



DENDROBIUM MINE AND CORDEAUX COLLIERY ANNUAL REVIEW FY22



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Table 1: Annual Review Title Block


Name of operations	Dendrobium Mine Cordeaux Colliery
Name of operator	South32 Illawarra Metallurgical Coal (IMC)
Development consent / project approval #	DA 60-03-2001 (Dendrobium) D74/134 (Cordeaux)
Name of holder of development consent / project approval	Dendrobium Coal Pty Ltd
Mining lease #	CCL 768, ML 1510, ML 1566 (Dendrobium) CCL 768 (Cordeaux)
Name of holder of mining lease	Dendrobium Coal Pty Ltd (ML 1510 and ML 1566) Illawarra Coal Holdings Pty Ltd (CCL 768).
Water approval #	10WA118772
Name of holder of water approval	Illawarra Coal Holdings Pty Ltd
Water access licence #	37465 36473 42385 42386
Name of holder of water access licence	Illawarra Coal Holdings Pty Ltd (37465, 42385, 42386) Dendrobium Coal Pty Ltd (36473)
MOP/RMP start date	1 October 2015
MOP/RMP end date	1 July 2022
Annual Review start date	1 July 2021
Annual Review end date	30 June 2022



I, Chris Schultz, certify that this audit report is a true and accurate record of the compliance status of Dendrobium Mine and Cordeaux Colliery for the period 1 July 2021 – 30 June 2022 and that I am authorised to make this statement on behalf of Illawarra Coal Holdings Pty Ltd and Dendrobium Coal Pty Ltd.

Note.

- a) *The Annual Review is an 'environmental audit' for the purposes of section 9.39 (2) of the Environmental Planning and Assessment Act 1979. Section 9.42 provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.*
- b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).*

Name of authorised reporting officer	Chris Schultz
Title of authorised reporting officer	Superintendent Environment (under Power of Attorney dated 10 February 2021)
Signature of authorised reporting officer	
Date	26 September 2022



1. STATEMENT OF COMPLIANCE

Table 2: Statement of Compliance

Development Consent	Purpose	Compliant?
DA 60-03-2001	Dendrobium Underground Coal Mine and associated surface facilities and infrastructure	
MOD-11-2-2002	Access of construction traffic to the Bradford Breaker Emplacement Area	
MOD-36-5-2002-I	Application for vehicles to access Benjamin Road.	
60-03-2001 MOD 3	Modification to Development Consent	
60-03-2001 MOD 4	Modification to Development Consent	No
60-03-2001 MOD 5	Modification to Development Consent	
60-03-2001 MOD 6	Area 3 Consent Modification	
60-03-2001 MOD 7	Strategic Biodiversity Offset	
60-03-2001 MOD 8	Surface Supply Upgrade	
60-03-2001 MOD 9	Gas Management Infrastructure	
Mining Lease		
	Number	
Mining Lease	1510	Yes
Consolidated Coal Lease	768	Yes
Mining Lease	1566	Yes
Environment Protection Licence		
EPL 3241	Dendrobium Mine	No
EPL 611	Cordeaux Colliery	Yes
Water Approval		
Water Supply Works	10WA118772	Yes
Ground Water Access Licences		
37465	10AL119249	Yes
36473	10AL118771	Yes
42385	10AL123125	Yes
42386	10AL123124	Yes
WaterNSW Access Consent		
F2020/1545 ¹	Special and Controlled Areas access	Yes

¹ Annual Statement of Compliance provided in Appendix 9.



Table 3: Non-compliances against relevant approvals

Relevant approval	Condition #	Condition description (summary)	Compliance status	Comment	Where addressed in Annual Review
DA 60-03-2001	Condition 1 of Schedule 4	Noise generated at the surface facilities does not exceed the noise impact assessment criteria.	Non-compliant	Noise monitoring identified exceedances at R6a and R39a.	Section 11.1
DA 60-03-2001	Condition 12 of Schedule 4	Surface water discharges must comply with discharge limits in EPL	Non-compliant	Exceedance of Zinc criteria at LDP 5.	Section 11.1
EPL 3241	Condition L2.4				

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: <ul style="list-style-type: none"> potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Refer to Section 11 for more detail regarding the non-compliances listed in Table 3.

The predictions and Statement of Commitments from the Dendrobium Environmental Assessment (EA) are incorporated into the Dendrobium Development Consent DA 60-03-2001 (as modified). An assessment of compliance with the conditions of DA 60-03-2001 is considered to be an assessment of compliance against the predictions in the EA. Compliance against the Development Consent is assessed in Appendix 3.



2. INTRODUCTION

2.1 Background

This Annual Review for Dendrobium Mine and Cordeaux Colliery details the environment and community performance for the 12-month period ending 30 June 2022 and meets the requirements set out in the *Post approval requirements for State significant mining developments - Annual Review Guideline* (NSW DPIE, October 2015).

The Annual Review has been prepared to meet the requirements of Condition 5 of Schedule 8 of the Dendrobium Development Consent DA 60-03-2001 (the Consent) and the NSW Resources Regulator requirement to submit an Annual Environmental Management Report (AEMR) (Condition 3) and Compliance Report (Condition 4) under Consolidated Coal Lease (CCL) 768 for Dendrobium Mine and Cordeaux Colliery.

A copy of the report is publicly available via the IMC website under Dendrobium Mine: <https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents>.

2.2 Overview of Operations

2.2.1 Dendrobium Mine

Dendrobium Mine is an underground mining operation approved in November 2001 by the Minister of the Department of Urban Affairs and Planning. The mine is owned and operated by Dendrobium Coal Pty Ltd, a subsidiary company of Illawarra Coal Holdings Pty Ltd (ICHPL), a wholly owned subsidiary of South32 Limited. It is operated on a continuous basis, 24 hours a day and 7 days a week.

The mining operations are located immediately adjacent to Mt Kembla, approximately 8 km west of Wollongong, NSW. Mt Kembla village is located within 500 m of the Pit Top site and has close historical links with coal mining.

Dendrobium Mine extracts coal from the Wongawilli Seam of the Southern Coalfield. Three mining areas make up the approved mine plan for Dendrobium and are named Areas 1, 2 and 3 (including 3A, 3B and 3C). Longwall mining during the reporting period was undertaken in Area 3A (Longwall (LW) 19) and Area 3B (LW17 and LW18) (refer to Plan 1 and Plan 2). The mine primarily produces hard coking coal and is approved to produce up to 5.2 million tonnes per annum until 31 December 2030. Dendrobium Mine is comprised of a number of sites as detailed below.

2.2.1.1 Dendrobium Pit Top

The Pit Top consists of:

- Administration buildings.
- Workshop, machinery and equipment storage areas.
- People and materials access to the underground workings via the Dendrobium Tunnel.
- A sediment pond.
- A grey water treatment and oily water separation facility.

The Pit Top layout is shown in Plan 3.



2.2.1.2 Kemira Valley Coal Loading Facility (KVCLF) (ML 1510)

Coal is transported from the underground workings to the KVCLF via a conveyor network, reaching the surface via the Kemira Valley Tunnel (KVT). The coal is then fed through a coal sizer, into a rill tower and deposited onto a 140,000-tonne capacity stockpile. Coal is loaded onto trains via an enclosed rail-loading chute. The KVCLF layout is shown in Plan 4.

2.2.1.3 Kemira Valley Rail Line (KVRL)

The private KVRL is used to transport the coal from the KVCLF to the Dendrobium Coal Preparation Plant (DCPP).

2.2.1.4 Ventilation Shaft 1

The fan housings associated with Ventilation Shaft 1 were decommissioned in October 2008 and relocated to Ventilation Shaft 3. This shaft now provides intake air to the underground workings. The Ventilation Shaft 1 site layout is shown in Plan 5.

2.2.1.5 Ventilation Shaft 2/3 Site (ML 1566)

Construction of Ventilation Shafts 2 and 3 commenced during 2006 and was completed in 2008. Ventilation Shaft 2 (downcast) and 3 (upcast) provide ventilation to the current and future underground workings in Area 3. The Ventilation Shaft 2/3 site layout is outlined in Plan 6. Construction of gas management infrastructure for Area 3C is planned to commence at this site in FY23.

2.2.1.6 Dendrobium Coal Preparation Plant (DCPP)

The DCPP is located within the Port Kembla Steelworks. The plant provides washing facilities for Dendrobium Run of Mine (RoM) coal prior to being blended with Bulli Seam coal in the coke making process at the Port Kembla Steelworks or at Port Kembla Coal Terminal (PKCT) for export.

2.2.1.7 Offsite Storage Facility (OSS)

The OSS is located in Unanderra and is used by Dendrobium Mine for the storage of equipment and consumables due to the limited storage space at the Pit Top. The OSS also houses operational equipment for Appin Mine. The site is managed by Linfox.

2.2.1.8 Dendrobium Mine Extension Project (DMEP)

IMC submitted an Environmental Impact Statement (EIS) to the Department of Planning, Industry and Environment (DPIE) for the Dendrobium Mine – Plan for the Future: Coal for Steelmaking project on 22 July 2019. On 5 February 2021, the Independent Planning Commission (IPC) handed down its decision on the project, being refusal of consent to the development application. A judicial review of the findings of the IPC has been lodged in the Land and Environment Court.

An EIS for the Dendrobium Mine Extension Project (DMEP) was submitted in March 2022. The DMEP EIS incorporated feedback from the IPC, with the major change being the reduction in the underground mining area by 60% and resulted in less predicted water loss and reduced potential impact to Aboriginal cultural heritage sites.

On 23 August 2022, South32 announced that it would be withdrawing the DMEP application.



2.2.2 Cordeaux Colliery

Cordeaux Colliery is owned and operated by Endeavour Coal Pty Ltd, a wholly owned subsidiary of ICHPL. Coal production ceased in March 2001 and recovery of longwall mining equipment was completed on 12 April 2001. Following cessation of mining, Cordeaux Colliery was placed on care and maintenance. Throughout this reporting period, Cordeaux Colliery maintained this status.

The Cordeaux Colliery Pit Top functions as office space and a storage facility. The Pit Top is used as a base for the exploration team, survey team and Environmental Field Team (EFT) activity across the Dendrobium and Appin mining leases and exploration tenements, and also for access into the catchment.

The Cordeaux Colliery Pit Top and the Corrimal No. 3 shaft site are of potential significant strategic value.

The Cordeaux Colliery Pit Top is wholly contained within an area of approximately 11.9 ha located within WaterNSW Special Areas (Plan 11). Cordeaux Colliery was serviced by four vertical shafts consisting of:

- Personnel and Materials access shaft.
- Bulk Coal Winder shaft. The shaft was also the second means of egress and contained the mine's two main ventilation fans.
- Corrimal No. 3 Shaft – mine ventilation fan shaft (ex-Corrimal Mine). This fan was used to complement ventilation flow through Cordeaux Colliery.
- Corrimal No. 2 Shaft - mine ventilation fan shaft (ex-Corrimal Mine). This fan was used to complement ventilation flow through Cordeaux Colliery.

Cordeaux Colliery is considered a “zero discharge site”, restricting water discharge directly to the surface lands of the WaterNSW Special Areas. Cordeaux Colliery Pit Top has approximately 40% of its area dedicated to surface water management.

As Cordeaux Colliery is currently deemed to be under care and maintenance, there were limited activities associated with the site during the reporting period and as a result, limited potential for environmental impacts.

2.3 Mine Contacts

The site contacts for Dendrobium Mine and Cordeaux Colliery are provided in Table 4.

Position	Name	Number
General Manager Dendrobium Mine	Simon Thomas	(02) 4255 4874
Superintendent Exploration Cordeaux	Amanda Crehan	(02) 4286 3160
Superintendent Environment	Chris Schultz	(02) 4286 3384
Specialist Environment – Dendrobium	James Alchin	(02) 4255 4463



3. APPROVALS

Current development consent approvals, leases and licences for Dendrobium Mine and Cordeaux Colliery are included in Table 5, Table 6, Table 7 and Table 8.

3.1.1 *Dendrobium Mine*

Table 5: Development Consent and Modifications associated with Dendrobium Mine

Development Approval	Purpose	Issue Date	Expiry date
DA 60-03-2001	Dendrobium Underground Coal Mine and associated surface facilities and infrastructure	20 Nov 2001	21 Dec 2023
MOD-11-2-2002	Permitting the access of construction traffic to the Bradford Breaker Emplacement Area (Drift Spoil Emplacement Area 1) via Cordeaux Road and Benjamin Road, Mt Kembla.	28 Feb 2002	21 Dec 2023
MOD-36-5-2002-I	Application for commencement of vehicles accessing Benjamin Road.	15 Aug 2002	21 Dec 2023
60-03-2001 MOD 3	Modification to Development Consent (Dept. Planning)	28 Aug 2003	21/ Dec 2023
60-03-2001 MOD 4	Modification to Development Consent (Dept. Planning)	5 Apr 2006	21 Dec 2023
60-03-2001 MOD 5	Modification to Development Consent (Dept. Planning)	30 Nov 2006	21 Dec 2023
60-03-2001 MOD 6	Area 3 Consent Modification	8 Dec 2008	31 Dec 2030
60-03-2001 MOD 7	Strategic Biodiversity Offset	2 Apr 2015	31 Dec 2030
60-03-2001 MOD 8	Surface Supply Upgrade	13 Jul 2018	31 Dec 2030
60-03-2001 MOD 9	Gas Management Infrastructure	8 Jul 2022	31 Dec 2030



Table 6: Mining Leases associated with Dendrobium Mine

Mining Lease / Sub-Lease	Number	Issue Date	Expiry Date	Mine Site
Mining Lease	1510	24 Apr 2002	23 Apr 2023	Dendrobium
Consolidated Coal Lease	768	29 Oct 1991	7 Oct 2029	Dendrobium
Mining Lease	1566	7 Sep 2005	6 Sep 2026	Dendrobium

Table 7: Licences associated with Dendrobium Mine

Licences/Consents	Number	Issue Date	Expiry Date
Licence to Store – Explosives (SafeWork NSW)	XSTR100152	5 Mar 2018	10 Jan 2023
Radiation Licence (EPA) ²	5061173	27 Jul 2022	27 Jul 2023
Radiation Licence (EPA) ³	5096770	26 Feb 2022	26 Feb 2023
Environment Protection Licence	3241	Aug 2000	n/a
Water Approval (Natural Resource Access Regulator)	10WA118772	1 Jul 2013	27 Jun 2028
Groundwater Access Licence	37465	N/A	
Groundwater Access Licence	36473	N/A	
Groundwater Access Licence	42385	N/A	
Groundwater Access Licence	42386	N/A	
Exploration Licence	A143	28 Jul 1979	7 Nov 2023 ⁴
Exploration Licence	A374	24 Oct 1986	24 Oct 2022 ⁵
WaterNSW Access Consent	F2020/1545	14 Mar 2020	13 Mar 2025

² KVCLF.

³ DCP.

⁴ Renewal pending.

⁵ Renewal pending.



Table 8: Current Mining Approvals for Dendrobium Mine

Approval	Number	Issue Date
Area 3A LW19 SMP	N/A	11 Mar 2021
Area 3B – LW9-18 SMP	N/A	8 Dec 2020
Area 3C – LW21	N/A	19 Dec 2019
Mining Operations Plan (MOP)	DOC19/681058	24 Jul 2020 ⁶

3.1.2 Cordeaux Colliery

Cordeaux Colliery is held under CCL 768. The relevant consents, leases, and licences for Cordeaux Colliery are presented in Table 9.

Table 9: Consents, Leases and Licences for Cordeaux Colliery

Facility/Document	Number	Issue Date	Expiry Date
Environment Protection Licence	611	27 Jul 2000	N/A
Development Consent (Wollongong City Council)	D74/134	20 Dec 1974	N/A
Exploration Licence	A338	8 Oct 1984	8 Oct 2019 ⁷
WaterNSW Access Consent	F2020/1545	14 Mar 2020	13 Mar 2025
Consolidated Coal Lease	768	29 Oct 1991	7 Oct 2029
Mining Lease	25	31 Oct 1975	As per CCL 768
Mining Lease	28	31 Oct 1975	As per CCL 768
Mining Lease	23	2 Sep 1981	As per CCL 768
Mining Lease	24	2 Feb 1976	As per CCL 768
Mining Lease	30	18 Oct 1976	As per CCL 768
Mining Lease	Lease No. 66 portion D1106	18 Oct 1976	As per CCL 768
Mining Purposes Lease	MPL 205	29 Sep 1982	As per CCL 768

⁶ Approval of latest Addendum. Note that the MOP expired on 2 July 2022 and has been replaced with the Rehabilitation Management Plan (RMP), however the MOP was in place over the reporting period.

⁷ An application to renew A388 was applied for on 8 October 2019. The granting of this renewal is still pending and continues until the department grants the renewal.



4. OPERATIONS SUMMARY

4.1 Mining

4.1.1 Dendrobium Mine

The RoM product for the reporting period was 3.43 million tonnes with a saleable product yield of 76%. A comparison showing the RoM production at Dendrobium Mine for past reporting periods is provided in Figure 1. During this reporting period, Dendrobium continued longwall mining in Area 3B and relocated to Area 3A in June 2022. Development will continue in Area 3A and 3C in the next reporting period.

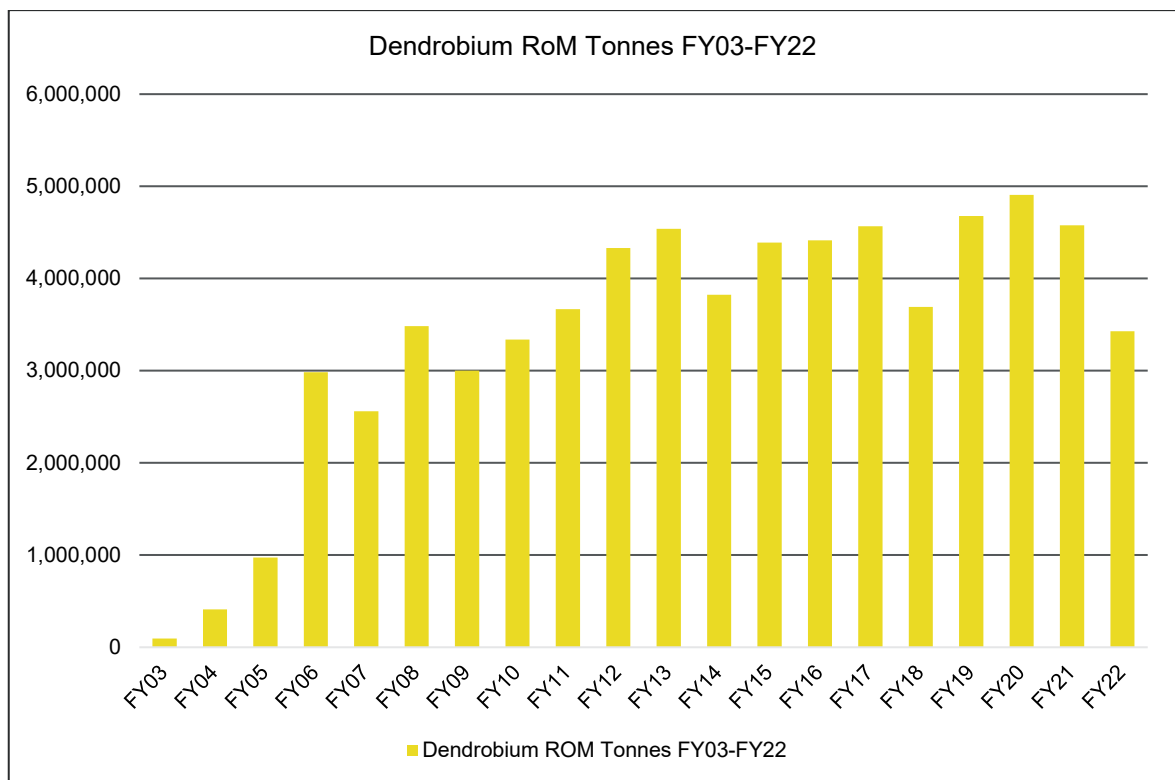


Figure 1: RoM Production for Dendrobium Mine.

The start and finish dates for longwalls in the current Dendrobium mining domain are provided in Table 10.



Table 10: Area 3 Longwall Start and Finish Dates

Longwall Number	Start Date	Finish Date
7	4 May 2011	23 Jan 2012
8	24 Feb 2012	29 Dec 2012
9	9 Feb 2013	2 Jun 2014
10	20 Jan 2014	20 Jan 2015
11	18 Feb 2015	26 Jan 2016
12	22 Feb 2016	31 Jan 2017
13	4 Mar 2017	19 Apr 2018
14	22 May 2018	26 Feb 2019
15	9 Apr 2019	22 Jan 2020
16	25 Feb 2020	4 Nov 2020
17	12 Dec 2020	13 Oct 2021
18	2 Dec 2021	17 May 2022
19	20 Jun 2022	Est. Feb 2023
21	Est. Mar 2023	Est. Jul 2023

4.1.2 Cordeaux Colliery

There was no mining at Cordeaux Colliery in the reporting period. The site is under care and maintenance.

4.2 Mineral Processing

4.2.1 Dendrobium Mine

Processing of the RoM coal produced at Dendrobium Mine is undertaken at the DCP. Coal wash is emplaced at the Appin Mine Coal Wash Emplacement Area (CWEA), directed to beneficial reuse, sold as a low-grade thermal coal or used as engineered fill under Operational Purpose Deductions (OPDs) (see Section 6.19.1.4). The production and waste summary for Dendrobium Mine is outlined in Table 11.



Table 11: Production Summary

Material	Approved limit	Previous Reporting Period	This Reporting Period	End of Next Reporting Period⁸
Waste Rock/ Overburden (Mt) ⁹	N/A	0	0	0
RoM Coal/Ore (Mt)	5.2	4.578	3.435	4.664
Coarse reject (Coal Wash Mt)	N/A	1.117	0.903	1.052
Saleable product (Mt)	N/A	3.595	2.608	3.625

4.2.2 Cordeaux Colliery

There was no mineral processing at Cordeaux Colliery in the reporting period. The site is under care and maintenance.

4.3 Ore and Product Stockpiles

4.3.1 Dendrobium Mine

A 140,000-tonne capacity stockpile, located at the KVCLF, is used to store RoM coal prior to it being loaded into trains for transport to the DCP. Train movements are limited to between 6 am and 11 pm as required by the Consent. During the reporting period, 2,825 trains were loaded at the KVCLF, transporting 3,325,936 tonnes of coal. A summary of train movements for FY22 is included in Table 12.

Table 12: Summary of KVCLF train movements - FY22

Month	Tonnes	Train Movements	Average Train Movements/Day
Jul-21	450,109	269	8.68
Aug-21	473,944	274	8.84
Sep-21	196,464	110	3.67
Oct-21	15,639	12	0.39
Nov-21	24,585	15	0.50
Dec-21	293,290	186	6.00
Jan-22	433,155	267	8.61

⁸ Estimate.

⁹ Not applicable as Dendrobium Mine is an underground coal mine.



Feb-22	428,878	262	9.36
Mar-22	347,334	207	6.68
Apr-22	374,085	220	7.33
May-22	98,935	57	1.84
Jun-22	189,518	110	3.67
TOTAL	3,325,936	1989	AVERAGE = 5.45

4.3.2 Cordeaux Colliery

There was no product storage at Cordeaux Colliery in the reporting period. The site is under care and maintenance.

4.4 Construction

4.4.1 Dendrobium Mine

4.4.1.1 Lower Portal Road Upgrade

The majority of construction works for the Lower Portal Road was completed during FY22 with guardrail and finishing works to be completed in early FY23. Once completed, this will allow additional access in the event of an emergency requiring the use of the secondary roadway and also for repair works to be undertaken on the Upper Portal Road.

There were no upgrades undertaken to the Upper Portal Road pending the completion of the Lower Portal Road works.

4.4.1.2 Female Bath House

In FY22, construction of the female bath house commenced to replace the current arrangement of temporary structures. Two-bathroom units were placed in a stack adjacent to the Technical Services building with plumbing and electrical connections completed by the end of FY22. The permanent staircase and finishing works are due to be completed early FY23 before commencing operation.

4.4.1.3 Area 3C Gas Drainage Infrastructure

While no construction activities occurred in FY22, planning for the installation of gas drainage infrastructure at the Ventilation Shaft 2/3 site was undertaken. MOD 9, for the gas drainage infrastructure, was approved on 8 July 2022. The infrastructure is required for drainage of Area 3C.

4.4.1.4 Emergency Response Equipment Upgrade

The upgrade of the emergency response equipment at Ventilation Shafts 1, 2 and 3 and the Dendrobium Portal and KVT was completed in FY22. This involved the following installation of equipment at each of the sites:



- Dendrobium Portal - Two sets of Mine Sealing Doors have been installed in an Airlock Configuration rated at 70 kPa and 35 kPa respectively. These doors can be operated remotely in the event of a pending over pressure event. In addition, ducting has been installed between the airlock seal to facilitate the introduction of inert gasses to the mine supplied by Coal Services Safe Gas System or Queensland Mines Rescue GAG¹⁰ engine system. A certified design has been provided to the mine to build an extension of the ducting to protrude out of the portal to facilitate a remote connection of the inert gas systems.
- Ventilation Shafts 1, 2 and 3 - The Wilsons Mining ROCSIL system has been installed. The system comprises of a pair of hydraulic hoses for each portal whereby a 2-part chemical can be pumped to the respective shaft and mixed via a canon discharge. This creates an expansion foam that will fill the void and creates a seal of 70-80 kPa.
- KVT - The Wilsons Mining ROCSIL system has also been installed at KVT. The system is comprised of a pair of hydraulic hoses which are run 50 m into the mine along the rib/roof line of the tunnel. A two-part chemical can be pumped to a canon discharge. This creates an expansion foam that will fill the tunnel void and will create a seal of 70-80 kPa.

4.4.1.5 Retaining Wall Replacement

During FY22, works commenced on the replacement of the retaining wall behind the bulk store due to degradation. This involved the removal of the existing concrete, forming and pouring a new wall section. Works are due to be completed in FY23.

4.4.1.6 Surface Infrastructure Subsidence Remediation

IMC maintains ongoing engagement with TransGrid to safely manage the 330 kV Transmission Towers assets which are located in Dendrobium Area 3. These towers will be influenced by mining induced subsidence movements. In consultation with IMC, TransGrid undertook a comprehensive assessment of mitigation measures in FY22 which were required for Tower 14 which will be influenced by the mining of Longwall 19. Mitigation works including tower member strengthening and installation of rollers were successfully upgraded in July 2022. The towers are routinely monitored by IMC throughout the active subsidence period in accordance with the management plan.

4.4.1.7 Minor Improvement Projects

Other improvement projects completed throughout the FY include:

- Ongoing maintenance to the drainage and greywater treatment systems.
- Awning installation to provide undercover area for locker storage.
- Bulk hydrocarbon storage container installation on the Portal Road (self-bunded).
- Hot water system upgrades for the Men's Bath House.

The bulk diesel and solcenic projects were not progressed to installation in the reporting period. This was due to subsidence concerns with the historical underlying kerosene workings. A self bunded bulk diesel tank has been purchased and is currently being stored at the OSS.

¹⁰ Gorniczny Agregat Gasniczy (GAG) is a jet engine inertisation unit developed for use in mines, controlling and suppressing coal seam fires and neutralising firedamp situations. The unit was designed in Poland in the 1970s, its name roughly translates as "Mine Fire Suppression Apparatus".



The new iAuditor environmental action tracker tool was implemented during the reporting period. The system allows for planned actions to be collated and scheduled to relevant environmental representatives for completion. These actions were previously recorded in a spreadsheet.

4.4.2 KVCLF

4.4.2.1 Fire Suppression System Replacement

The fire suppression system within the train loading system was replaced in the reporting period.

In 2021, the EPA introduced restrictions on the use of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), requiring these substances to be removed from operation by September 2022. The material being utilised in the fire suppression system at KVCLF was PFAS.

The PFAS was replaced with Fluorine free 3-3% Respondol ATF Foam. The PFAS containing material was removed and disposed of by the site's fire suppression specialist contractor at a facility licenced to accept the waste.

4.4.2.2 Minor Improvement Projects

Minor improvement projects were completed at KVCLF including:

- Road improvements on Stones Road due to landslips.
- Dewatering pipeline upgrades to allow for improved hydraulic efficiency. This included the rearrangement of pipework to bypass the break tank at the KVT.

4.4.3 DCPP

Several improvement works were undertaken at DCPP over the reporting period. These included structural repairs, guarding compliance, re-sheeting, handrails and ladder repairs and replacements, electrical circuit earth leakage fixes, conveyor fire protection systems maintenance, conveyor pull cord compliance and lift control system compliance.

4.4.4 Cordeaux

Upgrade of the site's electrical supply began in FY22 and is planned to be completed in FY23. The upgrade aims to replace ageing infrastructure that is no longer fit for purpose and align the infrastructure with ongoing high voltage maintenance requirements. Works in FY22 included:

- Installation of a barrier wall to separate potential mine shaft upcast air from the server room and offices.
- Progress of the design phase for the replacement of distribution boards that supply the Administration building and Workshop.

4.5 Exploration

4.5.1 Drilling Program

The boreholes drilled during the reporting period are summarised below in Table 13. All these holes coincide with CCL 768, although exploration holes are drilled under exploration titles wherever they are present (EL 143). Standard exploration holes typically targeted the Bulli and Wongawilli coal seams extending to the American Creek Coal Member. The purpose of these exploration boreholes was to assess coal thickness, depth of seam, coal quality, gas content, and to assist in determining possible future mining conditions by conducting geotechnical tests on the core samples. Some of these holes were drilled for approvals purposes, not exploration (refer comments in Table 13).



Plan 8 provides an overview of the locations of the exploration and environmental/mining approvals boreholes drilled across CCL 768 in the FY22 reporting period.

4.5.2 Cordeaux Colliery

No land preparation works occurred at the Cordeaux site as mining operations are under care and maintenance.



Table 13: Boreholes completed during the reporting period

Title Type	Title No.	Program	Hole Name	Alternative Name	Easting	Northing	Drill Type	Hole Purpose	Borehole Total Depth (m)	Drilling Start Date	Borehole Comments
Mining Lease	CCL768	Dendrobium - Area 3a	S2562	LW19a-01	292003.3	6191994	Partly cored - Borehole chipped to target depths prior to coring.	Coal Quality	365	11/08/2021	Coal Quality Exploration
Mining Lease	CCL768	Dendrobium - Area 3a	S2564	LW19a-04	291713.5	6192004	Partly cored - Borehole chipped to target depths prior to coring.	Coal Quality	335	7/09/2021	Coal Quality Exploration
Mining Lease	CCL768	Dendrobium - Area 3a	S2566	LW19a-02A	291984	6191823	Fully cored - Borehole cored from surface to total depth.	Coal Quality	327	27/07/2021	Coal Quality Exploration. Angled bore redrilled verticality issues (S2566A)
Mining Lease	CCL768	Dendrobium - Area 3a	S2566A	LW19a-02A1	291984	6191823	Partly cored - Borehole chipped to target depths prior to coring.	Coal Quality	365	5/08/2021	Coal Quality Exploration. Angled bore. Redrill of S2566.
Mining Lease	CCL768	Dendrobium - Area 3b	S2475A	EL5_2	288950.5	6190604	Partly cored - Borehole chipped to target depths prior to coring.	Geotech	215	21/10/2021	Stress Monitoring Borehole.
Mining Lease	CCL768	Dendrobium - Area 3b	S2493B	GW17-1B	289658.5	6191103	Fully cored - Borehole cored from surface to total depth.	Hydrological	276	27/08/2021	LW17 Post Mining
Mining Lease	CCL768	Dendrobium - Area 3c	S2514A	D-A3C-S17-20A	292464.5	6194440	Fully cored - Borehole cored from surface to total depth.	Hydrological	257	18/11/2021	Premining LW22
Mining Lease	CCL768	Dendrobium - Area 3c	S2518A	D-A3C-S17-22A	291851.5	6194972	Fully cored - Borehole cored from surface to total depth.	Hydrological	26	4/02/2022	Premining LW23
Mining Lease	CCL768	Dendrobium - Area 3c	S2518B	D-A3C-S17-22B	291851.5	6194972	Fully cored - Borehole cored from surface to total depth.	Hydrological	395	9/02/2022	Premining LW23



5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The actions arising from the previous Annual Review are detailed in Table 14.

Table 14: Actions arising from previous Annual Review

Action Required	Requested by	Where covered in this Report
Lower Portal Road Upgrade	IMC	Section 4.4.1.1
Replace the bulk diesel tank and bulk solcenic tanks with self-bunded tanks.	IMC	Section 4.4.1.7
DCPP various works which include structural repairs, guarding compliance, re-sheeting, handrails and ladder repairs and replacements, electrical circuit earth leakage fixes, conveyor fire protection systems maintenance, conveyor pull cord compliance and lift control system compliance.	IMC	Section 4.4.3
DDG and HVAS monitoring will be decommissioned in place of real-time monitoring.	IMC	Section 6.1.1.1
Directional noise monitoring system to be installed at the Pit Top.	IMC	Section 6.8.1.2
Extension sought for MOP which expires 1 July 2022	IMC	Section 8.1.1.1
Conceptual Closure Plan to be finalised	IMC	Section 8.1.1.1
Legacy Sites and Rehabilitation:		
<ul style="list-style-type: none"> Removal of contaminated soil from the O'Briens Gap Pump House Partial relinquishment of CCL 768 related to power line removals Continued investigation into the removal of redundant infrastructure associated with O'Briens Drift, particularly at the KVCLF Undertake final inspection of Summit Park Switchyard site. 	IMC	Section 8.1.1.3
Rehabilitation monitoring:		
<ul style="list-style-type: none"> Grass has established at the Summit Park Switchyard site and a final inspection report will be submitted in FY22. 	IMC	Section 8.1.1.3



Submission of EIS for Dendrobium Mine Extension Project.	IMC	Section 2.2.1.8
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Construction Activities:

- Lower Portal Road and culvert upgrade project.
- Upper Portal Road upgrade.
- Roof and retaining wall replacement at the Bulk Store.
- Men’s bathhouse upgrade.
- Installation of new female bathhouse.
- Area 3C gas drainage plant infrastructure.
- Upgrade of the emergency response equipment at Ventilation Shafts 1, 2 and 3 and the Dendrobium Portal and Kemira Valley Tunnel.

	IMC	Section 4.4.1
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KVCLF fire suppression system upgrades	IMC	Section 4.4.2.1
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Completion of installation of flow monitoring sites in Catchment watercourses	IMC	Section 12.1.5.5
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Dendrobium Mine is planning to continue environmental management in accordance with ISO 14001. Environmental Management Plans will be updated and governance reviews undertaken as required during the next reporting period.	IMC	Section 10.1
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Upgrade of Cordeaux Colliery’s electrical supply:

- installation of a pole-mounted transformer and installation of underground low voltage cabling to the Administration building, Workshop and Communications Huts.
- installation of a barrier wall to separate potential mine shaft upcast air from the server room and offices.
- replacement of distribution boards that supply the Administration building and Workshop.

	IMC	Section 4.4.4
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6. ENVIRONMENTAL PERFORMANCE

6.1 Air Pollution

6.1.1 *Dendrobium Mine*

Air quality management is an environment aspect within the Environmental Management System for the Dendrobium operation. At the Dendrobium Pit Top, the following dust controls were utilised during the reporting period:

- Vacuum sweeper truck operating on a regular basis on sealed areas.
- Hose downs of the yard.
- Automatic dust suppression spray system along the portal road.

During the reporting period, the Trigger Action Response Plan (TARP) continued to be implemented to manage dust in the yard at the Pit Top. The TARP details trigger levels and associated management actions in response to dust related events.

At the KVCLF, the following dust controls were utilised during the reporting period:

- Automatic dust suppression system on the stockpile. Eight sprays are located around the base of the stockpile whilst a further two sprays are located at the top of the rill tower. The spray system is programmed to activate if wind velocities exceed 10 m/s and/or when the coal moisture level drops below the trigger level of 8%. The sprays can also be activated by site personnel via a dial up system when required.
- Dust suppression system in the train loading chamber. This system maintains an adequate coal moisture level to minimise the potential for fugitive dust emissions whilst being transported from the KVCLF to the DCCP via the KVRL.
- Enclosed train loading facility that enables coal to be loaded into the train without fugitive emissions.
- Doors on the rill tower to minimise the fugitive emissions from the rill tower.
- Dust suppression system on the Kemira Valley conveyor (including sprays at the top and bottom of the Sizer, the jib pulley, and also around the Nebo Mains transfer point) that maintains an adequate coal moisture content to prevent dust emissions from the conveyor.
- Wind protection on conveyor gantries.

The dust suppression systems at the Pit Top and sprays at the KVCLF both use recycled water.

6.1.1.1 **Air Quality Monitoring System**

Dendrobium's air quality monitoring program consisted of two real time remote particulate matter optical photometers during the reporting period as required by the approved Air Quality Management Plan and Environment Protection Licence (EPL) 3241.

The results from the photometers are compared to the short term 24-hour average impact assessment criteria of 50 $\mu\text{g}/\text{m}^3$ and the annual impact assessment criteria of 30 $\mu\text{g}/\text{m}^3$.

Dust Deposition Gauges (DDGs) and High Volume Air Samplers (HVAS) may be used if required to investigate complaints or operational dust related issues, however they are not included in the regular dust monitoring program. These methods will be compared to the annual limit of 4 $\text{g}/\text{m}^2/\text{month}$ and 90 $\mu\text{g}/\text{m}^3$ respectively for deposited dust and total suspended particulate (TSP) as outlined in Table 15. DDGs and HVAS were not utilised in the reporting period.



Results from the air quality monitoring program are reported:

- via the IMC website in the 14-day report; and
- annually in the EPL Annual Return and Annual Review.

Table 15: Relevant Standard for Air Quality

Pollutant	Goal	Averaging Period
Particulate matter < 10 mm (PM ₁₀)	50 µg /m ³	24-hour
	30 µg /m ³	Annual
Total Suspended Particulates (TSP)	90 µg /m ³	Annual
Deposited Dust (insoluble solids)	4 g/m ²	Annual

6.1.1.2 Optical Photometer Results

Dust levels measured by the optical photometers at both Kemira Valley and Dendrobium displayed levels well below the required limits, as shown in Figure 2. In addition to mitigation measures implemented on site, significant rainfall over the majority of the reporting period has also assisted in the reduction of dust emissions. As this is the first reporting period for the optical photometers, a direct comparison to long term trends is not possible, however the results are below the air quality impact assessment criteria. A direct comparison to previous reporting periods will be included in future Annual Reviews.

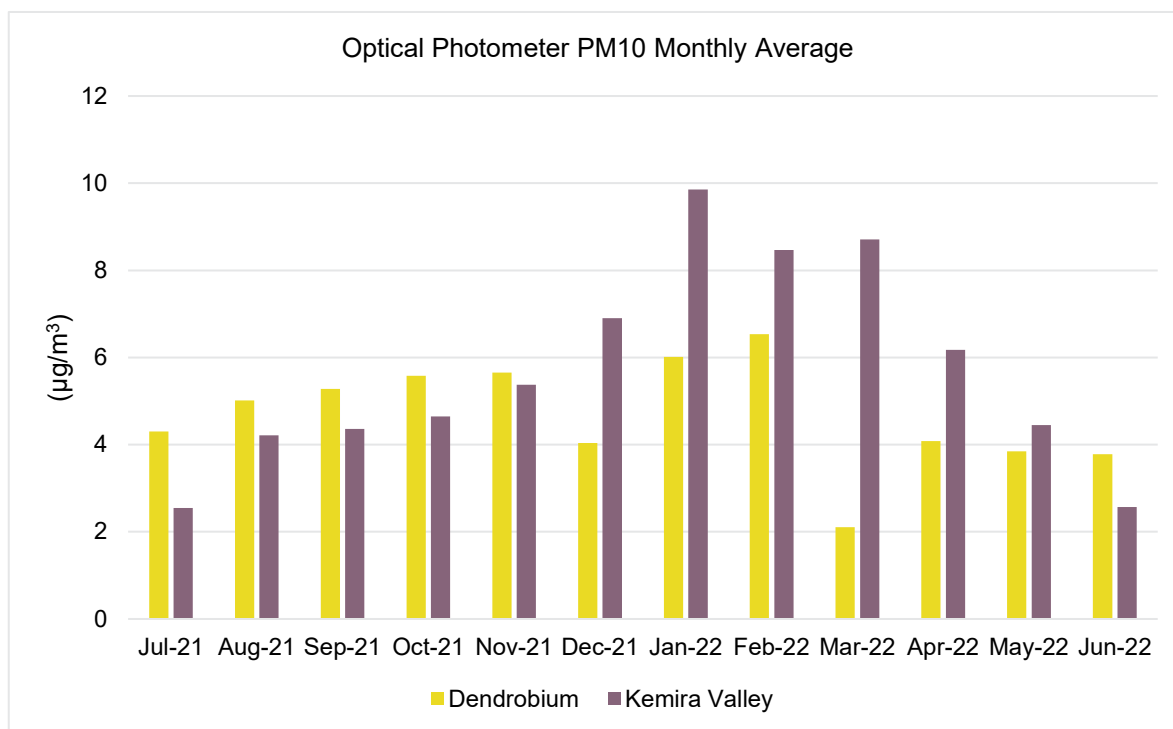


Figure 2: Optical Photometer Results - FY22

6.1.2 Cordeaux Colliery

Air quality is not actively monitored at Cordeaux Colliery as there is no coal handling at or coal transport from the site. Trafficable and storage areas are sealed.

6.1.3 Ventilation Shaft 1

No air quality issues are considered relevant for the Ventilation Shaft 1 as the site has been rehabilitated or is covered with gravel. Ventilation Shaft 1 is an intake shaft and therefore there are no dust emissions.

6.1.4 Ventilation Shaft 2/3

No air quality issues are considered relevant for Ventilation Shaft 2/3 as the site has been rehabilitated or is covered with gravel. Odour levels are low, and the site is in a remote location. No complaints have been received.

6.1.5 DCP

Air quality at the DCP is managed under the BlueScope Steel EPL 6092 with quarterly reporting to BlueScope Steel undertaken.

6.2 Erosion and Sediment

6.2.1 Dendrobium Mine

Erosion and sediment control at Dendrobium is managed in accordance with the approved Water Management Plan and Landscape Management Plan. These plans address erosion and sediment controls for the Dendrobium Pit Top, KVCLF, Ventilation Shaft 1 and 2/3 sites and the KVRL.



6.2.1.1 Erosion Control

Both the Dendrobium Mine Pit Top and KVCLF predominantly consist of sealed surfaces and vegetated areas. As limited soil is exposed, the potential for erosion is low.

6.2.1.2 Sediment Control

Sediment control structures are inspected and maintained on a regular basis. Sediment is removed from drainage pits along the dirty water drainage system and the grey water treatment plant (GWTP) by an industrial vacuum tanker as required. The sediment pond assists in settling out suspended solids before surface water enters the GWTP.

6.2.1.3 Slope Stability

Due to the significant rainfall at the site over FY22, the Dendrobium Pit Top experienced significant slope stability issues in the form of landslips in several locations – mostly along the portal road and adjacent to the Operations Building.

Initial “make safe” clean-up was conducted to allow safe site operations to continue. Following this, tree removal was conducted along the slope to reduce the likelihood of further slippage and risk of harm to personnel, infrastructure and equipment. The root balls of the trees were left in situ to aid in slope retention.

An engineering consultancy has been engaged to provide a repair solution that would avoid undercutting the unstable material using sheet piling and ballast to form a wall along the slope toe. Works were programmed to commence in late FY22, however due to ongoing rainfall, works will be undertaken in FY23.

6.2.2 Ventilation Shaft 1 and 2/3

Erosion is not a significant issue at the ventilation shaft sites as disturbed areas have been rehabilitated or stabilised with gravel.

6.2.3 Cordeaux Colliery

Erosion is not a significant issue at the Cordeaux Colliery Pit Top site as the majority of the mine surface is sealed with stormwater run-off directed to appropriate holding dams and filter systems. There are minimal unsealed areas.

6.2.4 DCPP

Erosion and sediment control at the DCPP is managed under the BlueScope Steel EPL 6092.

The sediment basin at 4-Area was dewatered and cleaned out during the reporting period (see Section 6.3.3).

6.3 Surface Water

6.3.1 Dendrobium Mine

6.3.1.1 Mine Subsidence

The surface water monitoring program under the Subsidence Management Plan (SMP) enables Dendrobium to maintain a database of regional water quality and to determine any changes to surrounding water quality. Potential water quality impacts as a result of mining are described in Section 6.14.



6.3.1.2 Mine Site Surface Facilities

The surface water monitoring network for surface facilities consists of five regular sites (see Plan 9) which include sites upstream and downstream of both the Pit Top and Kemira Valley, as well as the mine dewatering Licence Discharge Point (LDP) 5, located at Marley Place.

The monitoring program includes:

- recording of field observations; and
- analysis of the water by a NATA accredited laboratory covering pH, conductivity, total suspended solids (TSS), metals (specified for LDP 5) and oil and grease.

6.3.1.3 Monitoring and Results

The majority of the monitoring sites are located in natural watercourses that flow adjacent to the Dendrobium Pit Top and KVCLF sites, in particular American Creek and Brandy and Water Creek respectively. Upstream and downstream sites are sampled every two months, while LDP 5 is sampled monthly. Variations in water quality in response to local geology and rainfall were within expectations during the reporting period. Results from the downstream sites are compared to the results from upstream sites at each location. These comparisons are discussed in detail below. Rainfall data for the year is provided in Section 7.2.1.4.

6.3.1.4 KVCLF

During the reporting period, there has been no significant difference between the upstream and downstream results for points Dend 7 (upstream of the KVCLF) and Dend 10 (downstream of the KVCLF) identified in regular monitoring. Results indicate that the water management system in operation at the KVCLF site is effective with minimal influence on the surrounding Brandy and Water Creek. The results are summarised in Table 16 and Table 17. There was natural variation in sample results throughout the reporting period. However, trends for Dend 7 and Dend 10 remained relatively consistent for FY22. pH, electrical conductivity (EC) and Total Suspended Solids (TSS) for the reporting period are shown in Figure 3, Figure 4 and Figure 5 respectively. Elevated TSS in May can be attributed to high rainfall during the sampling period and scoured banks of the watercourse. The resulting higher TSS is observed in both upstream and downstream sites.

Overall trends show water quality has been stable in relation to the KVCLF site. Graphs depicting long-term trends in water quality are provided in Appendix 6.

Table 16: Summary of Water Quality Results – Dend 7 (Upstream of KVCLF)

Parameter	Units	Min	Max	FY Average
pH	pH units	6.3	8.2	7.7
TSS	mg/L	<5	151	44.7
Oil and Grease	mg/L	<5	7	5.3
Conductivity	µS/cm	269	509	393



Table 17: Summary of Water Quality Results – Dend 10 (Downstream of KVCLF)

Parameter	Units	Min	Max	FY Average
pH	pH units	6.9	8.3	7.8
TSS	mg/L	<5	295	68.3
Oil and Grease	mg/L	<5	<5	<5
Conductivity	µS/cm	165	523	377

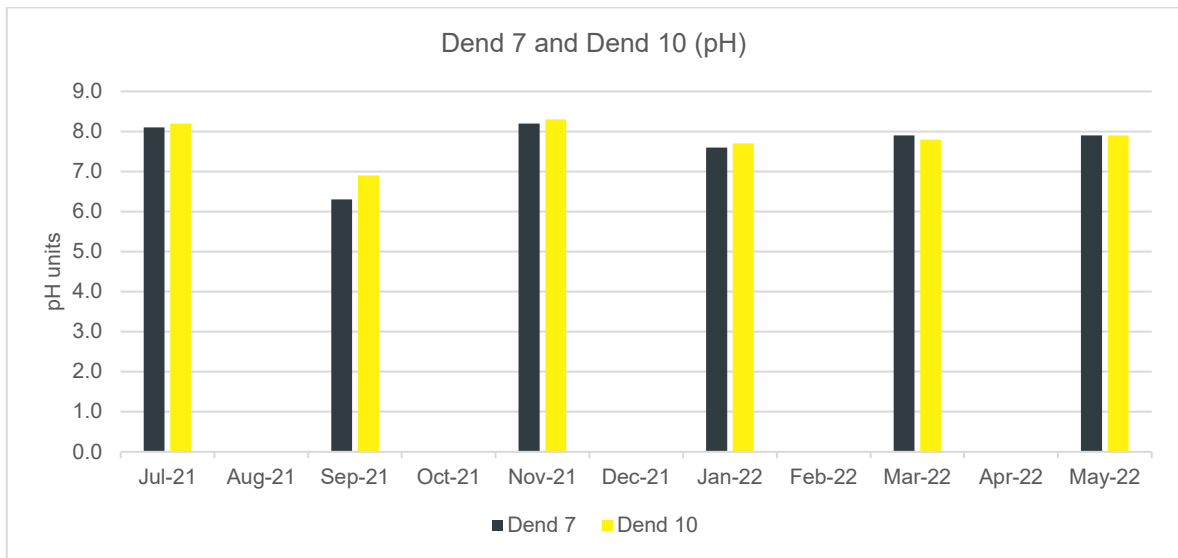


Figure 3: Dend 7 (upstream KVCLF) and Dend 10 (downstream KVCLF) - pH

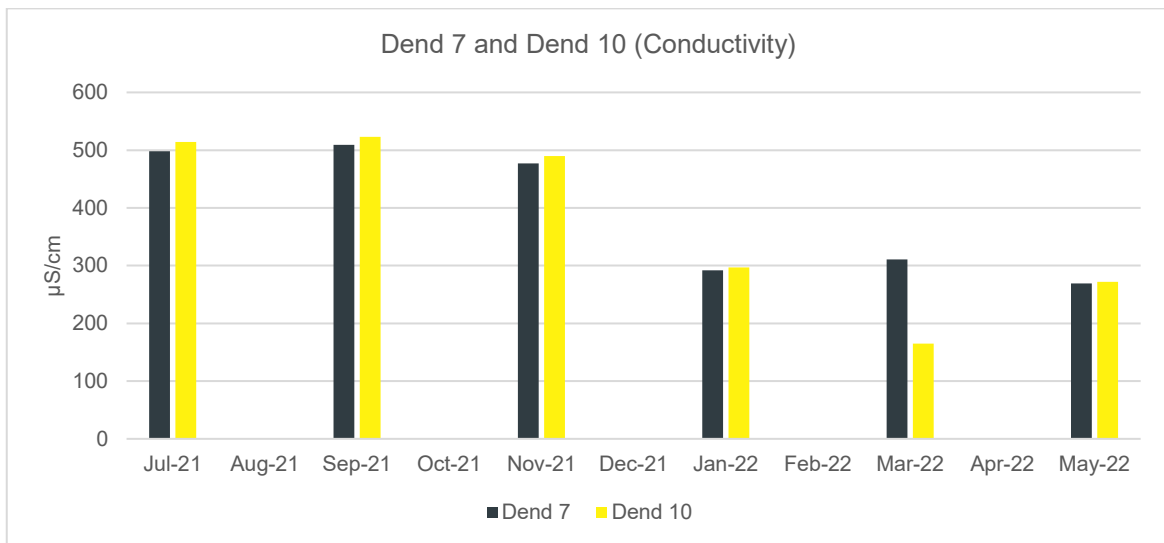


Figure 4: Dend 7 (upstream KVCLF) and Dend 10 (downstream KVCLF) - conductivity

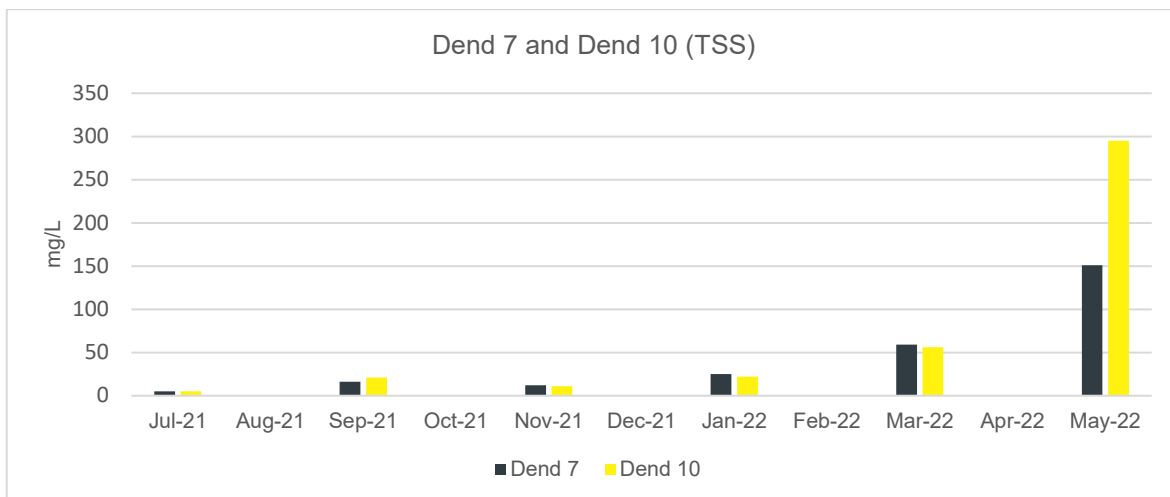


Figure 5: Dend 7 (upstream KVCLF) and Dend 10 (downstream KVCLF) - TSS

6.3.1.5 Dendrobium Pit Top

A comparison of the water quality results from Dend 12 (upstream of Pit Top) and Dend 13 (downstream of Pit Top) indicate that there is no significant variation in TSS, oil and grease levels, or pH, with the exception of May 2022, where high rainfall during the sampling period had scoured banks of the watercourse caused an elevated TSS reading both in the upstream and downstream samples. The results are summarised in Table 18 and Table 19. Trends for pH, conductivity and TSS for FY22 are shown in Figure 6, Figure 7 and Figure 8 respectively. Overall trends show water quality has been stable in relation to the Dendrobium Pit Top site. Graphs depicting long-term trends in water quality are provided in Appendix 6.

Table 18: Summary of Water Quality Results – Dend 12 (Upstream of Pit Top)

Parameter	Units	Min	Max	Average
pH	pH units	7.0	8.0	7.6
Total Suspended Solids	mg/L	<5	18	10.1
Oil and Grease	mg/L	<5	11	5.86
Conductivity	µS/cm	151	276	206

Table 19: Summary of Water Quality Results – Dend 13 (Downstream of Pit Top)

Parameter	Units	Min	Max	Average
pH	pH units	7.5	8.1	7.6
Total Suspended Solids	mg/L	<5	34	13.7
Oil and Grease	mg/L	<5	<5	<5
Conductivity	µS/cm	217	361	292

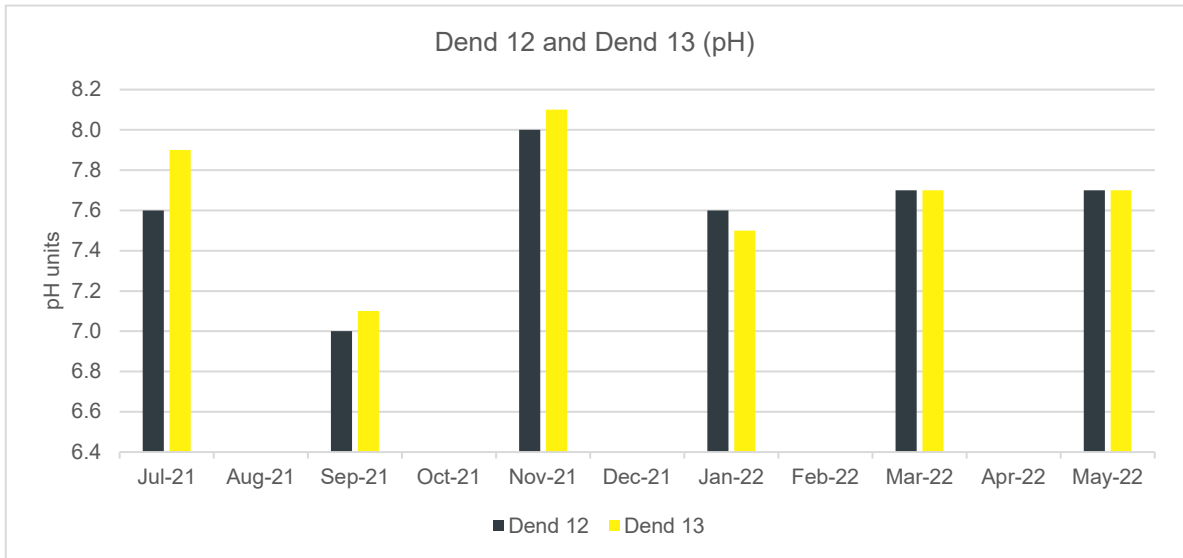


Figure 6: Dend 12 (upstream of Pit Top) and Dend 13 (downstream of Pit Top) – pH

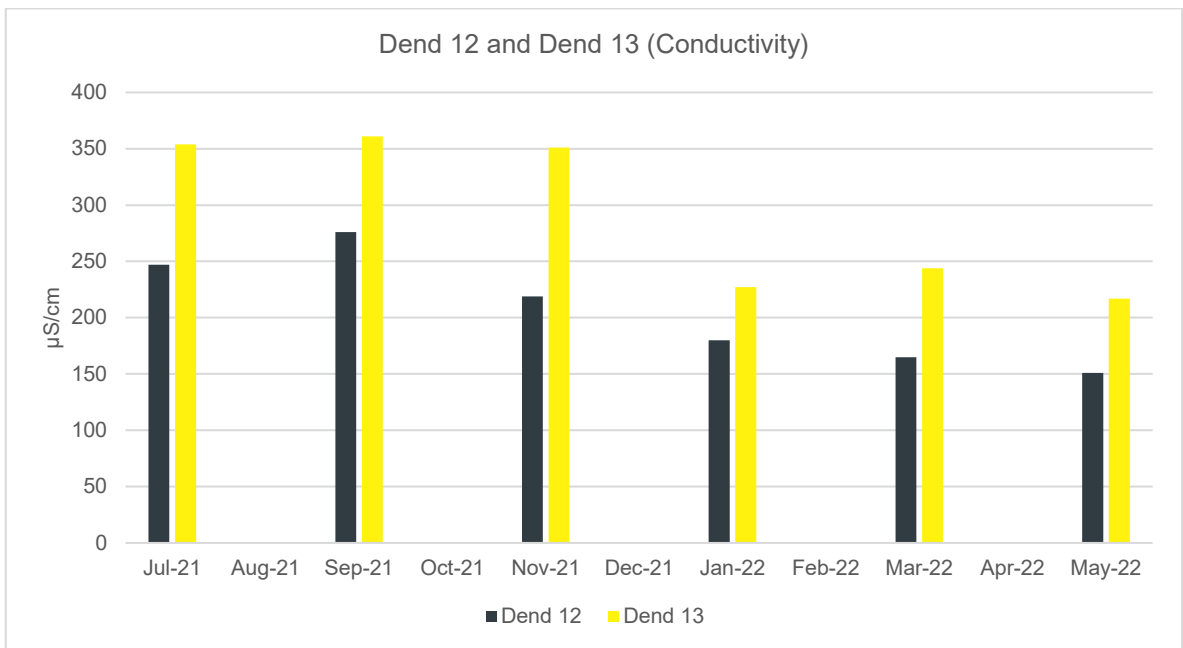


Figure 7: Dend 12 (upstream of Pit Top) and Dend 13 (downstream of Pit Top) – Conductivity

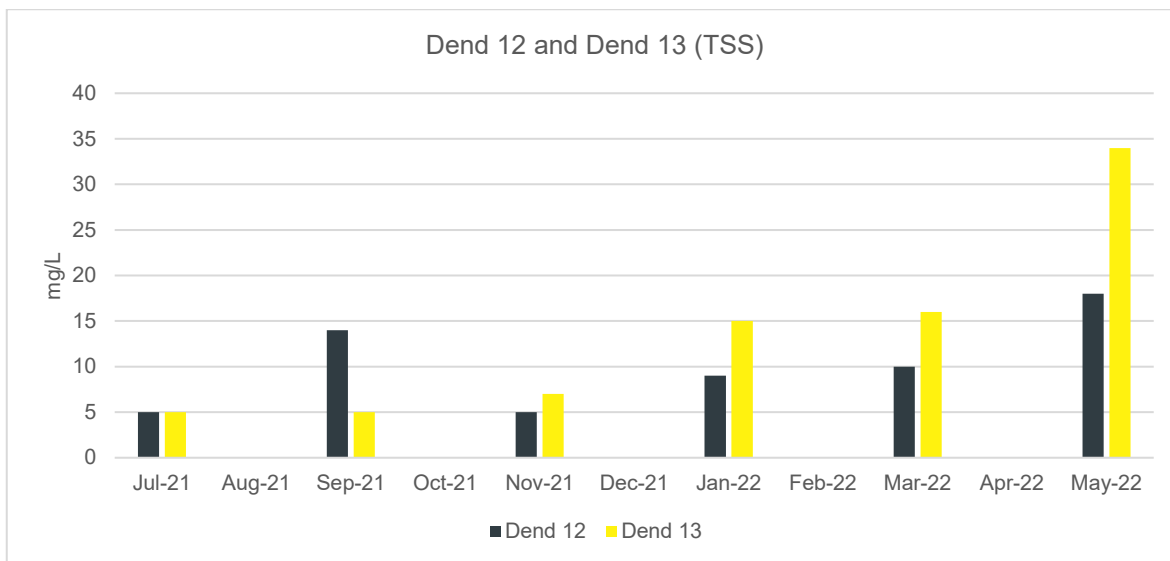


Figure 8: Dend 12 (upstream of Pit Top) and Dend 13 (downstream of Pit Top) – TSS

6.3.1.6 Monitoring and Results – LDP 5

Water from the old Kemira Mine workings and KVCLF sediment ponds is discharged through LDP 5, located at Marley Place (refer to Plan 9). Brine from the IMC Appin West and Appin North Water Treatment Plants is transported by truck to Marley Place and discharged through LDP 5. A total volume of 3,155.05 ML (including 128.95 ML and 48.98 ML of brine from the Appin West and Appin North Water Treatment Plants respectively) was discharged in this reporting period. Trends in water discharge over previous years is provided in Appendix 6.

A summary of the monitoring requirements and limits for the reporting period for LDP 5 are provided in Table 20. There was natural variation in sample results throughout the reporting period. The general trends for LDP 5 remained relatively consistent for FY22 as shown in Figure 9 and Figure 10. Long-term average trends have shown stable results within limits. Graphs depicting trends in water quality over previous years is provided in Appendix 6.

Table 20: Monitoring Requirements and Prescribed Limits for LDP 5

Parameter	Units	Frequency	Sampling Method	Licence Limit
Arsenic	mg/L	Monthly	Grab sample	1.3
Conductivity	µS/cm	Monthly	Grab sample	---
Copper	mg/L	Monthly	Grab sample	0.08
Nickel	mg/L	Monthly	Grab sample	5
Oil and Grease	mg/L	Monthly	Grab sample	10
TSS	mg/L	Monthly	Grab sample	30
Zinc	mg/L	Monthly	Grab sample	0.4
pH	pH	Monthly	Grab sample	6.5 - 9.0



The monitoring results from the LDP 5 sampling program are reviewed monthly. The monitoring results are reported to the relevant external stakeholders via the:

- EPL Annual Return (see Appendix 1);
- Annual Review; and
- IMC website (14-day Report).

A summary of monitoring results for the reporting period is provided in Table 21. The reporting period saw no non-compliances recorded against the EPL limit during the monthly compliance monitoring and is in line with trends from previous reporting periods. Graphs depicting long-term trends in water quality are provided in Appendix 6.

Parameter	Units	Min	Average	Max	EPL Limit
Arsenic	mg/L	0.001	0.008	0.012	1.3
Conductivity	µS/cm	1600	1733	1890	N/A
Copper	mg/L	<0.001	0.001	0.005	0.08
Nickel	mg/L	0.010	0.015	0.026	5
Oil and Grease	mg/L	<5	<5	<5	10
pH	pH	8.2	8.3	8.5	6.5 - 9.0
Total suspended solids	mg/L	<5	6.5	11	30
Zinc	mg/L	0.031	0.086	0.154	0.4

A copy of the 2021/2022 EPL Annual Return has been provided as Appendix 1.

An exceedance of criteria for Zinc was recorded in an investigative sample undertaken in October 2021 (see NC2 in Table 37) when reviewing the dilution of brine from the Appin North water treatment plant (WTP) at LDP 5.

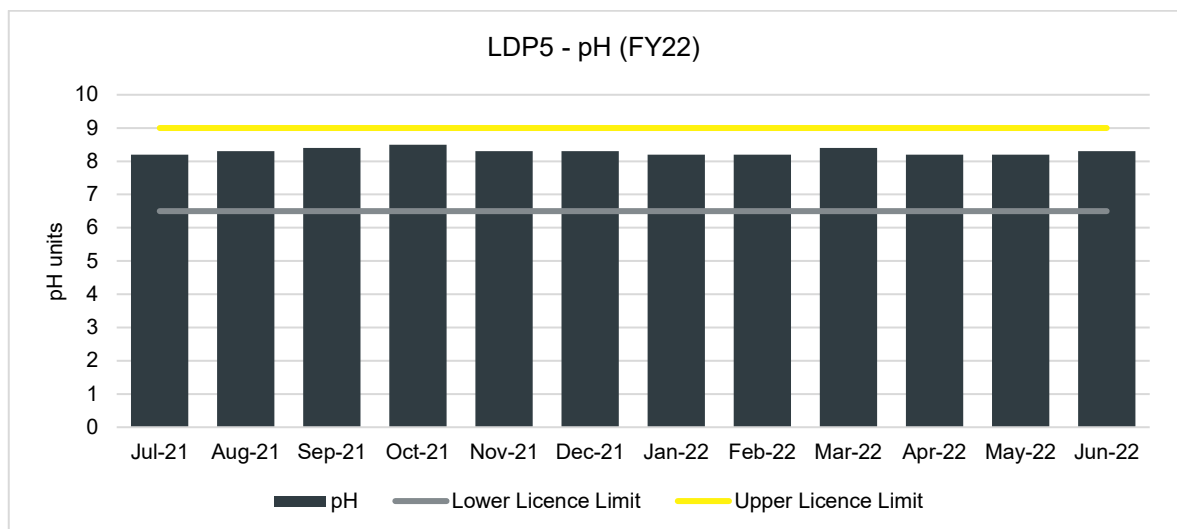


Figure 9: LDP 5 - pH (FY22)

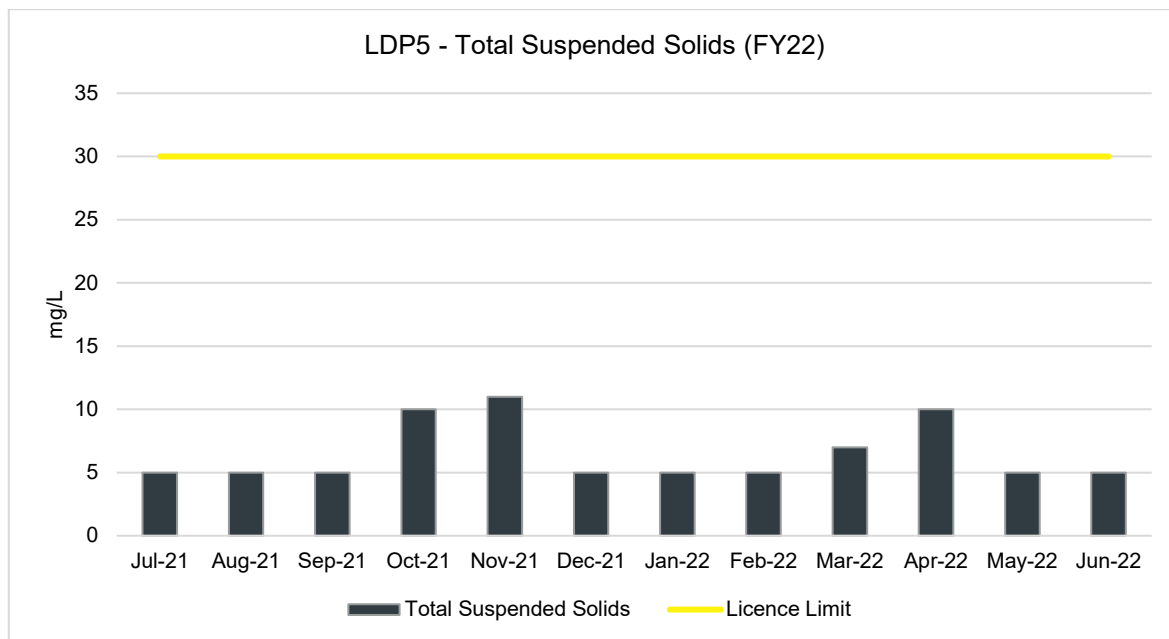


Figure 10: LDP 5 - TSS (FY22)

6.3.1.7 Allans Creek Monitoring Program

The monitoring program continued over the reporting period to meet the requirements of Condition E1 of EPL 3241. The purpose of the program is to determine the effect of the increased discharge of brine from the Appin Mine WTPs on Allans Creek, following the commissioning of the WTP at Appin North¹¹. The results from the monitoring will be compared to the predictions in the modelling undertaken. The monitoring is undertaken at five sites along Allans Creek (including LDP 5).

Following the identification of elevated levels of Zinc in brine from the Appin North WTP, the Allans Creek hydrogeochemical model was reviewed by Environmental Geochemistry International (EGi), using the results from the monitoring that had been undertaken. The conclusions were consistent with the 2019 EGi study.

The results of the monitoring and the comparison to the modelling results is planned to be completed in FY23, pending commissioning timeframes for the long-term WTP. Results from FY22 are generally consistent with FY21 results, with some natural variability within waterway results.

6.3.2 Cordeaux Colliery

Due to the cessation of coal mining, the amount of dirty water generated at the Pit Top has significantly reduced. Water from the surface areas is captured in the dirty water lagoon then transferred using a pump to the upper-level mine water holding lagoons for settlement and is gravity fed down through two more dams. This water is then transferred to underground mine workings via a gravity fed pipeline, negating the need for surface discharge. The water returned to the mine is of good quality.

During the reporting period approximately 5.6 ML of water was discharged from the mine water holding lagoons to the underground workings. An upgrade to the flow meter to reduce the risk of blocking from debris is proposed for FY23.

¹¹ The temporary water treatment plant was commissioned in May 2021. The long-term water treatment plant is planned to be commissioned in FY23.



Figure 11 shows the trends for pH and EC of water within the mine holding lagoons from 2000 to 2022. Since cessation of underground pumping operations in 2002, water quality in the mine water holding lagoons has greatly improved (particularly in relation to EC) and remained generally stable. During the reporting period, monitoring results within the mine water holding lagoons continue to reflect good water quality. The pH ranged between 6.62 and 8.19 and EC ranged between 145 and 209 $\mu\text{S}/\text{cm}$. Oil and grease results were below the limit of reporting for all samples collected in FY22, except for 3 September 2021 in which oil and grease was 6 mg/L.

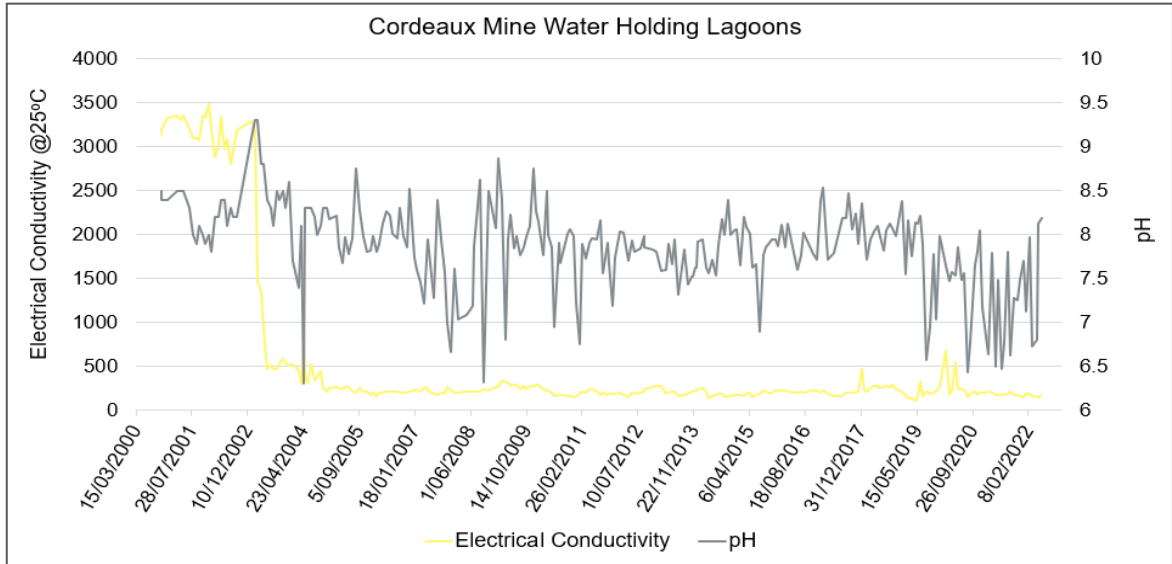


Figure 11: Water Quality Data - Mine Water Holding Lagoons

The clean area catchment run-off from the Cordeaux Pit Top site (including the sealed car parking area) reports to the sand filter lagoon and leaves site to the local environment via the sand filter underflow. Water quality from this point is analysed on a nominal monthly basis. Water quality analysis for this reporting period shows the discharge water quality was between 6.79 and 8.17 pH units, with EC ranging between 327 and 463 $\mu\text{S}/\text{cm}$. Oil and grease results were below the limit of reporting in all FY22 sampling events. Results from the Cordeaux Filter Lagoon outflow for the period 2000 to 2022 are shown in Figure 12.

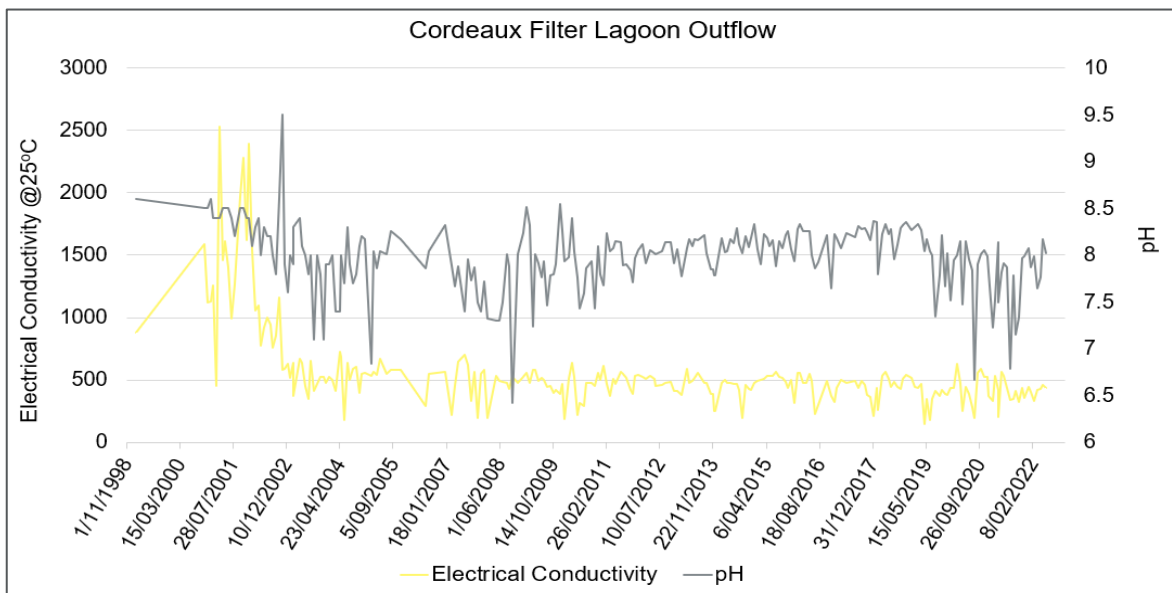


Figure 12: Water Quality Data - Cordeaux Filter Lagoon Underflow



The long-term data suggests that the existing storage capacity and water management is adequate in managing the current activities and rainfall events.

6.3.3 DCP

Surface water quality at the DCP is generally managed under the BlueScope Steel EPL 6092.

During FY22, IMC commenced an improvement project to dewater and desilt the sediment basin located within the 4-Area coal stockpiling site. Water was initially tested in three (3) locations prior to any treatment. Results were below the BlueScope Steel EPL 6092 limits for Point 88, with the exception of TSS. The pond was then treated with a flocculant to reduce TSS levels to meet the EPL requirements, confirmed via grab sample and discharged. Ongoing monitoring using a water quality meter was also implemented to identify any changes to TSS levels during the discharge process. The dewatering process was discussed with the Environment Protection Authority (EPA) prior to implementation and conducted in close collaboration with BlueScope Environmental Representatives.

6.4 Contaminated Land

6.4.1 Dendrobium Mine

No significant land pollution events occurred during the reporting period at Dendrobium Mine. A Preliminary Site Investigation (PSI) was undertaken by GHD in FY22. The PSI involved site inspections and a desktop assessment of previously reported areas of actual or potential contamination on site. A Targeted Site Investigation (TSI) is planned to be undertaken in FY23, using the results from the PSI.

6.4.2 Cordeaux Colliery

Cordeaux Colliery has a small, localised area which has been affected by leaching from the slag base at the surface switch yard. This was first noted in 2005 as vegetation in the localised area appeared to have been adversely affected. No further impact has been observed in this reporting period.

Rehabilitation planning for sites will include investigations to identify land contamination. If areas of contamination are identified that require remedial works, this will then be completed in an appropriate manner in accordance with the requirement/agreement of stakeholders and relevant Government agencies.

A PSI was undertaken by GHD in FY22. The PSI involved site inspections and a desktop assessment of previously reported areas of actual or potential contamination on site. A TSI is planned to be undertaken in FY23, using the results from the PSI.

No additional areas of land contamination were identified in FY22.

6.4.3 Corrimal No. 3 Shaft

On 4 April 2017, IMC identified that two transformers had been vandalised at the Corrimal No. 3 Ventilation Shaft which resulted in the spilling of oil at the site. The site is located north of Picton Road in proximity to Fire Trail No. 8, Cataract NSW. The spill was reported to relevant Government agencies. A clean up notice was issued by WaterNSW. A Remedial Action Plan (RAP) was submitted and works completed. WaterNSW advised the Clean Up Notice 4/2017 to be fully discharged. A Corrimal No. 3 Water Quality Monitoring Program (WQMP) was implemented. The final report completed in March 2020 recommended no further environmental monitoring related to the remediation of the transformer vandalism spill is warranted. Reporting on this incident is now considered to be complete.



A PSI was undertaken by GHD in FY22. A TSI is planned to be undertaken in FY23, using the results from the PSI.

Monthly inspections continue at Corrimal No. 3, focussing on weed management, site security and visual observations of sites previously affected by the spill. No environmental issues were identified during the reporting period.

6.4.4 DCP

Contaminated land at the DCP is managed under the BlueScope Steel EPL 6092.

A PSI was undertaken by GHD in FY22. The PSI involved site inspections and a desktop assessment of previously reported areas of actual or potential contamination on site. A TSI is planned to be undertaken in FY23, using the results from the PSI.

6.5 Threatened Fauna and Flora

6.5.1 Dendrobium Mine

No threatened species were identified on the Dendrobium Pit Top site, KVCLF or Ventilation Shaft 1 or 2/3 sites during this reporting period. Results from the flora and fauna monitoring undertaken via the SMP process are detailed in Section 6.14 of this report.

As noted in 6.2.1.3, slope stability issues at the Pit Top required the removal of a significant number of trees. The area was assessed and a Permit to Disturb was completed for these works.

6.5.2 Cordeaux Colliery

Tree trimming occurred beneath the endeavour energy powerlines during the reporting period. The site was inspected by a site environment specialist before work commenced and a Permit to Disturb was completed. No other activities have occurred at Cordeaux Colliery that would affect threatened flora or fauna species.

6.6 Weeds

6.6.1 Dendrobium Mine

Weeds are managed in accordance with the Landscape Management Plan.

Within the Dendrobium Pit Top area, some of the more accessible areas were targeted for weed species removal. This included the removal and/or treatment of Crofton Weed, Lantana, Privet, Ginger Lily and other woody and herbaceous weeds. Activities at the KVCLF targeted accessible areas for Mysore Thorn removal and/or treatment. Weed treatment was also undertaken along the KVRL.

Due to the significant amounts of rainfall over FY22, weed treatment and removal efforts were heavily impacted. A renewed focus in FY23 is planned to ensure that weeds continue to be managed effectively.

6.6.2 Cordeaux Colliery and Corrimal No. 3 Shaft

Weeds at Cordeaux Colliery are controlled on a routine basis by the site contract gardener through targeted spray activities. Weed growth within the area of the boundary fire break zone is addressed as required.

Weeds at Corrimal No. 3 Shaft are monitored during the monthly site inspection. Areas of concern are highlighted and targeted in periodic weed management campaigns.



6.6.3 Ventilation Shafts 1 and 2/3

Weed management is conducted at Ventilation Shaft 1 and Ventilation Shaft 2/3 in accordance with the Landscape Management Plan.

Weed species in the Ventilation Shaft 1 and 2/3 areas remain at very low densities and are generally located in disturbed areas or highly trafficked such as roadways. Inspections in FY22 were limited due to the excessive rainfall closing the catchment for over four months with minimal weed control activities undertaken.

6.7 Blasting

6.7.1 Dendrobium Mine

No surface blasting activities were undertaken during the reporting period. Minor blasting activities underground are undertaken using approved management plans.

6.7.2 Cordeaux Colliery

Cordeaux Colliery is under care and maintenance and no blasting was undertaken.

6.8 Operational Noise

6.8.1 Dendrobium Mine

6.8.1.1 Noise Management Strategies

Noise management is an important aspect of the Dendrobium operations as the Pit Top and KVCLF sites are located adjacent to residences in Mount Kembla and Kembla Heights. Quarterly noise monitoring is conducted to satisfy the requirements of the Consent and the approved Noise Management Plan.

Noise management strategies in place include:

- Low frequency reversing alarms installed on selected underground and surface-based vehicles.
- Rail track related noise management program.
- Noise monitors installed on the KVRL.
- Steel rollers replaced with polyurethane coated rollers on the Kemira Valley conveyor.
- Steel belt clips removed at KVT.
- Self-imposed night-time noise restrictions limiting mobile equipment and ballast movements around the Dendrobium Pit Top (from 10 pm to 6.00 am).
- Employee/contractor environment and community awareness training.

Noise from the rail operations on the KVRL has been a community concern since the commencement of operations under the Consent.

The rail line is located within 200 m of more than 500 receivers within the Mount Kembla, Cordeaux Heights and Unanderra communities. The track geometry consists of relatively tight curves which can increase the likelihood of squeal events caused by the wheel/track interface and/or brake related issues. Noise issues have been addressed by the Rail Noise Working Group (RNWG) through the below objectives:



- Review noise results and identify rail noise mitigation options.
- Improve targeted track maintenance.
- Develop strategies for positive proactive community engagement.

During previous reporting periods, the RNWG has undertaken numerous rail trials and noise monitoring campaigns to identify noise sources and minimise the rail noise generated in the local area. The work undertaken has been documented in previous Annual Reviews.

Rail noise investigations and actions were ongoing in FY22. They were discussed at the RNWG and some of the actions undertaken include track replacement following damage due to flooding and tamping of the track following wet weather.

The RNWG will continue to meet in FY23 to discuss complaints and monitoring results and identify improvement opportunities.

6.8.1.2 **Noise Monitoring Program**

The program includes noise monitoring of the Pit Top site, the KVCLF and the rail operations. Attended noise monitoring is carried out quarterly at three locations as shown on Plan 9. In FY22, an intermediate site for R39a was introduced to better measure compliance with the noise criteria. R39a is located near a stream and without line of sight to KVCLF, affecting the ability to measure potential noise emissions from operational activities. Instead, measurements are taken at a nearby location with low ambient noise and line of sight to KVCLF. Results are then extrapolated from this point to determine compliance.

In addition to the continuous noise monitors on the KVRL, five real-time noise monitors are installed at the Pit Top site as a proactive, internal measure to manage noise (refer to section 6.8.1.4).

The rail haulage noise measurements are completed annually. This monitoring has been undertaken as per the approved Noise Management Plan. Rail noise is also monitored using two fixed noise monitors along the KVRL. The data from the fixed noise monitors is used for investigating complaints.

The results from the attended noise monitoring are compared to the noise criteria for Dendrobium Mine and KVCLF for daytime, evening, and night-time periods as set out in the Consent. The LA_{eq} and LA_{1,1 min} noise impact assessment criteria are provided in Table 22.

Table 22: Monitoring Requirements and Prescribed Limits

Location	Noise Criteria LA _{eq,15 min} (dBA)			Noise Criteria LA _{1,1min} (dBA)
	Daytime (7 am - 6 pm)	Evening (6 pm -10 pm)	Night-time (10 pm - 7 am)	
R1	40	40	39	49
R6a	40	40	37	47
R39a	37	35	35	45

Attended noise monitoring was conducted on a quarterly basis throughout the reporting period.

During the reporting period, Dendrobium was generally compliant against the LA_{eq,15min} criterion, with the exception of six exceedances against the LA_{eq,15min} criterion and one exceedance against LA_{1,1min} at location R39a for KVCLF during evening and night periods, and one exceedance against the LA_{1,1min} at R6a in the night-time period. These exceedances are discussed in Section 11. These exceedances were reported to the Department of Planning and Environment (DPE), EPA and adjacent landholders as required.



Location R1 (17 High Street)

R1 is located to the north of the Pit Top. Representative noise results did not exceed the noise criteria during the reporting period. The LA_{eq,15-min} representative noise results for R1 for FY22 are provided in Figure 13 and annual averages are provided in Figure 14.

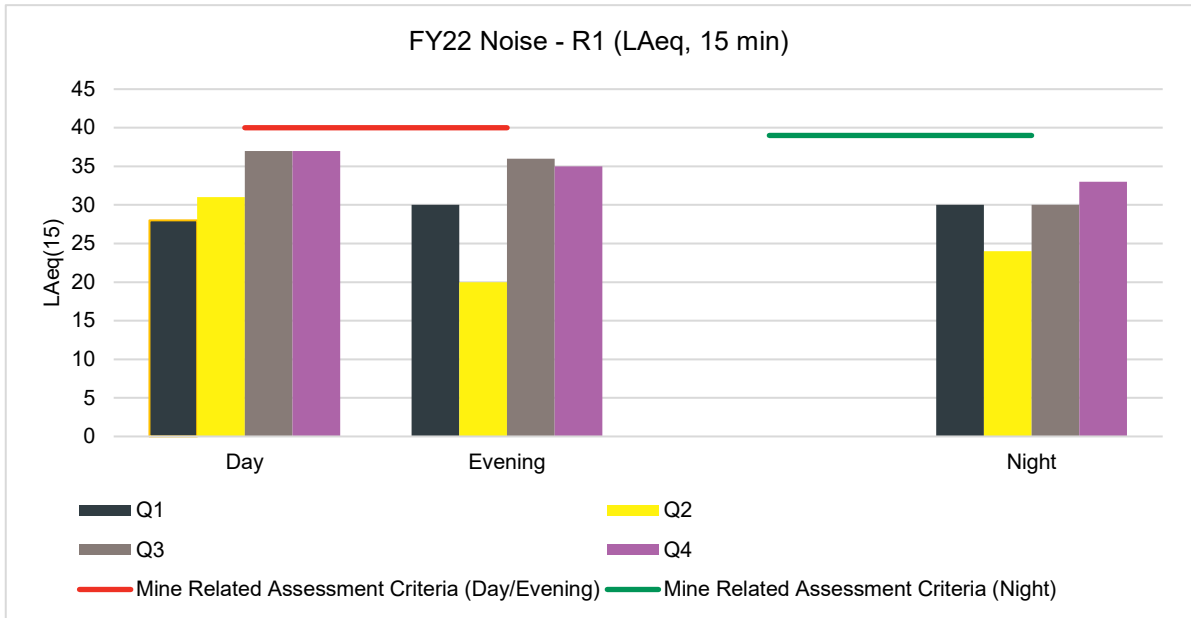


Figure 13: Site R1 Noise Compliance (LA_{eq,15 min}) – FY22

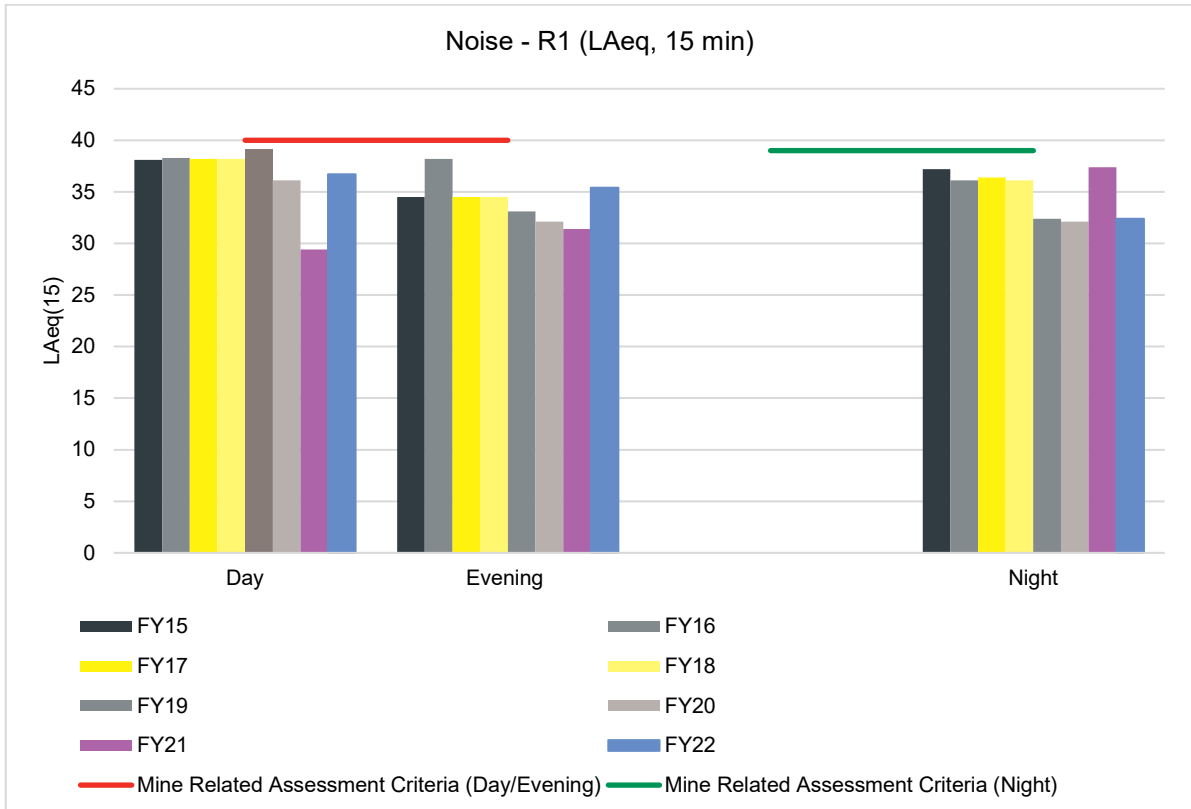


Figure 14: Site R1 Noise Compliance (LA_{eq,15 min}) – FY15 to FY22



Location R6a (374 Cordeaux Road)

R6a is located to the east of the Dendrobium Pit Top. The representative noise results did not exceed the noise criteria during the reporting period. LA_{eq} 15-min representative noise results for R6a for FY22 are provided in Figure 15 and annual averages are provided in Figure 16.

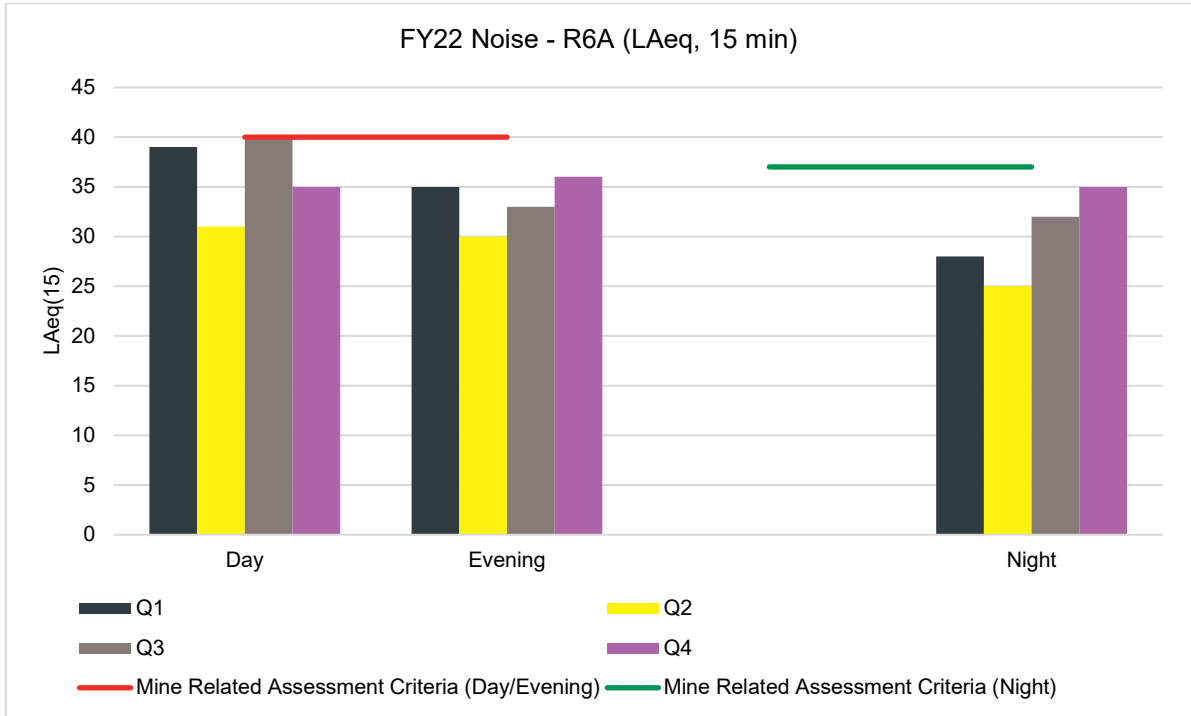


Figure 15: Site R6a Noise Compliance (LA_{eq,15 min}) – FY22

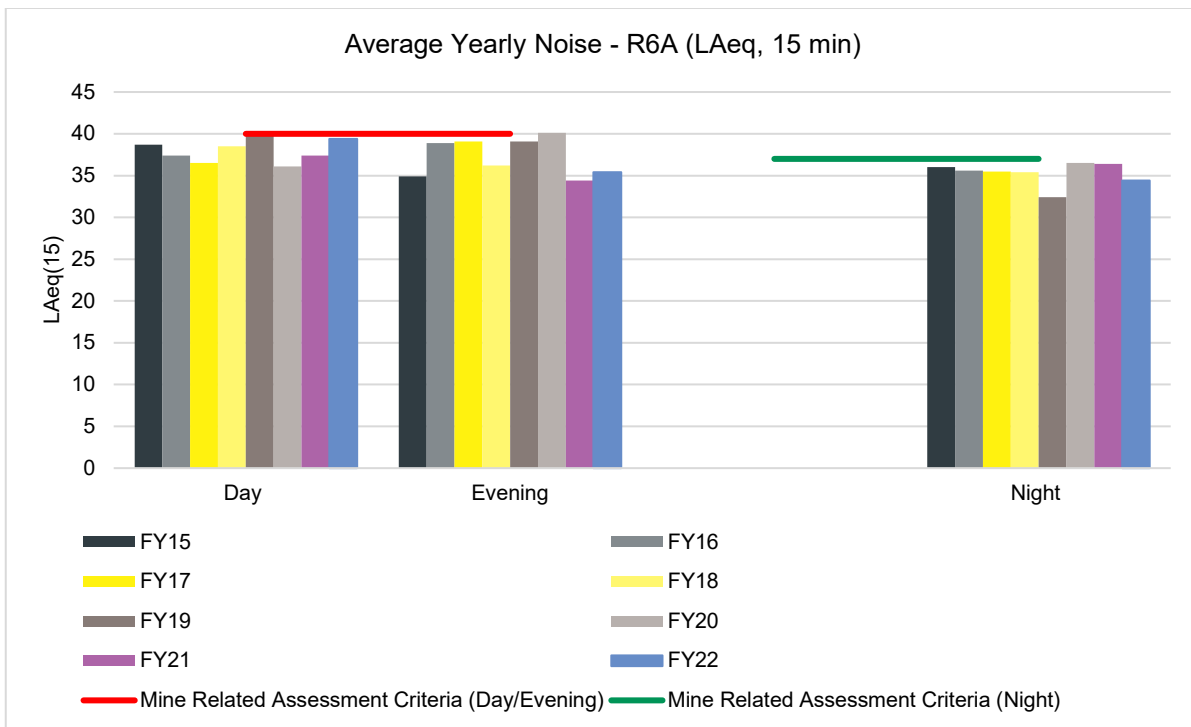


Figure 16: Site R6a Noise Compliance (LA_{eq,15 min}) – FY15 – FY22



Location R39a

R39a is located to the south-east of the KVCLF. There were three exceedances of the LA_{eq,15 min} noise assessment criteria in Condition 1 of Schedule 4 of the Consent in July 2021, one exceedance on 9 February 2022 and two exceedances on 2 June 2022. These exceedances are discussed in Section 11. The LA_{eq,15-min} representative noise results for R39a are provided in Figure 17 and annual averages are provided in Figure 18.

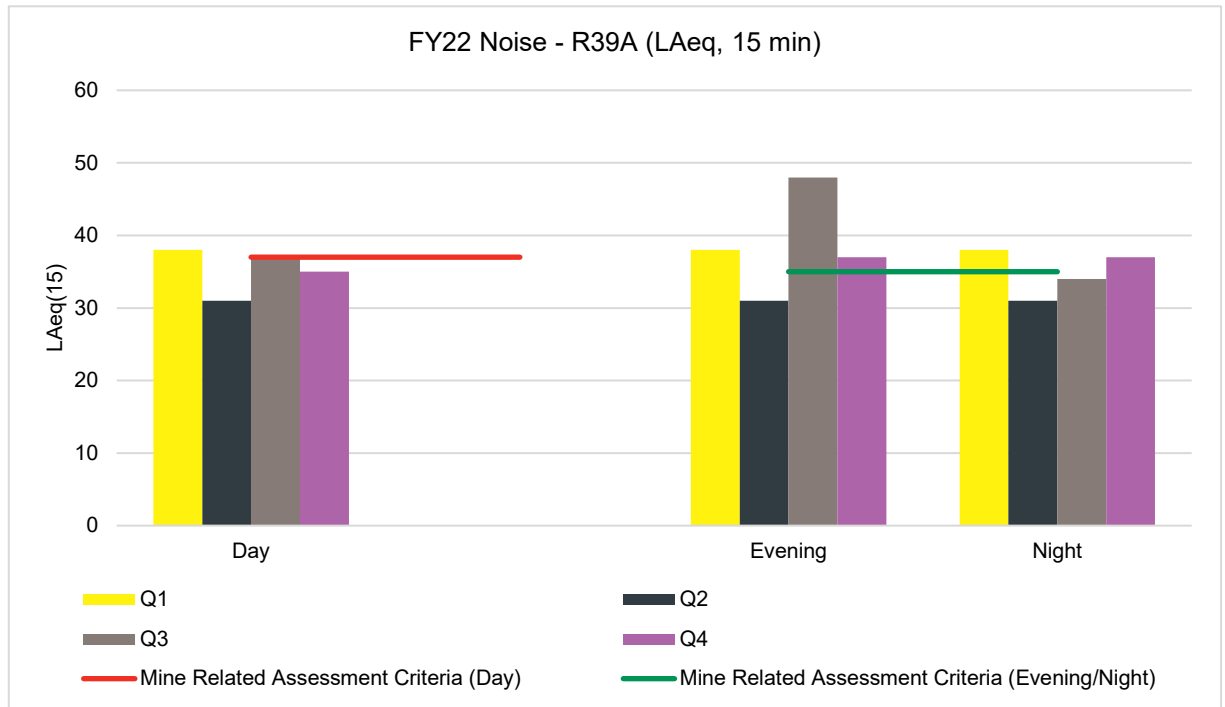


Figure 17: Site R39a Noise Compliance (LA_{eq,15 min}) – FY22

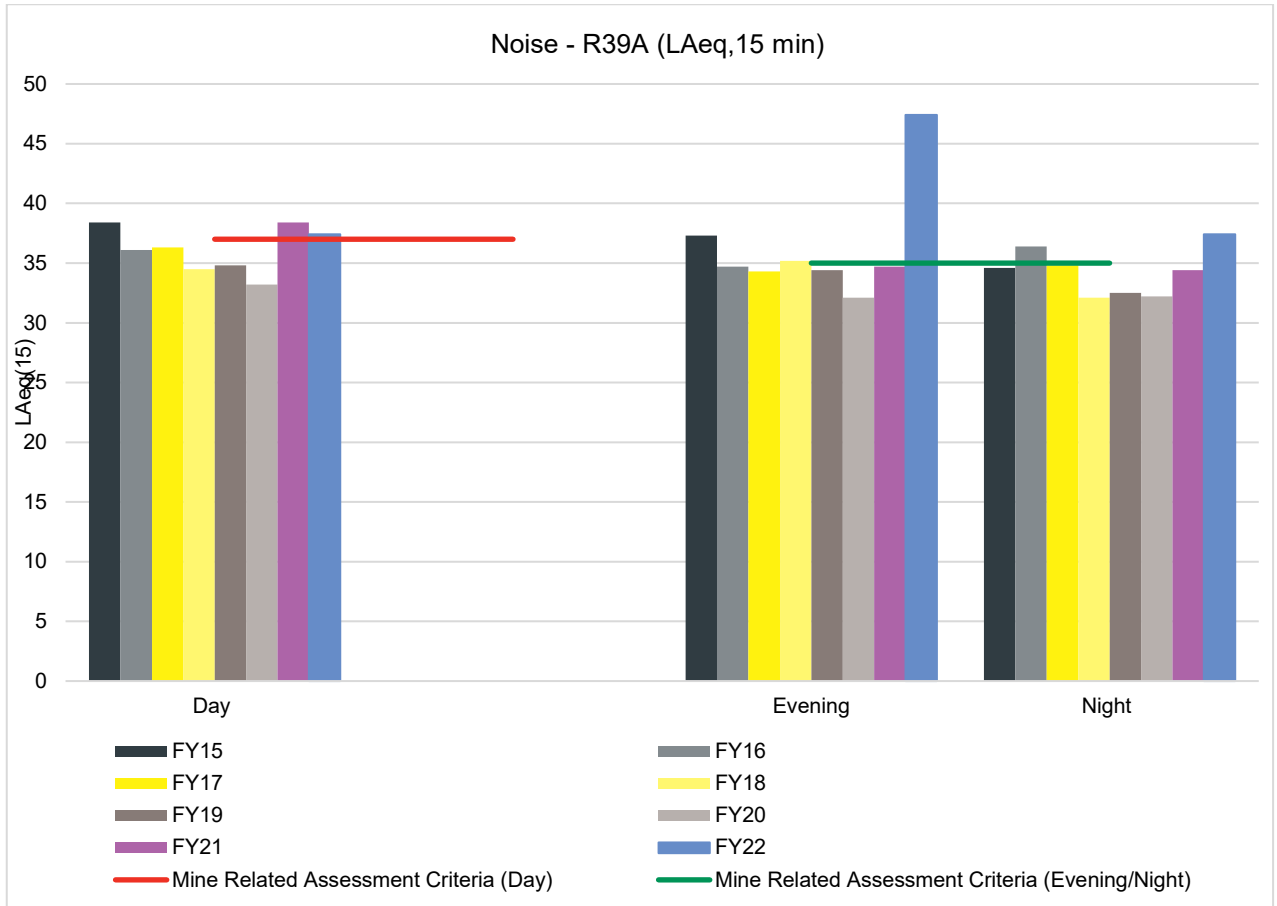


Figure 18: Site R39a Noise Compliance (LAeq,15 min) – FY15 – FY22

LA_{1,1 min}

There was one exceedance recorded for the LA_{1,1 min} noise impact assessment criteria in Condition 1 of Schedule 4 of the Consent at R39a in July 2021 and one exceedance at R6a recorded on 2 June 2022. These exceedances are discussed in Section 11. No exceedances or non-compliances were observed at R1 against LA_{1,1 min} criteria in Condition 1 of Schedule 4 of the Consent during the reporting period. LA_{1,1 min} representative noise results for sites R1, R6a and R39a are shown in Figure 19.

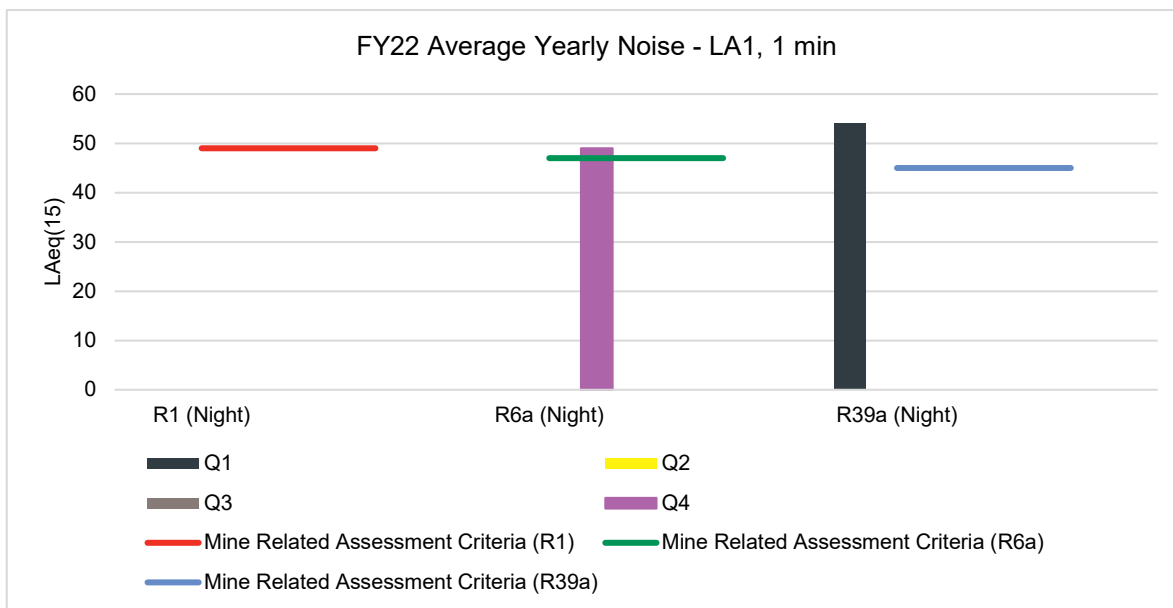


Figure 19: Site Noise Compliance (LA_{1,1 min}) for R1, R6a and R39a FY22¹²

6.8.1.3 Rail Haulage

A summary of the rail haulage noise criteria is presented in Table 23. The noise levels from all locomotives in use on the KVRL are required to comply with these noise impact assessment criteria.

Table 23: Rail Haulage Noise Criteria

Operating Conditions	Speed and Location of Measurement	Noise Criteria LA _{1,1 min} (dBA)
Idle with compressor radiator fans and air conditioning operating at maximum load occurring at idle	Stationary 15 m contour	70 dBA
All other throttle settings under self-load with compressor radiator fans and air conditioning operating	Stationary 15 m contour	87 dBA 95 dBLin
All service conditions	0-50 km/h 15 m from centreline of track	87 dBA 95 dBLin

Annual attended rail haulage noise measurements for the 82-class locomotive (Pacific National 8209) were conducted in October 2021. No exceedances or non-compliances with the noise impact assessment criteria were recorded.

¹² Where data is not shown on the graph, no mine related events were recorded and are deemed compliant.



6.8.1.4 ***Real-Time Noise Monitoring – Pit Top***

A directional noise monitoring system (DNMS) was installed at Dendrobium Mine in 2021.

The DNMS is comprised of five loggers that provide coverage of the Pit Top entrance, workshop and warehouse areas and Portal Road. The loggers record data on a continuous basis, and will assist IMC to identify activities, events and locations that contribute to the site noise level 15-minute average.

The data is uploaded to a software interface that generates noise contour maps that show how activities on site are contributing to total noise levels. An example LA_{eq-15min} graph and is shown in Plate 1.

Maximum noise level events are displayed for each residence and are able to be investigated by zooming to a shorter time period. The display at each residence will include the time of the event.

Noise trigger levels have been identified, and when the trigger levels are reached, it is planned for a notification to be provided to the appropriate site personnel using a traffic light warning system located in several locations around the Pit Top. This will allow site personnel to identify noisy equipment or activities that are contributing to higher noise levels and take action to reduce noise levels on site where practical and feasible.

It is anticipated that the notification system will be fully operational in the first half of FY23.

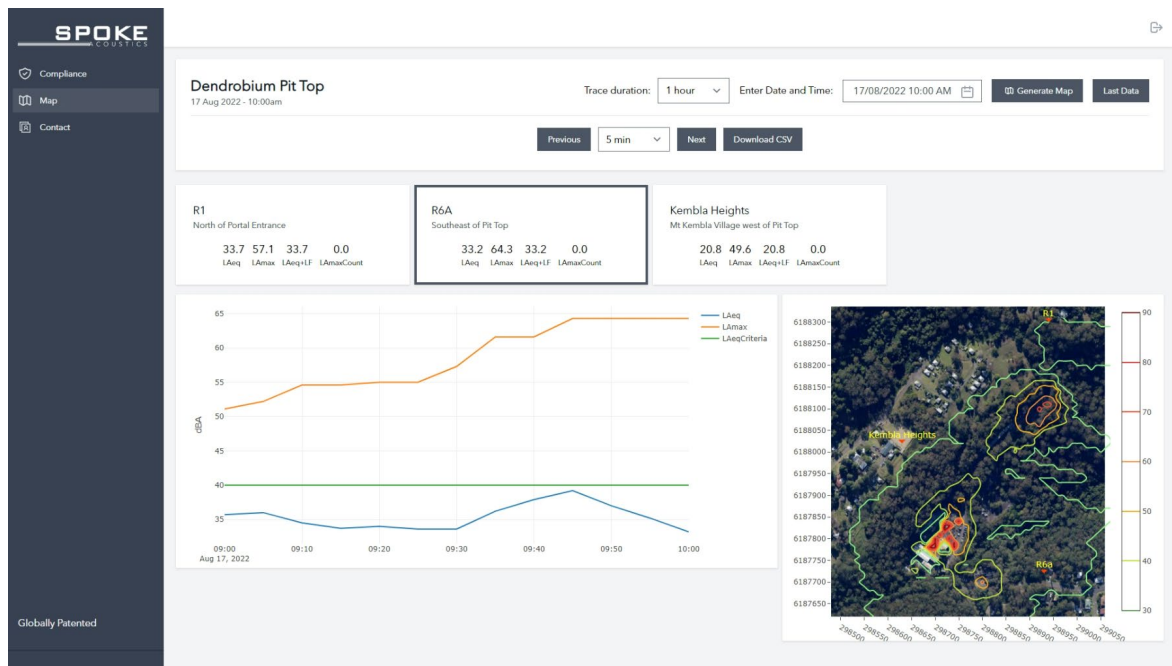


Plate 1: Real-time noise monitor system LA_{eq-15min} graph output

6.8.2 ***Cordeaux Colliery***

Noise is not monitored at Cordeaux Colliery as the site is in care and maintenance.

6.8.3 ***DCPP***

As the DCPP is within the BlueScope Steel premises, noise monitoring and management actions are not undertaken by IMC.



6.9 Visual Amenity and Lighting

6.9.1 Dendrobium Mine

Lighting at Dendrobium is managed in accordance with the Lighting Management Plan. The Dendrobium Pit Top site is shielded by established vegetation with minimal stray light leaving the site.

The KVCLF site is shielded within the valley with a majority of lighting turned off during the night-time period unless work is being carried out on site. No complaints regarding lighting at the KVCLF were received during the reporting period.

A lighting survey was conducted in late FY22 at Dendrobium and the KVCLF to verify compliance with Condition 29 of Schedule 4 of the Consent. Results were received in early FY23 and show that lighting at Dendrobium and the KVCLF meet the requirements for Australian Standard AS 4282:2019 – *Control of Obtrusive Effects and Outdoor Lighting*.

6.9.2 Cordeaux Colliery

Cordeaux Colliery is located in bushland with no immediate residential receivers. No complaints regarding lighting were received during the reporting period.

6.9.3 DCPP

As the DCPP is within the BlueScope Steel premises there were no lighting issues identified.

6.10 Aboriginal Heritage

6.10.1 Dendrobium Mine

The Dendrobium Area 3B LW9-LW18: Heritage Impact Assessment sets out the requirements to satisfy the Consent conditions for Aboriginal Heritage management in Dendrobium Area 3. Aboriginal Heritage Impact Permit (AHIP) No: 1132005 was issued to ICHPL on 18 December 2012. AHIP No: 1132005 allows for potential impacts (associated with subsidence movements from longwall mining) to Aboriginal archaeological sites within Dendrobium Area 3B. The management measures described in this Aboriginal Heritage Plan are the same as those to be implemented for AHIP No: 1132005. Details on subsidence impacts to Aboriginal Heritage sites over DA3B are included in Section 6.14.

6.10.2 Cordeaux Colliery

Sites of archaeological and natural significance were identified and assessed as part of previous longwall extraction approval processes. The assessments concluded that no significant effects would occur to the identified features as a result of longwall mining at Cordeaux Colliery.

Archaeological assessments and surveys were conducted in 2003 in relation to surface rehabilitation works planned for the Cordeaux sites. The assessments and surveys identified no items of aboriginal significance that will be disturbed by the potential rehabilitation activities.

6.11 Natural Heritage

6.11.1 Dendrobium Mine

Items of natural heritage are identified in the SMP process. Details regarding natural heritage and European heritage are reported in Section 6.14 of this report.



6.11.2 Cordeaux Colliery

Natural heritage is not considered a current issue at Cordeaux Colliery as the site is in care and maintenance.

6.12 Spontaneous Combustion

6.12.1 Dendrobium Mine

Spontaneous combustion has not been an issue at Dendrobium Mine. The coal characteristics at Dendrobium Mine are unlikely to lead to spontaneous combustion.

6.12.2 Cordeaux Colliery

There are no coal extraction or handling activities undertaken at Cordeaux Colliery and therefore no risk of spontaneous combustion.

6.13 Bushfire

6.13.1 Dendrobium Mine

During the reporting period, bushfire mitigation works were undertaken as required as described in the Bushfire Management Plan.

Asset Protection Zones maintained around surface facilities include:

- 28-38 Harry Graham Drive – Kembla Heights; and
- northern side of Cordeaux Road – Mount Kembla.

Fire Trails maintained around surface facilities include:

- containment line southern side of Dendrobium Mine Pit Top;
- Benjamin Road Fire Trail – Kembla Heights; and
- Stones Road Fire Trail – Kembla Heights.

Bushfire suppression sprays were installed at the Dendrobium Pit Top during FY20 to improve asset protection.

6.13.2 Cordeaux Colliery

Bushfire management at the Cordeaux Pit Top includes the maintenance of a fire break around the site boundary and of the extensive firefighting water pipeline (with booster pump facility) around the site. A tanker filling station for charging the fire line has been installed in proximity to the fire pump.

Clearing of excessive vegetation from within the pit-top boundary fire break zone is completed as required, determined by annual inspections. To reduce the risk of bush fires occurring due to contact with live power lines, line clearing is undertaken to selectively clear vegetation with the potential to encroach on power lines.

Prior to the onset of the summer months each year, IMC undertakes inspections of the property boundaries to determine appropriate bush fire mitigation and hazard reduction works to be undertaken prior to the hotter and drier summer months of the bushfire season. Sections of trees overhanging the Cordeaux site perimeter were identified during the reporting period and have been scheduled to be trimmed prior to the 22/23 bushfire season. In addition, during the reporting period the requirement to clear around the telecommunications infrastructure (GRN, Telstra and Optus) was



identified. Clearing of the understory has been undertaken and trimming of tree branches is scheduled to be completed before the 22/23 bushfire season.

The Rural Fire Service radio repeater is located in the personnel and materials tower at the Cordeaux Pit Top site.

6.14 Mine Subsidence

6.14.1 Dendrobium Mine

Mining using the longwall method results in subsidence (lowering) of the land surface. Dendrobium Mine has an approved SMP for each of its mining areas (1, 2, 3A, 3B and 3C) which describes the ongoing program of subsidence monitoring and management at the mine. These SMPs were developed in accordance with Condition 7 of Schedule 3 of the Consent.

The management of subsidence is undertaken in consultation with the Dendrobium Community Consultative Committee (DCCC), WaterNSW, Dams Safety NSW, NSW Resources Regulator, Mining, Exploration and Geoscience (MEG) and DPE, including the Biodiversity, Conservation and Science (BCS) Division. The implementation of the plan relates to monitoring and management of natural features, including:

- Surface water and groundwater.
- Landscapes, including steep slopes, cliffs, land suitability and areas prone to erosion or flooding.
- Terrestrial and aquatic ecology.
- Aboriginal and European heritage.
- Infrastructure (built features).

During the reporting period, LW17 extraction was completed on 13 October 2021. LW18 extraction commenced on 2 December 2021 and was completed on 17 May 2022. LW19 extraction commenced on 20 June 2022 and as of 30 June 2022 has extracted 56 m. Mine subsidence monitoring and reporting was carried out in accordance with the approved SMP for Area 3B and supporting management plans.

The monitoring program for LW17, LW18 and LW19 is defined by the Area 3A and 3B SMPs and supporting management plans which include:

- Dendrobium Area 3B Asset Protection Plan.
- Dendrobium Area 3B Groundwater Management Plan.
- Dendrobium Area 3A Swamp Impact, Monitoring, Management and Contingency Plan (SIMMCP).
- Dendrobium Area 3A Watercourse Impact, Monitoring, Management and Contingency Plan (WIMMCP).
- Dendrobium Area 3B SIMMCP.
- Dendrobium Area 3B WIMMCP.
- Dendrobium Area 3A Cultural Heritage Management Plan.
- Dendrobium Area 3B Aboriginal Cultural Heritage Management Plan.
- Dendrobium Colliery Area 3A –Longwalls 6 to 10 Part B - Subsidence Management Plan for Areas 1, 2, and 3A.
- Longwall 19 Area 3A Subsidence Management Plan.



- Waterfall 54 Management Plan.
- Sandy Creek Waterfall Management Plan.

A summary of monitoring commitments for this reporting period are provided in Appendix 7. Additional information is provided in the LW17 End of Panel (EoP) report, Area 3B SMP and supporting management plans, which can be accessed from the IMC website: <https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents>.

The LW18 EoP will be published in FY23.

6.14.1.1 Subsidence Movements

Subsidence movements resulting from the extraction of LW17 were measured at the following survey points and lines:

- Avon Dam Closure Lines.
- Wongawilli Creek Closure Lines.
- Dendrobium Area 3B and Avon Dam 3D monitoring points.
- Tributary Cross Lines.
- Swamp Cross Lines.
- Waterfall 54.
- Airborne Laser Scanner (ALS) of the area.

Subsidence parameters measured during the extraction and at the completion of LW17 were generally similar to or less than what was predicted within the Area 3B SMP (MSEC, 2022). For further detail on the subsidence movements measured for LW17, refer to the LW17 EoP Report. This report can be accessed via the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

The IMC Environmental Field Team (IMCEFT) undertook a detailed inspection at the base of Waterfall 54 on 2 August 2022. During the inspection a minor rockfall was observed. The Waterfall 54 Technical Committee met on 5 August 2022. Photographs of the rockfall were reviewed and it was concluded that the rockfall occurred between 6 October and 28 October 2021 and is likely associated with LW17 (refer to EX2 in Table 38 for additional detail).

6.14.1.2 Landscape Features

The IMCEFT have conducted detailed monitoring and inspections on landscape features including swamps, watercourses, rock outcrops and the general area within Dendrobium Area 3B. This monitoring was conducted in accordance with the Dendrobium Area 3B SMP, WIMMCP (versions dated December 2013, June 2015, October 2015, October 2017, March 2019, February 2020 and August 2020) and the SIMMCP (versions dated December 2013, June 2015, October 2015, October 2017, March 2019, February 2020 and October 2020).

Monitoring of water levels, water flow, water quality and key landscape features were also conducted by specialist consultants.

Twenty-nine new surface impacts, and updates to existing impacts, were identified by the IMCEFT during the FY22 reporting period. Impacts were observed within watercourses and landscape features such as access tracks, cliff lines and steep slopes. A summary of observed impacts over the reporting period is provided in Appendix 8.

For more information on landscape impacts, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.



6.14.1.3 Surface Water

HGEO (hydrogeologist consultants) completed an assessment of pre-, during and post-mining data after the completion of LW17 (HGEO, 2022). An additional report will be completed for LW18 in FY23.

On 22 December 2021, tributary site LA4_S1 recorded an exceeding predictions trigger for pH and EC, and a Level 1 trigger for Dissolved Oxygen (DO). A specialist assessment was undertaken in January 2022.

At many stream monitoring sites, including reference sites, water EC has decreased over the last two years due to higher-than-average rainfall and significant increase in runoff. Similarly, DO has trended higher due to higher flows and stream turbulence.

The effects of mining subsidence on surface water hydrology were assessed. TARP triggers for surface water hydrology were identified at Donalds Castle Creek (DCS2, DCU), DC13 (DC13S1), WC21 (WC21S1), WC15 (WC15S1), LA4 (LA4S1), LA3 (LA3S1) and LA2 (LA2S1). Water flow performance measures were met for LW17.

For more information on surface water, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

6.14.1.4 Wongawilli Creek

Towards the end of 2017, the water level in Pool 50 (previously 43a) on Wongawilli Creek fell below baseline levels (impact number DA3B_LW13_015, dated 28/11/2017). The observation triggered a Level 3 TARP because a previously reported fracture (first observed on 18/12/2013) is present in the sandstone forming the pool base. The water level returned to baseline levels during FY19. Pool water levels trended higher during the LW17 extraction period.

6.14.1.5 Upland Swamps – Shallow Groundwater and Soil Moisture

LW17 mined beneath and/or passed within 400 m of shallow groundwater and soil moisture sites within four swamps: Swamps 14, 23, 149 and 35a (HGEO, 2022).

Shallow groundwater TARP triggers were identified in Swamps 23 and 14 following the analysis of shallow groundwater data. No shallow groundwater TARP triggers were identified in Swamps 35a and 149.

Soil moisture TARP triggers were identified in Swamp 14 following the analysis of soil moisture data. No soil moisture TARP triggers were identified in Swamps 23, 35a and 149.

For more information on shallow groundwater and soil moisture, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

6.14.1.6 Aquatic Ecology

The aquatic ecology monitoring program is based on a Before, After, Control, Impact (BACI) design that provides a measure of variability at Potential Impact and Control Sites before, during and after extraction. This enables changes in the key indicators associated with mining-related impacts to be distinguished from natural variability.

Monitoring is undertaken in Wongawilli Creek, Donalds Castle Creek, tributaries WC21, WC15, LA4 and LA2 and comparable control sites.

The reductions in aquatic habitat that have occurred for over two years at monitoring sites along Donalds Castle Creek and WC21 constitute a Level 3 TARP trigger. No TARPs have been triggered



with respect to Wongawilli Creek during LW17 as there has not been a loss in aquatic habitat during the latest survey or previously for longer than one year.

Fracturing observed in other tributaries, including LA2, would likely cause flow diversions, however in isolation, these impacts represent relatively minimal impacts to the aquatic habitat and biota in this watercourse. The minor changes in water quality in LA4 also represent relatively minimal impacts to aquatic ecology.

Following the latest round of biennial monitoring in 2021, aquatic habitat in Wongawilli Creek was in good condition. No observations of physical mining impacts or potentially associated reduced pool water levels and flow were made by Cardno. AUSRIVAS indices and the abundance of aquatic macroinvertebrates on artificial collectors deployed in Wongawilli Creek were largely indicative of undisturbed habitat. There were some changes in macroinvertebrate abundances in 2021, however, these did not provide any strong evidence of impacts to macroinvertebrates, water quality or habitat condition in Wongawilli Creek. There was no apparent impact to fish assemblages in Wongawilli Creek in 2021.

During 2021 pool water levels and flow at sites on Donalds Castle Creek upstream of Fire Road 6 and WC21 remained reduced and likely associated previous and ongoing mining induced fracturing, flow diversions and/or groundwater depressurisation. Nevertheless, small pools were present on WC21 during each survey and on occasion in Donalds Castle Creek that would provide some limited aquatic habitat.

For more information on aquatic ecology, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

6.14.1.7 Terrestrial Ecology and Swamps

An annual terrestrial ecology report was prepared for 2021 (Niche, 2022) and forms the basis of assessment for the LW17 EoP Report.

In 2020, visual trends of drying (or areas of die-back) were observed at swamps that have been directly mined beneath. This general trend continued in 2021. Additional analysis in 2021 is suggestive of changing swamp conditions pre-mining and some limited observations of regeneration in previous areas of drying were observed.

Cumulative impacts have been observed at a number of Impact Upland Swamps, which show stronger trends of significant decline in total species richness over time and statistically significant changes to composition, with 'wetter' species becoming less common post-impact, suggesting a loss of species that prefer moist soils. Some swamps show a loss of species over time, with limited recruitment of new species.

For Area 3A, TARPs were triggered in two Impact Upland Swamps with no changes relative to 2020. For Area 3B, TARPs were triggered for five Upland Swamps. The increase is due to a continuation of trends observed across consecutive years, but largely a result of re-assessment of the complete LiDAR dataset that was not possible in 2020.

The Control Creeks for Littlejohn's Tree Frog (LJTF) monitoring in general were found to have a higher quality of breeding habitat for LJTF and were presumably chosen at the beginning of the program due to the known population of breeding adult records of LJTF and habitats. The 2021 analysis identified that where pre-mining frog detection data is available, detection was significantly lower at impact transects than the controls, indicating this disparity in control and impact transect pre-dates mining effects. Analysis in 2021 identified a statistically significant relationship between iron flocculant and the detection of the adult and egg mass lifecycle stages and that iron flocculant is more likely to occur at post-mining transects.

For Area 3A, three tributaries (SC10C, SC10(10) and WC17) had triggered a TARP and for Area 3B five tributaries: WC15, DC(1), DC13, WC21 and LA2 had triggered a TARP. These tributaries are



consistent with that of 2020, with LA2 being the only additional tributary to trigger a TARP level in 2021.

For more information on terrestrial ecology, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

6.14.1.8 Cultural Heritage

The assessment of cultural heritage and archaeological sites potentially impacted by LW17 was conducted by Niche Environment and Heritage Pty Ltd (Niche, 2022b). Two out of five Aboriginal archaeological sites were inspected as part of the assessment. Two were not accessed for safety reasons and will be assessed as part of the LW18 assessment. One was an isolated artefact and not inspected as it was considered not likely to be impacted by subsidence. No new impacts were recorded at the inspected sites.

For more information on cultural heritage, refer to the LW17 EoP Report on the IMC website: <https://www.south32.net/what-we-do/places-we-work/illawarra-metallurgical-coal/documents>.

6.14.1.9 Summary of Impacts

The observed impacts were generally less than or consistent with those predicted in the assessments undertaken prior to mining. A summary of the observed impacts and triggers during the reporting period is provided in Appendix 8. For further detail on impacts associated with LW17, refer to the LW 17 EoP Report. The locations of the surface impacts identified in the reporting period are shown in Plan 14.

6.14.2 Cordeaux

Due to the time elapsed since the last longwall panels were extracted at Cordeaux Colliery, the continued effects of subsidence will be negligible to nil and pose no threat to the safety of infrastructure or the public.

6.15 Hydrocarbon Contamination

6.15.1 *Dendrobium Mine*

Hydrocarbon bunded areas utilised during the reporting period were located:

- along the Pit Top Portal Road;
- at the rear of the workshop; and
- at the diesel refuelling/solcenic storage area.

Bunds are in place at all hydrocarbon facilities. Bunded areas are checked weekly and are pumped out when required to maintain sufficient capacity. In addition to the permanent bunded areas, portable bunds are used for transient storage or transportation of oils and fuels around the site. Spill kits and/or bins containing absorbent material are located around the site in areas where there is a higher potential for spillage. Surface personnel are made aware of the locations of these spill kits and absorbent material bins in their work area. The contents of the spill kits and the oil absorbent material bins are checked on a regular basis.

In this reporting period, a self-bunded hydrocarbon storage container (as shown in Plate 2) was installed along the Portal Road, to partially replace the permanent bunded storage area removed in FY21.



Plate 2: Hydrocarbon Storage Container

There were no externally reportable incidents of hydrocarbon contamination in the reporting period associated with Dendrobium Mine.

Following the identification of a bund modification at Appin East during FY22, a bund audit was undertaken throughout the IMC operations in March 2022, including Dendrobium Mine operations, to verify the compliance of chemical and hydrocarbon storage facilities. A number of improvement opportunities were identified, leading to corrective actions being progressively implemented to rectify identified issues.

6.15.2 Cordeaux Colliery

IMC has implemented and actioned a RAP following a transformer oil spill as a result of vandalism at the Corrimal No 3 Ventilation Shaft during a previous reporting period (refer to Section 6.4.3).

Following the identification of a bund modification at Appin East during FY22, a bund audit was undertaken throughout the IMC operations in March 2022, including Cordeaux Colliery Pit Top, to verify the compliance of chemical and hydrocarbon storage facilities. A number of improvement opportunities were identified, leading to corrective actions being progressively implemented to rectify identified issues.

6.16 Hazardous Material Management

6.16.1 Dendrobium Mine

6.16.1.1 Explosives

A Licence to Store Explosives is in place for the Dendrobium premises. Limited quantities of explosives were stored at Dendrobium over the reporting period.



6.16.1.2 Radiation Gauges

There is one radiation gauge located at the KVCLF site. The gauge is not currently being utilised. It was planned to decommission the gauge in FY22, however this was not completed and it will now be decommissioned in FY23. It is licenced and maintained as per the legal requirements. The gauge is housed in an appropriate container and inspected and tested in accordance with legislative requirements.

6.16.1.3 Dangerous Goods

The dangerous goods kept at Dendrobium Mine include compressed gases, flammable and combustible liquids and corrosive substances. Volumes stored are below the manifest quantities to require a Dangerous Goods Licence to be issued by SafeWork NSW.

A Site Emergency Information Container is installed adjacent to the front gate in accordance with legislative requirements. This information box includes the site manifest along with Safety Data Sheets (SDSs) for each of the dangerous goods kept on site.

6.16.1.4 Combustible Liquids

Dendrobium Pit Top has two bulk combustible liquid storage tanks, one for diesel and one for solcenic oil (~16100 L). These materials are delivered to site by tanker. These are stored in accordance with the requirements of *AS 1940-2017: The storage and handling of flammable and combustible liquids*.

6.16.1.5 Other Substances

IMC assesses new substances before their use on site by completing a Substance Evaluation Form and a risk assessment (based on the hazardous nature of the substance). SDSs and substance evaluations are available electronically from ChemAlert. Regular inspections of the storage sites are undertaken to check compliance with relevant standards.

6.16.2 Cordeaux Colliery

Cordeaux Colliery has an underground diesel tank (42,000 L holding capacity) and minor volumes of gas cylinders, and transient stores of oils/lubricants.

The diesel fuel is brought to site by fuel tankers. A bulk diesel fuel system has been installed utilising underground tank storage with locked bowser delivery. The majority of fuel used is for exploration equipment and field vehicles. Cordeaux Colliery has a Fuel System Operations Plan (FSOP) for the underground diesel tank. The FSOP was updated during the reporting period. Tank integrity testing and an analysis of the surrounding groundwater has been completed as required. The results confirm the absence of any leaks/contamination. A digital reconciliation monitoring system is installed on the diesel tank to better account for fuel-in and fuel-out of the system to assist in monitoring any fuel loss that could be attributed to tank leakage. This system is planned to be upgraded in FY23.

6.16.3 DCPP

Hazardous waste management at the DCPP is consistent with the standards practiced at Dendrobium Mine. SDSs and substance evaluations are available electronically from ChemAlert. Waste oil is collected on site and transported to a recovery waste management service.

There are ten gauges located in the DCPP that contain radiation regulated materials. The radiation regulated materials are licenced and maintained as per the legal requirements. All radiation regulated materials are housed in appropriate containers and are inspected and tested in accordance with legislative requirements.



6.17 Methane Ventilation

6.17.1 Dendrobium Mine

The underground mine workings are ventilated by drawing fresh air into the mine (intake air) via the Dendrobium Mine Portal Tunnel, KVT, and air intake Shafts No. 1 and 2. The ventilation air drawn through the mine is extracted via the No. 3 Shaft Ventilation Fans.

Three mine ventilation fans are installed at the No.3 Shaft site with two fans operating at any time. Mine ventilation air was drawn through the mine during the reporting period at an average rate of 109 m³/s with the discharge air (mine vent air) having an average concentration of methane (CH₄) of 0.10% and an average concentration of carbon dioxide (CO₂) of 0.14%.

A summary of Scope 1 and Scope 2 greenhouse gas (GHG) emissions during the reporting period for Dendrobium Mine and Cordeaux Colliery is provided in Table 24 and Figure 20. GHG emissions between FY15 and FY22 are shown in Figure 21. Cordeaux Colliery emissions are approximately 1.6% of the total emissions. GHG emissions were consistent between FY21 and FY22. Fluctuations in GHG emissions over FY22 are associated with increased or decreased production.

Table 24: GHG Emissions – Dendrobium Mine and Cordeaux Colliery – FY22

Pollutant	Units	FY21 Total	FY22 Total
Scope 1 emissions	kt CO _{2e}	240.99	236.66
Scope 2 emissions	kt CO _{2e}	60.65	63.46
Total	kt CO _{2e}	301.64	300.12

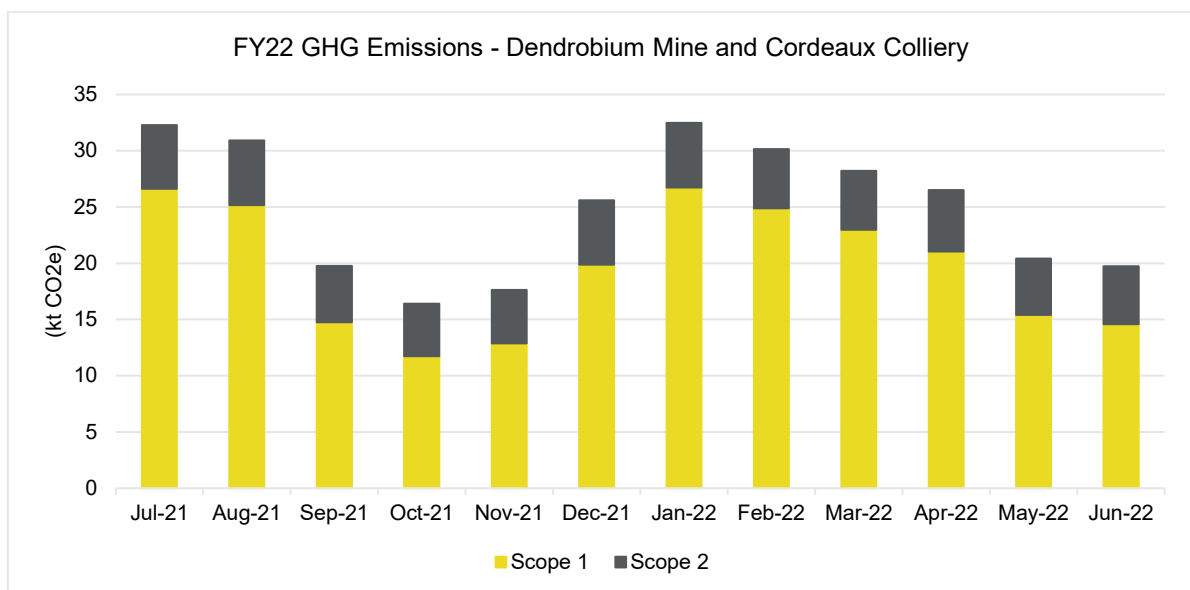


Figure 20: Dendrobium Mine and Cordeaux Colliery GHG emissions for FY22

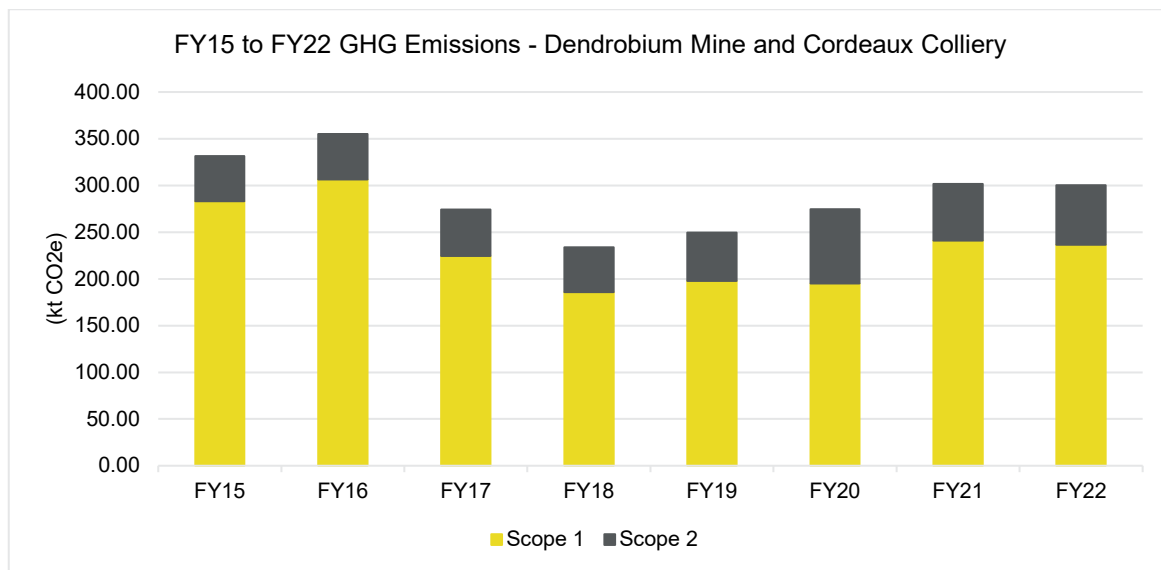


Figure 21: Dendrobium Mine and Cordeaux Colliery GHG emissions for FY15 to FY22

6.17.2 Decarbonisation Strategies

South32 has established greenhouse gas emission targets. Since setting these, IMC has met its short-term goal of maintaining Scope 1 emissions at FY15 levels through to the end of FY21. IMC is now working towards its medium-term emissions reduction target of 50% by 2035 on a FY21 baseline (operational emissions only). The plan is then to progressively reduce emissions, such that the business is carbon neutral by 2050. The goal of carbon neutrality by 2050 aligns South32 with the Paris Agreement, as well as the NSW aspirational target for 2050.

During FY19, IMC completed a concept level study that proposed a phased roadmap of projects with the aim of delivering the goal of carbon neutrality by 2050 through a combination of increased gas capture, treatment of ventilation air methane (VAM), and offsetting. During FY20, work towards delivering key projects associated with the roadmap to carbon neutrality began. In FY21, this work has focussed primarily on increasing the proportion of fugitive emissions generated by longwall production at Appin Mine that are captured by the gas drainage system and reticulated to abatement facilities (either power generation or flaring). This is measured by the post drainage capture efficiency (PDCE) metric. Dendrobium Mine has relatively low methane emissions in comparison to Appin Mine, which is why methane abatement at IMC is focussed on Appin Mine emissions.

Increases in longwall gas capture have been achieved with additional underground drilling programmes that began in FY20 and were continued into FY21. This includes directionally drilled holes targeting gas bearing strata below the longwall and into zones where it is thought gas can be extracted from the longwall goaf (the void formed by longwall extraction). Although the long-term target of an average PDCE of 67% has not yet been achieved, consistent increases in PDCE have been delivered with peak rates reaching or exceeding 67%. Average PDCE increased to approximately 56% in FY20, then to approximately 60% in FY21, and 63% in FY22. During South32's base year (FY15), PDCE was 51.4%. On several occasions during the previous three years, PDCE has reached 65-67% for periods of time, indicating the 67% annual target is achievable.

In FY22, South32 partnered with CSIRO to move ahead with work to address fugitive emissions that cannot be addressed through increases in gas drainage capture. South32 and CSIRO aim to develop and field demonstrate a full-scale next generation Thermal Flow Reversal Reactor (TFRR - known as thermal VAMMIT) and a safe ducting system at IMC's Appin Ventilation Shaft No 2 in FY23/FY24. This demonstration facility will process approximately 17 Nm³/s ventilation air (VA) and run in a self-



sustaining state at the low methane concentrations that are present in mine exhaust air (0.3 to 1% by volume).

The safe ducting system will provide critical safety features, such as fast responding laser type methane detectors, flame arrestor etc. to provide an intrinsically safe connection between a live coal mine and the thermal VAMMIT unit that will oxidise >96% VAM. The average achievable methane emissions reduction is estimated at approximately 30 kt CO_{2e} per year, based on Appin’s current exhaust average methane concentration.

6.17.3 Cordeaux Colliery

Cordeaux Colliery had no methane drainage extraction plant to support its underground gas management activities. Following cessation of mining (the site is in care and maintenance), the emissions to the atmosphere via the main mine ventilation fans significantly decreased. The mine ventilation fans were shut down and the shafts temporarily sealed in December 2003.

6.18 Public Safety

6.18.1 Public Safety around Operational Areas

Public and workplace safety is a major consideration for IMC. Safety risks and control mechanisms associated with the Dendrobium and Cordeaux operations are provided in Table 25.

Table 25: Safety Risks and Control Mechanisms

Potential Safety Risk	Control Mechanism
Safety on site	<p><u>Dendrobium</u></p> <p>The Dendrobium facilities and the Pit Top site has 24-hour surveillance of the front car park and entry areas. Fencing of the sediment ponds at both the Pit Top and KVCLF sites minimises the potential for injury to the public.</p> <p>Site personnel are required to undertake an induction which outlines the accountabilities and responsibilities in regard to safety whilst working on site, which enables them to gain access to site via the swipe card system.</p> <p>Prior to visitors entering the Pit Top area they are required to contact the Illawarra Access Controller (IAC) at the turnstile or their site contact to gain access to the site. From this point the visitor is accompanied by their site contact. Once on-site additional safety information is shared via:</p> <ul style="list-style-type: none"> • safety training and awareness sessions for all personnel working on site which allow for two-way communication between management and the workforce; • pre-shift safety discussions and Toolbox Talks; • posters and TV screens presenting safety information located around the site; • periodic business updates including email and newsletter material distributed to workers; and • various meeting forums that include safety as an agenda item in addition to a dedicated site HSE Committee meeting.



Risk assessments are required to be undertaken prior to undertaking work. This includes the use of Take 2s. Safety procedures are also in place and available.

Cordeaux

The Cordeaux Colliery Pit Top area is enclosed by a chain wire security fence around the perimeter of the site. The main site access gates are locked at all times that IMC personnel are not in attendance. Visitors must contact the IAC or their site contact at the turnstile to gain access to the site. From this point the visitor is accompanied by their site contact. Access to the site is via boom gates and turnstiles requiring a site access pass.

At risk infrastructure on site is maintained to reduce the risk to the general public. The site is currently under care and maintenance. When closure of the site occurs (at a time not yet determined), the site will be left in a permanently safe condition to the satisfaction of relevant authorities.

Remote sites (including Corrimal #3 shaft) have remained fenced and locked during this reporting period. A monthly inspection is completed at Corrimal #3 shaft which assesses site security.

Road Safety

Dendrobium

A Drivers' Code of Conduct is in place at Dendrobium to specify appropriate driver behaviour for all those who drive through the village to the mine including employees, contractors and truck transports, as required by the Consent and Traffic Management Plan. The Code of Conduct is communicated to personnel during the site induction and copies are periodically distributed to major suppliers and transport companies. Compliance with the Code of Conduct is strictly enforced.

Cordeaux

Lane alignment and roadway markings are present at the Cordeaux Colliery entrance on Picton Road to provide for safer traffic movements when entering and exiting the site.

Rail Safety

Dendrobium

The rail facilities are fenced (where possible), with the main sites patrolled on a regular basis by a contracted security firm.

Signage and security cameras are in place.

Site inspections are undertaken to maintain safety systems.

Community newsletters and letter box drops are used to communicate relevant safety information to the public.

6.18.2 Public Safety around mining areas

The current Dendrobium longwall mining activities are occurring within WaterNSW land. IMC has developed procedures for working around and accessing potentially unstable ground. The controls are outlined in the document 'Working Around Rock Falls, Cliff Lines and Unstable Areas' (ICAP0145). The controls currently in place are listed in Table 26.



Table 26: Safety Risks and Control Mechanisms – WaterNSW land

Potential Safety Risk	Control Mechanism
Rock falls	<p>There is restricted access into the Metropolitan Special Area.</p> <p>Signs are installed around potentially unstable areas that may be impacted by mining. Spatial data is installed on field tablets highlighting areas to avoid. Set distances are in place to remain back from hazardous features. New hazards or movements identified around unstable areas must be reported to supervisor and discussed with the team. Barricading/ safety tape are placed as required. Unstable areas are not to be accessed during active subsidence.</p> <p>IMC employees and contractors working around potentially unstable areas are required to complete the Site Induction, Emergency Response Training and 4WD training, maintain active communications and utilise the sign-in and sign-out process.</p>

6.19 Waste Management

6.19.1 Dendrobium Mine

6.19.1.1 General Waste

General waste bins are transported from Dendrobium Pit Top to Cleanaway’s depot at Charcoal Place, Unanderra. The waste is then tipped onto a sorting pad and is directed into its correct waste stream for recycling or disposal. Waste specific skips are in place for scrap steel, timber, oil drums and particulate filters. Dendrobium Mine’s main solid waste streams, the volume of waste recycled and disposed of, and the recycling efficiency for Dendrobium Pit Top is provided in Table 27 and Table 28 respectively.

Table 27: Waste Streams and Total Volumes

Waste Stream	Treatment / Disposal	Volume (tonnes)		
		FY20	FY21	FY22
Timber	Recycled off site	141.2	60.7	22.03
Cardboard and paper	Recycled off site	5.3	5.7	5.76
Steel and scrap metal	Recycled off site	243.3	195.4	235.9
Commingle	Recycled off site	5.0	3.8	2.94
General waste (ResourceCo)	Recycled off site	689.4	594.3	781.03
Particulate (diesel) filters	Off-site treatment and disposal in landfill	191	358.6	374.08
General waste	Landfill	73.59	101.5	99.89



Electronic waste	Recycled off site	0.026 ¹³	0.2 ¹⁴	1.87 ¹⁵
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Table 28: Recycling Efficiency for Reporting Period

Total Recycled (tonnes)	Total Removed from Site (tonnes)	% Recycled
1047.66	1521.86	69%

6.19.1.2 Waste Reduction and Recycling

In FY19, IMC and its main waste contractor began redirecting wastes from landfill to reduce the waste footprint of IMC. A Cleanaway and ResourceCo joint venture Resource Recovery Facility, located in Wetherill Park, processes dry non-recyclable waste. Combustible materials are turned into Processed Engineered Fuel (PEF), diverting approximately 94% of waste material from landfill. The PEFs, Low Calorific Value (CV) and High CV, comply with the requirement of the Clean Energy Regulator under the Emissions Reduction Fund.

Waste generated on site in FY22 was 1521.86 tonnes. 880.92 tonnes of the total waste was classified as general waste, of which 781.03 tonnes were diverted for recycling at ResourceCo and the remaining 99.89 tonnes was disposed as landfill. Redirecting this general waste to the recycling facility is an alternative end-of-life treatment and final disposal of products opportunity. Approximately 69% of total waste was recycled off-site during the reporting period. Waste has increased over the reporting period with a rise in landfill due to additional machines on-site for the longwall move undertaken prior to the end of FY22 (see Figure 22).

¹³ Recorded e-waste disposed at the Regional Operations Centre (ROC) via the University of Wollongong (UoW) e-waste bin. E-waste is recycled by an external recycling vendor.

¹⁴ 68kg was disposed at the Regional Operations Centre (ROC) via the University of Wollongong (UoW) e-waste bin. 136kg was disposed via Certified Environmental Disposal services provided by DXC.

¹⁵ Volume across IMC. All electronic waste is processed (recycled or disposed of) by ACT Logistics.

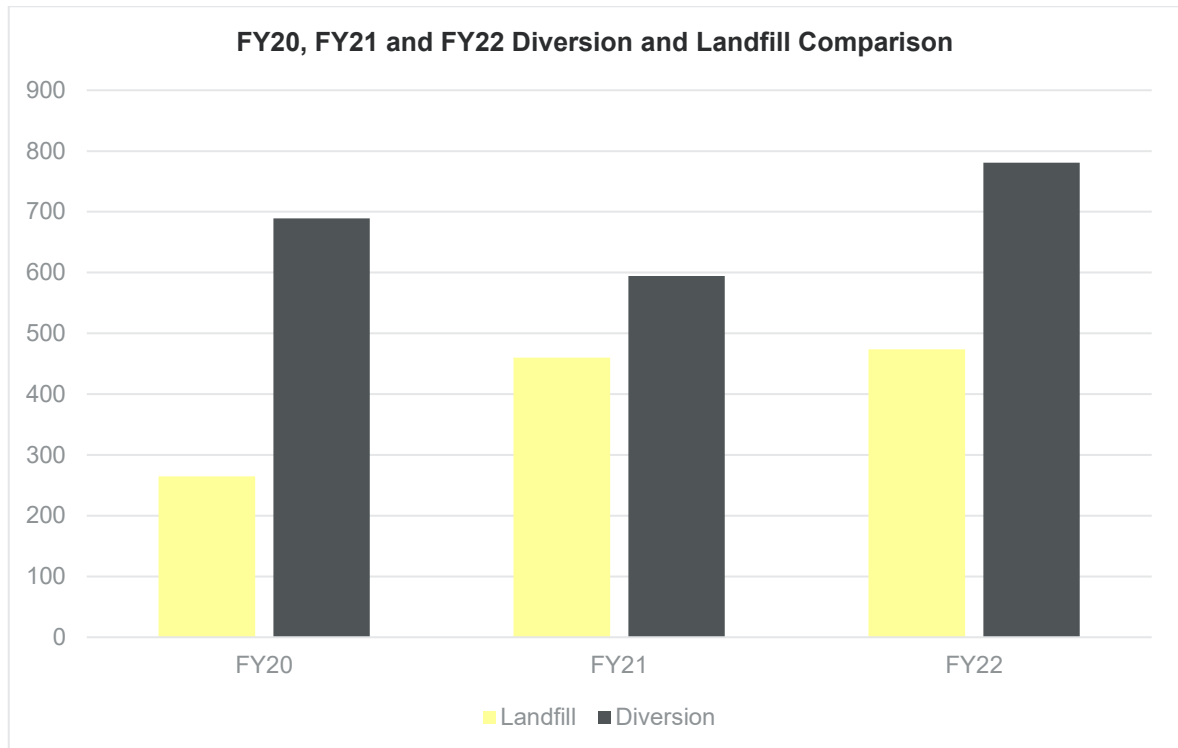


Figure 22: Recycled and landfill waste streams for FY20, FY21 and FY22

6.19.1.3 Oil and Grease Containment and Disposal

Oil and grease produced on-site is transported from the Pit Top for processing by a licenced contractor off-site. Oil sumps and traps are in place and are periodically inspected by site personnel and emptied as required by a licenced contractor. Hydraulic oil is separated from oily water volumes via a licenced contractor. Oil and grease volumes removed from site during the reporting period are included in Table 29.

Table 29: Oil and Grease Volumes – Dendrobium Mine

Waste Stream	Volume (tonnes)	
	FY21	FY22
Oil	35	41
Oily water/Sludge	45.3	1.6
Solcenic Oil ¹⁶	46.5	72.06

6.19.1.4 Coal Wash Management

Coal wash is a by-product of processing RoM coal. During FY22, a total of 0.934 Mt of coal wash was emplaced at the Appin Mine CWEA. This was comprised of 0.839 Mt of coal wash from the WCCPP and 0.95 Mt from the DCPD.

¹⁶ In FY21 this waste stream was reported as hydraulic oil.



The Stage 3 CWEA provides 33.5 Mt of coal wash emplacement with an expected emplacement life of approximately ten years as of June 2022 (based on projected coal wash volumes). The Stage 4 CWEA will provide an additional 26 Mt of coal wash emplacement with an expected life to 2048.

Table 30 outlines the nominal capacity and status of each of the coal wash emplacement areas.

Emplacement Stage	Estimated Capacity (Mt)	Emplacement Status
1	4.6	Complete
2	20.8	Complete
3	33.5	Current
4	26	Not Yet Commenced

During the reporting period, IMC diverted approximately 0.28 Mt of coal wash from the DCPD for beneficial uses (i.e. as an engineered fill in housing developments and for the development of arterial and agricultural roads, and a further 0.258 Mt under Operational Purpose Deductions (OPDs) for engineering works development, with over 7 Mt diverted since 2009. IMC has a long-term agreement with Lend Lease at Calderwood, that should continue to see a large volume of coal wash diverted for beneficial uses in the second half of FY23 and beyond. IMC continues to develop a pipeline of major projects that will require engineered fill for the next five years.

The IMC Coal Wash Road Base Project has not yielded results to date.

Considerable previous work continues to be carried out on the alternative uses of coal wash, including ongoing monitoring of potential contaminants when coal wash is used for landfill or emplacement. This work has been reported in previous Annual Reviews.

IMC will continue to be involved in research, the development of, and implementation of alternative uses for coal wash in order to minimise the volume of coal wash emplaced at the CWEA in the future.

Approximately 233 kt of coal wash was exported to India during FY22 as a low-grade thermal coal. The product is used for power generation and the production of cement after blending with high calorific value thermal coal. Anticipated sales in FY23 are estimated at 450 kt.

6.19.2 Ventilation Shafts 1, 2 and 3

During the reporting period, any waste generated at the Ventilation Shaft 2/3 site was taken off site and disposed of through the Dendrobium Mine processes. No activities are undertaken at Ventilation Shaft 1 and therefore there was no waste generated.

6.19.3 DCPD

Waste at the DCPD is managed under the BlueScope Steel contract with Veolia Waste Management.

6.19.4 Cordeaux Colliery

6.19.4.1 General Waste

General waste produced at Cordeaux Colliery was negligible throughout the reporting period as the site is on care and maintenance and the waste generated is predominantly from personnel utilising offices on site. A review of waste management for Cordeaux was undertaken during the reporting period and an action plan was implemented. This includes much of the waste that previously went to landfill now going to ResourceCo for recycling. Cleanaway Waste Management Services attend site to remove waste. The amount of waste from Cordeaux Colliery is shown in Table 31. Waste such as cardboard, paper and batteries are set aside for recycling or reuse. Site clean-ups undertaken during FY22 contributed to an increase in general waste (including ResourceCo).



Table 31: General Waste Volumes for Reporting Period – Cordeaux Colliery

Waste Stream	Treatment/ Disposal	Volume (tonnes)		
		FY20	FY21	FY22
Commingle	Recycled off site	2.34	8.8	2.52
General/Store Waste	Landfill	22.7	24.6	23.07
General Waste (ResourceCo)	Recycled off site	0	0	14.3
Cardboard	Recycled off site	0	0	0.34
Oily Water/Sludge	Treated off site	0	8.5	0
Timber	Recycled off site	3.66	0	0
Steel	Recycled off site	0	0	14.22

6.19.4.2 Sewage Treatment / Disposal

All sewage effluent is transported off site by a licenced contractor for treatment and disposal.

6.19.4.3 Oil and Grease Containment and Disposal

No bulk oils or greases are stored on site. Oil sumps and traps remain in place and are periodically inspected by site personnel and emptied as required by a licenced contractor.

7. WATER MANAGEMENT

7.1 Groundwater

7.1.1 *Dendrobium Mine*

The Dendrobium groundwater monitoring program was undertaken during the reporting period as defined in the approved Water Management Plan and Groundwater Monitoring Plan under the SMP. The purpose of the program is to analyse the water quality and quantity within the mine and mining area to satisfy health, safety and environmental aspects of the Consent and South32 Policies and Standards. The Plans were developed in consultation with Dams Safety NSW, DPIE (now DPE), WaterNSW, and the Department of Resources and Energy (now Resources Regulator).

Water sampling is performed underground with samples analysed on-site and at NATA accredited laboratories. Mine water usage, water flows and volumes within the mine are analysed and reported regularly (i.e. on a monthly basis). Surface and underground vibrating wire piezometers are utilised to monitor groundwater response to mining. Monthly reports are prepared and submitted to Dams Safety NSW, WaterNSW and DPE summarising water quality and the water balance at Dendrobium. During the reporting period, Dendrobium operated under a Principal TARP as outlined in the “Avon and Cordeaux Reservoirs DS Notification Area Management, Closure and Contingency Plan”. During most of the reporting period, the mine operated at ‘Normal’ in the Principal Response Flowchart (Figure 23) while had three days of ‘Level 1 Alarm’ in August 2021. The Level 1 TARP is related to heavy rainfall events and a leaking pipe in Area 1 rather than increased groundwater make.

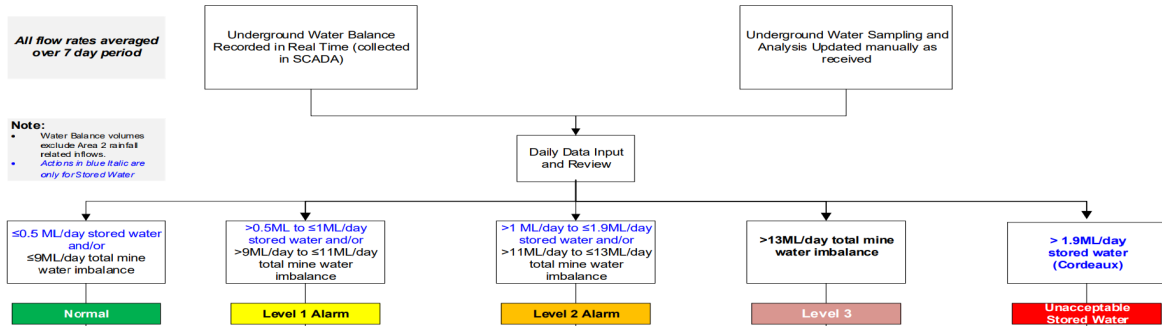


Figure 23: Cordeaux Principal Response Flowchart in “Avon and Cordeaux Reservoirs DS Notification Area Management, Closure and Contingency Plan”.

A summary of the mine water balance for the reporting period is provided in Figure 24.

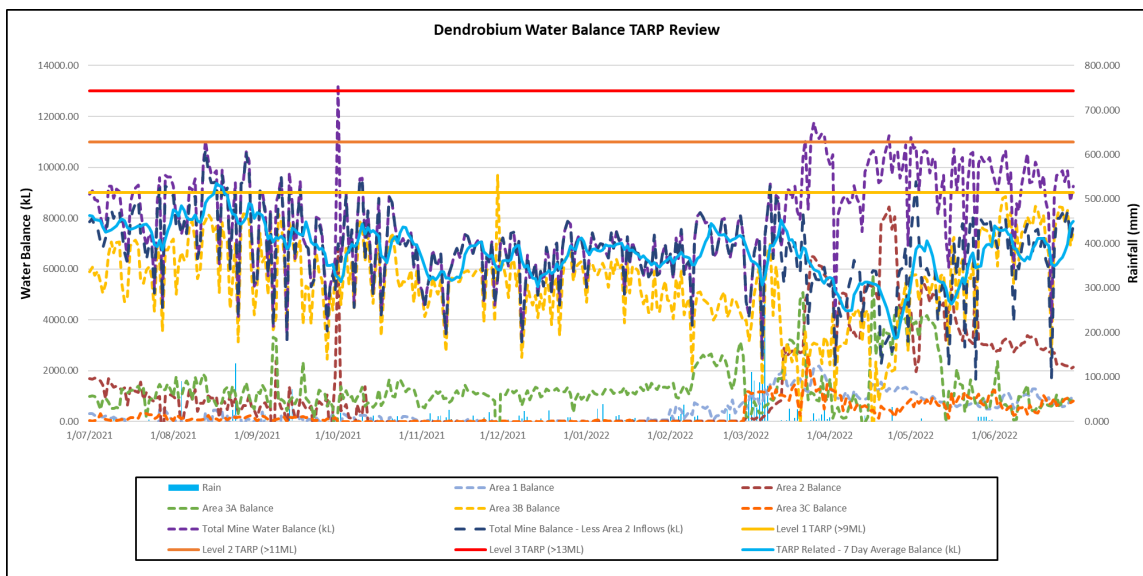


Figure 24: Dendrobium Mine Water Balance

The groundwater reporting to the mine workings during normal conditions is largely characteristic of coal measure and associated strata water. This water is higher in salinity and age based on water chemistry and isotope analysis. Water samples from inflow events have been typical of near seam coal and shale water. Geochemistry, and isotope analysis is conducted monthly to determine probabilistic proportions of any modern rain or dam water entering the workings. Fluctuations in the water balance were largely a result of significant rainfall events. The water balance for the reporting period is shown in Table 32.



Table 32: Water Balance Statistics for the reporting period

Statistic	Total Water Balance	7 Day average Water Balance Less Area 2 Inflows (TARP related)	Units
Mean	8,572	6,703	kL/day
Maximum	14,547	9,374	kL/day
Minimum	2,482	3,264	kL/day
Total	3,128,666	2,446,774	kL

Mining of LW17 resulted in continued depressurisation of the target coal seam and overlying strata. The observed changes in groundwater levels are in line with (or less than) numerical model predictions that support mining approvals. No Avon Dam series bores were installed to LW18 due to the prohibitively rough terrain.

As expected, the greatest depressurisation is within the Wongawilli Coal Seam, and decreases with height above the seam. Incremental drawdown in the Scarborough, Bulgo and Hawkesbury Sandstones is also apparent.

Between 2015 and 2020, a series of monitoring bores were installed along the barrier zone between Lake Avon reservoir and Area 3B. Groundwater monitoring in the Lake Avon barrier zone shows widespread depressurisation of all strata in response to mining in Area 3B and a general hydraulic gradient towards Area 3B, consistent with numerical model predictions. Groundwater levels at the base of the Hawkesbury Sandstone were likely near or just above the lake level prior to mining and have since declined to be below the lake level. There is evidence for recovery in groundwater pressures in the Colo Vale Sandstone.

The HGEO local seepage model was updated to reflect the observations at the post-mining bore hole S24361E at location AD8 and S2379B at AD5. Each of the ten model layers were updated by interpolating the permeability at corresponding depths in each test bore.

The current model update assesses the seepage rate from the shoreline adjacent to LW12 to LW17, utilising data from monitoring bores installed in the barrier pillar between the Lake and the Mine, including S2436E and S2479B which are adjacent to LW16 and LW17. The estimated average seepage rate for the 1.93 km of shoreline adjacent to LW12 to LW17 is 0.36 ML/day/km.

When extrapolated over the length of shoreline adjacent to LW12 to LW18 (2.5 km), the total seepage rate is 0.89 ML/day. This estimate is broadly consistent with previous estimates for seepage adjacent to LW12 to LW18.

The estimated seepage rate is most sensitive to permeability in the lower strata close to the longwalls, since the upper strata become desaturated when the model is run to a steady state (groundwater gradient towards the mine). The current data indicates that the post-mining permeability in the barrier zone adjacent to Lake Avon is highly heterogeneous, both within and between sites. The most recent regional numerical model results predict seepage loss from Lake Avon to Area 3B of between 0.09 and 0.45 ML/day, with a mean estimate of 0.18 ML/day (Watershed Hydrogeo, 2020). The estimate is somewhat higher than the range predicted by the regional model, but within the same order of magnitude. The higher estimate presented here reflects the conservative assumptions of the local scale model, such as uniform steady state flow towards the mine and complete desaturation above the longwall goaf. The modelled flux is within the 1 ML/day tolerable limit set by Dams Safety NSW.



7.1.2 Cordeaux Colliery

A total of 5.596 ML was pumped from the surface to Cordeaux underground workings during the reporting period. This is an increase from the previous reporting period (3.788 ML). The increase is in line with an increase in total rainfall recorded at the site in FY22, compared to the previous 12-month period.

7.2 Surface Water

7.2.1 Dendrobium Mine

Underground and surface operations at Dendrobium utilise a combination of potable and recycled mine water.

7.2.1.1 Potable Water use

Potable mains water (supplied by Sydney Water), is currently used for the longwall hydraulic roof supports (emulsions used underground require high quality water for batching) and surface amenities such as the kitchen and bathhouse facilities. Potable water is also used for fire suppression sprays installed in FY20, which are connected to the fire water tank. Potable water usage for the reporting period was 4.28 ML, which is a 65% decrease compared to the previous reporting period.

7.2.1.2 Recycled Water use

Recycled water is sourced from the Nebo Workings and used for various purposes on the surface and for underground operations. In this reporting period, a total of 612 ML of recycled water was used. These purposes include:

- Surface Operations:
 - Dust suppression along the Portal Road.
 - Cleaning of vehicles and equipment in the wash down bay.
 - General hose down.
 - Cleaning and firefighting.
- Underground Operations:
 - Secondary support activities.
 - Development and production units.
 - Dust suppression and firefighting supply.

7.2.1.3 Surface Water Management

Surface water runoff is separated into three streams at the Pit Top site. The three streams include:

- Clean water – This system collects runoff originating from the surrounding undisturbed land on the upstream (western) side of the site. This water is piped via sealed drains through the site into American Creek.
- Oily water – This system captures potentially contaminated water runoff from the workshop area and diesel fuel dispensing area. This is diverted into the oily water separator and then into the GWTP. Treated water is then pumped into the old Nebo Mine workings.
- Site runoff – This system captures general site runoff from site roads and the car park. This runoff is directed into the Pit Top sediment pond via a series of drains and pits that are cleaned



out on a regular basis using an industrial vacuum truck. Settled water is pumped from the sediment pond into the GWTP based on pond level. The treated water is then pumped into the old Nebo Mine Workings.

At the Kemira Valley site, surface water is separated into two streams, which include:

- Clean Water – This system captures clean runoff originating from the upstream side of the site. The runoff is diverted around the western side of the site and through a culvert beneath the rail line and sediment pond and into Brandy and Water Creek.
- Site Runoff – This system captures all site runoff from the roads and stockpile area. The runoff is directed to the sediment ponds and is reused in the site dust suppression system and/or the firefighting system. If there is excess water in the sediment ponds, water may be discharged via the mine dewatering pipeline into Allans Creek via LDP 5.

The Pit Top sediment pond and Kemira Valley sediment ponds are managed in accordance with the Water Management Plan.

Runoff from O'Brien's drift is classified as clean water therefore runoff is diverted into the natural drainage systems.

7.2.1.4 Rainfall

Dendrobium rainfall recorded during the reporting period was 2274.5 mm, an increase when compared to the previous reporting period in which 1544 mm rainfall was recorded. Annual rainfall for weather station DA3B located within the Dendrobium Mining Area is displayed in Figure 25. Rainfall data for FY11 to FY22 is displayed in Figure 26.

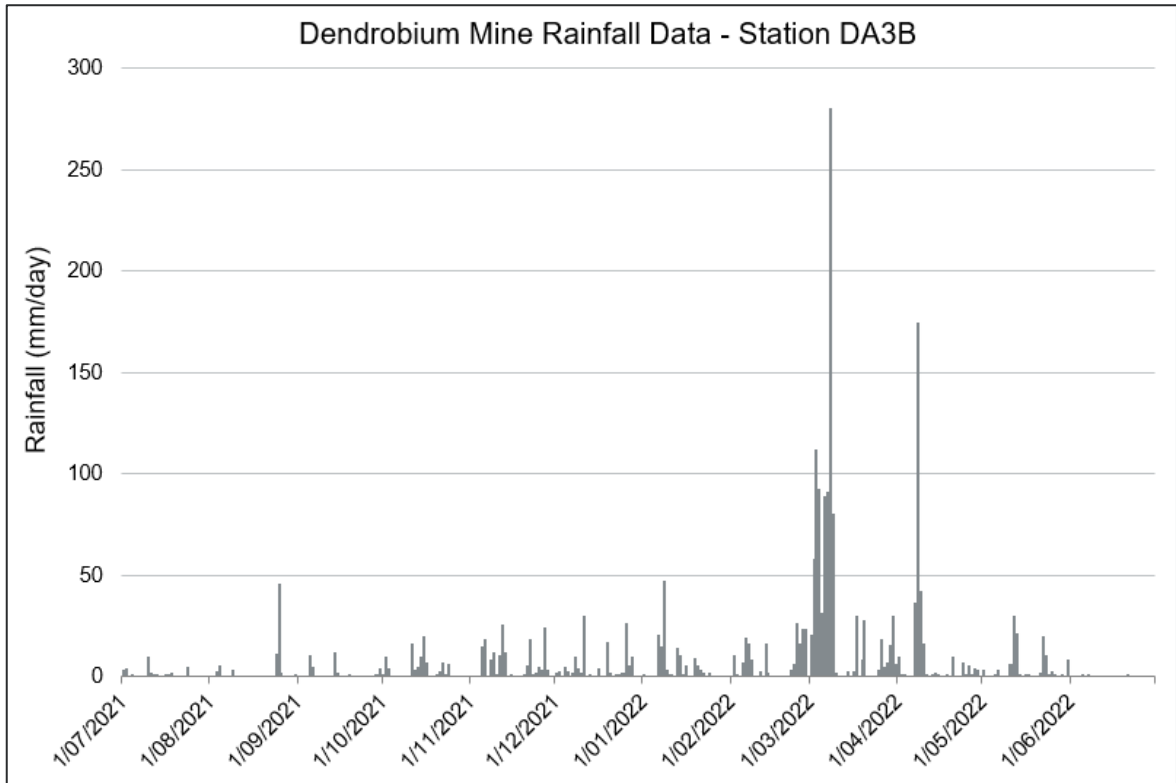


Figure 25: Dendrobium daily rainfall data for FY22

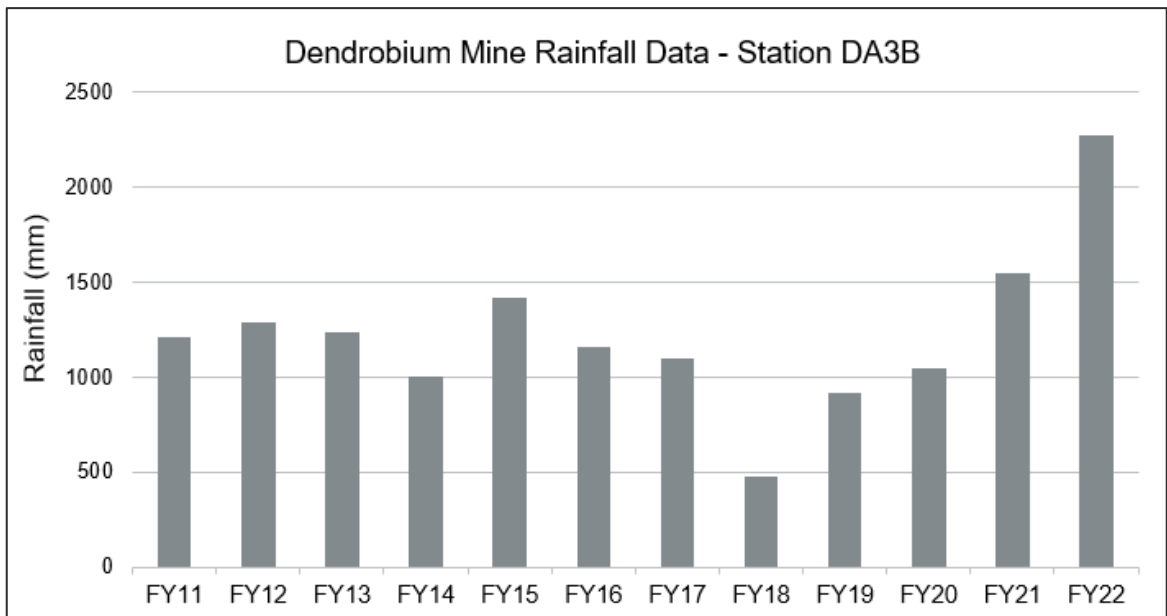


Figure 26: Annual rainfall data for Dendrobium - FY11 to FY22



7.2.2 Cordeaux Colliery

7.2.2.1 Water Supply and Use

Potable water use at Cordeaux Colliery is generally for personal consumption and toilet facilities. Potable water is brought to site by road tanker as required. During the reporting period the potable water used by site was 0.133 ML.

7.2.2.2 Surface Water Management

The surface facilities at Cordeaux Colliery have been designed to prevent water run-off from the site entering WaterNSW land. The design provides effective treatment of run-off from potentially dirty areas such as the coal bins, workshop area and machinery hard-stand areas. Drainage from these areas is directed to a dirty water holding lagoon. The clean and dirty water surface drainage circuits of the site remain in place.

As the site is on care and maintenance, the amount of dirty water generated from the surface areas has significantly reduced. Water from hardstand areas is captured in the dirty water lagoon then transferred by pump to the upper level mine water holding lagoons for settlement. The water is then transferred to underground mine workings via a gravity fed pipeline. This arrangement negates the requirement for any surface discharge. The water returned to the mine is essentially of good quality, containing no contaminants. Details of the monitoring and pumping volumes are provided in Section 7.1 of this report.

Runoff from the Corrimal shaft sites is classified as clean water therefore runoff is diverted into the natural drainage systems.

7.2.2.3 Rainfall

Rainfall for the Cordeaux surface facilities is recorded on a daily basis from a rainfall gauge located at Cordeaux Colliery Pit Top. The Cordeaux site received a total of 1962 mm of rainfall during the reporting period, which was an increase from the previous reporting period (1561.5 mm). Annual rainfall for the rain gauge located at Cordeaux Colliery is displayed in Figure 27. Figure 28 shows the total recorded rainfall for past reporting periods.

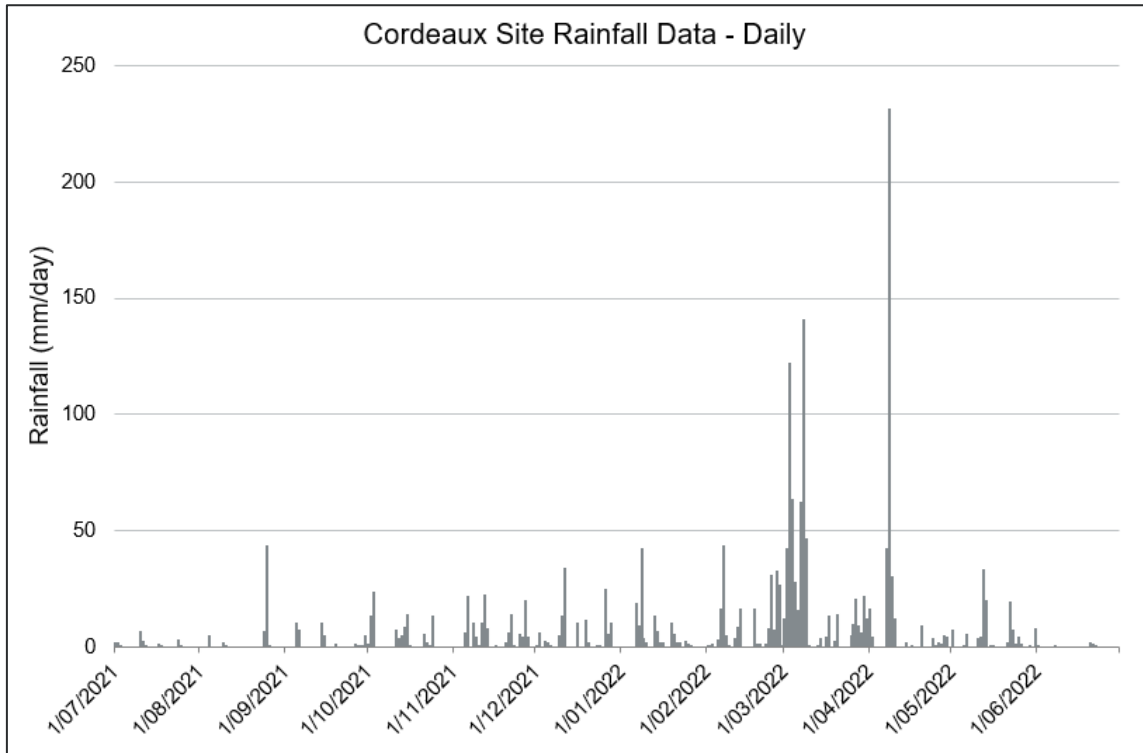


Figure 27: Cordeaux FY22 daily rainfall - site rain gauge

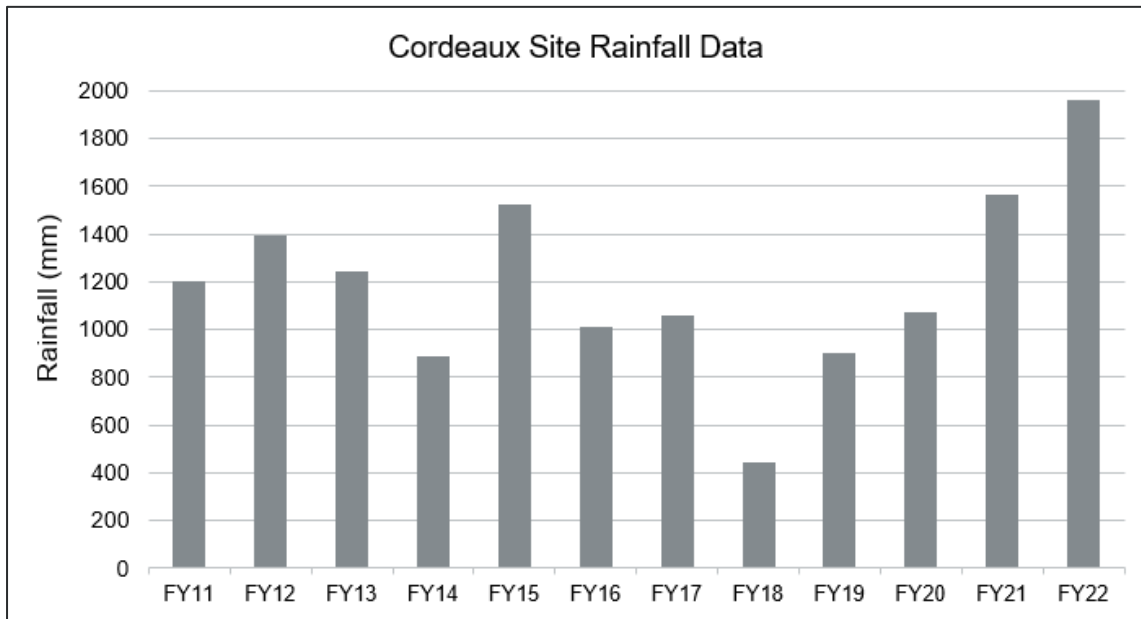


Figure 28: Cordeaux annual rainfall - FY11 to FY22

7.2.3 Ventilation Shafts 1, 2 and 3

No water usage occurs on the Ventilation Shaft 1 or Ventilation Shaft 2/3 sites.

Due to their location within WaterNSW Special Areas, the surface facilities at the Ventilation shafts have been designed to control sediment entering the surrounding WaterNSW land by capturing stormwater from disturbed areas and directing this water to sediment ponds. Rehabilitation of disturbed areas has been undertaken.



7.2.4 DCPP

Industrial water is supplied by Sydney Water mains via the BlueScope Steel water network. Industrial water consumption in FY22 is 290,383 kL, compared to 275,732 kL in FY21.

The stockpile operations reuse water from the sediment dams (No. 4 Area). Industrial water is used to 'top up' the systems as required due to water loss on vehicles and to the environment.

Potable water is supplied to the DCPP by Sydney Water mains via the BlueScope Steel water network. Potable water consumption in FY22 is 4,988 kL, which is based on the assumption of 466 litres per person per day.

Water produced from the DCPP is managed through the BlueScope Steel EPL. IMC advises BlueScope Steel if discharges of water from the DCPP occur.

7.3 Water Licences

Dendrobium Mine has a Water Supply Works Approval and four water access licences. Water take at Dendrobium Mine for FY22 is shown in Table 33.

Note: 1 unit = 1 ML.

Table 33: Water Take – Dendrobium Mine			
Water Licence Ref No.	Water Sharing Plan, Source and Management Zone	Entitlement (units)	Total (ML)
10AL118771	Greater Metropolitan Region Groundwater Sources Sydney Basin South Groundwater Source Nepean Management Zone 3	75	0
10AL119249	Greater Metropolitan Region Groundwater Sources Sydney Basin Nepean Groundwater Source Nepean Management Zone 2	3962	2795
10AL123124	Greater Metropolitan Region Groundwater Sources Sydney Basin Nepean Groundwater Source Nepean Management Zone 2	3653	0
10AL123125	Greater Metropolitan Region Groundwater Sources Sydney Basin Nepean Groundwater Source Nepean Management Zone 2	1840	0

7.4 Compensatory Water

No compensatory water was supplied to other users during the reporting period.



8. REHABILITATION

8.1 Rehabilitation for the Reporting Period

8.1.1 *Dendrobium Mine*

8.1.1.1 *Mining Operations Plan/Rehabilitation Management Plan (RMP)*

An extension to the end date in the MOP (from 1 July to 2 July 2022) was submitted to and approved by the Resources Regulator in FY21. The MOP expired on 2 July 2022.

Legislative Rehabilitation Reforms under the *Mining Act 1992* were passed by the government on 2 July 2021¹⁷. These reforms, through the *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021*, prescribe new mining lease conditions relating to rehabilitation and set clear, achievable and enforceable requirements for rehabilitation. A review of the MOP and its conversion to a RMP to meet the requirements of the Form and Way documents was undertaken in FY22.

The RMP, including draft rehabilitation objectives and criteria, was submitted to the Resources Regulator on 30 June 2022. Rehabilitation objectives have been submitted via the Resources Regulator Portal for approval and once approved, rehabilitation criteria will be submitted for approval. A Forward Plan will also be submitted to the Resources Regulator portal for approval.

An external review of the Conceptual Closure Plan was finalised in FY22. The outcomes of this review have been incorporated into the RMP.

8.1.1.2 *Rehabilitation Activities – FY22*

The focus in FY22 has been on developing Dendrobium Mine's RMP and associated documents in accordance with the requirements of the *Mining Amendment Regulation (Standard Conditions for Mining Leases – Rehabilitation) Regulation 2021*.

A rehabilitation campaign was undertaken by IMC in 2020 that demolished and rehabilitated redundant powerline circuits that traverse urban and rural residential areas generally located to the East of the Illawarra Escarpment State Conservation Area. A part lease relinquishment application (CCL 768) was lodged during the FY22 reporting period by IMC with the Resources Regulator to conclude this phase of rehabilitation work. The report was accepted in July 2022.

Investigations and studies were conducted into the removal of redundant infrastructure associated with O'Briens Drift, particularly at the KVCLF.

The rehabilitation security cost estimate for the Dendrobium operations was reviewed during the reporting period to align with the latest Resources Regulator Rehabilitation Cost Estimate (RCE) tool updates. No major changes to the existing security estimate were identified. A copy of the latest security cost estimate is provided as Appendix B¹⁸. A rehabilitation summary associated with the Dendrobium operation is provided in Table 34.

¹⁷ <https://www.resourcesregulator.nsw.gov.au/environment/rehabilitation/rehabilitation-and-compliance-reforms>

¹⁸ The RCE is Commercial in Confidence and is only provided to the Resources Regulator.



Table 34: Dendrobium Mine and Cordeaux Colliery Rehabilitation Summary¹⁹

Location	Area Affected/Rehabilitation (ha)			Reason for Variation
	FY21	FY22	FY23	
A: Total Mine Footprint	18,816	18,816	18,816	N/A
B: Total Active Disturbance	47.05	306	306	Note ²⁰
C: Land being prepared for rehabilitation	0	0	0.15 ²¹	N/A
D: Land under active rehabilitation	0	0	0.15 ²²	N/A
E: Completed rehabilitated area (Areas previously completed, currently include Corrimal No. 1 and 2 Shafts, ²³ Ventilation Shaft 2/3, ²⁴ Dendrobium Subsidence Event, ²⁵ Bradford Breaker ²⁶ , and Stage 2 Pathway ²⁷). Additional area associated with powerlines included in FY22.	8.09	41	41.15	Inclusion of additional sites ²⁸

8.1.1.3 **Further Development of the Final Rehabilitation Plan**

A Landscape Management Plan has been developed to meet the requirements of the Consent²⁹. This document outlines rehabilitation and closure requirements for the sites associated with Dendrobium Mine. As referenced in the Landscape Management Plan, the Dendrobium Mine Conceptual Closure Plan has been developed in line with regulatory and internal South32 requirements. The Conceptual Closure Plan document outlines areas that are required to be progressively rehabilitated or rehabilitated at mine closure and includes a forward work plan.

The forward work plan and schedule is available in the Dendrobium and Cordeaux RMP (Table 19, Page 49), available using this [link](#). Executing the rehabilitation work remains subject to the outcomes of these investigations and studies, as well as external and internal approval processes.

¹⁹ Does not include exploration.

²⁰ Increase because of 2022 review for the RMP. The data now includes an extensive powerline network that was not previously included in the disturbance calculations. It is likely the current amount is an overstatement as many of the redundant powerline easements would contain significant regrowth or cross into the urban interface.

²¹ O'Brien's Gap Pumphouse (0.05 ha) planned to be removed and site rehabilitated and WC21/Donalds Castle Creek subsidence remediation (0.1 ha).

²² O'Brien's Gap Pumphouse (0.05 ha) planned to be removed and site rehabilitated and WC21/Donalds Castle Creek subsidence remediation (0.1 ha).

²³ Corrimal No. 1 and 2 Shaft sites have been decommissioned.

²⁴ Vent Shaft 2/3 site is currently active. Temporary rehabilitation has been successfully established at the site.

²⁵ Rehabilitation works were completed in response to identified impacts in November 2013.

²⁶ Rehabilitation has been undertaken at the Bradford Breaker site however some additional works may be required.

²⁷ Dendrobium Coal Pty Ltd no longer owns land between Stones Road and Benjamin Road, Mount Kembla. As part of Stage 2 of the pathway project this land was sold, subsequent to a 4 Lot Subdivision or transferred to neighbours through boundary adjustments.

²⁸ Inclusion of powerlines that were removed.

²⁹ The requirement for a Landscape Management Plan was removed from the Consent as part of the MOD 9 application. Condition 20 of Schedule 4 requires the development of a Rehabilitation Management Plan in accordance with the requirements of the Mining Act 1992, and the development of a Mine Closure Plan at least two years prior to the cessation of mining at the site.



8.1.1.4 Exploration

Rehabilitation focus has been mainly around the five FY21 Seismic lines in Dendrobium Area 5 and boreholes in Dendrobium Area 3C including S2508, S2509, S2516, S2520 and S2526.

No other rehabilitation has taken place due to either catchment closure or wet conditions where the rehabilitation activities would have adverse effects on the environment.

8.1.1.5 Subsidence

Subsidence impacts associated with underground mining operations, predominantly soil cracking, were rehabilitated progressively as identified. Where these cracks occurred on access tracks, they were repaired. Cracks identified in bushland were monitored to verify they remediated naturally to avoid additional ground disturbance. Where there is a potential safety risk to workers walking near these sites, signage and caution tape is put in place. Details of remediated sites is included in the latest EoP Report. Any ongoing changes to these impacts will be rehabilitated as required.

The WC21 and Donalds Castle Creek Rehabilitation Plan was approved by the Department following extensive consultation with various agencies. The trial rehabilitation program commenced in FY22 with drilling and grouting of the two pools in WC21. These works are incomplete and were required to be placed on hold for the second half of FY22 due to WaterNSW Catchment closure. IMC intends to continue these works once WaterNSW Catchment is opened and remedial works to the access track have been completed. The track requires remedial works due to extensive wet weather in early 2022.

8.1.1.6 Rehabilitation monitoring

No rehabilitation monitoring was undertaken in the reporting period at surface facilities as no recent rehabilitation has been undertaken.

Monitoring at legacy sites includes periodic inspections to review vegetation establishment. Issues at O'Briens Gap have been identified with dirt bike activity in the area. Grass has established at the Summit Park Switchyard site and a final inspection report was submitted in FY22.

Subsidence remediation monitoring is undertaken when travelling along tracks where remediation activities have occurred.

8.1.2 Cordeaux Colliery

No rehabilitation was undertaken at the Cordeaux Colliery Pit Top site during the reporting period.

Cordeaux is to remain on care and maintenance in the immediate future, until longer-term options can be fully developed and approved.

Rehabilitation works have been previously undertaken and completed at Corrimal No. 1 and 2 Shaft sites, Cataract Weir Pump Facility, Cordeaux Re-injection Borehole, and Wilton Spray Irrigation site. These have been decommissioned and rehabilitated to the relevant guidelines.

See Section 6.4.3 for more information on the Corrimal No 3 Shaft rehabilitation.

8.2 Biodiversity Offsets

No new biodiversity offsets were sourced over the reporting period. Details of offset properties previously purchased and offset strategies developed are provided in previous Annual Reviews.



No offset credits were retired over the reporting period.

9. COMMUNITY

9.1 Community Complaints

9.1.1 *Dendrobium Mine*

IMC operates a 24-hour Community Call Line (free call 1800 102 210) and a general email address illawarracommunity@south32.net. The call line and email address enable the community to request and provide feedback about operational activities and lodge complaints on any aspect of the Dendrobium operations. The call line number and email address have been advertised throughout the reporting period in all correspondence distributed to the community.

A complaint received by IMC in whatever format will be investigated and resolved by the Community Team. The appropriate team member will investigate the complaint and seek assistance from the relevant site or operational personnel. Where required, additional details will be sought from the complainant where there is insufficient information for investigation.

Community complaints must be responded to within 24 hours of the complaint being received. Some complaints require ongoing investigation and remedial action to address the nature of the complaint.

Complaint information is provided publicly on the IMC website, and to the DCCC, IMC management, and government agencies on a regular basis.

For the reporting period, Dendrobium Mine received a total of 52 community complaints in comparison to 170 community complaints in FY21. The decrease in complaints is directly related to shifting one community member to a grievance process in June 2021. In FY21 this community member contributed to 72% of the complaints received

A summary of all complaints received in FY22 is provided in Appendix 5. This report details the nature of the complaint, investigation and outcome.

Figure 29 displays complaints received by issue under Grievance 0045671 for FY22. Noise and parking on Cordeaux Road are the primary cause for concern, with 18 complaints received in total.

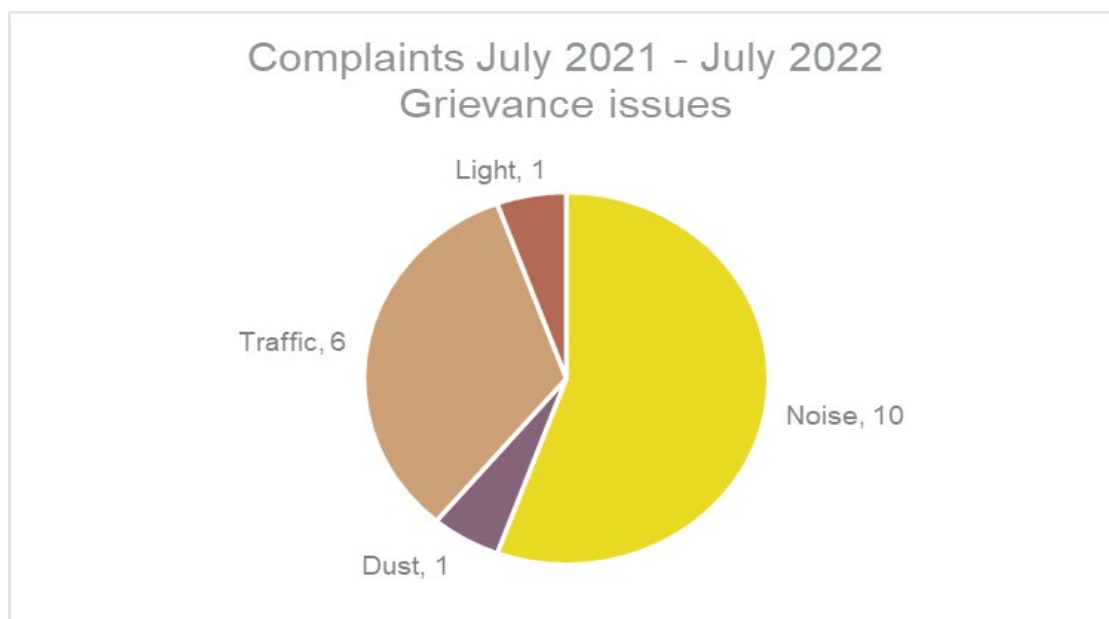


Figure 29: Issues recorded under Grievance 0045671 -FY22



Outside of the grievance process, 52 complaints were received in FY22. These were related to:

- Noise – Pit Top (56%)
- Noise – Rail Operations (13%)
- Traffic (19%)
- Environment (6%)
- Other (6%)

Figure 30 highlights the complaints by issue and month. The months of January and April saw a spike in noise complaints during longwall changeout activities. Improvements in the noise monitoring system and the complaints management process are planned in FY23.

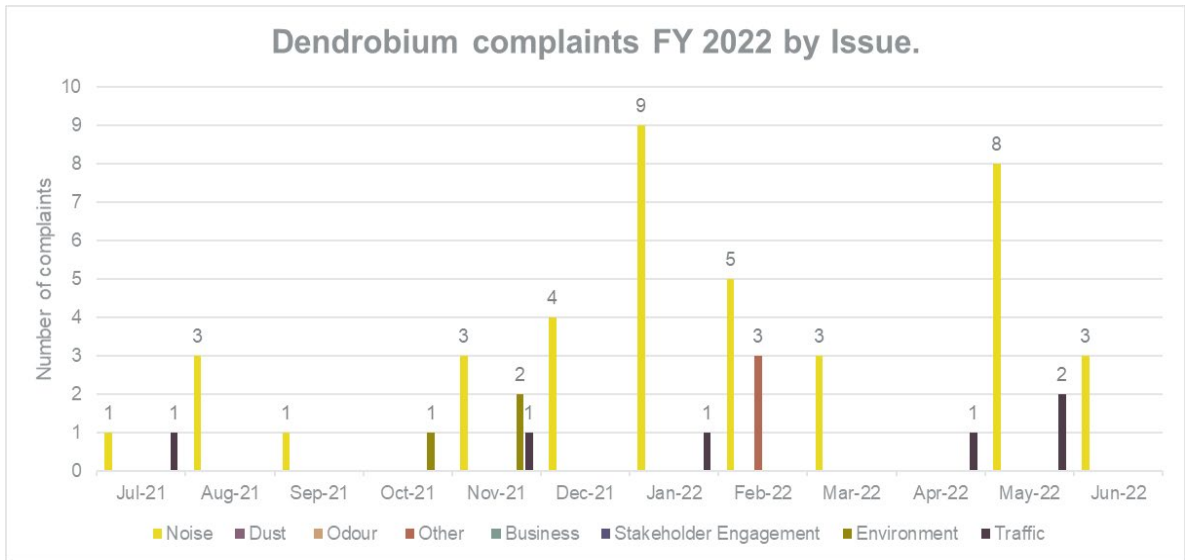


Figure 30: Dendrobium Community Complaints by Issue - FY22

Figure 31 shows the complaints received since FY18 to FY22. Noise from the Pit Top and rail operations feature as key areas of concern.

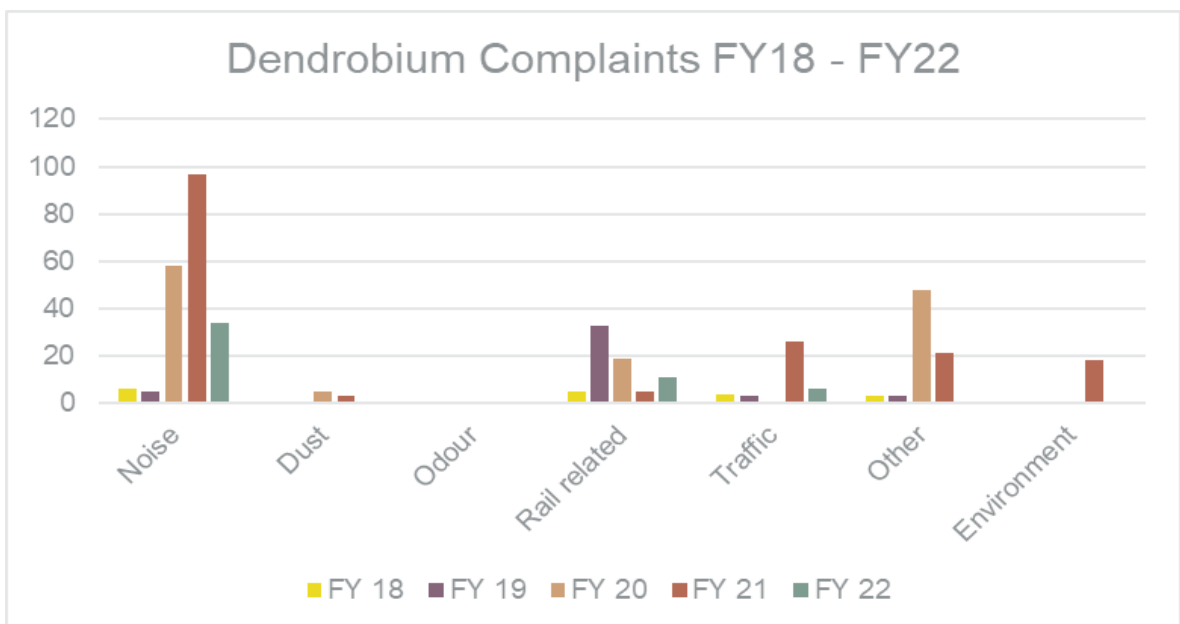


Figure 31: Dendrobium Community Complaints FY18 – FY22



9.1.2 Cordeaux Colliery

There were no community complaints for Cordeaux Colliery received during the reporting period.

9.2 Community Liaison

9.2.1 Dendrobium Mine

9.2.1.1 Community Consultation

Due to the location of the Dendrobium Pit Top facilities and KVCLF, it is essential that frequent and effective communication occurs between mine personnel and residents of Mount Kembla and surrounding areas. IMC takes a proactive approach to community consultation endeavouring to advise residents of issues in advance, including scheduled construction activities or unusual traffic movements. The consultation occurs using a variety of methods including:

- community newsletters and other letterbox drops;
- email notifications;
- Dendrobium Community Consultative Committee (DCCC) meetings;
- Dendrobium Community Enhancement Committee (DCEC) meetings;
- Dendrobium section on the IMC website;
- Dendrobium Mine Extension Project website;
- Dendrobium Mine Extension e-newsletter;
- participation in community events and activities;
- Community Perception Surveys; and
- individual landholder visits/meetings.

9.2.1.2 DCCC

The DCCC was established in January 2002 in accordance with Condition 9 of Schedule 8 of the Consent. The DCCC provides a mechanism to bring the community, environmental groups, local councils and IMC together:

- to establish good working relationships between the company, the community and other stakeholders in relation to Dendrobium Mine;
- for the ongoing communication of information and discussion of mining operations and the environmental performance of the mine;
- to discuss community concerns and review the resolution of community complaints;
- to discuss communication of relevant information on the mine and its environmental performance to the wider community, including results of environmental monitoring, environmental management reports and the results of audits; and
- to work together towards outcomes of benefit to the mine, immediate neighbours and the local and regional community.

The DCCC is comprised of an Independent Chairperson, local community members, environmental group representatives, representatives from Wollongong City Council and Wollondilly Shire Council and IMC representatives as outlined in Table 35.



Table 35: Membership of the DCCC as at 30 June 2022

Name	Member Category
Mike Archer	Independent Chairperson
Alex Beccari	Community Representative
Phil Diamond	Community Representative
Phil Grant	Community Representative
Vivien Twyford	Community Representative
Phill Ciunas	Community Representative
Jennifer Evans	Community Representative
Anita Mulrooney	Community Representative
Cr Michael Banasik ³⁰	Wollondilly Shire Council
Ron Zwicker	Wollongong City Council
John Wood	Wollongong City Council
Simon Thomas ³¹	IMC (General Manager Dendrobium Mine)
Chris Schultz	IMC (Superintendent Environment)
Antony Leone	IMC (Principal Community)

The Independent Chairperson Mike Archer was appointed to the role of Chair in October 2013 and has continued in the role since that date.

DCCC meetings cover discussions on the longwall and development activities, SMPs/Extraction Plans, approval processes, environmental compliance and management, EoP Reports, community complaints and community programs. A separate working group was established in January 2022 to provide a forum for open discussion between members of Dendrobium Mine, the community, the relevant councils and other stakeholders on the Dendrobium Mine Extension Project during the approvals process.

Copies of minutes from the DCCC meetings are available on the IMC website at: <https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents>.

9.2.1.3 Newsletters and Information Sheets

During the reporting period, IMC distributed community newsletters to the local community (Mt Kembla, Kembla Heights and communities located along the KVRL) covering a range of topics including:

- operations updates, including longwall and development progress;
- environmental improvement works;
- events and organisations supported by Dendrobium Mine and IMC;
- the Dendrobium Mine Extension Project; and
- DCCC and DCEC activities, including information on inspections and projects supported.

³⁰ Replaced Cr Noel Lowry following WSC elections in December 2021.

³¹ Replaced Anna-May Fauconnier.



9.2.1.4 Dendrobium Community Enhancement Program (DCEP)

The DCEP was established in 2002 to facilitate funding for community projects with a vision to create a strong community and positive environment for the residents in the zone of influence of Dendrobium Mine. Since inception, IMC has contributed over \$1.9 million to the fund and continues to contribute three cents per saleable tonne of coal from the Dendrobium operations (adjusted for CPI).

The program is administered by the DCEC which is comprised of an independent Chairperson, community representatives and IMC representatives. The committee met regularly during the reporting period, with extraordinary meetings also convened to conduct business planning and review of operations.

Local projects and activities supported by the DCEP in FY22 include:

- Covid-19 support to various local schools;
- Covid-19 support to various local charities supporting the disadvantaged;
- Life Education Program in local schools;
- Yesterday Stories Project, Wollongong Heritage Collections;
- maintenance equipment, Mount Kembla Pathway;
- Figtree AFL Club uniforms, training equipment and mental health program;
- Mount Kembla Rugby Club uniforms and training equipment;
- Mount Kembla Church lead light window upgrade;
- Lindsay Mayne Park facilities; and
- Various wellness programs at local schools.

Organisations in the local community are encouraged to apply for funding. Applications for funding under the DCEP are assessed against a range of selection criteria, which can be viewed at: <https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents>.

9.2.1.5 Ngayagang Yamba Project

The project is a collaboration between the Illawarra Local Aboriginal Land Council (ILALC), IMC and researchers at UoW. This project seeks to bring together diverse forms of knowledge, value systems and beliefs to co-design an approach to restoring cultural, environmental, and social values in the creek system. The project will be guided by the place-based Ngayagang Yanba program.

The project will seek to trial a collaborative approach by IMC, ILALC and UoW to restore Country. It will pilot a model through which the resource sector can engage with Aboriginal communities in the region and potentially beyond. It will also seek to explore regenerative economic opportunities to create social and economic enterprise opportunities, particularly for Indigenous businesses.

'Regenerating Country, regenerating economies' - is an industry funded project which will engage an Aboriginal approach to co-develop options for the regeneration and healing of Country and communities. The project will focus on the Mt Kembla-Mt Keira Creek System of American, Branch, Brandy and Water, and Byarong Creeks. These creeks hold cultural significance for local Aboriginal communities but have been impacted by historical residential and industrial development since European settlement in the area. The health of the creek system (which feeds into Allans creek and Port Kembla) impacts a range of values for both Aboriginal and non-Aboriginal communities in the region.

The project commenced in the reporting period and will continue in FY23.



9.2.2 **Cordeaux**

No specific community liaison was undertaken for Cordeaux Colliery during the reporting period.

10. INDEPENDENT AUDITS

10.1 Environmental Audits

During this reporting period the performance of Dendrobium’s Environmental Management System was assessed in a comprehensive series of audits (shown in Table 36). SAI Global has endorsed a “governance check” process as a part of the ISO 14001 certification. This process involves reviewing relevant environmental management plans in accordance with the schedule and incorporates both a desktop review and in-field verification. If non-conformances are identified during audits, they are recorded and tracked via the action tracking system utilised by IMC.

Table 36: Environmental Audits undertaken during the Reporting Period

Date	Type	Internal	External	Comments
June 2022	Annual ISO 14001		X	Re-certification
April 2022	Self-Assessment	X		Self-assessment of compliance with the South32 Environment Standard
May 2022	2 nd Line Assurance Health Check	X		Verification of outcomes of self-assessment against the Environment Standard.
May - July 2022	Reasonable Assurance Audit	X	X	Review of externally reported greenhouse gas and water data
Ongoing	Management plan governance checks	X		Governance checks are conducted internally as a part of ISO 14001 certification. A schedule has been developed and checks are undertaken as per the schedule.

10.1.1 **ISO 14001**

The IMC Environmental Management System has been certified to the International Standard ISO 14001 since May 2003. ISO 14001 Certification for Dendrobium Mine, DCPP and Cordeaux was maintained following an external audit over May and June 2022. No non-conformances were identified.

Dendrobium Mine, Cordeaux Colliery and the DCPP are included in IMC’s schedule of certified ISO 14001:2015 sites. Each of these operational sites has been regularly audited for compliance against this standard.

The auditing process requires demonstration of adequacy of systems to manage environmental aspects and impacts related to site activities. The systems audited include legal compliance, document control, records, corrective action, monitoring and control, training and management of risks.

10.1.2 **Environment Standard**

The Environment Standard Self Assessment for this reporting period was conducted by IMC personnel. It was found that the requirements of the Environment Standard are largely in place with



some opportunities to update existing processes. All corrective actions were raised in the action tracking system utilised by IMC and will be closed out as required.

Personnel from South32 Group Environment undertook a 2nd Line Assurance Health Check of the Self Assessment in May 2022 to verify that the assessment was an accurate reflection of the Environment Standard implementation. Improvement opportunities identified will be addressed in FY23.

10.1.3 Governance Reviews

The following internal Governance Reviews were conducted for Dendrobium during the reporting period:

- Traffic Management Plan
- Air Quality and Greenhouse Gas Management Plan;
- Water Management Plan;
- Landscape Management Plan
- Noise Management Plan;
- Bushfire Management Plan; and
- Environmental Management Strategy.

From these, the majority of corrective actions raised were administrative. All corrective actions were raised in the action tracking system utilised by IMC and closed out as required. Changes required to the respective management plan as a result of the Governance Review are recorded in the Management Plan Review Log.

10.1.4 Independent Environmental Audit

Environmental Resources Management Australia Pty Ltd (ERM) completed an independent environmental audit (IEA) of the Consent in October 2020. The primary purpose of the audit was to satisfy Condition 6 of Schedule 8 of the Consent, which requires the commissioning of an independent audit every 3 years, unless the Secretary directs otherwise.

The IEA identified four non-compliances (two duplicate), five administrative non-compliances and three observations.

An action plan to address the non-compliances and observations was developed and submitted to DPIE. The majority of actions were closed out in FY21, with one outstanding action that was closed out in FY22. The action plan and an update on progress of the action closed out in FY22 is provided in Appendix 4.

The next IEA is scheduled to be completed before 31 December 2023.

10.1.5 KPMG

KPMG undertook a reasonable assurance audit for NGER (National Greenhouse and Energy Reporting) and water data for the reporting period. This audit commenced in May and was completed in July 2022. There were no significant findings.

10.2 Environmental Risk Register

Environmental risks associated with the site operations are recorded in the Environmental Aspects and Impacts Register. The Environmental Aspects and Impacts Register is reviewed regularly and



is the basis of the Environmental Improvement Plan. Environmental risks were entered into the action tracking system utilised by IMC in FY22.

11. INCIDENTS, NON-COMPLIANCES AND EXCEEDANCES DURING THE REPORTING PERIOD

11.1 Site Compliance – Dendrobium

During the reporting period, Dendrobium Mine was generally compliant with legislation and approvals as listed in Section 3. Non-compliances and exceedances of criteria recorded during the reporting period are listed in Table 37 and Table 38 respectively. It is noted that an exceedance of criteria is not necessarily classified as a non-compliance. Non-compliance against legislation has also been included in this section.

A Warning Letter was issued by DPE in the reporting period (see Table 39).

The Dendrobium Mine Compliance Report, which reports compliance against the conditions in DA 60-03-2001, is attached as Appendix 3.

Table 37: Non-compliances during the reporting period	
NC1	
Non-compliance	Exceedances of the noise impact assessment criteria in Condition 1 of Schedule 4 of DA 60-03-2001 were recorded at R39a, located near the KVCLF.
Date	30 July 2021.
Details of non-compliance	<p>Representative L_{Aeq} noise levels recorded at this location were:</p> <ul style="list-style-type: none"> at 12.30 pm, a 1 dBA exceedance of the $L_{Aeq,15\text{ min}}$ impact assessment criteria of 37 dBA was recorded; at 7.00 pm, a 3 dBA exceedance of the $L_{Aeq,15\text{ min}}$ impact assessment criteria of 35 dBA was recorded; at 10.15 pm, a 3 dBA exceedance of the $L_{Aeq,15\text{ min}}$ impact assessment criteria of 35 dBA was recorded; and at 10.15 pm, a 9 dBA exceedance of the $L_{A1,1\text{ min}}$ impact assessment criteria of 45 dBA was recorded. <p>Note that for the determination of compliance, the NSW Industrial Noise Policy states in Section 11.1.3:</p> <p><i>A development will be deemed to be in non-compliance with noise consent or licence condition of the monitored noise level is more than 2dB above the statutory noise limit specified in the consent or licence condition.</i></p>
Location	Receiver R39a, Mt Kembla
Cause of non-compliance	The noise levels were determined to have exceeded the $L_{Aeq,15\text{ min}}$ noise impact assessment criteria at receiver R39a as a sustained exceedance. The exceedance was recorded following the replacement of existing compressors and installation of a new compressor adjacent to the sizer at the KVCLF.



	<p>The exceedance of the $L_{A1,1 \text{ min}}$ impact assessment criteria was determined to be as a result of rail squeal and wagon noise associated with a train leaving the KVCLF. It was identified that the locomotive being used at the time of the exceedance was a replacement locomotive not usually used on the Kemira Valley Rail Line. The use of alternative locomotives has been raised with Pacific National.</p>
<p>Actions taken to mitigate adverse effects of non-compliance</p>	<p>Confirmation of exceedances can only be undertaken during post analysis. Detailed post analysis work is required to extract meaningful noise levels, relating to the mine, using both time and frequency domain filters at 100 ms time steps.</p> <p>Mitigation at the time of monitoring is limited where the site is operating normally and in accordance with noise predictions in the environmental assessments.</p>
<p>Actions taken to prevent reoccurrence</p>	<p>An assessment of the air compressors was undertaken. There was no significant noise emission from the compressor shed. It was determined to be possible, but not confirmed, that the door on the compressor shed may have been open at the time of the monitoring leading to increased noise levels being recorded. A sign has been installed to remind personnel that the doors are not to be left open.</p> <p>The locomotive that contributed to the exceedance of the $L_{A1,1 \text{ min}}$ impact assessment criteria at R39a was no longer utilised on the KVRL.</p>
<p>NC2</p>	
<p>Non-compliance</p>	<p>An exceedance of the Zinc water quality limit was recorded at LDP 5, which is a non-compliance with Condition L2.4 of EPL 3241 and Condition 12 of Schedule 4 of DA 60-03-2001.</p>
<p>Date</p>	<p>13 October 2021.</p>
<p>Details of non-compliance</p>	<p>An exceedance of the water quality concentration limit for Zinc (of 0.4 mg/L) occurred at licence discharge point (LDP) 5, located at Marley Place, Unanderra. The exceedance (0.606 mg/L) was recorded during the discharge of brine from the Appin North water treatment plant on 13 October 2021. The exceedance was recorded as part of an investigation as opposed to in the monthly compliance sampling.</p>
<p>Location</p>	<p>LDP 5, located at Marley Place, Unanderra.</p>
<p>Cause of non-compliance</p>	<p>It is likely that the cause of the exceedance was inadequate mixing of brine with water from Dendrobium Mine. The exceedance was unable to be replicated in further sampling that was undertaken.</p>
<p>Actions taken to mitigate adverse effects of non-compliance</p>	<p>There was no environmental harm associated with the exceedance. A study has been undertaken of the brine discharge by EGi indicating that even at higher concentrations of Zinc in the brine that there was limited potential for bioaccumulation or bioavailability.</p> <p>No further exceedances of criteria have been recorded.</p>



Actions taken to prevent reoccurrence	Monthly sampling will continue to be undertaken at LDP 5. A sampling program, as required under Special Condition E1.1 continues to be undertaken.
NC3	
Non-compliance	Exceedance of the noise impact assessment criteria in Condition 1 of Schedule 4 of DA 60-03-2001 was recorded at R39a, located near the KVCLF.
Date	9 February 2022.
Details of non-compliance	<p>An exceedance of noise criteria was recorded at R39a on 9 February 2022. A representative noise level of 48 dBA L_{Aeq} was recorded in the evening period (7.15 - 7.30 pm), which exceeded the impact assessment criteria of 35 dBA. The exceedance was reported to DPE.</p> <p>An investigation into the exceedance was undertaken and the report concluded that the exceedance reported in February 2022 is not an exceedance of any noise limits that are consistent with historical or current NSW policy and guidelines.</p> <p>An investigation was undertaken by DPE and a Warning Letter was issued.</p>
Location	Receiver R39a, Mt Kembla
Cause of non-compliance	The exceedance was likely associated with the operation of the locomotive at the KVCLF at the time. It appeared that the tonal noise may only be present when the locomotive is idling or at a low notch number. The noise was not present in the day and night-time periods, and the high frequency noise ceased when the locomotive travelled away from the KVCLF.
Actions taken to mitigate adverse effects of non-compliance	The noise ceased when the locomotive moved away from the KVCLF.
Actions taken to prevent reoccurrence	The investigation undertaken determined that the noise from the locomotives on the KVRL should not be included in the assessment of compliance against noise impact assessment criteria in Condition 1 of Schedule 4. Noise from the rail operations should be assessed against the criteria in Condition 3 of Schedule 4. The Noise Management Plan has been updated to reflect the findings from the investigation.

Table 38: Exceedances of criteria during the reporting period

EX1	
Exceedance	Exceedances of the noise impact assessment criteria in Condition 1 of Schedule 4 of DA 60-03-2001 were recorded at R6a (374 Cordeaux Road) and R39a, located near the KVCLF.



Date	2 – 3 June 2022.
Details of exceedance	<p>Exceedances of $L_{Aeq,15\text{ min}}$ impact assessment criteria in Condition 1 of Schedule 4 of the Consent were recorded in the following periods at R39a on 2 June 2022:</p> <ul style="list-style-type: none"> In the evening period (6.00 – 6.15 pm), a noise level of 37 dBA was recorded, which is 2 dBA above the impact assessment criteria of 35 dBA. In the night-time period (10.45 – 11.00 pm), a noise level of 37 dBA was recorded, which is 2 dBA above the impact assessment criteria of 35 dBA. <p>An exceedance of the $L_{A1,1\text{ min}}$ impact assessment criterion in Condition 1 of Schedule 4 of the Consent was recorded at R6a on 3 June 2022 in the period of 12.15 – 12.45 am. A result of 47-49 dBA was recorded, which is an exceedance of the noise impact assessment criterion of 47 dBA.</p> <p>Note that for the determination of compliance, the NSW Industrial Noise Policy states in Section 11.1.3:</p> <p><i>A development will be deemed to be in non-compliance with noise consent or licence condition of the monitored noise level is more than 2dB above the statutory noise limit specified in the consent or licence condition.</i></p>
Location	Receiver R39a, KVCLF and Receiver R6a, 374 Cordeaux Road Mt Kembla.
Cause of exceedance	<p>The exceedances at R39a were likely to be caused by conveyor operations and were strongly influenced by a temperature inversion and katabatic wind conditions at the time of the monitoring.</p> <p>The cause of the exceedance at R6a was events from engine starts and machine operation. There were no sustained exceedances of criteria identified.</p>
Actions taken to mitigate adverse effects of non-compliance	<p>Confirmation of exceedances can only be undertaken during post analysis. Detailed post analysis work is required to extract meaningful noise levels, relating to the mine, using both time and frequency domain filters at 100 ms time steps.</p> <p>Mitigation at the time of monitoring is limited where the site is operating normally and in accordance with noise predictions in the environmental assessments.</p>
Actions taken to prevent reoccurrence	There were no specific actions identified as a result of the exceedances.
EX2	
Exceedance	A likely exceedance of the performance measure for Waterfall 54 was recorded. Condition 13 of the Area 3B SMP Approval provides for <i>Negligible environmental consequences including: no rock fall occurs at the waterfall or from its overhang.</i>
Date	Between 6 and 28 October 2021.



Details of exceedance	<p>The IMCEFT undertook a detailed inspection at the base of Waterfall 54 on 2 August 2022. During the inspection a minor rockfall was observed. The Waterfall 54 Technical Committee met on 5 August 2022 and reviewed photographs of the waterfall and concluded that the rockfall occurred between 6 October and 28 October 2021 and is likely associated with LW17.</p> <p>The rockfall site has an approximate length of 3 m, depth of 1.5 m and height of 1 m and was also screened from view by dense vegetation as well as the setback for the observation point during previous surveys. It appears that this is an isolated rockfall and there are no concerns that the structural integrity of the waterfall has been impacted.</p> <p>Though attributing this rockfall to the mining activity includes some uncertainty, it is minor and appears isolated, it likely constitutes an exceedance of the performance measure for Waterfall 54. Condition 13 of the Area 3B SMP Approval provides for negligible environmental consequences including: no rock fall occurs at the waterfall or from its overhang.</p>
Location	Waterfall 54, located in the Special Metropolitan Area
Cause of exceedance	It is likely that the cause of the rockfall was LW17 extraction.
Actions taken to mitigate adverse effects of non-compliance	IMC made the decision to stop LW17 short of the approved finish line at cut through 3 on or around 6 September 2021. As of 8 September 2021, there remained approximately 30 m of extraction to reach cut through 3 marking the revised completion of mining. As expected valley closure continued associated with LW17 after the completion of mining. The valley closure stabilised around early 2022.
Actions taken to prevent reoccurrence	IMC will continue to monitor landscape features during longwall mining operations and use subsidence prediction modelling to meet the performance measures. The measurements and observations for Waterfall 54 will be used to update predictive methods for Dendrobium Mine.

Table 39: Regulatory action during the reporting period	
Regulatory Action	Detail
Official Caution	None issued.
Warning Letters	A Warning Letter was issued on 14 June 2022 for the exceedances of noise impact assessment criteria in February 2022 (see NC3).
Penalty Notices	None issued.
Prosecution Proceedings	None commenced.



11.2 Site Compliance – Cordeaux

During the reporting period, Cordeaux Colliery was compliant with legislation and approvals as listed in Section 3.

12. ACTIVITIES PROPOSED IN THE NEXT REPORTING PERIOD

12.1 Dendrobium Mine

12.1.1 Mine Operations

During the next reporting period, Dendrobium will undertake longwall mining in Area 3A and 3C. Development will continue in Area 3A and 3C Gates, Wonga Mains, Corrimal Mains and Pioneer Mains.

12.1.2 DCP

Various works will continue over the next reporting period, including further structural repairs, guarding compliance, re-sheeting, handrails and ladder repairs and replacements, electrical circuit earth leakage fixes, conveyor fire protection systems maintenance, conveyor pull cord compliance and lift control system compliance.

12.1.3 Exploration

Planned exploration activities for FY23 include seven exploration boreholes.

Monitoring boreholes related to approvals will continue to be implemented in FY23 in support of ongoing Dendrobium mining operations. Seven approvals boreholes are planned which include post-mining monitoring boreholes, angle stress monitoring and groundwater boreholes proximal to underground workings.

No seismic operations are planned for FY23.

The proposed location of exploration boreholes planned for FY23 are shown in Plan 13.

12.1.4 Construction Activities

The following projects will be progressed in the next reporting period:

- Gas management infrastructure installation at Ventilation Shaft 2/3 site.
- Slope stability remediation to address landslip issues in FY22.
- Surface and yard repairs.
- LDP 5 access upgrade.
- Surface upgrades including installation of workshop domes and pallet racking.
- Area 3C ventilation upgrade.
- Area 3C power upgrade.



12.1.5 Environmental Management

12.1.5.1 Erosion and Sediment Control

Erosion and sediment control improvements planned to be undertaken during the next reporting period at the Dendrobium Pit Top include:

- Improvements and ongoing maintenance to drainage.
- Additional site sealing and surface repairs.

12.1.5.2 Weed Management

On-going weed management will continue at KVCLF and KVRL. There will be a renewed focus in FY23 (pending suitable weather) following the significant rainfall in FY22 hampering weed control efforts.

12.1.5.3 Noise Management

A directional real-time noise monitoring system was completed in FY22, with the five noise loggers installed and commissioned at the Dendrobium Pit Top during this reporting period (refer to Section 6.8.1.4). The system is used to proactively manage noise on site and identify potential impacts to the surrounding community. An alert/warning system will be developed and implemented in FY23.

12.1.5.4 Hydrocarbon and Chemical Management

Preliminary works (footings and base slab) are being undertaken in FY23 to facilitate installation of the bulk diesel tank and solcenic tanks. Initial investigations uncovered a damaged stormwater pipe that is required to be repaired first. Once repaired, piling can commence.

A Targeted Site Investigation (TSI) is planned to be undertaken in FY23, using the results from the PSI.

12.1.5.5 Water Management

The mine dewatering system will be changed in FY23 with the installation of a bypass to allow water from North West Mains (NWM) D2 pump station to be pumped directly to LDP 5, bypassing the old Kemira Workings. This change is being implemented to reduce the pressure on an existing pipe range which has been found to be leaking.

A turbidity probe will be installed on the dewatering pipeline at the Kemira Valley Break Tank, with alarms to the control room if elevated turbidity levels are detected. A water meter is also planned to be installed at this location to compare flows at LDP 5 to identify any potential leakage.

A new flow meter is also planned to be installed at LDP 5.

12.1.5.6 Environmental Monitoring

During FY22, additional surface flow monitoring sites were approved for installation in Catchment watercourses around the Dendrobium mining area. The sites include the install of a low-profile weir and flume-like halfpipe which directs surface flow through a control of known cross-sectional area. This improves the sensitivity of the control from what would have previously been a wide rockbar control. Before the end of June 2022, one flow site was installed. The remaining seven sites were postponed to FY23.



12.1.5.7 Infrastructure Subsidence Mitigation Measures

Transmission towers located within the Longwall 21 area of subsidence influence will be managed in FY23 using a similar approach to the Longwall 19 mitigation works in consultation with TransGrid.

12.1.5.8 Environmental Management System

Dendrobium Mine will continue to maintain certification against ISO 14001 in FY23. Environmental Management Plans will be updated and governance reviews undertaken as required.

12.1.6 Rehabilitation

The following activities under the Legacy Sites and Rehabilitation Program are planned for FY23:

- Removal of contaminated soil from the O'Briens Gap Pump House.
- Continued investigation into the removal of redundant infrastructure associated with O'Briens Drift, particularly at the KVCLF.

12.1.7 Community

IMC will continue to undertake community engagement and support community initiatives in FY23. This will include, but not be limited to, support of the Ngayagang Yanba Project.

12.2 Cordeaux Colliery

During the next reporting period, Cordeaux Colliery mining operations will remain on care and maintenance.

Upgrade of the site's electrical supply began in FY22 and aim to be completed in FY23. The upgrade aims to replace ageing infrastructure that is no longer fit for purpose and align the infrastructure with ongoing high voltage maintenance requirements. Works include:

- Installation of the replacement distribution boards that supply the Administration building and Workshop.
- Installation of a pole-mounted transformer and installation of underground low voltage cabling to the Administration building, Workshop and Communications Huts (pending capital approval).

A digital reconciliation monitoring system is installed on the diesel tank to better account for fuel-in and fuel-out of the system to assist in monitoring any fuel loss that could be attributed to tank leakage. This system is planned to be upgraded in FY23.



13. REFERENCES AND ASSOCIATED DOCUMENTS

13.1 References

- Dendrobium Mine Development Consent DA 60-03-2001 (as modified).
- Cardno, Longwall 17 End of Panel Report Aquatic Flora and Fauna Review (2022).
- IMC, Air Quality and Greenhouse Gas Management Plan.
- IMC, Bushfire Management Plan.
- IMC, Landscape Management Plan.
- IMC, Lighting Management Plan.
- IMC, Noise Management Plan.
- IMC, Traffic Management Plan.
- IMC, Waste Management Plan.
- IMC, Water Management Plan.
- IMC, Mining Operations Plan FY16 – FY22.
- IMC, Rehabilitation Management Plan.
- HGEO, Dendrobium Mine – End of Panel Surface Water and Shallow Groundwater Assessment for Longwall 17 (Area 3B). D22165. Report by HGEO Pty Ltd for South32 Illawarra Metallurgical Coal (2022).
- Avon and Cordeaux Reservoir Dams Safety NSW Notification Area Management Plan.
- Environment Protection Licence 3241.
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality- Volume 1, Chapter 3 (2000).
- IMC, Watercourse Impact Monitoring, Management and Contingency Plan, Dendrobium Area 3B.
- IMC, Swamp Impact, Monitoring, Management and Contingency Plan.
- IMC, Dendrobium 3B Longwall 17 End of Panel report.
- Niche, Dendrobium Areas 3A and 3B: Terrestrial Ecology Monitoring Program Annual Report 2021 (2022).
- Niche, Dendrobium Colliery Longwall 17 End of Panel Report – Aboriginal Cultural Heritage Assessment (2022b).
- MSEC, End of Panel Subsidence Monitoring Review Report for Dendrobium Longwall 17. MSEC1225 (2022).
- Dendrobium Mine – Plan for the Future: Coal for Steelmaking – Submissions Report (2020).
- JBS&G, Remedial Action Plan - Corrimal No 3 Ventilation Shaft Picton Road, NSW (Rev 3).
- IMC – Dendrobium Pit Top Yard Dust TARP_2021.
- IMC – Avon & Cordeaux Reservoirs DS Notification Area Management, Closure and Contingency Plan



NSW Department of Planning and Environment (2015). Annual Review Guideline, Post approval requirements for State Significant Developments, October 2015.

13.2 Acronyms used in Annual Review

Acronyms used in the Annual Review are provided in Table 40.

Table 40: Acronyms used in Annual Review			
ACRONYM	DEFINITION	ACRONYM	DEFINITION
AEMR	Annual Environmental Management Report	KVCLF	Kemira Valley Coal Loading Facility
AHIP	Aboriginal Heritage Impact Permit	KVRL	Kemira Valley Rail Line
ALS	Airborne Laser Scanner	KVT	Kemira Valley Tunnel
BACI	Before After Control Impact	LDP	Licence Discharge Point
BCS	Biodiversity and Conservation Science Division	LJTF	Littlejohn's Tree Frog
CCL	Consolidated Coal Lease	LW	Longwall
CPI	Consumer Price Index	m	metre
CSIRO	Commonwealth Scientific and Industrial Research Organisation	MEG	Mining and Exploration Group
CV	Calorific Value	ML	Mining Lease
CWEA	Coal Wash Emplacement Area	MOP	Mining Operations Plan
DCCC	Dendrobium Community Consultative Committee	NATA	National Association of Testing Authorities
DCEC	Dendrobium Community Enhancement Committee	NGER	National Greenhouse and Energy Reporting
DCEP	Dendrobium Community Enhancement Program	NSW	New South Wales
DCPP	Dendrobium Coal Preparation Plant	OEH	Office of Environment and Heritage (now BCS)
DDG	Dust Deposition Gauge	OPD	Operational Purpose Deduction



DMEP	Dendrobium Mine Extension Project	OSS	Offsite Storage Facility
DO	Dissolved Oxygen	PDCE	Post Drainage Capture Efficiency
DNMS	Directional Noise Monitoring System	PEF	Processed engineered fuel
DPE	Department of Planning and Environment ³²	PKCT	Port Kembla Coal Terminal
DPIE	Department of Planning, Industry and Environment ³³	PM ₁₀	Particulate matter 10 microns
EC	Electrical conductivity	PSI	Preliminary Site Investigation
EFT	IMC Environmental Field Team	RAP	Remedial Action Plan
EGi	Environmental Geochemistry International	RCE	Rehabilitation Cost Estimate
EIS	Environmental Impact Study	RMP	Rehabilitation Management Plan
EoP	End of Panel	RNWG	Rail Noise Working Group
EPL	Environment Protection Licence	RoM	Run of Mine
EP	Extraction Plan	RNWG	Rail Noise Working Group
EPA	Environment Protection Authority	SDS	Safety Data Sheet
FY	Financial Year	SIMMCP	Swamp Impact, Monitoring, Management and Contingency Plan
GWTP	Grey Water Treatment Plant	SMP	Subsidence Management Plan
HVAS	High Volume Air Sampler	TARP	Trigger Action Response Plan
IAC	Illawarra Access Controller	TFRR	Thermal Flow Reversal Reactor
ICHPL	Illawarra Coal Holdings Pty Ltd	TSP	Total Suspended Particulate

³² Previously DPIE

³³ Previously Department of Planning and Environment, Department of Planning, Department of Urban Affairs and Planning



IEA	Independent Environmental Audit	TSI	Targeted Site Investigation
ILALC	Illawarra Local Aboriginal Land Council	TSS	Total Suspended Solid
IMC	South32 Illawarra Metallurgical Coal	UoW	University of Wollongong
IPC	Independent Planning Commission	VAM	Ventilation Air Methane
ISO	International Standards Organisation	WTP	Water Treatment Plant
KPa	kilopascal	WIMMCP	Watercourse Impact, Monitoring, Management and Contingency Plan



13.3 Management Plans

The Management Plans required by the Dendrobium Mine Development Consent DA 60-03-2001 and EPL 3241 and their status are provided in Table 41.

Table 41: Management Plans

Management Plan	Approved Date ³⁴	Next Review
Air Quality and Greenhouse Gas Management Plan	8/06/2021	1/04/2023
Bushfire Management Plan	18/08/2021	18/08/2024
Environmental Management Strategy	22/07/2021	1/07/2024
Landscape Management Plan	10/08/2021	1/08/2024
Lighting and Visual Amenity Management Plan	8/06/2021	8/06/2024
Noise Management Plan	29/05/2021	1/04/2024
Pollution Incident Response Management Plan EPL 3241	6/05/2022	30/11/2023
Mining Operations Plan ³⁵	29/06/2015	2/07/2022
Rehabilitation Management Plan: Dendrobium Mine and Cordeaux Colliery	30/06/2022	30/06/2025
Traffic Management Plan	29/05/2021	1/04/2024
Waste Management Plan	1/06/2021	1/06/2024
Water Management Plan	1/06/2022	27/04/2025

³⁴ Approval date is either the date approved by the Department (as applicable) or internally (where Department approval not required).

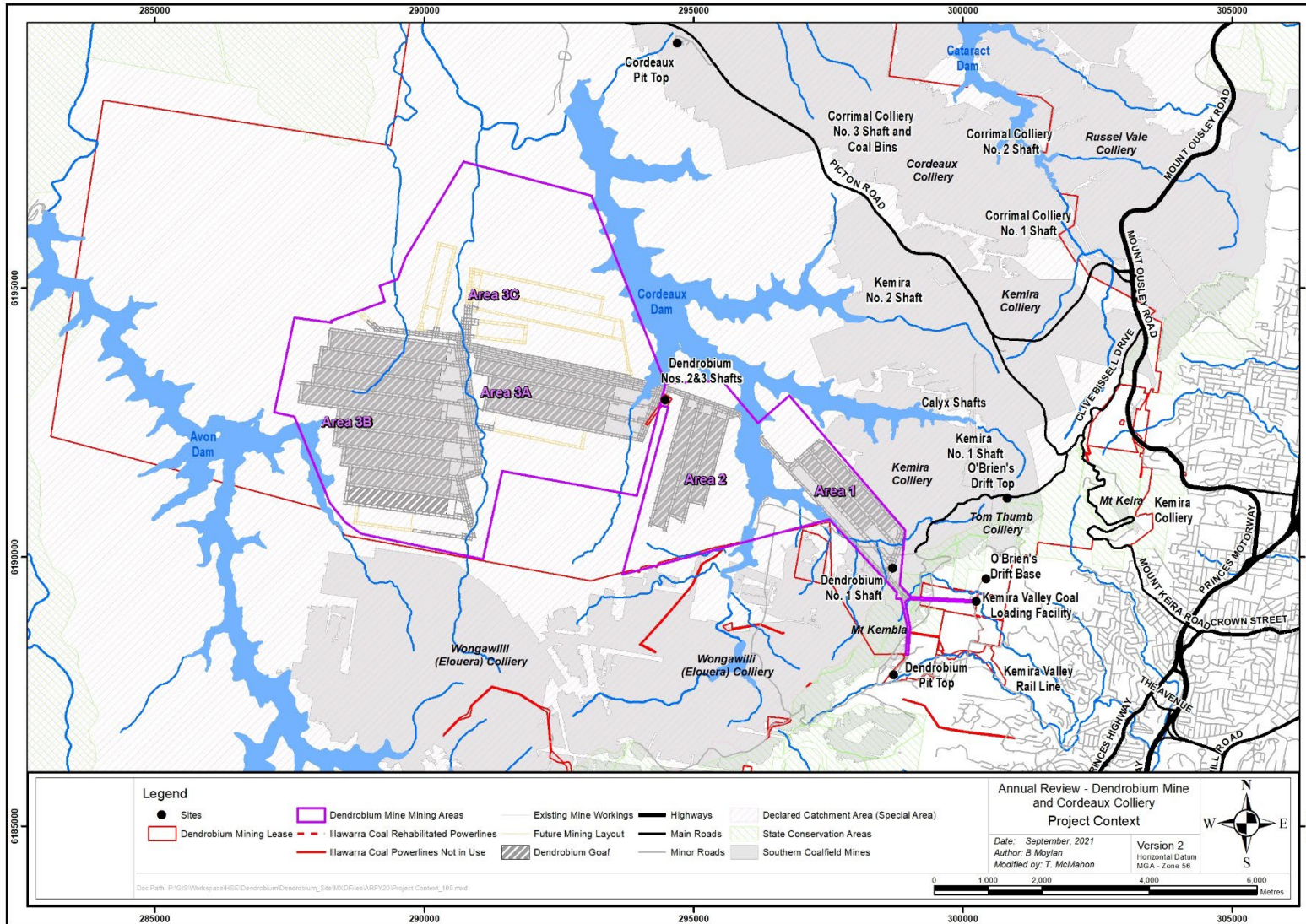
³⁵ Document became obsolete on 2 July 2022.



14. PLANS

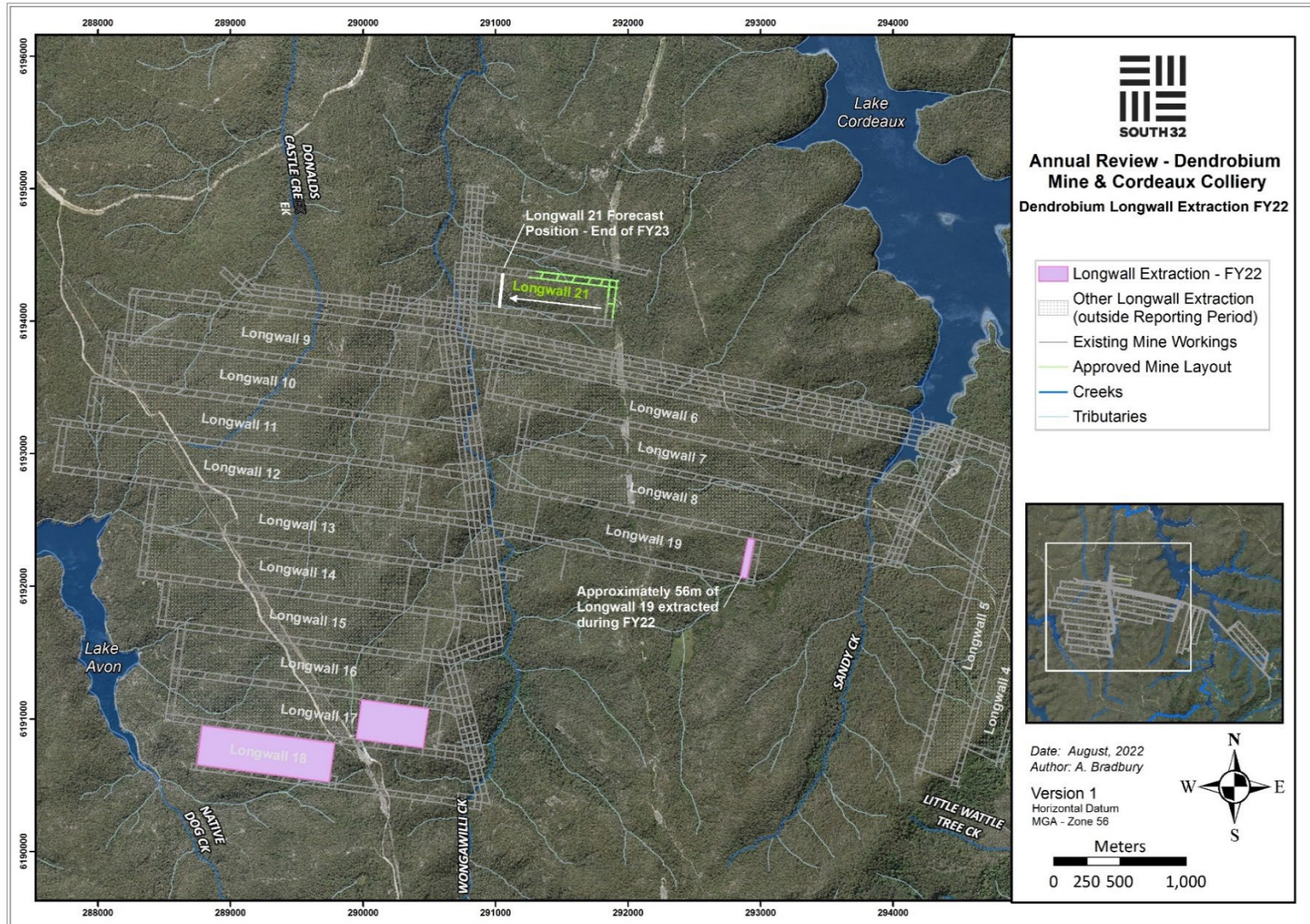


Plan 1: Location of Mining Domain



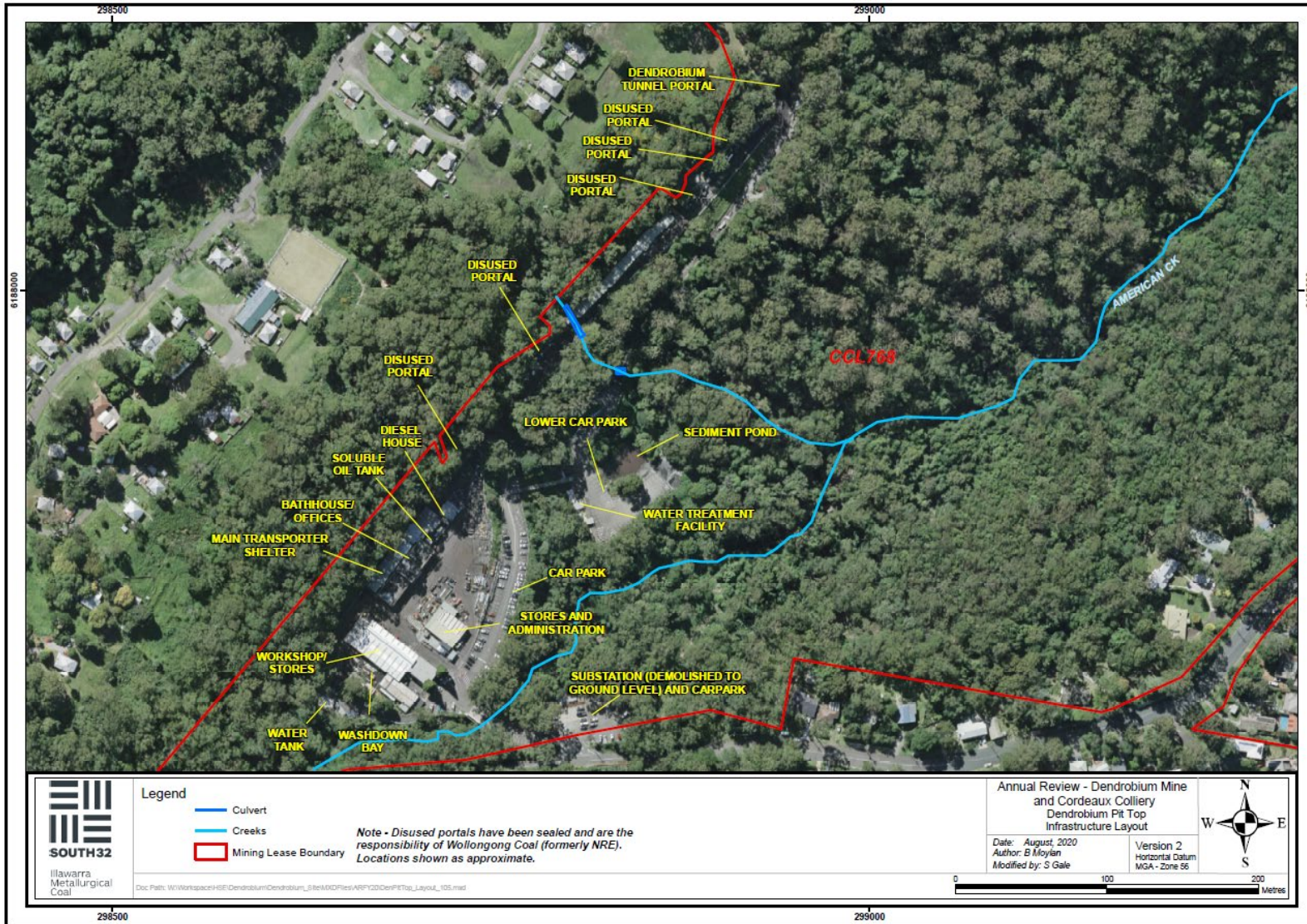


Plan 2: Longwall Status as end of FY22



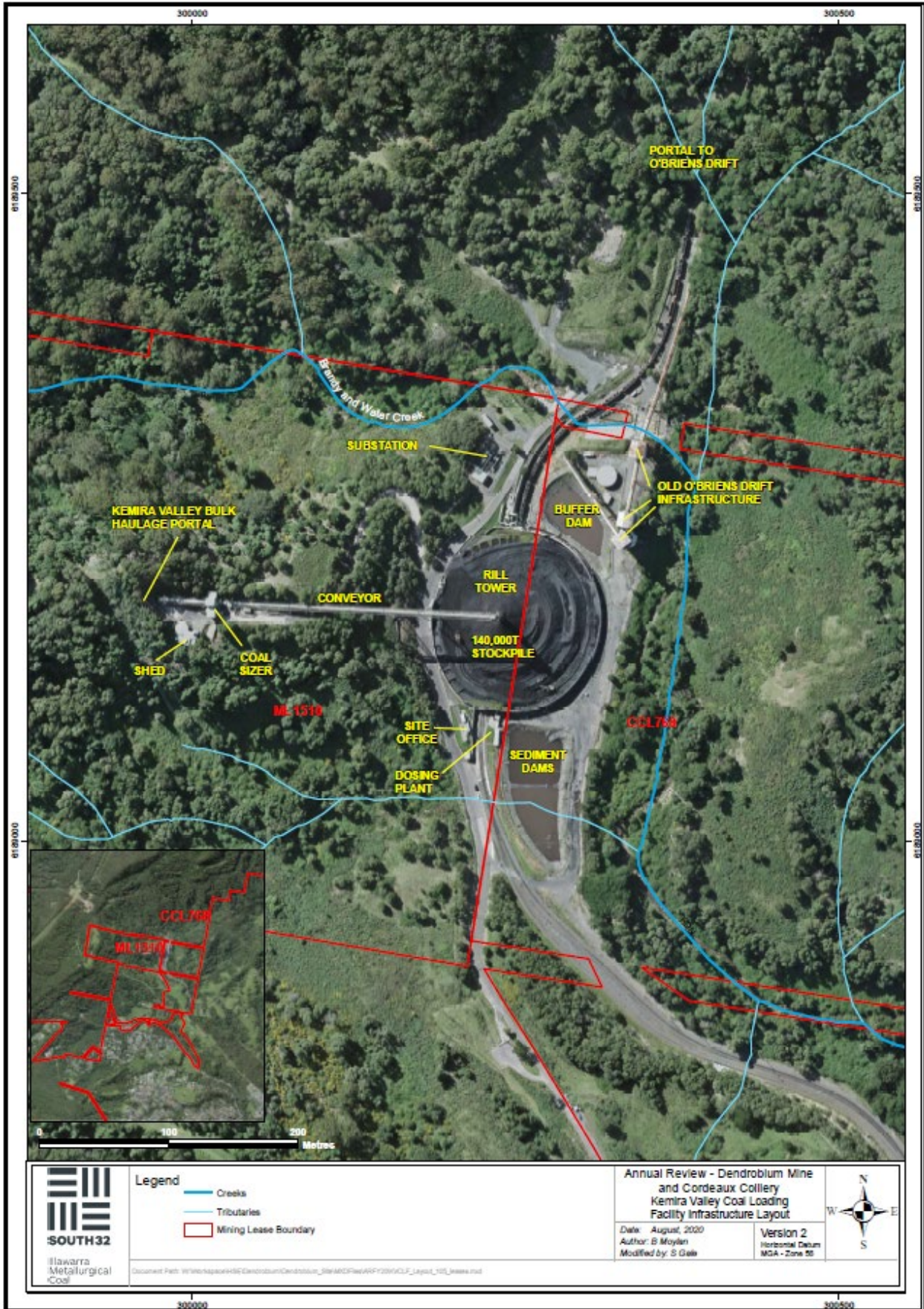


Plan 3: Site Layout - Dendrobium Mine Pit Top



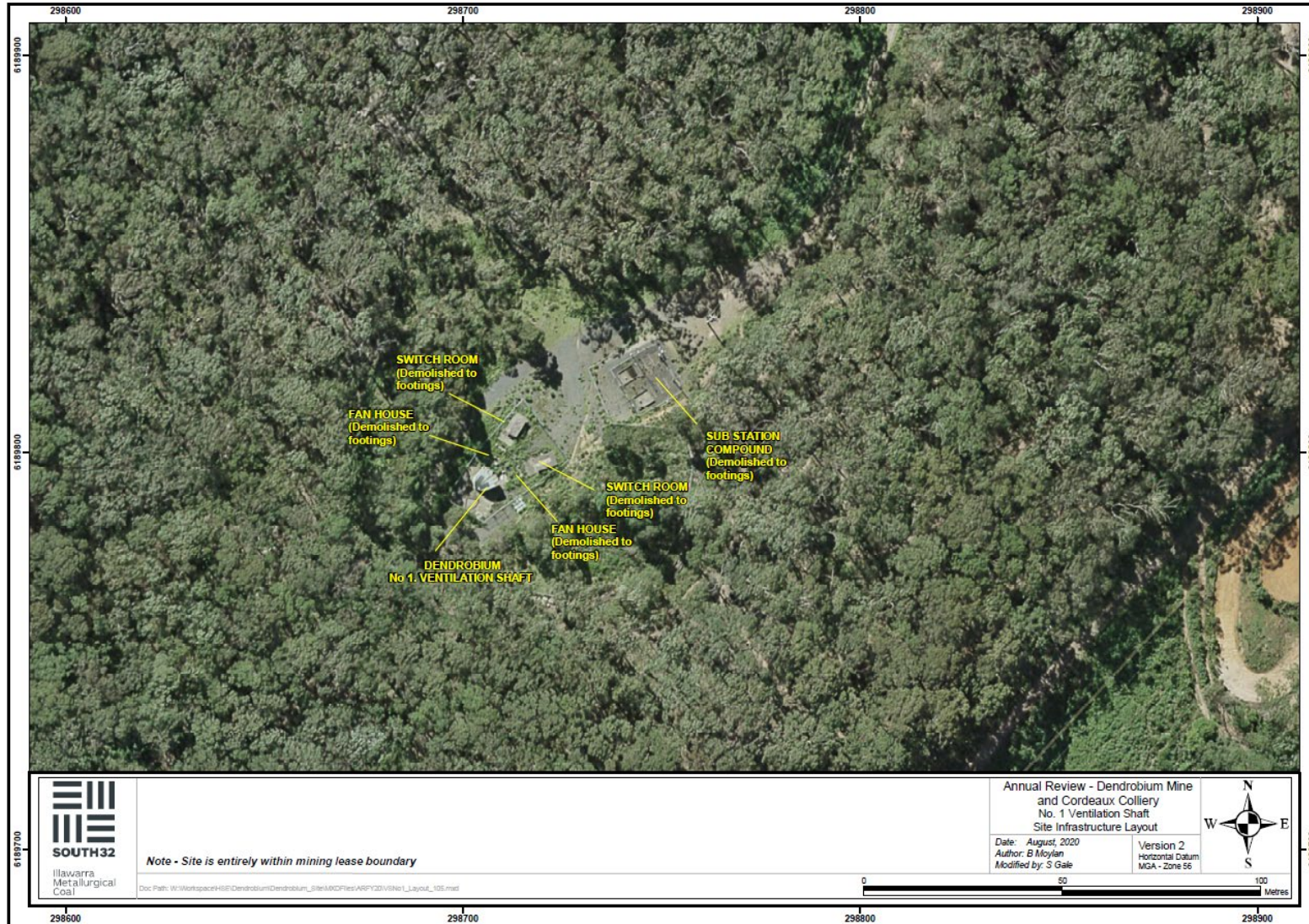


Plan 4: Site Layout - Kemira Valley Coal Loading Facility





Plan 5: Site Layout - No. 1 Ventilation Shaft





Plan 6: Site Layout - No. 2 and 3 Ventilation Shaft





Plan 7: Site Layout – Proposed Gas Drainage Infrastructure



SRH-21-07-000_200.mxd

Source: Geoscience Australia (2006); Department of Industry (2018); Department Finance, Services & Innovation (2018); South32 (2021)

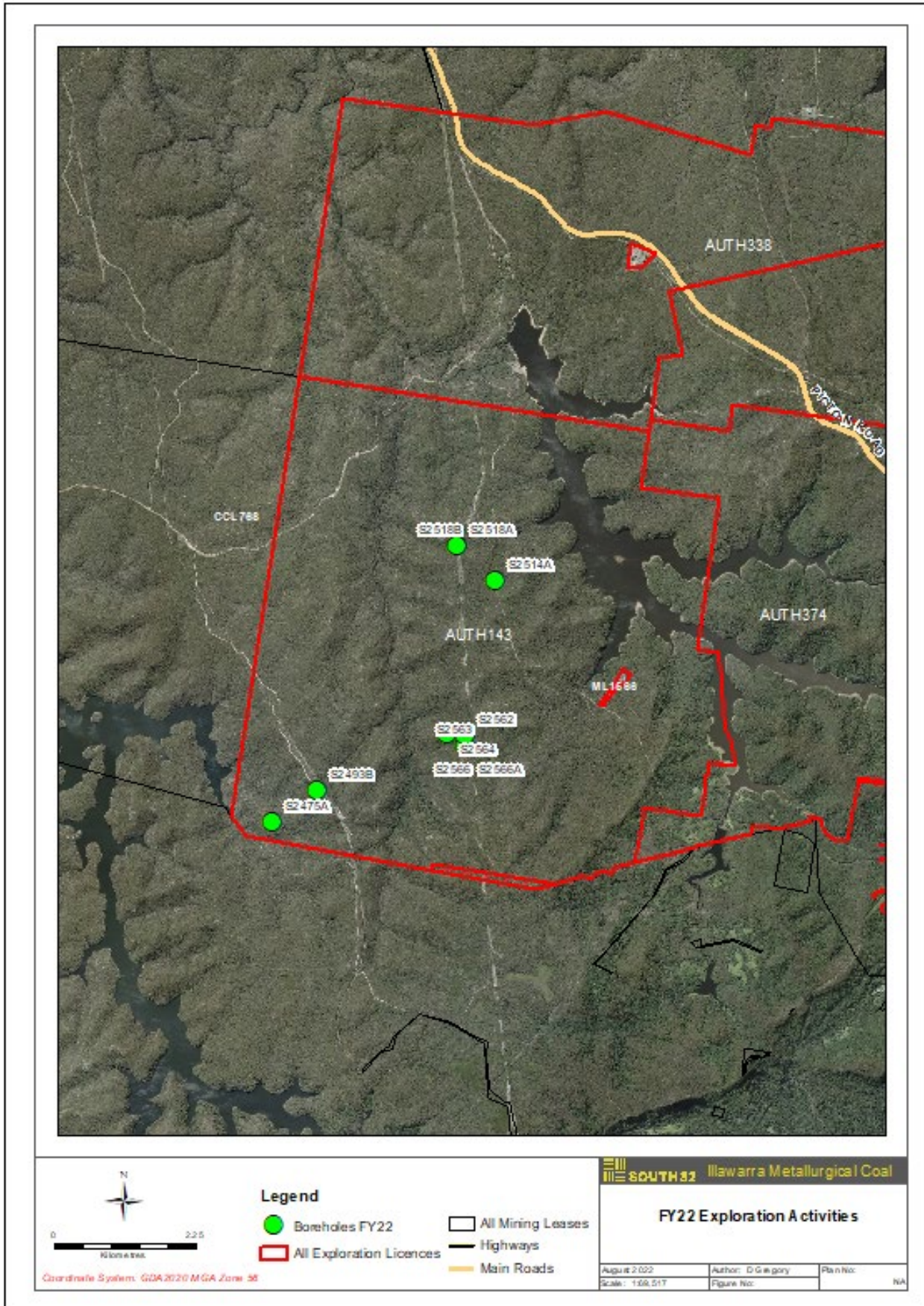
- LEGEND**
- Mining Lease (ML 1566)
 - Modification Component Indicative Location
 - Area to be Cleared
 - Asset Protection Zone - Vegetation Management
 - Vegetation Management



DENDROBIUM MINE
 Dendrobium - Gas Management
 Infrastructure General Arrangement

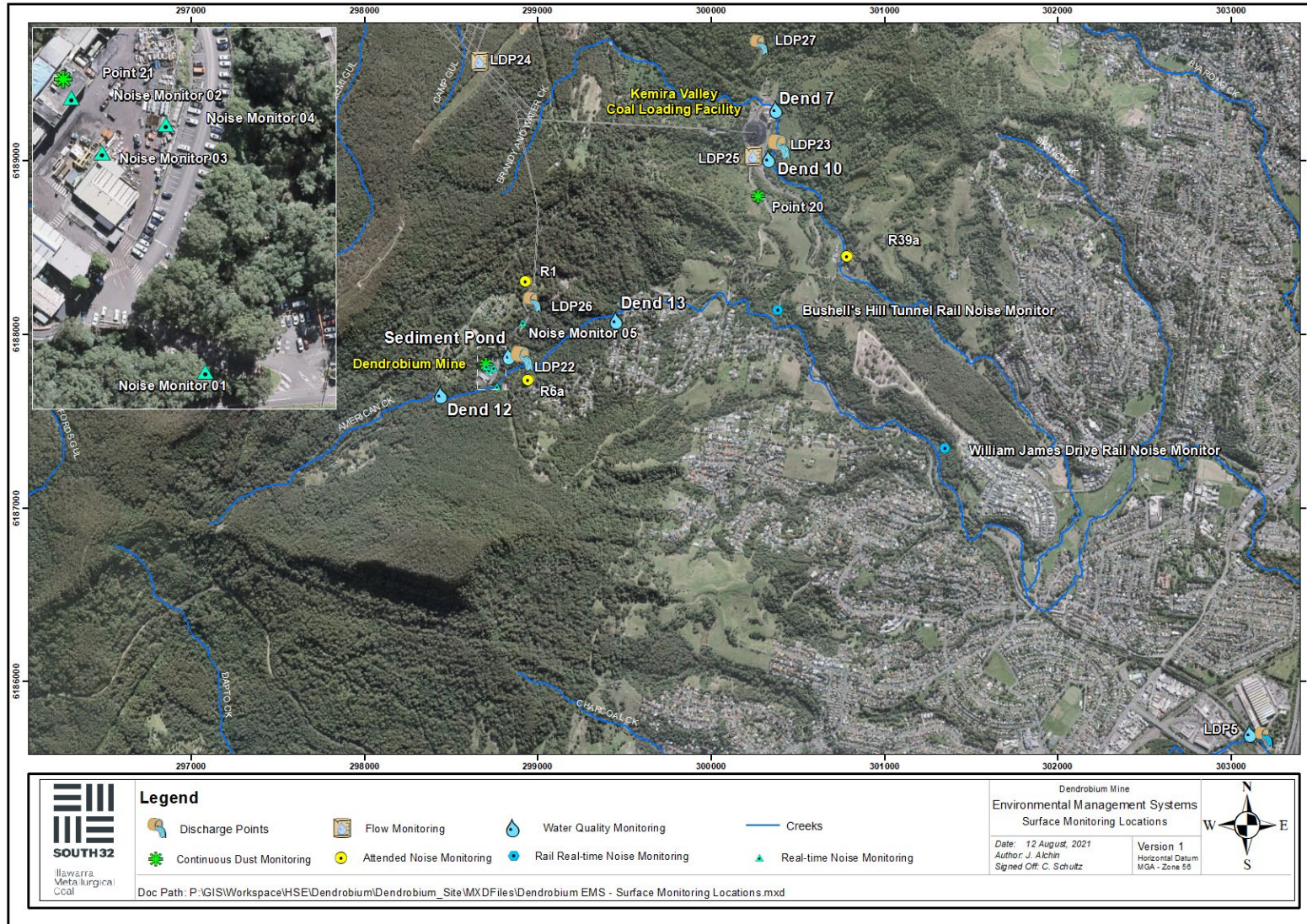


Plan 8: Exploration Activities - Dendrobium Mine - FY22



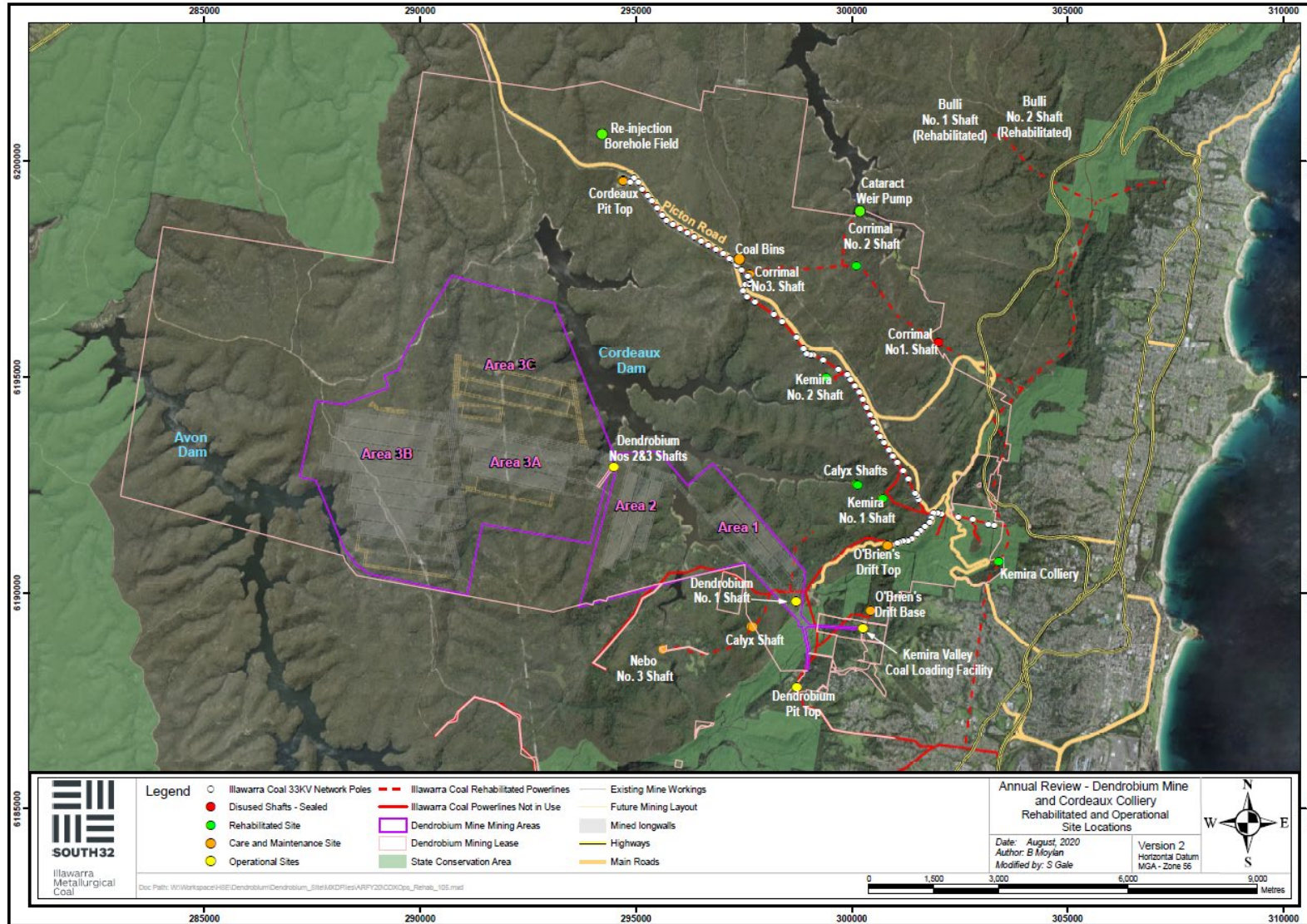


Plan 9: Monitoring Locations - Dendrobium Mine



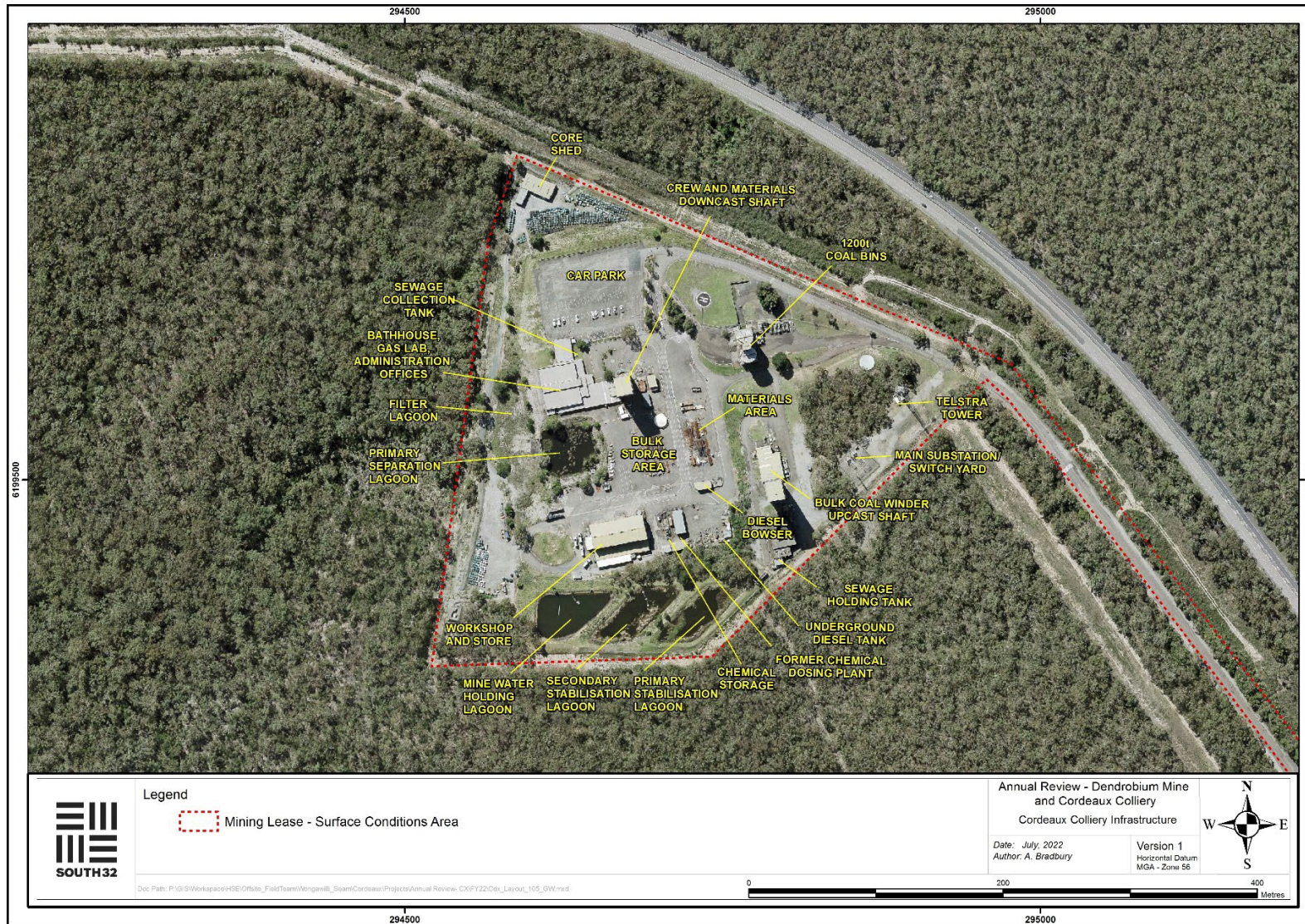


Plan 10: Operational and Rehabilitation Areas





Plan 11: Site Layout - Cordeaux Colliery



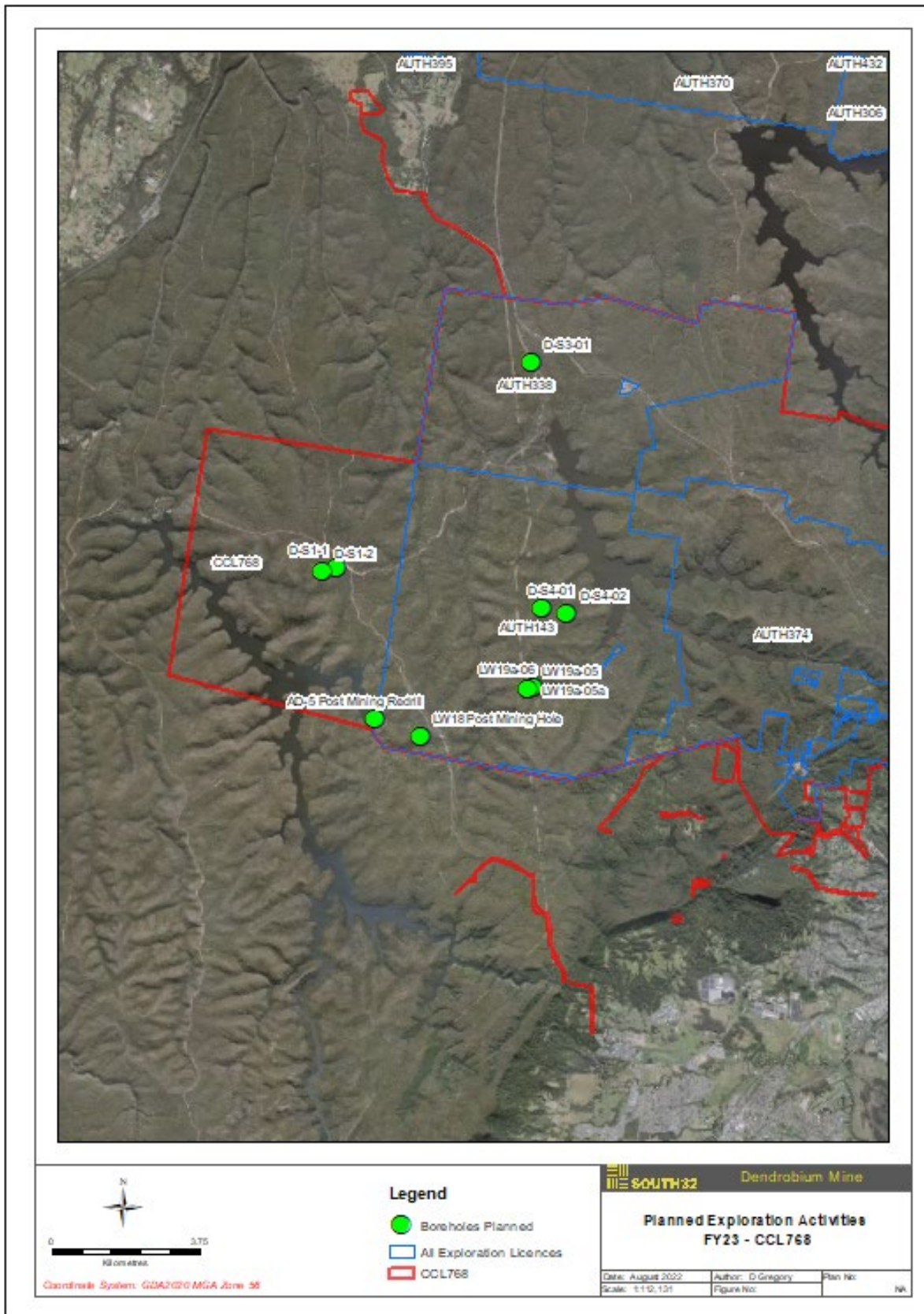


Plan 12: Monitoring Locations - Cordeaux Colliery



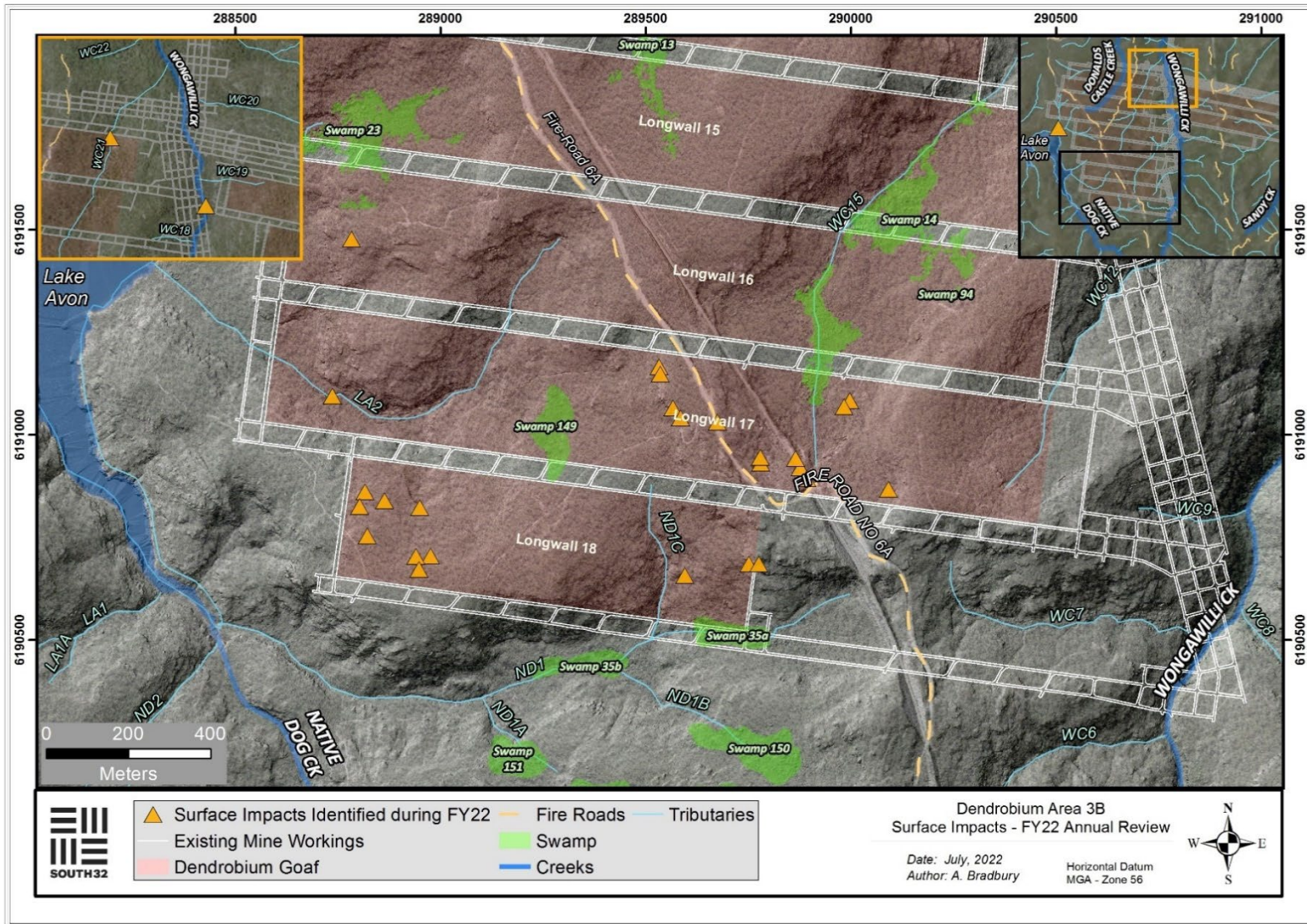


Plan 13: Planned Exploration Activities - CCL 768 - FY23





Plan 14: Dendrobium Mine subsidence impacts observed during – FY22





15. APPENDICES

Appendix 1: EPL 3241 Annual Return - FY22



A. Statement of Compliance - Licence Details

ALL Licence holders must check that the Licence details in Section A are correct.

If there are changes to any of these details, **you must advise Environment Protection Authority (EPA) and apply as soon as possible for a variation to your Licence or for a Licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: <http://www.epa.nsw.gov.au/licensing-and-regulation/licensing> or from regional offices of the EPA, or by contacting by telephone 02 9995 5700.

If you are applying to vary or transfer your Licence, you must still complete and submit this Annual Return.

A1. Licence holder

Licence number : 3241
Licence holder : DENDROBIUM COAL PTY LTD
Trading name (if applicable) :
ABN : 85 098 744 088
ACN :
Reporting period : From: 1-7-2021 To: 30-6-2022

A2. Premises to which Licence Applies (if applicable)

Common name (if any) : DENDROBIUM MINE
Premises : CORDEAUX ROAD MOUNT KEMBLA 2526 NSW

A3. Activities to which Licence Applies

Mining for coal
Coal works

A4. Other Activities (if applicable)

A5. Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Mining for coal	> 3,500,000.00 - 5,000,000.00	T annual production capacity
Coal works	> 2,000,000.00 - 5,000,000.00	T annual handing capacity

A6. Assessable Pollutants (if applicable)

Note that the identification of assessable pollutants is used to calculate the **load-based fee**.

The following assessable pollutants are identified for the fee-based activity classifications in the licence:

B. Monitoring and Complaints Summary

B1. Number of Pollution Complaints

Pollution Complaint Category	Complaints
Air	0
Water	0
Noise	37
Waste	0
Other	14
Total complaints recorded by the licensee during the reporting period	51

B2. Concentration Monitoring Summary

For each concentration monitoring point identified in your licence, details are displayed below. If concentration monitoring is not required by your licence, **no data** will appear below.

If data was provided from an uploaded file, the file name will be displayed below instead of any data.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Discharge Point 5

Stormwater and minewater discharge from Dendrobium mine. Brine discharge from Appin West mine. Discharge quality monitoring, Pipeline discharging to Allan's Creek at Marley Place. lat. long. -34.450367 150.855419

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Arsenic	milligrams per litre	12	12	0.001	0.008	0.012
Conductivity	microsiemens per centimetre	12	12	1600	1733	1890
Copper	milligrams per litre	12	12	<0.001	0.001	0.005
Nickel	milligrams per litre	12	12	0.010	0.015	0.026
Oil and Grease	milligrams per litre	12	12	<5	<5	<5



Annual Return

DENDROBIUM COAL PTY LTD

Licence 3241

pH	pH	12	12	8.2	8.3	8.5
Total suspended solids	milligrams per litre	12	12	<5	7	11
Zinc	milligrams per litre	12	12	0.031	0.086	0.154

Monitoring Point 20

PM10 monitoring, Photometer located at the Kemira Valley coal loading facility. lat. long. -34.423107 150.826605

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
PM10	micrograms per cubic metre	Continuous	Continuous	0.12	5.98	16.30

Monitoring Point 21

PM10 monitoring, Photometer located at the Dendrobium mine pit top. lat. long. -34.431440 150.809213

Pollutant	Unit of measure	No. of samples required	No. of samples collected and analysed	Lowest sample value	Mean of sample	Highest sample value
PM10	micrograms per cubic metre	Continuous	Continuous	0.15	4.72	23.94

B3. Volume or Mass Monitoring Summary

For each volume or mass monitoring point identified in your licence, details are displayed below. If volume or mass monitoring is not required by your licence, **no data** will appear below.

If data was provided from an uploaded file, the file name will be displayed below instead of any data.

Note that this does not exclude the need to conduct appropriate volume or mass monitoring of assessable pollutants are required by load-based licensing (if applicable).

Monitoring Point 24

Volume Monitoring, Pipeline dewatering underground water storage area. lat. long. -34.415564 150.809602

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	Highest result
megalitres per day	Continuous	Continuous	1.73	7.68	9.36



Monitoring Point 25

Volume Monitoring, Pipeline discharge for Kemira Valley sedimentation ponds. lat. long. -34.421191
150.826841

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	Highest result
megalitres per day	Continuous	Continuous	0.00	0.47	1.69

C. Statement of Compliance - Licence Conditions

C1. Compliance with Licence Conditions

Were all conditions of the licence complied with (including monitoring and reporting requirements)?	No
---	----

C2. Details of Non-Compliance with Licence

Licence condition number not complied with ▼
L2.4
Summary of particulars of the non-compliance ▼
Exceedance of water quality concentration limit for Zinc at LDP 5.
Further details on particulars of non-compliance, if required ▼
An exceedance of the water quality concentration limit for Zinc (of 0.4 mg/L) occurred at licence discharge point (LDP) 5, located at Marley Place, Unanderra. The exceedance (0.606 mg/L) was recorded during the discharge of brine from the Appin North water treatment plant on 13 October 2021. The exceedance was recorded as part of an investigation as opposed to in the monthly compliance sampling.
Number of times occurred ▼
1
Date(s) when the non-compliance occurred, if applicable ▼
13 October 2021
Cause of non-compliance ▼
It is likely that the cause of the exceedance was inadequate mixing of brine with water from Dendrobium Mine. The exceedance was unable to be replicated in further sampling that was undertaken.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance ▼
There was no environment harm associated with the exceedance. A study has been undertaken of the brine discharge by EGi indicating that even at higher concentrations of Zinc that there was limited potential for bioaccumulation or bioavailability. No further exceedances have been recorded.



Action taken or that will be taken to prevent a recurrence of the non-compliance ▼
Monthly sampling will continue to be undertaken at LDP5. A sampling program, as required under Special Condition E1.1 continues to be undertaken.
Uploaded Document Name ▼
Uploaded Document Description ▼

D. Statement of Compliance - Load Based Fee Calculation

If you are not required to monitor assessable pollutants by your licence, **no data** will appear below.

If assessable pollutants have been identified on your licence, the following worksheets for each assessable pollutant will determine your load based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been already sent to you with your licence. If you require additional copies, you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

E. Statement of Compliance - Requirement to Prepare PIRMP

Have you prepared a Pollution Incident Response Management Plan (PIRMP) as required under section 153A of the Protection of the Environment Operations (POEO) Act 1997?	Yes
Is the PIRMP available at the premises?	Yes
Is the PIRMP available in a prominent position on a publicly accessible website?	Yes
Address of the web page where the PIRMP can be accessed ▼	
https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents	
Has the PIRMP been tested?	Yes
The PIRMP was last tested on	30-11-2021
Has the PIRMP been updated?	Yes
The PIRMP was last updated on	6-5-2022
Number of times the PIRMP was activated in this reporting period?	0
The PIRMP was activated on	



F. Statement of Compliance - Requirement to Publish Pollution Monitoring Data

Are there any conditions attached to your licence that require pollution monitoring to be undertaken as required under section 66(6) of the Protection of the Environment Operations (POEO) Act 1997?	Yes
Do you operate a website?	Yes
Is the pollution monitoring data published on your website in accordance with the EPA's written requirements for publishing pollution monitoring data?	Yes
Address of the web page where the pollution monitoring data can be accessed ▼	
https://www.south32.net/our-business/australia/illawarra-metallurgical-coal/documents	

G. Statement of Compliance - Environment Management System and Practices

Do you have an ISO 14001 certified Environmental Management System (EMS) OR any other system that EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 certified EMS?	Yes
When was the last check (As per ISO 14001) of the EMS completed?	6-6-2022
Were there any non-conformances related to environmental issues identified in the last check of the EMS?	No
If there were non-conformances identified, were these non-conformances rectified?	

H. Signature and Certification

This Annual Return may only be signed by person(s) with legal authority to sign it as set out in following categories: an Individual, a Company, a Public authority or a Local council.

It is an offence under section 66 of the Protection of the Environment Operations Act 1997 to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of \$250,000 for a corporation and \$120,000 for an individual.

I/We

- declare that the information in the Monitoring and Complaints Summary in Section B of this Annual Return application is correct and not false or misleading in a material respect, and
- certify that the information in the Statement and Compliance in sections A, C, D, E, F, G and H and any other pages attached to Section C is correct and not false or misleading in a material respect.



Appendix 2: Rehabilitation Cost Estimates

Rehabilitation cost estimate provided only for the Resources Regulator. The Rehabilitation Cost estimate is commercial in nature.

Please contact the Resources Regulator or IMC representative for further information.



Appendix 3: Dendrobium Mine Development Consent Condition Compliance Report

Condition of Consent	Status	Comments
SCHEDULE 2: ADMINISTRATIVE CONDITIONS		
Obligation to Minimise Harm to the Environment		
1. The Applicant must 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	Reasonable and feasible measures were implemented over the reporting period to prevent/minimise harm to the environment.
Terms of Approval		
2. The Applicant must carry out the development generally in accordance with the: (a) Development Application (DA 60-03-2001), EIS and associated submissions to the Dendrobium Underground Coal Mine Project Commission of Inquiry, and in particular its: • Primary Submission (the Dendrobium Project, dated 30 July 2001); • Submission in Reply (the Dendrobium Project, undated); and • Environmental Effects of Subsidence Associated with the Dendrobium Project, prepared by National Environmental Consulting Services and dated August 2001; (b) Modification Application dated 12 February 2002 and supporting information dated 27 January 2002; (c) Modification Application and supporting information dated 24 May 2002 and additional supporting information dated 14 June 2002; (d) Modification Application and Statement of Environmental Effects for the Dendrobium Coal Sizer, prepared by Olsen Environmental Consulting and dated March 2005; (e) Application for Further Approval of West Cliff Emplacement Area Stage 3, Vol 2 (including Appendices), prepared by Cardno Forbes Rigby and dated July 2007, associated Response to Submissions dated 1 November 2007 and associated Statement of Commitments dated 28 November 2007 (see Appendix 3); (f) Modification Application – Modification of Area 3 Footprint and Review of Conditions of Consent dated 27 November 2007, EA and associated Statement of Commitments (see Appendix 4); and (g) Modification 7, Modification 8 and Modification 9.	Compliant	The listed documentation reflects changes to the development as a result of consultation with Authorities and the community. Management Plans and associated documentation reflect these changes and requirements.
2A. The Applicant must carry out the development in accordance with the conditions of this consent.	Not compliant	See Condition 1 of Schedule 4 and Condition 15 of Schedule 4
2B. The Applicant must carry out the development generally in accordance with the development layout shown in Appendix 2.	N/A	Construction works at the gas management infrastructure site had not commenced in the reporting period.
3. If there is any inconsistency between the above documents, the most recent document must prevail to the extent of the inconsistency. However, the conditions of this consent must prevail to the extent of any inconsistency.	Compliant	Document precedence is applied where required.



Condition of Consent	Status	Comments
<p>4. The Applicant must comply with any reasonable and feasible requirement/s of the Secretary arising from the Department's assessment of:</p> <p>(a) any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with the conditions of this consent;</p> <p>(b) any reviews, reports or audits undertaken or commissioned by the Department regarding compliance with the conditions of this consent; and</p> <p>(c) the implementation of any actions or measures contained in these documents.</p>	Compliant	Requirements have been complied with where reasonable and feasible.
Limits on Consent		
<p>5. Mining operations may take place in the mining area until 31 December 2030.</p> <p><i>Note: Under this consent, the Applicant is required to rehabilitate the site in accordance with the conditions of this consent and those imposed on the mining lease(s) associated with the development under the Mining Act 1992. Consequently this consent will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated to a satisfactory standard.</i></p>	Compliant	This date is in the future.
<p>6. The Applicant must not extract more than 5.2 million tonnes of RoM coal a year from the mining area.</p>	Compliant	Less than 5.2 million tonnes was extracted during the reporting period. Mining plans and production forecasts are developed on this basis.
<p>7. The Applicant must only transport coal from the surface facilities by rail.</p>	Compliant	Coal extracted from Dendrobium Mine was only transported via the Kemira Valley Rail Line during the reporting period.
Staged Submission of Management Plans/Monitoring Programs		
<p>8. With the approval of the Secretary, the Applicant may submit any management plan or monitoring program required by this consent on a progressive basis.</p>	Compliant	Plans required under the consent are submitted as required. No staged management plans were submitted.
<p>9. The Applicant must ensure that monitoring programs, management plans and the Environmental Management Strategy, as in existence at the date of modification of consent in November 2008, continue to be implemented (to the satisfaction of the Secretary) until replaced by monitoring programs and management plans approved in accordance with the conditions of this consent.</p>	Compliant	All required management plans have been implemented and are updated as required and approved by the Department as per DPE processes.
Structural Adequacy		
<p>10. The Applicant must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> • Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works. 	Compliant	All construction activities have been undertaken in accordance with the requirements of the BCA where applicable.



Condition of Consent	Status	Comments
<ul style="list-style-type: none"> <i>Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 sets out the requirements for the certification of the development.</i> 		
Demolition		
<p>11. The Applicant must ensure that all demolition work is carried out in accordance with <i>Australian Standard AS 2601-2001: The Demolition of Structures</i>, or its latest version.</p>	Compliant	Demolition during the reporting period has been undertaken generally in accordance with AS 2601-2001.
Operation of Plant and Equipment		
<p>12. The Applicant must ensure that all plant and equipment used on site is:</p> <p>(a) maintained in a proper and efficient condition; and</p> <p>(b) operated in a proper and efficient manner.</p>	Compliant	A maintenance management system is used to ensure that all plant and equipment used on site is maintained in a proper and efficient condition. Operators are trained and assessed as competent. The site entry process ensures that there is a maintenance strategy and operating procedure for equipment prior to going underground.
Community Enhancement		
<p>13. The Applicant must contribute \$0.03 per tonne of saleable coal production each financial year to fund the provision of significant present and future benefits to local communities directly affected by the development. These funds must be:</p> <p>(a) administered and expended in accordance with procedures which are to the satisfaction of WCC and the Secretary;</p> <p>(b) provided by 30 September each year over the life of the consent;</p> <p>(c) based on saleable coal production in the previous financial year; and</p> <p>(d) indexed in accordance with the CPI, with April 2005 used as the commencement date for indexation calculations.</p> <p>Any dispute over the operation of this fund must be referred to the Secretary for resolution.</p>	Compliant	Payment was made for FY22 in accordance with requirements.
Costs of Management Measures		
<p>14. The Applicant must be responsible for the costs of all management measures (including measures to minimise, mitigate, offset or remediate impacts of the development which are not recoverable by a third party through the Coal Mine Subsidence Compensation Act 2017 or the Mining Act 1992) including but not limited to remediation of natural features, rehabilitation of ecological systems, the provision of supplementary waters and monitoring of the effectiveness of the works, as determined by the Secretary.</p>	Compliant	Management measures were undertaken as required and at the cost of IMC where not recoverable by a third party.
Strategic Biodiversity Offsets		



Condition of Consent	Status	Comments
<p>15. If the Applicant is required to provide a biodiversity offset pursuant to this consent (including any biodiversity offset that is required under the conditions of a subordinate approval issued in accordance with this consent), the Secretary, in consultation with BCS, may accept in satisfaction of the requirement for the biodiversity offset, the provision of land that has conservation values which exceed the conservation values required to meet the relevant offsetting requirement. If the Secretary accepts such an offset under this condition, the Secretary must issue a written statement to the Applicant advising:</p> <ul style="list-style-type: none"> (a) the details of the proposed offset land; (b) the offset requirements that are being met; (c) the conservation values that have been relied upon to meet the offsetting requirements; and (d) that in the opinion of the Secretary: <ul style="list-style-type: none"> (i) the land has offsetting values in addition to those that have been relied upon to meet the offsetting requirement in condition 15(b); or (ii) if the land has been subject to a previous statement from the Secretary under this condition, confirmation that the land continues to have conservation values in addition to those that have been relied upon to meet the previous offsetting requirement, or that there are no further conservation values available in respect of the land. <p>If the Secretary has issued a statement under this condition, the Applicant can rely on that statement and the residual conservation values that the land subject to the statement may hold, to meet further offsetting requirement(s) that may be required under this consent or the project approval for the Bulli Seam Operations Project (08_0150).</p> <p>The Secretary's statement under this condition can be relied on a number of times in respect of the same land until all of the conservation values of the land the subject of the Secretary's statement have been relied upon to meet offsetting requirements under this consent or the approval for the Bulli Seam Operations Project (08_0150).</p> <p>The Applicant must make suitable arrangements to provide appropriate long-term security for the biodiversity offset area(s) accepted under this condition, within 2 years of the date of the Secretary's statement in respect of that land, unless otherwise agreed with the Secretary</p>	Compliant	A biodiversity offset area has been established and approved by the Secretary.
SCHEDULE 3: SPECIFIC ENVIRONMENTAL CONDITIONS – MINING AREA		
SUBSIDENCE		
<i>Note: These conditions should be read in conjunction with the Statement of Commitments.</i>		
Watercourse Impact Management		
<p>1. The Applicant must ensure that, as a result of the development:</p> <ul style="list-style-type: none"> (a) no rock fall occurs at Sandy Creek Waterfall or from its overhang; (b) the structural integrity of the waterfall, its overhang and its pool are not impacted; (c) cracking in Sandy Creek within 30 m of the waterfall is of negligible environmental and hydrological consequence; and (d) negligible diversion of water occurs from the lip of the waterfall to the satisfaction of the Secretary. 	Compliant	A SMP for Area 3A was approved that meets these requirements.



Condition of Consent	Status	Comments
<p>2. The Applicant must ensure that underground mining operations do not cause subsidence impacts at Sandy Creek and Wongawilli Creek other than “minor impacts” (such as minor fracturing, gas release, iron staining and minor impacts on water flows, water levels and water quality) to the satisfaction of the Secretary.</p> <p><i>Note: In this condition, “minor impacts” are those defined as minor triggers in Table 23.2 of the draft SMP submitted by the Applicant for Dendrobium Area 3A.</i></p>	Compliant	<p>A SMP for Area 3A was approved that meets these requirements. The approved SMP for Area 3B also addresses potential impacts on Wongawilli Creek. Longwall panels are aligned, where possible, to minimise impacts to watercourses.</p>
<p>3. The Applicant must ensure the development does not result in reduction (other than negligible reduction) in the quality or quantity of surface water or groundwater inflows to Lake Cordeaux or Lake Avon or surface water inflow to the Cordeaux River at its confluence with Wongawilli Creek, to the satisfaction of the Secretary.</p>	Compliant	<p>Potential subsidence impacts are covered in the relevant SMP.</p>
<p>4. Prior to carrying out any underground mining operations that could cause subsidence in either Area 3A, Area 3B or Area 3C, the Applicant must prepare a Watercourse Impact Monitoring, Management and Contingency Plan to the satisfaction of the Secretary. Each such Plan must:</p> <p>(a) demonstrate how the subsidence impact limits in conditions 1 - 3 are to be met;</p> <p>(b) include a monitoring program and reporting mechanisms to enable close and ongoing review by the Department and Resources Regulator of the subsidence effects and impacts (individual and cumulative) on Wongawilli Creek, Sandy Creek and Sandy Creek Waterfall;</p> <p>(c) include a general monitoring and reporting program addressing surface water levels, water flows, water quality, surface slope and gradient, erodibility, aquatic flora and fauna (including Macquarie Perch, any other threatened aquatic species and their habitats) and ecosystem function;</p> <p>(d) include a management plan for avoiding, minimising, mitigating and remediating impacts on watercourses, which includes a tabular contingency plan (based on the Trigger Action Response Plan structure) focusing on measures for remediating both predicted and unpredicted impacts;</p> <p>(e) address third and higher order streams individually but address first and second order streams collectively;</p> <p>(f) be prepared in consultation with BCS, WaterNSW and Resources Regulator;</p> <p>(g) incorporate means of updating the plan based on experience gained as mining progresses;</p> <p>(h) be approved prior to the carrying out of any underground mining operations that could cause subsidence impacts on watercourses in the relevant Area; and</p> <p>(i) be implemented to the satisfaction of the Secretary.</p> <p>Notes:</p> <ul style="list-style-type: none"> Should review by the Department of reports by the Applicant under paragraph (b) indicate that subsidence impacts have exceeded or threaten to limits imposed in conditions 1-3, then under condition 4 of Schedule 2 the Secretary may instruct the Applicant to implement reasonable and feasible requirements, which may include to cease mining within the operative longwall, shorten the length of that longwall or shorten the length and/or width of future longwalls. 	Compliant	<p>The Watercourse Impact Monitoring, Management and Contingency Plan has been incorporated into the Area 3B SMP and is available on the IMC website.</p>



Condition of Consent	Status	Comments
<ul style="list-style-type: none"> Requirements under paragraphs (a) and (b) in respect of Sandy Creek and Sandy Creek Waterfall relate only to the Watercourse Impact Monitoring, Management and Contingency Plan for Area 3A. 		
Swamp Impact Management		
<p>5. The Applicant must ensure that subsidence does not cause erosion of the surface or changes in ecosystem functionality of Swamp 15a and that the structural integrity of its controlling rockbar is maintained or restored, to the satisfaction of the Secretary.</p>	Compliant	Subsidence management measures for Swamp 15a are included in the SMP for Area 3A.
<p>6. Prior to carrying out any underground mining operations that could cause subsidence in either Area 3A, Area 3B or Area 3C, the Applicant must prepare a Swamp Impact Monitoring, Management and Contingency Plan to the satisfaction of the Secretary. Each such Plan must:</p> <p>(a) demonstrate how the subsidence impact limits in condition 5 are to be met;</p> <p>(b) include a monitoring program and reporting mechanisms to enable close and ongoing review by the Department and Resources Regulator of the subsidence effects and impacts (individual and cumulative) of each Area 3A longwall on Swamp 15a;</p> <p>(c) include a general monitoring and reporting program addressing surface water levels, near surface groundwater levels, water quality, surface slope and gradient, erodibility, flora and ecosystem function;</p> <p>(d) include a management plan for avoiding, minimising, mitigating and remediating impacts on swamps, which includes a tabular contingency plan (based on the Trigger Action Response Plan structure) focusing on measures for remediating both predicted and unpredicted impacts;</p> <p>(e) address headwater and valley infill swamps separately and address each swamp individually;</p> <p>(f) be prepared in consultation with BCS, WaterNSW and Resources Regulator;</p> <p>(g) incorporate means of updating the plan based on experience gained as mining progresses;</p> <p>(h) be approved prior to the carrying out of any underground mining operations that could cause subsidence impacts on swamps in the relevant Area; and</p> <p>(i) be implemented to the satisfaction of the Secretary.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> Should review by the Department of reports by the Applicant under paragraph (b) indicate that subsidence impacts have exceeded or threaten to exceed limits imposed in condition 5, then under condition 4 of Schedule 2 the Secretary may instruct the Applicant to implement reasonable and feasible requirements, which may include to cease mining within the operative longwall, shorten the length of that longwall or shorten the length and/or width of future longwalls. Requirements under paragraphs (a) and (b) relate only to the Swamp Impact Monitoring, Management and Contingency Plan for Area 3A. 	Compliant	The Swamp Impact Monitoring, Management and Contingency Plan has been incorporated into the Area 3A and 3B SMPs. The Swamp Impact Monitoring, Management and Contingency Plan and the Watercourse Impact Monitoring, Management and Contingency Plan documents were revised to take into account the SMP Approval Conditions and submissions from regulatory agencies.
Subsidence Management Plans		
<p>7. Prior to carrying out any underground mining operations that could cause subsidence in either Area 3A, 3B or 3C, the Applicant must prepare a Subsidence Management Plan (SMP) to the satisfaction of the Secretary and the Resources Regulator. Each such SMP must:</p>	Compliant	SMPs that meet these requirements have been and will be submitted as required. These SMPs



Condition of Consent	Status	Comments
<p>(a) integrate ongoing management of Areas 1 and 2; (b) integrate the Watercourse and Swamp Impact Monitoring, Management and Contingency Plans required under conditions 4 and 6; (c) include monitoring of subsidence effects; (d) include a WaterNSW Assets Protection Plan; (e) include monitoring, management, and contingency plans for all other significant natural features and all significant man made features which may be impacted by subsidence, including:</p> <ul style="list-style-type: none"> • landscape (including cliffs and steep slopes); • groundwater (see condition 13); • terrestrial flora and fauna and ecology (including all threatened species assessed as being likely to be significantly affected by the development and their habitats); • Aboriginal and other cultural heritage (see condition 12); and <p>electrical, communications and other infrastructure; (f) be prepared in consultation with BCS, WaterNSW and Resources Regulator; (g) be approved prior to the carrying out of any underground mining operations that could cause subsidence in the relevant Area; and (h) be implemented to the satisfaction of the Secretary and the Resources Regulator.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> • <i>The WaterNSW Assets Protection Plan required under this condition must also be prepared and implemented to the satisfaction of the WaterNSW.</i> • <i>The contingency plans required under paragraph (e) must address remediation (as appropriate) and be based on a TARP structure.</i> 		<p>are available on the IMC website.</p>
<p>8. The SMPs prepared under condition 7 for Areas 3B and 3C must:</p> <p>(a) include a mine plan for the relevant Area; (b) include a detailed subsidence impact assessment, clearly setting out all predicted subsidence effects, subsidence impacts and environmental consequences; (c) include a minimum of 2 years of baseline data, collected at appropriate frequency and scale, for all significant natural features; (d) identify and assess the significance of all natural features located within 600 m of the edge of secondary extraction; (e) distinguish between, clearly describe and adequately quantify all subsidence effects, subsidence impacts and environmental consequences; (f) propose limits on subsidence impacts and environmental consequences to be applied within the relevant Area; (g) be otherwise prepared in accordance with any guidelines for SMPs developed by the Department and/or Resources Regulator; (h) be approved prior to the carrying out of any underground mining operations that could cause subsidence in the relevant Area; and (i) be implemented to the satisfaction of the Secretary and the Resources Regulator.</p> <p><i>Note: In approving an SMP, the Secretary may impose conditions containing subsidence impact limits (similar to conditions 1- 3 & 5), subsidence management mechanisms (similar to conditions 4 & 6) or other conditions.</i></p>	<p>Compliant</p>	<p>SMPs are prepared in line with this condition.</p>



Condition of Consent	Status	Comments
End of Panel Reporting		
<p>9. Within 4 months of the completion of each longwall panel, or as otherwise permitted by the Secretary, the Applicant must:</p> <p>(a) prepare an end-of-panel report:</p> <ul style="list-style-type: none"> • reporting all subsidence effects (both individual and cumulative) for the panel and comparing subsidence effects with predictions; • describing in detail all subsidence impacts (both individual and cumulative) for the panel; • discussing the environmental consequences for watercourses, swamps, water yield, water quality, aquatic ecology, terrestrial ecology, groundwater, cliffs and steep slopes; and • comparing subsidence impacts and environmental consequences with predictions; and <p>(b) submit the report to the Department, Resources Regulator, WaterNSW, BCS, DPE Water and any other relevant agency to the satisfaction of the Secretary.</p>	Compliant	End of Panel Reports for Longwalls 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 have been submitted in accordance with the timing of this condition.
<p>10. The Applicant must include a comprehensive summary, analysis and discussion of the results of monitoring of subsidence effects, subsidence impacts and environmental consequences in each Annual Review.</p> <p><i>Note: Conditions 9 and 10 apply to Area 2, as well as to Areas 3A, 3B and 3C.</i></p>	Compliant	A summary of subsidence effects, impacts and environmental consequences is included in the Annual Review.
Subsidence Expert Assessments		
<p>11. The Applicant must pay the reasonable costs of the Department in engaging independent experts to advise it when it assesses SMPs prepared under condition 7 for Areas 3B and 3C.</p>	Compliant	IMC has paid the reasonable costs for engagement of independent experts by the Department.
ABORIGINAL HERITAGE		
<p>12. The SMPs prepared under condition 7 must include an Aboriginal Heritage Plan, which must include a:</p> <p>(a) description of known Aboriginal heritage sites;</p> <p>(b) protocol for the ongoing consultation and involvement of the Aboriginal community in the conservation and management of Aboriginal heritage;</p> <p>(c) description of the measures that would be implemented to protect Aboriginal sites generally, including measures that would be implemented to secure, analyse and record sites at risk of subsidence;</p> <p>(d) description of the measures that would be implemented to protect Aboriginal site 52-2-1646, including:</p> <ul style="list-style-type: none"> • a full recording and assessment of the site's rock art; • a more detailed subsidence assessment for the site; • measures which seek to avoid any significant impact on the site and any necessary contingency plans to protect the site against collapse or substantial impact on its rock art; and <p>(e) description of the measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered during the development.</p>	Compliant	The Aboriginal Heritage Plan has been incorporated into SMPs as required.
GROUNDWATER MONITORING PROGRAM		



Condition of Consent	Status	Comments
<p>13. The SMPs prepared under condition 7 must include a Groundwater Monitoring Program, which must include:</p> <p>(a) proposals to develop a detailed regional and local groundwater model, with special reference to flows to and from nearby water storages;</p> <p>(b) detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality;</p> <p>(c) groundwater impact assessment criteria;</p> <p>(d) a program to monitor the impact of the development on:</p> <ul style="list-style-type: none"> • groundwater levels, yield and quality (particularly any potential loss of flow to, or flow from, WaterNSW water storages); • coal seam aquifers and overlying aquifers; and • groundwater springs and seeps; and <p>(e) consideration of the requirements of the latest version (or subsequent replacement) of WaterNSW's <i>The Design of a Hydrological and Hydrogeological Monitoring Program to Access the Impacts of Longwall Mining in SCA Catchment</i>.</p>	Compliant	<p>The Groundwater Monitoring Program has been incorporated into SMPs as required.</p> <p>A Groundwater Monitoring and Modelling Plan is also in place.</p>
ENVIRONMENTAL OFFSETS		
<p>14. The Applicant must provide suitable offsets for loss of water quality or loss of water flows to WaterNSW storages, clearing and other ground disturbance (including cliff falls) caused by its mining operations and/or surface activities within the mining area, unless otherwise addressed by the conditions of this consent, to the satisfaction of the Secretary. These offsets must:</p> <p>(a) be submitted to the Secretary for approval by 30 April 2009;</p> <p>(b) be prepared in consultation with WaterNSW;</p> <p>(c) provide measures that result in a beneficial effect on water quality, water quantity, aquatic ecosystems and/or ecological integrity of WaterNSW's special areas or water catchments.</p>	Compliant	<p>This offset was accepted by WaterNSW on 10 February 2009.</p>
SCHEDULE 4: SPECIFIC ENVIRONMENTAL CONDITIONS – SURFACE FACILITIES		
NOISE		
Noise Impact Assessment Criteria		
<p>1. The Applicant must ensure that the noise generated at the surface facilities does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25% of any privately-owned land. The applicable criteria for any residence not listed in Table 1 must be the criteria applying at the nearest listed residence.</p>	Non-compliant	<p>Noise monitoring is undertaken in accordance with the approved Noise Management Plan. A summary of results is provided via the Dendrobium Mine Annual Review and in the 14-day report published on the IMC website.</p> <p>Non-compliances and exceedances of noise impact assessment criteria were recorded during the reporting period. Refer to Section 11.1 for details.</p>



Condition of Consent	Status	Comments																																																		
<p><i>Table 1: Noise impact assessment criteria dB(A)</i></p> <table border="1"> <thead> <tr> <th>Day <i>L_{Aeq}(15 min)</i></th> <th>Evening <i>L_{Aeq}(15 min)</i></th> <th>Night <i>L_{Aeq}(15 min)</i></th> <th><i>L_{A1}(1 min)</i></th> <th>Residence <i>(as shown in the Noise Monitoring Program)</i></th> </tr> </thead> <tbody> <tr> <td>42</td> <td>42</td> <td>38</td> <td>48</td> <td>R2</td> </tr> <tr> <td>41</td> <td>41</td> <td>40</td> <td>50</td> <td>R22</td> </tr> <tr> <td>40</td> <td>40</td> <td>39</td> <td>49</td> <td>R1</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>R9</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>R15a</td> </tr> <tr> <td>40</td> <td>40</td> <td>37</td> <td>47</td> <td>R3a</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>R5a</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>R6a&b</td> </tr> <tr> <td>37</td> <td>35</td> <td>35</td> <td>45</td> <td>R39a</td> </tr> </tbody> </table> <p><i>Notes:</i></p> <ul style="list-style-type: none"> To determine compliance with the <i>L_{Aeq}(15 minutes)</i> limit, noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable. To determine compliance with the <i>L_{A1}(1 minute)</i> limit, noise from the development is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the development is impractical, DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The noise emission limits identified in the above table apply under meteorological conditions of: <ul style="list-style-type: none"> wind speeds of up to 3 m/s at 10 metres above ground level; or up to 3°C/100 m temperature inversion strength for all receivers, plus a 2 m/s source-to-receiver component drainage flow wind at 10 metres above ground level for those receivers where applicable. These limits do not apply if the Applicant has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Applicant has advised the Department and DECC in writing of the terms of this agreement. 	Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night <i>L_{Aeq}(15 min)</i>	<i>L_{A1}(1 min)</i>	Residence <i>(as shown in the Noise Monitoring Program)</i>	42	42	38	48	R2	41	41	40	50	R22	40	40	39	49	R1					R9					R15a	40	40	37	47	R3a					R5a					R6a&b	37	35	35	45	R39a		
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<p>Land Acquisition Criteria</p> <p>2. If the noise generated at the surface facilities exceeds the relevant criteria in Table 2 at any residence on privately-owned land or on more than 25% of any privately-owned land, the Applicant must, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 8 - 10 of schedule 4. The applicable criteria for any residence not listed in Table 2 must be the criteria applying at the nearest listed residence.</p> <p><i>Table 2: Noise acquisition criteria dB(A)</i></p> <table border="1"> <thead> <tr> <th>Day <i>L_{Aeq}(15 min)</i></th> <th>Evening <i>L_{Aeq}(15 min)</i></th> <th>Night <i>L_{Aeq}(15 min)</i></th> <th>Residence <i>(as shown in the Noise Monitoring Program)</i></th> </tr> </thead> <tbody> <tr> <td>47</td> <td>47</td> <td>43</td> <td>R2</td> </tr> <tr> <td>46</td> <td>46</td> <td>45</td> <td>R22</td> </tr> <tr> <td>45</td> <td>45</td> <td>44</td> <td>R1</td> </tr> <tr> <td></td> <td></td> <td></td> <td>R9</td> </tr> <tr> <td></td> <td></td> <td></td> <td>R15a</td> </tr> <tr> <td>45</td> <td>45</td> <td>42</td> <td>R3a</td> </tr> <tr> <td></td> <td></td> <td></td> <td>R5a</td> </tr> <tr> <td></td> <td></td> <td></td> <td>R6a&b</td> </tr> <tr> <td>42</td> <td>40</td> <td>40</td> <td>R39a</td> </tr> </tbody> </table> <p><i>Note: Noise generated by the development is to be measured in accordance with the notes to Table 1.</i></p>	Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night <i>L_{Aeq}(15 min)</i>	Residence <i>(as shown in the Noise Monitoring Program)</i>	47	47	43	R2	46	46	45	R22	45	45	44	R1				R9				R15a	45	45	42	R3a				R5a				R6a&b	42	40	40	R39a	<p>N/A</p>	<p>Noise levels recorded from operational activities have not exceeded the criteria in Table 2.</p> <p>No written requests have been received from landholders for land acquisition due to noise in the reporting period.</p>										
Day <i>L_{Aeq}(15 min)</i>	Evening <i>L_{Aeq}(15 min)</i>	Night <i>L_{Aeq}(15 min)</i>	Residence <i>(as shown in the Noise Monitoring Program)</i>																																																	
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<p>Rail Haulage Impact Assessment Criteria</p> <p>3. The Applicant must ensure that noise generated by locomotives using the Kemira Valley rail line does not exceed the rail noise impact assessment criteria in Table 3.</p> <p><i>Table 3: Rail noise impact assessment criteria</i></p> <table border="1"> <thead> <tr> <th>Operating Condition</th> <th>Measurement Conditions</th> <th>Criteria <i>L_{A1}(1 min)</i></th> </tr> </thead> <tbody> <tr> <td rowspan="3">Locomotive at idle, with compressor radiator fans and air conditioning operating at maximum load All other throttle settings under self-load, with compressor radiator fans and air conditioning operating at maximum load All service conditions</td> <td>Stationary 15 metre contour</td> <td>70 dB(A)</td> </tr> <tr> <td>Stationary 15 metre contour</td> <td>87 dB(A) 95 dB(Lin)</td> </tr> <tr> <td>Up to 50 kilometres per hour, 15 metres from centreline of rail track</td> <td>87 dB(A) 95 dB(Lin) Must be non-tonal Linear noise levels must not exceed A-weighted noise levels by more than 15 dB</td> </tr> </tbody> </table> <p><i>Note: All measured noise levels must be assessed for tonality in accordance with the NSW Industrial Noise Policy, unless otherwise specified.</i></p>	Operating Condition	Measurement Conditions	Criteria <i>L_{A1}(1 min)</i>	Locomotive at idle, with compressor radiator fans and air conditioning operating at maximum load All other throttle settings under self-load, with compressor radiator fans and air conditioning operating at maximum load All service conditions	Stationary 15 metre contour	70 dB(A)	Stationary 15 metre contour	87 dB(A) 95 dB(Lin)	Up to 50 kilometres per hour, 15 metres from centreline of rail track	87 dB(A) 95 dB(Lin) Must be non-tonal Linear noise levels must not exceed A-weighted noise levels by more than 15 dB	<p>Compliant</p>	<p>Rail noise monitoring was undertaken during the reporting period. Overall noise levels (<i>L_{Aeq}</i> and <i>L_{eq}</i>) were compliant.</p>																																								
Operating Condition	Measurement Conditions	Criteria <i>L_{A1}(1 min)</i>																																																		
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<p>Continuous Improvement</p> <p>4. The Applicant must:</p> <p>(a) continue to investigate ways to reduce the noise generated by the development (including off-site road noise, noise and vibration</p>	<p>Compliant</p>	<p>Details of noise investigations undertaken and</p>																																																		



Condition of Consent	Status	Comments
<p>impacts from the operation of the Kemira Valley rail line and maximum noise levels which may result in sleep disturbance); (b) continue to implement all reasonable and feasible best practice noise mitigation measures; and (c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review, to the satisfaction of the Secretary.</p>		<p>mitigation improvements implemented are discussed in the Annual Review.</p>
<p>5. The Applicant must use its best endeavours to minimise wheel squeal, brake squeal and locomotive wheel slippage arising from rail haulage on the Kemira Valley rail line.</p>	<p>Compliant</p>	<p>Details regarding noise investigations undertaken and mitigation improvements implemented are detailed in the Annual Review (see Section 6.8).</p>
<p>Additional Noise Mitigation Measures</p>		
<p>6. Upon receiving a written request from the owner of any residence where subsequent noise monitoring shows the noise generated by the development is 3 dB(A) greater than the noise impact assessment criteria in Table 1 (except where a negotiated noise agreement is in place) the Applicant must implement reasonable and feasible noise mitigation measures (such as double glazing, insulation and/or air conditioning) at any residence on the land in consultation with the landowner. If within 3 months of receiving this request from the landowner, the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.</p>	<p>Compliant</p>	<p>No requests for noise mitigation were received during the reporting period.</p>
<p>Monitoring</p>		
<p>7. The Applicant must prepare a Noise Monitoring Program for the development to the satisfaction of the Secretary. This program must: (a) be submitted to the Secretary for approval by 30 April 2009; (b) be prepared in consultation with EPA; (c) provide for quarterly attended noise monitoring and real-time noise monitoring (where appropriate) to monitor the performance of the development, especially in residential areas close to the surface facilities; and (d) include a noise monitoring protocol for evaluating compliance with the noise impact and land acquisition criteria in this consent.</p> <p>The Applicant must implement the Noise Monitoring Program as approved by the Secretary.</p> <p><i>Note: This program must expressly monitor the modifying factors referred to in the NSW Industrial Noise Policy (such as intermittency, tonality and low frequency)</i></p>	<p>Compliant</p>	<p>An approved Noise Management Plan (Monitoring Program) is in place. The NMP is currently under review.</p>
<p>BLASTING AND VIBRATION</p>		
<p>8. The Applicant is not permitted to undertake blasting operations at the surface facilities except with the prior written approval of EPA and subject to any conditions which EPA may impose.</p>	<p>Compliant</p>	<p>No blasting activities were undertaken.</p>
<p>AIR QUALITY</p>		



Condition of Consent	Status	Comments																							
Impact Assessment Criteria																									
<p>9. The Applicant must ensure that dust generated by the development does not cause additional exceedances of the criteria listed in Tables 4 to 6 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land.</p> <p><i>Table 4: Long term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Total suspended particulate (TSP) matter</td> <td>Annual</td> <td>90 µg/m³</td> </tr> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>Annual</td> <td>30 µg/m³</td> </tr> </tbody> </table> <p><i>Table 5: Short term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10 µm (PM₁₀)</td> <td>24 hour</td> <td>50 µg/m³</td> </tr> </tbody> </table> <p><i>Table 6: Long term impact assessment criteria for deposited dust</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Maximum increase in deposited dust level</th> <th>Maximum total deposited dust level</th> </tr> </thead> <tbody> <tr> <td>Deposited dust</td> <td>Annual</td> <td>2 g/m²/month</td> <td>4 g/m²/month</td> </tr> </tbody> </table> <p><small>Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS/NZS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.</small></p>	Pollutant	Averaging period	Criterion	Total suspended particulate (TSP) matter	Annual	90 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³	Pollutant	Averaging period	Criterion	Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month	Compliant	Air quality monitoring is undertaken in accordance with the Air Quality and Greenhouse Gas Management Plan. Results are provided in the Annual Review and published in the 14-day report on the IMC website. No exceedances of criteria recorded for this reporting period.
Pollutant	Averaging period	Criterion																							
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Monitoring																									
<p>10. The Applicant must prepare and implement an Air Quality Monitoring Program for the surface facilities (excepting those surface facilities within the mining area) to the satisfaction of the Secretary. This program must:</p> <p>(a) be submitted to the Secretary for approval by 30 April 2009;</p> <p>(b) be prepared in consultation with EPA;</p> <p>(c) use a combination of high volume samplers and dust deposition gauges to monitor the performance of the development; and</p> <p>(d) include an air quality monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this consent.</p> <p>The Applicant must implement the Air Quality Monitoring Program as approved by the Secretary.</p>	Compliant	An approved Air Quality and Greenhouse Gas Management Plan is in place and has been implemented.																							
METEOROLOGICAL MONITORING																									
<p>11. During the development, the Applicant must ensure that it has a suitable meteorological station in the vicinity of the site that is generally in accordance with the requirements in the guideline <i>Approved Methods for Sampling of Air Pollutants in New South Wales</i>.</p>	Compliant	Weather stations are located at the KVCLF, Dendrobium Pit Top and Ventilation Shaft 2/3 site that generally meet these requirements.																							
WATER MANAGEMENT																									
Discharges																									
<p>12. The Applicant must ensure all surface water discharges from the surface facilities:</p> <p>(a) meet the relevant ANZECC water quality objectives for the protection of aquatic ecosystems and water quality of existing receiving waters; and</p> <p>(b) comply with the discharge limits (both volume and quality) set for the development in any EPL.</p>	Non-compliant	<p>Water quality monitoring is undertaken as per the Water Management Plan.</p> <p>An exceedance of the EPL water quality limits for Zinc was recorded during the reporting period.</p>																							



Condition of Consent	Status	Comments
		See Section 11 for details.
Water Management Plan		
<p>13. The Applicant must prepare a Water Management Plan for the surface facilities to the satisfaction of the Secretary. This plan must:</p> <p>(a) be submitted to the Secretary for approval by 30 April 2009;</p> <p>(b) be prepared in consultation with EPA, WaterNSW and DPE Water by suitably qualified expert/s whose appointment/s have been approved by the Secretary; and</p> <p>(c) include a:</p> <ul style="list-style-type: none"> • Site Water Balance; • Erosion and Sediment Control Plan; • Surface Water Monitoring Program; and • Surface and Ground Water Response Plan. <p>The Applicant must implement the Water Management Plan as approved by the Secretary.</p>	Compliant	An approved Water Management Plan is in place and has been implemented. The plan was last approved on 1 June 2022.
Site Water Balance		
<p>14. The Site Water Balance must:</p> <p>(a) include details of:</p> <ul style="list-style-type: none"> • sources and security of water supply; • water use on site; • water intercepted by mining operations; • water management on site; • off-site water transfers and water stored or disposed of underground; • reporting procedures; and <p>(b) describe measures to minimise water use by the development.</p>	Compliant	The Site Water Balance has been included in the Water Management Plan to meet these requirements.
Erosion and Sediment Control		
<p>15. The Erosion and Sediment Control Plan must:</p> <p>(a) be consistent with the requirements of the <i>Managing Urban Stormwater: Soils and Construction Manual</i> (Landcom 2004, or its latest version);</p> <p>(b) identify activities that could cause soil erosion and generate sediment;</p> <p>(c) describe measures to minimise soil erosion and the potential for transport of sediment to downstream waters;</p> <p>(d) describe the location, function, and capacity of erosion and sediment control structures; and</p> <p>(e) describe what measures would be implemented to monitor and maintain the structures over time.</p>	Compliant	The Erosion and Sediment Control Plan has been included in the Water Management Plan to meet these requirements.
Surface Water Monitoring Program		
<p>16. The Surface Water Monitoring Plan must include:</p> <p>(a) baseline data on surface water flows and quality in streams and other waterbodies that have been or could be affected by the surface facilities;</p> <p>(b) surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts;</p> <p>(c) a program to monitor the impact of the surface facilities on surface water flows and quality, stream health and channel stability; and</p> <p>(d) procedures for reporting the results of this monitoring.</p>	Compliant	The Surface Water Monitoring Plan has been included in the Water Management Plan to meet these requirements. A summary of the results from the monitoring program is provided in the Annual Review and published in the 14-day



Condition of Consent	Status	Comments												
		report on the IMC website.												
Surface and Ground Water Response Plan														
<p>17. The Surface and Ground Water Response Plan must describe what measures and/or procedures would be implemented to:</p> <p>(a) respond to any exceedances of the surface water, stream health, and groundwater assessment criteria; and</p> <p>(b) mitigate and/or offset any adverse impacts on groundwater dependent ecosystems, aquatic ecosystems or riparian vegetation.</p>	Compliant	The Surface and Ground Water Response Plan has been included in the Water Management Plan to meet these requirements.												
LANDSCAPE MANAGEMENT														
Rehabilitation														
<p>18. The Applicant must rehabilitate the surface facilities sites to the satisfaction of DRG. For rehabilitation works within the Metropolitan Special Area, the Applicant must also ensure that these works are carried out to the satisfaction of WaterNSW.</p>	Compliant	<p>A Mining Operations Plan³⁶ and Conceptual Site Closure Plan have been developed. Closure and/or rehabilitation activities, when undertaken, will meet the requirements of the relevant regulatory agencies. Rehabilitation undertaken during each financial year is reported in the Annual Review.</p>												
Rehabilitation Objectives³⁷														
<p>18A. The Applicant must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the documents listed in condition 2 of Schedule 2, and comply with the objectives in Table 7.</p>														
<i>Table 7: Rehabilitation Objectives</i>														
<table border="1"> <thead> <tr> <th>Feature</th> <th>Objective</th> </tr> </thead> <tbody> <tr> <td>All areas of the site affected by the development</td> <td> <ul style="list-style-type: none"> • Safe, stable and non-polluting • Fit for the intended post-mining land use/s • Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations • Minimise post-mining environmental impacts </td> </tr> <tr> <td>Areas proposed for native ecosystem re-establishment</td> <td> <ul style="list-style-type: none"> • Establish/restore self-sustaining native woodland ecosystems • Establish local plant community types • Establish: <ul style="list-style-type: none"> - riparian habitat within any diverted and/or re-established creek lines and retained water features; - habitat, feed and foraging resources for threatened fauna species; and - vegetation connectivity and wildlife corridors, as far as is reasonable and feasible </td> </tr> <tr> <td>Final Landform</td> <td> <ul style="list-style-type: none"> • Stable and sustainable for the intended post-mining land use/s • Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable • Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable </td> </tr> <tr> <td>Rehabilitation materials</td> <td> <ul style="list-style-type: none"> • Soil and vegetative materials from areas disturbed under this consent (including topsoils, substrates and seeds) are recovered, managed and used as rehabilitation resources </td> </tr> <tr> <td>Surface facilities sites</td> <td> <ul style="list-style-type: none"> • To be decommissioned and removed, unless the Resources Regulator agrees otherwise • All surface facilities sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment </td> </tr> </tbody> </table>	Feature	Objective	All areas of the site affected by the development	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Fit for the intended post-mining land use/s • Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations • Minimise post-mining environmental impacts 	Areas proposed for native ecosystem re-establishment	<ul style="list-style-type: none"> • Establish/restore self-sustaining native woodland ecosystems • Establish local plant community types • Establish: <ul style="list-style-type: none"> - riparian habitat within any diverted and/or re-established creek lines and retained water features; - habitat, feed and foraging resources for threatened fauna species; and - vegetation connectivity and wildlife corridors, as far as is reasonable and feasible 	Final Landform	<ul style="list-style-type: none"> • Stable and sustainable for the intended post-mining land use/s • Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable • Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable 	Rehabilitation materials	<ul style="list-style-type: none"> • Soil and vegetative materials from areas disturbed under this consent (including topsoils, substrates and seeds) are recovered, managed and used as rehabilitation resources 	Surface facilities sites	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Resources Regulator agrees otherwise • All surface facilities sites are to be revegetated with suitable local native plant species to a landform consistent with the surrounding environment 	Compliant	<p>The Rehabilitation Management Plan has been developed to meet these objectives.</p> <p>The objectives will be uploaded to the Resources Regulator portal in FY23 for approval.</p>
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All areas of the site affected by the development	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Fit for the intended post-mining land use/s • Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations • Minimise post-mining environmental impacts 													
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³⁶ The MOP was in place for the reporting period however has now been replaced with the Rehabilitation Management Plan.

³⁷ Conditions 18A and 18B were included in the Consent in MOD 9.



Condition of Consent		Status	Comments
	or the intended post mining land use(s)		
Portals and vent shafts of the development	<ul style="list-style-type: none"> To be decommissioned and made safe and stable Retain habitat for threatened species (e.g. bats), where practicable 		
Watercourses subject to approved mine water discharges	<ul style="list-style-type: none"> Hydraulically and geomorphologically stable Aquatic ecology and riparian vegetation that is the same or better than prior to grant of this consent 		
Mine water discharges following mine closure (from any location)	<ul style="list-style-type: none"> Negligible environmental consequence 		
Watercourses subject to subsidence impacts	<ul style="list-style-type: none"> Remediate physical damage as soon as reasonably practicable, unless the environmental impacts of remediation exceed the environmental benefits 		
Water quality	<ul style="list-style-type: none"> Water retained on the site is fit for the intended post-mining land use/s Water management is consistent with the regional catchment management strategy 		
Built features damaged by mining operations	<ul style="list-style-type: none"> Repair to pre-mining condition or equivalent unless the: <ul style="list-style-type: none"> owner agrees otherwise; or damage is fully restored, repaired or compensated for under the <i>Coal Mine Subsidence Compensation Act 2017</i> 		
Cliffs, minor cliffs, rock face features and steep slopes	<ul style="list-style-type: none"> No additional risk to public safety compared to prior to mining 		
Community	<ul style="list-style-type: none"> Ensure public safety Minimise adverse socio-economic effects associated with mine closure 		
18B. The Applicant must carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.		Compliant	Areas of disturbance outside of operational areas have been progressively rehabilitated.
Landscape Management Plan			
<p>³⁸19. The Applicant must prepare and implement a Landscape Management Plan for the surface facilities to the satisfaction of the Secretary and the DRG. This plan must:</p> <p>(a) be submitted for approval by 30 April 2009;</p> <p>(b) be prepared by suitably qualified expert/s whose appointment/s have been endorsed by the Secretary;</p> <p>(c) be prepared in consultation with OEH and WaterNSW; and</p> <p>(d) include a:</p> <ul style="list-style-type: none"> Rehabilitation Management Plan; and Mine Closure Plan. <p>The Applicant must implement the Landscape Management Plan as approved by the Secretary.</p> <p><i>Note: The Mine Closure Plan may be submitted at a date agreed by the Secretary, provided that this date is at least 2 years prior to the planned cessation of mining at the site.</i></p>		Compliant	An approved Landscape Management Plan was in place over the reporting period and was progressively implemented.
Rehabilitation Management Plan			
<p>20. The Rehabilitation Management Plan must include:</p> <p>(a) the rehabilitation objectives for the surface facilities sites;</p> <p>(b) a general description of the short, medium and long term measures that would be implemented to rehabilitate these sites;</p> <p>(c) performance and completion criteria for the rehabilitation of these sites;</p> <p>(d) a description of how the performance of the rehabilitation works would be monitored over time to achieve the stated objectives and against the relevant performance and completion criteria;</p> <p>(e) any measures necessary to ensure that abandoned mine workings do not impact on stored waters</p>		Compliant	The Rehabilitation Management Plan was included in the Landscape Management Plan over the reporting period.

³⁸ This Condition has been deleted from the Consent in MOD 9.



Condition of Consent	Status	Comments
or dams; and (f) details of who is responsible for monitoring, reviewing and implementing the plan. ³⁹		
20. The Applicant must prepare a Rehabilitation Management Plan for the development, in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. ⁴⁰	Compliant	A Rehabilitation Management Plan to meet the requirements of the mining lease has been developed.
Mine Closure Plan		
21. The Mine Closure Plan must: (a) be prepared in consultation with the affected councils and CCC; (b) define the objectives and criteria for mine closure; (c) investigate options for the future use of the surface facilities sites; (d) include the proposed management and use of any heritage-listed buildings; (e) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local and regional employment; (f) describe the measures that would be implemented to minimise or manage the on-going environmental effects of the development; and (g) describe how the performance of these measures would be monitored over time. ⁴¹	Compliant	A summary of the Conceptual Mine Closure Plan was provided in the Landscape Management Plan. A Conceptual Site Closure Plan (as a separate document) has been developed that generally meets these requirements and all requirements will be met closer to mine closure. Site Closure is not planned within the next two years.
21. The Applicant must prepare a Mine Closure Plan to the satisfaction of the Secretary. The plan must: (a) be prepared: (i) by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary; (ii) in consultation with the Department, WaterNSW, DPE Water, Resources Regulator, WCC and (if requested by the Secretary) the Mining Panel; (iii) in accordance with any relevant Resources Regulator Guideline; and (b) be subject to peer review and submitted for approval at a date agreed by the Secretary, provided that this date is at least 2 years prior to the planned cessation of mining at the site; (c) include detailed consideration of best practice measures and emerging technologies to mitigate post mining greenhouse gas emissions from the mine, including consideration of how such measures will be integrated into the mine closure strategy; (d) include a stakeholder engagement plan to guide mine closure planning processes and outcomes; (e) investigate ways to minimise adverse socio-economic effects associated with mine closure; (f) contain a detailed mine closure strategy, which includes:	N/A	A Conceptual Site Closure Plan has been developed that generally meets these requirements and all requirements will be met closer to mine closure. Site Closure is not planned within the next two years.

³⁹ Wording prior to approval of MOD 9.

⁴⁰ Condition 20 was revised in the Consent in MOD 9.

⁴¹ Wording prior to approval of MOD 9.



Condition of Consent	Status	Comments
<p>(i) detailed consideration of all issues associated with sealing or not sealing mine entrances, with particular reference to groundwater re-pressurisation, developing hydraulic pressure heads within main headings and long-term emergence of mine waters within the Metropolitan Special Area and/or the Illawarra Escarpment;</p> <p>(ii) consideration of other underground mines hydraulically connected to Dendrobium Mine (including options regarding isolating those other mines);</p> <p>(iii) include details of any measures necessary to ensure that mine workings do not impact on stored waters or dams;</p> <p>(iv) consideration of the most up-to-date groundwater and surface water inflow modelling for Dendrobium Mine, including improved modelling of points of anticipated groundwater outflow;</p> <p>(v) a robust risk assessment that fully and objectively identifies the potential hazards associated with mine closure, the likelihood and consequences associated with these hazards materialising, the extent to which consequences can be controlled should the hazards materialise, and the residual risks after control measures have been put in place; and</p> <p>(vi) options for managing residual risks, such as ongoing mine water discharges and surface leakages of contaminated mine water, should the Dendrobium Mine not be able to be effectively sealed, and any requirement for water treatment prior to discharge; and</p> <p>(g) be fully reviewed and revised every three years following approval, unless the Secretary agrees otherwise.</p> <p>The Applicant must implement the Mine Closure Plan as approved by the Secretary.</p> <p>Notes:</p> <ul style="list-style-type: none"> • <i>The Mine Closure Plan should address all land impacted by the development.</i> • <i>The Rehabilitation Plan and Mine Closure Plan require substantial integration to achieve all objectives for the rehabilitated site.</i> ⁴² 		
Bushfire Management Plan		
<p>22. The Applicant must prepare and implement a Bushfire Management Plan for the site, with particular reference to the mining area, in consultation with WaterNSW and to the satisfaction of the Rural Fire Service.</p>	Compliant	An approved Bushfire Management Plan that meets these requirements is in place.
Photographic Archival Recording		
<p>22A. The Applicant must undertake photographic archival recording of significant built and landscape elements affected by Modification 8 prior to the commencement, during the works and after the completion of works, in accordance with the NSW Heritage Division publications 'How to prepare archival records of heritage items and Photographic Recording of Heritage Items using Film or Digital Capture'. A copy of these archival recordings must be provided to the Heritage Council of NSW and WCC.</p>	Compliant	Archival recording was undertaken prior to, during and after the completion of works. The report dated 30 March 2020 was submitted to the WCC and Heritage Council of NSW.
Unexpected Historical Archaeological Relics		

⁴² Condition 20 was revised in the Consent in MOD 9.



Condition of Consent	Status	Comments
<p>22B. In the event that unexpected archaeological artefacts are uncovered during ground disturbing works, the Applicant must ensure work ceases in the subject area and a suitably trained archaeologist should attend the site to inspect the find. Should archaeological material be identified as having heritage significance, the Applicant must obtain any necessary further approvals before works can proceed.</p>	Compliant	No unexpected archaeological artefacts were identified during ground disturbing works.
TRANSPORT		
Rail Transport of Coal		
<p>23. The Applicant must ensure that trains do not travel on the Kemira Valley rail line: (a) between 12 midnight and 6 am, until 29 April 2010; and (b) between 11 pm and 6 am, from 30 April 2010 unless written approval is obtained from EPA for emergency use of the rail line.</p>	Compliant	<p>The rail curfew has been adhered to during the reporting period.</p> <p>No emergency use was required.</p>
<p>24. The Applicant must record the: (a) date and time of each train movement on the Kemira Valley rail line; and (b) amount of coal transported from the KVCLF each year and include a comprehensive summary and discussion of the results of this monitoring in each Annual Review.</p>	Compliant	<p>This data is recorded via the Logistics KPI Report and also on Pacific National Run Sheets. The data is summarised and reported in the Annual Review.</p>
Road Transport		
<p>25. The Applicant must prepare a Traffic Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval by 30 April 2009; (b) be prepared in consultation with the WCC, Mt Kembla Primary School and the CCC; (c) include traffic control measures for truck movements through residential areas, including Stones Road and its intersection with Cordeaux Road; (d) provide that mine shift changeover times and deliveries by heavy vehicle to the pit top facilities and KVCLF do not conflict with pick-up and drop-off times for Mt Kembla Primary School students; (e) provide heavy vehicle speed limits; (f) include a Driver's Code of Conduct to be applied to the applicant's employees and contractors working at the development and measures for the enforcement of this code; and (g) include procedures for regular monitoring of compliance with this plan.</p> <p>The Applicant must implement the Traffic Management Plan as approved by the Secretary.</p>	Compliant	<p>An approved Traffic Management Plan is in place and has been implemented.</p>
Road Maintenance		
<p>26. The Applicant must enter into an agreement with WaterNSW, to the satisfaction of the Secretary, to share the reasonable costs of maintenance of all access roads, bridges and creek crossings located on land controlled by WaterNSW and used by the Applicant.</p>	Compliant	<p>An agreement has been developed with WaterNSW.</p>
<p>27. The Applicant must establish an agreement with WCC to share the reasonable costs of maintenance of Stones Road for</p>	Compliant	<p>A Maintenance Agreement for Stones</p>



Condition of Consent	Status	Comments												
<p>the life of the development. Prior to decommissioning of the mine, Stones Road must be inspected, to the satisfaction of WCC, and the road restored by the Applicant to a standard not less than its condition prior to the development's approval. If roadworks are not carried out by the Applicant within one month of being informed by WCC that these works are required under the maintenance agreement, WCC must be entitled to carry out such maintenance work at the Applicant's cost. Any dispute over implementation of this condition is to be referred to the Secretary for resolution.</p>		<p>Road is in place, dated 28 August 2019.</p> <p>Significant upgrades were undertaken on Stones Road during the reporting period due to a land slip.</p>												
VISUAL														
Visual Amenity														
<p>28. The Applicant must minimise the visual impacts of the surface facilities to the satisfaction of the Secretary.</p>	Compliant	<p>A vegetative screen is maintained around the operation.</p>												
Lighting Emissions														
<p>29. The Applicant must:</p> <p>(a) ensure that all external lighting associated with the surface facilities complies with <i>Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting</i>;</p> <p>(b) take all practicable measures to mitigate off-site lighting impacts from the surface facilities;</p> <p>(c) ensure that light emitted from headlights of locomotives operating on the Kemira Valley rail line are screened from residences; and</p> <p>(d) report on the effectiveness of lighting emission controls in the Annual Review to the satisfaction of the Secretary.</p>	Compliant	<p>An approved Lighting and Visual Amenity Management Plan is in place.</p> <p>New lighting has been reviewed and modified where possible to minimise offsite impacts.</p>												
WASTE														
<p>30. The Applicant must:</p> <p>(a) monitor the amount of waste generated by the development;</p> <p>(b) investigate ways to reuse, recycle, or minimise this waste;</p> <p>(c) implement reasonable and feasible measures to minimise this waste; and</p> <p>(d) report on waste management and minimisation in the Annual Review to the satisfaction of the Secretary.</p>	Compliant	<p>Waste volumes are monitored. A summary of waste management activities associated with Dendrobium Mine is reported via the Annual Review.</p>												
BIODIVERSITY														
Biodiversity Credit Requirements														
<p>31. Unless otherwise agreed by the Secretary, the Applicant must retire the biodiversity credits specified in Table 8, prior to commencing vegetation clearing associated with Modification 9. The retirement of credits must be carried out in consultation with BCS and in accordance with the Biodiversity Offsets Scheme of the BC Act.</p> <p><i>Table 8: Biodiversity Credit Requirements</i></p> <table border="1"> <thead> <tr> <th>Credit Type</th> <th>Credits Require</th> </tr> </thead> <tbody> <tr> <td colspan="2">Ecosystem Credits</td> </tr> <tr> <td>PCT 1083 - Red Bloodwood -scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion</td> <td>17</td> </tr> <tr> <td colspan="2">Species Credits</td> </tr> <tr> <td><i>Caladenia tessellata</i></td> <td>33</td> </tr> <tr> <td><i>Genoplesium baueri</i></td> <td>33</td> </tr> </tbody> </table>	Credit Type	Credits Require	Ecosystem Credits		PCT 1083 - Red Bloodwood -scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	17	Species Credits		<i>Caladenia tessellata</i>	33	<i>Genoplesium baueri</i>	33	N/A	<p>The credits will be retired in FY23 prior to vegetation clearance occurring.</p>
Credit Type	Credits Require													
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<i>Genoplesium baueri</i>	33													
SCHEDULE 5: SPECIFIC ENVIRONMENTAL CONDITIONS - OTHER SITE COMPONENTS														
COAL WASHERY														



Condition of Consent	Status	Comments
Hot Gas Exhaust Stack Discharges		
1. The Applicant must: (a) ensure that the concentration of pollutants discharged from the coal dryer hot gas exhaust complies with discharge limits set for the development in any EPL; (b) regularly monitor the concentration of pollutants discharged from the coal dryer hot gas exhaust; and (c) report on waste management and minimisation in the Annual Review to the satisfaction of the Secretary.	N/A	The Coal Dryer is not in operation.
Fuel Source		
2. The Applicant must ensure the coal drying plant only uses blast furnace offgas or natural gas as fuel for the drier.	N/A	The Coal Dryer is not in operation.
WEST CLIFF COAL WASH EMPLACEMENT		
Coal Washery Reject		
3. The Applicant must: (a) monitor the amount of coal washery reject emplaced in the West Cliff Coal Wash Emplacement; (b) investigate ways to reduce emplacement of coal washery reject at West Cliff, including beneficial use or improved disposal options; and (c) report on these matters in the West Cliff AEMR to the satisfaction of the Secretary.	Compliant	Project Approval 08_0150 for the Bulli Seam Operations Project has been granted and as such takes precedence. Refer to Condition 8 of Schedule 5 of the Consent. <i>These requirements are reported in the Appin Mine Annual Review.</i>
Pollution Reduction Program		
4. The Applicant must develop with EPA a new Pollution Reduction Program (PRP) to be incorporated into the West Cliff Colliery's EPL. Subject to the satisfaction of EPA, the PRP must: (a) include investigation, trial and implementation of appropriate strategies, technologies or works to achieve agreed water quality discharge criteria for licensed discharges from the West Cliff Colliery site with particular reference to salinity; and (b) cover a period of not less than five years.	Compliant	Project Approval 08_0150 has been granted and as such takes precedence. Refer to Condition 8 of Schedule 5 of the Consent. <i>Condition 8 has been included in EPL 2504 that covers the construction/modification of water treatment plants, revised water quality limits and aquatic health monitoring.</i>
Water Quality Monitoring Program		
5. The Applicant must review its water quality monitoring program for the West Cliff Mine in consultation with EPA and DPE Water and to the satisfaction of the Secretary.	Compliant	Project Approval 08_0150 has been granted and as such takes precedence. Refer to Condition 8 of Schedule 5 of the Consent. <i>A Water Management Plan is in place for Appin</i>



Condition of Consent	Status	Comments
		<i>Mine. Consultation is undertaken as required.</i>
Brennans Creek Diversion Bypass Rehabilitation Plan		
6. The Applicant must, by 30 June 2009, develop a Brennans Creek Diversion Bypass Rehabilitation Plan in consultation with BCS, DPE Water and Resources Regulator and to the satisfaction of the Secretary.	Compliant	Project Approval 08_0150 has been granted and as such takes precedence. Refer to Condition 8 of Schedule 5 of the Consent. <i>Brennans Creek Diversion Bypass Rehabilitation Plan was submitted to DoP in December 2008. The plan was approved on 9 September 2009.</i>
General Management of the Emplacement		
7. Subject to condition 2 of schedule 2 and conditions 3- 6 above, the Applicant must monitor and manage the West Cliff Coal Wash Emplacement as part of the Environmental Management Plan for the West Cliff Mine. Monitoring and management of the Emplacement must be reported within the West Cliff AEMR, rather than the Annual Review for this development.	Compliant	Project Approval 08_0150 has been granted and as such takes precedence. Refer to Condition 8 of Schedule 5 of the Consent. <i>Emplacement operations are managed in accordance with the Appin Mine Coal Wash Emplacement Area Management Plan. Details of the emplacement operations, including the rehabilitation aspects, are included in the Appin Mine Annual Review.</i>
8. All references in this consent (including conditions 3 – 7 of this schedule and Appendix 3) that have direct application to the West Cliff Coal Wash Emplacement must cease to have force and effect subsequent to the grant of any project approval under Part 3A of the Environmental Planning & Assessment Act 1979 which includes the West Cliff Colliery and the West Cliff Coal Wash Emplacement Area.	Compliant	Project Approval 08_0150 has been granted.
SCHEDULE 6: SPECIFIC ENVIRONMENTAL CONDITIONS – EXTENDED SITE		
GREENHOUSE GASES & ENERGY EFFICIENCY		
1. The Applicant must prepare a Greenhouse and Energy Efficiency Plan for the development. This plan must: (a) be prepared in consultation with EPA and generally in accordance with the Guidelines for Energy Savings Action Plans (DEUS 2005, or its latest version); (b) be submitted to the Secretary by 30 April 2009 for approval; (c) include a program to monitor greenhouse gas emissions and energy use generated by the development;	Compliant	Documents to meet these requirements were originally submitted to the DoP by 30 April 2009 to meet these requirements and approved in December 2009.



Condition of Consent	Status	Comments
<p>(d) include a framework for investigating and implementing measures to reduce greenhouse gas emissions and energy use at the development;</p> <p>(e) include a research program to inform the continuous improvement of the greenhouse gas minimisation measures at the development;</p> <p>(f) describe how the performance of these measures would be monitored over time; and</p> <p>(g) report on the development's greenhouse gas emissions and minimisation measures in the AEMR to the satisfaction of the Secretary.</p> <p><i>Note: The Applicant may consider the Dendrobium Mine's greenhouse gas minimisation measures within its overall greenhouse gas minimisation measures across its Southern Coalfield mines and related operations.</i></p> <p>The Applicant must implement the Greenhouse and Energy Efficiency Plan as approved by the Secretary.</p>		<p>These requirements are included in the approved Air Quality and Greenhouse Gas Management Plan.</p> <p>A Decarbonisation Strategy for IMC is in place and progressively implemented and reviewed.</p>
<p>2. The Applicant must implement all reasonable and feasible measures to minimise the greenhouse gas emissions from the development to the satisfaction of the Secretary.</p>	Compliant	Measures being undertaken are reported in the Annual Review.
<p>SCHEDULE 7: ADDITIONAL PROCEDURES FOR AIR QUALITY AND NOISE MANAGEMENT</p>		
<p>NOTIFICATION OF LANDOWNERS</p>		
<p>1. If the results of monitoring required in Schedule 4 identify that the impacts generated by the development are greater than the relevant impact assessment criteria in Schedule 4, except where this is predicted in the documents listed in condition 2 of schedule 2 or where a negotiated agreement has been entered into in relation to that impact, then the Applicant must notify the Secretary and the affected landowners and/or existing or future tenants (including tenants of mine-owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in Schedule 4.</p>	Compliant	<p>Results are reported in the Annual Review which is publicly available on the IMC website. Monitoring results are provided in the 14-day report that is available on the IMC website.</p> <p>Exceedances of noise impact assessment criteria recorded during the reporting period have been reported to the Department and relevant landowners as required.</p>
<p>INDEPENDENT REVIEW</p>		
<p>2. If a landowner considers the development to be exceeding the impact assessment criteria in schedule 4, except where this is predicted in the EA, 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, the Applicant must within 2 months of the Secretary's decision:</p> <p>(a) consult with the landowner to determine his/her concerns;</p> <p>(b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to conduct monitoring on the land, to:</p> <ul style="list-style-type: none"> determine whether the development is complying with the relevant impact assessment criteria in schedule 4; and 	N/A	IMC is not aware of any requests for an Independent Review in this reporting period.



Condition of Consent	Status	Comments
<ul style="list-style-type: none"> identify the source(s) and scale of any impact on the land, and the development's contribution to this impact; and (c) give the Secretary and landowner a copy of the independent review. 		
<p>3. If the independent review determines that the development is complying with the relevant impact assessment criteria in schedule 4, then the Applicant may discontinue the independent review with the approval of the Secretary. If the landowner disputes the results of the independent review then either the Applicant or the landowner may refer the matter to the Secretary for resolution. Where matters referred to the Secretary under this condition cannot be resolved by the Director- General within 28 days, the Secretary must refer the matter to an Independent Dispute Resolution Process.</p>	N/A	No independent review has been undertaken.
<p>4. If the independent review determines that the development is not complying with the relevant impact assessment criteria in Schedule 4, and that the development is primarily responsible for this non compliance, then the Applicant must: (a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the development complies with the relevant criteria and conduct further monitoring to determine whether these measures ensure compliance; or (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria; or (c) offer to acquire all or part of the landowner's land in accordance with the procedures in conditions 6-8 below to the satisfaction of the Secretary.</p>	N/A	No independent review has been undertaken.
<p>5. If further monitoring under condition 4(a) determines that the development is complying with the relevant impact assessment criteria, then the Applicant may discontinue the independent review with the approval of the Secretary. If further monitoring under condition 4(a) determines that measures implemented under that condition have not achieved compliance with the impact assessment criteria in schedule 4, and the Applicant cannot secure a written agreement with the landowner under condition 4(b) to allow these exceedances, then the Applicant must, upon receiving a written request from the landowner, acquire all or part of the landowner's land in accordance with the procedures in conditions 6-8 below.</p>	N/A	No independent review has been undertaken.
LAND ACQUISITION		
<p>6. Within 3 months of receiving a written request from a landowner with acquisition rights, the Applicant must make a binding written offer to the landowner based on:</p> <p>(a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the development the subject of the development application, having regard to the:</p> <ul style="list-style-type: none"> existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but 	N/A	No written requests have been received by landowners for acquisition.



Condition of Consent	Status	Comments
<p>excluding any improvements that have resulted from the implementation of the 'additional noise mitigation measures' in condition 6 of schedule 4;</p> <p>(b) the reasonable costs associated with:</p> <ul style="list-style-type: none"> • relocating within the local government areas of the affected Councils, or to any other local government area determined by the Secretary; • obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and <p>(c) reasonable compensation for any disturbance caused by the land acquisition process.</p> <p>If, within 28 days of the Applicant making this offer, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution. Upon receiving such a referral, the Secretary must request the President of the NSW Division of the Australian Property Institute (the API) to appoint a qualified independent valuer to:</p> <ul style="list-style-type: none"> • consider submissions from both parties; • establish a fair market valuation for the land and determine reasonable costs and compensation for the acquisition, in accordance with paragraphs (a)-(c) above and any guidance or guidelines that the Secretary may prepare relating to this condition; and • propose any appropriate fair and reasonable terms of acquisition. <p>The appointed valuer is to provide a full report and explanation of their valuation, determinations and proposed terms of acquisition to the Secretary, the Applicant and the landowner. The Secretary must consider the report and decide whether the valuation, determinations and any proposed terms of acquisition are fair and reasonable and advise the parties accordingly. Within 14 days of receiving the Secretary's decision that the independent valuer's report is fair and reasonable, the Applicant must make a written offer to purchase the land at a price and according to terms not less than set out in the independent valuer's report. If the Secretary is of the opinion that the valuation and/or determination is not fair and/or reasonable, they must give notice to the parties that a further independent valuation and determination will be undertaken in accordance with this condition and duly request a further appointment by the API. If the landowner refuses to accept within 6 months a written offer duly made by the Applicant under this condition, then the Applicant's obligations to acquire the land must cease, unless otherwise agreed by the Secretary.</p>		
<p>7. The Applicant must bear the full costs of any independent valuer's valuation, determination and report.</p>	<p>N/A</p>	<p>No written requests have been received by landowners for acquisition.</p>
<p>8. If the Applicant and landowner agree that only part of the land must be acquired, then the Applicant must pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.</p>	<p>N/A</p>	<p>No written requests have been received by landowners for acquisition.</p>



Condition of Consent	Status	Comments
SCHEDULE 8: ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING		
ENVIRONMENTAL MANAGEMENT STRATEGY		
<p>1. The Applicant must prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must be submitted to the Secretary for approval by 30 April 2009, and:</p> <p>(a) provide the strategic framework for environmental management of the development;</p> <p>(b) identify the statutory requirements that apply to the development;</p> <p>(c) describe in general how the environmental performance of the development would be monitored and managed for the:</p> <ul style="list-style-type: none"> • mining area; • surface facilities; • other site components; and • extended site; <p>(d) describe the procedures that would be implemented to:</p> <ul style="list-style-type: none"> • keep the local community and relevant agencies informed about the operation and environmental performance of the development; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the development; • respond to any non-compliance; • manage cumulative impacts; and • respond to emergencies; and <p>(e) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development; and</p> <p>(f) include:</p> <ul style="list-style-type: none"> • references to any strategies, plans and programs approved under the conditions of this consent; and • a clear plan depicting all the monitoring to be carried out under the conditions of this consent. <p>The Environmental Management Strategy approved by the Secretary must be implemented.</p>	Compliant	An approved Environmental Management Strategy is in place and has been implemented.
MANAGEMENT PLAN REQUIREMENTS		
<p>2. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <p>(a) a summary of relevant background or baseline data;</p> <p>(b) details of:</p> <p>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</p> <p>(ii) any relevant limits or performance measures and criteria; and</p> <p>(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</p> <p>(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;</p> <p>(d) a program to monitor and report on the:</p> <p>(i) impacts and environmental performance of the development; and</p>	Compliant	Management Plans are progressively reviewed to meet these requirements.



Condition of Consent	Status	Comments
<p>(ii) effectiveness of the management measures set out pursuant to condition 2(c); (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: (i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); (ii) complaint; (iii) failure to comply with statutory requirements; and (h) a protocol for periodic review of the plan.</p> <p>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</p>		
<p>2A. Within three months of the: (a) submission of an incident report under condition 4 of Schedule 8; (b) submission of an Annual Review under condition 5 of Schedule 8; (c) submission of an Independent Environmental Audit under condition 6 of Schedule 8; or (d) approval of any modification of the conditions of this consent, the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.</p> <p>If necessary, to either improve the environmental performance of the development or cater for a modification, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Secretary and submitted to the Secretary for approval within six weeks of the review.</p> <p><i>Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.</i></p>	Compliant	<p>Management Plans have been reviewed as required (refer to Section 13.2).</p> <p>The Management Plan Review log has been maintained.</p>
REPORTING		
Incident Reporting		
<p>3. Within 24 hours of detecting the occurrence of an incident that causes (or may cause) material harm to the environment, the Applicant must notify the Department and other relevant agencies of the incident.</p>	Compliant	<p>There were no incidents that caused or had the potential to cause material environmental harm over the reporting period.</p>
<p>4. Within 7 days of notifying the Department and other relevant agencies of such an incident, the Applicant must provide the Department and these agencies with a written report that: (a) describes the date, time, and nature of the incident; (b) identifies the cause (or likely cause) of the incident; (c) describes what action has been taken to date; and (d) describes the proposed measures to address the incident.</p>	N/A	<p>There were no incidents that caused or had the potential to cause material environmental harm over the reporting period.</p>
Annual Review		
<p>5. By the end of September each year (or other such timing as may be agreed by the Secretary), and for at least 3 years</p>	Compliant	<p>The Annual Review is submitted to the relevant</p>



Condition of Consent	Status	Comments
<p>following the cessation of mining at the development, the Applicant must submit an Annual Review to the Secretary, CCC and all relevant agencies reviewing the environmental performance of the development to the satisfaction of the Secretary.</p> <p>This report must relate to the previous financial year and:</p> <ul style="list-style-type: none"> (a) identify the standards and performance measures that apply to the development; (b) describe the development (including any rehabilitation) that was carried out in the previous financial year; (c) describe the development (including any rehabilitation) that is proposed to be carried out over the current financial year; (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years; (e) include a summary of the monitoring results for the development during the past year; (f) a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, including a comparison of these results against the: <ul style="list-style-type: none"> (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed in condition 2 of Schedule 2. (g) identify any non-compliance or incident which occurred in the previous financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence; (h) evaluate and report on: <ul style="list-style-type: none"> (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions in this consent; (i) identify any trends in the monitoring data over the life of the development; (j) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and (k) describe what measures will be implemented over the next financial year to improve the environmental performance of the development. <p>Copies of the Annual Review must be submitted to the affected Councils and made available to the CCC and any interested person upon request.</p>		<p>stakeholders annually as per the requirements.</p> <p>The Annual Review is made available on the IMC website.</p>
<p>6. By 31 December 2011, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:</p> <ul style="list-style-type: none"> (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; (b) include consultation with the relevant agencies and the CCC; (c) assess the environmental performance of the development and assess whether it is complying with the relevant requirements 	<p>Compliant</p>	<p>The last Independent Environmental Audit was undertaken by ERM Pty Ltd in FY21.</p> <p>The requirements of this condition relating to the audit were met.</p>



Condition of Consent	Status	Comments
<p>in this consent and any relevant EPL or mining lease (including any strategy, plan or program required under these approvals); (d) review the adequacy of strategies, plans or programs required under these approvals; (e) recommend measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals; and (f) be conducted and reported to the satisfaction of the Secretary.</p> <p><i>Note: This audit team must be led by a suitably qualified auditor and include experts in the fields of a) mine subsidence impacts and remediation and b) stream hydrology and water quality.</i></p>		<p>The next IEA will be undertaken by 31 December 2023.</p>
<p>7. Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Secretary.</p> <p><i>Note: The audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.</i></p>	Compliant	<p>The FY21 IEA report, including the Response to Recommendations, was submitted to the Department as required.</p> <p>The progress on actions is provided in Appendix 5.</p>
Monitoring and Environmental Audits		
<p>8. Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.</p> <p><i>Note: For the purposes of this condition, as set out in the EP&A Act, “monitoring” is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an “environmental audit” is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.</i></p>	Compliant	Noted.
COMMUNITY CONSULTATIVE COMMITTEE		
<p>9. The Applicant must maintain a Community Consultative Committee (CCC) for the development to the satisfaction of the Secretary. This CCC must be operated in general accordance with the Department’s Community Consultative Committee Guidelines: State Significant Projects (2016) to the satisfaction of the Secretary.</p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> <i>The CCC is an advisory committee only.</i> <i>In accordance with the guidelines, the committee should comprise an independent chair and appropriate representation from the Applicant, Council and the local community.</i> 	Compliant	<p>The Dendrobium Community Consultative Committee is in place.</p> <p>Meetings are nominally held every two months.</p>
<p>10. If required by the CCC, the Applicant must establish and maintain a trust fund, or other funding arrangement that may be agreed between the Applicant and the CCC. This fund must be: (a) managed by the Chair of the CCC to facilitate the functioning of the CCC;</p>	Compliant	<p>Funds will be released as required when requested by the CCC.</p> <p>There were no requests in FY22.</p>



Condition of Consent	Status	Comments
<p>(b) used only if required for the engagement of consultants to interpret technical information and the like; (c) provided with \$8,000 per annum (indexed according to the CPI) by the Applicant for the duration of mining operations and other activities under the consent, or as otherwise directed by the Secretary; (d) managed so that any monies unspent during each year are returned to the Applicant; (e) managed so that the Chair of the CCC causes a record of the finances of the fund to be kept and provided to the Applicant and the Secretary at the end of each year the fund is used.</p>		
<p>ACCESS TO INFORMATION</p>		
<p>11. Before the commencement of Modification 8 until the completion of all rehabilitation required under this consent, the Applicant must: (a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website: (i) the documents referred to in condition 2 of Schedule 2 of this consent; (ii) all current statutory approvals for the development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) minutes of CCC meetings; (v) regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; (vi) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (vii) a summary of the current stage and progress of the development; (viii) contact details to enquire about the development or to make a complaint; (ix) a complaints register, updated monthly; (x) the Annual Reviews of the development; (xi) audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; (xii) any other matter required by the Secretary; and (b) keep such information up to date, to the satisfaction of the Secretary.</p>	<p>Compliant</p>	<p>Condition 11 of Schedule 8 was included in the Consent with MOD 8 dated 13/07/2018. These documents were not required to be available prior to MOD 8.</p> <p>A link has been provided on the IMC website to the DPE Major Projects website where documents associated with MOD 6, 7 and 8 are available.</p> <p>MOD 5 documents are available on the IMC website. IMC does not have access to documents prior to MOD 5.</p> <p>Approvals, strategies, plans, programs and other documentation is updated on the web site as they become available.</p> <p>Monitoring data is provided in the 14-day report.</p>



Appendix 4: Independent Environmental Audit Progress - FY22



Item No.	Assessment Requirement	Comment	Audit Classification	Response / Action (Recommendation)	IMC Response / Time Frame	Progress																										
Minister's Conditions of consent DA 60-03-2001 (including Modification 8 issued July 2018)																																
Sch 4, C1	<p>The Applicant must ensure that the noise generated at the surface facilities does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land, or on more than 25% of any privately-owned land. The applicable criteria for any residence not listed in Table 1 shall be the criteria applying at the nearest listed residence.</p> <p>Table 1: Noise impact assessment criteria dB(A)</p> <table border="1"> <thead> <tr> <th rowspan="2">Day LAeq(15 min)</th> <th rowspan="2">Evening LAeq(15 min)</th> <th colspan="2">Night</th> </tr> <tr> <th>LAeq(15 min)</th> <th>LA1(1 min)</th> </tr> </thead> <tbody> <tr> <td>42</td> <td>42</td> <td>38</td> <td>48</td> </tr> <tr> <td>41</td> <td>41</td> <td>40</td> <td>50</td> </tr> <tr> <td>40</td> <td>40</td> <td>39</td> <td>49</td> </tr> <tr> <td>40</td> <td>40</td> <td>37</td> <td>47</td> </tr> <tr> <td>37</td> <td>35</td> <td>35</td> <td>45</td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> To determine compliance with the LAeq(15 minute) limit, noise from the development is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, EPA may accept alternative means of determining compliance. 	Day LAeq(15 min)	Evening LAeq(15 min)	Night		LAeq(15 min)	LA1(1 min)	42	42	38	48	41	41	40	50	40	40	39	49	40	40	37	47	37	35	35	45	<p>The following exceedances in noise criteria were reported during the audit period:</p> <ul style="list-style-type: none"> 20/5/20 exceedance of day time criteria at R6a – not deemed as a non-compliance; 24/2/20 exceedance of day time criteria at R6a – not deemed as a non-compliance; 27/11/19 exceedance of evening criteria at R6a – not deemed as a non-compliance; 11/9/19 exceedance of day time criteria at R6a – deemed a non-compliance; and 13/6/19 exceedance of date and night LAeq(15min) at R6a – not deemed as a non-compliance. <p>Noise levels were assessed in accordance with the NSW Industrial Noise Policy to determine compliance.</p> <p>The Site received a warning letter from DPIE on 1 November 2019 for failing to make LA1(1min) noise monitoring results publicly available on the company website. IMC have since rectified this issue and made the results available.</p>	Non Compliance	Continue to implement all reasonable and feasible noise mitigation measures.	Noted. A directional noise monitoring system is planned to be installed in 2021.	<p>The directional noise monitors were installed in FY21.</p> <p>The software package to interpret data was completed in FY22.</p> <p>Refer to Section 6.8.1.4.</p> <p>CLOSED</p>
Day LAeq(15 min)	Evening LAeq(15 min)			Night																												
		LAeq(15 min)	LA1(1 min)																													
42	42	38	48																													
41	41	40	50																													
40	40	39	49																													
40	40	37	47																													
37	35	35	45																													



	<ul style="list-style-type: none"> • To determine compliance with the <i>L A1(1 minute) limit, noise from the development is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the development is impractical, DECC may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).</i> • The noise emission limits identified in the above table apply under meteorological conditions of: <ul style="list-style-type: none"> o <i>wind speeds of up to 3 m/s at 10 metres above ground level; or</i> o <i>up to 3oC/100 m temperature inversion strength for all receivers, plus a 2 m/s source-to-receiver component drainage flow wind at 10 metres above ground level for those receivers where applicable.</i> • <i>These limits do not apply if the Applicant has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Applicant has advised the Department and EPA in writing of the terms of this agreement.</i> 					
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Appendix 5: Community Complaints Report - FY22

Date	Nature of Complaint	Actions / Follow Up
June 2022	Grievance 0045671 1 Complaint received.	Complaints or communications received through Grievance 0045671 are reported separately to this process.
27/06/2022	A community member contacted the Community Line at 10.30 am to advise a very high pitch squealing noise coming from the trains across the weekend at 8.10 am and 7.39 pm.	The Logistics Team was advised of the complaint and completed an investigation of the trains and wagons and identified one with excess noise. Further investigation did not show defects however maintenance was completed on the train identified. The Community team contacted the community member several times throughout the investigation. The complaint was closed after the resident reported to be satisfied.
24/06/2022	A community member contacted the Community Line at 7.45 pm concerned about a large front end loader making noise at Dendrobium Mine stockpile area, Mt Kembla.	The Community team followed up with the operation team at Dendrobium Mine immediately and confirmed a dozer was working in the area to load trains. This activity was business as usual and ceased at 10.30 pm in line with the noise management plan. This concern was share with the management team. The community member was advised and satisfied with the outcome.
19/06/2022	A community member contacted the Community Line at 8.56 pm to advise they heard a "loud grinding noise from the train tracks" that occurred over the space of an hour.	The Community Team contacted Dendrobium Control room which reported no movements occurring at Kemira Valley. The logistics team investigated further and had confirmed the following day that no running trains or any track maintenance was occurring during the evening. The resident was contacted by the Community team to advise of the outcome of the investigation and were satisfied.
May 2022	Grievance 0045671 1 Complaint received.	Complaints or communications received through Grievance 0045671 are reported separately to this process.



Date	Nature of Complaint	Actions / Follow Up
22/05/2022	Resident raised concerns at 1.00 pm regarding loud ongoing engine noise from the Pit Top.	The Community Team contacted Dendrobium Control at 1.05 pm to determine what operations were occurring at the time. At 12.57 pm a supplier driver was filling up a fuel pod to take underground, otherwise generally little/no vehicular movements were occurring. The Community Team enquired of the resident further detail on the timing of the disturbance. No further information was provided from the resident. The supply driver was advised of the complaint for additional awareness.
18/05/2022	Community member advised that at 1.25 pm a truck did not do the stop at the stop sign on Stones Road. It was noted that this behaviour has not been addressed by South32 since the last complaint on 13 May.	The Logistics Team identified the contractor and driver (different company than the previous incident) and spoke directly with the supervisor to manage the individual involved. The resident was contacted by the Community Specialist to inform the outcome of the investigation and action taken.
16/05/2022	A community member raised concerns at 4.15 pm and 9.40 pm regarding ongoing engine and mechanical noise from the mine.	The noise was investigated. There were no movements other than usual movements to report that could have caused extra noise. No longwall change out machines were operating, or longwall equipment being towed. Two trailers were loaded at the portal and a JUG LHD was in transit to the workshop which could have potentially been the source of the noise, although the operator idled down the hill and drove slowly to the workshop. An email with the information about the investigation was sent to the community member.
15/05/2022	The community member raised concerns at 7.19 am regarding loud machinery noise coming from the Pit Top.	The complaint was investigated, and the noise generating activity was determined to be associated with the longwall changeout. Under direction of the Mine Operations Manager, South32 ceased the activity until later in the day. It was conducted between 11 am – 3 pm the same day. The location of the staged materials will be reviewed for future activity. An email with the information of the investigation was sent to the community member.



Date	Nature of Complaint	Actions / Follow Up
14/05/2022	Community member called the community line at 12.47 pm regarding ongoing mechanical noise, including crashing and banging etc.	<p>The noise was investigated and the activities that may have contributed to audible noise were:</p> <ul style="list-style-type: none"> • Tracking of a machine underground at about 10 am. • Bolts placement in a steel bin around the time of the call. • Movement of forklift. <p>These activities ceased at 1.00 pm. An email with the information of the investigation was sent to the community member.</p>
13/05/2022	At 9.43 am a community member advised that a truck did not stop at the stop sign on Stones Road.	South32 identified the company travelling on the road at the time of concern. It was reminded of its responsibilities and correct driver behaviour. The community member was informed of the outcome.
11/05/2022	Community member raised concerns related to an orange truck that travels on Cordeaux Road daily prior to 7 am.	Investigations confirmed a driver occasionally travelled to the site very close to 7 am, driving on Cordeaux Road early by a few minutes. The Drivers Code of Conduct and confirmation of curfew times was provided to the contract company. Actions were implemented to prevent re-occurrence. The community member did not request a call back.
7/05/2022	A member of the community contacted the Community Line at 9.05 am regarding loader noise emanating from the pit top for the last 90 minutes.	A shearer was being mobilised towards the portal as part of the longwall move at the time of concern. It required several towing tractors due to its size. South32 is implementing further controls to mitigate the noise in the future. The community member was advised of the outcome by email.
6/05/2022	A member of the community called the Community Line at 10.35 am regarding "droning" noise coming from the site over the past several hours.	No activities or noise out of the ordinary was reported by the Operations Team. Tree removal works on the surface planned to occur on Fridays only (over May and June) may have been the cause of the noise, although this was during standard working hours to minimise noise impacts associated with chainsaw work. The community member did not wish for a call back.



Date	Nature of Complaint	Actions / Follow Up
4/05/2022	A community member advised a slow train was squealing near William James Drive at 3.50 pm.	The shift leader attended the area to monitor noise that day. No noise issues were observed. On 5 May the Team conducted another noise audit showing some noise from the rear of the train however not excessive. The unit was inspected after discharging that night to ensure that all is operating as normal. Attempts to contact the resident with feedback were unanswered and a voice mail was left.
April 2022	Grievance 0045671 No complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process.
12/04/2022	A community member advised of a heavy haulage vehicle delivering a longwall chock up Cordeaux Road without an escort vehicle at 4:00 pm. The resident informed a previous commitment from South32 to provide pilot vehicle for heavy vehicles travelling on Cordeaux Road.	By law, a pilot is required for trucks over 3.5 m and the truck was just within this length. South32 agreed however to use pilot vehicles for all trucks carrying longwall chocks moving forward. The concern was raised and discussed at the Dendrobium Community Consultative Committee meeting. The community member was telephoned with this response on Monday 19/04/2022
March 2022	Grievance 0045671 No complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process.
20/03/2022	At 3.47 pm a community member called the community line about an incredibly slow train with a very loud squealy carriage at 11.28 am that day.	The community team contacted rail operations who advised there are speed restrictions on that section of the line as a result of the washout from the other week. The tamper would be operating Monday and Tuesday to realign the track allowing the train to resume the normal speed. The community member was advised on Monday 21/3/22 by return telephone call.



Date	Nature of Complaint	Actions / Follow Up
5/03/2022	Community member emailed a concern about the generator noise that occurred on 4/3/22. The email was sent at 8.13 am.	A temporary diesel compressor required to provide fresh air underground during planned maintenance activities from 8 am – 4 pm operated outside of standard working hours until 7.45 pm. Action was taken to turn off the compressor when concerns were received at the time of the noise. This detail was shared by return email at 12.47 pm the same day with information of the diesel compressor also operating on 5/03/22.
4/03/2022	At 6.27 pm a community member emailed regarding a loud humming and vibrating noise coming from the mine. They noted the nature of the noise was going to make sleep difficult and they didn't think it was acceptable for this type of constant noise to be coming from the mine.	Dendrobium Mine was notified of the concern and the noise was investigated immediately. An upgrade to the permanent electric compressor was underway and a temporary diesel compressor was being operated when needed to supply air underground, including over the weekend from 8 am – 4 pm. On this occasion the compressor would be switched off by 7:45 pm. Two emails were sent to the community member updating the information of the operations of the diesel compressor on that day. On 5/3/22 the community member sent a further email relating to the same noise. An investigation was completed, and the diesel compressor was turned off at about 12.35 pm the same day. A return email was sent to the community member detailing the action taken and the electrical compressor upgrade works.
February 2022	Grievance 0045671 No complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process.
21/02/2022	A community member contacted the community line at 11.20 am regarding a reversing alarm noise near the entrance to mine which had been occurring for over an hour. They did not wish for a call back.	An investigation was conducted. Noise monitoring data indicated an increase at the reported time of concern which correlated with minor traffic congestion in the driveway. The congestion caused vehicles to manoeuvre back and forth to clear room however there was no indication of a continuous reversing alarm for the hour. The Dendrobium Pit Top Noise Working Group is reviewing reversing alarm sound. The community member did not wish to be contacted.



Date	Nature of Complaint	Actions / Follow Up
21/02/2022	A community member contacted the community line at 8.35 am regarding noise from reversing trucks and advised it had been happening for the last 30 minutes. They did not wish for a call back.	The community team sought data and the logistics report from operations. Noise monitoring data indicated a spike in noise, though the source was unclear. It may have been multiple vehicles moving at the pit top over the 30-minute period. Teams working at the pit top were spoken to at the time regarding reversing alarms. The community member did not wish for a call back.
19/02/2022	A community member contacted the community line at 10.23 am to complain about rail squealing noise.	A representative from Pacific National attended the site and reported a minor wheel squeal. They recorded the noise as the train went past. Noise is continuing to be monitored to determine the source and methods of management. Community member contacted on 4 March with update who noted the squealing wheels is the main disturbance and they would like to see the squealing wagons identified and rectified.
18/02/2022	A member of the community contacted the community line at 11.40 am to complain about an ongoing loud mechanical noise coming from the mine.	The community team contacted Dendrobium operations to check noise monitoring data. Data indicated no issue, however if the Lower Portal Road construction was occurring, it would not be getting picked up by the noise monitoring system (as it is directional and does not face the Lower Portal Road). A member from our community team responded to complainant via email as requested.
10/02/2022	A community member contacted the community line at 3.05 pm regarding engine mechanical noises, squealing and screeching noises occurring for some time at the Dendrobium pit top.	The community team requested noise monitoring data which showed an increase in noise from the pit top at the time though the source was unclear and was not identified. A member of the community team responded to the complainant via email.



Date	Nature of Complaint	Actions / Follow Up
08/02/2022	<p>A caller contacted the community line at 11.05 am regarding an incident that occurred on 3 February. The community member was crossing the rail crossing in their vehicle when the boom gate unexpectedly closed, causing minor damage to their vehicle. The community member sought damages for the repair of their vehicle.</p>	<p>The caller was contacted directly and a process for the vehicle to be repaired at Illawarra Metallurgical Coal's cost was agreed.</p>
03/02/2022	<p>A member of the community contacted the community line at 7.25 pm concerned about the boom gate at Central Road Rail Crossing malfunctioning. The previous day the boom gate was staying down much longer than normal. Today the boom gate went up with the lights and bells still on, before closing for approximately 45 seconds. The community member did not wish for a call back.</p>	<p>The complaint was shared with the rail contractor, Pacific National, who attended the site and fixed the operation of the boom gates. The community member did not require a response.</p>



Date	Nature of Complaint	Actions / Follow Up
01/02/2022	A member of the community contacted the community line at 6 pm to request a face-to-face meeting to discuss the long grass at the church opposite his residence (needs mowing). Also, a complaint regarding the amount of Illawarra Metallurgical Coal buses travelling along Cordeaux Road.	A member of the community team contacted the resident to discuss the issues on the morning of 2/2/2022. A face-to-face meeting was then held with the community member to discuss the issues and follow up on the concerns. The number of buses travelling along Cordeaux Road is because of changes implemented due to Covid19 restrictions. This will change as restrictions ease. It was confirmed the church property referred to is not owned by Illawarra Metallurgical Coal.
January 2022	Grievance 0045671 2 complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process.
20/01/2022	A member of the community contacted the Community Line at about 12.55 am concerned about general mine noise and vehicle noise at Dendrobium Mine.	Dendrobium Mine was notified of the concern at about 8 am the following day. An investigation was conducted and determined that a production critical task was undertaken at the time of concern. A loader was taking pipes underground to the development team. The resident did not request a call back with the outcome.
24/01/2022	A member of the community contacted the Community Line at about 12:16 pm concerned about very loud engine noise coming from the pit top.	An investigation was conducted by Dendrobium personnel. No unusual activity was occurring at the time. It was noted a Veolia vacuum truck was sucking out drains - this is a weekly activity that has been occurring for many years.



Date	Nature of Complaint	Actions / Follow Up
15/01/2022	<p>A member of the community contacted the Community Line at about 3.55 pm concerned about constant engine noises coming from the pit top. The Community Team emailed the community member for more information at 4.05 pm and were advised at about 5 pm the noise was ongoing with loud engine noises and bangs which were disruptive.</p>	<p>An investigation was conducted by Dendrobium Mine at about 4.00 pm. There were limited activities at the pit top at this time.</p>
11/01/2022	<p>A member of the community contacted the Community Line at about 9.30 pm concerned about lots of machinery noise coming from Dendrobium Mine pit top.</p>	<p>An investigation was conducted by Dendrobium Mine at the time of concern. A number of vehicles were moving at the pit top as they exited the mine to prepare for shift change. The vehicles would be re-entering the mine from about 10 pm. This was a usual daily activity and nothing out of the ordinary was occurring. The humid weather was a likely factor in allowing noise to travel further. Noise and weather data was to be reviewed the following day. The community member requested a response by email which was provided at about 9.40 pm the same day.</p>
11/01/2022	<p>A member of the community contacted the Community Line at about 5 pm concerned about machinery noise and a loud booming coming from the Dendrobium Mine pit top. It was occurring at the time of the call and ongoing for about the previous 30 minutes.</p>	<p>An investigation was conducted by Dendrobium Mine at the time of concern. At 4.50 pm a forklift was towing a trailer on the Portal Road and then unloaded longwall pans on Portal Road. The unloading process takes about 30 seconds. This activity occurs daily and always during the day as it can create noise. The activity ceased for the day shortly after 5 pm. The only other activity at the time of concern was a small forklift in the yard lifting pallets which was identified to not be generating noise. The community member requested a response by email which was provided at about 7.20 pm the same day.</p>



Date	Nature of Complaint	Actions / Follow Up
10/01/2022	A member of the community contacted the Community Line at 9.40 pm concerned about machinery noise and clanging or dropping of items into a large metal bin.	An investigation was conducted by Dendrobium Mine at the time of concern. A machine towing a trailer with a heavy load had exited from underground at about 9.30 pm. The Undermanager spoke with the operator at about 9.45 pm with a reminder to be conscious of noise resulting from movement. No other activity was occurring at the pit top that would have resulted in the noise described. The community member did not wish for feedback on the outcome of the concern.
10/01/2022	A member of the community emailed the community team at 7.03 am saying "I just noticed a truck driving up Cordeaux Rd at around ten to seven going to the mine, isn't this outside your allowable travel times?"	The community team responded to the community member at 7.25 am advising we would speak to the driver. The transport was a subcontracted delivery. Generally, these deliveries would not come to site and be delivered directly to the offsite facility. Due to the urgency of the items, the delivery was redirected to site. The driver was unaware of the curfew along Cordeaux Road and proceeded to be at the mine site gate at 7am instead of waiting at the Cordeaux Road holding bay until 7am. The subcontractor has been contacted and explained the curfew.
10/01/2022	A local truck company lodged a complaint with the Police about traffic congestion related to South32's Rapid Antigen Testing Clinic at Marley Place. The Police forwarded to Dendrobium Mine for investigation.	Investigation determined a number of contributing factors including, unexpected number of operational staff returning from annual leave accessing the facility, Port Kembla Coal Terminal shutdown contractors commencing work and requiring testing and nursing staff/traffic control being overwhelmed with testing numbers. To ease traffic congestion the traffic flow was improved through the use of a car park, additional nurse/security was onboarded, staff and contractors were requested to attend for testing the day prior to accessing site in non-peak periods where possible and South32 staff monitored the traffic conditions moving forward. An emailed response was provided to the Police at 1.40 pm the same day.



Date	Nature of Complaint	Actions / Follow Up
03/01/2022	A member of the community phoned the Community Line at about 6.50 pm to advise the trains had been noisy over the Christmas period. A train on 3 January was particularly noisy with wheel squeal so loud they could not hear each other speaking as it passed.	The logistics team investigated when the concern was received. The 8 pm train was observed as it passed through the area near the community member and no wheel squeal was observed. The community member was contacted the following day and further details were provided. All rail movements were monitored the following day and no wheel squeal was reported. Movements in the area will continue to be checked on an ad-hoc basis.
1/01/2022	A member of the community phoned the Community Line at about 11.40 am about 'loud booming noise coming from Dendrobium Mine'. They wished for a reply by email	Dendrobium Mine investigated the concern at the time it was received. An operator was loading a bin with machinery at about 11.32 am which is a usual activity, however a bit on the machinery was vibrating which may have resulted in louder noise. The activity lasted about 5 minutes and ended around the time the concern was lodged by the community member. The operator was advised of the additional noise created and will be more wary of machines in future. The community member was provided feedback by email at 12 noon the same day
December 2021	Grievance 0045671 2 complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.
20/12/2021	A community member telephoned the community call line at 7.05 pm concerned about noise from the pit top. It was further described as 'loud bangs and booms'.	Dendrobium Control commenced an investigation into the noise the same day of the concern. Camera footage from the site did not detail any activities occurring that would result in the described noise. Noise monitoring data did not record loud bangs at or near the time of concern. The noise source could not be identified. The resident was provided the outcome of the investigation.



Date	Nature of Complaint	Actions / Follow Up
10/12/2021	<p>A community member telephoned the community call line at 11.01 am concerned about a semi-trailer that crossed the centre of the road as it turned a corner travelling downhill. The same truck was also observed to be travelling uphill at 7 am which is outside the allowable travel time.</p>	<p>The logistics team investigated and confirmed the truck travelled on Cordeaux Road slightly prior to the allowable travel time, arriving at Dendrobium Mine at 7.04 am. The truck company was advised of the breach. The truck was not oversized and did not require an escort, however the observed manoeuvre of the truck was discussed with the truck company and driver. The community member did not request a call back with details of the investigation.</p>
9/12/2021	<p>A community member emailed the Community Team at 6.19 am concerned about a piercing noise coming from the pit top between 7.45 and 8.30 pm the previous night (8/12/2021). The resident emailed at about 8.30 pm the same day to advise the same noise was occurring at the time of sending the email and requested more effort in identifying and ceasing the noise.</p>	<p>The Community Team followed up with Dendrobium Mine management regarding the noise concern. The noise source was determined on 10/12/2021 to be an activity occurring within the mine entrance (portal) to secure a railing to protect the emergency sealing doors. The activity should not have occurred in the evening, nor without proactively informing the community of a potentially noisy planned activity. The activity ceased and would continue during the daytime under a different method to reduce the noise generated. The resident was advised of the outcome by return email on 10/12/2021.</p>
07/12/2021	<p>A community member telephoned a member of the Community Team at 9.30 am to complain about a 'coal crusher' noise. The community member telephoned again the same day at 12.45 pm to advise the noise was repeated about 12.35 pm.</p>	<p>Dendrobium Mine investigated and could not determine the source of a 'coal crusher' noise. CCTV cameras and noise monitors were reviewed as part of the investigation. The community member was advised on 8 December 2021 by return telephone call.</p>



Date	Nature of Complaint	Actions / Follow Up
November 2021	Grievance 0045671 No complaints were received through grievance 0045671	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.
30/11/2021	A community member telephoned the community call line at 9.27 am concerned about rail squeal. The entire length of the train was making a high-pitched squealing noise.	Over the last two months there has been limited rail movements causing a build-up of surface rust on the rail tracks causing friction and the squeal. The rust will be worn away by rail movements and is common after a period of limited raiing. The surface rust was expected and the 6 am train was proactively delayed to reduce the impact on nearby residents. The community member provided further commentary suggesting the late evening and early morning trains continue to be delayed until the rust is worn away. Rail movements would be altered where possible to minimise impact and speed reduction in the area be trialled until the rust is removed.
11/11/2021	A community member telephoned the community line at 3.48 am to complain about noise. The noise was described as being a 'coal crusher'.	The concern was investigated and no activity that would result in a loud coal crushing noise was identified. The activity at Dendrobium Mine Pit Top at the time of concern was limited to a supply driver refuelling a machine. The machine was loaded later in the morning at about 6 am. The community member did not wish to be contacted with the outcome.
6/11/2021	Local police attended Dendrobium Mine at about 9.20 am after receiving concerns from local road users in Figtree about wide loads travelling without escort to the mine. The trucks width required them to take up slightly more than one driving lane.	The relevant approvals for the truck movements were provided to the police, including the width of the trucks which were within the requirements of not requiring an escort. The Police escorted the last truck movement from the mine at about 11 am and noted it did cross into the oncoming lane on corners in Mount Kembla and required more than one lane on Prince Highway, Figtree. Despite truck width being within requirements of not needing an escort, the Company decided the wide loads would be accompanied by pilot vehicles in future to improve safety.



Date	Nature of Complaint	Actions / Follow Up
4/11/2021	Resident contacted the Community Call Line at 11.30 am on 4 November concerned about loud machinery noise coming from the mine.	The concern was investigated, and the source of the noise was likely the Vacuum Truck cleaning two drainage pits on Lower Portal Road. The activity was of short duration and the noise had ceased shortly after the concern was received. The resident did not wish to be advised of the outcome of the investigation.
1/11/2021	Resident contacted the community line at 12.19 asking the bushland at the back of his property be cut back. Bushes and lantana are coming through his fence.	The community team discussed the issue with the rail personnel who agreed to undertake clearing and maintenance work in the area between the properties and rail line, commencing Wednesday 3 November. The community team advised the resident of the outcome by telephone on 2 November.
1/11/2021	The Community Team were made aware of a letter dated 13 October, from a resident requesting overgrowth between their property and the Kemira Valley Rail Line to be cut back. The letter referenced an earlier letter of 19 February making the same request.	Clearing and maintenance between properties and the rail line was undertaken within a week of the concern being received. The resident was advised of the planned action on 2 November. The letters sent earlier in the year could not be located in Company records. The resident was provided the Community Call Line and illawarracommunity@south32.net address for future correspondence.
October 2021	Grievance 0045671 2 complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.
7/10/2021	A resident telephoned a member of staff at midday about overgrown land in the rail corridor behind Rachel Crescent, Figtree	The Community Team passed the complaint to the Rail Management team to investigate. Cutting back and maintenance of the area behind the property was organised and the Community Team informed the landholder when the work would take place
September 2021	Grievance 0045671 5 complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.



Date	Nature of Complaint	Actions / Follow Up
03/09/2021	A member of the community telephoned the Community Line at 9.00 am about a very loud ongoing engine noise and screeching at the mine.	The Community Team passed the information onto the Dendrobium mine operations for investigation. This found that Longwall Sleds were being loaded and readied for transporting to the Portal. Resident was advised by email 3/9/21 and is being updated regularly about activities from longwall changeout.
August 2021	Grievance 0045671 No complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.
31/08/2021	A member of the community contacted the Community Team to report excessive noise the previous night. No further details were given.	The Community Team responded directly to the community member apologising for the disturbance. An investigation by the Dendrobium Mine operations showed there was unusual activity at the pit top the previous night during the early hours of the morning.
20/08/2021	A member of the community contacted a staff member to report that at approximately 8 pm on Friday 20/08 a silver RAV 4 pulled out of Dendrobium Pit top at considerable speed without stopping at the stop sign. The car exited the mine entrance in front of the vehicle travelling in an easterly direction causing the community member to brake hard. The car was reported to drive aggressively down Cordeaux Road.	The Community passed the information onto the Dendrobium Mine operations for follow up. No response was required to the community member



Date	Nature of Complaint	Actions / Follow Up
15/08/2021	Resident emailed community team at 9.00 am complaining of noise on and off for the last 30 minutes	The Community Team contacted Dendrobium Control immediately to investigate. Initial investigation found the only activity on surface during the time was a forklift unloading material. This was advised to the resident within a few hours of the complaint. Further investigation found that while there was some additional noise during the identified time, this was within allowable limits. Resident was advised by email on 19/08/21
July 2021	Grievance 0045671 No complaints received	Complaints or communications received through Grievance 0045671 are reported separately to this process and are subject to independent mediation.
18/07/2021	Resident contacted the Community Call Line at 10:25 pm to advise that large semi-trailer truck drove past residence (Cordeaux Road) making lots of noise.	The Community Team contacted Logistics and Dendrobium Mine to confirm if the truck was related to our activities. The investigation concluded the delivery came from Western Australia and was delivered to the wrong address. The truck was immediately turned around at the pit top. The freight company was contacted, issued a notice and readvised of the curfew delivery hours. The freight company responded and implemented actions to prevent re-occurrence. The resident did not request a call back with the outcome of the investigation.
1/07/2021	Resident contacted the Community Call Line at 10.45 pm to advise excessive truck or machine noise was audible for about the last 2 hours. The resident did not wish for a call back	The Community Team contacted Dendrobium Mine at about 11.00 pm to advise of the concern and investigate. Shift change was underway and no unusual activities were reported. Noise data received on 9 July was consistent with the reported increase in noise 9.50 pm – 11 pm. Noise was indicated to be within the Consent Conditions at R6a.

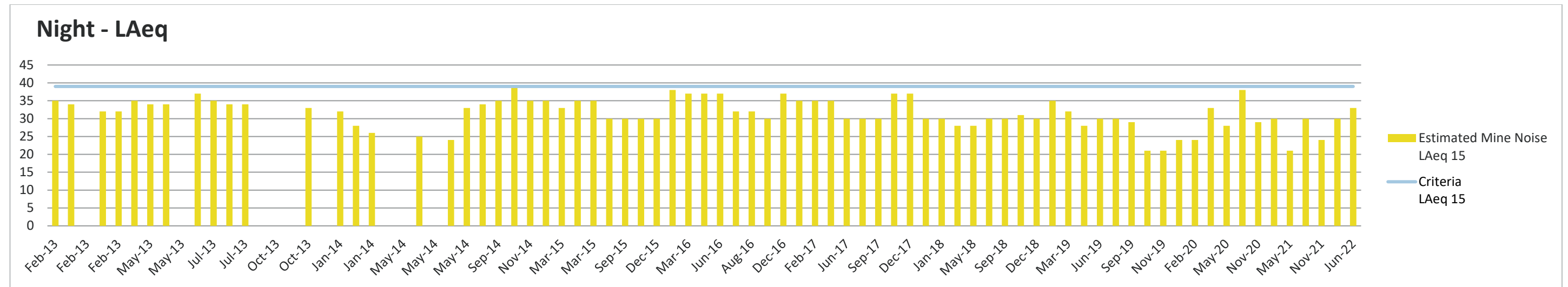
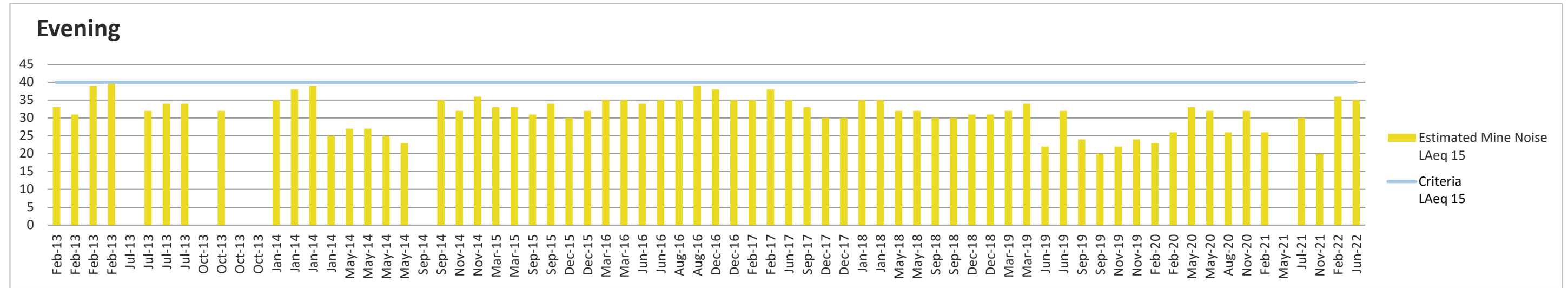
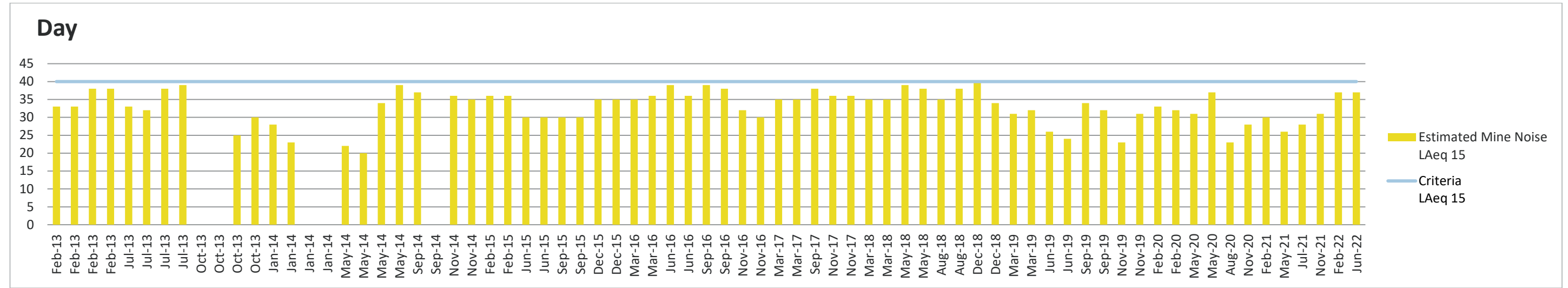


Appendix 6: Dendrobium Mine Long-Term Environmental Monitoring Data

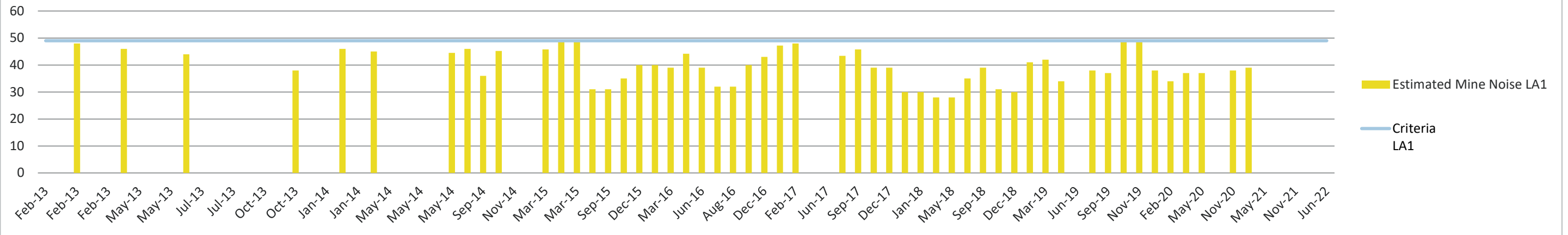
Appendix 6 – Long-term Environmental Monitoring Graphs

Noise Monitoring Results

R1

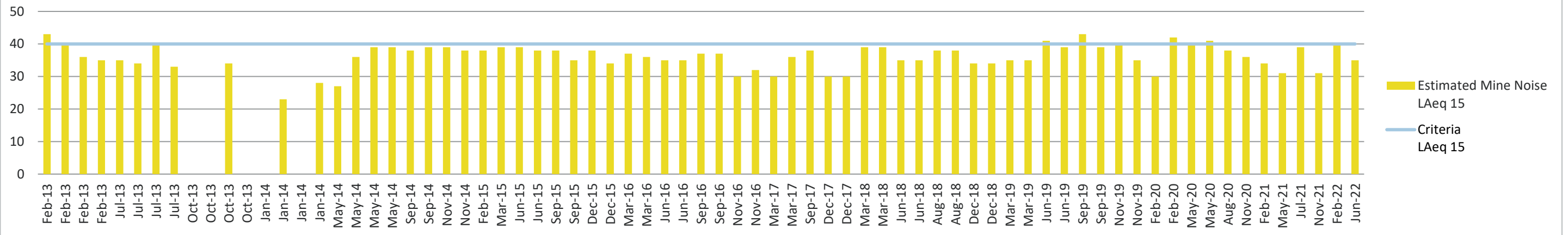


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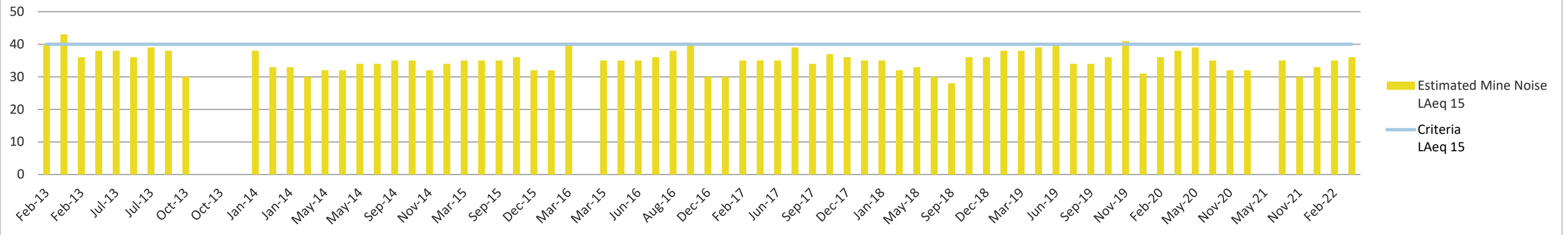


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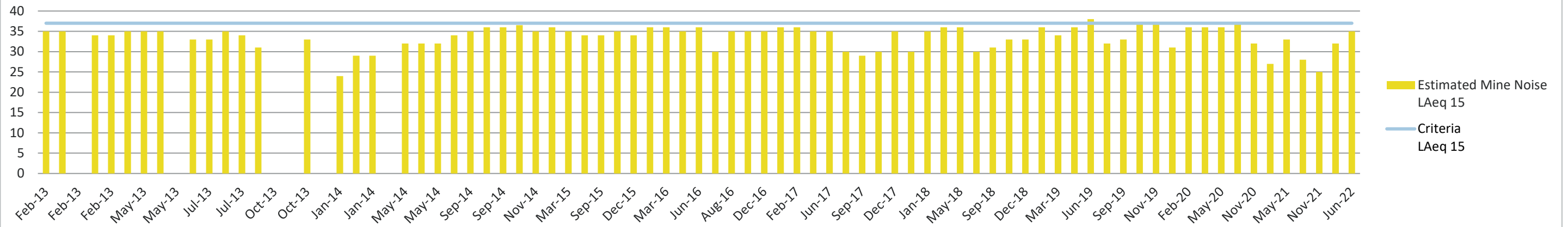
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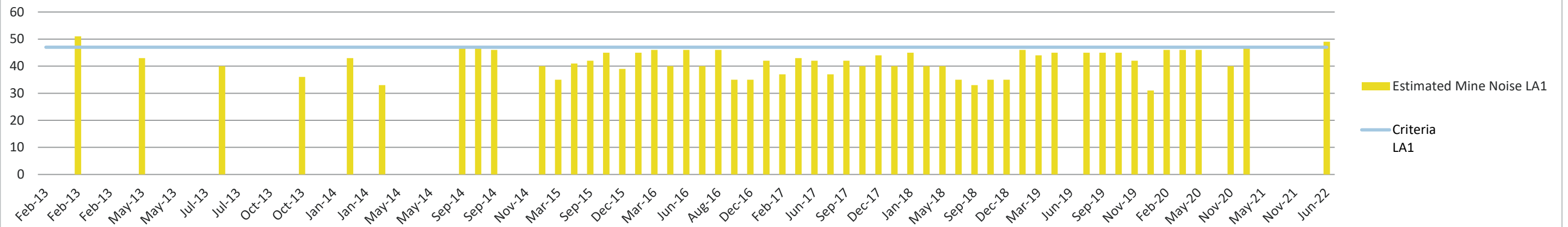
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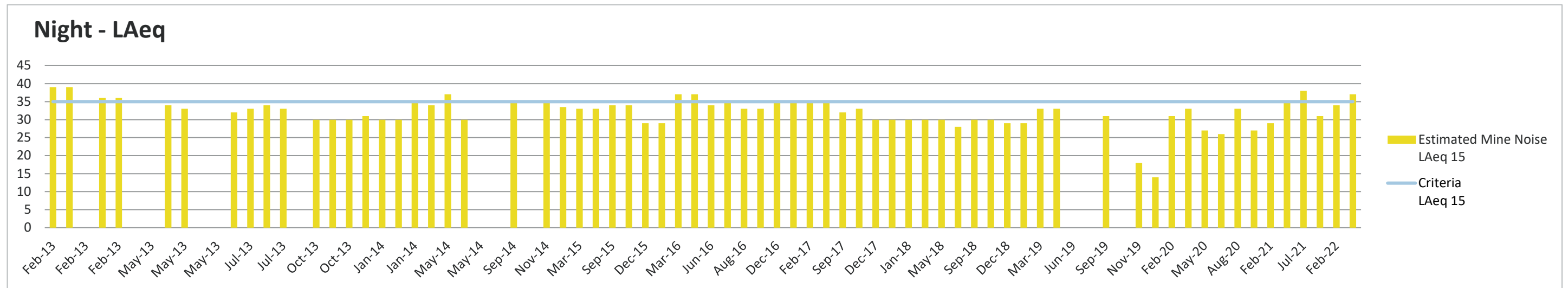
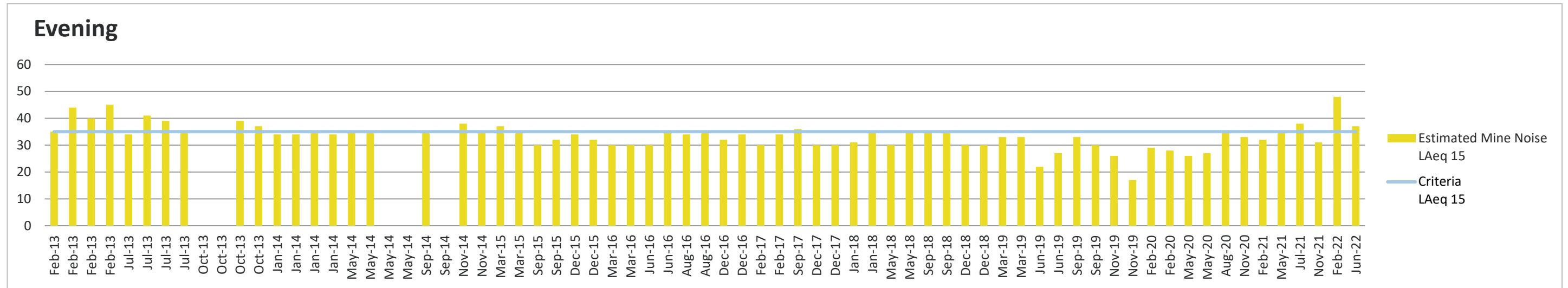
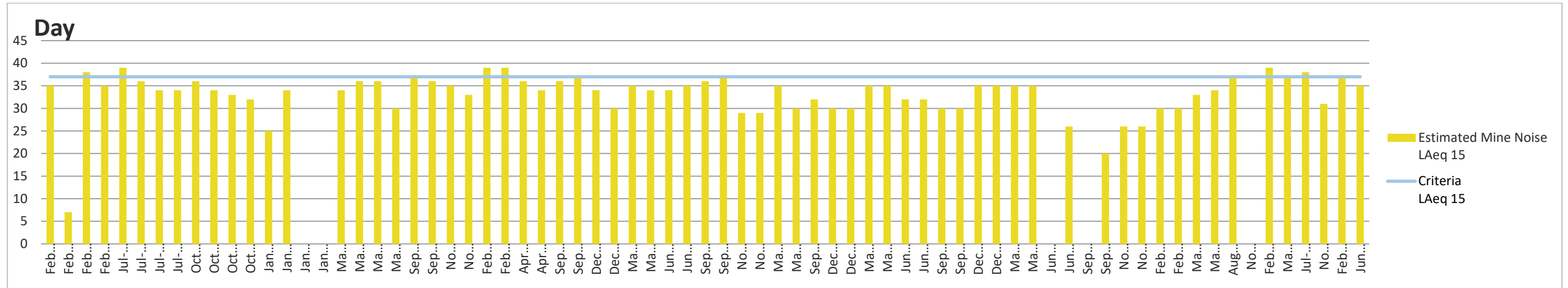


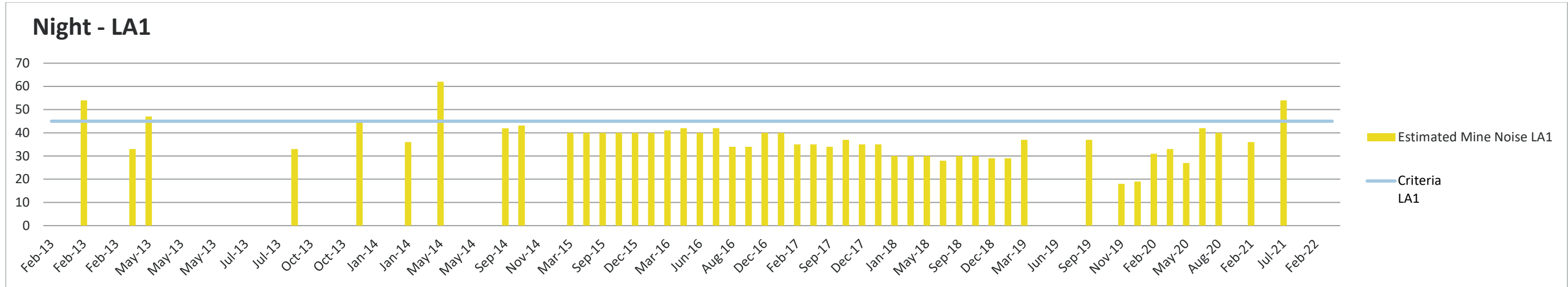
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Night - LA1

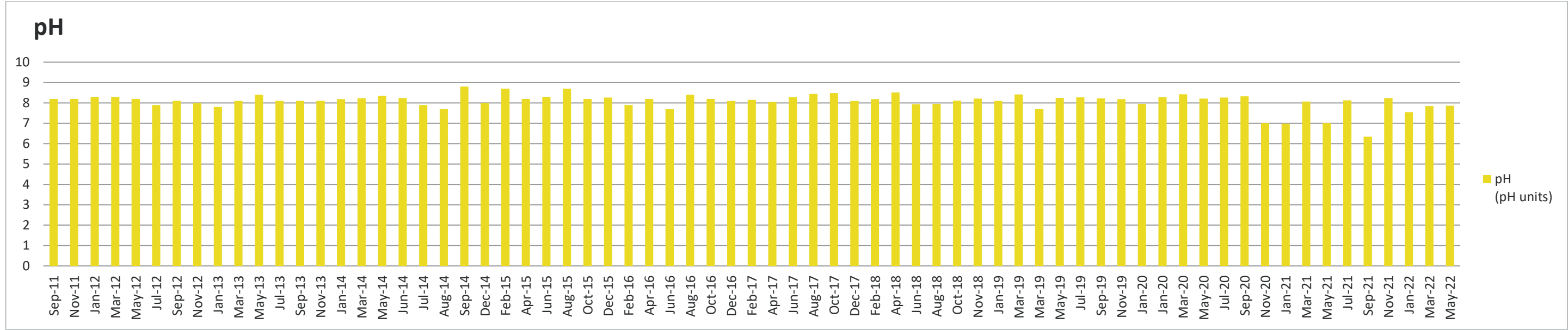


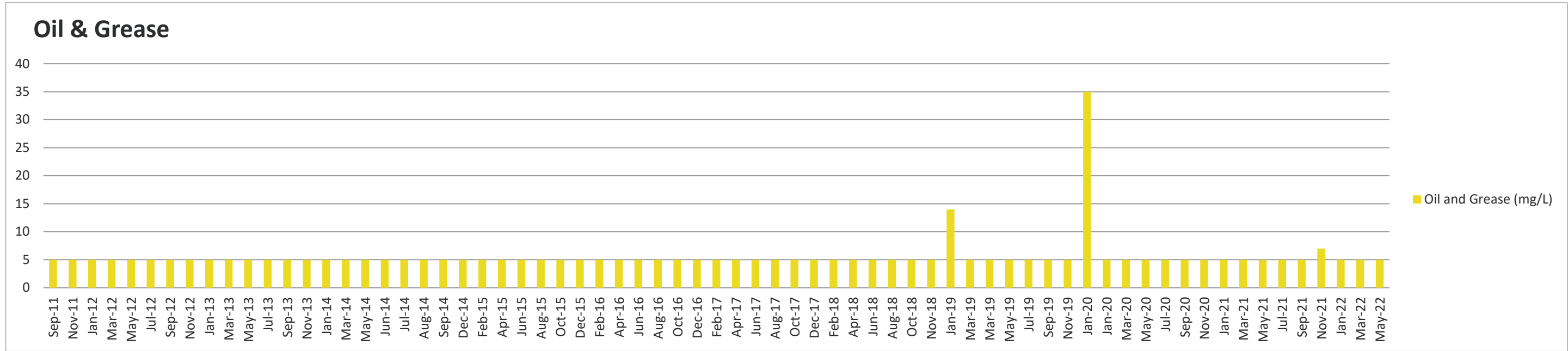
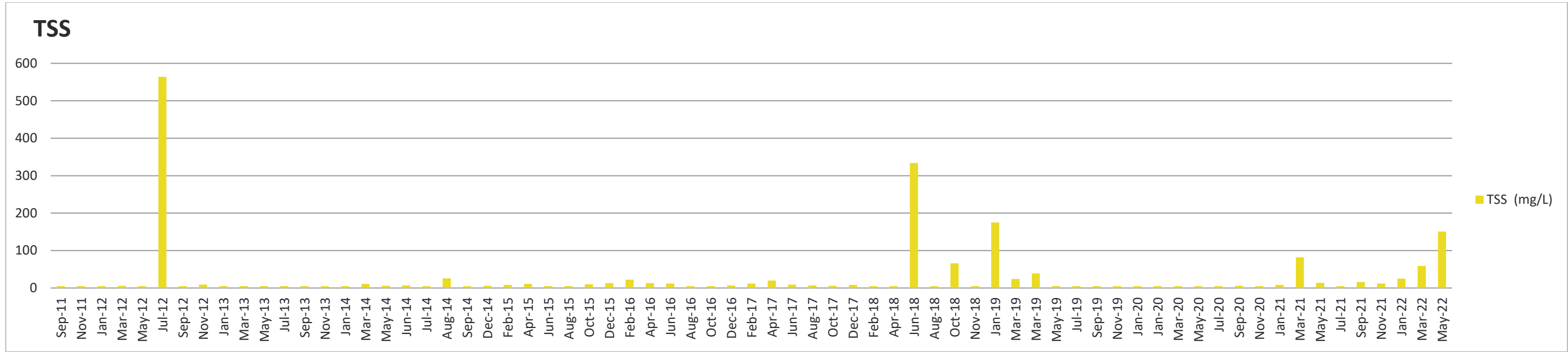




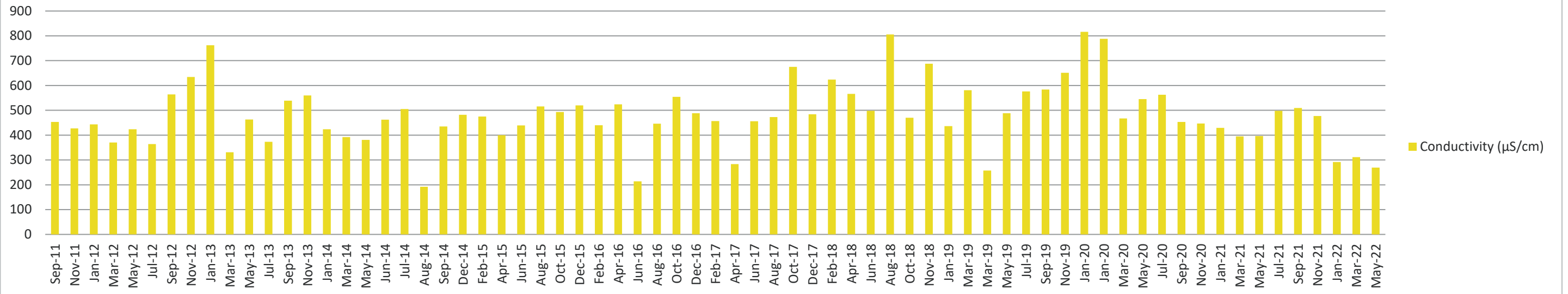
Water Quality Monitoring Results

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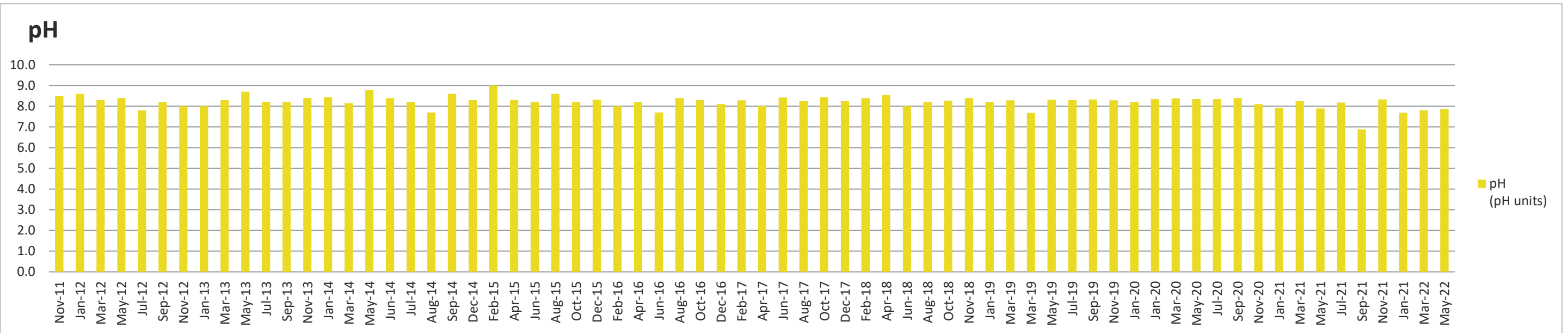


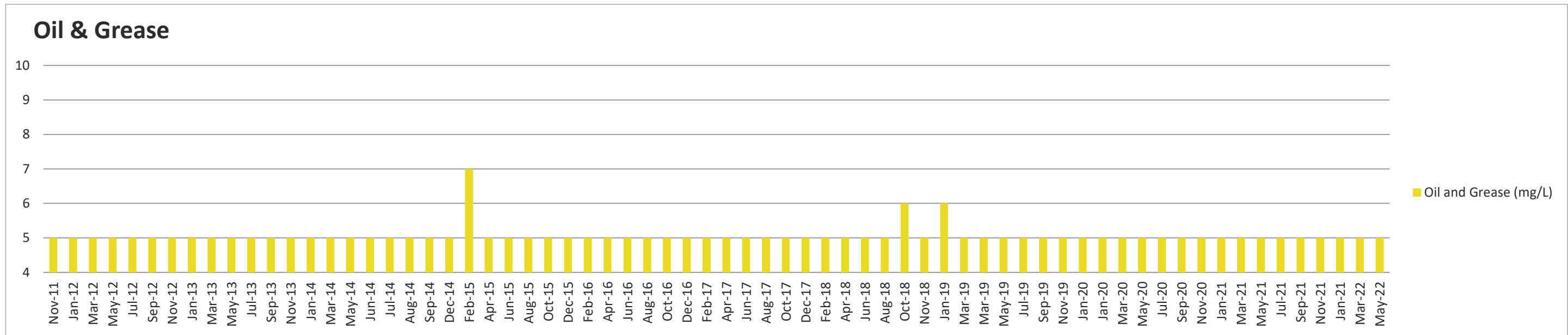
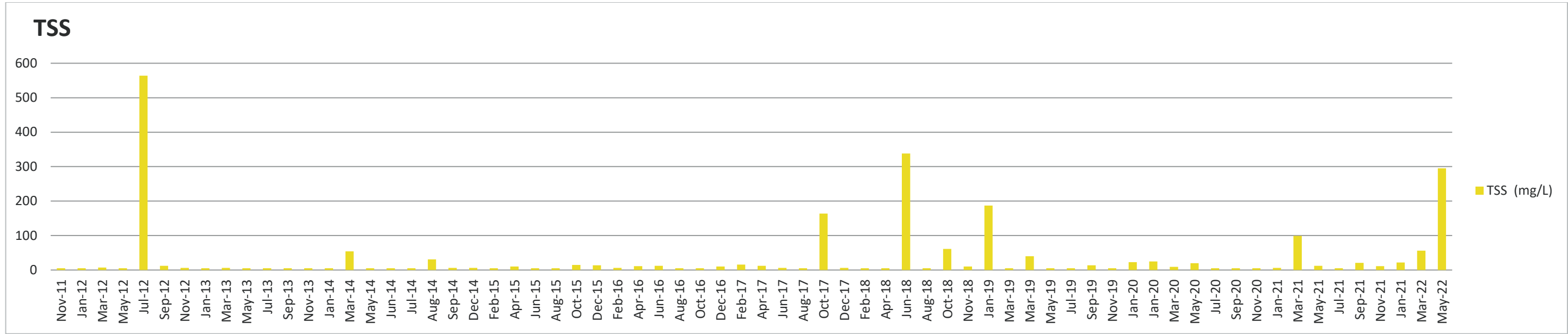


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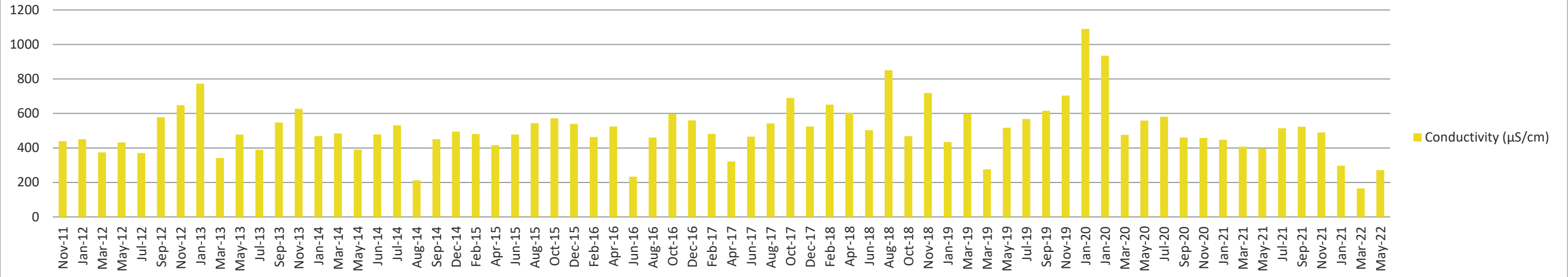


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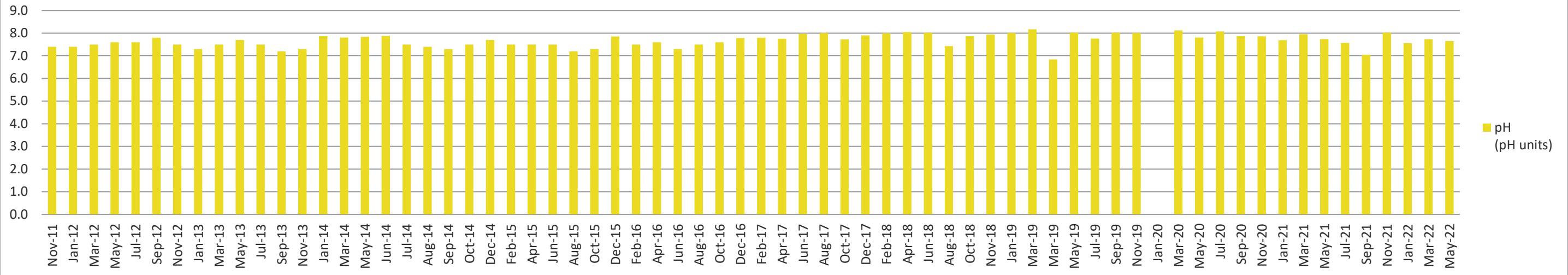


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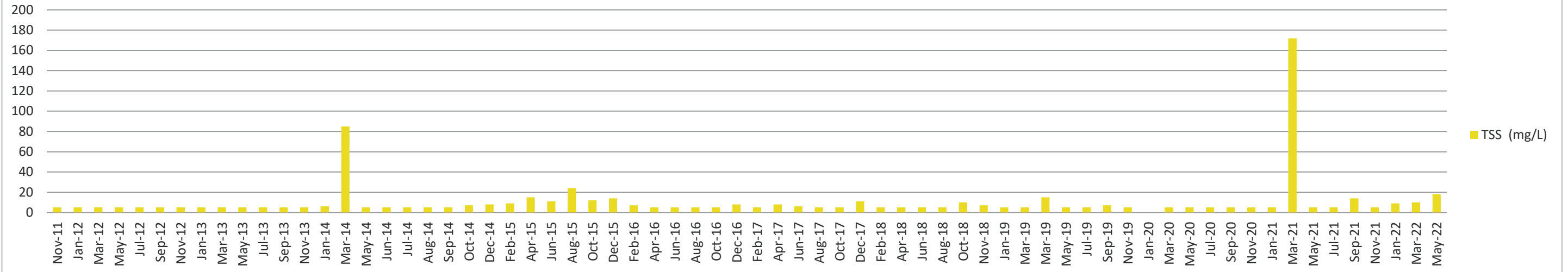


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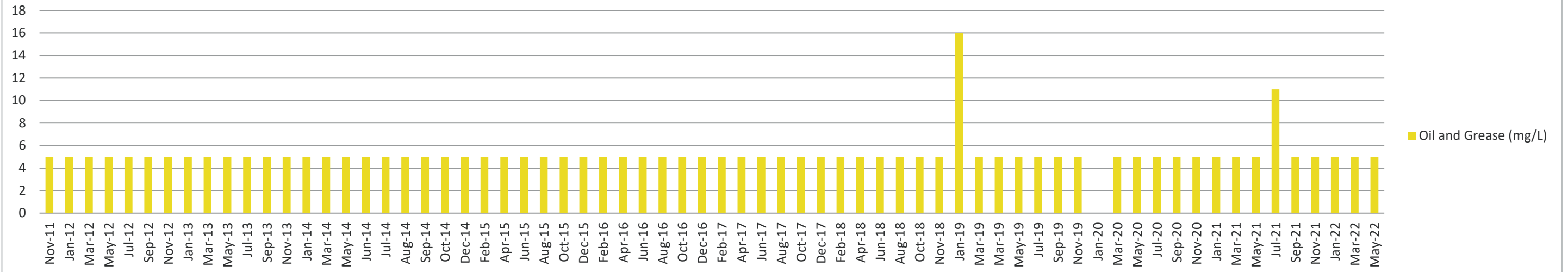
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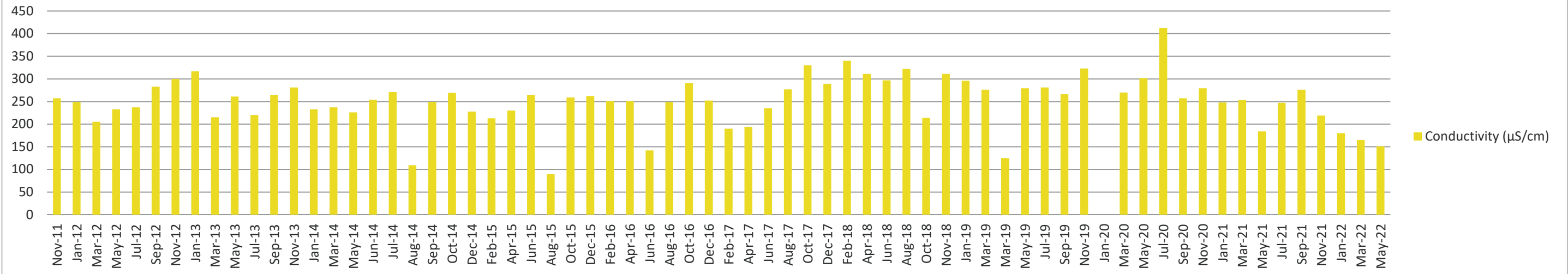
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Oil & Grease

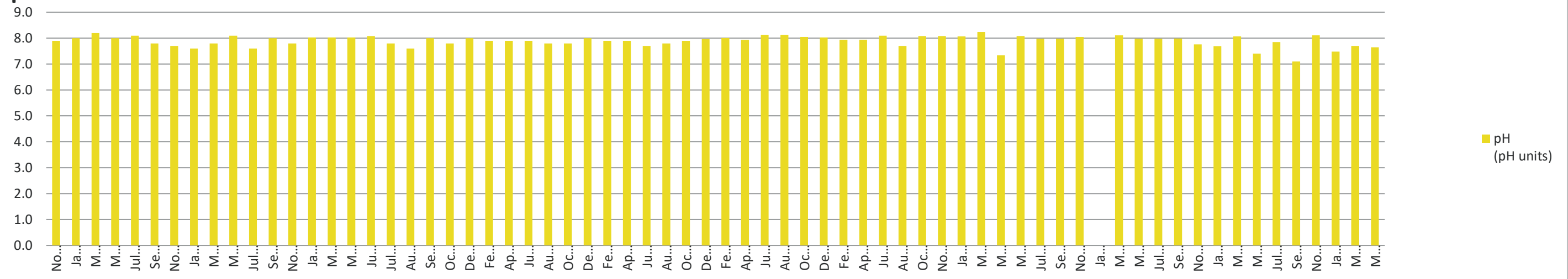


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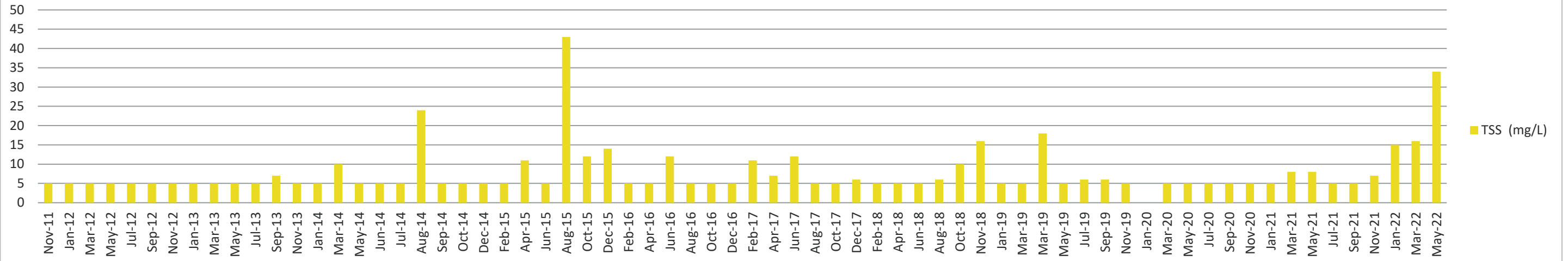


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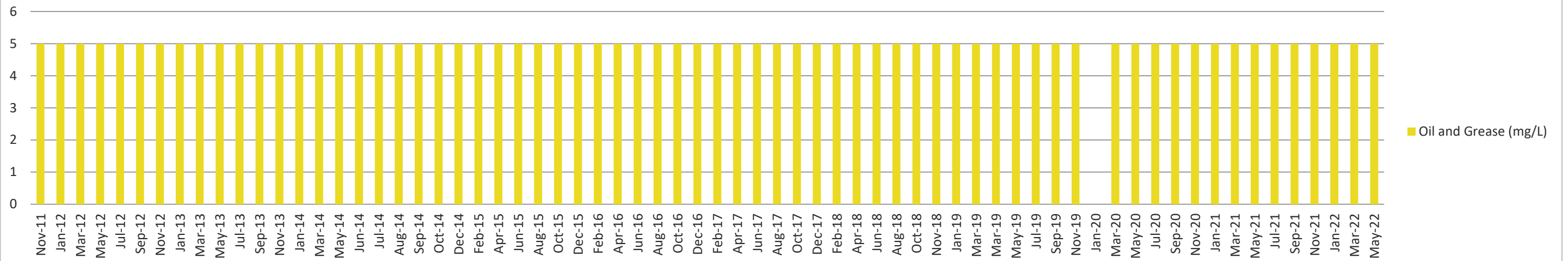
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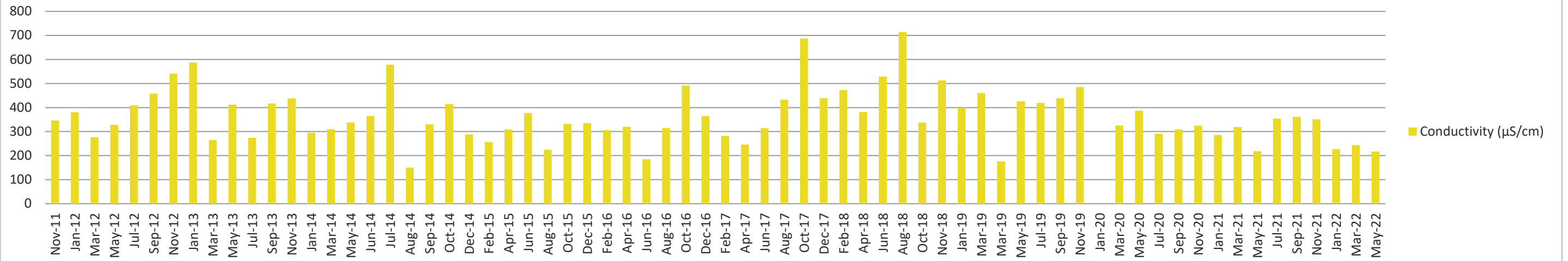
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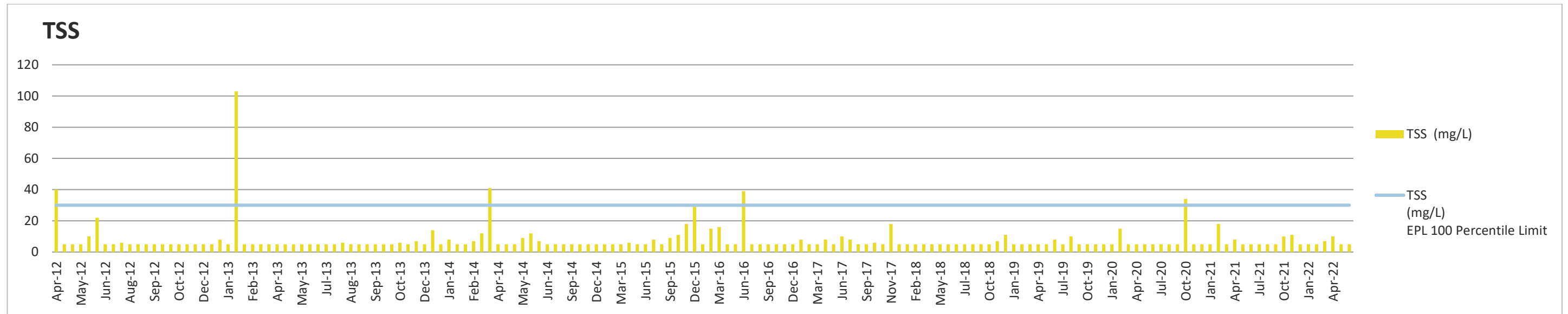
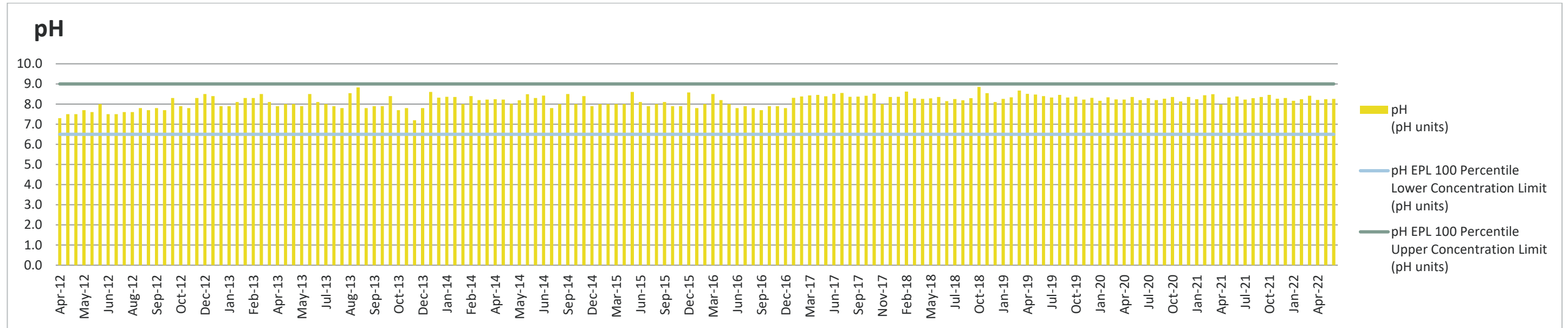
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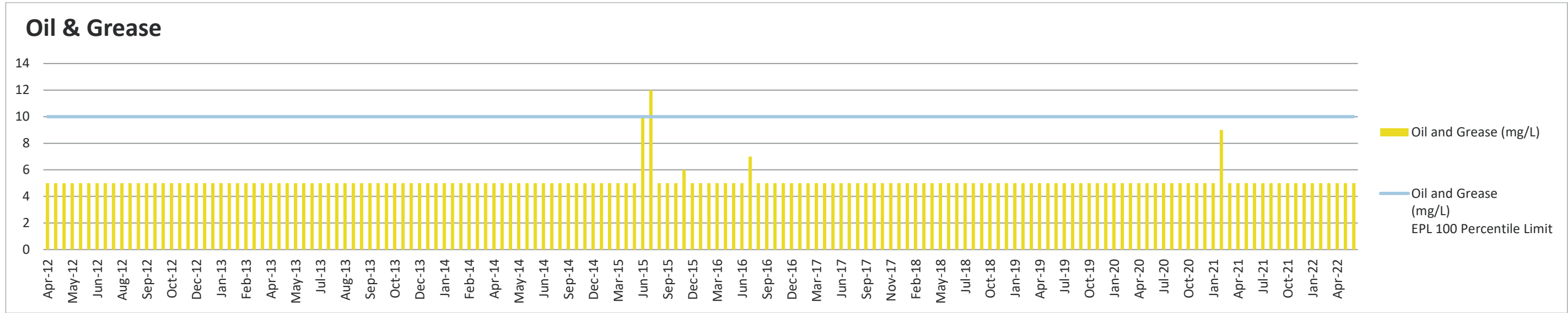
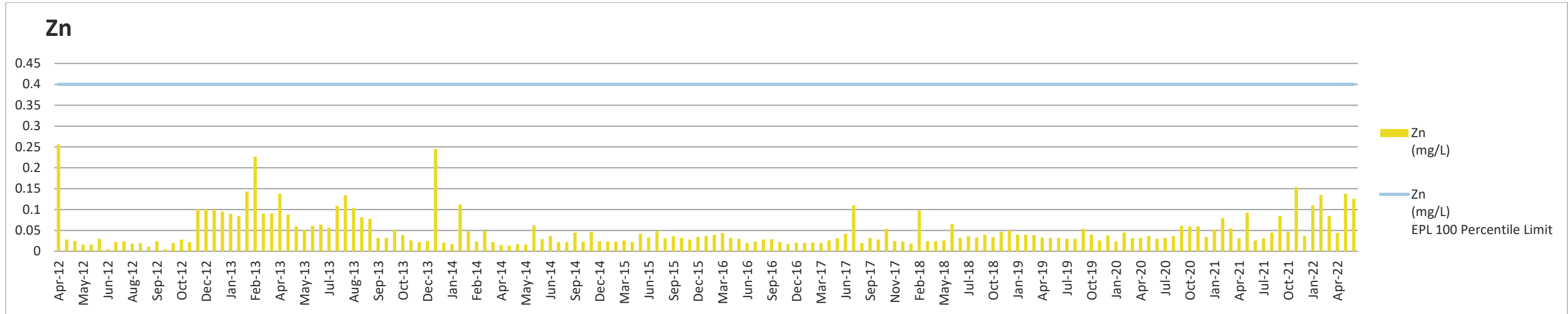
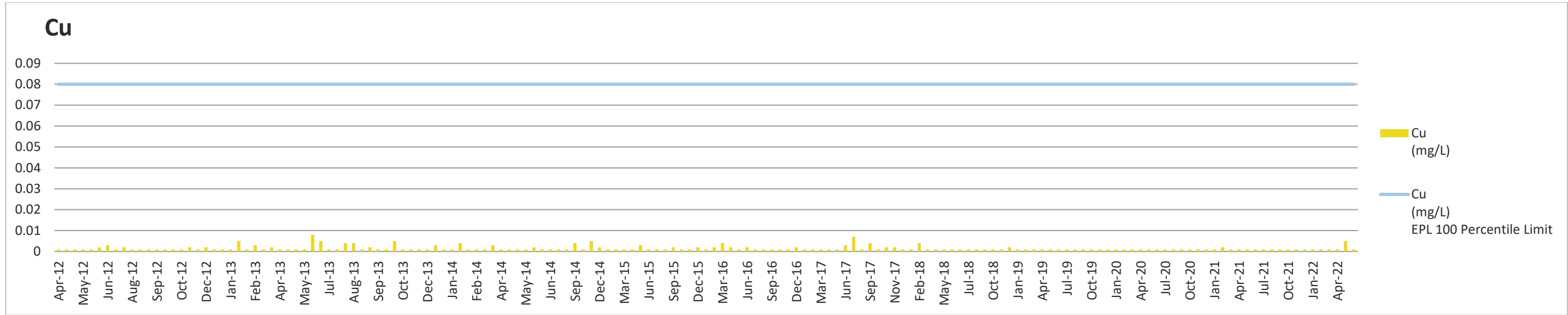


Conductivity

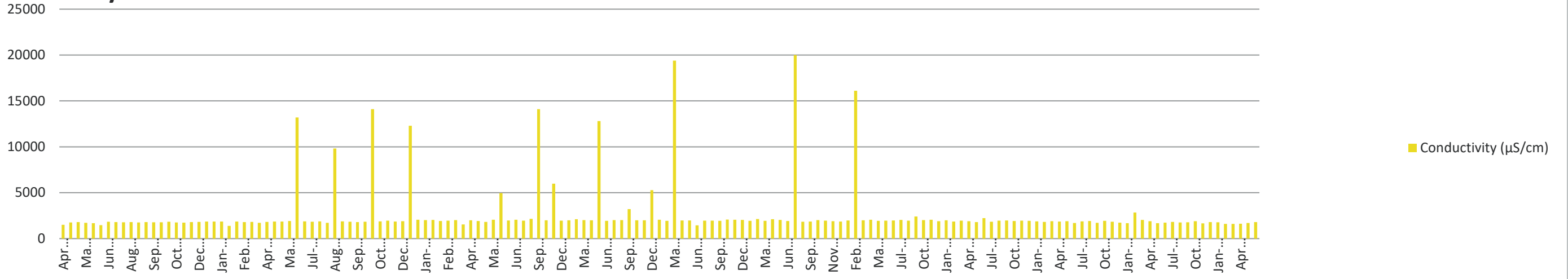


LDP 5

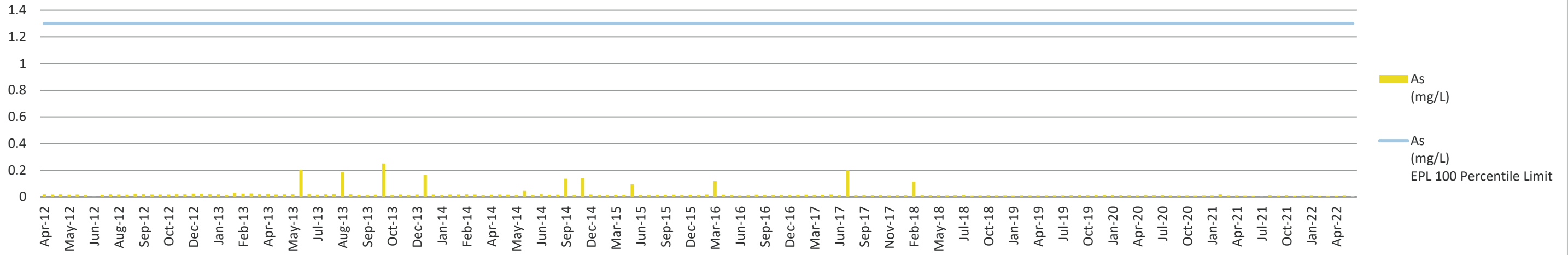




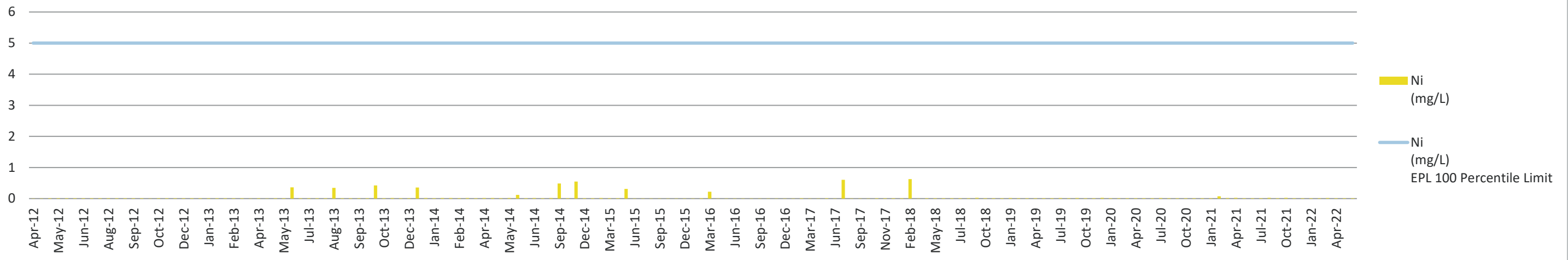
Conductivity



As

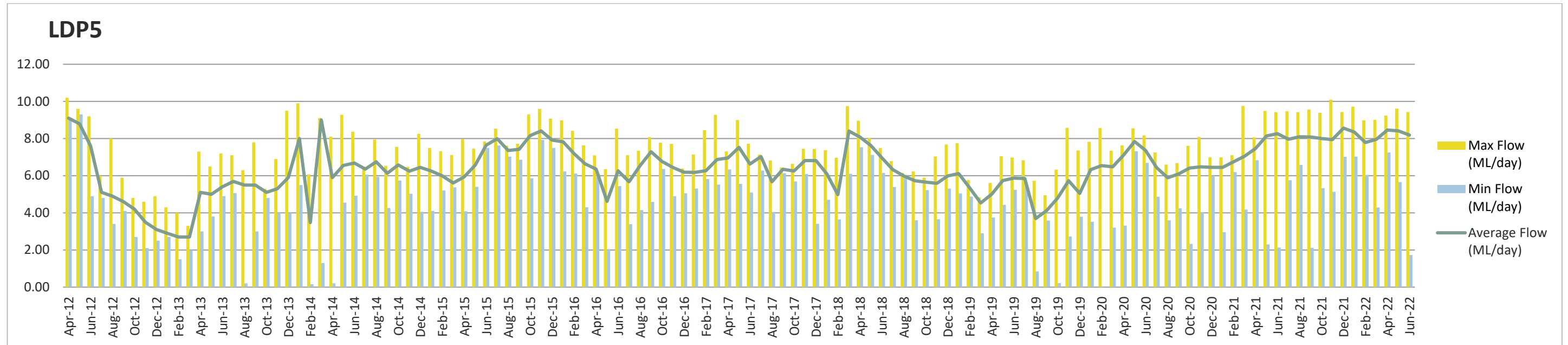


Ni

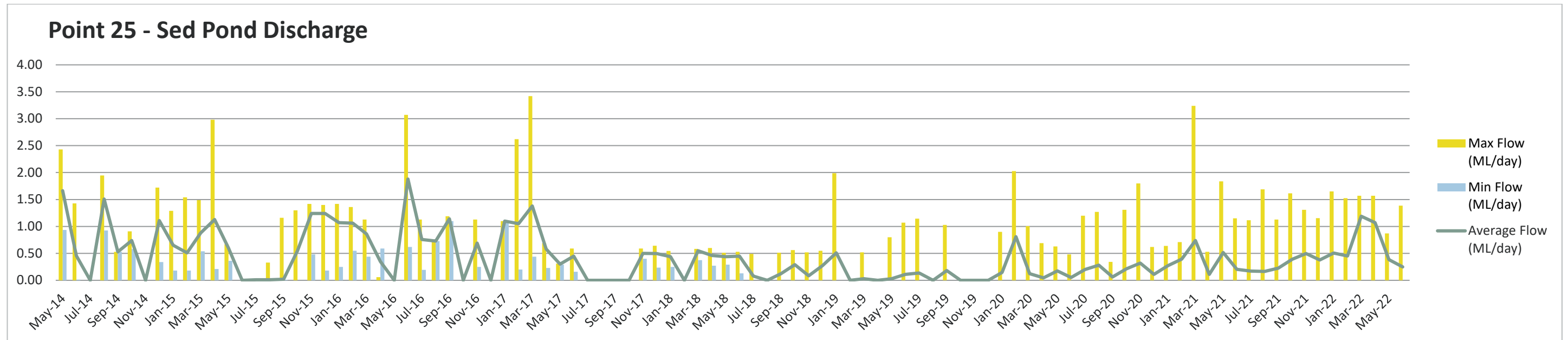


Water Discharge Results

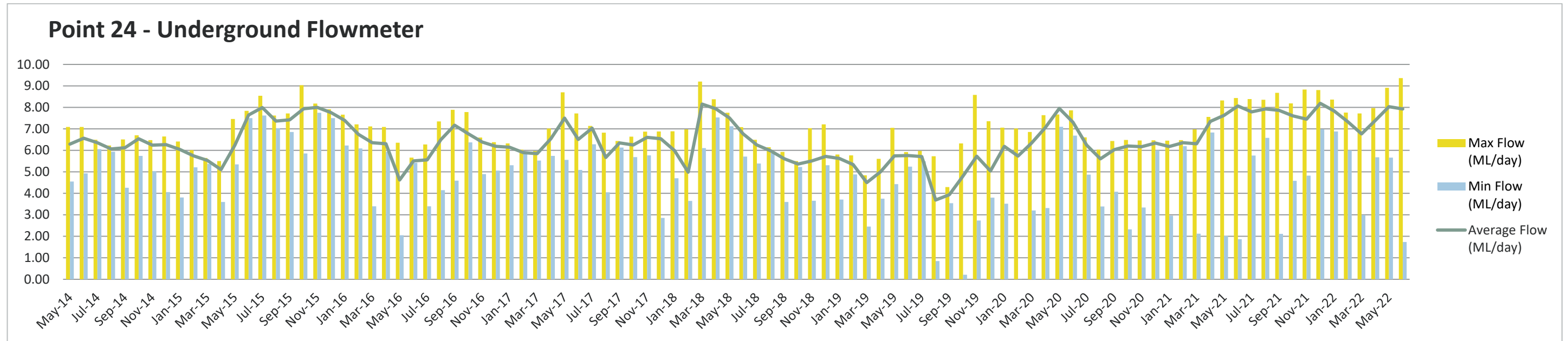
LDP 5



Point 25

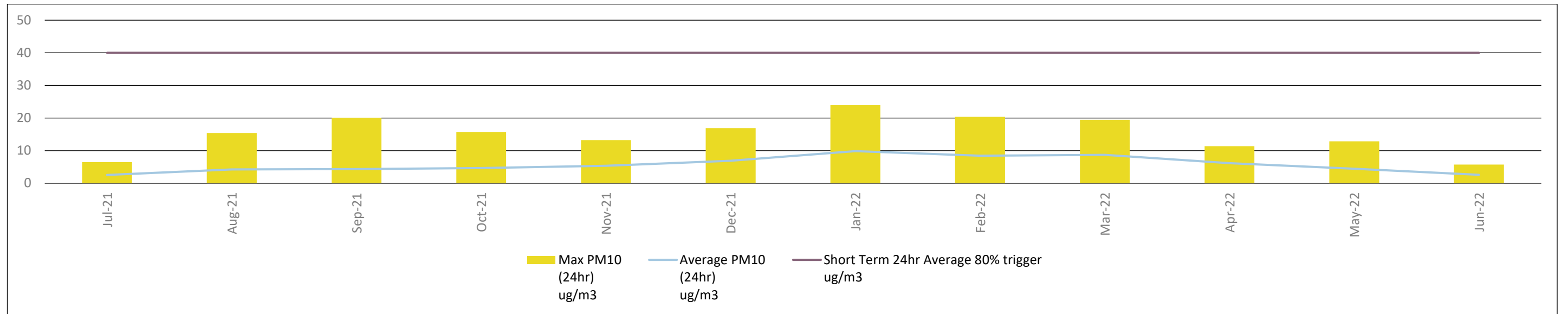


Point 24

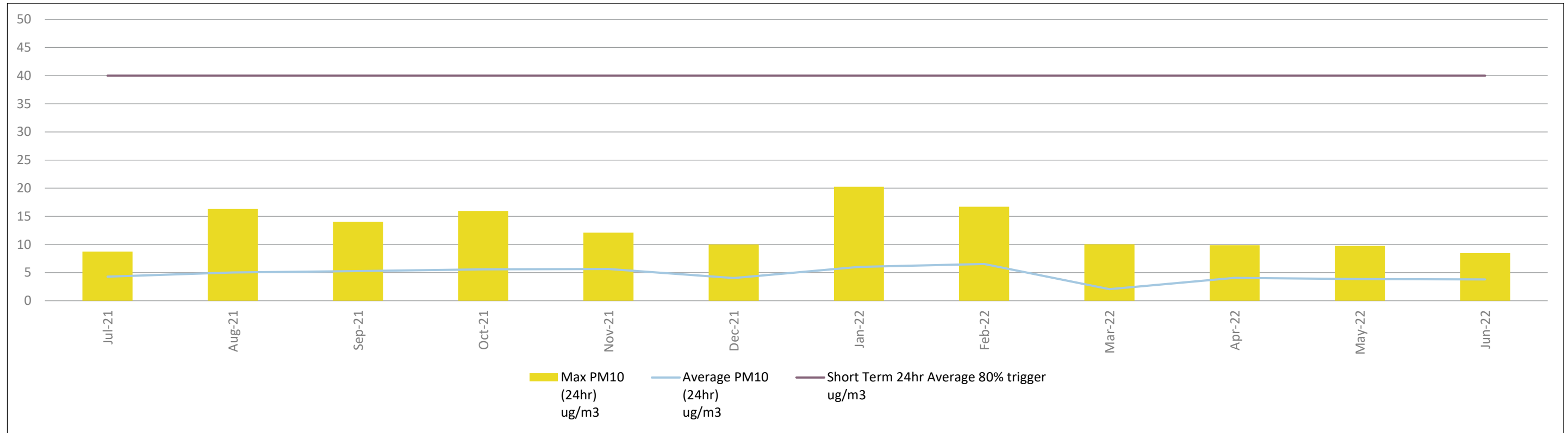


Air Quality Monitoring

Point 20 – Photometer PM₁₀

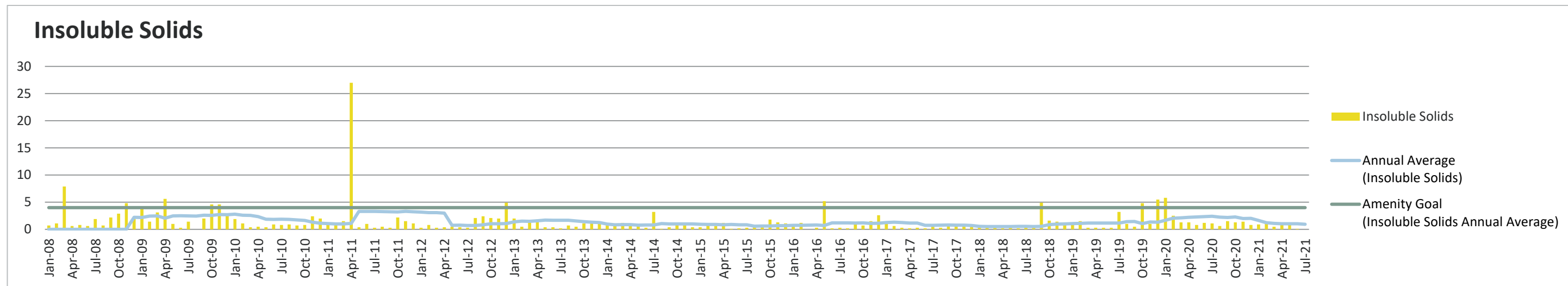


Point 21 – Photometer PM₁₀



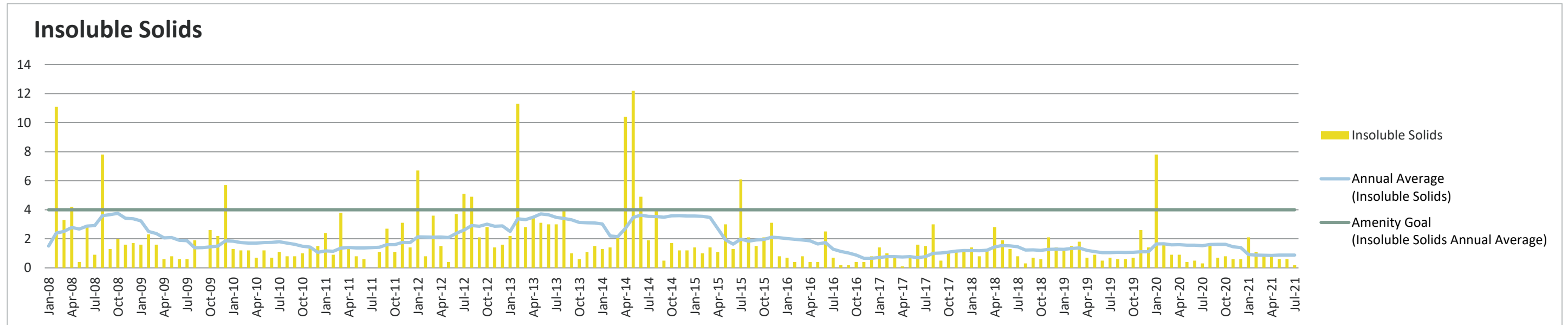
Previous Air Quality Monitoring¹

Point 6

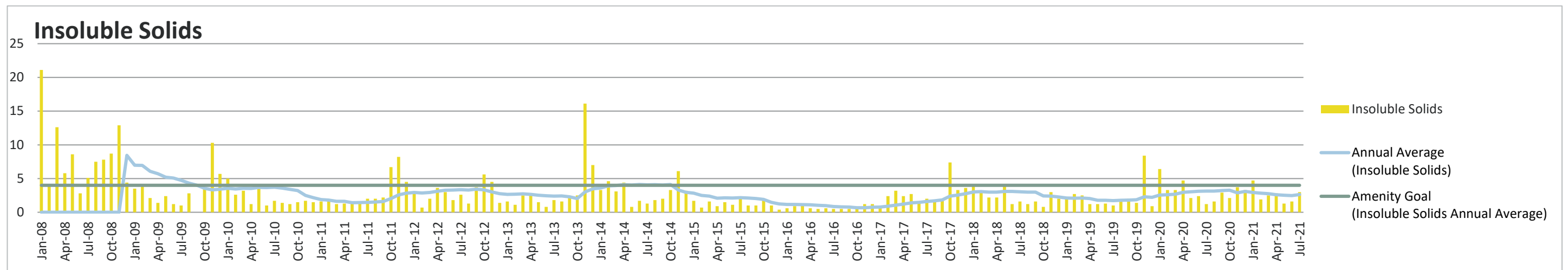


¹ High Volume Air Samplers and Dust Deposition Gauges were decommissioned in FY21.

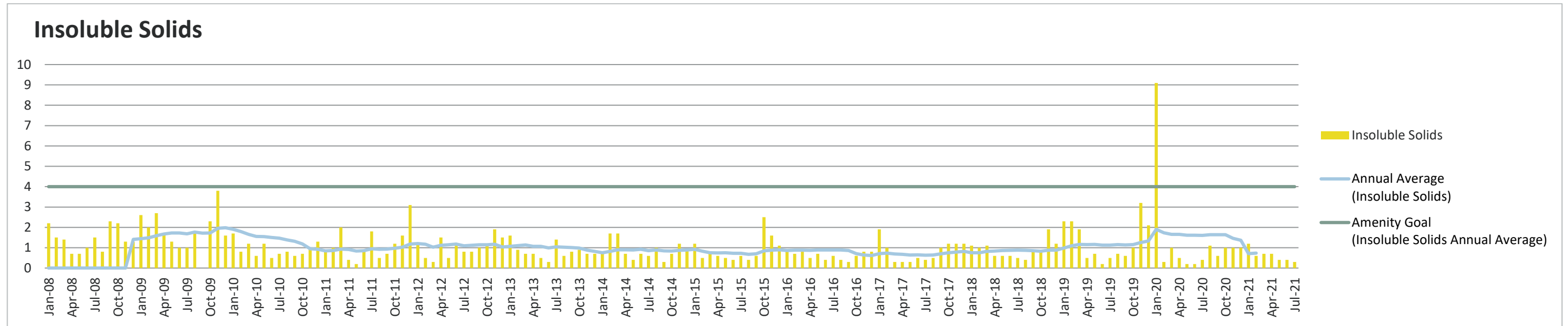
Point 9



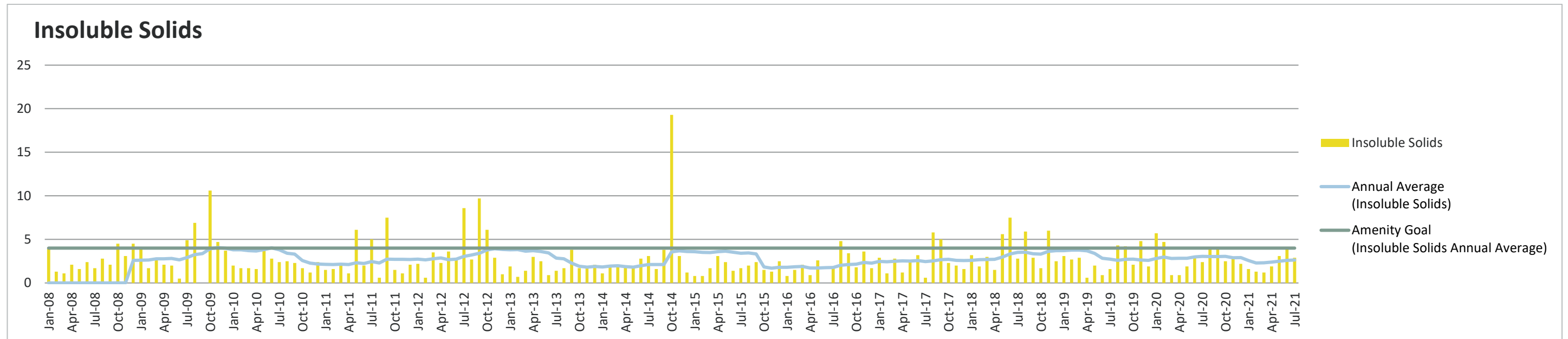
Point 13



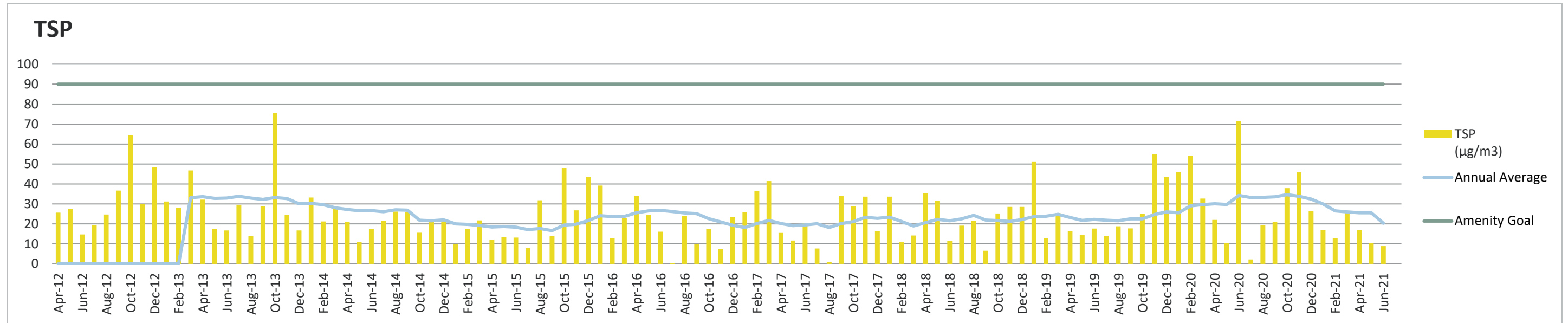
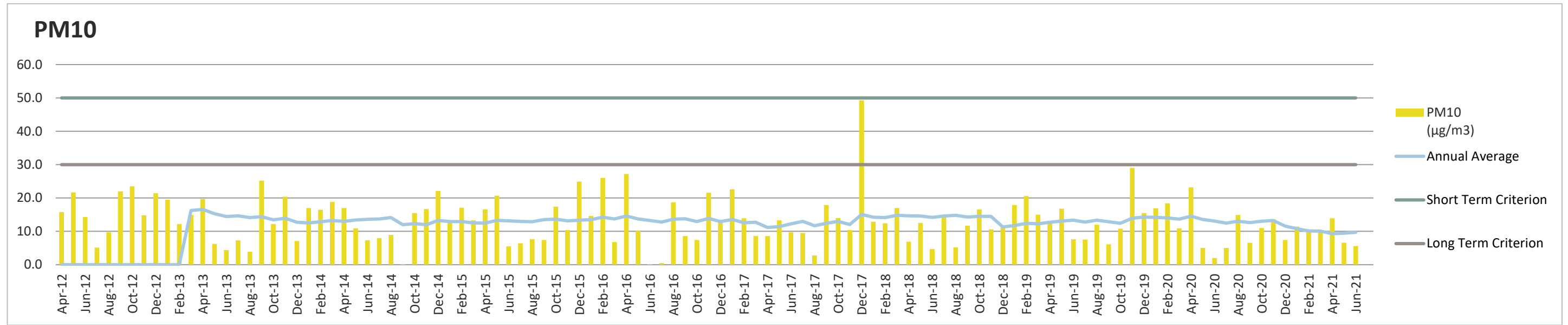
Point 17



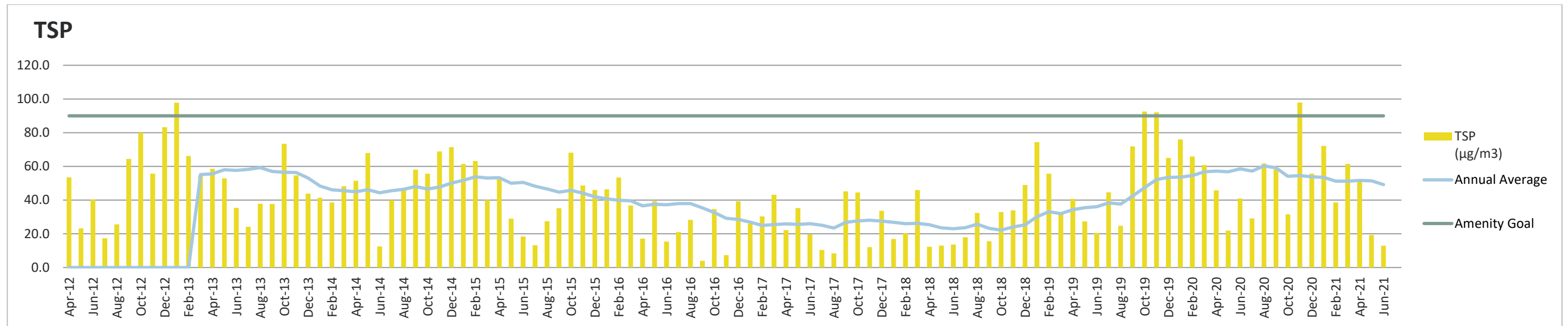
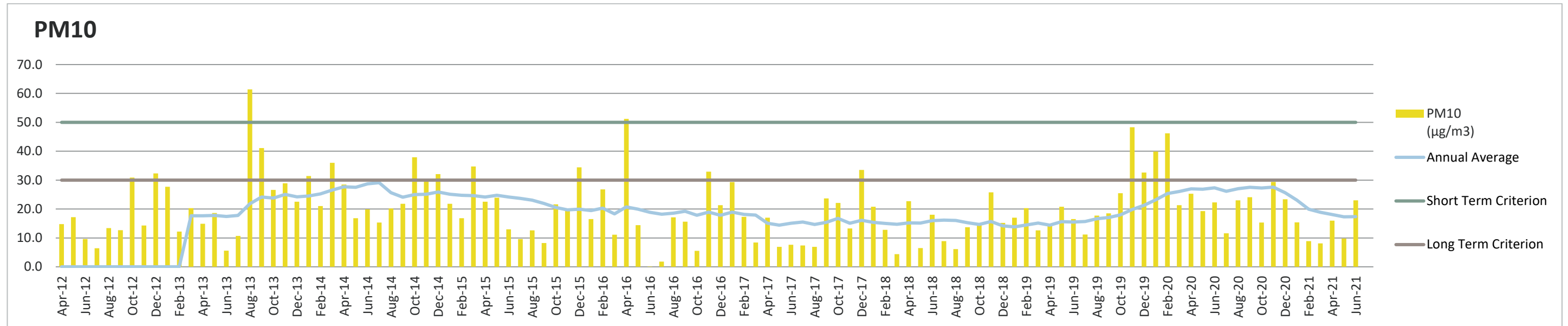
Point 18



Point 20



Point 21





Appendix 7: Subsidence Monitoring Program - Dendrobium Mine

SMP Commitments for the Reporting Period	Monitoring Frequency	Monitoring Undertaken
Subsidence Monitoring		
Airborne Laser Scanning (ALS) over Areas 3A and 3B – including 3D Digital Terrain Model (DTM)	ALS to be undertaken at conclusion of each longwall	As per SMP commitments
Swamp Cross Lines	Monthly during mining for key features during active subsidence	As per SMP commitments
Tributary Cross-Lines	Every 500 m extraction of Longwall	Swamp surveys: 13/10/2021, 17/06/2022
Avon Dam (+ LA4 Tributary)		Tributary surveys: 29/07/2021, 20/08/2021, 3/09/2021, 6/09/2021, 8/09/2021, 10/09/2021, 13/09/2021, 15/09/2021, 17/09/2021, 20/09/2021, 23/09/2021, 27/09/2021, 30/09/2021, 7/10/2021, 19/10/2021, 28/10/2021, 18/11/2021, 1/12/2021, 22/12/2021, 25/01/2022, 15/02/2022, 23/06/2022.
Waterfall 54		Avon Dam: 21/10/2021, 30/06/2022.
Dendrobium 3D GPS network		Waterfall 54: 29/07/2021, 20/08/2021, 27/08/2021, 1/09/2021, , 3/09/2021, 6/09/2021, 8/09/2021, 10/09/2021, 13/09/2021, 15/09/2021, 17/09/2021, 20/09/2021, 23/09/2021, 27/09/2021, 30/09/2021, 7/10/2021, 19/10/2021, 28/10/2021, 18/11/2021, 1/12/2021, 22/12/2021, 25/01/2022, 17/02/2022, 30/05/2022, 27/06/2022.
		Dendrobium 3D GPS network: 4/11/2021, June 2022.
Water Courses		



Observational, Photo Point and Water Monitoring

Avon Dam, Native Dog Creek, Wongawilli Creek, Donalds Castle Creek, WC6, WC7, WC8, WC9, WC12, WC15, WC21, LA2, LA3, LA4, LA4A, ND1 and ND1C.

Monthly two years pre and post mining, weekly when longwall is within 400 m of monitoring site

As per SMP commitments

Swamps 10, 11, 13, 14, 23, 35a, 35b, 149, 150 and 151

Water Quality

Wongawilli Creek and associated tributaries

WWU1, WWU4, WC_Pool 104, WC_Pool 87, WC_Pool 69, WC_Pool 49, WWM2, Wongawilli Ck (FR6), WC21_Pool 5, WC21_Pool 30, WC21_Pool 53, WC12_Pool 1, WC15_Pool 9, WC7_Pool 1

Monthly monitoring during and post mining for two years or until required

As per SMP commitments

Lake Avon and associated tributaries

LA3_Pool 4, LA2_Pool 5, LA1, LA_1

Donalds Castle Creek

Donalds Castle Ck (FR6), DCL3, DC_Pool 22

Sandy Creek and associated tributaries

Sck_Rockbar 5, Sandy Creek Arm, SC10C_Pool 1, SC10_Rockbar 3

Native Dog and associated tributaries

NDC_Pool 1, ND1_Pool 2, ND2_Pool3

Reference Sites

LC5_S1, CR36_S1, NDC1

Flow

Wongawilli Creek and associated tributaries

WWU, WWL, WWLA, WC21S1, WC15S1 and WC12S1

Continuous one-hour logging intervals

As per SMP commitments

Donalds Castle Creek and associated tributaries

DCU, DC13S1 and DCS2

Lake Avon and associated tributaries



LA2S1, LA3S1 and LA4S1

Native Dog Creek and associated tributaries

NDT1S1

Sandy Creek and associated tributaries

SCL2, SC10S1, SC10CS1

Reference

O'Hares Creek at Wedderburn, LC5S1, CR36S1

Aquatic Ecology

- | | | |
|--|---|-------------------------------|
| <ul style="list-style-type: none"> • Macroinvertebrate sampling and assessment using the AUSRIVAS protocol and quantitative sampling using artificial collectors • Individuals of the genus Austrocorduliidae and Gomphomacromiidae are identified to species level if possible • Fish are sampled using back-pack electrofisher and baited traps | <ul style="list-style-type: none"> • Two baseline monitoring campaigns prior to mining during autumn and spring • Monitoring during mining in autumn and spring • Monitoring post-mining for two years or as otherwise required • Monitoring target sites as mining progresses through the domain | <p>As per SMP commitments</p> |
|--|---|-------------------------------|

Swamps

Observational, Photo Point and Water Monitoring

- | | | |
|--|--|-------------------------------|
| <p>Impact Sites:</p> <ul style="list-style-type: none"> • Swamps 10, 11, 13, 14, 23, 35A, 35B, 149, 150 and 151 <p>Reference Sites:</p> <ul style="list-style-type: none"> • Swamps 2, 7, 15a, 22, 24, 25, 33, 84, 85, 86, 87 and 88 | <p>Monthly two years pre and post mining, weekly when longwall is within 400 m of monitoring site</p> <p>Reference sites six-monthly</p> | <p>As per SMP commitments</p> |
|--|--|-------------------------------|

Erosion Monitoring

- | | | |
|---|--|-------------------------------|
| <p>Impact Sites:</p> <ul style="list-style-type: none"> • Swamps 11, 13, 14, 23, 35A, 35B, 149, 150, 151 | <p>Ground based surveys to be completed for each longwall after each longwall or to define any new erosions identified by ALS survey</p> | <p>As per SMP commitments</p> |
|---|--|-------------------------------|



Shallow Groundwater Level

Impact Sites:

- Swamps 5, 10, 11, 13, 14, 23, 35A, 35B, 149, 150 and 151

Reference Sites

- Swamps 2, 7, 15A, 22, 25, 33, 84, 85, 86, 87 and 88

For open hole sites:

- Monthly baseline monitoring
- Weekly monitoring during active subsidence
- Monthly monitoring post mining for two years to be reviewed annually

As per SMP commitments

For instrumented sites:

- Automatic groundwater level monitoring, during and post-mining (four-hour interval or similar)
- Monitoring post mining for five years to be reviewed annually

Soil Moisture

Impact Sites:

- Swamps 11, 13, 14, 23, 35A, 35B, 149 and 150

Reference sites:

- Swamps 2, 7, 15A, 22, 24, 25, 33, 84, 85, 86, 87 and 88

- Monthly baseline for two years prior to mining
- Weekly monitoring when longwall is within 400 m of swamp
- Six-monthly monitoring for two years post mining

As per SMP commitments

For instrumented sites:

- Logged soil moisture level monitoring (four-hour intervals or similar)
- Monitoring post mining for five years to be reviewed annually

Terrestrial Flora – Composition and Distribution of Species

15 m transects consisting of 30 0.5 m X 0.5 m quadrats. The monitoring records:

- Presence of all species within each quadrat
- Percentage foliage cover and vegetation height

Surveys are undertaken in spring and autumn each year

As per SMP commitments



- Observations of dieback or changes in community structure
- Photo point monitoring at each transect

Terrestrial Flora – Swamp Size and Ecosystem Function

Detailed mapping including use of LiDAR data to indicate the location and extent of upland swamp boundaries followed by ground-truthing of these boundaries and vegetation sub-communities

- Baseline mapping prior to mining
 - Annual repeat mapping or as determined by observational monitoring
- As per SMP commitments

Terrestrial Fauna – Threatened Frog Species

Surveys are conducted along creeks with a focus on features susceptible to impacts:

- Potential breeding habitat for Littlejohn’s Tree Frog and Giant Burrowing Frog will be targeted
- Standardized transects to record numbers of individuals between surveys for each site
- Tadpole counts to be undertaken as part of the breeding habitat monitoring transects

Surveys are undertaken in optimal periods over the season

As per SMP commitments

Landscape - Targeted Sites

- Clifflines: DA3-CF25, DA3-CF26, DA3-CF41, DA3-CF42, DA3-CF43
- Watercourses / Swamps
 - Refer to Dendrobium Area 3 Watercourse and Swamp Monitoring TARP’s
- Fire Trails: Fire Roads 6A, 6N, 6P and 6Q

- Baseline monitoring campaign prior to mining
- Monthly monitoring during subsidence
- Monitoring to continue six-monthly for two years following the completion of mining

As per SMP commitments

Inspection of Active Mining Area – Landscape Features, Vegetation, Watercourses

- All mapped cliff, steep slopes, and watercourse, swamp and fire trail sites in subsidence area. Refer to Dendrobium Area 3B SMP.
- General observation of active mining areas.
- During mining recording includes impacts to:
 - Drainage
 - Disturbance of site erosion
 - Aggradations
 - Inundation
 - Rock fracturing
 - Changes in runoff
 - Changes in vegetation
 - Impacts to fauna / fish
 - Rockfalls

- Weekly monitoring when longwall extraction is within 400 m

As per SMP commitments



- Soil cracking
- Slumping

Terrestrial Fauna

- | | | |
|---|---|-------------------------------|
| <ul style="list-style-type: none"> • A number of sites located across and around Areas 2, 3A and 3B. Refer to Dendrobium Area 3B SMP. • Monitoring parameters include: <ul style="list-style-type: none"> - Vegetation communities - Vegetation condition - Changes in vegetation - Tree health - Swamp vegetation - Threatened species - Control sites | <ul style="list-style-type: none"> • Two baseline monitoring campaigns one year prior to mining during autumn and spring • Six-monthly monitoring during mining in autumn and spring • Six-monthly monitoring post mining for two years or as otherwise required | <p>As per SMP commitments</p> |
| <ul style="list-style-type: none"> • A number of sites located across and around Areas 2, 3A and 3B. Refer to Dendrobium Area 3A SMP. • Monitoring parameters include: <ul style="list-style-type: none"> - Species and habitat characteristics - Targeted surveys and monitoring of known populations of threatened frog species | <ul style="list-style-type: none"> • Two baseline monitoring campaigns one year prior to mining • Six-monthly monitoring during mining • Six-monthly monitoring post mining for two years or as otherwise required | <p>As per SMP commitments</p> |

Cultural Heritage

- | | | |
|---|--|-------------------------------|
| <ul style="list-style-type: none"> • Re-recording of the principal components identified by Sefton (Sefton 2000) • Macro and micro recording using digital photography (Navin Officer 2003) • Detailed elevation plans of shelter walls recording structural and surface features including but not limited to the art, graffiti, joints, bedding planes, exfoliation scars, cracks, mineral and microorganism growth, drip line and water seepage locations | <ul style="list-style-type: none"> • Baseline archival recording: prior to longwall mining • First impact assessment recording: following initial subsidence movement of the site • Sandstone shelter aboriginal sites will be monitored during mining • Further impact assessment recording: 12 months after undermining or final subsidence movement of the site | <p>As per SMP commitments</p> |
|---|--|-------------------------------|



Appendix 8: Summary of Observed Impacts and Triggers identified during the Reporting Period

Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
DA3B_LW17_025	Iron Staining	LA5	1/07/2021	1	Iron staining in tributary LA5.	6/07/2021
DA3B_LW17_026	Soil Cracking	Rail Corridor	7/07/2021	1	Soil cracking across rail corridor and adjacent bushland.	9/07/2021
DA3B_LW17_027	Soil Cracking	Rail Corridor	7/07/2021 & 15/07/2021	2	Soil cracking across rail corridor and adjacent bushland.	9/07/2021 & 29/07/2021
DA3B_LW17_028	Soil Cracking	Access Track	26/07/2021	1	Soil cracking to access track to the east of Swamp 14.	29/07/2021
DA3B_LW17_029	Soil Cracking	Rail Corridor	26/07/2021	1	Soil cracking across rail corridor/ballast.	29/07/2021
DA3B_LW17_030	Soil Cracking	Fire Road 6A	26/07/2021	1	Soil cracking along Fire Road 6A.	29/07/2021
DA3B_LW17_031	Iron Staining	Wongawilli Creek	2/08/2021	3	Iron staining in Wongawilli Creek.	9/08/2021
DA3B_LW17_032	Rock Displacement	Steep Slope/ Step	17/08/2021	1	Rock displacement from soil at the base of steep slope/step, east of Fire Road 6A.	25/8/2021
DA3B_LW17_033	Soil Cracking	Access Track	23/08/2021	1	Soil cracking to an access track to the east of Swamp 14.	25/8/2021
DA3B_LW17_034	Rock Fracturing	LA2	10/9/2021	2	Rock fracturing and cracking to LA2 tributary.	21/09/2021
DA3B_LW17_035	Rock Fracturing	Rock Outcrop	15/9/2021	1	Rock fracturing with an associated rockfall to a large rock outcrop/steep slope.	21/09/2021
DA3B_LW17_036	Rock Fracturing	Rock Outcrop	15/9/2021	1	Rock fracturing to a large rock outcrop/steep slope.	21/09/2021
DA3B_LW17_037	Rock Fracturing	Rock Outcrop	15/9/2021	2	Multiple rock fracturing to a large rock outcrop/steep slope.	21/09/2021
DA3B_LW17_038	Rock Movement	Rock Outcrop	15/9/2021	1	Rock movement and soil cracking to a large rock outcrop/steep slope.	21/09/2021
DA3B_LW17_039	Rock Movement	Rock outcrop	21/10/2021	1	Rock movement, rock and soil profile separation at rock outcrop.	8/11/2021



Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
DA3B_LW17_040	Rock Fracturing	Rock outcrop	21/10/2021	1	Rock fracturing to exposed rock outcrop.	8/11/2021
DA3B_LW9_019 (Update)	Iron Staining	WC21	2/08/2021	3	Iron staining extending into Wongawilli Creek.	9/08/2021
DA3B_LW18_001	Rock Fracturing, Uplift and Fragmentation	Rock Outcrop	14/12/2021	1	Rock fracturing to a rock outcrop to the south of Swamp 23.	15/12/2021
DA3B_LW18_002	Rock Fracturing	Rock Outcrop/ Steep Slope	31/01/2022	1	Rock fracturing and soil cracking to a rock outcrop/steep slope west of Fire Road 6A.	31/01/2022
DA3B_LW18_003	Rock Fracturing, Uplift and Soil Cracking	Rock Outcrop	31/01/2022	2	Rock fracturing to a rock outcrop west of Fire Road 6A.	31/01/2022
DA3B_LW18_004	Rock Fracturing & Uplift	Rock Outcrop	9/02/2022	1	Rock fracturing to a rock outcrop west of Fire Road 6A.	9/02/2022
DA3B_LW18_005 (Update)	Rockfall	Steep Slope/ Step	9/02/2022	2	Displacement between rock/soil and soil cracking at a steep slope west of Fire Road 6A.	9/02/2022 & 1/07/2022
DA3B_LW18_006	Rockfall	Steep Slope/Step	15/02/2022	2	Soil cracking to bushland near an access track west of Fire Road 6A.	16/02/2022
DA3B_LW18_007	Rock Fracturing	Rock Outcrop	8/06/2022	1	Rock fracturing to rock outcrop west of Fire Road 6A.	15/06/2022
DA3B_LW18_008	Soil Cracking	Bushland	9/06/2022	2	Soil cracking near access track west of Fire Road 6A.	15/06/2022
DA3B_LW18_009	Rock Displacement, Fracturing and Fragmentation	Rock Outcrop	9/06/2022	2	Rock fracturing, displacement and fragmentation in bushland near NDC1.	15/06/2022
DA3B_LW18_010	Rockfall and Fragmentation	Cliff line	10/06/2022	1	Rockfall at 7 m high cliff line, west of Fire Road 6A.	15/06/2022
DA3B_LW18_011	Rockfall	Rock Outcrop	10/06/2022	1	Rockfall to 4 m high rock outcrop, west of Fire Road 6A.	15/06/2022
DA3B_LW18_012	Soil Cracking	Bushland	30/06/2022	2	Soil cracking near access track west of Fire Road 6A.	1/07/2022
Swamp 23 (HGEO)	Shallow Groundwater	Swamp 23	N/A	3	Evidence for impact to swamp groundwater levels and duration at	HGEO (2022)



Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
					23_01 and 23_02, following passage of Longwalls 15 and 16.	
Swamp 14 (HGEO)	Soil Moisture	Swamp 14	N/A	3	Soil moisture at S14_S01 below baseline in contrast to recovery at reference Swamps 22, 85 and 86. S14_S02 shows lower moisture levels and durations compared with baseline and reference swamps.	HGEO (2022)
LA4_S1	Water Quality Trigger	LA4	1/07/2021	3	Trigger for electrical conductivity at LA4_S1.	6/07/2021
LA4_S1	Water Quality Trigger	LA4	17/12/2021	1	Trigger for dissolved oxygen at LA4_S1.	22/12/2021
LA4_S1	Water Quality Trigger	LA4	17/12/2021	Exceeding Predictions	Trigger for pH at LA4_S1.	22/12/2021
LA4_S1	Water Quality Trigger	LA4	17/12/2021	Exceeding Predictions	Trigger for electrical conductivity at LA4_S1.	22/12/2021
DCU	Surface Water Hydrology	Donalds Castle Creek	N/A	1	Frequency and duration of ecologically-significant cease-to-flow events.	HGEO (2022)
DCS2	Surface Water Hydrology	Donalds Castle Creek	N/A	3	General hydrological behaviour.	HGEO (2022)
				3	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	
DC13S1	Surface Water Hydrology	Donalds Castle Creek	N/A	3	General hydrological behaviour.	HGEO (2022)
				2	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	
WC21S1	Surface Water Hydrology	WC21	N/A	3	General hydrological behaviour.	HGEO (2022)
				2	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	



Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
WC15S1	Surface Water Hydrology	WC15	N/A	3	General hydrological behaviour.	HGEO (2022)
				2	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	
LA4S1	Surface Water Hydrology	LA4	N/A	1	General hydrological behaviour.	HGEO (2022)
				2	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	
LA3S1	Surface Water Hydrology	LA3	N/A	3	General hydrological behaviour.	HGEO (2022)
				3	Change in cease-to-flow frequency (beyond natural).	
				3	Changes to median flow.	
LA2S1	Surface Water Hydrology	LA2	N/A	1	Change in cease-to-flow frequency (beyond natural).	HGEO (2022)
				3	Changes to median flow.	
Donalds Castle Creek	Aquatic Ecology	Donalds Castle Creek	N/A	3	Reduction in aquatic habitat for >2 years or complete loss of habitat following the active subsidence period.	Cardno (2022)
WC21	Aquatic Ecology	WC21	N/A	3	Reduction in aquatic habitat for >2 years or complete loss of habitat following the active subsidence period.	Cardno (2022)
Swamp 15A(2)	Terrestrial Ecology (Flora)	Swamp 15A(2)	N/A	2	A statistically significant difference in Species composition.	Niche (2022)
Swamp 15B	Terrestrial Ecology (Flora)	Swamp 15B	N/A	2	A statistically significant difference in Total species richness.	Niche (2022)
				2	A statistically significant difference in Species composition.	
Swamp 13	Swamp Size	Swamp 13	N/A	1	Two years of decline in total swamp extent greater than the mean	Niche (2022)



Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
					(±SE) decline of the control group.	
Swamp 1A	Ecosystem Function	Swamp 1A	N/A	1	Trending decline Tea-tree Thicket for two consecutive monitoring periods greater than the control group.	Niche (2022)
Swamp 1B	Terrestrial Ecology (Flora) & Swamp Extent & Ecosystem Function	Swamp 1B	N/A	1	A statistically significant difference in Total species richness.	Niche (2022)
				Exceeding expectation	A statistically significant difference in Species composition.	
				2	Three years of decline in total swamp extent greater than the control group.	
				1	Decline in Tea-tree Thicket for two consecutive monitoring periods greater than the control group.	
Swamp 5	Ecosystem Function	Swamp 5	N/A	2	Decline in Tea-tree Thicket for three consecutive monitoring periods greater than the control group.	Niche (2022)
Swamp 23	Terrestrial Ecology (Flora) & Swamp Extent	Swamp 23	N/A	2	A statistically significant difference in Total species richness.	Niche (2022)
				1	Two years of decline in total swamp extent greater than the mean (±SE) decline of the control group.	
LA2	Terrestrial Ecology (Fauna)	LA2	N/A	1	Reduction in habitat (reduction in aquatic habitat, contrary to that observed at the controls) for 1 year following the active subsidence period.	Niche (2022)
DC(1)	Terrestrial Ecology (Fauna)	Donalds Castle Creek	N/A	3	Reduction in habitat (dry pools for extended times) for more than 2 years following the active subsidence period.	Niche (2022)



Site ID	Impact Type	Feature Affected	Identification Date	Trigger Level	Description	Refer to Impact Report/s Dated
DC13	Terrestrial Ecology (Fauna)	DC13	N/A	3	Continued reduction in habitat (fractured bedrock) for more than 2 years following the active subsidence period.	Niche (2022)
WC15	Terrestrial Ecology (Fauna)	WC15	N/A	2	Reduction in habitat (dry pools for extended time and bedrock cracking) for 2 years following the active subsidence period.	Niche (2022)
WC21	Terrestrial Ecology (Fauna)	WC21	N/A	3	Continued reduction in habitat (fractured bedrock) for more than 2 years following the active subsidence period.	Niche (2022)
SC10C	Terrestrial Ecology (Fauna)	SC10C	N/A	2	Appearance at SC10C (fractured bedrock and iron flocculant) and habitat unlikely to naturally regenerate within the monitoring period.	Niche (2022)
SC10(1)	Terrestrial Ecology (Fauna)	SC10	N/A	2	Appearance at SC10(1) (fractured bedrock and iron flocculant present at 13 of the 14 pools recorded) and habitat unlikely to naturally regenerate within the monitoring period.	Niche (2022)
WC17	Terrestrial Ecology (Fauna)	WC17	N/A	2	Appearance at WC17 (iron flocculant and fractured bedrock) and habitat unlikely to naturally regenerate within the monitoring period.	Niche (2022)



Appendix 9: WaterNSW Special and Controlled Areas Consent (F2020/1545) - Annual Statement of Compliance

Schedule 6 – Annual Statement of Compliance with Consent Conditions

Consent Holder

Illawarra Coal Holdings Pty Ltd

Consent Number

F2020/1545

Reporting Period

1 July 2021 to 30 June 2022

Compliance with Consent Conditions

1. Were all the following documents complied with during the reporting period? (tick a box)

Consent/Approval	Yes	No
a. Conditions of this Consent;	✓	
b. All Statutory Approvals;	✓	
c. Any environmental management plans, rehabilitation plans, revegetation plans, soil and water management plans, water monitoring plans or other plans required by Water NSW.	✓	

2. If you answered "No" to any part of Question 1, please supply the name of the non-compliance / incident and the date the written report was provided to Water NSW, in the table below:

Non Compliance / Incident (one line)	Date written report provided to Water NSW

3. How many pages have you attached?

(Each attached page must be initialled by the person(s) who signs Section 4 of this Statement of Compliance)

The Statement of Compliance has been attached as an Appendix to the:


- Dendrobium Mine and Cordeaux Colliery Annual Review FY22 (Appendix 9)
- Appin Mine Annual Review FY22 (Appendix 15).

These Annual Reviews meet the requirement of Condition 4.3.1 of Consent F2020/1545, for an annual report to be submitted by 30 September for the reporting period.

4. Signature and certification

The Statement of Compliance must only be signed by a person(s) with legal authority to sign it as set out below:

- By affixing the common seal in accordance with *Corporations Act 2001*, or
- By 2 directors, or
- By a director and a company secretary, or
- By a person delegated to sign on the company's behalf in accordance with the *Corporations Act 2001* and approved in writing by Water NSW to sign on the company's behalf.

Signature. 

Name: Chris Schultz
(printed)

Position Superintendent Environment (signed under Power of Attorney dated 10 February 2021)

Date: 26 September 2022

Signature:

Name:

(printed)

Position

Date:

SEAL (if signing under seal)

The Consent Holder can request Water NSW approval for the compliance requirements of this Consent be linked to and built into other compliance reporting that may be required under approvals issued under the EP&A Act.