Delta coal	Doc Owner: **Environment and Community Coordinator** Doc No:

CHAIN VALLEY COLLIERY

Annual Review 2019

1 January 2019 – 31 December 2019

Author:	Katie Weekes – EMM Consulting Environment Officer
Authorised by:	Chris Armit Environment and Community Coordinator
Date:	Original: 31 March 2020 Revised: 15 May 2020

Chain Valley Colliery – Annual Review (AEMR) 2019

Name of operation	Chain Valley Colliery
Name of operator	Great Southern Energy Pty Ltd trading as Delta Coal Pty Ltd
Project Approval #	SSD 5465
Name of Project Approval holder	Delta Coal Pty Ltd
Titles/Mining Leases #	Consolidated Coal Lease 707, Consolidated Coal Lease 706 (part), Mining lease 1051, Mining lease 1052, Mining lease 1308, Mining Lease 1370, Mining lease 1632 (part sublease), Mining Purposes Lease 1349, Mining Purposes Lease 337, Mining Purposes Lease 1389, Mining Purposes Lease 1400, Consolidated Coal Lease 719 (part sublease), Consolidated Coal Lease 721 (part sublease), Consolidated Coal Lease 722.
Name of holder of mining leases	Great Southern Energy Pty Ltd
Water License #	WAL41508 / Work Approval 20MW065025
MOP Commencement Date	1st October 2018
MOP Completion Date	31st December 2020
Annual Review start date	1 January 2019
Annual Review end date	31 December 2019

I, Chris Armit, certify that this audit report is a true and accurate record of the compliance status of Chain Valley Colliery for the period 1 January 2019 to 31 December 2019 and that I am authorised to make this statement on behalf of Great Southern Energy Pty Ltd (trading as Delta Coal Pty Ltd).

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Reporting Officer	Name: **Chris Armit** Title: **Environment & Community Coordinator** Date: **15/05/2020** Signature: 

Executive Summary

During the 2019 reporting period Chain Valley Colliery (CVC) produced approximately 0.8 Mt of coal from its underground mining operations and transported approximately 0.8 Mt of coal from site. This result was significantly higher than the volume produced in the previous 2018 reporting period (0.4 Mt).

During the reporting period, 792,950 tonnes of coal was transported from site to Mannering Colliery for processing.

There were no development consent modifications to Chain Valley Colliery development consent (SSD 5465) during the reporting period.

The Delta Coal Voluntary Planning Agreement (VPA) with Central Coast Council was executed during the previous reporting period. $29,982.33 was accrued during the reporting period, which was the total indexed contribution (31 December 2019).

A summary of the key environmental performance indicators and statement of compliance for the 2019 reporting period is provided in **Table 1**.

Table 1: Key Performance Indicators for the reporting period

Indicator	Value
Total full time employees (at 31 December 2019)	200
ROM coal produced on site (tonnes)	792,950
Product coal transported from site via Mannering Colliery (tonnes)	792,950
Total ROM coal to export market (tonnes)	0
Total ROM coal to domestic market (tonnes)	792,950
Total truck movements on public roads	0
General waste produced (tonnes)	221.5
Total waste recycled (tonnes)	201.5
Waste recycling % achieved	47.6%
Potable water consumed (ML)	87.2
Total water discharged from the operation (ML)	2092
Total number of community complaints received	0

Total number of reportable environmental incidents for the period	23 (19 of which were extraordinary events as per Schedule 3, Condition 11, Tables 3 to 5, Note D of SSD 5465)
Total funding accrued for the Voluntary Planning Agreement with Council	$29,982.33
Number of Community Consultative Committee (CCC) meetings undertaken	4
Total greenhouse gas emissions (CO_2 equivalent tonnes) Quarter 2 2019 period only (Delta Coal contribution to end of 2018/2019 financial year)	77,021

Statement of Compliance

Summary of Non-compliances (2019 Reporting Period):

The **twenty three** 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
CCL707, CCL706 (part), ML1051, ML1052, ML1308, ML1370, ML1632 (part sublease), MPL1349, MPL337, MPL1389, MPL1400, CCL719 (part sublease), CCL721 (part sublease), CCL722	Yes
Water Access Licence 41508 / Work Approval 20MW065025	Yes

Table 3: Non-compliances for 2019 at CVC

Relevant Approval	Condition No.	Condition Description (summary)	Compliance Status	Comment	Where addressed in Annual Review
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 26/10	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 30/10	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 31/10	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 07/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 12/11	Section 10

Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 19/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 22/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 26/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 28/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance- Regional Dust Event *	Non- Compliant	Exceedance 29/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 30/11	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 02/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 03/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 04/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 05/12	Section 10

Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 06/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 10/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 19/12	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	PM10 24 Hour Average Exceedance - Regional Dust Event *	Non- Compliant	Exceedance 31/12	Section 10
EPL 1770	L3.2	Daily Volume Discharge Limit Exceedance - LDP01 Discharge point	Non- Compliant	Exceedance 31/08	Section 10
EPL 1770	L2.4	Faecal Coliform Concentration Exceedance - LDP01 Discharge point	Non- Compliant	Exceedance 18/09	Section 10
Development Consent- SSD 5465 (Mod 2)	Schedule 3- Condition 11	Deposited Dust Criteria Exceedance - contamination	Non- Compliant	Exceedance 5/11 – 5/12	Section 10
EPL 1770	L2.4	Faecal Coliform Concentration Exceedance - LDP01 Discharge point	Non- Compliant	Exceedance 17/12	Section 10

* DPIE consider this to be an extraordinary event as per Schedule 3, Condition 11, Tables 3 to 5, Note D of SSD 5465. No formal incident report is required.

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

Table of Contents

1 Introduction

1.1 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, as 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 generally within the Fassifern Seam.

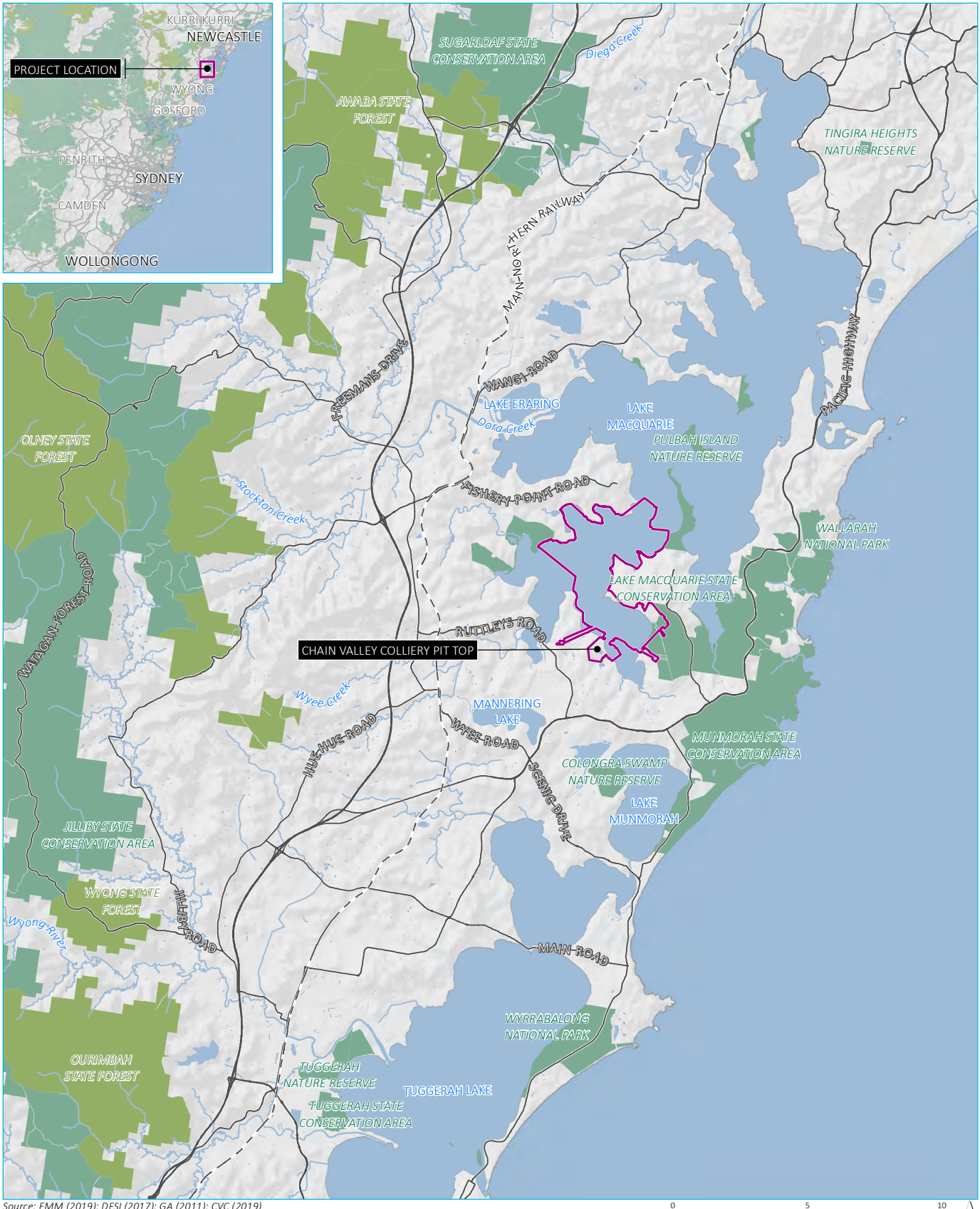
Delta Coal is currently undertaking the mine closure/rehabilitation process for the Moonee Colliery and the Catherine Hill Bay Coal Preparation Plant. The rehabilitation process for Wallarah Colliery has been completed and the lease in that area relinquished.

CVC peaked with a workforce of approximately 380 personnel in the mid 1980's. At the end of the reporting period, CVC had a workforce of 200 personnel.

1.2 Mine Contacts

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

Mine Manager:	Dave McLean
Telephone:	02 43580 800
Email:	dmclean@deltacoal.com.au
Environment and Community Coordinator:	Chris Armit
Telephone:	02 4358 0883
Email:	carmit@deltacoal.com.au
Postal Address:	Delta Coal Pty Ltd P.O Box 7115 Mannering Park NSW 2259



\\emmsvr1\EMM\Jobs\2018\H180389 - LakeCoal CVC and MC noise monitoring\8 GIS\02_Maps\N005_RegionalLocalContext_20191113_01.mxd 13/11/2019

Source: EMM (2019); DFSI (2017); GA (2011); CVC (2019)

0 5 10 km

GDA 1994 MGA Zone 56

N

KEY

- Chain Valley Colliery development consent boundary
- Rail line
- Main road
- Watercourse/drainage line
- Waterbody
- NPWS reserve
- State forest

Regional and local context

Chain Valley Colliery
Figure 1

EMM creating opportunities

2 Approvals

2.1 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 currently approved extraction area to allow underground mining to continue within the Fassifern Seam (refer "Site" boundary on **Plan 2** (**Appendix 2**);
- 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 concurrently to permit coal to be received from Chain Valley Colliery and transported via existing facilities to VPPS. The modification applications were subsequently approved on the 27 November 2014.

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.

A Statement of Environmental Effects to support a further third modification to SSD5465 was submitted to DPIE Resource Assessments in May 2019. The modification proposed the following changes to the CVC operations:

- resumption of bord and pillar workings and

- Increase of transfer of Coal from Chain Valley Colliery to Mannering Colliery via the underground link road from 1.3 million tonnes to 2.1 million tonnes

2.2 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.

2.3 Mining Operations Plan

The 2018 to 2020 Mining Operations Plan (MOP) was the MOP approval which covered extraction mentioned in the above Extraction Plan section and their associated first workings and mains headings. A MOP amendment was submitted in December 2019 for the extraction of Miniwall S4 and also some surface demolition and construction activities and included an updated Rehabilitation Cost Estimate.

This Annual Review has been completed in compliance with Condition 4 of Schedule 6 within SSD-5465. A copy of the modified Development Consent is attached as **Appendix 1**.

2.4 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 holding is shown on **Plan 1 (Appendix 2)** and the applicable mining tenements are listed in **Table** 4.

Table 4: Mining Tenements

Mining tenement	Holder	Grant date / Renewal date	Lease expiry date	Applicability
ML 1051	Great Southern Energy Pty Ltd	7 July 1941	7 July 2022	Incorporates part of the approved mining area.
ML 1052	Great Southern Energy Pty Ltd	7 July 1941	7 July 2022	Incorporates part of the approved mining area.
MPL 1349	Great Southern Energy Pty Ltd	5 October 1967	5 October 2028	Mining purposes lease for the Chain Valley pit top area.
CCL 706 (part)	Great Southern Energy Pty Ltd	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.

Mining tenement	Holder	Grant date / Renewal date	Lease expiry date	Applicability
CCL 707	Great Southern Energy Pty Ltd	3 July 1989	30 December 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.
ML 1308	Great Southern Energy Pty Ltd	4 May 1965	4 May 2022	Mining lease for the mine drift entries.
MPL 337	Great Southern Energy Pty Ltd	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 1389	Great Southern Energy Pty Ltd	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 Pty Ltd	6 November 1970	6 November 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.
CCL 719 (June 2003)	Centennial Mannering	3 July 1989	22 December 2020	Part CCL 719 subleased to LakeCoal, incorporates historic workings within the Wallarah and Great Northern Seams which are utilised for passive operational activities.
CCL 719 (Sublease B)	Centennial Mannering	3 July 1989	22 December 2020	Sub-lease from Centennial Mannering for Mannering Colliery.
CCL 721	Centennial Mannering	28 June 1989	29 July 2026	Incorporates part of the approved mining area, Part sublease to LakeCoal, incorporated into Chain Valley Colliery holding. Includes Mannering surface facilities.
ML1632	Centennial Myuna	13 April 2013	13 October 2022	Incorporates part of the approved mining area. Part sublease to LakeCoal, incorporated into Chain Valley Colliery holding.
CCL 722 (part)	Centennial Munmorah	28 June 1989	5 July 2019	Part sublease to LakeCoal, incorporated into Chain Valley Colliery holding. Centennial have put application in to renew this lease, awaiting approval.
ML1370 (part)	Centennial Myuna	26 September 1995	7 March 2033	Incorporates part of the approved mining area. Part sublease to LakeCoal, incorporated into Chain Valley Colliery holding.

Mining tenement	Holder	Grant date / Renewal date	Lease expiry date	Applicability
EL8428	Great Southern Energy Pty Ltd	7 December 2015	7 December 2020	Exploration Lease. Part of LakeCoal Tenement Holdings. Subsurface only.

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.

2.5 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 updated on 2 April 2019.

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 3**.

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.

2.6 Mine Geology

The Wallarah, Great Northern and 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 with the seam being approximately 30 m deeper than the Great Northern Seam, which underlies the Wallarah Seam by approximately 30 m also. **Figure 2** 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 m 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 Seam. Current operations and development consent only permits mining within the Fassifern Seam.

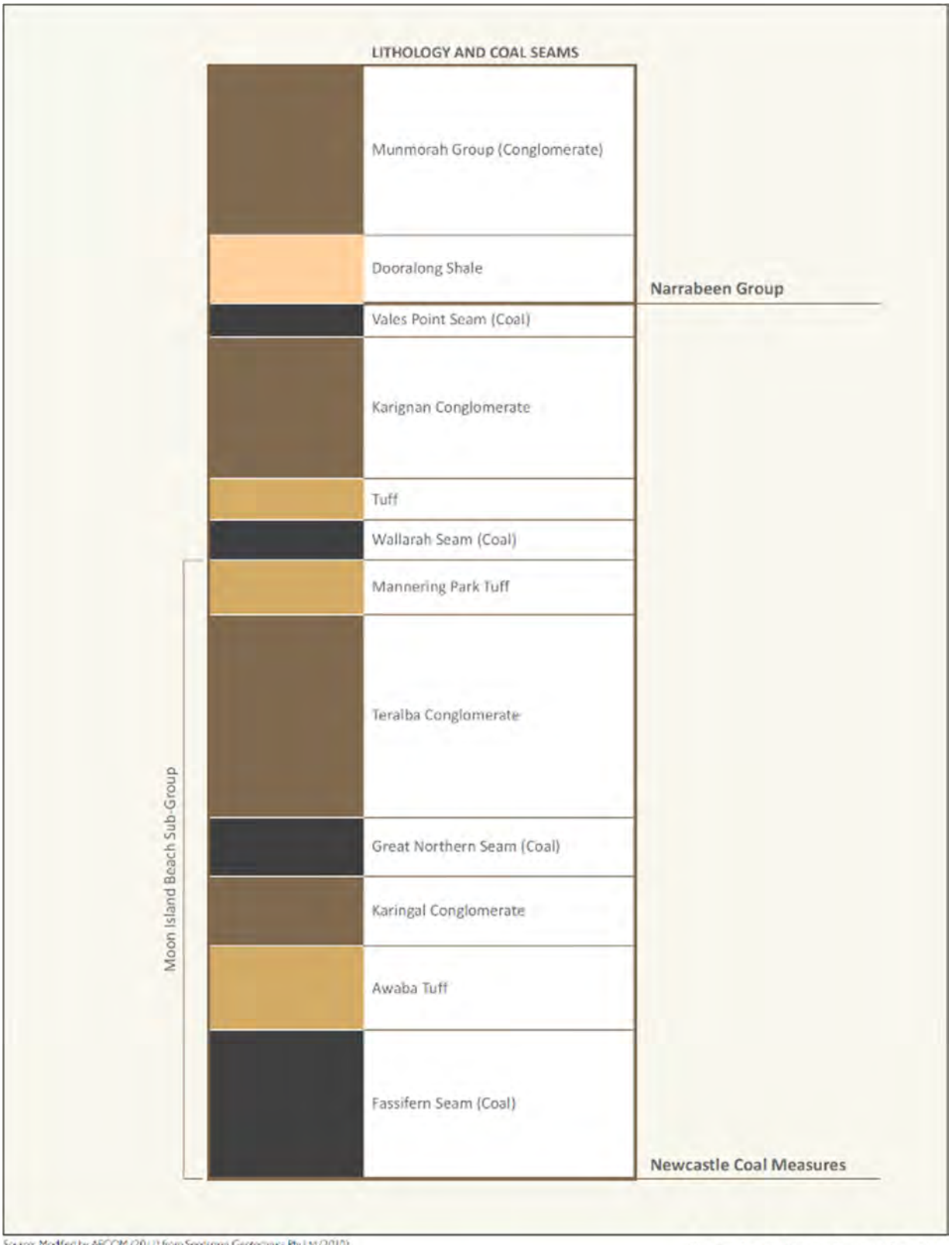


Figure 2: Typical Stratigraphy at Chain Valley Colliery

3 Operations

3.1 Exploration

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

3.2 Land Preparation

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

3.3 Construction/Demolition

There were no construction works undertaken during the reporting period.

Delta Coal commenced planning works associated with removal of legacy coal handling plant, unused coal bins, former mine cottages and other plant within the existing surface footprint.

An asbestos assessment and additions to the amended Mining Operations Plan (MOP) is also underway.

3.4 Mining

Since commencement of mining in the 1960's, CVC has been utilising bord and pillar methods with full and partial pillar extraction as the primary means of secondary coal extraction.

At the end of 2010 it was decided to change the primary extraction method to miniwall mining. Miniwall extraction commenced in September 2011.

During the 2017 reporting period a significant operational milestone was achieved with the connection of both CVC and MC underground and surface infrastructure through its link road project. As a result of the underground connection, CVC commenced the transport of coal to VPPS via the existing approved overland conveyor from MC in August 2017.

Total production for 2019 was 0.8 Mt, which comprised 1088 m of longwall retreat and 10,330 m of development drivage which occurred in Tailgate S2, Maingate S2, Maingate S3 and the North East Mains. Miniwall mining during the reporting period consisted of parts of Miniwall N1 and Miniwall S2. Mining areas in 2019 are shown in **Figure 3**.

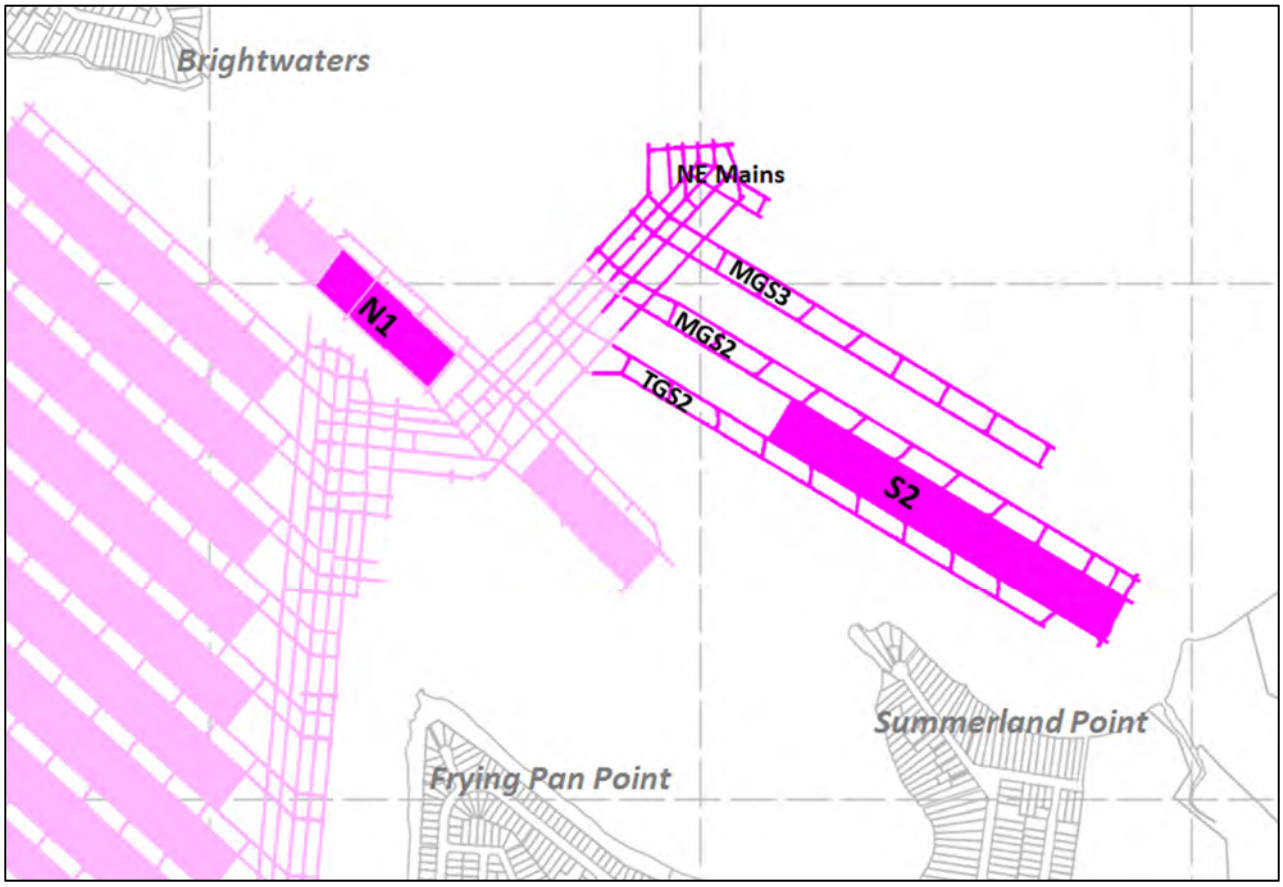


Figure 3: CVC 2019 mining area

A production summary for the reporting period is provided in **Figure 4** shows the past 14 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.

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	0.4 Mt	0.8 Mt	1.4 Mt
Saleable Product (Same as ROM)	2.1 Mt	0.4 Mt	0.8 Mt	1.4 Mt
Coarse Reject	n/a	n/a	n/a	n/a
Fine Reject	n/a	n/a	n/a	n/a

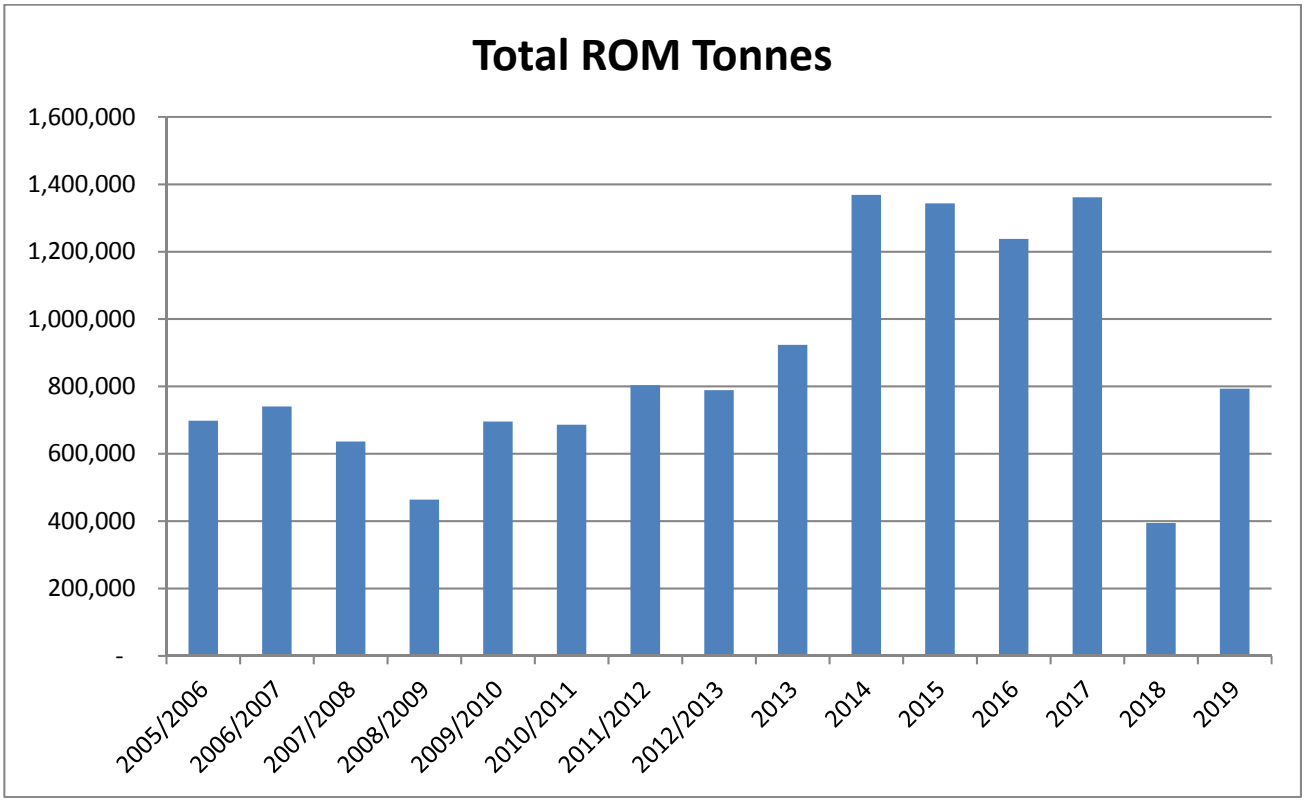


Figure 4: Annual ROM Production Levels

All coal produced was dispatched to VPPS via conveyor from Mannering Colliery. During the reporting period a total of 792,950 tonnes was dispatched to VPPS (domestic market).

3.5 Mineral Processing

CVC produces a raw, crushed thermal coal which is suitable for both export and domestic markets. During 2019 mined coal was transferred via conveyor to the surface at Mannering Colliery where it was screened and crushed to the specifications of the domestic customer Delta Electricity. No other mineral processing was carried out during the reporting period.

3.6 Waste Management

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

- general waste;
- scrap metal;
- comingled recycling;
- waste oil;
- pallets/timber recycling;
- oily rags;
- oil filters;
- oil drums;
- waste batteries; and

- confidential documents.

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 5**.

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.

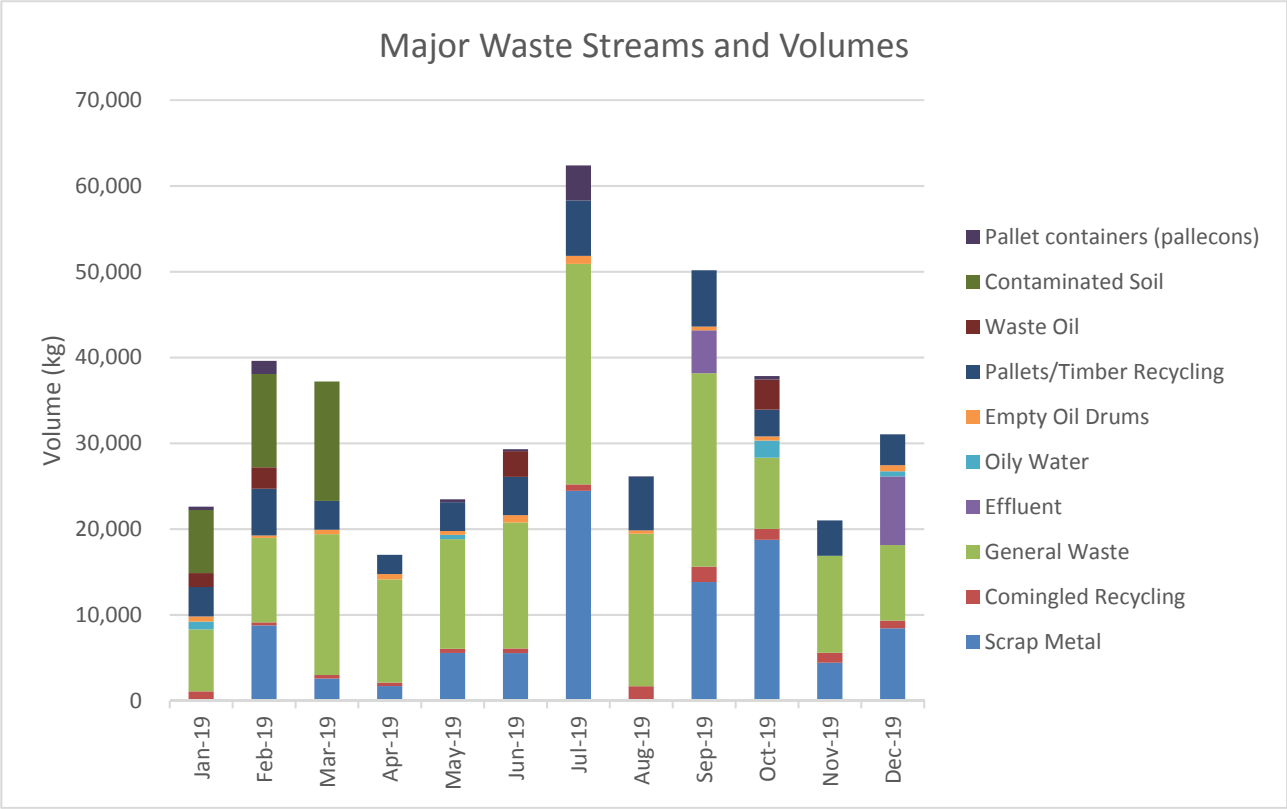


Figure 5: CVC Major Waste Streams and Volumes

3.7 Stockpiles

Following the linkage of both CVC and MC underground in August 2017 no coal has been transferred to the surface at CVC. There is some remnant coal remaining at the product coal stockpile area and is planned to be screened and trucked to Vales Point Power Station in Quarter 1 and Quarter 2 of 2020 via the private, internal roads. .

3.8 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 diesel tank;
- chemical storage sheds;
- a covered, bunded area for storage of pallets of oils, and bulk fluid containers; and
- 31.4 kL self-bunded diesel tank (compliant with both AS1692 and AS1940) moved from the coal stockpile area to the workshop area.

3 LPG gas bottles were added to site for the heating of hot water for showering in the bath house. There have been no other significant changes made to the management of hazardous materials during the reporting period.

3.9 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.

3.10 Proposed Changes

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

- move to bord and pillar mining pending CVC Mod 3 approval;
- submission of Miniwall S5 Extraction Plan if CVC Mod 3 is delayed or declined;
- submission of a Statement of Environmental Effects (SEE) for CVC Mod 4 - Northern Extension Area (Morriset Peninsular). This project is reliant on CVC Mod 3 approval to recommence bord and pillar mining methods at CVC;
- commence assessment to consolidate CVC development consent and MC project approval. This will provide the ability to conduct upgrade works and mining in the Great Northern Seam;
- commence environmental scoping assessment and exploration in the Moonee area;
- removal of legacy coal handling plant, unused coal bins, former mine cottages and other plant within the existing surface footprint;
- submission of a Review of Environmental Factors (REF) for a sewage pump station at CVC adjacent to the bath house and a sewer pipeline to Tall Timbers Road for connection to Central Coast Council sewage system;
- removal of remnant coal from the CVC product coal stockpile and transport via private road to Vales Point Power Station;
- obtain a land access licence agreement to gain access to Crown land adjacent to Lake Macquarie foreshore to conduct weed management works in this area; and
- regular housekeeping program.

4 Inspections and Actions Required from Previous Annual Review

4.1 Actions Required from Previous Annual Review Inspection

Delta Coal received formal acknowledgement from DPIE Compliance on 17 July 2019 that the site's 2018 Annual Review generally satisfied the project approval requirements. As identified in **Table 6**, there were some items requiring amending from DPIE's review (18 June 2019). There was no follow-up inspection of CVC undertaken by DPIE.

Table 6: Actions required from last Annual Review Inspection

Item	Issue / Observation	Action	Where discussed in Annual Review
1	Typographical error	Annual Review 2018 - Update Executive Summary regarding coal transport. Amend Table of Contents to include all sections, particularly Section 13	See Executive Summary and Table of Contents
2	Water licence	Annual Review 2018 - Update references to correct water licence	See Executive Summary, Section 6
3	Water management	Annual Review 2018 - –Section 2.8 Water taken during the reporting period is reported in accordance from Section 7 of the Annual Review Guideline	See Section 6
4	Rehabilitation	Annual Review 2018 - Identify the agreed post rehabilitation land use(s), and describe key issues that may affect rehabilitation in accordance with Section 6 of the Annual Review Guideline	See Section 7
5	Report layout and content	Annual Review 2018 - Ensure AR is consistent with the Departments' Annual Review Guidelines (2015)	This document

4.2 Actions required from 2019 Annual Review

As detailed in **Table 7**, there were some items requiring updating from DPIE's review letter dated 1 May 2020 which is reproduced in **Appendix 11**.

Table 7: Actions requiring updating in 2019 Annual Review

Item	Section	Action	Status
1	Section 10	Please update Table 19 to include all outstanding actions from the 2019 Independent Environmental Audit with updated expected completion dates	See Appendix 10 for IEA Action Plan

4.3 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 expanded throughout the reporting period to incorporate the documents as listed below in **Table 8**. Management plans listed as draft are due to be finalised in 2020 or within 3 months of receiving approval for Mod 3.

Table 8: Primary Elements of the Environmental Management System

Document Title	Reviewed	Status
Delta Coal Environment Policy	1 May 2019	Current
Environmental Management Strategy	November 2019	Incorporated into combined Delta Coal EMP. Review in consultation phase.
Environmental Monitoring Program	N/A	Incorporated into combined Delta Coal EMP. Not yet approved by DPIE
Environmental Risk Assessment	December 2019	Final
Water Management Plan	November 2019	Review in consultation phase
Air Quality Management Plan	November 2019	Review in consultation phase
Noise Management Plan	November 2019	Review in consultation phase
Heritage Management Plan	December 2019	Review in consultation phase
Biodiversity Management Plan	December 2019	Review in consultation phase
Coal Haulage Traffic Management Plan	December 2019	Review in consultation phase
Coal Haulage Drivers Code of Conduct	December 2019	Review in consultation phase
Seagrass Management Plan	June 2019	Final
Benthic Communities Management Plan	June 2019	Final
Groundwater Management Plan	September 2019	Final
Built Features Management Plan	June 2019	Final
Public Safety Management Plan	February 2019	Final
Rehabilitation Management Plan	March 2019	MOP 2018-2020
Subsidence Monitoring Program	January 2019	Final
Pollution Incident Response Management Plan (PIRMP)	May 2019	Final
Environmental Inspection	May 2019	Final
Complaints Register	December 2019	Updated monthly on www.deltacoal.com.au

5 Environmental Performance

5.1 Air Pollution

During the reporting period monitoring in accordance with the approved Air Quality Management Plan continued. Depositional dust monitoring results are shown in **Table 9** and the year-to-date averages are presented in **Figure 6.** 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** 7.

Table 9: Depositional Dust Results - 2019

Month	Limit	DDG001 - Mine Cottages	DDG002 - South Easement	DDG003 - Macquarie Shores	DDG004 - North Easement	DDG005 - Adjacent Vent Site
		Insoluble Solids	Insoluble Solids	Insoluble Solids	Insoluble Solids	Insoluble Solids
Jan-19	4	1.90	2.30	2.10	2.90	3.40
Feb-19	4	0.80	0.50	1.20	2.30	0.60
Mar-19	4	1.10	1.10	1.40	1.80	3.80
Apr-19	4	0.70	0.50	1.70	1.10	3.80
May-19	4	1.70	0.30	0.30	0.20	0.70
Jun-19	4	0.60	0.40	0.80	0.50	2.50
Jul-19	4	0.30	0.40	0.60	0.30	2.70
Aug-19	4	0.70	0.60	0.30	0.40	0.40
Sep-19	4	0.70	0.70	0.80	0.70	2.00
Oct-19	4	0.70	0.30	3.50	1.20	0.60
Nov-19	4	1.70	1.20	1.90	2.10	3.90
Dec-19	4	2.30	1.70	2.90	3.00	27.60
2019 AVG	4	1.10	0.83	1.46	1.38	4.33

Notes: 1) For site locations refer **Appendix 1: Plans**.

2) DDG005 recorded elevated results during the reporting period and in the years prior. An additional dust gauge has been installed at an alternative location nearby, with further consultation to be undertaken during the next reporting period regarding the approval for relocation of this gauge. Monitoring at DDG005 will continue to take place at the current location in accordance with the approved Air Quality Management Plan.

There was an exceedance to the maximum increase in deposited dust level (2g/m^2/month) and maximum total deposited dust level (4g/m^2/month) at point DDG005 (see Plans in **Appendix 2**) which recorded 27.6 g/m^2/month of insoluble solids between the sampling dates of 5 November and 5 December. This gauge is the closest of the five to nearby residences. There have been no changes to the main ventilation fan site operating conditions during the sampling period. Influence from localised landscaping and mowing activities on the private property be the likely cause of the elevated insoluble matter weight.

Given the contamination clearly present in the sample, DPIE advised on 16 December 2019 that they would not be taking any further action. DDG005 has shown evidence of contamination in previous years as illustrated in **Figure 7**. Given the ongoing occurrences of contamination, it is proposed to move the dust deposition gauge onto the ventilation fan site to avoid similar materials making their way into the dust depositional bottle.

The other 4 dust gauges are much closer to the mine site and recorded consistent readings at much lower levels that were within limits.

Excluding DDG005, deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m^2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m^2/month during the reporting period. Dust deposition results show low annual averages at all other sites. Annual averages were generally 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.

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 8**. The real-time monitor measures particulate matter less than 10 microns in size (PM10).

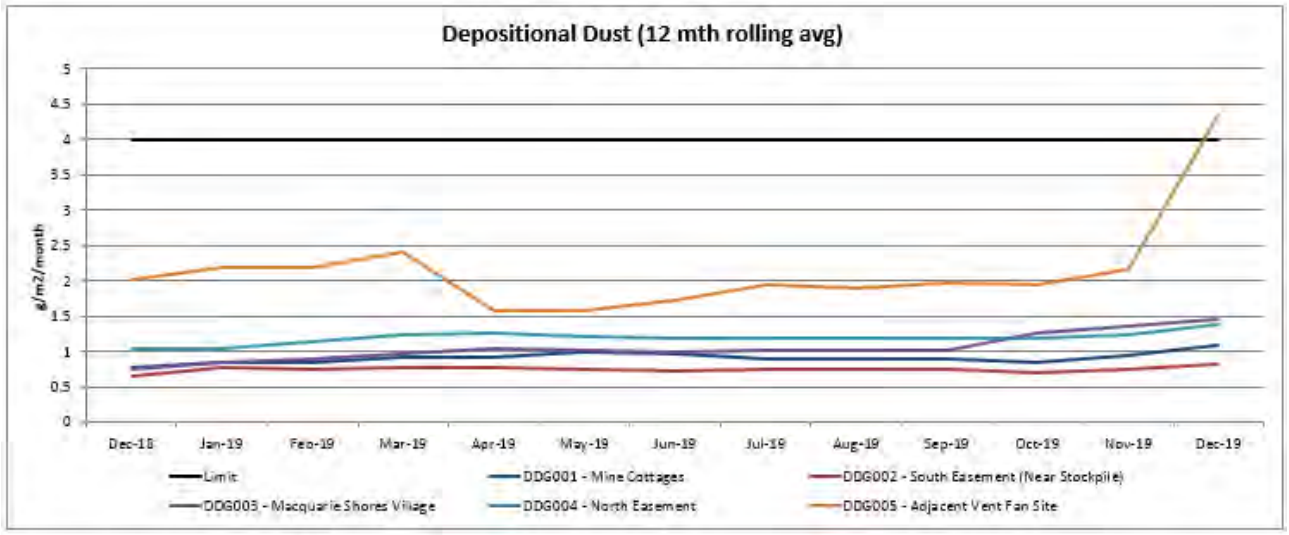


Figure 6: Annual Average Depositional Dust Results

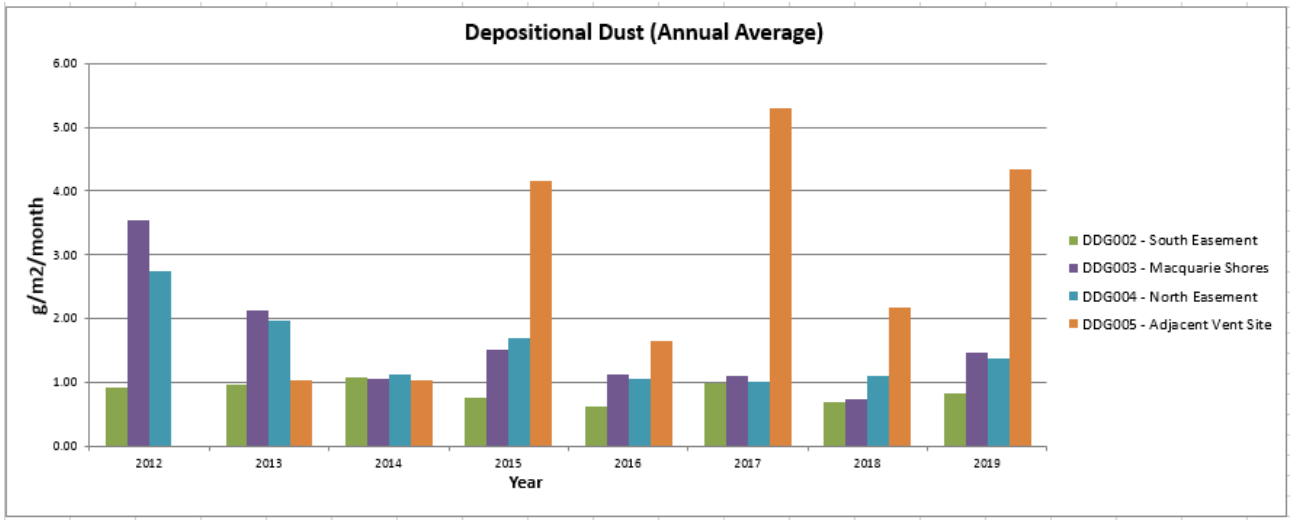


Figure 7: Annual Average Depositional Dust Trend

Delta coal

SCALE

0 250 500 1000

METRES

SCALE: 1:20 000
DRAWN: T Chisholm
CHECKED: K Weekes
DATE: 8/10/2019
DRG NO: C1S0266

Chain Valley Colliery
Air Quality Management Plan
Air Quality Monitoring Locations

Data capture from the real time monitor for the 2019 period was 99.5%, with the results trend generally reflecting that expected during the majority of the year. There were 19 exceedances of the EPA short-term 24hr average criteria (50 µg/m^3) during the reporting period, occurring between 26 October and 31 December 2019. Elevated levels during this period were due to an extremely warm spring and summer, characterised by significant bushfire and dust storm events.

All events were reported to DPIE, who considered them to be extraordinary events as per Schedule 3, Condition 11, Tables 3 to 5, Note D of SSD 5465.

The EPA long-term annual average criterion (30 µg/m^3) was not exceeded during the 2019 period. Daily results, the rolling average and relevant limits are shown on **Figure 9.**

Daily (24-hour) results ranged from a minimum of 5.0 µg/m^3 to a maximum of 214.8 µg/m^3 during 2019. The 2019 annual average of 24hr PM_{10} results was 20.9 µg/m^3. The most comparative locations from the EIS where PM_{10} air quality modeling was completed relate to receptors R12 and R15, with cumulative PM_{10} annual average predictions of 22 µg/m^3 and 20 µg/m^3 respectively. The actual location of real time PM_{10} monitoring is in between these two receivers, so a result of 20.9 µg/m^3 is consistent with the modeled values.

Monitoring of the PM_{10} via the TEOM unit commenced in late December 2013. When comparing the 2019 annual results to the previous year, the data capture rate was similar to 2018. Data from the commencement of monitoring through to the end of the reporting period is shown on **Figure 10**.

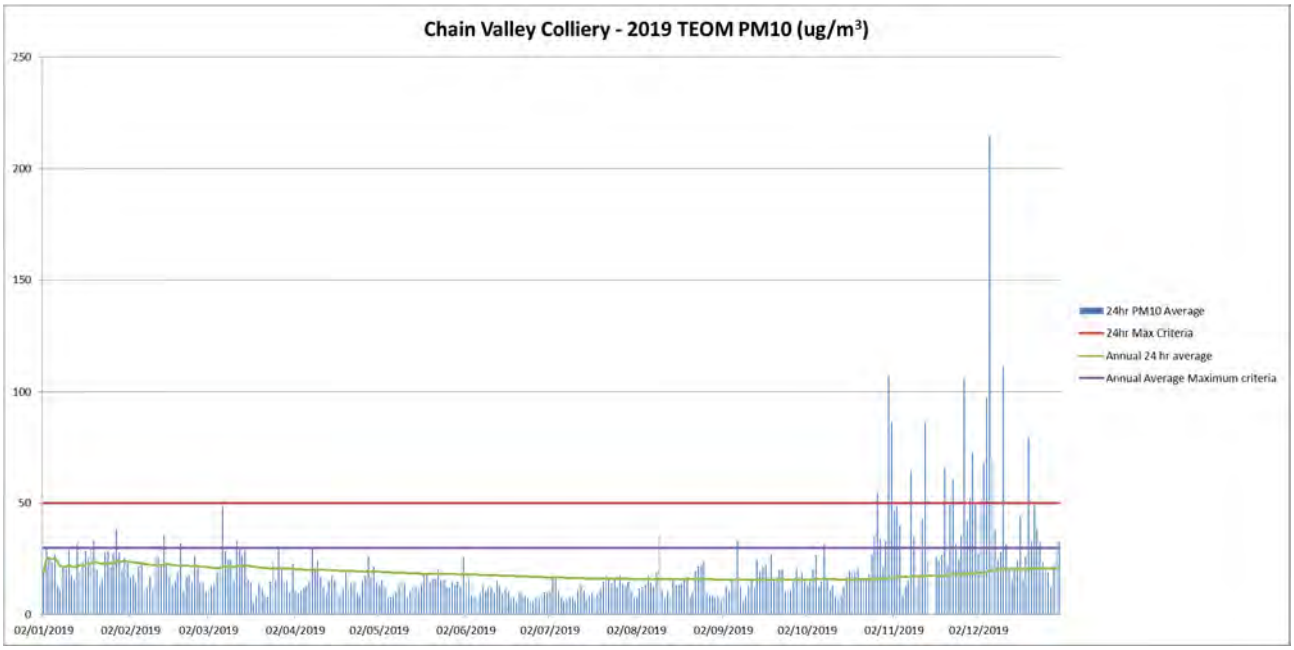


Figure 9: PM_{10} monitoring results during the reporting period

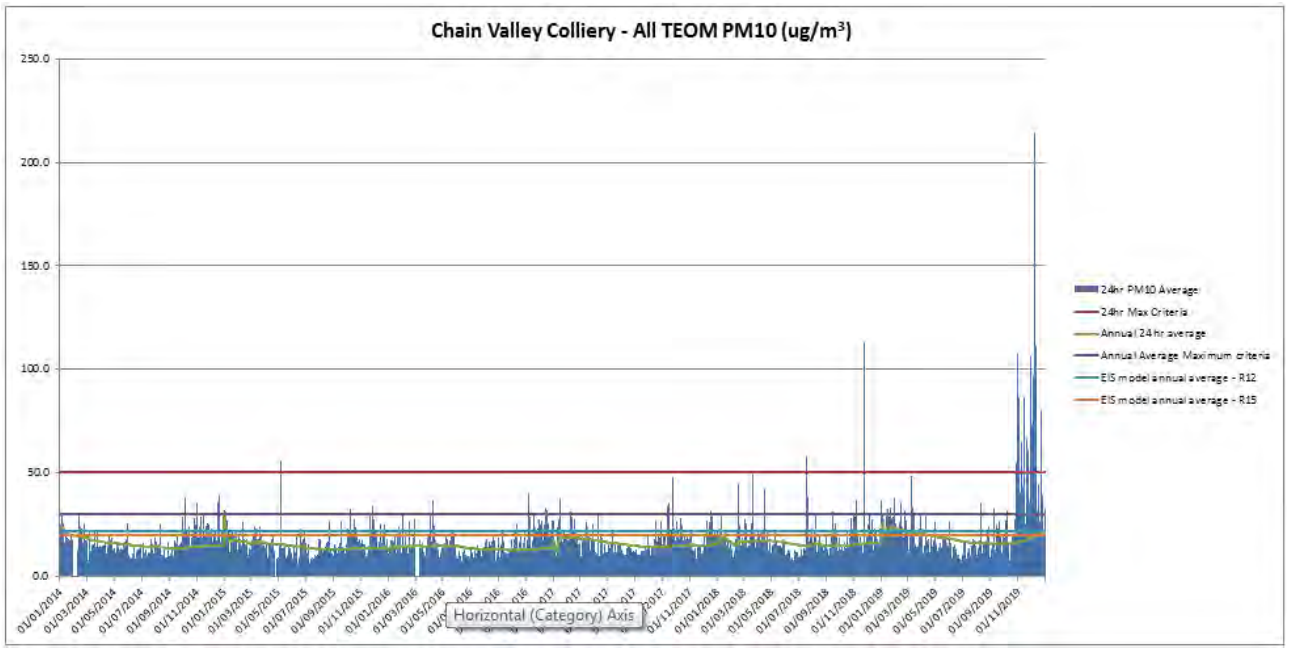


Figure 10: Long term PM_{10} data compared against criteria and EIS predictions

In relation to **Figure 10,** note that the apparent spikes in the rolling 24 hour annual averages are associated with the commencement of a new calendar year when the annual average "resets", and is not reflective of significant annual average air quality changes.

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 during the reporting period relating to dust.

The air quality monitoring program, including depositional dust and PM_{10} monitoring will continue into the 2020 reporting period.

5.2 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.

5.3 Threatened Flora

5.3.1 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 degree angle of draw to the Colliery workings. Only first workings are permitted in the Seagrass Protection Barrier, which will result in negligible subsidence.

Seagrass monitoring occurred during the reporting period in accordance with the current Seagrass Management Plan with the monitoring report reproduced in **Appendix 4**. Seagrass transect locations are shown in the report.

The discussion from the report (Laxton & Laxton, July 2019) related to the results obtained during the reporting period highlighted the following:

- In June 2019, seagrass cover at the transects ranged from 24.71 to 100 percent in the study area. The health and condition of the seagrass was good generally but, at some stations, the percentage cover was much lower than it was 2018, particularly at Transects T1 to T8. Some seagrasses were lightly fouled with epiphytic algae while others were clear of epiphytic algae. The brown seaweed *Cystophyllum onustum* was present on shells and pebbles protruding through the seagrass, almost reaching the surface at Transects E1 to E4.
- Changes in the percentage area of the substratum covered by seagrasses in 2016 to 2019, compared with the 2008 values are shown in Table 7.2. 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 41% respectively.
- Results from 2008 to 2019 for changes in seagrass cover are shown in **Figure 11** and **Figure 12.**

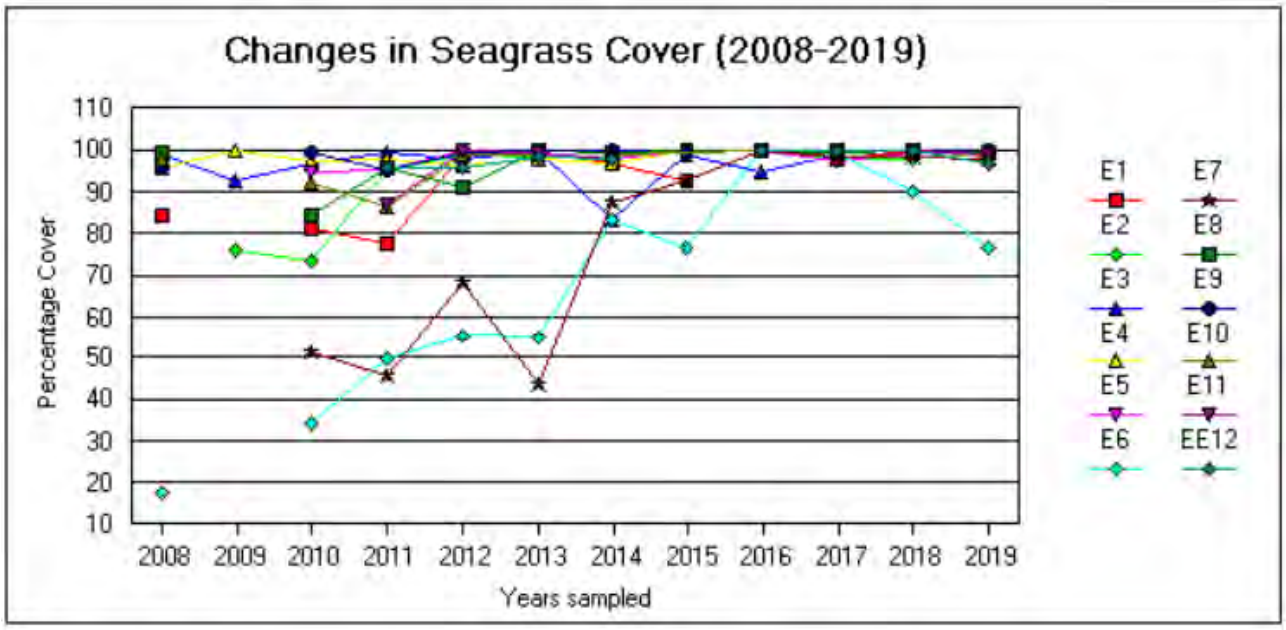


Figure 11: Changes in Seagrass Cover (2008 - 2019), Transects E1 to E12

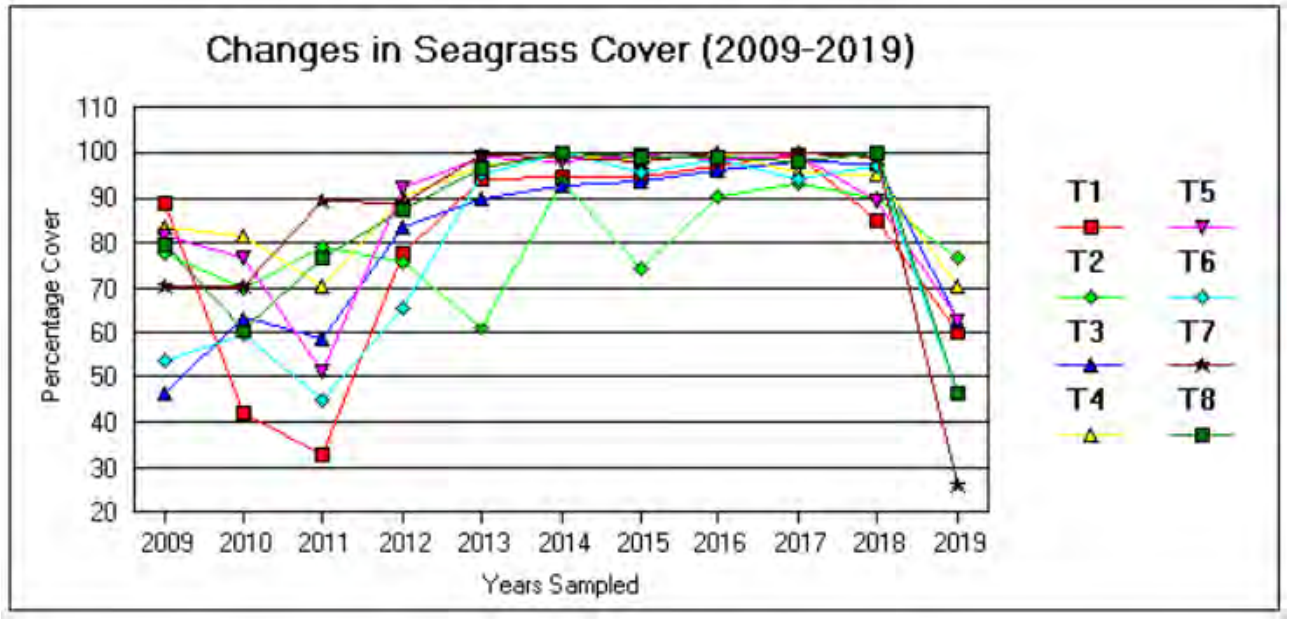


Figure 12: Changes in Seagrass Cover (2009 - 2019), Transects T1 to T8

5.3.2 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 13 and **Figure 14** 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 commenced in 2019. The latest approved version of this document is available from the Delta Coal website.

Annual biodiversity monitoring was undertaken by EMM Consulting in accordance with the Biodiversity Management Plan was continued during the reporting period. Fieldwork was carried out in November 2019. The report is reproduced in **Appendix 5**.

The monitoring specifically looks at:

- the Swamp Oak Floodplain Forest below the sediment dams;
- 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 65% which is lower than previous monitoring, but 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 2019 monitoring. Weed monitoring and management is discussed in **Section 6.5**.

5.4 Threatened Fauna

5.4.1 Terrestrial Fauna

No clearing works were undertaken during the reporting period and as a result potential to impact to threatened fauna or other native fauna was minimised.

5.4.2 Aquatic Fauna

In September 2019, 22 benthic stations were sampled (Laxton & Laxton, September 2019). The following is a history of benthos sampling from 2014 to 2019.

By March 2014, mining beneath the lake had proceeded so that two Reference stations (R) had been re-designated Impact Stations (IM). They were:

- R3 became IM5; and
- R4 became IM6.

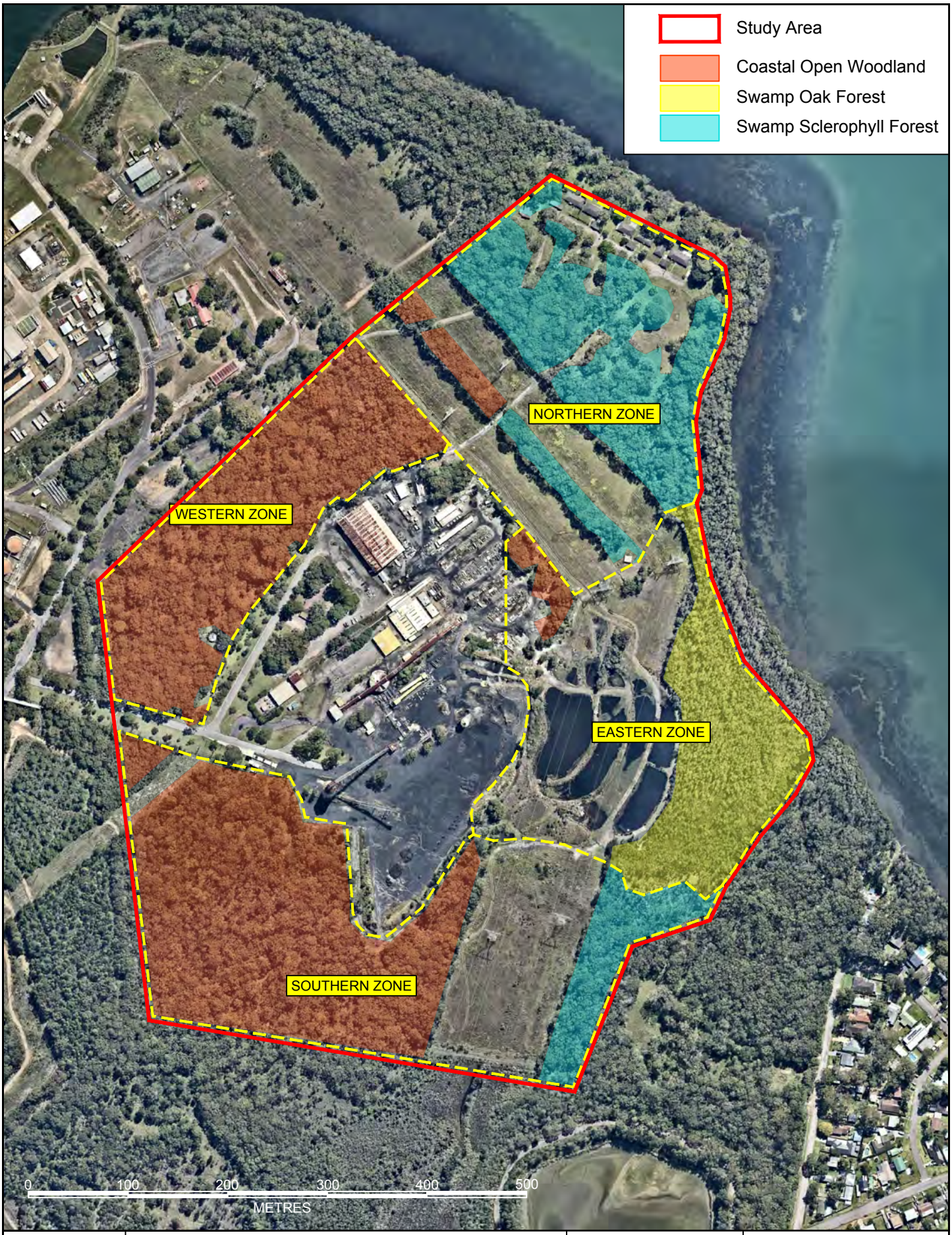
By September 2014, Station R5 had also become an impact station, namely IM7.

In March 2016 two more stations were added to the sampling schedule. They were:

- C5 GR 367701 6334310; and
- R7 GR 366232 6333856.

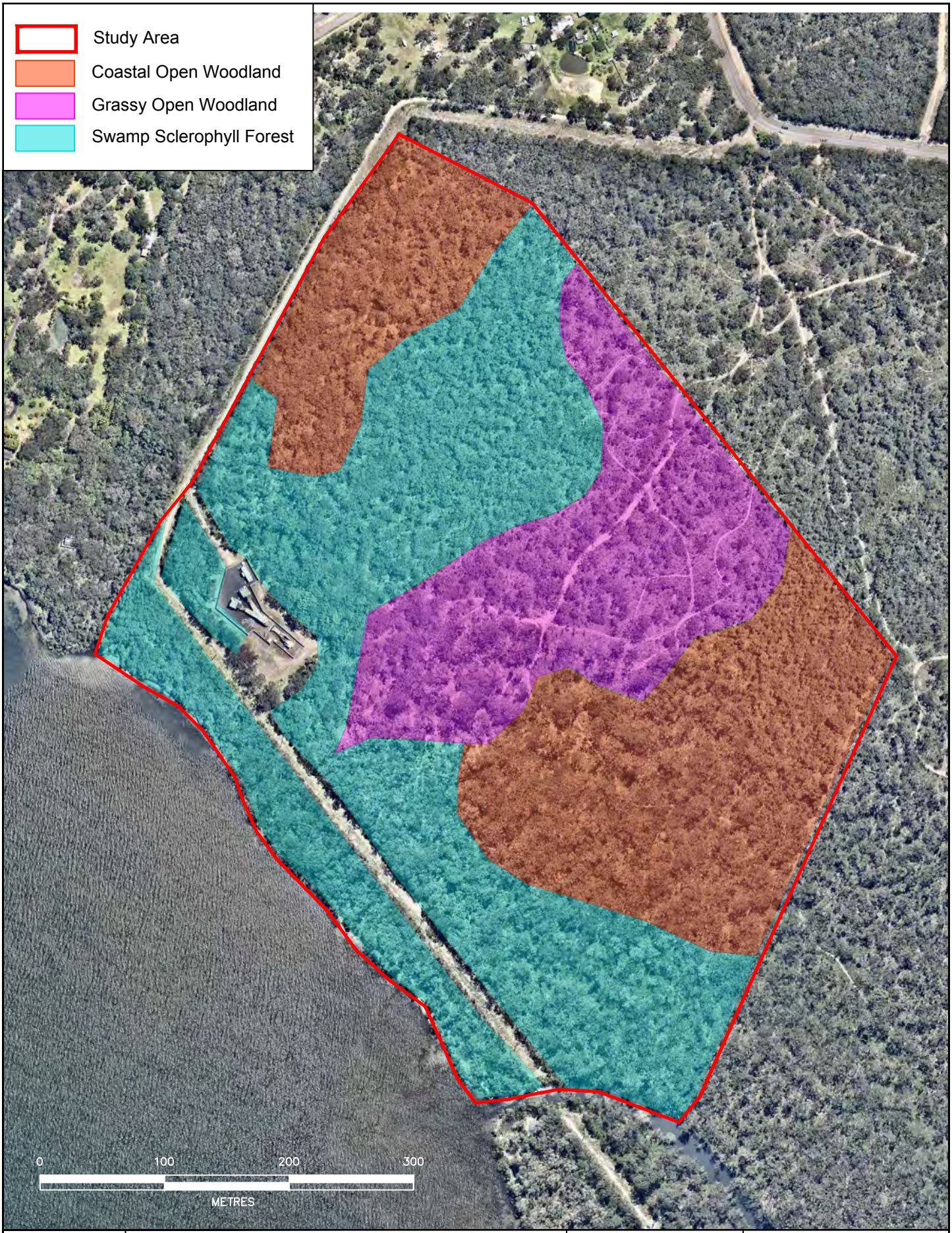
In September 2016, difficult geology beneath Bardens Bay and along parts of Summerland Point led Lake Coal to begin mining beneath Chain Valley Bay. To accommodate this change in mining direction, three additional benthos sampling stations were added. They were C6, R8 and R9:

- C6 GR 363988 6332492;
- R8 GR 364523 6332010; and
- R9 GR 365258 6331210.



N W E S	DELTA COAL CHAIN VALLEY COLLIERY	SCALE:	1:5000	DATE:	29 Nov 2019
		DRAWN:	R Tubridy	DRG NO:	C1S0270
	SURFACE FACILITIES BROAD VEGETATION TYPES	CHECKED:	K Weekes	REV NO:	1
		SIGNED:	-	SIZE:	A4

Delta coal



N
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DELTA COAL
CHAIN VALLEY COLLIERY

VENTILATION FAN COMPOUND
BROAD VEGETATION TYPES

SCALE:	1:4000	DATE:	29 Nov 2019
DRAWN:	R Tubridy	DRG NO:	C1S0271
CHECKED:	K Weekes	REV NO:	1
SIGNED:	-	SIZE:	A4

Delta coal

The total number of Stations sampled in September 2017 was 19. In March 2018, three new stations were added to the sampling program. They were:

- C7 GR 366276 6334947;
- R10 GR 365172 6334706; and
- R11 GR 367072 6333639.

Benthic sampling locations are shown on **Figure 15**.

The mud basin off Summerland Point, in Chain Valley Bay and Bardens Bay, was found to be inhabited by 24 species of organisms greater than 1 mm in size. This list was derived from the 16 samplings undertaken between February 2012 and September 2019. Polychaete worms and bivalve molluscs were the most frequently encountered animals.

During the reporting period sampling for benthic fauna was undertaken in Lake Macquarie during March and September 2019. Monitoring was undertaken in accordance with the approved Benthic Communities Management Plan.

The 16 samplings of the benthos undertaken at six monthly intervals between February 2012 and September 2019 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), dissolved oxygen concentration and turbidity of the bottom water, measured only on the day the benthos was sampled, had little influence on the species composition of the benthos over the period sampled. However, 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).

These 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.

In March 2019 and September 2019 the total number of organisms found in sediment from the 22 stations was 832 and 815 respectively as detailed in **Table 10**. This was around half the number of organisms collected in September 2018. This suggests that some extinction events have occurred.

Table 10: Number of Species found at each Station from February 2012 to September 2019

Station	C1	C2	C3	C4	C5	C6	R1	R2	R3	R4	R5	R6	R7	R8	R9
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	4	3			
Sept. 2014	3	4	4	8			6	5	6	6	3	3			
March 2015	3	3	5	3			5	3	6	5	3	3			
Sept. 2015	5	4	4	3			5	3	4	6	5	4			
March 2016	6	4	5	5	5		6	5	6	4	4	4	8		
Sept. 2016	7	3	6	5	4	8	8	4	5	6	6	7	7	5	8
March 2017	2	4	5	3	5	5	4	5	4	5	4	4	4	3	5
Sept. 2017	4	4	4	4	4	5	4	3	6	5	4	4	4	5	4
March 2018	4	4	8	4	4	3	7	8	5	4	6	3	4	3	4
Sept. 2018	3	4	4	6	5	5	4	4	5	5	5	4	6	4	5
March 2019	6	3	4	4	6	5	4	5	7	3	5	4	4	4	4
Sept. 2019	5	6	5	5	4	5	4	3	7	4	4	4	5	4	4

Station	C7	IM1	IM2	IM3	IM4	R10	R11
February 2012		7	4	4	5		
September 2012		4	4	3	5		
March 2013		7	5	5	5		
September 2013		4	3	4	5		
March 2014		5	9	4	5		
September 2014		5	6	3	6		
March 2015		5	4	4	5		
September 2015		5	5	4	4		
March 2016		6	6	3	4		
September 2016		6	4	6	3		
March 2017		3	4	3	4		
September 2017		5	5	5	5		
March 2018	5	5	7	3	4	4	4

September 2018	5	4	8	4	4	4	4
March 2019	3	5	5	2	4	6	6
September 2019	6	6	5	7	5	4	3

In summary, the mud basin off Summerland Point and in Chain Valley between February 2012 and September 2019 was found to be inhabited by 24 species of organisms greater than 1 mm in size. Polychaete worms and bivalve molluscs were the most frequently encountered animals. Benthic sampling locations are shown in **Figure 15**.

Bottom sediment in the study area was composed of a small fraction of black sand and shell fragments of various sizes. Most of the sediment was fine black mud with varying proportions of black sand and shell fragments. Over the past 3 years, little significant rain has fallen in the catchments of Lake Macquarie. As stated in the report by Laxton & Laxton (September 2019), over that period of time the salinity of the water column has become very high (over 39 parts per thousand by March 2019) and almost uniform from surface to bottom. The water of the lake became very clear for long periods. This high water clarity led to some interesting effects on the 48 benthos of the study area. First, the small seagrass, *Halophila sp.* became established as a dense bed in 6 m 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, at stations C4 and IM2, red and brown algae were found on mussels at depths between 4.5 and 6 m of water in September 2018.

In August and September 2019 some heavy rain fell in the catchment of Lake Macquarie. This rainfall lowered the salinity of water in the lake to around 36 parts per thousand.

In September 2019 some changes to the composition of the upper 100 mm 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.

For the first time in 16 samplings of sediments of Lake Macquarie, large numbers of juvenile *Dosinia sculpta* bivalve molluscs (3-4 mm diameter) were found, especially in sandy sediments.

As the monitoring data received in the reporting period did not indicate any adverse impacts to benthic community diversity or abundance directly associated with mine subsidence, continued monitoring of the communities will be undertaken as per the Benthic Communities Management Plan.

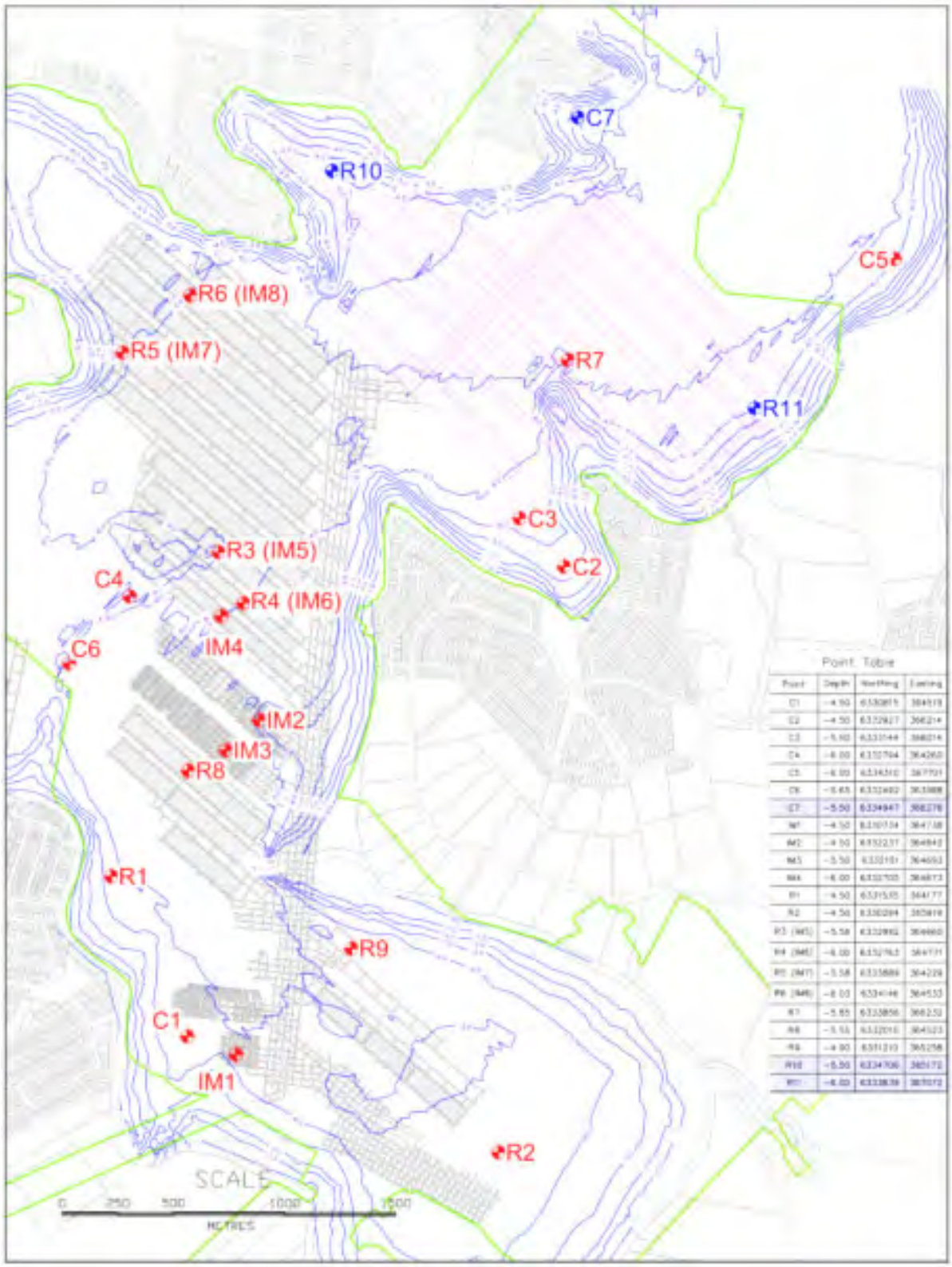


Figure 15: Benthic Sampling Locations

5.5 Weed Management

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 weed contractor to undertake a significant 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 2020 reporting period.

5.6 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 interseam shafts. This blasting is imperceptible from an environmental impact point of view.

5.7 Operational Noise

Relevant noise criteria from the Development Consent and EPL are provided in **Table 11**. Attended noise monitoring locations are shown on **Figure 16**.

Table 11: 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(36*)	46(45*)
All other privately-owned land	-	35	35	35	45

**Values in brackets are EPL noise limits and variations to the consented criterion.*

It is of note that the noise limits outlined in Development Consent SSD-5465 and EPL 1770 are inconsistent, with EPL 1770 appearing to contain a typographical error for the noise limits applicable at monitoring location ATN007 (also known as EPL Point 23 or R22) from the 2015 review. This was raised with the EPA as part of the future review of EPL1770.

The long term noise goals are reproduced in **Table 12**. Mechanisms that will be used to achieve these goals are detailed in Section 4 of the Noise Management Plan.

Table 12: 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 19 and 23 March (Quarter 1), 28 and 29 June (Quarter 2), 28 and 29 August (Quarter 3) and 19 and 20 December (Quarter 4) 2019.

Results of the attended noise monitoring undertaken during the 2019 reporting period were in accordance with the CVC approved Noise Management Plan and are provided in **Appendix 7** CVC was compliant with the relevant limits during 2019 noise monitoring. The Noise Management Plan was updated and submitted to DPIE for approval during the reporting period.

The real-time noise monitor located at site RTN001 as shown on **Figure 16** was re-established in October 2019 and data is available via a website interface.

5.8 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 2019. A visual and stray light survey was submitted to DPIE in December 2019.

5.9 Aboriginal Heritage

No impact on any Aboriginal heritage sites has occurred during the reporting period nor are any impacts expected due to the locations of the mine workings in relation to the known aboriginal sites. The surface facilities and disturbed area associated with mine infrastructure have no known Aboriginal sites.

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 reporting period.

5.10 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.

5.11 Spontaneous Combustion

The R_{70} self-heating rate value recorded for a sample from the middle of the Fassifern Seam is 3.03 ^{o}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.

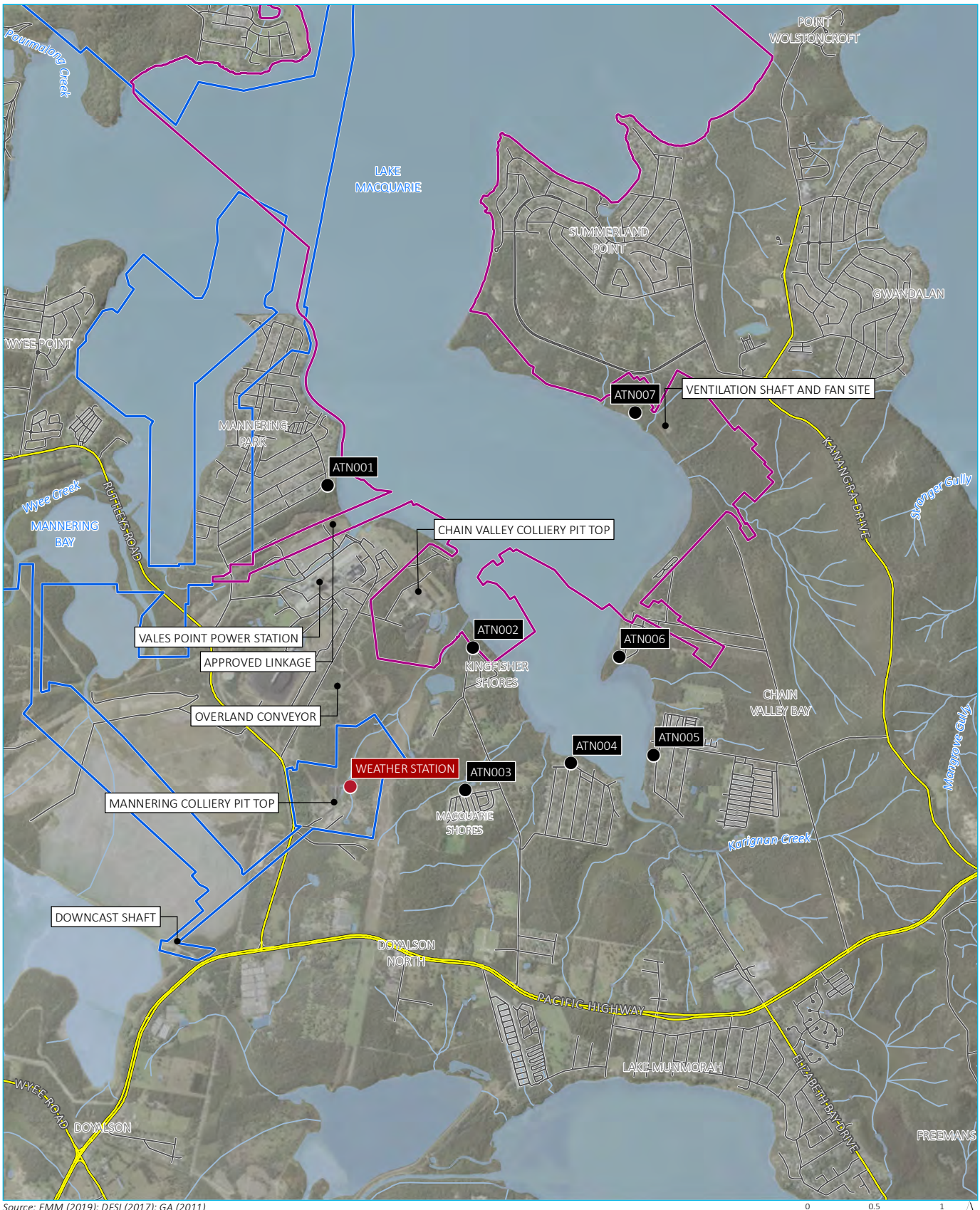
Moist adiabatic benchmark tests of the samples from CVC indicate that self-heating is controlled by the moisture in the coal and the initial start temperature. Heating development to thermal runaway would take in the order of 48 to 72 days for the middle of the Fassifern Seam, but the top and bottom 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.



\\emmsvr1\emm\Jobs\2018\H180389 - LakeCoal CVC and MC noise monitoring\8 GIS\02_Maps\N006_NoiseMonitoringAssessmentLocationsChainValley_20191113_01.mxd 13/11/2019

Source: EMM (2019); DFSI (2017); GA (2011)

0 0.5 1 km

GDA 1994 MGA Zone 56

N

KEY

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

Noise monitoring and assessment locations

Chain Valley Colliery
Figure 2

EMM
creating opportunities

5.12 Bushfire

The pit top area contains vegetation which is considered to be bushfire prone land (Category 1) as shown on **Figure 17**. The ventilation shaft area has also been identified as containing Category 1 vegetation as shown on **Figure 18**.

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.

There was a significant bushfire on the 17th October 2013, which, while not affecting the pit top site, threatened the ventilation shaft site. The site was able to be defended by the Rural Fire Service (RFS), but it highlighted a number of potential risks that had not previously been considered, such as access to the site during a bushfire event.

A risk assessment and review was undertaken following this event which determined additional asset protection zones (APZ's) would be required. Approval was subsequently sought and approved during the reporting period for the establishment of the proposed APZ's. Figure 19 shows the approved 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 will be 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 2019 with follow-up slashing and clearing as required.

Figure 17: Bushfire Prone Land Map for CVC Pit Top Area (Source: Wyong Council, 2015)

Figure 18: Bushfire Prone Land Map for Ventilation Shaft Area (Wyong Council, 2015)

Figure 19: Approved APZ's for CVC

5.13 Mine Subsidence

5.13.1 Overview of Mining Progress

Please refer to **Section 3.4** for details of the mining activities undertaken during the 2019 reporting period.

5.13.2 Approvals

During the reporting period Delta Coal undertook its mining activities in accordance with its extraction plan approvals for N1/S1 Miniwalls and S2/S3 Miniwalls.

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

5.13.3 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. The bathymetric surveys were undertaken in January and July 2019.

5.13.4 Performance Measures

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

Table 13: SSD-5465 Summary of Subsidence Performance Measures

Condition No.	Condition
Condition 1, Schedule 4	The Proponent shall ensure that vertical subsidence within the High Water Mark Subsidence Barrier and within Seagrass beds is limited to a maximum of 20 millimeters (mm)
Condition 2, Schedule 4	The Applicant shall ensure that the development does not cause any exceedance of the performance measures in Table 8 to the satisfaction of the Director-General
Table 8, Schedule 4: 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
Condition 4, Schedule 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 Director-General
Table 9, Schedule 4: Subsidence Impact Performance Measures - Built Features	Trinity Point Marina Development and other built features. They are to remain: • Always safe; • Serviceability should be maintained wherever practicable. Loss of serviceability must be fully compensated; • Damage must be fully compensated.

The Annual Subsidence Report as required by SSD-5465 (Appendix 9 - Statement of Commitments) is provided in **Appendix 8**. Details are summarised below.

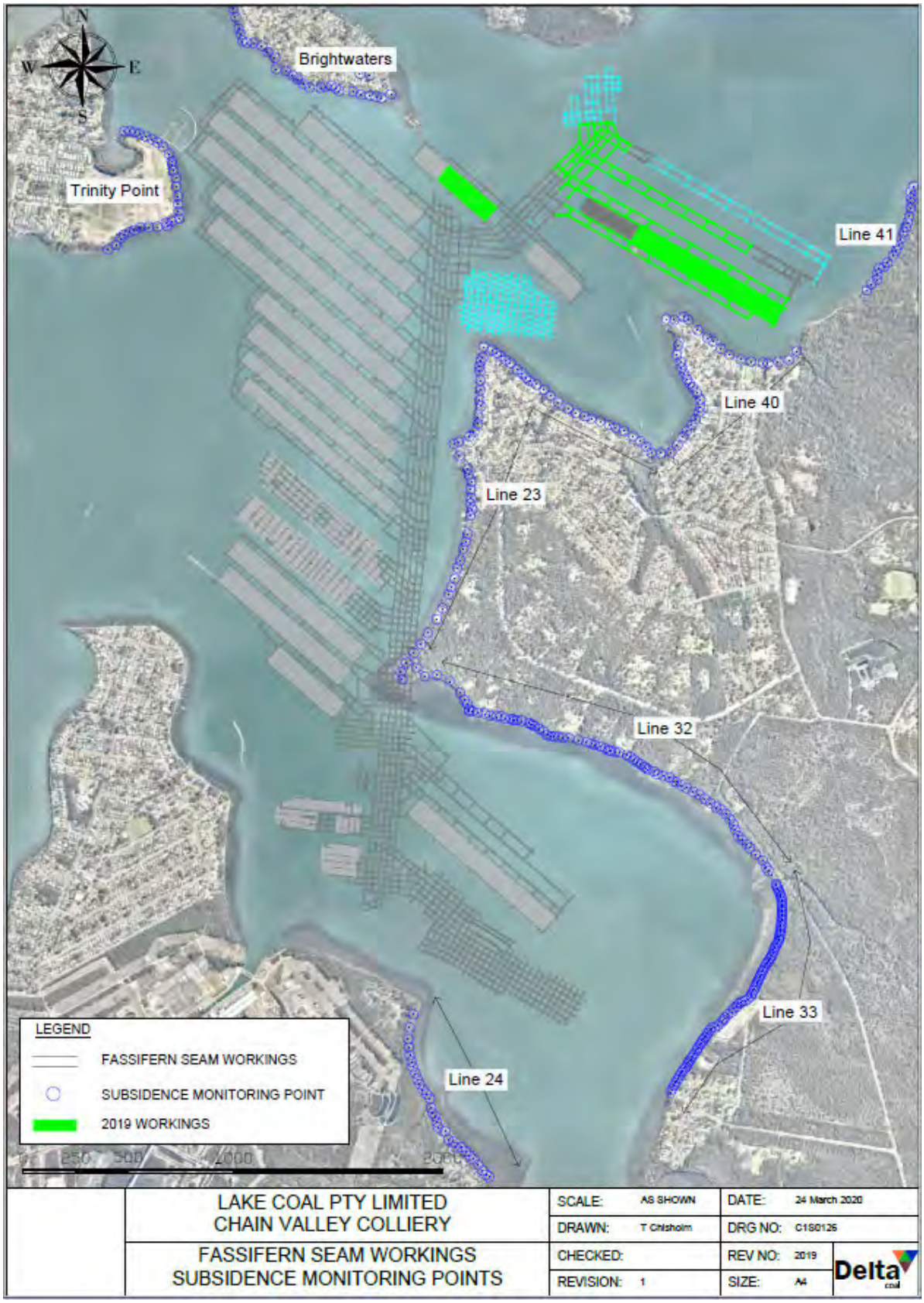


Figure 20: Shoreline subsidence monitoring locations

Trinity Point

Figure 21 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, however, there has been no movement attributable to subsidence.

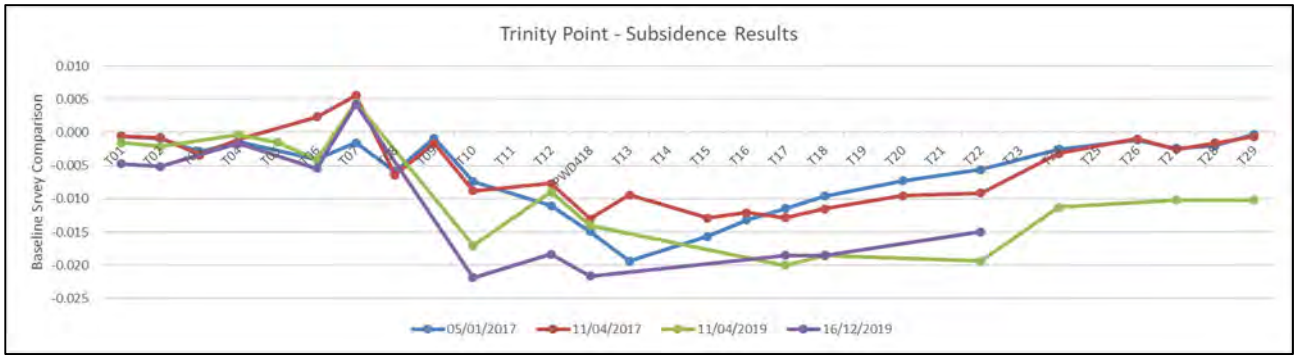


Figure 21: Trinity Point Subsidence Results

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 22**. No subsidence has been detected along the monitoring line.

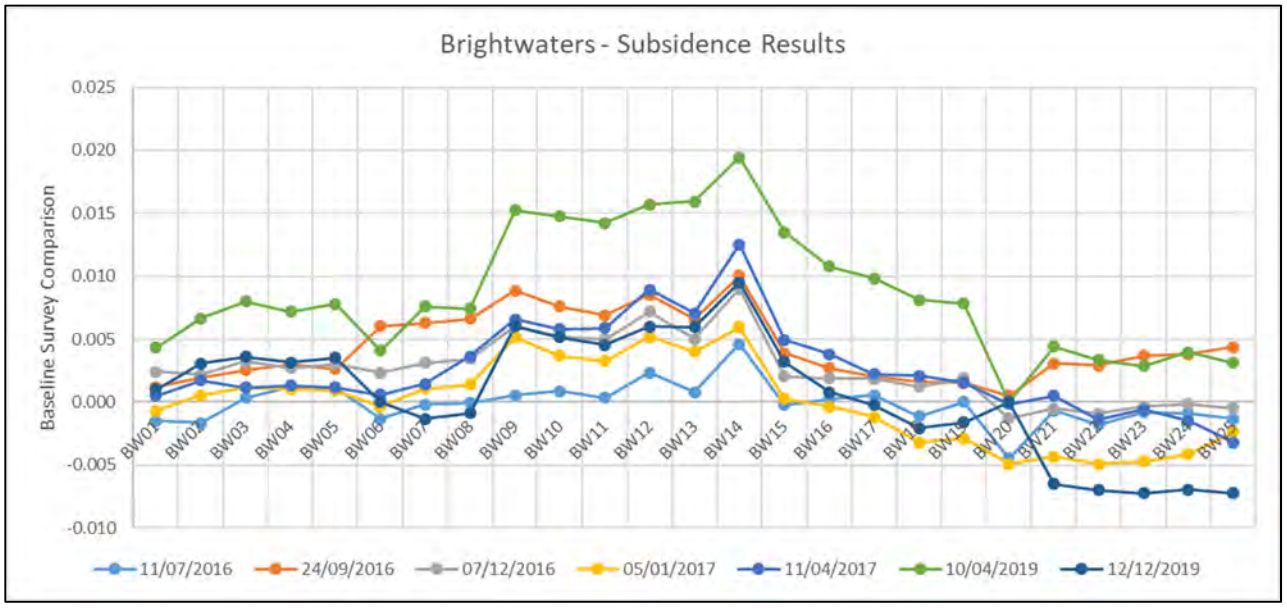


Figure 22: Brightwaters Subsidence Results

Summerland Point – Line 23

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 145 mm of subsidence was measured (Point S71) since 1994.

It is noted this point, along with points #63-75 have all experienced more than negligible amounts of subsidence (20 mm) since June 2008. Since 2008, when Fassifern first workings were completed, subsidence movement has ranged between 20-40 mm, primarily due to the impact of multi-seam extraction in the Wallarah and Great Northern seams. Ongoing subsidence appears to have slowed in recent years, with approximately 10 mm of movement (Point S71) during the 2018 and 2019 reporting periods as detailed in **Figure 23**.

This subsidence is, however, linked to residual effects from both first and second workings in the Wallarah and Great Northern seams above the Fassifern Seam workings *(Ditton Geotechnical Services, 2013 - CHV-002/2)*, due the presence of soft claystone floor beneath the Great Northern Seam. The measured subsidence movement over time was assessed alongside the theoretical subsidence movement and indicates actual subsidence in line with expectations for Wallarah and Great Northern seam secondary pillar extraction.

The Wallarah and Great Northern workings were assessed as long-term stable (*Seedsman Geotechnics, 2008 – CV11*) prior to mining in the Fassifern Seam being undertaken beneath the seams in the High Water Mark Subsidence Barrier (HWMSB). It is considered, then, that the subsidence effects along the foreshore are not a result of the 2008 Fassifern first workings or current miniwall extraction – rather due to the continuing consolidation of moisture-sensitive claystones in the Great Northern Seam floor, and would have occurred irrespective of the development of the Fassifern Seam roadways.

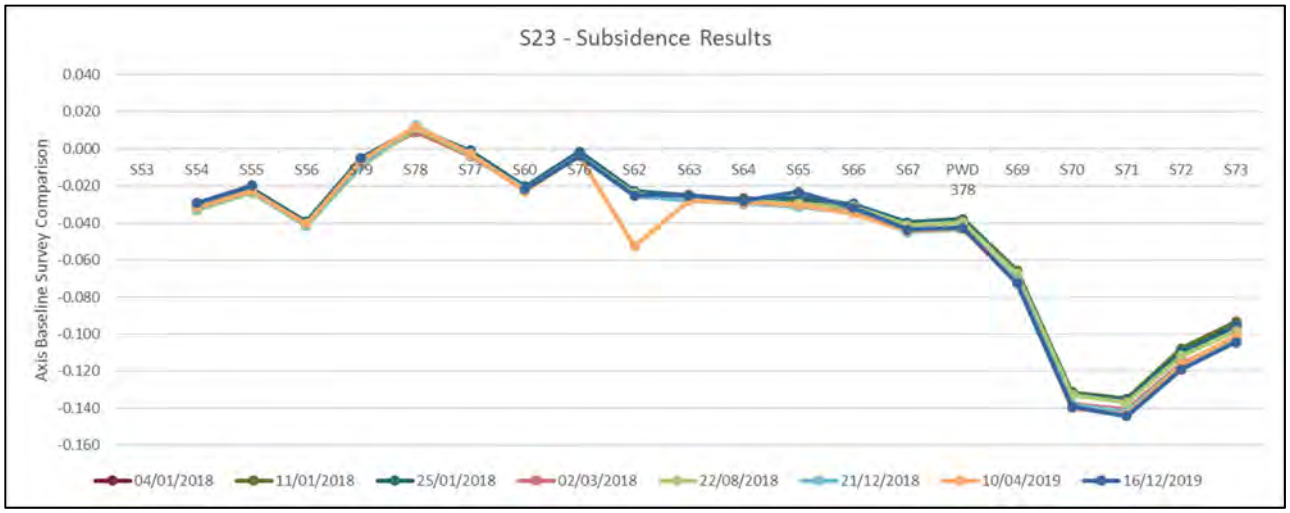


Figure 23: Line 23 Subsidence Results

Chain Valley Bay– Lines 33, 32 and 24

Monitoring points on the foreshore of Chain Valley Bay have historically been monitored during periods of extraction in the Great Northern and Wallarah seams in the vicinity of the shoreline. Due to the commencement of Fassifern Seam extraction in Chain Valley Bay (CVB), a Multi-Seam Mining Feasibility Investigation (MSMFI) report *(Ditton Geotechnical Services, CHV-002-7)* was commissioned to assess the impact of the Fassifern Seam mine workings on the previously mined Great Northern and Wallarah seam workings and potential resultant impact on the foreshore in Chain Valley Bay.

Surveys of the existing monitoring points (many of which had experienced 40-60 mm of subsidence) were resumed 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 (20 mm). However, no additional subsidence movement was detected during the miniwall extraction in CVB. **Figure 24**, **Figure 25** and **Figure 26** show the subsidence monitoring results for the reporting period.

A specific point (989A) measured approximately 40 mm of movement during the report period. As the adjacent monitoring points are stable this is assumed to be related to damage / movement of the specific monitoring point rather than mine-subsidence related.

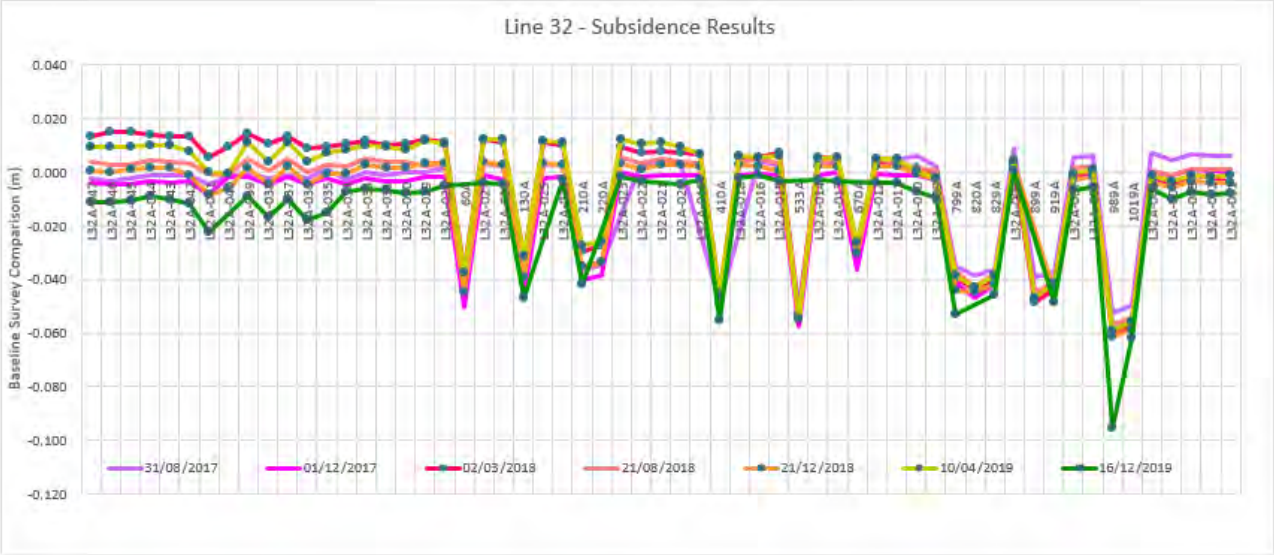


Figure 24: Line 32 Subsidence Results

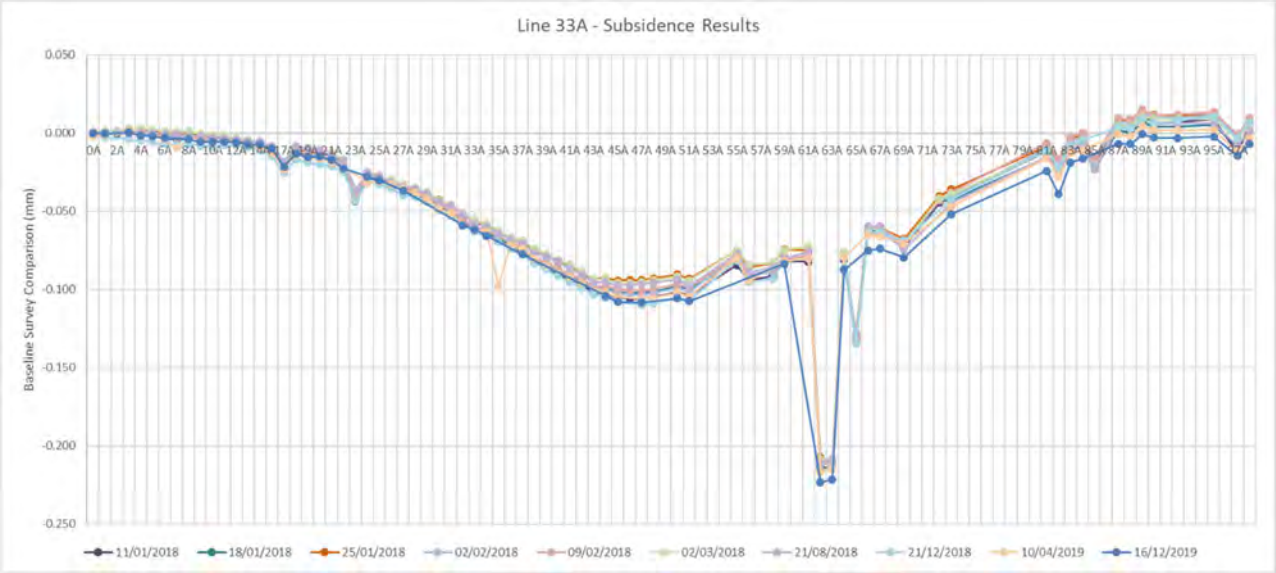


Figure 25: Line 33A Subsidence Results

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.

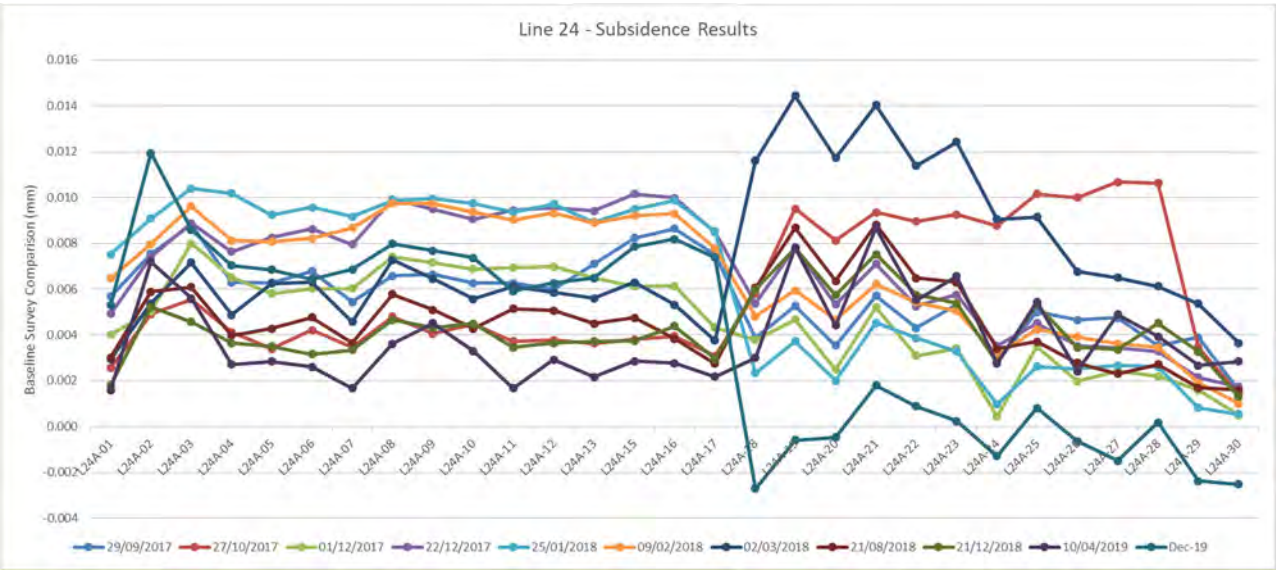


Figure 26: Line 24 Subsidence Results

The survey accuracy, combined with ground movement, is generally responsible for most movement <10 mm. Occasionally there will be disturbance or deterioration to survey marks, particularly given they are in publicly accessed areas.

Summerland Point – Line 40

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 ±5 mm and appears seasonal. **Figure 27** shows the reporting period subsidence results for Line 40.

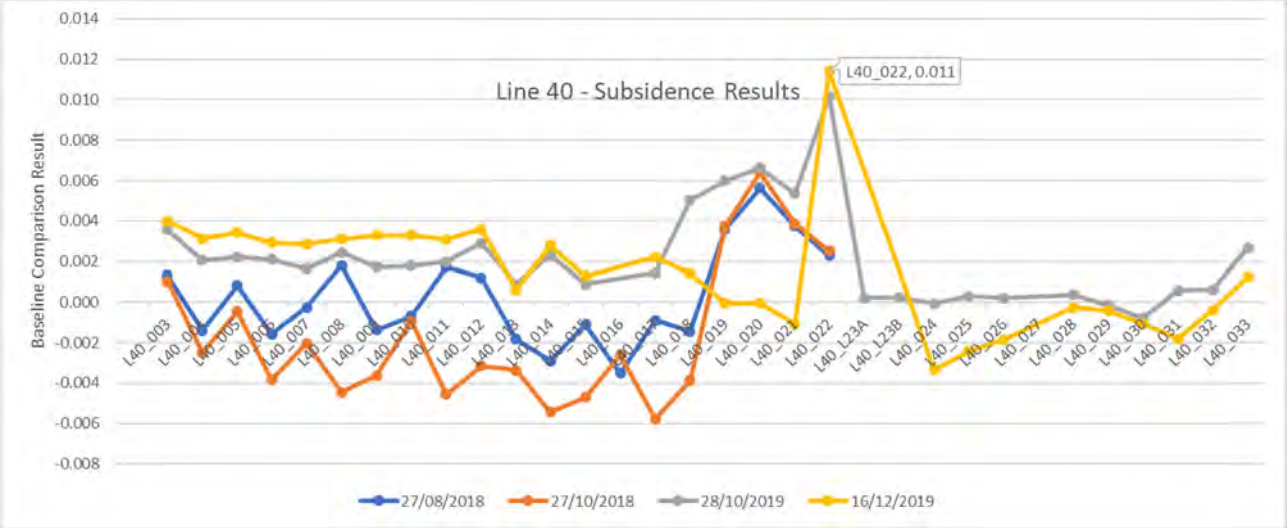


Figure 27: Line 40 Subsidence Results

5.13.5 Lake Floor Bathymetric Survey / Scanning

As all of CVC'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. Previous mine operators, 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 data provided by NSW Office of Environment and Heritage (OEH) in 2010.

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 it vertical subsidence predictions over the MW7-12 mining area by approximately 430 mm. The relevant authorities were notified of the exceedance and an incident report was submitted on 11 November 2017. Bathymetric surveys over the Chain Valley Bay mining area have indicated subsidence is developing in line with predictions. As a result of the exceedance CVC has committed to increasing the frequency of the surveys to 6 monthly. Six monthly surveys have been undertaken during 2018 and 2019.

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.

A comparative analysis of the survey results highlights some elevation changes which are unrelated to mining generally. These appear to be minor movements, perhaps related to movement of sediment as a result of wave action in Lake Macquarie. The surveys have shown that subsidence can be monitored with a useful level of accuracy.

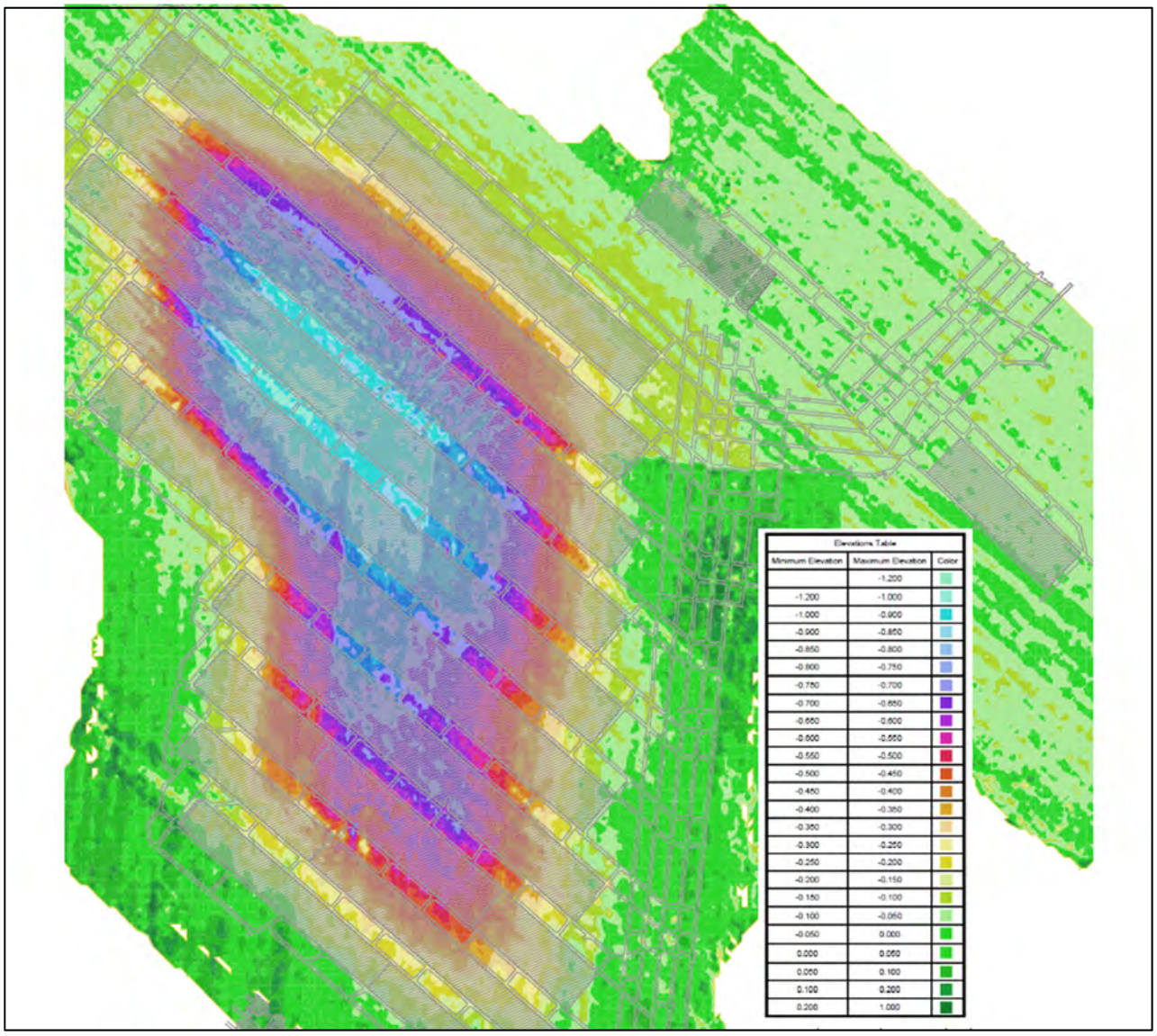


Figure 28: Miniwalls 7-12, N1 and S1, January 2019 Bathymetric Survey

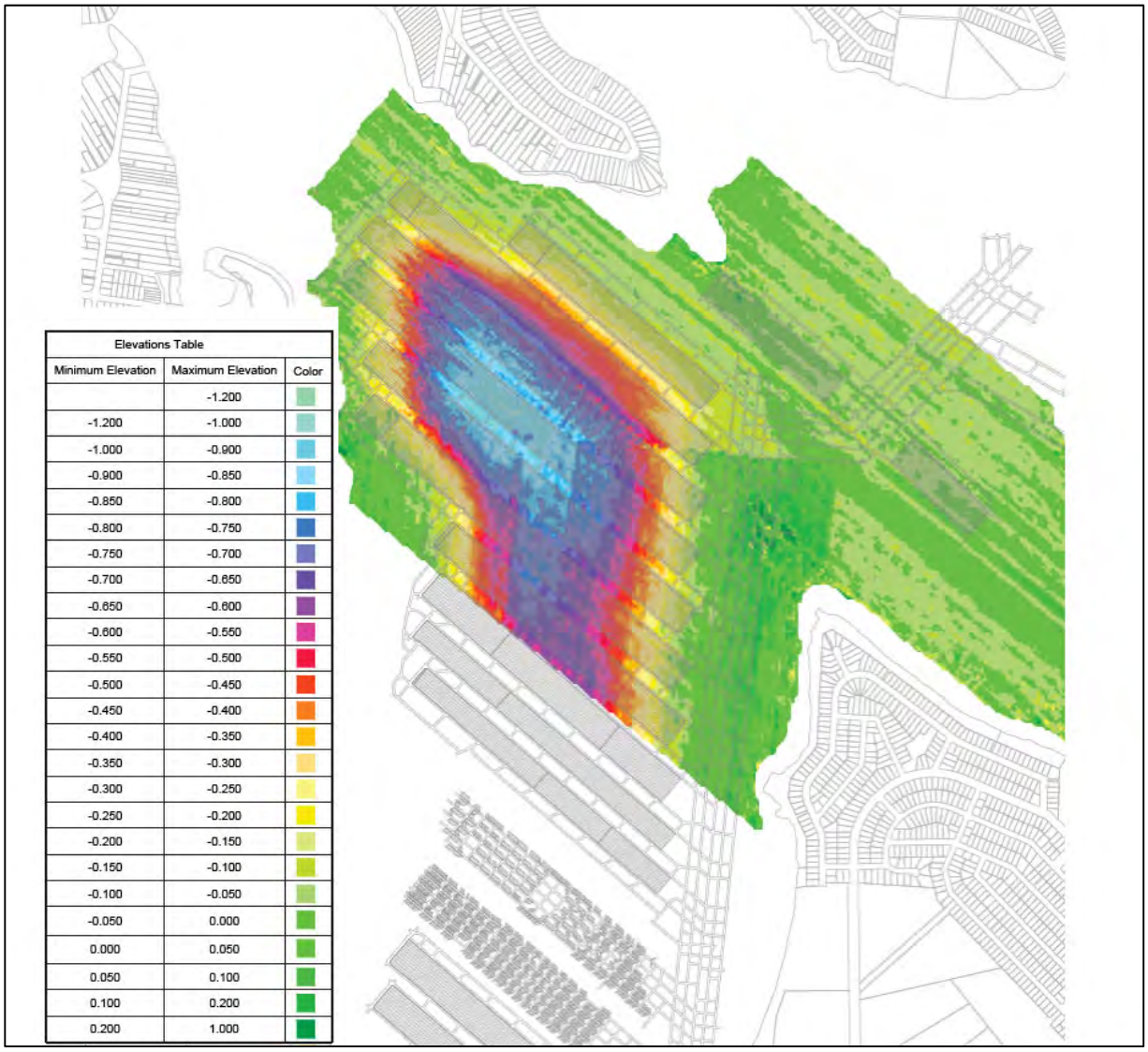


Figure 29: Miniwalls 7-12, S1 and N1, July 2019 Bathymetric Survey

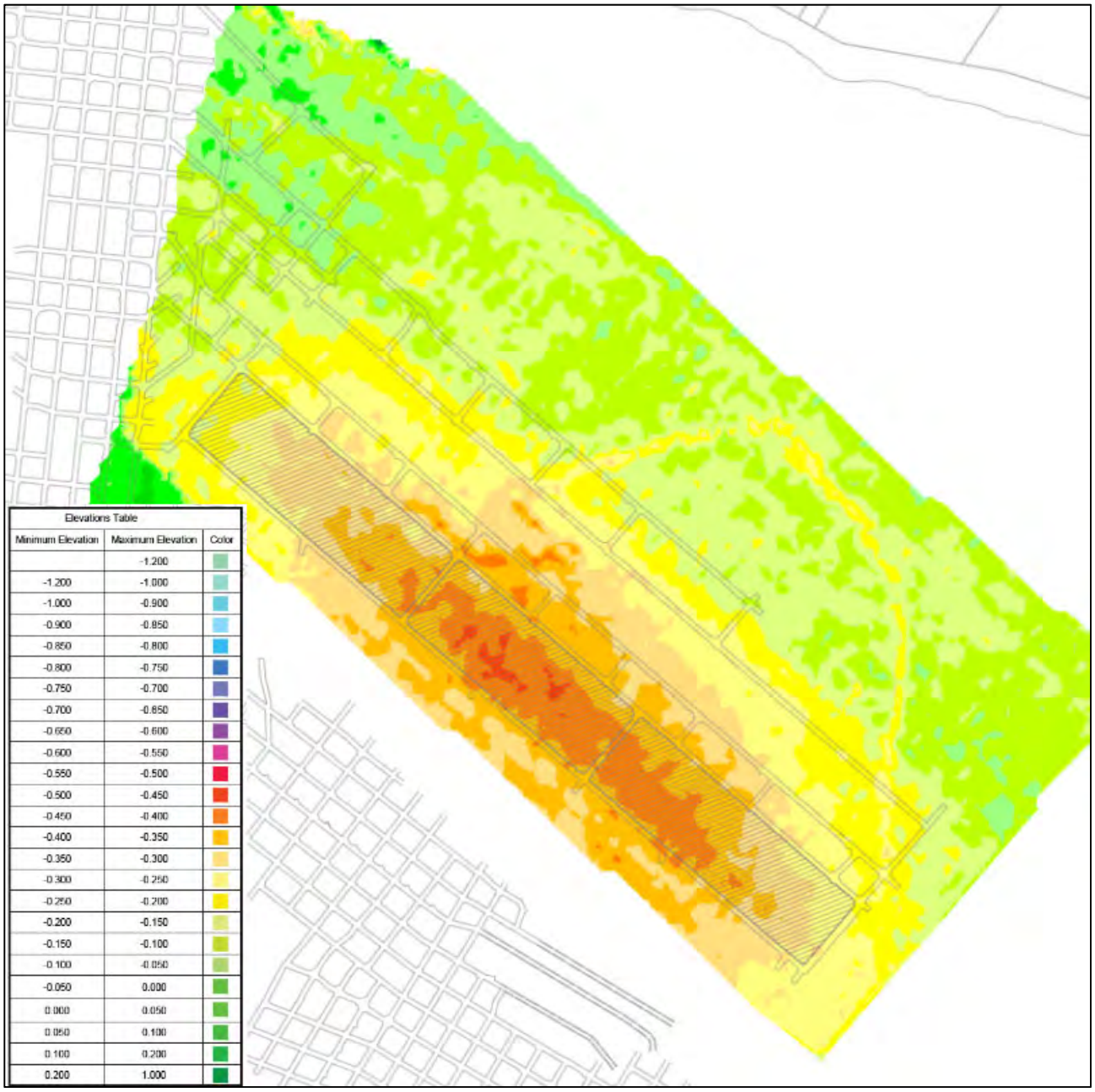


Figure 30: Lake Bed Subsidence Results, Chain Valley Bay Miniwall CVB1, July 2019

Figure 28 to **Figure 30** shows the 2019 scan results over Miniwalls 7-12 and N1, S1 comparative to the initial bathymetric surveys.

Approximately 1200 mm of subsidence developed over the Miniwall 7-12 domain (above predictions of 780 mm). CVC notified the relevant authorities of the exceedance and submitted an incident report on 11 November 2017. Negligible subsidence has been detected over Miniwalls S1 and N1.

Bathymetric surveys over the Chain Valley Bay mining area (**Figure 30**) have indicated subsidence of up to 400 mm directly over the extracted area. An increased angle of draw of surface subsidence has been detected, but no impacts to the shoreline were observed. Minimal subsidence movement was detected from the previous survey in the area (January 2018).

Monitoring is planned to continue in accordance with the approved Extraction Plan during the 2020 reporting period.

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.

5.14 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.

5.15 Methane Drainage

Methane levels in the Fassifern seam of approximately 2 – 4 m^3/t do not warrant the need for 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 generally low enough to ensure operations are not adversely affected by the gas levels.

Given the mining operations are being undertaken beneath Lake Macquarie and 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).

During the Quarter 2 2019 period CVC (Delta Coal contribution to end of 2018/2019 financial year) emitted approximately 77,021tonnes of CO_2e.

5.16 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 generally 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 generally 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.

A Built Features Management Plan was developed for the Extraction Plan associated with Miniwalls S2 and S3. This included subsidence monitoring for the Pelican Rock Navigational Marker and associated foreshore infrastructure.

Public safety is also a consideration in the road coal haulage operations; this is discussed in **Section 5.17**.

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

5.17 Other Issues and Risks

During the reporting period approximately 99% of the coal produced at CVC was sent to the VPPS via overland conveyor. This is a significant reduction in public safety risk as transport prior to August 2017 was via truck on public roads and overland conveyor.

An Independent Traffic Audit was prepared by GHD for the reporting period. Given there was no truck movements during the 2019 period, the audit concluded there was no departure from the procedural requirements set out in the Protocol documents.

5.18 Summary of Environmental Performance

In summary, environmental performance during the reporting period for CVC is detailed in **Table 14**.

Table 14: 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.	Main trend (attended noise monitoring during 2019): 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. The EIS predicted that that CVC will operate within acceptable noise limits.	There were no exceedances during 2019 quarterly attended noise monitoring (see **Appendix 7** for results). Nosie management will continued to be monitored in an effective manner.
Blasting	n/a	n/a	n/a	n/a
Air Quality	Chapter 10 Quality and Greenhouse Gases *(EIS, EMGA Mitchell McLennan 2013)*	In accordance with approved criteria and EIS predictions	Main trend (depositional dust results 2019): Based on modelling in the EIS, total dust emissions from CVC are expected to be minor, at less than 2 grams/m^2/month. The depositional dust results for 2019 reflect this, remaining generally minor at most locations for the reporting period.	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**. Management of air quality will continued to be monitored in an effective manner.

Biodiversity	Chapter 14 Terrestrial Ecology *(EIS, EMGA Mitchell McLennan 2013)*	In accordance with approved criteria and EIS predictions/surveys.	Main trend: Vegetation and habitat values broadly similar to previous years.	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. Biodiversity will continue to be monitored.
Heritage	Chapter 15 Heritage *(EIS, EMGA Mitchell McLennan 2013)*	No predicted impact on aboriginal or non-aboriginal heritage items was identified in the EIS.	n/a	n/a

6 Water Management

6.1 Water Management

6.1.1 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 2019 reporting period, approximately 5240 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 the NSW Environment Protection Authority (EPA) EPL No.1770. This daily average is consistent over the reporting period when compared with 2018 data (refer to **Section 6.1.4** Water Balance for long term water data).

The maximum groundwater extraction on any day during 2019 peaked at 8981 kL, which reflects the automated control of pumping limits 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. Groundwater extraction data is summarised in **Table 15** and **Figure 31.**

Table 15: CVC Water Take - 2019

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	1913 ML	1913 ML

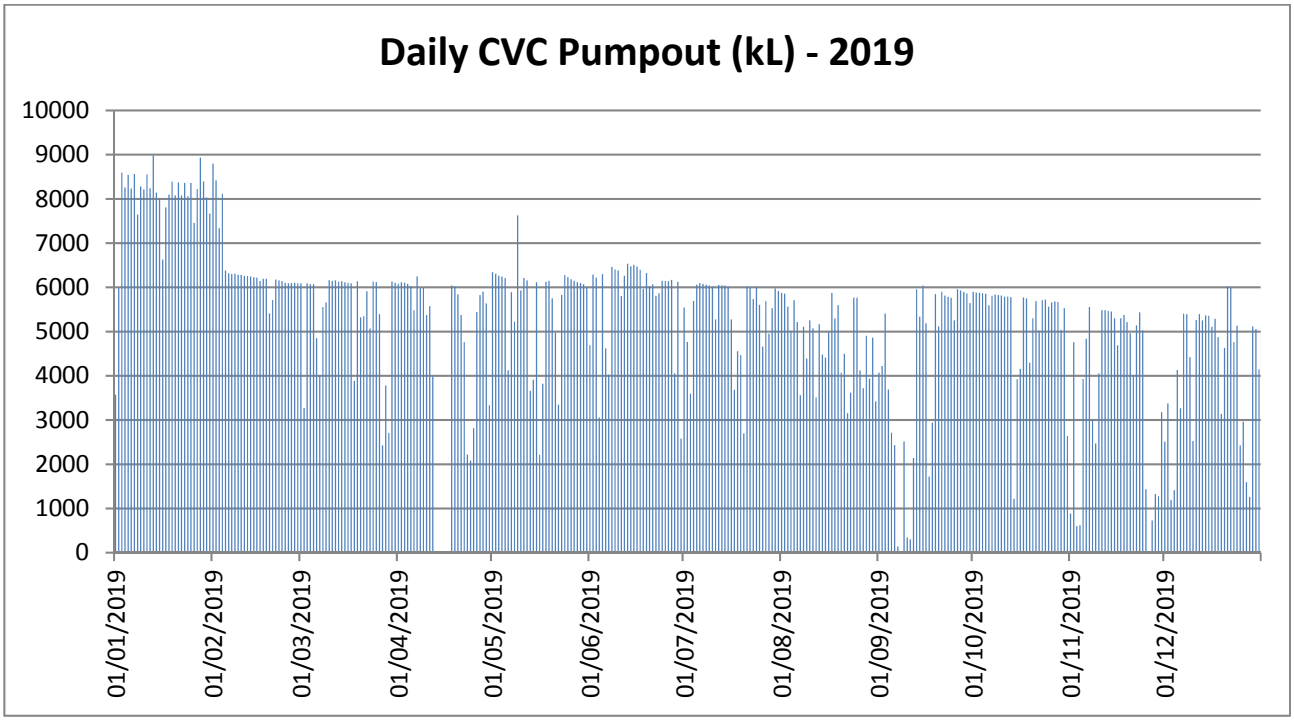


Figure 31: Daily groundwater extraction volumes (2019)

6.1.2 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 2019 reporting period the daily average discharges were 5733 kL with a maximum of 13,343.5 kL and a minimum of 209 kL.

Figure 32 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. There were no discharges via Point 27 during the reporting period. Volumes presented are the sum of both points, to reflect total discharge volumes against the relevant licence limit.

As shown in **Figure 32**, there was one exceedance of the daily volumetric limit (12,161 kL) during the reporting period. Further detail is provided in **Section 6.3**.

CVC also completed an upgrade to the underground water storage and pumping network during a previous reporting period. The increased storage capacity allows UG dewatering to be restricted for longer periods of time which ultimately improves the storm surge capacity in the surface water management system. The reduction in the exceedances modelled has been attributed to this improvement project. Real time telemetry was also added to the site's discharge point in 2015 to assist with the review of actual (real time flows) during prolonged rain events.

Water quality monitoring is required, and undertaken, at the licensed discharge point (LDP1). Refer to **Plan 3** (**Appendix 2**) for the location of LDP1. Results for pH, EC, TSS and faecal coliforms and a comparison against the compliance limits specified in EPL 1770 are presented in **Figure 33**, **Figure 34**, **Figure 35** and **Figure 36**, respectively.

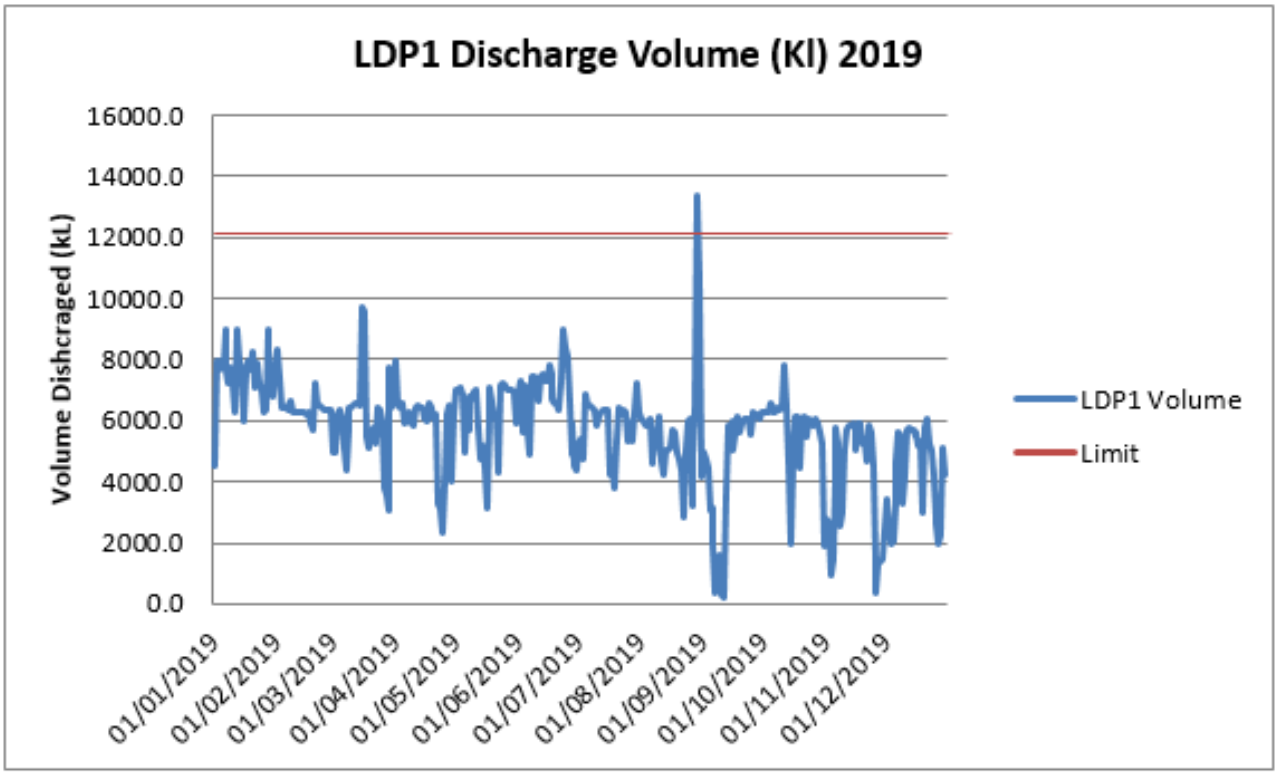


Figure 32: Mine Dewatering Volumes

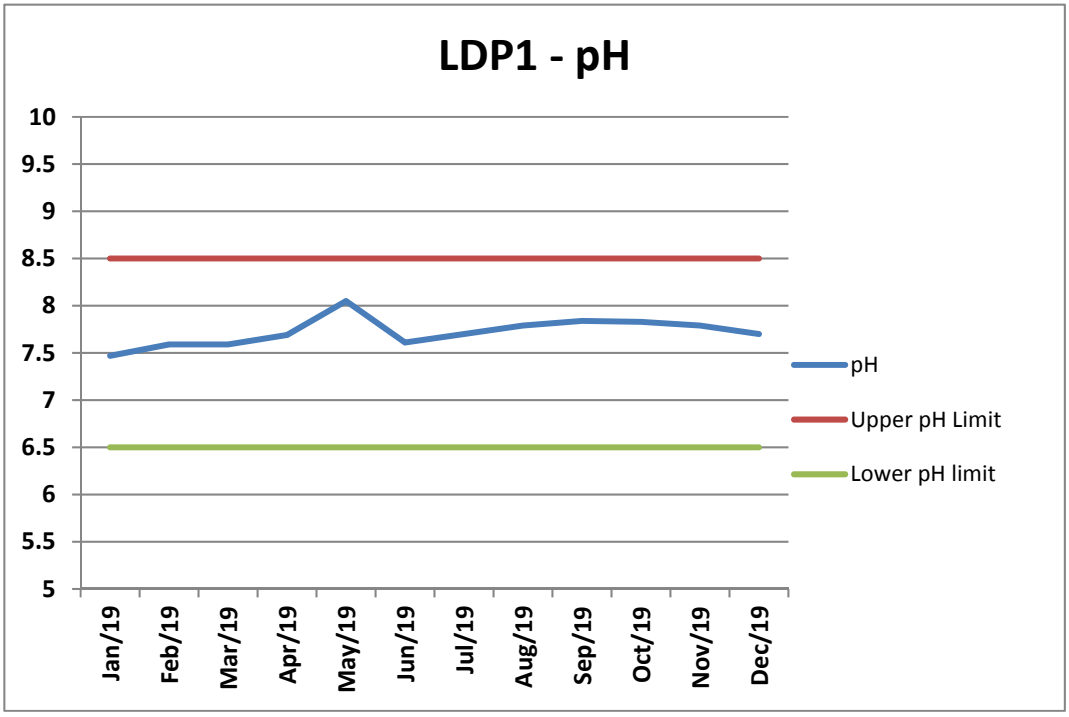


Figure 33: pH monitoring results at LDP1

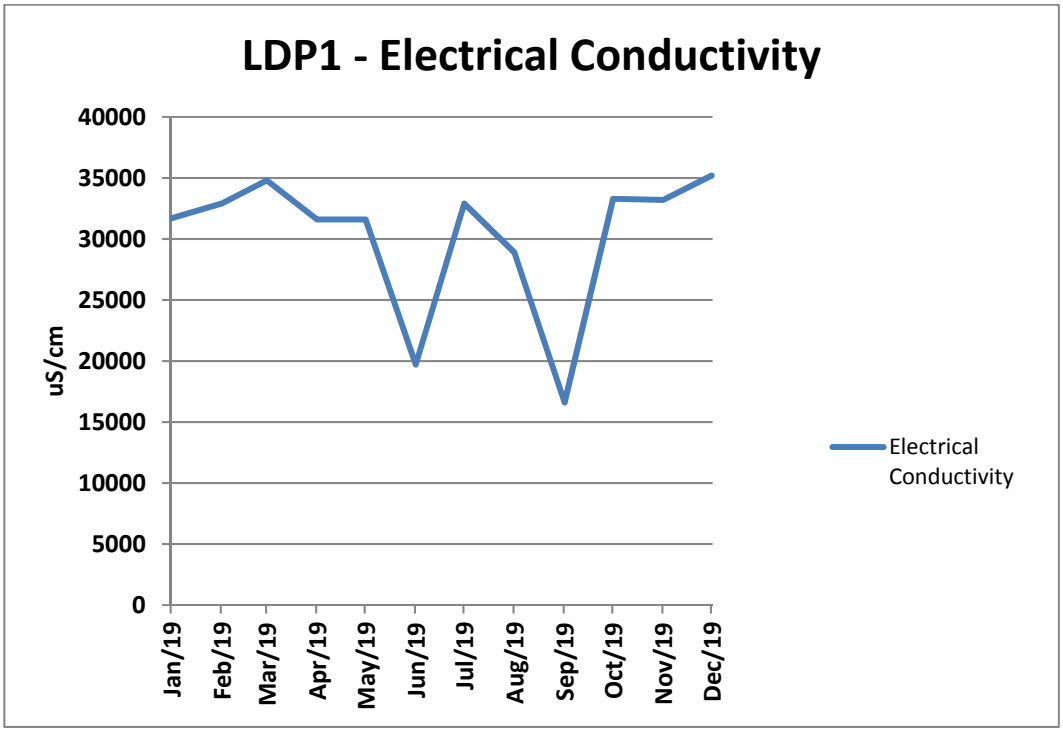


Figure 34: Electrical conductivity monitoring results at LDP1

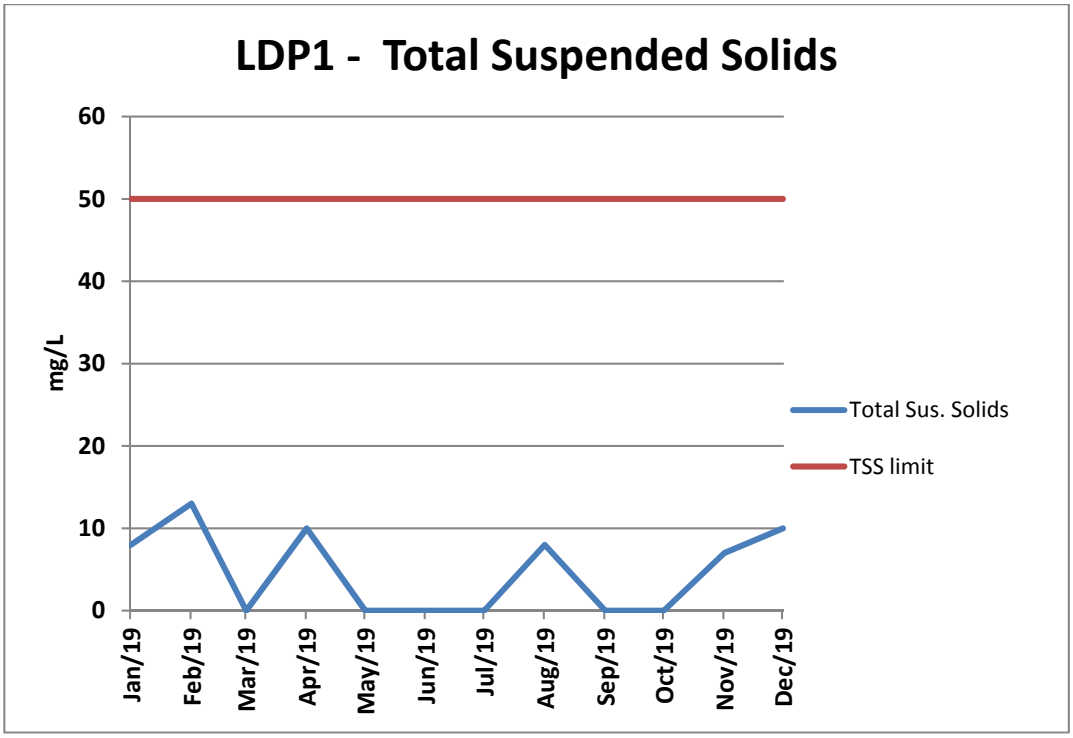


Figure 35: Total suspended solids monitoring results at LDP1

Notes: 1. TSS results shown as zero were below the limit of reporting (<5mg/L)

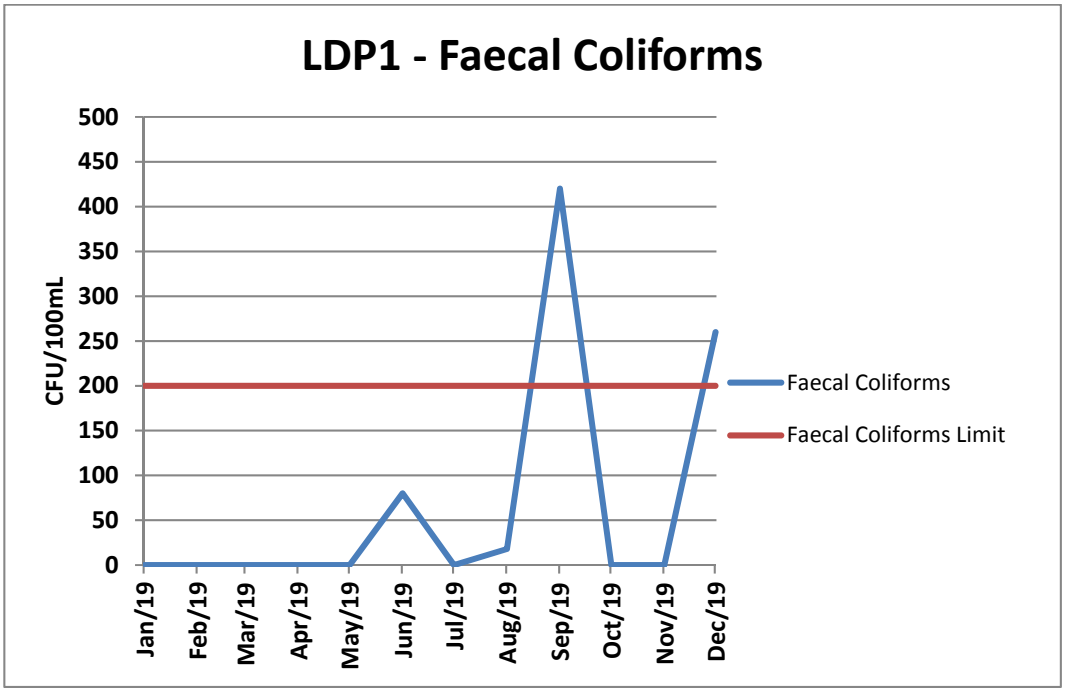


Figure 36: Faecal coliform results at LDP1

As detailed in **Figure 36**, there were two exceedances of the faecal coliform limit during the reporting period. Further information is provided in **Section 6.3**.

6.1.3 Long Term Water Management

To assess any long-term trends in both water quality and quantity, eight years of data is presented for pH (**Figure 37**), electrical conductivity (**Figure 38**), total suspended solids (**Figure 39**) and faecal coliforms from LDP1 (**Figure 40**).

The annual average of mine dewatering volumes for the past eleven years is also presented in **Figure 41**. 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 it is evident that despite some infrequent higher results of faecal coliforms and one TSS result over 50 mg/L, there are no significant trends or changes in the water quality parameters. 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.

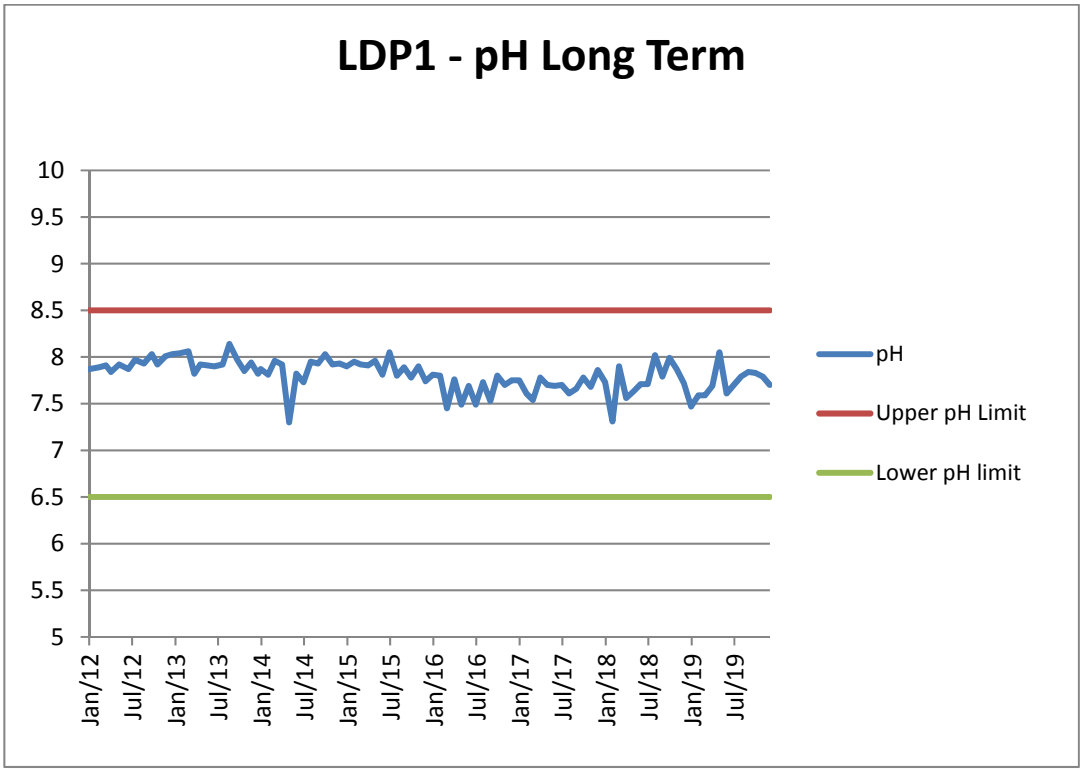


Figure 37: Long term pH results from LDP1

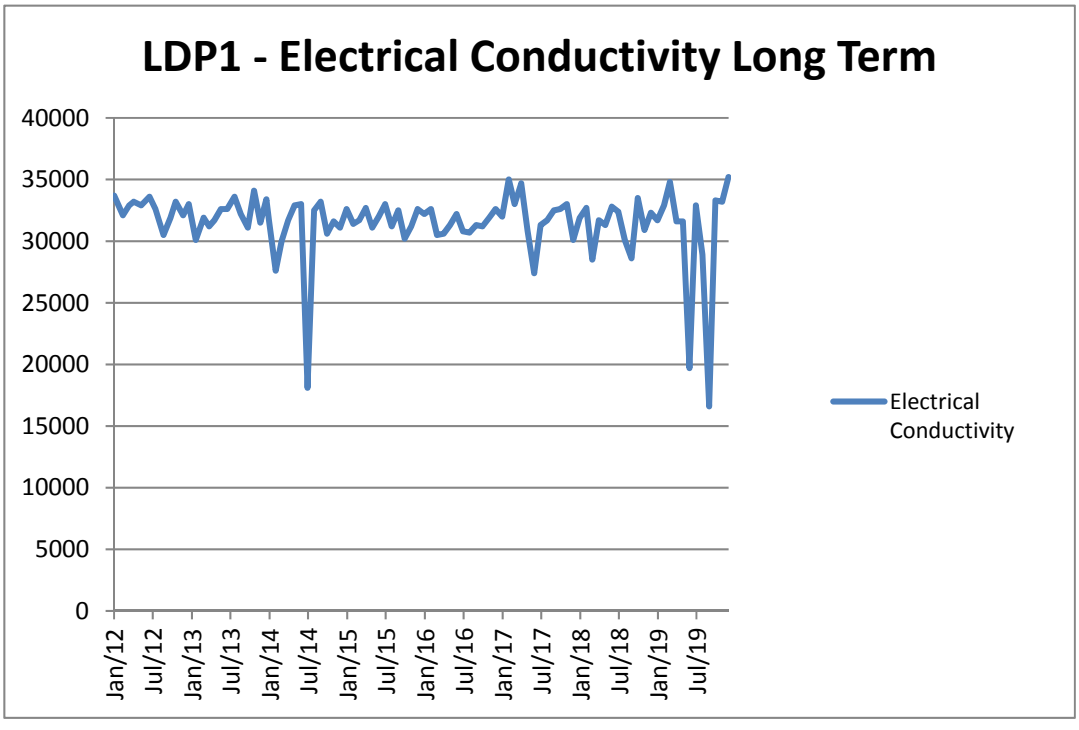


Figure 38: Long term EC results from LDP1

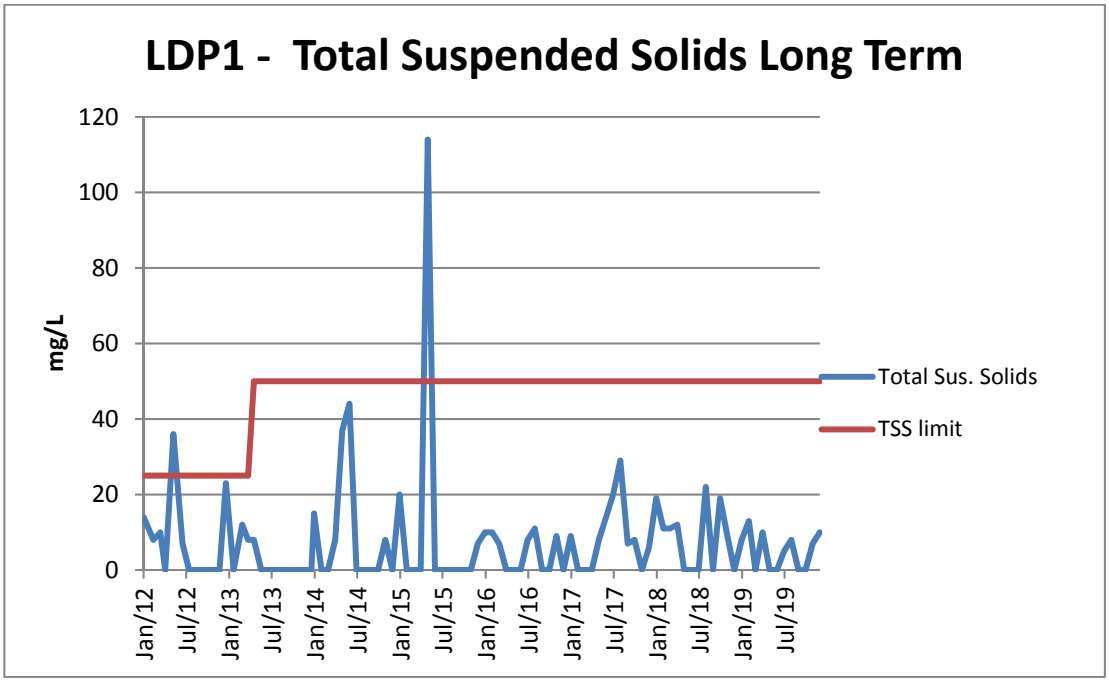


Figure 39: Long term TSS results from LDP1

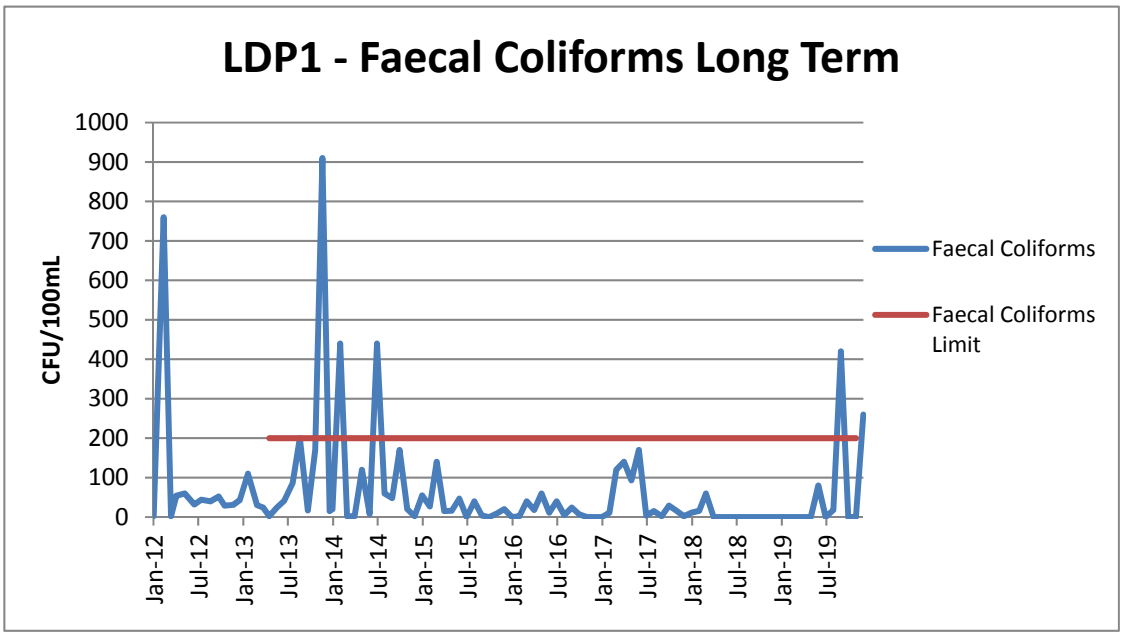


Figure 40: Long term faecal coliform results from LDP1

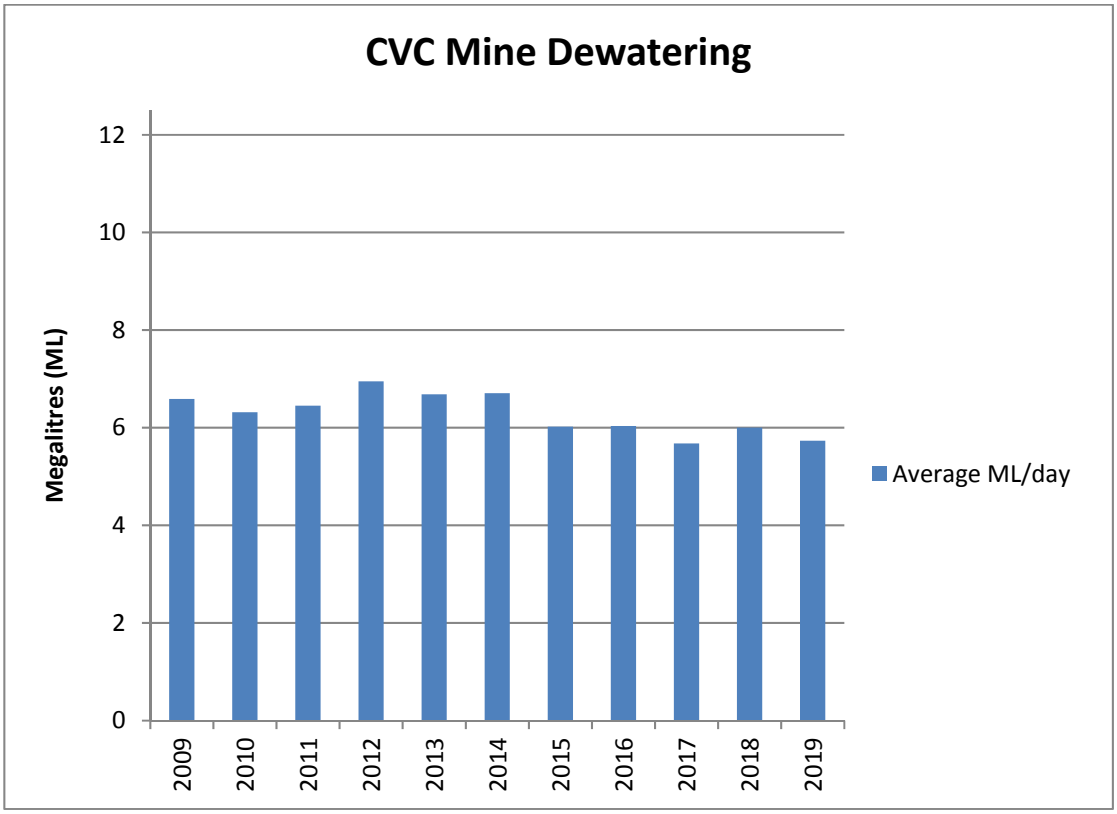


Figure 41: Long term Mine Dewatering Volumes

6.1.4 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 16.**

Table 16: Key water balance predictions and actual results during 2019

Water Balance Results (from EIS)	Reporting Period Result	Comment
Daily average discharge through the LDP1 of 16.46 ML/day	Daily annual average discharge of 5.7 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 13.3 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 result maximum result would not be expected except in the event of a 1:100 ARI

Water Balance Results (from EIS)	Reporting Period Result	Comment
		rainfall event. UG Storage and Pumping infrastructure upgrade project completed in 2016.
Likelihood of LDP1 volumetric limit exceedance on any given day of 4% (or approximately 15 times per year)	One exceedance of the EPL volumetric limit at LDP1	Result reflects significance of rainfall events during the year and improvements made to both the surface and underground water management system subsequent to the EIS modelling.
Average annual rainfall 1206 mm	988 mm	Total rainfall less than previous data.
Potable water use of 161.9 ML/yr	87.2 ML	Potable water usage reduced due to Miniwall mining outage.

6.2 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 stockpiles 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 will if required overflow in D9, which then flows into D10 prior to being discharged from site via the licenced discharge point. The pollution control ponds (sediment dams) and the location of the monitoring points are show on **Plan 3** (**Appendix 2**).

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. 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.

6.3 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.

6.4 Surface Water Pollution

There was one exceedance of the volumetric limit of 12,161 kL at LDP1. The recorded daily volume was 13,343 kL, which is 1.12 ML more than the volume limit detailed in the EPL. A total of 172 mm of rain fell during a three-day period, with the majority of rain falling on 30 August 2019 being 102.4 mm.

There were no exceedances of pH or TSS water quality criteria during the reporting period. There were two faecal coliform exceedances recorded during 2019. The first exceedance occurred on 18 September 2019 during a significant rainfall event. A faecal coliform count of 420 colony forming units per 100 millilitres (CFU/100mL), which is greater than the EPL limit of 200 CFU/100ml.

The second faecal coliform exceedance occurred on 17 December 2019. The specific cause of the high faecal coliform result in this case is not known. The result from follow-up sampling was below the 200 CFU/100ml limit.

6.5 Groundwater Pollution

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

7 Rehabilitation

7.1 Buildings

There was no rehabilitation of buildings undertaken in the reporting period.

7.2 Rehabilitation of Disturbed Land

There were no significant rehabilitation works on disturbed lands during the reporting period, which relates the fixed nature of the surface infrastructure and the ongoing mining operations requiring continued use of all this area. A summary of the rehabilitation statistics for Chain Valley Colliery is provided in **Table 17** and **Table 18**. A copy of the site's final rehabilitation plans is provided in **Appendix 2.** The plans are consistent with the approved CVC Mining Operations Plan.

Table 17: Summary of rehabilitation at CVC

	Previous period (2018)	This period (2019)	Next period (2020)
A. Total mine footprint (managed by Delta Coal)	Approximately 14.70	Approximately 14.70	Approximately 14.70
B Total active disturbance	14.70	14.70	14.70
C. Land being prepared for rehabilitation	Nil	Nil	Nil
D Land under active rehabilitation	Nil	Nil	Nil
E Completed rehabilitation	Nil	Nil	Nil

Table 18: Maintenance activities on rehabilitated land at CVC

	Area Treated (Ha)		
NATURE OF TREATMENT	**This period (2019)**	**Next period (2020)**	**Comment/Control Strategies/Treatment Detail**
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	0	n/a
Re-seeding/replanting (species density, season etc.)	0	0	n/a
Adversely affected by weeds (type and treatment)	12.5	7	An extensive weed control program was undertaken during this reporting period. Follow up works are planned for the next reporting period.

	Area Treated (Ha)		
NATURE OF TREATMENT	**This period (2019)**	**Next period (2020)**	**Comment/Control Strategies/Treatment Detail**
Feral animal control (additional fencing, trapping, baiting etc.)	0	0	No feral animal control undertaken during the reporting period.

7.3 Rehabilitation Trials and Research

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

7.4 Further Development of the Final Rehabilitation Plan

The currently approved Rehabilitation Management Plan was updated during the 2014 reporting period, it was provided to numerous regulators and stakeholders as required by Condition 27, Schedule 3 of SSD-5465. After receiving comments back from relevant agencies, the final version of the Rehabilitation Management Plan was submitted to both the Department of Planning and Environment and DRE for approval on the 8 December 2014.

A review and update of management plans, including the CVC Rehabilitation Management Plan commenced in 2019. The contents of the currently approved plan were used to form the basis of the Mining Operations Plan for CVC which is current until 31 December 2020. The proposed final rehabilitation plan, consistent with both the Rehabilitation Management Plan and Mining Operations Plan is provided as **Plan 4** (**Appendix 2**).

7.5 Post Rehabilitation Land Use(s)

As identified in the 2018-2020 Mining Operations Plan (MOP) 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 Sunset Power International (a related entity to Great Southern Energy) 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:
  - Broad-Leaved Scribbly Gum Open Forest (for Mannering pit top);
  - 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.

7.6 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 coal bins, 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);
- concrete pads and footings will be removed to an estimated depth of 300 mm below surface levels and disposed of in an appropriate place or recycled. Following removal, these areas 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; and
- 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 would be 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.

7.7 Objectives

The rehabilitation objectives below have been compiled from Condition 13 within Schedule 3 of SSD_5465 and Condition 25 within Schedule 3 of SSD-5465 and are listed in **Table 19**.

Table 19: Rehabilitation objectives

Feature	Objective
Mine site (as a whole of disturbed land and water)	• Safe, stable and non-polluting. • Final land use compatible with surrounding land use.
Surface Infrastructure	• To be decommissioned and removed, unless agreed otherwise with relevant regulatory authority and landowner.
Portals and ventilation shafts	• To be decommissioned and made safe and stable. • Retain habitat for threatened species (e.g. bats), where practicable (Chain Valley pit top facilities only).

Feature	Objective
Other land affected by the development	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems: - 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	• Repair to pre-mining condition or equivalent unless: - the owners agrees otherwise; or - the damage is fully restored, repaired or compensated under the *Mine Subsidence Compensation Act 1961*.
Community	• Ensure public safety. • Minimise the adverse socio-economic effects associated with mine closure.

7.8 Other Infrastructure

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

8 Community

8.1 Community Complaints

There were no community complaints received during the reporting period.

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 42** and **Figure 43**.

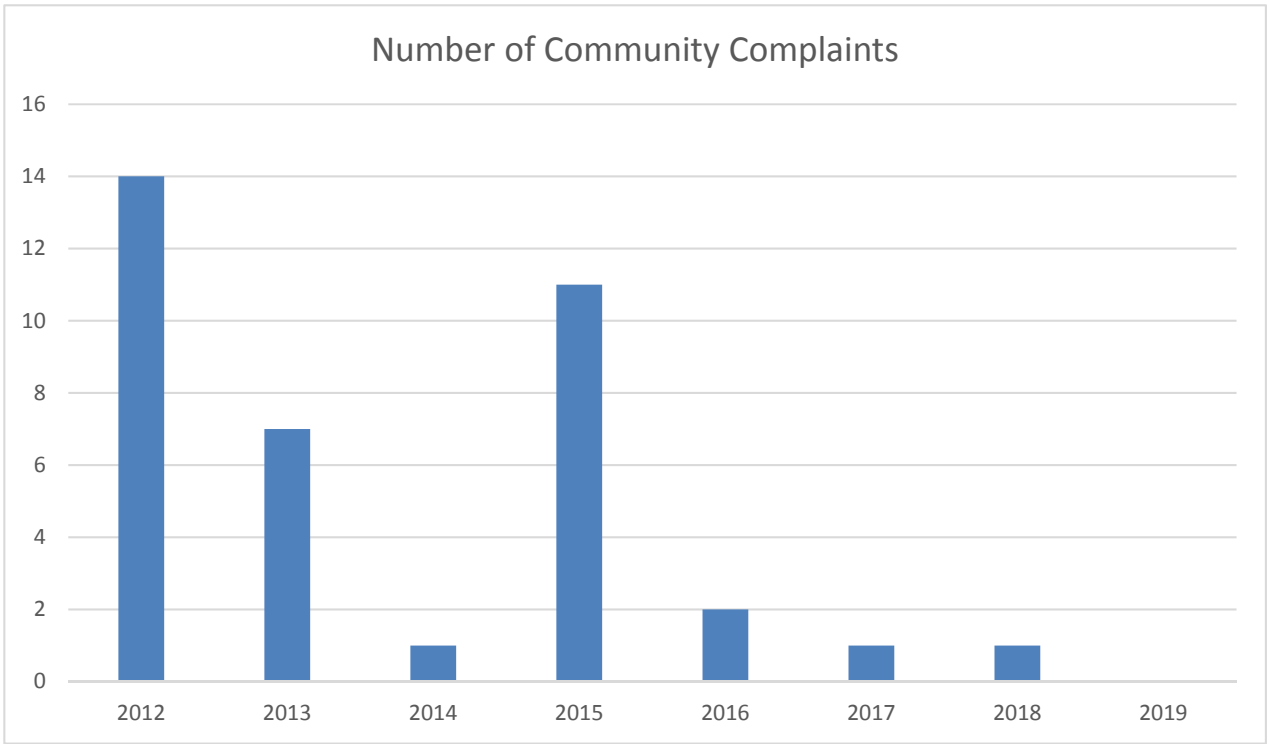


Figure 42: Total community complaints by year

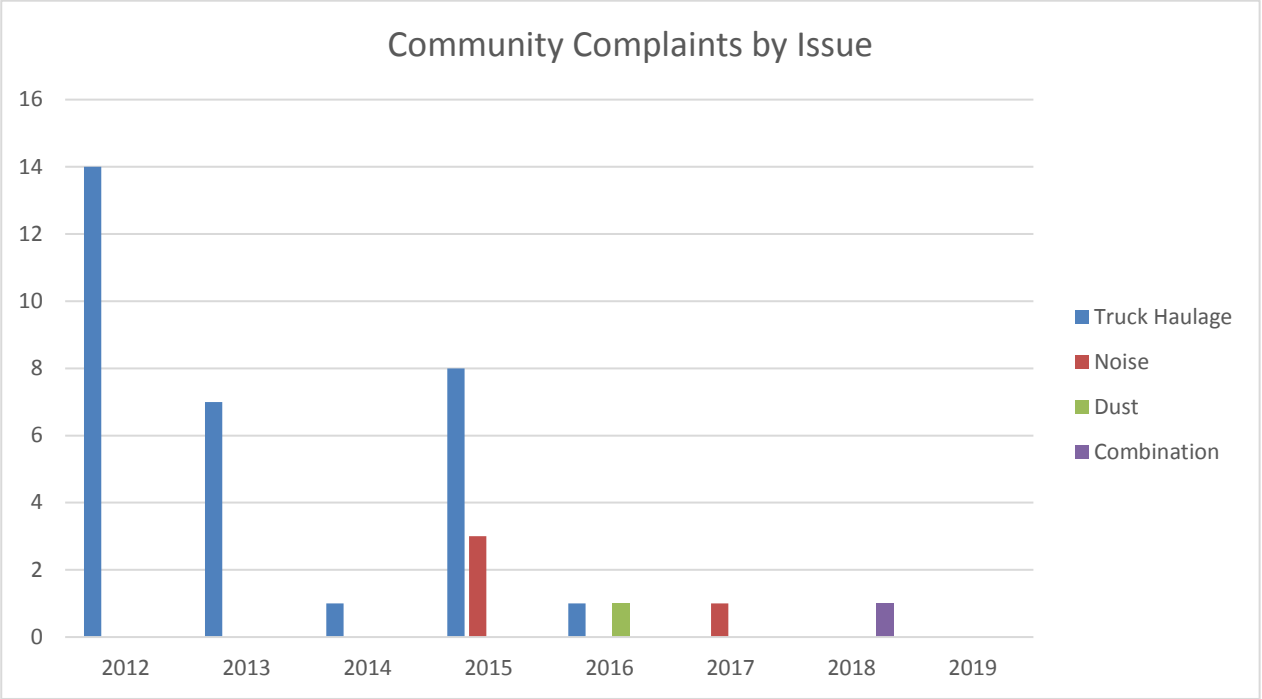


Figure 43: Total community complaints by issue

8.2 Community Liaison

The CVC/Mannering 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 13 February 2019, 15 May 2019, 14 August 2019 and 13 November 2019. 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 115 277**) also remained in place during the reporting period and is displayed prominently and permanently on the website.

8.3 Voluntary Planning Agreement

As outlined previously, the 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.

During 2019, Delta Coal and Central Coast Council held community information sessions in the suburbs of Mannering Park, Gwandalan and Chain Valley Bay to advise local residents and community groups of the recently established fund.

8.4 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.

9 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**.

Outcomes are summarised below.

9.1 Key Audit Outcomes

Recommendations with respect to the annual review are summarized in **Table 20**.

Table 20: 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
2	Noise	REC7: Ensure accurate / consistent monitoring results are presented in Annual Reviews.	See **Section 5.7** and **Appendix 7**
3	Air	REC9: Ensure issues with data capture are reported in Section 1 and 7 of the Annual Review.	See **Section 5.1**
	Sewage management	REC10: Include an update of sewage system during the audit period in the Annual Review.	See **Section 3.10** and **Table 20**
4	Biodiversity management plan	REC12: Include the biodiversity monitoring reports as appendices to the Annual Review.	See **Appendix 5**
5	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
		Include the biodiversity monitoring reports as appendices to the Annual Review.	See **Appendix 5**
		Include an update on Audit Action Plan.	See **Appendix 10**
8	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 4.2**
	Statement of Commitments		
9	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 6.2**

Item	Issue / Observation	Action	Status
	CCL721		
10	Condition 5	REC33: Report against compliance with the MOP in future Annual Reviews.	See **Section 7**
	Additional recommendations		
11	Surface Water Discharges	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.	See **Section 6.3**
12	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 6**
13		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 6**
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 Appendix 8, Appendix 5 and Appendix 4**

9.2 Action Plan

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

9.3 Future Audit

The next Independent Environmental Compliance Audit is scheduled for Quarter 2 2022. An updated table of compliance with the 2019 Independent Environmental Audit will be completed as part of that audit.

10 Incidents and non-compliances during the reporting period

All non-compliances and exceedances, and reportable incidents relating to the site's licences and approvals are summarised below in **Table 21**.

Table 21: Summary of reportable incidents/non-compliances for 2019

Date	Description of Incident	Approval/Condition/Clause	Actions taken to address incident
26/10/2019 30/10/2019 31/10/2019 07/11/2019 12/11/2019 19/11/2019 22/11/2019 26/11/2019 28/11/2019 29/11/2019 30/11/2019 02/12/2019 03/12/2019 04/12/2019 05/12/2019 06/12/2019 10/12/2019 19/12/2019 31/12/2019	PM10 24 Hour Average Exceedance (RTD 001) - Kingfisher Shores	Schedule 3 Condition 11 SSD 5465	In 2019 the TEOM recorded several occasions when a 24 hour PM10 value was greater than the 24 hour average criterion of 50ug/m^3 on the dates listed. There were 19 occasions when levels were greater than the EPA short-term 24hr average criteria (50 µg/m3) during the reporting period, occurring between 26 October and 31 December 2019. Elevated levels during this period were due to an extremely warm spring and summer, characterised by significant bushfire and dust storm events. All events were reported to DPIE, who considered them to be extraordinary events as per Schedule 3, Condition 11, Tables 3 to 5, Note D of SSD 5465. Consequently, the exceedances do not represent a non–compliance with the consent. Accordingly Delta Coal is not intending to undertake any further actions as a result of the elevated levels.
31/08/2019	Daily Volume Discharge Limit Exceedance - LDP01 Discharge point	L3.1 and L3.2 EPL 1770	This event was reported to DPIE and EPA. As detailed in Condition L3.2 of EPL 1770, the volumetric limit for discharges to waters at EPA Point 1 and Point 27 is 12,161 kL/day. On 30 August 2019 an exceedance of the daily volume discharge limit for EPA Point 1 of was recorded by the site flow meter. The recorded daily volume was 13,343 kL which is 1.12 ML more than the volume limit detailed in EPL 1770 in conditions L3.1 and L3.2. This volume exceedance occurred during a significant rainfall event that took place from 29 to 31 August

Date	Description of Incident	Approval/Condition/Clause	Actions taken to address incident
			2019. A total of 172 mm of rain fell during this three-day period, with the majority of rain falling on 30 August 2019 being 102.4 mm. Pumping rates from underground workings and any surface flow is generally well below the daily limit for the days either side of the rainfall event. The remaining main underground pump was turned off for a period of 9 hours on the 31/8/19 to reduce the likelihood of a second day's volume exceedance in consultation with mine management with the aim of not compromising underground safety and underground infrastructure.
18/09/2019	Faecal Coliform Concentration Exceedance - LDP01 Discharge point	L2.4 EPL 1770	This event was reported to DPIE and EPA. This exceedance occurred during a significant rainfall event. As detailed in Condition L2.4 of EPL 1770, the faecal coliform concentration limit at EPA Point 1 (LDP1) and Point 27 is 200 colony forming units (CFUs) per 100 millilitre (CFU/100mL). A water grab sample is taken and analysed on a monthly basis during discharge for LDP1 in accordance with EPL 1770. The sample was taken on 18 September 2019. On 23 September 2019 the faecal coliform concentration was reported as 420 CFU/100mL. Underground mine discharge had been reduced during the rainfall event so as to avoid exceeding the total discharge volume limit. Discharge from LDP1 was therefore limited to surface runoff and dam contents. The concentration of the OTC (outlet to creek) sample would indicate that the water discharged from CVC, while over the EPL limit for faecal coliform, is diluting the receiving waters. Results show elevated upstream concentrations in samples also taken on 18 September 2019, which are not due to CVC. A due diligence water sample was taken on the 23 September 2019 at 12.25pm from EPA ID Point 1. The faecal coliform concentration of ~40 CFU/100mL in the sample taken on 23 September 2019 was well below the limit specified in Condition L2.4 of EPL 1770.
5/11/2019 – 5/12/2019	Deposited Dust Criteria Exceedance - contamination	Schedule 3- Condition 11 SSD 5465	This event was reported to DPIE and EPA. Given the contamination clearly present in the sample, DPIE advised that they would not be taking any further action, and this is not classified as an exceedance. DDG005 has shown evidence of contamination in previous years. Given the occurrences of contamination, it is proposed to move the dust deposition gauge onto the ventilation fan site to avoid similar materials making their way into the dust depositional bottle.
17/12/2019	Faecal Coliform Concentration Exceedance - LDP01 Discharge point	L2.4 EPL 1770	This event was reported to DPIE and EPA. As detailed in Condition L2.4 of EPL 1770, the faecal coliform concentration limit at EPA Point 1 (LDP1) and Point 27 is 200 colony forming units (CFUs) per 100 millilitre (CFU/100mL).

Date	Description of Incident	Approval/Condition/Clause	Actions taken to address incident
			A water grab sample is taken and analysed on a monthly basis during discharge for LDP1 in accordance with EPL 1770. The sample was taken on 17 December 2019. On 23 December 2019 the faecal coliform concentration was reported as 260 CFU/100mL. The presence of faecal bacteria in aquatic environments such as the CVC sedimentation ponds is an indicator of faecal contamination from man, other animals or birds. The specific source of the contamination in this case is not known. While domestic waste from the CVC bath house is treated via a 3 part septic system, with the wastewater discharged to the sedimentation ponds, faecal coliform levels at LDP1 are generally below the limit specified in the EPL. It is also possible that environmental variables may have influenced the results or there was some localised contamination of the LDP1 sample. The follow-up result from sampling taken on 24 December was well below the relevant limits. A chlorine dosing system is proposed to be installed as a short term measure to manage faecal coliform levels. As part of the pollution studies and reduction program required by Condition U1 PRP8 – Construction of Sewerage System in EPL 1770, Delta Coal have selected a preferred option for the connection of CVC to sewer and is in consultation with the EPA in relation to the appropriate approvals pathway.

11 Activities to be completed in the next reporting period

A summary of the activities that were proposed to be undertaken during the 2019 reporting period and current status is provided in **Table 22.**

Table 22: Update on activities undertaken in the 2019 reporting period

Activity Proposed in 2018 Annual Report	Status Update	31 December 2019 update, percentage complete
Trial of chemical dust suppressant around unsealed access roads to reduce windblown dust	Commissioned and completed in 2019.	100%
Implementation of the 2019 Weed Action Plan	Commissioned and completed in 2019.	100%
Development of the site rehabilitation monitoring program and baseline monitoring.	Consultant engaged to conduct monitoring in Q2 2019.	100%
A modification to the development consent will be submitted to allow for an increase in the amount of coal handled at Mannering Colliery and transferred via existing infrastructure to VPPS. The modification also includes a minor change in mining method (namely the description of bord and pillar mining)	The environmental assessment (EA) and supporting air quality and noise mitigation assessments were finalised for submission to DPIE in Q2 2019.	100%
Independent Environmental Audit	Commissioned and completed in Q2 2019.	100%
Transfer of Environmental Licences (EPL, Water and Radiation) and Titles	To be completed in Q1/Q2 2019 due to receivership and change in ownership.	100%
Demolition of Mine Cottages	To be completed in Q4 2019.	Not complete. Awaiting MOP approval
Submission of Extraction Plan for S2/S3 Miniwall Panels.	Completed in Q2 2019.	100%

Submission of updated MOP including Bord and Pillar activities post S2/S3 Miniwalls	To be completed in 2019.	Not complete. To be completed if receive approval for CVC Mod 3.
A modification to the development consent will be submitted to allow for the transfer of additional coal from CVC to Mannering Colliery (via the approved underground linkage) and a change in mining method (including an updated definition of first workings).	The environmental assessment (EA) and supporting subsidence and groundwater assessments are being finalised for submission to DPIE in Q2 2019.	Finalised, awaiting submission.
Housekeeping Activities	Ongoing	

Table 23: Activities proposed for the 2020 reporting period

Activity Proposed in 2018 Annual Report	What happened in 2019	Proposed Activities for 2020
Trial of chemical dust suppressant around unsealed access roads to reduce windblown dust	Completed in 2019.	Ongoing use of chemical dust suppressant on unsealed access roads
Implementation of the 2019 Weed Action Plan	Completed in December 2019	Ongoing weed management in 2020 in accordance with Weed Action Plan
Development of the site rehabilitation monitoring program and baseline monitoring.	Consultant engaged to conduct in Q2 2019	Ongoing rehabilitation monitoring planned for Q2 2020
A modification to the development consent will be submitted to allow for an increase in the amount of coal handled at Mannering Colliery and transferred via existing infrastructure to VPPS. The modification also includes a minor change in mining method (namely the description of bord and pillar mining)	The environmental assessment (EA) and supporting air quality and noise mitigation assessments were submitted to DPIE in Q2, 2019	Awaiting approval. Update of management plans will be required during Q2 2020 Submission of a Statement of Environmental Effects (SEE) for CVC Mod 4 - Northern Extension Area (Morriset Peninsular). This project is reliant on CVC Mod 3 approval to recommence bord and pillar mining methods at CVC
Removal of legacy coal handling plant, unused coal bins, former mine cottages and other plant within the existing surface footprint	Tendering commenced in Q4 2019	Submission of updated MOP including demolition activities. Demolition to commence in Q2 2020
Submission of Extraction Plan for S2/S3 Miniwall Panels	Completed in Q2 2019	Submission of Extraction Plan for S4 Miniwall panel Submission of Miniwall S5 Extraction Plan if CVC Mod 3 is delayed or declined
Submission of updated MOP including bord and pillar activities post S2/S3 Miniwalls	Completed in 2019	Submission of updated MOP including demolition activities and S4 Miniwall

A modification to the development consent will be submitted to allow for the transfer of additional coal from CVC to Mannering Colliery (via the approved underground linkage) and a change in mining method (including an updated definition of first workings).	The environmental assessment (EA) and supporting subsidence and groundwater assessments was finalised for submission to DPE in Q2, 2019	Awaiting approval. Update of management plans required during Q2 2020
Removal of remnant coal and carbonaceous material in the stockpile area	Commenced planning Q4 2019.	Proposed to be removed in Q1/Q2 2020
N/A	N/A	Commence assessment to consolidate CVC development consent and MC project approval. Consolidation to include mining in the Great Northern Seam and site infrastructure upgrade works
N/A	N/A	Obtain licence to access Munmorah SCA and commence environmental scoping assessment and exploration in the Moonee area
N/A	N/A	Obtain a land access licence agreement to gain access to Crown land adjacent to Lake Macquarie foreshore to conduct weed management works in this area
N/A	N/A	Installation of temporary chlorine dosing plant to reduce Faecal Coliforms from CVC Bath house effluent and shower water
N/A	N/A	Submission of a Review of Environmental Factors (REF) for a sewage pump station at CVC for connection to Central Coast Council sewage system

Housekeeping Activities	Ongoing	Ongoing

12 References

Documents used in the preparation of this report are detailed in **Table 24**.

Table 24: References

Reference	Title
Legislation and Regulations	Development consent SSD-5465 (as modified) Environment Protection Licence (EPL) 1770 *Mining Act 1992* *Protection of the Environment Operations Act, 1997*
External documents	AECOM, 2011 – *Environmental Assessment Chain Valley Colliery Domains 1 & 2 Continuation Project*. Prepared for LakeCoal Pty Ltd. EMGA Mitchell McLennan, 2013 – *Environmental Impact Statement, Chain Valley Colliery Mining Extension 1 Project.* Prepared for LakeCoal Pty Ltd. EMM Consulting (February 2020) Biodiversity Monitoring 2019 Chain Valley Colliery. Laxton, J. H. & Laxton, E. S., 2019 – *Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW (Results for 2008 to 2019)* Laxton, J. H. & Laxton, E. S., 2018 – *Lake Macquarie Benthos Survey Results No. 16 (September 2019)* NSW DPIE (January 2019) Community Consultative Guidelines for State Significant Development Total Earth Care Pty Ltd (January 2020) Weed Action Plan Chain Valley Colliery, Mannering Colliery and Summerland Point Ventilation Shaft

13 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 generally 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 *Environmental Planning and Assessment Act 1979*

EPL Environmental Protection License**kL** Kilolitre

LDP1 Licenced 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

PM_{10} Particulate matter less than 10 microns in size

POEO Act *Protection of the Environment Operations Act 1997*

ROM Run of mine

Secretary Secretary of the Department, or nominee

TEOM Tapered element oscillating microbalance

t - CO_2-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.

VPPS	Vales Point Power Station
WCJV	Wallarah Coal Joint Venture

14 Appendices

Appendix 1: Development Consent SSD-5465

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:	LakeCoal 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)

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DEFINITIONS

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
Annual Review	The review required by Condition 4 of Schedule 6
Applicant	LakeCoal Pty Limited, or any other person or persons who rely on this consent to carry out the development that is subject to this consent
Approved mine plan	The mine plan show 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
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
CCC	Community Consultative Committee
Coal haulage route	The route proposed in the EIS for haulage of coal by trucks between the site and Port Waratah Coal Services (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 & Environment
Development	The development described in the EIS, as amended by SEE Mod 1
DPI Water	Department of Primary Industries - Water
DRE	Division of Resources and Energy of the Department of Industry
DPI Fisheries	Fisheries Division of the Department of Primary Industries
EA	Environmental Assessment titled '*Environmental Assessment – Chain Valley Colliery Domains 1 and 2 Continuation Project*' dated July 2010 and associated response to submissions titled '*Submissions Report – Chain Valley Colliery Domains 1 and 2 Continuation Project',* dated 14 November 2011
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 *Fisheries Management Act 1994*
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	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the POEO Act
Evening	The period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build or carry out
First workings	Development of the main headings and gateroads in the underground mining area
Ha	Hectare
Heritage item	An item as defined under the *Heritage Act 1977* and/or an Aboriginal object or Aboriginal place as defined under the *National Parks and Wildlife Act 1974*
High Water Mark Subsidence Barrier	The area of land defined: a) on the surface by the highwater level of Lake Macquarie and a point 2.44 metres in elevation above that highwater level; and b) in the seam, where it is intersected by lines: • 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	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedule 3 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 the Land Titles Office at the date of this consent
LMCC	Lake Macquarie City Council
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mining operations	Includes all extraction, processing, handling, storage and transportation of coal carried out on the site
Minister	Minister for Planning, or delegate
Minor	Not very large, important or serious
Mitigation	Activities associated with reducing the impacts of the development
MSB	Mine Subsidence Board
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
OEH	Office of Environment and Heritage
Peak hour periods	7 am to 9 am and 4:30 pm to 6 pm weekdays
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency, Delta Electricity or a mining company (or its subsidiary)
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
Rehabilitation	The treatment or management of land disturbed by the development for the purpose of establishing a safe, stable and non-polluting environment
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact
Road Maintenance Agreement	The document prepared by McCullough Robertson Lawyers and titled '*Road Maintenance Agreement*', signed by WSC on 1 July 2013 and by LakeCoal on 5 July 2013
ROM coal	Run-of-mine coal
RMS	Roads and Maritime Services
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 miniwall or pillar extraction methods
Secretary	Secretary of the Department, or nominee
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.
Site	All land within the Development Area (see Appendices 1 and 2)
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

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
Threatened Species	As defined under the *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*
WSC	Wyong Shire Council

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.

TERMS OF CONSENT

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

2A. The Applicant shall carry out the development in accordance with the:
   (a) Statement of Commitments; and
   (b) conditions of this consent.

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.

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.

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 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.

Coal Extraction

6. The Applicant shall 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 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.

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.

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.

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.

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.

COMMUNITY ENHANCEMENT

12. 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:
    (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.

SURRENDER OF EXISTING PROJECT APPROVAL

13. Within 12 months of the date of this development consent, unless the Secretary agrees otherwise, the Applicant shall surrender its project approval for the Chain Valley Colliery Domains 1 & 2 Continuation Project (10_0161) to the satisfaction of the Secretary, in accordance with section 75YA of the EP&A Act.

    Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrender of a consent or approval should not be understood as implying that works legally constructed under a valid consent or approval can no longer be legally maintained or used.

14. Prior to the surrender of the existing project approval, the conditions of this consent (including any notes) shall prevail to the extent of any inconsistency with the conditions of the existing project approval (10_0161).

STRUCTURAL ADEQUACY

15. 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:
    (a) the relevant requirements of the BCA; and
    (b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.

    Notes:
    - *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.*

DEMOLITION

16. 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.

OPERATION OF PLANT AND EQUIPMENT

17. The Applicant shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

UPDATING AND STAGING STRATEGIES, PLANS OR PROGRAMS

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 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.

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.

Notes:

- *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.*

ROAD MAINTENANCE CONTRIBUTION

19. The Applicant must pay Road Maintenance Fees to WSC in accordance with its Road Maintenance Agreement with WSC.

SCHEDULE 3
ENVIRONMENTAL CONDITIONS – GENERAL

TRANSPORT

Monitoring of Coal Transport

1. 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.

Road Works

2. 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;
   (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, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.

Road Transport Protocol

3. The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall:
   (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;
   (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 shall implement the approved Road Transport Protocol as approved from time to time by the Secretary.

Independent Traffic Audit

4. 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:
   (a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC 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 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.

   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 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:
   (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 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.

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 shall:
   (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;

(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;
(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);
(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;
(e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and
(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.

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

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

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 shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
(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;
(b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;
(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
(d) 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 shall implement the approved management plan as approved from time to time by the Secretary.

AIR QUALITY

Odour

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

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.

Table 3: Long-term criteria for particulate matter

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

Table 4: Short-term criterion for particulate matter

Pollutant	Averaging period	[d] Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 5: Long-term criteria for deposited dust

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

Notes for Tables 3 to 5:

- *[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.*

Operating Conditions

12. The Applicant shall:
    (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;
    (b) implement best practice management to minimise the risk of spontaneous combustion and related emissions;
    (c) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site;
    (d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent;
    (e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above);
    (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.

Air Quality Management Plan

13. The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (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:
        - 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 shall implement the approved management plan as approved from time to time by the Secretary.

METEOROLOGICAL MONITORING

14. 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:

(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.

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 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.

Water Pollution

16. Unless an EPL authorises otherwise, the Applicant shall comply with Section 120 of 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.

Water Management Plan

18. 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:
- 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 shall implement the approved management plan as approved from time to time by the Secretary.

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.

BIODIVERSITY

Biodiversity Enhancement Strategy

19. 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.

Table 6: 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 6 see the applicable figures in Appendix 7.

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.

Biodiversity Management Plan

20. 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:
    (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;
    (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 shall implement the approved management plan as approved from time to time by the Secretary.

20A. 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.

HERITAGE

Heritage Management Plan

21. The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must:
    (a) be prepared in consultation with any relevant Aboriginal stakeholders;
    (b) be submitted to the Secretary for approval within 6 months of the date of this consent;

(c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site;
(d) detail the responsibilities of all stakeholders; and
(e) include programs/procedures and management measures for:
- 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.

The Applicant shall implement the approved management plan as approved from time to time by the Secretary.

VISUAL

Visual Amenity and Lighting

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.

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.

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.

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.

Table 7: Rehabilitation Objectives

Feature	***Objective***
Mine site (as a whole)	• Safe, stable and non-polluting. • Final land use compatible with surrounding land uses.
Rehabilitation materials	• Materials (including topsoils, substrates and seeds of the disturbed area) are recovered, appropriately managed and used effectively as resources in rehabilitation.
Surface infrastructure	• To be decommissioned and removed, unless the DRE agrees otherwise.
Portals and ventilation shafts	• To be decommissioned and made safe and stable. • Retain habitat for threatened species (eg bats), where

	practicable.
Other land affected by the development	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of: – local native plant species (unless the DRE agrees otherwise); and – a landform consistent with the surrounding environment.
Built features damaged by mining operations	• Repair to pre-mining condition or equivalent unless: – the owner agrees otherwise; or – the damage is fully restored, repaired or compensated under the *Mine Subsidence Compensation Act 1961*.
Community	• 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 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.

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.

SCHEDULE 4
ENVIRONMENTAL CONDITIONS – UNDERGROUND MINING

SUBSIDENCE

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.

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.

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: • *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 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

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.

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.

Table 9: Subsidence Impact Performance Measures – Built Features

Built Features	***Performance Measure***
Trinity Point Marina Development Other built features	• 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 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.*

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.

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.

Extraction Plan

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;

(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;

(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;

(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.

The Applicant shall implement the approved management plan as approved from time to time by the Secretary.

Notes:
- *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.*

8. The Applicant shall 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 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.

9A. 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.

Payment of Reasonable Costs

10. 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.

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 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
   (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).

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 Secretary in writing for an independent review of the impacts of the development on his/her land.

   If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall:
   (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the 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 Secretary and landowner a copy of the independent review.

SCHEDULE 6
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
   (a) be submitted to the Secretary for approval within 7 months of the date of this consent;
   (b) provide the strategic framework for environmental management of the development;
   (c) identify the statutory approvals that apply to the development;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
   (e) describe the procedures that would be implemented to:
      - 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
   (f) include:
      - 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.

   The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.

Adaptive Management

2. 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.

   Where any exceedance of these criteria and/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 remediation measures as directed by the Secretary,
   to the satisfaction of the Secretary.

Management Plan Requirements

3. The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - 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;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the development;
      - effectiveness of any management measures (see c above);
   (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;
   (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
   (g) a protocol for managing and reporting any:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria; and

(h) a protocol for periodic review of the plan.

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

Annual Review

4. 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:
   (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;
   (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:
   - 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;

   (c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the development;
   (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this consent, (unless the conditions require otherwise),

   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.

   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.

Community Consultative Committee

6. 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).

   Notes:
   - *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.*

REPORTING

Incident Reporting

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.

Regular Reporting

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.

INDEPENDENT ENVIRONMENTAL AUDIT

9. 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.

ACCESS TO INFORMATION

11. The Applicant shall:
   (a) make copies of the following publicly available on its website:
      - 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

   (b) keep this information up-to-date,

   to the satisfaction of the Secretary.

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
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78	31322
4	981106
3	981104
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19	13120
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21	13120
22	13120
23	13120
24	13120
60	13120
30	13123
31	13123
A	368634
100	1065718
102	1065718
20	1113256
7329	1148149
5	981103
9	13120
100	713777
25	13120
26	13120
27	13120
28	13120
29	13120

APPENDIX 2
DEVELOPMENT AREA

Figure 1: *Chain Valley Extension Project – Development Application Area and Lease Plan (The Site)*

APPENDIX 3
DEVELOPMENT LAYOUT

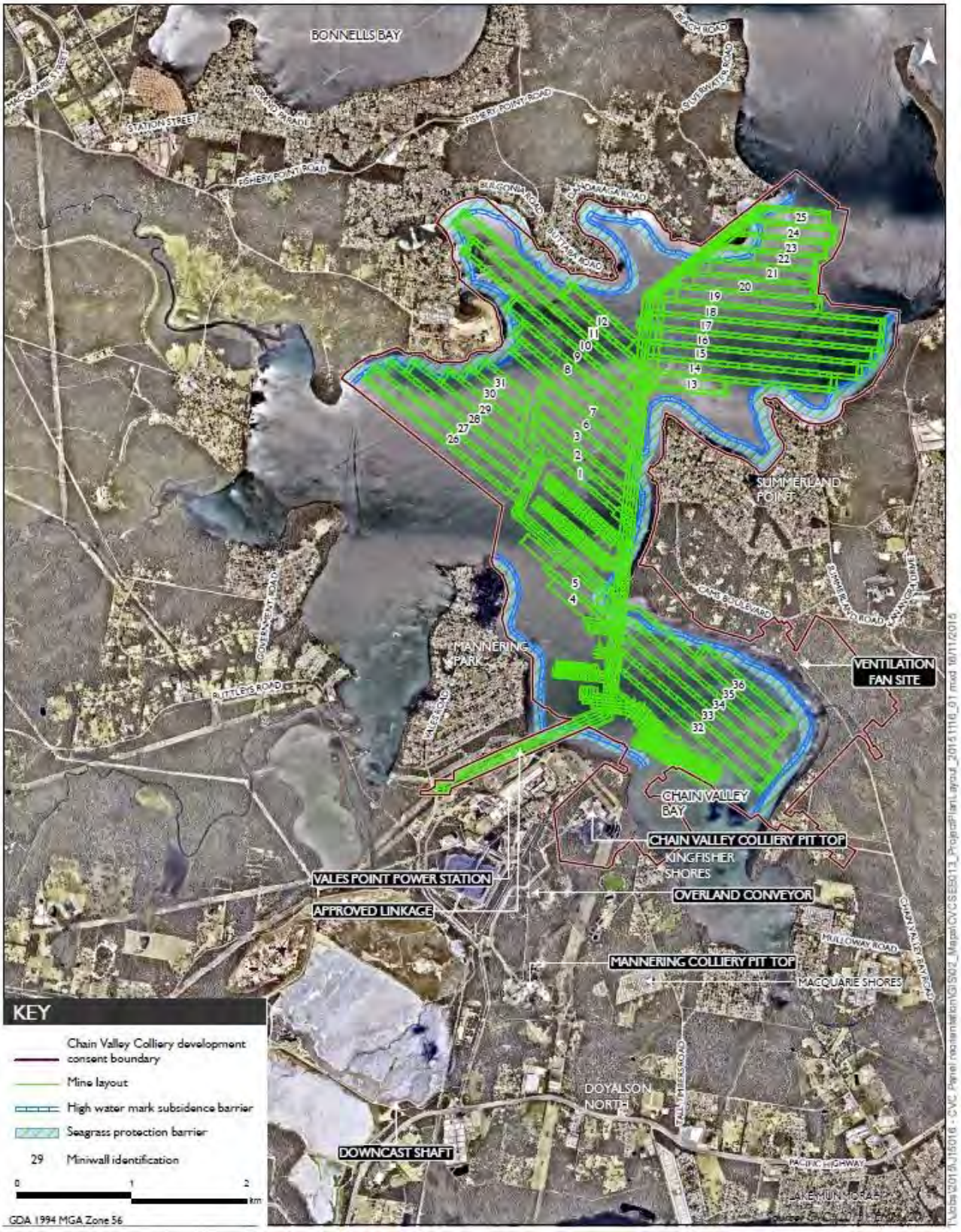


Figure 1: *Layout of the Chain Valley Extension Project*

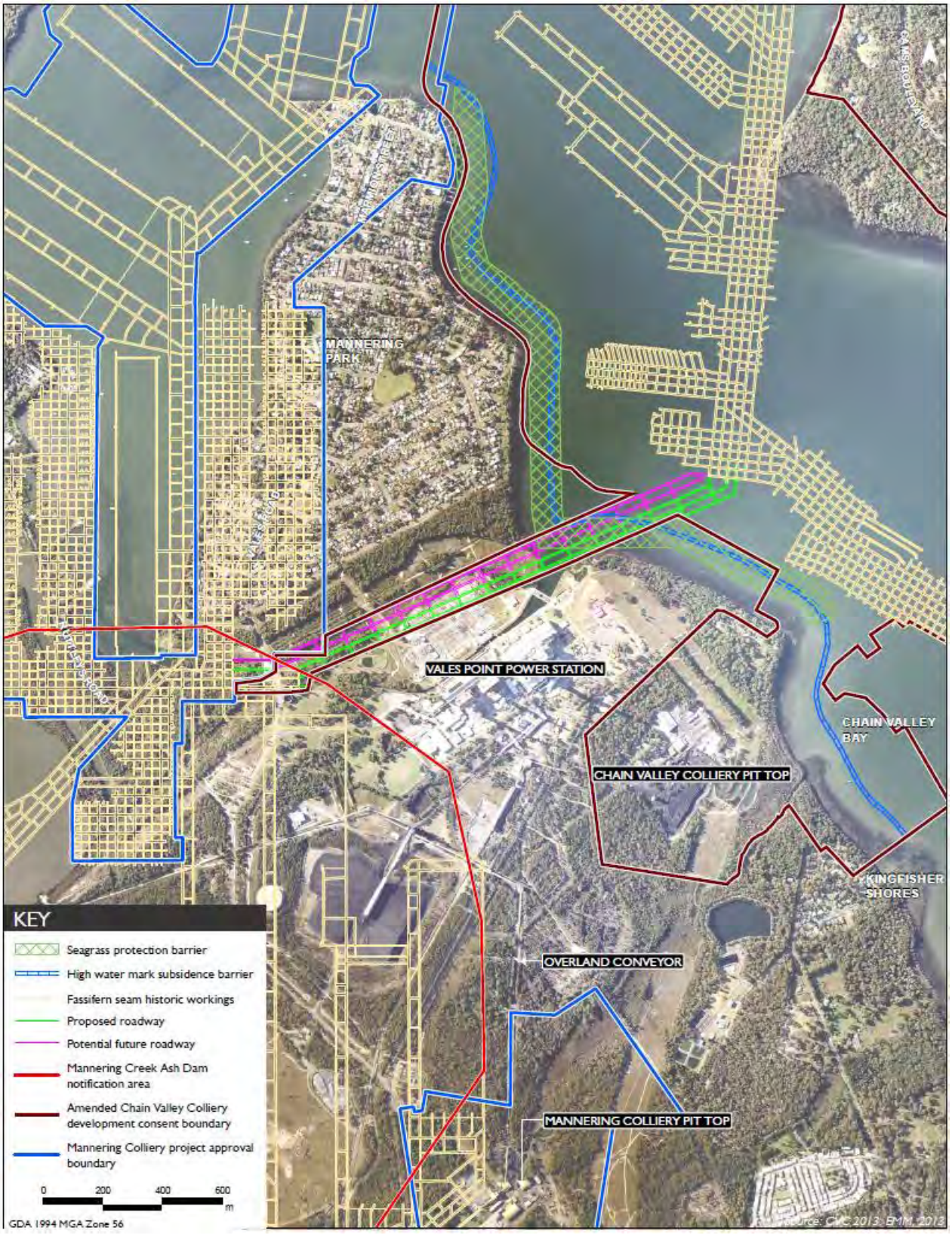


Figure 2: *Location of the underground linkage to Mannering Colliery*

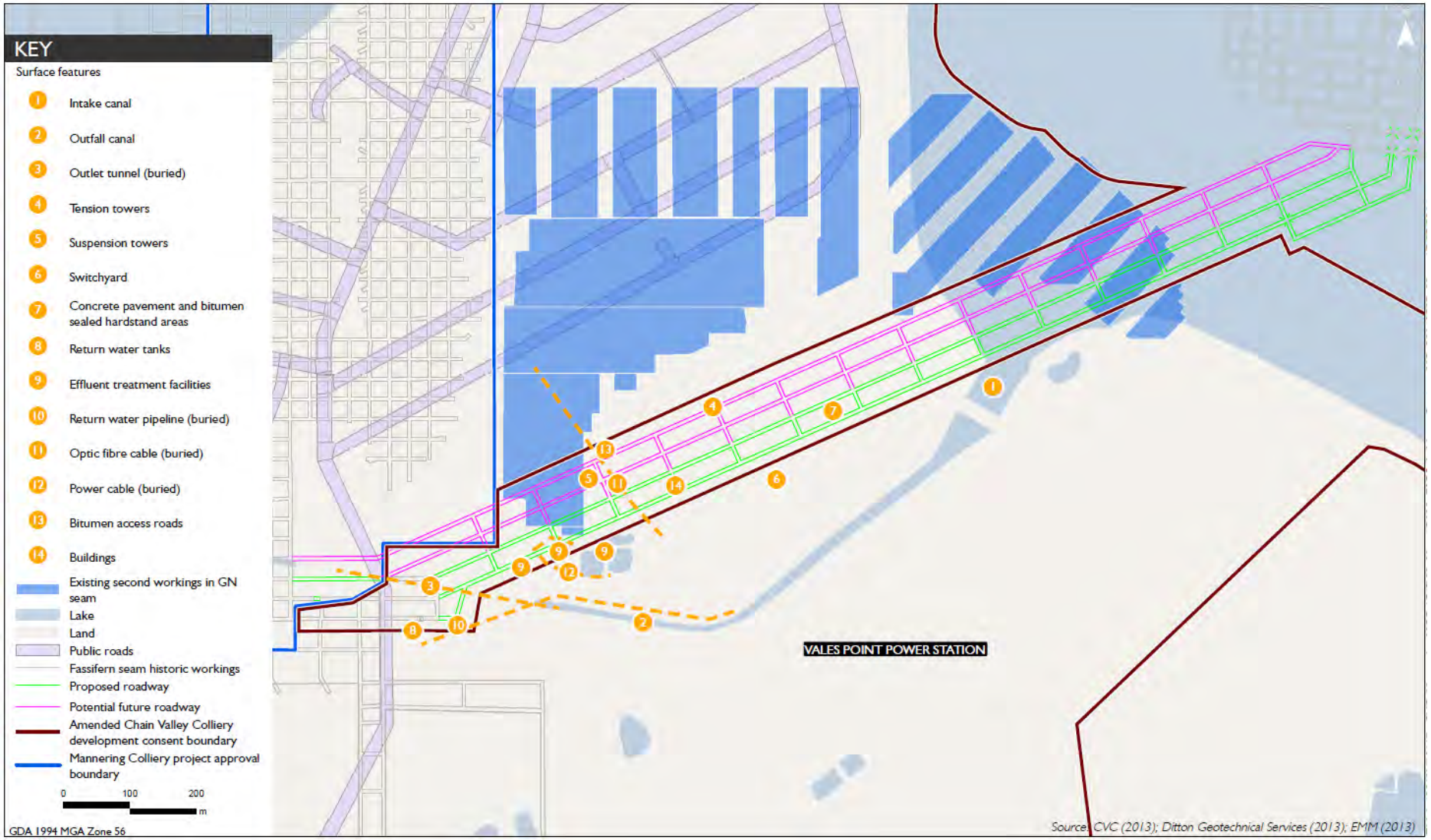


Figure 3: *Location of the underground linkage and surface infrastructure*

APPENDIX 4
KEY SURFACE FACILITIES

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

APPENDIX 5
COAL HAULAGE ROUTE – PUBLIC ROADS

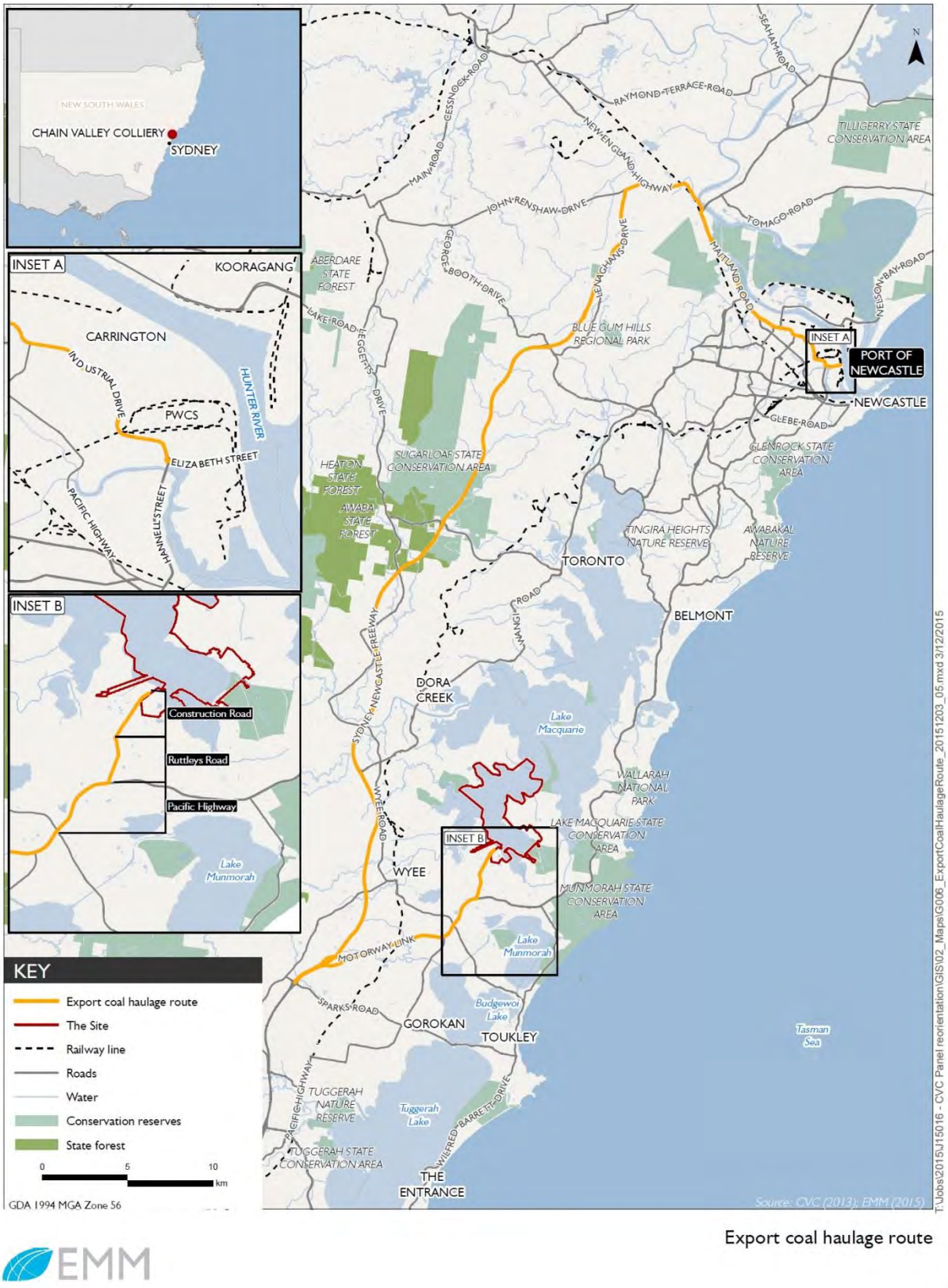
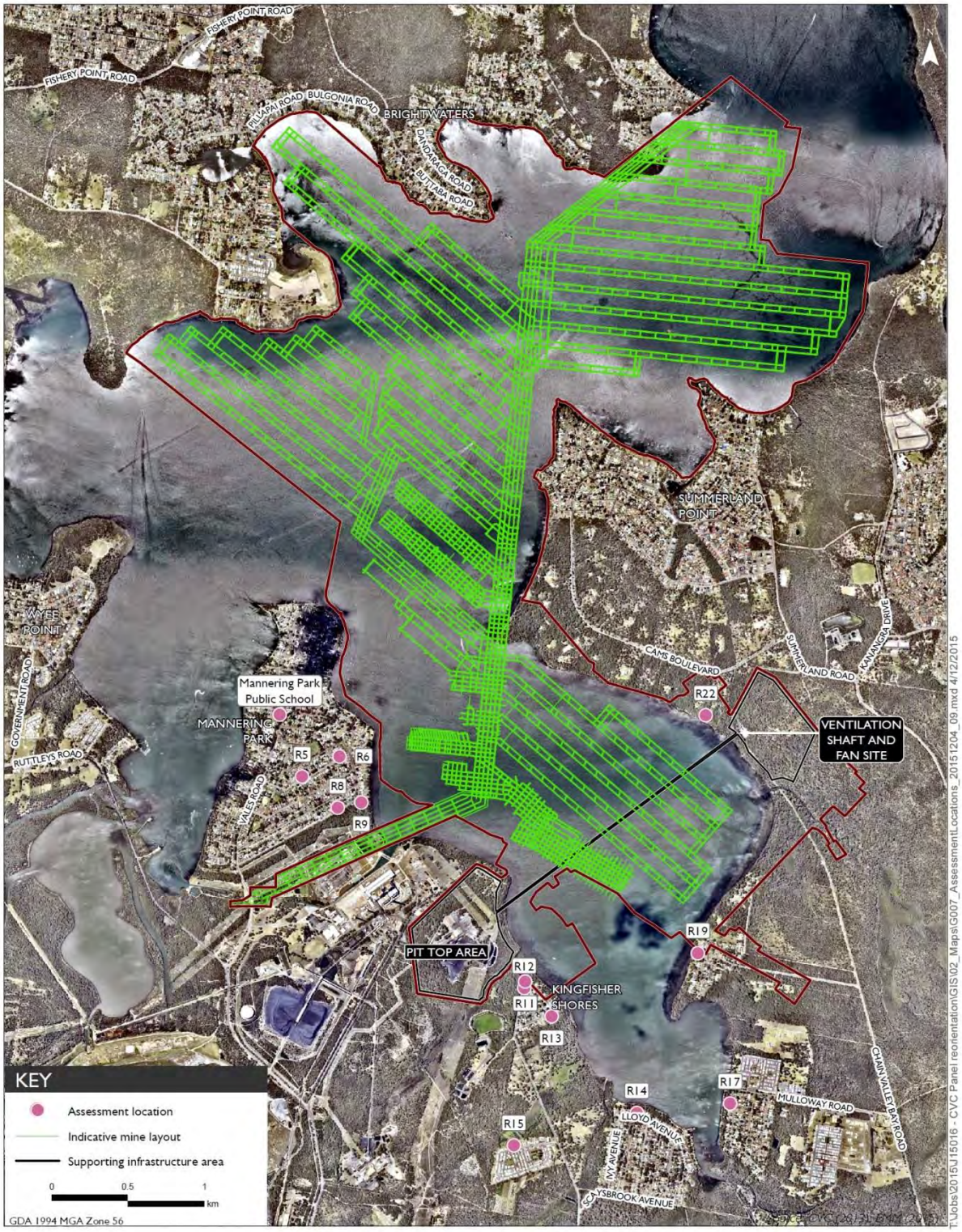


Figure 1: Export Coal Haulage Route

APPENDIX 6
NOISE RECEIVER LOCATIONS



EMM

Figure 1: *Noise Receiver Locations*

APPENDIX 7
BIODIVERSITY ENHANCEMENT AREA

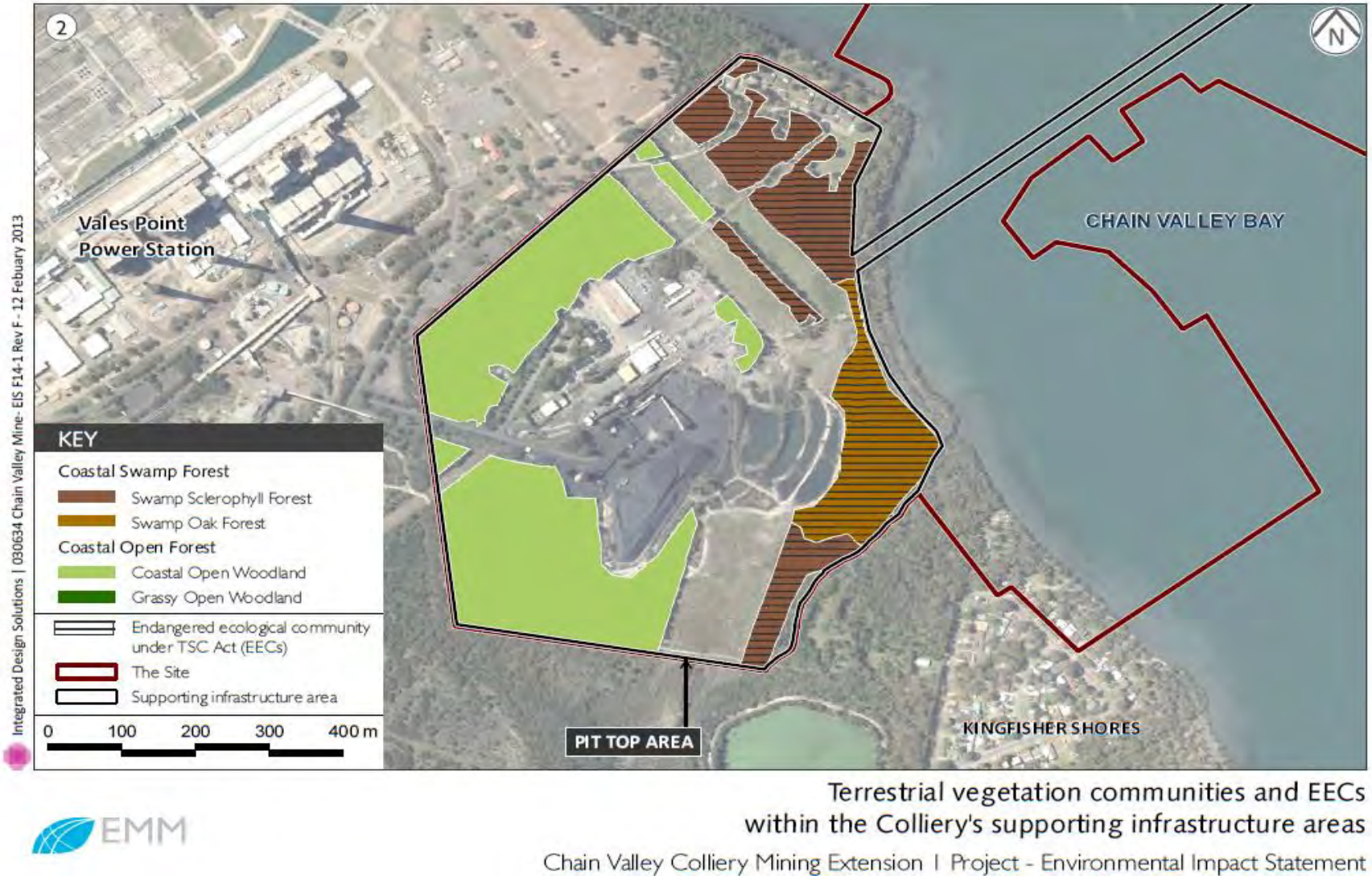


Figure 1: *Location of the Biodiversity Enhancement Area, shown in red and orange hatching*

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 shall be that recorded by the meteorological station described in condition 15 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 Secretary directs otherwise.

5. 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:
   (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	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: • 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. 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: • 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	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: • 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 AWTS in accordance with the parametres 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 parametres. 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.
Noise	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: • 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. 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: • 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	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: • 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	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: • 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 undertaken 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.
Subsidence	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: • 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.
Marine ecology	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 • 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.

Terrestrial ecology	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:
	• investigate one of the following options in consultation with OEH to offset the biodiversity impacts arising from the proposed modification:
	  ○ 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 OEH 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:
	  ○ 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. LakeCoal 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. 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.
Wastes	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.
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, LakeCoal will: ensure additional surface lighting at the Colliery complies with *AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.
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: • 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	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.
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: • 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.
Other	LakeCoal will commit to only carrying out mining operations in the extension areas consistent with the development consent granted pursuant to this Proposal.

Appendix 2: Plans

ML1632 - A
CCL721 - A
ML1632 - B
ML1370 - B
CCL721
ML1632 - A
ML1632 - B
ML1051
CCL707
EASSIFERN SEAM HOLDING
ML1051
CCL707
ML1051
ML1052
LOT 1 DP226133
ML1052
CCL707
CCL707
CCL707
MPL1308
MPL337
MPL1389
MPL1349
pt CCL719
(GTN only)
CCL707
(Fassi only)
CCL707
FASSIFERN SEAM HOLDING
CCL721
CCL722

Lease No	Area	Particulars
CCL 707	815ha	Expires 30/12/2023
CCL 706	368.2ha	Expires 29/04/2022
ML 1051	259ha	Expires 07/07/2022
ML 1052	213.6ha	Expires 07/07/2022
ML 1308	8.1ha	Expires 04/05/2022
MPL 1349	32.8ha	Expires 05/10/2028
MPL 1400	3.1ha	Expires 06/11/2031
MPL 1389	0.1ha	Expires 14/05/2031
MPL 337	0.7ha	Expires 25/01/2037
Sublease CCL 719	10ha	Expires 22/09/2020
Sublease CCL 719 (Sublease B)	808.5ha	Expires 30/06/2022
Sublease CCL 721 (Sublease B)	2405.8ha	Expires 30/06/2022
Sublease CCL 722 (Sublease B)	30.8ha	Expires 30/06/2022
Sublease ML 1632 (Sublease B)	427.2ha	Expires 30/06/2022
Sublease ML 1370 (Sublease B)	112.7ha	Expires 30/06/2022
Sublease CCL 721 (Sublease A)	26.8ha	Expires 01/07/2018, Renewal Sought
Sublease ML 1632 (Sublease A)	67.7ha	Expires 01/07/2018, Renewal Sought
EL8428	656.2ha	Expires 07/12/2020
Lot 1 DP 226133	95.6ha	Freehold

Chain Valley Holding - Fassifern Seam

Mining Leases

LAKE COAL PTY LIMITED
CHAIN VALLEY COLLIERY

ANNUAL REVIEW (AEMR) 2018
PLAN 1 - Mining Tenements

SCALE:	1:15 000 @ A2	DATE:	13 March 2019
DRAWN:	T Chisholm	DRG NO:	C4P0180_2
CHECKED:	C Armit	REV NO:	2018
		SIZE:	A2

LakeCoal

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6328000

MINIWALL 10
MINIWALL 9
MINIWALL 8
MINIWALL 7
MINIWALL 6

WEST 2
WEST 1

Surface Ventilation Fan Site

Pit Top Facilities

LEGEND

GREAT NORTHERN SEAM WORKINGS
FASSIFERN SEAM WORKINGS (2018)

SITE BOUNDARY (SSD 5465)
FASSIFERN SEAM HOLDING
GREAT NORTHERN SEAM HOLDING

364000
365000
366000
367000
368000
369000

LAKE COAL PTY LIMITED
CHAIN VALLEY COLLIERY

ANNUAL REVIEW (AEMR) 2018
PLAN 2 - Mining Areas

SCALE:	1:15 000 @ A2	DATE:	13 March 2019
DRAWN:	T Chisholm	DRG NO:	C4P0180_2
CHECKED:	C Armit	REV NO:	2018
		SIZE:	A2

LakeCoal

N
W
E
S

Oil / Water Separator
Wash down sump
Oxy - acetalene storage compounds
Cable shed
Workshop and Store
Hazardous Substances & Dangerous Goods
Fire Station
Hard Stand Storage
Aerated Water Treatment System
Down cast Shaft
Mine Dewatering Lines
Main Office
Training Centre
Compressors
Operations Office
132000 litre Water Tanks
Bathhouse
Septic Tanks
Haulage Room
ROM Bin
Switch Room
Cable Belt Switch room
80000 litre Water Tank
Sub Station
Tube Bundle Monitoring
Cable belt Drive
Switch room
250 tonne bin
Entry Gate to Colliery
Weighbridge
Final Products Bin
Coal Stockpile Area
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
D13
Sediment Dams
Buried Discharge Pipeline
Licenced Discharge Point No. 1
E: 364 998
N: 6329 479
Tidal Creek

VENTILATION FAN SITE
Switch room
Ventilation Fans
Old switch room
Services Borehole

PIT TOP FACILITIES
CHAIN VALLEY COLLIERY

0 50 100 200
METRES

LAKE COAL PTY LIMITED CHAIN VALLEY COLLIERY	SCALE: 1:2000	DATE: 14 March 2019	
	DRAWN: T Chisholm	DRG NO: C4P0180_3	
ANNUAL REVIEW (AEMR) 2018 Plan 3 - Surface Facilities	CHECKED: C Armit	REV NO: 2018	LakeCoal
		SIZE: A3	

N
W
E
S

Oil / Water Separator
Wash down sump
Oxy - acetalene storage compounds
Cable shed
Workshop and Store
Hazardous Substances & Dangerous Goods
Fire Station
Hard Stand Storage
Aerated Water Treatment System
Mine Dewatering Lines
Compressors
Main Office
Training Centre
Operations Office
Bathhouse
Septic Tanks
132000 litre Water Tanks
80000 litre Water Tank
Haulage Room
Switch Room
Sub Station
Tube Bundle Monitoring
Cable Belt Switch room
ROM Bin
Cable belt Drive
Switchroom
250 tonne bin
Entry Gate to Colliery
Weighbridge
Final Products Bin
Coal Stockpile Area
SEAL SHAFT
Down cast Shaft
SEAL DRIFTS
CUT & FILL TO MATCH SURROUNDING RL's
REMOVE STRUCTURES AND LEVEL GROUND TO SUIT
Sediment Dams
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
Tidal Creek

PIT TOP FACILITIES
CHAIN VALLEY COLLIERY

0 50 100 200
METRES

VENTILATION FAN SITE

Switch room
Ventilation Fans
Old switch room
SEAL SHAFT
SEAL SERVICE BOREHOLE
Services Borehole
REMOVE STRUCTURES AND LEVEL GROUND TO SUIT

Rehabilitation - Bushland
Rehabilitation -Grassland
Rehabilitation - Surface Water Flow
Rehabilitation - Proposed Dams

LAKE COAL PTY LIMITED
CHAIN VALLEY COLLIERY

ANNUAL REVIEW (AEMR) 2018
Plan 4 - Proposed Rehabilitation

SCALE:	1:2000	DATE:	14 March 2019
DRAWN:	T Chisholm	DRG NO:	C4P0180_4
CHECKED:	C Armit	REV NO:	2018
		SIZE:	A3

LakeCoal

Appendix 3: Environment Protection Licence 1770

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	0-2000000 T annual handing capacity
Mining for coal	> 500000-2000000 T annual production capacity

Region

North - Hunter

Ground Floor, NSW Govt Offices, 117 Bull Street
NEWCASTLE WEST NSW 2302

Phone: (02) 4908 6800

Fax: (02) 4908 6810

PO Box 488G

NEWCASTLE NSW 2300

Environment Protection Licence

Licence - 1770

Environment Protection Licence

Licence - 1770

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	0 - 2000000 T annual handing capacity
Mining for coal	Mining for coal	> 500000 - 2000000 T annual production capacity

A1.2 The licensee must not produce by mining activities more than 1.5 million tonnes of coal within any calendar year.

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.

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

Environment Protection Licence

Licence - 1770

SURFACE PREMISES OF THE COLLIERY IDENTIFIED IN PLAN TITLED "EPL PREMISES PLAN FIGURE 2 - SURFACE EXTENTS" 12 MARCH 2015 DOC15/39169 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 DOC14/10689 AND THE UNDERGROUND ROAD JOINING MANNERING COLLIERY TITLED "LOCATION OF UNDERGROUND LINKAGE" DOC14/298690-02 ACCOMPANYING SSD5465-MOD 1 APPROVAL AND THE PLAN TITLED "EPL PREMISES PLAN - FIG 1 PROJECT EXTENTS, MONITORING AND COMPLIANCE LOCATIONS" 12 MARCH 2015 DOC15/83810.

Note: An updated plan of the premises must be provided to the EPA by the licensee, to the EPA's specifications.

A3 Other activities

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

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

Environment Protection Licence

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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		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.

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
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 identifed 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.

Noise/Weather

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) 275a Cams Boulevard, CHAIN VALLEY BAY, 2259
26	Meteorological Station	Ruttleys Road Doyalson

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\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

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

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	Waste	Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which receipt is not a scheduled activity under Schedule 1 of the POEO 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	As specified in each particular resource recovery exemption	NA

	Protection of the Environment Operations (Waste) Regulation 2014.

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)
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
Night	Night-LA1 (1 minute)	-	45

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)	-	36
Night	Night-LA1 (1 minute)	-	45

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 meterorological conditions except for any one of the following:
(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.

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 by the sigma-theta method referred to in Part E4 of Appendix E to the *NSW industrial Noise Policy* (EPA 2000)

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 $L_{Aeq(15\ min)}$ 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 then 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 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 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.

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 occuring 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 sewage treatment plant. The design of the system must be in accordance with the DEC'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.

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

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.

O6 Waste management

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.

O6.2 The licensee must ensure that waste identified for recycling is stored separately from other waste.

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).

O7.2 The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.

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.

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.

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.

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.

Bunding

O7.7 All above ground tanks containing material that is likely to cause material harm to the environmental must be bunded or have an alternative spill containment system in place.

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.

Environment Protection Licence

Licence - 1770

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

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

Environment Protection Licence

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:
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".

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 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.

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.

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

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:
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.

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.

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

Environment Protection Licence

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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 a copy of the form that must be completed and returned to the EPA.

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.

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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 the incident occurred.

R3 Written report

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

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 Other general conditions

G2.1 **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 Environent 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

8 Pollution Studies and Reduction Programs

U1 PRP 8 - Construction of Sewerage System

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 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.

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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 *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
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 *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
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 Environmen t 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 mo nths. 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 *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

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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

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End Notes

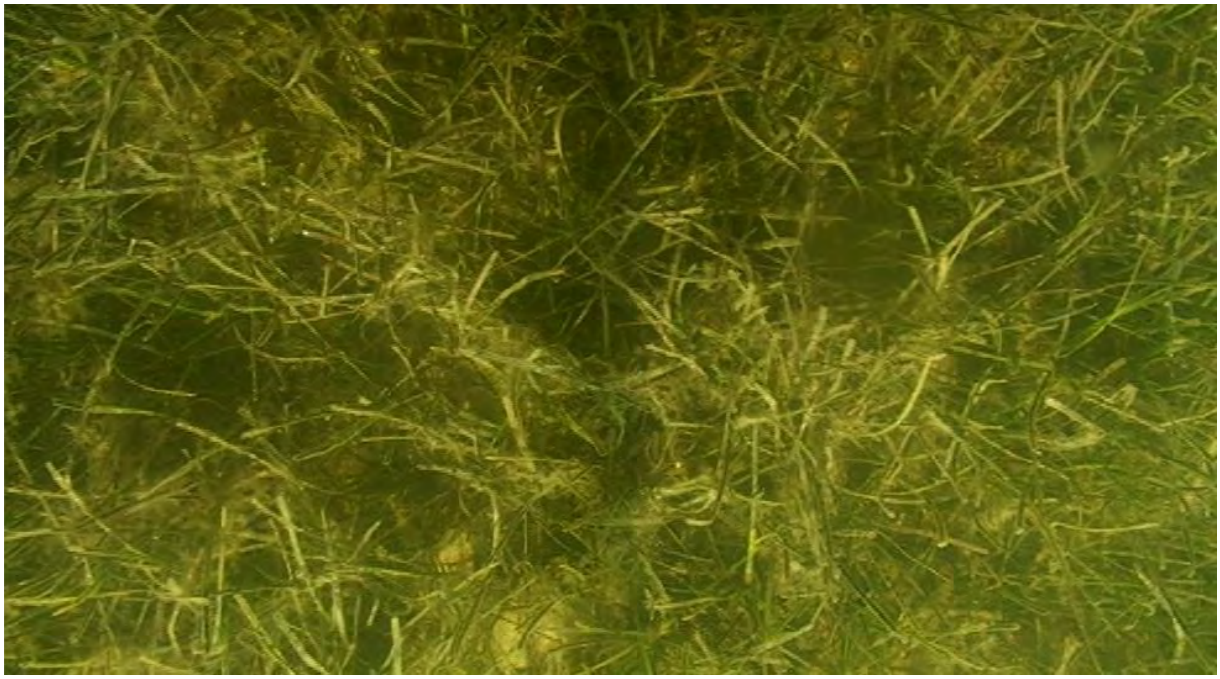
1	Licence varied by notice 1008662, issued on 24-Oct-2001, which came into effect on 24-Oct-2001.
2	Licence transferred through application 141163, approved on 24-Apr-2002, which came into effect on 20-Apr-2002.
3	Licence varied by notice 1026573, issued on 16-Apr-2003, which came into effect on 11-May-2003.
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

Appendix 4: Seagrass Monitoring Report

Lake Coal – Chain Valley Colliery

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

(Results for 2008 to 2019)



by John H. Laxton and Emma Laxton

July 2019

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Summary

Table of Transect Endpoint Coordinates and sea bed heights.

Transect Endpoint Coordinates MGA Zone 56 / metres A.H.D										
Transect No.	**Easting**	**Northing**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Diff 08-**
E1 Inner	363985.72	6331796.94	-0.68	-0.68	-0.67	-0.69	-0.70	-0.68	-0.66	-0.02
E1 Outer	364003.72	6331816.06	-0.99	-.099	-1.02	-1.02	-1.02	-1.05	-0.99	-0.01
E2 Inner	364035.49	6331701.00	-0.67	-0.65	-0.67	-0.67	-0.67	-0.69	-0.63	-0.01
E2 Outer	364077.23	6331716.71	-1.70	-1.84	-1.81	-1.84	-1.85	-1.80	-1.76	-0.02
E3 Inner	363953.11	6331405.11	-0.33	-0.28	-0.31	-0.33	-0.33	-0.31	-0.30	-0.02
E3 Outer	364027.16	6331417.57	-2.29	-2.30	-2.35	-2.33	-2.34	-2.38	-2.34	0.00
E4 Inner	364220.00	6331077.87	-0.48	-0.46	-0.47	-0.47	-0.46	-0.47	-0.46	0.00
E4 Outer	364259.75	6331121.87	-1.69	-1.71	-1.63	-1.67	-1.66	-1.67	-1.56	-0.13
E5 Inner	365005.84	6330163.57	-0.41	-0.38	-0.42	-0.38	-0.39	-0.43	-0.35	-0.11
E5 Outer	365034.05	6330224.84	-1.59	-1.58	-1.55	-1.56	-1.57	-1.60	-1.53	-0.15
E6 Inner	365118.47	6329788.47	-0.45	-0.45	-0.48	-0.48	-0.44	-0.44	-0.48	0.00
E6 Outer	365174.78	6329802.22	-1.13	-1.13	-1.14	-1.16	-1.16	-1.16	-1.14	-0.07
E7 Inner	385350.82	6332350.29	-0.23	-0.23	-0.22	-0.16	-0.19	-0.22	-0.22	-0.02
E7 Outer	365298.68	6332344.74	-1.65	-1.68	-1.74	-1.72	-1.77	-1.69	-1.66	-0.02
E8 Inner	365128.03	6331795.60	-0.28	-0.31	-0.32	-0.31	-0.25	-0.34	-0.38	0.11
E8 Outer	365096.65	6331811.91	-0.96	-1.00	-1.02	-1.10	-1.00	-1.04	-1.01	0.02
E9 Inner	365040.22	6331607.83	-0.26	-0.28	-0.29	-0.30	-0.25	-0.29	-0.30	0.11
E9 Outer	364912.70	6331523.88	-1.14	-1.16	-1.18	-1.21	-1.17	-1.20	-1.31	0.24
E10 Inner	365422.57	6331427.14	-0.42	-0.42		-0.43	-0.42	-0.43	-0.49	0.04
E10 Outer	365395.00	6331361.69	-1.68	-1.73		-1.69	-1.70	-1.79	-1.80	0.07
E11 Inner	365553.95	6331410.18	-0.35	-0.34		-0.37	-0.35	-0.37	-0.41	-0.09
E11 Outer	365524.48	6331343.17	-1.04	-1.07		-1.09	-1.08	-1.10	-1.14	-0.05
E12 Inner	365750.13	6331328.50	-0.55	-0.55		-0.59	-0.55	-0.56	-0.59	0.02
E12 Outer	365734.72	6331284.93	-1.38	-1.39		-1.44	-1.41	-1.44	-1.53	-0.07
E13 Inner	365990.66	6331278.21	-0.54	-0.59		-0.58	-0.58	-0.58	-0.65	0.03
E13 Outer	365970.63	6331190.94	-1.35	-1.40		-1.39	-1.44	-1.42	-1.46	0.01
E14 Inner	366447.40	6331046.59	-0.48	-0.45		-0.45	-0.45	-0.45	-0.54	-0.02
E14 Outer	366371.08	6330984.10	-1.31	-1.30		-1.31	-1.32	-1.34	-1.38	-0.04
E15 Inner	366657.36	6330098.68	-0.37	-0.32		-0.33	-0.31	-0.32	-0.36	-0.02
E15 Outer	366611.13	6330167.43	-1.11	-1.13		-1.18	-1.12	-1.16	-1.17	-0.10
-.10E16 Inner	366310.74	6329644.22	-0.44	-0.42		-0.46	-0.45	-0.48	-0.47	-0.10
E16 Outer	366272.62	6329666.71	-0.96	-0.95		-0.98	-0.98	-1.01	-0.99	-0.13
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								
C5 inner	56365676	6333038						-0.09	0.03	
C5 outer	56365703	6333084						-2.18	-2.17	
C6 inner	56366045	6332831						-0.04	0.01	
C6 outer	56366058	6332871						-2.00	-1.82	
T1 inner	365388.39	6333100.63	-0.38	-0.47	-0.43	-0.46	-0.45	-0.48	-0.37	-0.03
T1 outer	365400.16	6332952.03	-1.18	-1.15	-1.19	--	-1.21	-1.20	-1.17	0.02
T2 inner	365383.99	6332949.75	-0.72	-0.75	-0.74	-0.72	-0.72	-0.74	-0.83	0.13
T2 outer	365377.34	6332816.66	-1.34	-1.35	-1.37	-1.35	-1.37	-1.36	-1.35	0.04
T3 inner	365357.00	6332831.43	-0.34	-0.35	-0.34	-0.38	-0.35	-0.38	-0.37	0.08
T3 outer	365350.44	6332589.92	-1.03	-1.03	-1.06	-1.03	-1.04	-1.06	-1.11	0.10
T4 inner	365303.47	6332575.45	-0.46	-0.49	-0.46	-0.49	-0.50	-0.50	-0.38	-0.08
T4 outer	365347.64	6332380.21	-1.16	-1.13	-1.15	-1.15	-1.16	-1.15	-1.16	0.04
T5 inner	365299.87	6332338.33	-0.43	-0.48	-0.43	-0.46	-0.47	-0.52	-0.50	0.08
T5 outer	365320.77	6332207.30	-1.43	-1.47	-1.43	-1.44	-1.46	-1.47	-1.50	0.12
T6 inner	365267.87	6332207.03	-0.45	-0.45	-0.42	-0.42	-0.41	-0.42	-0.39	-0.08
T6 outer	365336.78	6332262.48	-1.61	-1.63	-1.68	-1.63	-1.64	-1.64	-1.64	0.03
T7 inner	365295.26	6332270.84	-0.18	-0.20	-0.21	-0.20	-0.12	-0.22	-0.26	0.09
T7 outer	365267.87	6332207.03	-1.63	-1.71	-1.67	-1.67	-1.67	-1.69	-1.69	0.05
T8 inner	365336.78	6332262.48	-0.13	-0.20	-0.17	-0.27	-0.18	-0.27	-0.15	-0.05
T8 outer	365295.26	6332270.84	-1.18	-1.18	-1.23	-1.18	-1.18	-1.24	-1.20	0.06
A1 inner	365336.78	6332262.48		-0.51	-0.57	-0.56	-0.59	-0.58	-0.52	0.01
A1 outer	365295.26	6332270.84		-1.19	-1.20	-1.24	-1.25	-1.25	-1.32	0.13
A2 inner	365336.78	6332262.48		-0.39	-0.44	-0.42	-0.45	-0.46	-0.45	0.06
A2 outer	365295.26	6332270.84		-0.81	-0.87	-0.86	-0.86	-0.89	-0.91	0.10
A3 inner	365336.78	6332262.48		-0.33	-0.34	-0.31	-0.30	-0.35	-0.25	-0.08
A3 outer	365295.26	6332270.84		-3.44	-1.38	-1.42	-1.43	-1.44	-1.24	-0.20
A4 inner	365336.78	6332262.48		-0.16	-0.19	-0.16	-0.16	-0.17	-0.17	0.01
A4 outer	365295.26	6332270.84		-0.72	-0.73	-0.73	-0.71	-0.71	-0.68	-0.04
A5 inner	365336.78	6332262.48		-0.30	-0.32	-0.33	-0.30	-0.32	-0.36	0.06
A5 outer	365295.26	6332270.84		-0.96	-0.95	-0.95	-0.95	-0.98	-1.01	0.05
A6 inner	365336.78	6332262.48		-0.14	-0.16	-0.14	-0.14	-0.15	-0.20	0.06
A6 outer	365295.26	6332270.84		-0.68	-0.69	-0.68	-0.68	-0.73	-0.76	0.08
L1 inner	364292.51	6330367.71			-1.12	-1.14	-1.11	-1.12	-1.07	-0.05
L1 outer	364304.21	6330399.90			-1.63	-1.66	-1.70	-1.63	-1.68	0.05
F1 inner	56366321	6333281.31						-0.22	-0.30	0.08
F1 outer	56366285	6333250.37						-1.28	-1.22	-0.06
F2 inner	56366342	6333330.55						-0.21	-0.19	-0.025
F2 outer	56366291	6333450.83						-1.95	-1.94	-0.01
F3 inner	56366611	6333163.06						-0.08	-0.12	0.04
F3 outer	56366620	6333228.02						-1.85	-1.70	-0.15
F4 inner	56366968	6333242.58						-0.08	-0.10	0.02
F4 outer	56366918	6333284.49						-2.42	-2.44	0.02
F5 inner	56367106	6333361.98						-0.30	-0.29	-0.01

F5 outer	56367068	6333421.28						-2.43	-2.48	0.05
F6 inner	56367271	6333493.19						-0.27	-0.28	0.01
F6 outer	56367202	6333522.83						-2.78	-2.75	-0.03
F7 inner	56367402	6333682.09						-0.45	-0.45	0.00
F7 outer	56367374	6333694.93						-1.37	-1.47	0.10
S1 inner	56365009	6334470.41						-0.61	-0.56	-0.05
S1 outer	56365077	6334481.77						-1.75	-1.71	-0.04
S2 inner	56364642	6334943.57						-0.25	-0.23	-0.02
S2 outer	56364673	6334939.82						-1.56	-1.51	-0.05
S3 inner	56365017	6335008.93						-0.08	-0.15	0.07
S3 outer	56365041	6334932.70						-1.84	-1.94	0.10
S4 inner	56365235	6334992.86						-0.08	-0.14	-0.66
S4 outer	56365217	6334889.31						-1.70	-1.74	0.04
S5 inner	56362275	6334709.08						-0.66	-0.66	0.00
S5 outer	56365569	6334693.44						-1.36	-1.40	0.04
S6 inner	56366144	6334765.21						-0.07	-0.06	-0.01
S6 outer	56366172	6334761.92						-0.89	-0.89	0.00

Seagrass cover at each transect for each year sampled.

Transect E1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	84.15		81.01	77.75	98.62	99.44	96.85	92.44	99.88	97.96	97.87	99.12
% no seagrass	15.85		18.99	22.25	1.38	0.56	3.15	7.56	0.12	2.04	2.13	0.88
Transect E2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	83.72		75.87	73.38	95.49	99.09	98.38	98.49	99.71	100.0	97.94	97.94
% no seagrass	16.28		24.13	26.62	4.49	0.91	1.62	1.51	0.29	0.00	2.06	2.06
Transect E3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	98.29		98.97	92.76	96.97	99.16	97.66	100.0	83.53	98.90	94.56	98.97
% no seagrass	1.71		1.03	7.24	1.54	0.84	2.34	0.00	16.47	1.10	5.44	1.03
Transect E4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	80.16		98.54	95.74	100.0	97.50	98.06	96.43	98.01	96.76	99.71	99.85
% no seagrass	19.84		1.46	4.26	0.00	2.50	1.94	3.57	1.99	3.24	0.29	0.15
Transect E5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.88		94.93	95.19	100.0	98.82	97.01	99.82	100.0	97.22	99.41	98.97
% no seagrass	4.12		5.07	4.81	0.00	1.18	2.99	0.18	0.00	2.78	0.59	1.03
Transect E6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	17.74		34.06	49.56	55.51	54.93	83.24	76.62	100.0	99.56	89.91	76.69
% no seagrass	82.16		65.94	50.44	44.49	45.07	16.76	23.38	0.00	0.44	10.09	23.31
Transect E7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.93		51.40	45.47	68.31	43.38	87.65	92.65	100.0	98.16	98.16	97.65
% no seagrass	2.07		48.60	54.53	31.69	56.62	12.35	7.35	0.00	1.84	1.84	2.35

Transect E8	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
% seagrass	99.32		84.26	95.56	90.96	99.93	99.26	99.85	100.0	99.34	100.0	99.34
% no seagrass	0.68		15.74	4.44	9.04	0.07	0.74	0.15	0.00	0.66	0.00	0.66
Transect E9	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.94		99.39	95.51	99.49	99.71	99.71	99.56	100.0	99.78	100.0	100.0
% no seagrass	4.06		0.61	4.49	0.51	0.29	0.29	0.44	0.00	0.22	0.00	0.00
Transect E10	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.94		92.21	86.25	98.99	98.82	98.87	NS	100.0	100.0	100.0	98.21
% no seagrass	2.06		7.79	13.75	1.01	1.18	1.13		0.00	0.00	0.00	1.79
Transect E11	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				86.93	99.85	99.49	97.65	NS	100.0	100.0	100.0	98.94
% no seagrass				13.07	0.15	0.51	2.35		0.00	0.00	0.00	1.06
Transect E12	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				95.68	95.53	98.09	97.94	NS	100.0	100.0	100.0	97.0
% no seagrass				7.32	4.47	1.91	2.06		0.00	0.00	0.00	3.0
Transect E13	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				93.97	99.26	100.0	99.93	NS	100.0	100.0	100.0	99.95
% no seagrass				6.03	0.74	0.00	0.07		0.00	0.00	0.00	0.05
Transect E14	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				86.54	99.34	100.0	99.68	NS	100.0	90.44	100.0	98.24
% no seagrass				13.46	0.56	0.00	0.32		0.00	9.56	0.00	1.76
Transect E15	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				90.29	99.93	99.66	92.28	NS	100.0	93.31	99.85	50.66
% no seagrass				9.71	0.07	0.34	7.72		0.00	6.69	0.15	49.34
Transect E16	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				82.79	93.22	94.12	97.87	NS	100.0	99.94	99.71	95.0
% no seagrass				17.21	6.78	5.88	2.13		0.00	0.06	0.29	5.0
Transect T1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	88.94		41.90	32.60	77.91	94.41	94.85	94.65	97.35	99.47	85.29	59.92
% no seagrass	11.06		58.10	67.40	22.09	5.59	5.15	5.35	2.65	0.53	14.71	40.08
Transect T2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	77.91		70.29	7.95	75.74	60.83	93.68	74.41	90.59	93.31	90.00	76.87
% no seagrass	22.09		29.71	92.05	24.26	39.17	6.32	25.59	9.41	6.69	10.00	23.13
Transect T3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	46.20		63.16	58.53	83.53	89.93	92.65	93.82	96.10	98.19	97.57	63.01
% no seagrass	53.80		36.84	41.47	16.47	10.07	7.35	6.18	3.90	1.81	2.43	36.99
Transect T4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	83.51		81.89	70.37	90.37	97.28	99.41	97.94	99.85	95.76	95.07	70.44
% no seagrass	16.49		18.01	29.63	9.63	2.72	0.59	2.06	0.15	4.24	4.93	29.56

Transect T5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	81.78		77.00	51.40	92.35	99.12	98.24	99.41	98.82	99.56	89.63	62.65
% no seagrass	18.22		23.00	48.60	7.65	0.88	1.76	0.59	1.18	0.44	10.37	37.35
Transect T6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	53.82		59.63	44.77	65.59	95.22	99.85	95.74	98.82	94.41	97.13	46.18
% no seagrass	46.18		40.37	53.23	34.41	4.78	0.15	4.26	1.18	5.59	2.87	53.82
Transect T7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.93		70.79	89.34	89.09	99.78	98.97	98.38	100.0	99.85	98.97	25.88
% no seagrass	2.07		29.51	10.66	10.91	0.22	1.03	1.62	0.00	0.15	1.03	74.12
Transect T8	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.94		60.29	76.99	87.64	96.76	99.85	99.26	99.26	98.24	100.0	46.32
% no seagrass	4.06		39.71	23.01	13.26	3.24	0.15	0.74	0.74	1.76	0.00	53.68
Transect A1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							97.97	98.09	88.97	99.85	96.18	85.15
% no seagrass							2.03	1.91	11.03	0.15	3.82	14.85
Transect A2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							92.38	96.99	98.75	98.38	94.93	98.09
% no seagrass							7.62	3.01	1.25	1.62	5.07	1.91
Transect A3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							100.0	86.40	94.85	96.69	98.01	99.26
% no seagrass							0.00	13.60	5.15	3.31	1.99	0.74
Transect A4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							94.51	93.97	99.12	100.0	89.78	48.98
% no seagrass							5.49	6.03	0.88	0.00	10.22	51.02
Transect A5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							96.37	95.59	99.71	100.0	97.35	84.50
% no seagrass							3.63	4.41	0.29	0.00	2.65	15.50
Transect A6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							99.56	98.01	96.97	97.65	93.53	90.88
% no seagrass							0.44	1.99	3.03	2.35	6.47	9.12
Transect C1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	48.60		80.53	68.71	85.38	99.31	97.82	94.04	99.94	76.18	99.68	34.26
% no seagrass	51.40		19.47	31.29	14.62	0.69	2.18	5.96	0.06	23.82	0.32	65.74
Transect C2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	93.09		98.03	67.79	95.21	97.24	96.69	100.0	98.09	99.40	96.69	81.62
% no seagrass	6.91		1.97	32.21	4.79	2.76	3.31	0.00	1.91	0.60	3.31	18.38
Transect C3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.59		88.75	94.41	97.16	99.93	98.75	98.46	99.90	96.47	100.0	87.21
% no seagrass	4.41		11.25	5.59	2.84	0.07	1.25	1.54	0.10	3.53	0.00	12.79

Transect C4	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
% seagrass	87.25		86.56	58.09	90.40	100.0	98.49	99.49	99.96	96.47	96.76	74.56
% no seagrass	12.75		13.44	41.91	9.60	0.00	1.51	0.51	0.04	3.53	3.24	25.44
Transect C5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	100.0
% no seagrass											0.00	0.00
Transect C6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.56	97.76
% no seagrass											0.44	2.24
Transect L1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass								99.12	99.71	97.87	97.87	94.63
% no seagrass								0.88	0.29	2.13	2.13	5.37
Transect F1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											97.81	100.0
% no seagrass											2.19	0.00
Transect F2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.63	94.93
% no seagrass											0.37	5.07
Transect F3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.93	87.82
% no seagrass											0.07	12.18
Transect F4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											98.16	48.90
% no seagrass											1.84	51.1
Transect F5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.04	80.80
% no seagrass											0.96	19.2
Transect F6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	81.99
% no seagrass											10.00	18.01
Transect F7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											98.24	97.65
% no seagrass											1.76	2.35
Transect S1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											62.50	24.71
% no seagrass											37.50	75.29
Transect S2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											96.62	85.83
% no seagrass											3.38	14.17

Transect S3	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
% seagrass											99.19	97.13
% no seagrass											0.81	2.87
Transect S4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.97	98.82
% no seagrass											0.03	1.18
Transect S5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.12	67.08
% no seagrass											0.88	32.92
Transect S6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	99.78
% no seagrass											0.00	0.22

Changes in Seagrass Cover in each region of Lake Macquarie

Fourteen stations in Chain Valley Bay, ten off Summerland Point and four in Crangan Bay were surveyed for seagrass cover from 2011 to 2019. Seagrass cover for these three regions of the lake are shown in the table below. In 2014 six stations in Bardens Bay were added to the sampling schedule. By 2018, 50 seagrass transects were being sampled.

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

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
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
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
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

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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

Chain Valley Colliery 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, to be known as the High Water Mark (HWM) Subsidence Barrier, was calculated using a 35^{o} angle of draw from the depth of mining. The zone is approximately 130 meters wide. J.H. & E.S. Laxton – Environmental Consultants P/L were 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 work in 2012-15 was supervised by Mr Chris Ellis of LDO Group. In 2016/18, the ecological studies were supervised by Mr Wade Covey. In 2019 the work was supervised by Mr Chris Armit.

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 30^{th} and 31^{st} 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, 2014, 2015 and 2017 found the small seagrass *Halophila ovalis* 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 McDonell (Contact: 02 43580880), Mr Owen Farrugia (the previous 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: 0447 653 387).

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 lake bed 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 lake bed 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 John H. Laxton and 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). Also 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 video photographic resurvey 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 a further photographic resurvey of the 22 permanent seagrass transects was carried out, including determination of the elevation of the inner and outer ends of each transect using differential GPS (Pearson and Associates Pty. Ltd). A further 6 transects through the seagrass beds were added to the schedule. These new transects were located along the eastern shoreline of Chain Valley Bay (Figure 4.1).

In June 2012 and June 2013, 28 transects were resurveyed using the underwater video camera mounted on the floating platform. The lake bed 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.

LDO Lake Coal has 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 lake bed 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.

Bardens Bay around Trinity Point on the southern side is quite deep and seagrasses occupy only 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 2015. We were instructed not to resurvey Transects E10 to E16, located in Chain Valley Bay because no mining was to be undertaken in this area in the near future. A new Transect L1 was established and photographed.

The seagrass photographic survey in 2016 was undertaken between June 14th and 16th 2016. Very rough weather with heavy rainfall preceded the survey in June 2016. Purchase Order 486395.

In 2017 all established seagrass transects (35) were re-photographed between June 20th and 23rd. 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 2018. Fifteen new seagrass transects were added to the sampling schedule in 2018, bringing the total number of transects sampled to 50. The purchase order was 520872.

The 2019 seagrass survey was carried out between June 25th and June 27th. Order No. D100504.

2. Participants in the 2019 Survey and sequence of events

Mr Chris Armit, on behalf of Delta Coal, authorized the 2019 resurvey of the existing seagrass transects and the 15 new transects. The video photography was carried out between 25th and 27th June 2019 (Purchase order D100504). Ms. Zofia Laxton provided assistance in the field and laboratory during this work; The determination of the elevations of the inner and outer ends of the transects by differential GPS was undertaken in July 2019. This phase of the work was carried out by Mr Sean Price and Mr Chris Smith of Daly.Smith Pty. Ltd. (02 4973 2745) of Morisset.

3. Methods

Seagrass photography

A Sony Handycam 6.1 megapixel video camera (DCR-SR300E) with 40 GB hard drive fitted with a wide conversion lens x0.7 (VCL-HG737C) was inserted into an underwater housing. The underwater housing was mounted vertically in the centre of a 1m long surf board. This rig was towed alongside the 5.9m work boat. Experimentation revealed that the best photographic results were obtained when the boat and

photographic rig were poled very slowly along the transect line on windless days. Good quality photographs were obtained both in boat shadow and full sunlight although half shadow sequences could still be evaluated satisfactorily. In 2011 LED lights were added to the photographic rig to permit photography before dawn and to provide additional illumination when the rig was photographing in the boat shadow. This illumination provided excellent photographs in 2012 and 2013. In 2014, the level of Lake Macquarie was low because of the effect of the high pressure ridge over the western Tasman Sea. Although conditions were calm and seemingly ideal for video photography, a problem was encountered that was not apparent in earlier years. As the photographic rig was poled slowly across the seagrass beds in shallow water, bubbles of oxygen derived from photosynthesis rose through the water column and adhered to the face plate of the camera housing. This caused the video camera to focus on the bubbles and not the seagrass below. The result were badly out of focus video footage. At least ten stations had to be rephotographed the next day, making sure that any bubbles of oxygen were wiped away.

In 2015 good photographs were obtained at all Transects except A3 and A4 where bubbles of oxygen caused the camera to focus on the front lens of the camera housing.

In 2016 a new photographic platform was built incorporating the same camera and housing and utilized two powerful 12v LED underwater lights to illuminate the substratum. This rig could be used at night and allowed stations to be photographed before the problem with oxygen bubbles could manifest (around mid-day). This photographic rig was used in the 2017, 2018 and 2019 seagrass surveys.

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 beginning of each transect was marked by photographing a label with the transect number printed in large type.

At the end of the each day's photography, the hard drive of the video camera was downloaded to a desk top computer. The videos were played using Windows Media Player. The film was paused at around 1m intervals along the transect line. Each still frame was examined and the following information was recorded on a data sheet:

1. The file name and number of the video segment being examined.
2. The transect number and the date the video was taken.
3. 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 Cystophyllum omustum*);
   (f) % area occupied by filamentous and thallous algae (green or brown algae);
   (g) Number of the large bivalve *Pinna menkei*;
   (h) % area of uncolonised ground (bare ground, no macroscopic epibenthos).

Sixty-eight still photographs or quadrats were analyzed along each transect. At the end of the analysis of the photographs, the results were entered into a Lotus 123 work sheet and mean values for each category of organism were calculated.

Surveying Methods

Mr Sean Price of Daly.Smith P/L and staff 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 lake bed 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 lake bed was recorded.

The memory of the hand held 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 was made;
- The elevations of the seabed at the inner and outer ends of each transect, relative to AHD, were established and tabulated

4. Locations of permanent seagrass monitoring transects

Figures 4.1, 4.2 and 4.3 shows the area of Chain Valley Bay, Summerland Point, Bardens Bay, Brightwaters and Crangan Bay where the seagrass transects are located. In 2018 and 2019, a total of 50 transects were photographed.

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.

Transects E1 to E16	Established experimental transects in Chain Valley Bay and Summerland Point.
Transects T1 to T8	Established experimental transects along Summerland Point.
Transects C1 to C4	Established control stations in Crangan Bay.
Transects A1 to A6	Establised experimental stations in Bardens Bay in 2014.
Transect L1	Established in Chain Valley Bay in 2015.
Transects C5 to C6	Estabished in 2018.
Transects F1 to F7	Estabished in 2018.
Transects S1 to S6	Estabished in 2018.

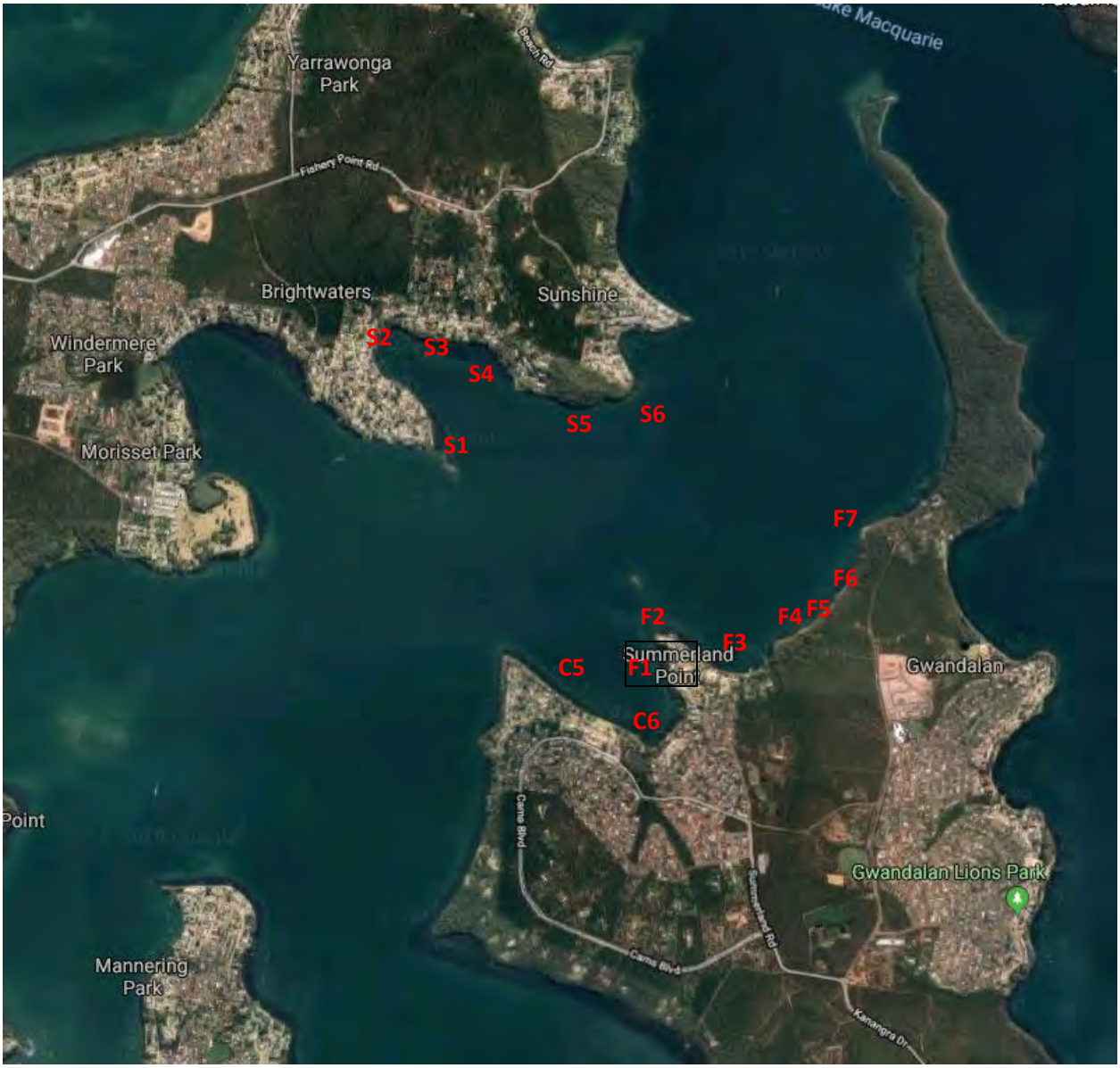


Figure 4.3. Location of transects C5-C6, F1-F7 and S1-S6.

Table 4.1 shows the precise locations of the inner and outer ends of the permanent seagrass monitoring transects in Chain Valley Bay, Summerland Point, Bardens Bay and Brightwaters as determined by differential GPS. Transects in Crangan Bay were for biological purposes only and did not require precise locations (hand held GPS coordinates were sufficient to re-locate them.

Table 4.1 Coordinates of inner and outer ends of permanent seagrass monitoring transects in Chain Valley Bay and Summerland Point and Bardens Bay.

Transect No.	Easting	Northing
E1 Inner	56363985.72	6331796.94
E1 Outer	56364003.72	6331816.06
E2 Inner	56364035.49	6331701.00
E2 Outer	56364077.23	6331716.71
E3 Inner	56363953.11	6331405.11
E3 Outer	56364027.16	6331417.57
E4 Inner	56364220.00	6331077.87
E4 Outer	56364259.75	6331121.87
E5 Inner	56365005.84	6330163.57
E5 Outer	56365034.05	6330224.84
E6 Inner	56365118.47	6329788.47
E6 Outer	56365174.78	6329802.22
E7 Inner	56385350.82	6332350.29
E7 Outer	56365298.68	6332344.74
E8 Inner	56365128.03	6331795.60
E8 Outer	56365096.65	6331811.91
E9 Inner	56365040.22	6331607.83
E9 Outer	56364912.70	6331523.88
E10 Inner	56365422.57	6331427.14
E10 Outer	56365395.00	6331361.69
E11 Inner	56365553.95	6331410.18
E11 Outer	56365524.48	6331343.17
E12 Inner	56365750.13	6331328.50
E12 Outer	56365734.72	6331284.93
E13 Inner	56365990.66	6331278.21
E13 Outer	56365970.63	6331190.94
E14 Inner	56366447.40	6331046.59
E14 Outer	56366371.08	6330984.10
E15 Inner	56366657.36	6330098.68
E15 Outer	56366611.13	6330167.43
E16 Inner	56366310.74	6329644.22
E16 Outer	56366272.62	6329666.71
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

C5 inner	56365676.16	6333038.72
C5 outer	56365703.00	6333084.97
C6 inner	56366045.25	6332831.74
C6 outer	56366058.27	6332871.22
T1 inner	56365388.39	6333100.63
T1 outer	56365400.16	6332952.03
T2 inner	56365383.99	6332949.75
T2 outer	56365377.34	6332816.66
T3 inner	56365357.00	6332831.43
T3 outer	56365350.44	6332589.92
T4 inner	56365303.47	6332575.45
T4 outer	56365347.64	6332380.21
T5 inner	56365299.87	6332338.33
T5 outer	56365320.77	6332207.30
T6 inner	56365267.87	6332207.03
T6 outer	56365336.78	6332262.48
T7 inner	56365295.26	6332270.84
T7 outer	56365267.87	6332207.03
T8 inner	56365336.78	6332262.48
T8 outer	56365295.26	6332270.84
A1 inner	56365336.78	6332262.48
A1 outer	56365295.26	6332270.84
A2 inner	56365336.78	6332262.48
A2 outer	56365295.26	6332270.84
A3 inner	56365336.78	6332262.48
A3 outer	56365295.26	6332270.84
A4 inner	56365336.78	6332262.48
A4 outer	56365295.26	6332270.84
A5 inner	56365336.78	6332262.48
A5 outer	56365295.26	6332270.84
A6 inner	56365336.78	6332262.48
A6 outer	56365295.26	6332270.84
L1 inner	56364292.51	6330367.71
L1 outer	56364304.21	6330399.90
F1 inner	56366321.02	6333250.37
F1 outer	56366285.49	6333250.37
F2 inner	56366342.20	6333330.55
F2 outer	56366291.43	6333450.83
F3 inner	56366611.15	6333163.06
F3 outer	56366620.59	6333228.02
F4 inner	56366968.12	6333242.58
F4 outer	56366918.39	6333284.49
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
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	36365569.66	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 because it had been placed in 2014 in water so deep that the survey staff and GPS unit could not reach the lake bed. In 2015 the end of the transect was moved inshore to coincide with the outer edge of the seagrass bed.

5. Transect length and depth profiles

Table 5.1 shows the length of each permanent transect.

Table 5.1. Transect lengths in 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 A1	42.60	**Transect A2**	24.00
Transect A3	34.80	**Transect A4**	26.30
Transect A5	18.30	**Transect A6**	13.70
Transect L1	20.00	**Transect C5**	41.573
Transect C6	13.673	**Transect F1**	47.114
Transect F2	130.552	**Transect F3**	65.638
Transect F4	65.037	**Transect F5**	70.461
Transect F6	74.807	**Transect F7**	30.473
Transect S1	69.635	**Transect S2**	31.461
Transect S3	79.984	**Transect S4**	105.048
Transect S5	16.599	**Transect S6**	27.665

6. Definitions of seagrass characteristics, fouling levels and other organisms

The following photographs show the various characteristics of seagrass (*Zostera capricorni*) and other organisms defined in Section 3, whose percentage cover was determined in each quadrat.

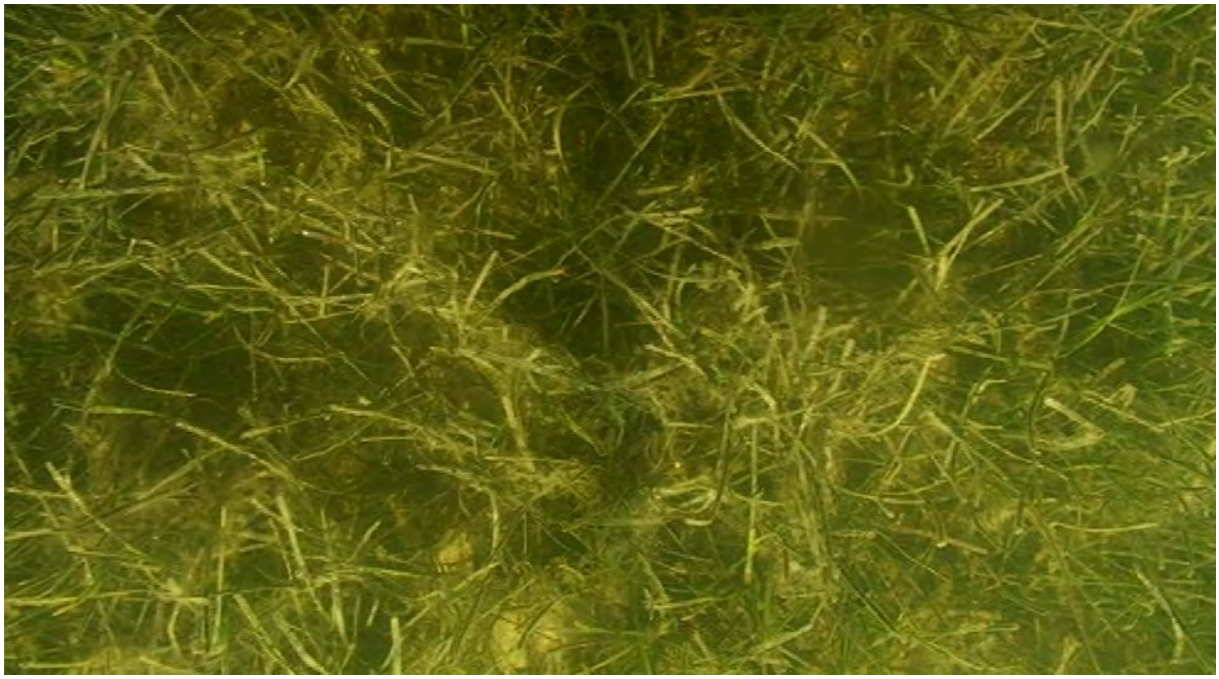


Plate 1. Short leaved sea grass with level 1 fouling (no fouling).

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

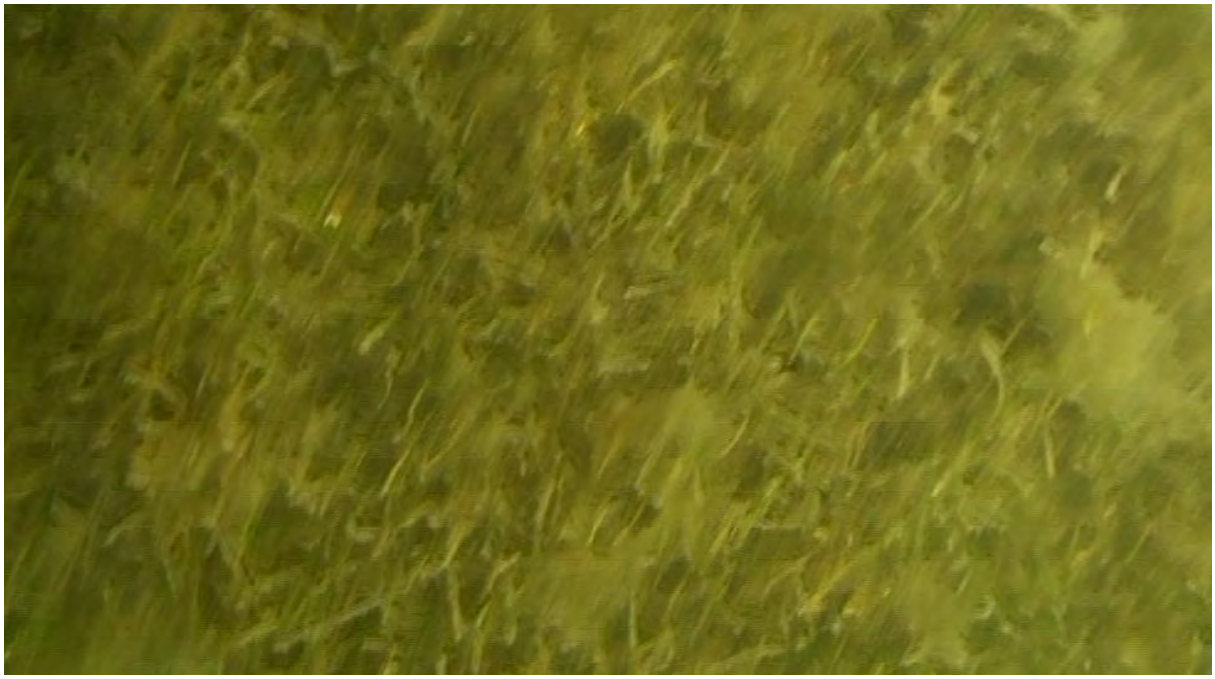


Plate 3. Short leaved seagrass with level 3 fouling (heavy fouling)

Plate 4. Dense long leaved seagrass with level 1 fouling (no fouling).

Plate 5. Long leaved seagrass with level 2 fouling (low fouling).

Plate 6. Seagrass with some bare ground.

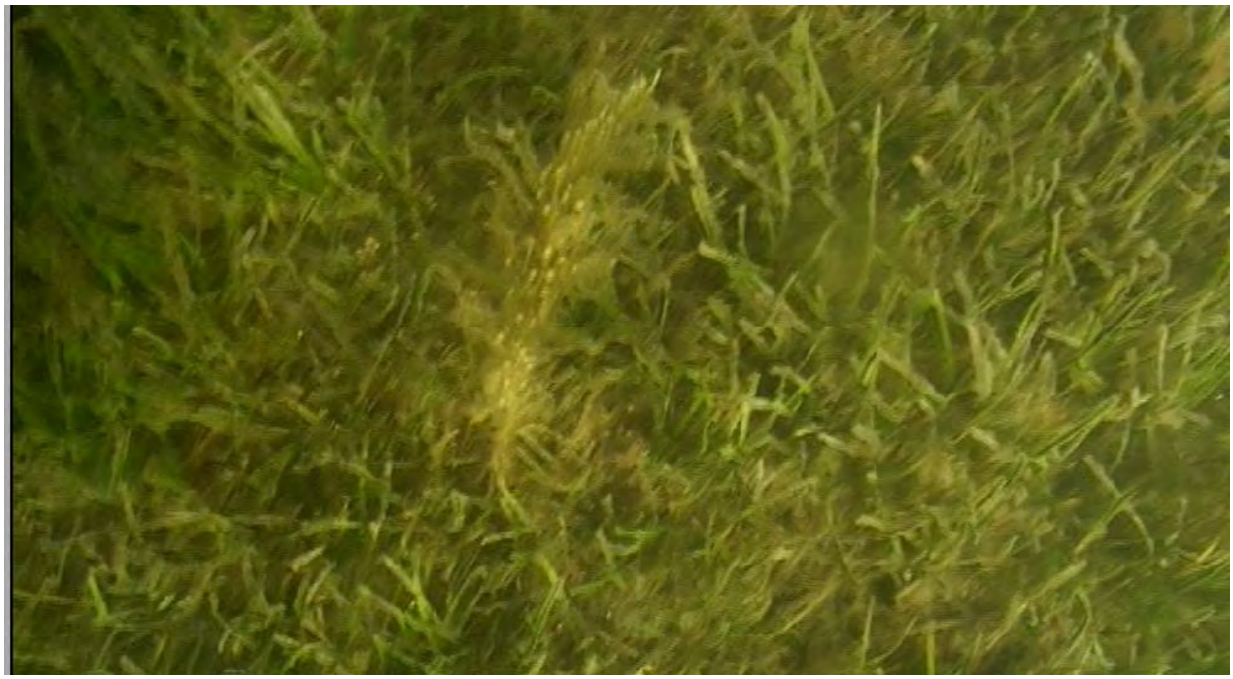


Plate 7. Short leaved seagrass with a single *Cystophyllum onustum* plant.

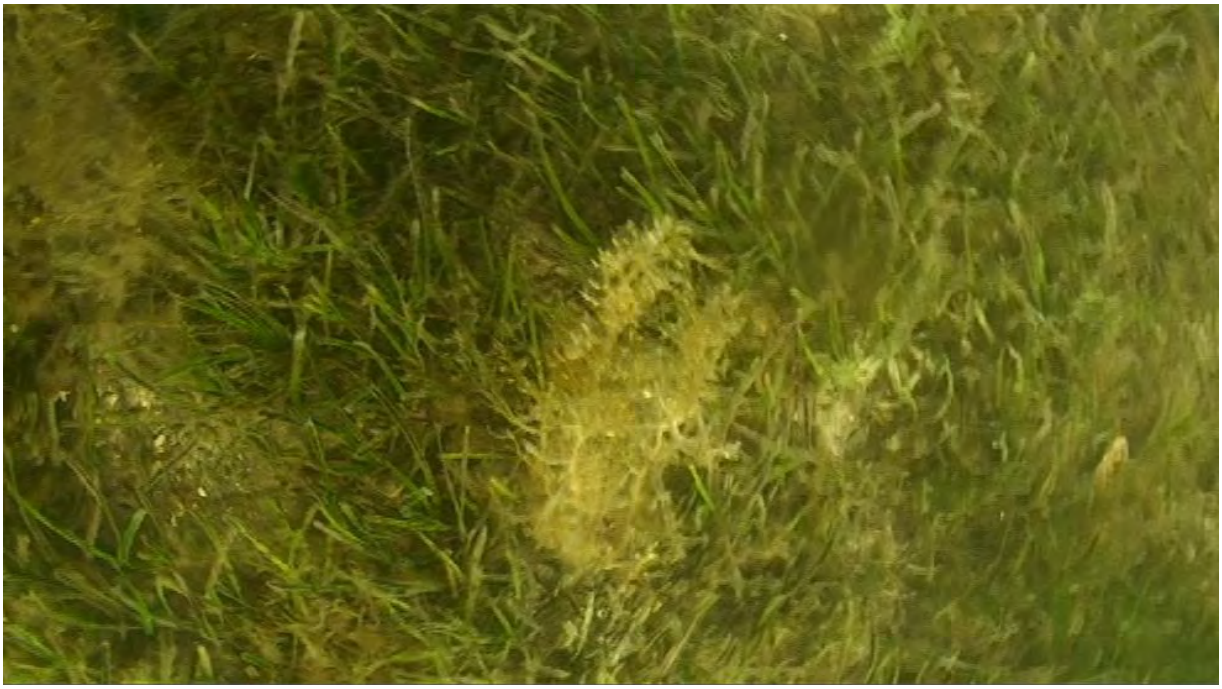


Plate 8. Short leaved seagrass with level 2 fouling (low fouling) and a *Cystophyllum onustum* plant.

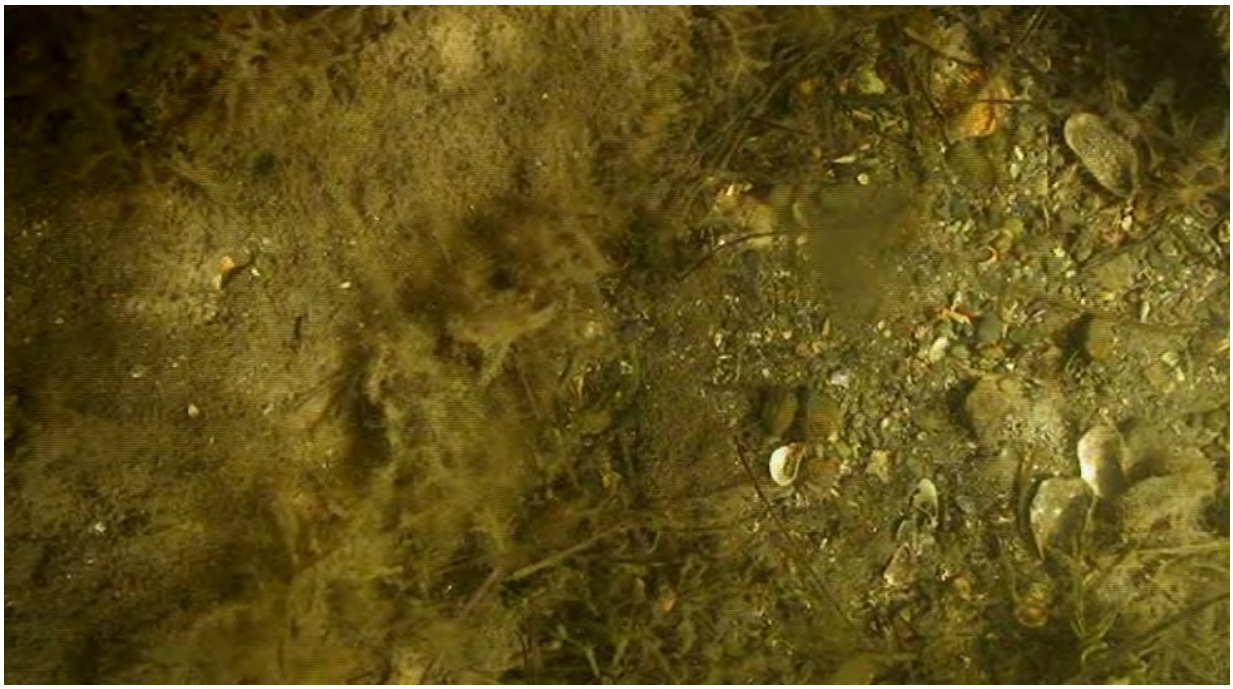


Plate 9. Algal mat and some bareground.

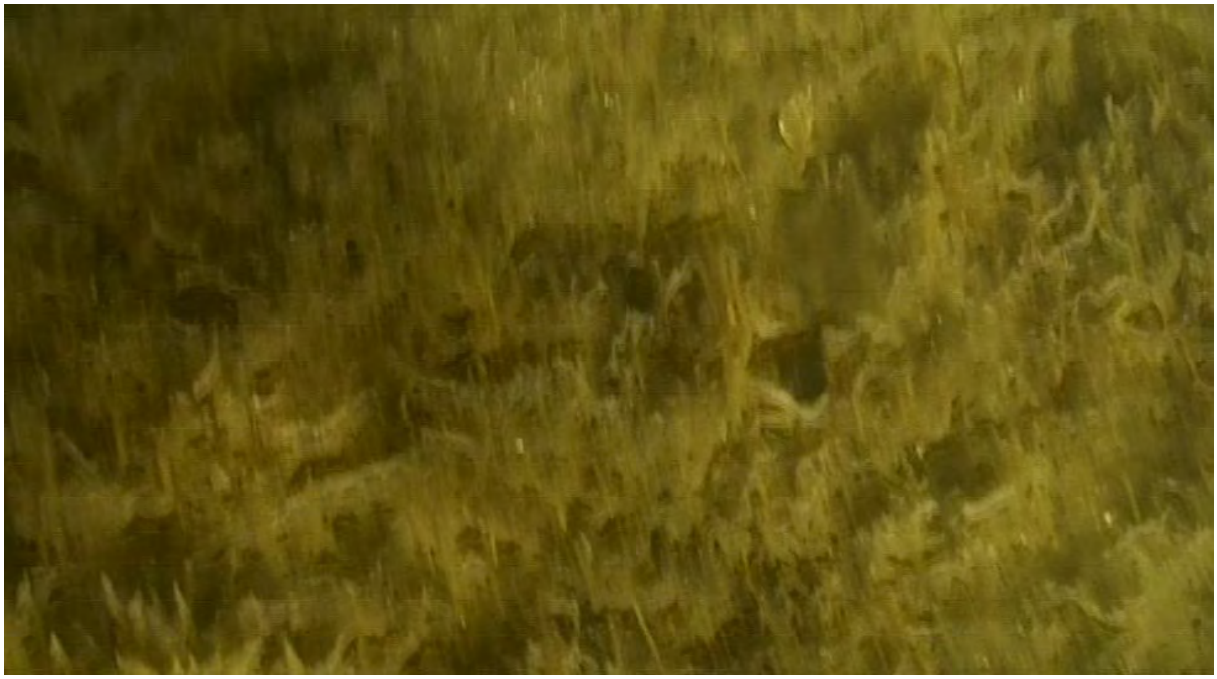


Plate 10. Dense algal mat.

Plate 11. Horse mussel or *Pinna menkei.*

Plate 12. *Halophila ovalis* (paddle weed) seen at transect E6 in Chain Valley Bay for the first time on 12th June 2010.

Plate 13. *Hormosira banksii* (fucoid brown alga) found at Transect C1 in Crangan Bay for the first time on 12th June 2010.

Plate 14. The brown alga *Cystophyllum onustum* growing on a shell in Chain Valley Bay.

7. Results of analysis of quadrats along permanent transects

Table 7.1 shows the percentage of seagrass present along each permanent transect in Chain Valley Bay, Summerland Point, Bardens Bay, Brightwaters and Crangan Bay between the period 2008 to 2018. The table shows that since 2008, seagrass coverage has been increasing throughout the study area, and percentage cover has been consistent since 2012 (Table 7.1). Figure 7.1 shows changes in the percentage cover of seagrasses at Transects E1 to E10 that have been sampled for 10 years.

Table 7.1 Percentage seagrass present along each transect (2008-2019)

Transect Endpoint Coordinates MGA Zone 56 / metres A.H.D										
Transect No.	**Easting**	**Northing**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Diff 08-**
E1 Inner	363985.72	6331796.94	-0.68	-0.68	-0.67	-0.69	-0.70	-0.68	-0.66	-0.02
E1 Outer	364003.72	6331816.06	-0.99	-.099	-1.02	-1.02	-1.02	-1.05	-0.99	-0.01
E2 Inner	364035.49	6331701.00	-0.67	-0.65	-0.67	-0.67	-0.67	-0.69	-0.63	-0.01
E2 Outer	364077.23	6331716.71	-1.70	-1.84	-1.81	-1.84	-1.85	-1.80	-1.76	-0.02
E3 Inner	363953.11	6331405.11	-0.33	-0.28	-0.31	-0.33	-0.33	-0.31	-0.30	-0.02
E3 Outer	364027.16	6331417.57	-2.29	-2.30	-2.35	-2.33	-2.34	-2.38	-2.34	0.00
E4 Inner	364220.00	6331077.87	-0.48	-0.46	-0.47	-0.47	-0.46	-0.47	-0.46	0.00
E4 Outer	364259.75	6331121.87	-1.69	-1.71	-1.63	-1.67	-1.66	-1.67	-1.56	-0.13
E5 Inner	365005.84	6330163.57	-0.41	-0.38	-0.42	-0.38	-0.39	-0.43	-0.35	-0.11
E5 Outer	365034.05	6330224.84	-1.59	-1.58	-1.55	-1.56	-1.57	-1.60	-1.53	-0.15
E6 Inner	365118.47	6329788.47	-0.45	-0.45	-0.48	-0.48	-0.44	-0.44	-0.48	0.00
E6 Outer	365174.78	6329802.22	-1.13	-1.13	-1.14	-1.16	-1.16	-1.16	-1.14	-0.07
E7 Inner	385350.82	6332350.29	-0.23	-0.23	-0.22	-0.16	-0.19	-0.22	-0.22	-0.02
E7 Outer	365298.68	6332344.74	-1.65	-1.68	-1.74	-1.72	-1.77	-1.69	-1.66	-0.02
E8 Inner	365128.03	6331795.60	-0.28	-0.31	-0.32	-0.31	-0.25	-0.34	-0.38	0.11
E8 Outer	365096.65	6331811.91	-0.96	-1.00	-1.02	-1.10	-1.00	-1.04	-1.01	0.02
E9 Inner	365040.22	6331607.83	-0.26	-0.28	-0.29	-0.30	-0.25	-0.29	-0.30	0.11
E9 Outer	364912.70	6331523.88	-1.14	-1.16	-1.18	-1.21	-1.17	-1.20	-1.31	0.24
E10 Inner	365422.57	6331427.14	-0.42	-0.42		-0.43	-0.42	-0.43	-0.49	0.04
E10 Outer	365395.00	6331361.69	-1.68	-1.73		-1.69	-1.70	-1.79	-1.80	0.07
E11 Inner	365553.95	6331410.18	-0.35	-0.34		-0.37	-0.35	-0.37	-0.41	-0.09
E11 Outer	365524.48	6331343.17	-1.04	-1.07		-1.09	-1.08	-1.10	-1.14	-0.05
E12 Inner	365750.13	6331328.50	-0.55	-0.55		-0.59	-0.55	-0.56	-0.59	0.02
E12 Outer	365734.72	6331284.93	-1.38	-1.39		-1.44	-1.41	-1.44	-1.53	-0.07
E13 Inner	365990.66	6331278.21	-0.54	-0.59		-0.58	-0.58	-0.58	-0.65	0.03
E13 Outer	365970.63	6331190.94	-1.35	-1.40		-1.39	-1.44	-1.42	-1.46	0.01
E14 Inner	366447.40	6331046.59	-0.48	-0.45		-0.45	-0.45	-0.45	-0.54	-0.02
E14 Outer	366371.08	6330984.10	-1.31	-1.30		-1.31	-1.32	-1.34	-1.38	-0.04
E15 Inner	366657.36	6330098.68	-0.37	-0.32		-0.33	-0.31	-0.32	-0.36	-0.02
E15 Outer	366611.13	6330167.43	-1.11	-1.13		-1.18	-1.12	-1.16	-1.17	-0.10

-.10E16 Inner	366310.74	6329644.22	-0.44	-0.42		-0.46	-0.45	-0.48	-0.47	-0.10
E16 Outer	366272.62	6329666.71	-0.96	-0.95		-0.98	-0.98	-1.01	-0.99	-0.13
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								
C5 inner	56365676	6333038						-0.09	0.03	
C5 outer	56365703	6333084						-2.18	-2.17	
C6 inner	56366045	6332831						-0.04	0.01	
C6 outer	56366058	6332871						-2.00	-1.82	
T1 inner	365388.39	6333100.63	-0.38	-0.47	-0.43	-0.46	-0.45	-0.48	-0.37	-0.03
T1 outer	365400.16	6332952.03	-1.18	-1.15	-1.19	--	-1.21	-1.20	-1.17	0.02
T2 inner	365383.99	6332949.75	-0.72	-0.75	-0.74	-0.72	-0.72	-0.74	-0.83	0.13
T2 outer	365377.34	6332816.66	-1.34	-1.35	-1.37	-1.35	-1.37	-1.36	-1.35	0.04
T3 inner	365357.00	6332831.43	-0.34	-0.35	-0.34	-0.38	-0.35	-0.38	-0.37	0.08
T3 outer	365350.44	6332589.92	-1.03	-1.03	-1.06	-1.03	-1.04	-1.06	-1.11	0.10
T4 inner	365303.47	6332575.45	-0.46	-0.49	-0.46	-0.49	-0.50	-0.50	-0.38	-0.08
T4 outer	365347.64	6332380.21	-1.16	-1.13	-1.15	-1.15	-1.16	-1.15	-1.16	0.04
T5 inner	365299.87	6332338.33	-0.43	-0.48	-0.43	-0.46	-0.47	-0.52	-0.50	0.08
T5 outer	365320.77	6332207.30	-1.43	-1.47	-1.43	-1.44	-1.46	-1.47	-1.50	0.12
T6 inner	365267.87	6332207.03	-0.45	-0.45	-0.42	-0.42	-0.41	-0.42	-0.39	-0.08
T6 outer	365336.78	6332262.48	-1.61	-1.63	-1.68	-1.63	-1.64	-1.64	-1.64	0.03
T7 inner	365295.26	6332270.84	-0.18	-0.20	-0.21	-0.20	-0.12	-0.22	-0.26	0.09
T7 outer	365267.87	6332207.03	-1.63	-1.71	-1.67	-1.67	-1.67	-1.69	-1.69	0.05
T8 inner	365336.78	6332262.48	-0.13	-0.20	-0.17	-0.27	-0.18	-0.27	-0.15	-0.05
T8 outer	365295.26	6332270.84	-1.18	-1.18	-1.23	-1.18	-1.18	-1.24	-1.20	0.06
A1 inner	365336.78	6332262.48		-0.51	-0.57	-0.56	-0.59	-0.58	-0.52	0.01
A1 outer	365295.26	6332270.84		-1.19	-1.20	-1.24	-1.25	-1.25	-1.32	0.13
A2 inner	365336.78	6332262.48		-0.39	-0.44	-0.42	-0.45	-0.46	-0.45	0.06
A2 outer	365295.26	6332270.84		-0.81	-0.87	-0.86	-0.86	-0.89	-0.91	0.10
A3 inner	365336.78	6332262.48		-0.33	-0.34	-0.31	-0.30	-0.35	-0.25	-0.08
A3 outer	365295.26	6332270.84		-3.44	-1.38	-1.42	-1.43	-1.44	-1.24	-0.20
A4 inner	365336.78	6332262.48		-0.16	-0.19	-0.16	-0.16	-0.17	-0.17	0.01
A4 outer	365295.26	6332270.84		-0.72	-0.73	-0.73	-0.71	-0.71	-0.68	-0.04
A5 inner	365336.78	6332262.48		-0.30	-0.32	-0.33	-0.30	-0.32	-0.36	0.06
A5 outer	365295.26	6332270.84		-0.96	-0.95	-0.95	-0.95	-0.98	-1.01	0.05
A6 inner	365336.78	6332262.48		-0.14	-0.16	-0.14	-0.14	-0.15	-0.20	0.06
A6 outer	365295.26	6332270.84		-0.68	-0.69	-0.68	-0.68	-0.73	-0.76	0.08
L1 inner	364292.51	6330367.71			-1.12	-1.14	-1.11	-1.12	-1.07	-0.05
L1 outer	364304.21	6330399.90			-1.63	-1.66	-1.70	-1.63	-1.68	0.05
F1 inner	56366321	6333281.31						-0.22	-0.30	0.08

F1 outer	56366285	6333250.37						-1.28	-1.22	-0.06
F2 inner	56366342	6333330.55						-0.21	-0.19	-0.25
F2 outer	56366291	6333450.83						-1.95	-1.94	-0.01
F3 inner	56366611	6333163.06						-0.08	-0.12	0.04
F3 outer	56366620	6333228.02						-1.85	-1.70	-0.15
F4 inner	56366968	6333242.58						-0.08	-0.10	0.02
F4 outer	56366918	6333284.49						-2.42	-2.44	0.02
F5 inner	56367106	6333361.98						-0.30	-0.29	-0.01
F5 outer	56367068	6333421.28						-2.43	-2.48	0.05
F6 inner	56367271	6333493.19						-0.27	-0.28	0.01
F6 outer	56367202	6333522.83						-2.78	-2.75	-0.03
F7 inner	56367402	6333682.09						-0.45	-0.45	0.00
F7 outer	56367374	6333694.93						-1.37	-1.47	0.10
S1 inner	56365009	6334470.41						-0.61	-0.56	-0.05
S1 outer	56365077	6334481.77						-1.75	-1.71	-0.04
S2 inner	56364642	6334943.57						-0.25	-0.23	-0.02
S2 outer	56364673	6334939.82						-1.56	-1.51	-0.05
S3 inner	56365017	6335008.93						-0.08	-0.15	0.07
S3 outer	56365041	6334932.70						-1.84	-1.94	0.10
S4 inner	56365235	6334992.86						-0.08	-0.14	-0.66
S4 outer	56365217	6334889.31						-1.70	-1.74	0.04
S5 inner	56362275	6334709.08						-0.66	-0.66	0.00
S5 outer	56365569	6334693.44						-1.36	-1.40	0.04
S6 inner	56366144	6334765.21						-0.07	-0.06	-0.01
S6 outer	56366172	6334761.92						-0.89	-0.89	0.00

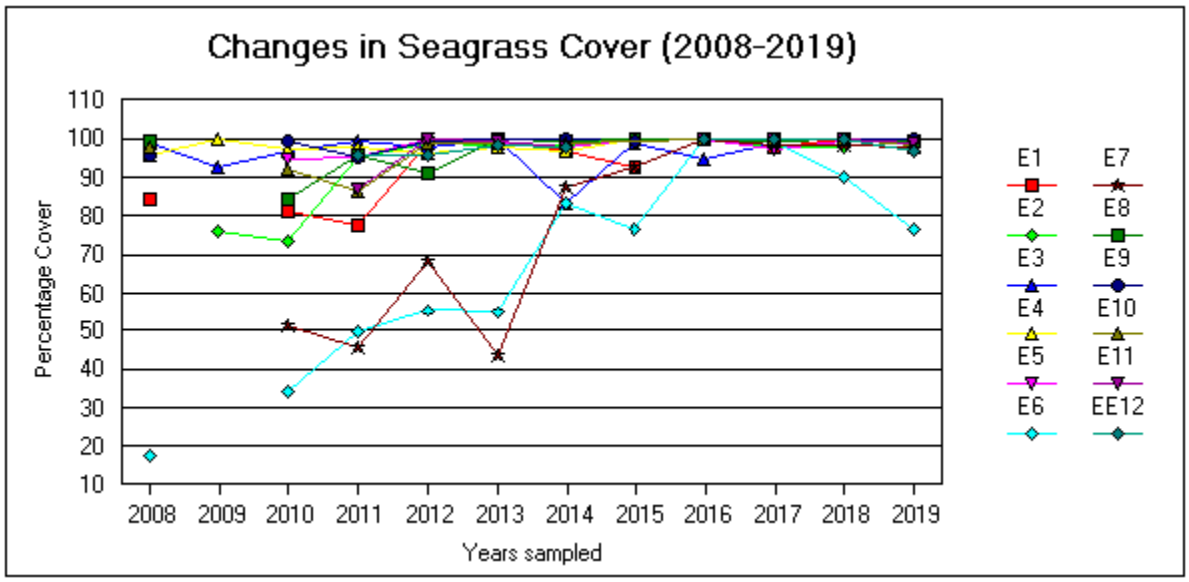


Figure 7.1. Changes in percentage area of seagrasses at Transects E1 to E12 that had been sampled for 11 years.

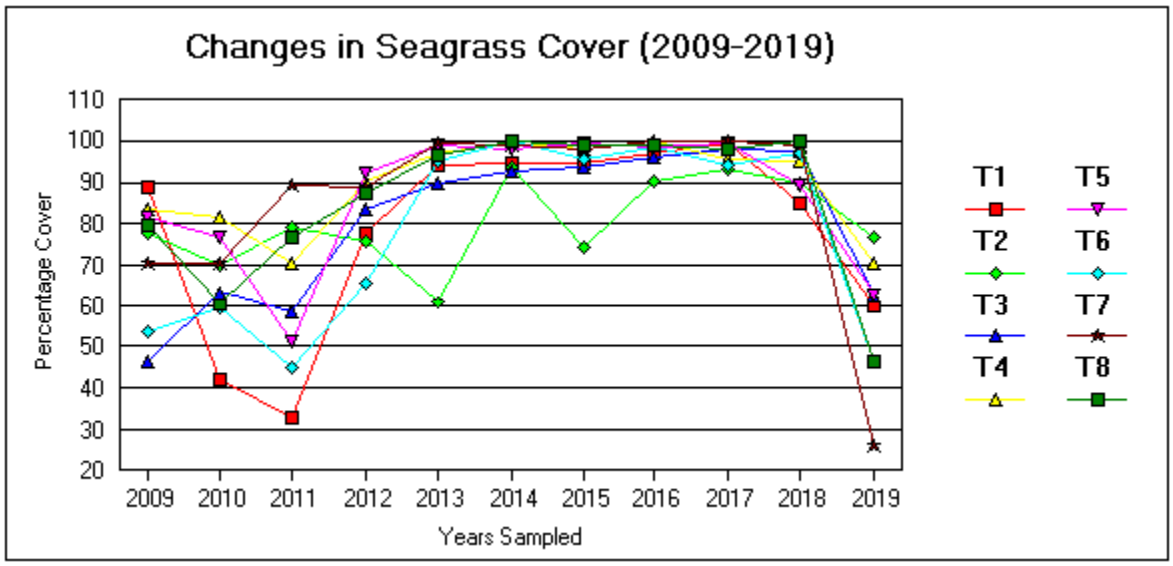


Figure 7.2 Changes in percentage area of seagrasses at Transects T1 to T8 that had been sampled for 10 years.

In June 2019, seagrass cover at the transects ranged from 24.71 to 100 percent in the study area (Table 7.1). The health and condition of the seagrass was good generally but, at some stations, the percentage cover was much lower than it was 2018 (Figure 7.2) particularly at Transects T1 to T8. Some seagrasses were lightly fouled with epiphytic algae while others were clear of epiphytic algae. The brown seaweed *Cystophyllum onustum* was present on shells and pebbles protruding through the seagrass, almost reaching the surface at Transects E1 to E4.

Plate 15 shows sand deposited on seagrasses along Summerland Point after strong onshore winds in June 2011. This event demonstrated how climatic conditions can effect 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.

Changes in the percentage area of the substratum covered by seagrasses in 2016 to 2019, compared with the 2008 values are shown in Table 7.2. 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 41% respectively.

Plate 15. *Zostera caprcorni* covered by sand along Summerland Point after strong southwesterly winds

Table 7.2

Transect E1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	84.15		81.01	77.75	98.62	99.44	96.85	92.44	99.88	97.96	97.87	99.12
% no seagrass	15.85		18.99	22.25	1.38	0.56	3.15	7.56	0.12	2.04	2.13	0.88
Transect E2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	83.72		75.87	73.38	95.49	99.09	98.38	98.49	99.71	100.0	97.94	97.94
% no seagrass	16.28		24.13	26.62	4.49	0.91	1.62	1.51	0.29	0.00	2.06	2.06
Transect E3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	98.29		98.97	92.76	96.97	99.16	97.66	100.0	83.53	98.90	94.56	98.97
% no seagrass	1.71		1.03	7.24	1.54	0.84	2.34	0.00	16.47	1.10	5.44	1.03
Transect E4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	80.16		98.54	95.74	100.0	97.50	98.06	96.43	98.01	96.76	99.71	99.85
% no seagrass	19.84		1.46	4.26	0.00	2.50	1.94	3.57	1.99	3.24	0.29	0.15

Transect E5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.88		94.93	95.19	100.0	98.82	97.01	99.82	100.0	97.22	99.41	98.97
% no seagrass	4.12		5.07	4.81	0.00	1.18	2.99	0.18	0.00	2.78	0.59	1.03
Transect E6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	17.74		34.06	49.56	55.51	54.93	83.24	76.62	100.0	99.56	89.91	76.69
% no seagrass	82.16		65.94	50.44	44.49	45.07	16.76	23.38	0.00	0.44	10.09	23.31
Transect E7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.93		51.40	45.47	68.31	43.38	87.65	92.65	100.0	98.16	98.16	97.65
% no seagrass	2.07		48.60	54.53	31.69	56.62	12.35	7.35	0.00	1.84	1.84	2.35
Transect E8	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	99.32		84.26	95.56	90.96	99.93	99.26	99.85	100.0	99.34	100.0	99.34
% no seagrass	0.68		15.74	4.44	9.04	0.07	0.74	0.15	0.00	0.66	0.00	0.66
Transect E9	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.94		99.39	95.51	99.49	99.71	99.71	99.56	100.0	99.78	100.0	100.0
% no seagrass	4.06		0.61	4.49	0.51	0.29	0.29	0.44	0.00	0.22	0.00	0.00
Transect E10	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.94		92.21	86.25	98.99	98.82	98.87	NS	100.0	100.0	100.0	98.21
% no seagrass	2.06		7.79	13.75	1.01	1.18	1.13		0.00	0.00	0.00	1.79
Transect E11	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				86.93	99.85	99.49	97.65	NS	100.0	100.0	100.0	98.94
% no seagrass				13.07	0.15	0.51	2.35		0.00	0.00	0.00	1.06
Transect E12	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				95.68	95.53	98.09	97.94	NS	100.0	100.0	100.0	97.0
% no seagrass				7.32	4.47	1.91	2.06		0.00	0.00	0.00	3.0
Transect E13	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				93.97	99.26	100.0	99.93	NS	100.0	100.0	100.0	99.95
% no seagrass				6.03	0.74	0.00	0.07		0.00	0.00	0.00	0.05
Transect E14	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				86.54	99.34	100.0	99.68	NS	100.0	90.44	100.0	98.24
% no seagrass				13.46	0.56	0.00	0.32		0.00	9.56	0.00	1.76
Transect E15	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				90.29	99.93	99.66	92.28	NS	100.0	93.31	99.85	50.66
% no seagrass				9.71	0.07	0.34	7.72		0.00	6.69	0.15	49.34
Transect E16	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass				82.79	93.22	94.12	97.87	NS	100.0	99.94	99.71	95.0
% no seagrass				17.21	6.78	5.88	2.13		0.00	0.06	0.29	5.0
Transect T1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	88.94		41.90	32.60	77.91	94.41	94.85	94.65	97.35	99.47	85.29	59.92
% no seagrass	11.06		58.10	67.40	22.09	5.59	5.15	5.35	2.65	0.53	14.71	40.08

Transect T2	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
% seagrass	77.91		70.29	7.95	75.74	60.83	93.68	74.41	90.59	93.31	90.00	76.87
% no seagrass	22.09		29.71	92.05	24.26	39.17	6.32	25.59	9.41	6.69	10.00	23.13
Transect T3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	46.20		63.16	58.53	83.53	89.93	92.65	93.82	96.10	98.19	97.57	63.01
% no seagrass	53.80		36.84	41.47	16.47	10.07	7.35	6.18	3.90	1.81	2.43	36.99
Transect T4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	83.51		81.89	70.37	90.37	97.28	99.41	97.94	99.85	95.76	95.07	70.44
% no seagrass	16.49		18.01	29.63	9.63	2.72	0.59	2.06	0.15	4.24	4.93	29.56
Transect T5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	81.78		77.00	51.40	92.35	99.12	98.24	99.41	98.82	99.56	89.63	62.65
% no seagrass	18.22		23.00	48.60	7.65	0.88	1.76	0.59	1.18	0.44	10.37	37.35
Transect T6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	53.82		59.63	44.77	65.59	95.22	99.85	95.74	98.82	94.41	97.13	46.18
% no seagrass	46.18		40.37	53.23	34.41	4.78	0.15	4.26	1.18	5.59	2.87	53.82
Transect T7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	97.93		70.79	89.34	89.09	99.78	98.97	98.38	100.0	99.85	98.97	25.88
% no seagrass	2.07		29.51	10.66	10.91	0.22	1.03	1.62	0.00	0.15	1.03	74.12
Transect T8	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.94		60.29	76.99	87.64	96.76	99.85	99.26	99.26	98.24	100.0	46.32
% no seagrass	4.06		39.71	23.01	13.26	3.24	0.15	0.74	0.74	1.76	0.00	53.68
Transect A1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							97.97	98.09	88.97	99.85	96.18	85.15
% no seagrass							2.03	1.91	11.03	0.15	3.82	14.85
Transect A2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							92.38	96.99	98.75	98.38	94.93	98.09
% no seagrass							7.62	3.01	1.25	1.62	5.07	1.91
Transect A3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							100.0	86.40	94.85	96.69	98.01	99.26
% no seagrass							0.00	13.60	5.15	3.31	1.99	0.74
Transect A4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							94.51	93.97	99.12	100.0	89.78	48.98
% no seagrass							5.49	6.03	0.88	0.00	10.22	51.02
Transect A5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							96.37	95.59	99.71	100.0	97.35	84.50
% no seagrass							3.63	4.41	0.29	0.00	2.65	15.50
Transect A6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass							99.56	98.01	96.97	97.65	93.53	90.88
% no seagrass							0.44	1.99	3.03	2.35	6.47	9.12
Transect C1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**

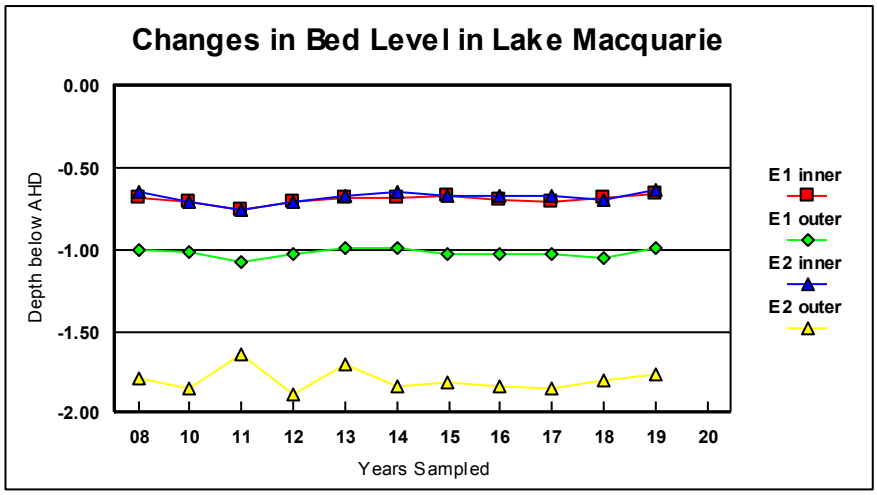
% seagrass	48.60		80.53	68.71	85.38	99.31	97.82	94.04	99.94	76.18	99.68	34.26
% no seagrass	51.40		19.47	31.29	14.62	0.69	2.18	5.96	0.06	23.82	0.32	65.74
Transect C2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	93.09		98.03	67.79	95.21	97.24	96.69	100.0	98.09	99.40	96.69	81.62
% no seagrass	6.91		1.97	32.21	4.79	2.76	3.31	0.00	1.91	0.60	3.31	18.38
Transect C3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	95.59		88.75	94.41	97.16	99.93	98.75	98.46	99.90	96.47	100.0	87.21
% no seagrass	4.41		11.25	5.59	2.84	0.07	1.25	1.54	0.10	3.53	0.00	12.79
Transect C4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass	87.25		86.56	58.09	90.40	100.0	98.49	99.49	99.96	96.47	96.76	74.56
% no seagrass	12.75		13.44	41.91	9.60	0.00	1.51	0.51	0.04	3.53	3.24	25.44
Transect C5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	100.0
% no seagrass											0.00	0.00
Transect C6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.56	97.76
% no seagrass											0.44	2.24
Transect L1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass								99.12	99.71	97.87	97.87	94.63
% no seagrass								0.88	0.29	2.13	2.13	5.37
Transect F1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											97.81	100.0
% no seagrass											2.19	0.00
Transect F2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.63	94.93
% no seagrass											0.37	5.07
Transect F3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.93	87.82
% no seagrass											0.07	12.18
Transect F4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											98.16	48.90
% no seagrass											1.84	51.1
Transect F5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.04	80.80
% no seagrass											0.96	19.2
Transect F6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	81.99
% no seagrass											10.00	18.01
Transect F7	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											98.24	97.65

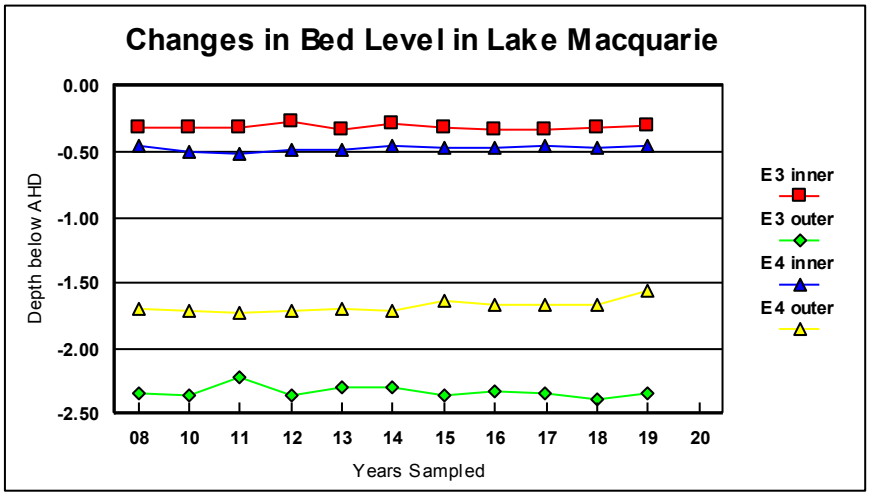
% no seagrass											1.76	2.35
Transect S1	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											62.50	24.71
% no seagrass											37.50	75.29
Transect S2	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											96.62	85.83
% no seagrass											3.38	14.17
Transect S3	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.19	97.13
% no seagrass											0.81	2.87
Transect S4	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.97	98.82
% no seagrass											0.03	1.18
Transect S5	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											99.12	67.08
% no seagrass											0.88	32.92
Transect S6	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
% seagrass											100.0	99.78
% no seagrass											0.00	0.22

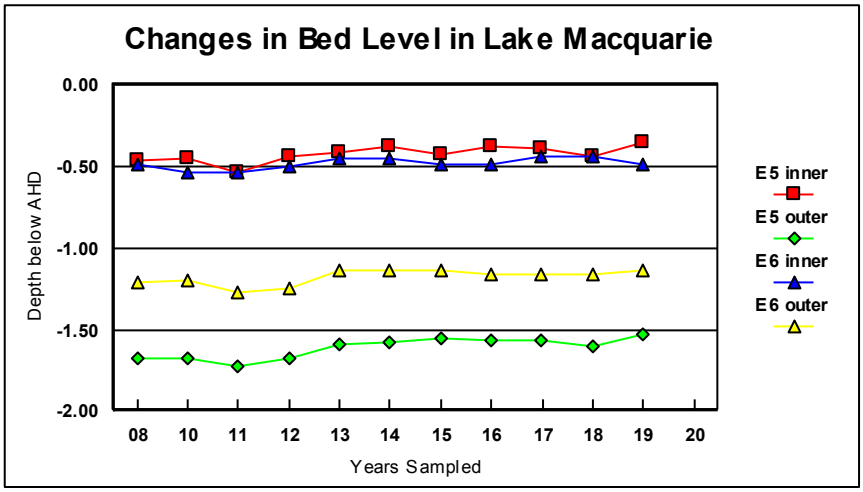
Table 7.2. Changes in the percentage area of the substratum covered by seagrasses in 2008 to 2019.

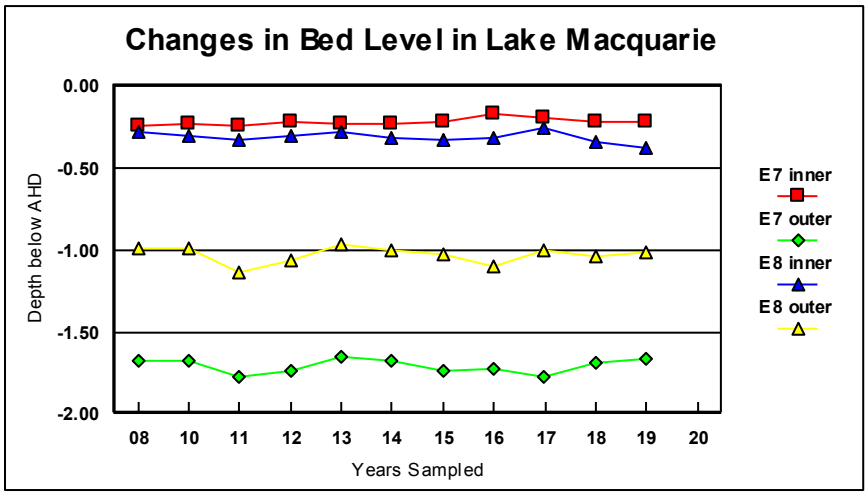
8. Changes in Elevation of the Lake Bed

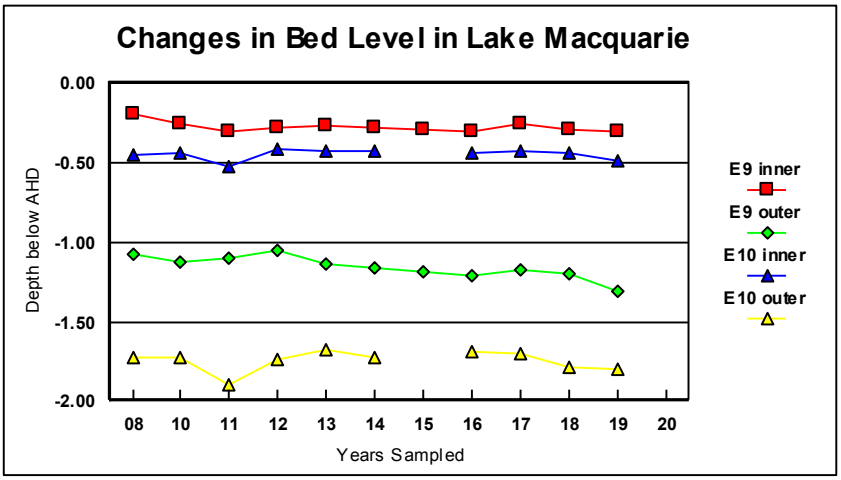
Figure 8.1 shows changes to the level of the lake bed at the inner and outer ends of Transects that have been sampled for eleven years. Table 8.1 compares the elevation of the lake bed at the inner and outer ends of each transect for the years 2013 to 2019 compared with 2008.

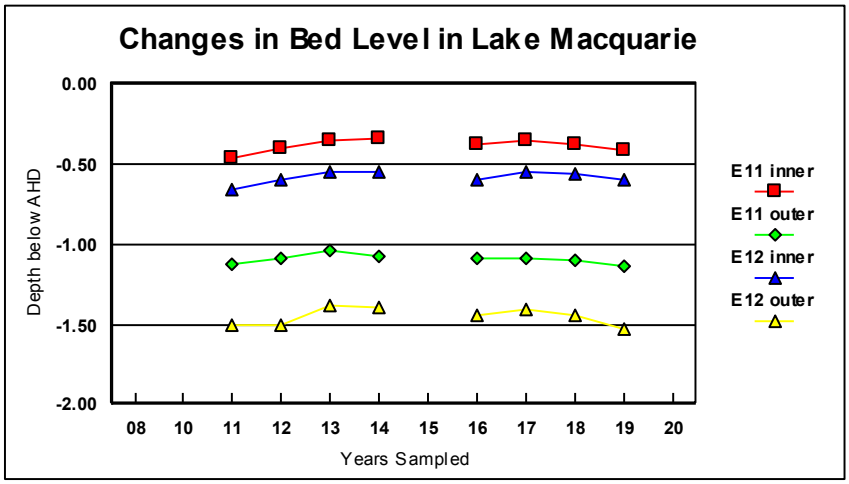

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E1 inner
E1 outer
E2 inner
E2 outer

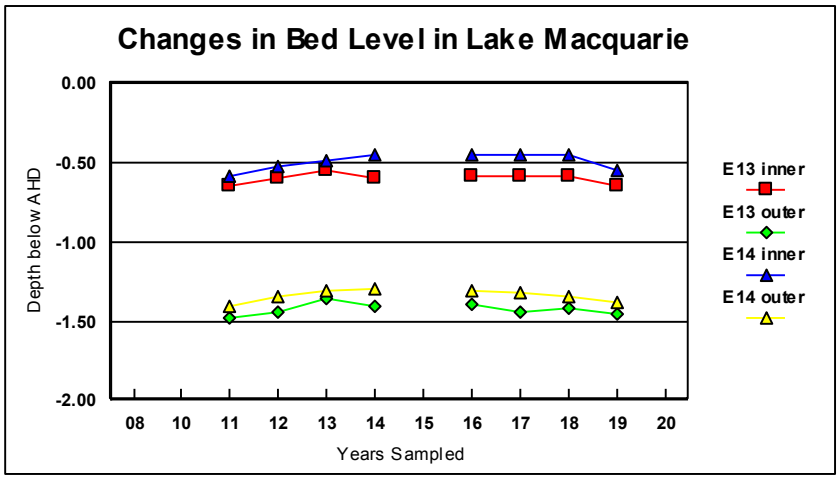

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
-2.50
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E3 inner
E3 outer
E4 inner
E4 outer

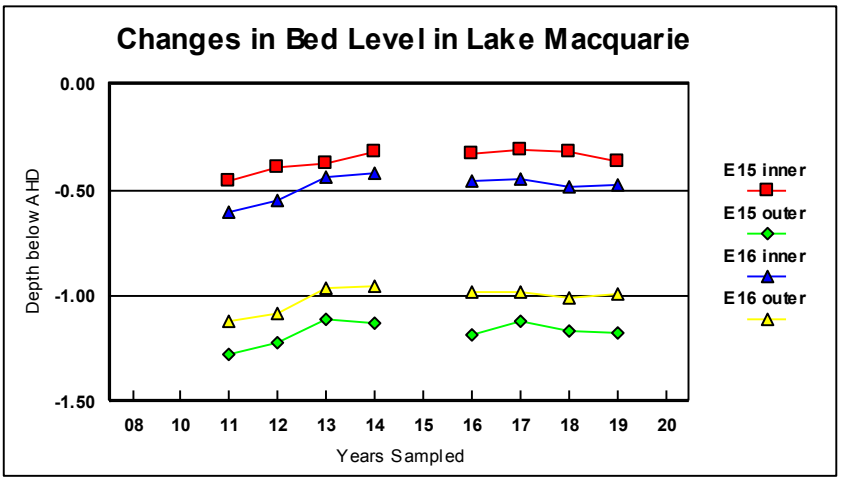

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E5 inner
E5 outer
E6 inner
E6 outer

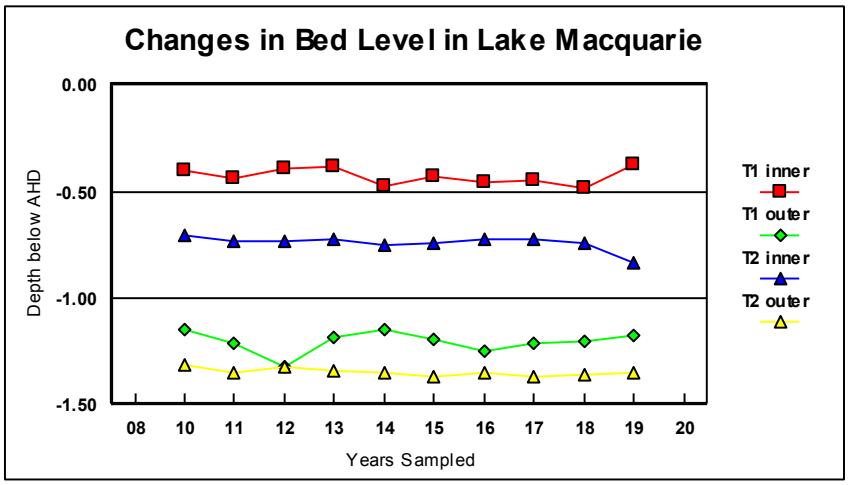

Changes in Bed Level in Lake Macquarie
0.00
-0.50
-1.00
-1.50
-2.00
Depth below AHD
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E7 inner
E7 outer
E8 inner
E8 outer

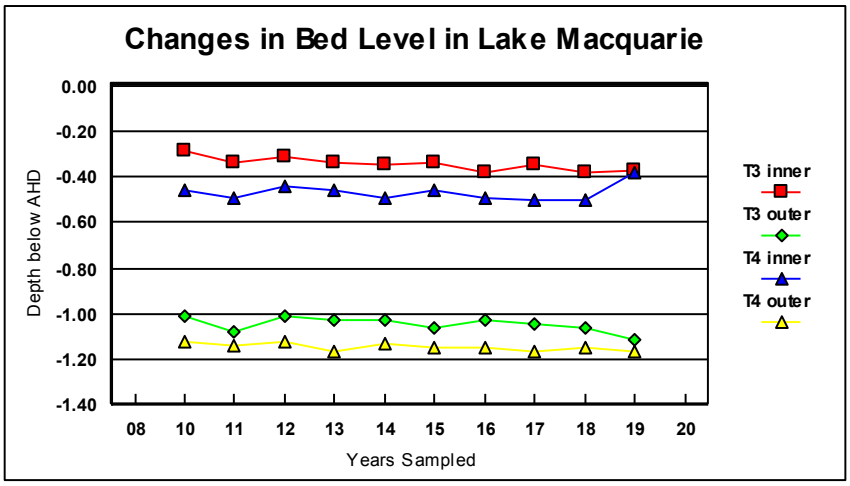

Changes in Bed Level in Lake Macquarie
0.00
-0.50
-1.00
-1.50
-2.00
Depth below AHD
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E9 inner
E9 outer
E10 inner
E10 outer

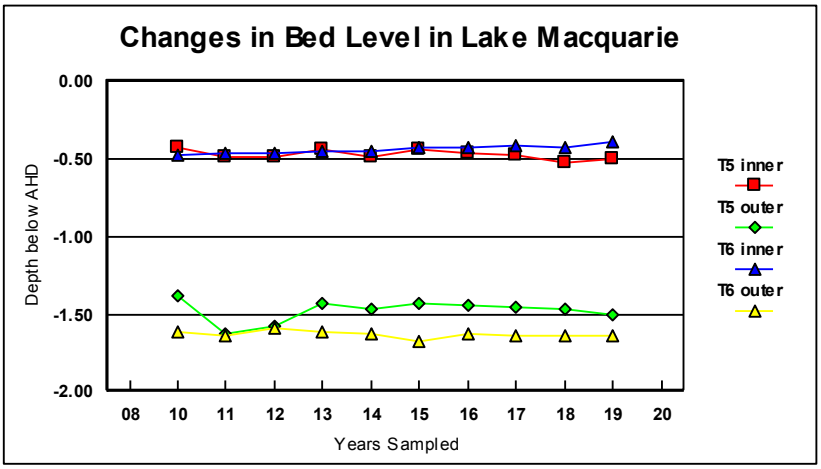

Changes in Bed Level in Lake Macquarie
0.00
-0.50
-1.00
-1.50
-2.00
Depth below AHD
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E11 inner
E11 outer
E12 inner
E12 outer

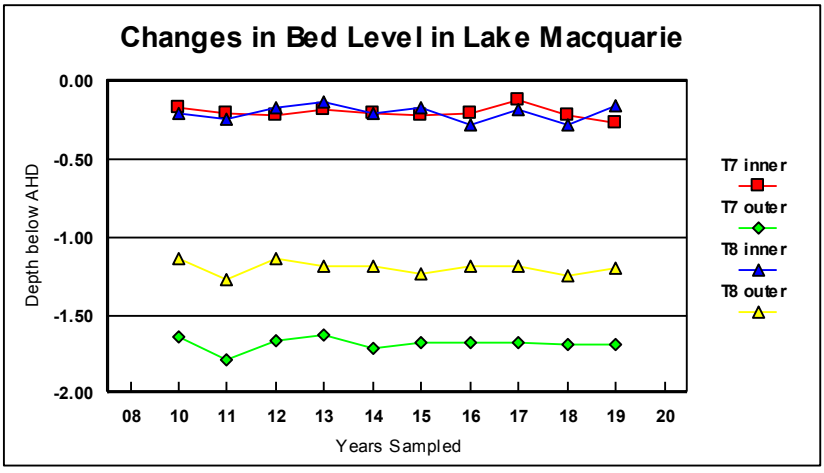

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E13 inner
E13 outer
E14 inner
E14 outer

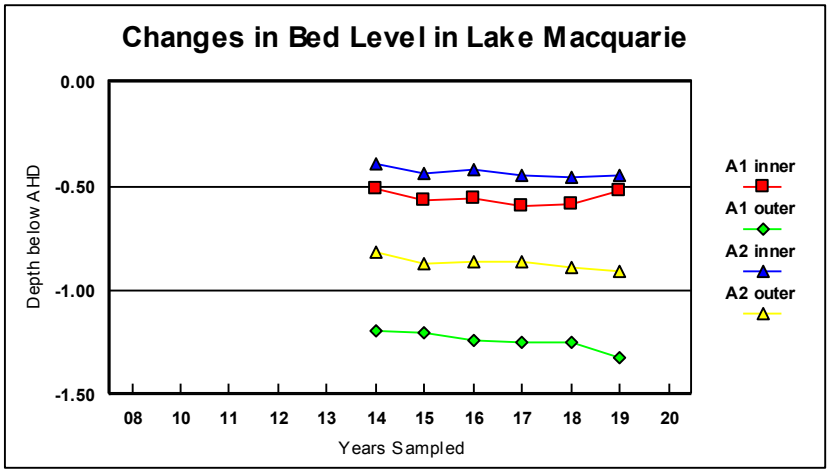

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
E15 inner
E15 outer
E16 inner
E16 outer

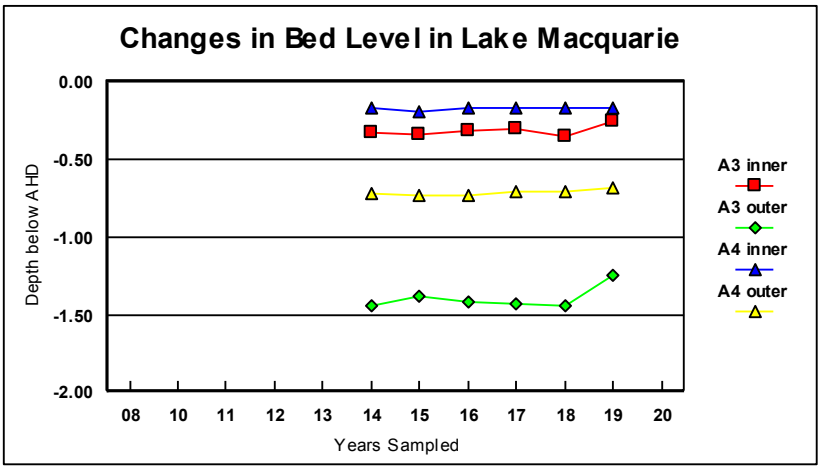

Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
T1 inner
T1 outer
T2 inner
T2 outer


Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
T3 inner
T3 outer
T4 inner
T4 outer


Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
T5 inner
T5 outer
T6 inner
T6 outer


Changes in Bed Level in Lake Macquarie
Depth below AHD
0.00
-0.50
-1.00
-1.50
-2.00
08 10 11 12 13 14 15 16 17 18 19 20
Years Sampled
T7 inner
T7 outer
T8 inner
T8 outer





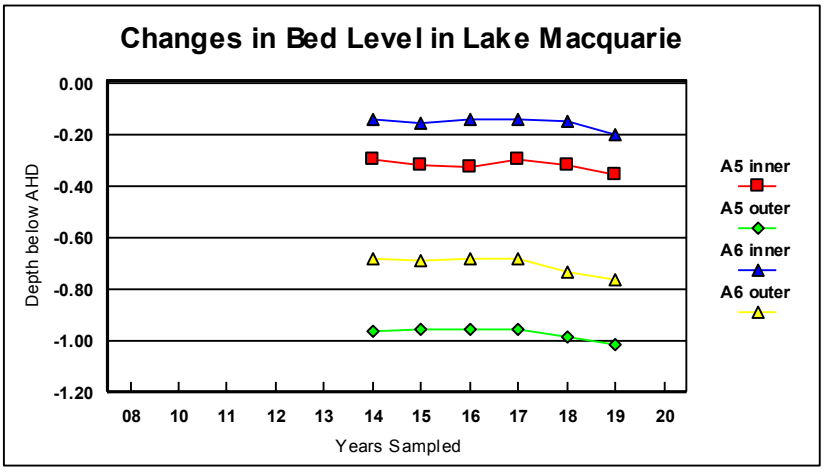


Figure 8.1. Changes in lake bed level at the inner and outer ends of each transect.

Table 8.1. Changes in elevation of the lake bed in 2012 to 2019 compared with 2008 and the starting dates of each new transect.

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Transect Endpoint Coordinates MGA Zone 56 / metres A.H.D										
Transect No.	**Easting**	**Northing**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Diff 08-**
E1 Inner	363985.72	6331796.94	-0.68	-0.68	-0.67	-0.69	-0.70	-0.68	-0.66	-0.02
E1 Outer	364003.72	6331816.06	-0.99	-.099	-1.02	-1.02	-1.02	-1.05	-0.99	-0.01
E2 Inner	364035.49	6331701.00	-0.67	-0.65	-0.67	-0.67	-0.67	-0.69	-0.63	-0.01
E2 Outer	364077.23	6331716.71	-1.70	-1.84	-1.81	-1.84	-1.85	-1.80	-1.76	-0.02
E3 Inner	363953.11	6331405.11	-0.33	-0.28	-0.31	-0.33	-0.33	-0.31	-0.30	-0.02
E3 Outer	364027.16	6331417.57	-2.29	-2.30	-2.35	-2.33	-2.34	-2.38	-2.34	0.00
E4 Inner	364220.00	6331077.87	-0.48	-0.46	-0.47	-0.47	-0.46	-0.47	-0.46	0.00
E4 Outer	364259.75	6331121.87	-1.69	-1.71	-1.63	-1.67	-1.66	-1.67	-1.56	-0.13
E5 Inner	365005.84	6330163.57	-0.41	-0.38	-0.42	-0.38	-0.39	-0.43	-0.35	-0.11
E5 Outer	365034.05	6330224.84	-1.59	-1.58	-1.55	-1.56	-1.57	-1.60	-1.53	-0.15
E6 Inner	365118.47	6329788.47	-0.45	-0.45	-0.48	-0.48	-0.44	-0.44	-0.48	0.00
E6 Outer	365174.78	6329802.22	-1.13	-1.13	-1.14	-1.16	-1.16	-1.16	-1.14	-0.07
E7 Inner	385350.82	6332350.29	-0.23	-0.23	-0.22	-0.16	-0.19	-0.22	-0.22	-0.02
E7 Outer	365298.68	6332344.74	-1.65	-1.68	-1.74	-1.72	-1.77	-1.69	-1.66	-0.02
E8 Inner	365128.03	6331795.60	-0.28	-0.31	-0.32	-0.31	-0.25	-0.34	-0.38	0.11
E8 Outer	365096.65	6331811.91	-0.96	-1.00	-1.02	-1.10	-1.00	-1.04	-1.01	0.02
E9 Inner	365040.22	6331607.83	-0.26	-0.28	-0.29	-0.30	-0.25	-0.29	-0.30	0.11
E9 Outer	364912.70	6331523.88	-1.14	-1.16	-1.18	-1.21	-1.17	-1.20	-1.31	0.24
E10 Inner	365422.57	6331427.14	-0.42	-0.42		-0.43	-0.42	-0.43	-0.49	0.04
E10 Outer	365395.00	6331361.69	-1.68	-1.73		-1.69	-1.70	-1.79	-1.80	0.07
E11 Inner	365553.95	6331410.18	-0.35	-0.34		-0.37	-0.35	-0.37	-0.41	-0.09
E11 Outer	365524.48	6331343.17	-1.04	-1.07		-1.09	-1.08	-1.10	-1.14	-0.05
E12 Inner	365750.13	6331328.50	-0.55	-0.55		-0.59	-0.55	-0.56	-0.59	0.02
E12 Outer	365734.72	6331284.93	-1.38	-1.39		-1.44	-1.41	-1.44	-1.53	-0.07
E13 Inner	365990.66	6331278.21	-0.54	-0.59		-0.58	-0.58	-0.58	-0.65	0.03
E13 Outer	365970.63	6331190.94	-1.35	-1.40		-1.39	-1.44	-1.42	-1.46	0.01
E14 Inner	366447.40	6331046.59	-0.48	-0.45		-0.45	-0.45	-0.45	-0.54	-0.02
E14 Outer	366371.08	6330984.10	-1.31	-1.30		-1.31	-1.32	-1.34	-1.38	-0.04
E15 Inner	366657.36	6330098.68	-0.37	-0.32		-0.33	-0.31	-0.32	-0.36	-0.02
E15 Outer	366611.13	6330167.43	-1.11	-1.13		-1.18	-1.12	-1.16	-1.17	-0.10
-.10E16 Inner	366310.74	6329644.22	-0.44	-0.42		-0.46	-0.45	-0.48	-0.47	-0.10
E16 Outer	366272.62	6329666.71	-0.96	-0.95		-0.98	-0.98	-1.01	-0.99	-0.13
C1 Inner	56368596	6332235								
C1 Outer	56368616	6332250								
C2 Inner	56368619	6332147								
C2 Outer	56368658	6332151								
C3 Inner	56368524	6331811								
C3 Outer	56368538	6331806								

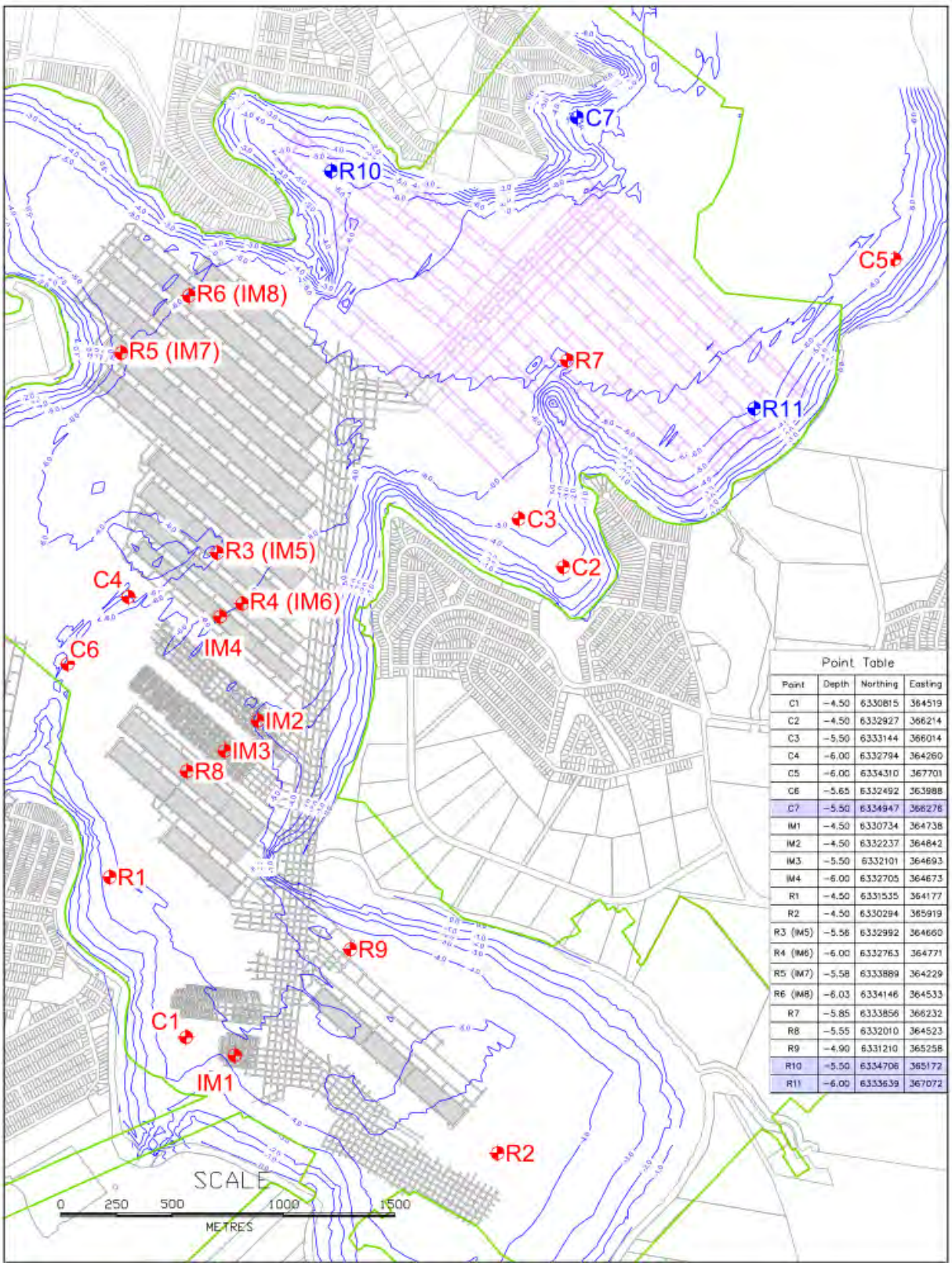
C4 Inner	56368467	6331435								
C4 Outer	56368486	6331421								
C5 inner	56365676	6333038						-0.09	0.03	
C5 outer	56365703	6333084						-2.18	-2.17	
C6 inner	56366045	6332831						-0.04	0.01	
C6 outer	56366058	6332871						-2.00	-1.82	
T1 inner	365388.39	6333100.63	-0.38	-0.47	-0.43	-0.46	-0.45	-0.48	-0.37	-0.03
T1 outer	365400.16	6332952.03	-1.18	-1.15	-1.19	--	-1.21	-1.20	-1.17	0.02
T2 inner	365383.99	6332949.75	-0.72	-0.75	-0.74	-0.72	-0.72	-0.74	-0.83	0.13
T2 outer	365377.34	6332816.66	-1.34	-1.35	-1.37	-1.35	-1.37	-1.36	-1.35	0.04
T3 inner	365357.00	6332831.43	-0.34	-0.35	-0.34	-0.38	-0.35	-0.38	-0.37	0.08
T3 outer	365350.44	6332589.92	-1.03	-1.03	-1.06	-1.03	-1.04	-1.06	-1.11	0.10
T4 inner	365303.47	6332575.45	-0.46	-0.49	-0.46	-0.49	-0.50	-0.50	-0.38	-0.08
T4 outer	365347.64	6332380.21	-1.16	-1.13	-1.15	-1.15	-1.16	-1.15	-1.16	0.04
T5 inner	365299.87	6332338.33	-0.43	-0.48	-0.43	-0.46	-0.47	-0.52	-0.50	0.08
T5 outer	365320.77	6332207.30	-1.43	-1.47	-1.43	-1.44	-1.46	-1.47	-1.50	0.12
T6 inner	365267.87	6332207.03	-0.45	-0.45	-0.42	-0.42	-0.41	-0.42	-0.39	-0.08
T6 outer	365336.78	6332262.48	-1.61	-1.63	-1.68	-1.63	-1.64	-1.64	-1.64	0.03
T7 inner	365295.26	6332270.84	-0.18	-0.20	-0.21	-0.20	-0.12	-0.22	-0.26	0.09
T7 outer	365267.87	6332207.03	-1.63	-1.71	-1.67	-1.67	-1.67	-1.69	-1.69	0.05
T8 inner	365336.78	6332262.48	-0.13	-0.20	-0.17	-0.27	-0.18	-0.27	-0.15	-0.05
T8 outer	365295.26	6332270.84	-1.18	-1.18	-1.23	-1.18	-1.18	-1.24	-1.20	0.06
A1 inner	365336.78	6332262.48		-0.51	-0.57	-0.56	-0.59	-0.58	-0.52	0.01
A1 outer	365295.26	6332270.84		-1.19	-1.20	-1.24	-1.25	-1.25	-1.32	0.13
A2 inner	365336.78	6332262.48		-0.39	-0.44	-0.42	-0.45	-0.46	-0.45	0.06
A2 outer	365295.26	6332270.84		-0.81	-0.87	-0.86	-0.86	-0.89	-0.91	0.10
A3 inner	365336.78	6332262.48		-0.33	-0.34	-0.31	-0.30	-0.35	-0.25	-0.08
A3 outer	365295.26	6332270.84		-3.44	-1.38	-1.42	-1.43	-1.44	-1.24	-0.20
A4 inner	365336.78	6332262.48		-0.16	-0.19	-0.16	-0.16	-0.17	-0.17	0.01
A4 outer	365295.26	6332270.84		-0.72	-0.73	-0.73	-0.71	-0.71	-0.68	-0.04
A5 inner	365336.78	6332262.48		-0.30	-0.32	-0.33	-0.30	-0.32	-0.36	0.06
A5 outer	365295.26	6332270.84		-0.96	-0.95	-0.95	-0.95	-0.98	-1.01	0.05
A6 inner	365336.78	6332262.48		-0.14	-0.16	-0.14	-0.14	-0.15	-0.20	0.06
A6 outer	365295.26	6332270.84		-0.68	-0.69	-0.68	-0.68	-0.73	-0.76	0.08
L1 inner	364292.51	6330367.71			-1.12	-1.14	-1.11	-1.12	-1.07	-0.05
L1 outer	364304.21	6330399.90			-1.63	-1.66	-1.70	-1.63	-1.68	0.05
F1 inner	56366321	6333281.31						-0.22	-0.30	0.08
F1 outer	56366285	6333250.37						-1.28	-1.22	-0.06
F2 inner	56366342	6333330.55						-0.21	-0.19	-0.025
F2 outer	56366291	6333450.83						-1.95	-1.94	-0.01
F3 inner	56366611	6333163.06						-0.08	-0.12	0.04
F3 outer	56366620	6333228.02						-1.85	-1.70	-0.15
F4 inner	56366968	6333242.58						-0.08	-0.10	0.02
F4 outer	56366918	6333284.49						-2.42	-2.44	0.02
F5 inner	56367106	6333361.98						-0.30	-0.29	-0.01

F5 outer	56367068	6333421.28						-2.43	-2.48	0.05
F6 inner	56367271	6333493.19						-0.27	-0.28	0.01
F6 outer	56367202	6333522.83						-2.78	-2.75	-0.03
F7 inner	56367402	6333682.09						-0.45	-0.45	0.00
F7 outer	56367374	6333694.93						-1.37	-1.47	0.10
S1 inner	56365009	6334470.41						-0.61	-0.56	-0.05
S1 outer	56365077	6334481.77						-1.75	-1.71	-0.04
S2 inner	56364642	6334943.57						-0.25	-0.23	-0.02
S2 outer	56364673	6334939.82						-1.56	-1.51	-0.05
S3 inner	56365017	6335008.93						-0.08	-0.15	0.07
S3 outer	56365041	6334932.70						-1.84	-1.94	0.10
S4 inner	56365235	6334992.86						-0.08	-0.14	-0.66
S4 outer	56365217	6334889.31						-1.70	-1.74	0.04
S5 inner	56362275	6334709.08						-0.66	-0.66	0.00
S5 outer	56365569	6334693.44						-1.36	-1.40	0.04
S6 inner	56366144	6334765.21						-0.07	-0.06	-0.01
S6 outer	56366172	6334761.92						-0.89	-0.89	0.00

In Table 8.1 the differences in seabed height between 2008 and 2019 are shown in red. In 2019 no bed elevation had changed by more than 0.15 m compared with values from 2008.

9. Coal Mining in 2019

Figure 9.1 shows the extent of mining up to June 2019.



Point Table

Point	Depth	Northing	Easting
C1	-4.50	6330815	364519
C2	-4.50	6332927	366214
C3	-5.50	6333144	366014
C4	-6.00	6332794	364260
C5	-6.00	6334310	367701
C6	-5.65	6332492	363988
C7	-5.50	6334947	366276
IM1	-4.50	6330734	364738
IM2	-4.50	6332237	364842
IM3	-5.50	6332101	364693
IM4	-6.00	6332705	364673
R1	-4.50	6331535	364177
R2	-4.50	6330294	365919
R3 (IM5)	-5.56	6332992	364660
R4 (IM6)	-6.00	6332763	364771
R5 (IM7)	-5.58	6333889	364229
R6 (IM8)	-6.03	6334146	364533
R7	-5.85	6333856	366232
R8	-5.55	6332010	364523
R9	-4.90	6331210	365258
R10	-5.50	6334706	365172
R11	-6.00	6333639	367072

Figure 9.1. Extent of Underground Mining up to June 2019.

10. 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 2018-2019).
- 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.

11. Discussion

In 2019 seagrass cover along the transects ranged from 24.71 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 heal. This healing process took place over the period of this study and is almost complete in most areas.

In 2019, however, at a time of very low rainfall and a very long lived high atmospheric pressure over the lake, there was some reductions in seagrass cover at some transects. This reduction in seagrass cover in 2019 was most noticeable along the shore of Summerland Point. Water level in the lake was depressed for long periods by around 0.3m. This lowered lake level caused increased water temperature over the seagrss beds and increased damaging wave attack during periods of strong westerly winds. Less water over the seagrass beds also increased the likelihood of damage by boats, waders and swimmers.

Now that the full complement of stations have been sampled for ten consecutive years (except for Bardens Bay), average values for seagrass cover and condition for the three regions of Lake Macquarie under investigation (Summerland Point, Chain Valley Bay, Crangan Bay and Bardens Bay) may be calculated (Table 10.1).

In 2019 there were no changes in sea bed height greater than 0.15m (0.15m limit) compared with the datum years.

Table 10.1. Average composition, % cover and condition of seagrass beds in the four regions of lake Macquarie under investigation for the years 2011 to 2018.

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
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

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
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

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Mr Stewart Ambridge	Delta Coal
Mr Sean Price	Daly.Smith Pty. Ltd., Surveyors.
Mr Chris Smith	Daly.Smith Pty. Ltd., Surveyors.

Appendix 2 – Results of Analysis of Quadrat photographs comprising each Transect (Results for June 2019

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Transect E1		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
34	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	90	1	1	10	0	0	0	100
37	90	1	1	10	0	0	0	100
35	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	90	1	1	10	0	0	0	100
41	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
30	90	1	1	0	0	0	10	100
68	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	80	1	1	0	0	0	20	100
15	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
50	100	2	1	0	0	0	0	100
61	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
62	100	2	1	0	0	0	0	100
59	100	2	1	0	0	0	0	100
60	100	2	1	0	0	0	0	100
49	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
53	100	2	1	0	0	0	0	100
1	100	2	1	0	0	0	0	100

Transect E2		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	40	1	1	0	0	0	60	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	50	1	1	10	0	0	40	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	80	1	1	0	0	0	20	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	90	1	1	10	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect E3		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
34	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
4	90	2	1	0	0	0	10	100
6	90	2	1	0	0	0	10	100
3	100	2	1	0	0	0	0	100
5	90	2	1	0	0	0	10	100
2	80	2	1	0	0	0	20	100
7	90	2	1	0	0	0	10	100
8	90	2	1	0	0	0	10	110
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
1	100	2	1	0	0	0	0	100

Transect E4		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
19	90	1	1	0	0	0	10	100
24	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100

Transect E5		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
34	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
30	90	1	1	10	0	0	0	100
51	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
67	100	2	1	0	0	0	0	100
1	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
33	40	2	1	0	0	0	60	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect E6		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
37	80	1	1	0	20	0	0	100
41	80	1	1	0	20	0	0	100
40	60	1	1	0	0	0	40	100
39	80	1	1	0	20	0	0	100
38	80	1	1	0	20	0	0	100
36	80	1	1	0	20	0	0	100
43	90	1	1	0	10	0	0	100
35	80	1	1	0	20	0	0	100
2	95	1	1	5	0	0	0	100
33	10	1	1	90	0	0	0	100
32	10	1	1	90	0	0	0	100
42	80	1	1	0	20	0	0	100
44	100	1	1	0	0	0	0	100
30	10	1	1	90	0	0	0	100
63	60	1	1	0	40	0	0	100
67	100	1	1	0	0	0	0	100
66	80	1	1	0	0	0	20	100
65	60	1	1	0	0	0	40	100
64	80	1	1	0	0	0	20	100
62	80	1	1	0	0	0	20	100
46	90	1	1	0	0	0	10	100
56	80	1	1	0	10	0	10	100
53	90	1	1	0	10	0	0	100
52	90	1	1	0	10	0	0	100
47	100	1	1	0	0	0	0	100
31	10	1	1	90	0	0	0	100
34	70	1	1	0	0	0	30	100
29	100	1	1	0	0	0	0	100
28	80	1	1	0	0	0	20	100
8	60	1	1	0	0	0	40	100
27	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
7	60	1	1	0	10	0	30	100
13	90	1	1	0	0	0	10	100
6	50	1	1	0	10	0	40	100
5	60	1	1	0	10	0	30	100
4	50	1	1	0	0	0	50	100
3	90	1	1	0	0	0	10	100
12	90	1	1	0	10	0	0	100
68	90	1	1	10	0	0	0	100
14	90	1	1	0	10	0	0	100
20	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
21	80	1	1	0	0	0	10	90
15	90	1	1	0	0	0	10	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	90	1	1	0	0	0	10	100
18	90	1	1	0	0	0	10	100
25	100	1	1	0	0	0	0	100
17	80	1	1	0	0	0	20	100
26	100	1	1	0	0	0	0	100
16	60	1	1	0	0	0	40	100
60	70	2	1	0	0	0	30	100
61	60	2	1	0	0	0	40	100
45	40	2	1	60	0	0	0	100
59	70	2	1	0	0	0	30	100
58	90	2	1	0	0	0	10	100
57	100	2	1	0	0	0	0	100
55	40	2	1	0	0	0	60	100
54	60	2	1	0	0	0	40	100
51	50	2	1	0	0	0	50	100
50	70	2	1	0	0	0	30	100
48	70	2	1	0	0	0	30	100
49	70	2	1	0	0	0	30	100

Transect E7		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
68	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
54	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
65	100	2	1	0	0	0	0	100
40	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
47	100	2	1	0	0	0	0	100
55	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
41	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
21	70	2	1	0	0	0	30	100
20	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	70	2	1	0	0	0	30	100
23	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
2	90	2	1	0	0	0	10	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
27	100	2	1	0	0	0	0	100
1	10	2	1	0	0	0	90	100

Transect E8		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
27	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
40	90	2	1	0	0	0	10	100
41	100	2	1	0	0	0	0	100
42	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	90	2	1	0	0	0	0	90
50	100	2	1	0	0	0	0	100
51	100	2	1	0	0	0	0	100
52	100	2	1	0	0	0	0	100
53	100	2	1	0	0	0	0	100
54	100	2	1	0	0	0	0	100
55	90	2	1	0	0	0	10	100
56	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
59	100	2	1	0	0	0	0	100
60	100	2	1	0	0	0	0	100
61	100	2	1	0	0	0	0	100
62	100	2	1	0	0	0	0	100
63	100	2	1	0	0	0	0	100
64	85	2	1	0	0	0	15	100
65	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
67	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect E9		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect E10		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	70	1	1	0	0	0	30	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	70	1	1	0	0	0	30	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	80	1	1	0	0	0	20	100
41	60	1	1	0	0	0	40	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	98	1	1	0	2	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect E11		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	98	1	1	0	2	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	98	1	1	0	2	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	97	1	1	0	3	0	0	100
43	100	1	1	0	0	0	0	100
44	95	1	1	0	5	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	90	1	1	0	10	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	50	1	1	0	50	0	0	100
68	100	1	1	0	0	0	0	100

Transect E12		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
24	0	0	0	0	0	0	100	100
25	0	0	0	0	0	0	100	100
36	98	1	1	0	2	0	0	100
59	98	1	1	0	2	0	0	100
49	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
1	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect E13		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
68	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
43	97	1	1	0	3	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
1	100	2	1	0	0	0	0	100

Transect E14		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	90	1	1	10	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	80	1	1	20	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	90	1	1	10	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	90	1	1	10	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	90	1	1	10	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	40	1	1	60	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect E15		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
53	0	0	0	0	0	0	100	100
45	0	0	0	0	0	0	100	100
54	0	0	0	0	0	0	100	100
55	0	0	0	0	0	0	100	100
56	0	0	0	0	0	0	100	100
57	0	0	0	0	0	0	100	100
58	0	0	0	0	0	0	100	100
46	0	0	0	0	0	0	100	100
44	0	0	0	0	0	0	100	100
43	50	1	1	0	0	0	50	100
47	80	1	1	0	0	0	20	100
48	50	1	1	0	0	0	50	100
49	80	2	1	0	0	0	20	100
42	65	2	1	0	0	0	35	100
41	30	2	1	0	0	0	70	100
40	20	2	1	0	0	0	80	100
39	60	2	1	0	0	0	40	100
38	60	2	1	0	0	0	40	100
1	80	2	1	0	0	0	20	100
50	80	2	1	0	0	0	20	100
51	40	2	1	0	0	0	60	100
63	70	2	1	0	0	0	30	100
67	60	2	1	0	0	0	40	100
66	60	2	1	0	0	0	40	100
65	80	2	1	0	0	0	20	100
64	90	2	1	0	0	0	10	100
62	80	2	1	0	0	0	20	100
52	20	2	1	0	0	0	80	100
61	80	2	1	0	0	0	20	100
60	70	2	1	0	0	0	30	100
59	70	2	1	0	0	0	30	100
36	20	2	1	0	0	0	80	100
37	60	2	1	0	0	0	40	100
34	30	2	1	0	0	0	70	100
35	10	2	1	0	0	0	90	100
2	80	2	1	0	0	0	20	100
10	70	2	1	0	0	0	30	100
15	30	2	1	0	0	0	70	100
14	40	2	1	0	0	0	60	100
13	20	2	1	0	0	0	80	100
12	60	2	1	0	0	0	40	100
11	60	2	1	0	0	0	40	100
8	50	2	1	0	0	0	50	100
9	40	2	1	0	0	0	60	100
17	70	2	1	0	0	0	30	100
7	50	2	1	0	0	0	50	100
6	40	2	1	0	0	0	60	100
5	40	2	1	0	0	0	60	100
4	60	2	1	0	0	0	40	100
3	70	2	1	0	0	0	30	100
16	40	2	1	0	0	0	60	100
18	80	2	1	0	0	0	20	100
33	50	2	1	0	0	0	50	100
27	80	2	1	0	0	0	20	100
32	60	2	1	0	0	0	40	100
31	60	2	1	0	0	0	40	100
30	70	2	1	0	0	0	30	100
29	80	2	1	0	0	0	20	100
28	80	2	1	0	0	0	20	100
25	60	2	1	0	0	0	40	100
26	60	2	1	0	0	0	40	100
19	70	2	1	0	0	0	30	100
24	80	2	1	0	0	0	20	100
23	60	2	1	0	0	0	40	100
22	60	2	1	0	0	0	40	100
21	70	2	1	0	0	0	30	100
20	60	2	1	0	0	0	40	100
68	50	2	1	0	0	0	50	100

Transect E16		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	80	1	1	0	0	0	20	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	80	1	1	0	0	0	20	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	80	1	1	0	0	0	20	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	60	1	1	0	0	0	40	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	60	1	1	0	0	0	40	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	60	1	1	0	0	0	40	100
37	80	1	1	0	0	0	20	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	60	1	1	0	0	0	40	100
48	60	1	1	0	0	0	40	100
49	60	1	1	0	0	0	40	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	80	1	1	0	0	0	20	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect T1		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
31	0	0	0	0	0	0	100	100
27	0	0	0	0	0	0	100	100
30	0	0	0	0	0	0	100	100
24	0	0	0	0	0	0	100	100
25	0	0	0	0	0	0	100	100
15	0	0	0	0	0	0	100	100
26	0	0	0	0	0	0	100	100
33	0	0	0	0	0	0	100	100
16	0	0	0	0	0	0	100	100
32	0	0	0	0	0	0	100	100
28	0	0	0	0	0	0	100	100
29	0	0	0	0	0	0	100	100
52	70	1	1	0	0	0	30	100
62	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
53	60	1	1	0	0	0	40	100
55	60	1	1	0	0	0	40	100
54	60	1	1	0	0	0	40	100
56	90	1	1	0	0	0	10	100
50	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
59	80	1	1	0	0	0	20	100
18	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
21	20	2	1	0	0	0	80	100
19	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
35	70	2	1	0	0	0	30	100
14	20	2	1	0	0	0	80	100
17	40	2	1	0	0	0	60	100
36	40	2	1	0	0	0	60	100
34	20	2	1	0	0	0	80	100
42	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
39	70	2	1	0	0	0	30	100
40	80	2	1	0	0	0	20	100
41	100	2	1	0	0	0	0	100
44	70	2	1	0	0	0	30	100
22	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
8	30	2	1	0	0	0	70	100
23	100	2	1	0	0	0	0	100
10	50	2	1	0	0	0	50	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	70	2	1	0	0	0	30	100
13	60	2	1	0	0	0	40	100
11	50	2	1	0	0	0	50	100
9	20	2	1	0	0	0	80	100
46	100	2	1	0	0	0	0	100
45	70	2	1	0	0	0	30	100
7	20	2	1	0	0	0	80	100
6	30	2	1	0	0	0	70	100
58	60	2	1	0	0	0	40	100
5	35	2	1	0	0	0	65	100
4	100	2	1	0	0	0	0	100
3	70	2	1	0	0	0	30	100
1	100	2	1	0	0	0	0	100
63								0
64								0
65								0
66								0
67								0
68								0

Transect T2		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
48	0	0	0	0	0	0	100	100
47	0	0	0	0	0	0	100	100
46	0	0	0	0	0	0	100	100
45	0	0	0	0	0	0	100	100
41	0	0	0	0	0	0	100	100
36	0	0	0	0	0	0	100	100
44	0	0	0	0	0	0	100	100
43	0	0	0	0	0	0	100	100
31	90	1	1	0	0	0	10	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
32	90	1	1	0	0	0	10	100
12	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
33	80	1	1	0	0	0	20	100
35	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
49	20	2	1	0	0	0	80	100
53	90	2	1	0	0	0	10	100
50	20	2	1	0	0	0	80	100
51	70	2	1	0	0	0	30	100
61	60	2	1	0	0	0	40	100
67	50	2	1	0	0	0	50	100
66	90	2	1	0	0	0	10	100
65	90	2	1	0	0	0	10	100
63	50	2	1	0	0	0	50	100
62	70	2	1	0	0	0	30	100
59	90	2	1	0	0	0	10	100
60	70	2	1	0	0	0	30	100
52	80	2	1	0	0	0	20	100
58	90	2	1	0	0	0	10	100
57	90	2	1	0	0	0	10	100
56	80	2	1	0	0	0	20	100
55	90	2	1	0	0	0	10	100
54	90	2	1	0	0	0	10	100
42	40	2	1	0	0	0	60	100
1	100	2	1	0	0	0	0	100
40	100	2	1	0	0	0	0	100
8	90	2	1	0	0	0	10	100
15	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
13	90	2	1	10	0	0	0	100
9	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
38	70	2	1	0	0	0	30	100
37	20	2	1	0	0	0	80	100
2	97	2	1	3	0	0	0	100
27	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
68	70	2	1	0	0	0	30	100

Transect T3		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
41	0	0	0	0	0	0	100	100
43	0	0	0	0	0	0	100	100
40	0	0	0	0	0	0	100	100
31	0	0	0	0	0	0	100	100
42	0	0	0	0	0	0	100	100
36	0	0	0	0	0	0	100	100
6	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	20	1	1	0	0	0	80	100
12	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
45	20	2	1	0	0	0	80	100
48	30	2	1	0	0	0	70	100
49	40	2	1	0	0	0	60	100
46	20	2	1	0	0	0	80	100
47	20	2	1	0	0	0	80	100
51	70	2	1	0	0	0	30	100
44	10	2	1	0	0	0	90	100
50	100	2	1	0	0	0	0	100
54	90	2	1	0	0	0	10	100
52	70	2	1	0	0	0	30	100
62	40	2	1	0	0	0	60	100
67	100	2	1	0	0	0	0	100
66	60	2	1	0	0	0	40	100
65	60	2	1	0	0	0	40	100
64	70	2	1	0	0	0	30	100
63	90	2	1	0	0	0	10	100
60	100	2	1	0	0	0	0	100
61	60	2	1	0	0	0	40	100
53	90	2	1	0	0	0	10	100
59	100	2	1	0	0	0	0	100
58	90	2	1	0	0	0	10	100
57	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
55	95	2	1	0	0	0	5	100
1	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
39	60	2	1	0	0	0	40	100
38	60	2	1	0	0	0	40	100
11	100	2	1	0	0	0	0	100
16	10	2	1	0	0	0	90	100
15	70	2	1	0	0	0	30	100
14	90	2	1	0	0	0	10	100
13	100	2	1	0	0	0	0	100
8	60	2	1	0	0	0	40	100
10	100	2	1	0	0	0	0	100
18	50	2	1	0	0	0	50	100
7	60	2	1	0	0	0	40	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
17	20	2	1	10	0	0	70	100
19	10	2	1	0	0	0	90	100
37	80	2	1	0	0	0	20	100
27	10	2	1	0	0	0	90	100
35	60	2	1	0	0	0	40	100
2	30	2	1	0	0	0	70	100
32	20	2	1	0	0	0	80	100
30	10	2	1	0	0	0	90	100
25	60	2	1	0	0	0	40	100
26	40	2	1	0	0	0	60	100
20	90	2	1	0	0	0	10	100
24	80	2	1	0	0	0	20	100
23	80	2	1	0	20	0	0	100
22	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
68	90	2	1	0	0	0	10	100

Transect T4		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
55	0	0	0	0	0	0	100	100
56	0	0	0	0	0	0	100	100
54	0	0	0	0	0	0	100	100
53	0	0	0	0	0	0	100	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
41	70	2	1	0	0	0	30	100
48	60	2	1	0	0	0	40	100
39	60	2	1	0	0	0	40	100
50	60	2	1	0	0	0	40	100
40	70	2	1	0	0	0	30	100
49	60	2	1	0	0	0	40	100
46	70	2	1	0	0	0	30	100
47	60	2	1	0	0	0	40	100
42	60	2	1	0	0	0	40	100
45	60	2	1	0	0	0	40	100
51	40	2	1	0	0	0	60	100
43	50	2	1	0	0	0	50	100
44	70	2	1	0	0	0	30	100
1	70	2	1	0	0	0	30	100
52	30	2	1	0	0	0	70	100
63	60	2	1	0	0	0	40	100
67	60	2	1	0	0	0	40	100
66	70	2	1	0	0	0	30	100
65	70	2	1	0	0	0	30	100
64	70	2	1	0	0	0	30	100
61	40	2	1	0	0	0	60	100
62	50	2	1	0	0	0	50	100
37	90	2	1	0	0	0	10	100
60	30	2	1	0	0	0	70	100
59	70	2	1	0	0	0	30	100
58	60	2	1	0	0	0	40	100
57	80	2	1	0	0	0	20	100
38	60	2	1	0	0	0	40	100
34	80	2	1	0	0	0	20	100
36	80	2	1	0	0	0	20	100
35	80	2	1	0	0	0	20	100
11	100	2	1	0	0	0	0	100
16	80	2	1	0	0	0	20	100
15	100	2	1	0	0	0	0	100
14	80	2	1	0	0	0	20	100
13	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
18	80	2	1	0	0	0	20	100
7	90	2	1	0	0	0	10	100
6	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
17	80	2	1	0	0	0	20	100
20	100	2	1	0	0	0	0	100
19	80	2	1	0	0	0	20	100
2	90	2	1	0	0	0	10	100
28	90	2	1	0	0	0	10	100
33	80	2	1	0	0	0	20	100
32	80	2	1	0	0	0	20	100
31	90	2	1	0	0	0	10	100
30	60	2	1	0	0	0	40	100
29	80	2	1	0	0	0	20	100
27	100	2	1	0	0	0	0	100
21	60	2	1	0	0	0	40	100
26	70	2	1	0	0	0	30	100
25	70	2	1	0	0	0	30	100
24	60	2	1	0	0	0	40	100
23	80	2	1	0	0	0	20	100
22	60	2	1	0	0	0	40	100
68	90	2	1	0	0	0	10	100

Transect T5		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
59	0	0	0	0	0	0	100	100
46	90	1	1	0	0	0	10	100
1	70	2	1	0	0	0	30	100
45	80	2	1	0	0	0	20	100
49	50	2	1	0	0	0	50	100
48	40	2	1	0	0	0	60	100
47	70	2	1	0	0	0	30	100
43	90	2	1	0	0	0	14	104
44	80	2	1	0	0	0	20	100
51	40	2	1	0	0	0	60	100
42	80	2	1	0	0	0	20	100
41	80	2	1	0	0	0	20	100
40	90	2	1	0	0	0	10	100
39	90	2	1	0	0	0	10	100
38	80	2	1	0	0	0	20	100
50	60	2	1	0	0	0	40	100
53	50	2	1	0	0	0	50	100
52	40	2	1	0	0	0	60	100
36	80	2	1	0	0	0	20	100
62	50	2	1	0	0	0	50	100
67	20	2	1	0	0	0	80	100
66	10	2	1	0	0	0	90	100
65	20	2	1	0	0	0	80	100
64	20	2	1	0	0	0	80	100
63	70	2	1	0	0	0	30	100
61	50	2	1	0	0	0	50	100
54	80	2	1	0	0	0	20	100
60	20	2	1	0	0	0	80	100
58	10	2	1	0	0	0	90	100
57	40	2	1	0	0	0	60	100
56	40	2	1	0	0	0	60	100
55	60	2	1	0	0	0	40	100
37	90	2	1	0	0	0	10	100
34	70	2	1	0	0	0	30	100
35	90	2	1	0	0	0	10	100
2	60	2	1	0	0	0	40	100
10	60	2	1	0	0	0	40	100
15	80	2	1	0	0	0	20	100
14	70	2	1	0	0	0	30	100
13	60	2	1	0	0	0	40	100
12	60	2	1	0	0	0	40	100
11	70	2	1	0	0	0	30	100
8	70	2	1	0	0	0	30	100
9	60	2	1	0	0	0	40	100
17	50	2	1	0	0	0	50	100
7	70	2	1	0	0	0	30	100
6	70	2	1	0	0	0	30	100
5	50	2	1	0	0	0	50	100
4	50	2	1	0	0	0	50	100
3	50	2	1	0	0	0	50	100
16	50	2	1	0	0	0	50	100
18	50	2	1	0	0	0	50	100
33	80	2	1	0	0	0	20	100
27	80	2	1	0	0	0	20	100
32	90	2	1	0	0	0	10	100
31	90	2	1	0	0	0	10	100
30	90	2	1	0	0	0	10	100
29	90	2	1	0	0	0	10	100
28	70	2	1	0	0	0	30	100
25	90	2	1	0	0	0	10	100
26	80	2	1	0	0	0	20	100
19	60	2	1	0	0	0	40	100
24	90	2	1	0	0	0	10	100
23	80	2	1	0	0	0	20	100
22	80	2	1	0	0	0	20	100
21	70	2	1	0	0	0	30	100
20	70	2	1	0	0	0	30	100
68	20	2	1	0	0	0	80	100

Transect T6		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
53	0	0	0	0	0	0	100	100
51	0	0	0	0	0	0	100	100
55	0	0	0	0	0	0	100	100
52	0	0	0	0	0	0	100	100
49	0	0	0	0	0	0	100	100
50	0	0	0	0	0	0	100	100
58	0	0	0	0	0	0	100	100
48	0	0	0	0	0	0	100	100
46	0	0	0	0	0	0	100	100
56	0	0	0	0	0	0	100	100
57	0	0	0	0	0	0	100	100
59	0	0	0	0	0	0	100	100
63	0	0	0	0	0	0	100	100
67	0	0	0	0	0	0	100	100
66	0	0	0	0	0	0	100	100
65	0	0	0	0	0	0	100	100
64	0	0	0	0	0	0	100	100
45	0	0	0	0	0	0	100	100
61	0	0	0	0	0	0	100	100
60	0	0	0	0	0	0	100	100
42	80	2	1	0	0	0	20	100
40	40	2	1	0	0	0	60	100
39	50	2	1	0	0	0	50	100
41	60	2	1	0	0	0	40	100
38	70	2	1	0	0	0	30	100
1	60	2	1	0	0	0	40	100
43	70	2	1	0	0	0	30	100
44	50	2	1	0	0	0	50	100
47	10	2	1	0	0	0	90	100
36	80	2	1	0	0	0	20	100
54	10	2	1	0	0	0	90	100
62	10	2	1	0	0	0	90	100
37	80	2	1	0	0	0	20	100
34	90	2	1	0	0	0	10	100
35	60	2	1	0	0	0	40	100
2	60	2	1	0	0	0	40	100
10	70	2	1	0	0	0	30	100
15	60	2	1	0	0	0	40	100
14	70	2	1	0	0	0	30	100
13	80	2	1	0	0	0	20	100
12	50	2	1	0	0	0	50	100
11	60	2	1	0	0	0	40	100
8	80	2	1	0	0	0	20	100
9	80	2	1	0	0	0	20	100
17	80	2	1	0	0	0	20	100
7	60	2	1	0	0	0	40	100
6	70	2	1	0	0	0	30	100
5	80	2	1	0	0	0	20	100
4	50	2	1	0	0	0	50	100
3	60	2	1	0	0	0	40	100
16	60	2	1	0	0	0	40	100
18	70	2	1	0	0	0	30	100
33	60	2	1	0	0	0	40	100
27	80	2	1	0	0	0	20	100
32	70	2	1	0	0	0	30	100
31	80	2	1	0	0	0	20	100
30	90	2	1	0	0	0	10	100
29	90	2	1	0	0	0	10	100
28	90	2	1	0	0	0	10	100
25	80	2	1	0	0	0	20	100
26	80	2	1	0	0	0	20	100
19	60	2	1	0	0	0	40	100
24	80	2	1	0	0	0	20	100
23	70	2	1	0	0	0	30	100
22	70	2	1	0	0	0	30	100
21	80	2	1	0	0	0	20	100
20	60	2	1	0	0	0	40	100
68	40	2	1	0	0	0	60	100

Transect T7		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	0	0	0	0	0	0	100	100
65	0	0	0	0	0	0	100	100
20	0	0	0	0	0	0	100	100
21	0	0	0	0	0	0	100	100
22	0	0	0	0	0	0	100	100
24	0	0	0	0	0	0	100	100
25	0	0	0	0	0	0	100	100
64	0	0	0	0	0	0	100	100
18	0	0	0	0	0	0	100	100
2	0	0	0	0	0	0	100	100
58	0	0	0	0	0	0	100	100
57	0	0	0	0	0	0	100	100
37	0	0	0	0	0	0	100	100
38	0	0	0	0	0	0	100	100
19	0	0	0	0	0	0	100	100
23	0	0	0	0	0	0	100	100
17	0	0	0	0	0	0	100	100
16	0	0	0	0	0	0	100	100
9	0	0	0	0	0	0	100	100
3	0	0	0	0	0	0	100	100
4	0	0	0	0	0	0	100	100
6	0	0	0	0	0	0	100	100
7	0	0	0	0	0	0	100	100
15	0	0	0	0	0	0	100	100
8	0	0	0	0	0	0	100	100
46	0	0	0	0	0	0	100	100
11	0	0	0	0	0	0	100	100
12	0	0	0	0	0	0	100	100
13	0	0	0	0	0	0	100	100
10	0	0	0	0	0	0	100	100
14	0	0	0	0	0	0	100	100
55	90	2	1	0	0	0	10	100
53	80	2	1	0	0	0	20	100
54	90	2	1	0	0	0	10	100
52	80	2	1	0	0	0	20	100
51	50	2	1	0	0	0	50	100
50	60	2	1	0	0	0	40	100
66	10	2	1	0	0	0	90	100
67	20	2	1	0	0	0	80	100
56	60	2	1	0	0	0	40	100
49	60	2	1	0	0	0	40	100
59	10	2	1	0	0	0	90	100
61	40	2	1	0	0	0	60	100
62	50	2	1	0	0	0	50	100
63	40	2	1	0	0	0	60	100
60	20	2	1	0	0	0	80	100
34	80	2	1	0	0	0	20	100
48	20	2	1	0	0	0	80	100
47	80	2	1	0	0	0	20	100
32	90	2	1	0	0	0	10	100
5	20	2	1	0	0	0	80	100
26	20	2	1	0	0	0	80	100
27	20	2	1	0	0	0	80	100
28	30	2	1	0	0	0	70	100
29	40	2	1	0	0	0	60	100
30	30	2	1	0	0	0	70	100
31	80	2	1	0	0	0	20	100
35	70	2	1	0	0	0	30	100
33	80	2	1	0	0	0	20	100
45	40	2	1	0	0	0	60	100
36	70	2	1	0	0	0	30	100
39	10	2	1	0	0	0	90	100
40	20	2	1	0	0	0	80	100
41	40	2	1	0	0	0	60	100
42	40	2	1	0	0	0	60	100
43	40	2	1	0	0	0	60	100
44	60	2	1	0	0	0	40	100
68	20	2	1	0	0	0	80	100

Transect T8		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
35	0	0	0	0	0	0	100	100
31	0	0	0	0	0	0	100	100
32	0	0	0	0	0	0	100	100
33	0	0	0	0	0	0	100	100
39	0	0	0	0	0	0	100	100
45	40	2	1	0	0	0	60	100
49	60	2	1	0	0	0	40	100
48	30	2	1	0	0	0	70	100
47	30	2	1	0	0	0	70	100
46	50	2	1	0	0	0	50	100
42	80	2	1	0	0	0	20	100
44	60	2	1	0	0	0	40	100
43	70	2	1	0	0	0	30	100
51	40	2	1	0	0	0	60	100
41	20	2	1	0	0	0	80	100
40	10	2	1	0	0	0	90	100
50	50	2	1	0	0	0	50	100
52	50	2	1	0	0	0	50	100
38	40	2	1	0	0	0	60	100
61	80	2	1	0	0	0	20	100
67	50	2	1	0	0	0	50	100
66	40	2	1	0	0	0	60	100
65	10	2	1	0	0	0	90	100
64	20	2	1	0	0	0	80	100
63	10	2	1	0	0	0	90	100
62	50	2	1	0	0	0	50	100
60	80	2	1	0	0	0	20	100
53	40	2	1	0	0	0	60	100
59	60	2	1	0	0	0	40	100
58	80	2	1	0	0	0	20	100
57	50	2	1	0	0	0	50	100
56	60	2	1	0	0	0	40	100
55	70	2	1	0	0	0	30	100
54	80	2	1	0	0	0	20	100
1	80	2	1	0	0	0	20	100
34	10	2	1	0	0	0	90	100
37	20	2	1	0	0	0	80	100
36	20	2	1	0	0	0	80	100
9	80	2	1	0	0	0	20	100
14	80	2	1	0	0	0	20	100
13	40	2	1	0	0	0	60	100
12	30	2	1	0	0	0	70	100
11	10	2	1	0	0	0	90	100
10	70	2	1	0	0	0	30	100
8	30	2	1	0	0	0	70	100
16	50	2	1	0	0	0	50	100
7	20	2	1	0	0	0	80	100
6	30	2	1	0	0	0	70	100
5	40	2	1	0	0	0	60	100
4	40	2	1	0	0	0	60	100
3	60	2	1	0	0	0	40	100
15	70	2	1	0	0	0	30	100
17	60	2	1	0	0	0	40	100
2	70	2	1	0	0	0	30	100
25	70	2	1	0	0	0	30	100
30	10	2	1	0	0	0	90	100
29	50	2	1	0	0	0	50	100
28	60	2	1	0	0	0	40	100
27	70	2	1	0	0	0	30	100
26	70	2	1	0	0	0	30	100
24	60	2	1	0	0	0	40	100
18	60	2	1	0	0	0	40	100
23	50	2	1	0	0	0	50	100
22	60	2	1	0	0	0	40	100
21	70	2	1	0	0	0	30	100
20	80	2	1	0	0	0	20	100
19	80	2	1	0	0	0	20	100
68	40	2	1	0	0	0	60	100

Transect A1		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
20	80	1	1	0	0	0	20	100
10	80	1	1	0	0	0	20	100
16	80	1	1	0	0	0	20	100
15	60	1	1	0	0	0	40	100
19	70	1	1	0	0	0	30	100
48	100	1	1	0	0	0	0	100
21	80	1	1	0	0	0	20	100
9	90	1	1	0	0	0	10	100
18	80	1	1	0	0	0	20	100
8	90	1	1	0	0	0	10	100
7	90	1	1	0	0	0	10	100
6	90	1	1	0	0	0	10	100
22	70	1	1	0	0	0	30	100
17	80	1	1	0	0	0	20	100
51	80	2	1	0	0	0	20	100
52	80	2	1	0	0	0	20	100
53	90	2	1	0	0	0	10	100
49	90	2	1	0	0	0	10	100
50	80	2	1	0	0	0	20	100
55	100	2	1	0	0	0	0	100
47	90	2	1	0	0	0	10	100
46	100	2	1	0	0	0	0	100
45	70	2	1	0	0	0	30	100
44	80	2	1	0	0	0	20	100
54	100	2	1	0	0	0	0	100
1	90	2	1	0	0	0	10	100
56	100	2	1	0	0	0	0	100
57	90	2	1	0	0	0	10	100
63	100	2	1	0	0	0	0	100
67	80	2	1	0	0	0	20	100
66	100	2	1	0	0	0	0	100
65	90	2	1	0	0	0	10	100
64	90	2	1	0	0	0	10	100
62	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
61	90	2	1	0	0	0	10	100
42	80	2	1	0	0	0	20	100
60	90	2	1	0	0	0	10	100
59	100	2	1	0	0	0	0	100
43	60	2	1	0	0	0	40	100
34	60	2	1	0	0	0	40	100
41	90	2	1	0	0	0	10	100
13	80	2	1	0	0	0	20	100
25	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
23	90	2	1	0	0	0	10	100
14	70	2	1	0	0	0	30	100
12	80	2	1	0	0	0	20	100
27	90	2	1	0	0	0	10	100
11	90	2	1	0	0	0	10	100
5	60	2	1	0	0	0	40	100
4	40	2	1	0	0	0	60	100
3	80	2	1	0	0	0	20	100
26	90	2	1	0	0	0	10	100
28	100	2	1	0	0	0	0	100
40	90	2	1	0	0	0	10	100
35	60	2	1	0	0	0	40	100
39	90	2	1	0	0	0	10	100
38	100	2	1	0	0	0	0	100
37	80	2	1	0	0	0	20	100
36	80	2	1	0	0	0	20	100
2	100	2	1	0	0	0	0	100
29	80	2	1	0	0	0	20	100
33	90	2	1	0	0	0	10	100
32	100	2	1	0	0	0	0	100
31	90	2	1	0	0	0	10	100
30	80	2	1	0	0	0	20	100
68	70	2	1	0	0	0	30	100

Transect A2		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	80	1	1	0	0	0	20	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	80	1	1	0	0	0	20	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	90	1	1	0	0	0	10	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	50	1	1	0	0	0	50	100
68	70	1	1	0	0	0	30	100

Transect A3		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
6	50	1	1	0	0	0	50	100
7	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
14	100	1	2	0	0	0	0	100
28	100	1	2	0	0	0	0	100
25	100	1	2	0	0	0	0	100
26	100	1	2	0	0	0	0	100
27	100	1	2	0	0	0	0	100
8	100	1	2	0	0	0	0	100
13	100	1	2	0	0	0	0	100
9	100	1	2	0	0	0	0	100
10	100	1	2	0	0	0	0	100
11	100	1	2	0	0	0	0	100
15	100	1	2	0	0	0	0	100
12	100	1	2	0	0	0	0	100

Transect A4		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	60	1	1	0	0	0	40	100
2	60	1	1	0	0	0	40	100
3	50	1	1	0	0	0	50	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	90	1	1	0	0	0	10	100
7	50	1	1	0	0	0	50	100
8	60	1	1	0	0	0	40	100
9	40	1	1	0	0	0	60	100
10	40	1	1	0	0	0	60	100
11	80	1	1	0	0	0	20	100
12	80	1	1	0	0	0	20	100
13	60	1	1	0	0	0	40	100
14	50	1	1	0	0	0	50	100
15	50	1	1	0	0	0	50	100
16	80	1	1	0	0	0	20	100
17	90	1	1	0	0	0	10	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	80	1	1	0	0	0	20	100
31	90	1	1	0	0	0	10	100
32	50	1	1	0	0	0	50	100
33	60	1	1	0	0	0	40	100
34	50	1	1	0	0	0	50	100
35	50	1	1	0	0	0	50	100
36	40	1	1	0	0	0	60	100
37	20	1	1	0	0	0	80	100
38	40	1	1	0	0	0	60	100
39	50	1	1	0	0	0	50	100
40	20	1	1	0	0	0	80	100
41	60	1	1	0	0	0	40	100
42	60	1	1	0	0	0	40	100
43	60	1	1	0	0	0	40	100
44	60	1	1	0	0	0	40	100
45	80	1	1	0	0	0	20	100
46	20	1	1	0	0	0	80	100
47	10	1	1	0	0	0	90	100
48	80	1	1	0	0	0	20	100
49	80	1	1	0	0	0	20	100
50								0
51								0
52								0
53								0
54								0
55								0
56								0
57								0
58								0
59								0
60								0
61								0
62								0
63								0
64								0
65								0
66								0
67								0
68								0

Transect A5		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	90	1	1	0	0	0	10	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	90	1	1	0	0	0	10	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	60	1	1	0	0	0	40	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	20	1	1	0	0	0	80	100
39	20	1	1	0	0	0	80	100
40	40	1	1	0	0	0	60	100
41	60	1	1	0	0	0	40	100
42	60	1	1	0	0	0	40	100
43	80	1	1	0	0	0	20	100
44	80	1	1	0	0	0	20	100
45	40	1	1	0	0	0	60	100
46	10	1	1	0	0	0	90	100
47	20	1	1	0	0	0	80	100
48	20	1	1	0	0	0	80	100
49	40	1	1	0	0	0	60	100
50	60	1	1	0	0	0	40	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	80	1	1	0	0	0	20	100
58	40	1	1	0	0	0	60	100
59	80	1	1	0	0	0	20	100
60	80	1	1	0	0	0	20	100
61								0
62								0
63								0
64								0
65								0
66								0
67								0
68								0

Transect A6		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	0	0	0	0	0	0	100	100
5	0	0	0	0	0	0	100	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	80	1	1	0	0	0	20	100
13	80	1	1	0	0	0	20	100
14	90	1	1	0	0	0	10	100
15	90	1	1	0	0	0	10	100
16	80	1	1	0	0	0	20	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	80	1	1	0	0	0	20	100
20	80	1	1	0	0	0	20	100
21	90	1	1	0	0	0	10	100
22	70	1	1	0	0	0	30	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	80	1	1	0	0	0	20	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	90	1	1	0	0	0	10	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	60	1	1	0	0	0	40	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	90	1	1	0	0	0	10	100
47	100	1	1	0	0	0	0	100
48	70	1	1	0	0	0	30	100
49	100	1	1	0	0	0	0	100
50	70	1	1	0	0	0	30	100
51	70	1	1	0	0	0	30	100
52	100	1	1	0	0	0	0	100
53	40	1	1	0	0	0	60	100
54	70	1	1	0	0	0	30	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect C1		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
68	0	0	0	0	0	0	100	100
23	0	0	0	0	0	0	100	100
28	0	0	0	0	0	0	100	100
17	0	0	0	0	0	0	100	100
16	0	0	0	0	0	0	100	100
29	0	0	0	0	0	0	100	100
14	0	0	0	0	0	0	100	100
30	0	0	0	0	0	0	100	100
31	0	0	0	0	0	0	100	100
32	0	0	0	0	0	0	100	100
65	0	0	0	0	0	0	100	100
67	0	0	0	0	0	0	100	100
61	0	0	0	0	0	2	100	100
49	40	2	1	0	0	0	60	100
48	50	2	1	0	0	0	50	100
47	60	2	1	0	0	0	40	100
46	50	2	1	0	0	0	50	100
42	60	2	1	0	0	0	40	100
43	70	2	1	0	0	0	30	100
44	90	2	1	0	0	0	10	100
45	70	2	1	0	0	0	30	100
50	50	2	1	0	0	0	50	100
54	40	2	1	0	0	0	60	100
51	50	2	1	0	0	0	50	100
59	40	2	1	0	0	0	60	100
66	5	2	1	0	0	0	95	100
64	5	2	1	0	0	0	95	100
63	25	2	1	0	0	0	75	100
62	20	2	1	0	0	2	80	100
60	20	2	1	0	0	1	80	100
58	50	2	1	0	0	0	50	100
52	80	2	1	0	0	0	20	100
57	40	2	1	0	0	1	60	100
56	40	2	1	0	0	0	60	100
55	30	2	1	0	0	0	70	100
40	80	2	1	0	0	0	20	100
53	40	2	1	0	0	1	60	100
41	100	2	1	0	0	0	0	100
34	5	2	1	0	0	0	95	100
39	90	2	1	0	0	0	10	100
9	80	2	1	0	0	0	20	100
13	5	2	1	0	0	0	95	100
12	50	2	1	0	0	0	50	100
11	60	2	1	0	0	0	40	100
10	80	2	1	0	0	0	20	100
7	60	2	1	0	0	0	40	100
8	70	2	1	0	0	0	30	100
18	5	2	1	0	0	0	95	100
6	60	2	1	0	0	0	40	100
5	10	2	1	0	0	0	90	100
4	20	2	1	0	0	0	80	100
3	0	2	1	0	0	0	100	100
15	5	2	1	0	0	0	95	100
19	5	2	1	0	0	0	95	100
38	90	2	1	0	0	0	10	100
33	5	2	1	0	0	0	95	100
37	80	2	1	0	0	0	20	100
36	50	2	1	0	0	0	50	100
35	30	2	1	0	0	0	70	100
2	40	2	1	0	0	0	60	100
26	30	2	1	0	0	0	70	100
27	40	2	1	0	0	0	60	100
20	10	2	1	0	0	0	90	100
25	35	2	1	0	0	0	65	100
24	20	2	1	0	0	0	80	100
22	5	2	1	0	0	0	95	100
21	5	2	1	0	0	0	95	100
1	80	2	1	0	0	0	20	100

Transect C2		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
62	0	0	0	0	0	0	100	100
64	0	0	0	0	0	1	100	100
63	0	0	0	0	0	0	100	100
25	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
53	10	2	1	0	0	0	90	100
46	60	2	1	0	0	0	40	100
48	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
44	40	2	1	0	0	0	60	100
67	100	2	1	0	0	0	0	100
50	100	2	1	0	0	0	0	100
43	80	2	1	0	0	0	20	100
42	100	2	1	0	0	0	0	100
49	90	2	1	0	0	0	10	100
52	60	2	1	0	0	0	40	100
51	40	2	1	0	0	0	60	100
54	60	2	1	0	0	0	40	100
57	30	2	1	0	0	0	70	100
55	20	2	1	0	0	0	80	100
56	10	2	1	0	0	0	90	100
59	50	2	1	0	0	0	50	100
58	20	2	1	0	0	0	80	100
65	70	2	1	0	0	0	30	100
60	50	2	1	0	0	0	50	100
61	50	2	1	0	0	0	50	100
1	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
16	90	2	1	0	0	0	10	100
15	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
68	20	2	1	0	0	0	80	100

Transect C3		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
34	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
50	70	1	1	0	0	0	30	100
49	80	1	1	0	0	1	20	100
48	80	1	1	0	0	0	20	100
47	70	1	1	0	0	0	30	100
46	80	1	1	0	0	0	20	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	60	1	1	0	0	0	40	100
38	90	1	1	0	0	0	10	100
51	80	1	1	0	0	0	20	100
53	100	1	1	0	0	0	0	100
36	90	1	1	0	0	0	10	100
62	100	1	1	0	0	0	0	100
67	70	1	1	0	0	0	30	100
66	80	1	1	0	0	0	20	100
65	80	1	1	0	0	0	20	100
64	80	1	1	0	0	0	20	100
63	90	1	1	0	0	0	10	100
60	80	1	1	0	0	0	20	100
61	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
59	90	1	1	0	0	0	10	100
58	90	1	1	0	0	0	10	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	90	1	1	0	0	0	10	100
37	90	1	1	0	0	0	10	100
68	80	1	1	0	0	0	20	100
35	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
25	90	1	1	0	0	0	10	100
26	100	1	1	0	0	0	0	100
28	90	1	1	0	0	0	10	100
33	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
9	65	2	1	0	0	1	35	100
8	70	2	1	0	0	0	30	100
7	70	2	1	0	0	0	30	100
2	90	2	1	0	0	0	10	100
6	80	2	1	0	0	0	20	100
5	60	2	1	0	0	0	40	100
4	80	2	1	0	0	0	20	100
3	100	2	1	0	0	0	0	100
11	60	2	1	0	0	0	40	100
10	90	2	1	0	0	0	10	100
18	90	2	1	0	0	0	10	100
12	75	2	1	0	0	0	25	100
13	80	2	1	0	0	0	20	100
20	80	2	1	0	0	0	20	100
22	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
17	80	2	1	0	0	0	20	100
19	60	2	1	0	0	0	40	100
14	80	2	1	0	0	0	20	100
16	80	2	1	0	0	0	20	100
15	60	2	1	0	0	0	40	100
1	80	2	1	0	0	0	20	100

Transect C4		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	80	1	1	0	0	0	20	100
2	80	1	1	0	0	0	20	100
3	80	1	1	0	0	0	20	100
4	80	1	1	0	0	0	20	100
5	80	1	1	0	0	0	20	100
6	80	1	1	0	0	0	20	100
7	80	1	1	0	0	0	20	100
8	80	1	1	0	0	0	20	100
9	80	1	1	0	0	0	20	100
10	90	1	1	0	0	0	10	100
11	70	1	1	0	0	0	30	100
12	100	1	1	0	0	0	0	100
13	60	1	1	0	0	0	40	100
14	90	1	1	0	0	0	10	100
15	60	1	1	0	0	0	40	100
16	80	1	1	0	0	0	20	100
17	90	1	1	0	0	0	10	100
18	70	1	1	0	0	0	30	100
19	60	1	1	0	0	0	40	100
20	60	1	1	0	0	0	40	100
21	60	1	1	0	0	0	40	100
22	70	1	1	0	0	1	30	100
23	70	1	1	0	0	0	30	100
24	40	1	1	0	0	1	60	100
25	80	1	1	0	0	0	20	100
26	60	1	1	0	0	0	40	100
27	60	1	1	0	0	1	40	100
28	90	1	1	0	0	1	10	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	60	1	1	0	0	1	40	100
32	60	1	1	0	0	0	40	100
33	90	1	1	0	0	0	10	100
34	90	1	1	0	0	0	10	100
35	90	1	1	0	0	0	10	100
36	90	1	1	0	0	0	10	100
37	90	1	1	0	0	0	10	100
38	80	1	1	0	0	0	20	100
39	90	1	1	0	0	0	10	100
40	90	1	1	0	0	0	10	100
41	90	1	1	0	0	1	10	100
42	90	1	1	0	0	0	10	100
43	90	1	1	0	0	0	10	100
44	90	1	1	0	0	0	10	100
45	30	1	1	0	0	0	70	100
46	0	0	0	0	0	0	100	100
47	80	1	1	0	0	0	20	100
48	90	1	1	0	0	0	10	100
49	90	1	1	0	0	0	10	100
50	100	1	1	0	0	1	0	100
51	90	1	1	0	0	0	10	100
52	60	1	1	0	0	1	40	100
53	60	1	1	0	0	0	40	100
54	90	1	1	0	0	0	10	100
55	90	1	1	0	0	0	10	100
56	90	1	1	0	0	0	10	100
57	90	1	1	0	0	0	10	100
58	90	1	1	0	0	1	10	100
59	80	1	1	0	0	0	20	100
60	30	1	1	0	0	0	70	100
61	20	1	1	0	0	0	80	100
62	30	1	1	0	0	1	70	100
63	60	1	1	0	0	0	30	90
64	80	1	1	0	0	0	20	100
65	60	1	1	0	0	0	40	100
66	80	1	1	0	0	0	20	100
67	50	1	1	0	0	0	50	100
68	60	1	1	0	0	1	40	100

Transect C5		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
27	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
40	100	2	1	0	0	0	0	100
41	100	2	1	0	0	0	0	100
42	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	100	2	1	0	0	0	0	100
50	100	2	1	0	0	0	0	100
51	100	2	1	0	0	0	0	100
52	100	2	1	0	0	0	0	100
53	100	2	1	0	0	0	0	100
54	100	2	1	0	0	0	0	100
55	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
59	100	2	1	0	0	0	0	100
60	100	2	1	0	0	0	0	100
61	100	2	1	0	0	0	0	100
62	100	2	1	0	0	0	0	100
63	100	2	1	0	0	0	0	100
64	100	2	1	0	0	0	0	100
65	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
67	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect C6		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
20	98	2	1	0	2	0	0	100
21	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
27	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
37	90	2	1	0	0	0	10	100
38	100	2	1	0	0	0	0	100
39	90	2	1	0	0	0	10	100
40	50	2	1	0	0	0	50	100
41	100	2	1	0	0	0	0	100
42	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	100	2	1	0	0	0	0	100
50	95	2	1	0	0	2	5	100
51	100	2	1	0	0	0	0	100
52	100	2	1	0	0	0	0	100
53	100	2	1	0	0	0	0	100
54	100	2	1	0	0	0	0	100
55	95	2	1	0	0	1	5	100
56	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
59	100	2	1	0	0	0	0	100
60	100	2	1	0	0	0	0	100
61	50	2	1	0	0	0	50	100
62	100	2	1	0	0	0	0	100
63	90	2	0	0	0	0	10	100
64	100	2	1	0	0	0	0	100
65	100	2	1	0	0	0	0	100
66	90	2	1	0	0	0	10	100
67	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect L1		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	80	1	1	0	0	0	20	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	80	1	1	0	0	0	20	100
11	90	1	1	0	0	0	10	100
12	70	1	1	0	0	0	30	100
13	80	1	1	0	0	0	20	100
14	90	1	1	0	0	0	10	100
15	60	1	1	0	0	0	40	100
16	60	1	1	0	0	0	40	100
17	40	1	1	0	0	0	60	100
18	40	1	1	0	0		60	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	80	1	1	0	0	0	20	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	80	1	1	0	0	0	20	100
31	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	90	1	1	0	0	0	10	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect F1		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
6	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	0	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
23	100	2	1	0	0	0	0	100
24	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
26	100	2	1	0	0	0	0	100
27	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	100	2	1	0	0	0	0	100
37	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
40	100	2	1	0	0	0	0	100
41	100	2	1	0	0	0	0	100
42	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	100	2	1	0	0	0	0	100
50	100	2	1	0	0	0	0	100
51	100	2	1	0	0	0	0	100
52	100	2	1	0	0	0	0	100
53	100	2	1	0	0	0	0	100
54	100	2	1	0	0	0	0	100
55	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
58	100	2	1	0	0	0	0	100
59	100	2	1	0	0	0	0	100
60	100	2	1	0	0	0	0	100
61	100	2	1	0	0	0	0	100
62	100	2	1	0	0	0	0	100
63	100	2	1	0	0	0	0	100
64	100	2	1	0	0	0	0	100
65	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
67	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect F2		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	95	2	1	0	5	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	98	1	1	0	2	0	0	100
6	98	1	1	0	2	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	97	1	1	0	3	0	0	100
10	98	1	1	0	2	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
15	98	1	1	0	2	0	0	100
16	98	1	1	0	2	0	0	100
17	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
21	98	1	1	0	2	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	95	1	1	0	0	0	5	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	90	1	1	0	10	0	0	100
32	90	1	1	0	0	0	10	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	95	1	1	0	0	0	5	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	95	1	1	0	0	0	5	100
47	95	1	1	0	0	0	5	100
48	95	1	1	0	0	0	5	100
49	100	1	1	0	0	0	0	100
50	90	1	1	0	0	0	10	100
51	80	1	1	0	0	0	20	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	95	1	1	0	0	0	5	100
57	95	1	1	0	0	0	5	100
58	95	1	1	0	0	0	5	100
59	85	1	1	0	0	0	15	100
60	70	1	1	0	0	0	30	100
61	70	1	1	0	0	0	30	100
62	50	1	1	0	0	0	50	100
63	80	1	1	0	0	0	20	100
64	85	1	1	0	0	0	15	100
65	90	1	1	0	0	0	5	95
66	100	1	1	0	0	0	0	100
67	70	1	1	0	0	0	30	100
68	65	1	1	0	0	0	35	100

Transect F3		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
68	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
46	95	1	1	0	0	0	5	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
52	98	1	1	0	2	0	0	100
63	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
53	98	1	1	0	2	0	0	100
66	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
41	45	1	1	0	0	0	55	100
55	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
54	98	1	1	0	2	0	0	100
43	35	2	1	0	0	0	65	100
44	60	2	1	0	0	0	40	100
49	95	2	1	0	0	0	5	100
48	40	2	1	0	0	0	60	100
45	90	2	1	0	0	0	10	100
47	85	2	1	0	0	0	15	100
34	100	2	1	0	0	0	0	100
42	20	2	1	0	0	0	80	100
8	10	2	1	0	0	0	90	100
11	85	2	1	0	0	0	15	100
10	20	2	1	0	0	0	80	100
9	0	2	1	0	0	0	100	100
6	100	2	1	0	0	0	0	100
7	60	2	1	0	0	0	40	100
13	100	2	1	0	0	0	0	100
5	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
15	55	2	1	0	0	0	45	100
14	90	2	1	0	0	0	10	100
35	100	2	1	0	0	0	0	100
25	98	2	1	0	0	0	2	100
2	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
29	65	2	1	0	0	0	35	100
20	95	2	1	0	0	0	5	100
24	50	2	1	0	0	0	50	100
16	100	2	1	0	0	0	0	100
19	95	2	1	0	0	0	5	100
18	95	2	1	0	0	0	5	100
17	95	2	1	0	0	0	5	100
1	100	2	1	0	0	0	0	100

Transect F4		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	85	2	1	0	0	0	15	100
3	85	2	1	0	0	0	15	100
4	90	2	1	0	0	0	10	100
5	95	2	1	0	0	0	5	100
6	95	2	1	0	0	2	5	100
7	85	2	1	0	0	1	15	100
8	95	2	1	0	0	0	5	100
9	95	2	1	0	0	0	5	100
10	95	2	1	0	0	0	5	100
11	95	2	1	0	0	0	5	100
12	85	2	1	0	0	0	15	100
13	85	2	1	0	0	0	15	100
14	90	2	1	0	0	0	10	100
15	90	2	1	0	0	0	10	100
16	90	2	1	0	0	0	10	100
17	55	2	1	0	0	0	45	100
18	50	2	1	0	0	0	50	100
19	75	2	1	0	0	0	25	100
20	65	2	1	0	0	0	35	100
21	100	2	1	0	0	0	0	100
22	95	2	1	0	0	0	5	100
23	65	2	1	0	0	0	35	100
24	85	2	1	0	0	0	15	100
25	90	2	1	0	0	0	10	100
26	90	2	1	0	0	0	10	100
27	10	2	1	0	0	1	90	100
28	15	2	1	0	0	0	85	100
29	75	2	1	0	0	0	25	100
30	90	2	1	0	0	0	10	100
31	90	2	1	0	0	1	10	100
32	85	2	1	0	0	0	15	100
33	85	2	1	0	0	0	15	100
34	90	2	1	0	0	0	10	100
35	65	2	1	0	0	0	35	100
36	10	2	1	0	0	0	90	100
37	20	2	1	0	0	0	80	100
38	15	2	1	0	0	0	85	100
39	10	2	1	0	0	0	90	100
40	5	2	1	0	0	1	95	100
41	0	2	1	0	0	0	100	100
42	0	2	1	0	0	0	100	100
43	5	2	1	0	0	1	95	100
44	20	2	1	0	0	0	80	100
45	5	2	1	0	0	1	95	100
46	0	2	1	0	0	0	100	100
47	0	2	1	0	0	0	100	100
48	5	2	1	0	0	1	95	100
49	10	2	1	0	0	0	90	100
50	5	2	1	0	0	1	95	100
51	20	2	1	0	0	0	80	100
52	40	2	1	0	0	0	60	100
53	20	2	1	0	0	0	80	100
54	0	2	1	0	0	0	100	100
55	10	2	1	0	0	0	90	100
56	0	2	1	0	0	0	100	100
57	0	2	1	0	0	0	100	100
58	5	2	1	0	0	0	95	100
59	15	2	1	0	0	0	85	100
60	10	2	1	0	0	0	90	100
61	10	2	1	0	0	0	90	100
62	5	2	1	0	0	0	98	103
63	15	2	1	0	0	0	85	100
64	25	2	1	0	0	0	75	100
65	25	2	1	0	0	0	75	100
66	50	2	1	0	0	0	50	100
67	70	2	1	0	0	0	30	100
68	65	2	1	0	0	0	35	100

Transect F5		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	95	2	1	0	0	0	5	100
2	95	2	1	0	0	0	5	100
3	90	2	1	0	0	1	10	100
4	20	2	1	0	0	0	80	100
5	35	2	1	0	0	0	65	100
6	25	2	1	0	0	0	75	100
7	80	2	1	0	0	0	20	100
8	65	2	1	0	0	0	35	100
9	85	2	1	0	0	0	25	110
10	70	2	1	0	0	0	30	100
11	75	2	1	0	0	0	25	100
12	65	2	1	0	0	0	35	100
13	85	2	1	0	0	0	15	100
14	85	2	1	0	0	0	15	100
15	90	2	1	0	0	0	10	100
16	95	2	1	0	0	0	5	100
17	95	2	1	0	0	0	5	100
18	90	2	1	0	0	0	10	100
19	85	2	1	0	0	0	15	100
20	90	2	1	0	0	0	10	100
21	85	2	1	0	0	0	15	100
22	90	2	1	0	0	0	10	100
23	70	2	1	0	0	0	30	100
24	65	2	1	0	0	0	35	100
25	50	2	1	0	0	0	20	70
26	70	2	1	0	0	0	30	100
27	65	2	1	0	0	0	35	100
28	65	2	1	0	0	0	35	100
29	80	2	1	0	0	0	20	100
30	95	2	1	0	0	0	5	100
31	85	2	1	0	0	0	15	100
32	90	2	1	0	0	0	10	100
33	85	2	1	0	0	0	15	100
34	90	2	1	0	0	0	10	100
35	85	2	1	0	0	0	15	100
36	95	2	1	0	0	0	5	100
37	95	2	1	0	0	0	5	100
38	90	2	1	0	0	0	10	100
39	85	2	1	0	0	0	15	100
40	75	2	1	0	0	0	25	100
41	80	2	1	0	0	0	20	100
42	65	2	1	0	0	0	35	100
43	85	2	1	0	0	0	15	100
44	100	2	1	0	0	0	0	100
45	85	2	1	0	0	0	15	100
46	70	2	1	0	0	0	30	100
47	75	2	1	0	0	0	25	100
48	85	2	1	0	0	0	15	100
49	85	2	1	0	0	0	15	100
50	85	2	1	0	0	0	15	100
51	90	2	1	0	0	0	10	100
52	95	2	1	0	0	0	5	100
53	95	2	1	0	0	0	5	100
54	80	2	1	0	0	0	20	100
55	85	2	1	0	0	0	15	100
56	85	2	1	0	0	0	15	100
57	95	2	1	0	0	0	5	100
58	90	2	1	0	0	0	10	100
59	90	2	1	0	0	0	10	100
60	75	2	1	0	0	0	25	100
61	85	2	1	0	0	0	15	100
62	70	2	1	0	0	0	30	100
63	75	2	1	0	0	0	25	100
64	85	2	1	0	0	0	15	100
65	90	2	1	0	0	0	10	100
66	85	2	1	0	0	0	15	100
67	95	2	1	0	0	0	5	100
68	95	2	1	0	0	0	5	100

Transect F6		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	95	2	1	0	0	0	5	100
2	95	2	1	0	0	0	5	100
3	100	2	1	0	0	0	0	100
4	85	2	1	0	0	0	15	100
5	90	2	1	0	0	0	10	100
6	90	2	1	0	0	0	10	100
7	95	2	1	0	0	0	5	100
8	75	2	1	0	0	0	25	100
9	60	2	1	0	0	0	40	100
10	85	2	1	0	0	0	15	100
11	70	2	1	0	0	0	30	100
12	65	2	1	0	0	0	35	100
13	50	2	1	0	0	0	50	100
14	60	2	1	0	0	0	40	100
15	70	2	1	0	0	0	30	100
16	85	2	1	0	0	0	15	100
17	95	2	1	0	0	0	5	100
18	95	2	1	0	0	0	5	100
19	100	2	1	0	0	0	0	100
20	95	2	1	0	0	0	5	100
21	95	2	1	0	0	0	5	100
22	100	2	1	0	0	0	0	100
23	95	2	1	0	0	0	5	100
24	95	2	1	0	0	0	5	100
25	85	2	1	0	0	0	15	100
26	90	2	1	0	0	0	10	100
27	85	2	1	0	0	0	15	100
28	95	2	1	0	0	0	5	100
29	95	2	1	0	0	0	5	100
30	95	2	1	0	0	0	5	100
31	95	2	1	0	0	0	5	100
32	90	2	1	0	0	0	10	100
33	95	2	1	0	0	0	5	100
34	80	2	1	0	0	0	20	100
35	50	2	1	0	0	0	50	100
36	40	2	1	0	0	0	60	100
37	65	2	1	0	0	0	45	110
38	50	2	1	0	0	0	50	100
39	45	2	1	0	0	0	55	100
40	75	2	1	0	0	0	25	100
41	60	2	1	0	0	0	40	100
42	50	2	1	0	0	0	50	100
43	65	2	1	0	0	0	35	100
44	85	2	1	0	0	0	15	100
45	95	2	1	0	0	0	5	100
46	85	2	1	0	0	0	15	100
47	90	2	1	0	0	0	10	100
48	90	2	1	0	0	0	10	100
49	80	2	1	0	0	0	20	100
50	75	2	1	0	0	0	25	100
51	65	2	1	0	0	0	35	100
52	85	2	1	0	0	0	15	100
53	70	2	1	0	0	0	30	100
54	85	2	1	0	0	0	15	100
55	65	2	1	0	0	0	35	100
56	75	2	1	0	0	0	25	100
57	85	2	1	0	0	0	15	100
58	80	2	1	0	0	0	20	100
59	95	2	1	0	0	0	5	100
60	95	2	1	0	0	0	5	100
61	90	2	1	0	0	0	10	100
62	85	2	1	0	0	0	15	100
63	70	2	1	0	0	0	30	100
64	95	2	1	0	0	0	5	100
65	95	2	1	0	0	0	5	100
66	100	2	1	0	0	0	0	100
67	95	2	1	0	0	0	5	100
68	100	2	1	0	0	0	0	100

Transect F7		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	2	1	0	0	0	0	100
2	100	2	1	0	0	0	0	100
3	100	2	1	0	0	0	0	100
4	100	2	1	0	0	0	0	100
5	95	2	1	0	0	0	5	100
6	100	2	1	0	0	0	0	100
7	100	2	1	0	0	0	0	100
8	100	2	1	0	0	0	0	100
9	100	2	1	0	0	0	0	100
10	100	2	1	0	0	0	0	100
11	100	2	1	0	0	0	0	100
12	100	2	1	0	0	0	0	100
13	100	2	1	0	0	0	0	100
14	100	2	1	0	0	0	0	100
15	100	2	1	0	0	0	0	100
16	100	2	1	0	0	0	0	100
17	100	2	1	0	0	1	0	100
18	100	2	1	0	0	0	0	100
19	100	2	1	0	0	0	0	100
20	100	2	1	0	0	0	0	100
21	100	2	1	0	0	0	0	100
22	100	2	1	0	0	0	0	100
23	95	2	1	0	0	0	5	100
24	100	2	1	0	0	0	0	100
25	100	2	1	0	0	0	0	100
26	95	2	1	0	0	0	5	100
27	100	2	1	0	0	0	0	100
28	100	2	1	0	0	0	0	100
29	100	2	1	0	0	0	0	100
30	100	2	1	0	0	0	0	100
31	100	2	1	0	0	0	0	100
32	100	2	1	0	0	0	0	100
33	100	2	1	0	0	0	0	100
34	100	2	1	0	0	0	0	100
35	100	2	1	0	0	0	0	100
36	75	2	1	0	0	0	25	100
37	100	2	1	0	0	0	0	100
38	100	2	1	0	0	0	0	100
39	100	2	1	0	0	0	0	100
40	85	2	1	0	0	0	15	100
41	100	2	1	0	0	0	0	100
42	100	2	1	0	0	0	0	100
43	100	2	1	0	0	0	0	100
44	100	2	1	0	0	0	0	100
45	100	2	1	0	0	0	0	100
46	85	2	1	0	0	0	15	100
47	100	2	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100
49	100	2	1	0	0	0	0	100
50	100	2	1	0	0	0	0	100
51	100	2	1	0	0	0	0	100
52	95	2	1	0	0	0	5	100
53	95	2	1	0	0	0	5	100
54	95	2	1	0	0	0	5	100
55	100	2	1	0	0	0	0	100
56	85	2	1	0	0	0	15	100
57	100	2	1	0	0	0	0	100
58	80	2	1	0	0	0	20	100
59	75	2	1	0	0	0	25	100
60	100	2	1	0	0	0	0	100
61	100	2	1	0	0	0	0	100
62	85	2	1	0	0	0	15	100
63	100	2	1	0	0	0	0	100
64	100	2	1	0	0	0	0	100
65	100	2	1	0	0	0	0	100
66	100	2	1	0	0	0	0	100
67	100	2	1	0	0	0	0	100
68	100	2	1	0	0	0	0	100

Transect S1		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
34	0	0	0	0	10	0	90	100
54	0	0	0	0	30	0	70	100
52	0	0	0	0	60	0	40	100
39	0	0	0	0	100	0	0	100
25	0	0	0	0	90	0	10	100
26	0	0	0	0	100	0	0	100
27	0	0	0	0	100	0	0	100
28	0	0	0	0	30	0	70	100
30	0	0	0	0	100	0	0	100
20	0	0	0	0	100	0	0	100
31	0	0	0	0	90	0	10	100
32	0	0	0	0	10	0	90	100
33	0	0	0	0	0	0	100	100
2	0	0	0	0	100	0	0	100
35	0	0	0	0	10	0	90	100
36	0	0	0	0	0	0	100	100
21	0	0	0	0	100	0	0	100
42	0	0	0	0	100	0	0	100
38	0	0	0	0	65	0	35	100
18	0	0	0	0	100	0	0	100
64	0	0	0	0	100	0	0	100
3	0	0	0	0	100	0	0	100
4	0	0	0	0	0	0	100	100
5	0	0	0	0	40	0	60	100
50	0	0	0	0	80	0	20	100
66	0	0	0	0	100	0	0	100
65	0	0	0	0	100	0	0	100
63	0	0	0	0	100	0	0	100
10	0	0	0	0	100	0	0	100
43	0	0	0	0	100	0	0	100
12	0	0	0	0	100	0	0	100
62	0	0	0	0	100	0	0	100
14	0	0	0	0	100	0	0	100
61	0	0	0	0	100	0	0	100
51	0	0	0	0	80	0	20	100
37	0	0	0	0	0	0	100	100
53	20	1	1	0	0	0	80	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
48	60	1	1	0	0	0	40	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
67	10	1	1	0	90	0	0	100
49	30	1	1	0	70	0	0	100
1	65	1	1	0	10	0	25	100
47	60	1	1	0	40	0	0	100
11	10	1	1	0	90	0	0	100
15	80	1	1	0	0	0	20	100
13	10	1	1	0	90	0	0	100
8	20	1	1	0	2	0	78	100
9	65	1	1	0	2	0	33	100
17	20	1	1	0	80	0	0	100
7	20	1	1	0	0	0	80	100
6	10	1	1	0	10	0	80	100
16	100	1	1	0	0	0	0	100
19	10	1	1	0	90	0	0	100
46	100	1	1	0	0	0	0	100
41	60	1	1	0	40	0	0	100
45	100	1	1	0	0	0	0	100
44	60	1	1	0	40	0	0	100
29	20	1	1	0	0	0	80	100
40	80	1	1	0	20	0	0	100
22	10	1	1	0	90	0	0	100
24	10	1	1	0	90	0	0	100
23	10	1	1	0	90	0	0	100
68	40	1	1	0	60	0	0	100

Transect S2		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	30	1	1	0	0	0	70	100
14	20	1	1	0	0	0	80	100
15	20	1	1	0	0	0	80	100
16	40	1	1	0	0	0	60	100
17	30	1	1	0	0	0	70	100
18	60	1	1	0	0	0	40	100
19	50	1	1	0	0	0	50	100
20	40	1	1	0	0	0	60	100
21	35	1	1	0	0	0	65	100
22	75	1	1	0	0	0	25	100
23	65	1	1	0	0	0	35	100
24	80	1	1	0	0	0	20	100
25	95	1	1	0	0	0	5	100
26	85	1	1	0	0	0	15	100
27	90	1	1	0	0	0	10	100
28	60	1	1	0	0	0	40	100
29	50	1	1	0	0	0	50	100
30	65	1	1	0	0	0	35	100
31	80	1	1	0	0	0	20	100
32	80	1	1	0	0	0	20	100
33	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61								0
62								0
63								0
64								0
65								0
66								0
67								0
68								0

Transect S3		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	95	1	1	0	0	0	5	100
2	95	1	1	0	0	0	5	100
3	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
10	85	1	1	0	0	0	15	100
11	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
13	95	1	1	0	0	0	5	100
14	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
18	95	1	1	0	0	0	5	100
19	85	1	1	0	0	0	15	100
20	85	1	1	0	0	0	15	100
21	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
23	90	1	1	0	0	0	10	100
24	85	1	1	0	0	0	15	100
25	95	1	1	0	0	0	5	100
26	75	1	1	0	0	0	25	100
27	100	1	1	0	0	0	0	100
28	85	1	1	0	0	0	15	100
29	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
31	95	1	1	0	0	0	5	100
32	95	1	1	0	0	0	5	100
33	95	1	1	0	0	0	5	100
34	95	1	1	0	0	0	5	100
35	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	95	1	1	0	0	0	5	100
41	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
48	95	1	1	0	0	0	5	100
49	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
58	85	1	1	0	0	0	15	100
59	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	95	1	1	0	0	0	5	100
62	95	1	1	0	0	0	5	100
63	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
66	95	1	1	0	0	0	5	100
67	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100

Transect S4		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
41	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
52	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
6	100	1	1	0	0	0	0	100
5	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
30	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
22	80	1	1	0	20	0	0	100
25	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
29	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
21	40	2	1	0	0	0	60	100
48	100	2	1	0	0	0	0	100
57	100	2	1	0	0	0	0	100
56	100	2	1	0	0	0	0	100
46	100	2	1	0	0	0	0	100
47	100	2	1	0	0	1	0	100
49	100	2	1	0	0	0	0	100

Transect S5		Sorted data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	0	0	0	0	0	0	100	100
66	0	0	0	0	0	0	100	100
2	0	0	0	0	0	0	100	100
17	0	0	0	0	0	0	100	100
16	0	0	0	0	0	0	100	100
15	0	0	0	0	0	0	100	100
65	0	0	0	0	0	0	100	100
18	0	0	0	0	0	0	100	100
5	0	0	0	0	0	0	100	100
4	0	0	0	0	0	0	100	100
7	0	0	0	0	0	0	100	100
3	0	0	0	0	0	0	100	100
6	0	0	0	0	0	0	100	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
45	45	1	1	0	0	0	55	100
67	85	1	1	0	0	0	15	100
44	75	1	1	0	0	0	25	100
49	65	1	1	0	0	0	35	100
43	100	1	1	0	0	0	0	100
42	95	1	1	0	0	0	5	100
41	75	1	1	0	0	0	25	100
48	75	1	1	0	0	0	25	100
55	95	1	1	0	0	0	5	100
50	40	1	1	0	0	0	60	100
51	85	1	1	0	0	0	15	100
61	60	1	1	0	0	0	40	100
64	60	1	1	0	0	0	40	100
63	80	1	1	0	0	0	20	100
62	100	1	1	0	0	0	0	100
39	85	1	1	0	0	0	15	100
52	70	1	1	0	0	0	30	100
60	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	90	1	1	0	0	0	10	100
40	80	1	1	0	0	0	20	100
34	95	1	1	0	0	0	5	100
38	85	1	1	0	0	0	15	100
37	100	1	1	0	0	0	0	100
36	90	1	1	0	0	0	10	100
12	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
19	80	1	1	0	0	0	20	100
20	80	1	1	0	0	0	20	100
21	80	1	1	0	0	0	20	100
22	40	1	1	0	0	0	60	100
68	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
35	85	1	1	0	0	0	15	100
33	95	1	1	0	0	0	5	100
14	20	2	1	0	0	0	80	100
10	75	2	1	0	0	0	25	100
11	90	2	1	0	0	0	10	100
59	65	2	1	0	0	0	35	100
9	85	2	1	0	0	0	15	100
8	70	2	1	0	0	0	30	100
27	95	2	1	0	0	0	5	100
58	80	2	1	0	0	0	20	100
26	95	2	1	0	0	0	5	100
23	95	2	1	0	0	0	5	100
25	100	2	1	0	0	0	0	100
24	80	2	1	0	0	0	20	100
54	95	2	1	0	0	0	5	100
28	85	2	1	0	0	0	15	100
31	90	2	1	0	0	0	10	100
29	85	2	1	0	0	0	15	100
30	85	2	1	0	0	0	15	100
53	95	2	1	0	0	0	5	100

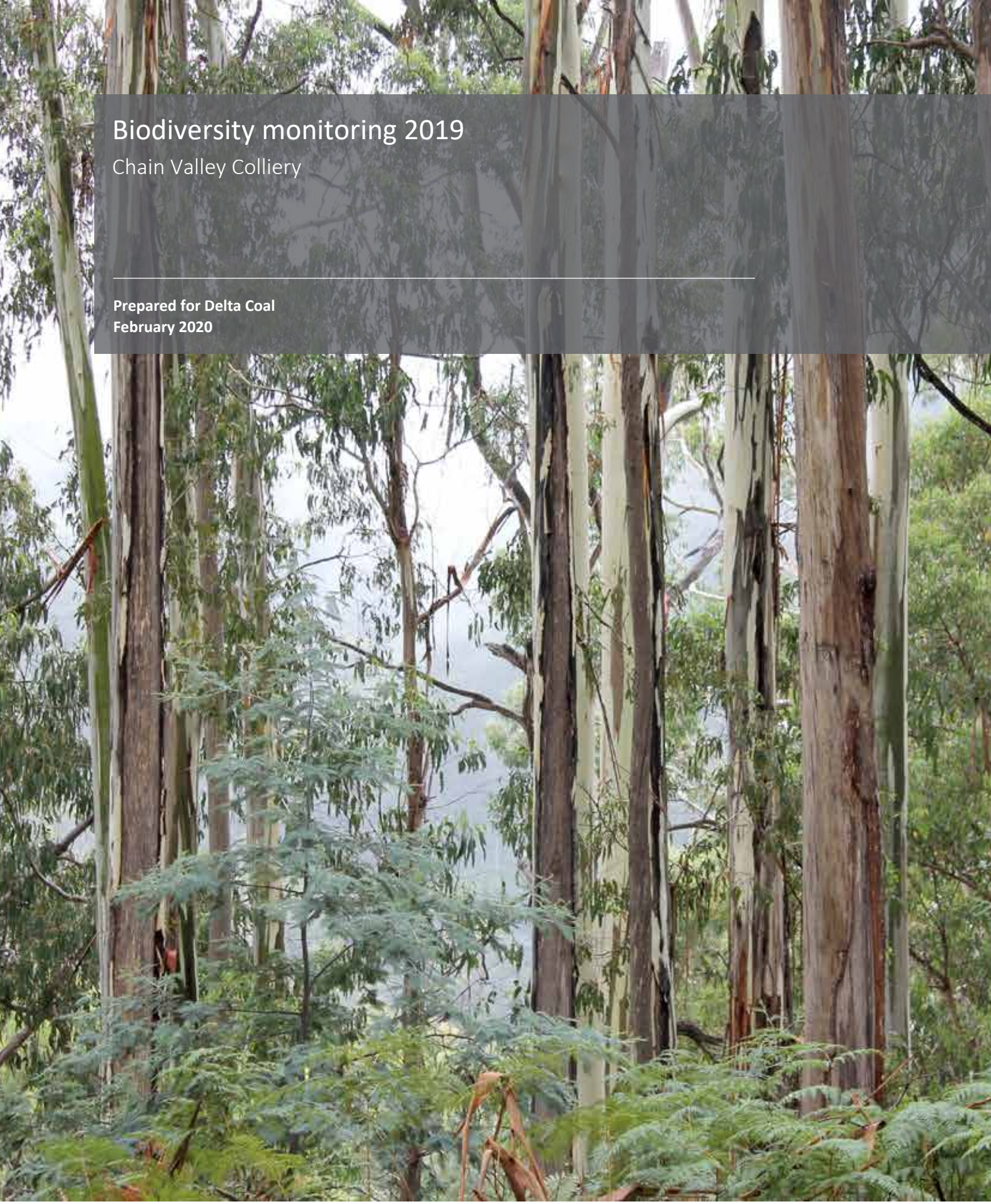
Transect S6		Raw data						
	Zostera	Long=1	Fouling	Cystophyllum	% algae	Pinna	% Bare	Total
Quadrat	% cover	Short=2	1,2,3	% cover	filamentous	Number	Ground	Cover
1	100	1	1	0	0	0	0	100
44	100	1	1	0	0	0	0	100
50	100	1	1	0	0	0	0	100
49	100	1	1	0	0	0	0	100
47	100	1	1	0	0	0	0	100
46	100	1	1	0	0	0	0	100
45	100	1	1	0	0	0	0	100
42	100	1	1	0	0	0	0	100
43	100	1	1	0	0	0	0	100
52	95	1	1	0	0	0	5	100
41	100	1	1	0	0	0	0	100
40	100	1	1	0	0	0	0	100
39	100	1	1	0	0	0	0	100
38	100	1	1	0	0	0	0	100
37	100	1	1	0	0	0	0	100
51	100	1	1	0	0	0	0	100
53	100	1	1	0	0	0	0	100
35	100	1	1	0	0	0	0	100
62	100	1	1	0	0	0	0	100
67	100	1	1	0	0	0	0	100
66	100	1	1	0	0	0	0	100
65	100	1	1	0	0	0	0	100
64	100	1	1	0	0	0	0	100
63	100	1	1	0	0	0	0	100
60	100	1	1	0	0	0	0	100
61	100	1	1	0	0	0	0	100
54	100	1	1	0	0	0	0	100
59	100	1	1	0	0	0	0	100
58	100	1	1	0	0	0	0	100
57	100	1	1	0	0	0	0	100
56	100	1	1	0	0	0	0	100
55	100	1	1	0	0	0	0	100
36	100	1	1	0	0	0	0	100
34	100	1	1	0	0	0	0	100
2	100	1	1	0	0	0	0	100
10	100	1	1	0	0	0	0	100
15	100	1	1	0	0	0	0	100
14	100	1	1	0	0	0	0	100
13	100	1	1	0	0	0	0	100
12	100	1	1	0	0	0	0	100
11	100	1	1	0	0	0	0	100
8	100	1	1	0	0	0	0	100
9	100	1	1	0	0	0	0	100
17	100	1	1	0	0	0	0	100
7	100	1	1	0	0	0	0	100
6	95	1	1	0	0	0	5	100
5	100	1	1	0	0	0	0	100
4	100	1	1	0	0	0	0	100
3	100	1	1	0	0	0	0	100
16	100	1	1	0	0	0	0	100
19	100	1	1	0	0	0	0	100
18	100	1	1	0	0	0	0	100
33	100	1	1	0	0	0	0	100
27	100	1	1	0	0	0	0	100
32	100	1	1	0	0	0	0	100
31	100	1	1	0	0	0	0	100
30	95	1	1	0	0	0	5	100
29	100	1	1	0	0	0	0	100
28	100	1	1	0	0	0	0	100
25	100	1	1	0	0	0	0	100
26	100	1	1	0	0	0	0	100
20	100	1	1	0	0	0	0	100
24	100	1	1	0	0	0	0	100
23	100	1	1	0	0	0	0	100
22	100	1	1	0	0	0	0	100
21	100	1	1	0	0	0	0	100
68	100	1	1	0	0	0	0	100
48	100	2	1	0	0	0	0	100

Appendix 5: Biodiversity Monitoring Report

Biodiversity monitoring 2019

Chain Valley Colliery

Prepared for Delta Coal
February 2020



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Biodiversity monitoring 2019

Chain Valley Colliery

Report Number

H190762 RP1

Client

Delta Coal

Date

20 February 2020

Version

v1 Final

Prepared by

Eugene Dodd
Senior Ecologist
20 February 2020

Approved by

Katie Diver
National Technical Leader
20 February 2020

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1 Introduction

1.1 Rehabilitation monitoring plan requirements

Chain Valley Colliery (CVC) and Mannering Colliery (MC) (the mines) are underground coal mines located at the southern extent of Lake Macquarie, approximately 60 km south of Newcastle. The mines are operated by Delta Coal Pty Ltd (Delta Coal) and produce thermal coal for the domestic and export markets.

The mines operate in accordance with project approval MP10_0161 and SSD-5465. MP10_0161 required the preparation of Chain Valley Colliery Biodiversity Management Plan (EMGA 2016) (BMP). The BMP includes an annual terrestrial biodiversity monitoring program which commenced in 2016, comprising:

- 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 has not undertaken the weed monitoring component of the field surveys as this has recently been completed for a weed management plan and bush regeneration works by Total Earth Care 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 and downstream of the D10 discharge was monitored in line with the method set out in in the BMP, including:

- completion of two biobanking plots as per Section 11.1 of the BMP and the proforma in Appendix 1 of the BMP; and
- a comparison of the collected plot data against the previous years' data (specifically to monitor dieback of *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.

2.2 Condition of vegetation adjacent to the ventilation shafts and fans

Condition monitoring of vegetation surrounding the ventilation shaft area includes:

- observation of two Rough-barked Apple (*Angophora floribunda*) trees directly adjacent to the Ventilation Shaft, as shown in Figure 9 of the BMP, for 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, 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 (recorded by EMM during the 2018 monitoring) and significant new weed occurrences in the eastern management zone (within the Swamp Oak Forest) as well as at the ventilation shaft area. The weed monitoring component of the field surveys has recently been completed for a weed management plan and bush regeneration works by Total Earth Care 2019.

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 one of the BMP and includes recording of activity of feral species by searching for tracks, diggings, burrows and sighting of individuals.

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 Figure 3.1 with a description of the findings for each plot provided below. The weighted score for the combination for the combination of the two plots is 65, which is identical to the 2018 monitoring. No remedial actions are required as the score is above the minimum trigger of 60.

3.1.1 Plot 1

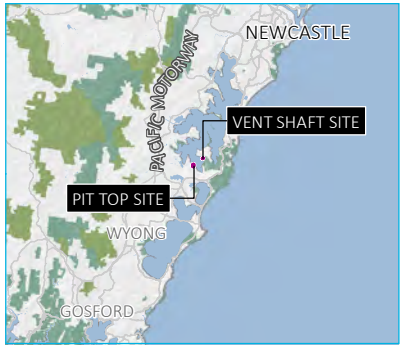
The condition and composition of the vegetation within Plot 1 was broadly comparable with the monitoring results from the previous year. The canopy of Swamp Oak is continuing to regenerate, with slight increase in coverage from 19.5 % to 20.5 %. The ground cover was largely unchanged with one additional native species recorded; Samphire (*Sarcocornia quinqueflora subsp. quinqueflora*). This species is a Halophyte (grows in saline conditions) therefore its presence should be monitored to determine if it increases in dominance.

Weed prevalence was limited to a single Ground Asparagus (*Asparagus aethiopicus*) plant, with no evidence of any new weed species within the plot or area immediately adjacent.

3.1.2 Plot 2

The condition and composition of the vegetation within Plot 2 was broadly comparable with the 2018 monitoring. Swamp Oak was the only canopy species present, which increased its canopy cover from 23 % to 23.5 %. The ground cover was largely unchanged with one additional native species recorded; Samphire (*Sarcocornia quinqueflora subsp. quinqueflora*). As discussed above, this species is a Halophyte, therefore its presence should be monitored to determine if it increases in dominance, indicating potential transition of the community. This is unlikely to be of concern unless it occurs concurrently with dieback of Swamp Oak.

Weed prevalence within the plot was substantially lower than 2018, with no Bitou Bush (*Chrysanthemoides monilifera*) or Cassia (*Senna pendula var. glabra*) recorded in 2019, likely owing to successful weed control. It is noted that these species, and Sharp Rush (*Juncus acutus*) are relatively frequent outside of the plot. These will require ongoing management, to prevent them increasing in prevalence at the expense of native species.



KEY

- FDI100
- Plot (20x20 m) and transcent (20x50 m)
- Local road
- Vehicular track

Strahler stream order

- 1st order
- 2nd order

Source: EMM (2020); DFSI (2017); GA (2015); DPI (2013)

0 50 100 m

GDA 1994 MGA Zone 56

N

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Pit top monitoring
eastern zone

Chain Valley Colliery
Biodiversity monitoring 2019
Figure 3.1

EMM
creating opportunities

3.2 Condition of vegetation adjacent to the ventilation shafts and fans

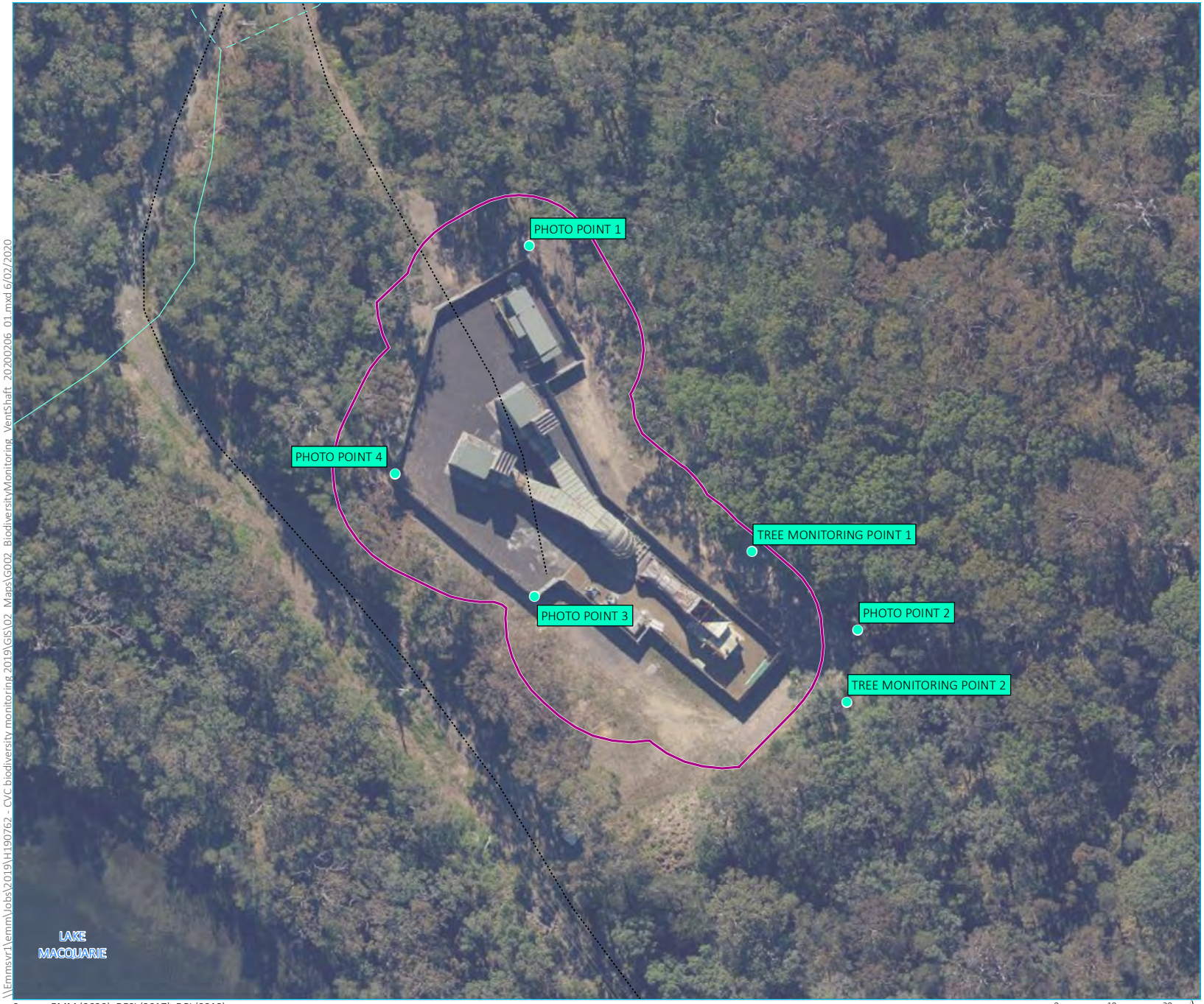
A photolog of the photo monitoring points and tree monitoring points are provided in Appendix B, with a summary of observations provided in Table 1.1.

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 would affect the photo point monitoring, with obvious clearance of shrubs and regenerating small trees close compound.

When clearance for the asset protection zones is taken into account (APZ), 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 in 2019 compared to the previous year.

Table 3.1 Monitoring point observations

Monitoring point	2019 monitoring observations
1	Vegetation appears healthy with observable growth of canopy species and midstorey species. Not comparable with the 2016 monitoring given the clearing for an asset protection zones (APZ).
2	Vegetation appears healthy with observable growth of canopy species and midstorey species compared, to previous monitoring events. Isolated dieback of individual branchlets observed, however on balance, canopy crown density has is similar or demonstrates a net increase.
3	Vegetation has increased in height and density with native midstorey species growth particularly prevalent.
4	Vegetation appears healthy with observable growth of canopy species and midstorey species. Not comparable with the 2016 monitoring given the clearing for an asset protection zones (APZ).
Tree 1	Tree appears healthy, with new growth, dense foliage within the crown and no dieback observed.
Tree 2	Tree appears healthy, with new growth and dense foliage within the crown. Small areas of dieback observed on small and isolated limbs, however this is less noticeable than observed in previous years. The tree has increase foliage cover compared to the 2016 BMP photograph.



KEY

- FDI100
- Photo point
- Vehicular track

Strahler stream order

- 1st order
- 2nd order

\\Emmsvr1\emm\Jobs\2019\H190762 - CVC biodiversity monitoring 2019\GIS\02 Maps\G002 BiodiversityMonitoring_VentShaft_20200206_01.mxd 6/02/2020

Source: EMM (2020); DFSI (2017); DPI (2013)

0 10 20 m

GDA 1994 MGA Zone 56

N

Ventilation shaft monitoring

Chain Valley Colliery
Biodiversity monitoring 2019
Figure 3.2

EMM creating opportunities

3.3 Location and distribution of weeds

Evidence of weed control was apparent during the site survey. Weed prevalence was similar to previous years in the Swamp Oak Forest and improved at the vent shaft area.

Weed prevalence has been documented in Appendix C (TEC 2019), with a detail of weed treatment conducted, including species and locations targeted. A list of recommendations are also provided for each areas with several actions likely required.

3.4 Abundance and distribution of feral animal use

No evidence of feral animals has been detected for the last three years of monitoring (2017-2019).

4 Summary

The 2019 biodiversity monitoring established that the vegetation and habitat values within the subject areas was broadly similar to the 2018 monitoring.

Observations and photo monitoring at the vent shaft area demonstrated increased growth of native vegetation, especially observable in the ground and midstory. The canopy within the Swamp Oak areas had also increased slightly with additional tree dieback trees observed. No remedial actions are required as the condition score remained above the trigger threshold.

Whilst evidence of successful weed control was observed in several area, ongoing control is recommended to suppress those weeds still present and to prevent reestablishment in treated area.

Appendix A

Swamp Oak monitoring data

A.1.1 Plot 1

Plot 1 Swamp Oak Floodplain Forest

Photo no:	Plot 1

Date:	6/11/2019

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	15
6	25
7	35
8	15
9	30
10	5
AVG	**20.5**

Native plant species (#) (plot):	8

Regeneration (%) (plot):	1

Trees with Hollows (#) (plot):	0

Total length of fallen logs (m) (plot):	6

Layer	**Cover in 20x20m plot (%)**
Native midstorey	0
Native ground (grasses)	8
Native ground (shrubs)	0
Native ground (other)	93
Exotics	0.1

Soecies	**Common Name**	**Native**
Asparagus aethiopicus	Ground asparagus	n
Baumea juncea	Twig-rush	y
Casuarina glauca	Swamp Oak	y
Fimbristylis ferruginea	Rusty Sedge	y
Gahnia clarkei	Tall Saw-sedge	y
Juncus krausii	Sea Rush	y
Selliera radicans	Creeping Brookweed	y
Sarcocornia quinqueflora su	Samphire	y

Weeds

Weeds were largely limited to one Ground Asparagus plant.

Dieback of canopy
No additional dieback of canopy species from the last monitoring period. Individual Swamp Oak trees appear to increase in cover.

Water	Waterlogged soils with ponding areas and channels containing flowing waters.

Comments

No Bitou Bush seedlings (Chrysanthemoides monilifera) were observed - one seedling was hand pulled during the last survey (2018). Samphire (*Sarcocornia quinqueflora subsp. quinqueflora*) was recorded for the first time. This species was recorded in low abundance adjacent to the discharge channels.

A.1.2 Plot 2

Plot 2 Swamp Oak Floodplain Forest

Photo no:	Plot 2

Date:	6/11/2018

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	15
4	35
5	25
6	20
7	30
8	20
9	15
10	20
AVG	**23.5**

Species	**Common Name**	**Native**
Asparagus aethiopicus	Ground asparagus	n
Baumea juncea	Twig-rush	y
Casuarina glauca	Swamp Oak	y
Fimbristylis ferruginea	Rusty Sedge	y
Gahnia clarkei	Tall Saw-sedge	y
Juncus krausii	Sea Rush	y
Samolus repens	Creeping Brookweed	y
Selliera radicans	Swamp Weed	y
Sporobolus virginicus	Marine Couch	y
Sarcocornia quinqueflora	Samphire	y

Native plant species (#) (plot):	9
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)	8
Native ground (shrubs)	0
Native ground (other)	88
Exotics	0.5

Weeds

No Bitou Bush or Cassia was recorded within the plots and one Ground Asparagus were recorded. Weeds were frequently recorded throughout the plot and surrounding area.

Dieback of canopy

No additional dieback of canopy species from the last monitoring period. Individual Swamp Oak trees appear to increase in cover.

Water	Soils waterlogged throughout majority of area, occasional areas of shallow pooled water.

Comments

Swamp Oak recruitment observed.

A.1.3 Weighted condition score for Plot 1 and 2 combined

Site attribute	Benchmark	Plot 1 data	Plot 1 score	Plot 2 data	Plot 2 score	Average	Weighting %	Calculation	Weighted score %
A	>6	8	4	9	4	4	25	25	25.0
B	5 to 18	20.5	3	23.5	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	8	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	93	1	88	1	1	2.5	0.625	0.6
G		0	4	0.5	3	3.5	5	4.375	4.4
H	> 0	0	1	0	0	0.5	20	2.5	2.5
I		1	4	1	4	4	12.5	12.5	12.5
J	> 20	6	2	19	4	2	10	5	5.0
Total						27	100		**65.0** 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 – Total Earth Care 2019

total earth care

Weed Management

Bush Regeneration Works 2019

Delta Coal

Company/Client Delta Coal – Chris Armit / Katie Weekes
Site name & location Chain Valley Colliery & Mannering Valley Colliery, Mannering Park
Site Manager/Supervisor Aaron Mason / Joshua Watkins

Works Report

Prepared

By: Aaron Mason of Total Earth Care Pty. Ltd.
For: Delta Coal – Chris Armit / Katie Weeks

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1.0 Introduction

Total Earth Care Pty. Ltd. was contracted by Delta Coal to provide weed management works at Chain Valley Colliery and Mannering Valley Colliery. A total of five (5) crew days were completed on site targeting areas highlighted by Delta Coal Officer – Chris Armit. These preliminary works precede the implementation of a Weed Management Plan currently being developed for Delta Coal.

Chain Valley Colliery

Mannering Valley Colliery

2.0 Site Description

2.1 Work Areas

- See section 3

2.2 Flora

2.2.1 Threatened or Locally Significant Species or Vegetation Communities as Listed by the TSCA

The site is considered significant as it contributes to a broad area of reserved bushland that encompasses it. It also:

- contains and adjoins relatively intact vegetation communities
- it contains vegetation of State or local significance
- it contains Swamp Oak Floodplain Forest which is an Endangered Ecological Community (EEC) under the *Threatened Species Conservation Act* (1995)
- it contains threatened species under the *Threatened Species Conservation Act* (1995)
- and provides valuable fauna habitat and corridors linking adjacent bushland and waterways

2.2.2 Threatened Species Conservation Act 1995

In NSW, the key piece of legislation relating to the protection and management of biodiversity and threatened species is the Threatened Species Conservation Act 1995 (TSC Act). The Office of Environment and Heritage (OEH) is responsible for administering the TSC Act, which aims to protect species, populations and ecological communities threatened with extinction in NSW.

One aim of the TSC 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 TSC Act are identified as having significant impacts on the conservation of native flora and fauna. There are currently 37 key threatening processes listed under the TSC 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. (Delta WMP 2015)

2.2.3 Flora Considerations

- Work carefully within EEC
- Prior to any works being undertaken the presence or absence of threatened flora will be determined by conducting a brief survey of each management zone. Obviously cutting or damaging any native flora let alone threatened flora was avoided.
- All plants will be positively identified prior to their removal (Precautionary Principle applies)
- All weed removal within 2 metres of a threatened / regionally significant species will be hand weeding or cut and paint (no spraying).
- No spraying of chemicals within 5 metres of a threatened / regionally significant species

2.2.4 Exotic vegetation

Table 1: Weed species of national and regional significance identified or potentially present.

Common Name	Species Name
Bitou bush	*Chrysanthemoides monilifera*
Blackberry	*Rubus fruticosus*
Crofton Weed	*Ageratina adenophora*
Fireweed	*Senecio madagascariensis*
Green Cestrum	*Cestrum parquii*
Ground Asparagus	*Asparagus aethiopicus*
Lantana	*Lantana camara*
Mother of Millions	*Bryophyllum delogoense.*
Pampas Grass	*Cortaderia selloana*
Salvinia	*Salvinia molesta*
Spiny Rush	*Juncus acutus*
Tussock Paspalum	*Paspalum quadrifarium*
St Johns Wort	*Hypericium perforatum*

Table 2: Environmental weed species identified as growing on site

Common Name	Species Name
Canary Island Date Palm	*Phoenix canariensis -*
Canna Lilly	*Canna indica*
Coastal Morning Glory	*Ipomoea cairica*
Coral Tree	*Erythrina X sykesii*
Camphor Laurel	*Cinammomum camphora*
Castor Oil	*Ricinus communis*
Cobbler's Peg	*Bidens pilosa*
Cooch	*Cynodon dactylon*
Easter Cassia	*Senna pendula*
Green Cestrum	*Cestrum parquii*
Japanese Honeysuckle	*Lonicera japonica*
Kikuyu	*Pennisetum clandestinum*
Madeira Vine	*Anredera cordifolia*
Milk Thistle	*Sonchus oleraceus*
Mother of Millions	*Bryophyllum delagoense*
Ochna	*Ochna serrulata*
Paddy's Lucerne	*Sida rhombifolia*
Paspalum	*Paspalum dilatatum*
Penny Wort	*Hydrocotlye bonariensis*
Privet – Broad Leaf	*Ligustrum lucidum*
Privet – Narrow Leaf	*Ligustrum sinense*
Purple Top	*Verbena bonariensis*
Swiss Cheese Plant	*Monstera deliciosa*
Tall Fleabane	*Conyza sumatrensis*
Turkey Rhubarb	*Acetosa sagittata*
Vasey Grass	*Paspalum urvillei*
Whisky Grass	*Andropogon virginicus*
Wild Tobacco	*Solanum mauritianum*
Wild Watsonia	*Watsonia bulbillifera*

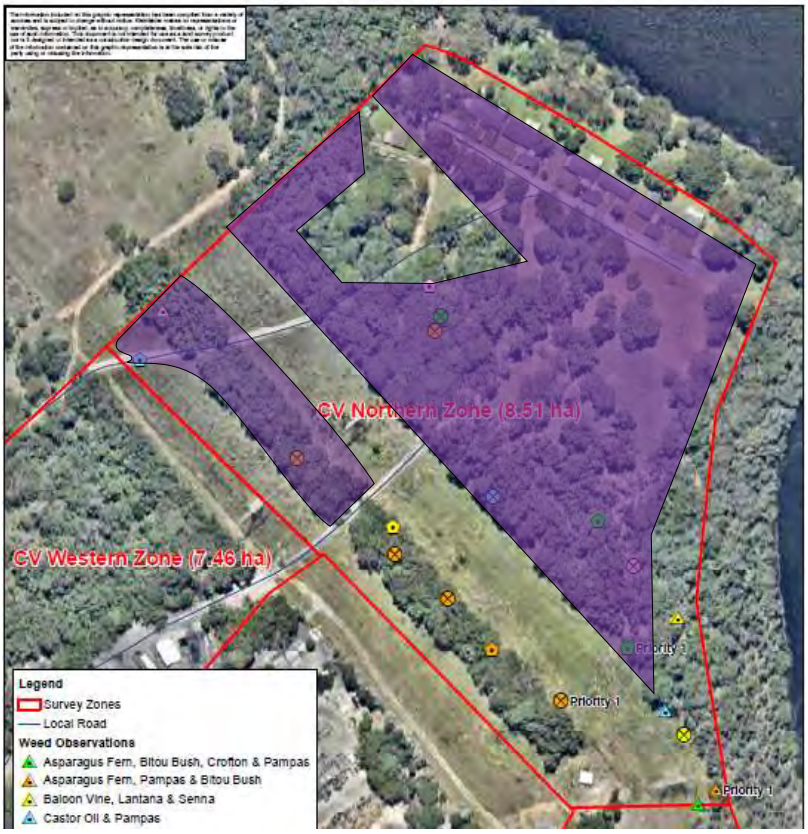
2.3 Fauna Considerations

- The habitat and refuge potential of weeds and rubbish was be considered prior to its removal
- Manual removal of some weeds was implemented allowing frogs, birds, lizards to move into adjoining sections of bushland.
- Generally weeds are removed gradually / incrementally in areas where an infestation is severe/extensive, however due to time constraints for this project, a relative swift removal of woody weeds was required
- Limited disturbance of rocks, logs and any other potential habitat unnecessarily
- Only registered herbicides around water use were used or not at all

A detailed fauna list can be requested during the implementation of the Weed Management Plan (if TEC are selected)

3.0 Bush Regeneration Works

3.1 CV North



Works involved:

- Primary Weeding and some Secondary weeding
- Considerable focus on areas surrounding dwelling and along eastern edges
- Works generally progressed from core bushland back out to trail/weedy edges. Targeting Lantana, Pampas, Senna, Ochna, Tobacco Bush and other exotics
- Large plumes of Lantana were successfully sprayed when conditions were suitable
- Systematically sweep known problem areas prior to seed setting and reduce propagule recruitment
- Targeted Noxious, WoNS and environmental weeds using industry approved methods
- Weed propagules/seed will be bagged and removed from site
- Photographic monitoring of works (in progress) have been included in this report
-

Recommendations:

- Continue primary and secondary weeding before xmas 2019. Weeds are in peak growing season
- Target remaining Lantana, Senna, Honeysuckle, Pampas Grass
- Target Blackberry in November 2019 before it sets fruit (currently in flower)
- Use a combination of handweeding and spot spraying to cover larger areas before summer growth period.

3.2 CV Central and CV East

Works:

- Minimal works were completed here due to other client priorities
- Targeting some Lantana, Pampas Grass, Castor Oil & Crofton
- Spot sprayed some Crofton weed when conditions were appropriate.
- Target Noxious, WoNS and environmental weeds using industry approved methods
- Some weed propagules/seed were bagged and removed from site

Recommendations:

- Treat plumes of Lantana, Pampas Grass, Castor Oil, Crofton Weed using a combination of cut/paint, hand removal and spraying techniques.
- Considerable areas of *Juncus acutus* and Pampas that need works around CVC and ponds
- Priority weeds in southern half of CV East to be worked before xmas 2019.
- Carefully treat weeds around ponds where there is active bird/reptile life

3.3 CV West

Works involved:

- Considerable time was spent in CV West due to the nature of weed/native ratio and the weeds returning rampantly after works completed some time ago.
- After preliminary inspection, the southern half of CV west contained the majority of the weeds. Primary weeding along the southern edges of CV West. Targeted Lantana, Senna, Bitou Bush, Pine Trees, Crofton Weed, Pampas Grass and other problematic weeds.
- A systematic work pattern was used to sweep through core sections and the northern edges bordering the fire trail. Sporadic Lantana, Pampas Grass, several large Camphor Laurel trees, Passionfruit Vine and Crofton Weed.
- Immediately Targeted Pampas Grass which is a noxious weed (currently in full flower)
- The eastern and western edges contained several Lantana, Oleander, Pines and Senna which were cut and painted with Glyphosate.
- Cut and paint, chisel and paint, spraying and manual removal were all techniques utilised
- Target Noxious, WoNS and environmental weeds using industry approved methods
- Trained/qualified/inducted staff will undertake all works
- Weed propagules/seed will be bagged and removed from site
- Photographic monitoring of works included in this report

Recommendations

- Follow up works should be scheduled soon as weeds will return in large densities during the upcoming the summer months. A 12-24 month contract is suggested so any saplings regrowth can be secondary weeded and maintained to reduce numbers for next season
- Regular observation for weeds on edges, fire trails and road verges.
- Systematic sweeps to effectively cover large areas will be utilised.
- Focus on Lantana, Pampas, Crofton, Camphor laurel, Senna and Pine Trees

3.4 MC North

Works:

- Selective works were completed here due to other priorities. The main focus was the southern remnant bushland pocket and any obvious weeds around wetlands/ponds
- Targeting some Lantana, Pine Tree, Pampas Grass, Castor Oil & Crofton
- Numerous *Acacia saligna* were cut and painted
- Spot sprayed some Crofton weed, Thistle and Pampas when conditions were appropriate.
- Target Noxious, WoNS and environmental weeds using industry approved methods
- Some weed propagules/seed were bagged and removed from site

Recommendations:

- Immediate works in the southern remnant bushland to consolidate primary weeding completed in August/September 2019.
- Treat plumes of Lantana, Pampas Grass, Castor Oil, Crofton Weed using a combination of cut/paint, hand removal and spraying techniques.
- Continue the treatment of remaining *Acacia saligna* around the northern retention pond.
- Considerable areas of *Juncus acutus* and Pampas need works
- Carefully treat weeds around ponds where there is active bird/reptile life

3.5 MC West

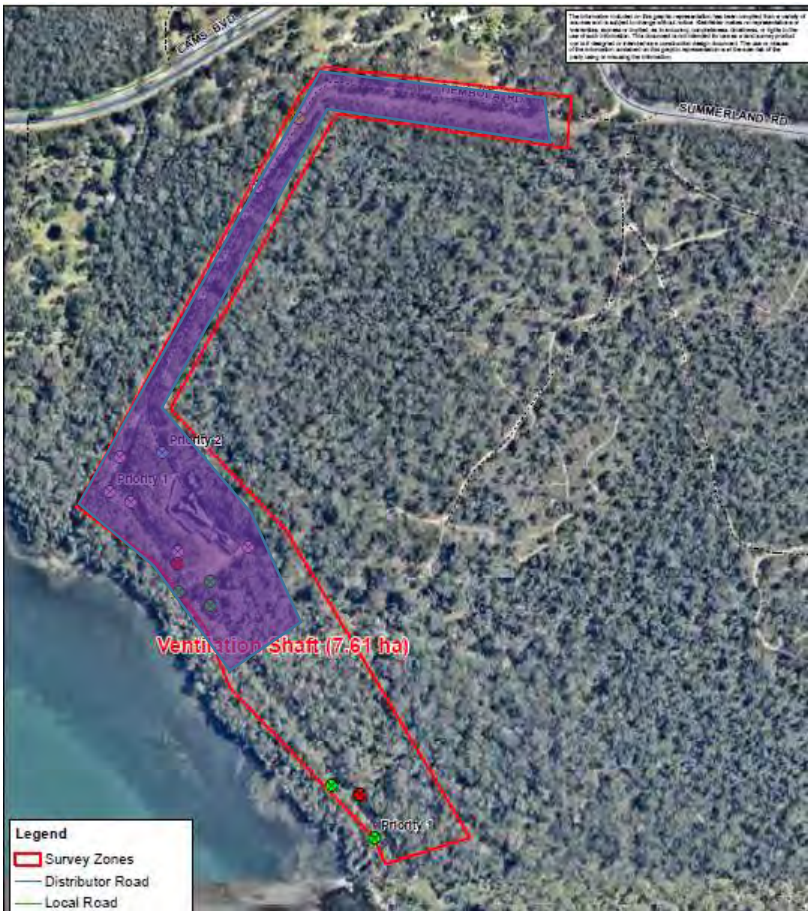
Works:

- Most of the works in MC West were around the coal loading/storage area
- Chris Armit requested a day for complete some APZ works along the northern coal conveyor belt where the native vegetation was growing near/over causing a fire risk especially coming into summer.
- Another request by Chris Armit was completed on Day 1 of our work schedule. This was to clear low lying grasses/weeds from 2 x fenced areas manned for routine maintenance. This involved spraying grass weeds and herbaceous weeds from 2 separate caged areas
- Targeting some Lantana, Bitou Bush, Pampas Grass, Castor Oil & Crofton
- Spot sprayed some Crofton weed when conditions were appropriate.
- Target Noxious, WoNS and environmental weeds using industry approved methods
- Several bags of weed propagules/seed were removed from site

Recommendations:

- A large pocket of Bamboo and Lantana require immediate treatment before spreading through more native bushland.
- Treat plumes of Lantana, Pampas Grass, Castor Oil, Crofton Weed using a combination of cut/paint, hand removal and spraying techniques.
- Numerous large Pine Trees are spread across this zone and over Delta fencelines.
- Considerable areas of *Juncus acutus* and Pampas that need works

3.6 Ventilation Shaft



Works:

- Staff spent some time weeding along the edges of fire trail and areas surrounding the ventilation shaft area. Due to this being away from CVC and MVC, this section was left to last to minimise transit time loss for staff movement.
- The majority of weeds were to the north of the ventilation shaft and there was more than first observed. Lantana, Senna, Crofton, Bitou were the priority weeds treated
- Spot sprayed some Crofton weed when conditions were appropriate.
- Target Noxious, WoNS and environmental weeds using industry approved methods

Recommendations:

- Immediately treat remaining weeds including Bitou Bush in the southern edges of this zone.
- Sweep all bushland that surrounds the ventilation shaft structure.
- Treat plumes of Lantana, Pampas Grass, Castor Oil, Crofton Weed using a combination of cut/paint, hand removal and spraying techniques
-

3.7 Weed Species List and Treatment

Botanical Name	Common Name	Weeding Technique	WONS	Noxious Weed Class	Herbicide Group	Herbicide Application	Ratio
Acetosa sagittata	Turkey Rhubarb	Juvenile single specimens to be dug out. Large infestations foliar spraying with Glyphosate.			M	Glyphosate 360g/L	1/100
Ageratina riparia	Mist Flower	Physical removal. Large stands can be sprayed Glyphosate.		4	M	Glyphosate 360g/L	1/100
Alternathera philoxeroides	Alligator Weed	Hand weeded, bagged and taken to deep landfill or terrestrial specimens spot sprayed with Glyphosate/Metsulfuron-Methyl	YES	3	M & B	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	1/100 & 1g/10L
Andropogoon virginicus	Whiskey Grass	Remove seed and crown out with knife or spot spray			M	Glyphosate 360g/L	1/100
Anredera cordifolia	Madeira vine	Individuals to be dug out					
Araujia sericifera	Moth Vine	Small patches to be hand pulled, scraped & painted with Glyphosate			M	Glyphosate 360g/L	Neat
Arundo donax	Giant Reed	Cut and paint with neat Glyphosate.			M	Glyphosate 360g/L	Neat
Asparagus aethiopicus	Asparagus Fern	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	YES		M & B	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	1/100 & 1g/10L
Asparagus asparagoides	Bridal Creeper	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl.	YES	4	M & B	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	1/100 & 1g/10L
Asparagus officinalis	Asparagus	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	YES		M & B	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	1/100 & 1g/10L
Asparagus plumosus	Climbing Asparagus Fern	Small single specimens to be crowned or Sprayed with Glyphosate/metsulfuron methyl	YES		M & B	Glyphosate 360g/L & Metsulfuron-Methyl 600 g/kg	1/100 & 1g/10L
Aster subulatus	Aster	Hand removal, cut and paint, or foliar spraying in large stands.			M	Glyphosate 360g/L	1/100 & Neat
Bidens pilosa	Cobblers Pegs	Foliar spraying using Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100

Brassica sp.	Mustard Weed	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Briza maxima	Blowfly Grass	Hand removal, foliar spraying with Glyphosate.			M	Glyphosate 360g/L	1/100
Bryophyllum delagoense	Mother of Millions	Hand pulled or spot sprayed with Starane Advance		3	I	Fluroxypyr 333 g/L present as meptyl ester	0.36/100
Cardiospermum grandiflorum	Balloon Vine	Skirted, Hand removed & scraped and painted with Glyphosate			M	Glyphosate 360g/L	Neat
Cestrum parqui	Green Cestrum	Scrape & painted with Glyphosate or cut and painted with Vigilant Gel		3	M or I	Glyphosate 360g/L or Picloram 43g/km	Neat
Chloris gayana	Rhodes Grass	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Cinnamomom camphora	Camphor laurel	Scrape and paint or drill and fill with neat Glyphosate			M	Glyphosate 360g/L	Neat
Conyza bonariensis	Fleabane	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Coreopsis sp.	Tickseed	Foliar spraying with Glyphosate or manually removed.			M	Glyphosate 360g/L	1/100
Cortaderia selloana	Pampas Grass	Foliar spraying or cutr/paint with Glyphosate or hand removed.		4	M	Glyphosate 360g/L	1/100 & Neat
Cotoneaster glaucophyllus	Cotoneaster	Cut & paint with Glyphosate			M	Glyphosate 360g/L	1/100
Cirsium vulgare	Spear Thistle	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Crocosmia sp	Crocosmia	Remove seed and crown corm with trowel					
Cynodon dactylon	Couch	Foliar spraying with Glyphosate			M	Glyphosate 360g/L	1/100
Ehrharta erecta	Panic Veldgrass	Foliar spraying with Glyphosate			M	Glyphosate 360g/L	1/100
Eragrostis curvula	African Love Grass	Hand pulled or brush cut and foliar sprayed with Glyphosate			M	Glyphosate 360g/L	1/100
Erythrina crista-galli	Cockspur Coral Tree	Cut & paint or drill/frill and paint with Glyphosate			M	Glyphosate 360g/L	Neat
Erythrina X sykesii	Coral tree	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate			M	Glyphosate 360g/L	Neat
Foeniculum vulgare	Fennel	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Ipomoea cairica	Coastal Morning Glory	Small single specimens hand pulled, skirting larger vines scraping and painting with neat Glyphosate			M	Glyphosate 360g/L	Neat

Ipomoea indica	Blue Morning Glory	Small single specimens hand pulled, skirting larger vines scraping and painting with neat Glyphosate			M	Glyphosate 360g/L	Neat
Lactuca serriola	Prickly Lettuce	Physical removal, ciut and paint, or foliar sprayinng with Glyphosate.			M	Glyphosate 360g/L	1/100 & Neat
Lantana camara	Lantana	Cut and paint, sprayed or splattered with Glyphosate	YES	4	M	Glyphosate 360g/L	Neat
Ligustrum lucidum	Large Leaf Privet	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate		4	M	Glyphosate 360g/L	Neat
Ligustrum sinense	Small Leaf Privet	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate		4	M	Glyphosate 360g/L	Neat
Lonicera japonica	Japanese Honeysuckle	Scrape & painted with Glyphosate		4	M	Glyphosate 360g/L	Neat
Myriophylum aquaticum	Parrots Feather	Physical Removal					
Ochna serrulata	Mickey mouse plant	Double side scrape and paint all stems to 75% coverage.			M	Glyphosate 360g/L	Neat
Olea europaea subsp. cuspidata	African Olive	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate			M	Glyphosate 360g/L	Neat
Opuntia stricta	Prickly Pear	Removed by hand					
Paspalum dilatatum	Caterpillar Grass	Foliar spraying with Glyphosate			M	Glyphosate 360g/L	1/100
Paspalum quadrifarium	Tussock Paspalum	Hand pulled or brush cut and foliar sprayed with Glyphosate				Glyphosate 360g/L	1/100
Pinus radiata	Radiata	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate		4	M	Glyphosate 360g/L	Neat
Plantago lanceolata	Plantain	Foliar spraying with Glyphosate			M	Glyphosate 360g/L	1/100
Ricinus communis	Castor Oil Plant	Hand pulled and cut & painted with neat Glyphosate		4	M	Glyphosate 360g/L	Neat
Rubus fruticosus aggregate	Blackberry	Brush cut, crowned and scraped & painted with neat Glyphosate	YES	4	M	Glyphosate 360g/L	Neat
Rumex sp.	Dock	Hand removed, cut and painted, or spot sprayed.			M	Glyphosate 360g/L	1/100 & Neat
Sida rhombifolia	Paddy's Lucerne	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Solanum mauritianum	Tobacco Bush	Cut & paint with Glyphosate			M	Glyphosate 360g/L	Neat
Solanum nigrum	Blackberry Night Shade	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100

Solanum pseudocapsicum	Jerusalem Cherry	Cut and paint with neat Glyphosate.			M	Glyphosate 360g/L	Neat
Sonchus oleraceus	Common Sow thistle	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Verbena sp.	Purple top	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Vinca major	Greater Periwinkle	Foliar spraying with Glyphosate, hand pulled and brush cut			M	Glyphosate 360g/L	1/100
Watsonia meriana	Wild Watsonia	Hand removal of plant and corms if soil conditions suit. Foliar spraying with diluted Glyphosateor Associate. Painting with neat Glyphosate.			M	Glyphosate 360g/L	1/100 & 1g/10L
Zantedeschia aethiopica	Arum Lily	Physical removal of whole plant and rhizome or cut and paint with Neat Glyphosate			M	Glyphosate 360g/L	
Phytolacca octandra L.	Inkweed	Physical removal of whole plant and rhizome or cut and paint with Neat Glyphosate			M	Glyphosate 360g/L	

4.0 Photographic Monitoring

CHAIN VALLEY COLLIERY

CV WESTERN

CV NORTHERN ZONE

CV Eastern/Central Zone

MANNERING COLLIERY
MC NORTHERN ZONE

MC WESTERN ZONE APZ


BURIED SEWER
LINE ADJACENT
TO ROAD


TO ROAD

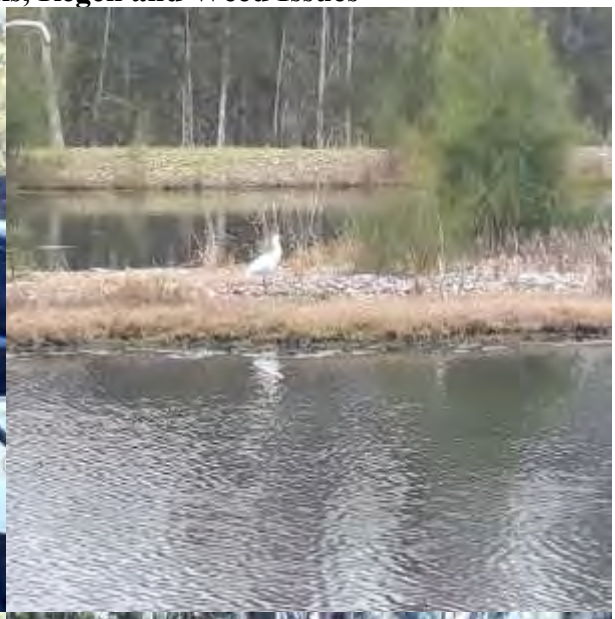



11000 VOLTS



PHOTOS OF WORKED AREAS, NO BEFORE

Miscellaneous Photos –
Additional Works, Regen and Weed Issues



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Appendix 6: Weed Action Plan

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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Table of Contents

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

N

Data Source:
Total Earth Care
Nearmap
Wyong ELA 2016 v2

Tel: 02 9913 1432 Fax: 02 9913 1434

total earth care

Title: Mannering Colliery:
Subject Site & Survey Effort

Map No: 2

Site: Mannering Colliery

Client: Delta Coal

Date: November 2019

Project No: 11483

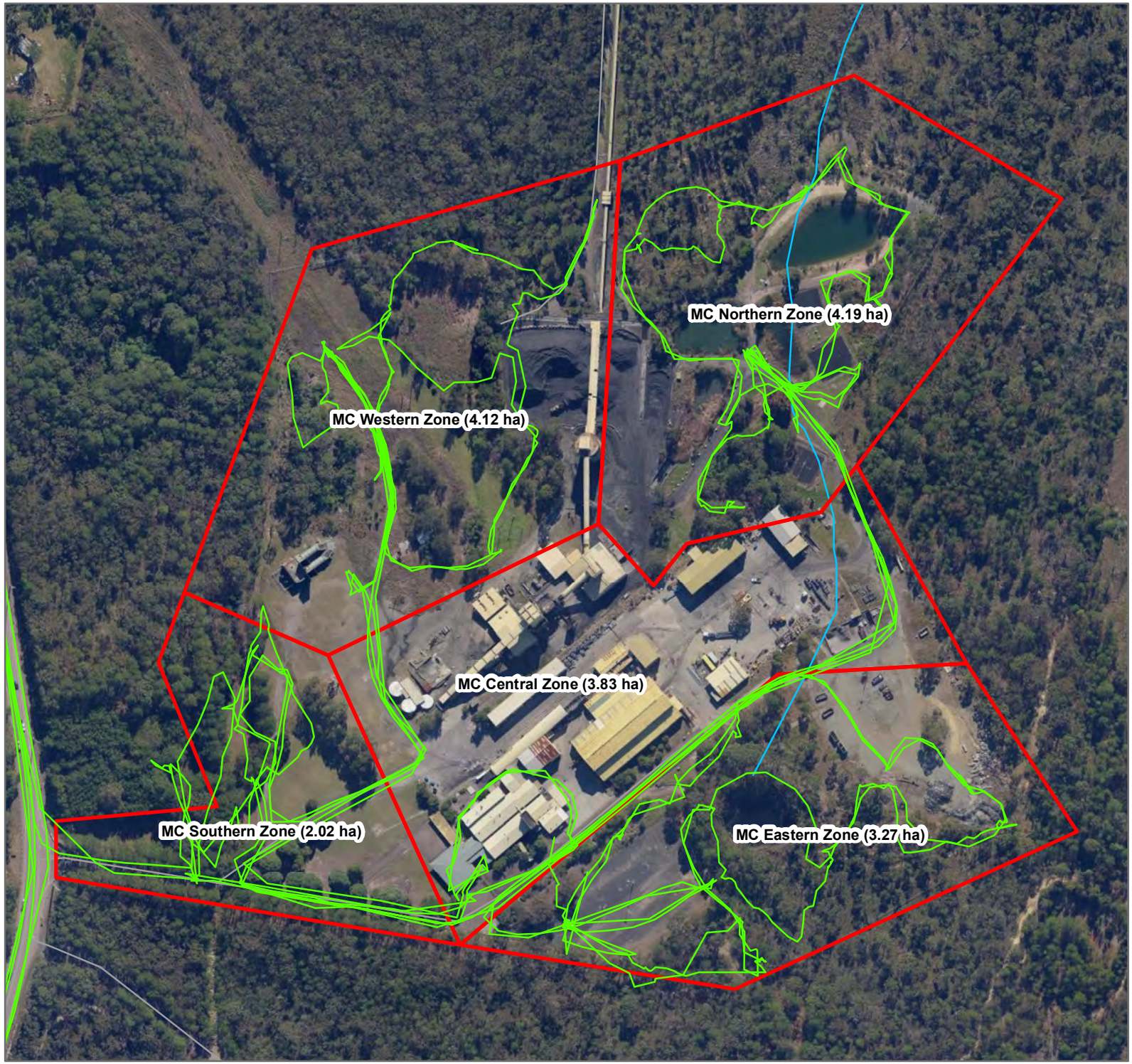
Author: G Barron

Legend

- Management Zones
- Road
- Creek
- Survey Effort

0 25 50 100 Meters

N



Data Source:
Total Earth Care
Nearmap

total earth care

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

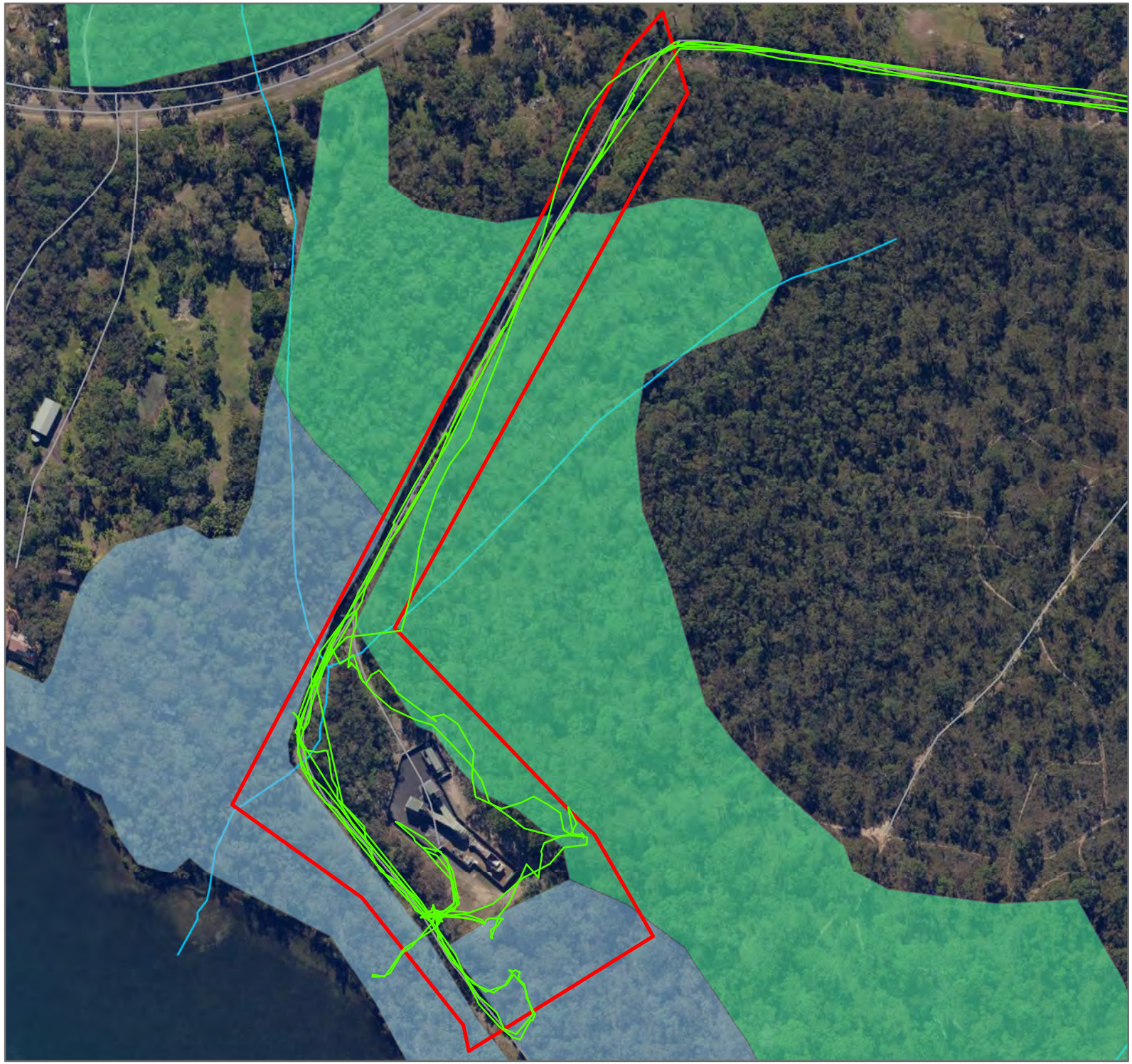
0 25 50 100 Meters

N

Data Source:
Total Earth Care
SIX Maps
Wyong ELA 2016 v2

Tel: 02 9913 1432 Fax: 02 9913 1434

total earth care



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	This zone is approximately 8.2 ha and includes cleared powerline easements and modified areas surrounding the cottages and bushland. **Area A – <5% weed cover** 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. **Area B – 5-25% weed cover** Highest weed densities are found along the edge of the bushland and species present include Blackberry, Asparagus Fern, Fishbone Fern (*Nephrolepis cordifolia*), *Monstera deliciosa* and *Senna pendula var. glabrata.* **Area C – 25-50% weed cover** Dense area of Blackberry, Lantana, Ochna serrulata, Wild Tobacco (*Solanum mauritianum)* and herbaceous weeds. Evidence of Blackberry and Pampas Grass being treated. Appears to have been the focus area of Bush Regeneration efforts. **Area D – 5-25% weed cover** Mostly ornamental exotic plant species in front of houses. **Area E – 5-25% weed cover** Dense patch of *Monstera deliciosa*. **Area F – 5-25% weed cover** Patch of Camphor Laurel (*Cinnamomum camphora*) and Coral trees (*Erythrina x sykesii*) including several saplings. **Area G – 5-25% weed cover** Bushland strip between powerline easements containing scattered small outbreaks of weeds including *Senna pendula var. glabrata* and Lantana. **Area H – 5-25% weed cover** Powerline easement with scattered Fireweed and Purple Top (*Verbena bonariensis*).
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	• Follow up treatment of Lantana, Blackberry, *Senna pendula var. glabrata* in Areas A and C. • Primary treatment of Asparagus Fern particularly along edges in Area B. • Primary treatment of *Senna pendula var. glabrata* and *Monstera deliciosa,* 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

Road

Management Zones

Weed Density

- < 5%
- 5 - 25%
- 25 - 50%

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

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.1.2 Chain Valley Colliery – Western Zone

Table 2. Chain Valley Colliery – Western Zone Area Descriptions

Description	This zone is approximate 6.4 ha of highly resilient bushland with predominantly low weed densities. Evidence throughout of bush regeneration efforts. **Area A – <5% weed cover** 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. **Area B – 5-25% weed cover** 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.
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	• 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

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.1.3 Chain Valley Colliery – Southern Zone

Table 3. Chain Valley Colliery – Southern Zone Area Descriptions

Description	This zone is approximate 7.2 ha of highly resilient and mostly undisturbed bushland with predominantly low weed densities. **Area A – 5-25% weed cover** Scattered small outbreaks of *Senna pendula var. glabrata*, 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. **Area B – <5% weed cover** Highly resilient bushland. Some *Pinus radiata* saplings coming up adjacent to the track that runs along the southern part of the area. **Area C – 5-25% weed cover** Powerline easement containing scattered *Pinus radiata* saplings, herbaceous weeds and Oleander. **Area D – <5% weed cover** Resilient bushland with scattered *Pinus radiata* saplings along easement edge. **Area E – 5-25% weed cover** Mostly managed lawn along driveway. Scattered *Pinus radiata* saplings, African Lovegrass (*Eragrostis curvula*) and Oleander (*Nerium oleander*) on bushland edges. **Area F – 25-50% weed cover** 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.
Priority Weeds	Lantana, Pampas Grass, Bitou Bush and *Pinus radiata* 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	• 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 *Pinus radiata* 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

Road

Management Zones

Weed Density

- < 5%
- 5 - 25%
- 25 - 50%

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
- Pamas Grass (treated) & Lantana camara
- Pampas Grass (treated)
- Pinus radiata
- Senna pendula var. glabrata
- Senna pendula var. glabrata - removed

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.1.4 Chain Valley Colliery – Eastern Zone

Table 4. Chain Valley Colliery – Eastern Zone Area Descriptions

Description	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. **Area A – <5% weed cover** Small occurrences of Caster Oil and Lantana on dam walls. Scattered occurrences of *Senna pendula var. glabrata* and Narrow-leafed Cotton Bush (*Gomphocarpus fruticosus*) in the easements to the north. **Area B – 5-25% weed cover** Small amounts of scattered Whiskey Grass (*Andropogon virginicus*), Pampas Grass and Bitou Bush on easement edges and damp areas. **Area C – <5% weed cover** Small amounts of scattered Whiskey Grass, Pampas Grass, Bitou Bush and other herbaceous weeds on easement edges. **Area D – 5-25% weed cover** Encroachments of weeds from the track to the south of the area and the easement edges. Scattered small outbreaks of Asparagus Fern, *Senna pendula var. glabrata*, Lantana, African Love Grass, Blackberry Nightshade and Bitou Bush. A small Lantana thicket has been treated. **Area E – 5-25% weed cover** Dense areas of Pampas Grass in this area and across property boundary. Scattered occurrences of Crofton Weed, Lantana and Bitou Bush. **Area F – 5-25% weed cover** Cleared powerline easement containing scattered Whiskey Grass, Cotton Bush, Fireweed and herbaceous weeds. Small lantana thicket and Pampas Grass under powerline pylon. **Area G – 25-50% weed cover** Dense stand of Wild Tobacco. Asparagus Fern starting to come up. Scattered small occurrences of Bitou Bush, Lantana, Ginger Lily, Ochna, Inkweed, Crofton and *Senna pendula var. glabrata*. Large stands of Lantana have been treated. Coral trees, Fishbone Fern, *Monstera deliciosa*, *Senna pendula var. glabrata* and Ginger Lily along creek line in southern corner. **Area H – <5% weed cover** Parts of this area have been recently burnt and are coming up with early successional native species such as *Dodonaea triquetra.* 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 *Senna pendula var. glabrata* along the edges of the easement in the north of this area.
Priority Weeds	Lantana, Asparagus Fern, Bitou Bush, Pampas Grass and *Senna pendula var. glabrata*.
Priority Areas	Area G along creek line should be targeted to prevent weed propagules travelling downstream. Area H is mostly resilient bushland that has been mapped as two EECs (see Map 1).

Key Management Issues	• 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, *Senna pendula var. glabrata* 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

N

Data Source:
Total Earth Care
SIX Maps

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.2 Mannering Colliery

Mannering Colliery has more disturbed areas and fewer large tracts of undisturbed bushland then 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	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. **Area A – 5-25% weed cover** *Pinus radiata* saplings, Whiskey Grass and Fireweed along track edges. Treated *Acacia saligna.* Dense stands of *Juncus acutus* in low lying areas. **Area B – 50-75% weed cover** Dense area of weeds including Lantana, Bitou Bush, Crofton Weed, Pampas Grass, Senna and *Juncus acutus.* Lantana and some Pampas Grass has been treated. **Area C – 25-50% weed cover** High density of herbaceous weeds. *Acacia saligna* present, most of which has been treated. *Juncus acutus* present. Pampas Grass present most of which has been treated. Whiskey Grass along track edges. **Area D – 25-50% weed cover** High density of herbaceous weeds across disturbed area. **Area E – 5-25% weed cover** Hydrocotyl is scattered along the dam edges and Typha within the dam. **Area F – 5-25% weed cover** Typha within the dam. **Area G – 5-25% weed cover** The edges of Area G contains *Pinus radiata* saplings. Within the low lying damp wetland areas Large stands of Lantana and Pampas Grass have been treated. **Area H – <5% weed cover** Limited access due to fencing. Scattered Crofton Weed, Lantana, Bitou Bush, Camphor Laurel trees and mature and sapling *Pinus radiata.* A Resource Regulator identified Coolatai Grass (*Hyparrhenia hirta*) present on the western wall of the largest dam. EMM consultants confirmed the species ID. **Area I – <5% weed cover** Mostly disturbed and cleared areas. Herbaceous weeds, Whiskey Grass and Fireweed along track edges. **Area J – 50-75% weed cover** 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 *Pinus radiata* present. Scattered herbaceous weeds including *Bidens pilosa*, Fleabane (*Conyza sp.*) and Purple Top.
Priority Weeds	Lantana, Bitou Bush, Pampas Grass, Crofton Weed, Fireweed, Senna, *Pinus radiata, Juncus acutus, Coolatai Grass* and Senna
Priority Areas	Area J to follow up from primary weed treatment in this area. Area B to follow up primary treatment of Lantana and Pampas Grass and prevent propagules form spreading downstream.

Key Management Issues	• 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 *Juncus acutus* • 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

Management Zones

Road

Creek

Weed Density

< 5%

5 - 25%

25 - 50%

50 - 75%

Key Points

- Acacia saligna
- Acacia saligna (treated) & Juncus acutus
- Acacia saligna, Bitou Bush & Crofton Weed,
- Bitou Bush
- Bitou Bush & Crofton Weed
- Bitou Bush & Lantana camara
- Bitou Bush - removed
- Coolatai Grass
- Crofton Weed & Senna pendula var. glabrata
- Crofton Weed, Juncus acutus & Pampas Grass (treated)
- Fireweed
- Juncus acutus
- Lantana camara
- Lantana camara - treated
- Pampas Grass - treated
- Pinus radiata
- Senna pendula var. glabrata

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.2.2 Mannering Colliery – Western Zone

Table 6. Mannering Colliery – Western Zone Area Descriptions

Description	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. **Area A – 5-25% weed cover** Scattered herbaceous weeds and exotic grasses. Small scattered patches of Asparagus Fern. **Area B – 5-25% weed cover** Powerline easements mostly consisting of exotic grasses, some Lantana patches, *Senna pendula var. glabrata* and Fireweed, particularly closer to the dam edges. **Area C – 5-25% weed cover** Small scattered outbreaks of Crofton Weed, Pampas Grass, Bitou Bush, Whiskey Grass and African Love Grass throughout this area. **Area D – 25-50% weed cover** Scattered outbreaks of Lantana, Crofton Weed, Bitou Bush, Whiskey Grass and herbaceous weeds. Lantana thickets have been treated. New shoots are coming requiring treatment. **Area E – <5% weed cover** Isolated patch of vegetation containing a small thicket of Lantana. **Area F – 25-50% weed cover** Lantana, Crofton Weed, Bitou Bush, and a large outbreak of Bamboo are dominating this area. **Area G – 5-25% weed cover** 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.
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	• 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

Management Zones

Road

Creek

Weed Density

< 5%

5 - 25%

25 - 50%

50 - 75%

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

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.2.3 Mannering Colliery – Southern Zone

Table 7. Mannering Colliery – Southern Zone Area Descriptions

Description	This zone is approximately 2.02 ha. It is mostly dominated by mature *Pinus radiata* and Bamboo. This zone is a low priority due to the lack of remnant bushland and the extent of the pine forest. **Area A – 50-75% weed cover** Mature and sapling *Pinus radiata* lining the driveways. **Area B – 25-50% weed cover** High densities of mature *Pinus radiata* 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 *Pinus radiata.* **Area C – 5-25% weed cover** Mostly herbaceous weeds and exotic grasses.
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	• Primary treatment of Fireweed and *Pinus radiata* 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

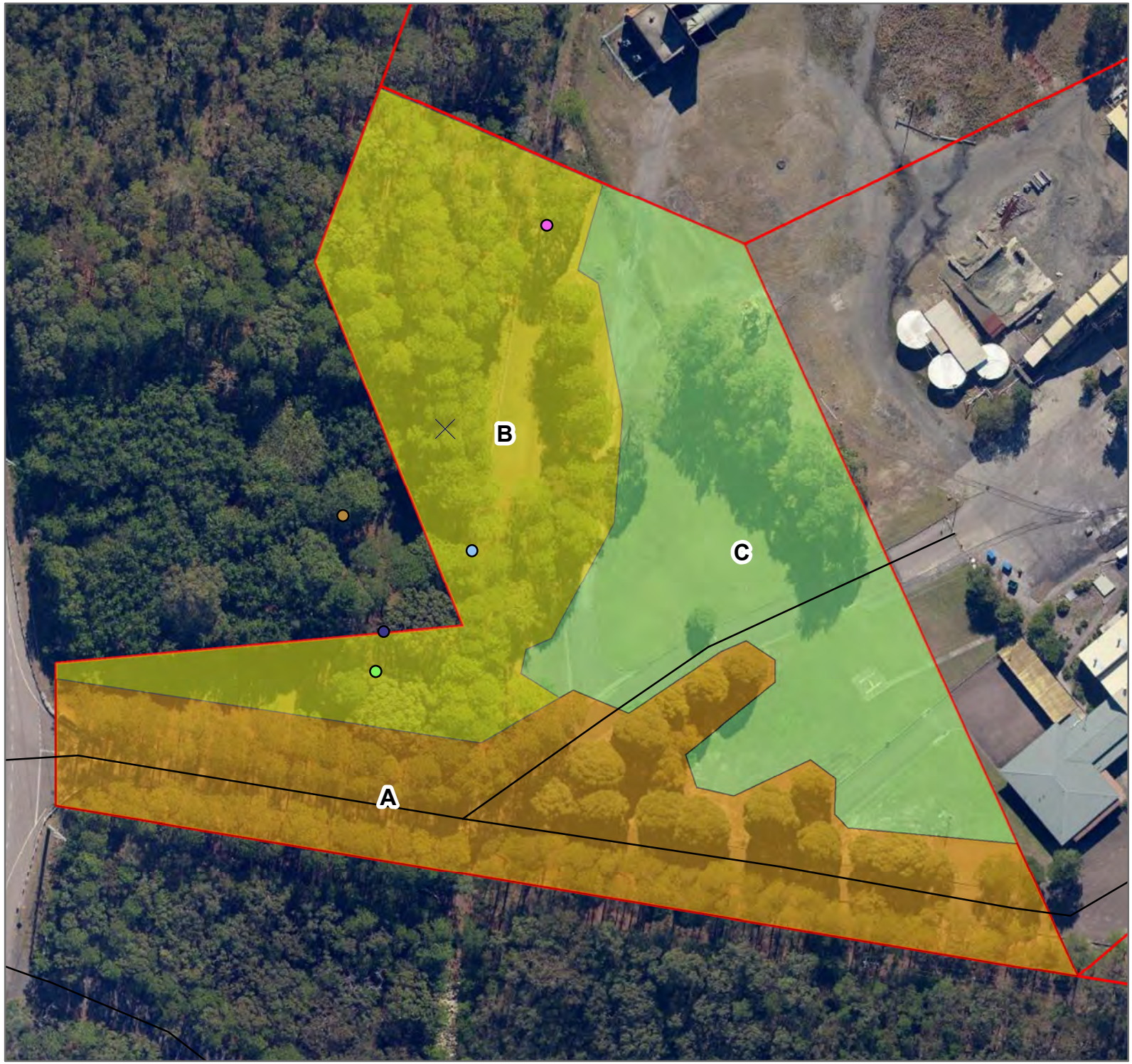
Site: Mannering Colliery

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

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

4.2.4 Mannering Colliery – Eastern Zone

Table 8. Mannering Colliery – Eastern Zone Area Descriptions

Description	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. **Area A – 5-25% weed cover** Mostly planted ornamental exotics and some natives. Herbaceous weeds, exotic grasses and Fireweed across lawn. **Area B – 25-50% weed cover** Scattered herbaceous weeds, exotic and weedy grasses around edges of disturbed area. **Area C – 5-25% weed cover** Small area of weed encroachment including Crofton Weed. Evidence of treated Pampas Grass. Small outbreaks of Crofton Weed and Lantana present. **Area D – <5% weed cover** Mostly weed free bushland with some *Pinus radiata* saplings and African Lovegrass in the south-west corner of the area. **Area E – 25-50% weed cover** Dominated by mature and sapling *Pinus radiata.*
Priority Weeds	Crofton Weed, Lantana, Pampas Grass, *Pinus radiata* and Fireweed.
Priority Areas	Area C and D. These areas are highly resilient and connected to bushland to the south.
Key Management Issues	• 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

Management Zones

Road

Creek

Weed Density

- < 5%
- 5 - 25%
- 25 - 50%
- 50 - 75%

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

0 15 30 60 Meters

N

Data Source:
Total Earth Care
Nearmap

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434

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	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. **Area A – 5-25% weed cover** 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 andherbaceous weeds.
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	• 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	Easy vehicle access. Key required. Red-bellied black snake observed on site.

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

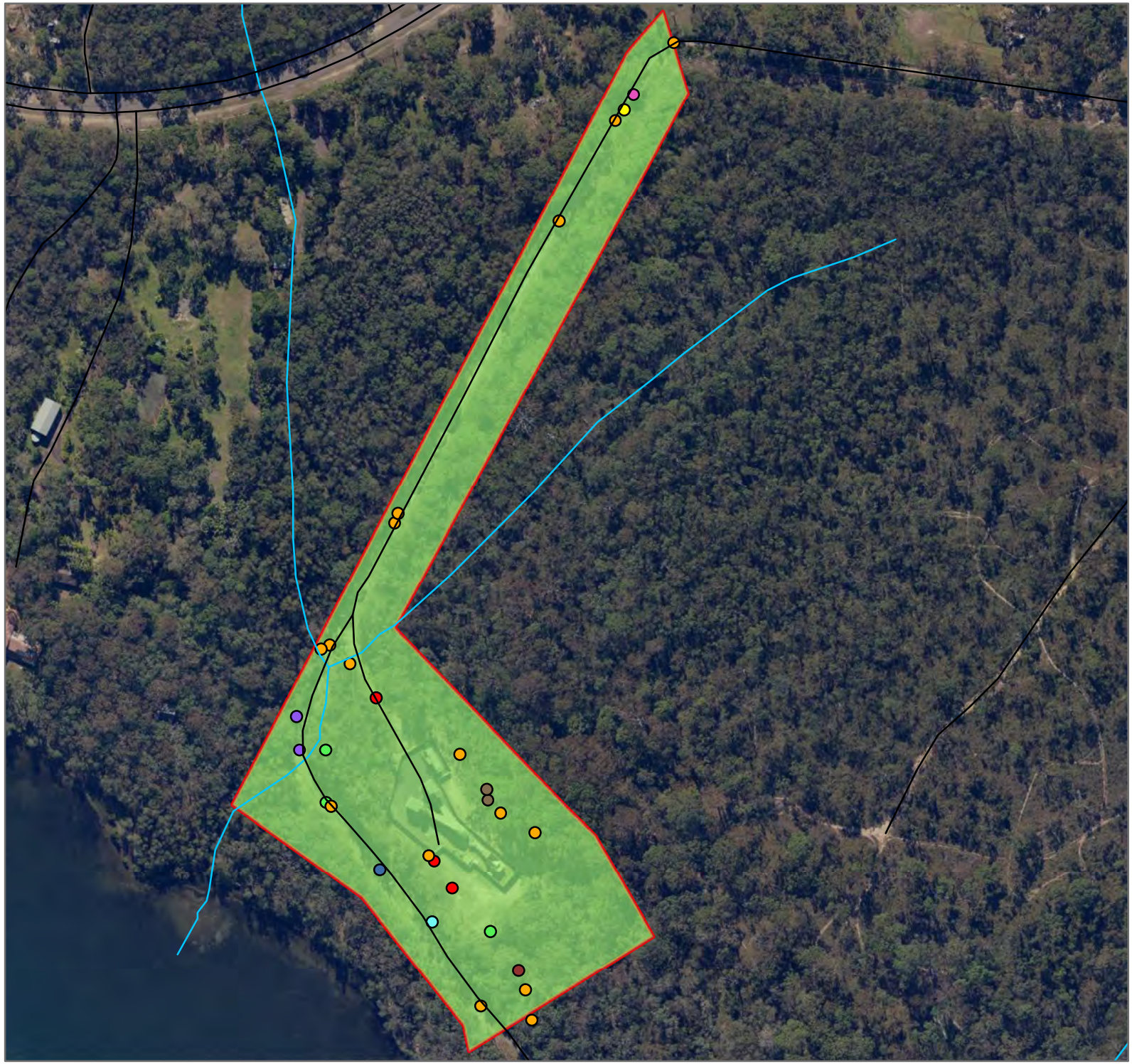
0 25 50 100 Meters

N

Data Source:
Total Earth Care
SIX Maps

total earth care

Tel: 02 9913 1432 Fax: 02 9913 1434



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	*Acacia saligna*				Environment	
Crofton Weed	*Ageratina adenophora*				Environment, Agriculture	
Scarlet Pimpernel	*Anagallis arvensis*					
Whisky Grass	*Andropogon virginicus*				Environment	
Giant Reed	*Arundo donax*			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	*Asparagus aethiopicus*	Yes				PoD
Cobblers Pegs	*Bidens pilosa*					
Buffalo Grass	*Bouteloua dactyloides*					
Bitou Bush	*Chrysanthemoides monilifera subsp rotundata*	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	*Cinnamomum camphora*				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	*Cirsium vulgare*					
Fleabane	*Conyza bonariensis*					
Pampas Grass	*Cortaderia jubata*			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	*Ehrharta erecta*					
African Lovegrass	*Eragrostis curvula*				Environment	
Coral Tree, Common Coral Tree	*Erythrina x sykesii*				Environment	
Fennel	*Foeniculum vulgare*					
Narrow-Leaf Cotton Bush / Swan Plant	*Gomphocarpus fruticosus*					
Ginger Lily	*Hedychium gardnerianum*				Environment	
Pennywort	*Hydrocotyle bonariensis*					
Coolatai Grass	*Hyparrhenia hirta*				Environment, Agriculture	
Spiny Rush, Spike Rush, Sharp Rush	*Juncus acutus*				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	*Lantana camara*	Yes	Asset Protection			PoD
Fishbone Fern	*Nephrolepis cordifolia*				Environment	
Ochna	*Ochna serrulata*				Environment	
Bamboo, Black Bamboo, Rhizomatous Bamboo,	*Phyllostachys nigra*				Environment	
Inkweed	*Phytolacca octandra*					
Radiata Pine, Pine Wildings	*Pinus radiata*				Environment	
Plantain	*Plantago lanceolata*					
Castor Oil Plant	*Ricinus communis*					
Blackberry	*Rubus fruticosus aggregate*	Yes				PoD; All species in the Rubus fruiticosus species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree
Fireweed	*Senecio madagascariensis*	Yes	Asset Protection			PoD
Senna / Cassia	*Senna pendula*				Environment	
Paddy's Lucerne	*Sida rhombifolia*					
Tobacco Bush/ Wild Tobacco	*Solanum mauritianum*				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	*Solanum nigrum*					
Purpletop	*Verbena bonarensis*					

Appendix B. Species Specific Weeding Techniques

Common Name	Botanical Name	Weeding Technique	Recommended Timing for Treatment	Herbicide Application	Herbicide Group	Ratio
Golden Wreath Wattle	*Acacia saligna*	Chainsaw and paint with neat Glyphosate.	All year round	Glyphosate 360g/L	M	Neat
Crofton Weed	*Ageratina adenophora*	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Scarlet Pimpernel	*Anagallis arvensis*	Hand removal, spot spraying with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Whisky Grass	*Andropogon virginicus*	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	*Arundo donax*	Cut and paint with neat Glyphosate.	All year round	Glyphosate 360g/L	M	Neat
Asparagus Fern	*Asparagus aethiopicus*	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	*Bidens pilosa*	Foliar spraying using Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Buffalo Grass	*Bouteloua dactyloides*	Hand removal, brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Bitou Bush	*Chrysanthemoides monilifera subsp rotundata*	Small single specimens hand pulled or larger shrubs cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Camphor Laurel	*Cinnamomum camphora*	Scrape and paint or drill and fill with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Spear Thistle	*Cirsium vulgare*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Fleabane	*Conyza bonariensis*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Pampas Grass	*Cortaderia jubata*	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	*Ehrharta erecta*	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	*Eragrostis curvula*	Hand pulled or brush cut and foliar sprayed with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Coral Tree, Common Coral Tree	*Erythrina x sykesii*	<80mm cut & painted; >80mm will be drilled/frilled with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Fennel	*Foeniculum vulgare*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Narrow-Leaf Cotton Bush / Swan Plant	*Gomphocarpus fruticosus*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100 & Neat
Ginger Lily	*Hedychium gardnerianum*	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	*Hydrocotyle bonariensis*	Hand pulled or spot sprayed with Dicamba	All year round			
Coolatai Grass	*Hyparrhenia hirta*	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	*Juncus acutus*	Juvenile single specimens to be dug out. Large infestations foliar spraying with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Lantana	*Lantana camara*	Cut and paint, sprayed or splattered with Glyphosate. Hand pull small shoots.	All year round	Glyphosate 360g/L	M	Neat
Fishbone Fern	*Nephrolepis cordifolia*	Hand removal. Brush cut then sprayed with Glyphosate.	All year round	Glyphosate 360g/L	M	1/100
Ochna	*Ochna serrulata*	Double side scrape and paint all stems to 75% coverage.	All year round	Glyphosate 360g/L	M	Neat
Bamboo, Black Bamboo, Rhizomatous Bamboo,	*Phyllostachys nigra*	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	*Phytolacca octandra*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Radiata Pine, Pine Wildings	*Pinus radiata*	<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	*Plantago lanceolata*	Foliar spraying with Glyphosate	All year round	Glyphosate 360g/L	M	1/100
Castor Oil Plant	*Ricinus communis*	Hand pulled and cut & painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Blackberry	*Rubus fruticosus aggregate*	Brush cut, crowned and scraped & painted with neat Glyphosate	Between flowering and fruiting from November to January	Glyphosate 360g/L	M	Neat
Fireweed	*Senecio madagascariensis*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Senna / Cassia	*Senna pendula*	Small individuals hand removed, larger plants cut and painted with neat Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Paddy's Lucerne	*Sida rhombifolia*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Tobacco Bush/ Wild Tobacco	*Solanum mauritianum*	Cut & paint with Glyphosate	All year round	Glyphosate 360g/L	M	Neat
Blackberry Night Shade	*Solanum nigrum*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100
Purpletop	*Verbena bonarensis*	Foliar spraying with Glyphosate, hand pulled and brush cut	All year round	Glyphosate 360g/L	M	1/100

Appendix 7: Noise Monitoring Results

Table 1 Chain Valley Colliery attended noise monitoring results – ATN001

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	26/3	15:35 (Day)	44	46	53	50	67	74	70	Nil	IA	N/A	35	N/A	2.4 m/s @ 169 B class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and bird noise consistent. Wind in trees, resident noise, car passbys and distant traffic occasional.
ATN001	26/3	18:32 (Eve.)	46	48	52	52	59	78	70	Nil	IA	N/A	35	N/A	3.8 m/s @ 165 B class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise consistent. Bird noise frequent. Wind in trees, resident noise, car passbys and distant traffic occasional.
ATN001	26/3	23:14 (Night)	45	47	49	50	53	59	67	Nil	IA	IA	35	35	2.1 m/s @ 148 F class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistent. Wind in trees, local traffic and dogs barking occasional.
ATN001	11/6	15:13 (Day)	45	47	52	64	52	74	67	Nil	IA	N/A	35	N/A	2.5 m/s @149 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise consistent. Bird noise and resident noise frequent. Wind in trees, car passbys and distant dogs barking occasional.
ATN001	11/6	19:12 (Eve.)	44	45	49	54	48	71	67	Nil	IA	N/A	35	N/A	0.3 m/s @220 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistent. Distant dogs barking, nearby animals, car passbys and nearby traffic occasional.
ATN001	11/6	23:12 (Night)	45	46	47	49	48	55	66	Nil	IA	IA	35	35	0.4 m/s @193 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and a nearby air conditioner consistent. Insects occasional.
ATN001	11/9	14:53 (Day)	43	45	56	51	70	80	68	Nil	IA	N/A	35	N/A	3.3 m/s @ 76° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Vales Point Power Station (VPPS) noise consistently audible. Bird noise and wind in trees frequently audible. Car passbys and resident noise

Table 1 Chain Valley Colliery attended noise monitoring results – ATN001

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]			
																	occasionally audible.
ATN001	11/9	18:00 (Eve.)	43	44	56	55	70	78	67	Nil	IA	N/A	35	N/A	0.4 m/s @ 61° C class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise consistently audible. Bird noise frequently audible. Dogs barking and car passbys occasionally audible.
ATN001	11/9	22:00 (Night)	40	42	43	43	45	54	64	Nil	IA	IA	35	35	0.4 m/s @ 29° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and a nearby air conditioner consistently audible. Distant dog barking frequently audible. Distant traffic and wind in trees occasionally audible.
ATN001	25/11	08:49 (Day)	43	45	55	52	68	79	71	Nil	IA	N/A	35	N/A	0.6 m/s @ 21° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car passbys and dogs barking occasionally audible.
ATN001	25/11	09:04 (Day)	44	46	55	53	68	76	70	Nil	IA	N/A	35	N/A	1.1 m/s @ 315° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car passbys and dogs barking occasionally audible.
ATN001	25/11	09:19 (Day)	43	44	55	52	67	79	70	Nil	IA	N/A	35	N/A	1.8 m/s @ 60° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car

Table 1 Chain Valley Colliery attended noise monitoring results – ATN001

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]			
																	passbys and dogs barking occasionally audible.
ATN001	25/11	09:34 (Day)	43	44	52	48	65	75	69	Nil	IA	N/A	35	N/A	1.3 m/s @ 37° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car passbys and dogs barking occasionally audible.
ATN001	25/11	09:49 (Day)	42	44	51	49	64	78	69	Nil	IA	N/A	35	N/A	1.0 m/s @ 16° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car passbys and dogs barking occasionally audible.
ATN001	25/11	10:04 (Day)	42	44	48	52	57	68	69	Nil	IA	N/A	35	N/A	1.0 m/s @ 50° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Vales Point Power Station (VPPS) noise and insects consistently audible. Bird noise and resident noise frequently audible. Car passbys and dogs barking occasionally audible.
ATN001	25/11	20:03 (Eve.)	45	50	52	53	55	76	65	Nil	IA	N/A	35	N/A	3.3 m/s @ 4° D class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise and wind in trees frequently audible. Resident noise, local and distant traffic and dogs barking occasionally audible.
ATN001	25/11	20:18 (Eve.)	42	46	50	52	55	63	64	Nil	IA	N/A	35	N/A	5.3 m/s @ 8° D class stability	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise and wind in

Table 1 Chain Valley Colliery attended noise monitoring results – ATN001

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]			
															N/N		trees frequently audible. Resident noise, local and distant traffic and dogs barking occasionally audible.
ATN001	25/11	23:34 (Night)	42	44	45	46	47	68	70	Nil	IA	IA	35	35	1.6 m/s @ 336° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, wind in trees, resident noise, local and distant traffic and dogs barking occasionally audible.
ATN001	25/11	23:49 (Night)	42	44	45	46	48	52	68	Nil	IA	IA	35	35	1.3 m/s @ 217° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, wind in trees, resident noise, local and distant traffic and dogs barking occasionally audible.
ATN001	26/11	00:04 (Night)	43	44	45	46	47	61	67	Nil	IA	IA	35	35	0.6 m/s @ 223° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, wind in trees, resident noise, local and distant traffic and dogs barking occasionally audible.
ATN001	26/11	00:19 (Night)	43	45	46	47	48	64	67	Nil	IA	IA	35	35	0.9 m/s @ 115° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, wind in trees, resident noise, local and distant traffic and dogs barking occasionally audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 2 Chain Valley Colliery attended noise monitoring results – ATN002

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]			
ATN002	26/3	16:06 (Day)	35	38	43	45	51	60	58	Nil	IA	N/A	49	N/A	2.0 m/s @ 158 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Bird noise consistent. Wind in trees and VPPS noise frequent. Resident noise, local traffic and boat noise occasional.
ATN002	26/3	19:15 (Eve.)	35	38	44	44	55	67	58	Nil	IA	N/A	49	N/A	2.1 m/s @ 165 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Insects and VPPS noise consistent. Distant and local traffic frequent. Wind in trees and distant dogs barking occasional.
ATN002	26/3	23:39 (Night)	31	33	36	38	40	51	57	Nil	IA	IA	49	54	0.9 m/s @ 155 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** Insects, bird noise and VPPS noise consistent. Wind in trees frequent. Distant traffic occasional.
ATN002	11/6	16:09 (Day)	37	41	49	60	53	70	60	Nil	IA	N/A	49	N/A	0.9 m/s @162 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Insects and bird noise consistent and dominant. VPPS noise consistent. Resident noise, local traffic and dogs barking occasional. Aircraft noise on one occasion.
ATN002	11/6	19:26 (Eve.)	45	47	49	56	49	59	67	Nil	<48	N/A	49	N/A	0.2 m/s @327 F class stability N/Y	'N/A'/Nil	**CVC conveyor and dozer tracks noise frequent.** VPPS noise consistent and dominant. Local traffic and bird noise occasional.
ATN002	11/6	23:46 (Night)	44	46	48	52	50	55	69	Nil	IA	IA	49	54	0.2 m/s @158 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise consistent and dominant. Car passby on one occasion.
ATN002	11/9	15:47 (Day)	36	40	49	52	61	67	62	Nil	IA	N/A	49	N/A	2.4 m/s @ 78° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Residents talking, car passbys and local traffic frequently audible. Dogs barking briefly

Table 2 Chain Valley Colliery attended noise monitoring results – ATN002

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]			
																	audible.
ATN002	11/9	19:16 (Eve.)	38	40	44	44	53	64	65	Nil	<35	N/A	49	N/A	0.5 m/s @ 25° C class stability Y/Y	Nil/Nil	**CVC forklift noise audible on one occasion.** VPPS noise, insects and frogs consistently audible. Resident noise, car passbys and local traffic frequently audible.
ATN002	11/9	23:36 (Night)	41	42	44	45	47	54	66	Nil	IA	IA	49	54	1.2 m/s @ 0° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and frogs consistently audible. Bird noise occasionally audible. Distant dogs barking briefly audible.
ATN002	25/11	10:45 (Day)	40	44	48	50	58	64	63	Nil	IA	N/A	49	N/A	2.5 m/s @ 30° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
ATN002	25/11	11:00 (Day)	39	43	51	53	63	71	64	Nil	<30	N/A	49	N/A	1.8 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
ATN002	25/11	11:15 (Day)	38	42	50	48	59	73	62	Nil	<30	N/A	49	N/A	2.3 m/s @ 59° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally

Table 2 Chain Valley Colliery attended noise monitoring results – ATN002

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]			
																	audible.
ATN002	25/11	11:30 (Day)	36	39	46	45	56	74	61	Nil	IA	N/A	49	N/A	1.7 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
ATN002	25/11	11:45 (Day)	38	41	50	46	60	74	61	Nil	IA	N/A	49	N/A	3.0 m/s @ 49° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
ATN002	25/11	12:00 (Day)	37	40	45	47	54	65	60	Nil	<30	N/A	49	N/A	2.6 m/s @ 75° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
ATN002	25/11	21:29 (Eve.)	40	42	44	46	49	56	64	Nil	IA	N/A	49	N/A	1.9 m/s @ 4° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Aircraft noise, local and distant traffic and wind in trees occasionally audible.
ATN002	25/11	21:44 (Eve.)	39	42	45	46	56	60	64	Nil	IA	N/A	49	N/A	2.2 m/s @ 19° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Aircraft noise, local and distant traffic and wind in trees

Table 2 Chain Valley Colliery attended noise monitoring results – ATN002

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]			
																	occasionally audible.
ATN002	25/11	22:02 (Night)	40	42	45	46	49	55	65	Nil	IA	IA	49	54	2.4 m/s @ 15° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN002	25/11	22:17 (Night)	40	41	42	44	45	48	64	Nil	IA	IA	49	54	1.7 m/s @ 9° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN002	25/11	22:32 (Night)	38	41	44	44	54	56	64	Nil	IA	IA	49	54	1.7 m/s @ 16° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN002	25/11	22:47 (Night)	37	40	49	44	57	79	64	Nil	IA	IA	49	54	1.8 m/s @ 20° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 3 Chain Valley Colliery attended noise monitoring results – ATN003

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	26/3	15:45 (Day)	36	38	44	45	55	63	60	Nil	IA	N/A	36	N/A	3.6 m/s @ 161 B class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects and bird noise consistent. Wind in trees, distant traffic and resident noise frequent. Aircraft noise and dogs barking occasional.
ATN003	26/3	18:53 (Eve.)	35	37	40	42	45	62	58	Nil	IA	N/A	36	N/A	2.2 m/s @ 152 B class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects and bird noise consistent. Wind in trees, resident noise, distant and local traffic frequent. Aircraft noise occasional.
ATN003	26/3	23:18 (Night)	34	37	39	41	42	49	50	Nil	IA	IA	36	45	2.1 m/s @ 161 F class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects, bird noise and idling noise from NE (unrelated to CVC) consistent. Distant traffic frequent.
ATN003	11/6	15:19 (Day)	34	37	44	56	46	67	55	Nil	IA	N/A	36	N/A	1.9 m/s @147 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects, bird noise and distant traffic consistent. Local traffic and resident noise frequent. Wind in foliage on occasion.
ATN003	11/6	18:45 (Eve.)	36	38	40	46	41	50	61	Nil	IA	N/A	36	N/A	0.3 m/s @194 D class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects consistent. VPPS noise consistent. Distant and local traffic frequent. Aircraft noise occasional. Noise from WWTP just audible throughout measurement.
ATN003	11/6	22:59 (Night)	39	41	43	45	44	48	63	Nil	<36	45	36	45	0.3 m/s @190 F class stability N/Y	'N/A' / Nil	**CVC horn noise on occasion.** VPPS noise consistent and dominant. Distant traffic and bird noise occasional.
ATN003	11/9	15:05 (Day)	32	34	42	43	51	67	57	Nil	IA	N/A	36	N/A	3.4 m/s @ 75° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Wind in foliage, residents talking and local traffic frequently audible.

Table 3 Chain Valley Colliery attended noise monitoring results – ATN003

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	11/9	18:54 (Eve.)	37	38	40	42	44	47	61	Nil	<35	N/A	36	N/A	0.3 m/s @ 56° C class stability Y/Y	Nil/Nil	**CVC forklift noise audible on two occasions.** VPPS noise, insects and frogs consistently audible. Resident noise, distant and local traffic frequently audible. Dogs barking occasionally audible.
ATN003	11/9	23:14 (Night)	35	38	42	44	48	52	64	Nil	IA	IA	36	45	1.3 m/s @ 3° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise briefly audible.
ATN003	25/11	09:01 (Day)	38	41	45	46	53	72	61	Nil	IA	N/A	36	N/A	0.7 m/s @ 334° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN003	25/11	09:16 (Day)	35	38	42	45	49	62	61	Nil	IA	N/A	36	N/A	1.6 m/s @ 46° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN003	25/11	09:31 (Day)	36	38	41	42	48	59	62	Nil	IA	N/A	36	N/A	1.3 m/s @ 36° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN003	25/11	09:46 (Day)	36	38	43	44	54	64	61	Nil	IA	N/A	36	N/A	1.1 m/s @ 32° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic

Table 3 Chain Valley Colliery attended noise monitoring results – ATN003

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]			
																	occasionally audible
ATN003	25/11	10:01 (Day)	36	39	48	45	58	77	61	Nil	IA	N/A	36	N/A	0.8 m/s @ 23° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN003	25/11	10:16 (Day)	36	42	59	59	73	79	63	Nil	IA	N/A	36	N/A	0.9 m/s @ 79° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Wind in foliage, aircraft noise, nearby construction, lawnmowing, local and distant traffic occasionally audible
ATN003	25/11	20:48 (Eve.)	38	40	42	45	47	57	61	Nil	IA	N/A	36	N/A	3.0 m/s @ 9° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic occasionally audible. Nearby chimes briefly audible.
ATN003	25/11	21:03 (Eve.)	38	40	41	42	44	51	61	Nil	IA	N/A	36	N/A	2.9 m/s @ 15° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic occasionally audible. Nearby chimes briefly audible.
ATN003	26/11	00:28 (Night)	32	34	37	38	42	62	58	Nil	IA	IA	36	45	0.6 m/s @ 133° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic occasionally audible. Nearby animal and bird noise briefly audible.
ATN003	26/11	00:43 (Night)	33	35	36	38	40	46	61	Nil	IA	IA	36	45	0.4 m/s @ 145° E class stability	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic

Table 3 Chain Valley Colliery attended noise monitoring results – ATN003

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]			
															Y/Y		occasionally audible. Nearby animal and bird noise briefly audible.
ATN003	26/11	00:58 (Night)	33	35	36	37	40	46	60	Nil	IA	IA	36	45	0.8 m/s @ 64° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic occasionally audible. Nearby animal and bird noise briefly audible.
ATN003	26/11	00:13 (Night)	33	34	36	37	40	45	61	Nil	IA	IA	36	45	0.5 m/s @ 39° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic occasionally audible. Nearby animal and bird noise briefly audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 4 Chain Valley Colliery attended noise monitoring results – ATN004

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]			
ATN004	26/3	16:20 (Day)	36	40	53	53	64	74	67	Nil	IA	N/A	35	N/A	2.5 m/s @ 125 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects consistent. Bird noise frequent. Car passbys, wind in trees, distant traffic, distant dogs barking, resident noise and nearby sign occasional.
ATN004	26/3	18:01 (Eve.)	40	43	53	56	63	77	57	Nil	IA	N/A	35	N/A	2.3 m/s @ 177 B class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects consistent. Bird noise frequent. Car passbys, wind in trees, distant traffic, distant dogs barking, resident noise and nearby sign occasional.
ATN004	26/3	22:47 (Night)	36	38	41	43	49	57	46	Nil	IA	IA	35	45	2.4 m/s @ 171 F class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects consistent. Resident noise, distant dogs barking, wind in trees and distant traffic occasional.
ATN004	11/6	15:57 (Day)	35	39	50	61	54	72	57	Nil	IA	N/A	35	N/A	1.0 m/s @140 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects consistent. Bird noise and distant traffic frequent. Car passbys, wind in trees, dogs barking and aircraft noise occasional.
ATN004	11/6	18:46 (Eve.)	34	36	47	57	44	72	60	Nil	IA	N/A	35	N/A	0.3 m/s @194 D class stability Y/Y	Nil / Nil	**Site noise inaudible.** VPPS noise, distant traffic and insects consistent. Distant dogs barking and car passbys occasional.
ATN004	11/6	22:46 (Night)	34	36	39	44	40	54	60	Nil	<29	44	35	45	0.4 m/s @232 D class stability Y/Y	'N/A' / 'N/A'	**CVC Dozer tracks and horns audible on occasion.** VPPS noise and insects consistent. Bat noise, distant traffic, a neighbouring mine, nearby animals and dogs barking occasional.
ATN004	11/9	15:37 (Day)	32	34	52	55	63	73	63	Nil	IA	N/A	35	N/A	2.8 m/s @ 81° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise consistently audible. Bird noise frequently audible. Car passbys, local traffic and dogs barking occasionally audible.

Table 4 Chain Valley Colliery attended noise monitoring results – ATN004

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]			
ATN004	11/9	19:02 (Eve.)	33	35	45	50	56	63	60	Nil	IA	N/A	35	N/A	0.3 m/s @ 48° C class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Resident noise, car passbys, local traffic, distant dogs barking and aircraft noise occasionally audible.
ATN004	11/9	23:03 (Night)	33	36	39	41	45	50	60	Nil	IA	IA	35	45	1.1 m/s @ 4° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bat noise frequently audible. Distant traffic occasionally audible.
ATN004	25/11	12:23 (Day)	34	38	49	52	60	67	59	Nil	IA	N/A	35	N/A	2.4 m/s @ 64° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Insects and bird noise consistently audible. Wind in trees, aircraft noise, resident noise, distant and local traffic occasionally audible.
ATN004	27/11	21:02 (Eve.)	31	33	35	36	40	59	55	Nil	IA	N/A	35	N/A	3.5 m/s @ 374° D class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, resident noise, aircraft noise distant and local traffic, distant dogs barking and wind in trees occasionally audible.
ATN004	26/11	01:01 (Night)	27	29	32	33	37	52	54	Nil	IA	IA	35	45	0.7 m/s @ 113° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Distant traffic and bird noise occasionally audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 5 Chain Valley Colliery attended noise monitoring results – ATN005

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	26/3	16:46 (Day)	34	36	44	43	54	69	59	Nil	IA	N/A	35	N/A	1.9 m/s @ 143 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects and nearby music consistent. Bird noise frequent. Distant traffic, VPPS noise, distant dogs barking and nearby dogs occasional.
ATN005	26/3	19:19 (Eve.)	35	37	42	43	52	56	55	Nil	IA	N/A	35	N/A	3.1 m/s @ 159 B class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects consistent. Bird noise, distant traffic, distant dogs barking, wind in trees, aircraft noise and resident noise occasional.
ATN005	26/3	22:22 (Night)	30	32	37	39	44	51	54	Nil	IA	IA	35	45	2.7 m/s @ 156 F class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects consistent. VPPS noise, distant traffic, wind in trees, distant dogs barking and nearby car occasional.
ATN005	11/6	16:23 (Day)	34	37	45	55	48	64	55	Nil	IA	N/A	35	N/A	0.3 m/s @115 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Distant traffic consistent. Bird noise frequent. VPPS noise, distant dogs barking, resident noise and nearby traffic occasional.
ATN005	11/6	18:21 (Eve.)	38	40	42	50	43	61	60	Nil	IA	N/A	35	N/A	0.3 m/s @217 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise, distant traffic and insects consistent. Bird noise, distant dogs barking and resident noise occasional.
ATN005	11/6	22:21 (Night)	40	42	44	47	45	65	62	Nil	IA	IA	35	45	0.2 m/s @154 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistent. Distant and nearby traffic and bird/bat noise occasional.
ATN005	11/9	16:02 (Day)	35	39	43	45	49	59	58	Nil	IA	N/A	35	N/A	2.2 m/s @ 65° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Distant traffic, dogs barking, resident noise and wind in trees occasionally audible.

Table 5 Chain Valley Colliery attended noise monitoring results – ATN005

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	11/9	19:26 (Eve.)	37	39	41	43	44	62	59	Nil	IA	N/A	35	N/A	0.5 m/s @ 40° B class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise consistently audible. Distant traffic frequently audible. Bird noise and distant dogs barking occasionally audible.
ATN005	11/9	23:27 (Night)	38	41	42	44	45	59	61	Nil	IA	IA	35	45	1.4 m/s @ 1° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Lapping water frequently audible. Bat noise occasionally audible.
ATN005	25/11	12:49 (Day)	38	40	44	46	51	60	58	Nil	IA	N/A	35	N/A	3.5 m/s @ 55° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise, insects and bird noise consistently audible. Distant and local traffic, nearby boats and wind in trees occasionally audible.
ATN005	27/11	21:30 (Eve.)	32	34	39	41	47	54	55	Nil	IA	N/A	35	N/A	3.0 m/s @ 39° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Resident noise, aircraft noise, distant and local traffic and distant dogs barking occasionally audible.
ATN005	25/11	23:06 (Night)	36	38	41	43	47	62	58	Nil	IA	IA	35	45	2.2 m/s @ 28° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and lapping water consistently audible. Distant traffic and bird noise occasionally audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI (refer to Section **Error! Reference source not found.**).
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. IA = inaudible.
5. N/A = not applicable.

Table 6 Chain Valley Colliery attended noise monitoring results – ATN006

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	26/3	17:10 (Day)	36	38	49	49	61	72	58	Nil	IA	N/A	37	N/A	2.0 m/s @ 143 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Lapping water consistent. Bird noise frequent. Distant traffic, VPPS noise, wind in trees and resident noise occasional.
ATN006	26/3	19:41 (Eve.)	35	38	42	45	48	63	54	Nil	IA	N/A	37	N/A	3.3 m/s @ 144 B class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects and VPPS noise consistent. Wind in trees frequent. Resident noise, bird noise, distant traffic, dogs barking and boat noise occasional.
ATN006	26/3	22:01 (Night)	33	36	41	44	48	57	50	Nil	IA	IA	37	45	2.1 m/s @ 163 F class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** Insects and wind in trees consistent. VPPS noise and bat noise occasional.
ATN006	11/6	16:44 (Day)	35	37	48	60	48	68	56	Nil	IA	N/A	37	N/A	0.3 m/s @236 B class stability Y/Y	Nil / Nil	**Site noise inaudible.** Distant traffic consistent. Bird noise frequent. Distant dogs barking and nearby traffic occasional.
ATN006	11/6	18:00 (Eve.)	37	39	42	49	43	52	59	Nil	IA	N/A	37	N/A	0.5 m/s @256 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** Insects and VPPS noise consistent. Bird noise, distant traffic and a car passby occasional.
ATN006	11/6	22:00 (Night)	38	40	41	43	42	58	61	Nil	IA	IA	37	45	0.5 m/s @226 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and distant traffic consistent. Insects and bird noise occasional.
ATN006	11/9	16:25 (Day)	35	37	53	48	62	81	61	Nil	IA	N/A	37	N/A	2.9 m/s @ 66° B class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Resident noise frequently audible.
ATN006	11/9	19:48 (Eve.)	37	39	42	43	48	65	61	Nil	IA	N/A	37	N/A	0.1 m/s @ 150° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise and distant traffic frequently audible.

Table 6 Chain Valley Colliery attended noise monitoring results – ATN006

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	11/9	23:48 (Night)	36	38	41	42	46	59	60	Nil	IA	IA	37	45	1.0 m/s @ 349° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, running water in nearby drain and insects consistently audible. Bat noise, aircraft noise and distant traffic occasionally audible.
ATN006	25/11	12:28 (Day)	34	37	41	44	48	59	55	Nil	IA	N/A	37	N/A	2.4 m/s @ 64° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	12:43 (Day)	35	38	43	44	48	60	58	Nil	IA	N/A	37	N/A	3.3 m/s @ 59° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	12:58 (Day)	38	40	43	45	48	57	58	Nil	IA	N/A	37	N/A	4.5 m/s @ 45° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	13:13 (Day)	36	39	42	44	47	65	57	Nil	IA	N/A	37	N/A	3.6 m/s @ 68° A class stability	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise,

Table 6 Chain Valley Colliery attended noise monitoring results – ATN006

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]			
															N/N		construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	12:28 (Day)	37	39	44	46	53	66	60	Nil	IA	N/A	37	N/A	3.7 m/s @ 69° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	13:43 (Day)	37	41	45	47	51	60	61	Nil	IA	N/A	37	N/A	4.0 m/s @ 61° A class stability N/N	'N/A' / 'N/A'	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise, construction noise to south east and distant traffic frequently audible. Resident noise, boat noise, nearby fish, wind in trees, distant dogs barking and local traffic occasionally audible.
ATN006	25/11	21:26 (Eve.)	34	35	38	40	45	63	58	Nil	IA	N/A	37	N/A	1.8 m/s @ 4° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. wind in trees and nearby fish occasionally audible.
ATN006	25/11	21:41 (Eve.)	33	34	38	39	47	57	58	Nil	IA	N/A	37	N/A	2.3 m/s @ 16° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. wind in trees and nearby fish occasionally audible.
ATN006	25/11	22:00 (Night)	32	34	37	39	41	57	57	Nil	IA	IA	37	45	2.4 m/s @ 15° D class stability	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees and

Table 6 Chain Valley Colliery attended noise monitoring results – ATN006

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]			
															Y/Y		urban hum to north west frequently audible. Nearby fish and distant traffic occasionally audible.
ATN006	25/11	22:15 (Night)	33	34	36	38	39	42	57	Nil	IA	IA	37	45	1.7 m/s @ 9° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees and urban hum to north west frequently audible. Nearby fish and distant traffic occasionally audible.
ATN006	25/11	22:30 (Night)	33	35	37	38	40	52	58	Nil	IA	IA	37	45	1.7 m/s @ 16° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees and urban hum to north west frequently audible. Nearby fish and distant traffic occasionally audible.
ATN006	25/11	22:45 (Night)	33	36	39	41	44	50	59	Nil	IA	IA	37	45	1.8 m/s @ 20° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees and urban hum to north west frequently audible. Nearby fish and distant traffic occasionally audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 7 Chain Valley Colliery attended noise monitoring results – ATN007

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]			
ATN007	**26/3**	**17:39 (Day)**	**52**	**53**	**54**	**54**	**58**	**62**	**73**	**2 dB**	**43 (41+2)**	**N/A**	**46**	**N/A**	**3.5 m/s @ 167 B class stability N/N**	**'N/A' / 'N/A'**	**CVC vent fan noise consistent and dominant. Bird noise frequent. Wind in trees and aircraft noise occasional.**
ATN007	**26/3**	**18:05 (Eve.)**	**51**	**53**	**53**	**54**	**55**	**60**	**73**	**2 dB**	**43 (41+2)**	**N/A**	**46**	**N/A**	**2.3 m/s @ 177 B class stability Y/Y**	**Nil / Nil**	**CVC vent fan noise consistent and dominant. Bird noise consistent. Wind in trees occasional.**
ATN007	**26/3**	**22:02 (Night)**	**53**	**54**	**55**	**55**	**56**	**57**	**74**	**2 dB**	**44 (42+2)**	**43**	**46**	**46**	**2.1 m/s @ 163 F class stability N/N**	**'N/A' / 'N/A'**	**CVC vent fan noise consistent and dominant. Insects and bird noise consistent. Distant traffic occasional.**
ATN007	**11/6**	**17:36 (Day)**	**50**	**52**	**52**	**53**	**53**	**55**	**73**	**Nil**	**41**	**N/A**	**46**	**N/A**	**0.8 m/s @235 D class stability Y/Y**	**Nil / Nil**	**CVC vent fan noise consistent and dominant. Insects barely audible. Distant dogs barking briefly.**
ATN007	**11/6**	**18:04 (Eve.)**	**51**	**52**	**53**	**55**	**53**	**63**	**73**	**2 dB**	**43 (41+2)**	**N/A**	**46**	**N/A**	**0.5 m/s @236 D class stability Y/Y**	**Nil / Nil**	**CVC vent fan noise consistent and dominant. Bird noise frequent. Insects barely audible. Aircraft noise.**
ATN007	**11/6**	**22:23 (Night)**	**40**	**42**	**42**	**44**	**43**	**46**	**65**	**2 dB**	**44 (42+2)**	**43**	**46**	**46**	**0.2 m/s @181 F class stability N/Y**	**'N/A' / Nil**	**CVC vent fan noise consistent and dominant. Distant traffic frequent.**
ATN007	**11/9**	**17:03 (Day)**	**51**	**52**	**53**	**53**	**55**	**63**	**73**	**Nil**	**43**	**N/A**	**46**	**N/A**	**1.3 m/s @ 60° B class stability Y/Y**	**Nil/Nil**	**CVC vent fan noise consistent and dominant. Bird noise frequently audible. Distant traffic occasionally audible.**
ATN007	11/9	18:00 (Eve.)	51	52	53	53	54	55	73	2 dB	45 (43+2)	N/A	46	N/A	0.4 m/s @ 61° C class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Bird noise and insects frequently audible.

Table 7 Chain Valley Colliery attended noise monitoring results – ATN007

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]			
ATN007	11/9	22:20 (Night)	42	43	44	44	45	52	66	2 dB	45 (43+2)	44	46	46	0.7 m/s @ 10° F class stability N/Y	'N/A' / Nil	**CVC vent fan noise consistent and dominant.** Distant traffic frequently audible. Bird noise occasionally audible.
ATN007	27/11	16:45 (Day)	40	41	43	44	51	63	64	Nil	41	N/A	46	N/A	2.6 m/s @ 58° A class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible. Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	17:00 (Day)	40	41	44	44	53	59	64	Nil	41	N/A	46	N/A	2.7 m/s @ 67° A class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible. Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	17:15 (Day)	39	41	42	43	46	57	64	Nil	41	N/A	46	N/A	2.0 m/s @ 99° A class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible. Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	17:30 (Day)	40	41	44	44	54	62	64	Nil	41	N/A	46	N/A	1.8 m/s @ 81° A class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible. Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	17:45 (Day)	40	41	44	44	51	66	64	Nil	41	N/A	46	N/A	3.4 m/s @ 81° A class stability N/N	'N/A' / 'N/A'	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible.

Table 7 Chain Valley Colliery attended noise monitoring results – ATN007

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]			
																	Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	18:00 (Day)	40	41	44	43	49	72	64	Nil	41	N/A	46	N/A	2.6 m/s @ 62° A class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects, bird noise, distant traffic and wind in trees frequently audible. Aircraft noise and distant dogs barking occasionally audible.
ATN007	27/11	18:18 (Eve.)	40	42	44	44	51	61	64	2 dB	42 (40+2)	N/A	46	N/A	2.1 m/s @ 69° D class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Bird noise consistently audible. Wind in trees and distant traffic frequently audible. Aircraft noise occasionally audible.
ATN007	27/11	18:33 (Eve.)	40	42	43	43	49	67	64	2 dB	42 (40+2)	N/A	46	N/A	2.5 m/s @ 83° D class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Bird noise consistently audible. Wind in trees and distant traffic frequently audible. Aircraft noise occasionally audible.
ATN007	27/11	22:02 (Night)	40	42	44	45	46	50	63	2 dB	41 (39+2)	40	46	46	1.8 m/s @ 58° F class stability N/Y	'N/A' / Nil	**CVC vent fan noise consistent and dominant.** Insects consistently audible. Wind in trees, distant traffic and distant dogs barking occasionally audible.
ATN007	27/11	22:17 (Night)	40	42	44	45	46	47	63	2 dB	41 (39+2)	40	46	46	2.0 m/s @ 28° F class stability N/Y	'N/A' / Nil	**CVC vent fan noise consistent and dominant.** Insects consistently audible. Wind in trees, distant traffic and distant dogs barking occasionally audible.
ATN007	27/11	22:32 (Night)	39	41	43	44	45	47	63	2 dB	41 (39+2)	40	46	46	1.8 m/s @ 20° F class stability N/Y	'N/A' / Nil	**CVC vent fan noise consistent and dominant.** Insects consistently audible. Wind in trees, distant traffic and distant

Table 7 Chain Valley Colliery attended noise monitoring results – ATN007

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]			
																	dogs barking occasionally audible.
ATN007	27/11	22:47 (Night)	39	41	43	44	45	53	63	2 dB	41 (39+2)	40	46	46	1.8 m/s @ 18° E class stability Y/Y	Nil/Nil	**CVC vent fan noise consistent and dominant.** Insects consistently audible. Wind in trees, distant traffic and distant dogs barking occasionally audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 8 Chain Valley Colliery attended noise monitoring results – R12

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	26/3	16:06 (Day)	35	38	43	45	51	60	58	Nil	IA	N/A	49	N/A	2.0 m/s @ 158 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Bird noise consistent. Wind in trees and VPPS noise frequent. Resident noise, local traffic and boat noise occasional.
R12	26/3	19:15 (Eve.)	35	38	44	44	55	67	58	Nil	IA	N/A	49	N/A	2.1 m/s @ 165 A class stability Y/Y	Nil/Nil	**Site noise inaudible.** Insects and VPPS noise consistent. Distant and local traffic frequent. Wind in trees and distant dogs barking occasional.
R12	26/3	23:39 (Night)	31	33	36	38	40	51	57	Nil	IA	IA	49	54	0.9 m/s @ 155 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** Insects, bird noise and VPPS noise consistent. Wind in trees frequent. Distant traffic occasional.
R12	11/6	16:09 (Day)	37	41	49	60	53	70	60	Nil	IA	N/A	49	N/A	0.9 m/s @162 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects and bird noise consistent and dominant. VPPS noise consistent. Resident noise, local traffic and dogs barking occasional. Aircraft noise on one occasion.
R12	11/6	19:26 (Eve.)	45	47	49	56	49	59	67	Nil	<48	N/A	49	N/A	0.2 m/s @327 F class stability N/Y	'N/A' / Nil	**CVC conveyor and dozer tracks noise frequent.** VPPS noise consistent and dominant. Local traffic and bird noise occasional.
R12	11/6	23:46 (Night)	44	46	48	52	50	55	69	Nil	IA	IA	49	53	0.2 m/s @158 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise consistent and dominant. Car passby on one occasion.
R12	11/9	15:47 (Day)	36	40	49	52	61	67	62	Nil	IA	N/A	49	N/A	2.4 m/s @ 78° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Residents talking, car passbys and local traffic frequently audible. Dogs barking briefly

Table 8 Chain Valley Colliery attended noise monitoring results – R12

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]			
																	audible.
R12	11/9	19:16 (Eve.)	38	40	44	44	53	64	65	Nil	<35	N/A	49	N/A	0.5 m/s @ 25° C class stability Y/Y	Nil/Nil	**CVC forklift noise audible on one occasion.** VPPS noise, insects and frogs consistently audible. Resident noise, car passbys and local traffic frequently audible.
R12	11/9	23:36 (Night)	41	42	44	45	47	54	66	Nil	IA	IA	49	53	1.2 m/s @ 0° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise, insects and frogs consistently audible. Bird noise occasionally audible. Distant dogs barking briefly audible.
R12	25/11	10:45 (Day)	40	44	48	50	58	64	63	Nil	IA	N/A	49	N/A	2.5 m/s @ 30° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
R12	25/11	11:00 (Day)	39	43	51	53	63	71	64	Nil	<30	N/A	49	N/A	1.8 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
R12	25/11	11:15 (Day)	38	42	50	48	59	73	62	Nil	<30	N/A	49	N/A	2.3 m/s @ 59° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally

Table 8 Chain Valley Colliery attended noise monitoring results – R12

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]			
																	audible.
R12	25/11	11:30 (Day)	36	39	46	45	56	74	61	Nil	IA	N/A	49	N/A	1.7 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
R12	25/11	11:45 (Day)	38	41	50	46	60	74	61	Nil	IA	N/A	49	N/A	3.0 m/s @ 49° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
R12	25/11	12:00 (Day)	37	40	45	47	54	65	60	Nil	<30	N/A	49	N/A	2.6 m/s @ 75° A class stability Y/Y	Nil/Nil	**Site noise occasionally audible including reversing alarms.** VPPS noise, insects and bird noise consistently audible. Aircraft noise, local and distant traffic frequently audible. Resident noise occasionally audible.
R12	25/11	21:29 (Eve.)	40	42	44	46	49	56	64	Nil	IA	N/A	49	N/A	1.9 m/s @ 4° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Aircraft noise, local and distant traffic and wind in trees occasionally audible.
R12	25/11	21:44 (Eve.)	39	42	45	46	56	60	64	Nil	IA	N/A	49	N/A	2.2 m/s @ 19° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Aircraft noise, local and distant traffic and wind in trees

Table 8 Chain Valley Colliery attended noise monitoring results – R12

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]			
																	occasionally audible.
R12	25/11	22:02 (Night)	40	42	45	46	49	55	65	Nil	IA	IA	49	53	2.4 m/s @ 15° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Local and distant traffic, resident noise and wind in trees occasionally audible. Dog barking briefly audible.
R12	25/11	22:17 (Night)	40	41	42	44	45	48	64	Nil	IA	IA	49	53	1.7 m/s @ 9° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Local and distant traffic, resident noise and wind in trees occasionally audible. Dog barking briefly audible.
R12	25/11	22:32 (Night)	38	41	44	44	54	56	64	Nil	IA	IA	49	53	1.7 m/s @ 16° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Local and distant traffic, resident noise and wind in trees occasionally audible. Dog barking briefly audible.
R12	25/11	22:47 (Night)	37	40	49	44	57	79	64	Nil	IA	IA	49	53	1.8 m/s @ 20° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Local and distant traffic, resident noise and wind in trees occasionally audible. Dog barking briefly audible.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Table 9 Chain Valley Colliery attended noise monitoring results – R13

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]			
R13	26/3	16:28 (Day)	33	36	56	56	69	76	69	Nil	IA	N/A	43	N/A	1.6 m/s @ 140 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Bird noise consistent. VPPS noise and local traffic frequent. Wind in trees and dogs barking occasional.
R13	26/3	19:33 (Eve.)	33	36	46	46	58	71	53	Nil	IA	N/A	43	N/A	1.9 m/s @ 150 B class stability Y/Y	Nil / Nil	**Site noise inaudible.** Insects consistent. VPPS noise, distant and local traffic frequent. Resident noise and dogs barking occasional.
R13	26/3	23:58 (Night)	28	32	41	45	47	66	49	Nil	IA	IA	43	49	1.3 m/s @ 160 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** Insects and VPPS noise consistent. Bird noise, and wind in trees occasional.
R13	11/6	16:41 (Day)	33	36	46	57	48	66	58	Nil	IA	N/A	43	N/A	0.4 m/s @218 A class stability Y/Y	Nil / Nil	**Site noise inaudible.** Bird noise consistent. VPPS noise consistent. Resident noise and local traffic occasional.
R13	11/6	19:46 (Eve.)	40	42	43	48	45	52	60	Nil	<39	N/A	43	N/A	0.4 m/s @283 F class stability N/Y	'N/A' / Nil	**CVC conveyor noise on occasion.** VPPS noise consistent. Local traffic and resident noise frequent.
R13	12/6	00:09 (Night)	46	47	49	52	51	54	64	Nil	IA	IA	43	49	0.4 m/s @165 F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise consistent and dominant. Distant and local traffic and bird noise on occasion.
R13	11/9	16:09 (Day)	35	41	51	54	61	68	58	Nil	IA	N/A	43	N/A	2.9 m/s @ 61° B class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and bird noise consistently audible. Residents talking, car passbys and local traffic frequently audible. Dogs barking occasionally audible.
R13	11/9	19:35 (Eve.)	38	41	43	44	47	51	60	Nil	IA	N/A	43	N/A	0.3 m/s @ 57° B class stability	Nil/Nil	**Site noise inaudible.** VPPS consistently audible. Birds, local traffic and other fauna

Table 9 Chain Valley Colliery attended noise monitoring results – R13

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]			
															Y/Y		occasionally audible.
R13	11/9	23:55 (Night)	38	40	43	45	47	57	60	Nil	<40	<40	43	49	1.0 m/s @ 346° E class stability Y/Y	Nil/Nil	**CVC bangs audible on one occasion.** VPPS noise consistently audible. Bird noise frequently audible. Distant traffic occasionally audible.
R13	25/11	10:31 (Day)	37	40	49	51	61	68	61	Nil	IA	N/A	43	N/A	1.1 m/s @ 153° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.
R13	25/11	10:46 (Day)	39	45	52	54	61	70	61	Nil	IA	N/A	43	N/A	2.5 m/s @ 30° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.
R13	25/11	11:01 (Day)	39	43	47	50	53	64	59	Nil	IA	N/A	43	N/A	1.8 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.
R13	25/11	11:16 (Day)	35	39	49	50	58	70	59	Nil	IA	N/A	43	N/A	2.3 m/s @ 59° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.

Table 9 Chain Valley Colliery attended noise monitoring results – R13

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]			
R13	25/11	11:31 (Day)	33	37	44	47	54	63	56	Nil	IA	N/A	43	N/A	1.7 m/s @ 58° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.
R13	25/11	11:46 (Day)	33	37	48	49	59	70	58	Nil	IA	N/A	43	N/A	3.0 m/s @ 49° A class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Bird noise frequently audible. Resident noise, boat noise, distant and local traffic, aircraft noise and distant dogs barking occasionally audible.
R13	27/11	20:23 (Eve.)	36	38	42	42	52	58	56	Nil	IA	N/A	43	N/A	2.4 m/s @ 50° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS and insects consistently audible. Bird noise, local and distant traffic, wind in trees and aircraft noise occasionally audible. Dog barking briefly audible.
R13	27/11	20:38 (Eve.)	35	37	43	45	53	60	56	Nil	IA	N/A	43	N/A	2.1 m/s @ 54° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS and insects consistently audible. Bird noise, local and distant traffic, wind in trees and aircraft noise occasionally audible. Dog barking briefly audible.
R13	25/11	23:08 (Night)	38	40	42	43	45	48	59	Nil	IA	IA	43	49	2.3 m/s @ 28° F class stability N/Y	'N/A' / Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees frequently audible. Aircraft noise occasionally audible. Another mine in the vicinity audible for approximately 10 minutes.

Table 9 Chain Valley Colliery attended noise monitoring results – R13

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]			
R13	25/11	23:23 (Night)	35	38	40	42	44	48	59	Nil	IA	IA	43	49	2.3 m/s @ 36° D class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees frequently audible. Aircraft noise occasionally audible. Another mine in the vicinity audible for approximately 10 minutes.
R13	25/11	23:38 (Night)	34	36	38	40	42	49	58	Nil	IA	IA	43	49	1.0 m/s @ 271° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees frequently audible. Aircraft noise occasionally audible. Another mine in the vicinity audible for approximately 10 minutes.
R13	25/11	23:53 (Night)	33	36	42	46	48	51	58	Nil	IA	IA	43	49	1.2 m/s @ 205° E class stability Y/Y	Nil/Nil	**Site noise inaudible.** VPPS noise and insects consistently audible. Wind in trees frequently audible. Aircraft noise occasionally audible. Another mine in the vicinity audible for approximately 10 minutes.

Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact sheet C of the NPfI.
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.
4. IA = inaudible.
5. N/A = not applicable.

Appendix 8: Annual Subsidence Report

Chain Valley Colliery and Mannering Colliery

2019 Annual Subsidence Report

Report Prepared for Great Southern Energy Pty Ltd (trading as Delta Coal)
February 2020

Prepared

on 27 March 2020

by Chris Armit *MEng BSci DipCLM*

Contents

1 Introduction

1.1 Overview

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 (Figure 1). An underground linkage within the Fassifern Seam is approved between CVC and MC, which enables coal extracted at CVC to be transferred to, and handled at, MC.

Great Southern Energy Pty Ltd (trading as Delta Coal (DC)) took over as owner and operator of CVC and as the operator of MC on 1 April 2019. Prior to the purchase by Great Southern Energy Pty Ltd, CVC was owned and operated by LakeCoal Pty Ltd (LakeCoal). LakeCoal also operated MC under an agreement with the owners of the mine; Centennial Mannering Pty Limited, a wholly owned subsidiary of Centennial Coal Company Limited (Centennial).

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 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 1.3 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.

This Annual Subsidence report (ASR) has been prepared to satisfy the relevant conditions of SSD-5465 and MP06_0311 and provides an overview of subsidence performance for CVC and MC in 2019.

1.2 Purpose

The purpose of this ASR is to provide an overview of subsidence performance for CVC and MC. 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 2019

1.3 Scope

This ASR relates specifically to underground mining undertaken at CVC and MC in the period 1 January 2019 to 31 December 2019. Within this period, no mining was undertaken at MC. First workings and secondary extraction were undertaken at CVC and included:

- first workings:
  - Tailgate S2;
  - Maingate S2;
  - Maingate S3; and
  - part of the North-East Mains;
- secondary extraction:
  - Miniwall N1; and
  - Miniwall S2

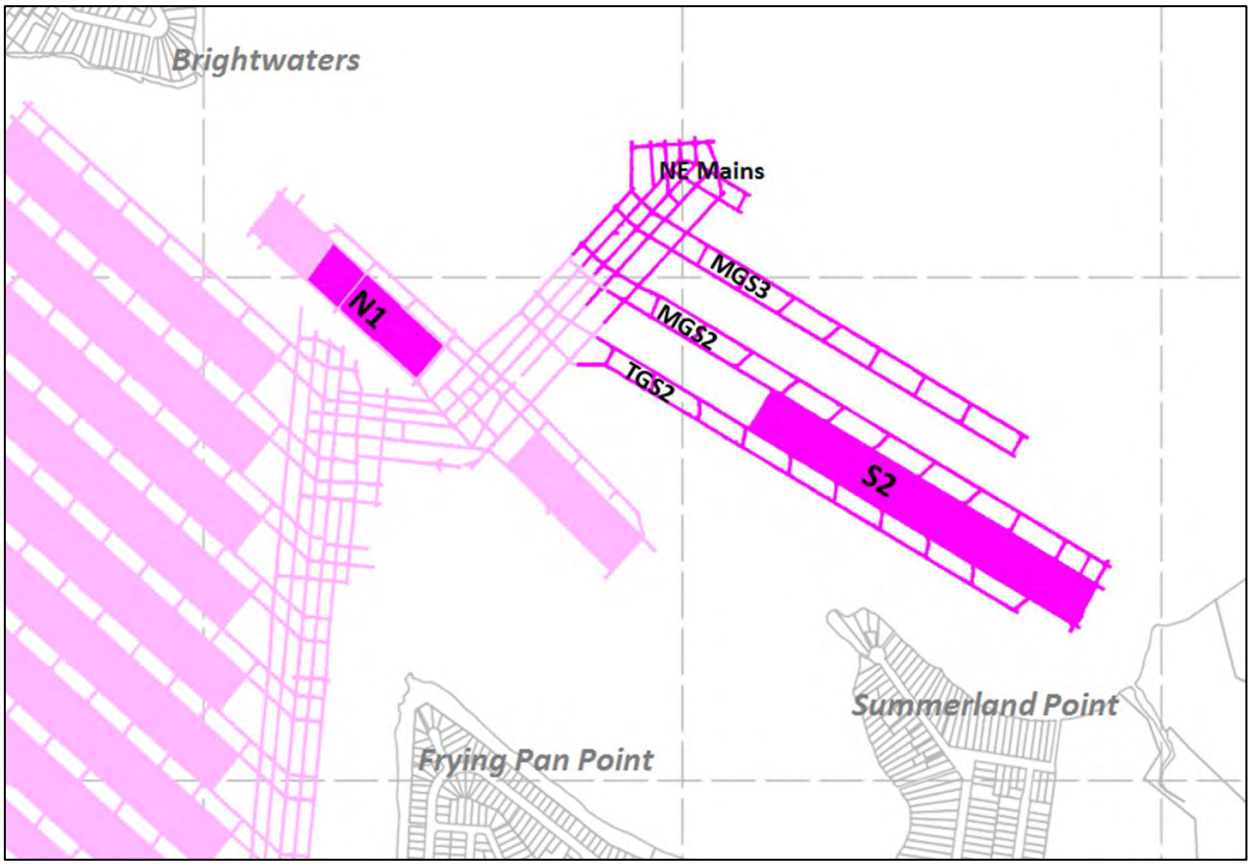


Figure 1 – Chain Valley Colliery 2019 Mining Area

1.4 Approval and legislative requirements

1.4.1 Chain Valley Colliery

In accordance with Schedule 2, Condition 2 and 2A of SSD-5465 (as modified), in addition to carrying out the works in accordance with the conditions of SSD-5465, DC carries out works generally in accordance with the Environmental Impact Statement (EIS); Statement of Environmental Effects (SEE) (Mod 1); SEE (Mod 2); project layout plans and Statement of Commitments. An Ecological and Archaeological assessment was conducted in August and a Conservation Risk Assessment Approval from National Parks and Wildlife Service (NPWS) Miniwall S4 was granted in October 2019 to allow access and foreshore subsidence monitoring activities for Miniwall S4. These monitoring points will be installed prior to Miniwall S4 extraction commencing.

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); project layout plans and Statement of Commitments.

1.5 Stakeholder engagement

DC has consulted with the local community via the CVC and MC Community Consultative Committee (CCC) on subsidence results through 2019. This report will be provided to the CCC and applicable regulators and added to the Delta Coal website.

1.6 Supporting documentation

This ASR has included a review of relevant sections of the following documentation:

- Laxton, J, Laxton, E & Laxton, March 2019, *Lake Macquarie Benthos Survey Report No. 16*. Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Lake Coal.
- Laxton, J & Laxton, E 2019, *Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW (Results for 2008 to 2019)*. Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Delta Coal.
- September 2019, *Lake Macquarie Benthos Survey Report No. 17*. Report prepared by J.H. & E.S. Laxton – Environmental Consultants P/L for Delta Coal.
- June 2019, *Pelican Rock Navigational Marker Pre-mining inspection*, Delta Coal
- Jan 2019 Daly Smith *Bathymetric Survey*
- July 2019 Daly Smith *Survey of Pelican Rock navigational marker*
- July 2019 Daly Smith *Bathymetric Survey*
- 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*
- *Conservation Risk Assessment Approval for Miniwall S4 monitoring*

2 Monitoring and Comparison

2.1 Chain Valley Colliery Monitoring Overview

CVC has a *Subsidence Monitoring Program* and the purpose of this program 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.

2.2 Chain Valley Colliery

2.2.1 Scope of subsidence monitoring

i 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 High Water 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 of 20 mm.

A key objective of the mine design at CVC is to minimise vertical subsidence within the HWMSB and prevent additional 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.

ii 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* (Delta Coal 2019) 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.

iii 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 2019) 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.

2.2.2 Methods of subsidence monitoring

i 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).

ii 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 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.

A comparative analysis of the survey results highlights some elevation changes which are unrelated to mining, generally; however, these appear to be minor movements, perhaps related to movement of sediment as a result of wave action in Lake Macquarie. The surveys have shown that subsidence can be monitored with a useful level of accuracy.

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 430mm. LakeCoal notified the relevant authorities of the exceedance and submitted an incident report on 11 November 2017. As a result of the exceedance LakeCoal committed to increasing the frequency of the surveys to 6 monthly.

In 2019, bathymetric surveys were completed at six monthly intervals in January 2019 and July 2019.

Secondary Extraction Panel	Maximum Approved Subsidence (mm)	Maximum Subsidence Prediction (mm)	Maximum Subsidence (mm) Measurement
Miniwall S1	780	380	<200
Miniwall N1	780	440	<200
Miniwall S2	780	300	Survey due post extraction in Q2 2020

Table 1 – Chain Valley Colliery Extraction

Monitoring will continue in accordance with the approved *Miniwall S2/S3 Extraction Plan* during the 2020 reporting 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 bathymetric survey of Domains 1 and 2 commissioned by LakeCoal in March 2012 was compared to a bathymetric survey of Lake Macquarie undertaken by OEH in 2010, to determine the subsidence which had occurred during this period.

2.2.3 Bathymetric Scanning Results - 2019

Figure -Figure shows the 2019 scan results over Miniwalls 7-12 and N1, S1 comparative to the initial bathymetric surveys. Approximately 1200mm of subsidence has developed over the Miniwall 7-12 domain (above predictions of 780mm), but no further subsidence have been detected since the 2017 surveys.

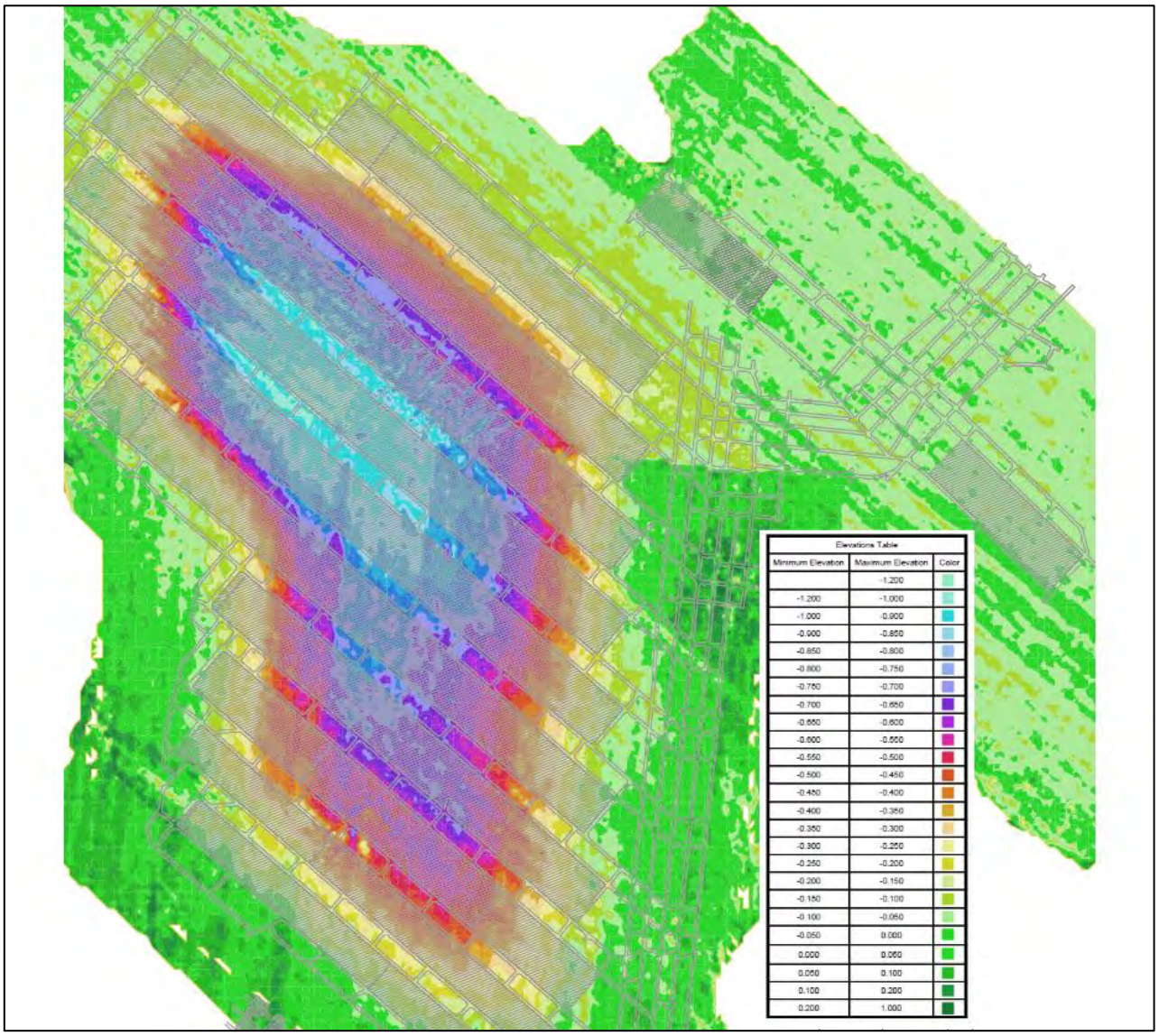


Figure 2 – Miniwalls 7-12, N1 and S1 (Jan-19 Survey)

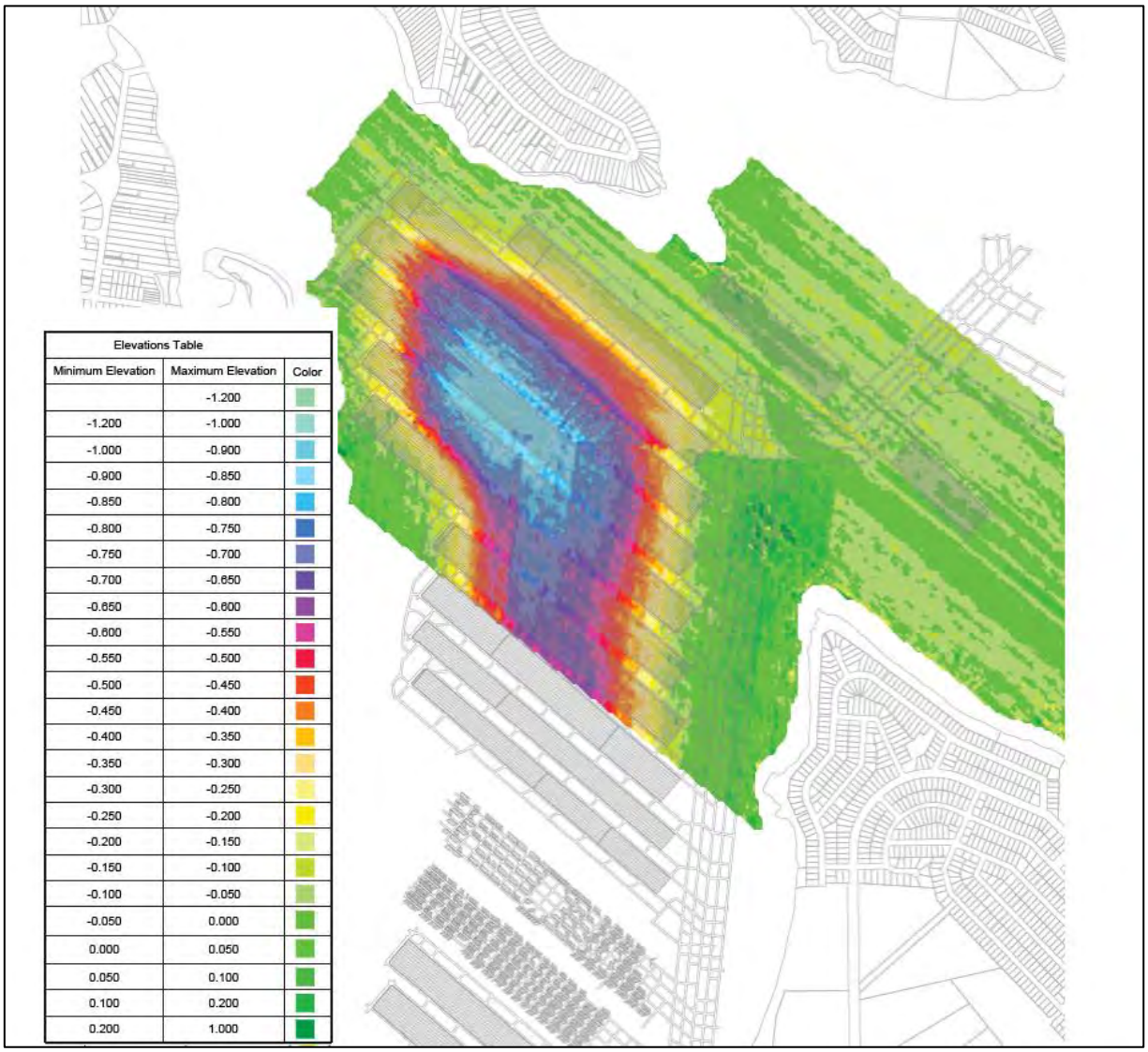


Figure 3 – Miniwalls 7-12, S1 and N1 (July-19)

Bathymetric surveys over the Chain Valley Bay mining area (Figure) have indicated subsidence of up to 400mm directly over the extracted area. An increased angle of draw of surface subsidence has been detected, but no impacts to the shoreline were observed. Minimal subsidence movement was detected from the previous survey in the area (January 2018).

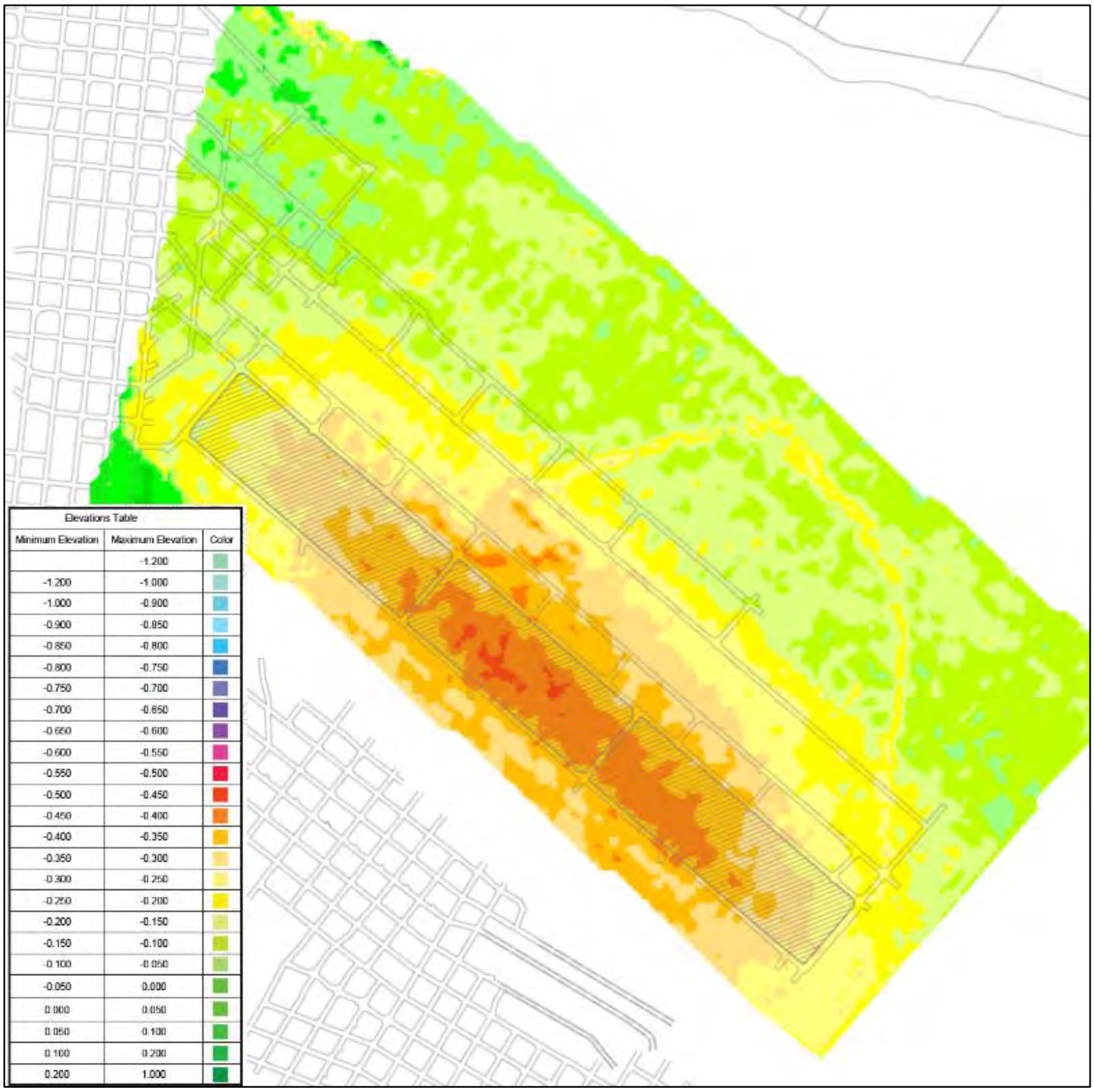
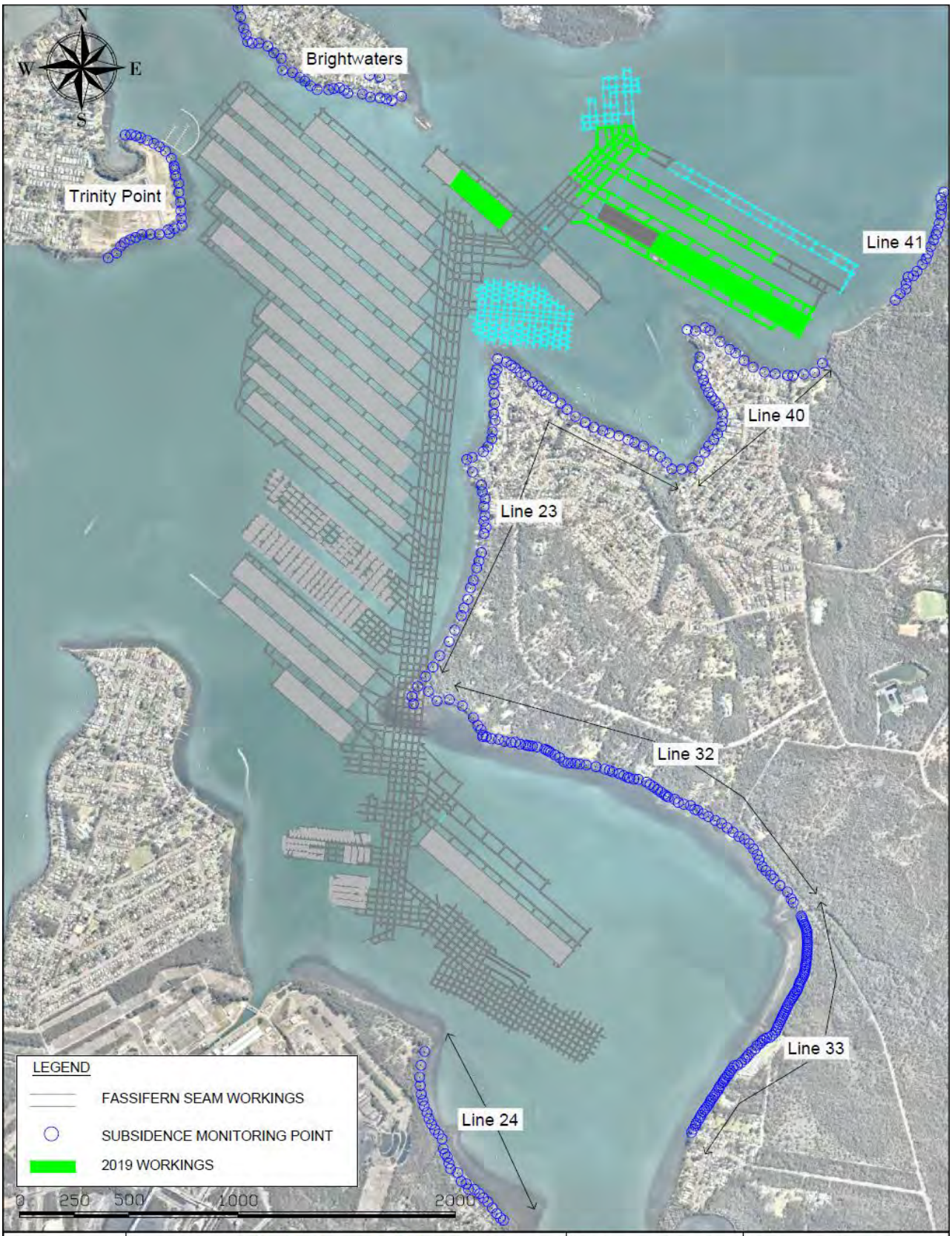


Figure 4 – Chain Valley Bay Miniwall CVB1 (July-19)

i Foreshore monitoring

Delta Coal completes subsidence monitoring around Trinity Point, Brightwaters, Frying Pan Bay, Summerland Point, Chain Valley Bay (**Figure 11**). Monitoring points occur along the foreshore at approximately 20 m – 30 m intervals. The results are uploaded to DPIE DRE's online subsidence web portal 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.



LAKE COAL PTY LIMITED CHAIN VALLEY COLLIERY	SCALE: AS SHOWN	DATE: 24 March 2020	
	DRAWN: T Chisholm	DRG NO: C1S0126	
FASSIFERN SEAM WORKINGS SUBSIDENCE MONITORING POINTS	CHECKED:	REV NO: 2019	Delta coal
	REVISION: 1	SIZE: A4	

Figure 5 – Foreshore subsidence monitoring lines

2.2.4 Trinity Point

Figure Figure 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, however nil movement attributable to subsidence has been detected.

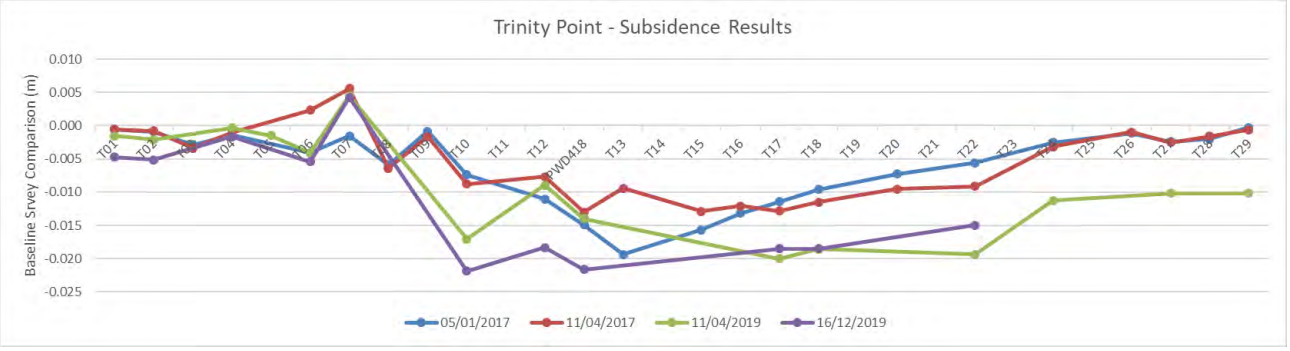


Figure 6 - Trinity Point Subsidence Results

2.2.5 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** . Nil subsidence movement has been detected along the monitoring line.

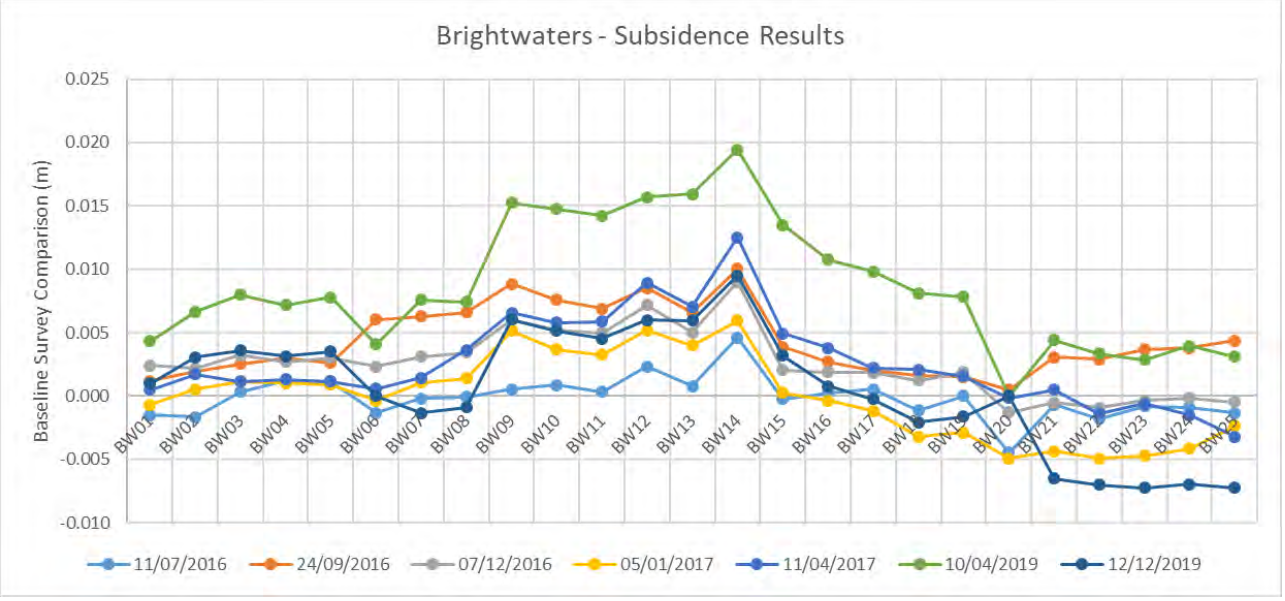


Figure 7 - Brightwaters Subsidence Results

2.2.6 Summerland Point

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.

It is noted this point, along with points #63-75 have all experienced more than negligible amounts of subsidence (20mm) since June 2008. Since 2008, when Fassifern first workings were completed, subsidence has ranged between 20-40mm, primarily due to the impact of multi-seam extraction in the Wallarah and Great Northern Seams. Ongoing subsidence movement appears to have slowed in recent years, with approximately 10mm of movement (Point S71) during the 2018 and 2019 reporting periods.

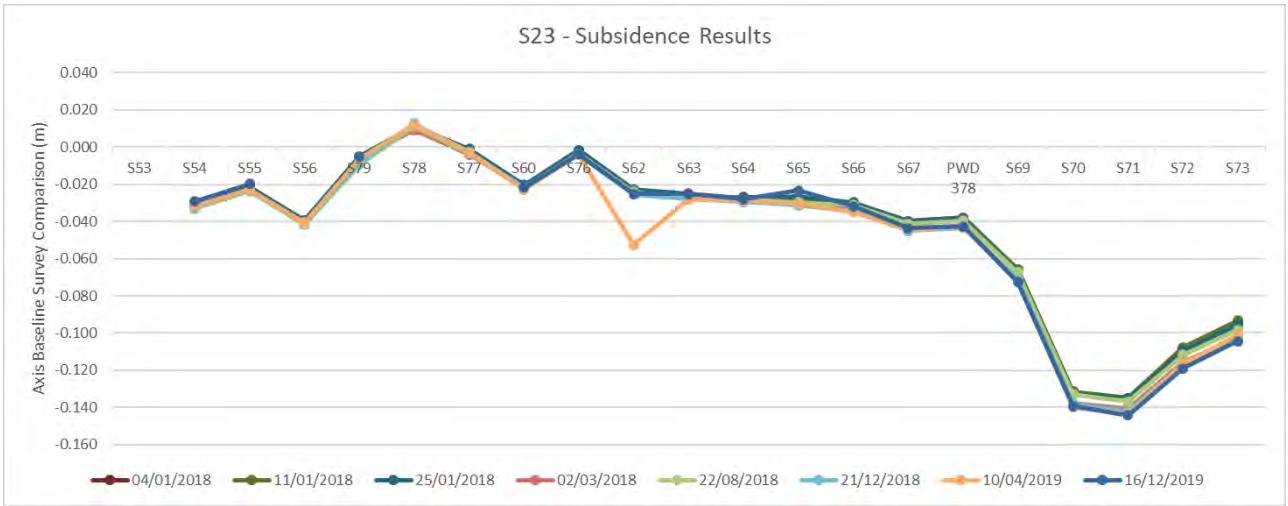


Figure 8 - Line 23 Subsidence Results

This subsidence is however linked to residual effects from both first and second workings in the Wallarah and Great Northern Seams above the Fassifern seam workings *(Ditton Geotechnical Services, 2013 - CHV-002/2)*, due the presence of soft claystone floor beneath the Great Northern seam. The measured subsidence movement over time was assessed alongside the theoretical subsidence movement and indicates actual subsidence in line with expectations for Wallarah and Great Northern seam secondary pillar extraction.

The Wallarah and Great Northern Seam workings were assessed as long-term stable (*Seedsman Geotechnics, 2008 – CV11*) prior to mining in the Fassifern Seam being undertaken beneath the seams in the High Water Mark Subsidence Barrier (HWMSB). It is considered, then, that the subsidence effects along the foreshore are not a result of the 2008 Fassifern first workings or current miniwall extraction – rather due to the continuing consolidation of moisture-sensitive claystones in the Great Northern seam floor, and would occurred irrespective of the development of the Fassifern Seam roadways.

2.2.7 Chain Valley Bay– Lines 33, 32 and 24

Monitoring Points on the foreshore of Chain Valley Bay have historically been monitored during periods of extraction in the Great Northern and Wallarah Seams in the vicinity of the shoreline. Due to the commencement of Fassifern Seam extraction in Chain Valley Bay (CVB), a Multi-Seam Mining Feasibility Investigation (MSMFI) report *(Ditton Geotechnical Services, CHV-002-7)* was commissioned by Lakecoal to assess the impact of the Fassifern seam mine workings on the previously mined Great Northern and Wallarah seam workings and potential resultant impact on the foreshore in Chain Valley Bay.

Surveys of the existing monitoring points (many of which had experienced 40-60mm of subsidence) were resumed 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** , **Figure** and **Figure** show the subsidence monitoring results for the reporting period. A specific point (989A) measured approximately 40mm of movement during the report period; as the adjacent monitoring points are stable this is assumed to be related to damage / movement of the specific monitoring point rather than mine-subsidence related.

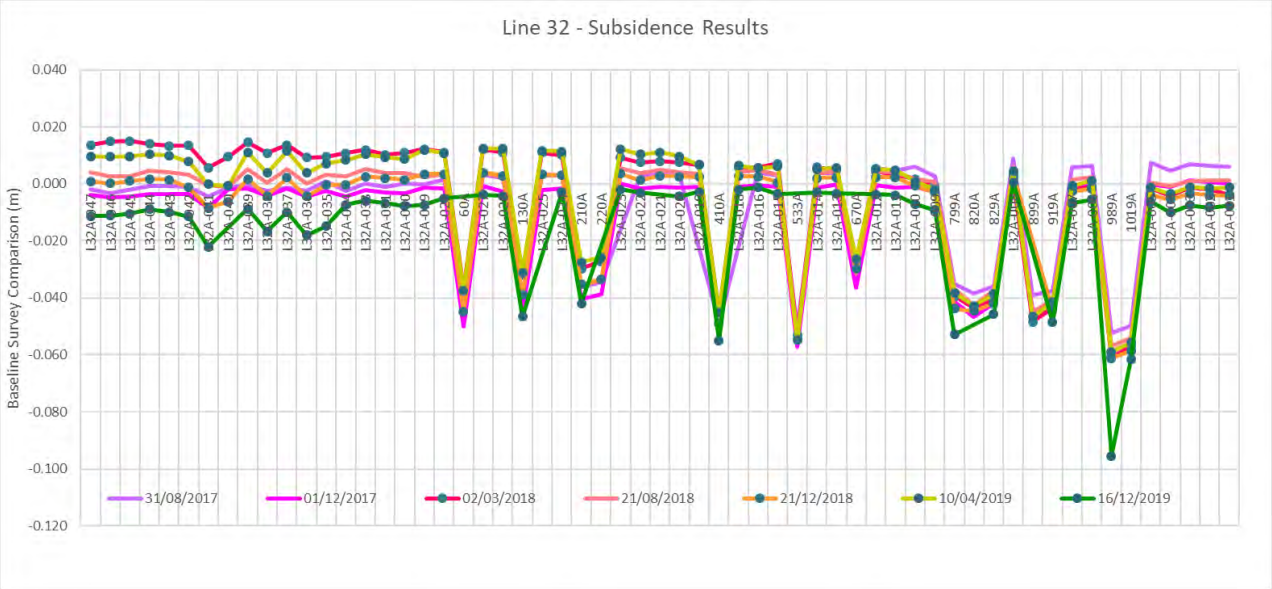


Figure 9 - Line 32 Subsidence Results

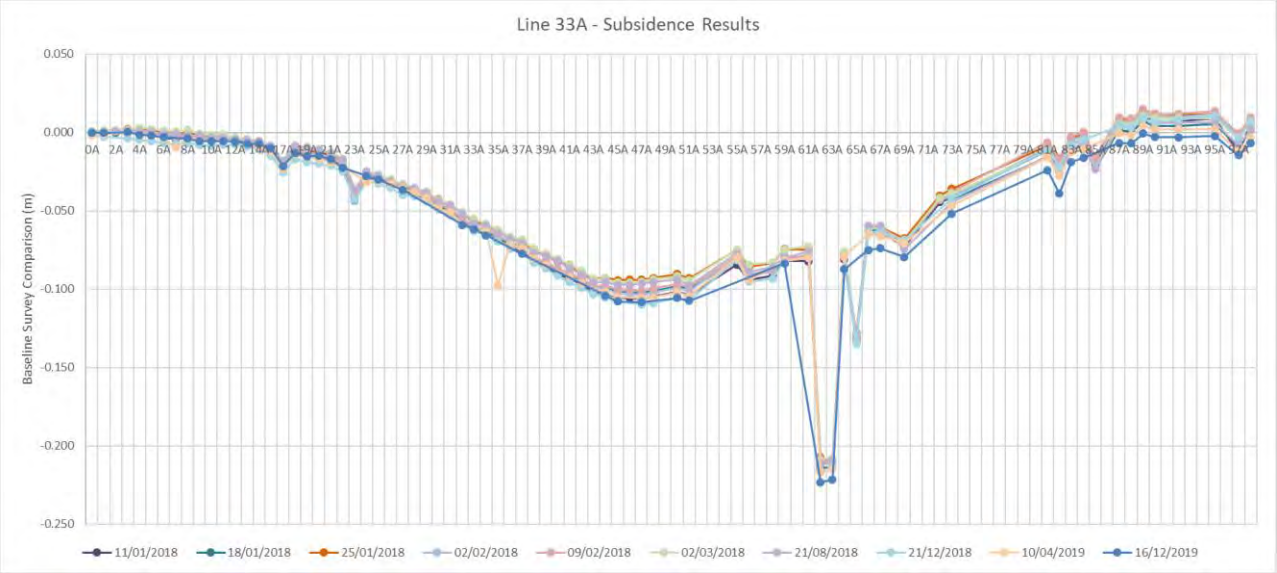


Figure 10 - Line 33A Subsidence Results

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.

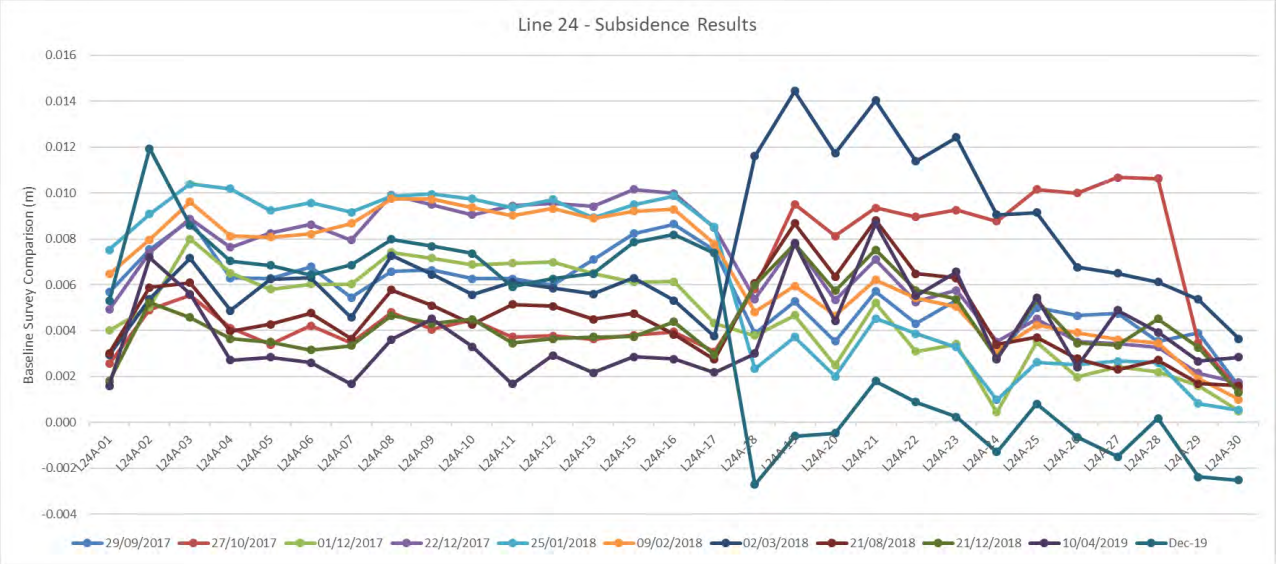


Figure 11 - Line 24 Subsidence Results

2.2.8 Summerland Point – Line 40

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 ±5mm and appears seasonal. **Figure** shows the reporting period subsidence results for Line 40.

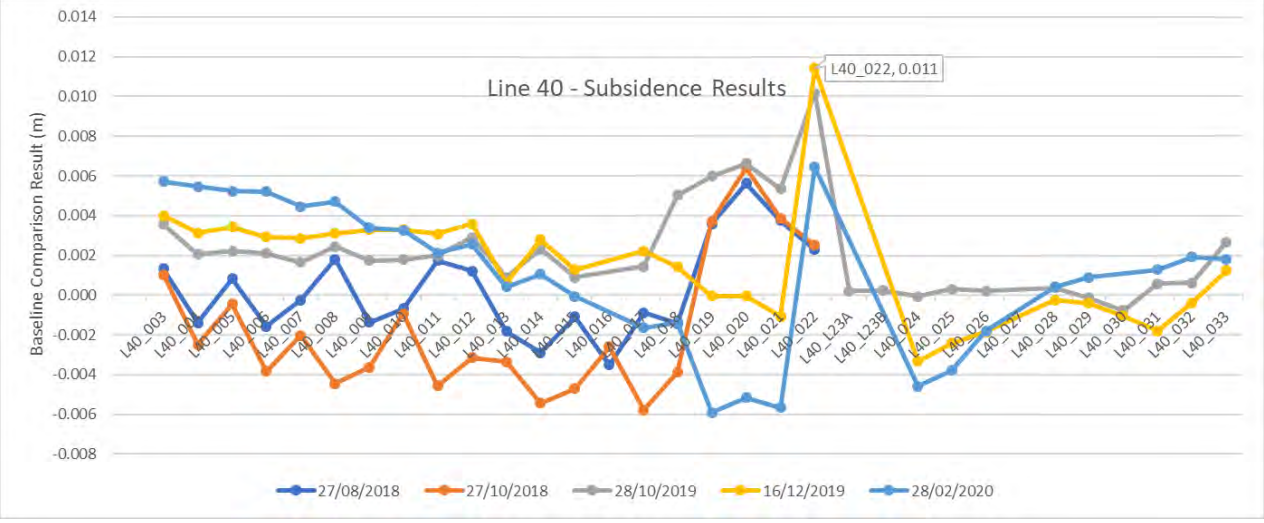


Figure 12 - Line 40 Subsidence Results

i Pelican Rock Navigation 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, S3 and S4.

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.

The pre-mining recorded data at Pelican Rock Navigation Marker was 1.14 mm Australian Height Datum and the navigational pole was vertical.

2.2.9 Timing of subsidence monitoring

Timing of subsidence monitoring at CVC is defined in approved extraction plans and is summarised in Table 5.1.

Table 2 Frequency of subsidence monitoring

Type of monitoring	Pre-extraction requirements	During extraction requirements	Post extraction requirements
Bathymetric surveys	Single baseline survey prior to extraction	End of panel (of relevance to S2, S3 and S4)	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, S3 and S4)	Visual inspection and confirmation from RMS of nil impacts

2.3 Mannering Colliery Monitoring Overview

2.3.1 Methods of subsidence monitoring

i Overview

Subsidence monitoring at MC includes 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).

As acknowledged in MC's *Annual Review 2018* (LakeCoal 2019), at the commencement of mining operations associated with the link road project between CVC and MC, previous mine operators, LakeCoal, implemented a subsidence monitoring program. 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 at MC was reduced to an annual survey.

2.4 Mannering Colliery

There was no mining undertaken at Mannering Colliery during 2019. Mining is approved in the Mannering Colliery Project approval (MP06_0311MP) but is not currently approved in the combined CVC and MC 2018-2020 Mining Operations Plan. There were no subsidence prediction reports prepared for Mannering Colliery in 2019.

3 Impacts to built features from 2019 mining activities

3.1 Chain Valley Colliery

No built features have been identified as requiring direct management within the lake area impacted by 2019 mining activities at CVC.

All mining activities at CVC during 2019 occurred beneath Lake Macquarie and as such had no direct impact on surface facilities or infrastructure.

Navigation markers (including Frying Pan Bay and Pelican Rock) were monitored in 2019 via the Subsidence Management TARP.

Pelican Rock Navigation Marker was inspected on 19 May 2019 prior to first workings mining beneath this feature. A survey for RL and tilt was conducted on 10 July 2019 by Daly Smith Surveyors. Miniwall mining did not pass by this feature in 2019. A post mining survey is scheduled to take place in Quarter 2020 post S2 extraction completion.

3.2 Mannering Colliery

As noted previously, at the commencement of mining operations associated with the Link Road Project, a subsidence monitoring program was implemented with monitoring points installed around VPPS (Figure 13).

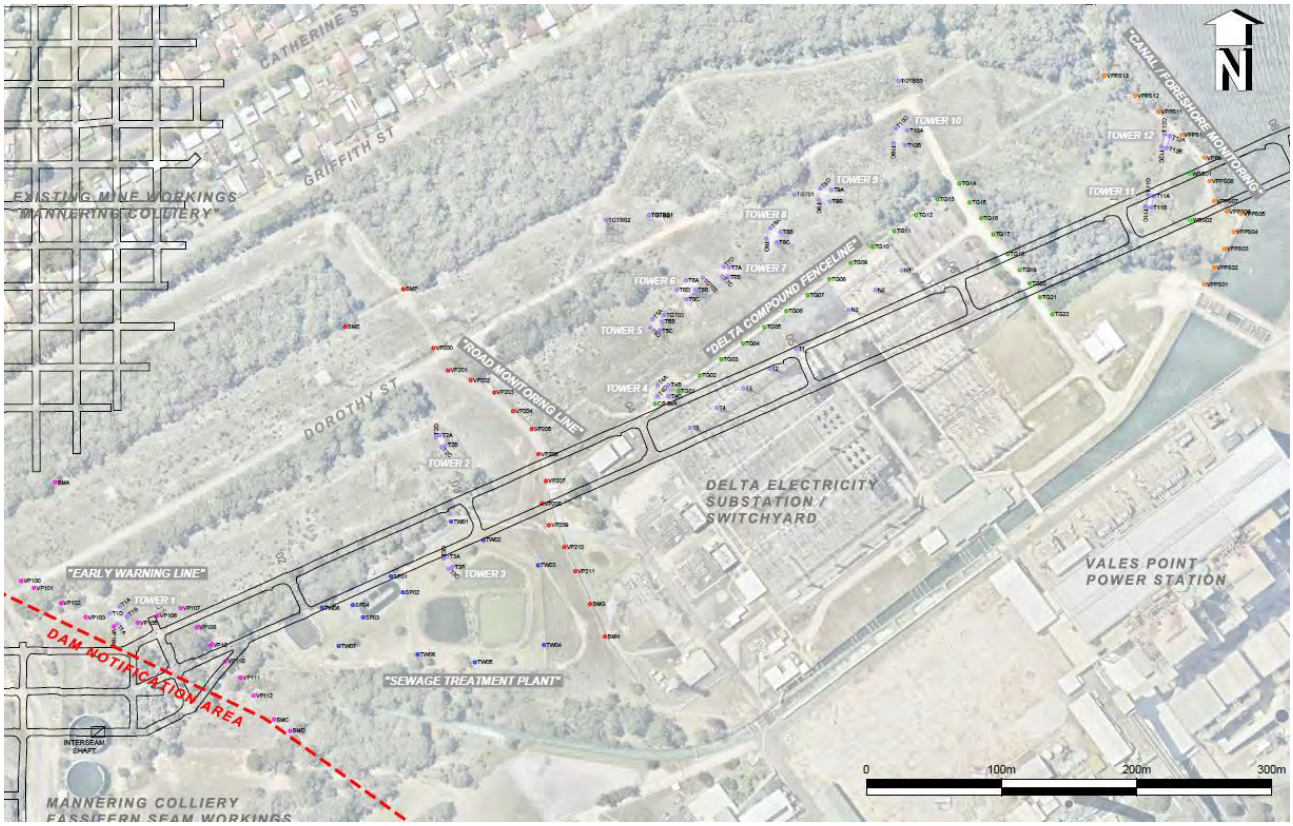


Figure 13 - Vales Point Power Station Monitoring Locations

At the completion of the link road project, subsidence monitoring frequency was reduced with the frequency of monitoring dropped back to an annual survey. A survey was carried out of the monitoring points on 18 April 2019, with the results shown in Figure 14.

No discernible subsidence impact from the Linkage Road Project workings was observed in 2019.

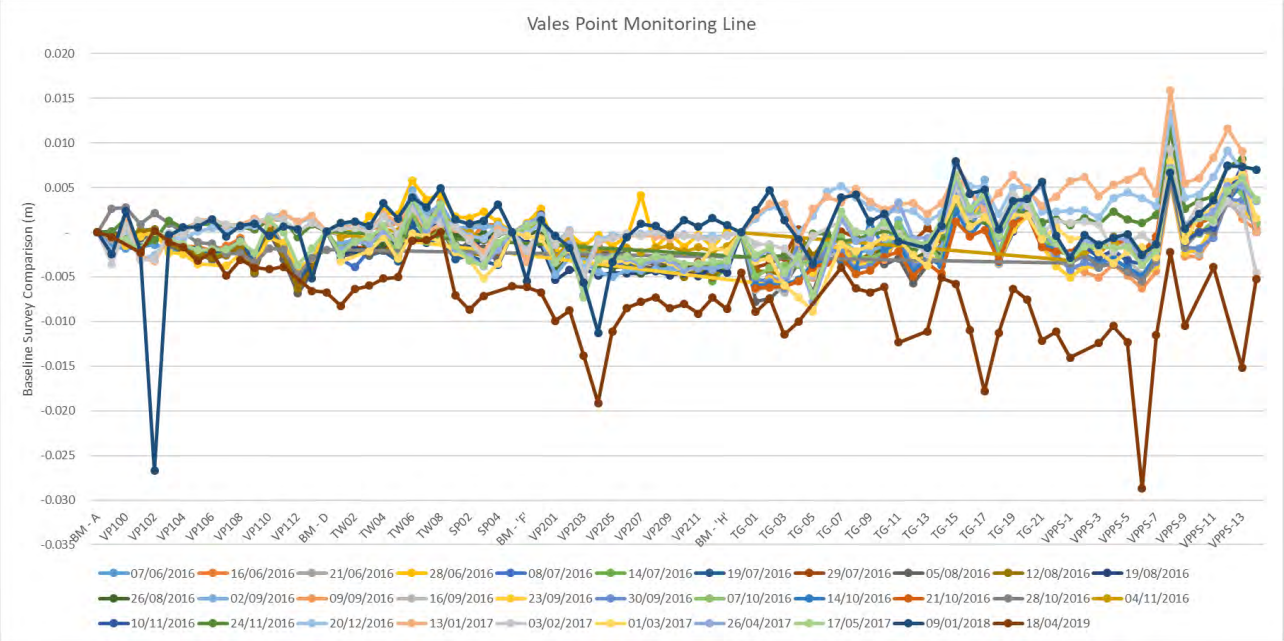


Figure 14 - Vales Point Monitoring Line Subsidence Results

4 Impacts to natural features

4.1 Chain Valley Colliery

Subsidence impact performance measures to natural and heritage features are detailed in SSD5465-Mod 2 Table 8 as below.

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: • *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.

4.1.1 Seagrass bed monitoring

Annual seagrass bed monitoring was undertaken in 2019 as per the approved seagrass management plan. The Seagrass bed report is stored on www.deltacoal.com.au. The below table is taken from the report and displays compliance to the subsidence impact performance measures table for 2019.

Condition from SSD5465 - Mod 2	**Compliance Status and Comments**
Schedule 4 Environmental Conditions – underground mining Performance Measures - Natural Environment Biodiversity - Benthic Communities Subsidence Impact Performance Measure - Negligible environmental consequences including: 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.	Compliant – See sections 7, 8 and11 - Conclusions
Measurements undertaken by generally accepted methods	Compliant – See section 3 Methods
Measurements Methods fully described	Compliant – See sections 3 Methods
Statement of Commitments - Marine Ecology – continue annual seagrass surveys/monitoring	Compliant – See historical seagrass surveys/monitoring

Table 3 Seagrass monitoring compliance

4.1.2 Benthic Communities monitoring

Benthic monitoring was undertaken in March 2019 and September 2019. The Benthic Communities report is stored on www.deltacoal.com.au. The below table is taken from the September 2019 report and displays compliance to the subsidence impact performance measures table for 2019.

The results from the September 2019 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 displays nil to minor environmental consequences due to underground mining.

Condition from SSD5465 - Mod 2	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 sections 4 and 5
Measurements Methods fully described	Compliant – See sections 4 and 5

Table 4 Benthic Communities monitoring compliance

5 Adaptive Management – Trigger Action Response Plan (TARP) implementation and Remediation

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

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 2019.

There was no subsidence related remediation activities undertaken during 2019 as a result of mining activities at CVC.

5.1 Mannering Colliery

There is no subsidence management TARP at MC.

There was no subsidence related remediation activities undertaken during 2019 as associated with Mannering Colliery.

References

Development Consent SSD5465

Project Approval MP06_0311

Delta Coal CVC Subsidence Management TARP

Delta Coal CVC Subsidence Monitoring Program

Lake Coal N1 / S1 Extraction Plan

Delta Coal S2/S3 Extraction Plan

Lake Coal Mining Operations Plan 2018 to 2020

Appendix 9: Chain Valley Colliery Independent Environmental Audit

INDEPENDENT ENVIRONMENTAL AUDIT 2019

Chain Valley Colliery

Prepared for:

Delta Coal
Off Construction Road
Vales Point NSW 2259

SLR

SLR Ref: 630.12751-R01
Version No: -v0.1
June 2019

PREPARED BY

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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

CONTENTS

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DOCUMENT REFERENCES

TABLES

FIGURES

APPENDICES

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.

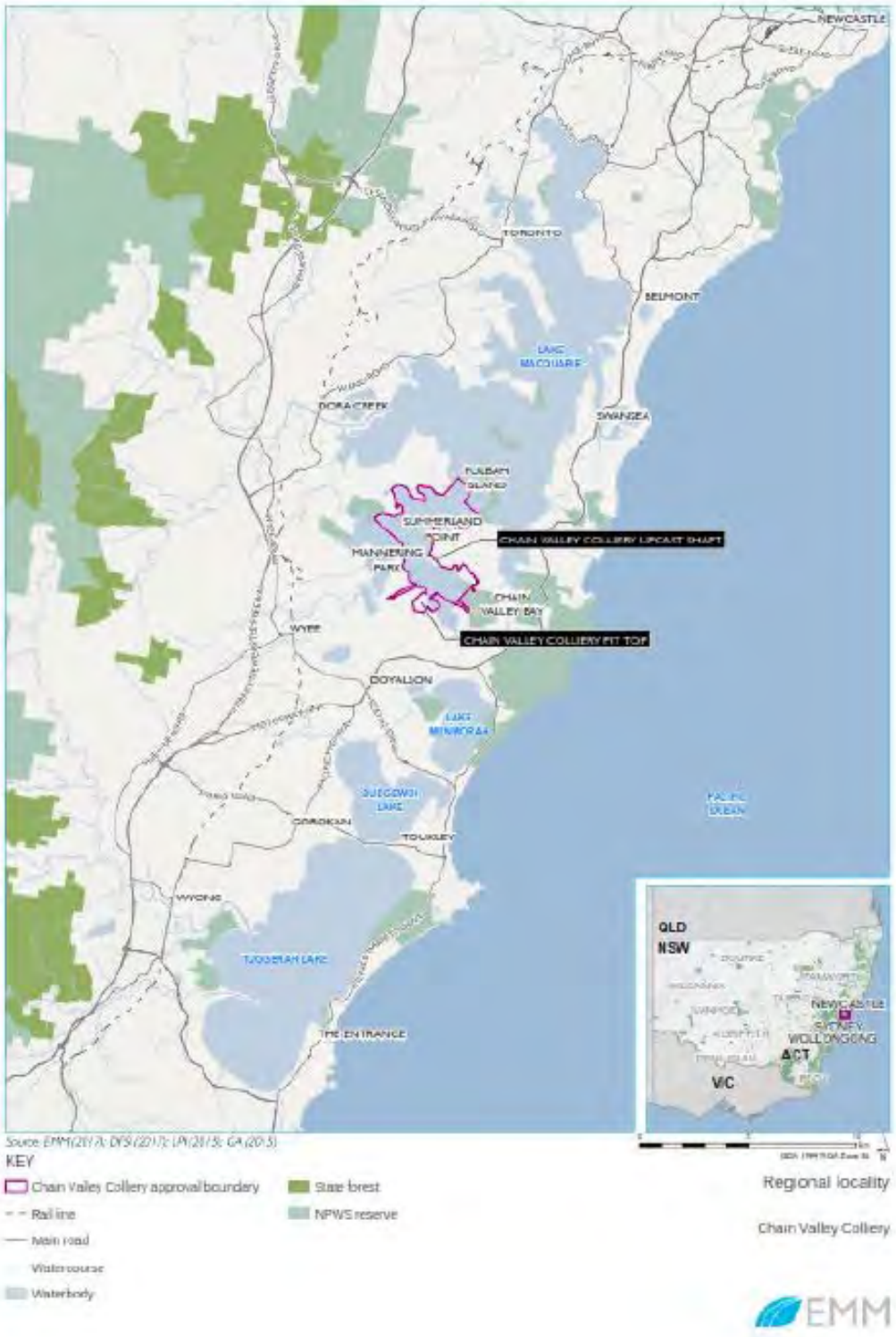

Figure 1 Locality – CVC (Prepared by EMM)

Miniwall 7-12

Clause 88 Application Submitted -	28/03/2014
Clause 88 Approval Recieved -	14/04/2014
Extraction Plan Application Submitted -	27/05/2014
Extraction Plan Approval Granted -	06/06/2014

Miniwalls S1 & N1

Clause 33 Notification Submitted -	11/01/2018
Extraction Plan Application Submitted -	18/05/2018
Extraction Plan Conditional Approval -	24/05/2018

Domain No. 2 - Minwalls 1-5 (Amendment)

Clause 88 Application Submitted -	4/01/2011
Clause 88 Approval Granted -	12/09/2011
SMP Application Submitted -	10/03/2011
SMP Approval Granted -	27/07/2011

Domain No. 2 - Miniwalls 4-6 (Amendment)

Clause 88 Application Submitted -	12/11/2012
Clause 88 Approval Granted -	30/04/2013
SMP Application Submitted -	23/08/2012
SMP Approval Granted -	04/12/2012

Chain Valley Bay

Clause 33 Notification Submitted -	29/05/2017
Extraction Plan Application Submitted -	30/06/2017
Extraction Plan Conditional Approval -	16/10/2017

pt. ML1632
pt. ML1632
pt CCL721
pt. ML1632 (sublease)
pt. ML1632 (sublease)
pt CCL721
pt. ML1632 (sublease)
ML1051
pt. ML1370 (sublease)
CCL707
pt CCL721
ML1051
CCL707
ML1051
ML1052
pt CCL721
pt CCL721
ML1052
ML1052
CCL707

DELTA COAL CHAIN VALLEY COLLIERY	SCALE: 1:12500	DATE: 15 April 2019	
	DRAWN: T Chisholm	DRG NO: C4P0089	
FASSIFERN SEAM APPROVALS 2011 - 2019	CHECKED: C Armit	REV NO: 0	Delta coal
	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 *The Department sees noise and general monitoring and reporting obligations as key issues for CVC and Mannering Collieries at this time.*
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. *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.* 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	Email sent to contact from SLR on 20 March 2019. The CCC Chairperson sent an email to the CCC requesting any comments. A response was provided by the CCC chairperson based on 25 March. *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.* One of the members of the CCC stated in an email to the CCC Chairperson on 25 March 2019: *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.*
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 con- sequences, regardless of the likelihood of occurrence.
Medium		Non - compliance with: • Potential for serious environmental consequences, but is unlikely to occur; or • Potential for moderate environmental consequences but is likely to occur.
Low		Non - compliance with: • Potential for moderate environmental consequences, but is unlikely to occur; or • Potential for low environmental consequences but is likely to occur.
Administrative 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 Acton 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 duri9ng 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	During the night time Q2 monitoring on 28 June 2016, $L_{A1,1minute}$ 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 CVCliery’s product coal stockpiling activities. 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: • 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:

<table>
<tr><th>Date</th><th>Description of Incident / Non - compliance</th><th>Approval Condition</th><th>Actions Taken to Address Incident / Non - compliance</th></tr>
<tr><td></td><td></td><td></td><td>
Table 1.2 :$L_{A1,1minute}$ GENERATED BY CVC AGAINST IMPACT ASSESSMENT CRITERIA
<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 $L_{A1,1min}$ dB [4]</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>
Notes:
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; and
4. Bolded results in red are those greater than the relevant criterion (if applicable).

It should also be noted that there were no community complaints received as a result of the noise exceedances recorded on 28 June 2016.
</td></tr>
<tr><td colspan="4">2017</td></tr>
<tr><td>24 October 2017</td><td>1dB exceedance of night time $L_{Aeq15\ min}$ criteria at ATN007.</td><td>SSD 5465
Schedule 3, Condition 7</td><td>Follow up noise monitoring undertaken by site confirmed that noise levels were back within compliance.
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.
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.</td></tr>
</table>

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 50.2µg/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	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 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 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 (PM_{10}) nominates a 24 hour PM_{10} criterion of 50µg/m^3 as: • 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. 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 57.82µg/m^3 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. 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.
4 December 2018	PM_{10} 24 Hour Average Exceedance (RTD 001)- Kingfisher Shores	SSD 5465 Schedule 3, Condition 11	The TEOM recorded a 24 hour PM_{10} value of 112.98 µg/m^3 and 91.59 µg/m^3 against the 24 hour average criterion of 50µg/m^3 on the 22 and 23 November respectively. 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

Date	Description of Incident / Non - compliance	Approval Condition	Actions Taken to Address Incident / Non - compliance
			notifications from OEH (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 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 (PM_{10}) nominates a 24 hour PM_{10} criterion of 50µg/m^3 as: • 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. 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 PM_{10} value of 112.98µg/m^3 and 91.59 µg/m^3 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. 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.

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 • 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: (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 • 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 in 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 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.
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	Administrative non - compliance 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 Admin - Non - Compliance 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 • 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
	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. 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. Notes: • 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.		Heritage - June 2014; Biodiversity Management Plan - 16 March 2016; Seagrass Management Plan - April 2014; and Environmental Management System - 2012. Admin Non - Compliance: This condition is non - compliant as plans have not been 'regularly' updated. 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.	• 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	**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. Admin Non - Compliance.	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.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
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; (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, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.	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; - Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and - 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. 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). Historical admin non - compliance with no further action.	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Schedule 3 Condition 3	**Road Transport Protocol** The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall: (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; (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 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; (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 shall implement the approved Road Transport Protocol	Administrative Non - Compliance	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. 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. Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012. <u>Preparation:</u> a) Evidence of consultation from 2014; b) Section 8.3; c) Overall document. Covered in Section 8; d) Code of conduct discussed in Section 8.11. Not attached to the document. <u>Implementation:</u> Records and training. 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>.	REC 4 • 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.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
Schedule 3 Condition 4	**Independent Traffic Audit** 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: (a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC 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.	Administrative Non - Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	REC 5 • Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.
Schedule 3 Condition 5	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. A summary of the audit report must be included in the Annual Review.	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.
Schedule 3 Condition 6	**Alternative Coal Transport Options** 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: (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	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.	REC 6 • Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.

<table>
<tr><th>Schedule and Condition Number</th><th>Condition</th><th>Compliance Status</th><th>Evidence</th><th>Recommendations</th></tr>
<tr><td></td><td>and rail transport.</td><td></td><td></td><td></td></tr>
<tr><td>Schedule 3
Condition 7</td><td>Noise Impact Assessment Criteria
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.
Table 1: Noise Criteria dB(A)
<table><tr><th>Location</th><th>Day
$L_{Aeq(15\ min)}$</th><th>Evening
$L_{Aeq(15\ min)}$</th><th>Night
$L_{Aeq(15\ min)}$</th><th>Night
$L_{A1(1\ min)}$</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></td><td>Non – Compliant (Low Risk)</td><td>- 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).</td><td>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.</td></tr>
<tr><td>Schedule 3
Condition 8</td><td>Operating Conditions
The Applicant shall:
(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;
(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;
(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);
(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;
(e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and
(f) prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit; to</td><td>Administrative Non - Compliance</td><td>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.
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.
c) No evidence of reduced operations during adverse meteorological conditions.
d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period.
e) Conducted as part of this Independent Audit. Note that no noise monitoring of site plant/equipment and operations was</td><td>REC 8
• 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.</td></tr>
</table>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	the satisfaction of the Secretary. Table 2: Long-term Noise Goals dB(A) Location / Day $L_{Aeq(15\ min)}$ / Evening $L_{Aeq(15\ min)}$ / Night $L_{Aeq(15\ min)}$ R11 – R13: 41 / 41 / 41 R22: 40 / 40 / 40		conducted as part of the audit. f) No evidence of action plan. Admin Non - Compliance. Exceedances of long term noise goals occurred during the monitoring period. However these are longterm noise goals, not criteria.	
Schedule 3 Condition 9	**Noise Management Plan** The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must: (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; (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent; (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 (d) 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 shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non - Compliance	Current plan dated 12 March 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. Admin Non - Compliance. Preparation: a) Compliant. Evidence from 2014; b) Compliant - Section 4; c) Compliant - Section 4; d) Compliant - Section 5 and 6 Implementation: No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance. No notification to residents following recorded exceedances in accordance with Section 6.2. Admin Non - Compliance. Real time noise monitor removed from site. Admin Non - Compliance.	Nil. Previous recommendations relate to updating all management plans.
Schedule 3	The Applicant shall ensure that all reasonable and feasible avoidance	Non –	2019 - no longterm data for annual averages.	REC 9

<table>
<tr><th>Schedule and Condition Number</th><th>Condition</th><th>Compliance Status</th><th>Evidence</th><th>Recommendations</th></tr>
<tr><td>Condition 11</td><td>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.

Table 3: Long-term criteria for particulate matter
<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 (PM_{10})</td><td>Annual</td><td>[a] 30 µg/m³</td></tr></table>
Table 4: Short-term criterion for particulate matter
<table><tr><th>Pollutant</th><th>Averaging period</th><th>[d] Criterion</th></tr><tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td>[a] 50 µg/m³</td></tr></table>
Table 5: Long-term criteria for deposited dust
<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></td><td>Compliant (Low Risk)</td><td>Annual Review 2018 - Depositional dust gauges were below criteria.
Short term PM_{10} non -compliances on 3 April 2018, 18 July 2018 and 4 December 2018. The 2018 annual average of 24hr PM_{10} 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. Non - Compliance (Low Risk) for exceeding criteria.

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.
The EPA long-term annual average criteria (30 µg/m³) for PM_{10} 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 PM_{10} 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 non - compliances in Section 1 or 7 of the Annual Review.

Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual</td><td>• 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.</td></tr>
</table>

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
			maximum level of 4 g/m^2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m^2/month. Daily (24-hour) results ranged from a minimum of 2.1 µg/m^3 to a maximum of 39.8 µg/m^3 during 2016. For PM_{10} 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. Field Evidence 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. Correspondence 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.	
Schedule 3 Condition 12	**Operating Conditions** The Applicant shall: (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; (b) implement best practice management to minimise the risk of spontaneous combustion and related emissions; (c) implement all reasonable and feasible measures to minimise the	Administrative Non - Compliance	Field Evidence 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. Correspondence Incidents reports are prepared and provided to DPE and EPA.	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

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	release of greenhouse gas emissions from the site; (d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent; (e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above); (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.		Sighted by the audit team. a) Evidence of dust monitoring and watercart use; b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion; c) Monitoring of fuel and energy usage; d) Air quality management system - for monitoring continues to be undertaken; 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; 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.	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.
Schedule 3 Condition 13	**Air Quality Management Plan** The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must: (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: • is capable of evaluating the operating conditions of this consent; • evaluates and reports on:	Administrative Non - Compliance	Preparation: 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. a) Section 1.4; b) Section 3; c) Section 4; d) and e) - Section 5 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.	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. • Ensure TEOM is setup with alarms/notifications for when results are approaching or have exceeded the short term criterion for

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	• 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 shall implement the approved management plan as approved from time to time by the Secretary.		Implementation: Evidence of monitoring; Minimal issues observed with dust management; and The real time air quality monitor is not being used as a management tool. Section 5.3 of 2014 Air Quality Management Plan states: *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.* Admin Non - Compliance 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.	particulate matter. This will ensure exceedances are immediately detected and reported as soon as possible to the EPA and DPE.
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. Admin Non - Compliant. 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.
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	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	REC 11 • Update the water balance or justify why the current water balance is still

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	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: • 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:		28 July 2016 stating that a series of management plans would be updated in late 2016/2017. This was not completed. Admin Non - Compliance. 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. Preparation: 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 changes at the pit top. Monitoring information outlined in Section 5; c) Covered in Section 4; d) Covered in Appendix B; and e) Covered in several sections. Implementation: - 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.	applicable to the current operations. • Ensure dams and drainage lines are free on silt. Establish a maintenance schedule.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	• 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 shall implement the approved management plan as approved from time to time by the Secretary. 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.			
Schedule Condition 20	**Biodiversity Management Plan** 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: (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; (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;	Administrative Non - Compliance	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. Admin Non - Compliance. Preparation: a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe; b) Baseline data in Section 3.2; c) Mostly covered in Section 4 and 5, but not split into short,	REC 12 • 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
	• 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 shall implement the approved management plan as approved from time to time by the Secretary.		medium and longterm measures; d) Section 11; e) See Table 11; f) Section 13. <u>Implementation:</u> 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.	
Schedule 3 Condition 21	**Heritage Management Plan** The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must: (a) be prepared in consultation with any relevant Aboriginal stakeholders; (b) be submitted to the Secretary for approval within 6 months of the date of this consent; (c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site; (d) detail the responsibilities of all stakeholders; and (e) include programs/procedures and management measures for: • 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	<u>Preparation:</u> 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> a) Section 4.4 and 4.5; b) Condition outside of audit period; c) Section 4; d) Section 11; e) In various sections. <u>Implementation:</u> 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. Section 12 of the Heritage Management Plan refers to the resubmission of this management plan within three months	REC 13 • Update the Heritage Management Plan, including the removal of Site #45-7-0154.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	• 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. The Applicant shall implement the approved management plan as approved from time to time by the Secretary.		of submitting the Independent Environmental Audit. This was not completed.	
Schedule 3 Condition 22	**Visual Amenity and Lighting** 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 CVC 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 Admin - Non - Compliance.	REC 14 • Complete a visual and lighting assessment against the Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.
Schedule 3 Condition 27	**Rehabilitation** 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	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. Admin Non - Compliance. Preparation: a) Outside of audit period; b) Covers this requirement. Note, a separate MOP has also been prepared for the site; c) Section 8;	REC 15 • Ensure a copy of the approved Rehabilitation Management Plan is put on the website.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	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.		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 <u>Admin Non - Compliant.</u>	
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.
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. 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	REC 16 • See **Section 5.2** of the Main Audit Report for Subsidence Recommendations.

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	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: • *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.	
Schedule 4 Condition 3	**Offsets** 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.	REC 16 • See **Section 5.2** of the Main Audit Report for Subsidence Recommendations.
Schedule 4 Condition 7	**Extraction Plan** The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must: (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	Administrative Non - Compliance	<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	REC 16 • See Section 5.2 of the Main Audit Report for Subsidence Recommendations.

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	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;		sub conditions. Evidence of consultation included in management plans. Implementation: 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. 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. - Minor environmental consequences including minor changes to species composition of distribution. 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 Admin Non - Compliance. 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	**Notification of Landowners** As soon as practicable after obtaining monitoring results showing: (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	Administrative Non - Compliance	a) 2018 - Short term PM_{10} 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'	REC 17 • Define who are potentially 'affected landowners' in the Air Quality Management Plan

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	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).		(Admin Non - Compliance). 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'. 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). Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring. 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.	• 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.
Schedule 6 Condition 1	**Environmental Management Strategy** The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must: (a) be submitted to the Secretary for approval within 7 months of the date of this consent; (b) provide the strategic framework for environmental management of the development; (c) identify the statutory approvals that apply to the development; (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development; (e) describe the procedures that would be implemented to: • 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	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. Admin Non - Compliance. No evidence that the EMS was updated following the last audit or other modifications. Preparation: a) - NA as outside audit period; b) Framework provided as part of document; c) Approvals are listed but are out of date; d) Section 9.5; e) Covered in Several Sections 8-11; and f) Plans listed in Section 9.	REC 18 • 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.

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	• respond to any non - compliance; • respond to emergencies; and (f) include: • 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. The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.		Implementation: There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (Admin Non - Compliance). The EMS is supposed to be reviewed every three years. Last review was 2012, therefore Admin Non - Compliance.	
Schedule 6 Condition 2	**Adaptive Management** 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. Where any exceedance of these criteria and/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 remediation measures as directed by the Secretary, to the satisfaction of the Secretary.	Non-Compliant (Low Risk)	There have been some exceedances of criteria during the audit period. 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; b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred; c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance. Exceedances have generally been investigated with no further recommendations.	Nil recommendation.
Schedule 6 Condition 4	**Annual Review** 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: (a) describe the development (including any rehabilitation) that was	Administrative Non - Compliance	The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA. a) Section 1 and 2; b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence; c) Section 7 - however this is different to the Annual Review	REC 19 • The Annual Reviews are set out differently to the DPE Annual Review Guidelines (2015). Ensure table of contents matches the guidelines.

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	carried out in the past 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 past calendar year, which includes 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 documents listed in condition 2 of Schedule 2; (c) identify any non - compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.		guidelines; d) Trends covered for water management and air quality; e) Limited information on this condition in the Annual Reviews; f) Section 8; The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link: https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~/media/3AA21D35168042FE813DD0FB92E00E58.ashx Therefore Admin Non - Compliance.	• 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	**Revision of Strategies, Plans and Programs** Within 3 months of: (a) the submission of an annual review under Condition 4 above; (b) the submission of an incident report under Condition 7 below; (c) the submission of an audit report under Condition 9 below; or (d) any modification to the conditions of this consent, (unless the conditions require otherwise), 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.	Administrative Non - compliance	This timing has not been met. Several of the management plans were not updated since the previous audit.	REC 20 • 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	Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews. No evidence of any incident causing material harm requiring immediate notification. 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 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. 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. 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.	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. • 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. REC 21 • 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	Evidence of reporting on the Lake Coal and Delta Coal website. Note Schedule 3 Condition 1 outlines requirements to report transport.	REC 22 • Ensure website reporting meets the conditions of the Development Consent.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
			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.	
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: • 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	a) and b) Copies of this information is still available on the Lakecoal website. With the exception of EIS's. Admin Non - Compliant. 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.	REC 23 • Ensure all relevant information is brought across to the Delta Coal website.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	• 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	• 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	Evidence of the Water Management Plan. Evidence of surface water monitoring, including results in Annual Reviews. 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: · 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. There is also no timing proposed for inspections in the Water Management Plan.	REC 24 • 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	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: • 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. 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: • 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	No evidence of review or update of Noise Management Plan during audit period. Admin Non - Compliance. Real time noise monitoring system removed during the audit period and has not been replaced. No evidence of progressive noise mitigation implementation	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 • 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
	reviewed and updated as required to include the commitments made below. LakeCoal will: • 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)	Separate Extraction Plan requirements including monitoring and reporting. 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. Subsidence impacts are reported in the Annual Review, however it would be preferable if a standalone subsidence report was prepared. There is not a seperate Annual Subsidence Report, therefore Admin Non - Compliant. No evidence of raw survey result being provided to OEH within 7 days of completion. Admin Non - Compliant. 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"	• 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	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: • 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	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. Other aspects of this statement of commitments have been met.	As per REC 13 • Update the Heritage Management Plan, including the removal of Site #45-7-0154.
EPL 1770				
L3.1	**Volume and Mass Limits** 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.	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.	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. *See Appendix 2 for full list of criteria*	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 then 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
	or nature reserve. 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. 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).			
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. * 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.	REC 25 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.
O7.2	Sewage Treatment 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	As per 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

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}. Admin Non - Compliance.	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. • 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
	POINT 25 Pollutant: Particulate matter; Units of measure: micrograms per cubic metre; Frequency: Continuous; Sampling Method: AM-22	Non - compliance	in Annual Reviews. See Schedule 3 Condition 11 of the Development Consent.	
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	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 • 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.	REC 26 • 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	*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.
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.	REC 28 • 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	* Designated representatives of the company included in the Pollution Incident Response Plan (PIRMP), dated September 2018. * Admin Non-compliant: The designated representatives of the company, included in the PIRMP, are not current.	REC 29 • 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 • 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 • 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 • 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
	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.			
CCL 721				
Condition 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:	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. Implementation: No areas available for rehabilitation at site.	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	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.			
Condition 5	**The EMR must:** a) report against compliance with the MOP; b) report on progress in respect of rehabilitation completion criteria; c) report on the extent of compliance with regulatory requirements; and d) have regard to any relevant guidelines adopted by the Director-General.	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.	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. • 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
				REC 33 • Report against compliance with the MOP in future Annual Reviews
Condition 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.	REC 34 • Ensure Group Exploration Reports meet the required timeframe. • Ensure figures are included in the reports.
CCL 707				
Condition 2 1-4	Sub Condition 1 Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:- (a) ongoing mining operations and environmental management; and (b) ongoing monitoring of the project. Sub Condition 2 The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.	Non-Compliant (Low Risk)	All sub conditions are non - compliant. 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.	Nil recommendation

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations
	A Plan must be lodged with the Director-General:- (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. <u>Sub Condition 3</u> A Plan must be lodged with the Director-General:- (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. 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:- <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			

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	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; (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.	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. • 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. As per REC 33 • Report against compliance with the MOP in future Annual Reviews.
Condition 7	**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:	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.	As per REC 34 • 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: • 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	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: (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.	Compliant	Updates on VPA's provide in Annual Reviews. 2019 is not included yet as not due for payment. 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. 2017: A further $52,206 was accrued by LakeCoal during the reporting period in accordance with the VPA agreement. 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. Evidence of receipts provided to audit team.	
Surrender of Existing Project Approval				
15	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: (a) the relevant requirements of the BCA; and (b) any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts. Notes: • 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	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. A) Evidence of occupation certificate dated 15 August 2018. B) is not applicable.	
Demolition				
16	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.	Not Triggered	Based on site communication Environment and Community Co-ordinator there was no demolition. None outlined in Annual Reviews.	
Operation of Plant and Equipment				
17	The Applicant shall ensure that all plant and equipment used at the site is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Compliant	Evidence of maintenance records for trucks and dozers. Spreadsheet records date back to 2010.	
UPDATING AND STAGING STRATEGIES, PLANS OR PROGRAMS				
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 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. 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. Notes: • 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	The following Management Plans are applicable to Chain Valley and outlined on the Chain Valley website: 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. Admin Non - Compliance: This condition is non - compliant as plans have not been 'regularly' updated. 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.	All management plans require updating due to the length of time since the previous reviews. All should in a Delta Coal template. 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.
Road Maintenance Contribution				
19	The Applicant must pay Road Maintenance Fees to WSC in accordance with its Road Maintenance Agreement with WSC.	Compliant	Evidence of Road Maintenance Agreement on 1 July 2013 signed by both LakeCoal and Wyong Shire Council. 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.	
Schedule 3 - Environmental Conditions - General				
Transport				
Monitoring of Coal Transport				
1	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. Admin Non Compliance.	See recommendation regarding detailed transport records. 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.
Road Works				
2	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; (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, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.	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; - Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and - 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. 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). Historical admin non - compliance with no further action.	
Road Transport Protocol				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
3	The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall: (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; (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 shall implement the approved Road Transport Protocol as approved from time to time by the Secretary.	Administrative Non-Compliance	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. 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. Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012. Preparation: a) Evidence of consultation from 2014; b) Section 8.3; c) Overall document. Covered in Section 8; d) Code of conduct discussed in Section 8.11. Not attached to the document. Implementation: Records and training. 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.	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.
Independent Traffic Audit				
4	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: (a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC 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.	Administrative Non-Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.
5	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. A summary of the audit report must be included in the Annual Review.	Administrative Non-Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	
Alternative Coal Transport Options				
6	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: (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.	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.	Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.
Noise				
Noise Impact Assessment Criteria				
7	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.	Non-Compliant (Low Risk)	- 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).	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.
	Table 1: Noise Criteria dB(A) Location / Day / Evening / Night 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.			
Operation Conditions				
8	8. The Applicant shall: (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; (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; (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); (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; (e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and (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.	Administrative Non-Compliance	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. 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. c) No evidence of reduced operations during adverse meteorological conditions. d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period. 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. f) No evidence of action plan. Admin Non - Compliance.	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.
	Table 2: Long-term Noise (Laeq dB(A) Location / Day / Evening / Night R11 – R13 41 41 41 R22 40 40 40		Exceedances of long term noise goals occurred during the monitoring period. However these are longterm noise goals, not criteria.	
	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.	Compliant	Quarterly noise monitoring reports indicate that noise monitoring is conducted in accordance with the Industrial Noise Policy (INP).	
Noise Management Plan				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
9	The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must: (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; (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent; (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 (d) 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 shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non-Compliance	Current plan dated 12 March 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. Admin Non - Compliance. Preparation: a) Compliant. Evidence from 2014; b) Compliant - Section 4; c) Compliant - Section 4; d) Compliant - Section 5 and 6 Implementation: No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance. No notification to residents following recorded exceedances in accordance with Section 6.2. Admin Non - Compliance. Real time noise monitor removed from site. Admin Non - Compliance.	
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)	2019 - no longterm data for annual averages. Annual Review 2018 - Depositional dust gauges were below criteria. 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. 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. 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 non compliances in Section 1 or 7 of the Annual Review. 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. Daily (24-hour) results ranged from a minimum of 2.1 µg/m3 to a maximum of 39.8 µg/m3 during 2016. 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. Field Evidence 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. Correspondence 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.	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.
	Notes for Tables 3 to 5: • aTotal 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	The Applicant shall: (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; (b) implement best practice management to minimise the risk of spontaneous combustion and related emissions; (c) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site; (d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent; (e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above); (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.	Administrative Non-Compliance	Field Evidence 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. Correspondence Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. a) Evidence of dust monitoring and watercart use; b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion; c) Monitoring of fuel and energy usage; d) Air quality management system - for monitoring continues to be undertaken; 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; 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.	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.
Air Quality Management Plan				

Table 3: Long-term criteria for particulate matter

Pollutant	Averaging period	[d] Criterion
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m³
Particulate matter < 10 µm (PM_{10})	Annual	[a,b] 30 µg/m³

Table 4: Short-term criterion for particulate matter

Pollutant	Averaging period	[d] Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m³

Table 5: Long-term criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
[c] Deposited dust	Annual	[b] 2 g/m²/month	[a] 4 g/m²/month

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
13	The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must: (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: • 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 shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non-Compliance	Preparation: 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. a) Section 1.4; b) Section 3; c) Section 4; d) and e) - Section 5 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. Implementation: Evidence of monitoring; Minimal issues observed with dust management; and The real time air quality monitor is not being used as a management tool. Section 5.3 of 2014 Air Quality Management Plan states: *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.* Admin Non - Compliance 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.	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.
METEOROLOGICAL MONITORING				
14	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: (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	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). 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. The system is real time, with this observed by SLR during the site visit.	
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	Evidence in Annual Review for Water Licence - 20BL173107 and usage. There is excess water at Chain Valley hence discharge occurs for most days of the year.	
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	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. Admin Non - Compliant. 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.
Water Management Plan				
18	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: • 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.	Administrative Non-	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. Admin Non - Compliance. 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. Preparation: 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
	(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 shall implement the approved management plan as approved from time to time by the Secretary. 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.	Compliance	changes at the pit top. Monitoring information outlined in Section 5; c) Covered in Section 4; d) Covered in Appendix B; and e) Covered in several sections. Implementation: - 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	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.	Compliant	Outlined in Biodiversity Management Plan (March 2016) - Section 6. Enhancement mostly includes weed management with some previous rubbish removal. 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: * 80.3% - 2016; * 80.3% - 2017; and * 65% - 2018. No monitoring in 2019 yet. These are above the trigger levels, therefore no further action required. Excerpt from 2018 Annual Review: *Annual biodiversity monitoring in accordance with the plan was continued during the reporting period, being undertaken in May 2018. The monitoring specifically looks at;* *- the Swamp Oak Floodplain Forest below the sediment dams;* *- 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 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*	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 Biodiversity Monitoring Report outlining results, a comparison against trigger levels and potential reasons for changes.
	Table 6: 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 6 see the applicable figures in Appendix 7.* Note: To identify the Biodiversity Enhancement Area referred to in Table 6 see the applicable figures in Appendix 7. 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.			
Biodiversity Management Plan				
20	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: (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; (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 shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non-Compliance	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. Admin Non - Compliance. Preparation: a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe; b) Baseline data in Section 3.2; c) Mostly covered in Section 4 and 5, but not split into short, medium and longterm measures; d) Section 11; e) See Table 11; f) Section 13. Implementation: 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.	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.
20A	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.	Compliant	Mod 2 was approved 16 December 2015. Water MP is dated 15 March 2016 and revised following DPE feedback.	
Heritage				
Heritage Management Plan				
21	The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must: (a) be prepared in consultation with any relevant Aboriginal stakeholders; (b) be submitted to the Secretary for approval within 6 months of the date of this consent; (c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site; (d) detail the responsibilities of all stakeholders; and (e) include programs/procedures and management measures for: • 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. The Applicant shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non-Compliance	Preparation: 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. Admin Non - Compliance. a) Section 4.4 and 4.5; b) Condition outside of audit period; c) Section 4; d) Section 11; e) In various sections. Implementation: 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. 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.	Update the Heritage Management Plan, including the removal of Site #45-7-0154.
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 Admin - Non - Compliance.	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 7: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	• Safe, stable and non-polluting. • Final land use compatible with surrounding land uses.
Rehabilitation materials	• Materials (including topsoils, substrates and seeds of the disturbed area) are recovered, appropriately managed and used effectively as resources in rehabilitation.
Surface infrastructure	• To be decommissioned and removed, unless the DRE agrees otherwise.
Portals and ventilation shafts	• To be decommissioned and made safe and stable. • Retain habitat for threatened species (eg bats), where practicable.

Other land affected by the development	• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:
	  • local native plant species (unless the DRE agrees otherwise); and
	  • a landform consistent with the surrounding environment.

Built features damaged by mining operations	• Repair to pre-mining condition or equivalent unless:
	  • the owner agrees otherwise; or
	  • the damage is fully restored, repaired or compensated under the *Mine Subsidence Compensation Act 1961*.

Community	• 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. Admin Non - Compliance. Preparation: 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. Implementation: 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 8: Subsidence Impact Performance Measures – Natural and Heritage Features **Biodiversity** Threatened species or endangered populations: Negligible environmental consequences Seagrass beds: Negligible environmental consequences including: • 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	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. 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.	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.
	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 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				
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. 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. No evidence of subsidence impacts to built features. Based on discussions with the site, the Audit team understands there has been no damage to the marina. No evidence of damage in Annual Reviews.	See Section 5.2 of the Main Audit Report for Subsidence Recommendations.
	Table 9: Subsidence Impact Performance Measures – Built Features **Built Features** / **Performance Measure** Trinity Point Marina Development, Other built features: • 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 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. *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.* 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				

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Compliance Status</th><th>Evidence</th><th>Recommended Action</th></tr>
<tr><td rowspan="3">7</td><td>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;</td><td>Compliant</td><td>A summary of Extraction Plans are outlined below:
<table><tr><th>Year</th><th>Longwalls</th><th>Extraction Plan Reference</th></tr><tr><td>2016</td><td>MW10-11-12</td><td>MW 7-12 Extraction Plan (Extraction Plan 1)</td></tr><tr><td>2017</td><td>MW12</td><td>MW 7-12 Extraction Plan (Extraction Plan 1)</td></tr><tr><td></td><td>MW5A</td><td>MW 7-12 Extraction Plan – MW5A Mod (Extraction Plan 2 – Mod to EP1)</td></tr><tr><td></td><td>MW CVB1</td><td>MW CVB 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></table>
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.

<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).</td><td></td></tr>
<tr><td></td><td></td><td><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.

The 2017 Annual Review states exceedance of vertical subsidence over MW7-12.</td><td>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</td></tr>
<tr><td></td><td>(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;</td><td>Administrative Non-Compliance</td><td><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.

<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.

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.
- Minor environmental consequences including minor changes to species composition of distribution.

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>.

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.</td><td>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</td></tr>
<tr><td></td><td>(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;</td><td>Compliant</td><td><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.

<u>Summary of Seagrass monitoring results from 2018 Annual Review..</u>

Seagrass cover has been high consistently at each transect since 2012, with seagrass health and condition being good.

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.

<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.

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.</td><td>See Section 5.2 of the Main Audit Report for Subsidence Recommendations.</td></tr>
<tr><td></td><td>(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.</td><td></td><td>j) Public Safety Management Plans prepared flor 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</td><td></td></tr>
</table>

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
	The Applicant shall implement the approved management plan as approved from time to time by the Secretary. Notes: • 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	The Applicant shall 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.	Compliant	This information is available in management plans.	
First Workings				
9	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.	Compliant	Revised first workings approval for the North Mining Area. 20 July 2018. Miniwalls N1/S1.	
9A	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.	Not Triggered	This is a historical condition. Wording from prior Audit report. Not applicable to this audit period. *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.*	
Payment of Reasonable Costs				
10	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.	Compliant	Evidence of report provided by Delta Coal titled: Subsidence Data Review for the Proposed Miniwalls CVB1 to CVB3 at Chain Valley Colliery (15 November 2017, DgS).	
SCHEDULE 5 - ADDITIONAL PROCEDURES				
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 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 (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).	Administrative Non-Compliance	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' (Admin Non - Compliance). 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'. 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). Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring. 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.	Define who are potentially 'affected landowners' in the Air Quality Management Plan? 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.
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 Secretary in writing for an independent review of the impacts of the development on his/her land. If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the 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 Secretary and landowner a copy of the independent review.	Not Triggered	Environment and Community Co-ordinator provided the site complaints records. 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. Based on discussions with the Environment and Community Co-ordinator there was no request for an independent review.	
SCHEDULE 6 - ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING				
ENVIRONMENTAL MANAGEMENT				
Environmental Management Strategy				
1	1. The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must: (a) be submitted to the Secretary for approval within 7 months of the date of this consent; (b) provide the strategic framework for environmental management of the development; (c) identify the statutory approvals that apply to the development; (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development; (e) describe the procedures that would be implemented to: • 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 (f) include: • 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. The Applicant shall implement the approved management strategy as approved from time to time by the Secretary.	Administrative Non-Compliance	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. Admin Non - Compliance. No evidence that the EMS was updated following the last audit or other modifications. Preparation: a) - NA as outside audit period; b) Framework provided as part of document; c) Approvals are listed but are out of date; d) Section 9.5; e) Covered in Several Sections 8-11; f) Plans listed in Section 9. Implementation: There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (Admin Non - Compliance). The EMS is supposed to be reviewed every three years. Last review was 2012, therefore Admin Non - Compliance.	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.
Adaptive Management				

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
2	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. Where any exceedance of these criteria and/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 remediation measures as directed by the Secretary, to the satisfaction of the Secretary.	Non-Compliant (Low Risk)	There have been some exceedances of criteria during the audit period. 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; b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred; c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance. Exceedances have generally been investigated with no further recommendations.	
Management Plan Requirements				
3	The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data; (b) a description of: • 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; (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the development; • effectiveness of any management measures (see c above); (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; (f) a program to investigate and implement ways to improve the environmental performance of the development over time; (g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and (h) a protocol for periodic review of the plan. Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Compliant	DPE provided a letter to LakeCoal on 29 August 2016 outlining that: *'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'.* 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. 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). 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.	All management plans require updating due to the length of time since the previous reviews. Include in a Delta Coal template. 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.
Annual Review				
4	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: (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; (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: • 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; (c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.	Administrative Non-Compliance	The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA. a) Section 1 and 2; b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence; c) Section 7 - however this is different to the Annual Review guidelines; d) Trends covered for water management and air quality; e) Limited information on this condition in the Annual Reviews; f) Section 8; The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link: https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~/media/3AA21D35168042FE813DD0FB92E00E58.ashx Therefore Admin Non - Compliance.	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.
Revision of Strategies, Plans and Programs				
5	Within 3 months of: (a) the submission of an annual review under Condition 4 above; (b) the submission of an incident report under Condition 7 below; (c) the submission of an audit report under Condition 9 below; or (d) any modification to the conditions of this consent, (unless the conditions require otherwise), 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. 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.	Administrative Non-Compliance	This timing has not been met. Several of the management plans were not updated since the previous audit.	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 Chain Valley's Strategies, Plans and Programs.
Community Consultative Committee				
6	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). Notes: • 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	Evidence if CCC meeting minutes on website across the audit period. CCC appears to operate as per the guidelines. CCC committee members outlined in the Annual Review.	
REPORTING				
Incident Reporting				
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	Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews. No evidence of any incident causing material harm requiring immediate notification. 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. 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. 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.	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. Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).
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	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.	Ensure website reporting meets the conditions of the Development Consent.
INDEPENDENT ENVIRONMENTAL AUDIT				
9	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.	Compliant	Evidence of Audit from Hanson Bailey dated July 2016. The audit covered the period from 1 November 2012 - 31 December 2015. 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.	
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	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.	
ACCESS TO INFORMATION				
11	The Applicant shall: (a) make copies of the following publicly available on its website: • 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 (b) keep this information up-to-date, to the satisfaction of the Secretary.	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. 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.	Ensure all relevant information is brought across to the Delta Coal website.
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.	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	Evidence of meteorological data. 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.	
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	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: (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.	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	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: • 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. 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: • 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	Evidence of the Water Management Plan. Evidence of groundwater monitoring, including results in Annual Reviews. Annual Review supplied to Doi Water 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.	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	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: • 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 AWTS 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	Evidence of the Water Management Plan. Evidence of surface water monitoring, including results in Annual Reviews. 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: · *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.* There is also no timing proposed for inspections in the Water Management Plan.	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	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: • 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. 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: • 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	No evidence of review or update of Noise Management Plan during audit period. Admin Non - Compliance. Real time noise monitoring system removed during the audit period and has not been replaced. No evidence of progressive noise mitigation implementation	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 Chain Valley. Mannering Colliery is also owned by Delta Coal. Update the Noise Management Plan.
Air Quality and greenhouse gases	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: • 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	The MP covers this requirement. Recording of data in Annual Reviews and site records.	
Traffic and transport	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: • 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 undertaken 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	Evidence of document dated 10 December 2014. Outside of audit period, therefore not trigered for this period.	
Subsidence	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: • 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)	Subsidence is managed under Extraction Plans, not SMP's. SMP's cover past mining areas. Separate Extraction Plan requirements including monitoring and reporting. 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. 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. No evidence of raw survey result being provided to OEH within 7 days of completion.Admin Non - Compliant. 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"	Assess the subsidence conditions regarding the Statement of Commitments and review which conditions are applicable for current mining and proposed future operations. 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.

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Marine ecology	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 • 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	Evidence of benthic organism and seagrass monitoring. Evidence of monitoring reports by independent consultants. Meets the requirements of this statement of commitments. However additional recommendation provided.	See previous recommendations regarding biodiversity and Annual Reporting.
Terrestrial ecology	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: • investigate one of the following options in consultation with OEH to offset the biodiversity impacts arising from the proposed modification: 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; or o consult with OEH to identify a suitable conservation program and provide $10,000 of funding; or o purchase and retire 5 credits on the Biobanking register. • update the BMP to include the following: 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; and o relocation of suitable hollow-bearing felled trees adjacent to the APZs to create additional fauna habitat;	Compliant	Evidence from 2016 Annual Review. *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.* APZ's have been established. Evidence of weed management in biodiversity management report. Limited weeds onsite. Based on discussions with site no clearing of hollow bearing trees during the audit period. Biodiversity monitoring completed however no specific report provided, only data summary spreadsheets.	As per Schedule 3 Condition 20 recommendation. 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.
	• 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.	Not Triggered	Dam embankment work completed in 2014 which is outside of this period. Evidence of weed management provided. Weed management sighted during field inspection.	
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. LakeCoal 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. 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	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. Other aspects of this statement of commitments have been met.	Update the Heritage Management Plan, including the removal of Site #45-7-0154.
Waste	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.	Compliant	Waste management outlined in the Annual Reviews. Some minor waste management recommendations outlined in Schedule 3 Condition 23.	
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.	Note	This is a safety condition, outside the scope of this audit.	
Visual	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.	Compliant	The most recent lighting audit for Chain Valley is from 2013. Prepared by Wadco May 2013. 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. Minimal aspects have been installed at site since the previous audit, hence condition is compliant.	

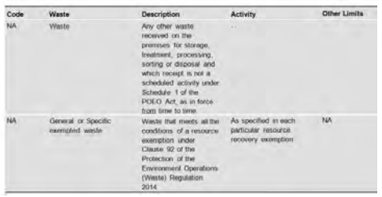
Condition Number	Condition	Compliance Status	Evidence	Recommended Action
Soil	Soil Management and monitoring of soils will continue to be undertaken in accordance with the Colliery's WMP, which will be reviewed and updated as required to include the commitments made below. LakeCoal will: • prevent disturbance 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: * 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.
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: • 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	* 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	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.	Compliant	In general activities completed in accordance with this licence.	
	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	From Annual Reviews: 2018 - 0.4Mt 2017- 1.2Mt 2016 - 1.2Mt Within levels for 2019.	
A1.2	The licensee must not produce by mining activities more than 1.5 million tonnes of coal within any calendar year. 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.	Compliant	Within limit during audit period.	
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 SURFACE PREMISES OF THE COLLIERY IDENTIFIED IN PLAN TITLED "EPL PREMISES PLAN FIGURE 2 - SURFACE EXTENTS" 12 MARCH 2015 DOC15/39189 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 DOC14/10689 AND THE UNDERGROUND ROAD JOINING MANNERING COLLIERY TITLED "LOCATION OF UNDERGROUND LINKAGE" DOC14/29869-02 ACCOMPANYING SSD5465-MOD 1 APPROVAL AND THE PLAN TITLED "EPL PREMISES PLAN - FIG 1 PROJECT EXTENTS, MONITORING AND COMPLIANCE LOCATIONS" 12 MARCH 2015 DOC15/83810.	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:			
	Ancillary Activity Sewage Treatment Systems	Compliant	Evidence of sewage system certification.	
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.	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.	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 1405 / / 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
	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 monitonng 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.	
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 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) 275a Cams Boulevard, CHAIN VALLEY BAY, 2259 26 — Meteorological Station — Ruffleys Road Doyalson	Compliant	Based on a review of monitoring data the site has been compliant with monitoring locations.	
2 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.	Compliant	Based on the information provided to SLR, the site has generally complied with these requirements. No evidence of material harm.	
L2	Concentration limits			
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			
	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	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.
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.	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.	
	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			
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		No evidence of waste receival.	

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
	 Code / Waste / Description / Activity / Other Limits NA / Waste / Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which receipt is not a scheduled activity under Schedule 1 of the POEO 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	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.
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)	- 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 recommendation with monitoring to continue.	
	POINT 12 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		
	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	Note		
	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	Note		
	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	Note		
	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 Night / Night-LA1 (1 minute) / - / 45	Note Note		

Condition Number	Condition	Compliance Status	Evidence	Recommended Action
	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) / -- / 36 Night / Night-LA1 (1 minute) / -- / 45	Note		
	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	Note		
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.	Compliant	Given compliance was generally achieved at defined noise monitoring locations, no further monitoring at other receivers was required.	
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.	Note		
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: (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.	Note		
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 by the sigma-theta method referred to in Part E4 of Appendix E to the NSW industrial Noise Policy (EPA 2000) Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.	Compliant	Evidence of meteorological data. 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.	
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.	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	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 then 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 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).	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. Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).
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		
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. * 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.	* 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			

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Compliance Status</th><th>Evidence</th><th>Recommended Action</th></tr>
<tr><td>O6.1</td><td>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.</td><td>Compliant</td><td>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.</td><td></td></tr>
<tr><td>O6.2</td><td>The licensee must ensure that waste identified for recycling is stored separately from other waste.</td><td>Compliant</td><td>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.</td><td>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.</td></tr>
<tr><td>O7</td><td>Other operating conditions</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Sewage Treatment</td><td></td><td></td><td></td></tr>
<tr><td>O7.1</td><td>All sewage generated on the premises must be directed, collected and treated by the sewage treatment system(s).</td><td>Compliant</td><td>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.</td><td></td></tr>
<tr><td>O7.2</td><td>The licensee is responsible for the correct operation of the sewage treatment system(s) on their premises.</td><td>Administrative Non-Compliance</td><td rowspan="4">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</td><td>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.</td></tr>
<tr><td>O7.3</td><td>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.</td><td>Administrative Non-Compliance</td><td></td></tr>
<tr><td>O7.4</td><td>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.</td><td>Administrative Non-Compliance</td><td></td></tr>
<tr><td>O7.5</td><td>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.</td><td>Administrative Non-Compliance</td><td></td></tr>
<tr><td>O7.6</td><td>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.</td><td>Compliant</td><td>Treated water is discharged through this point.</td><td></td></tr>
<tr><td></td><td>Bunding</td><td></td><td></td><td></td></tr>
<tr><td>O7.7</td><td>All above ground tanks containing material that is likely to cause material harm to the environmental must be bunded or have an alternative spill containment system in place.</td><td>Compliant</td><td>Evidence of bunding sighted during the field inspection around fuel tanks. Other chemicals stored within bunded area and report to the oily water separator.</td><td></td></tr>
<tr><td colspan="5">5 Monitoring and Recording Conditions</td></tr>
<tr><td>M1</td><td>Monitoring records</td><td></td><td></td><td></td></tr>
<tr><td>M1.1</td><td>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.</td><td>Compliant</td><td>Based on the evidence provided this condition has been met. Evidence of raw monitoring data for air and water.</td><td></td></tr>
<tr><td>M1.2</td><td>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.</td><td>Compliant</td><td>Evidence of raw monitoring data. Evidence of data dating back four years.</td><td></td></tr>
<tr><td>M1.3</td><td>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.</td><td>Compliant</td><td>Evidence of chain of custody forms and monitoring results for air and water. Meets condition a-d requirements.</td><td></td></tr>
<tr><td>M2</td><td>Requirement to monitor concentration of pollutants discharged</td><td></td><td></td><td></td></tr>
<tr><td>M2.1</td><td>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:</td><td>Administrative Non-Compliance</td><td>There has been data capture issues identified in Annual Reviews for PM10. Admin Non - Compliance.</td><td rowspan="3">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.</td></tr>
<tr><td>M2.2</td><td>Air Monitoring Requirements</td><td rowspan="2">Administrative Non-Compliance</td><td rowspan="2">There were some issues with data capture with this outlined in Annual Reviews. See Schedule 3 Condition 11 of the Development Consent.</td></tr>
<tr><td></td><td>POINT 25
<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></td></tr>
<tr><td>M2.3</td><td>Water and/ or Land Monitoring Requirements</td><td></td><td></td><td></td></tr>
<tr><td></td><td>POINT 1
<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></td><td rowspan="2">Compliant</td><td rowspan="2">Based on evidence provided (Annual Review monitoring results) surface water discharge monitoring was completed as per this schedule.</td><td></td></tr>
<tr><td></td><td>POINT 27
<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></td><td></td></tr>
<tr><td>M3</td><td>Testing methods - concentration limits</td><td></td><td></td><td></td></tr>
</table>

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. Non - Compliance. - Q3 2016 - monitoring conducted prior to 1:00am. Non - Compliance. - Q4 2016 - monitoring conducted prior to 1:00am and within 2 months of Q3 2016 monitoring. Non - Compliance. - 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.	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.	

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

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. * Admin Non-compliant: 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
	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	Compliant	Data for volume monitoring provided. Also summarised in Annual Review.	
6 Reporting Conditions				
R1	Annual return documents			
R1.1	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, 7. a Statement of Compliance - Environmental Management Systems and Practices; and 8. a Statement of Compliance - Environmental Improvement Works. 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.	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	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.	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	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.	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	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.	Not Triggered		
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.	Ensure Annual Returns are completed as per the EPA requirements and submitted within 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.	Compliant	Evidence of Annual Returns from past years sighted.	
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.	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			
	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.	Not Triggered	A PIRMP has been prepared for the site. Latest dated 21 Sept 2018. Evidence of testing PIRMP with this dated in EPL Annual Returns. Although there were some incidents, it does not appear any incident required the PIRMP to be enacted. PIRMP is currently being updated. No material harm identified.	
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	Where an authorised officer of the EPA suspects on reasonable grounds that: 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.	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.	
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.	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.	
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.	Not Triggered	Based on discussions with the Environment and Community Co-ordinator this condition has not been triggered.	
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.	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	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).	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			
		Compliant	PRP 7 is relevant to the audit period. Document is dated 19 February 2016. Evidence of email submission provided.	
8 Pollution Studies and Reduction Programs				
U1	PRP 8 - Construction of Sewerage System			
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 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.	Administrative Non-Compliance	The upgrade has been designed but not yet constructed. This was supposed to be completed by 7 July 2017.	Liaise with the EPA regarding the current status of the Sewage System Project. Implement any agreed actions in terms of timing.

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 Environent 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

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) <u>Admin Non-compliant</u>: 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) <u>Admin Non-compliant</u>: 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**	Note		
	(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**	Note		
	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**			
	(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director- General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals. (b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery. {c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area. {d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder. {e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992. {f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.	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	- 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).	
28	**Security**			
	(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. (b) The lease holder must provide the security required by sub-clause {a) in one of the following forms: (i) cash, (ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution	Compliant	Security deposit provided to SLR for this audit. Dated August 2018 with RCE value of $3,109,607. Evidence of approval letter from Resources Regulator dated 19 October 2018.	
29	**Prescribed Dam**			
	(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. (b) Where the lease holder desires to mine within the notification area he must: (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 (ii) provide such information as the Minister may direct. (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: (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). {ii) the notifications referred lo in clause (a) are accompanied by a description or plan of the area to be mined. (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. (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 (v) where the Dams Safety Committee has made recommendations the approval is in terms that are: - in accordance with those recommendations; or - where the Minister does not accept those recommendations or any of them - in accordance with a determination under sub-paragraph (ii) of this paragraph. (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: as determined by agreement between the Minister and the Minister administering the Dams Safety Act 1978; or - in the event of failure to reach such agreement - as determined by the Premier. (d) The Minister, on notice from the Dams Safety Committee, may at any time or times: (i) cancel any approval given where a notice pursuant to Section 18 of the Dams Safety Act 1978 is given. (ii) suspend for a period of time, alter, omit from or add to any approval given or conditions imposed.	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**			
	The licence holder must make every reasonable attempt, and be able to demonstrate their attempts, to enter into a cooperation agreement with the holder(s) of any overlapping petroleum title(s). The cooperation agreement should address but not be limited to issues such as: - access arrangements - operational interaction procedures dispute resolution - information exchange well location - timing of drilling - potential resource extraction conflicts and rehabilitation issues.	Note		
Special Conditions				
32	**Barriers**			
	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: (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; (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; (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.	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	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. 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	Outside of the audit period.	
Mining, Rehabilitation, Environmental Management Process (MREMP)				
2. Mining Operations Plan (MOP)				
1	Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:- (a) ongoing mining operations and environmental management; and (b) ongoing monitoring of the project.		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.	
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	A Plan must be lodged with the Director-General:- (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.	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.	
4	The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:- (a) area(s) proposed to be disturbed under the Plan; (b) mining and rehabilitation method(s) to be used and their sequence; (c) areas to be used for disposal of tailings/waste; (d) existing and proposed surface infrastructure; (e) 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.		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. Conditions a-j.	
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	Annual Reviews prepared and submitted for 2016, 2017, 2018. There are recommendations relating to the Annual Review from this audit which are covered within Schedule 6 Condition 4 of the Development Consent.	
2	The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of: (a) the accepted Mining Operations Plan; (b) development consent requirements and conditions; (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.	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				
	(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 (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) ((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). (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 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.	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. No additional Subsidence Management Plans prepared in the audit period.	Discharge locations sighted in the field inspection. Records of discharge volume and water quality outlined in Annual Reviews.
5. Working Requirement				
	The lease holder must: (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, OR (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. The Minister may at any time or times, by instrument in writing sensed on the l lease holder, increase or decrease the expenditure required or the number of people to be employed	Compliant	Operations meet sub condition a and b.	
6. Control of Operations				
	(a) If an Environmental Officer of the Department believes that the lease holder is not complying with any provision of the Act or any condition of this lease relating to the working of the lease, he may direct the lease holder to:- (I) cease working the lease; or (ii) cease that part of the operation not complying with the Act or conditions; until in the opinion of the Environmental Officer the situation is rectified. (b) The lease holder must comply with any direction given. The Director- General may confirm, vary or revoke any such direction. (c) A direction referred to in this condition may be sensed on the Mine Manager.	Not Triggered	Based on information provided to SLR this has not been triggered.	
7. 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.
8. 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		
9. 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		
10. Terms of the non-exclusive licence				

	The terms of the non-exclusive copyright licence granted under condition 8 (a) 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		
11. 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 Conservation. (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 Conservation.	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				
	(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:- • 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. (b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.	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	(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. (2) If the lease holder drills exploratory drill holes he must satisfy the Director- General that:- (a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established; b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface; (c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwater's; (d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape; (e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers. (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. (g) 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 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				

	(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate. (b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.	Not Triggered	Based on information provided to SLR this has not been triggered.	
19. 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.	
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				
	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. 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.	
23. Resource Recovery				
	(a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or (which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals. (b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery. (c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area. (d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder. (e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992. (f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision The lease holder must comply with the requirements of this notice	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)				
	(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. (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.	Compliant	Security deposit provided to SLR for this audit. Dated August 2018 with RCE value of $3,109,607. Evidence of approval letter from Resources Regulator dated 19 October 2018.	
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

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:

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

The findings of the Audit are reported truthfully, accurately and completely;

I have exercised due diligence and professional judgement in conducting the Audit;

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 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 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);

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 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.

Note.

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.

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).

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

NSW GOVERNMENT | Planning & Environment

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,

28/2/19.

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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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

SCT Operations Pty Ltd
ABN 23 078 328 953
www.sct.gs

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Email: s.macgregor@sct.gs

Christopher Jones
Associate – Env Man Permitting & Compliance
SLR Consulting Australia Pty Ltd
10 Kings Rd
NEW LAMBTON NSW 2305

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 12km^2 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.

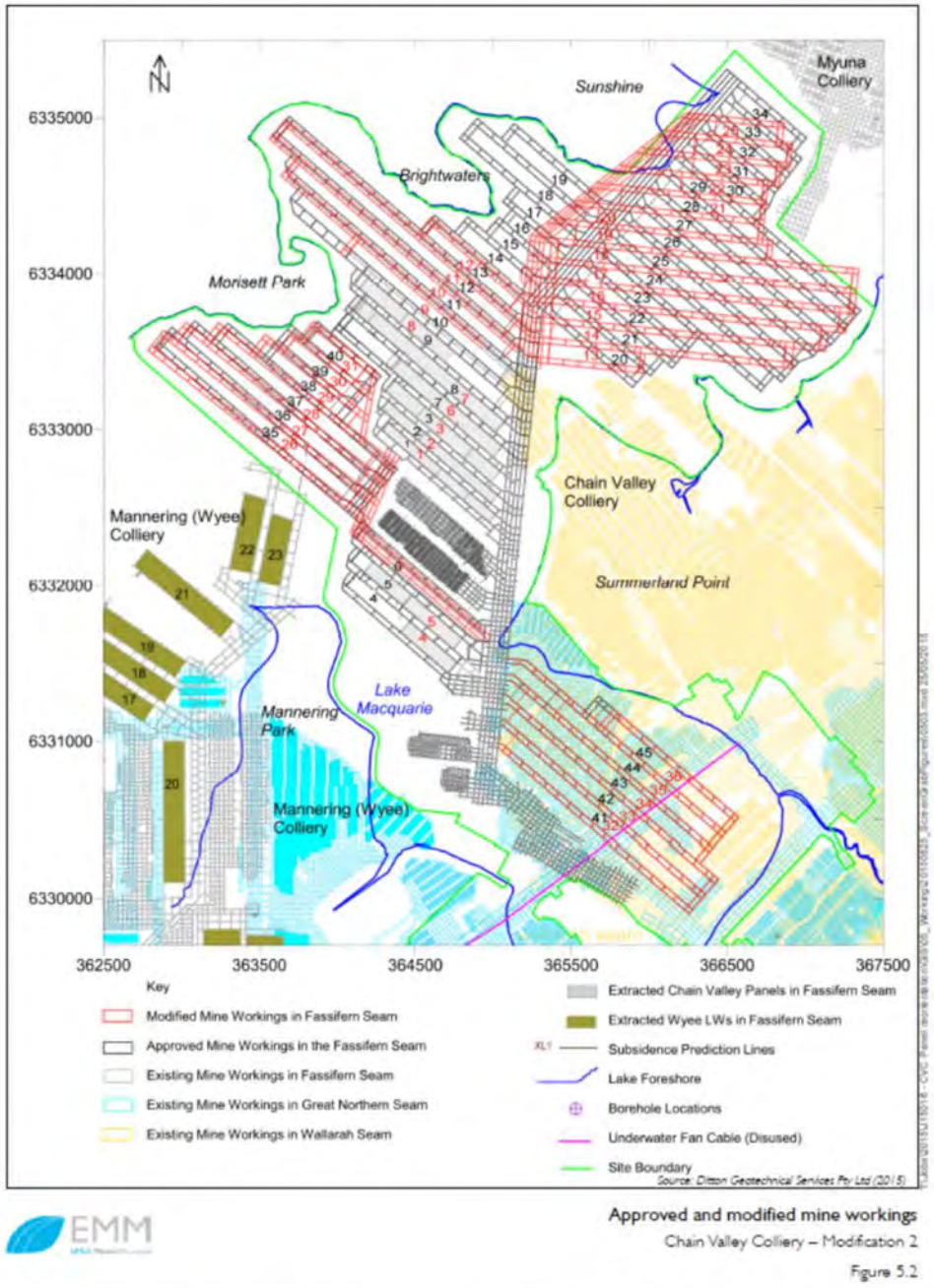

Figure 1: Plan showing proposed mining layout (from MOD2 EA)

The Great Northern Seam was mined over an area of approximately 4.5km^2, 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 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 give 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.

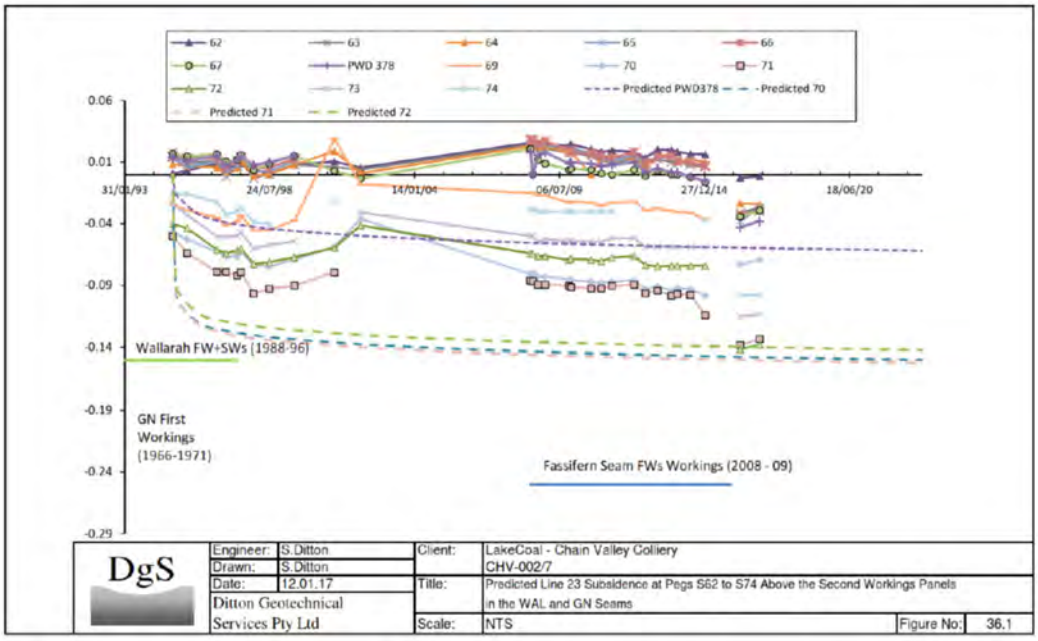

Figure 2: Line 23 subsidence monitoring (from 2017 & 2018 AERs)

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

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 :

Delta Coal

December 2019

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
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	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 2 Condition 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.	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	100%
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	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	Administrative non - compliance 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 Admin - Non - Compliance 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
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 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. 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. Notes: • 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	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: Heritage - June 2014; Biodiversity Management Plan - 16 March 2016; Seagrass Management Plan - April 2014; and Environmental Management System - 2012. Admin Non - Compliance: This condition is non - compliant as plans have not been 'regularly' updated. 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.	REC 2 All management plans require updating due to the length of time since the previous reviews. All should in a Delta Coal template. 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.	REC 2 Agree 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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. Admin Non - Compliance.	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	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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; (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, WSC, RMS and Delta Electricity and to the satisfaction of the Secretary.	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; - Email from Lyle Marshall & Associated (LC construction contractor) to WSC dated 21/03/14; and - 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. 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). Historical admin non - compliance with no further action.	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 3	**Road Transport Protocol** The Applicant shall prepare a Road Transport Protocol to the satisfaction of the Secretary. This protocol shall: (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; (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 CVC Colliery coal haulage trucks; • details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck	Administrative Non - Compliance	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. 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. Coal Haulage Driver Code of Conduct on the CVC website is dated 04/10/2012. Preparation: a) Evidence of consultation from 2014; b) Section 8.3; c) Overall document. Covered in Section 8; d) Code of conduct discussed in Section 8.11. Not attached to the document. Implementation: Records and training. 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.	REC 4 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.	REC 4 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
	• 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 shall implement the approved Road Transport Protocol as approved from time to time by the Secretary.					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 4	**Independent Traffic Audit** 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: (a) be undertaken without prior notice to the Applicant, and in consultation with RMS, NCC, WSC 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.	Administrative Non - Compliance	Admin Non - Compliance: No evidence provided by site indicating Traffic Audits were completed annually.	REC 5 Ensure Traffic Audits are completed annually in accordance with this condition. Ensure the report is submitted to the DPE.	REC 5 Agree: 31/12/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 5	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. A summary of the audit report must be included in the Annual Review.	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: 31/03/20	0%
Schedule 3 Condition 6	**Alternative Coal Transport Options** 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: (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.	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.	REC 6 Ensure the Alternative Transport Options Report is completed as per the frequency in this condition.	REC 6 Agree: 31/12/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 7	**Noise Impact Assessment Criteria** 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. *Table 1. Noise Criteria dB(A)* Location / Day $L_{Aeq(15\ min)}$ / Evening $L_{Aeq(15\ min)}$ R5: 38 / 38 R11: 49 / 49 R12: 49 / 49 R13: 43 / 43 R15: 36 / 36 R19: 37 / 37 R22: 46 / 46 all other privately-owned land: 35 / 35	Non – Compliant (Low Risk)	- 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).	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.	REC 7 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 8	**Operating Conditions** The Applicant shall: (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; (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; (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); (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; (e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and (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. Table 2. Long term Noise Goals dB(A) Location / Day R11 R13 / 41 R22 / 40	Administrative Non - Compliance	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. 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. c) No evidence of reduced operations during adverse meteorological conditions. d) Evidence of inspection of silencers during 2016. No evidence of progress towards long term goal in the 2017-2019 audit period. 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. f) No evidence of action plan. Admin Non - Compliance. Exceedances of long term noise goals occurred during the monitoring period. However these are longterm noise goals, not criteria.	REC 8 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.	REC 8 Agree: 31/12/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 9	**Noise Management Plan** The Applicant shall prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must: (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; (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent; (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 (d) 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 shall implement the approved management plan as approved from time to	Administrative Non - Compliance	Current plan dated 12 March 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. Admin Non - Compliance. Preparation: a) Compliant. Evidence from 2014; b) Compliant - Section 4; c) Compliant - Section 4; d) Compliant - Section 5 and 6 Implementation: No evidence of audit, review and update of noise management plan during audit period as prescribed in Section 9. Admin Non - Compliance. No notification to residents following recorded exceedances in accordance with Section 6.2. Admin Non - Compliance. Real time noise monitor removed from site. Admin Non - Compliance.			

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 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. *Table 3: Long-term criteria for particulate matter* **Pollutant** Total suspended particulate (TSP) matter Particulate matter < 10 µm (PM_{10}) *Table 4: Short-term criterion for particulate matter* **Pollutant** Particulate matter < 10 µm (PM_{10}) *Table 5: Long-term criteria for deposited dust* **Pollutant** / **Averaging period** Deposited dust / Annual	Non – Compliant (Low Risk)	2019 - no longterm data for annual averages. Annual Review 2018 - Depositional dust gauges were below criteria. Short term PM_{10} non -compliances on 3 April 2018, 18 July 2018 and 4 December 2018. The 2018 annual average of 24hr PM_{10} results was 16.1 µg/m^3. Daily (24-hour) results ranged from a minimum of 6.13 µg/m^3 to a maximum of 112.98 µg/m^3 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. Non - Compliance (Low Risk) for exceeding criteria. 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/m^2/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. The EPA long-term annual average criteria (30 µg/m^3) for PM_{10} was not exceeded during the 2017 period. Daily (24-hour) results ranged from a minimum of 5.39 µg/m^3 to a maximum of 47.78 µg/m^3 during 2017. The 2017 annual average of 24hr PM_{10} results was 15.1 µg/m^3. 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	REC 9 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.	REC 9a Agree: 30/09/19 REC 9c Agree: 30/03/20 REC 9d Agree: 30/09/19	100% 0% Talk to CN re: 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
			Annual Review 2016 - Deposited dust levels for the reporting period were below the EPA long term criteria annual maximum level of 4 g/m^2/month at all sites. Additionally, no gauges showed annual increases in deposited dust levels above the EPA maximum of 2 g/m^2/month. Daily (24-hour) results ranged from a minimum of 2.1 µg/m^3 to a maximum of 39.8 µg/m^3 during 2016. For PM_{10} 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. Field Evidence 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. Correspondence 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.			

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 12	**Operating Conditions** The Applicant shall: (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; (b) implement best practice management to minimise the risk of spontaneous combustion and related emissions; (c) implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site; (d) operate an air quality management system on site to ensure compliance with the relevant conditions of this consent; (e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 3-5 above); (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.	Administrative Non - Compliance	Field Evidence 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. Correspondence Incidents reports are prepared and provided to DPE and EPA. Sighted by the audit team. a) Evidence of dust monitoring and watercart use; b) Based on discussions with Environment and Community Co-ordinator there have been no issues on the surface regarding spontaneous combustion; c) Monitoring of fuel and energy usage; d) Air quality management system - for monitoring continues to be undertaken; 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; 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.	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. 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.	See REC 9 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 13	**Air Quality Management Plan** The Applicant shall prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must: (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: • 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 shall implement the approved management plan as approved from time to time by the Secretary.	Administrative Non - Compliance	<u>Preparation:</u> 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. a) Section 1.4; b) Section 3; c) Section 4; d) and e) - Section 5 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>Implementation:</u> Evidence of monitoring; Minimal issues observed with dust management; and The real time air quality monitor is not being used as a management tool. Section 5.3 of 2014 Air Quality Management Plan states: *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.* <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.	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. 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.	See REC 9 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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. Admin Non - Compliant. 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	100% 0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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: • 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	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. Admin Non - Compliance. 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. Preparation: 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 changes at the pit top. Monitoring information outlined in Section 5; c) Covered in Section 4; d) Covered in Appendix B; and e) Covered in several sections. Implementation: - 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.	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	100% Ongoing

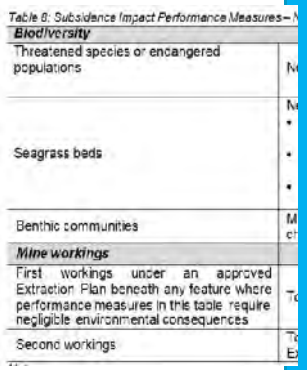
Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
	(d) a Ground Water Monitoring Program which includes a program to: • monitor and report groundwater inflows to underground workings; • predict, manage and monitor impacts to 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 shall implement the approved management plan as approved from time to time by the Secretary. 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.					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule Condition 20	**Biodiversity Management Plan** 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: (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; (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	Administrative Non - Compliance	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. Admin Non - Compliance. Preparation: a) Original document prepared by EMM. Updated document prepared by LakeCoal. The original document met this timeframe; b) Baseline data in Section 3.2; c) Mostly covered in Section 4 and 5, but not split into short, medium and longterm measures; d) Section 11; e) See Table 11; f) Section 13. Implementation: 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.	REC 12 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.	REC 12 Agree: 31/3/19	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 21	**Heritage Management Plan** The Applicant shall prepare a Heritage Management Plan for the development to the satisfaction of the Secretary. This Plan must: (a) be prepared in consultation with any relevant Aboriginal stakeholders; (b) be submitted to the Secretary for approval within 6 months of the date of this consent; (c) include consideration of the Aboriginal and non-Aboriginal cultural context and significance of the site; (d) detail the responsibilities of all stakeholders; and (e) include programs/procedures and management measures for: • 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	Administrative Non - Compliance	Preparation: 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. Admin Non - Compliance. a) Section 4.4 and 4.5; b) Condition outside of audit period; c) Section 4; d) Section 11; e) In various sections. Implementation: 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. 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.	REC 13 Update the Heritage Management Plan, including the removal of Site #45-7-0154.	REC 13 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 22	**Visual Amenity and Lighting** 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 CVC 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 Admin - Non - Compliance.	REC 14 Complete a visual and lighting assessment against the Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	REC14 Agree: 31/12/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 3 Condition 27	**Rehabilitation** 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	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. Admin Non - Compliance. Preparation: 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. Implementation: 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.	REC 15 Ensure a copy of the approved Rehabilitation Management Plan is put on the website.	REC 15 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	0%
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.  *Table 8: Subsidence Impact Performance Measures – N* ***Biodiversity*** Threatened species or endangered populations Seagrass beds Benthic communities ***Mine workings*** First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences Second workings	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. 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.	REC 16 See **Section 5.2** of the Main Audit Report for Subsidence Recommendations.	See REC 16 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 4 Condition 3	**Offsets** 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.	REC 16 See **Section 5.2** of the Main Audit Report for Subsidence Recommendations.	See REC 16 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 4 Condition 7	**Extraction Plan** The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must: (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	Administrative Non - Compliance	<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. <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. 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. - Minor environmental consequences including minor changes to species composition of distribution. 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>. 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.	REC 16 See Section 5.2 of the Main Audit Report for Subsidence Recommendations.	See REC 16 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 5 Condition 1	**Notification of Landowners** As soon as practicable after obtaining monitoring results showing: (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 (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).	Administrative Non - Compliance	a) 2018 - Short term PM_{10} 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' (Admin Non - Compliance). 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'. 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). Exceedance of night time LA1 Minute criteria at two residential receivers during Q2 2016 monitoring. 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.	REC 17 Define who are potentially 'affected landowners' in the Air Quality Management Plan? 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.	REC 17 Agree: 30/09/19 and ongoing	100% Note to talk to JF re: affected landowner notification strategy.

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 6 Condition 1	**Environmental Management Strategy** The Applicant shall prepare an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must: (a) be submitted to the Secretary for approval within 7 months of the date of this consent; (b) provide the strategic framework for environmental management of the development; (c) identify the statutory approvals that apply to the development; (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development; (e) describe the procedures that would be implemented to: • 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 (f) include: • 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	Administrative Non - Compliance	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. Admin Non - Compliance. No evidence that the EMS was updated following the last audit or other modifications. Preparation: a) - NA as outside audit period; b) Framework provided as part of document; c) Approvals are listed but are out of date; d) Section 9.5; e) Covered in Several Sections 8-11; and f) Plans listed in Section 9. Implementation: There is evidence of complaints and incident management. No evidence of landowners being contacted for dust or noise exceedances. Non complaint for implementation (Admin Non - Compliance). The EMS is supposed to be reviewed every three years. Last review was 2012, therefore Admin Non - Compliance.	REC 18 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.	REC 18 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 6 Condition 2	**Adaptive Management** 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. Where any exceedance of these criteria and/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 remediation measures as directed by the Secretary, to the satisfaction of the Secretary.	Non-Compliant (Low Risk)	There have been some exceedances of criteria during the audit period. 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; b) Incident reports submitted to the DPE, however some reports have been well after the incident or non - compliance occurred; c) Remedial measures - additional subsidence modelling completed following MW7-12 subsidence exceedance. Exceedances have generally been investigated with no further recommendations.	Nil recommendation.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 6 Condition 4	**Annual Review** 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: (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; (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: • 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; (c) identify any non - compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the development; (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any	Administrative Non - Compliance	The 2016, 2017 and 2018 Annual Reviews were reviewed as part of the IEA. a) Section 1 and 2; b) Section 3. Some sections do not report against all Development Consent criteria eg. subsidence; c) Section 7 - however this is different to the Annual Review guidelines; d) Trends covered for water management and air quality; e) Limited information on this condition in the Annual Reviews; f) Section 8; The Annual Reviews have not been prepared to cover the current Annual Review Guidelines. See link: https://www.planning.nsw.gov.au/Policy-and-Legislation/Mining-and-Resources/~/media/3AA21D35168042FE813DD0FB92E00E58.ashx Therefore Admin Non - Compliance.	REC 19 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.	REC 19 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 6 Condition 5	**Revision of Strategies, Plans and Programs** Within 3 months of: (a) the submission of an annual review under Condition 4 above; (b) the submission of an incident report under Condition 7 below; (c) the submission of an audit report under Condition 9 below; or (d) any modification to the conditions of this consent, (unless the conditions require otherwise), 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. 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.	Administrative Non - compliance	This timing has not been met. Several of the management plans were not updated since the previous audit.	REC 20 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.	REC 20 Agree: 31/03/20 and 30/09/19	0% 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	Evidence of incident notification in 'Incident Management' folder provided to SLR. Evidence provided in Annual Reviews. No evidence of any incident causing material harm requiring immediate notification. 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 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. 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. 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.	See 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. 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. REC 21 Ensure exceedances and other incidents are reported as per this condition (Detailed Incident Report within 7 days).	REC 9 Agree: 30/09/19 REC 21 Agree	100% 100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	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 and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Schedule 6 Condition 11	The Applicant shall: (a) make copies of the following publicly available on its website: • 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 (b) keep this information up-to-date, to the satisfaction of the Secretary.	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. 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.	REC 23 Ensure all relevant information is brought across to the Delta Coal website.	REC 23 Agree: 30/09/19	100%
SSD 5465 Statement of Commitments						

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Surface water SOC's	• 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	Evidence of the Water Management Plan. Evidence of surface water monitoring, including results in Annual Reviews. 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: · 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. There is also no timing proposed for inspections in the Water Management Plan.	REC 24 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.	REC 24 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Noise SOC's	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: • 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. 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: • modification to belt/movement alarms;	Administrative Non - compliance	No evidence of review or update of Noise Management Plan during audit period. Admin Non - Compliance. Real time noise monitoring system removed during the audit period and has not been replaced. No evidence of progressive noise mitigation implementation	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 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.	See REC 7 Agree: 31/03/20 See REC 8 Agree: 31/06/20	0% 0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Subsidence SOC's	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: • 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	Non-Compliant (Low Risk)	Subsidence is managed under Extraction Plans, not SMP's. SMP's cover past mining areas. Separate Extraction Plan requirements including monitoring and reporting. 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. Subsidence impacts are reported in the Annual Review, however it would be preferable if a standalone subsidence report was prepared. There is not a seperate Annual Subsidence Report, therefore Admin Non - Compliant. No evidence of raw survey result being provided to OEH within 7 days of completion. Admin Non - Compliant. 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"	As per REC 16 See Section 5.2 of the Main Audit Report for Subsidence Recommendations.	See REC 16	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Heritage SOC's	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: • 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	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. Other aspects of this statement of commitments have been met.	As per REC 13 Update the Heritage Management Plan, including the removal of Site #45-7-0154.	See REC 13 30/09/19	100%
EPL 1770						

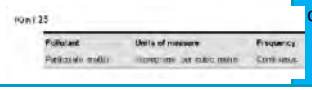
Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
L3.1	**Volume and Mass Limits** For each discharge point or utilisation area specified below (by a point number), the volume/mass of: a) liquids discharged to water; or; b) solids or liquids applied to the area; must not exceed the volume/mass limit specified for that discharge point or area.	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.	Nil 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.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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. *See Appendix 2 for full list of criteria*	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.		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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 then 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 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).	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
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. * 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.	REC 25 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.	REC 25 Agree 30/09/19	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	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	As per 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.	See REC 10 Agree: 31/09/19 and 31/03/20	50%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	See REC 10 Agree: 31/09/19 and 31/03/20	
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	See REC 10 Agree: 31/09/19 and 31/03/20	
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	See REC 10 Agree: 31/09/19 and 31/03/20	

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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}. Admin Non - Compliance.	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. 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.	See REC 9 Agree: 30/09/19	
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.	As per REC 9	See REC 9 Agree: 30/09/19	

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	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 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.	See REC 7 Agree: 31/03/20 See REC 8 Agree: 31/06/20	

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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	0%
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.	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	0%
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.	REC 28 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.	REC 28 Agree: 30/09/19	100%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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. * Admin Non-compliant: The designated representatives of the company, included in the PIRMP, are not current.	REC 29 Update the details of designated representatives of the company in the PIRMP.	REC 29 Agree: 30/09/19	100%
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 Ensure Annual Returns are completed as per the EPA requirements and submitted within the due date.	REC 30 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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 Send a combined noise report for the Annual Return period to the EPA.	REC 31 Agree: 31/03/20	0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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 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.	Administrative Non - compliance	The upgrade has been designed but not yet constructed. This was supposed to be completed by 7 July 2017.	REC 32 Liaise with the EPA regarding the current status of the Sewage System Project. Implement any agreed actions in terms of timing.	REC 32 Agree: 30/06/20	0%
CCL 721						

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Condition 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	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. Implementation: No areas available for rehabilitation at site.	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Condition 5	**The EMR must:** a) report against compliance with the MOP; b) report on progress in respect of rehabilitation completion criteria; c) report on the extent of compliance with regulatory requirements; and d) have regard to any relevant guidelines adopted by the Director-General.	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.	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. 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. REC 33 Report against compliance with the MOP in future Annual Reviews.	See REC 19 Agree: 31/03/20 REC 33 Agree: 31/03/20	0% 0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Condition 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.	REC 34 Ensure Group Exploration Reports meet the required timeframe. Ensure figures are included in the reports.	REC 34 Agree	In Lawlex 100%
CCL 707						

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Condition 2 1-4	Sub Condition 1 Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:- (a) ongoing mining operations and environmental management; and (b) ongoing monitoring of the project. Sub Condition 2 The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement. A Plan must be lodged with the Director-General:- (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. Sub Condition 3 A Plan must be lodged with the Director-General:- (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	Non-Compliant (Low Risk)	All sub conditions are non - compliant. 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.	Nil recommendation		

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
	Sub Condition 4 (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.					

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
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; (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.	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. 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. As per REC 33 Report against compliance with the MOP in future Annual Reviews.	See REC 19 Agree: 31/03/20 See REC 33 Agree: 31/03/20	100% 0%

Schedule and Condition Number	Condition	Compliance Status	Evidence	Recommendations	Delta Coal Confirmation Due date	% Complete
Condition 7	**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.	As per REC 34 Ensure Group Exploration Reports meet the required timeframe. Ensure figures are included in the reports.	See 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

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:) 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: 31/03/20 0%
Surface Water Discharges	The Annual Reviews need to provide a clear statement regarding whether discharge criteria have been met.	Agree: 31/03/20
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

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

Recommendation	Delta Coal Confirmation and Due Date
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.	Agree: 31/12/20
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 but potentially a peer review and separate subsidence impact assessment report.
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).	Agree: 31/03/20
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.	Agree: 31/03/20

Recommendation	Delta Coal Confirmation and Due Date
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'.	Agree: 31/3/20 0%
Assess the triggers from the Extraction Plans eg. ANOVA/ANOSIM level is approaching 5% in the bi-annual monitoring reports.	Agree: 31/3/20 0%

Appendix 11: DPIE Letter – 2019 Annual Review

Chris Armit
Environmental & Community Coordinator
Chain Valley Colliery
PO Box 7115
MANNERING PARK NSW 2259

By Email Only: carmit@deltacoal.com.au

01/05/2020

Dear Mr Armit

Chain Valley Extension Project (SSD 5465)
Annual Review 2019 - Request for Additional Information

Reference is made to the Annual Review for the period 1 January 2019 to 31 December 2019, submitted to the Department of Planning, Industry and Environment (the Department) as required under Schedule 6, Condition 4 of SSD 5465 (the Consent, as modified).

The Department has reviewed the Annual Review and considers more information is required to satisfy the reporting requirements of the Consent and the Department's *Annual Review Guideline* (October 2015). Under the provisions of Schedule 2, Condition 4 of the Consent, please amend the Annual Review to include the following information:

1. **Section 10** – please update Table 19 to include all outstanding actions from the 2019 Independent Environmental Audit with updated expected completion dates.

You are requested to provide the information, or notification that the information will not be provided, to the Department by **29 May 2020**. If you are unable to provide the requested information within this timeframe, you are required to provide, and commit to, a timeframe detailing the provision of this information.

If you have any questions, please contact Joel Curran, Senior Compliance Officer, on 02 4904 2702 or compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance