation:</u></p> <p>a) Outside of audit period;</p> <p>b) Covers this requirement. Note, a separate MOP has also been prepared for the site;</p> <p>c) Section 8;</p>	<p>REC 15</p> <ul style="list-style-type: none"> • Ensure a copy of the approved Rehabilitation Management Plan is put on the website.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and (f) be integrated with the other management plans required under this consent.</p> <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Note: The Rehabilitation Management Plan should address all land impacted by the development whether prior to, or following, the date of this consent.</p>		<p>d) Generally covered in Section 7; e) Section 6; f)) Linked to MOP.</p> <p><u>Implementation:</u> There is no rehabilitation onsite. Minimal surface footprint. Extraction Plans cover subsidence management. The Rehabilitation Management Plan is not on the CVC website, which makes this <u>Admin Non - Compliant</u>.</p>	
Schedule 4 Condition 1	<p>Subsidence</p> <p>The Applicant shall ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within seagrass beds is limited to a maximum of 20 millimetres (mm). If at any stage predicted subsidence levels are exceeded within these areas, an ecological monitoring program shall be initiated to assess the impacts to ecological communities and threatened species and if appropriate, offsets are to be provided for any impacts detected.</p>	Administrative Non - Compliance	<p>This condition is outlined in the Annual Review (see Section 3.16.4 in 2018 Annual Review), however no update has been provided on whether the condition has been met. Based on this the auditor cannot determine compliance.</p>	<p>REC 16</p> <ul style="list-style-type: none"> See Section 5.2 of the Main Audit Report for Subsidence Recommendations.
Schedule 4 Condition 2	<p>Performance Measures – Natural Environment</p> <p>The Applicant shall ensure that the development does not cause any exceedance of the performance measures in Table 8 to the satisfaction of the Secretary.</p>	Administrative Non - Compliance	<p>The subsidence performance is outlined in the Annual Reviews. There is no specific table or section addressing if the site has met these performance measures.</p> <p>Reports from 2016 to 2018 titled Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW. These reports do not assess against these performance measures as the word 'negligible' is not in the report. There is no definition of negligible.</p> <p>Biodiversity Monitoring Reports do not cover these performance measures.</p> <p>Benthic monitoring reports do not specifically address these performance measures.</p> <p>Despite this there is no evidence that these performance measures have been exceeded, however the auditor is not able to determine compliance based on the information</p>	<p>REC 16</p> <ul style="list-style-type: none"> See Section 5.2 of the Main Audit Report for Subsidence Recommendations.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations																
	<table><tr><td colspan="2">Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features</td></tr><tr><td colspan="2">Biodiversity</td></tr><tr><td>Threatened species or endangered populations</td><td>Negligible environmental consequences</td></tr><tr><td>Seagrass beds</td><td>Negligible environmental consequences including:<ul style="list-style-type: none">• negligible change in the size and distribution of seagrass beds;• negligible change in the functioning of seagrass beds; and• negligible change to the composition or distribution of seagrass species within seagrass beds.</td></tr><tr><td>Benthic communities</td><td>Minor environmental consequences, including minor changes to species composition and/or distribution.</td></tr><tr><td colspan="2">Mine workings</td></tr><tr><td>First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences</td><td>To remain long-term stable and non-subsiding.</td></tr><tr><td>Second workings</td><td>To be carried out only in accordance with an approved Extraction Plan.</td></tr></table>	Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features		Biodiversity		Threatened species or endangered populations	Negligible environmental consequences	Seagrass beds	Negligible environmental consequences including: <ul style="list-style-type: none">• negligible change in the size and distribution of seagrass beds;• negligible change in the functioning of seagrass beds; and• negligible change to the composition or distribution of seagrass species within seagrass beds.	Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.	Mine workings		First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	To remain long-term stable and non-subsiding.	Second workings	To be carried out only in accordance with an approved Extraction Plan.		provided.	
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Schedule 4 Condition 3	<p>Offsets</p> <p>If the Applicant exceeds the performance measures in Table 8 and the Secretary determines that:</p> <p>(a) it is not reasonable or feasible to remediate the impact or environmental consequence; or</p> <p>(b) the remediation measures implemented by the Applicant have failed to satisfactorily remediate the impact or environmental consequence;</p> <p>then the Applicant shall provide a suitable offset to compensate for the impact or environmental consequence to the satisfaction of the Secretary.</p> <p>Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.</p>	Administrative Non - Compliance	<p>There is no specific assessment against subsidence criteria in the Annual Review, therefore we cannot determine compliance.</p> <p>The 2017 Annual Review stated there was an exceedance of predicted subsidence values over the MW7-12 mining area, but not an exceedance of the performance measures in this table.</p>	<p>REC 16</p> <ul style="list-style-type: none">See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																
Schedule 4 Condition 7	<p>Extraction Plan</p> <p>The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must:</p> <p>(h) include a Benthic Communities Management Plan, which has been prepared in consultation with OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or</p>	Administrative Non - Compliance	<p><u>Preparation:</u></p> <p>Evidence of Benthic Communities Management Plans in EP 1, 3 and 4. Overall Extraction Plan and management plans have been approved by the DPE. No Benthic Communities Management Plan for EP 2 (Modification to EP 1). Plan updated for each EP. The Plans cover the requirements of the</p>	<p>REC 16</p> <ul style="list-style-type: none">See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>environmental consequences of the proposed second workings on benthic communities, and which includes:</p> <ul style="list-style-type: none"> • surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured; • benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities; • a program of ongoing seasonal monitoring of benthic species in both control and impact sites; • development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the monitoring and survey data collected; and • updating the model every 2 years using the most recent monitoring and survey data; 		<p>sub conditions. Evidence of consultation included in management plans.</p> <p><u>Implementation:</u></p> <p>Evidence of bi-annual benthic communities monitoring during the Audit period. Reports are prepared every six months except no evidence of September 2018 report provided to SLR. Reports prepared by John and Emma Laxton. Results are also summarised in the Annual Review.</p> <p>There is no definition of what a 'minor' impact is in the Benthic Communities Management Plan or the bi-annual monitoring reports, with this being a subsidence performance criteria in Schedule 4 Condition 2.</p> <p>- Minor environmental consequences including minor changes to species composition of distribution.</p> <p>There is no definitive guide as to what constitutes reporting of an incident or non - compliance ie. 'What is greater than minor?' See Section 6 of May 2018 Benthic Communities Management Plan. As there is little interpretation of results against subsidence performance measures this is a <u>Admin Non - Compliance</u>.</p> <p>The Extraction Plan - EP3 (Appendix 1) outlines a Trigger Action Response Plan (TARP). It has triggers relating to statistical change in benthic communities. eg. Trigger Level 1 = ANOVA/ANOSIM level is approaching 5%. There is no discussion in the bi-annual reports about how the site is tracking against those triggers.</p>	
Schedule 5 Condition 1	<p>Notification of Landowners</p> <p>As soon as practicable after obtaining monitoring results showing:</p> <p>(a) an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until</p>	Administrative Non - Compliance	<p>a) 2018 - Short term PM₁₀ <u>non - compliances</u> on 3 April 2018, 18 July 2018 and 4 December 2018. For 2018 there was evidence provided to SLR through correspondence with EPA that these dust events were regional. There was however no evidence provided of contact with 'affected landowners'</p>	<p>REC 17</p> <ul style="list-style-type: none"> • Define who are potentially 'affected landowners' in the Air Quality Management Plan

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	the development is again complying with the relevant criteria; and (b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).		<p>(Admin Non - Compliance).</p> <p>2017 - Noise <u>non - compliance</u> in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. No evidence of notifying 'affected landowner/s'.</p> <p>2016 - Exceedance of daily discharge limit at LDP1 on January 2016 as a result of heavy rainfall (SLR believes no affected landowners, therefore no notification required).</p> <p>Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring.</p> <p>b) No evidence that the 'Mine Dust and You' fact sheet was provided for 2018 dust exceedances for 'affected landowners'. However as these events were proven to be regional, the auditors do not believe this is required for the 2018 exceedances.</p>	<ul style="list-style-type: none"> Affected landowners should be contacted when there is a <u>non - compliance</u> relating to dust or noise. This should be completed even if it is a regional dust event as Delta Coal are still recording it as a <u>non - compliance</u> in the Annual Review.
Schedule 6 Condition 1	<p>Environmental Management Strategy</p> <p>The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:</p> <p>(a) be submitted to the Secretary for approval within 7 months of the date of this consent;</p> <p>(b) provide the strategic framework for environmental management of the development;</p> <p>(c) identify the statutory approvals that apply to the development;</p> <p>(d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;</p> <p>(e) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> keep the local community and relevant agencies informed about the operation and environmental performance of the development; receive, handle, respond to, and record complaints; resolve any disputes that may arise during the course of the development; 	Administrative Non - Compliance	<p>EMS Document is dated 12 October 2012. The EMS was approved by DP&E with a letter dated 6/11/12. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p>No evidence that the EMS was updated following the last audit or other modifications.</p> <p><u>Preparation:</u></p> <p>a) - NA as outside audit period;</p> <p>b) Framework provided as part of document;</p> <p>c) Approvals are listed but are out of date;</p> <p>d) Section 9.5;</p> <p>e) Covered in Several Sections 8-11; and</p> <p>f) Plans listed in Section 9.</p>	<p>REC 18</p> <ul style="list-style-type: none"> Prepare a cross referencing table outlining where sub conditions have been covered. Ensure plans are reviewed as per Schedule 6 Condition 5. Include Schedule 5 Condition 2 requirement in the EMS to notify landowners of exceedances 'as soon as practical'. Define a time period for as soon as practical.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> • respond to any non - compliance; • respond to emergencies; and <p>(f) include:</p> <ul style="list-style-type: none"> • copies of any strategies, plans and programs approved under the conditions of this consent; and • a clear plan depicting all the monitoring required to be carried out under the conditions of this consent. <p>The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.</p>		<p><u>Implementation:</u></p> <p>There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (<u>Admin Non - Compliance</u>).</p> <p>The EMS is supposed to be reviewed every three years. Last review was 2012, therefore <u>Admin Non - Compliance</u>.</p>	
Schedule 6 Condition 2	<p>Adaptive Management</p> <p>The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p> <p>(c) implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary.</p>	Non-Compliant (Low Risk)	<p>There have been some exceedances of criteria during the audit period.</p> <p>a) Exceedances noted for air (regional dust), noise and a discharge volume issue during the audit period. Also <u>Non - Compliance</u> relating to subsidence which is outlined in the 2017 Annual Review. Evidence of exceedance/incident reports provided;</p> <p>b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred;</p> <p>c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance.</p> <p>Exceedances have generally been investigated with no further recommendations.</p>	Nil recommendation.
Schedule 6 Condition 4	<p>Annual Review</p> <p>By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was</p>	Administrative Non - Compliance	<p>The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA.</p> <p>a) Section 1 and 2;</p> <p>b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence;</p> <p>c) Section 7 - however this is different to the Annual Review</p>	<p>REC 19</p> <ul style="list-style-type: none"> • The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;</p> <p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the past calendar year, which includes a comparison of these results against the:</p> <ul style="list-style-type: none"> • relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • monitoring results of previous years; and • relevant predictions in the documents listed in condition 2 of Schedule 2; <p>(c) identify any non - compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the development;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.</p>		<p>guidelines;</p> <p>d) Trends covered for water management and air quality;</p> <p>e) Limited information on this condition in the Annual Reviews;</p> <p>f) Section 8;</p> <p>The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link:</p> <p>https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~media/3AA21D35168042FE813DD0FB92E00E58.ashx</p> <p>Therefore <u>Admin Non - Compliance</u>.</p>	<ul style="list-style-type: none"> • Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport. • Include the biodiversity monitoring reports as appendices to the Annual Review. • See Section 5.2 of the Main Audit Report for Subsidence Recommendations. • Include an update on Audit Action Plan.
Schedule 6 Condition 5	<p>Revision of Strategies, Plans and Programs</p> <p>Within 3 months of:</p> <p>(a) the submission of an annual review under Condition 4 above;</p> <p>(b) the submission of an incident report under Condition 7 below;</p> <p>(c) the submission of an audit report under Condition 9 below; or</p> <p>(d) any modification to the conditions of this consent, (unless the conditions require otherwise),</p> <p>the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.</p>	Administrative Non - compliance	<p>This timing has not been met. Several of the management plans were not updated since the previous audit.</p>	<p>REC 20</p> <ul style="list-style-type: none"> • Include statement in future Annual Reviews stating that Management Plans have been reviewed and state which management plans will or will not be updated within 3 months. • Develop and implement a plan to update CVC's Strategies, Plans and Programs.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.			
Schedule 6 Condition 7	The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Administrative Non - compliance	<p>Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews.</p> <p>No evidence of any incident causing material harm requiring immediate notification.</p> <p>Evidence of notification to Secretary and EPA for dust incidents in 2018. One incident occurred on 18 July 2018, with the site finding this non compliance on 1 August 2018. The exceedance was then reported on 10 August 2018 (greater than 7 days - <u>Admin Non - Compliance</u>). It appears that short term dust exceedances are only determined during the monthly data download, with reporting sometimes occurring two to three weeks after an incident occurs. The two other dust exceedances in 2018 appear to have been reported as per this condition.</p> <p>2017 - Noise non - compliance in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. Greater than 7 days - <u>Admin Non - Compliance</u>.</p> <p>There was a non - compliance relating to an exceedance of predicted subsidence. The non - compliance was determined based on bathymetric surveys (October 2017) but was not reported (as per Exceedance Report) until 13 December 2017.</p>	<p>As per REC 9</p> <ul style="list-style-type: none"> Update the Air Quality Management Plan following this audit. Improve data capture for PM₁₀. Review possibilities of backup power supply. Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review. Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE. <p>REC 21</p> <ul style="list-style-type: none"> Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).
Schedule 6 Condition 8	Regular Reporting The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Administrative Non - compliance	<p>Evidence of reporting on the Lake Coal and Delta Coal website.</p> <p>Note Schedule 3 Condition 1 outlines requirements to report transport.</p>	<p>REC 22</p> <ul style="list-style-type: none"> Ensure website reporting meets the conditions of the Development Consent.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
			<p>The Applicant shall:</p> <p>(a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and</p> <p>(b) make these records publicly available on its website at the end of each calendar quarter.</p> <p>Admin Non - Compliance: This has not been completed. No EIS's shown on the LakeCoal or Delta Coal website.</p> <p>Information now available on the Delta Coal website. However no management plans and EIS's are on the website. No Rehabilitation Management Plan was on the website. No noise monitoring reports on website.</p>	
Schedule 6 Condition 10	<p>Independent Environmental Audit</p> <p>Within 6 weeks of the completion of this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.</p>	Administrative Non - compliance	<p>No evidence has been provided of the submission of the previous audit report.</p> <p>The submission timing for this audit has been extended by the DPE until 25 June 2019.</p>	Nil recommendation
Schedule 6 Condition 11	<p>The Applicant shall:</p> <p>(a) make copies of the following publicly available on its website:</p> <ul style="list-style-type: none"> • the EIS; • all current statutory approvals for the development; • all approved strategies, plans and programs required under the conditions of this consent; • a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; • a complaints register (updated monthly); • minutes of CCC meetings; • the Annual Reviews of the development; 	Administrative Non - compliance	<p>a) and b) Copies of this information is still available on the Lakecoal website. With the exception of EIS's. Admin Non - Compliant.</p> <p>Information now available on the Delta Coal website. However no management plans and EIS's are on the website. No Rehabilitation Management Plan on the website. No noise monitoring reports on website.</p>	<p>REC 23</p> <ul style="list-style-type: none"> • Ensure all relevant information is brought across to the Delta Coal website.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<ul style="list-style-type: none"> any Independent Environmental Audit, and any other audit, and the Applicant's response to the recommendations in these audits; any other matter required by the Secretary; and (b) keep this information up-to-date, to the satisfaction of the Secretary.			
SSD 5465 Statement of Commitments				
Surface water SOC's	<ul style="list-style-type: none"> develop a program to monitor creek line channel stability and the health of riparian vegetation within Swindles Creek. Monitoring will be undertaken in accordance with Section 8.5.2 of the Surface Water Impact Assessment (EIS Appendix E) and incorporated into the Colliery's WMP or Biodiversity Management Plan; 	Administrative Non - compliance	<p>Evidence of the Water Management Plan.</p> <p>Evidence of surface water monitoring, including results in Annual Reviews.</p> <p>Admin Non - Compliant: Evidence of photos provided of channel stability monitoring of Swindles Creek, however it does not appear to have been completed in accordance with Section 5.4 of the Water Management Plan. No evidence of:</p> <ul style="list-style-type: none"> Documenting general observations of water quantity and quality; Documenting locations and dimensions of significant erosive or depositional features; Documenting evidence of erosion and exposed soils; Documenting general indicators of stream health, including abundance of flora and fauna; and Review and comparison of results to previous rounds of monitoring. <p>There is also no timing proposed for inspections in the Water Management Plan.</p>	<p>REC 24</p> <ul style="list-style-type: none"> A separate report should be completed for Stream Health Channel Flow and Riparian Vegetation Monitoring. This should compare results from previous inspections. Information to be included in the Annual Review.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Noise SOC's	<p>Management and monitoring of noise will continue to be undertaken in accordance with the Colliery's NMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • continue attended compliance monitoring on site which will be used to identify potential hot spots and primary noise sources; • continue real-time noise monitoring alerts to site personnel to enable implementation of any required rapid noise management initiatives; • manage potential non - compliance through a noise complaint handling and response system, including the identification of responsible sources to enable targeted remedial action; • assess if further noise mitigation options for the ventilation fans are reasonable and feasible following the receipt of attenuation proposals; and • discuss potential management measures or agreement options with the landowner at 275 Cams Boulevard, following receipt of proposals from acoustics specialists. <p>In addition to the above, LakeCoal is committed to the progressive implementation of feasible measures to target long term noise goals which are designed to reduce noise emissions from the Colliery. Long term options for investigation include:</p> <ul style="list-style-type: none"> • modification to belt/movement alarms; • investigation of surface conveyer and coal preparation equipment, to determine if noise reductions are possible; • identifying sound attenuation options for the surface bulldozer and front end loader; • strategic placement of acoustic barriers; • attenuation for the surface screener/shaker; • installation of quiet rollers for surface conveyor belts; • acoustic treatments around compressors; and • the use of a conveyor stacker for product coal stockpiling. 	Administrative Non - compliance	<p>No evidence of review or update of Noise Management Plan during audit period. Admin Non - Compliance.</p> <p>Real time noise monitoring system removed during the audit period and has not been replaced.</p> <p>No evidence of progressive noise mitigation implementation</p>	<p>As per REC 7</p> <ul style="list-style-type: none"> • Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures. • Ensure accurate/consistent monitoring results are presented in Annual Reviews. <p>As per REC 8</p> <ul style="list-style-type: none"> • The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.
Subsidence SOC's	Management and monitoring of subsidence will continue to be undertaken in accordance with the Colliery's SMP, which will be	Non-Compliant	Subsidence is managed under Extraction Plans, not SMP's. SMP's cover past mining areas.	As per REC 16

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • provide raw subsidence survey data to OEH within 7 days of completion; • undertake annual bathymetric surveys of the lake bed to determine actual subsidence and undertake a comparison with predicted levels. Should measured subsidence significantly exceed predicted levels, LakeCoal will review future panel designs to limit future impacts to acceptable levels; • install a new foreshore survey line above the first and second workings panels where the underground linkage passes beneath them and possibly extending from the foreshore to the point of connection with the MC workings; • inspect existing conditions in the Fassifern Seam and undertake geotechnical and geological mapping in the roadways proximate to the proposed linkage in both CVC and MC workings; • complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB. Development below the foreshore will be limited to two headings only until floor conditions can be confirmed; • develop infrastructure monitoring and management plans in consultation with infrastructure owners and other relevant stakeholders; • re-establish and re-survey Survey Line 24; • install a suitable survey line at the starting end above Great Northern Seam first workings to provide early warning monitoring data for the tension towers and switchyard structures; • monitor tension and suspension towers and switchyard conductor suspension frames directly above the panels, foreshore and adjacent inlet canal wall; • ensure that a monitoring and management plan for the MP01 sewer rising main is in place prior to commencement of mining that may impact Council's infrastructure; and • complete an annual subsidence report and make this report publicly 	(Low Risk)	<p>Separate Extraction Plan requirements including monitoring and reporting.</p> <p>Some of the aspects in this condition have not been triggered, however due to a lack of a defined subsidence report it has been difficult for SLR to determine which conditions are not triggered and which are relevant.</p> <p>Subsidence impacts are reported in the Annual Review, however it would be preferable if a standalone subsidence report was prepared. There is not a separate Annual Subsidence Report, therefore Admin Non - Compliant.</p> <p>No evidence of raw survey result being provided to OEH within 7 days of completion. Admin Non - Compliant.</p> <p>No evidence provided regarding - "complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB"</p>	<ul style="list-style-type: none"> • See Section 5.2 of the Main Audit Report for Subsidence Recommendations.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	available on the Colliery's website.			
Heritage SOC's	<p>Management and monitoring of heritage will continue to be undertaken in accordance with the Colliery's HMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • review and revise the HMP to remove site #45-7-0154 and incorporate any other changes as a result of the proposed modification; • update the HMP following approval of the Proposal to include the extended area to which it relates; • ensure that should unanticipated Aboriginal or historic heritage artefacts be found during dam embankment and diversion works, work will cease and the site assessed by an archaeologist; and • ensure that in the unlikely event that skeletal remains are found during dam embankment and diversion works, work will cease immediately in the area and the NSW Police Coroner called to determine if the material is of Aboriginal origin. OEH and relevant Aboriginal community stakeholders will be notified if the remains are positively identified as being of Aboriginal origin to determine their appropriate management prior to works recommencing. 	Administrative Non - compliance	<p>The most recent date of the Heritage Management Plan is 23 June 2014. The highlighted condition is from MOD 2 (December 2015). Site 45-7-0154 is still included the document.</p> <p>Other aspects of this statement of commitments have been met.</p>	<p>As per REC 13</p> <ul style="list-style-type: none"> • Update the Heritage Management Plan, including the removal of Site #45-7-0154.
EPL 1770				
L3.1	<p>Volume and Mass Limits</p> <p>For each discharge point or utilisation area specified below (by a point number), the volume/mass of:</p> <p>a) liquids discharged to water; or;</p> <p>b) solids or liquids applied to the area;</p> <p>must not exceed the volume/mass limit specified for that discharge point or area.</p>	Non – Compliant (Low Risk)	<p>Discharge volumes have been recorded at site.</p> <p>No exceedances in 2017 or 2018 Annual Reviews. Based on information provided by Environment and Community Co-ordinator no exceedances for 2019.</p> <p>Non-compliant: There were two exceedances of the daily volumetric limit (12,161 kL) during the 2016 which were related to significant rainfall events. These exceedances occurred on the:</p> <ol style="list-style-type: none"> 1. 6 January 2016 – A total of 14,152 kL was discharged 2. 5 June 2016 – A total of 16,391 kL was discharged. <p>No further recommendations.</p>	Nil recommendations.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
L3.2	The volumetric daily discharge limit for the premises is the combined discharge measured at EPA discharge points 1 and 27 and must not exceed 12161 kilolitres per day.	Non – Compliant (Low Risk)	There were two exceedances of the daily volumetric limit (12,161 kL) during 2016 which were related to significant rainfall events. These exceedances occurred on the: 1. 6 January 2016 – A total of 14,152 kL was discharged. 2. 5 June 2016 – A total of 16,391 kL was discharged. No further recommendations.	Nil recommendations.
L5.1	Noise Limits Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2. <u>See Appendix 2 for full list of criteria</u>	Non – Compliant (Low Risk)	- Exceedance of LA1(1minute) criteria of 7dB at Point 14 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016. - 1dB exceedance of LAeq(15minute) criteria at Point 23 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded. - No exceedances recorded during 2018 period. - No evidence obtained on performance during the 2019 audit period.	Nil recommendations.
L5.7	To determine compliance: 1. With the LAeq(15 min) noise limits in condition L5.1 and condition L5.2, the licensee must locate noise monitoring equipment; (a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises; (b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable, (c) within approximately 50 metres if the boundary of a national park	Administrative Non - compliance	It is noted that monitoring for LA1(1minute) noise levels is not completed at 1m from a façade - however such noise monitoring is generally not practical due to disturbance to residents during the sensitive night-time period.	Nil recommendations.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>or nature reserve.</p> <p>2. With the LA1(1 minute) noise limits in condition L5.1 and L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.</p> <p>3. With the noise limits in condition L5.1 and condition L5.2, the noise monitoring equipment must be located;</p> <p>(a) at the most affected point at a location where there is no dwelling at the location, or</p> <p>(b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).</p>			
O5.1	The licensee must maintain, and implement as necessary, a current emergency response plan for the premises. The licensee must keep the emergency response plan on the premises at all times. The emergency response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. If a current emergency response plan does not exist at the date on which this condition is attached to the licence, the licensee must develop an emergency response plan within three months of that date.	Administrative Non - compliance	<p>A PIRMP has been prepared for the site. Latest dated 21 September 2018.</p> <p>Evidence of testing PIRMP - including details of tests from 21 December 2018.</p> <p>Although there were some incidents, it does not appear any incident required the PIRMP to be enacted.</p> <p>* PIRMP is kept on-site.</p> <p>* Observation: The PIRMP is labelled LakeCoal, has persons listed in it who are no longer at site, does not have email details for government contacts, and figures do not clearly show the location of hazardous substances and where pollution response equipment is stored.</p>	<p>REC 25</p> <p>Update the PIRMP to include:</p> <ul style="list-style-type: none"> • Current site contacts; • Email details for government contacts; and • Figures that clearly show the location of hazardous substances and where pollution response equipment is stored.
O7.2	<p>Sewage Treatment</p> <p>The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.</p>	Administrative Non - compliance	<p>Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite.</p> <p>There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. Evidence of testing of wastewater through lab results</p>	<p>As per REC 10</p> <ul style="list-style-type: none"> • Include additional detail in the Water Management Plan regarding sewage management. • Include an update of sewage system during the audit period in the Annual Review. • Ensure servicing is completed and

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
				records kept onsite.
O7.3	Sewage Treatment Correct operation involves regular supervision and system maintenance. The licensee must be aware of the system requirements and must ensure that the necessary service contracts are in place.	Administrative Non - compliance	Same as L7.2	As per REC 10
O7.4	Sewage Treatment The sewage treatment system(s) must be serviced by a suitably qualified and experienced waste water technician at least once each quarterly period and a minimum of four times per year.	Administrative Non - compliance	Same as L7.2	As per REC 10
O7.5	Sewage Treatment The licensee must record each inspection and any actions required or recommended by the technician; including all results from tests performed on the sewage treatment system(s) by the technician as defined in Condition O7.4.	Administrative Non - compliance	Same as L7.2	As per REC 10
M2.1	Monitoring and Recording For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	Administrative Non - compliance	There has been data capture issues identified in Annual Reviews for PM ₁₀ . <u>Admin Non - Compliance.</u>	As per REC 9 <ul style="list-style-type: none"> Update the Air Quality Management Plan following this audit. Improve data capture for PM₁₀. Review possibilities of backup power supply. Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review. Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.
M2.2	Air Monitoring Requirements	Administrative	There were some issues with data capture with this outlined	As per REC 9

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations								
	<p>POINT 25</p> <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Particulate matter</td><td>micrograms per cubic metre</td><td>Continuous</td><td>AM-22</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Particulate matter	micrograms per cubic metre	Continuous	AM-22	Non - compliance	in Annual Reviews. See Schedule 3 Condition 11 of the Development Consent.	
Pollutant	Units of measure	Frequency	Sampling Method									
Particulate matter	micrograms per cubic metre	Continuous	AM-22									
M4.1	<p>To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.7 and L5.8, and</p> <p>(a) at each one of the locations listed in condition L5.1;</p> <p>(b) occur quarterly within the reporting period of the Environment Protection Licence with at least 2 months between monitoring periods;</p> <p>(c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters;</p> <p>(d) the night time 15 minute attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;</p> <p>(e) the night time LA1 (1 min) attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;</p> <p>(f) one quarterly monitoring must occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night, and</p> <p>(g) each quarterly monitoring must be undertaken on a different day(s) of the week not including Saturdays, Sundays and public holidays; and</p> <p>(h) these monitoring conditions take effect in the 2015 Reporting period.</p> <p>Note: The intention of this condition is that quarterly monitoring be undertaken at each sensitive receiver. That at each sensitive receiver monitoring is undertaken over a range of different days excluding weekends and public holidays during the reporting period so as to be representative of operating hours. That night time 15 minute attended monitoring and the LA1 (1min) monitoring for three of the quarters be undertaken at worst case being the most stable atmospheric</p>	Administrative Non - compliance		<p>As per REC 7</p> <ul style="list-style-type: none">Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures.Ensure accurate/consistent monitoring results are presented in Annual Reviews. <p>As per REC 8</p> <ul style="list-style-type: none">The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.								

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	conditions and when noise would be most intrusive to sleep. All of the sensitive receivers do not have to be monitored on the same day, evening and night for sub condition f.			
M4.2	For the Annual Reporting Period ending March 2015 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this licence, as a single report attached to the Annual Return for the premises.	Administrative Non - compliance	No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	<p>REC 26</p> <ul style="list-style-type: none"> For future Annual Returns a single noise monitoring report should be prepared and attached to the Annual Return.
M6.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Administrative Non - compliance	<p>*<u>Admin Non-compliant</u>: The Complaints Register does not include the personal details of the complainant.</p> <p>* Not all complaints registered in the register included the method by which the complaint was made.</p> <p>* There are additional complaints outlined in the Annual Review compared to the Complaints Registers provided to the auditor.</p>	<p>REC 27</p> <ul style="list-style-type: none"> Ensure all complaints are recorded in the internal database on site and the relevant details required under this condition are outlined in the Annual Review.
M7.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Administrative Non - compliance	<p>*Telephone line for complaints advertised on the LakeCoal and Delta Coal websites.</p> <p>* However no evidence of notifying to the community that the complaints line exists.</p>	<p>REC 28</p> <ul style="list-style-type: none"> With the new ownership an advertisement should be placed in the paper/newsletter providing a link to the Delta Coal website and outlining the complaint management details.
M7.4	The licensee must notify the EPA with contact details of personnel capable of a timely response to emergencies or any other exigent circumstances. (a) the nominated contact must be available at all times. (b) contact details must include a telephone number and must be current. (c) such notification must be made within 14 days of receiving this	Administrative Non - compliance	<p>* Designated representatives of the company included in the Pollution Incident Response Plan (PIRMP), dated September 2018.</p> <p>* Admin Non-compliant: The designated representatives of the company, included in the PIRMP, are not current.</p>	<p>REC 29</p> <ul style="list-style-type: none"> Update the details of designated representatives of the company in the PIRMP.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	licence.			
R1.5	The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Administrative Non - compliance	The 2017-18 Annual Return is dated 4 June 2018 and was supposed to be submitted to the EPA by 30 May 2018. From the date of the Annual Return it appears it wasn't submitted to the EPA time The 2016-17 Annual Return was dated within the 60 days.	REC 30 <ul style="list-style-type: none"> Ensure Annual Returns are completed as per the EPA requirements and submitted within the due date.
R4.1	The licensee must submit to the EPA a noise compliance assessment report at the end of each reporting period. The report must be submitted with the Environment Protection Licence Annual Return. The report must be prepared by a suitably qualified and experienced acoustical consultant which: (a) details the noise monitoring undertaken in accordance with condition M4; (b) assesses compliance with noise limits presented in condition L5.1 and condition 5.2; and (c) outlines any management actions taken within the monitoring period to address any exceedances of limits contained in condition L5.1 and condition L5.2. Note: The licensee must provide the EPA with one report, but this report may be a combination of the monitoring undertaken by the licensee as part of their quarterly monitoring program as required by the Project Approval SSD-5456 and must include LA1(1min).		No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	REC 31 <ul style="list-style-type: none"> Send a combined noise report for the Annual Return period to the EPA.
U1.1	By 07 July 2017 the licensee must construct a pump station, rising main and other infrastructure in order to connect the sewage from Chain Valley Colliery to Wyong Shire Council's sewerage system. The construction must be undertaken by an appropriately qualified an experienced person. The Licensee must: a) obtain the appropriate approvals and permits required for the development; b) construct option A or option B in accordance with the document	Administrative Non - compliance	The upgrade has been designed but not yet constructed. This was supposed to be completed by 7 July 2017.	REC 32 <ul style="list-style-type: none"> Liaise with the EPA regarding the current status of the Sewage System Project. Implement any agreed actions in terms of timing.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>titled "Concept Design Report for Sewage Treatment System Upgrade Chain Valley Colliery" dated 1 February 2016 and prepared by RGH Consulting Group;</p> <p>c) include connection of sewage from the administration building to the rising main;</p> <p>c) notify the EPA in writing at hunter.region@epa.nsw.gov.au within 2 weeks of the pump station and rising main being commissioned; and</p> <p>d) provide the EPA with a report on commissioning of the pump station and rising main which details the final option constructed within 2 weeks of the pump station and rising main being commissioned.</p>			
CCL 721				
Condition 3.	<p>Mining Operations Plan</p> <p>(a) Mining operations must not be carried out otherwise than in accordance with:</p> <p>a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries.</p> <p>(b) The MOP must:</p> <p>i) identify areas that will be disturbed by mining operations;</p> <p>ii) detail the staging of specific mining operations;</p> <p>iii) identify how the mine will be managed to allow mine closure;</p> <p>iv) identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;</p> <p>v) reflect the conditions of approval under:</p> <p>the Environmental Planning and Assessment Act 1979</p> <p>the Protection of the Environment Operations Act 1997</p> <p>and any other approvals relevant to the development including the conditions of this lease; and</p> <p>vi) have regard to any relevant guidelines adopted by the Director-General.</p> <p>(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.</p> <p>(d) It is not a breach of this condition if:</p>	Non-Compliant (Low Risk)	<p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is non - compliant. <u>There is now an approved MOP therefore there is no further recommendation relating to this period of time.</u></p> <p>Both MOPs cover the required aspects of this condition.</p> <p><u>Implementation:</u></p> <p>No areas available for rehabilitation at site.</p>	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the Mining Act 1992, the Environmental Planning and Assessment Act 1979, Protection of the Environment Operations Act 1997 or the Occupational Health and Safety Act 2000; and</p> <p>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.</p> <p>{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.</p>			
Condition 5	<p>The EMR must:</p> <p>a) report against compliance with the MOP;</p> <p>b) report on progress in respect of rehabilitation completion criteria;</p> <p>c) report on the extent of compliance with regulatory requirements; and</p> <p>d) have regard to any relevant guidelines adopted by the Director-General.</p>	Administrative Non - compliance	<p>a) Admin Non-compliant: The 2016, 2017 & 2018 Annual Reviews do not report against compliance with the MOP.</p> <p>b) N/A - Rehabilitation has not commenced at the site;</p> <p>c) 2016, 2017 & 2018 Annual Reviews - Executive Summary & Section 3; and</p> <p>d) Admin Non-compliant: 2016, 2017 and 2018 Annual Reviews not prepared in accordance with the DPE Annual Review guidelines.</p>	<p>As per REC 19</p> <ul style="list-style-type: none"> The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines. Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport. Include the biodiversity monitoring reports as appendices to the Annual Review. See Section 5.2 of the Main Audit Report for Subsidence Recommendations. Include an update on Audit Action Plan.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
				<p>REC 33</p> <ul style="list-style-type: none"> Report against compliance with the MOP in future Annual Reviews
Condition 11	<p>Reports</p> <p>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:</p> <p>(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;</p> <p>(b) Details of expenditure incurred in conducting that exploration;</p> <p>(c) A summary of all geological findings acquired through mining or development evaluation activities;</p> <p>(d) Particulars of exploration proposed to be conducted in the next twelve months period;</p> <p>(e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.</p>	Administrative Non - compliance	<p>Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports.</p> <p>LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement.</p> <p>In the version supplied to SLR there are no figures.</p>	<p>REC 34</p> <ul style="list-style-type: none"> Ensure Group Exploration Reports meet the required timeframe. Ensure figures are included in the reports.
CCL 707				
Condition 2 1-4	<p><u>Sub Condition 1</u></p> <p>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 with environmental conditions of development consent and other approvals will form the basis for:-</p> <p>(a) ongoing mining operations and environmental management; and</p> <p>(b) ongoing monitoring of the project.</p> <p><u>Sub Condition 2</u></p> <p>The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.</p>	Non-Compliant (Low Risk)	<p>All sub conditions are <u>non - compliant</u>.</p> <p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is <u>non - compliant</u>. There is now an approved MOP therefore there is no further recommendation relating to this period of time.</p>	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	<p>A Plan must be lodged with the Director-General:-</p> <ul style="list-style-type: none"> (a) prior to the commencement of mining operations (including mining purposes); (b) subsequently as appropriate prior to the expiry of any current Plan; and (c) in accordance with any direction issued by the Director-General. <p><u>Sub Condition 3</u></p> <p>A Plan must be lodged with the Director-General:-</p> <ul style="list-style-type: none"> (a) prior to the commencement of mining operations (including mining purposes); (b) subsequently as appropriate prior to the expiry of any current Plan; and (c) in accordance with any direction issued by the Director-General. <p>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:-</p> <p><u>Sub Condition 4</u></p> <ul style="list-style-type: none"> (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) existing flora and fauna on the site; (f) progressive rehabilitation schedules; (g) areas of particular environmental, ecological and cultural sensitivity and measures to protect these areas; (h) water management systems (including erosion and sediment controls); (i) proposed resource recovery; and 			

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	(j) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation.			
Condition 3-2	<p>AEMR</p> <p>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:</p> <p>(a) the accepted Mining Operations Plan;</p> <p>(b) development consent requirements and conditions;</p> <p>(c) Department of Environment and Conservation and Department of Planning licences and approvals;</p> <p>(d) any other statutory environmental requirements;</p> <p>(e) details of any variations to environmental approvals applicable to the lease area; and</p> <p>(f) where relevant, progress towards final rehabilitation objectives.</p>	Administrative Non - compliance	Annual Review covers conditions b-f. However there is minimal information regarding a review and forecast against the MOP.	<p>As per REC 19</p> <ul style="list-style-type: none"> The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines. Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport. Include the biodiversity monitoring reports as appendices to the Annual Review. See Section 5.2 of the Main Audit Report for Subsidence Recommendations. Include an update on Audit Action Plan. <p>As per REC 33</p> <ul style="list-style-type: none"> Report against compliance with the MOP in future Annual Reviews.
Condition 7	<p>Reports</p> <p>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:</p>	Administrative Non - compliance	<p>Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports.</p> <p>LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement.</p> <p>In the version supplied to SLR there are no figures.</p>	<p>As per REC 34</p> <ul style="list-style-type: none"> Ensure Group Exploration Reports meet the required timeframe. Ensure figures are included in the reports.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	(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.			

7 Additional Recommended Actions

Additional recommendations relating to compliant conditions are outlined within **Table 9**.

Table 9 Additional Recommendations

Aspect	Recommendation
Management Systems	It provided difficult for Delta Coal to provide requested information in a timely manner. SLR recommends a review of the management system to ensure information is correctly filed and readily available.
Audit Preparations	Little information was provided to SLR prior to the audit which resulted in numerous additional information requests. Additional time is required by Delta Coal to prepare for the next Independent Environmental Audit. An internal audit is recommended prior to the next Independent Environmental Audit to ensure information and evidence is available to the Independent Environmental Auditor.
Waste Management	Ensure the minor waste management issues identified during the audit are rectified, including: <ul style="list-style-type: none"> • Improve bin labelling; • Ensure all hydrocarbon containers (empty or full) are stored within bunds.
Groundwater	Attempt to contact property owners and ask for permission to monitor the private groundwater bores. Some additional consultation with Council may be required.
Surface Water Discharges	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.
Future Annual Returns	LakeCoal and Delta Coal to prepare Annual Returns based on the period of the Annual Return and dates of the sale of CVC.

8 Conclusion

Conditions were assessed across the SSD 5465, SSD 5465 Statement of Commitments), EPL 1770, CCL 707 and CCL 721. In summary:

- There were 29 Administrative Non – Compliances and 7 Low Risk Non – Compliances in SSD 5465;
- There were 3 Administrative Non – Compliances and 1 Low Risk Non Compliance in the Statement of Commitments;
- There were 16 Administrative Non – Compliances and 3 Low Risk Non – Compliances in the EPL;
- There were 2 Administrative Non – Compliances and 1 Low Risk Non – Compliance in CCL 707; and
- There were 2 Administrative Non – Compliances and 1 Low Risk Non – Compliance in CCL 721.

There are a series of grouped recommendations across **Section 6** and **7**.

The majority of non - compliances and recommendations related to administrative issues, including not fully implementing the Project Approval and management plans. The field inspection did not identify any major issues that required immediate attention. The situation at the time of Independent Environmental Audit made the task of auditing more difficult than expected for SLR. This included the change in management from LakeCoal to Delta Coal and the previous Environment and Community Co-ordinator leaving LakeCoal prior to the commencement of the audit. Little information was provided to SLR prior to the Independent Environmental Audit which resulted in numerous additional information requests following the site component. Additional time is required by Delta Coal to prepare for the next Independent Environmental Audit.

APPENDIX A

Photographs



Photo 1 Previous Underground Mining Area – Lake Macquarie Shoreline



Photo 2 Cardboard included in general waste bin. Improvement Required.



Photo 3 Hydraulic oil container stored on the side within bunded area. Improvement Required.



Photo 4 Hydraulic oil container should not be stored in general waste



Photo 5 Diesel Tank stored within Bund



Photo 6 Coal Material in drain should be removed



Photo 7 The Oily water separator worked effectively during the audit period



Photo 8 Licenced discharge point in operation

APPENDIX B

Compliance Spreadsheet

Development Consent SSD - 5465

Audit Period = 1 January 2016 – 5 April 2019

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
SCHEDULE 2 - ADMINISTRATIVE CONDITIONS				
OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT				
1	In addition to meeting the specific performance criteria established under this consent, the Applicant shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.	Compliant	There have been no major incidents where there has been material harm.	
Terms of Consent				
2	2. The Applicant shall carry out the development generally in accordance with the: (a) EIS; (b) SEE Mod 1; (c) SEE Mod 2; and (d) Project Layout Plans. Note: The Project Layout Plans of the development are shown in Appendices 2 to 4 and Appendix 7A	Compliant	Based on a review of the information provided activities have generally been carried out in accordance with approvals. Although some non-compliances have been noted.	
2A	The Applicant shall carry out the development in accordance with the: (a) Statement of Commitments; and (b) conditions of this consent.	Compliant	Based on a review of the information provided activities have generally been carried out in accordance with approvals. Although some non-compliances have been noted.	
3	If there is any inconsistency between the documents in condition 2, the more recent document shall prevail to the extent of the inconsistency. The conditions of this consent shall prevail over the documents in conditions 2 and 2A(a) to the extent of any inconsistency.	Note	No inconsistency found during the audit.	
4	The Applicant shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of: (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted by the Applicant in accordance with this consent; and (b) the implementation of any actions or measures contained in these documents.	Compliant	Evidence of consultation with the DPE and other agencies. Consultation in the Annual Review. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in 2016. Evidence of consultation with the DPE regarding incident management.	
Limits of Consent				
Mining Operations				
5	The Applicant may carry out mining operations on the site until 31 December 2027. Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of either the Secretary or the DRE. Consequently this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.	Compliant	Mining operations undertaken during the audit period	
Coal Extraction				
6	The Applicant shall not extract more than 2.1 million tonnes of ROM coal from the site in any calendar year.	Compliant	Within limits based on Annual Reviews. Annual Review 2018 -398,336 tonnes Annual Review 2017 - 1,361,205 tonnes Annual Review 2016 - 1,238,214 tonnes	
Coal Transport - Public Roads				
7	The Applicant shall ensure that no laden coal trucks are dispatched from the site to public roads outside of the hours of 5:30 am to 5:30 pm, Monday to Friday, and not at all on Saturdays, Sundays or public holidays	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.
8	The Applicant shall not dispatch from the site more than: (a) 660,000 tonnes of product coal in any calendar year to Port Waratah Coal Services for export; (b) 180,000 tonnes of product coal in any calendar year to domestic customers other than Vales Point Power Station; (c) a total of 270 laden coal trucks per day by public roads; (d) a total of 32 laden coal trucks per hour; and (e) an average of 16 laden coal trucks per hour by public roads during peak hour periods, calculated monthly, until the intersection of M1 Motorway and Sparks Road Interchange (East Side - unsignalised with stop sign) is upgraded to a signalised intersection.	Non-Compliant (Low Risk)	2018 Annual Review - 394,213 tonnes transported, but 0 t from public roads. 2017 Annual Review- 1,378,996 tonnes transported to power station. 254 tonnes on public roads. 2016 Annual Review - 1,175,523 tonnes to domestic market. 2,414 tonnes on public roads. a) Within this limit; b) Within this limit; c) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date; d) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date; e) Based on the Annual Review data this has been met. Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.
Coal Transport - Vales Point Power Station				
9	The Applicant shall ensure that only private roads are used for the transport of coal by truck to Vales Point Power Station, except in an emergency. In an emergency, product coal may be transported by public roads, with the prior written approval of the Secretary, and subject to any restrictions that the Secretary may impose.	Compliant	Annual Review provides total tonnages. Evidence of signage. Evidence of Transport Management Plan. No reason to determine non-compliance.	
10	The Applicant shall restrict the transport of coal by truck to the Vales Point Power Station between 10 pm and 5:30 am to: (a) 16 laden trucks per hour for the Spring and Autumn months; and (b) zero during Winter months.	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.
Planning Agreement				
11	Within 12 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant shall enter into a planning agreement with the WSC in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the WSC for community enhancement purposes. The agreement must include provision for those matters set out in condition 12 below. If there is any dispute between the Applicant and WSC relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the Secretary for resolution.	Administrative Non-Compliance	Discharge locations sighted in the field inspection. Records of discharge volume and water quality outlined in Annual Reviews.	
Community Enhancement				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
12	<p>The Applicant shall pay WSC \$0.035 for each tonne of product coal produced by the development for the purposes of improving public infrastructure and providing community projects for the communities of Summerland Point, Gwandalan, Chain Valley Bay and Mannering Park. Payments from the approval date of project approval 10_0161 must be:</p> <p>(a) made by the end of March, for coal produced in the previous calendar year;</p> <p>(b) made for each year that coal is produced by the colliery; and</p> <p>(c) subject to indexation in accordance with the Australian Bureau of Statistics Consumer Price Index.</p>	Compliant	<p>Updates on VPA's provide in Annual Reviews. 2019 is not included yet as not due for payment.</p> <p>2016: As at the end of the reporting period \$212,477 had been accrued by LakeCoal. All funding associated with the VPA was transferred into a designated VPA holding account administered by the Council during the reporting period.</p> <p>2017: A further \$52,206 was accrued by LakeCoal during the reporting period in accordance with the VPA agreement.</p> <p>2018: A total value of \$398,336 was accrued and paid to Central Coast Council by LakeCoal during the reporting period. A further \$15,549.90 was accrued during the reporting period, which was the total indexed contribution (31/12/18). The total Voluntary Planning Agreement (VPA) required January to September (Pre Appointment) 2018 was \$11,117.70. The total VPA required from October to December (Receivership Period) 2018 was \$4,432.20.</p> <p>Evidence of receipts provided to audit team.</p>	
Surrender of Existing Project Approval				
15	<p>The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structure, that are part of the development are constructed in accordance with:</p> <p>(a) the relevant requirements of the BCA; and</p> <p>(b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.</p> <p>Notes:</p> <ul style="list-style-type: none">• Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works;• Part 8 of the EP&A Regulation sets out the requirements for the certification of the development; and• Under Section 15 of the Mine Subsidence Compensation Act 1961, the Applicant is required to obtain the MSB's approval before constructing any improvements in a Mine Subsidence District.	Compliant	<p>Based on site communication with Environment and Community Co-ordinator. Construction of the control room undertaken in audit period. Based on site communication there was no further construction.</p> <p>A) Evidence of occupation certificate dated 15 August 2018.</p> <p>B) is not applicable.</p>	
Demolition				
16	<p>The Applicant shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.</p>	Not Triggered	<p>Based on site communication Environment and Community Co-ordinator there was no demolition.</p> <p>None outlined in Annual Reviews.</p>	
Operation of Plant and Equipment				
17	<p>The Applicant shall ensure that all plant and equipment used at the site is:</p> <p>(a) maintained in a proper and efficient condition; and</p> <p>(b) operated in a proper and efficient manner.</p>	Compliant	<p>Evidence of maintenance records for trucks and dozers. Spreadsheet records date back to 2010.</p>	
UPDATING AND STAGING STRATEGIES, PLANS OR PROGRAMS				
18	<p>The Applicant must regularly review the strategies, plans and programs required under this consent and ensure that these documents are updated to incorporate measures to improve the environmental performance of the development and reflect current best practice in the mining industry. To facilitate these updates, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.</p> <p>With the agreement of the Secretary, the Applicant may prepare a revision or stage of any strategy, plan or program required under this consent without undertaking consultation with all parties nominated under the applicable condition in this consent.</p> <p>Notes:</p> <ul style="list-style-type: none">• While any strategy, plan or program may be submitted on a staged basis, the Applicant must ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.• If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.	Administrative Non-Compliance	<p>The following Management Plans are applicable to Chain Valley and outlined on the Chain Valley website:</p> <p>Water Management Plan - July 2015;</p> <p>Air Quality Management Plan - July 2014;</p> <p>Noise Management Plan - March 2014;</p> <p>Heritage - June 2014;</p> <p>Biodiversity Management Plan - 16 March 2016;</p> <p>Seagrass Management Plan - April 2014; and</p> <p>Environmental Management System - 2012.</p> <p>Admin Non - Compliance: This condition is non - compliant as plans have not been 'regularly' updated.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p>	<p>All management plans require updating due to the length of time since the previous reviews. All should in a Delta Coal template.</p> <p>Ensure there is a cross referencing table covering this condition in management plans.</p> <p>Additional detail including Trigger, Action, Response Tables (contingency plan) should be developed in the next round of management plan updates.</p>
Road Maintenance Contribution				
19	<p>The Applicant must pay Road Maintenance Fees to WSC in accordance with its Road Maintenance Agreement with WSC.</p>	Compliant	<p>Evidence of Road Maintenance Agreement on 1 July 2013 signed by both LakeCoal and Wyong Shire Council.</p> <p>Evidence of road maintenance fees for 2016 (23 January 2017 email), 2017 (22 Jan 2018 email). No road maintenance required in 2018 as no road haulage.</p>	
Schedule 3 - Environmental Conditions - General				
Transport				
Monitoring of Coal Transport				
1	<p>The Applicant shall:</p> <p>(a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and</p> <p>(b) make these records publicly available on its website at the end of each calendar quarter.</p>	Non-Compliant (Low Risk)	<p>a) Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided on the spreadsheet provided. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition.</p> <p>b) Evidence of publically available information regarding transport. However this information showed most quarters in 2016 and 2017. However no coal records on the website in 2018 or 2019. <u>Admin Non Compliance.</u></p>	<p>See recommendation regarding detailed transport records.</p> <p>Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.</p>
Road Works				
2	<p>The Applicant shall upgrade the Ruttleys Road and Construction Road intersection within 6 months of the date of this consent, unless the Secretary directs otherwise, by:</p> <p>(a) installing additional signage on and adjacent to Construction Road prior to the intersection;</p> <p>(b) repairing the surface of Construction Road as required and ensuring the edge seal of the left turn lane is of sufficient width to accommodate coal trucks;</p> <p>(c) installing or replacing "Stop" signs in accordance with Austroads guidelines;</p> <p>(d) repainting road line markings and raised pavements associated with this intersection; and</p> <p>(e) installing barriers to prevent trucks parking on the gravel area adjacent to the intersection and the electricity substation located in the vicinity of this intersection.</p> <p>The design and construction of these works must be undertaken in consultation with, and to the relevant satisfaction of, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.</p>	Administrative Non-Compliance	<p>Based on site communications with Environment and Community Co-ordinator. No upgrades completed during this audit period. However there is a <u>historical admin non - compliance</u> from the previous audit period, with these details noted by Hansen Bailey (2016).</p> <p>- WSC Civil Design Approval SCC11-2013 dated 1/04/14 and WSC invoice for construction assessment and certificate dated 17/07/13;</p> <p>- Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and</p> <p>- Email from LC to Delta Electricity dated 29/01/14 and response from Delta Electricity dated 11/02/14 confirming approval of the proposed works.</p> <p>No evidence that the required Ruttleys Road and Construction Road intersection upgrade was to the satisfaction of RMS and DPE. Construction works for the intersection upgrade were completed on 14/08/2014, which is outside of 6 months of the date of approval of SSD-5465 (i.e. 23/06/2014). <u>Historical admin non - compliance</u> with no further action.</p>	
Road Transport Protocol				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																																														
3	<p>The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall:</p> <p>(a) be prepared in consultation with RMS, NCC, WSC, DRE and CCC and submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(b) describe the designated haulage routes to be used (as shown in Appendix 5); the maximum number of road movements proposed and the haulage hours permitted under this consent;</p> <p>(c) include a Traffic Management Plan, which includes:</p> <ul style="list-style-type: none">• procedures to ensure that drivers adhere to the designated haulage routes;• measures to maximise the use of a low frequency (regular) trucking schedule rather than an intermittently-high frequency (campaign) trucking schedule, especially during the morning peak hour;• contingency plans to apply when (for example) the designated haulage route is disrupted, including procedures for notifying relevant agencies and affected communities of the need to implement such contingency plans;• procedures to ensure that all haulage vehicles associated with the development are clearly distinguishable as Chain Valley Colliery coal haulage trucks;• details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site;• measures to ensure that the provisions of the Traffic Management Plan are implemented, eg driver training in the heavy vehicle driver's Code of Conduct and contractual agreements with heavy vehicle operators; and• procedures for ensuring compliance with and enforcement of the heavy vehicle driver's Code of Conduct; <p>(d) include a Code of Conduct for heavy vehicle drivers that addresses:</p> <ul style="list-style-type: none">• travelling speeds;• instructions to avoid grouping or convoying of trucks;• instructions to drivers not to overtake each other on the haulage route, as far as practicable, and to maintain appropriate distances between vehicles;• instruction to drivers to adhere to the designated haulage routes;• instruction to drivers to be properly safety conscious and to strictly obey all traffic regulations; and• appropriate penalties for infringements of the Code. <p>The Applicant shall implement the approved Road Transport Protocol as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p>Evidence of Road Transport Protocol. Road Transport Protocol, which includes; MSP-D-14559 – Coal Haulage Traffic Management Plan and POL-D-14926 Coal Haulage Driver Code of Conduct.</p> <p>Coal Haulage Traffic Management System Plan on the CVC website is dated 18/03/14. This plan has not been updated since the previous audit.</p> <p>Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012.</p> <p><u>Preparation:</u></p> <p>a) Evidence of consultation from 2014;</p> <p>b) Section 8.3;</p> <p>c) Overall document. Covered in Section 8;</p> <p>d) Code of conduct discussed in Section 8.11. Not attached to the document.</p> <p><u>Implementation:</u></p> <p>Records and training.</p> <p>Section 12 of this plan states - "The Manager of Mining Engineering or his representative shall formerly review this document every three years". No evidence of any review in 2017, therefore <u>Admin Non - Compliant</u>.</p>	<p>Ensure Coal Haulage Traffic Management Plan is reviewed as per the requirements of the consent and commitments in the management plan.</p> <p>Attach Driver Code of Conduct to the management plan.</p>																																														
Independent Traffic Audit																																																		
4	<p>Prior to 31 March 2014, and every 12 months thereafter, unless the Secretary directs otherwise, the Applicant shall commission a suitably qualified person, whose appointment has been approved by the Secretary, to conduct an Independent Traffic Audit of the development. This audit must:</p> <p>(a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC and the CCC;</p> <p>(b) assess the impact of the development on the performance and safety of the road network, including a review of:</p> <ul style="list-style-type: none">• haulage records;• accident records on the haulage route, infringements relating to the code of conduct and any incidents involving haulage vehicles;• community complaints register; and <p>(c) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts.</p>	Administrative Non-Compliance	<p><u>Admin Non - Compliance</u>; No evidence provided by site indicating Traffic Audits were completed annually.</p>	<p>Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.</p>																																														
5	<p>Within 1 month of receiving the audit report, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the report to the Secretary, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report.</p> <p>A summary of the audit report must be included in the Annual Review.</p>	Administrative Non-Compliance	<p><u>Admin Non - Compliance</u>; No evidence provided by site indicating Traffic Audits were completed annually.</p>																																															
Alternative Coal Transport Options																																																		
6	<p>Prior to 31 December 2014, and every three years thereafter, the Applicant shall prepare and submit to the Secretary for approval, a study of the reasonable and feasible options to reduce or eliminate the use of public roads to transport coal from the development. The assessment must include:</p> <p>(a) an analysis of the capital, construction and operating costs of the alternative transport options; and</p> <p>(b) quantified social and environmental impacts associated with road and rail transport.</p>	Administrative Non-Compliance	<p>Evidence provided of 2014 study with the letter dated 10 December 2014. The condition requires an audit every three years which would be in late 2017. No evidence of 2017 report provided to SLR, therefore <u>Admin Non - Compliance</u>.</p>	<p>Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.</p>																																														
Noise																																																		
Noise Impact Assessment Criteria																																																		
7	<p>The Applicant shall ensure that the noise generated by the development at any residence on privately- owned land does not exceed the criteria for the location in Table 1 nearest to that residence.</p>	Non-Compliant (Low Risk)	<p>- Exceedance of LA1(1minute) criteria of 6dB and 7dB at ATN4 and R13 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016.</p> <p>- 1dB exceedance of LAeq(15minute) criteria at ATN007 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded.</p> <p>- No exceedances recorded during 2018 period.</p> <p>- No exceedances recorded during the 2019 audit period (January - April 2019).</p>	<p>Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures.</p> <p>Ensure accurate/consistent monitoring results are presented in Annual Reviews.</p>																																														
	<p>Table 1 - Noise Criteria dB(A)</p> <table><tr><th rowspan="2">Location</th><th>Day</th><th>Evening</th><th colspan="2">Night</th></tr><tr><th>L_{night} and</th><th>L_{night} and</th><th>L_{night} and</th><th>L_{night} and</th></tr><tr><td>R8</td><td>38</td><td>38</td><td>38</td><td>45</td></tr><tr><td>R11</td><td>40</td><td>40</td><td>40</td><td>54</td></tr><tr><td>R12</td><td>49</td><td>49</td><td>49</td><td>53</td></tr><tr><td>R13</td><td>43</td><td>43</td><td>43</td><td>48</td></tr><tr><td>R15</td><td>36</td><td>36</td><td>36</td><td>45</td></tr><tr><td>R19</td><td>37</td><td>37</td><td>37</td><td>45</td></tr><tr><td>R22</td><td>46</td><td>46</td><td>46</td><td>46</td></tr><tr><td>All other privately-owned land</td><td>35</td><td>35</td><td>35</td><td>45</td></tr></table> <p>Notes:</p> <ul style="list-style-type: none">• To interpret the locations referred to in Table 1, see Appendix 6 and the EIS; and• Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.				Location	Day	Evening	Night		L _{night} and	L _{night} and	L _{night} and	L _{night} and	R8	38	38	38	45	R11	40	40	40	54	R12	49	49	49	53	R13	43	43	43	48	R15	36	36	36	45	R19	37	37	37	45	R22	46	46	46	46	All other privately-owned land	35
Location	Day	Evening	Night																																															
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R15	36	36	36	45																																														
R19	37	37	37	45																																														
R22	46	46	46	46																																														
All other privately-owned land	35	35	35	45																																														
Operation Conditions																																																		
8	<p>8. The Applicant shall:</p> <p>(a) implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;</p> <p>(b) regularly assess the noise monitoring and meteorological data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;</p> <p>(c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);</p> <p>(d) use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;</p> <p>(e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and</p> <p>(f) prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit; to the satisfaction of the Secretary.</p>	Administrative Non-Compliance	<p>a) The 2016 Annual Review documented an investigation into repairs/maintenance of ventilation fan silencers. No further evidence during audit period. Therefore no continued implementation. <u>Admin Non - Compliance</u>.</p> <p>b) Evidence of real time noise monitoring conducted throughout 2016,2017 and 2018 where no triggers were reported. During audit site inspection the real-time noise monitor was not in operation and has been removed from site. The Environment and Community Co-ordinator stated the real - time noise monitoring was removed in January 2019. <u>Admin - Non Compliance</u> as the monitor should have been active the entire IEA period.</p> <p>c) No evidence of reduced operations during adverse meteorological conditions.</p> <p>d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period.</p> <p>e) Conducted as part of this Independent Audit. Note that no noise monitoring of site plant/equipment and operations was conducted as part of the audit.</p> <p>f) No evidence of action plan. <u>Admin Non - Compliance</u>.</p>	<p>The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.</p>																																														
	<p>Table 2 - Long-term noise goals dB(A)</p> <table><tr><th rowspan="2">Location</th><th>Day</th><th>Evening</th><th colspan="2">Night</th></tr><tr><th>L_{night} and</th><th>L_{night} and</th><th>L_{night} and</th><th>L_{night} and</th></tr><tr><td>R11 - R13</td><td>41</td><td>41</td><td>41</td><td>41</td></tr><tr><td>R22</td><td>41</td><td>41</td><td>41</td><td>41</td></tr></table>	Location	Day	Evening	Night		L _{night} and	L _{night} and	L _{night} and	L _{night} and	R11 - R13	41	41	41	41	R22	41	41	41	41		<p>Exceedances of long term noise goals occurred during the monitoring period. However these are longterm noise goals, not criteria.</p>																												
Location	Day		Evening	Night																																														
	L _{night} and	L _{night} and	L _{night} and	L _{night} and																																														
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	<p>Notes:</p> <ul style="list-style-type: none">• To interpret the locations referred to in Table 2, see Appendix 6 and the EIS; and• Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.	Compliant	<p>Quarterly noise monitoring reports indicate that noise monitoring is conducted in accordance with the Industrial Noise Policy (INP).</p>																																															
Noise Management Plan																																																		

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
9	<p>The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the EPA and submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary;</p> <p>(b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;</p> <p>(c) describe the proposed noise management system in detail including the mitigation measures that would be implemented to minimise noise during construction and operations, including on and off site road noise generated by vehicles associated with the development; and</p> <p>(d) include a monitoring program that:</p> <ul style="list-style-type: none"> • uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent; • evaluates and reports on: • the effectiveness of the on-site noise management system; and • compliance against the noise operating conditions; and • defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p>Current plan dated 12 March 2014.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. Admin Non - Compliance.</p> <p><u>Preparation:</u></p> <p>a) Compliant. Evidence from 2014;</p> <p>b) Compliant - Section 4;</p> <p>c) Compliant - Section 4;</p> <p>d) Compliant - Section 5 and 6</p> <p><u>Implementation:</u></p> <p>No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance.</p> <p>No notification to residents following recorded exceedances in accordance with Section 6.2. Admin Non - Compliance.</p> <p>Real time noise monitor removed from site. Admin Non - Compliance.</p>	
Air Quality				
Odour				
10	The Applicant shall ensure that no offensive odours are emitted from the site, as defined under the POEO Act.	Compliant	Based on records from Annual Review and discussions with Environment Community Co-ordinator there have been no odour complaints. No odours identified in field visit.	
Air Quality Criteria				
11	The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedance of the criteria listed in Tables 3, 4 and 5 at any residence on privately-owned land.	Non-Compliant (Low Risk)	<p>2019 - no longterm data for annual averages.</p> <p>Annual Review 2018 - Depositional dust gauges were below criteria.</p> <p>Short term PM10 non-compliances on 3 April 2018, 18 July 2018 and 4 December 2018. The 2018 annual average of 24hr PM10 results was 16.1 µg/m3. Daily (24-hour) results ranged from a minimum of 6.13 µg/m3 to a maximum of 112.98 µg/m3 during 2018. There were some data capture issues in 2018 relating to the TEOM. These were not reported as non compliances in Section 1 or 7 of the Annual Review. Low Risk Non - Compliance for exceeding criteria.</p> <p>Annual Review 2017 - Excluding DDG005, deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m2/month during the reporting period. Note, the depositional dust gauge exceedance was not recorded as an exceedance in Section 1 or 7 of the Annual Review. Non compliance relating to exceedance of DDG5 and also not reporting in Section 1 or 7 of the Annual Review.</p> <p>The EPA long-term annual average criteria (30 µg/m3) for PM10 was not exceeded during the 2017 period. Daily (24-hour) results ranged from a minimum of 5.39 µg/m3 to a maximum of 47.78 µg/m3 during 2017. The 2017 annual average of 24hr PM10 results was 15.1 µg/m3. Within short term criteria. It was noted there was some data capture issues The 2017 Annual Review states that <i>'When comparing the 2017 annual results to the previous year, the data capture rate was slightly higher in 2017. This was primarily due to power outages associated with electrical storms in 2016 and a failed air conditioner during the 2016 reporting period'</i>. Data capture issues were not reported as non compliances in Section 1 or 7 of the Annual Review.</p> <p>Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m2/month.</p> <p>Daily (24-hour) results ranged from a minimum of 2.1 µg/m3 to a maximum of 39.8 µg/m3 during 2016.</p> <p>For PM10 data capture - When comparing the 2016 annual results to the previous year, the data capture rate was slightly lower in 2016. This was primarily due to power outages associated with electrical storms, a failed air conditioner unit in February 2016 and a pest infestation in the units electrical circuit. Non - compliance relating to data capture.</p> <p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust. It is highly likely that other sources contribute to dust levels.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. However there is often a delay in identifying short term criterion exceedances.</p>	<p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM10. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>
			<p>Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m2/month.</p> <p>Daily (24-hour) results ranged from a minimum of 2.1 µg/m3 to a maximum of 39.8 µg/m3 during 2016.</p> <p>For PM10 data capture - When comparing the 2016 annual results to the previous year, the data capture rate was slightly lower in 2016. This was primarily due to power outages associated with electrical storms, a failed air conditioner unit in February 2016 and a pest infestation in the units electrical circuit. Non - compliance relating to data capture.</p> <p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust. It is highly likely that other sources contribute to dust levels.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. However there is often a delay in identifying short term criterion exceedances.</p>	
	<p>Notes for Tables 3 to 5:</p> <ul style="list-style-type: none"> • a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to other sources); • b Incremental impact (i.e. incremental increase in concentrations due to the development on its own); • c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and • d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed to by the Secretary. 	Note	--	
Operating Conditions				
12	<p>The Applicant shall:</p> <p>(a) implement best practice air quality management at the site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the development;</p> <p>(b) implement best practice management to minimise the risk of spontaneous combustion and related emissions;</p> <p>(c) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site;</p> <p>(d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent;</p> <p>(e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above);</p> <p>(f) regularly assess the air quality monitoring data, and modify operations on site to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary.</p>	Administrative Non-Compliance	<p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team.</p> <p>a) Evidence of dust monitoring and watercart use;</p> <p>b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion;</p> <p>c) Monitoring of fuel and energy usage;</p> <p>d) Air quality management system - for monitoring continues to be undertaken;</p> <p>e) Based on discussions with Environment and Community Co-ordinator water carts are used on exposed surfaces. Product is generally a wet product, therefore no water sprays required;</p> <p>f) The real time air quality monitor is not being used as a management tool. During the audit period there was no system to notify persons of when the TEOM identified short term impact assessment non - compliances. Non - compliances are only identified during the monthly download. Admin non - compliance relating to not determining TEOM exceedances as soon as they occur.</p>	<p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM10. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>
Air Quality Management Plan				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
13	<p>The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval within 6 months of the date of this consent; (b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent; (c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site; (d) describe the proposed on-site air quality management system; and (e) include an air quality monitoring program that: <ul style="list-style-type: none"> • is capable of evaluating the operating conditions of this consent; • evaluates and reports on: <ul style="list-style-type: none"> • the effectiveness of the air quality management system; and • compliance against the air quality operating conditions; • defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p><u>Preparation:</u></p> <p>Evidence of Air Quality Management Plan dated 15 January 2016. The Air Quality Management Plan on the website 18 July 2014, with this approved on 24 July 2014. No evidence of approval provided by Delta Coal for 2016 Management Plan, therefore 2014 plan reviewed for adequacy.</p> <ul style="list-style-type: none"> a) Section 1.4; b) Section 3; c) Section 4; d) and e) - Section 5 <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p> <p><u>Implementation:</u></p> <p>Evidence of monitoring;</p> <p>Minimal issues observed with dust management; and</p> <p>The real time air quality monitor is not being used as a management tool.</p> <p>Section 5.3 of 2014 Air Quality Management Plan states:</p> <p><i>Every 30 minutes the real time data from the monitor is sent via wireless (Next-G) connection to a web based data management system (Vista Data Vision) which is also used for the Company's real time noise monitoring system. A web based interface then allows the data to be viewed or downloaded, reports to be created and <u>automated alarm generation when the predefined triggers are reached</u>.</i></p> <p><u>Admin Non - Compliance</u> as no alarm was set up. The only way exceedances could be determine during the audit period was by manual download or viewing of results. This generally occurred every month.</p>	<p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM10. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>
METEOROLOGICAL MONITORING				
14	<p>During the life of the development, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:</p> <ul style="list-style-type: none"> (a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy, unless a suitable alternative is approved by the Secretary following consultation with the EPA. 	Compliant	<p>There is no current meteorological station at Chain Valley. The nearest station is at Mannering. This station at Mannering meets the requirements of a) and b).</p> <p>The 2013 Audit confirmed that the DPE and EPA (under revision of EPL 1770) approved use of Mannering Colliery monitor as representative of Chain Valley and ability to calculate temperature lapse rate by use of sigma-theta method.</p> <p>The system is real time, with this observed by SLR during the site visit.</p>	
Soil and Water				
Note:	Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.	Compliant	Evidence in Annual Review for Water Licence - 20BL173107 and usage.	
Water Supply				
15	The Applicant shall ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of mining operations to match its available water supply, to the satisfaction of the Secretary.	Compliant	<p>Evidence in Annual Review for Water Licence - 20BL173107 and usage.</p> <p>There is excess water at Chain Valley hence discharge occurs for most days of the year.</p>	
Water Pollution				
16	Unless an EPL authorises otherwise, the Applicant shall comply with Section 120 of the POEO Act.	Compliant	Based on the information provided there is no evidence that the site did not comply with the POEO Act.	
Sewage Management				
17	The Applicant shall manage on-site sewage in accordance with NSW Environmental Guidelines: Use of Effluent by Irrigation (DEC 2004) and the National Guidelines for Sewerage Systems - Effluent Management (ANZECC 1997) or its latest version, to the satisfaction of EPA.	Administrative Non-Compliance	<p>Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite.</p> <p>There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. <u>Admin. Non - Compliant</u>. Evidence of testing of wastewater through lab results.</p>	<p>Include additional detail in the Water Management Plan regarding sewage management.</p> <p>Include an update of sewage system during the audit period in the Annual Review.</p> <p>Ensure servicing is completed and records kept onsite.</p>
Water Management Plan				
18	<p>The Applicant shall prepare a Water Management Plan for the surface facilities sites to the satisfaction of the Secretary. This plan must be prepared in consultation with DPI Water and EPA, by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary, and submitted to the Secretary for approval within 6 months of the date of this consent. This plan must include:</p> <ul style="list-style-type: none"> (a) a comprehensive water balance for the development that includes details of: <ul style="list-style-type: none"> • sources and security of water supply; • water make in the underground workings; • water transfers from the underground operations to the surface; • water use; and • any water discharges; (b) management plans for the surface facilities sites, that include: <ul style="list-style-type: none"> • a detailed description of water management systems for each site, including: <ul style="list-style-type: none"> • clean water diversion systems; • erosion and sediment controls; and • any water storages; • measures to minimise potable water use and to reuse and recycle water; • measures to manage acid sulphate soils, if encountered; • activities that would involve ground disturbance at the site; and • monitoring and reporting procedures. 	Administrative Non-	<p>The current Water Management Plan is dated July 2015. This plan was approved by the DPE on 21 July 2015. This plan is out of date due to the age of the plan and also does not cover MOD 2. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>The Plan outlines several activities which are planned to be undertaken in 2015. Evidence of consultation in 2015 update with this outlined in Section 1.2.</p> <p><u>Preparation:</u></p> <ul style="list-style-type: none"> a) Section 3 of the report. Most of the information of the Water Balance is from 2013 and should be reviewed; b) Section 4. Includes details of mitigation measures. Figure 4 is a detailed figure, but may require some updating based on minor 	Update the water balance or justify why the current water balance is still applicable to the current operations.

Condition Number	Condition	Compliance Status	Evidence	Recommended Action					
	<p>(c) a Surface Water Management Plan which:</p> <ul style="list-style-type: none">• includes baseline data on surface water flows and quality of Swindles Creek;• details surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on surface water resources or surface water quality;• provides a program to monitor:• surface water discharges;• surface water flows and quality; and• channel stability; <p>(d) a Ground Water Monitoring Program which includes a program to:</p> <ul style="list-style-type: none">• monitor and report groundwater inflows to underground workings;• predict, manage and monitor impacts to nearby groundwater bores on privately-owned land that may be impacted by the development; and <p>(e) a detailed review of surface water management at the site, with particular reference to the water storages within the dirty water management system, to:</p> <ul style="list-style-type: none">• determine whether the capacity, integrity, retention time and management of the dirty water storages (particularly the final Pollution Control Dam) are sufficient to ensure that water discharged from the site meets the EPL limits and surface water impact assessment criteria within the Surface Water Management Plan; and• propose any appropriate changes to the surface water management system. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Note: The Secretary may require the Applicant to implement upgrades and other changes identified under paragraph (e), in accordance with condition 4 of schedule 2.</p>	Compliance	<p>changes at the pit top. Monitoring information outlined in Section 5;</p> <p>c) Covered in Section 4;</p> <p>d) Covered in Appendix B; and</p> <p>e) Covered in several sections.</p> <p><u>Implementation:</u></p> <ul style="list-style-type: none">- The plan is a little out of date - from 2015, with some information dating back to 2013;- Evidence of surface water and groundwater monitoring in Annual Review;- Water management sighted in the field. Separation of water streams. Dams are stable; and- Some desilting of a drainage line is required.	Ensure dams and drainage lines are free on silt. Establish a maintenance schedule.					
BIODIVERSITY									
Biodiversity Enhancement Strategy									
19	<p>The Applicant shall implement a Biodiversity Enhancement Strategy as described in the EIS and summarised in Table 6, in consultation with OEH, and to the satisfaction of the Secretary.</p>	Compliant	<p>Outlined in Biodiversity Management Plan (March 2016) - Section 6.</p> <p>Enhancement mostly includes weed management with some previous rubbish removal.</p> <p>Monitoring is completed with a summary outlined in the 2016-2018 Annual Reviews. Excel and email summaries of monitoring was provided to the auditors. Final weighted scores were recorded of:</p> <ul style="list-style-type: none">* 80.3% - 2016;* 80.3% - 2017; and* 65% - 2018. <p>No monitoring in 2019 yet.</p> <p>These are above the trigger levels, therefore no further action required.</p> <p>Excerpt from 2018 Annual Review: <i>Annual biodiversity monitoring in accordance with the plan was continued during the reporting period, being undertaken in May 2018. The monitoring specifically looks at;</i></p> <ul style="list-style-type: none">- <i>the Swamp Oak Floodplain Forest below the sediment dams;</i>- <i>weeds (both at the pit top area and ventilation shaft site); and</i>- <i>feral animal activity.</i> <p><i>The monitoring results were assessed against the criteria and triggers within the Biodiversity Management Plan with no trigger levels being reached. Specifically, monitoring of the two established plots within the Swamp Oak floodplain forest, recorded a total weighted score of 65% which is significantly higher than the established trigger value of 60% (refer to the Biodiversity Management Plan for details on site attributes and methodology for determining the weighted score). There was no feral animal activity recorded during the 2018 monitoring</i></p>	<p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>The current monitoring is provided in a spreadsheet with an email summary. Prepare a small Biodiversity Monitoring Report outlining results, a comparison against trigger levels and potential reasons for changes.</p>					
	<p><i>Table 6: Summary of the Biodiversity Enhancement Strategy</i></p> <table><tr><th>Area</th><th>Offset Type</th><th>Minimum Size/Amount</th></tr><tr><td>Biodiversity Enhancement Area</td><td>Enhancement and restoration measures, including weed and rubbish removal, return of natural hydrological regime and regeneration with native endemic species.</td><td>3 ha (in total) of Swamp Sclerophyll Floodplain Forest and Swamp Oak Floodplain Forest endangered ecological communities within the surface facilities sites</td></tr></table> <p><i>Note: To identify the Biodiversity Enhancement Area referred to in Table 6 see the applicable figures in Appendix 7.</i></p> <p>Note: To identify the Biodiversity Enhancement Area referred to in Table 6 see the applicable figures in Appendix 7.</p> <p>The Applicant shall implement its preferred option of the three options set out in new dot point 1 of the Terrestrial Ecology section of its Statement of Commitments by 1 December 2016, following consultation with OEH and to the satisfaction of the Secretary.</p>		Area	Offset Type	Minimum Size/Amount	Biodiversity Enhancement Area	Enhancement and restoration measures, including weed and rubbish removal, return of natural hydrological regime and regeneration with native endemic species.	3 ha (in total) of Swamp Sclerophyll Floodplain Forest and Swamp Oak Floodplain Forest endangered ecological communities within the surface facilities sites	
Area	Offset Type	Minimum Size/Amount							
Biodiversity Enhancement Area	Enhancement and restoration measures, including weed and rubbish removal, return of natural hydrological regime and regeneration with native endemic species.	3 ha (in total) of Swamp Sclerophyll Floodplain Forest and Swamp Oak Floodplain Forest endangered ecological communities within the surface facilities sites							
Biodiversity Management Plan									
20	<p>The Applicant shall prepare a Biodiversity Management Plan for the surface facilities sites, for all areas that are not, or will not, be subject to condition 7 of schedule 4, to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared by a suitably qualified person approved by the Secretary, in consultation with OEH, and submitted to the Secretary within 6 months of the date of this consent;</p> <p>(b) establish baseline data for the existing habitat in the Biodiversity Enhancement Area and elsewhere on the site;</p> <p>(c) describe the short, medium, and long term measures that would be implemented to:</p> <ul style="list-style-type: none">• manage the impacts of clearing vegetation;• manage the remnant vegetation and habitat in the Biodiversity Enhancement Area and elsewhere on the site; and• implement the Biodiversity Enhancement Strategy, including detailed performance and completion criteria; <p>(d) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;</p> <p>(e) identify the potential risks to the successful implementation of the Biodiversity Enhancement Strategy, and the contingency measures that would be implemented to mitigate these risks; and</p> <p>(f) include details of who would be responsible for monitoring, reviewing, and implementing the plan.</p> <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p>The Biodiversity Management Plan is dated 16 March 2016. This was approved by the DPE on 20 April 2016. Covers pit top and fan sites. Seagrass management covered under a separate plan. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p><u>Preparation:</u></p> <p>a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe;</p> <p>b) Baseline data in Section 3.2;</p> <p>c) Mostly covered in Section 4 and 5, but not split into short, medium and longterm measures;</p> <p>d) Section 11;</p> <p>e) See Table 11;</p> <p>f) Section 13.</p> <p><u>Implementation:</u></p> <p>Section 14 refers to the resubmission of this management plan within three months of submitting the Independent Environmental Audit. The previous audit is dated July 2016.</p> <p>Evidence of biodiversity monitoring reports.</p>	<p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>The current monitoring is provided in a spreadsheet with an email summary. Prepare a small report outlining results, a comparison against trigger levels and potential reasons for changes.</p> <p>Prepare a separate section with short, medium and longterm measures in the Biodiversity Management Plan.</p>					
20A	<p>Within 3 months of the approval of MOD 2, the Applicant shall revise the Biodiversity Management Plan to incorporate the measures required to implement its commitments described in new dot point 2 of the Terrestrial Ecology section of its Statement of Commitments, and submit it to the Secretary for approval.</p>	Compliant	<p>Mod 2 was approved 16 December 2015. Water MP is dated 15 March 2016 and revised following DPE feedback.</p>						
Heritage									
Heritage Management Plan									
21	<p>The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must:</p> <p>(a) be prepared in consultation with any relevant Aboriginal stakeholders;</p> <p>(b) be submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;</p> <p>(d) detail the responsibilities of all stakeholders; and</p> <p>(e) include programs/procedures and management measures for:</p> <ul style="list-style-type: none">• the ongoing monitoring of site 45-7-0189 at Summerland Point;• managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols;• ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage within the site; (including procedures for keeping records of this);• appropriate identification, management, conservation and protection of both Aboriginal and non-Aboriginal heritage items identified on the site; and• ensuring relevant workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p><u>Preparation:</u></p> <p>Plan dated 23/6/2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>a) Section 4.4 and 4.5;</p> <p>b) Condition outside of audit period;</p> <p>c) Section 4;</p> <p>d) Section 11;</p> <p>e) In various sections.</p> <p><u>Implementation:</u></p> <p>Evidence of some monitoring of shell midden site #45-7-0189 in Annual Reviews. Monitoring every 2 years until Year 5 (Year 1, 3 and 5). 2017 was the fifth year, hence no further monitoring required.</p> <p>Section 12 of the Heritage Management Plan refers to the resubmission of this management plan within three months of submitting the Independent Environmental Audit. This was not completed.</p>	<p>Update the Heritage Management Plan, including the removal of Site #45-7-0154.</p>					
Visual									
Visual Amenity and Lighting									

Condition Number	Condition	Compliance Status	Evidence	Recommended Action															
22	The Applicant shall: (a) minimise visual impacts, and particularly the off-site lighting impacts, of the Surface facilities sites; (b) take all reasonable and feasible measures to further mitigate off-site lighting impacts from the development; and (c) ensure that all external lighting associated on site complies with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting, to the satisfaction of the Secretary.	Administrative Non-Compliance	The most recent lighting audit for Chain Valley is from 2013. Prepared by Wadco May 2013. a) and b) The pit top area and ventilation shaft site are not dominant features of the landscape the pit top area is somewhat overshadowed by the adjacent power station. The ventilation fans were designed to maintain a relatively low profile, below the surrounding vegetation to ensure amenity and lighting impacts were minimised. Some lights have been removed, including those at the stockpile. There were no complaints to visual or lighting during the audit period. c) Compliance with this requirement could not be determined due to the date of the previous Visual and Lighting audit. Therefore <u>Admin - Non - Compliance</u> .	Complete a visual and lighting assessment against the Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.															
Waste																			
23	The Applicant shall: (a) minimise and monitor the waste generated by the development; (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and (c) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	Compliant	a) Evidence of waste totals provided in Annual Review. b) The field inspection generally noted that waste was stored well. However the following minor improvements were identified: * Some bins are not well labelled; * Cardboard contained in some general waste bins; * 1 hydraulic oil drum not contained in bund; * Numerous empty oil drums stored on there side within the bund. This may lead to some leakage of oil from drums; * 2 larger 44 gallon drums stored outside bund in a laydown area. Unknown substances. Numerous bins and spill containers were noted. c) Effective reporting in the Annual Review	Ensure the minor waste management issues identified during the audit are rectified. Including: * Improve bin labelling; * Ensure all hydrocarbon containers (empty or full) are stored within bunds.															
Bushfire Management																			
24	The Applicant shall: (a) ensure that the development is suitably equipped to respond to any fires on site; and (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the Surface facilities sites.	Compliant	The following measures are in place at Chain Valley. * A high capability for firefighting purposes through the 100mm diameter mine water reticulation line and the mine Emergency Management System; * Firebreaks and fire trails in the vicinity of the pit top area and ventilation shaft site; * Fire hydrants and depots placed in strategic positions around the pit top area; and * Regular training of mine firefighting crews and liaison with local rural firefighting brigades Evidence of firefighting equipment noted in site inspection. Asset Protection Zone figures outlined in the Annual Review.																
Rehabilitation																			
Rehabilitation Objectives																			
25	The Applicant shall rehabilitate the site to the satisfaction of the DRE. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EIS, and comply with the objectives in Table 7.	Not Triggered	Based on discussions with site and a review of Annual Reviews and MOP's there has been no rehabilitation.																
	<table><tr><th colspan="2">Table 7: Rehabilitation Objectives</th></tr><tr><th>Feature</th><th>Objective</th></tr><tr><td>Mine site (as a whole)</td><td><ul style="list-style-type: none">Safe, stable and non-polluting.Final land use compatible with surrounding land uses.</td></tr><tr><td>Rehabilitation materials</td><td><ul style="list-style-type: none">Materials (including topsoils, substrates, and seeds of the disturbed area) are recovered, appropriately managed and used effectively as resources in rehabilitation.</td></tr><tr><td>Surface infrastructure</td><td><ul style="list-style-type: none">To be decommissioned and removed, unless the DRE agrees otherwise.</td></tr><tr><td>Portals and ventilation shafts</td><td><ul style="list-style-type: none">To be decommissioned and made safe and stable.Retain habitat for threatened species (eg. bats), where practicable.</td></tr><tr><td>Other land affected by the development</td><td><ul style="list-style-type: none">Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:<ul style="list-style-type: none">local native plant species (unless the DRE agrees otherwise); anda landform consistent with the surrounding environment.</td></tr><tr><td>Built features damaged by mining operations</td><td><ul style="list-style-type: none">Repair to pre-mining condition or equivalent unless:<ul style="list-style-type: none">the owner agrees otherwise; orthe damage is fully restored, repaired or compensated under the Mine Subsidence Compensation Act 1961.</td></tr><tr><td>Community</td><td><ul style="list-style-type: none">Ensure public safety.Minimise the adverse socio-economic effects associated with mine closure.</td></tr></table>				Table 7: Rehabilitation Objectives		Feature	Objective	Mine site (as a whole)	<ul style="list-style-type: none">Safe, stable and non-polluting.Final land use compatible with surrounding land uses.	Rehabilitation materials	<ul style="list-style-type: none">Materials (including topsoils, substrates, and seeds of the disturbed area) are recovered, appropriately managed and used effectively as resources in rehabilitation.	Surface infrastructure	<ul style="list-style-type: none">To be decommissioned and removed, unless the DRE agrees otherwise.	Portals and ventilation shafts	<ul style="list-style-type: none">To be decommissioned and made safe and stable.Retain habitat for threatened species (eg. bats), where practicable.	Other land affected by the development	<ul style="list-style-type: none">Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:<ul style="list-style-type: none">local native plant species (unless the DRE agrees otherwise); anda landform consistent with the surrounding environment.	Built features damaged by mining operations
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Community	<ul style="list-style-type: none">Ensure public safety.Minimise the adverse socio-economic effects associated with mine closure.																		
	Notes: * These rehabilitation objectives apply to all subsidence impacts and environmental consequences caused by underground mining taking place after the granting of project approval MP 10_0161, and to all development surface infrastructure that is part of the development, whether constructed prior to or following the date of this consent. * Rehabilitation of subsidence impacts and environmental consequences caused by mining which took place prior to the date of project approval (MP 10_0161) may be subject to the requirements of other approvals (eg under a mining lease or a Subsidence Management Plan approval).	Note																	
Progressive Rehabilitation																			
26	The Applicant shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance to the satisfaction of the Secretary and DRE.	Not Triggered	Based on discussions with site and a review of Annual Reviews and MOP's there has been no rehabilitation.																
Rehabilitation Management Plan																			
27	The Applicant shall prepare a Rehabilitation Management Plan for the development, in consultation with OEH, DPI Water, WSC, LMCC, and the CCC, and to the satisfaction of the DRE. This plan must: (a) be submitted to the Secretary and the DRE for approval within 12 months of the date of approval of this development consent; (b) be prepared in accordance with any relevant DRE guideline and be consistent with the rehabilitation objectives in the EIS and in Table 7; (c) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 7; (d) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved; (e) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and (f) be integrated with the other management plans required under this consent. The Applicant shall implement the approved management plan as approved from time to time by the Secretary. Note: The Rehabilitation Management Plan should address all land impacted by the development whether prior to, or following, the date of this consent.	Administrative Non-Compliance	Evidence of Rehabilitation Management Plan. Update dated 1 March 2019. This plan appears unapproved and no evidence of this plan being sent to the DPE. Current approved Rehabilitation Management Plan is from December 2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u> . <u>Preparation:</u> a) Outside of audit period; b) Covers this requirement. Note, a separate MOP has also been prepared for the site; c) Section 8; d) Generally covered in Section 7; e) Section 6; f) Linked to MOP. <u>Implementation:</u> There is no rehabilitation onsite. Minimal surface footprint. Extraction Plans cover subsidence management. The Rehabilitation Management Plan is not on the CVC website, which makes this Admin Non - Compliant.	Ensure a copy of the approved Rehabilitation Management Plan is put on the website.															
SCHEDULE 4 - ENVIRONMENTAL CONDITIONS – UNDERGROUND MINING																			
Subsidence																			
1	1. The Applicant shall ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within seagrass beds is limited to a maximum of 20 millimetres (mm). If at any stage predicted subsidence levels are exceeded within these areas, an ecological monitoring program shall be initiated to assess the impacts to ecological communities and threatened species and if appropriate, offsets are to be provided for any impacts detected.	Administrative Non-Compliance	This condition is outlined in the Annual Review (see Section 3.16.4 in 2018 Annual Review), however no update has been provided on whether the condition has been met. Based on this the auditor can not determine compliance.	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.															
Performance Measures – Natural Environment																			
2	The Applicant shall ensure that the development does not cause any exceedance of the performance measures in Table 8 to the satisfaction of the Secretary.																		

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																
	<table><tr><td colspan="2">Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features</td></tr><tr><td>Biodiversity</td><td></td></tr><tr><td>Threatened species or endangered populations</td><td>Negligible environmental consequences</td></tr><tr><td>Seagrass beds</td><td>Negligible environmental consequences including:<ul style="list-style-type: none">negligible change in the size and distribution of seagrass beds;negligible change in the functioning of seagrass beds; andnegligible change to the composition or distribution of seagrass species within seagrass beds.</td></tr><tr><td>Benthic communities</td><td>Minor environmental consequences, including minor changes to species composition and/or distribution.</td></tr><tr><td colspan="2">Mine workings</td></tr><tr><td>First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences</td><td>To remain long-term stable and non-subsiding</td></tr><tr><td>Second workings</td><td>To be carried out only in accordance with an approved Extraction Plan.</td></tr></table>	Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features		Biodiversity		Threatened species or endangered populations	Negligible environmental consequences	Seagrass beds	Negligible environmental consequences including: <ul style="list-style-type: none">negligible change in the size and distribution of seagrass beds;negligible change in the functioning of seagrass beds; andnegligible change to the composition or distribution of seagrass species within seagrass beds.	Benthic communities	Minor environmental consequences, including minor changes to species composition and/or distribution.	Mine workings		First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	To remain long-term stable and non-subsiding	Second workings	To be carried out only in accordance with an approved Extraction Plan.	Administrative Non-Compliance	The subsidence performance is outlined in the Annual Reviews. There is no specific table or section addressing if the site has met these performance measures.	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.
Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features																				
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Notes: <ul style="list-style-type: none">The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see Condition 7 below).Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of approval of this consent.	Reports from 2016 to 2018 titled Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW. These reports do not assess against these performance measures as the word 'negligible' is not in the report. There is no definition of negligible.																			
			Biodiversity Monitoring Reports do not cover these performance measures.																	
			Benthic monitoring reports do not specifically address these performance measures.																	
			Despite this there is no evidence that these performance measures have been exceeded, however the auditor is not able to determine compliance based on the information provided.																	
Offsets																				
3	If the Applicant exceeds the performance measures in Table 8 and the Secretary determines that: (a) it is not reasonable or feasible to remediate the impact or environmental consequence; or (b) the remediation measures implemented by the Applicant have failed to satisfactorily remediate the impact or environmental consequence; then the Applicant shall provide a suitable offset to compensate for the impact or environmental consequence to the satisfaction of the Secretary. Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.	Administrative Non-Compliance	There is no specific assessment against subsidence criteria in the Annual Review, therefore we cannot determine compliance. The 2017 Annual Review stated there was an exceedance of predicted subsidence values over the MW7-12 mining area, but not an exceedance of the performance measures in this table..	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																
Performance Measures - Built Features																				
4	The Applicant shall ensure that the development does not cause any exceedances of the performance measures in Table 9, to the satisfaction of the Secretary.	Compliant	Based on discussions with Environment and Community Co-ordinator feno peg monitoring has been completed at Trinity Point. Results outlined in Annual Review.	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																
	<table><tr><td colspan="2">Table 9: Subsidence Impact Performance Measures – Built Features</td></tr><tr><td>Built Features</td><td>Performance Measure</td></tr><tr><td>Trinity Point Marina Development</td><td><ul style="list-style-type: none">Always safeServiceability should be maintained wherever practicable. Loss of serviceability must be fully compensated.Damage must be fully repaired, replaced or fully compensated.</td></tr><tr><td>Public Safety</td><td></td></tr><tr><td>Public Safety</td><td>Negligible additional risk.</td></tr></table>		Table 9: Subsidence Impact Performance Measures – Built Features		Built Features	Performance Measure	Trinity Point Marina Development	<ul style="list-style-type: none">Always safeServiceability should be maintained wherever practicable. Loss of serviceability must be fully compensated.Damage must be fully repaired, replaced or fully compensated.	Public Safety		Public Safety	Negligible additional risk.	Subsidence monitoring results for Trinity Point peninsula, Brightwaters peninsular and subsidence monitoring lines numbers 23, 33, 32 and 24 are included in Appendix 7 of the Annual Review. These are purely just numbers with no discussion on compliance against the subsidence impact performance measures in this table.							
Table 9: Subsidence Impact Performance Measures – Built Features																				
Built Features	Performance Measure																			
Trinity Point Marina Development	<ul style="list-style-type: none">Always safeServiceability should be maintained wherever practicable. Loss of serviceability must be fully compensated.Damage must be fully repaired, replaced or fully compensated.																			
Public Safety																				
Public Safety	Negligible additional risk.																			
	Notes: <ul style="list-style-type: none">The Applicant will be required to define more detailed performance indicators for each of these performance measures in Built Features Management Plans or a Public Safety Management Plan (see Condition 7 below).Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.The requirements of this condition only apply to the impacts and consequences of mining operations undertaken following the date of this development consent.Requirements regarding safety or serviceability do not preclude preventative actions or mitigation being taken prior to or during mining in order to achieve or maintain these outcomes.Requirements under this condition may be met by measures undertaken in accordance with the Mine Subsidence Compensation Act 1961.	Note	See Schedule 4 Condition 7.																	
5	Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the subsidence performance measures in Table 9 is to be settled by the Secretary, following consultation with the MSB and the DRE. Any decision by the Secretary shall be final and not subject to further dispute resolution under this consent.	Not Triggered	Based on discussions provided and site records this has not been triggered.																	
Multi-Seam Mining Feasibility Investigation																				
6	Prior to the submission of an Extraction Plan for Miniwalls 41 to 45 in Chain Valley Bay, the Applicant must prepare a detailed Multi-Seam Mining Feasibility Investigation to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with DRE by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary; (b) assess the extent of the soft claystone floor/roof conditions within former workings in the Great Northern and Wallarah Seams; (c) assess the stability of remnant coal pillars within former workings in the Great Northern and Wallarah Seams; (d) give particular consideration to the risks of irregular subsidence, pillar run and long-term subsidence leading to subsidence outside of the predicted angle of draw; (e) include revised multi-seam subsidence predictions for the proposed second workings; and (f) recommend final design of the second workings and any necessary adaptive management measures.	Compliant	The 2018 Annual Review provides an update on this condition. <i>In accordance with the requirements of SSD 5465 LakeCoal submitted the multi-seam mining feasibility investigation required for the mining of the miniwalls in the Chain Valley Bay Area (shown as MW41-45 in SSD 5465) during the reporting period. While the consent conceptually approved 5 miniwalls in this area (subject to the feasibility investigation) LakeCoal lodged an extraction plan for only 3 miniwalls during the reporting period. Extensive consultation with the Department of Resources and Energy as well as the Department of Planning and Environment was undertaken during the reporting period as part of the Extraction Plan development for the Chain Valley Bay Miniwalls. As at 31 December 2017 LakeCoal had not received approval for miniwall panels CVB2 and CVB3 which were subject to further investigations /assessment.</i> Evidence provided of: - DgS Subsidence Report - Multi-Seam Mining Feasibility Study for the Proposed Miniwalls CVB1 - 4 at Chain Valley - May 2017. Generally meets the requirements of Condition a-f. - Evidence of letter from DPE- RR outlining proposed changes to report.																	
Extraction Plan																				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																			
7	The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must: (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary; (b) be approved by the Secretary before the Applicant carries out any second workings covered by the plan; (c) include detailed plans of existing and proposed first and second workings and any associated surface development, including any applicable adaptive management measures; (d) include detailed performance indicators for each of the performance measures in Tables 8 and 9; (e) provide revised predictions of the potential subsidence effects, subsidence impacts and environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent; (f) describe the measures that would be implemented to ensure compliance with the performance measures in Tables 8 and 9, and manage or remediate any impacts and/or environmental consequences; (g) include a Built Features Management Plan, which has been prepared in consultation with DRE and the owners of affected public infrastructure, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, and which • addresses in appropriate detail all items of public infrastructure and other public infrastructure and all classes of other built features; • has been prepared following appropriate consultation with the owner/s of potentially affected feature/s; • recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate all predicted impacts on potentially affected built features in a timely manner; and;	Compliant	<p>A summary of Extraction Plans are outlined below:</p> <table><thead><tr><th>Year</th><th>Longwalls</th><th>Extraction Plan Reference</th></tr></thead><tbody><tr><td>2016</td><td>MW10-11-12</td><td>MW 7-12 Extraction Plan (Extraction Plan 1)</td></tr><tr><td rowspan="3">2017</td><td>MW12</td><td>MW 7-12 Extraction Plan (Extraction Plan 1)</td></tr><tr><td>MW5A</td><td>MW 7-12 Extraction Plan – MW5A Mod (Extraction Plan 2 – Mod to EP1)</td></tr><tr><td>MW CV81</td><td>MW CV8 1-3 Extraction Plan (Extraction Plan 3)</td></tr><tr><td>2018</td><td>N1/S1</td><td>Miniwalls S1/N1 (Extraction Plan 4)</td></tr><tr><td>2019</td><td>N1/S1</td><td>Miniwalls S1/N1 (Extraction Plan 4)</td></tr></tbody></table> <p>There are other Extraction Plans that have not yet been approved or Chain Valley have not implemented. With the mining of MW5A, this is a modification to Extraction Plan 1 and does not contain a full set of documentation.</p> <p><u>Preparation:</u> a) Covered in EP 1, 3 and 4. These plans have been endorsed by Secretary with dates outlined in Section 2.1 of each report. b) Approval letters for EP1 - 4 were provided to the Audit team.; c) EP1 - 4 include detailed plans (including graphical plans) meeting this condition; d) EP 2 (Mod) not included. EP 2 - Section 4. EP 3 and 4 - Section 3.3. Also some performance measures included in Appendices; e) Detailed predictions by specialists summarised in EP reports. No predictions provided for EP 2 (Mod). Separate appendix for subsidence report; f) Subsidence Management sections are outlined in the EP 1,3 and 4. Subsidence Management also outlined in specific management plans required under the overarching EP; g) EP's have been approved by the DPE with no requirement to complete a Built Features Management Plan. Wording in EP 1 (Section 6) and EP 3 and 4 (Section 4).</p>	Year	Longwalls	Extraction Plan Reference	2016	MW10-11-12	MW 7-12 Extraction Plan (Extraction Plan 1)	2017	MW12	MW 7-12 Extraction Plan (Extraction Plan 1)	MW5A	MW 7-12 Extraction Plan – MW5A Mod (Extraction Plan 2 – Mod to EP1)	MW CV81	MW CV8 1-3 Extraction Plan (Extraction Plan 3)	2018	N1/S1	Miniwalls S1/N1 (Extraction Plan 4)	2019	N1/S1	Miniwalls S1/N1 (Extraction Plan 4)	
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			<p><u>Implementation:</u> A summary of subsidence monitoring is provided in the Annual Review. Although there is some analysis of subsidence impacts, there is no specific assessment of how the site has tracked against the key subsidence impact performance measures in Schedule 4 Condition 2 and 4 of this Development Consent.</p> <p>The 2017 Annual Review states exceedance of vertical subsidence over MW7-12.</p>	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																			
	(h) include a Benthic Communities Management Plan, which has been prepared in consultation with OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities, and which includes: • surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured; • benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities; • a program of ongoing seasonal monitoring of benthic species in both control and impact sites; • development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the monitoring and survey data collected; and • updating the model every 2 years using the most recent monitoring and survey data;	Administrative Non-Compliance	<p><u>Preparation:</u> Evidence of Benthic Communities Management Plans in EP 1, 3 and 4. Overall Extraction Plan and management plans have been approved by the DPE. No Benthic Communities Management Plan for EP 2 (Modification to EP 1). Plan updated for each EP. The Plans cover the requirements of the sub conditions. Evidence of consultation included in management plans.</p> <p><u>Implementation:</u> Evidence of bi-annual benthic communities monitoring during the Audit period. Reports are prepared every six months except no evidence of September 2018 report provided to SLR. Reports prepared by John and Emma Laxton. Results are also summarised in the Annual Review.</p> <p>There is no definition of what a 'minor' impact is in the Benthic Communities Management Plan or the bi-annual monitoring reports, with this being a subsidence performance criteria in Schedule 4 Condition 2. - <i>Minor environmental consequences including minor changes to species composition of distribution.</i></p> <p>There is no definitive guide as to what constitutes reporting of an incident or non - compliance ie. "What is greater than minor?" See Section 6 of May 2018 Benthic Communities Management Plan. As there is little interpretation of results against subsidence performance measures this is a <u>Admin Non - Compliance</u>.</p> <p>The Extraction Plan - EP3 (Appendix 1) outlines a Trigger Action Response Plan (TARP). It has triggers relating to statistical change in benthic communities. eg. Trigger Level 1 = ANOVA/ANOSIM level is approaching 5%. There is no discussion in the bi-annual reports about how the site is tracking against those triggers.</p>	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																			
	(i) include a Seagrass Management Plan, which has been prepared in consultation with OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on seagrass beds, and which includes: • a program of ongoing monitoring of seagrasses in both control and impact sites; and • a program to predict and manage subsidence impacts and environmental consequences to seagrass beds to ensure the performance measures in Table 8 are met;	Compliant	<p><u>Preparation:</u> Evidence of Seagrass Management Plans developed for EP1, 3 and 4. Evidence of trigger levels in Section 4.1 of the February 2018 document.</p> <p><u>Summary of Seagrass monitoring results from 2018 Annual Review.</u></p> <p><i>Seagrass cover has been high consistently at each transect since 2012, with seagrass health and condition being good.</i></p> <p><i>During the 2018 monitoring most sites reported similar results to the previous year and in most cases, when compared to the 2008 baseline data have shown a significant increase in seagrass cover. A significant portion of the sites sampled have achieved a 100% seagrass cover value.</i></p> <p><u>Implementation:</u> There is minimal wording in the Annual Seagrass Monitoring Report or the Annual Review regarding how the site has tracked against the Subsidence Performance Criteria eg. Negligible impacts (see Schedule 4 Condition 2). Based on monitoring results there appears to be negligible change. The Seagrass Management Plan defines negligible impacts, however this definition is not based on quantitative data.</p> <p>There is little mention of how the site has tracked against the trigger levels in Section 4.1 of the February 2018 Seagrass Management Plan within the Annual Review. There is some mention of this in the 2018 Seagrass Monitoring Report, including Table 7.2 of the 2018 report which highlights changes where there has been a 20% change.</p>	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.																			
	(j) include a Public Safety Management Plan, which has been prepared in consultation with DRE, to ensure public safety; (k) include a Subsidence Monitoring Program which has been prepared in consultation with DRE, to: • provide data to assist with the management of the risks associated with subsidence; • validates the subsidence predictions; • analyses the relationship between the predicted and resulting subsidence effects and predicted and resulting impacts under the plan and any ensuing environmental consequences; and • informs the contingency plan and adaptive management process; (l) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 8 and 9, or where any such exceedance appears likely; (m) include appropriate revisions to the Rehabilitation Management Plan required under Condition 28 of Schedule 3; and (n) include a program to collect sufficient baseline data for future Extraction Plans.		<p>j) Public Safety Management Plans prepared for EP 3 and 4. Not required for EP1 and 2, with these EP's being approved by the DPE; k) Subsidence Monitoring Program developed for EP 1, 3 and 4. Meets requirements of consent; l) Subsidence Management TARP's have been completed for EP 3 and 4. These have sufficient detail. No TARP for EP1, however this</p>																				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
	<p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Notes:</p> <ul style="list-style-type: none">• To identify the underground mining areas approved under this consent referred to in this condition, see Appendix 3.• This condition does not limit secondary extraction under a Subsidence Management Plan approved as at the date of this consent.	Compliant	document was prepared in 2013 (outside current audit period); m) Rehabilitation Management Plan attached to EP's; and n) Monitoring outlined in the Subsidence Monitoring Program.	
8	<p>The Applicant shall ensure that the management plans required under conditions 7(g)-(j) above include:</p> <p>(a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent; and</p> <p>(b) a detailed description of the measures that would be implemented to remediate predicted impacts.</p>	Compliant	This information is available in management plans.	
First Workings				
9	<p>The Applicant shall not carry out first workings on site that are not generally in accordance with the approved mine plan without written approval of the Secretary.</p>	Compliant	Revised first workings approval for the North Mining Area. 20 July 2018. Miniwalls N1/S1.	
9A	<p>Within 3 months of the approval of MOD 1, the Applicant shall produce and subsequently implement a Built Features Management Plan that considers surface infrastructure potentially affected by the first workings of the Underground Linkage between Chain Valley Colliery and Mannering Colliery, including WCS's MP01 sewer rising main, TransGrid's electricity transmission assets and infrastructure associated with the Vales Point Power Station, to the satisfaction of the Secretary.</p>	Not Triggered	<p>This is a historical condition. Wording from prior Audit report. Not applicable to this audit period.</p> <p>See CVC Link Road Built Features Management System Plan MSP-19193 dated 18/05/15. LakeCoal sought an extension from DP&E to the date required to submit the Built Features Management System Plan via letter on 11/02/15. Viewed the response letter from DP&E dated 13/02/15 confirming that an extension for submission date to 27/05/15 was approved. Viewed letter from DP&E dated 4/06/15 approving the CVC Link Road Built Features Management System Plan as submitted on 18/05/15.</p>	
Payment of Reasonable Costs				
10	<p>The Applicant shall pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to review the adequacy of any aspect of an Extraction Plan.</p>	Compliant	<p>Evidence of report provided by Delta Coal titled:</p> <p>Subsidence Data Review for the Proposed Miniwalls CVB1 to CVB3 at Chain Valley Colliery (15 November 2017, DgS).</p>	
SCHEDULE 5 - ADDITIONAL PROCEDURES				
ADDITIONAL PROCEDURES				
NOTIFICATION OF LANDOWNERS				
1	<p>As soon as practicable after obtaining monitoring results showing:</p> <p>(a) an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and</p> <p>(b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).</p>	Administrative Non-Compliance	<p>a) 2018 - Short term PM10 non - compliances on 3 April 2018, 18 July 2018 and 4 December 2018. For 2018 there was evidence provided to SLR through correspondence with EPA that these dust events were regional. There was however no evidence provided of contact with 'affected landowners' (<u>Admin Non - Compliance</u>).</p> <p>2017 - Noise non - compliance in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. No evidence of notifying 'affected landowner/s'.</p> <p>2016 - Exceedance of daily discharge limit at LDP1 on January 2016 as a result of heavy rainfall (SLR believes no affected landowners, therefore no notification required).</p> <p>Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring.</p> <p>b) No evidence that the 'Mine Dust and You' fact sheet was provided for 2018 dust exceedances for 'affected landowners'. However as these events were proven to be regional, the auditors do not believe this is required for the 2018 exceedances.</p>	<p>Define who are potentially 'affected landowners' in the Air Quality Management Plan?</p> <p>Affected landowners should be contacted when there is a non - compliance relating to dust or noise. This should be completed even if it is a regional dust event as Delta Coal are still recording it as a non - compliance in the Annual Review.</p>
INDEPENDENT REVIEW				
2	<p>If an owner of privately-owned land considers the development to be exceeding the relevant criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land.</p> <p>If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall:</p> <p>(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:</p> <ul style="list-style-type: none">• consult with the landowner to determine his/her concerns;• conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and• if the development is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and <p>(b) give the Secretary and landowner a copy of the independent review.</p>	Not Triggered	<p>Environment and Community Co-ordinator provided the site complaints records.</p> <p>Based on discussions with the Environment and Community Co-ordinator there was a complaint to the EPA in August 2018 regarding noise, dust and vibration. Other complaints have also been received during the audit period.</p> <p>Based on discussions with the Environment and Community Co-ordinator there was no request for an independent review.</p>	
SCHEDULE 6 - ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING				
ENVIRONMENTAL MANAGEMENT				
Environmental Management Strategy				
1	<p>1. The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:</p> <p>(a) be submitted to the Secretary for approval within 7 months of the date of this consent;</p> <p>(b) provide the strategic framework for environmental management of the development;</p> <p>(c) identify the statutory approvals that apply to the development;</p> <p>(d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;</p> <p>(e) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none">• keep the local community and relevant agencies informed about the operation and environmental performance of the development;• receive, handle, respond to, and record complaints;• resolve any disputes that may arise during the course of the development;• respond to any non-compliance;• respond to emergencies; and <p>(f) include:</p> <ul style="list-style-type: none">• copies of any strategies, plans and programs approved under the conditions of this consent; and• a clear plan depicting all the monitoring required to be carried out under the conditions of this consent. <p>The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.</p>	Administrative Non-Compliance	<p>EMS Document is dated 12 October 2012.The EMS was approved by DP&E with a letter dated 6/11/12. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>No evidence that the EMS was updated following the last audit or other modifications.</p> <p>Preparation:</p> <p>a) - NA as outside audit period;</p> <p>b) Framework provided as part of document;</p> <p>c) Approvals are listed but are out of date;</p> <p>d) Section 9.5;</p> <p>e) Covered in Several Sections 8-11;</p> <p>f) Plans listed in Section 9.</p> <p>Implementation:</p> <p>There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (<u>Admin Non - Compliance</u>).</p> <p>The EMS is supposed to be reviewed every three years. Last review was 2012, therefore <u>Admin Non - Compliance.</u></p>	<p>Prepare a cross referencing table outlining where sub conditions have been covered.</p> <p>Ensure plans are reviewed as per Schedule 6 Condition 5.</p> <p>Include Schedule 5 Condition 2 requirement in the EMS to notify landowners of exceedances 'as soon as practical'. Define a time period for as soon as practical.</p>
Adaptive Management				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
2	<p>The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p> <p>(c) implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary.</p>	Non-Compliant (Low Risk)	<p>There have been some exceedances of criteria during the audit period.</p> <p>a) Exceedances noted for air (regional dust), noise and a discharge volume issue during the audit period. Also non compliance relating to subsidence which is outlined in the 2017 Annual Review. Evidence of exceedance/incident reports provided;</p> <p>b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred;</p> <p>c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance.</p> <p>Exceedances have generally been investigated with no further recommendations.</p>	
Management Plan Requirements				
3	<p>The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) detailed baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> the relevant statutory requirements (including any relevant approval, licence or lease conditions); any relevant limits or performance measures/criteria; the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; <p>(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> impacts and environmental performance of the development; effectiveness of any management measures (see c above); <p>(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> incidents; complaints; non-compliances with statutory requirements; and exceedances of the impact assessment criteria and/or performance criteria; and <p>(h) a protocol for periodic review of the plan.</p> <p>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</p>	Compliant	<p>DPE provided a letter to LakeCoal on 29 August 2016 outlining that:</p> <p><i>'With the exception of the Air Quality Management Plan (AQMP), we are satisfied that Chain Valley Colliery has a comprehensive suite of approved management plans and strategies in place (subject to the proposed revision program outlined in your letter dated 28 July 2016).'</i></p> <p>That letter committed to all the management plans being updated in late 2016 and early 2017. That has not been completed. Despite this, the plans contain the relevant aspects of this condition.</p> <p>The all management plan condition has been reviewed for the site management plans, with the exception of the EMS and the Extraction Plan (not required).</p> <p>Condition requirements a) - h) have generally been covered by the site management plans therefore this condition is compliant. However there is little information regarding contingency response for some plans. It is noted that plans do not contain a checklist of this condition.</p>	<p>All management plans require updating due to the length of time since the previous reviews. Include in a Delta Coal template.</p> <p>Ensure there is a cross referencing table covering this condition in management plans.</p> <p>Additional detail including Trigger, Action, Response Tables (contingency plan) should be developed in the next round of management plan updates.</p>
Annual Review				
4	<p>By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;</p> <p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the past calendar year, which includes a comparison of these results against the:</p> <ul style="list-style-type: none"> relevant statutory requirements, limits or performance measures/criteria; requirements of any plan or program required under this consent; monitoring results of previous years; and relevant predictions in the documents listed in condition 2 of Schedule 2; <p>(c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the development;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.</p>	Administrative Non-Compliance	<p>The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA.</p> <p>a) Section 1 and 2;</p> <p>b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence;</p> <p>c) Section 7 - however this is different to the Annual Review guidelines;</p> <p>d) Trends covered for water management and air quality;</p> <p>e) Limited information on this condition in the Annual Reviews;</p> <p>f) Section 8;</p> <p>The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link:</p> <p>https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~media/3AA21D35168042FE813DD0FB92E00E58.aspx</p> <p>Therefore Admin Non - Compliance.</p>	<p>The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.</p> <p>Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p>
Revision of Strategies, Plans and Programs				
5	<p>Within 3 months of:</p> <p>(a) the submission of an annual review under Condition 4 above;</p> <p>(b) the submission of an incident report under Condition 7 below;</p> <p>(c) the submission of an audit report under Condition 9 below; or</p> <p>(d) any modification to the conditions of this consent, (unless the conditions require otherwise),</p> <p>the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.</p> <p>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.</p>	Administrative Non-Compliance	<p>This timing has not been met. Several of the management plans were not updated since the previous audit.</p>	<p>Include statement in future Annual Reviews stating that Management Plans have been reviewed and state which management plans will or will not be updated within 3 months.</p> <p>Develop and implement a plan to update Chain Valley's Strategies, Plans and Programs.</p>
Community Consultative Committee				
6	<p>The Applicant shall continue to operate a Community Consultative Committee (CCC) for the development to the satisfaction of the Secretary. This CCC must be operated in accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Developments (Department of Planning, 2007, or its latest version).</p> <p>Notes:</p> <ul style="list-style-type: none"> The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent. In accordance with the guideline, the Committee should be comprised of an independent chair and appropriate representation from the Applicant, Council, recognised environmental groups and the local community. In operating the CCC, the Department will accept the continued representation from existing CCC members. 	Compliant	<p>Evidence if CCC meeting minutes on website across the audit period.</p> <p>CCC appears to operate as per the guidelines.</p> <p>CCC committee members outlined in the Annual Review.</p>	
REPORTING				
Incident Reporting				
7	<p>The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.</p>	Administrative Non-Compliance	<p>Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews.</p> <p>No evidence of any incident causing material harm requiring immediate notification.</p> <p>Evidence of notification to Secretary and EPA for dust incidents in 2018. One incident occurred on 18 July 2018, with the site finding this non compliance on 1 August 2018. The exceedance was then reported on 10 August 2018 (greater than 7 days - Admin Non - Compliance). It appears that short term dust exceedances are only determined during the monthly data download, with reporting some times occurring two to three weeks after an incident occurs. The two other dust exceedances in 2018 appear to have been reported as per this condition.</p> <p>2017 - Noise non - compliance in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. Greater than 7 days - Admin Non - Compliance.</p> <p>There was a non - compliance relating to an exceedance of predicted subsidence. The non - compliance was determined based on bathymetric surveys (October 2017) but was not reported (as per Exceedance Report) until 13 December 2017.</p>	<p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p> <p>Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).</p>
Regular Reporting				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
8	The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Administrative Non-Compliance	<p>Evidence of reporting on the Lake Coal and Delta Coal website. Note Schedule 3 Condition 1 outlines requirements to report transport.</p> <p>The Applicant shall: (a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and (b) make these records publicly available on its website at the end of each calendar quarter.</p> <p>Admin Non - Compliance: This has not been completed.</p> <p>No EIS's shown on the LakeCoal or Delta Coal website.</p> <p>Information now available on the Delta Coal website. However no management plans and EIS's are on the website.</p> <p>No Rehabilitation Management Plan was on the website.</p> <p>No noise monitoring reports on website.</p>	Ensure website reporting meets the conditions of the Development Consent.
INDEPENDENT ENVIRONMENTAL AUDIT				
9	<p>By the end of February 2016 (or other such timing as agreed by the Secretary), and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:</p> <p>(a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; (b) include consultation with the relevant agencies; (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals); (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and (e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under the abovementioned approvals.</p> <p>Note: This audit team must be led by a suitably qualified auditor and include experts in any field specified by the Secretary.</p>	Compliant	<p>Evidence of Audit from Hanson Bailey dated July 2016. The audit covered the period from 1 November 2012 - 31 December 2015.</p> <p>a) 2016 report prepared by Suitably qualified experts - Hansen Bailey who were endorsed by the DPE; b) Evidence of consultation with agencies - Section 1.5.3 and Table 4. c) Performance assessed as per this condition; d) Relevant plans assessed; e) Recommendations proposed.</p>	
10	Within 6 weeks of the completion of this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.	Administrative Non-Compliance	<p>No evidence has been provided of the submission of the previous audit report.</p> <p>The submission timing for this audit has been extended by the DPE until 25 June 2019.</p>	
ACCESS TO INFORMATION				
11	<p>The Applicant shall:</p> <p>(a) make copies of the following publicly available on its website:</p> <ul style="list-style-type: none"> • the EIS; • all current statutory approvals for the development; • all approved strategies, plans and programs required under the conditions of this consent; • a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; • a complaints register (updated monthly); • minutes of CCC meetings; • the Annual Reviews of the development; • any Independent Environmental Audit, and any other audit, and the Applicant's response to the recommendations in these audits; • any other matter required by the Secretary; and <p>(b) keep this information up-to-date, to the satisfaction of the Secretary.</p>	Administrative Non-Compliance	<p>a) and b) Copies of this information is still available on the Lakecoal website. With the exception of EIS's, <u>Admin Non - Compliant</u>.</p> <p>Information now available on the Delta Coal website. However no management plans and EIS's are on the website.</p> <p>No Rehabilitation Management Plan on the website.</p> <p>No noise monitoring reports on website.</p>	Ensure all relevant information is brought across to the Delta Coal website.
NOISE COMPLIANCE ASSESSMENT				
Applicable Meteorological Conditions				
1	<p>The noise criteria in Table 1 of the conditions are to apply under all meteorological conditions except the following:</p> <p>(a) during periods of rain or hail; (b) average wind speed at microphone height exceeds 5 m/s; (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or (d) temperature inversion conditions greater than 3°C/100 m.</p>	Compliant	Quarterly noise monitoring reports indicate that noise monitoring is with appropriate weather exclusion methodology.	
Determination of Meteorological Conditions				
2	Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station described in condition 15 of schedule 3.	Compliant	<p>Evidence of meteorological data. Spreadsheet provided with measurements.</p> <p>2012 audit confirmed that DPE and EPA (under revision of EPL 1770) approved use of Mannering Colliery monitor as representative of Chain Valley and ability to calculate temperature lapse rate by use of sigma-theta method.</p>	
Compliance Monitoring				
3	Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.	Compliant	Operator attended noise monitoring conducted on a quarterly basis. Meets this condition.	
4	This monitoring must be carried out at least 4 times in each calendar year (ie at least once every 3 months), unless the Secretary directs otherwise.	Compliant	Operator attended noise monitoring conducted on a quarterly basis. Meets this condition.	
5	<p>Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to:</p> <p>(a) monitoring locations for the collection of representative noise data; (b) meteorological conditions during which collection of noise data is not appropriate; (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.</p>	Compliant	Quarterly noise monitoring reports indicate that noise monitoring is conducted using calibrated sound level meters and acoustic calibrators in accordance with the relevant standards and monitoring is conducted at representative locations. Modifying factors, are applied when triggered as evidenced in the Q4 2017 exceedance at R22 where a low frequency penalty was applicable to the measured CVC noise contribution.	

Statement of Commitments - SSD 5465

Audit Period = 1 January 2016 – 5 April 2019

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
APPENDIX 9 - STATEMENT OF COMMITMENTS				
Item	Commitment			
Groundwater	<p>In addition to the management and mitigation measures undertaken at the Colliery for groundwater as described in the WMP, the following commitments specific to the Proposal will be undertaken. Some commitments are already undertaken under the WMP. LakeCoal will:</p> <ul style="list-style-type: none">• assess whether abnormal or significant groundwater inflow changes occur in the active panels;• maintain the water flow monitoring appliances used to measure pumped water volumes to and from the Colliery in good working order;• maintain and plot records of daily total Colliery water pumping and annually communicate an interpretation of the findings within the Annual Review. A copy of the Annual Review will be supplied to DPI Water;• measure water levels and quality within private bores, where access is possible, in relevant areas to assess if any adverse effects occur due to subsidence from the Proposal; and• develop groundwater assessment criteria and triggers, response protocols and contingency measures. Although it is not anticipated that private bore yields would be impacted due to subsidence, should such a situated arise, LakeCoal would provide an alternative water supply until the impacted bore recovers. <p>Any monitored or reported adverse impacts on the yield, saturated thickness or quality of a private registered bore will be investigated by LakeCoal. In the event of a groundwater level drop of over 2 m for a period of two months or more, a notable increase in iron hydroxide, or an adverse change in salinity as a consequence of subsidence, LakeCoal will enter into negotiations with the affected landowners and the Mine Subsidence Board with the intent of formulating an agreement which provides for one, or a combination of:</p> <ul style="list-style-type: none">• re-establishment of saturated thickness in the affected bore(s) through bore deepening;• establishment of additional bores to provide a yield at least equivalent to the affected bore prior to mining;• provision of access to alternative sources of water; and/or• compensation to reflect increased water extraction costs (eg. due to lowering pumps or installation of additional or alternative pumping equipment).	Compliant	<p>Evidence of the Water Management Plan.</p> <p>Evidence of groundwater monitoring, including results in Annual Reviews.</p> <p>Annual Review supplied to Doi Water</p> <p>Based on discussions with the Environment and Community Co-ordinator, groundwater monitoring on private bores is completed 'where property access is granted'. There has been an attempt from LakeCoal (letter dated 23 April 2012) to contact the council to obtain further details of the owners of groundwater bores. No further information was provided to SLR in terms of whether the owners were contacted. As an attempt has been made to contact property owners regarding groundwater monitoring this condition has been called compliant.</p>	Attempt to contact property owners and ask for permission to monitor the private groundwater bores. Some additional consultation with Council may be required.
Surface water	<p>Management and monitoring of surface water will continue to be undertaken in accordance with the Colliery's WMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none">• update the WMP to include any changes as a result of the proposed modification;• limit the main underground pumps to a maximum pump out rate of 10.5 ML/day within 12 months of approval;• request an amendment of EPL1770 to include a condition on the daily discharge volume limit stating that "Exceedance of the volume limit for Point 1 is permitted only if the discharge from Point 1 occurs solely as a result of rainfall at the premises exceeding 10 mm during the 24 hours immediately prior to commencement of the discharge";• undertake daily measurements of discharge volumes and report publicly on a monthly basis via LakeCoal's website;• continue collection of baseline water quality data to aid in the development of appropriate discharge water quality trigger values;• engage suitably qualified expert to conduct an assessment of the metals contained within discharge water in accordance with the ANZECC water quality guidelines and provide this assessment to the EPA by 31 December 2013;• investigate water saving measures to minimise the amount of potable water required from WSC for Colliery operations;• quantify the groundwater storage capacity in the Great Northern and Wallarah Seams;• continue effluent monitoring regime of receiving soils from the AVTS in accordance with the parameters and testing frequencies identified in the Colliery's WMP. The results of this monitoring program will be reviewed by a suitably qualified expert and used to determine the appropriateness of the existing irrigation area to receive this effluent;• develop a program to monitor creek line channel stability and the health of riparian vegetation within Swindles Creek. Monitoring will be undertaken in accordance with Section 8.5.2 of the Surface Water Impact Assessment (EIS Appendix E) and incorporated into the Colliery's WMP or Biodiversity Management Plan; and• record monitoring data in accordance with the Colliery's WMP and EPL 1770. Monitoring data will be interpreted as it is received to ensure appropriate operational guidance on monitoring water quality within desired parameters. Results of water quality monitoring will be reported in the Annual Review and made available to the CCC, as well as Wyong and Lake Macquarie Councils.	Administrative Non-Compliance	<p>Evidence of the Water Management Plan.</p> <p>Evidence of surface water monitoring, including results in Annual Reviews.</p> <p><u>Admin Non - Compliant:</u> Evidence of photos provided of channel stability monitoring of Swindles Creek, however it does not appear to have been completed in accordance with Section 5.4 of the Water Management Plan. No evidence of:</p> <ul style="list-style-type: none">• <i>Documenting general observations of water quantity and quality;</i>• <i>Documenting locations and dimensions of significant erosive or depositional features;</i>• <i>Documenting evidence of erosion and exposed soils;</i>• <i>Documenting general indicators of stream health, including abundance of flora and fauna; and</i>• <i>Review and comparison of results to previous rounds of monitoring.</i> <p>There is also no timing proposed for inspections in the Water Management Plan.</p>	A separate report should be completed for Stream Health Channel Flow and Riparian Vegetation Monitoring. This should compare results from previous inspections. Information to be included in the Annual Review.
Noise	<p>Management and monitoring of noise will continue to be undertaken in accordance with the Colliery's NMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none">• continue attended compliance monitoring on site which will be used to identify potential hot spots and primary noise sources;• continue real-time noise monitoring alerts to site personnel to enable implementation of any required rapid noise management initiatives;• manage potential non-compliance through a noise complaint handling and response system, including the identification of responsible sources to enable targeted remedial action;• assess if further noise mitigation options for the ventilation fans are reasonable and feasible following the receipt of attenuation proposals; and• discuss potential management measures or agreement options with the landowner at 275 Cams Boulevard, following receipt of proposals from acoustics specialists. <p>In addition to the above, LakeCoal is committed to the progressive implementation of feasible measures to target long term noise goals which are designed to reduce noise emissions from the Colliery. Long term options for investigation include:</p> <ul style="list-style-type: none">• modification to belt/movement alarms;• investigation of surface conveyer and coal preparation equipment, to determine if noise reductions are possible;• identifying sound attenuation options for the surface bulldozer and front end loader;• strategic placement of acoustic barriers;• attenuation for the surface screener/shaker;• installation of quiet rollers for surface conveyor belts;• acoustic treatments around compressors; and• the use of a conveyor stacker for product coal stockpiling.	Administrative Non-Compliance	<p>No evidence of review or update of Noise Management Plan during audit period. <u>Admin Non - Compliance.</u></p> <p>Real time noise monitoring system removed during the audit period and has not been replaced.</p> <p>No evidence of progressive noise mitigation implementation</p>	<p>Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures.</p> <p>Ensure accurate/consistent monitoring results are presented in Annual Reviews.</p> <p>The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not Chain Valley. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.</p>
Air Quality and greenhouse gases	<p>Management and monitoring of air quality and greenhouse gases will continue to be undertaken in accordance with the Colliery's AQCHCMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none">• investigate the use of a stacker to replace hauling between current conveyor system and stockpiles;• undertake GHG monitoring comprising measurement of carbon dioxide and methane at the ventilation shaft and fan sites; and• record and report annual diesel, oil, grease, acetylene and electricity use to fulfil National Greenhouse and Energy Reporting Scheme requirements.	Compliant	<p>The MP covers this requirement. Recording of data in Annual Reviews and site records.</p>	
Traffic and transport	<p>Management and monitoring of traffic and transport will continue to be undertaken in accordance with the Colliery's RTP. In addition, LakeCoal will continue to investigate alternative options for transporting export coal to the PWCS, specifically the preferred rail transport option, requiring the construction of a private haul road to the VPPS coal unloading facility and associated infrastructure upgrades. In addition, LakeCoal will:</p> <ul style="list-style-type: none">• provide a detailed feasibility report of rail transport options to DP&I as part of the next coal transport options report to be submitted, by 31 December 2014. Should the report identify that coal transport via rail is feasible, and subject to obtaining necessary agreements, LakeCoal will prepare and lodge an application to modify the relevant approval so as to permit the installation and operation of facilities necessary to undertake rail transport of coal to PWCS;• discuss the potential to utilise proposed rail loading facilities associated with the Wallarah 2 Coal Project, following this project receiving approval; and• investigate options to reduce peak hour traffic would be investigated including potentially limiting the peak hourly volumes of the Colliery truck traffic which would be permitted to travel via this intersection should the Colliery not be using rail transport for export coal by five years from the granting of development consent. Alternatively, a pro rata financial contribution to the cost of installing traffic signals at the southbound intersection of the F3 and Sparks Road interchange could be made commensurate with the percentage of Colliery generated traffic using the intersection.	Not Triggered	<p>Evidence of document dated 10 December 2014. Outside of audit period, therefore not triggered for this period.</p>	
Subsidence	<p>Management and monitoring of subsidence will continue to be undertaken in accordance with the Colliery's SMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none">• provide raw subsidence survey data to OEH within 7 days of completion;• undertake annual bathymetric surveys of the lake bed to determine actual subsidence and undertake a comparison with predicted levels. Should measured subsidence significantly exceed predicted levels, LakeCoal will review future panel designs to limit future impacts to acceptable levels;• install a new foreshore survey line above the first and second workings panels where the underground linkage passes beneath them and possibly extending from the foreshore to the point of connection with the MC workings;• inspect existing conditions in the Fassifern Seam and undertake geotechnical and geological mapping in the roadways proximate to the proposed linkage in both CVC and MC workings;• complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB. Development below the foreshore will be limited to two headings only until floor conditions can be confirmed;• develop infrastructure monitoring and management plans in consultation with infrastructure owners and other relevant stakeholders;• re-establish and re-survey Survey Line 24;• install a suitable survey line at the starting end above Great Northern Seam first workings to provide early warning monitoring data for the tension towers and switchyard structures;• monitor tension and suspension towers and switchyard conductor suspension frames directly above the panels, foreshore and adjacent inlet canal wall;• ensure that a monitoring and management plan for the MP01 sewer rising main is in place prior to commencement of mining that may impact Council's infrastructure; and• complete an annual subsidence report and make this report publicly available on the Colliery's website.	Non-Compliant (Low Risk)	<p>Subsidence is managed under Extraction Plans, not SMP's. SMP's cover past mining areas.</p> <p>Separate Extraction Plan requirements including monitoring and reporting.</p> <p>Some of the aspects in this condition have not been triggered, however due to a lack of a defined subsidence report it has been difficult for SLR to determine which conditions are not triggered and which are relevant.</p> <p>Subsidence impacts are reported in the Annual Review, however it would be preferable if a standalone subsidence report was prepared. There is not a separate Annual Subsidence Report, therefore <u>Admin Non - Compliant.</u></p> <p>No evidence of raw survey result being provided to OEH within 7 days of completion.<u>Admin Non - Compliant.</u></p> <p>No evidence provided regarding - "complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB"</p>	<p>Assess the subsidence conditions regarding the Statement of Commitments and review which conditions are applicable for current mining and proposed future operations.</p> <p>A separate subsidence impact assessment report should be prepared annually and appended to the Annual Review. This report should be prepared or peer reviewed by a subsidence specialist. This should assess subsidence performance measures from the Project Approval and triggers/commitments from the Extraction Plans.</p>

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Marine ecology	<p>Management and monitoring of marine ecology will continue to be undertaken in accordance with the Colliery's BCMP and SGMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will</p> <ul style="list-style-type: none">• revise the BCMP to include the sampling locations in the assessment of the Proposal;• undertake seasonal surveys (spring and autumn) for the Site as required under the BCMP;• commission additional independent sampling and analysis to validate results obtained during monitoring, and review future panel design if impacts due to subsidence are determined to be moderate or greater;• revise the SGMP to include the transect locations utilised in the assessment of the Proposal;• continue annual seagrass surveys/monitoring;• continue annual subsidence surveys (bathymetric surveys) and land based surveys;• include results from the BCMP and SGMP within the Colliery's Annual Review; and• make the Annual Review and annual subsidence surveys available on the Colliery's website.	Compliant	<p>Evidence of benthic organism and seagrass monitoring.</p> <p>Evidence of monitoring reports by independent consultants.</p> <p>Meets the requirements of this statement of commitments. However additional recommendation provided.</p>	See previous recommendations regarding biodiversity and Annual Reporting.
Terrestrial ecology	<p>In addition to the management and mitigation measures undertaken at the Colliery for terrestrial ecology as described in the BMP, the following commitments specific to the Proposal will be undertaken. Some commitments are already undertaken under the BMP. LakeCoal will:</p> <ul style="list-style-type: none">• investigate one of the following options in consultation with OEH to offset the biodiversity impacts arising from the proposed modification:<ul style="list-style-type: none">o provide \$10,000 of funding, which is equivalent to the biodiversity being lost (i.e. 5 credits x \$2,000 per credit) to existing environmental programs at the site which benefits the Swamp Sclerophyll EEC; oro consult with OEH to identify a suitable conservation program and provide \$10,000 of funding; oro purchase and retire 5 credits on the Biobanking register.• update the BMP to include the following:<ul style="list-style-type: none">o the completion of pre-disturbance surveys in the survey area for Black-eyed Susan, Leafless Tongue Orchid and Variable Midge Orchid during their flowering periods (July to December, November to February and September to October, respectively);o pre-disturbance surveys by an ecologist to determine the important components of vegetation communities and fauna habitats that should be preferentially retained in the APZs;o installation of delineation fencing around threatened flora populations (if found) to ensure their protection during development and maintenance of the APZs;o condition monitoring for threatened flora populations (if found);o retention of hollow-bearing trees in the APZs, where possible, with details to be included in a hollow tree register;o installation of nest boxes (or salvaged hollows) within the APZs under the supervision of a suitably qualified ecologist or wildlife carer to replace hollows where hollow-bearing trees cannot be retained;o measures for APZ maintenance that include weed control;o clearing of hollow-bearing trees (if required) under the supervision of a suitably qualified ecologist;o any injured fauna would be taken to the nearest veterinary hospital for treatment before release; ando relocation of suitable hollow-bearing felled trees adjacent to the APZs to create additional fauna habitat;	Compliant	<p>Evidence from 2016 Annual Review.</p> <p><i>LakeCoal provided an offset payment of \$10,000 for the proposed APZ's during the reporting period in accordance with the Statement of Commitment's in SSD 5465.</i> APZ's have been established.</p> <p>Evidence of weed management in biodiversity management report. Limited weeds onsite.</p> <p>Based on discussions with site no clearing of hollow bearing trees during the audit period.</p> <p>Biodiversity monitoring completed however no specific report provided, only data summary spreadsheets.</p>	<p>As per Schedule 3 Condition 20 recommendation.</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>The current monitoring is provided in a spreadsheet with an email summary. Prepare a small report outlining results, a comparison against trigger levels and potential reasons for changes.</p> <p>Prepare a separate section with short, medium and longterm measures in the Biodiversity Management Plan.</p>
	<ul style="list-style-type: none">• undertake the design of the dam embankment and spillway works in consultation with an ecologist to minimise potential impacts on the Swamp Oak Floodplain Forest EEC;• ensure pre-clearing surveys are undertaken by an ecologist to minimise the potential impact to fauna and significant vegetation prior to clearing works being undertaken within the embankment and spillway area;• clearly delineate the clearing footprint and cordon off surrounding vegetation as a 'no go' zone during works to the dam embankment and spillway;• minimise disturbance areas where possible by ensuring all stockpiling of materials, parking of machinery etc, is undertaken in previously cleared areas;• ensure that, wherever possible, dead standing timber and fallen timber will be avoided by any clearing works, or if required to be removed, be relocated into suitable habitat areas nearby;• ensure all equipment used for the earthworks associated with the dam embankment and spillway will be cleaned of excess soil potentially containing pathogens and weed seeds prior to entering the Site;• install sediment fencing surrounding the proposed earthwork areas, in accordance with a site-specific erosion and sediment control plan for the works;• ensure that in the event that sedimentation dam water is released from Dam 10 prior to the works being undertaken, it will be undertaken in a controlled manner over a number of days to ensure that the release does not result in significant erosion and sedimentation to the Swamp Oak Floodplain Forest;• continue the management and monitoring of flora and fauna in accordance with the BMP for the life of the mine, including:<ul style="list-style-type: none">- the condition and composition of the Swamp Oak Floodplain Forest area;- the condition of vegetation adjacent to the ventilation shaft and fans;- the location and distribution of weed infestations; and- the abundance and distribution of feral animal use.• noxious weeds will be removed and continually controlled from the pit top area, allowing for natural regeneration of vegetation;• weed invasion will be monitored as part of the Colliery's BMP; and• the condition of the EEC areas will be monitored through the Colliery's BMP.	Not Triggered	<p>Dam embankment work completed in 2014 which is outside of this period.</p> <p>Evidence of weed management provided. Weed management sighted during field inspection.</p>	
Heritage	<p>Management and monitoring of heritage will continue to be undertaken in accordance with the Colliery's HMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none">• review and revise the HMP to remove site #45-7-0154 and incorporate any other changes as a result of the proposed modification;• update the HMP following approval of the Proposal to include the extended area to which it relates;• ensure that should unanticipated Aboriginal or historic heritage artefacts be found during dam embankment and diversion works, work will cease and the site assessed by an archaeologist; and• ensure that in the unlikely event that skeletal remains are found during dam embankment and diversion works, work will cease immediately in the area and the NSW Police Coroner called to determine if the material is of Aboriginal origin. OEH and relevant Aboriginal community stakeholders will be notified if the remains are positively identified as being of Aboriginal origin to determine their appropriate management prior to works recommencing.	Administrative Non-Compliance	<p>The most recent date of the Heritage Management Plan is 23 June 2014. The highlighted condition is from MOD 2 (December 2015). Site 45-7-0154 is still included the document.</p> <p>Other aspects of this statement of commitments have been met.</p>	Update the Heritage Management Plan, including the removal of Site #45-7-0154.
Waste	<p>Management and monitoring of waste will continue to be undertaken in accordance with the Colliery's Waste Management Standard. In addition, LakeCoal will continue to try and improve its waste volumes and waste management practices in line with its objective for 60% of all wastes generated at the Colliery (excluding wastewater) to be recyclable or reusable.</p>	Compliant	<p>Waste management outlined in the Annual Reviews. Some minor waste management recommendations outlined in Schedule 3 Condition 23.</p>	
Hazards	<p>Management and monitoring of hazards will continue in accordance with the Colliery's existing hazard management measures. Periodic review of the effectiveness of existing measures will occur in accordance with the Colliery's safety management system and additional measures implemented as warranted.</p>	Note	<p>This is a safety condition, outside the scope of this audit.</p>	
Visual	<p>Management and monitoring of visual impacts will continue to be undertaken in accordance with the Colliery's existing commitment. In addition, LakeCoal will: ensure additional surface lighting at the Colliery complies with AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.</p>	Compliant	<p>The most recent lighting audit for Chain Valley is from 2013. Prepared by Wadco May 2013.</p> <p>The pit top area and ventilation shaft site are not dominant features of the landscape the pit top area is somewhat overshadowed by the adjacent power station. The ventilation fans were designed to maintain a relatively low profile, below the surrounding vegetation to ensure amenity and lighting impacts were minimised. Some lights have been removed, including those at the stockpile. There were no complaints to visual or lighting during the audit period.</p> <p>Minimal aspects have been installed at site since the previous audit, hence condition is compliant.</p>	

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Soil	Soil Management and monitoring of soils will continue to be undertaken in accordance with the Colliery's WMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will: <ul style="list-style-type: none"> • prevent disturbance of ASS where practicable during any construction activities; • prepare an ASSMP where there is potential that ASS will be disturbed; • test and handle any ASS disturbed in accordance with the ASSMP and treat or dispose of to an appropriately licensed facility; • limit the area of any disturbance at the surface infrastructure sites and period of exposure; • implement site management procedures such as watering of disturbed areas and unsecured stockpiles; • ensure relevant licences and management plans are in place for the correct storage and handling of hydrocarbons; • maintain suitable bunding around all hazardous liquid storage areas; • maintain oil separation facilities on the wash down sump for the treatment of oily water; and • remove all waste oil from site and dispose via a licensed external waste collection company. 	Compliant	Minimal disturbance at site, therefore no soil testing completed. Evidence of land farming areas for hydrocarbon soil. Evidence of oily water separator and management system. The field inspection generally noted that waste was stored well. However the following minor things were identified: <ul style="list-style-type: none"> * Some bins are not well labelled and contain a mix of substances; * Cardboard contained in some general waste bins; * 1 hydraulic oil drum not contained in bund; * Numerous empty oil drums stored on the side within bund. This may lead to some leakage of oil from drums; * 2 larger 44 gallon drums stored outside bund in a laydown area. Unknown substances. Numerous bins and spill containers were noted.	Ensure the minor waste management issues identified during the audit are rectified. <ul style="list-style-type: none"> * Improve bin labelling; * Ensure all hydrocarbon containers (empty or full) are stored within bunds.
Rehabilitation and mine closure	Rehabilitation will be undertaken in accordance with the Colliery's RMP and the MOP in force at the time. Detailed management and monitoring proposals for final rehabilitation will be included within a Mine Closure Plan to be prepared at least two years prior to cessation of mining activities.	Not Triggered	No area available for rehabilitation.	
Economic	LakeCoal will contribute \$0.035/t of coal from the Colliery into a dedicated community fund to improve public infrastructure and for the provision of community projects in the surrounding communities of Chain Valley Bay, Mannering Park, Summerland Point and Gwandalan.	Compliant	The VPA was not executed with the WSC within the required date - 23 December 2014. There were numerous attempts between 2013 to 2016 to execute this agreement (based on evidence from prior audit). The VPA was executed on 1 September 2016. Evidence of payment in the 2016, 2017 and 2018 Annual Reviews. Evidence of receipts from 19 March 2018 and 23 March 2017.	
Social	LakeCoal will continue to implement management measures and monitoring programs to prevent or minimise negative impacts and enhance positive impacts in accordance with its Environment and Community Policy. LakeCoal will: <ul style="list-style-type: none"> • maintain open and constructive communication with affected individuals and groups; • participate in the CCC; • provide environmental monitoring data and other relevant information in a timely manner via the LakeCoal website; • be responsive to community issues and actual and/or perceived impacts from the Colliery's activities; • work in partnership with stakeholders to address community needs; • ensure effective management of LakeCoal's social impacts; • liaise regularly with relevant government agencies and councils; • provide regular Colliery updates with landowners and local residents through the CCC; • continue payments, throughout the life of the Proposal, to the community fund established; and • consider individual sponsorship opportunities throughout the life of the Proposal. 	Compliant	<ul style="list-style-type: none"> * Evidence of CCC meeting minutes; * Monitoring data on the website; * Evidence of VPA payments; * Evidence of interactions with community through Delta Coal. 	
Other	LakeCoal will commit to only carrying out mining operations in the extension areas consistent with the development consent granted pursuant to this Proposal.	Compliant	Discharge locations sighted in the field inspection. Records of discharge volume and water quality outlined in Annual Reviews.	

Environment Protection Licence

Audit Period = 1 January 2016 – 5 April 2019

Condition Number	Condition	Compliance Status	Evidence	Recommended Action												
1 Administrative Conditions																
A1	What the licence authorises and regulates															
A1.1	<p>This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.</p> <p>Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.</p>	Compliant	In general activities completed in accordance with this licence.													
	<table><tr><th>Scheduled Activity</th><th>Fee Based Activity</th><th>Scale</th></tr><tr><td>Coal works</td><td>Coal works</td><td>0 - 2000000 T annual handing capacity</td></tr><tr><td>Mining for coal</td><td>Mining for coal</td><td>> 500000 - 2000000 T annual production capacity</td></tr></table>	Scheduled Activity	Fee Based Activity	Scale	Coal works	Coal works	0 - 2000000 T annual handing capacity	Mining for coal	Mining for coal	> 500000 - 2000000 T annual production capacity	Compliant	<p>From Annual Reviews:</p> <p>2018 - 0.4Mt 2017- 1.2Mt 2016 - 1.2Mt</p> <p>Within levels for 2019.</p>				
Scheduled Activity	Fee Based Activity	Scale														
Coal works	Coal works	0 - 2000000 T annual handing capacity														
Mining for coal	Mining for coal	> 500000 - 2000000 T annual production capacity														
A1.2	<p>The licensee must not produce by mining activities more than 1.5 million tonnes of coal within any calendar year.</p> <p>Note: These limits on the scale of the fee based activities are based on Project Approval SSD5465 granted under the S.89E of the Environmental Planning and Assessment Act 1979 which limits extraction to 1.5 million tonnes of run of mine (ROM) coal per calendar year.</p>	Compliant	Within limit during audit period.													
A2	Premises or plant to which this licence applies															
A2.1	The licence applies to the following premises:															
	<div><div><p>Premises Details</p><p>CHAIN VALLEY COLLIERY</p><p>CONSTRUCTION ROAD</p><p>CHAIN VALLEY BAY</p><p>NSW 2299</p></div><div><p>SURFACE PREMISES OF THE COLLIERY IDENTIFIED IN PLAN TITLED "EPL PREMISES PLAN FIGURE 2 - SURFACE EXTENTS" 12 MARCH 2015</p><p>DOC1619189 AND UNDERGROUND PREMISES (MINING FOR COAL) INCLUDES ONLY MINING FOR COAL IN THE FASSIFERN COAL SEAM AND GREAT NORTHERN COAL SEAM AS IDENTIFIED IN THE PLAN TITLED "FIGURE 1: GENERAL LAYOUT OF THE CHAIN VALLEY EXTENSION PROJECT" 28/1/14 ACCOMPANYING THE LICENCE APPLICATION DOC1416889 AND THE UNDERGROUND ROAD JOINING MANNERING COLLIERY TITLED "LOCATION OF UNDERGROUND LINKAGE" DOC14288896-92 ACCOMPANYING SSD5465-MOD 1 APPROVAL AND THE PLAN TITLED "EPL PREMISES PLAN - FIG 1 PROJECT EXTENTS, MONITORING AND COMPLIANCE LOCATIONS" 12 MARCH 2015 DOC1619189.</p></div></div>	Note	Note													
	Note: An updated plan of the premises must be provided to the EPA by the licensee, to the EPA's specifications.	Note														
A3	Other activities															
A3.1	This licence applies to all other activities carried on at the premises, including:															
	<div><div>Ancillary Activity</div><div>Sewage Treatment Systems</div></div>	Compliant	Evidence of sewage system certification.													
A4	Information supplied to the EPA															
A4.1	<p>Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.</p> <p>In this condition the reference to "the licence application" includes a reference to:</p> <p>a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and</p> <p>b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.</p>	Compliant	Works generally carried out in accordance with this condition.													
2 Discharges to Air and Water and Applications to Land																
P1	Location of monitoring/discharge points and areas															
P1.1	The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.															
	<table><tr><th colspan="4">Air</th></tr><tr><th>EPA identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr><tr><td>25</td><td>Air Monitoring Point Particulate Matter PM10 Thermo Fisher Scientific TEOM 140S</td><td></td><td>MPSTP Compound 220 Tall Timbers Road Doyalson NSW 2262</td></tr></table>	Air				EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	25	Air Monitoring Point Particulate Matter PM10 Thermo Fisher Scientific TEOM 140S		MPSTP Compound 220 Tall Timbers Road Doyalson NSW 2262	Compliant	Evidence of PM10 monitor. Evidence of data.	
Air																
EPA identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description													
25	Air Monitoring Point Particulate Matter PM10 Thermo Fisher Scientific TEOM 140S		MPSTP Compound 220 Tall Timbers Road Doyalson NSW 2262													
P1.2	The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.	Note	Note													
P1.3	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.															

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																														
	<table><tr><th colspan="4">Water and land</th></tr><tr><th>EPA Identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr><tr><td>1</td><td>Discharge to waters Discharge quality and volume monitoring</td><td>Discharge to waters Discharge quality and volume monitoring</td><td>Discharge to waters and monitoring from final settlement pond via low level discharge identified as EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project Extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.</td></tr><tr><td>27</td><td>Discharge to waters Discharge quality and volume monitoring</td><td>Discharge to waters Discharge quality and volume monitoring</td><td>Discharge to waters via concrete high level spillway from final settlement pond adjacent to EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.</td></tr></table>	Water and land				EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	1	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters and monitoring from final settlement pond via low level discharge identified as EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project Extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.	27	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters via concrete high level spillway from final settlement pond adjacent to EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.	Compliant	Discharge locations sighted in the field inspection. Records of discharge volume and water quality outlined in Annual Reviews.															
Water and land																																		
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description																															
1	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters and monitoring from final settlement pond via low level discharge identified as EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project Extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.																															
27	Discharge to waters Discharge quality and volume monitoring	Discharge to waters Discharge quality and volume monitoring	Discharge to waters via concrete high level spillway from final settlement pond adjacent to EPA 1 on plan of the premises titled "EPL premises Plan Fig 1 Project extents, Monitoring and Compliance Locations" dated 12 March 2015 DOC15/83810.																															
P1.4	The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.	Compliant	Based on a review of monitoring data the site has been compliant with monitoring locations.																															
	<table><tr><th colspan="3">Noise</th></tr><tr><th>EPA identification no.</th><th>Type of monitoring point</th><th>Location description</th></tr><tr><td>9</td><td>Noise monitoring</td><td>(R8) 109 Griffith Street, MANNERING PARK, 2259</td></tr><tr><td>12</td><td>Noise monitoring</td><td>(R11) 35 Lakeshore Avenue, CHAIN VALLEY BAY, 2259</td></tr><tr><td>13</td><td>Noise monitoring</td><td>(R12) 20 Lakeshore Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259</td></tr><tr><td>14</td><td>Noise monitoring</td><td>(R13) 33 Karoola Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259</td></tr><tr><td>16</td><td>Noise monitoring</td><td>(R15) Short Street, Macquarie Shores, CHAIN VALLEY BAY, 2259</td></tr><tr><td>20</td><td>Noise monitoring</td><td>(R19) 2 Sunset Parade, CHAIN VALLEY BAY, 2259</td></tr><tr><td>23</td><td>Noise monitoring</td><td>(R22) 27/3a Carns Boulevard, CHAIN VALLEY BAY, 2259</td></tr><tr><td>26</td><td>Meteorological Station</td><td>Rutleys Road Doyalson</td></tr></table>			Noise			EPA identification no.	Type of monitoring point	Location description	9	Noise monitoring	(R8) 109 Griffith Street, MANNERING PARK, 2259	12	Noise monitoring	(R11) 35 Lakeshore Avenue, CHAIN VALLEY BAY, 2259	13	Noise monitoring	(R12) 20 Lakeshore Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259	14	Noise monitoring	(R13) 33 Karoola Avenue, Kingfisher Shores, CHAIN VALLEY BAY, 2259	16	Noise monitoring	(R15) Short Street, Macquarie Shores, CHAIN VALLEY BAY, 2259	20	Noise monitoring	(R19) 2 Sunset Parade, CHAIN VALLEY BAY, 2259	23	Noise monitoring	(R22) 27/3a Carns Boulevard, CHAIN VALLEY BAY, 2259	26	Meteorological Station	Rutleys Road Doyalson	
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26	Meteorological Station	Rutleys Road Doyalson																																
2 Limit Conditions																																		
L1	Pollution of waters	Compliant	Based on the information provided to SLR, the site has generally complied with these requirements. No evidence of material harm.																															
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.																																	
L2	Concentration limits	Compliant	Evidence of discharge water quality in Annual Review. Within criteria of this condition between 2016 - 2018 Annual Reviews. Based on information provided by the Environment and Community Co-ordinator there have been no exceedances during 2019.	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.																														
L2.1	For each monitoring/discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.																																	
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.																																	
L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table/s.																																	
L2.4	Water and/or Land Concentration Limits																																	
	<table><tr><th colspan="6">POINT 1.27</th></tr><tr><th>Pollutant</th><th>Units of Measure</th><th>50 percentile concentration limit</th><th>90 percentile concentration limit</th><th>30QM concentration limit</th><th>100 percentile concentration limit</th></tr><tr><td>Faecal Coliforms</td><td>colony forming units per 100 millilitres</td><td></td><td></td><td></td><td>200</td></tr><tr><td>pH</td><td>pH</td><td></td><td></td><td></td><td>6.5-8.5</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td></td><td></td><td></td><td>50</td></tr></table>	POINT 1.27						Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	30QM concentration limit	100 percentile concentration limit	Faecal Coliforms	colony forming units per 100 millilitres				200	pH	pH				6.5-8.5	Total suspended solids	milligrams per litre				50			
POINT 1.27																																		
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Faecal Coliforms	colony forming units per 100 millilitres				200																													
pH	pH				6.5-8.5																													
Total suspended solids	milligrams per litre				50																													
L3	Volume and mass limits	Non-Compliant (Low Risk)	Discharge volumes have been recorded at site. No exceedances in 2017 or 2018 Annual Reviews. Based on information provided by Environment and Community Co-ordinator no exceedances for 2019. Non-compliant: There were two exceedances of the daily volumetric limit (12,161 kL) during the 2016 which were related to significant rainfall events. These exceedances occurred on the: 1. 6 January 2016 – A total of 14,152 kL was discharged 2. 5 June 2016 – A total of 16,391 kL was discharged. No further recommendations.																															
L3.1	For each discharge point or utilisation area specified below (by a point number), the volume/mass of: a) liquids discharged to water; or; b) solids or liquids applied to the area; must not exceed the volume/mass limit specified for that discharge point or area.																																	
	<table><tr><th>Point</th><th>Unit of Measure</th><th>Volume/Mass Limit</th></tr><tr><td>1</td><td>kilolitres per day</td><td>12161</td></tr><tr><td>27</td><td>kilolitres per day</td><td>12161</td></tr></table>				Point	Unit of Measure	Volume/Mass Limit	1	kilolitres per day	12161	27	kilolitres per day	12161																					
Point	Unit of Measure	Volume/Mass Limit																																
1	kilolitres per day	12161																																
27	kilolitres per day	12161																																
L3.2	The volumetric daily discharge limit for the premises is the combined discharge measured at EPA discharge points 1 and 27 and must not exceed 12161 kilolitres per day.	Non-Compliant (Low Risk)	There were two exceedances of the daily volumetric limit (12,161 kL) during 2016 which were related to significant rainfall events. These exceedances occurred on the: 1. 6 January 2016 – A total of 14,152 kL was discharged. 2. 5 June 2016 – A total of 16,391 kL was discharged. No further recommendations.																															
L4	Waste		No evidence of waste receipt.																															
L4.1	The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the																																	

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																				
	<table><tr><th>Code</th><th>Waste</th><th>Description</th><th>Activity</th><th>Other Limits</th></tr><tr><td>NA</td><td>Waste</td><td>Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which is not a scheduled activity under Schedule 1 of the PROCO Act, as in force from time to time.</td><td></td><td></td></tr><tr><td>NA</td><td>General or Specific exempted waste</td><td>Waste that meets all the conditions of a resource exemption under Clause 92 of the Protection of the Environment Operations (Waste) Regulation 2014.</td><td>As specified in each particular resource recovery exemption.</td><td>NA</td></tr></table>	Code	Waste	Description	Activity	Other Limits	NA	Waste	Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which is not a scheduled activity under Schedule 1 of the PROCO Act, as in force from time to time.			NA	General or Specific exempted waste	Waste that meets all the conditions of a resource exemption under Clause 92 of the Protection of the Environment Operations (Waste) Regulation 2014.	As specified in each particular resource recovery exemption.	NA	Compliant	<p>Evidence of waste totals provided in Annual Review.</p> <p>The field inspection generally noted that waste was stored well. However the following minor things were identified:</p> <ul style="list-style-type: none">* Some bins are not well labelled and contain a mix of substances;* Cardboard contained in some general waste bins;* 1 hydraulic oil drum not contained in bund;* Numerous empty oil drums stored on the side within bund. This may lead to some leakage of oil from drums;* 2 larger 44 gallon drums stored outside bund in a laydown area. Unknown substances. <p>Numerous bins and spill containers were noted.</p>	<p>Ensure the minor waste management issues identified during the audit are rectified:</p> <ul style="list-style-type: none">* Improve bin labelling;* Ensure all hydrocarbon containers (empty or full) are stored within bunds.					
Code	Waste	Description	Activity	Other Limits																				
NA	Waste	Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which is not a scheduled activity under Schedule 1 of the PROCO Act, as in force from time to time.																						
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource exemption under Clause 92 of the Protection of the Environment Operations (Waste) Regulation 2014.	As specified in each particular resource recovery exemption.	NA																				
L5	Noise Limits																							
L5.1	Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.	Non-Compliant (Low Risk)	<p>- Exceedance of LA1(1minute) criteria of 7dB at Point 14 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016</p> <p>- 1dB exceedance of LAeq(15minute) criteria at Point 23 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded.</p> <p>- No exceedances recorded during 2018 period.</p> <p>- No evidence obtained on performance during the 2019 audit period.</p> <p>Nil recommendation with monitoring to continue.</p>																					
	<p>POINT 12</p> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>-</td><td>54</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	-	49	Evening	Evening LAeq (15 minute)	-	49	Night	Night LAeq (15 minute)	-	49	Night	Night LA1 (1 minute)	-	54	Note		
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																					
Day	Day LAeq (15 minute)	-	49																					
Evening	Evening LAeq (15 minute)	-	49																					
Night	Night LAeq (15 minute)	-	49																					
Night	Night LA1 (1 minute)	-	54																					
	<p>POINT 13</p> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>-</td><td>49</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>-</td><td>53</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	-	49	Evening	Evening LAeq (15 minute)	-	49	Night	Night LAeq (15 minute)	-	49	Night	Night LA1 (1 minute)	-	53	Note		
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																					
Day	Day LAeq (15 minute)	-	49																					
Evening	Evening LAeq (15 minute)	-	49																					
Night	Night LAeq (15 minute)	-	49																					
Night	Night LA1 (1 minute)	-	53																					
	<p>POINT 14</p> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>-</td><td>49</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	-	43	Evening	Evening LAeq (15 minute)	-	43	Night	Night LAeq (15 minute)	-	43	Night	Night LA1 (1 minute)	-	49	Note		
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																					
Day	Day LAeq (15 minute)	-	43																					
Evening	Evening LAeq (15 minute)	-	43																					
Night	Night LAeq (15 minute)	-	43																					
Night	Night LA1 (1 minute)	-	49																					
	<p>POINT 16</p> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>-</td><td>36</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>-</td><td>36</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>-</td><td>36</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>-</td><td>45</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	-	36	Evening	Evening LAeq (15 minute)	-	36	Night	Night LAeq (15 minute)	-	36	Night	Night LA1 (1 minute)	-	45	Note		
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																					
Day	Day LAeq (15 minute)	-	36																					
Evening	Evening LAeq (15 minute)	-	36																					
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Night	Night LA1 (1 minute)	-	45																					
	<p>POINT 20</p> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>-</td><td>37</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>-</td><td>37</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>-</td><td>37</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>-</td><td>45</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	-	37	Evening	Evening LAeq (15 minute)	-	37	Night	Night LAeq (15 minute)	-	37	Night	Night LA1 (1 minute)	-	45	Note		
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		Note																						

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																				
	<div>POINT 23</div> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>—</td><td>46</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>—</td><td>46</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>—</td><td>36</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>—</td><td>45</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	—	46	Evening	Evening LAeq (15 minute)	—	46	Night	Night LAeq (15 minute)	—	36	Night	Night LA1 (1 minute)	—	45	Note		
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Night	Night LA1 (1 minute)	—	45																					
	<div>POINT 9</div> <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Day</td><td>Day LAeq (15 minute)</td><td>—</td><td>38</td></tr><tr><td>Evening</td><td>Evening LAeq (15 minute)</td><td>—</td><td>38</td></tr><tr><td>Night</td><td>Night LAeq (15 minute)</td><td>—</td><td>38</td></tr><tr><td>Night</td><td>Night LA1 (1 minute)</td><td>—</td><td>45</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Day	Day LAeq (15 minute)	—	38	Evening	Evening LAeq (15 minute)	—	38	Night	Night LAeq (15 minute)	—	38	Night	Night LA1 (1 minute)	—	45	Note		
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Night	Night LAeq (15 minute)	—	38																					
Night	Night LA1 (1 minute)	—	45																					
L5.2	<p>The licensee must ensure that noise generated on the premises does not exceed:</p> <p>a) 35 LAeq(15min) during the day, evening or night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1; and b) 45 LA1(1min) during the night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1.</p> <p>Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above tables.</p>	Compliant	Given compliance was generally achieved at defined noise monitoring locations, no further monitoring at other receivers was required.																					
L5.3	<p>For the purpose of condition L5.1 and condition L5.2:</p> <p>(a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and public holidays; (b) Evening is defined as the period 6pm to 10pm, and (c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.</p>	Note																						
L5.4	<p>The noise limits set out in condition L5.1 and condition L5.2 apply under all meteorological conditions except for any one of the following:</p> <p>(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or (b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or (c) Stability category G temperature inversion conditions.</p>	Note																						
L5.5	<p>For the purpose of condition L5.4:</p> <p>(a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point 26. (b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW industrial Noise Policy (EPA 2000)</p> <p>Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.</p>	Compliant	<p>Evidence of meteorological data. Spreadsheet provided with measurements.</p> <p>2012 audit confirmed that DPE and EPA (under revision of EPL 1770) approved use of Mannering Colliery monitor as representative of Chain Valley and ability to calculate temperature lapse rate by use of sigma-theta method.</p>																					
L5.6	<p>For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.</p>	Compliant	Quarterly noise monitoring reports indicate that noise monitoring is conducted using calibrated sound level meters and acoustic calibrators in accordance with the relevant standards.																					
L5.7	<p>To determine compliance:</p> <p>1. With the LAeq(15 min) noise limits in condition L5.1 and condition L5.2, the licensee must locate noise monitoring equipment;</p> <p>(a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;</p> <p>(b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable,</p> <p>(c) within approximately 50 metres if the boundary of a national park or nature reserve.</p> <p>2. With the LA1(1 minute) noise limits in condition L5.1 and L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.</p> <p>3. With the noise limits in condition L5.1 and condition L5.2, the noise monitoring equipment must be located;</p> <p>(a) at the most affected point at a location where there is no dwelling at the location, or</p> <p>(b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).</p>	Administrative Non-Compliance	It is noted that monitoring for LA1(1minute) noise levels is not completed at 1m from a façade - however such noise monitoring is generally not practical due to disturbance to residents during the sensitive night-time period.																					

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
L5.8	A non-compliance of condition L5.1 or condition L5.2 will still occur where noise generated from the premises in excess of the appropriate limit is measured; a) at a location other than an area prescribed by conditions L5.7 1(a) and L5.7 1(b), and /or b) at a point other than the most affected point at a location.	Noted		
L5.9	For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.	Compliant	Modifying factors, are applied when triggered as evidenced in the Q4 2017 exceedance at Point 23 where a low frequency penalty was applicable to the measured CVC noise contribution.	
4 Operating Conditions				
O1	Activities must be carried out in a competent manner	Compliant	Generally activities have been completed in a competent manner.	
O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Compliant	a) and b). From a review of records and inspection of waste in the field operations have generally been carried out in a competent manner. Evidence of waste totals provided in Annual Review. The field inspection generally noted that waste was stored well. However the following minor things were identified: * Some bins are not well labelled and contain a mix of substances; * Cardboard contained in some general waste bins; * 1 hydraulic oil drum not contained in bund; * Numerous empty oil drums stored on the side within bund. This may lead to some leakage of oil from drums; * 2 larger 44 gallon drums stored outside bund in a laydown area. Unknown substances. Numerous bins and spill containers were noted.	Ensure the minor waste management issues identified during the audit are rectified: * Improve bin labelling; * Ensure all hydrocarbon containers (empty or full) are stored within bunds.
O2	Maintenance of plant and equipment			
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Compliant	Evidence of maintenance records for trucks and dozers. Spreadsheet records date back to 2010.	
O3	Dust			
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust on or from the premises.	Compliant	Non - compliance relating to dust criteria are outlined in Schedule 3 Condition 11. The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. It is highly likely that other sources contribute to dust levels.	Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.
O3.2	Activities occurring in or on the premises must be carried out in a manner that will minimise the generation of wind-blown or traffic generated dust.	Compliant		Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).
O3.3	All trafficable areas, coal stockpile(s) and storage areas, and vehicle manoeuvring areas in or on the premises must be maintained, at all times, in a condition that will minimise the generation of dust.	Compliant		
O3.4	All vehicles transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage.	Compliant	No reason to determine otherwise. No evidence of non - compliance. No complaints regarding truck haulage.	
O3.5	Activities occurring in or on the premises must be carried out in a manner that will minimise the tracking of dust from the premises.	Compliant	The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust. It is highly likely that other sources contribute to dust levels.	
O4	Effluent application to land			
O4.1	An area must be provided for the use of effluent from the sewage treatment plant. The design of the system must be in accordance with the DEC's Environmental Guideline: Use of Effluent By Irrigation.	Compliant	Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite. There is limited detail in the Water Management Plan regarding the sewage water management system.	
O4.2	The quantity of wastewater applied to the utilisation area(s) must not exceed the capacity of the utilisation area(s) to effectively utilise the effluent. For the purpose of this condition, "effectively utilise" includes the ability of the soil to absorb the nutrient, salt and hydraulic loads and the applied organic material without causing harm to the environment.	Compliant	Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite. There is limited detail in the Water Management Plan regarding the sewage water management system. A series of laboratory results for treated effluent testing provided for this audit. The system currently operates below the capacity.	
O5	Emergency response			
O5.1	The licensee must maintain, and implement as necessary, a current emergency response plan for the premises. The licensee must keep the emergency response plan on the premises at all times. The emergency response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. If a current emergency response plan does not exist at the date on which this condition is attached to the licence, the licensee must develop an emergency response plan within three months of that date.	Administrative Non-Compliance	A PIRMP has been prepared for the site. Latest dated 21 September 2018. Evidence of testing PIRMP - including details of tests from 21 December 2018. Although there were some incidents, it does not appear any incident required the PIRMP to be enacted. * PIRMP is kept on-site. * <u>Observation:</u> The PIRMP is labelled LakeCoal, has persons listed in it who are no longer at site, does not have email details for government contacts, and figures do not clearly show the location of hazardous substances and where pollution response equipment is stored.	* Update the PIRMP to include: - Current site contacts; - Email details for government contacts; and - Figures that clearly show the location of hazardous substances and where pollution response equipment is stored.
O6	Waste management			

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																								
O6.1	The licensee must ensure that any liquid and/or non liquid waste generated and/or stored at the premises is assessed and classified in accordance with the EPA's Waste Classification Guidelines as in force from time to time.	Compliant	Detailed testing program of waster water was sighted. Waste has been stored at the premises generally consistent with the EPA's Guideline. Evidence of waste management including recycling and disposal.																									
O6.2	The licensee must ensure that waste identified for recycling is stored separately from other waste.	Compliant	The field inspection generally noted that waste was stored well. However the following minor things were identified: * Some bins are not well labelled and contain a mix of substances; * Cardboard contained in some general waste bins; * 1 hydraulic oil drum not contained in bund; * Numerous empty oil drums stored on the side within bund. This may lead to some leakage of oil from drums; * 2 larger 44 gallon drums stored outside bund in a laydown area. Unknown substances. Numerous bins and spill containers were noted.	Ensure the minor waste management issues identified during the audit are rectified. Including: * Improve bin labelling; * Ensure all hydrocarbon containers (empty or full) are stored within bunds.																								
O7	Other operating conditions																											
	Sewage Treatment																											
O7.1	All sewage generated on the premises must be directed, collected and treated by the sewage treatment system(s).	Compliant	Despite minimal evidence of servicing being provided based on information provided, it appears sewage from the site is treated onsite based on reporting in the Annual Review.																									
O7.2	The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.	Administrative Non-Compliance	Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite. There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. Evidence of testing of wastewater through lab results	Include additional detail in the Water Management Plan regarding sewage management. Include an update of sewage system during the audit period in the Annual Review. Ensure servicing is completed and records kept onsite.																								
O7.3	Correct operation involves regular supervision and system maintenance. The licensee must be aware of the system requirements and must ensure that the necessary service contracts are in place.	Administrative Non-Compliance																										
O7.4	The sewage treatment system(s) must be serviced by a suitably qualified and experienced waste water technician at least once each quarterly period and a minimum of four times per year.	Administrative Non-Compliance																										
O7.5	The licensee must record each inspection and any actions required or recommended by the technician; including all results from tests performed on the sewage treatment system(s) by the technician as defined in Condition O7.4.	Administrative Non-Compliance																										
O7.6	All treated sewage that is discharged from the premises must be discharged through licensed discharge point "EPA Identification no. 1", as defined in condition P1.3.	Compliant	Treated water is discharged through this point.																									
	Bunding																											
O7.7	All above ground tanks containing material that is likely to cause material harm to the environmental must be banded or have an alternative spill containment system in place.	Compliant	Evidence of bunding sighted during the field inspection around fuel tanks. Other chemicals stored within banded area and report to the oily water separator.																									
5 Monitoring and Recording Conditions																												
M1	Monitoring records																											
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	Compliant	Based on the evidence provided this condition has been met. Evidence of raw monitoring data for air and water.																									
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Compliant	Evidence of raw monitoring data. Evidence of data dating back four years.																									
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Compliant	Evidence of chain of custody forms and monitoring results for air and water. Meets condition a-d requirements.																									
M2	Requirement to monitor concentration of pollutants discharged																											
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	Administrative Non-Compliance	There has been data capture issues identified in Annual Reviews for PM10. <u>Admin Non - Compliance.</u>	Update the Air Quality Management Plan following this audit. Improve data capture for PM10. Review possibilities of backup power supply. Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.																								
M2.2	Air Monitoring Requirements	Administrative Non-Compliance	There were some issues with data capture with this outlined in Annual Reviews. See Schedule 3 Condition 11 of the Development Consent.	Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.																								
	<div>POINT 25</div> <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Particulate matter</td><td>micrograms per cubic metre</td><td>Continuous</td><td>AM-22</td></tr></table>				Pollutant	Units of measure	Frequency	Sampling Method	Particulate matter	micrograms per cubic metre	Continuous	AM-22																
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M2.3	Water and/ or Land Monitoring Requirements																											
	<div>POINT 1</div> <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Biochemical oxygen demand</td><td>milligrams per litre</td><td>Once a month (min. of 4 weeks)</td><td>Grab sample</td></tr><tr><td>Enterococci</td><td>colony forming units per 100 millilitres</td><td>Once a month (min. of 4 weeks)</td><td>Grab sample</td></tr><tr><td>Faecal Coliforms</td><td>colony forming units per 100 millilitres</td><td>Once a month (min. of 4 weeks)</td><td>Grab sample</td></tr><tr><td>pH</td><td>pH</td><td>Once a month (min. of 4 weeks)</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Once a month (min. of 4 weeks)</td><td>Grab sample</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Biochemical oxygen demand	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample	Enterococci	colony forming units per 100 millilitres	Once a month (min. of 4 weeks)	Grab sample	Faecal Coliforms	colony forming units per 100 millilitres	Once a month (min. of 4 weeks)	Grab sample	pH	pH	Once a month (min. of 4 weeks)	Grab sample	Total suspended solids	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample	Compliant	Based on evidence provided (Annual Review monitoring results) surface water discharge monitoring was completed as per this schedule.	
Pollutant	Units of measure	Frequency	Sampling Method																									
Biochemical oxygen demand	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample																									
Enterococci	colony forming units per 100 millilitres	Once a month (min. of 4 weeks)	Grab sample																									
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pH	pH	Once a month (min. of 4 weeks)	Grab sample																									
Total suspended solids	milligrams per litre	Once a month (min. of 4 weeks)	Grab sample																									
	<div>POINT 27</div> <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Enterococci</td><td>colony forming units per 100 millilitres</td><td>Daily during any discharge</td><td>Grab sample</td></tr><tr><td>Faecal Coliforms</td><td>colony forming units per 100 millilitres</td><td>Daily during any discharge</td><td>Grab sample</td></tr><tr><td>pH</td><td>pH</td><td>Daily during any discharge</td><td>Grab sample</td></tr><tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Daily during any discharge</td><td>Grab sample</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Enterococci	colony forming units per 100 millilitres	Daily during any discharge	Grab sample	Faecal Coliforms	colony forming units per 100 millilitres	Daily during any discharge	Grab sample	pH	pH	Daily during any discharge	Grab sample	Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample							
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M3	Testing methods - concentration limits																											

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																																			
M3.1	.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. Note: The Protection of the Environment Operations (Clean Air) Regulation 2010 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	Compliant	Based on evidence provided monitoring has generally been completed as per these requirements. Spreadsheet with results provided. Note, for PM10 monitoring there were some times during the audit period where there was a failure of the unit.																																				
M3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	Compliant	Discharge monitoring appears to have been completed in accordance with requirements. Grab samples are tested at the laboratory. Discharge point sighted in the field inspection.																																				
M4	Environmental monitoring																																						
	Requirement to monitor noise																																						
M4.1	To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.7 and L5.8, and (a) at each one of the locations listed in condition L5.1; (b) occur quarterly within the reporting period of the Environment Protection Licence with at least 2 months between monitoring periods; (c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters; (d) the night time 15 minute attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am; (e) the night time LA1 (1 min) attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am; (f) one quarterly monitoring must occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night, and (g) each quarterly monitoring must be undertaken on a different day(s) of the week not including Saturdays, Sundays and public holidays; and (h) these monitoring conditions take effect in the 2015 Reporting period. Note: The intention of this condition is that quarterly monitoring be undertaken at each sensitive receiver. That at each sensitive receiver monitoring is undertaken over a range of different days excluding weekends and public holidays during the reporting period so as to be representative of operating hours. That night time 15 minute attended monitoring and the LA1 (1min) monitoring for three of the quarters be undertaken at worst case being the most stable atmospheric conditions and when noise would be most intrusive to sleep. All of the sensitive receivers do not have to be monitored on the same day, evening and night for sub condition f.	Administrative Non-Compliance	- Q1 2016 - monitoring at Point 12/Point 13 conducted for only 15 minutes during the evening period - Q2 2016 - monitoring during the night-time period conducted prior to 1:00 am. <u>Non - Compliance.</u> - Q3 2016 - monitoring conducted prior to 1:00am. <u>Non - Compliance.</u> - Q4 2016 - monitoring conducted prior to 1:00am and within 2 months of Q3 2016 monitoring. <u>Non - Compliance.</u> - Q3 2017 monitoring conducted within 2 months of Q2 2017 monitoring. - 2018 monitoring has been completed as per requirements. - 2019 Q1 - monitoring conducted prior to 1:00am. - Measurements are generally taken over a range of days however on occasion some quarters are conducted on the same days. It is noted that following 2016 with the exception of Q1 2017 and Q1 2018 where extended noise monitoring was conducted in accordance with (f) night time noise monitoring during the night time was conducted between 1am and 4am.	Update Noise Management Plan. Ensure monitoring is completed in accordance with Noise Management Plan.																																			
M4.2	For the Annual Reporting Period ending March 2015 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this licence, as a single report attached to the Annual Return for the premises.	Administrative Non-Compliance	No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	For future Annual Returns a single noise monitoring report should be prepared and attached to the Annual Return.																																			
M5	Weather monitoring																																						
M5.1	At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.																																						
	<p>POINT 26</p> <table> <tr> <th>Parameter</th><th>Sampling method</th><th>Units of measure</th><th>Averaging period</th><th>Frequency</th></tr> <tr> <td>Rainfall</td><td>AM-4</td><td>millimetres</td><td>24 hours</td><td>Continuous</td></tr> <tr> <td>Wind Direction at 10 metres</td><td>AM-2 & AM-4</td><td>Degrees</td><td>1 hour</td><td>Continuous</td></tr> <tr> <td>Wind speed</td><td>AM-2 & AM-4</td><td>metres per second</td><td>1 hour</td><td>Continuous</td></tr> <tr> <td>Temperature at 10 metres</td><td>AM-4</td><td>degrees Celsius</td><td>1 hour</td><td>Continuous</td></tr> <tr> <td>Sigma theta</td><td>AM-2 & AM-4</td><td>Degrees</td><td>15 minutes</td><td>Continuous</td></tr> <tr> <td>Relative humidity</td><td>AM-4</td><td>percent</td><td>1 hour</td><td>Continuous</td></tr> </table>	Parameter	Sampling method	Units of measure	Averaging period	Frequency	Rainfall	AM-4	millimetres	24 hours	Continuous	Wind Direction at 10 metres	AM-2 & AM-4	Degrees	1 hour	Continuous	Wind speed	AM-2 & AM-4	metres per second	1 hour	Continuous	Temperature at 10 metres	AM-4	degrees Celsius	1 hour	Continuous	Sigma theta	AM-2 & AM-4	Degrees	15 minutes	Continuous	Relative humidity	AM-4	percent	1 hour	Continuous	Compliant	Evidence of meteorological data from Mannering weather station. Spreadsheet provided with measurements. 2012 audit confirmed that DPE and EPA (under revision of EPL 1770) approved use of Mannering Colliery monitor as representative of Chain Valley and ability to calculate temperature lapse rate by use of sigma-theta method.	
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Sigma theta	AM-2 & AM-4	Degrees	15 minutes	Continuous																																			
Relative humidity	AM-4	percent	1 hour	Continuous																																			
M6	Recording of pollution complaints																																						
M6.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Compliant	Evidence of complaints greater than 4 years.																																				
M6.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Administrative Non-Compliance	*Admin Non-compliant: The Complaints Register does not include the personal details of the complainant. * Not all complaints registered in the register included the method by which the complaint was made. * There are additional complaints outlined in the Annual Review compared to the Complaints Registers provided to the auditor.	Ensure all complaints are recorded in the internal database on site and the relevant details required under this condition are outlined in the Annual Review.																																			
M6.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Compliant	Evidence of complaints greater than 4 years.																																				
M6.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Note																																					
M7	Telephone complaints line																																						
M7.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Compliant	Community hotline advertised on the Lake Coal website (now redundant). Also contact line provided on Delta Coal website.																																				
M7.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Administrative Non-Compliance	*Telephone line for complaints advertised on the LakeCoal and Delta Coal websites. * However no evidence of notifying to the community that the complaints line exists.	With the new ownership an advertisement should be placed in the paper/newsletter providing a link to the Delta Coal website and outlining the complaint management details.																																			
M7.3	The preceding two conditions do not apply until 3 months after the date of the issue of this licence.	Noted	Outside of audit period.																																				
M7.4	The licensee must notify the EPA with contact details of personnel capable of a timely response to emergencies or any other exigent circumstances. (a) the nominated contact must be available at all times. (b) contact details must include a telephone number and must be current. (c) such notification must be made within 14 days of receiving this licence.	Administrative Non-Compliance	* Designated representatives of the company included in the Pollution Incident Response Plan (PIRMP), dated September 2018. * <u>Admin Non-compliant:</u> The designated representatives of the company, included in the PIRMP, are not current.	Update the details of designated representatives of the company in the PIRMP.																																			
M8	Requirement to monitor volume or mass																																						
M8.1	For each discharge point or utilisation area specified below, the licensee must monitor: a) the volume of liquids discharged to water or applied to the area; b) the mass of solids applied to the area; c) the mass of pollutants emitted to the air; at the frequency and using the method and units of measure, specified below.																																						

Condition Number	Condition	Compliance Status	Evidence	Recommended Action												
	<div>POINT 1</div> <table><tr><th>Frequency</th><th>Unit of Measure</th><th>Sampling Method</th></tr><tr><td>Continuous during discharge</td><td>kilolitres per day</td><td>In line instrumentation</td></tr></table> <div>POINT 27</div> <table><tr><th>Frequency</th><th>Unit of Measure</th><th>Sampling Method</th></tr><tr><td>Continuous during discharge</td><td>kilolitres per day</td><td>In line instrumentation</td></tr></table>	Frequency	Unit of Measure	Sampling Method	Continuous during discharge	kilolitres per day	In line instrumentation	Frequency	Unit of Measure	Sampling Method	Continuous during discharge	kilolitres per day	In line instrumentation	Compliant	Data for volume monitoring provided. Also summarised in Annual Review.	
Frequency	Unit of Measure	Sampling Method														
Continuous during discharge	kilolitres per day	In line instrumentation														
Frequency	Unit of Measure	Sampling Method														
Continuous during discharge	kilolitres per day	In line instrumentation														
6 Reporting Conditions																
R1	Annual return documents															
R1.1	<p>1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:</p> <p>1. a Statement of Compliance,</p> <p>2. a Monitoring and Complaints Summary,</p> <p>3. a Statement of Compliance - Licence Conditions,</p> <p>4. a Statement of Compliance - Load based Fee,</p> <p>5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,</p> <p>6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data,</p> <p>7. a Statement of Compliance - Environmental Management Systems and Practices; and</p> <p>8. a Statement of Compliance - Environmental Improvement Works.</p> <p>At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.</p>	Compliant	Evidence of: 2016-17 AR and 2017-18 AR. The 2018-19 was not due at the time of the audit. Completed on EPA form.													
R1.2	<p>An Annual Return must be prepared in respect of each reporting period, except as provided below.</p> <p>Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.</p>	Compliant	Evidence of: 2016-17 AR and 2017-18 AR. The 2018-19 was not due at the time of the audit. Completed on EPA form.													
R1.3	<p>Where this licence is transferred from the licensee to a new licensee:</p> <p>a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and</p> <p>b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.</p> <p>Note: An application to transfer a licence must be made in the approved form for this purpose.</p>	Compliant	Evidence of: 2016-17 AR and 2017-18 AR. The 2018-19 was not due at the time of the audit. Completed on EPA form. LakeCoal and Delta Coal are in the process of preparing separate Annual Returns based on the change of ownership for the 2018-19 period.	LakeCoal and Delta Coal to prepare Annual Returns based on the period of the Annual Return and dates of the sale of Chain Valley.												
R1.4	<p>Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:</p> <p>a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or</p> <p>b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.</p>	Not Triggered														
R1.5	<p>The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').</p>	Administrative Non-Compliance	<p>The 2017-18 Annual Return is dated 4 June 2018 and was supposed to be submitted to the EPA by 30 May 2018. From the date of the Annual Return it appears it wasn't submitted to the EPA time</p> <p>The 2016-17 Annual Return was dated within the 60 days.</p>	Ensure Annual Returns are completed as per the EPA requirements and submitted within the due date.												
R1.6	<p>The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.</p>	Compliant	Evidence of Annual Returns from past years sighted.													
R1.7	<p>Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:</p> <p>a) the licence holder; or</p> <p>b) by a person approved in writing by the EPA to sign on behalf of the licence holder.</p>	Compliant	Evidence of: 2016-17 AR and 2017-18 AR. The 2018-19 was not due at the time of the audit. Completed on EPA form. Signed.													
R2	Notification of environmental harm															
	<p>Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.</p>	Not Triggered	<p>A PIRMP has been prepared for the site. Latest dated 21 Sept 2018.</p> <p>Evidence of testing PIRMP with this dated in EPL Annual Returns.</p> <p>Although there were some incidents, it does not appear any incident required the PIRMP to be enacted.</p> <p>PIRMP is currently being updated. No material harm identified.</p>													
R2.1	Notifications must be made by telephoning the Environment Line service on 131 555.															
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.															
R3	Written report															
R3.1	<p>Where an authorised officer of the EPA suspects on reasonable grounds that:</p> <p>a) where this licence applies to premises, an event has occurred at the premises; or</p> <p>b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.</p>	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.													
R3.2	<p>The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.</p>	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.													
R3.3	<p>The request may require a report which includes any or all of the following information:</p> <p>a) the cause, time and duration of the event;</p> <p>b) the type, volume and concentration of every pollutant discharged as a result of the event;</p> <p>c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;</p> <p>d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;</p> <p>e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;</p> <p>f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and</p> <p>g) any other relevant matters.</p>	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.													
R3.4	<p>The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.</p>	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.													
R4	Other reporting conditions															
	Noise Monitoring Report															

Condition Number	Condition	Compliance Status	Evidence	Recommended Action																								
R4.1	<p>The licensee must submit to the EPA a noise compliance assessment report at the end of each reporting period. The report must be submitted with the Environment Protection Licence Annual Return. The report must be prepared by a suitably qualified and experienced acoustical consultant which:</p> <p>(a) details the noise monitoring undertaken in accordance with condition M4; (b) assesses compliance with noise limits presented in condition L5.1 and condition 5.2; and (c) outlines any management actions taken within the monitoring period to address any exceedances of limits contained in condition L5.1 and condition L5.2.</p> <p>Note: The licensee must provide the EPA with one report, but this report may be a combination of the monitoring undertaken by the licensee as part of their quarterly monitoring program as required by the Project Approval SSD-5456 and must include LA1(1min).</p>	Administrative Non-Compliance	No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	Send a combined noise report for the Annual Return period to the EPA.																								
7 General Conditions																												
G1	Copy of licence kept at the premises or plant.																											
G1.1	A copy of this licence must be kept at the premises to which the licence applies.	Compliant	A copy of the licence was provided by the Environment and Community Co-ordinator.																									
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.	Noted																										
G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Compliant	A copy of the licence was provided by the Environment and Community Co-ordinator. A copy was included in hard copy.																									
G2	Other general conditions																											
G2.1	Completed Programs																											
	<table><tr><th>PRP</th><th>Description</th><th>Completed Date</th></tr><tr><td>Coal Mine Particulate Matter Control Best Practice</td><td>Requires licensee to conduct a site specific Best Management Practice (BMP) determination to identify ways to reduce particle emissions</td><td>28-September-2012</td></tr><tr><td>Assessment of Potential Impacts of Metals in wastewater</td><td>The licensee must conduct an assessment of metals detected in wastewater discharges from the mine in accordance with the ANZECC water quality guidelines. To obtain a greater understanding of the type and concentration of metals discharged in mine water and entering the receiving waters. To limit the concentration of metals discharged in mine water within ANZECC guidelines.</td><td>23-October-2013</td></tr><tr><td>Air Quality Monitoring</td><td>The licensee must evaluate best locations and install monitoring devices as defined in Project Approval MP10_0161 under the Environment Planning & Assessment Act 1979.</td><td>31-December-2013</td></tr><tr><td>PRP4 - Upgrade to Clean and Dirty Water Management System</td><td>The licensee must review and upgrade separation of the Clean and Dirty Water Management System and review and upgrade bunding.</td><td>14-August-2015</td></tr><tr><td>PRP5 - Remediation of Dam Wall and Spillway formalisation</td><td>The licensee must design and remediate the dam wall on the final control pond and formalise a spillway to prevent dam seepage and to ensure that volumetric discharge can be monitored</td><td>27-February-2015</td></tr><tr><td>PRP 6 Upgrade to Sewage Treatment Systems</td><td>Assessment of options for improved disinfection of effluent from STP on licenced premises.</td><td>06-January-2015</td></tr><tr><td>PRP7 Sewage Treatment System Concept Design</td><td>Provide the EPA with a Concept Design and Timetable for Implementation of Upgrade to the Sewage Treatment System</td><td>19-February-2016</td></tr></table>	PRP	Description	Completed Date	Coal Mine Particulate Matter Control Best Practice	Requires licensee to conduct a site specific Best Management Practice (BMP) determination to identify ways to reduce particle emissions	28-September-2012	Assessment of Potential Impacts of Metals in wastewater	The licensee must conduct an assessment of metals detected in wastewater discharges from the mine in accordance with the ANZECC water quality guidelines. To obtain a greater understanding of the type and concentration of metals discharged in mine water and entering the receiving waters. To limit the concentration of metals discharged in mine water within ANZECC guidelines.	23-October-2013	Air Quality Monitoring	The licensee must evaluate best locations and install monitoring devices as defined in Project Approval MP10_0161 under the Environment Planning & Assessment Act 1979.	31-December-2013	PRP4 - Upgrade to Clean and Dirty Water Management System	The licensee must review and upgrade separation of the Clean and Dirty Water Management System and review and upgrade bunding.	14-August-2015	PRP5 - Remediation of Dam Wall and Spillway formalisation	The licensee must design and remediate the dam wall on the final control pond and formalise a spillway to prevent dam seepage and to ensure that volumetric discharge can be monitored	27-February-2015	PRP 6 Upgrade to Sewage Treatment Systems	Assessment of options for improved disinfection of effluent from STP on licenced premises.	06-January-2015	PRP7 Sewage Treatment System Concept Design	Provide the EPA with a Concept Design and Timetable for Implementation of Upgrade to the Sewage Treatment System	19-February-2016	Compliant	PRP 7 is relevant to the audit period. Document is dated 19 February 2016. Evidence of email submission provided.	
PRP	Description	Completed Date																										
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8 Pollution Studies and Reduction Programs																												
U1	PRP 8 - Construction of Sewerage System																											
U1.1	<p>By 07 July 2017 the licensee must construct a pump station, rising main and other infrastructure in order to connect the sewage from Chain Valley Colliery to Wyong Shire Council's sewerage system. The construction must be undertaken by an appropriately qualified an experienced person. The Licensee must:</p> <p>a) obtain the appropriate approvals and permits required for the development; b) construct option A or option B in accordance with the document titled "Concept Design Report for Sewage Treatment System Upgrade Chain Valley Colliery" dated 1 February 2016 and prepared by RGH Consulting Group; c) include connection of sewage from the administration building to the rising main; c) notify the EPA in writing at hunter.region@epa.nsw.gov.au within 2 weeks of the pump station and rising main being commissioned; and d) provide the EPA with a report on commissioning of the pump station and rising main which details the final option constructed within 2 weeks of the pump station and rising main being commissioned.</p>	Administrative Non-Compliance	<p>The upgrade has been designed but not yet constructed.</p> <p>This was supposed to be completed by 7 July 2017.</p>	Liaise with the EPA regarding the current status of the Sewage System Project. Implement any agreed actions in terms of timing.																								

Consolidated Coal Lease 721

Audit Period = 1 January 2016 – 5 April 2019

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Mining Lease Conditions 2008				
1	Notice to Landholders Within a period of three months from the date of granting or renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice. If there are ten or more landholders affected, 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 lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.	Not Triggered	Not within period.	
2	Environmental Harm The proponent shall implement all 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	Based on information provided there is no evidence of material harm.	
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 Environmental Planning and Assessment Act 1979 the Protection of the Environment Operations Act 1997 and any other approvals relevant to the development including the conditions 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: i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the Mining Act 1992, the Environmental Planning and Assessment Act 1979, Protection of the Environment Operations Act 1997 or the Occupational Health and Safety Act 2000; 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.	Non-Compliant (Low Risk)	Two MOPs provided for this audit. MOP 1 - 1 April 2015 - 31 March 2018. MOP 2 - 1 October 2018 - 31 December 2020. There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is non - compliant. There is now an approved MOP therefore there is no further recommendation relating to this period of time. Both MOPs cover the required aspects of this condition. <u>Implementation:</u> No areas available for rehabilitation at site.	
4	Environmental 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	Evidence of Annual Reviews from 2016, 2017 and 2018. Evidence of lodgements.	
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.	Administrative Non-Compliance	a) Admin Non-compliant: The 2016, 2017 & 2018 Annual Reviews do not report against compliance with the MOP. b) N/A - Rehabilitation has not commenced at the site; c) 2016, 2017 & 2018 Annual Reviews - Executive Summary & Section 3; and d) Admin Non-compliant: 2016, 2017 and 2018 Annual Reviews not prepared in accordance with the DPE Annual Review guidelines.	Report against compliance with the MOP in future Annual Reviews. As per recommendations in Schedule 6 Condition 4.
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	Additional reporting was prepared for subsidence. Work appears to have been completed as per the direction and feedback from the Resources Regulator.	
7	Rehabilitation Disturbed land must be rehabilitated to a sustainable/agreed end land use to the satisfaction of the Director-General.	Not Triggered	No areas available for rehabilitation.	
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 Applications for Subsidence Management Approvals guidelines (EDG17) (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 New Subsidence Management Plan Approval Process - Transitional Provisions (EDP09). (d) Subsidence Management Plans are to be prepared in accordance with the Guideline for Applications for Subsidence Management Approvals. (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 New Approval Process for Management of Coal Mining Subsidence - Policy.	Compliant	Subsidence Management Plans prepared prior to this audit period. Several Extraction Plans prepared during the audit period. They are prepared under a separate Extraction Plan Guideline and do not specifically need to cover this condition.	
9	Working Requirement The lease holder must: (a) ensure that at least 142 competent people are efficiently employed on the lease area on each week day except Sunday or any week day that is a public holiday, OR (b) expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than \$2,485,000 per annum whilst the lease is in force. The Minister may at any time or times, by instrument in writing served on the lease holder, increase or decrease the expenditure required or the number of people to be employed.	Compliant	Operations meet sub condition b.	
10	Control of Operations			

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
	(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. (c) A direction referred to in this condition may be served on the Mine Manager.	Not Triggered	Discharge locations sighted in the field inspection. Records of discharge volume and water quality outlined in Annual Reviews.	
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.	Administrative Non-Compliance	Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports. LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement. In the version supplied to SLR there are no figures.	Ensure Group Exploration Reports meet the required timeframe. Ensure figures are included in the reports.
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.	Note		
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.	Note		
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.	Note		
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 dwelling or occupied premises, as the case may be, unless determined otherwise by the Department of Environment and Climate Change.	Not Triggered	No surface blasting has been undertaken during the audit period.	
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.	N/A	This is not a safety audit.	
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 groundwater's; (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. (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.	Not Triggered	Based on site communications no exploration drilling in this lease area.	
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 accepted 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	The field inspection around the pit top and other areas did not identify any significant areas of erosion.	
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.	Not Triggered	Based on information provided to SLR this has not been triggered.	
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	Not Triggered	Based on information provided to SLR this has not been triggered.	
21	Roads and Tracks (a) Operations must not affect any road unless in accordance with an accepted 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.	Not Triggered	Based on information provided to SLR this has not been triggered.	
22	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 operations. Any clearing not authorised under the Mining Act 1992 must comply with the provisions of the Native Vegetation Act 2003. (c) The lease holder must obtain all necessary approvals or licences before using timber from any Crown land within the lease area.	Not Triggered	Based on information provided to SLR this has not been triggered.	

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
25	Resource Recovery			
	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
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.	Note	<p>- Exceedance of LA1(1minute) criteria of 6dB and 7dB at ATN4 and R13 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016.</p> <p>- 1dB exceedance of LAeq(15minute) criteria at ATN007 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded.</p> <p>- No exceedances recorded during 2018 period.</p> <p>- No exceedances recorded during the 2019 audit period (January - April 2019).</p>	
28	Security			
	<p>(a) The single security in the sum of \$1,905,000 must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under CCL 719 and CCL 721. 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.</p> <p>(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:</p> <p>(i) cash,</p> <p>(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution</p>	Compliant	<p>Security deposit provided to SLR for this audit.</p> <p>Dated August 2018 with RCE value of \$3,109,607. Evidence of approval letter from Resources Regulator dated 19 October 2018.</p>	
29	Prescribed Dam			
	<p>(a) Notwithstanding any Mining Operations Plan, the lease holder must not mine within any part of the lease area which is within the notification area of the Mannering Creek Ash Dam, Colongra Creek Ash Dam and Vales Point Ash Dam without the prior written approval of the Minister and subject to any conditions he may stipulate.</p> <p>(b) Where the lease holder desires to mine within the notification area he must:</p> <p>(i) at least twelve (12) months before mining is to commence or such lesser time as the Minister may permit, notify the Minister of the desire to do so. A plan of the mining system to be implemented must accompany the notice; and</p> <p>(ii) provide such information as the Minister may direct.</p> <p>(c) The Minister must not, except in the circumstances set out in sub-paragraph (ii), grant approval unless sub-paragraph (i) of this paragraph has been complied with. This sub-paragraph is complied with if:</p> <p>(i) the Dams Safety Committee as constituted by Section 7 of the Dams Safety Act 1978 and the owner of the dam have been notified in writing of the desire to mine referred to in paragraph (b).</p> <p>(ii) the notifications referred to in clause (a) are accompanied by a description or plan of the area to be mined.</p> <p>(iii) the Director-General has complied with any reasonable request made by the Dams Safety Committee or the owner of the dam for further information in connection with the mining proposal.</p> <p>(iv) the Dams Safety Committee has made its recommendations concerning the mining proposal or has informed the Minister in writing that it does not propose to make any such recommendations; and</p> <p>(v) where the Dams Safety Committee has made recommendations the approval is in terms that are:</p> <p>- in accordance with those recommendations; or</p> <p>- where the Minister does not accept those recommendations or any of them - in accordance with a determination under sub-paragraph (ii) of this paragraph.</p> <p>(vi) Where the Minister does not accept the recommendations of the Dams Safety Committee or where the Dams Safety Committee has failed to make any recommendations and has not informed the Minister in writing that it does not propose to make any recommendations, the approval shall be in terms that are, in relation to matters dealing with the safety of the dam:</p> <p>as determined by agreement between the Minister and the Minister administering the Dams Safety Act 1978; or</p> <p>- in the event of failure to reach such agreement - as determined by the Premier.</p> <p>(d) The Minister, on notice from the Dams Safety Committee, may at any time or times:</p> <p>(i) cancel any approval given where a notice pursuant to Section 18 of the Dams Safety Act 1978 is given.</p> <p>(ii) suspend for a period of time, alter, omit from or add to any approval given or conditions imposed.</p>	Compliant	There are no prescribed dams.	
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.	Not Triggered		
31	Cooperation Agreement			
	<p>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:</p> <p>- access arrangements</p> <p>- operational interaction procedures dispute resolution</p> <p>- information exchange well location</p> <p>- timing of drilling</p> <p>- potential resource extraction conflicts and rehabilitation issues.</p>	Note		
Special Conditions				
32	Barriers			
	<p>The lease holder, unless with the consent of the Minister and subject to such conditions as the Minister may impose, shall not conduct mining operations on those parts of the subject area within the highwater level subsidence control zone defined:</p> <p>(a) on the surface by the highwater level of Lake Macquarie and Pallamanaba Creek and a point 2.44 metres in elevation above that highwater level;</p> <p>(b) in the seam by a line defined by an angle of draw of 35° drawn landwards from the line drawn vertically beneath a point 2.44 metres in elevation above the highwater level of Lake Macquarie and Pallamanaba Creek;</p> <p>(c) in the seam by a line defined by an angle of draw of 35° drawn lakewards from the line drawn vertically beneath the highwater level of Lake Macquarie.</p>	Compliant	Based on the information provided, mining has been completed within approved limits.	

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
33	Any approval or consent given by the Minister including any approval or consent given pursuant to any condition or term contained in a lease consolidated into this lease to the effect that the lease holder may conduct mining operations on those parts of the subject area within the highwater level subsidence control zone as defined in Condition 32 shall be deemed to be a consent given for the purposes of the said Condition 32, subject to the same conditions of that approval or consent Provided however that this clause shall also apply to any barrier 60.35 metres wide within the said zone.	Compliant	Based on the information provided, mining has been completed within approved limits.	
34	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.	Compliant	Based on the information provided, mining has been completed within approved limits.	
35	Unless with the consent of the Minister first had and obtained, and subject to such conditions as he may impose, the lease holder shall not conduct mining operations on those parts of the subject area: (a) beneath the main buildings of the Munmorah and Vales Point Power Stations constructed on the excepted surface of the subject area; (b) within the marginal zone which is the area contained by an angle of draw of 35° measured outwards from the external walls of the main buildings of the Munmorah and Vales Point Power Station to the floor of the seam.	Compliant	Based on the information provided, mining has been completed within approved limits.	
36	Any approval or consent given by the Minister, including any approval or consent given pursuant to any condition or term contained in a lease consolidated into this lease, to the effect that the lease holder may conduct mining operations on those parts of the subject area within the barrier defined in Condition 35 shall be deemed to be a consent given for the purposes of the said Condition 35, subject to the same conditions of that approval or consent.	Compliant	Based on the information provided, mining has been completed within approved limits.	
37	The lease holder shall be limited to the following purposes and conditions within the specified areas described on Plan No. 06180 marked Plan 'B'. Condition 12 noted on Plan 'B' is replaced by Condition 37.	Compliant	Based on the information provided, mining has been completed within approved limits.	

Consolidated Coal Lease 707

Audit Period = 1 January 2016 – 5 April 2019

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Mining Lease Conditions 2004				
Notice to Landholders				
1	<p>Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.</p> <p>If there are ten or more landholders affected, 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 lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.</p>	Not Triggered	Outside of the audit period.	
Mining, Rehabilitation, Environmental Management Process (MREMP)				
2. Mining Operations Plan (MOP)				
1	<p>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 with environmental conditions of development consent and other approvals will form the basis for:-</p> <p>(a) ongoing mining operations and environmental management; and (b) ongoing monitoring of the project.</p>	Non-Compliant (Low Risk)	<p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is non - compliant. There is now an approved MOP therefore there is no further recommendation relating to this period of time.</p> <p>Both MOPs cover the required aspects of this condition.</p>	
2	The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.		MOP prepared in accordance with the DPE - RR Guidelines.	
3	<p>A Plan must be lodged with the Director-General:-</p> <p>(a) prior to the commencement of mining operations (including mining purposes); (b) subsequently as appropriate prior to the expiry of any current Plan; and (c) in accordance with any direction issued by the Director-General.</p>		<p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is non - compliant. There is now an approved MOP therefore there is no further recommendation relating to this period of time.</p> <p>Both MOPs cover the required aspects of this condition.</p>	
4	<p>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:-</p> <p>(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) existing flora and fauna on the site; (f) progressive rehabilitation schedules; (g) areas of particular environmental, ecological and cultural sensitivity and measures to protect these areas; (h) water management systems (including erosion and sediment controls); (i) proposed resource recovery; and (j) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation.</p>		<p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is non - compliant. There is now an approved MOP therefore there is no further recommendation relating to this period of time.</p> <p>Both MOPs cover the required aspects of this condition. Conditions a-j.</p>	
5	The Plan when lodged will be reviewed by the Department.	Note		
6	The Director-General may within two (2) months of the lodgement of a Plan, require modification and re-lodgement.	Note		
7	(7) If (2) months of the lodgement of a Plan, the lease holder may proceed with implementation of the Plan.	Note		
8	During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) - (7) above.	Note		
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.	Compliant	<p>Annual Reviews prepared and submitted for 2016, 2017, 2018.</p> <p>There are recommendations relating to the Annual Review from this audit which are covered within Schedule 6 Condition 4 of the Development Consent.</p>	
2	<p>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:</p> <p>(a) the accepted Mining Operations Plan; (b) development consent requirements and conditions; (c) Department of Environment and Conservation and Department of Planning 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.</p>	Administrative Non-Compliance	Annual Review covers conditions b-f. However there is minimal information regarding a review and forecast against the MOP.	Ensure the Annual Review reports on the progress of the operation against the MOP.


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.	Note		
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 and the local council.	Note		
4. Subsidence Management				
	<p>(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.</p> <p>(b) Underground mining operations which will potentially lead to subsidence include secondary extraction panels such as longwalls or miniwalls, associated first workings (gate roads, installation roads and associated main headings, etc.), and pillar extractions, and are otherwise defined by the Applications for Subsidence Management Approvals guidelines \ (EDG17)</p> <p>(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 Coal Mines Regulation Act 1982, or the document New Subsidence Management Plan Approval Process - Transitional Provisions (EDP09).</p> <p>(d) Subsidence Management Plans are to be prepared in accordance with the Guideline for Applications for Subsidence Management Approvals.</p> <p>(e) Subsidence Management Plans as approved shall form part of the Mining Operations Plan required under Condition 2 and will be subject to the Annual Environmental Management Report process as set out under Condition 3. The SMP is also subject to the requirements for subsidence monitoring and reporting, set out in the document New Approval Process for Management of Coal Mining Subsidence - Policy.</p>	Compliant	<p>Subsidence Management Plans prepared prior to this audit period. Several Extraction Plans prepared during the audit period. They are prepared under a separate Extraction Plan Guideline and do not specifically need to cover this condition.</p> <p>No additional Subsidence Management Plans prepared in the audit period.</p>	<p>Discharge locations sighted in the field inspection.</p> <p>Records of discharge volume and water quality outlined in Annual Reviews.</p>
5. Working Requirement				
	<p>The lease holder must:</p> <p>(a) ensure that at least 43 competent people are efficiently employed on the lease area on each week day except Sunday or any week day that is a public holiday.</p> <p>OR</p> <p>(b) expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than \$752,500 per annum whilst the lease is in force.</p> <p>The Minister may at any time or times, by instrument in writing sensed on the lease holder, increase or decrease the expenditure required or the number of people to be employed</p>	Compliant	Operations meet sub condition a and b.	
6. Control of Operations				
	<p>(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:-</p> <p>(i) cease working the lease; or</p> <p>(ii) cease that part of the operation not complying with the Act or conditions;</p> <p>until in the opinion of the Environmental Officer the situation is rectified.</p> <p>(b) The lease holder must comply with any direction given. The Director-General may confirm, vary or revoke any such direction.</p> <p>(c) A direction referred to in this condition may be sensed on the Mine Manager.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
7. Reports				
	<p>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:</p> <p>(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;</p> <p>(b) Details of expenditure incurred in conducting that exploration;</p> <p>(c) A summary of all geological findings acquired through mining or development evaluation activities;</p> <p>(d) Particulars of exploration proposed to be conducted in the next twelve months period;</p> <p>(e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.</p>	Administrative Non-Compliance	<p>Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports.</p> <p>LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement.</p> <p>In the version supplied to SLR there are no figures.</p>	<p>Ensure Group Exploration Reports meet the required timeframe.</p> <p>Ensure figures are included in the reports.</p>
8. Licence to Use Reports				
	<p>(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.</p> <p>(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.</p>	Note		
9. Confidentiality				
	<p>(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:</p> <p>(i) the lease holder has agreed that specified reports may be made non- confidential.</p> <p>(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.</p> <p>(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.</p> <p>(c) The Director-General may extend the period of confidentiality.</p>	Note		
10. Terms of the non-exclusive licence				

	<p>The terms of the non-exclusive copyright licence granted under condition 8 (a) are:</p> <p>(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.</p> <p>(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.</p> <p>(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.</p> <p>(d) there is no royalty payable by the Minister for the licence.</p> <p>(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.</p>	Note		
11. Blasting				
	<p>(a) Ground Vibration</p> <p>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 Conservation.</p> <p>(b) Blast Overpressure</p> <p>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 dwelling or occupied premises, as the case may be, unless determined otherwise by the Department of Environment and Conservation.</p>	Not Triggered	No above ground blasting has been undertaken during the audit period.	
12. 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.	N/A	This is not a safety audit.	
13. Rehabilitation				
	<p>(a) Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that:-</p> <ul style="list-style-type: none"> there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion. the state of the land is compatible with the surrounding land and land use requirements. the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land. in cases where revegetation is required and native vegetation has been removed or damaged, the original species must be re- established with close reference to the flora survey included in the Mining Operations Plan. If the original vegetation was not native, any re-established vegetation must be appropriate to the area and at an acceptable density. the land does not pose a threat to public safety. <p>(b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.</p>	Not Triggered	No areas available for rehabilitation. Minimal disturbance required during the audit period.	
14	The lease holder must comply with any direction given by the Director-General regarding the stabilisation and revegetation of any mine residues, tailings or overburden dumps situated on the lease area.	Not Triggered	Based on information provided to SLR this has not been triggered. There are no tailings or overburden areas.	
15. Exploratory Drilling				
15	<p>(1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.</p> <p>(2) If the lease holder drills exploratory drill holes he must satisfy the Director- General that:-</p> <p>(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;</p> <p>b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;</p> <p>(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwater's;</p> <p>(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;</p> <p>(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.</p> <p>(f) 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.</p> <p>(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.</p>	Not Triggered	Based on discussions with Environment and Community Co-ordinator there has been no exploration for several years. Nothing mentioned in the Annual Reviews.	
16. 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 accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwater's. The lease holder must observe and perform any instructions given by the Director-General in this regard.	Compliant	The field inspection around the pit top and other areas did not identify any significant areas of erosion.	
17. 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.	Not Triggered	Based on information provided to SLR this has not been triggered.	
18. Fences, Gates				

	<p>(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.</p> <p>(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
19. Roads and Tracks				
	<p>a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.</p> <p>(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.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
20	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 Natural Resources.	Compliant	Minimal tracks. Only around pit top and vent shaft area.	
21. Trees and Timber				
	<p>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.</p> <p>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 operations. Any clearing not authorised under the Mining Act 1992 must comply with the provisions of the Native Vegetation Act 2003.</p> <p>(c) The lease holder must obtain all necessary approvals or licences before using timber from any Crown land within the lease area.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
23. Resource Recovery				
	<p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p> <p>(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.</p>	Not Triggered	Based on information provided to SLR this has not been triggered.	
24. 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.	Note		
25. Single Security (extended)				
	<p>(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 Lease 1051 (Act 1906), Mineral Lease 1052 (Act 1906), Mineral Lease 1308 (Act 1906), Mining Purposes Lease 211 (Act 1906), Mining Purposes Lease 1349 (Act 1906), Mining Purposes Lease 1389 (Act 1906), Mining Purposes Lease 1400 (Act 1906), Consolidated Coal Lease 706 (Act 1973) and Mining Purposes Lease 337 (Act 1973) is extended to apply to this lease.</p> <p>(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.</p>	Compliant	<p>Security deposit provided to SLR for this audit.</p> <p>Dated August 2018 with RCE value of \$3,109,607. Evidence of approval letter from Resources Regulator dated 19 October 2018.</p>	
28. 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.	Note		
29. Special Conditions - Road Transport				
	Unless with the consent of the Minister first had and obtained and subject to such conditions as he may stipulate, the leaseholder shall not transport any coal, won from or conveyed through the subject area, by public road otherwise than in accordance with the document entitled 'Chain Valley Colliery, Road Transport Protocol' prepared by Planning NSW and dated 25 February 2003.	Note		

APPENDIX C

Audit Certification Form

Development Name	Chain Valley Colliery
Development Consent No.	SSD 5465
Description of Development	Underground Coal Mine
Development Address	Off Construction Road, Vales Point NSW 2259
Operator	Delta Coal
Operator Address	Off Construction Road, Vales Point NSW 2259
Title of Audit	Chain Valley Colliery 2019 Independent Environmental Audit
<p><i>I certify that I have undertaken the independent Audit and prepared the contents of the attached independent Audit report and to the best of my knowledge:</i></p> <p><i>The Audit has been undertaken in accordance with relevant approval condition(s) and in accordance with the Auditing standard AS/NZS ISO 19011:2014 and Post Approval Guidelines – Independent Audits</i></p> <p><i>The findings of the Audit are reported truthfully, accurately and completely;</i></p> <p><i>I have exercised due diligence and professional judgement in conducting the Audit;</i></p> <p><i>I have acted professionally, in an unbiased manner and did not allow undue influence to limit or over-ride objectivity in conducting the Audit;</i></p> <p><i>I am not related to any owner or operator of the development as an employer, business partner, employee, sharing a common employer, having a contractual arrangement outside the Audit, spouse, partner, sibling, parent, or child;</i></p> <p><i>I do not have any pecuniary interest in the Audited development, including where there is a reasonable likelihood or expectation of financial gain or loss to me or to a person to whom I am closely related (i.e. immediate family);</i></p> <p><i>Neither I nor my employer have provided consultancy services for the Audited development that were subject to this Audit except as otherwise declared to the lead regulator prior to the Audit; and</i></p> <p><i>I have not accepted, nor intend to accept any inducement, commission, gift or any other benefit (apart from fair payment) from any owner or operator of the development, their employees or any interested party. I have not knowingly allowed, nor intend to allow my colleagues to do so.</i></p> <p>Note.</p> <p><i>The Independent Audit is an ‘environmental Audit’ for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an Audit report produced to the Minister in connection with an environmental Audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>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).</i></p>	
Signature	
Name of Lead / Principal Auditor	Chris Jones
Address	10 Kings Road, New Lambton NSW 2305, Australia
Email Address	cjones@slrconsulting.com
Auditor Certification (if relevant)	Principal Environmental Auditor
Date:	24 June 2019

APPENDIX D

Endorsement of SLR

Chris Armit
Environment and Community
Lake Coal
PO Box 7115
MANNERING PARK NSW 2259

Contact: Leah Cook
Phone: 02 65753403
Email: leah.cook@planning.nsw.gov.au
compliance@planning.nsw.gov.au

**Chain Valley Colliery and Mannering Colliery
2019 Independent Environmental Audit Scope and Team Endorsement**

Dear Mr Armit,

Thank you for providing a copy of SLR's Independent Environmental Audit (IEA) proposal for Chain Valley and Mannering Collieries, for endorsement of the team in accordance with SSD 5465, as modified and PA 06_0311, as modified.

The Department has reviewed the information provided and endorses the scope of the IEA and proposed audit team with the following personnel:

- Chris Jones – Lead Auditor
- Tracey Ball – Senior Assistant Auditor
- Martin Davenport - Noise specialist

The Department has also requested that the audit team includes an independent subsidence specialist (endorsement pending) and their audit findings should be incorporated into the SLR report.

The Department expects that the audit will be conducted in accordance with the Independent Audit Guideline, October 2015. A copy of this guideline is available at:

<http://www.planning.nsw.gov.au/~media/Files/DPE/Guidelines/independent-audit-guideline-2015-10-23.ashx>

Please ensure that your audit team consults with relevant agencies to ascertain any aspects that the agencies wish the audit to address. Evidence of agency consultation and clear referencing to audit findings in relation to any agency request is to be provided in the audit report.

Please note that the Chain Valley approval has a tighter timeframe for delivery of the audit report and response to audit recommendations (RAR) (6weeks for the date of inspection, unless otherwise agreed). Please ensure that the RAR includes responses to all non-compliances and auditor recommendations with clear timeframes (dd-mm-yyyy) for implementation of the proposed corrective action.

Please contact me if you require any further clarification.

Yours sincerely,

 28/11/19.

Leah Cook
Team Leader - Compliance
As Nominee of the Secretary

Hi Chris

After due consideration, I, as nominee of the Secretary, approve an extension of time for the submission of the Chain valley IEA to 25th June 2019.

Any further concerns please contact the compliance team.

Regards,

Leah Cook

Team Leader - Compliance
Department of Planning & Environment
Suite 14, Level 1, 1 Civic Av
PO Box 3145
Singleton NSW 2330
<http://www.planning.nsw.gov.au>
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Please consider the environment before printing this e-mail.

From: Chris Armit <CArmit@deltacoal.com.au>

Sent: Wednesday, 3 April 2019 3:54 PM

To: Leah Cook <Leah.Cook@planning.nsw.gov.au>; DPE PSVC Compliance Mailbox <compliance@planning.nsw.gov.au>; Joel Curran <Joel.Curran@planning.nsw.gov.au>

Cc: Christopher Jones <cjones@slrconsulting.com>; Tracey Ball <tball@slrconsulting.com>

Subject: CVC IEA Reporting - Time Extension Request

Dear Leah,

We have commenced our CVC and Mannering IEA's this Tuesday, 3rd April 2019. I have been requested by Chris Jones (SLR Consulting) to seek from the secretary or secretary's nominee an extension of time required to submit a copy of the Chain Valley Independent Environmental Audit report to the proposed date of the 31st May 2019.

Currently, the 6 week due date would be 14th May, this is a proposed extension of approximately 2.5 weeks to account for personnel annual leave over the Easter/School holiday period. See below applicable CVC Mod 2 – IEA reporting condition.

10. Within 6 weeks of the completion of this audit, or as otherwise agreed by the **Secretary**, submit a copy of the audit report to the **Secretary**, together with its response to any contained in the audit report.

Chris Jones does not seek an extension for the Mannering IEA as it already has a 12 week completion period from audit start which gives an achievable report submission date of 25th June 2019 .

Regards,
Chris

APPENDIX E

Review of Subsidence (SCT 2019)

6 June 2019

Christopher Jones
Associate – Env Man Permitting
& Compliance
SLR Consulting Australia Pty Ltd
10 Kings Rd
NEW LAMBTON NSW 2305

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Email: sctnsw@sct.gs

BRISBANE OFFICE
Telephone/Fax: 0428 318 009 (international +61 428 318 009)
Email: p.cartwright@sct.gs

BENDIGO OFFICE
Telephone: +61 3 5443 5941
Email: s.macgregor@sct.gs

CHA4988

Dear Chris

**Independent Audit of Subsidence Related Issues for Chain Valley Colliery
2016-2019**

Chain Valley Colliery (CVC) is an underground coal mine located at the southern end of Lake Macquarie approximately 40km south of Newcastle. CVC is required under Section 9 of Schedule 6 of Modification 2 of Development Consent SSD-5465 to undertake an Independent Environment Audit (IEA) by the end of February 2016 and every 3 years thereafter. CVC commissioned SLR Consulting Australia Pty Ltd (SLR) as the lead auditor for the 2019 IEA with SCT Operations Pty Ltd (SCT) providing an independent specialist review of subsidence related compliance as requested by the Department of Planning and Environment (DPE). This report presents the outcomes of our review of subsidence related compliance at CVC for the period 1 January 2016 to 5 April 2019 during which mining took place in Fassifern Seam miniwall panels MW10-12, MW5A, MW CVB1, N1 and S1.

Our review indicates that CVC is generally compliant or likely to be generally compliant with the development consent conditions and their commitments in relation to subsidence. There are multiple areas for improvement in monitoring systems and analysis and reporting of subsidence results. The monitoring systems in place for benthic and seagrass communities appear unlikely to be able to discriminate impacts to a level that would ensure subsidence related impacts are minor or negligible as required in the development consent conditions.

1. SCOPE OF WORKS

The scope of works as outlined in Jones (2019) requires the subsidence specialist to:

- Attend a one day site visit scheduled for 2 April 2019 to complete site inspections and review available information on site.

- Assess compliance for all subsidence related conditions in the Development Consent (SSD-5465), Consolidated Coal Leases and Statement of Commitments.

The outcomes of the one day site visit are presented in Section 3.

The following documents were reviewed as a basis to understand commitments made by LakeCoal Pty Ltd (LakeCoal) to manage subsidence impacts, regulatory requirements for management of subsidence impacts as conditions of approval and information provided by LakeCoal to confirm compliance or otherwise with these approval conditions.

Project Applications

1. EMM 2015 Chain Valley Colliery – Modifications 2: Statement of Environmental Effects | Section 96 Modification to SSD-5465 prepared for LakeCoal Pty Limited by EMM dated 29 June 2015.
2. Chain Valley Colliery – Extraction Plan MW7 to MW12 prepared by Lake Coal dated 28 March 2013.
3. Chain Valley Colliery SMP Application - MW7 to MW12: Application for Subsidence Management Plan Approval – Written Report. Letter dated 3 March 2014.
4. Chain Valley Colliery Extraction Plan Miniwalls CVB1 to CVB3 prepared by Lake Coal ENV 00015 Rev 4 dated 28 June 2017.
5. Chain Valley Colliery Subsidence Monitoring Program Miniwalls CVB1 to CVB3 prepared by Lake Coal ENV 00014 dated 9 June 2017.
6. Chain Valley Colliery Extraction Plan Miniwalls S1 to N1 Prepared by Lake Coal Rev 1 dated 3 May 2018.

Project Approvals

7. Mod 2 Consolidated Consent SSD-5465 December 2015 which includes:
 - a. Schedule 4: Environmental Conditions – Underground Mining Subsidence.
 - b. Appendix 9: Statement of Commitments in relation to Subsidence (Pg38) and Marine ecology (Pg39).
8. Chain Valley Colliery Extension Project (SSD 5465): Variation to Extraction Plan MW7-12 to include MW5A. Letter of Approval from DPE dated 13 February 2017.
9. Chain Valley Colliery Extension Project (SSD 5465): Extraction Plan Northern Mining Area Approval of Miniwalls N1 and S1. Letter of Approval from DPE dated 24 May 2018.

10. Chain Valley Colliery Extension Project (SSD 5465) Approval of First Workings for Northern Mining Area. Letter of Approval from DPE dated 20 July 2018.

Compliance Monitoring

11. Chain Valley Colliery – Annual Review 2016: 1 January 2016 – 31 December 2016. Document reference RPT 00024 dated 28 April 2017.
12. Chain Valley Colliery – Annual Review 2017: 1 January 2017 – 31 December 2018. Document reference RPT 00041.
13. Chain Valley Colliery – Annual Review 2018: 1 January 2018 – 31 December 2018. Document reference RPT 00059.
14. DgS 2017 Subsidence Data Review for Proposed Miniwalls CVB1 to CVB3 at Chain Valley Colliery. A letter report prepared by Ditton Geotechnical Services Pty Ltd (DgS) addressed to Adrian Moodie and date 15 November 2017.

2. BACKGROUND

This section brings together information available from a range of sources reviewed during the IEA as context for the audit.

CVC has been operating as an underground mine since 1962. The colliery has extracted coal from the Wallarah Seam, the Great Northern Seam and more recently the Fassifern Seam. Figure 1 reproduced from EMM (2015) shows the workings in the Wallarah and Great Northern Seams and Fassifern Seam to 2015 and the additional workings in the Fassifern Seam applied for under Modification 2 (MOD2) to SSD 5465.

All three coal seams dip gently to the southeast. The overburden depth to the uppermost Wallarah Seam ranges from approximately 80m in the north (Borehole EBU11) to 160m in the southeast. The Wallarah Seam is nominally 2.6m thick. The interburden to the Great Northern Seam comprises mainly conglomerate strata ranging in thickness from 10m in the north (EBU11) to 30m in the south. The Great Northern Seam and Fassifern Same mining sections are nominally 3m thick although the Fassifern Seam is somewhat thicker. In places, the Fassifern Seam is separated from the Great Northern Seam by approximately 80m of interburden comprising predominantly conglomerate strata but this reduces to 30m in the south under Chain Valley Bay.

CVC mine the Wallarah Seam using bord and pillar mining over an area of approximately 12km² located mainly (80%) under the Gwandalan / Summerland Point peninsular and (20%) under Lake Macquarie (Chain Valley Bay). Full extraction is limited to the land areas. First workings and partial extraction mining extends below Summerland Point, the lakeshore and Chain Valley Bay. Mining in the Wallarah Seam ceased in 1997.

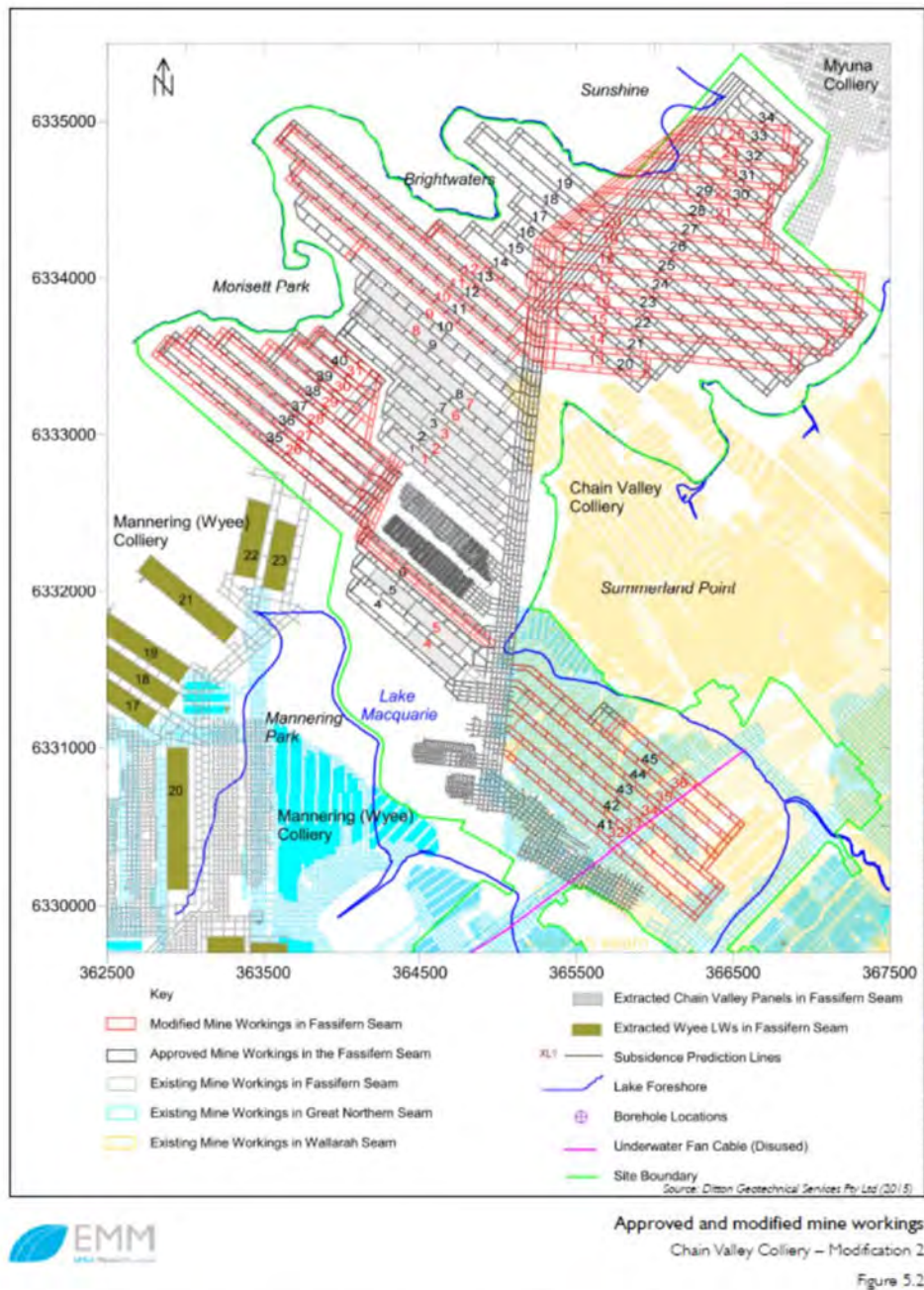


Figure 1: Plan showing proposed mining layout (from MOD2 EA)

The Great Northern Seam was mined over an area of approximately 4.5km², half below Chain Valley Bay and half below the southern part of the Gwandalan / Summerland Point peninsular. There are areas of full extraction including under both the lake and the peninsular and a similar sized area of partial extraction. There are large areas of small standing pillars along the northern shore of Chain Valley Bay south of Summerland Point.

The Fassifern Seam has been mined since 2006 as a series of narrow panels, initially pillar extraction panels with place changing and then from the latter half of 2011 as miniwall panels. All the panels are located under Lake Macquarie in areas at least 26.5° angle of draw from the lakeshore.

Since 1979, CVC was operating under existing use right under the Mining Act 1992 until an Environmental Assessment process as required by a change in legislation was undertaken between 2009 and 2012 culminating in project approval MP 10_0161 on 23 January 2012. A modification was approved on 30 August 2012. In December 2013, a development consent (SSD 5465) was received for the Chain Valley Extension Project under Section 89E of the Environmental Planning and Assessment Act 1979 for CVC to continue mining via miniwall methods to the north of a previously approved boundary. This consent was modified as Modification 1 in November 2014 and MOD2 in December 2015. The IEA is being undertaken to comply with Section 9 of Schedule 6 of MOD2 of Development Consent SSD-5465.

In 2006, CVC was operated by Lake Coal Pty Ltd on behalf of the Wallarah Coal Joint Venture with Lake Coal holding an 80% shareholding in the joint venture. In March 2011 the remaining 20% was acquired by a consortium of shareholders through the entity Fassi Coal Pty Ltd. On 3 October 2018, Lake Coal Pty Ltd and Fassi Coal Pty Ltd were placed into voluntary administration and subsequently purchased on 1 April 2019 by Great Southern Energy trading as Delta Coal.

3. SITE INSPECTION

A site inspection was conducted by the author on 2 April 2018 as part of the IEA team to meet with CVC Environment and Community Coordinator, Mr Chris Armit, and to gain an understanding of:

- the history of mining at CVC
- the approvals under which the colliery is operating
- the monitoring data available
- the processes for reporting environmental impacts and
- conduct a surface inspection of the lakeshore at Summerland Point and Trinity Point.

The site visit was successful and informative. It was difficult to gain access to much of the foreshore areas, but the site inspection provided context for the audit.

Table 1 summarises the panels that were mined during each calendar year during the audit period from 1 January 2016 to 5 April 2019.

Table 1: Panels mined during audit period

Year	Miniwalls	Extraction Plan
2016	MW10, 11 & 12	Miniwalls 7-12 Extraction Plan (EP1)
2017	MW12	EP1
	MW5A	EP1 Miniwall 5A Modification (EP2)
	MWCVB1	Miniwalls CVB1-3 Extraction Plan (EP3)
2018	N1/S1	Miniwalls N1/S1 Extraction Plan (EP4)
2019	N1/S1	Miniwalls N1/S1 Extraction Plan (EP4)

The primary source of information of environmental impacts available for the audit were the three Annual Review (AR) reports for 2016, 2017 and 2018. No information was reviewed for the period 1 January 2019 to 5 April 2019.

4. OUTCOMES OF REVIEW

The issues identified in the consent conditions and repeated in the EA and various EPs and Subsidence Management Plans (SMPs) as requiring management of potential subsidence impacts include:

- Trinity Point Marina Development.
- Benthic communities on the floor of Lake Macquarie.
- Seagrass communities along the shore of Lake Macquarie.
- A requirement for long-term stable, non-subsiding first workings below any features requiring negligible environmental consequences.
- Second workings to be carried out in accordance with an approved EP.
- Other unspecified built features.
- Other unspecified threatened species or endangered populations.
- Negligible additional risk to public safety.

Given that subsidence from the mining undertaken during the IEA review period has been entirely under Lake Macquarie only the first five items are considered further in this audit review. The fifth item relating to second workings being carried out in accordance with an approved EP is the subject of this audit more generally.

Our review of the AR reports indicates that the monitoring to manage these features involves:

- monitoring of vertical subsidence along the lakeshore at selected sites
- annual bathymetric monitoring of the lake floor elevation
- surveys of benthic communities at multiple sites (the number varies) around the periphery of mining areas

- surveys of seagrass communities.

The following conclusions are drawn from the information presented in the AR reports and DgS (2017).

4.1 Trinity Point Marina Development

Lakeshore subsidence monitoring indicates that there was approximately 10mm of subsidence at Trinity Point during the mining of adjacent miniwalls. Such low levels of subsidence are not expected to be perceptible or to cause any significant impact to the built features of the Trinity Bay Marina. On this basis, the relevant consent condition is considered to have been met.

Improvements related to the presentation of survey data for the Trinity Point Marina Development and the survey technique have been identified during the audit and it is recommended that these improvements be included in future ARs.

The data from Trinity Point Marina Development is not presented in the 2016 AR despite being referenced as Table 3.7 (a table which appears in the report but presents Greenhouse Gas Emission data).

The survey data is presented in the 2017 AR but in tabular form. The location of the monitoring points is difficult to relate to the location on the ground and changes are difficult to discern from the tabular data. Graphical presentation of the data and a figure showing where the ground movements have occurred and during which period of mining would assist with drawing meaning from the results and managing the potential for impacts.

There was no surveying data presented in the 2018 AR as there was no mining nearby.

A recommendation for the presentation of all future survey data would be to include a thorough and comprehensive analysis of the subsidence monitoring undertaken and independently reported so that the data can be meaningfully interpreted and comprehended by anyone with an interest in the outcomes.

The data presented in the ARs is for vertical level only. Subsidence monitoring based on levelling alone as a measure of ground movements is at the very basic end of contemporary subsidence monitoring practice. Three dimensional surveying with total station survey technology and high quality GNSS (i.e. GPS) control is readily available and widely used for subsidence monitoring. The benefits in terms of understanding the nature and extent of ground movements are significant. Horizontal movements are typically greater than the vertical movements in areas beyond the immediate footprint of mining. To measure and report only vertical subsidence movements is to miss most of the ground movements.

For sensitive high value features such as the marina, real-time continuous GNSS monitoring is available at relatively low cost and can be used to provide high confidence subsidence monitoring in three dimensions. A significant upgrade of subsidence monitoring systems and reporting protocols at CVC is recommended.

4.2 Benthic Communities

The development consent conditions for benthic communities require no more than minor environmental consequences, including minor changes to species composition and/or distribution. The ARs discuss the results of surveys being undertaken six monthly and annually during the audit period. There is no evidence of a 2019 survey yet, but it is anticipated that this survey has been undertaken and will be included in the 2019 AR. SCT does not have expertise in benthic communities, but specialist survey reports included in the AR are interpreted as indicating mining subsidence has not had any significant impacts on the benthic communities. On this basis, the relevant consent condition is considered to have been met.

There are two issues that have been identified in the audit that are not critical but do suggest that the benthic community monitoring may not be able to deliver the outcomes anticipated in the development consent conditions.

The benthic communities appear to be being surveyed in areas outside the area where subsidence is greatest so the association between the survey data gathered and impacts from mining subsidence appears tenuous. These communities are noted in the AR as being insensitive to water depth so there may be no need to consider the effects of subsidence increasing water depth. If that is the case, it is difficult to understand why there is a need to undertake the monitoring at all.

Second, the surveying being undertaken appears to be of a nature that would make a definitive assessment of whether impacts were of “minor environmental consequences” somewhat challenging. The Benthic Communities Management Plan presents a statistical approach to quantifying the results that is to be conducted every three years. It is unclear whether this triennial statistical analysis has been completed. No results were found in the three ARs relating to the audit period. Even with statistical analysis, it is unclear how any quantitative changes that were able to be determined could be meaningfully linked to subsidence, especially given the spatial difference between the sampling and the areas of subsidence. The monitoring is interesting and may be useful in a broader sense, but it does not appear to be suitable as an auditable consent condition.

4.3 Seagrass Communities

The approach that CVC has adopted to protect the seagrass communities is based on a Seagrass Protection Barrier (SPB) equivalent to 26.5° angle of draw from the edge of the seagrass beds or 35° angle of draw from the lakeshore whichever is greater so that there is no secondary extraction directly below the seagrass beds or even close to them. The survey data presented indicates that there may have been some movement on the northern lakeshore of Chain Valley Bay due to earlier mining, but the data does not appear to have been analysed with the rigour required to confirm or otherwise any impacts to the seagrass communities. On balance, the relevant consent condition is considered likely to have been met, but further work is recommended to confirm this to the level required in the consent conditions.

Where only one seam has been mined, the SPB approach is expected to limit subsidence to less than about 20mm at the edge of the seagrass beds and less than about 200mm at the edge of extraction. The bathymetric survey data from Miniwalls 7-12 supports this expectation.

In areas where more than one seam has been mined, a protection barrier based on angle of draw is likely to be less effective. The northern shore of Chain Valley Bay is an area where there is pre-existing mining in two seams below the lakeshore. Bathymetric surveying shows that the mining of Miniwall CVB1 caused subsidence of 300-350mm at 110m from the panel edge. This same surveying indicates that subsidence has reduced to low levels at 250m from the panel edge which is still well away from the edge of the seagrass beds and therefore there is unlikely to have been any impacts from mining Miniwall CVB at the edge of the seagrass beds.

The lakeshore subsidence monitoring on Line 23 indicates that there has been approximately 140mm of subsidence at Pegs 70 and 71 (Table 3.19) and Pegs 71 and 72 (Figure 3.18) since the line was installed in 1994. The apparent additional 20-40mm of subsidence during the period of mining Miniwall CVB1 is plotted in Figure 2 (reproduced from the 2017 AR and 2018 AR). The same figure is shown in both reports without any update during 2018.

The subsidence observed is in an area where the Great Northern Seam and Wallarah Seam were mined in a way that would only be expected to cause low level subsidence. An assumption is made in the 2017 AR that there has been some ongoing movement associated with this previous mining. This assumption may be true, but the IEA review could not find evidence in the data presented to confirm if there is an ongoing trend through 2018 (and 2019) or if the offset observed during the period of monitoring is due to a shift in the survey control or other similar effect. Such information would be necessary to inform an assessment of whether there had been any significant impact to the seagrass beds in the area.

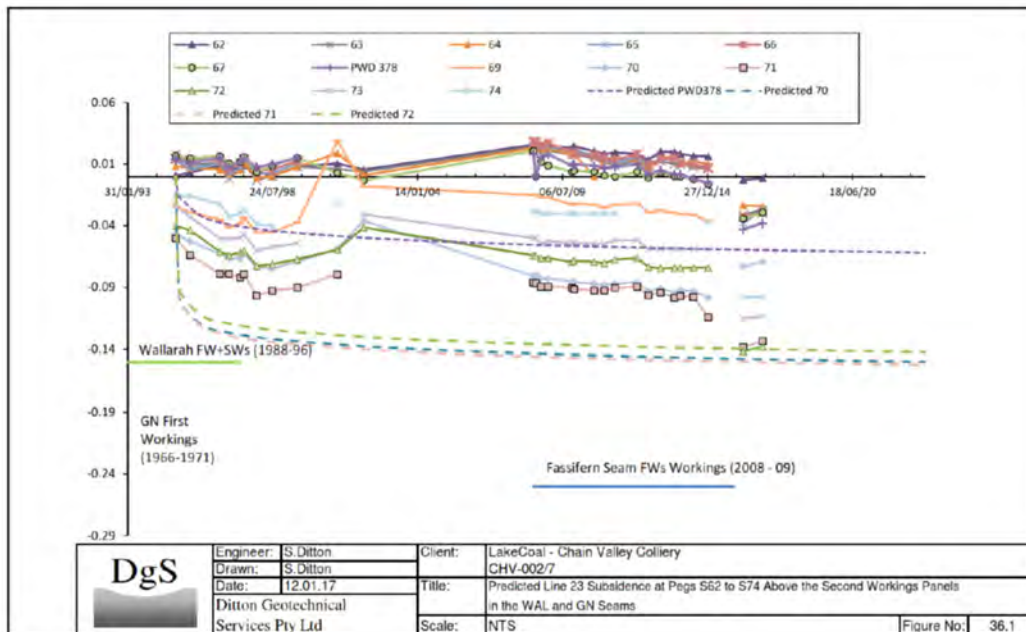


Figure 2: Line 23 subsidence monitoring (from 2017 & 2018 AERs)

The explanation provided that the subsidence is not due to mining Miniwall CVB1 and relates to earlier mining may be reasonable but similarly there may be other explanations. The mismatch between the data for Pegs 70, 71 and 72 presented in the table and the figure and the general lack of focus on the detail of the data do not build confidence in the information presented or in the ability of the monitoring to identify if the seagrass communities have been protected as required. A thorough review of the survey data and the generation of a subsidence report is recommended as is ongoing monitoring of this lakeshore.

It is not clear that the development consent conditions relating to the seagrass communities exempt CVC from the impacts due to earlier mining and the related commitments for offsets and other management controls as has been assumed in the 2017 and 2018 ARs.

4.4 Long-Term Stable First Workings

The information presented in the reports reviewed does not allow the long-term stability of the first workings to be assessed with confidence because the bathymetric survey method used does not have a high enough resolution to be unequivocal and lakeshore survey monitoring data is not convincing. Nevertheless, long-term stability is considered likely given the mining geometries involved. The data presented in Figure 2 suggests the possibility of some lack of long-term stability in the overlying seams. A close and thorough examination of this survey data is recommended to confirm whether this is the case or a result of survey related issues.

The relevant consent condition is considered likely to have been met without there being clear evidence to support this.

4.5 Second workings carried out in accordance with an approved EP

The IEA review indicates that all the second workings undertaken during the review period were carried out under approved EPs. The review further indicates that the subsidence related components have been carried out in general accordance with the processes described in the EA and EP.

The adequacy of the approaches described in the approved EA and EP to resolve compliance or otherwise of the impacts on benthic communities and seagrass communities is considered questionable but the challenges of finding better methodologies is recognised.

Improvements are recommended in relation to ground surveying along the lakeshore. The survey data that has been collected does not appear to have been thoroughly analysed. Thorough analysis may confirm that there is not any ongoing subsidence on the northern shore of Chain Valley Bay. If there is ongoing subsidence, this should be being monitored on a regular and ongoing basis. The use of a three-dimensional, continuous reading GNSS monitoring station with real-time monitoring should be considered.

The annual bathymetric subsidence monitoring appears to have been too infrequent to monitor subsidence for the management of panel design that was outlined in the Miniwall 7-12 EA. There does not appear to have been a design response when changes in subsidence were observed. The estimates of maximum subsidence have been increased and then further exceeded, but there has been no change in design. It is unclear if the commitment to six monthly bathymetry surveys after the subsidence observed in the 2017 AR has been adhered to.

Table 4 of the 2013 Miniwalls 7-12 EA indicates maximum subsidence of 440mm. The EA explains the subsidence monitoring plan as including:

In addition, regular and routine monitoring of the foreshore, lake bed, seagrass communities and benthic communities provide a means to verify and validate that predicted subsidence levels are not being exceeded, that the resultant levels of subsidence are not resulting in excessive impacts beyond those predicted. The mine design can then be adapted and refined as required if exceedances occur or are likely to occur.

Annual bathymetric surveys of the lake bed will be used to validate and confirm the predicted vertical subsidence around the miniwall panels. In addition ongoing surveys of benthic and seagrass communities will ensure that the resultant vertical subsidence levels are not resulting in more significant impacts than predicted. Appendix 2 and 3 contain the mines Benthic Community and Seagrass Management Plans.

The 2015 MOD2 subsidence assessment notes that the May 2015 bathymetric survey showed maximum subsidence of 570mm above Miniwalls 3-6. The MOD2 subsidence assessment updates the maximum subsidence predictions from 0.62m to 0.78m. The earlier 2013 predictions for Miniwalls 7-12 were 0.44m. These were updated to 0.72m. The associated assessments that rely on maximum predicated subsidence are considered in the MOD2 assessment.

Miniwall 12 was completed early in 2017. The 2017 AR reports maximum subsidence of 800-1100mm indicated by the bathymetric survey conducted in October 2017. The reference to subsidence exceeding predictions by approximately 430mm is not clear given that maximum subsidence of 1100mm exceeding predictions by 430mm would imply a prediction of 670mm. Nevertheless, maximum subsidence is significantly (250%) greater than the 440mm maximum subsidence predicted in the 2013 EA and 50% higher than the 720mm maximum subsidence predicted in the 2015 MOD2 assessment for the area above Miniwalls 7-12 (as per Figure 3a in DgS (2017)).

The sequence of significantly higher than predicted subsidence levels does not appear to have caused impacts greater than predicted, notwithstanding the absence of convincing assessment methodologies or that results for 2019 are not available. However, a more conservative approach to assessing future impacts from further mining is recommended to build confidence that the subsidence processes in play are understood and impacts that rely on the subsidence impacts can be suitably assessed prior to mining.

4.6 Other Issues

A range of other subsidence related compliance issues are presented in the IEA matrix. These are discussed in that matrix.

5. RECOMMENDATIONS

Recommendations from the IEA subsidence review are consolidated in this section.

A more conservative approach to assessing future impacts from further mining is recommended to build confidence that the subsidence processes in play are understood and impacts that rely on the subsidence impacts can be suitably assessed prior to mining.

A significant upgrade of subsidence monitoring systems and reporting protocols at CVC is recommended.

Presentation of all future survey data in ARs would benefit from a thorough and comprehensive analysis of the subsidence monitoring being undertaken by an external consultant so that the data can be meaningfully interpreted and is comprehensible by anyone with an interest in the outcomes.

The use of three dimensional surveying with total station survey and high quality GNSS (GPS) control is recommended. This technology is readily available and widely used for subsidence monitoring in NSW.

For sensitive high value features such as the marina or similar features, real-time continuous GNSS monitoring is available at relatively low cost and can be used to provide high confidence subsidence monitoring in three dimensions.

A review of benthic and seagrass community monitoring systems is recommended to confirm that the monitoring is capable of discriminating minor and negligible impacts as required by the development consent conditions.

A thorough review of the survey data and monitoring approach for Line 23 along the northern lakeshore of Chain Valley Bay is recommended.

If you have any queries or require further clarification of any of these issues, please don't hesitate to contact me directly.

Yours sincerely



Ken Mills
Principal Geotechnical Engineer

References

DGS 2017 Subsidence Data Review for Proposed Miniwalls CVB1 to CVB3 at Chain Valley Colliery. A letter report prepared by Ditton Geotechnical Services Pty Ltd (DgS) addressed to Adrian Moodie and date 15 November 2017.

EMM 2015 Chain Valley Colliery – Modifications 2: Statement of Environmental Effects | Section 96 Modification to SSD-5465 prepared for LakeCoal Pty Limited by EMM dated 29 June 2015.

Jones C. 2019, email 4 March 2019.

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Appendix 10: Independent Environmental Audit Action Plan

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 106 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

INDEPENDENT ENVIRONMENTAL AUDIT

ACTION PLAN

2019

Chain Valley Colliery

Non-compliance summary and recommendations Prepared by :

SLR Consulting and SCT

Confirmation and Due date Prepared by : June 2019

Delta Coal



21st March 2022 Update

Action Table from Chain Valley Colliery IEA Audit Findings – Summary of Non-Compliances

Table 1 outlines the summary of non-compliances relating to the statutory conditions of Chain Valley Colliery, proposed recommendation, Delta confirmation and due date.

Table 1 Summary of Non-Compliances

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
SSD 5465 (as modified)						
Schedule 2 Condition 7	The Applicant shall ensure that no laden coal trucks are dispatched from the site to public roads outside of the hours of 5:30 am to 5:30 pm, Monday to Friday, and not at all on Saturdays, Sundays or public holidays	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	REC 1 Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.	REC 1 Agree	REC 1: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 2 Condition 8	<p>The Applicant shall not dispatch from the site more than:</p> <p>(a) 660,000 tonnes of product coal in any calendar year to Port Waratah Coal Services for export;</p> <p>(b) 180,000 tonnes of product coal in any calendar year to domestic customers other than Vales Point Power Station;</p> <p>(c) a total of 270 laden coal trucks per day by public roads;</p> <p>(d) a total of 32 laden coal trucks per hour; and</p> <p>(e) an average of 16 laden coal trucks per hour by public roads during peak hour periods, calculated monthly, until the intersection of M1 Motorway and Sparks Road Interchange (East Side - unsignalised with stop sign) is upgraded to a signalised intersection.</p>	Non-Compliant (Low Risk)	<p>2018 Annual Review - 394,213 tonnes transported, but 0 t from public roads.</p> <p>2017 Annual Review- 1,378,996 tonnes transported to power station. 254 tonnes on public roads.</p> <p>2016 Annual Review - 1,175,523 tonnes to domestic market. 2,414 tonnes on public roads.</p> <p>a) Within this limit;</p> <p>b) Within this limit;</p> <p>c) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date;</p> <p>d) There is no evidence provided of breakdown on public roads for 2016, 2018 and 2019 year to date;</p> <p>e) Based on the Annual Review data this has been met.</p> <p>Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition.</p>	As per REC 1 Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.	See REC 1 Agree	REC 1: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 2 Condition 10	The Applicant shall restrict the transport of coal by truck to the Vales Point Power Station between 10 pm and 5:30 am to: (a) 16 laden trucks per hour for the Spring and Autumn months; and (b) zero during Winter months.	Non-Compliant (Low Risk)	Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided in the spreadsheet. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR in unable to determine if the site is compliant with this condition.	As per REC 1 Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent.	See REC 1 Agree	REC 1: 100%
Schedule 2 Condition 11	Planning Agreement Within 12 months of the date of this consent, unless otherwise agreed by the Secretary, the Applicant shall enter into a planning agreement with the WSC in accordance with Division 6 of Part 4 of the EP&A Act that provides for payment to the WSC for community enhancement purposes. The agreement must include provision for those matters set out in condition 12 below. If there is any dispute between the Applicant and WSC relating to the preparation or implementation of the planning agreement, then either party may refer the matter to the Secretary for resolution.	Administrative Non - Compliance	<u>Administrative non - compliance</u> prior to this audit period. The VPA was not executed with the WSC within the required date - 23 December 2014. There were numerous attempts between 2013 to 2016 to execute this agreement (based on evidence from the prior audit). The VPA was executed on 1 September 2016. Evidence of payment in the 2016, 2017 and 2018 Annual Reviews. Evidence of receipts from 19 March 2018 and 23 March 2017. Historical <u>Admin - Non - Compliance</u> for not meeting 12 month date. No further action proposed.	Nil Action		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 2 Condition 18	<p>The Applicant must regularly review the strategies, plans and programs required under this consent and ensure that these documents are updated to incorporate measures to improve the environmental performance of the development and reflect current best practice in the mining industry. To facilitate these updates, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.</p> <p>With the agreement of the Secretary, the Applicant may prepare a revision or stage of any strategy, plan or program required under this consent without undertaking consultation with all parties nominated under the applicable condition in this consent.</p> <p>Notes:</p> <ul style="list-style-type: none"> • While any strategy, plan or program may be submitted on a staged basis, the Applicant must ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times. • If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program. 	Administrative Non - Compliance	<p>The following Management Plans are applicable to CVC and outlined on the CVC website:</p> <p>Water Management Plan - July 2015; Air Quality Management Plan - July 2014; Noise Management Plan - March 2014; Heritage - June 2014; Biodiversity Management Plan - 16 March 2016; Seagrass Management Plan - April 2014; and Environmental Management System - 2012.</p> <p><u>Admin Non - Compliance:</u> This condition is non - compliant as plans have not been 'regularly' updated.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p>	<p>REC 2</p> <p>All management plans require updating due to the length of time since the previous reviews. All should in a Delta Coal template.</p> <p>Ensure there is a cross referencing table covering this condition in management plans.</p> <p>Additional detail including Trigger, Action, Response Tables (contingency plan) should be developed in the next round of management plan updates.</p>	<p>REC 2</p> <p>Agree 30/09/19</p>	<p>REC 2: 100%</p> <p>All MP's listed have been revised and provided to DPIE and stakeholders for approval.</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 3 Condition 1	Monitoring of Coal Transport The Applicant shall: (a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and (b) make these records publicly available on its website at the end of each calendar quarter.	Non – Compliant (Low Risk)	a) Detailed coal records only provided for 2017. This included loads and tonnages for Delta (Vales Point), Weathertex and Port Waratah Coal Service. There are no times provided on the spreadsheet provided. SLR requested additional spreadsheets but no detailed information was provided for 2016, 2018 and 2019 year to date. As no information was provided SLR is unable to determine if the site is compliant with this condition. b) Evidence of publically available information regarding transport. However this information showed most quarters in 2016 and 2017. However no coal records on the website in 2018 or 2019. <u>Admin Non - Compliance.</u>	As per REC 1 Ensure detailed records of coal transportation are recorded and able to be provided to auditors upon request. The spreadsheets should cover the requirements of the key conditions of the Development Consent. REC 3 Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.	See REC 1 Agree REC 3 Agree 30/09/19	REC 3: 100%
Schedule 3 Condition 2	Road Works The Applicant shall upgrade the Ruttleys Road and Construction Road intersection within 6 months of the date of this consent, unless the Secretary directs otherwise, by: (a) installing additional signage on and adjacent to Construction Road prior to the intersection;	Administrative Non - Compliance	'Based on site communications with Environment and Community Co-ordinator. No upgrades completed during this audit period. However there is a historical Admin Non - Compliance from the previous audit period, with these details noted by Hansen Bailey (2016). - WSC Civil Design Approval SCC11-2013 dated 1/04/14 and WSC invoice for construction assessment and certificate dated 17/07/13;	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(b) repairing the surface of Construction Road as required and ensuring the edge seal of the left turn lane is of sufficient width to accommodate coal trucks;</p> <p>(c) installing or replacing "Stop" signs in accordance with Austroads guidelines;</p> <p>(d) repainting road line markings and raised pavements associated with this intersection; and</p> <p>(e) installing barriers to prevent trucks parking on the gravel area adjacent to the intersection and the electricity substation located in the vicinity of this intersection.</p> <p>The design and construction of these works must be undertaken in consultation with, and to the relevant satisfaction of, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.</p>		<p>- Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and</p> <p>- Email from LC to Delta Electricity dated 29/01/14 and response from Delta Electricity dated 11/02/14 confirming approval of the proposed works.</p> <p>No evidence that the required Ruttleys Road and Construction Road intersection upgrade was to the satisfaction of RMS and DPE.</p> <p>Construction works for the intersection upgrade were completed on 14/08/2014, which is outside of 6 months of the date of approval of SSD-5465 (i.e. 23/06/2014). Historical admin non-compliance with no further action.</p>			
Schedule 3 Condition 3	<p>Road Transport Protocol</p> <p>The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall:</p> <p>(a) be prepared in consultation with RMS, NCC, WSC, DRE and CCC and submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(b) describe the designated haulage routes to be used (as shown in Appendix 5); the maximum number of road movements proposed and the haulage hours permitted under this consent;</p> <p>(c) include a Traffic Management Plan, which includes:</p>	Administrative Non - Compliance	<p>Evidence of Road Transport Protocol. Road Transport Protocol, which includes; MSP-D-14559 – Coal Haulage Traffic Management Plan and POL-D-14926 Coal Haulage Driver Code of Conduct.</p> <p>Coal Haulage Traffic Management System Plan on the CVC website is dated 18/03/14. This plan has not been updated since the previous audit.</p> <p>Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012.</p> <p>Preparation:</p> <p>a) Evidence of consultation from 2014;</p>	<p>REC 4</p> <p>Ensure Coal Haulage Traffic Management Plan is reviewed as per the requirements of the consent and commitments in the management plan.</p> <p>Attach Driver Code of Conduct to the management plan.</p>	<p>REC 4</p> <p>Agree: 30/09/19</p>	REC 4: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> procedures to ensure that drivers adhere to the designated haulage routes; measures to maximise the use of a low frequency (regular) trucking schedule rather than an intermittently-high frequency (campaign) trucking schedule, especially during the morning peak hour; contingency plans to apply when (for example) the designated haulage route is disrupted, including procedures for notifying relevant agencies and affected communities of the need to implement such contingency plans; 		<p>b) Section 8.3;</p> <p>c) Overall document. Covered in Section 8;</p> <p>d) Code of conduct discussed in Section 8.11. Not attached to the document.</p> <p>Implementation:</p> <p>Records and training.</p> <p>Section 12 of this plan states - "The Manager of Mining Engineering or his representative shall formerly review this document every three years". No evidence of any review in 2017, therefore Admin Non - Compliant.</p>			
	<ul style="list-style-type: none"> procedures to ensure that all haulage vehicles associated with the development are clearly distinguishable as CVC Colliery coal haulage trucks; details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site; measures to ensure that the provisions of the Traffic Management Plan are implemented, eg driver training in the heavy vehicle driver's Code of Conduct and contractual agreements with heavy vehicle operators; and procedures for ensuring compliance with and enforcement of the heavy vehicle driver's Code of Conduct; <p>(d) include a Code of Conduct for heavy vehicle drivers that addresses:</p> <ul style="list-style-type: none"> travelling speeds; 					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> • instructions to avoid grouping or conveying of trucks; • instructions to drivers not to overtake each other on the haulage route, as far as practicable, and to maintain appropriate distances between vehicles; • instruction to drivers to adhere to the designated haulage routes; • instruction to drivers to be properly safety conscious and to strictly obey all traffic regulations; and • appropriate penalties for infringements of the Code. <p>The Applicant shall implement the approved Road Transport Protocol as approved from time to time by the Secretary.</p>					
Schedule 3 Condition 4	<p>Independent Traffic Audit</p> <p>Prior to 31 March 2014, and every 12 months thereafter, unless the Secretary directs otherwise, the Applicant shall commission a suitably qualified person, whose appointment has been approved by the Secretary, to conduct an Independent Traffic Audit of the development. This audit must:</p> <p>(a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC and the CCC;</p> <p>(b) assess the impact of the development on the performance and safety of the road network, including a review of:</p> <ul style="list-style-type: none"> • haulage records; 	Administrative Non - Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	<p>REC 5</p> <p>Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.</p>	<p>REC 5</p> <p>Agree: 31/12/19</p>	REC 5: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> • accident records on the haulage route, infringements relating to the code of conduct and any incidents involving haulage vehicles; • community complaints register; and (c) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts. 					
Schedule 3 Condition 5	<p>Within 1 month of receiving the audit report, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the report to the Secretary, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report.</p> <p>A summary of the audit report must be included in the Annual Review.</p>	Administrative Non - Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	As per REC 5 Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.	See REC 5 Agree: 31/12/19	REC 5: 100%
Schedule 3 Condition 6	<p>Alternative Coal Transport Options</p> <p>Prior to 31 December 2014, and every three years thereafter, the Applicant shall prepare and submit to the Secretary for approval, a study of the reasonable and feasible options to reduce or eliminate the use of public roads to transport coal from the development. The assessment must include:</p> <p>(a) an analysis of the capital, construction and operating costs of the alternative transport options; and</p>	Administrative Non - Compliance	Evidence provided of 2014 study with the letter dated 10 December 2014. The condition requires an audit every three years which would be in late 2017. No evidence of 2017 report provided to SLR, therefore Admin Non - Compliance.	<p>REC 6</p> <p>Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.</p> <p>Comments</p>	REC 6 Agree: 31/12/20	REC 6: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22																																							
	(b) quantified social and environmental impacts associated with road and rail transport.			Approach DPIE- Compliance and DPIE Resource assessments to remove this requirement as coal is conveyed from CVC underground to Mannering Colliery for crushing and then conveyed to Vales Point Power Station. Trucking generally ceased so feasibility study on coal transport alternatives is of little current benefit to stakeholders.																																									
Schedule 3 Condition 7	<p>Noise Impact Assessment Criteria</p> <p>The Applicant shall ensure that the noise generated by the development at any residence on privately- owned land does not exceed the criteria for the location in Table 1 nearest to that residence.</p> <p><i>Table 1: Noise Criteria dB(A)</i></p> <table><tr><th rowspan="2">Location</th><th>Day</th><th>Evening</th><th></th></tr><tr><th>L_{Aeq}(15 min)</th><th>L_{Aeq}(15 min)</th><th>L_{Aeq}(15 min)</th></tr><tr><td>R8</td><td>38</td><td>38</td><td>38</td></tr><tr><td>R11</td><td>49</td><td>49</td><td>49</td></tr><tr><td>R12</td><td>49</td><td>49</td><td>49</td></tr><tr><td>R13</td><td>43</td><td>43</td><td>43</td></tr><tr><td>R15</td><td>36</td><td>36</td><td>36</td></tr><tr><td>R19</td><td>37</td><td>37</td><td>37</td></tr><tr><td>R22</td><td>46</td><td>46</td><td>46</td></tr><tr><td>all other privately-owned land</td><td>35</td><td>35</td><td>35</td></tr></table>	Location	Day	Evening		L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	R8	38	38	38	R11	49	49	49	R12	49	49	49	R13	43	43	43	R15	36	36	36	R19	37	37	37	R22	46	46	46	all other privately-owned land	35	35	35	Non – Compliant (Low Risk)	<ul style="list-style-type: none">- Exceedance of LA1(1minute) criteria of 6dB and 7dB at ATN4 and R13 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016.- 1dB exceedance of LAeq(15minute) criteria at ATN007 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded.- No exceedances recorded during 2018 period.- No exceedances recorded during the 2019 audit period (January - April 2019).	<p>REC 7</p> <p>Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures.</p> <p>Ensure accurate / consistent monitoring results are presented in Annual Reviews.</p>	<p>REC 7</p> <p>Agree: 31/03/20</p>	<p>REC 7: 100%</p>
Location	Day		Evening																																										
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)																																										
R8	38	38	38																																										
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all other privately-owned land	35	35	35																																										

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22											
Schedule 3 Condition 8	<p>Operating Conditions</p> <p>The Applicant shall:</p> <p>(a) implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;</p> <p>(b) regularly assess the noise monitoring and meteorological data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;</p> <p>(c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);</p> <p>(d) use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;</p> <p>(e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and</p> <p>(f) prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit; to the satisfaction of the Secretary.</p> <table><caption>Table 2: Long-term Noise Goals dB(A)</caption><thead><tr><th rowspan="2">Location</th><th>Day</th><th>Evening</th></tr><tr><th>L_{Aeq}(15 min)</th><th>L_{Aeq}(15 min)</th></tr></thead><tbody><tr><td>R11 – R13</td><td>41</td><td>41</td></tr><tr><td>R22</td><td>40</td><td>40</td></tr></tbody></table>	Location	Day	Evening	L _{Aeq} (15 min)	L _{Aeq} (15 min)	R11 – R13	41	41	R22	40	40	Administrative Non - Compliance	<p>a) The 2016 Annual Review documented an investigation into repairs/maintenance of ventilation fan silencers. No further evidence during audit period. Therefore no continued implementation. Admin Non - Compliance.</p> <p>b) Evidence of real time noise monitoring conducted throughout 2016, 2017 and 2018 where no triggers were reported. During audit site inspection the real-time noise monitor was not in operation and has been removed from site. The Environment and Community Co-ordinator stated the real - time noise monitoring was removed in January 2019. Admin - Non Compliance as the monitor should have been active the entire IEA period.</p> <p>c) No evidence of reduced operations during adverse meteorological conditions.</p> <p>d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period.</p> <p>e) Conducted as part of this Independent Audit. Note that no noise monitoring of site plant/equipment and operations was conducted as part of the audit.</p> <p>f) No evidence of action plan. Admin Non - Compliance.</p> <p>Exceedances of long-term noise goals occurred during the monitoring period. However these are long-term noise goals, not criteria.</p>	<p>REC 8</p> <p>The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.</p>	<p>REC 8</p> <p>Agree: 31/12/19</p>	<p>REC 8: 100%</p>
Location	Day		Evening														
	L _{Aeq} (15 min)	L _{Aeq} (15 min)															
R11 – R13	41	41															
R22	40	40															

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 3 Condition 9	<p>Noise Management Plan</p> <p>The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the EPA and submitted to the Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Secretary;</p> <p>(b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;</p> <p>(c) describe the proposed noise management system in detail including the mitigation measures that would be implemented to minimise noise during construction and operations, including on and off site road noise generated by vehicles associated with the development; and</p> <p>(d) include a monitoring program that:</p> <ul style="list-style-type: none"> • uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent; • evaluates and reports on: • the effectiveness of the on-site noise management system; and • compliance against the noise operating conditions; and • defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents. 	Administrative Non - Compliance	<p>Current plan dated 12 March 2014.</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. Admin Non - Compliance.</p> <p>Preparation:</p> <p>a) Compliant. Evidence from 2014;</p> <p>b) Compliant - Section 4;</p> <p>c) Compliant - Section 4;</p> <p>d) Compliant - Section 5 and 6</p> <p>Implementation:</p> <p>No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance.</p> <p>No notification to residents following recorded exceedances in accordance with Section 6.2. Admin Non - Compliance.</p> <p>Real time noise monitor removed from site. Admin Non - Compliance.</p>	-	-	<p>NMP Revised and updated for both CVC's Mod 3 and Mod 4.</p> <p>100%</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	The Applicant shall implement the approved management plan as approved from time to time by the Secretary.					

Schedule 3 Condition 11	<p>The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedance of the criteria listed in Tables 3, 4 and 5 at any residence on privately-owned land.</p> <p>Table 3: Long-term criteria for particulate matter</p> <table><tr><th>Pollutant</th><th>Averaging period</th></tr><tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td></tr></table> <p>Table 4: Short-term criterion for particulate matter</p> <table><tr><th>Pollutant</th><th>Averaging period</th></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td></tr></table> <p>Table 5: Long-term criteria for deposited dust</p> <table><tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th></tr><tr><td>^cDeposited dust</td><td>Annual</td><td>^b 2 g/m²/month</td></tr></table>	Pollutant	Averaging period	Total suspended particulate (TSP) matter	Annual	Particulate matter < 10 µm (PM ₁₀)	Annual	Pollutant	Averaging period	Particulate matter < 10 µm (PM ₁₀)	24 hour	Pollutant	Averaging period	Maximum increase in deposited dust level	^c Deposited dust	Annual	^b 2 g/m ² /month	Non – Compliant (Low Risk)	<p>2019 - no long term data for annual averages.</p> <p>Annual Review 2018 - Depositional dust gauges were below criteria.</p> <p>Short term PM₁₀ non -compliances on 3 April 2018, 18 July 2018 and 4 December 2018. The 2018 annual average of 24hr PM₁₀ results was 16.1 µg/m³. Daily (24-hour) results ranged from a minimum of 6.13 µg/m³ to a maximum of 112.98 µg/m³ during 2018. There were some data capture issues in 2018 relating to the TEOM. These were not reported as non - compliances in Section 1 or 7 of the Annual Review. <u>Non - Compliance (Low Risk)</u> for exceeding criteria.</p> <p>Annual Review 2017 - Excluding DDG005, deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m²/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m²/month during the reporting period. Note, the depositional dust gauge exceedance was not recorded as an exceedance in Section 1 or 7 of the Annual Review. <u>Non - compliance</u> relating to exceedance of DDG5 and also not reporting in Section 1 or 7 of the Annual Review.</p> <p>The EPA long-term annual average criteria (30 µg/m³) for PM₁₀ was not exceeded during the 2017 period. Daily (24-hour) results ranged from a minimum of 5.39 µg/m³ to a maximum of 47.78 µg/m³ during 2017. The 2017 annual average of 24hr PM₁₀ results was 15.1 µg/m³. Within short term criteria. It was noted there was some data capture issues The 2017 Annual Review states that 'When comparing the 2017 annual results to the previous year, the data capture rate was slightly higher in 2017. This was primarily due to power outages associated with electrical storms in 2016 and a failed air conditioner during the 2016 reporting period'. Data capture issues were not reported as <u>non - compliances</u> in Section 1 or 7 of Annual Review.</p>	<p>REC 9</p> <p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM10. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>	<p>REC 9a Agree: 30/09/19</p> <p>REC 9c Agree: 30/03/20</p> <p>REC 9d Agree: 30/09/19</p>	<p>REC 9a: 100%</p> <p>REC 9b: 100%</p> <p>REC 9d: 100%</p>
Pollutant	Averaging period																					
Total suspended particulate (TSP) matter	Annual																					
Particulate matter < 10 µm (PM ₁₀)	Annual																					
Pollutant	Averaging period																					
Particulate matter < 10 µm (PM ₁₀)	24 hour																					
Pollutant	Averaging period	Maximum increase in deposited dust level																				
^c Deposited dust	Annual	^b 2 g/m ² /month																				

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
			<p>Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m²/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m²/month.</p> <p>Daily (24-hour) results ranged from a minimum of 2.1 µg/m³ to a maximum of 39.8 µg/m³ during 2016.</p> <p>For PM₁₀ data capture - When comparing the 2016 annual results to the previous year, the data capture rate was slightly lower in 2016. This was primarily due to power outages associated with electrical storms, a failed air conditioner unit in February 2016 and a pest infestation in the units electrical circuit. <u>Non - compliance</u> relating to data capture.</p> <p><u>Field Evidence</u></p> <p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust. It is highly likely that other sources contribute to dust levels.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. However there is often a delay in identifying short term criterion exceedances.</p>			
Schedule 3 Condition 12	Operating Conditions The Applicant shall:	Administrative Non - Compliance	<u>Field Evidence</u>	As per REC 9	See REC 9 Agree: 30/09/19	REC 9: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(a) implement best practice air quality management at the site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the development;</p> <p>(b) implement best practice management to minimise the risk of spontaneous combustion and related emissions;</p> <p>(c) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site;</p> <p>(d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent;</p> <p>(e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above);</p> <p>(f) regularly assess the air quality monitoring data, and modify operations on site to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary.</p>		<p>The field assessment did not identify a high number of dust sources. There are disturbed surfaces, but these are small compared to most mines. Water truck sighted. Outside sources contribute to dust.</p> <p><u>Correspondence</u></p> <p>Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team.</p> <p>a) Evidence of dust monitoring and watercart use;</p> <p>b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion;</p> <p>c) Monitoring of fuel and energy usage;</p> <p>d) Air quality management system - for monitoring continues to be undertaken;</p> <p>e) Based on discussions with Environment and Community Co-ordinator water carts are used on exposed surfaces. Product is generally a wet product, therefore no water sprays required;</p> <p>f) The real time air quality monitor is not being used as a management tool. During the audit period there was no system to notify persons of when the TEOM identified short term impact assessment <u>non - compliances</u>. <u>Non - compliances</u> are only identified during the monthly download. <u>Admin non - compliance</u> relating to not determining TEOM exceedances as soon as they occur.</p>	<p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM₁₀. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>		
Schedule 3 Condition 13	Air Quality Management Plan	Administrative Non - Compliance	<u>Preparation:</u>	As per REC 9	See REC 9 Agree: 30/09/19	REC 9: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the EPA, and submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;</p> <p>(c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site;</p> <p>(d) describe the proposed on-site air quality management system; and</p> <p>(e) include an air quality monitoring program that:</p> <ul style="list-style-type: none"> • is capable of evaluating the operating conditions of this consent; • evaluates and reports on: • the effectiveness of the air quality management system; and • compliance against the air quality operating conditions; • defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>		<p>Evidence of Air Quality Management Plan dated 15 January 2016. The Air Quality Management Plan on the website 18 July 2014, with this approval provided by Delta Coal for 2016 Management Plan, therefore 2014 plan reviewed for adequacy.</p> <p>a) Section 1.4;</p> <p>b) Section 3;</p> <p>c) Section 4;</p> <p>d) and e) - Section 5</p> <p>Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed.</p> <p><u>Implementation:</u></p> <p>Evidence of monitoring;</p> <p>Minimal issues observed with dust management; and</p> <p>The real time air quality monitor is not being used as a management tool.</p> <p>Section 5.3 of 2014 Air Quality Management Plan states:</p> <p><i>Every 30 minutes the real time data from the monitor is sent via wireless (Next-G) connection to a web based data management system (Vista Data Vision) which is also used for the Company's real time noise monitoring system. A web based interface then allows the data to be viewed or downloaded, reports to be created and automated alarm generation when the predefined triggers are reached.</i></p>	<p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM₁₀. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p>		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
			<u>Admin Non - Compliance</u> as no alarm was set up. The only way exceedances could be determine during the audit period was by manual download or viewing of results. This generally occurred every month.			
Schedule 3 Condition 17	Sewage Management The Applicant shall manage on-site sewage in accordance with NSW Environmental Guidelines: Use of Effluent by Irrigation (DEC 2004) and the National Guidelines for Sewerage Systems - Effluent Management (ANZECC 1997) or its latest version, to the satisfaction of EPA.	Administrative Non - Compliance	Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite. There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. <u>Admin Non - Compliant</u> . Evidence of testing of wastewater through lab results.	REC 10 Include additional detail in the Water Management Plan regarding sewage management. Include an update of sewage system during the audit period in the Annual Review. Ensure servicing is completed and records kept onsite.	REC 10 Agree: 30/09/19 and 31/03/20	REC 10: 100%
Schedule 3 Condition 18	Water Management Plan The Applicant shall prepare a Water Management Plan for the surface facilities sites to the satisfaction of the Secretary. This plan must be prepared in consultation with DPI Water and EPA, by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary, and submitted to the Secretary for approval within 6 months of the date of this consent. This plan must include: (a) a comprehensive water balance for the development that includes details of: <ul style="list-style-type: none"> • sources and security of water supply; • water make in the underground workings; 	Administrative Non - Compliance	The current Water Management Plan is dated July 2015. This plan was approved by the DPE on 21 July 2015. This plan is out of date due to the age of the plan and also does not cover MOD 2. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u> . The Plan outlines several activities which are planned to be undertaken in 2015. Evidence of consultation in 2015 update with this outlined in Section 1.2. <u>Preparation:</u>	REC 11 Update the water balance or justify why the current water balance is still applicable to the current operations. Ensure dams and drainage lines are free on silt. Establish a maintenance schedule.	REC 11 Agree 31/03/20	REC 11: 100% Ongoing

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> • water transfers from the underground operations to the surface; • water use; and • any water discharges; <p>(b) management plans for the surface facilities sites, that include:</p> <ul style="list-style-type: none"> • a detailed description of water management systems for each site, including: • clean water diversion systems; • erosion and sediment controls; and • any water storages; • measures to minimise potable water use and to reuse and recycle water; • measures to manage acid sulphate soils, if encountered; • activities that would involve ground disturbance at the site; and • monitoring and reporting procedures. <p>(c) a Surface Water Management Plan which:</p> <ul style="list-style-type: none"> • includes baseline data on surface water flows and quality of Swindles Creek; • details surface water impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on surface water resources or surface water quality; • provides a program to monitor: • surface water discharges; • surface water flows and quality; and • channel stability; 		<p>a) Section 3 of the report. Most of the information of the Water Balance is from 2013 and should be reviewed;</p> <p>b) Section 4. Includes details of mitigation measures. Figure 4 is a detailed figure, but may require some updating based on minor changes at the pit top. Monitoring information outlined in Section 5;</p> <p>c) Covered in Section 4;</p> <p>d) Covered in Appendix B; and</p> <p>e) Covered in several sections.</p> <p><u>Implementation:</u></p> <ul style="list-style-type: none"> - The plan is a little out of date - from 2015, with some information dating back to 2013; - Evidence of surface water and groundwater monitoring in Annual Review; - Water management sighted in the field. Separation of water streams. Dams are stable; and - Some desilting of a drainage line is required. 			

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(d) a Ground Water Monitoring Program which includes a program to:</p> <ul style="list-style-type: none"> • monitor and report groundwater inflows to underground workings; • predict, manage and monitor impacts to nearby groundwater bores on privately-owned land that may be impacted by the development; and <p>(e) a detailed review of surface water management at the site, with particular reference to the water storages within the dirty water management system, to:</p> <ul style="list-style-type: none"> • determine whether the capacity, integrity, retention time and management of the dirty water storages (particularly the final Pollution Control Dam) are sufficient to ensure that water discharged from the site meets the EPL limits and surface water impact assessment criteria within the Surface Water Management Plan; and • propose any appropriate changes to the surface water management system. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Note: The Secretary may require the Applicant to implement upgrades and other changes identified under paragraph (e), in accordance with condition 4 of schedule 2.</p>					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule Condition 20	<p>Biodiversity Management Plan</p> <p>The Applicant shall prepare a Biodiversity Management Plan for the surface facilities sites, for all areas that are not, or will not, be subject to condition 7 of schedule 4, to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared by a suitably qualified person approved by the Secretary; in consultation with OEH, and submitted to the Secretary within 6 months of the date of this consent;</p> <p>(b) establish baseline data for the existing habitat in the Biodiversity Enhancement Area and elsewhere on the site;</p> <p>(c) describe the short, medium, and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> • manage the impacts of clearing vegetation; • manage the remnant vegetation and habitat in the Biodiversity Enhancement Area and elsewhere on the site; and • implement the Biodiversity Enhancement Strategy, including detailed performance and completion criteria; <p>(d) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;</p> <p>(e) identify the potential risks to the successful implementation of the Biodiversity Enhancement Strategy, and the contingency measures that would be implemented to mitigate these risks; and</p>	Administrative Non - Compliance	<p>The Biodiversity Management Plan is dated 16 March 2016. This was approved by the DPE on 20 April 2016. Covers pit top and fan sites. Seagrass management covered under a separate plan. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p><u>Preparation:</u></p> <p>a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe;</p> <p>b) Baseline data in Section 3.2;</p> <p>c) Mostly covered in Section 4 and 5, but not split into short, medium and longterm measures;</p> <p>d) Section 11;</p> <p>e) See Table 11;</p> <p>f) Section 13.</p> <p><u>Implementation:</u></p> <p>Section 14 refers to the resubmission of this management plan within three months of submitting the Independent Environmental Audit. The previous audit is dated July 2016. Evidence of biodiversity monitoring reports.</p>	<p>REC 12</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>The current monitoring is provided in a spreadsheet with an email summary. Prepare a small report outlining results, a comparison against trigger levels and potential reasons for changes.</p> <p>Prepare a separate section with short, medium and longterm measures in the Biodiversity Management Plan.</p>	<p>REC 12</p> <p>Agree: 31/3/20</p>	<p>REC 12: 100%</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(f) include details of who would be responsible for monitoring, reviewing, and implementing the plan.</p> <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>					
Schedule 3 Condition 21	<p>Heritage Management Plan</p> <p>The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must:</p> <p>(a) be prepared in consultation with any relevant Aboriginal stakeholders;</p> <p>(b) be submitted to the Secretary for approval within 6 months of the date of this consent;</p> <p>(c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;</p> <p>(d) detail the responsibilities of all stakeholders; and</p> <p>(e) include programs/procedures and management measures for:</p> <ul style="list-style-type: none"> the ongoing monitoring of site 45-7-0189 at Summerland Point; managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols; 	Administrative Non - Compliance	<p><u>Preparation:</u></p> <p>Plan dated 23/6/2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p>a) Section 4.4 and 4.5;</p> <p>b) Condition outside of audit period;</p> <p>c) Section 4;</p> <p>d) Section 11;</p> <p>e) In various sections.</p> <p><u>Implementation:</u></p> <p>Evidence of some monitoring of shell midden site #45-7-0189 in Annual Reviews. Monitoring every 2 years until Year 5 (Year 1, 3 and 5). 2017 was the fifth year, hence no further monitoring required.</p> <p>Section 12 of the Heritage Management Plan refers to the resubmission of this management plan within three months of submitting the Independent Environmental Audit. This was not completed.</p>	<p>REC 13</p> <p>Update the Heritage Management Plan, including the removal of Site #45-7-0154.</p>	<p>REC 13</p> <p>Agree: 30/09/19</p>	<p>REC 13: 100%</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage within the site; (including procedures for keeping records of this); appropriate identification, management, conservation and protection of both Aboriginal and non-Aboriginal heritage items identified on the site; and ensuring relevant workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>					
Schedule 3 Condition 22	<p>Visual Amenity and Lighting</p> <p>The Applicant shall:</p> <p>(a) minimise visual impacts, and particularly the off-site lighting impacts, of the Surface facilities sites;</p> <p>(b) take all reasonable and feasible measures to further mitigate off-site lighting impacts from the development; and</p> <p>(c) ensure that all external lighting associated on site complies with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting, to the satisfaction of the Secretary.</p>	Administrative Non - Compliance	<p>The most recent lighting audit for CVC is from 2013. Prepared by Wadco May 2013.</p> <p>a) and b) The pit top area and ventilation shaft site are not dominant features of the landscape the pit top area is somewhat overshadowed by the adjacent power station. The ventilation fans were designed to maintain a relatively low profile, below the surrounding vegetation to ensure amenity and lighting impacts were minimised. Some lights have been removed, including those at the stockpile. There were no complaints to visual or lighting during the audit period.</p> <p>c) Compliance with this requirement could not be determined due to the date of the previous Visual and Lighting audit. Therefore <u>Admin - Non - Compliance</u>.</p>	<p>REC 14</p> <p>Complete a visual and lighting assessment against the Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.</p>	<p>REC14</p> <p>Agree: 31/12/19</p>	REC14: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 3 Condition 27	<p>Rehabilitation</p> <p>The Applicant shall prepare a Rehabilitation Management Plan for the development, in consultation with OEH, DPI Water, WSC, LMCC, and the CCC, and to the satisfaction of the DRE. This plan must:</p> <p>(a) be submitted to the Secretary and the DRE for approval within 12 months of the date of approval of this development consent;</p> <p>(b) be prepared in accordance with any relevant DRE guideline and be consistent with the rehabilitation objectives in the EIS and in Table 7;</p> <p>(c) describe how the performance of the rehabilitation would be monitored and assessed against the objectives in Table 7;</p> <p>(d) describe the process whereby additional measures would be identified and implemented to ensure the rehabilitation objectives are achieved;</p> <p>(e) provide for detailed mine closure planning, including measures to minimise socio-economic effects due to mine closure, to be conducted prior to the site being placed on care and maintenance; and</p> <p>(f) be integrated with the other management plans required under this consent.</p> <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p>	Administrative Non - Compliance	<p>Evidence of Rehabilitation Management Plan. Update dated 1 March 2019. This plan appears unapproved and no evidence of this plan being sent to the DPE. Current approved Rehabilitation Management Plan is from December 2014. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance.</u></p> <p><u>Preparation:</u></p> <p>a) Outside of audit period;</p> <p>b) Covers this requirement. Note, a separate MOP has also been prepared for the site;</p> <p>c) Section 8;</p> <p>d) Generally covered in Section 7;</p> <p>e) Section 6;</p> <p>f) Linked to MOP.</p> <p><u>Implementation:</u></p> <p>There is no rehabilitation onsite. Minimal surface footprint.</p> <p>Extraction Plans cover subsidence management.</p> <p>The Rehabilitation Management Plan is not on the CVC website, which makes this <u>Admin Non - Compliant.</u></p>	<p>REC 15</p> <p>Ensure a copy of the approved Rehabilitation Management Plan is put on the website.</p>	<p>REC 15</p> <p>Agree: 30/09/19</p>	REC 15: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	Note: The Rehabilitation Management Plan should address all land impacted by the development whether prior to, or following, the date of this consent.					
Schedule 4 Condition 1	Subsidence The Applicant shall ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within seagrass beds is limited to a maximum of 20 millimetres (mm). If at any stage predicted subsidence levels are exceeded within these areas, an ecological monitoring program shall be initiated to assess the impacts to ecological communities and threatened species and if appropriate, offsets are to be provided for any impacts detected.	Administrative Non - Compliance	This condition is outlined in the Annual Review (see Section 3.16.4 in 2018 Annual Review), however no update has been provided on whether the condition has been met. Based on this the auditor cannot determine compliance.	REC 16 See Section 5.2 of the Main Audit Report for Subsidence Recommendations.	REC 16 Agree: 31/03/20	REC 16: 100%
Schedule 4 Condition 2	Performance Measures – Natural Environment The Applicant shall ensure that the development does not cause any exceedance of the performance measures in Table 8 to the satisfaction of the Secretary.	Administrative Non - Compliance	The subsidence performance is outlined in the Annual Reviews. There is no specific table or section addressing if the site has met these performance measures. Reports from 2016 to 2018 titled Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW. These reports do not assess against these performance measures as the word 'negligible' is not in the report. There is no definition of negligible. Biodiversity Monitoring Reports do not cover these performance measures. Benthic monitoring reports do not specifically address these performance measures.	REC 16 See Section 5.2 of the Main Audit Report for Subsidence Recommendations.	See REC 16 Agree: 31/03/20	REC 16: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22																
	<table><tr><td colspan="2">Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features</td></tr><tr><td colspan="2">Biodiversity</td></tr><tr><td>Threatened species or endangered populations</td><td>Negligible environmental consequences</td></tr><tr><td>Seagrass beds</td><td>Negligible environmental consequences • negligible change in the seagrass beds; • negligible change in the and • negligible change to the seagrass species with</td></tr><tr><td>Benthic communities</td><td>Minor environmental consequences to species composition</td></tr><tr><td colspan="2">Mine workings</td></tr><tr><td>First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences</td><td>To remain long-term stable</td></tr><tr><td>Second workings</td><td>To be carried out only in a Extraction Plan.</td></tr></table>	Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features		Biodiversity		Threatened species or endangered populations	Negligible environmental consequences	Seagrass beds	Negligible environmental consequences • negligible change in the seagrass beds; • negligible change in the and • negligible change to the seagrass species with	Benthic communities	Minor environmental consequences to species composition	Mine workings		First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	To remain long-term stable	Second workings	To be carried out only in a Extraction Plan.		Despite this there is no evidence that these performance measures have been exceeded, however the auditor is not able to determine compliance based on the information provided.			
Table 8: Subsidence Impact Performance Measures – Natural and Heritage Features																						
Biodiversity																						
Threatened species or endangered populations	Negligible environmental consequences																					
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Second workings	To be carried out only in a Extraction Plan.																					
Schedule 4 Condition 3	<p>Offsets</p> <p>If the Applicant exceeds the performance measures in Table 8 and the Secretary determines that:</p> <p>(a) it is not reasonable or feasible to remediate the impact or environmental consequence; or</p> <p>(b) the remediation measures implemented by the Applicant have failed to satisfactorily remediate the impact or environmental consequence;</p> <p>then the Applicant shall provide a suitable offset to compensate for the impact or environmental consequence to the satisfaction of the Secretary.</p> <p>Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.</p>	Administrative Non - Compliance	<p>There is no specific assessment against subsidence criteria in the Annual Review, therefore we cannot determine compliance.</p> <p>The 2017 Annual Review stated there was an exceedance of predicted subsidence values over the MW7-12 mining area, but not an exceedance of the performance measures in this table.</p>	<p>REC 16</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p>	See REC 16 Agree: 31/03/20	REC 16: 100%																

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 4 Condition 7	<p>Extraction Plan</p> <p>The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must:</p> <p>(h) include a Benthic Communities Management Plan, which has been prepared in consultation with OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities, and which includes:</p> <ul style="list-style-type: none"> • surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured; • benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities; • a program of ongoing seasonal monitoring of benthic species in both control and impact sites; • development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities composition, incorporating the monitoring and survey data collected; and 	Administrative Non - Compliance	<p><u>Preparation:</u></p> <p>Evidence of Benthic Communities Management Plans in EP 1, 3 and 4. Overall Extraction Plan and management plans have been approved by the DPE. No Benthic Communities Management Plan for EP 2 (Modification to EP 1). Plan updated for each EP. The Plans cover the requirements of the sub conditions. Evidence of consultation included in management plans.</p> <p><u>Implementation:</u></p> <p>Evidence of bi-annual benthic communities monitoring during the Audit period. Reports are prepared every six months except no evidence of September 2018 report provided to SLR. Reports prepared by John and Emma Laxton. Results are also summarised in the Annual Review.</p> <p>There is no definition of what a 'minor' impact is in the Benthic Communities Management Plan or the bi-annual monitoring reports, with this being a subsidence performance criteria in Schedule 4 Condition 2.</p> <p>- Minor environmental consequences including minor changes to species composition of distribution.</p> <p>There is no definitive guide as to what constitutes reporting of an incident or non - compliance ie. 'What is greater than minor?' See Section 6 of May 2018 Benthic Communities Management Plan. As there is little interpretation of results against subsidence performance measures this is a <u>Admin Non - Compliance</u>.</p>	<p>REC 16</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p>	See REC 16 Agree: 31/03/20	REC 16: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> updating the model every 2 years using the most recent monitoring and survey data; 		The Extraction Plan - EP3 (Appendix 1) outlines a Trigger Action Response Plan (TARP). It has triggers relating to statistical change in benthic communities. eg. Trigger Level 1 = ANOVA/ANOSIM level is approaching 5%. There is no discussion in the bi-annual reports about how the site is tracking against those triggers.			
Schedule 5 Condition 1	<p>Notification of Landowners</p> <p>As soon as practicable after obtaining monitoring results showing:</p> <p>(a) an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and</p> <p>(b) an exceedance of any relevant air quality criteria in Schedule 3, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).</p>	Administrative Non - Compliance	<p>a) 2018 - Short term PM₁₀ <u>non - compliances</u> on 3 April 2018, 18 July 2018 and 4 December 2018. For 2018 there was evidence provided to SLR through correspondence with EPA that these dust events were regional. There was however no evidence provided of contact with 'affected landowners' (<u>Admin Non - Compliance</u>).</p> <p>2017 - Noise <u>non - compliance</u> in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. No evidence of notifying 'affected landowner/s'.</p> <p>2016 - Exceedance of daily discharge limit at LDP1 on January 2016 as a result of heavy rainfall (SLR believes no affected landowners, therefore no notification required).</p> <p>Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring.</p> <p>b) No evidence that the 'Mine Dust and You' fact sheet was provided for 2018 dust exceedances for 'affected landowners'. However as these events were proven to be regional, the auditors do not believe this is required for the 2018 exceedances.</p>	<p>REC 17</p> <p>Define who are potentially 'affected landowners' in the Air Quality Management Plan?</p> <p>Affected landowners should be contacted when there is a <u>non - compliance</u> relating to dust or noise. This should be completed even if it is a regional dust event as Delta Coal are still recording it as a <u>non - compliance</u> in the Annual Review.</p>	<p>REC 17</p> <p>Agree: 30/09/19 and ongoing</p>	REC 17: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 6 Condition 1	<p>Environmental Management Strategy</p> <p>The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:</p> <p>(a) be submitted to the Secretary for approval within 7 months of the date of this consent;</p> <p>(b) provide the strategic framework for environmental management of the development;</p> <p>(c) identify the statutory approvals that apply to the development;</p> <p>(d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;</p> <p>(e) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> • keep the local community and relevant agencies informed about the operation and environmental performance of the development; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the development; • respond to any non - compliance; • respond to emergencies; and <p>(f) include:</p> <ul style="list-style-type: none"> • copies of any strategies, plans and programs approved under the conditions of this consent; and 	Administrative Non - Compliance	<p>EMS Document is dated 12 October 2012. The EMS was approved by DP&E with a letter dated 6/11/12. Evidence of letter to DPE from LakeCoal dated 28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. <u>Admin Non - Compliance</u>.</p> <p>No evidence that the EMS was updated following the last audit or other modifications.</p> <p><u>Preparation:</u></p> <p>a) - NA as outside audit period;</p> <p>b) Framework provided as part of document;</p> <p>c) Approvals are listed but are out of date;</p> <p>d) Section 9.5;</p> <p>e) Covered in Several Sections 8-11; and</p> <p>f) Plans listed in Section 9.</p> <p><u>Implementation:</u></p> <p>There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (<u>Admin Non - Compliance</u>).</p> <p>The EMS is supposed to be reviewed every three years. Last review was 2012, therefore <u>Admin Non - Compliance</u>.</p>	<p>REC 18</p> <p>Prepare a cross referencing table outlining where sub conditions have been covered.</p> <p>Ensure plans are reviewed as per Schedule 6 Condition 5.</p> <p>Include Schedule 5 Condition 2 requirement in the EMS to notify landowners of exceedances 'as soon as practical'. Define a time period for as soon as practical.</p>	<p>REC 18</p> <p>Agree: 30/09/19</p>	REC 18: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> a clear plan depicting all the monitoring required to be carried out under the conditions of this consent. <p>The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.</p>					
Schedule 6 Condition 2	<p>Adaptive Management</p> <p>The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedules 3 and 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p> <p>(c) implement remediation measures as directed by the Secretary, to the satisfaction of the Secretary.</p>	Non-Compliant (Low Risk)	<p>There have been some exceedances of criteria during the audit period.</p> <p>a) Exceedances noted for air (regional dust), noise and a discharge volume issue during the audit period. Also <u>Non - Compliance</u> relating to subsidence which is outlined in the 2017 Annual Review. Evidence of exceedance/incident reports provided;</p> <p>b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred;</p> <p>c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance.</p> <p>Exceedances have generally been investigated with no further recommendations.</p>	Nil recommendation.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 6 Condition 4	<p>Annual Review</p> <p>By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;</p> <p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the past calendar year, which includes a comparison of these results against the:</p> <ul style="list-style-type: none"> • relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • monitoring results of previous years; and • relevant predictions in the documents listed in condition 2 of Schedule 2; <p>(c) identify any non - compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the development;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p>	Administrative Non - Compliance	<p>The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA.</p> <p>a) Section 1 and 2;</p> <p>b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence;</p> <p>c) Section 7 - however this is different to the Annual Review guidelines;</p> <p>d) Trends covered for water management and air quality;</p> <p>e) Limited information on this condition in the Annual Reviews;</p> <p>f) Section 8;</p> <p>The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link:</p> <p>https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~/_media/3AA21D35168042FE813DD0FB92E00E58.ashx</p> <p>Therefore <u>Admin Non - Compliance</u>.</p>	<p>REC 19</p> <p>The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.</p> <p>Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p> <p>Include an update on Audit Action Plan.</p>	<p>REC 19</p> <p>Agree: 31/03/20</p>	REC 19: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.					
Schedule 6 Condition 5	<p>Revision of Strategies, Plans and Programs</p> <p>Within 3 months of:</p> <p>(a) the submission of an annual review under Condition 4 above;</p> <p>(b) the submission of an incident report under Condition 7 below;</p> <p>(c) the submission of an audit report under Condition 9 below; or</p> <p>(d) any modification to the conditions of this consent, (unless the conditions require otherwise),</p> <p>the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.</p> <p>Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.</p>	Administrative Non - compliance	This timing has not been met. Several of the management plans were not updated since the previous audit.	<p>REC 20</p> <p>Include statement in future Annual Reviews stating that Management Plans have been reviewed and state which management plans will or will not be updated within 3 months.</p> <p>Develop and implement a plan to update CVC's Strategies, Plans and Programs.</p>	<p>REC 20</p> <p>Agree: 31/03/20 and 30/09/19</p>	REC 20: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 6 Condition 7	The Applicant shall immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.	Administrative Non - compliance	<p>Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews.</p> <p>No evidence of any incident causing material harm requiring immediate notification.</p> <p>Evidence of notification to Secretary and EPA for dust incidents in 2018. One incident occurred on 18 July 2018, with the site finding this non - compliance on 1 August 2018. The exceedance was then reported on 10 August 2018 (greater than 7 days - <u>Admin Non - Compliance</u>). It appears that short term dust exceedances are only determined during the monthly data download, with reporting sometimes occurring two to three weeks after an incident occurs. The two other dust exceedances in 2018 appear to have been reported as per this condition.</p> <p>2017 - Noise non - compliance in 2017 (24 October 2017 at ATN007 (Summerland Point). Evidence of report to the DPE on 8 November 2017. Greater than 7 days - <u>Admin Non - Compliance</u>.</p> <p>There was a non - compliance relating to an exceedance of predicted subsidence. The non - compliance was determined based on bathymetric surveys (October 2017) but was not reported (as per Exceedance Report) until 13 December 2017.</p>	<p>See REC 9</p> <p>Update the Air Quality Management Plan following this audit.</p> <p>Improve data capture for PM₁₀. Review possibilities of backup power supply.</p> <p>Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.</p> <p>Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.</p> <p>REC 21</p> <p>Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).</p>	<p>REC 9</p> <p>Agree: 30/09/19</p> <p>REC 21</p> <p>Agree</p>	<p>REC 9: 100%</p> <p>REC 21:</p> <p>Ongoing</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Schedule 6 Condition 8	Regular Reporting The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.	Administrative Non - compliance	Evidence of reporting on the Lake Coal and Delta Coal website. Note Schedule 3 Condition 1 outlines requirements to report transport. The Applicant shall: (a) keep accurate records of the amount of coal transported from the site (on a weekly basis); and (b) make these records publicly available on its website at the end of each calendar quarter. Admin Non - Compliance: This has not been completed. No EIS's shown on the LakeCoal or Delta Coal website. Information now available on the Delta Coal website. However no management plans and EIS's are on the website. No Rehabilitation Management Plan was on the website. No noise monitoring reports on website.	REC 22 Ensure website reporting meets the conditions of the Development Consent.	REC 22 Agree: 30/09/19	REC 22: 100%
Schedule 6 Condition 10	Independent Environmental Audit Within 6 weeks of the completion of this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.	Administrative Non - compliance	No evidence has been provided of the submission of the previous audit report. The submission timing for this audit has been extended by the DPE until 25 June 2019.	Nil recommendation		
Schedule 6 Condition 11	The Applicant shall: (a) make copies of the following publicly available on its website:	Administrative Non - compliance	a) and b) Copies of this information is still available on the Lakecoal website. With the exception of EIS's. Admin Non - Compliant.	REC 23	REC 23 Agree: 30/09/19	REC 23: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> the EIS; all current statutory approvals for the development; all approved strategies, plans and programs required under the conditions of this consent; a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent; a complaints register (updated monthly); minutes of CCC meetings; the Annual Reviews of the development; any Independent Environmental Audit, and any other audit, and the Applicant's response to the recommendations in these audits; any other matter required by the Secretary; and <p>(b) keep this information up-to-date, to the satisfaction of the Secretary.</p>		<p>Information now available on the Delta Coal website. However no management plans and EIS's are on the website.</p> <p>No Rehabilitation Management Plan on the website.</p> <p>No noise monitoring reports on website.</p>	Ensure all relevant information is brought across to the Delta Coal website.		
SSD 5465 Statement of Commitments						
Surface water SOC's	<ul style="list-style-type: none"> develop a program to monitor creek line channel stability and the health of riparian vegetation within Swindles Creek. Monitoring will be undertaken in accordance with Section 8.5.2 of the Surface Water Impact Assessment (EIS Appendix E) and incorporated into the Colliery's WMP or Biodiversity Management Plan; 	Administrative Non - compliance	<p>Evidence of the Water Management Plan.</p> <p>Evidence of surface water monitoring, including results in Annual Reviews.</p> <p>Admin Non - Compliant: Evidence of photos provided of channel stability monitoring of Swindles Creek, however it does not appear to have been completed in accordance with Section 5.4 of the Water Management Plan. No evidence of:</p>	REC 24	REC 24 Agree: 31/03/20	REC 24: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
			<ul style="list-style-type: none"> · Documenting general observations of water quantity and quality; · Documenting locations and dimensions of significant erosive or depositional features; · Documenting evidence of erosion and exposed soils; · Documenting general indicators of stream health, including abundance of flora and fauna; and · Review and comparison of results to previous rounds of monitoring. <p>There is also no timing proposed for inspections in the Water Management Plan.</p>	A separate report should be completed for Stream Health Channel Flow and Riparian Vegetation Monitoring. This should compare results from previous inspections. Information to be included in the Annual Review.		
Noise SOC's	<p>Management and monitoring of noise will continue to be undertaken in accordance with the Colliery's NMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • continue attended compliance monitoring on site which will be used to identify potential hot spots and primary noise sources; • continue real-time noise monitoring alerts to site personnel to enable implementation of any required rapid noise management initiatives; • manage potential non - compliance through a noise complaint handling and response system, including the identification of responsible sources to enable targeted remedial action; 	Administrative Non - compliance	<p>No evidence of review or update of Noise Management Plan during audit period. Admin Non - Compliance.</p> <p>Real time noise monitoring system removed during the audit period and has not been replaced.</p> <p>No evidence of progressive noise mitigation implementation</p>	<p>As per REC 7</p> <p>Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures.</p> <p>Ensure accurate/consistent monitoring results are presented in Annual Reviews.</p> <p>As per REC 8</p>	<p>See REC 7 Agree: 31/03/20</p> <p>See REC 8 Agree: 31/06/20</p>	<p>REC 7: 100%</p> <p>REC 8: 100%</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> • assess if further noise mitigation options for the ventilation fans are reasonable and feasible following the receipt of attenuation proposals; and • discuss potential management measures or agreement options with the landowner at 275 Cams Boulevard, following receipt of proposals from acoustics specialists. <p>In addition to the above, LakeCoal is committed to the progressive implementation of feasible measures to target long term noise goals which are designed to reduce noise emissions from the Colliery. Long term options for investigation include:</p> <ul style="list-style-type: none"> • modification to belt/movement alarms; • investigation of surface conveyer and coal preparation equipment, to determine if noise reductions are possible; • identifying sound attenuation options for the surface bulldozer and front end loader; • strategic placement of acoustic barriers; • attenuation for the surface screener/shaker; • installation of quiet rollers for surface conveyor belts; • acoustic treatments around compressors; and • the use of a conveyor stacker for product coal stockpiling. 			<p>The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.</p>		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Subsidence SOC's	<p>Management and monitoring of subsidence will continue to be undertaken in accordance with the Colliery's SMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • provide raw subsidence survey data to OEH within 7 days of completion; • undertake annual bathymetric surveys of the lake bed to determine actual subsidence and undertake a comparison with predicted levels. Should measured subsidence significantly exceed predicted levels, LakeCoal will review future panel designs to limit future impacts to acceptable levels; • install a new foreshore survey line above the first and second workings panels where the underground linkage passes beneath them and possibly extending from the foreshore to the point of connection with the MC workings; • inspect existing conditions in the Fassifern Seam and undertake geotechnical and geological mapping in the roadways proximate to the proposed linkage in both CVC and MC workings; • complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB. Development below the foreshore will be limited to two headings only until floor conditions can be confirmed; 	Non-Compliant (Low Risk)	<p>Subsidence is managed under Extraction Plans, not SMP's. SMP's cover past mining areas.</p> <p>Separate Extraction Plan requirements including monitoring and reporting.</p> <p>Some of the aspects in this condition have not been triggered, however due to a lack of a defined subsidence report it has been difficult for SLR to determine which conditions are not triggered and which are relevant.</p> <p>Subsidence impacts are reported in the Annual Review, however it would be preferable if a standalone subsidence report was prepared. There is not a separate Annual Subsidence Report, therefore Admin Non - Compliant.</p> <p>No evidence of raw survey result being provided to OEH within 7 days of completion. Admin Non - Compliant.</p> <p>No evidence provided regarding - "complete representative borehole core drilling and sampling of the Fassifern Seam floor at the start and finishing ends of the underground linkage and where the headings pass beneath the SPB"</p>	<p>As per REC 16</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p>	See REC 16	REC 16: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> • develop infrastructure monitoring and management plans in consultation with infrastructure owners and other relevant stakeholders; • re-establish and re-survey Survey Line 24; • install a suitable survey line at the starting end above Great Northern Seam first workings to provide early warning monitoring data for the tension towers and switchyard structures; • monitor tension and suspension towers and switchyard conductor suspension frames directly above the panels, foreshore and adjacent inlet canal wall; • ensure that a monitoring and management plan for the MP01 sewer rising main is in place prior to commencement of mining that may impact Council's infrastructure; and • complete an annual subsidence report and make this report publicly available on the Colliery's website. 					
Heritage SOC's	<p>Management and monitoring of heritage will continue to be undertaken in accordance with the Colliery's HMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will:</p> <ul style="list-style-type: none"> • review and revise the HMP to remove site #45-7-0154 and incorporate any other changes as a result of the proposed modification; • update the HMP following approval of the Proposal to include the extended area to which it relates; 	Administrative Non - compliance	<p>The most recent date of the Heritage Management Plan is 23 June 2014. The highlighted condition is from MOD 2 (December 2015). Site 45-7-0154 is still included the document.</p> <p>Other aspects of this statement of commitments have been met.</p>	As per REC 13 Update the Heritage Management Plan, including the removal of Site #45-7-0154.	See REC 13 30/09/19	REC 13: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<ul style="list-style-type: none"> ensure that should unanticipated Aboriginal or historic heritage artefacts be found during dam embankment and diversion works, work will cease and the site assessed by an archaeologist; and ensure that in the unlikely event that skeletal remains are found during dam embankment and diversion works, work will cease immediately in the area and the NSW Police Coroner called to determine if the material is of Aboriginal origin. OEH and relevant Aboriginal community stakeholders will be notified if the remains are positively identified as being of Aboriginal origin to determine their appropriate management prior to works recommencing. 					
EPL 1770						
L3.1	<p>Volume and Mass Limits</p> <p>For each discharge point or utilisation area specified below (by a point number), the volume/mass of:</p> <p>a) liquids discharged to water; or;</p> <p>b) solids or liquids applied to the area;</p> <p>must not exceed the volume/mass limit specified for that discharge point or area.</p>	Non – Compliant (Low Risk)	<p>Discharge volumes have been recorded at site.</p> <p>No exceedances in 2017 or 2018 Annual Reviews. Based on information provided by Environment and Community Co-ordinator no exceedances for 2019.</p> <p>Non-compliant: There were two exceedances of the daily volumetric limit (12,161 kL) during the 2016 which were related to significant rainfall events. These exceedances occurred on the:</p> <ol style="list-style-type: none"> 6 January 2016 – A total of 14,152 kL was discharged 5 June 2016 – A total of 16,391 kL was discharged. <p>No further recommendations.</p>	Nil recommendations.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
L3.2	The volumetric daily discharge limit for the premises is the combined discharge measured at EPA discharge points 1 and 27 and must not exceed 12161 kilolitres per day.	Non – Compliant (Low Risk)	There were two exceedances of the daily volumetric limit (12,161 kL) during 2016 which were related to significant rainfall events. These exceedances occurred on the: 1. 6 January 2016 – A total of 14,152 kL was discharged. 2. 5 June 2016 – A total of 16,391 kL was discharged. No further recommendations.	Nil recommendations.		
L5.1	Noise Limits Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2. <u>See Appendix 2 for full list of criteria</u>	Non – Compliant (Low Risk)	- Exceedance of LA1(1minute) criteria of 7dB at Point 14 in June 2016. Documented in 2016 Annual Review and Quarterly Monitoring report (Global Acoustics report 16217_R01). Corrective actions undertaken and documented in incident report dated 05/07/2016. - 1dB exceedance of LAeq(15minute) criteria at Point 23 during the daytime period in October 2017 (Q4). Documented in 2017 Annual Review. However it is noted that a discrepancy between+E52 monitoring results presented in the 2017 Annual Review and Q4 Monitoring report (Global Acoustics Report 17424_R01) where no exceedance is recorded. - No exceedances recorded during 2018 period. - No evidence obtained on performance during the 2019 audit period.	Nil recommendations.		
L5.7	To determine compliance: 1. With the LAeq(15 min) noise limits in condition L5.1 and condition L5.2, the licensee must locate noise monitoring equipment;	Administrative Non - compliance	It is noted that monitoring for LA1(1minute) noise levels is not completed at 1m from a façade - however such noise monitoring is generally not practical due to disturbance to residents during the sensitive night-time period.	Nil recommendations.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;</p> <p>(b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable,</p> <p>(c) within approximately 50 metres if the boundary of a national park or nature reserve.</p> <p>2. With the LA1(1 minute) noise limits in condition L5.1 and L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.</p> <p>3. With the noise limits in condition L5.1 and condition L5.2, the noise monitoring equipment must be located;</p> <p>(a) at the most affected point at a location where there is no dwelling at the location, or</p> <p>(b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).</p>					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
O5.1	The licensee must maintain, and implement as necessary, a current emergency response plan for the premises. The licensee must keep the emergency response plan on the premises at all times. The emergency response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. If a current emergency response plan does not exist at the date on which this condition is attached to the licence, the licensee must develop an emergency response plan within three months of that date.	Administrative Non - compliance	<p>A PIRMP has been prepared for the site. Latest dated 21 September 2018.</p> <p>Evidence of testing PIRMP - including details of tests from 21 December 2018.</p> <p>Although there were some incidents, it does not appear any incident required the PIRMP to be enacted.</p> <p>* PIRMP is kept on-site.</p> <p>* Observation: The PIRMP is labelled LakeCoal, has persons listed in it who are no longer at site, does not have email details for government contacts, and figures do not clearly show the location of hazardous substances and where pollution response equipment is stored.</p>	<p>REC 25</p> <p>Update the PIRMP to include:</p> <p>Current site contacts;</p> <p>Email details for government contacts; and</p> <p>Figures that clearly show the location of hazardous substances and where pollution response equipment is stored.</p>	REC 25 Agree 30/09/19	REC 25: 100%
O7.2	Sewage Treatment The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.	Administrative Non - compliance	<p>Sewage system - 2 systems. Envirocycle for offices and second system is a septic system that handles the bathhouse and toilet facilities. This water is treated onsite.</p> <p>There is limited detail in the Water Management Plan regarding the sewage water management system. Garden Wastemaster Australia complete servicing. Evidence of one email from 6 March 2019 organising servicing. However no evidence of servicing provided. Evidence of testing of wastewater through lab results</p>	<p>As per REC 10</p> <p>Include additional detail in the Water Management Plan regarding sewage management.</p> <p>Include an update of sewage system during the audit period in the Annual Review.</p> <p>Ensure servicing is completed and records kept onsite.</p>	See REC 10 Agree: 31/09/19 and 31/03/20	REC 10: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
07.3	Sewage Treatment Correct operation involves regular supervision and system maintenance. The licensee must be aware of the system requirements and must ensure that the necessary service contracts are in place.	Administrative Non - compliance	Same as L7.2	As per REC 10	See REC 10 Agree: 31/09/19 and 31/03/20	100%
07.4	Sewage Treatment The sewage treatment system(s) must be serviced by a suitably qualified and experienced waste water technician at least once each quarterly period and a minimum of four times per year.	Administrative Non - compliance	Same as L7.2	As per REC 10	See REC 10 Agree: 31/09/19 and 31/03/20	100%
07.5	Sewage Treatment The licensee must record each inspection and any actions required or recommended by the technician; including all results from tests performed on the sewage treatment system(s) by the technician as defined in Condition 07.4.	Administrative Non - compliance	Same as L7.2	As per REC 10	See REC 10 Agree: 31/09/19 and 31/03/20	100%
M2.1	Monitoring and Recording For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	Administrative Non - compliance	There has been data capture issues identified in Annual Reviews for PM ₁₀ . <u>Admin Non - Compliance.</u>	As per REC 9 Update the Air Quality Management Plan following this audit. Improve data capture for PM ₁₀ . Review possibilities of backup power supply. Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.	See REC 9 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22								
				Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.										
M2.2	Air Monitoring Requirements <div><div>POINT 25</div><table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Particulate matter</td><td>micrograms per cubic metre</td><td>Continuous</td><td>AM-22</td></tr></table></div>	Pollutant	Units of measure	Frequency	Sampling Method	Particulate matter	micrograms per cubic metre	Continuous	AM-22	Administrative Non - compliance	There were some issues with data capture with this outlined in Annual Reviews. See Schedule 3 Condition 11 of the Development Consent.	As per REC 9	See REC 9 Agree: 30/09/19	Rec 9 = 100%
Pollutant	Units of measure	Frequency	Sampling Method											
Particulate matter	micrograms per cubic metre	Continuous	AM-22											
M4.1	To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.7 and L5.8, and (a) at each one of the locations listed in condition L5.1; (b) occur quarterly within the reporting period of the Environment Protection Licence with at least 2 months between monitoring periods; (c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters;	Administrative Non - compliance		As per REC 7 Continue investigations of any noise issues and, where practicable, implement reasonable and feasible mitigation measures. Ensure accurate/consistent monitoring results are presented in Annual Reviews. As per REC 8	See REC 7 Agree: 31/03/20 See REC 8 Agree: 31/06/20	REC 7 = 100% REC 8 = 100% revised NMP submitted in 2020 and again in 2021 for approval of removing the CVC continuous noise monitor. Initial comments supported the logger removal.								

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(d) the night time 15 minute attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;</p> <p>(e) the night time LA1 (1 min) attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;</p> <p>(f) one quarterly monitoring must occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night, and</p> <p>(g) each quarterly monitoring must be undertaken on a different day(s) of the week not including Saturdays, Sundays and public holidays; and</p> <p>(h) these monitoring conditions take effect in the 2015 Reporting period.</p>			<p>The real - time noise monitor should be re-established for the site. Liaise with the DPE regarding the best location as the majority of noise complaints have resulted from Mannering Colliery operations, not CVC. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.</p>		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	Note: The intention of this condition is that quarterly monitoring be undertaken at each sensitive receiver. That at each sensitive receiver monitoring is undertaken over a range of different days excluding weekends and public holidays during the reporting period so as to be representative of operating hours. That night time 15 minute attended monitoring and the LA1 (1min) monitoring for three of the quarters be undertaken at worst case being the most stable atmospheric conditions and when noise would be most intrusive to sleep. All of the sensitive receivers do not have to be monitored on the same day, evening and night for sub condition f.					
M4.2	For the Annual Reporting Period ending March 2015 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this licence, as a single report attached to the Annual Return for the premises.	Administrative Non - compliance	No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	REC 26 For future Annual Returns a single noise monitoring report should be prepared and attached to the Annual Return.	REC 26 Agree: 31/03/20	REC 26: 100%
M6.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint;	Administrative Non - compliance	*Admin Non-compliant: The Complaints Register does not include the personal details of the complainant. * Not all complaints registered in the register included the method by which the complaint was made. * There are additional complaints outlined in the Annual Review compared to the Complaints Registers provided to the auditor.	REC 27 Ensure all complaints are recorded in the internal database on site and the relevant details required under this condition are outlined in the Annual Review.	REC 27 Agree: 31/03/20	REC 27: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and</p> <p>f) if no action was taken by the licensee, the reasons why no action was taken.</p>					
M7.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Administrative Non - compliance	<p>*Telephone line for complaints advertised on the LakeCoal and Delta Coal websites.</p> <p>* However no evidence of notifying to the community that the complaints line exists.</p>	<p>REC 28</p> <p>With the new ownership an advertisement should be placed in the paper/newsletter providing a link to the Delta Coal website and outlining the complaint management details.</p>	<p>REC 28</p> <p>Agree: 30/09/19</p>	REC 28: 100%
M7.4	<p>The licensee must notify the EPA with contact details of personnel capable of a timely response to emergencies or any other exigent circumstances.</p> <p>(a) the nominated contact must be available at all times.</p> <p>(b) contact details must include a telephone number and must be current.</p> <p>(c) such notification must be made within 14 days of receiving this licence.</p>	Administrative Non - compliance	<p>* Designated representatives of the company included in the Pollution Incident Response Plan (PIRMP), dated September 2018.</p> <p>* Admin Non-compliant: The designated representatives of the company, included in the PIRMP, are not current.</p>	<p>REC 29</p> <p>Update the details of designated representatives of the company in the PIRMP.</p>	<p>REC 29</p> <p>Agree: 30/09/19</p>	<p>REC 29: 100%</p> <p>CVC PIRMP updated December 2021 in reporting period.</p>
R1.5	The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Administrative Non - compliance	<p>The 2017-18 Annual Return is dated 4 June 2018 and was supposed to be submitted to the EPA by 30 May 2018. From the date of the Annual Return it appears it wasn't submitted to the EPA time</p> <p>The 2016-17 Annual Return was dated within the 60 days.</p>	<p>REC 30</p> <p>Ensure Annual Returns are completed as per the EPA requirements and submitted within the due date.</p>	<p>REC 30</p> <p>Agree: 31/03/20</p>	REC 30: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
R4.1	<p>The licensee must submit to the EPA a noise compliance assessment report at the end of each reporting period. The report must be submitted with the Environment Protection Licence Annual Return. The report must be prepared by a suitably qualified and experienced acoustical consultant which:</p> <p>(a) details the noise monitoring undertaken in accordance with condition M4;</p> <p>(b) assesses compliance with noise limits presented in condition L5.1 and condition 5.2; and</p> <p>(c) outlines any management actions taken within the monitoring period to address any exceedances of limits contained in condition L5.1 and condition L5.2.</p> <p>Note: The licensee must provide the EPA with one report, but this report may be a combination of the monitoring undertaken by the licensee as part of their quarterly monitoring program as required by the Project Approval SSD-5456 and must include LA1(1min).</p>		No evidence of a consolidated noise report prepared for the Annual Returns. Evidence from 2015/16, but none during the audit period.	<p>REC 31</p> <p>Send a combined noise report for the Annual Return period to the EPA.</p>	<p>REC 31</p> <p>Agree: 31/03/20</p>	REC 31: 100%
U1.1	By 07 July 2017 the licensee must construct a pump station, rising main and other infrastructure in order to connect the sewage from Chain Valley Colliery to Wyong Shire Council's sewerage system. The construction must be undertaken by an appropriately qualified and experienced person. The Licensee must:	Administrative Non - compliance	<p>The upgrade has been designed but not yet constructed.</p> <p>This was supposed to be completed by 7 July 2017.</p>	<p>REC 32</p> <p>Liaise with the EPA regarding the current status of the Sewage System Project. Implement any agreed actions in terms of timing.</p>	<p>REC 32</p> <p>Agree: 30/06/20</p>	REC 32: 70%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>a) obtain the appropriate approvals and permits required for the development;</p> <p>b) construct option A or option B in accordance with the document titled "Concept Design Report for Sewage Treatment System Upgrade Chain Valley Colliery" dated 1 February 2016 and prepared by RGH Consulting Group;</p> <p>c) include connection of sewage from the administration building to the rising main;</p> <p>c) notify the EPA in writing at hunter.region@epa.nsw.gov.au within 2 weeks of the pump station and rising main being commissioned; and</p> <p>d) provide the EPA with a report on commissioning of the pump station and rising main which details the final option constructed within 2 weeks of the pump station and rising main being commissioned.</p>					<p>31/03/2022 Update: The CVC Sewage Project Development Application was approved by Council in December 2020. A contractor was awarded a tender for the works in 2021 and commencement of construction is anticipated for Q2 2022 with completion by 25/08/2022. EPL 1770 was varied in 2021 to extend the due date of PRP8 – extended to 25/08/2022.</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
CCL 721						
Condition 3.	<p>Mining Operations Plan</p> <p>(a) Mining operations must not be carried out otherwise than in accordance with:</p> <p style="padding-left: 40px;">a Mining Operations Plan (MOP) which has been approved by the Director-General of the Department of Primary Industries.</p> <p>(b) The MOP must:</p> <p style="padding-left: 40px;">i) identify areas that will be disturbed by mining operations;</p> <p style="padding-left: 40px;">ii) detail the staging of specific mining operations;</p> <p style="padding-left: 40px;">iii) identify how the mine will be managed to allow mine closure;</p> <p style="padding-left: 40px;">iv) identify how mining operations will be carried out on site in order to prevent and or minimise harm to the environment;</p> <p style="padding-left: 40px;">v) reflect the conditions of approval under:</p> <p style="padding-left: 40px;">the Environmental Planning and Assessment Act 1979</p> <p style="padding-left: 40px;">the Protection of the Environment Operations Act 1997</p> <p style="padding-left: 40px;">and any other approvals relevant to the development including the conditions of this lease; and</p> <p style="padding-left: 40px;">vi) have regard to any relevant guidelines adopted by the Director-General.</p> <p>(c) The titleholder may apply to the Director-General to amend an approved MOP at any time.</p> <p>(d) It is not a breach of this condition if:</p>	Non-Compliant (Low Risk)	<p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p> <p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is <u>non-compliant</u>. <u>There is now an approved MOP therefore there is no further recommendation relating to this period of time.</u></p> <p>Both MOPs cover the required aspects of this condition.</p> <p><u>Implementation:</u></p> <p>No areas available for rehabilitation at site.</p>	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the Mining Act 1992, the Environmental Planning and Assessment Act 1979, Protection of the Environment Operations Act 1997 or the Occupational Health and Safety Act 2000; and</p> <p>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.</p> <p>{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.</p>					
Condition 5	<p>The EMR must:</p> <p>a) report against compliance with the MOP;</p> <p>b) report on progress in respect of rehabilitation completion criteria;</p> <p>c) report on the extent of compliance with regulatory requirements; and</p> <p>d) have regard to any relevant guidelines adopted by the Director-General.</p>	Administrative Non - compliance	<p>a) Admin Non-compliant: The 2016, 2017 & 2018 Annual Reviews do not report against compliance with the MOP.</p> <p>b) N/A - Rehabilitation has not commenced at the site;</p> <p>c) 2016, 2017 & 2018 Annual Reviews - Executive Summary & Section 3; and</p> <p>d) Admin Non-compliant: 2016, 2017 and 2018 Annual Reviews not prepared in accordance with the DPE Annual Review guidelines.</p>	<p>As per REC 19</p> <p>The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.</p>	<p>See REC 19 Agree: 31/03/20</p> <p>REC 33 Agree: 31/03/20</p>	<p>REC 19: 100%</p> <p>REC 33: 100%</p>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
				<p>Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p> <p>Include an update on Audit Action Plan.</p> <p>REC 33</p> <p>Report against compliance with the MOP in future Annual Reviews.</p>		
Condition 11	Reports	Administrative Non - compliance	<p>Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports.</p> <p>LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement.</p> <p>In the version supplied to SLR there are no figures.</p>	<p>REC 34</p> <p>Ensure Group Exploration Reports meet the required timeframe.</p> <p>Ensure figures are included in the reports.</p>	REC 34 Agree	REC 34: In site compliance management system-100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>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:</p> <p>(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;</p> <p>(b) Details of expenditure incurred in conducting that exploration;</p> <p>(c) A summary of all geological findings acquired through mining or development evaluation activities;</p> <p>(d) Particulars of exploration proposed to be conducted in the next twelve months period;</p> <p>(e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.</p>					
CCL 707						
Condition 2 1-4	<p><u>Sub Condition 1</u></p> <p>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 with environmental conditions of development consent and other approvals will form the basis for:-</p>	Non-Compliant (Low Risk)	<p>All sub conditions are <u>non - compliant</u>.</p> <p>Two MOPs provided for this audit.</p> <p>MOP 1 - 1 April 2015 - 31 March 2018.</p> <p>MOP 2 - 1 October 2018 - 31 December 2020.</p>	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(a) ongoing mining operations and environmental management; and</p> <p>(b) ongoing monitoring of the project.</p> <p><u>Sub Condition 2</u></p> <p>The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.</p> <p>A Plan must be lodged with the Director-General:-</p> <p>(a) prior to the commencement of mining operations (including mining purposes);</p> <p>(b) subsequently as appropriate prior to the expiry of any current Plan; and</p> <p>(c) in accordance with any direction issued by the Director-General.</p> <p><u>Sub Condition 3</u></p> <p>A Plan must be lodged with the Director-General:-</p> <p>(a) prior to the commencement of mining operations (including mining purposes);</p> <p>(b) subsequently as appropriate prior to the expiry of any current Plan; and</p> <p>(c) in accordance with any direction issued by the Director-General.</p> <p>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:-</p>		<p>There appears to be a gap in the MOPs between March and October 2017. There has been no evidence of the reason why there was a gap and whether the site was approved to operate without a MOP in that period. As there is no information provided this condition is <u>non-compliant</u>. There is now an approved MOP therefore there is no further recommendation relating to this period of time.</p>			

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<u>Sub Condition 4</u> (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) existing flora and fauna on the site; (f) progressive rehabilitation schedules; (g) areas of particular environmental, ecological and cultural sensitivity and measures to protect these areas; (h) water management systems (including erosion and sediment controls); (i) proposed resource recovery; and (j) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation.					
Condition 3-2	AEMR 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;	Administrative Non - compliance	Annual Review covers conditions b-f. However there is minimal information regarding a review and forecast against the MOP.	As per REC 19 The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.	See REC 19 Agree: 31/03/20 See REC 33 Agree: 31/03/20	REC 19: 100% REC 33: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
	<p>(c) Department of Environment and Conservation and Department of Planning licences and approvals;</p> <p>(d) any other statutory environmental requirements;</p> <p>(e) details of any variations to environmental approvals applicable to the lease area; and</p> <p>(f) where relevant, progress towards final rehabilitation objectives.</p>			<p>Ensure transport records from this Audit period (January 2016) onwards are recorded on the website. This could be appended to the Annual Review summarising the weekly transport.</p> <p>Include the biodiversity monitoring reports as appendices to the Annual Review.</p> <p>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</p> <p>Include an update on Audit Action Plan.</p> <p>As per REC 33</p> <p>Report against compliance with the MOP in future Annual Reviews.</p>		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete as of 31/03/22
Condition 7	<p>Reports</p> <p>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:</p> <p>(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;</p> <p>(b) Details of expenditure incurred in conducting that exploration;</p> <p>(c) A summary of all geological findings acquired through mining or development evaluation activities;</p> <p>(d) Particulars of exploration proposed to be conducted in the next twelve months period;</p> <p>(e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.</p>	Administrative Non - compliance	<p>Evidence of submission for 2016, 2017 and 2018 Group Exploration Reports.</p> <p>LakeCoal received a PIN from the Resources Regulator on 7 November 2017 for late lodgement.</p> <p>In the version supplied to SLR there are no figures.</p>	<p>As per REC 34</p> <p>Ensure Group Exploration Reports meet the required timeframe.</p> <p>Ensure figures are included in the reports.</p>	See REC 34	REC 34: 100% Reminders in Lawlex

Additional recommendations relating to compliant conditions are outlined within **Table 7**.

Table 2 Additional Recommendations

Aspect	Recommendation	Delta Coal Confirmation and Due Date
Management Systems	It provided difficult for Delta Coal to provide requested information in a timely manner. SLR recommends a review of the management system to ensure information is correctly filed and readily available.	Agree: 30/09/19 100%
Audit Preparations	Little information was provided to SLR prior to the audit which resulted in numerous additional information requests. Additional time is required by Delta Coal to prepare for the next Independent Environmental Audit. An internal audit is recommended prior to the next Independent Environmental Audit to ensure information and evidence is available to the Independent Environmental Auditor.	Disagree first sentence: Most of documents requested in original RFI prior to site audit were provided and publicly available information present on the website. Further requests resulted as Auditors got into auditing. Some time-delays were encountered from both parties.
Waste Management	Ensure the minor waste management issues identified during the audit are rectified, including: <ul style="list-style-type: none"> • Improve bin labelling; • Ensure all hydrocarbon containers (empty or full) are stored within bunds. 	Agree: 30/09/19 100% Ongoing
Groundwater	Attempt to contact property owners and ask for permission to monitor the private groundwater bores. Some additional consultation with Council may be required.	Agree: 31/09/20 - 0% - Groundwater monitoring of private bores nearby undertaken for Consent Consolidation EIS reporting where access was permitted. It is noted that local groundwater is not considered to have beneficial use due to high salinity.
Surface Water Discharges	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.	Agree: 31/03/20 100%
Future Annual Returns	LakeCoal and Delta Coal to prepare Annual Returns based on the period of the Annual Return and dates of the sale of CVC.	Agree: 31/03/20 100%

Taken from Subsidence Section 5.2.3 from Chain Valley Colliery IEA

Recommendation	Delta Coal Confirmation and Due Date
A more conservative approach to assessing future impacts from further mining is recommended to build confidence that the subsidence processes in play are understood and impacts that rely on the subsidence impacts can be suitably assessed prior to mining	Noted.
A significant upgrade of subsidence monitoring systems and reporting protocols at CVC is recommended	Noted
The use of three dimensional surveying with total station survey and high quality global positioning system (GPS) control is recommended. This technology is readily available and widely used for subsidence monitoring in NSW.	Noted
For sensitive high value features such as the marina or similar features, real-time continuous GNSS monitoring is available at relatively low cost and can be used to provide high confidence subsidence monitoring in three dimensions.	Noted
A thorough review of the survey data and monitoring approach for Line 23 along the northern lakeshore of CVC Bay is recommended.	Noted
A review of benthic and seagrass community monitoring systems is recommended to confirm that the monitoring is capable of discriminating minor and negligible impacts as required by the development consent conditions.	<p>Agree: 31/12/20</p> <p>Benthic Communities statistical analysis completed April 2020.</p> <p>Note to add to report.</p>
A separate subsidence impact assessment report should be prepared annually and appended to the Annual Review. Presentation of all future survey data in Annual Reviews would benefit from a thorough and comprehensive analysis of the subsidence monitoring being undertaken by an external consultant so that the data can be meaningfully interpreted and is comprehensible by anyone with an interest in the outcomes; and	Agree: 31/03/20, It doesn't specifically require an external consultant as specialist resources are available on site. 100%

Recommendation	Delta Coal Confirmation and Due Date
<p>The report should assess performance against subsidence impact performance measures from the Development Consent as well as any other commitments, triggers and management measures from Extraction Plans. This report should assess how the Extraction Plans tracked against Trigger Action Response Plan (TARP's).</p>	<p>Agree: 31/03/20 100%</p>
<p>Include how the site is tracking against subsidence performance criteria (Schedule 4 Condition 4) in the Biodiversity Monitoring Reports, Annual Seagrass Monitoring Report and the Annual Review. This should include a table outlining if performance criteria have been met and where further information can be found.</p>	<p>Agree: 31/03/20 100%</p>
<p>Develop a TARP when updating the Benthic Communities Management Plan. This should address the wording of Schedule 4 Condition 2 SSD 5465. A series of triggers should be developed based on quantitative data and this should be reported in the bi - annual monitoring reports and the Annual Review. An example of a trigger would be '% change in organisms between monitoring events'.</p>	<p>Agree: 31/3/20 100%</p> <p>The Chain Valley Colliery Subsidence Management TARP updated to include threatened species and endangered populations.</p> <p>Subsidence management TARP not appended to Benthic Communities Monitoring Plan but is appended to the Miniwall S5 and NMA Pillar Extraction Plan, featuring the Benthic Communities Management Plan.</p>

Recommendation	Delta Coal Confirmation and Due Date
<p>Assess the triggers from the Extraction Plans eg. ANOVA/ANOSIM level is approaching 5% in the bi-annual monitoring reports.</p>	<p>Agree: 31/3/20 0%</p> <p>Benthic Communities statistical analysis completed April 2020. Statistical analysis was not undertaken in biannual monitoring. Statistical analysis of benthos results not undertaken in 2021, however, species volume and distribution increased, indicating that trigger levels would not have been met. Statistical analysis undertaken every 2 years to update the benthic model using the most recent monitoring and survey data. Next statistical analysis planned for 2022.</p> <p>Recommend removal of biannual monitoring to annual monitoring.</p>

Appendix 11: 2021 Chain Valley Colliery - Coal Haulage Records

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 107 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

Week Ending	Coal Transport via Public Roads (t)	Coal Transport via Private Roads (t)
10/01/2021	0	0
17/01/2021	0	0
24/01/2021	0	0
31/01/2021	0	0
07/02/2021	391.58	0
14/02/2021	251.92	0
21/02/2021	0	0
28/02/2021	0	0
07/03/2021	0	0
14/03/2021	0	0
21/03/2021	0	0
28/03/2021	0	0
04/04/2021	0	0
11/04/2021	0	0
18/04/2021	0	0
25/04/2021	0	0
02/05/2021	0	0
09/05/2021	0	0
16/05/2021	0	0
23/05/2021	0	0
30/05/2021	0	0
06/06/2021	0	0
13/06/2021	0	0
20/06/2021	0	0
27/06/2021	0	0
04/07/2021	0	0
11/07/2021	0	0
18/07/2021	0	0
25/07/2021	0	0
01/08/2021	0	0
08/08/2021	0	0
15/08/2021	0	0
22/08/2021	0	0
29/08/2021	0	0
05/09/2021	0	0
12/09/2021	0	0
19/09/2021	0	0
26/09/2021	0	0
03/10/2021	0	0
10/10/2021	0	0
17/10/2021	0	0
24/10/2021	0	0
31/10/2021	0	0
07/11/2021	0	0
14/11/2021	0	0
21/11/2021	0	0
28/11/2021	0	0
05/12/2021	0	0
12/12/2021	0	0
19/12/2021	0	0
26/12/2021	0	0
02/01/2022	0	0

Appendix 12: DPIE Letter – 2021 Annual Review Approval

Review Date	Next Review Date	Revision No	Document Owner	Page
		1	Environmental Compliance Coordinator	Page 108 of 108
DOCUMENT UNCONTROLLED WHEN PRINTED				

Department of Planning and Environment

Lachlan McWha
Environmental Compliance Coordinator
Great Southern Energy Pty Ltd trading as Delta Coal
Awabakal Country
Off Construction Road
Off Ruttleys Road
MANNERING PARK NSW 2259

By email only: lmcwha@deltacoal.com.au

12/05/2022

Dear Mr McWha

**Chain Valley Extension (SSD-5465)
2021 Annual Review**

Reference is made to the Annual Review for the period 1 January 2021 to 31 December 2021, submitted to the Department of Planning and Environment (the department) on 31 March 2021 as required under Schedule 6 condition 8 of Development Consent SSD-5465, as modified (the consent).

The department has reviewed the Annual Review and considers it to generally satisfy the reporting requirements of the consent and the department's *Annual Review Guideline* (October 2015). Please make publicly available a copy of the 2021 Annual Review on the company website.

Please note that the department's acceptance of this Annual Review is not an endorsement of the compliance status of the project. Non-compliances identified in the Annual Review will be assessed in accordance with the department's Compliance Policy. Further correspondence may be sent in relation to non-compliances.

Should you wish to discuss the matter further, please contact James Epstein, Senior Compliance Officer on 02 65753419 or compliance@planning.nsw.gov.au

Yours sincerely

A handwritten signature in black ink that reads "H Watters".

Heidi Watters
Team Leader Northern
Compliance

As nominee of the Planning Secretary