

Department of Planning and Environment

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MACH Energy
Awabakal Country
Suit 1 Level 3, 426 King Street
Newcastle West NSW 2302

01/07/2022

Mt Pleasant Coal (DA92/97) - 2021 Annual Review

Dear Mr Lauritzen

I refer to the Annual Review for the period 1 January 2021 to 31 December 2021, submitted to the Department of Planning and Environment (the department) on 30 March 2022 as required under Schedule 5 Condition 3 of DA92/97 as modified (the approval).

The department has reviewed the Annual Review and considers it to generally satisfy the reporting requirements of the approval/consent and the department's *Annual Review Guideline* (October 2015). Please make publicly available a copy of the 2021 Annual Review on the company website.

Please note that the department's acceptance of this Annual Review is not an endorsement of the compliance status of the project. Non-compliances identified in the Annual Review will be assessed in accordance with the department's Compliance Policy. Further correspondence may be sent in relation to the following non-compliances –

- Schedule 3 Condition 44F Construction of Rail and Water Supply Infrastructure - works undertaken on 31 March 2021 outside approved hours prior to notifying nearby residents.

Should you wish to discuss the matter further, please contact Jennifer Sage, Compliance Officer on 0400 245 170 or compliance@planning.nsw.gov.au

Yours sincerely

A handwritten signature in black ink that reads "H Watters".

Heidi Watters
Team Leader Northern
Compliance

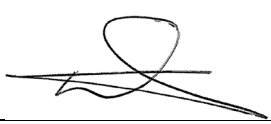
As nominee of the Planning Secretary



MOUNT PLEASANT OPERATION

**2021 ANNUAL REVIEW &
ANNUAL REHABILITATION REPORT**

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Approved By:	Richard Bailey	Revision Number:	00

MOUNT PLEASANT OPERATION 2021 ANNUAL REVIEW	
Name of Operation	Mount Pleasant Operation
Name of Operator	MACH Energy Australia Pty Ltd
Development Consent	Development Consent DA 92/97
Name of Holder of Development Consent	MACH Energy Australia Pty Ltd
Mining Leases	Mining Lease 1645, Mining Lease 1708, Mining Lease 1709, Mining Lease 1713, Mining Lease 1750 and Mining Lease 1808
Name of Holder of Mining Leases	MACH Energy Australia Pty Ltd J.C.D Australia Pty Ltd
Water Licences	Water Access Licences – see Table 3 Bore Licence Certificate 20BL168734
Name of Holder of Water Licences	MACH Energy Australia Pty Ltd
MOP Start Date	1 July 2021
MOP End Date	30 June 2023
Annual Review Start Date	1 January 2021
Annual Review End Date	31 December 2021
<p>I, Richard Bailey, certify that this audit report is a true and accurate record of the compliance status of the Mount Pleasant Operation for the period 1 January to 31 December 2021 and that I am authorised to make this statement on behalf of MACH Energy Australia Pty Ltd.</p> <p>Note.</p> <p>a) <i>The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p>b) <i>The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of Authorised Reporting Officer	Richard Bailey
Title of Authorised Reporting Officer	General Manager Operations
Signature of Authorised Reporting Officer	
Date	30 March 2022

STATEMENT OF COMPLIANCE

The compliance status of the Mount Pleasant Operation with its relevant approval conditions at the end of the reporting period (31 December 2021) is provided in Table SoC-1.

Table SoC-1
Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
Development Consent DA 92/97	No
EPBC 2011/5795	Yes
Environment Protection Licence 20850	Yes
Authorisation 459	Yes
Mining Lease 1645	Yes
Mining Lease 1708	Yes
Mining Lease 1709	Yes
Mining Lease 1713	Yes
Mining Lease 1750	Yes
Mining Lease 1808	Yes
Water licences (as per Table 3)	Yes
Bore Licence Certificate 20BL168734	Yes

Non-compliances are characterised as shown in Table SoC-2. Table SoC-3 summarises non-compliances with the approval conditions. During the reporting period, there were five observations that resulted in non-compliances against sixteen approval conditions (Table SoC-3).

Table SoC-2
Compliance Status Key for Table SoC-3 – Non-Compliances

Risk Level	Colour Code	Comment
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).

Table SoC-3
Summary of Non-Compliances

Relevant Approval	Condition Number	Condition Description	Compliance Status	Comment	Report Section
Development Consent DA 92/97	S3 C3	Applicant must comply with all noise criteria.	NC (low risk)	See Table 31	Section 10.2
Development Consent DA 92/97	S3 44f	All MOD 4 construction works outside of the Mining Lease Boundary must be carried out during Standard Construction Hours, unless the works are approved under an Out of Hours Work Protocol.	NC (low risk)	See Table 31	Section 10.2
Development Consent DA 92/97	S3 C26	Applicant must ensure that any surface water discharges from the site comply with the applicable discharge limits and relevant provisions of the POEO Act or Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2022.	NC (low risk)	See Table 31	Section 10.2

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1 INTRODUCTION

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales (NSW), approximately 3 kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton (Figure 1). The villages of Aberdeen and locality of Kayuga are also located approximately 5 km north-northeast and 1 km north of the MPO boundary, respectively (Figure 1). MACH Energy Australia Pty Ltd (MACH Energy) purchased the MPO from Coal & Allied Operations Pty Ltd (Coal & Allied) in 2016.

MACH Mount Pleasant Operations Pty Ltd is the manager of the MPO as agent for, and on behalf of, the unincorporated Mount Pleasant Joint Venture between MACH Energy (95 per cent [%] owner) and J.C.D. Australia Pty Ltd (5% owner).

The initial development application for the MPO was made in 1997. This was supported by an Environmental Impact Statement (EIS) prepared by Environmental Resources Management Mitchell McCotter (ERM Mitchell McCotter) (ERM Mitchell McCotter, 1997). On 22 December 1999, the then Minister for Urban Affairs and Planning granted Development Consent DA 92/97 to Coal & Allied. This allowed for the “Construction and operation of an open cut coal mine, coal preparation plant, transport and rail loading facilities and associated facilities” at the MPO. The consent allowed for operation 24 hours per day, seven days per week and the extraction of 197 million tonnes (Mt) of run-of-mine (ROM) coal over a 21 year period, at a rate of up to 10.5 Mt of ROM coal per year.

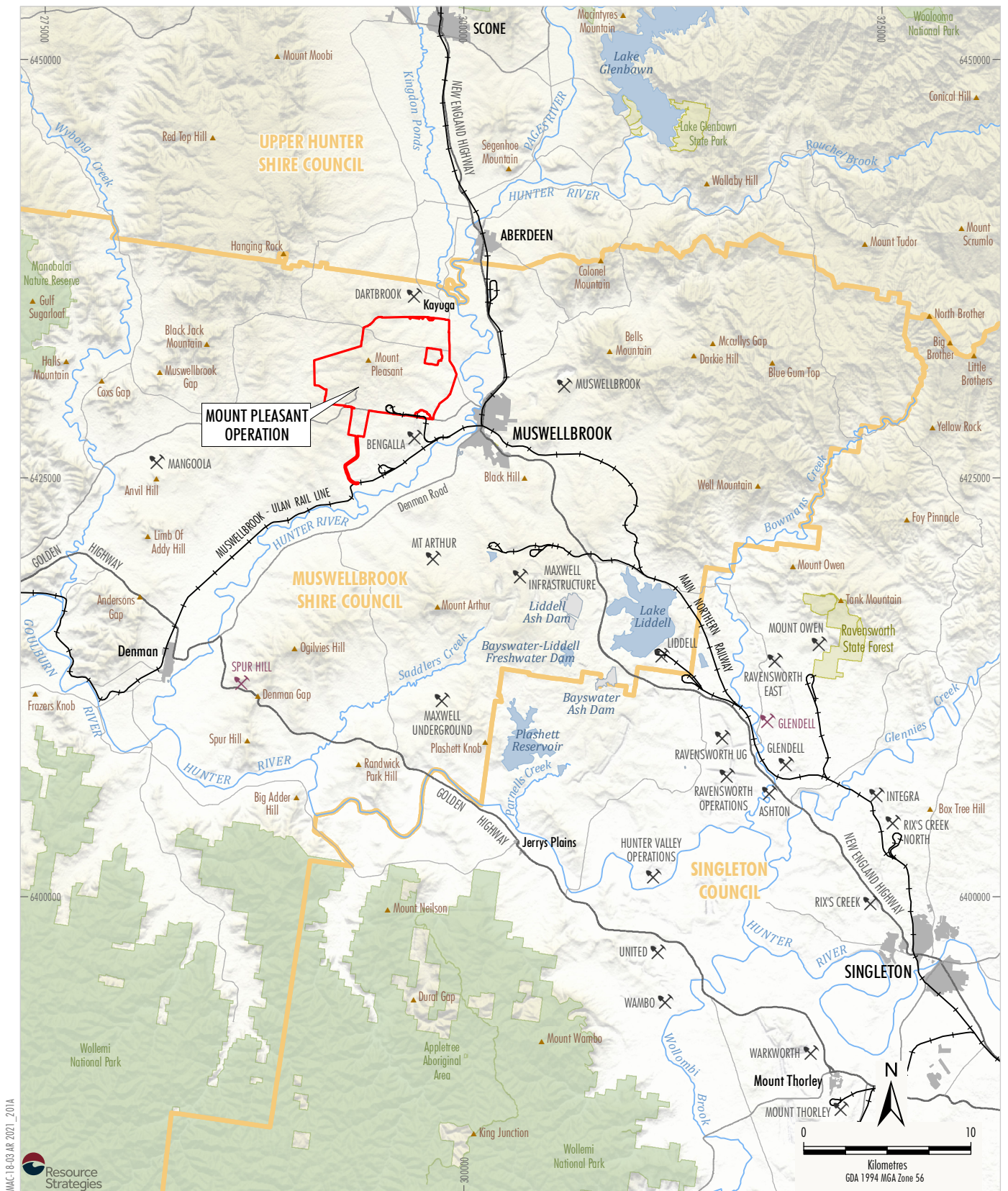
The MPO Modification 1 (MOD 1) was submitted for approval on 19 May 2010. MOD 1 included the provision of an infrastructure envelope for siting the mine infrastructure, the provision of an optional conveyor/service corridor linking the MPO facilities with the Muswellbrook-Ulan Rail Line and modification of the existing Development Consent DA 92/97 boundaries to accommodate the optional conveyor/service corridor and minor administrative changes. MOD 1 was approved on 19 September 2011.

The MPO South Pit Haul Road Modification (MOD 2) was submitted for approval on 30 January 2017 with a supporting Environmental Assessment (EA) prepared by MACH Energy (MACH Energy, 2017a). MOD 2 proposed to realign an indicative internal haul road to enable more efficient access to the South Pit open cut. MOD 2 was approved on 29 March 2017.

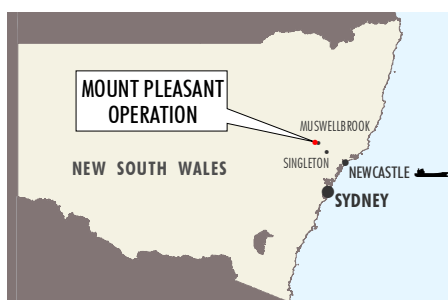
The MPO Mine Optimisation Modification (MOD 3) was submitted on 31 May 2017. MOD 3 comprised an extension to the time limit on mining operations (to 22 December 2026) and extensions to the South Pit Eastern Out of Pit Emplacement to facilitate development of an improved final landform. MOD 3 was approved on 24 August 2018.

The MPO Rail Modification (MOD 4) was submitted on 18 December 2017. MOD 4 proposed the following changes:

- duplication of the approved rail spur, rail loop, conveyor and rail load-out facility and associated services;
- duplication of the Hunter River water supply pump station, water pipeline and associated electricity supply that followed the original rail spur alignment; and
- demolition and removal of the redundant approved infrastructure within the extent of the Bengalla Mine, once the new rail, product loading and water supply infrastructure has been commissioned and is fully operational.



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MOUNT PLEASANT OPERATION

Project Location

Figure 1

MOD 4 was approved on 16 November 2018. Appendix 2 of the modified Development Consent DA 92/97 illustrates the Conceptual Project Layout Plan of the approved MPO at 2021 and 2025, Approved Surface Disturbance Plan and Conceptual Final Landform incorporating the MOD 4 infrastructure relocations (Development Consent DA 92/97 Attachment 1). MOD 4 construction work continued during the reporting period.

Figure 2 shows the general arrangement of the MPO, as well as the extent of disturbance and rehabilitation at the end of 2021 and the forecast additional disturbance and rehabilitation proposed for 2022.

1.1 PURPOSE AND SCOPE

This Annual Review details MACH Energy's environmental and community performance for the reporting period 1 January 2021 to 31 December 2021. This Annual Review has been prepared in accordance with the NSW Department of Planning and Environment (DPE) (formerly Department of Planning, Industry and Environment [DPIE]) *Post-approval requirements for State significant mining developments - Annual Review Guideline – October 2015* (DPE, 2015) and MACH Energy's statutory approvals (Section 2), specifically Condition 3, Schedule 5 of Development Consent DA 92/97 and Condition 3(f) of Mining Leases (MLs) 1645, 1708, 1709, 1713, 1750 and 1808.

This Annual Review is not intended to be an exhaustive description of MACH Energy's operations, approvals and activities, rather it is a summary of MACH Energy's compliance status with respect to MACH Energy's statutory approvals.

In March 2017, the Secretary of the DPE revised the submission timing of the MPO Annual Review to the end of March each year.

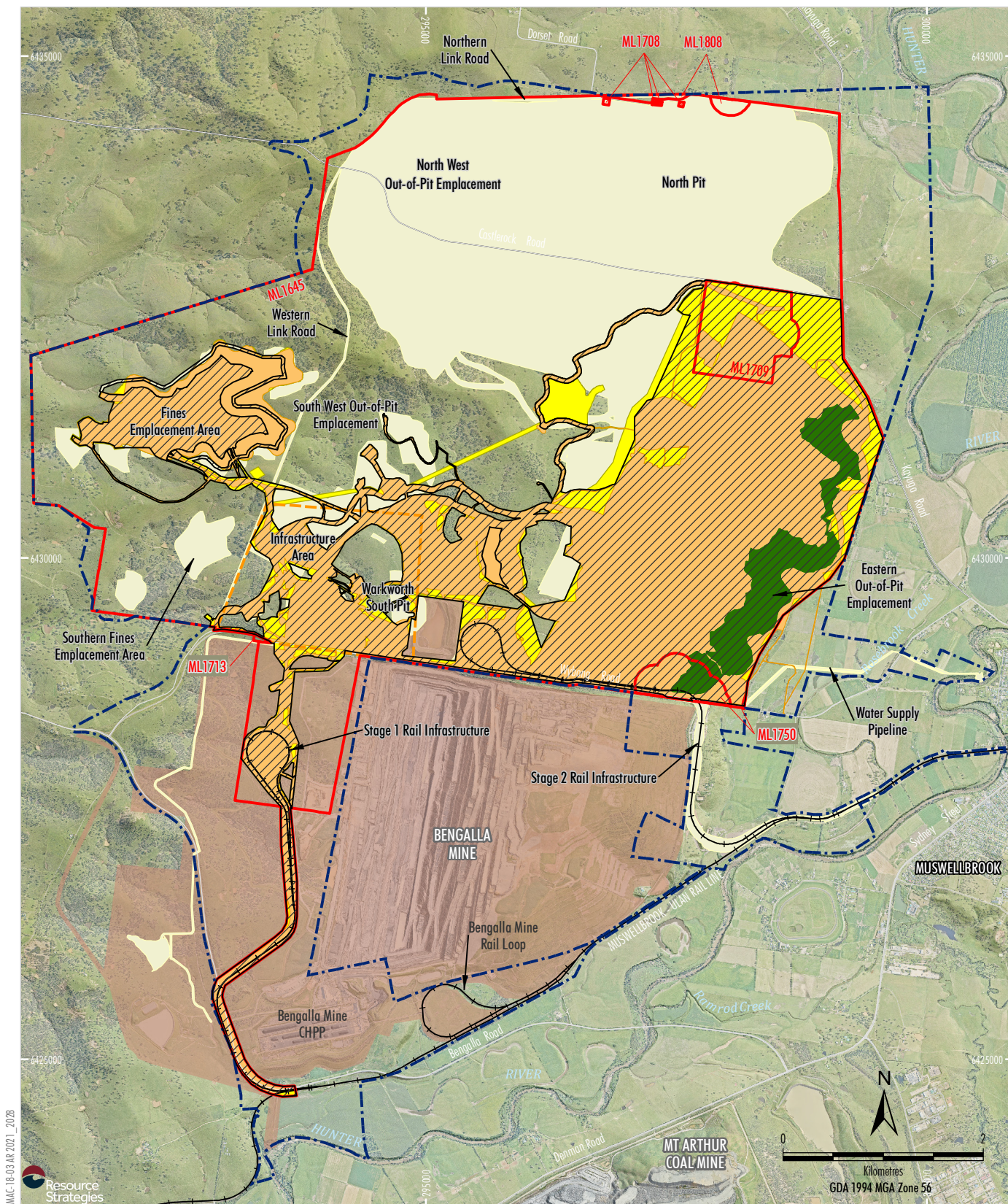
This Annual Review is distributed to a range of stakeholders including government authorities, Muswellbrook Shire Council (MSC) and members of the Community Consultative Committee (CCC). A copy of the Annual Review will be made publicly available on the MACH Energy website (<https://machenergyaustralia.com.au/mount-pleasant/documentation/>).

1.2 KEY PERSONNEL

Contact details for key MACH Energy personnel responsible for the environmental and community management of the MPO are provided in Table 1.

Table 1
Key Personnel

Position	Contact	Phone Number
General Manager - Operations	Richard Bailey	1800 931 873
General Manager - Resource Development	Chris Lauritzen	
Environmental Superintendent	Andrew Reid	
Land and Property Superintendent	Ian Webber	
External Relations Manager	Ngaire Baker	



LEGEND

- Mining Lease Boundary
- Development Consent Boundary
- Approximate Extent of Existing/Approved Surface Development (DA92/97) ¹
- Infrastructure Area Envelope
- MOP Footprint ²
- End 2021 Active Disturbance Area
- End 2021 Rehabilitation Area
- 2022 Forecast Additional Disturbance Area
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)

NOTES

¹ Excludes some incidental Project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, signalling, other ancillary works and construction disturbance.

² Mount Pleasant Operation Mining Operations Plan and Rehabilitation Management Plan (July 2021)

Source: MACH Energy (2022); NSW Spatial Services (2022); Department of Planning and Environment (2016) Orthophoto: MACH Energy (Dec 2021)

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MOUNT PLEASANT OPERATION

2021 Mining Activities

Figure 2

2 APPROVALS

The MPO operates under a number of statutory approvals, leases and licences that regulate activities at the MPO (Tables 2 and 3).

Table 2
Consent, Lease and Licence Details

Consent/Lease/Licence	Authority	Grant/Renewal	Expiry Date
Development Consent DA 92/97 ¹	DPE	22/12/1999	-
EPBC Approval 2011/5795 ²	DAWE	16/11/2020 ²	28/10/2040
EPL 20850 ³	EPA	24/11/2016 ³	-
Authorisation 459 ⁴	MEG	07/04/1992	08/04/2018 ⁴
ML 1645	MEG	17/12/2010	17/12/2031
ML 1708	MEG	02/02/2015	02/02/2036
ML 1709	MEG	02/02/2015	02/02/2036
ML 1713	MEG	02/02/2015	02/02/2036
ML 1750	MEG	03/03/2017	03/03/2038
ML 1808	MEG	29/09/2020	29/09/2041
Bore Licence Certificate 20BL168734	Dol - L&W	13/03/2003	Perpetuity

Note:

EPBC = *Environment Protection and Biodiversity Conservation Act 1999*;

DAWE = Commonwealth Department of Agriculture, Water and the Environment (formerly Commonwealth Department of the Environment and Energy);

EPL = Environment Protection Licence, EPA = NSW Environment Protection Authority;

MEG = Mining, Exploration and Geosciences within the Department of Regional NSW (formerly Division of Resources and Geoscience); and Dol - L&W = NSW Department of Industry – Lands & Water.

¹ Development Consent DA 92/97 has been modified four times since the original approval was granted in 1999. Approval for MOD 1 was granted on 19 September 2011, approval for MOD 2 was granted on 29 March 2017, approval for MOD 3 was granted on 24 August 2018 and approval for MOD 4 was granted on 16 November 2018.

² EPBC Approval 2011/5795, originally granted on 29 February 2012, was extended from 28 October 2035 to 28 October 2040 on 16 November 2020. The EPBC Approval 2011/5795 was varied on 24 November 2021.

³ EPA varied EPL 20850 on 28 October 2021. This Annual Review references the varied EPL 20850 conditions.

⁴ A renewal request has been submitted and is currently awaiting approval. The existing approval will continue until the renewal is approved.

MACH Energy will continue to manage its existing Water Access Licences (WALs) (Table 3) and acquire new licences, as required during the next reporting period.

Table 3
MACH Energy Water Access Licences (*Water Management Act 2000*)

Water Sharing Plan	Water Source	Licence Number	Entitlement (Unit)
<i>Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009</i>	Hunter Regulated River Alluvial Water Source	18253	74
		18266	68
		18206	24
		18199	5
		18122	33
		18131	60
		21503	21
<i>Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009 (continued)</i>	Muswellbrook Water Source	23935	41
	Sydney Basin – North Coast Groundwater Source	41437	640
		40298	90
	Krui River Water Source	18336	12
	Hunter Regulated River Water Source	879	243
		880	124
		1113	366
		973	3
		974	210
		975	8
		988	156
		989	8
		1307	37.5
		1229	480
		1230	8
		1259	33.2
		1227	99
		1258	5
		992	75
		7808	36
		702	267
		1260	4.8
		993	265
		1308	15.1
		604	183
		605	8
		677	24
		1338	17.5
		662	9
		663	16
		10775	243
		41438	455
		638	225
		639	134

2.1 MANAGEMENT PLANS

Development Consent DA 92/97 requires MACH Energy to submit management plans and strategies prior to carrying out any development on-site. The currently approved MPO management plans are summarised in Table 4.

Table 4
Approved Management Plans

Plan	Relevant Development Consent DA 92/97 Condition	Approval Date
Mining Operations Plan and Rehabilitation Management Plan (MOP) (1 July 2021 – 30 June 2023) ¹	Schedule 3, Condition 56	24 June 2021
Noise Management Plan (NMP)	Schedule 3, Condition 9	21 December 2021
Air Quality and Greenhouse Gas Management Plan (AQGGMP)	Schedule 3, Condition 23	24 May 2019
Aboriginal Heritage Management Plan (AHMP)	Schedule 3, Condition 36	31 October 2019
Water Management Plan (WMP)	Schedule 3, Condition 28	31 October 2019 ²
Blast Management Plan (BMP)	Schedule 3, Condition 17	14 April 2020
Visual Impact Management Plan (VIMP) (previously the Landscape Management Plan)	Schedule 3, Condition 47	31 October 2019
Waste Management Plan (WasteMP)	Schedule 3, Condition 52	14 January 2019
Rehabilitation Strategy	Schedule 3, Condition 54	16 May 2019 ³
Biodiversity Management Plan (BioMP)	Schedule 3, Condition 32	31 October 2019
Environmental Management Strategy	Schedule 5, Condition 1	20 May 2021
Construction Environmental Management Plan (CEMP)	Schedule 3, Condition 44I	10 March 2020
Out of Hours Work Protocol (OHWP)	Schedule 3, Condition 44G	15 March 2021

¹ The approved MOP meets the requirements for a Rehabilitation Management Plan (RMP) (Condition 56, Schedule 3 of Development Consent [DA 92/97]).

² The WMP was revised during the previous reporting period following the completion of the Independent Environmental Audit (IEA) undertaken by MACH Energy in accordance with Condition 9, Schedule 5 of Development Consent DA 92/97. The updated WMP was lodged with DPE for approval on 26 November 2020. WMP was updated and re-submitted on 17 June 2021 to address DPE comments. WMP is currently awaiting approval. This Annual Review reports against the currently approved WMP (approved on 31 October 2019).

³ The revised Rehabilitation Strategy was lodged with DPE on 16 October 2021. As at 31 December 2021, the revised Rehabilitation Strategy was awaiting approval.

A summary of updates approved for the listed management plans during the reporting period is provided below:

- The MOP was updated to include contemporary information on the MPO's current mine planning, including construction, mine development, topsoil management and rehabilitation. The MOP term was updated to 1 July 2021 to 30 June 2023.
- The revised Rehabilitation Strategy was prepared to incorporate updates to maintain consistency with the MOP and lodged with DPE on 16 October 2021.
- The NMP has been updated with revised site monitoring locations following a noise review commissioned by MACH Energy in 2020.
- The OHWP was prepared to undertake MOD 4 construction works (outside of the Mining Lease boundary) outside the hours specified in Schedule 3, Condition 44F of Development Consent DA 92/97.
- The Environmental Management Strategy was prepared to update the MPO environmental monitoring locations to reflect the approval of site-wide Environmental Management Plans (updated following the approval of MOD 4), and to update the complaints management procedure.

In accordance with Condition 4, Schedule 5 of Development Consent DA 92/97, MACH Energy will review, and if necessary, revise, the strategies, plans and programs required under the consent within three months of the submission of this Annual Review, to the satisfaction of the Secretary of the DPE.

3 OPERATIONS SUMMARY

3.1 MINING OPERATIONS

MACH Energy commenced substantial works at the MPO on 25 November 2016. During 2021, MACH Energy completed the following construction activities on site, including:

- continuation of the new Rail Loop, Train Load-Out and Hunter River Pump Station relocation approved as part of MOD 4 of Development Consent DA 92/97;
- completion and commissioning of a permanent secondary flocculant plant at the discharge point into the Fines Emplacement Area (FEA);
- commencement of the FEA Stage 1 Lift Project to increase the capacity for fines deposition; and
- ongoing progressive rehabilitation of temporary construction areas and mining areas.

Mining activities that occurred during the reporting period included:

- continuation of steady-state coal extraction within Pits A - F;
- continued development of the open cut footprint with pre-stripping of areas to the west of the current high wall to mine coal in Terraces 4 and 5;
- ongoing modifications and upgrades to the Coal Handling and Preparation Plant (CHPP) including completion of the Tertiary Sizing Station Replacement and Fines Product Cyclones upgrade and replacement; and
- ongoing progressive rehabilitation of the Eastern Out of Pit Overburden Emplacement Area (including 'natural landform' profiling of areas in accordance with geomorphic design principles [i.e. including macro and micro relief]).

During the reporting period, a total of 10.07 Mt of ROM coal was produced.

The amounts of waste rock, overburden, ROM coal, coarse reject, fine reject and product coal produced during the previous reporting period, current reporting period and forecast for the next reporting period, are outlined in Table 5.

Table 5
Production Summary

Material	Approved Limit	2020 Reporting Period (Actual)	2021 Reporting Period (Actual)	2022 Reporting Period (Forecast)
Waste Rock/Overburden (Mbcm)	N/A	24.04	26.59	29.01
ROM Coal (Mt)	10.5 Mt per calendar year ¹	8.54	10.07	10.32
Coarse Reject (Mt)	N/A	1.22	2.47	2.44
Fine Rejects (Mt)	N/A	0.39	0.58	0.90
Saleable Product (Mt)	N/A	6.11	7.27	7.05

Note:

Mbcm = million bank cubic metres and N/A = not applicable.

¹ Condition 6, Schedule 2 of Development Consent DA 92/97 relevantly states:

The Applicant must not extract more than 10.5 million tonnes of ROM coal from the site in a calendar year.

3.2 OTHER OPERATIONS

Key operational conditions outlined in Schedule 2 of Development Consent DA 92/97 and their corresponding compliance status during the reporting period are outlined in Table 6.

3.3 ACTIVITIES FORECAST FOR THE NEXT REPORTING PERIOD

The following construction activities are forecast to be undertaken during the 2022 reporting period:

- final commissioning of the new Rail Loop and Train Load-Out;
- continuation of construction and relocation of the Hunter River Pump Station;
- decommissioning and removal of the existing rail spur and loop, and associated rail infrastructure;
- ongoing installation of visual bunding and vegetation screening as required, to provide screening of the MPO from sensitive viewpoints;
- continuation and completion of the FEA Stage 1 Lift Project to increase the capacity for fines deposition;
- CHPP feed chute replacement, primary and secondary sizer replacement;
- bathhouse facilities expansion at the Infrastructure Area;
- construction and commissioning of the new High Wall Dam (HWD2) including associated 22 kilovolt (kV) electrical works due to the open cut expansion to the west;
- decommissioning and removal of the current High Wall Dam (HWD1);
- workshop facilities upgrades including new maintenance bays for the supplementary mining fleet to be mobilised;
- commencement of the civil and drainage upgrades at the CHPP Area including works at the CHPP Sediment Dam; and
- progressive rehabilitation of temporary construction areas and mining areas.

The following mining-related activities are forecast to be undertaken during the 2022 reporting period:

- continuation of steady-state coal extraction within Pits A - F;
- commencement of mining coal in Terraces 4 and 5 to the west of the open cut following undertaking all pre-strip and blasting activities; ongoing modifications to the CHPP including feed chute replacement; primary sizer replacement; and secondary sizer replacement; and
- ongoing progressive rehabilitation of the Eastern Out of Pit Overburden Emplacement Area (including 'natural landform' profiling of areas in accordance with geomorphic design principles [i.e. including macro and micro relief]).

Further information regarding proposed construction and mining activities in 2022 is provided in the currently approved MOP.

Table 6
Key Operational Conditions Met

Operational Condition from Development Consent DA 92/97		Condition Met?	Comment
Limits on Consent (Condition 5, Schedule 2)	5. <i>The Applicant may carry out mining operations on the site until 22 December 2026.</i> <i>Note: Under this consent, the Applicant is required to rehabilitate the site and carry out additional undertakings to the satisfaction of both the Secretary and DRG. Consequently this consent will continue to apply in all other respects - other than the right to conduct mining operations - until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.</i>	Yes	-
Coal Extraction (Condition 6, Schedule 2)	6. <i>The Applicant must not extract more than 10.5 million tonnes of ROM coal from the site in a calendar year.</i>	Yes	ROM coal extraction did not exceed 10.5 Mt during 2020.
Coal Transport (Condition 7, Schedule 2)	7. <i>Product coal may only be transported from the site by rail.</i>	Yes	Product coal was transported from the site by rail only.
Train Movement (Condition 8, Schedule 2)	8. <i>The Applicant must ensure that train movements at the site (ie arrival or dispatch) do not exceed:</i> <i>(a) a maximum of 18 per day; or</i> <i>(b) 6 per day, averaged over each calendar year.</i> <i>Note: In this condition, “day” means any 24-hour period.</i>	Yes	The maximum number of train movements at the site was 12 in one day. The average number of train movements was approximately 5 per day.
Structural Adequacy (Condition 9, Schedule 2)	9. <i>All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with:</i> <i>(a) the relevant requirements of the BCA; and</i> <i>(b) any additional requirements of SA NSW where the building or structure is located on land within a declared Mine Subsidence District.</i> <i>Notes:</i> <ul style="list-style-type: none"> <i>Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works;</i> <i>Part 8 of the EP&A Regulation sets out the requirements for the certification of the development;</i> <i>The development is located in the Muswellbrook Mine Subsidence District. Under Section 21 of the Mine Subsidence Compensation Act 2017, the Applicant is required to obtain the Chief Executive of SA NSW’s approval before carrying out certain development in a Mine Subsidence District.</i> 	Yes	All buildings constructed during the reporting period were constructed in accordance with the Building Code of Australia (BCA) and the Subsidence Advisory (SA) NSW.

Table 6 (Continued)
Key Operational Conditions Met

Operational Condition from Development Consent DA 92/97		Condition Met?	Comment
Demolition (Condition 10, Schedule 2)	10. <i>The Applicant must ensure that all demolition work on site is carried out in accordance with AS 2601-2001: The Demolition of Structures, or its latest version.</i>	Yes	Demolition work was carried out in accordance with AS 2601-2001.
Protection of Public Infrastructure (Condition 11, Schedule 2)	11. <i>Unless the Applicant and the applicable authority agree otherwise, the Applicant must:</i> <i>(a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and</i> <i>(b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development,</i> <u><i>Note: This condition does not include matters that are expressly provided for in the conditions of this consent, such as the maintenance of public roads.</i></u>	Yes	N/a – no public infrastructure was damaged or relocated as a result of the development (MPO) during the reporting period.
Operation of Plant and Equipment (Condition 12, Schedule 2)	12. <i>The Applicant must ensure that all plant and equipment used on site, or to transport coal from the site, is:</i> <i>(a) maintained in a proper and efficient condition; and</i> <i>(b) operated in a proper and efficient manner.</i>	Yes	All plant and equipment in use at the MPO is maintained in suitable condition.

4 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

A reconciliation of the actions required by the DPE, the previous Annual Review and actions taken in response by MACH Energy during the reporting period are outlined in Table 7.

Table 7
Actions Required by the DPE and 2020 Annual Review

Action	Requested by	Action Taken by Operator	Section Reference
<i>Engagement of a suitably qualified hydrogeologist to provide further advice regarding exceedances recorded at site 5000D000.</i>	2020 Annual Review	A summary of the advice received from the suitably qualified hydrogeologist has been included in the section within this Annual Review.	Section 6.2.3
<i>Continued monitoring of EC results at site W6A until June 2021 and communication of results to DPIE. Should the EC measurements at the site indicate persistent elevated EC measurements, a suitably qualified hydrologist will be engaged to provide advice</i>	2020 Annual Review	A summary of the outcomes of the continued monitoring of electrical conductivity (EC) results at site W6A has been included in the section within this Annual Review.	Section 6.1.3
<i>Continued consultation regarding the potential Aboriginal Heritage Conservation Areas</i>	2020 Annual Review	Consultation regarding the potential Aboriginal Heritage Conservation Areas was continued.	Section 5.6.2
<i>Continued collaboration with the University of Newcastle on various rehabilitation related research projects as described in Section 7.3.</i>	2020 Annual Review	A summary of the rehabilitation related research projects continued in collaboration with the University of Newcastle has been provided in sections within this Annual Review.	Section 5.9 and Section 7.3
<i>Continuation of MOD 4 construction activities.</i>	2020 Annual Review	MOD 4 construction activities were continued during the reporting period.	Section 3

5 ENVIRONMENTAL PERFORMANCE

5.1 METEOROLOGY

Meteorological monitoring was undertaken during the reporting period at the mine meteorological stations along Kayuga Road (M-WS4) and Wybong Road (M-WM2) (Figure 3). Data collected included 10 minute, hourly and 24 hourly wind speed, wind direction, sigma, temperature, humidity, solar radiation and rainfall measurements. Data collected during the reporting period has been summarised for rainfall, temperature and wind in the following subsections. M-WS4 has been utilised for this summary as the original meteorological station at the MPO.

5.1.1 Rainfall

During the reporting period, 902 millimetres (mm) of rain was recorded over 70 wet days at the MPO weather station M-WS4. The highest daily rainfall was 58.4 mm on 8 December 2021.

There was an increase in the cumulative rainfall and the number of wet days for the reporting period in comparison to the 2020 reporting period (785.9 mm and 65 days, respectively). Cumulative rainfall at the MPO has generally been consistent with 2019 levels since the commencement of the MPO, except for 2016, 2020 and 2021 where significantly more rainfall was received at the site.

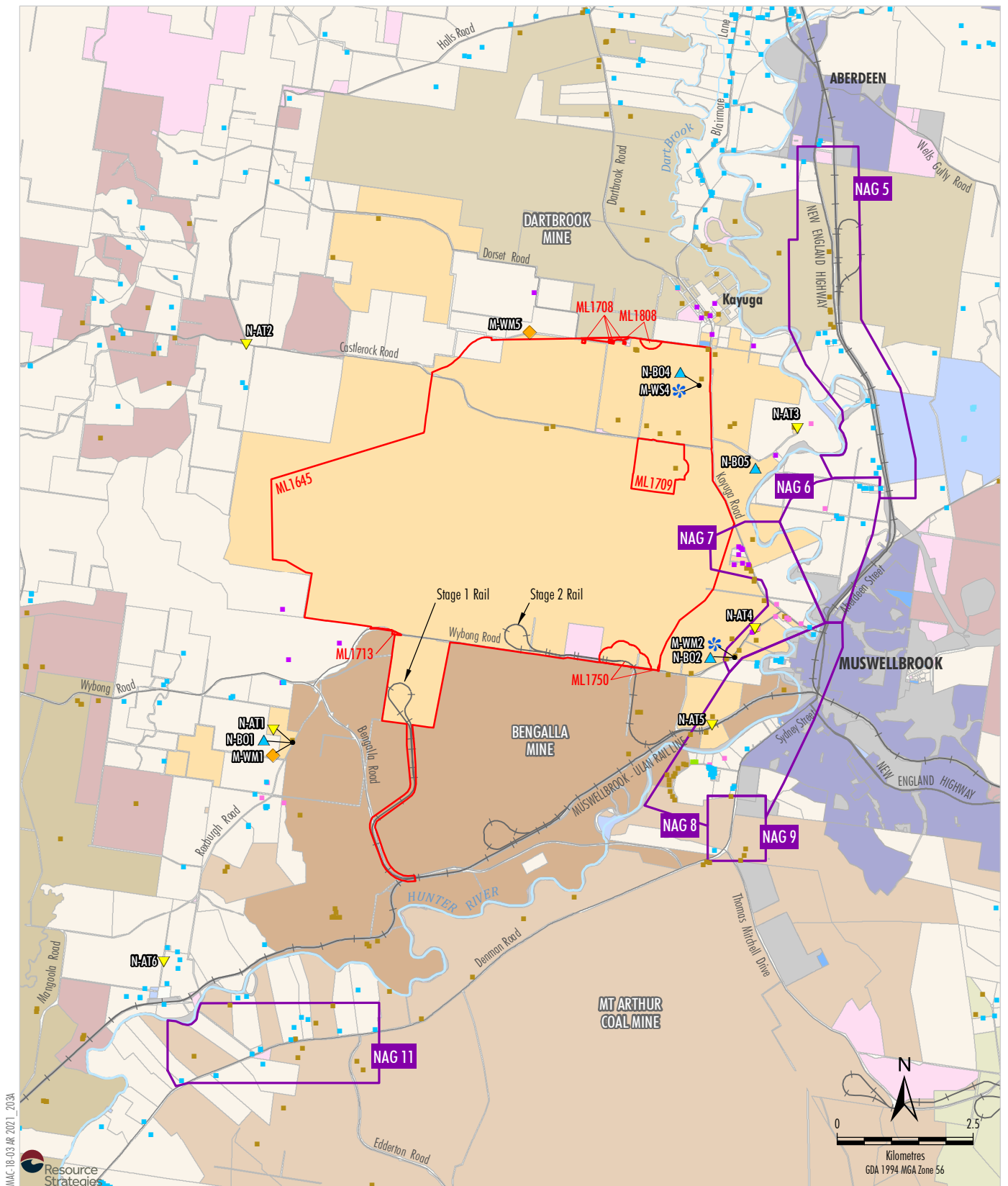
The monthly rainfall distribution, number of wet days and cumulative rainfall is summarised in Table 8. Monthly rainfall records and cumulative rainfall over the reporting period are shown in Chart 1.

5.1.2 Temperature

During the reporting period, the maximum temperature recorded at the MPO weather station M-WS4 was 38 degrees Celsius (°C) (26 January) and the minimum temperature recorded was -2.5°C (29 May). Monthly minimum and maximum temperatures derived from hourly temperature measurements are presented in Table 9. Monthly mean temperatures are shown in Chart 2. Monthly temperatures at the MPO in 2021 are generally consistent with those measured since 2017, with the exception of cooler November and December months likely due to increased rainfall.

5.1.3 Wind Speed and Direction

During the reporting period, the majority of prevailing winds were from the south-east and north-west. Only a very minor percentage of winds were generated from the south-west and almost none were generated from the north-east. This is consistent with trends observed in previous Annual Reviews (Coal & Allied, 2014, 2015 and 2016; MACH Energy, 2017b; MACH Energy, 2018; MACH Energy, 2019, MACH Energy, 2020a and MACH Energy, 2021). An annual wind rose is presented in Chart 3.



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LEGEND

- Mining Lease Boundary (Mount Pleasant Operation)
- Mount Pleasant-controlled
- Bengalla-controlled
- Dartbrook-controlled
- Mangoola-controlled
- Muswellbrook Coal-controlled
- Mt Arthur-controlled
- Other Mining/Resource-controlled
- Crown
- The State of NSW
- Muswellbrook Shire Council
- Upper Hunter Shire Council
- Privately-owned Land
- Muswellbrook and Upper Hunter LEP Zones B2, B5, R1, R5
- Muswellbrook and Upper Hunter LEP Zones IN1, SP2, RE1, RE2, W1

Noise Assessment Group (NAG) (DA 92/97) Category of Rural Residence under DA92/97

- Mine-owned
- Privately-owned - Acquisition on Request
- Privately-owned - Mitigation on Request
- Privately-owned - Mitigation/Acquisition on Request*
- Other Privately-owned
- ▼ Monitoring Sites
- ▼ Noise Monitoring, Attended Noise
- ▲ Noise Monitoring, Real-time Noise Monitoring Site
- ★ Weather Station
- ◆ Weather Mast

* Mitigation on Request - rail noise/Acquisition on Request - air quality.
MACH is only required to acquire and/or install air quality mitigation measures at this property if not reasonably achievable under a separate approval for the Bengalla Mine.

Source: MACH (2022); NSW Spatial Services (2022)

MACHEnergy
MOUNT PLEASANT OPERATION
Noise and Meteorological
Monitoring Sites

Figure 3

Table 8
Rainfall Summary 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly Rainfall (mm)	70.4	96.7	129.2	10.9	14.9	62.8	30.2	23.7	36.8	69.4	229.9	127.4
Cumulative Rainfall (mm)	70.4	167	296.2	307	321.9	384.7	414.9	438.4	475.2	544.7	774.4	901.9
Wet Days*	5	10	8	1	3	7	3	2	4	6	15	6

Note:

* Wet days are classified as days receiving rainfall greater than 2 mm.

Table 9
Temperature Summary 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum Temperature (°C)	11.0	11.7	11.1	1.1	-2.5	-0.6	-2.3	1.4	2.7	7.8	8.3	14.3
Maximum Temperature (°C)	38.0	36.0	32.4	29.3	25.2	21.0	24.2	26.7	29.4	33.7	29.9	33.0

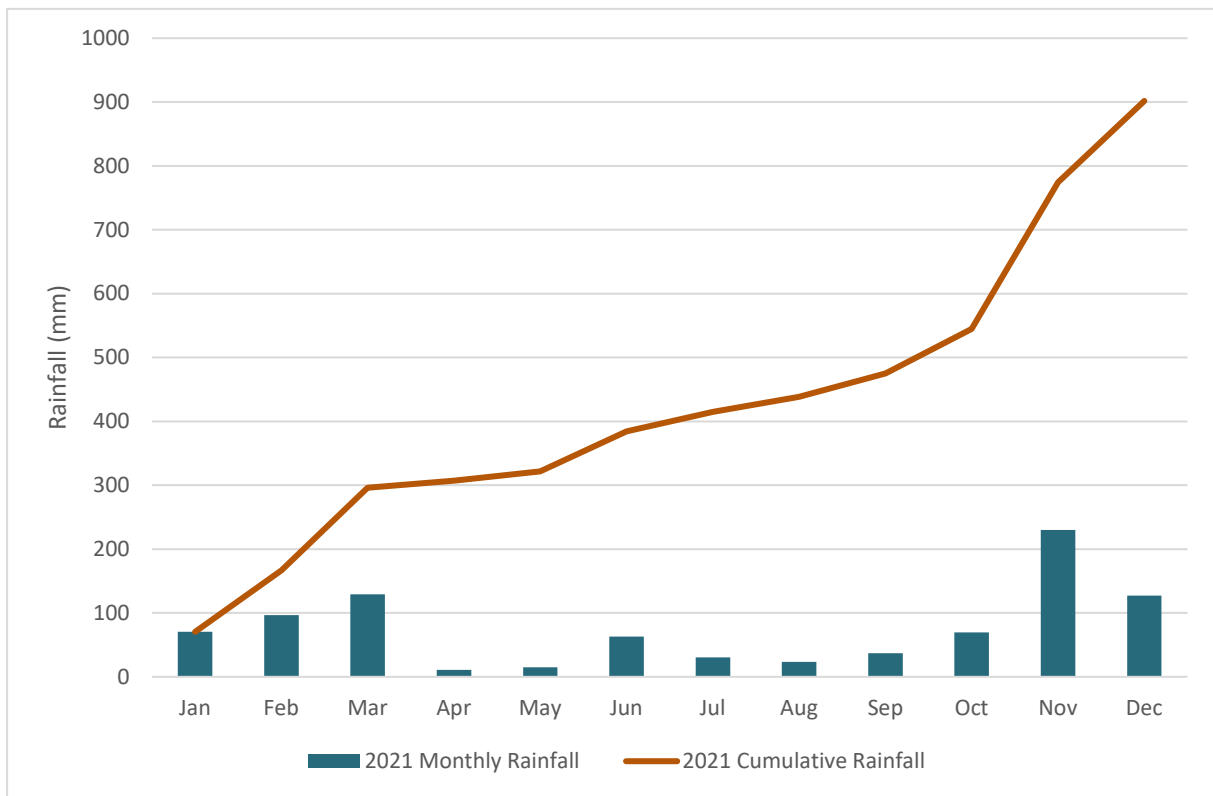


Chart 1: MPO Monthly and Cumulative Rainfall 2021



Chart 2: MPO Monthly Mean Temperature 2021

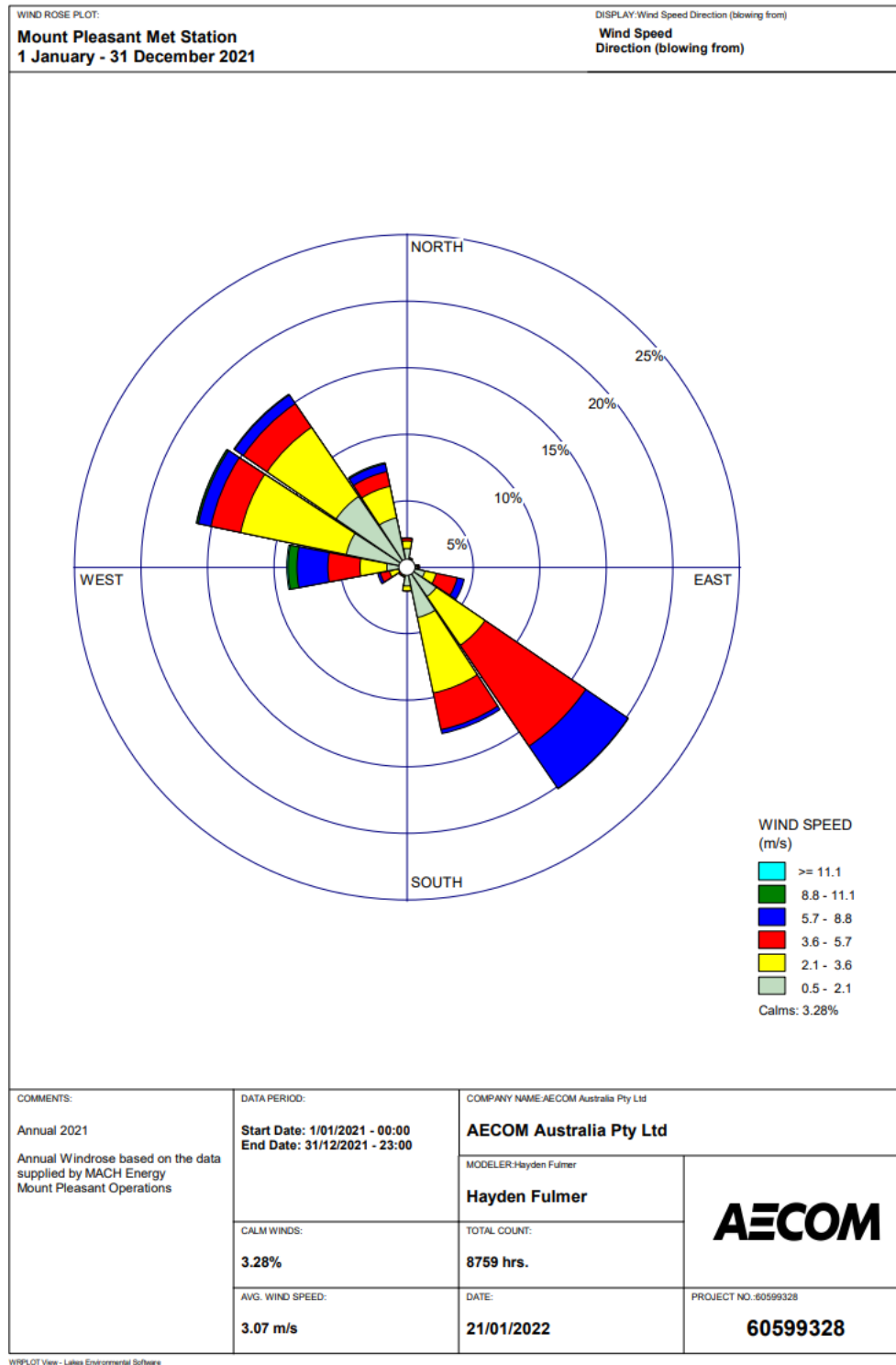


Chart 3: MPO Annual Wind Rose 2021

5.2 NOISE

Key noise criteria for the MPO are defined in Tables 3 and 5 of Development Consent DA 92/97 (Conditions 3 and 5, Schedule 3) and EPL 20850 (Condition P1.3). Additional noise conditions relating to land acquisition, noise mitigation upon request, rail noise, noise monitoring and preparation of the NMP are also detailed in these approval documents.

5.2.1 Approval Criteria and Management Plan Requirements

Development Consent DA 92/97 and EPL 20850

The Noise Impact Assessment Criteria defined in Table 3 of Development Consent DA 92/97 (Condition 3, Schedule 3) is provided in Table 10.

Table 10
Noise Impact Assessment Criteria (dBA)

Location	Day	Evening	Night	
	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{Aeq} (15min)	L _{A1} (1min)
68, 74	43	42	42	45
86a	42	42	42	45
35, 35b, 77	42	41	41	45
79, 80a, 140c, 526	41	41	41	45
289	41	40	40	45
84a, 139, 154, 203, 257, 258a	40	40	40	45
83	40	39	39	45
86b, 140a, 202, 259	39	39	39	45
198, 202b	38	38	38	45
260, 261	37	37	37	45
169, 272	36	36	36	45
NAG 5 - All privately-owned land	41	40	39	45
NAG 6 - All privately-owned land	37	37	37	45
NAG 7 - All privately-owned land	40	37	37	45
NAG 8 - All privately-owned land	41	39	39	45
NAG 9 - All privately-owned land	39	38	37	45
NAG 11 - All privately-owned land	37	36	35	45
All other privately-owned land	35	35	35	45

Source: Development Consent DA 92/97 and EPL 20850.

Notes: dBA = A-weighted decibels.

L_{Aeq} = A-weighted equivalent continuous noise level.

L_{Aeq} (15 min) = equivalent continuous noise level over a 15 minute period.

L_{Aeq} (1 min) = equivalent continuous noise level over a 1 minute period.

The cumulative noise criteria defined in Table 5 of Development Consent DA 92/97 (Condition 5, Schedule 3) are provided in Table 11.

Table 11
Cumulative Noise Criteria (dBA)

Location	Day	Evening	Night
	L _{Aeq} (period)	L _{Aeq} (period)	L _{Aeq} (period)
NAG 8, 9	55	45	40
All other privately-owned land	50	45	40

Note: L_{Aeq}(period) = equivalent continuous noise level over a measured period.

The construction noise criteria defined in Table 10A of Development Consent DA 92/97 (Condition 44H, Schedule 3) are provided in Table 12.

Table 12
Construction Noise Criteria (dBA)

Location	Standard Construction Hours
	L _{Aeq} (15min)
67, 215, 216, 218, 219	47
206, 217, 220, 221, 225, 532, 533	48
222, 223, 531	49
224, 530	50
19, 20, 21, 207, 289	51
527, 528	56
529	54
68*	57
23*	69
All other privately-owned land	5 dBA above the daytime operational L _{Aeq} (15min) noise criteria in Table 10

Source: Development Consent DA 92/97

Note: * This land is now owned by MACH Energy.

Noise criteria and other noise related conditions stipulated in EPL 20850 are generally consistent with those prescribed in Development Consent DA 92/97.

Noise Management Plan

MACH Energy revised the NMP during the reporting period with revised site monitoring locations following a review commissioned by MACH Energy. The NMP was approved on 21 December 2021.

The NMP describes the following construction and operational noise controls to be implemented to limit construction and operational noise:

- Plant will operate in less exposed areas during the more sensitive evening/night period.
- Vegetation clearance will be limited to daytime hours.
- 'Quackers' will be used in place of reverse beepers.
- Noise suppression will be provided on major operational mobile plant.
- Temporary cessation of work within an area, or from a particularly noisy piece of equipment, will be considered when adverse weather conditions are present.
- All plant and machinery used on-site will be maintained regularly to minimise noise generation.

- All plant and machinery used on-site will be operated in a proper and efficient manner (e.g. at correct speed) to minimise noise generation.
- Regular communication and updates will be provided to local residents on the status and nature of site construction and operational activities.
- In the event of a complaint from a local resident, MACH Energy will implement the complaints response process.

The following performance indicators are specified in the NMP to track the performance of the MPO:

- Effective implementation of the Real-time Response Protocol for noise.
- Results of operator attended noise monitoring, conducted and assessed in accordance with the *NSW Industrial Noise Policy* (EPA, 2000) and *Noise Policy for Industry* (NPfI) as relevant, are compliant with the noise criteria in Table 11.
- Complaints are minimised and appropriate management actions are implemented following receipt of a complaint.

Construction Environmental Management Plan

MACH Energy prepared the CEMP during the previous reporting period in response to MOD 4 approval (16 November 2018) in accordance with Condition 44I, Schedule 3 of Development Consent DA 92/97. The CEMP was approved on 10 March 2020. The CEMP describes additional control measures to minimise cumulative noise impacts of MOD 4 the Rail 2 Project construction works and the MPO.

Out of Hours Work Protocol

MACH Energy prepared the OHWP during the reporting period to undertake MOD 4 construction works (outside of the Mining Lease boundary) outside the hours specified in Schedule 3, Condition 44F of Development Consent DA 92/97. The OHWP was approved on 15 March 2021. The OHWP describes the management of noise associated with the MOD 4 requirement for out of hours construction activities, in accordance with Development Consent DA 92/97.

5.2.2 Performance During the Reporting Period

Operator Attended Noise Monitoring

Operator attended monitoring was undertaken monthly by Global Acoustics Pty Ltd during the 2021 reporting period, in accordance with the NMP and EPL 20850. Operator attended monitoring was undertaken at six locations selected to represent privately-owned receivers surrounding the MPO, as shown on Figure 3 and in Table 13.

During the reporting period, MACH Energy complied with all statutory conditions relating to noise. A summary of the noise monitoring results recorded during the reporting period are presented in Appendix A.

Monitoring was undertaken in accordance with EPL 20850 and Australian Standard AS1055 ‘Acoustics, Description and Measurement of Environmental Noise’.

All applicable measured noise levels attributable to the MPO were generally compliant with the relevant noise criteria from Development Consent DA 92/97 and EPL 20850 during the reporting period, except for one elevated $L_{A1(1min)}$ reading in August. Follow-up monitoring for the elevated reading in August showed no further investigation was required. There were no exceedances of the construction noise criteria from Development Consent DA 92/97 (Table 12) during the reporting period.

Table 13
Noise Monitoring Locations

Monitoring Location				Justification
Site ID	Description	Easting	Northing	
N-AT1	South-west of the MPO	291465	6427182	Representative of dwellings to the south-west
N-AT2	North-west of the MPO	290608	6434490	Representative of dwellings to the north-west
N-AT3	East of the MPO	300725	6432946	Representative of dwellings to the north-east and east (e.g. NAG 5)
N-AT4	South-east of the MPO	299947	6429264	Representative of dwellings to the east (i.e. NAGs 6 and 7)
N-AT5	South-east of the MPO	299161	6427503	Representative of dwellings to the south-east (i.e. NAGs 8 and 9)
N-AT6	South-west of the MPO	289092	6423155	Representative of dwellings to the south-southwest (e.g. NAG 11)

Results of the operator attended noise monitoring for each monitoring round during the reporting period are available in the monthly reporting on the MACH Energy website (<https://machenergyaustralia.com.au/mount-pleasant/documentation/>).

Real-time Noise Monitoring

Real-time monitoring systems were installed at three locations (N-BO1, N-BO2 and N-BO4) in November 2016 prior to construction work commencing on-site and at one location (N-BO5) in June 2020 (Figure 3). Real-time noise monitoring was undertaken at these locations 24 hours per day, seven days per week for the duration of the reporting period. The real-time noise monitoring was not used to assess compliance with noise criteria, but instead was used for ongoing performance assessment and to inform implementation of real-time response management actions.

During the reporting period, a number of real-time noise monitoring triggers occurred, which prompted the implementation of real-time response management actions where these were related to mining noise from the MPO, consistent with the Real-time Response Protocol outlined in the NMP.

Complaints

A total of 67 noise-related complaints were received by MACH Energy during 2021 (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>). The number of noise-related complaints received during the reporting period was 16% more than in the previous reporting period. In response to the complaints, the noise monitoring records were reviewed and the External Relations Manager (ERM) organised the cessation of noise-intensive works where necessary. In all cases, the ERM made further contact with the complainant to provide an update of the noise activities. All operator attended noise monitoring results for the reporting period were compliant.

Out of Hours Work Monthly Reporting

Monthly out of hours work reports were provided to DPE during the MOD 4 construction works in accordance with the OHWP (approved on 15 March 2021). The monthly reports included detail on out of hours construction activities, frequency, timeframes, and noise monitoring results and construction noise-related complaints received within the period, where required.

5.2.3 Trends and Key Management Implications

A noise exceedance event occurred on 27 August 2021, where attended monitoring identified a sustained exceedance (measurements at 00:18 and 00:54) of the $L_{A1(1 \text{ minute})}$ criterion at monitoring location N-AT4. MACH Energy followed the NMP procedure and modified operations upon notification of the exceedance. No environmental harm nor known impacts on the amenity of nearby residences occurred. Follow-up monitoring indicated compliance with the relevant noise criteria.

The monitoring results are generally consistent with the results recorded during the 2020 reporting period (MACH Energy, 2021). In particular, noise levels were observed to have increased from 2020 levels at N-AT3 as mining progressed north (i.e. towards the monitor) and N-AT4 as the MOD 4 construction works progressed near the monitor during the reporting period.

Two potential non-compliances related to the MOD 4 out of hours works were reported during the reporting period. No environmental harm nor known impacts on the amenity of nearby residences occurred. Further detail regarding the reported potential non-compliances is provided in Section 10.2.

Noise-related complaints slightly increased in 2021 compared to 2020 likely due to intensification of mining operations and MOD 4 construction works. No MOD 4 construction works specific complaints were received during the reporting period. MACH Energy continued the development of the Eastern Out of Pit Overburden Emplacement Area during the reporting period, which provides shielding of operations to Muswellbrook and nearby residences.

Comparison to MOD 3 Predictions

MOD 3 predictions for noise were modelled for three scenarios during the mine life (i.e. Year 2018, Year 2021 and Year 2025). The attended monitoring noise levels were generally below the predicted $L_{Aeq(15min)}$ levels under applicable meteorological conditions. There were several measured $L_{Aeq(15min)}$ noise level levels at N-AT3 and N-AT4 that were slightly above the MOD 3 predicted levels in August, September and October 2021; and May and August 2021, respectively.

The elevated level recorded was not linked to any specific operational practices, and no trend of elevated levels was observed. Such minor differences between levels and predicted levels are likely due to the inherent uncertainties associated with predictive modelling (e.g. activities may not occur in the same location, or at the same magnitude, as anticipated when developing predictive models).

5.2.4 Implemented or Proposed Management Actions

All noise management measures outlined in the NMP and summarised in Section 5.2.1 were undertaken during the reporting period. In particular, MACH Energy continued to implement real-time noise monitoring at the four real-time noise monitoring locations with the Real-time Response Protocol used where appropriate.

MACH Energy commissioned a review of the MPO's noise management regime by a recognised noise specialist during the previous reporting period. The review's findings indicated the MPO's existing noise management practices are commensurate with best practice. Notwithstanding, some minor revisions to the noise monitoring network were recommended. Consistent with the recommendations of the review, the NMP was updated to relocate monitor N-AT3 approximately 600 metres (m) to the north-east and to adjust the real-time response triggers for N-BO2. The updated NMP was approved on 21 December 2021.

5.3 BLASTING

Airblast overpressure and ground vibration assessment criteria for the MPO are defined in Table 7 of Development Consent DA 92/97 (Condition 10, Schedule 3) and EPL 20850 (Conditions L4.2, L4.3, L4.4 and L4.5). Additional conditions relating to blasting hours and frequency, property inspections and investigations, monitoring locations, measurement methodology, operating conditions and preparation of the BMP, are also detailed in these approval documents.

MACH Energy revised the BMP during the previous reporting which was approved on 14 April 2020.

5.3.1 Approval Criteria and Management Plan Requirements

Development Consent DA 92/97 and EPL 20850

A summary of the assessment criteria for blasting is included in Table 14.

Table 14
Assessment Criteria for Blasting

Location	Airblast Overpressure (dB[Lin Peak])	Ground Vibration (mm/s)	Allowable Exceedance
Residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
Historic heritage sites	-	10	0%
All public infrastructure	-	50	0%

Source: Table 7 of Development Consent DA 92/97 (Condition 10, Schedule 3).

Notes: mm/s = millimetres per second and dB = decibels.

Conditions L4.2, L4.3, L4.4 and L4.5 of EPL 20850 contain the same blasting assessment criteria for residences on privately-owned land as specified in Table 15. However, EPL 20850 requires that monitoring does not exceed these criteria at monitoring sites B-VOC, B-VOA and B-VO2 rather than at all residences on privately-owned land (Figure 4).

Airblast overpressure, ground vibration and fume monitoring were conducted for every blast event at the blast monitoring sites shown on Figure 4.

5.3.2 Performance During the Reporting Period

A total of 106 blasts occurred during the reporting period and are detailed in Appendix B. All recorded blast measurements were in accordance with the relevant blasting criteria (Section 5.3.1). No blast fume events occurred during the reporting period.

Comparison to MOD 3 Predictions

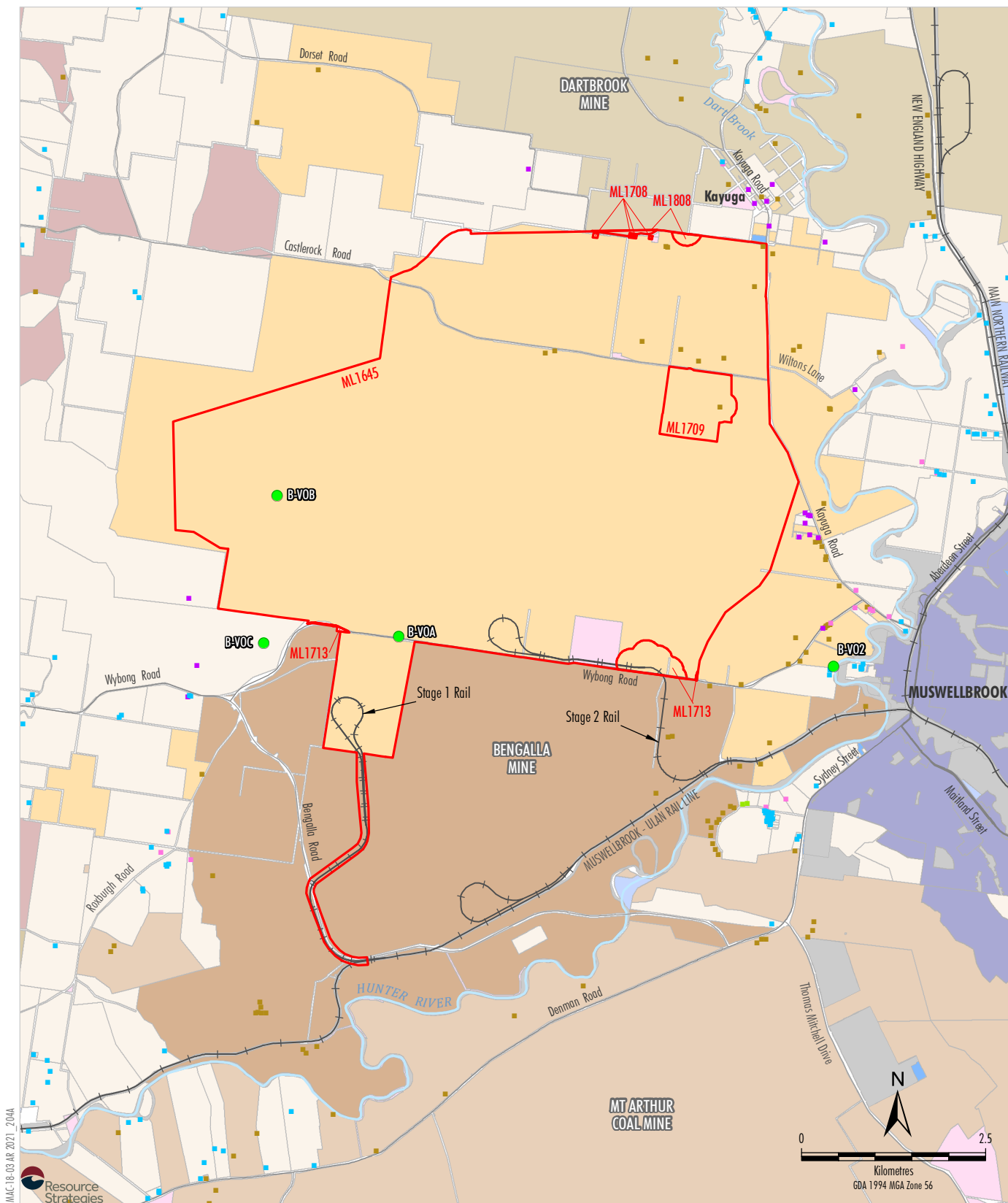
A comparison of MPO's blast performance against the MOD 3 predictions is summarised in Table 15. Monitors B-VOC and B-VO2 are located in close proximity to Receiver 43 and Receiver 67 and comparative discussion is provided below. For other receivers, direct comparison with monitoring results is obscured by the distance between blast locations, receivers and blast monitors.

Table 15
Comparison of MOD 3 Predictions and 2021 Raw Monitoring Data

Closest Receiver ID	MOD 3 Predictions		Closest Blast Monitoring Site to Land Holder	Maximum Recorded Level in 2021	
	Airblast Overpressure (dBL [in Peak])	Ground Vibration (mm/s)		Airblast Overpressure (dBL [in Peak])	Ground Vibration (mm/s)
43	111.2 to 112.1	0.6 to 1.1	B-VOC	112.7	0.85
272	111.1 to 111.2	0.5 to 0.6	B-VOC	112.7	0.85
153	111.4 to 112.5	0.8 to 1.4	B-VOA	117.9	2.03
147	111.7 to 114.2	0.9 to 2.5	B-VO2	115.7	1.23
136	112.2 to 117.3	1.2 to 5.3	B-VO2	115.7	1.23
121	113.7 to 119.9	2.1 to 8.6	B-VO2	115.7	1.23
112	114 to 120.1	2.3 to 8.8	B-VO2	115.7	1.23
67	113 to 115.6	1.7 to 3.6	B-VO2	115.7	1.23
23	111.9 to 114.3	1.1 to 2.6	B-VO2	115.7	1.23

Source: Table 8-1 of MPO MOD 3 Noise & Blasting Assessment.

Blast predictions are made using a site-specific empirical prediction model to best predict airblast and ground vibration levels. At Receiver 43 and Receiver 67, maximum recorded results are within (or slightly lower than) the range of predictions made in MOD 3. At other receivers, Table 15 shows that blast monitoring data at the most representative monitoring site are also generally within or marginally sometimes lower or higher than the ranges predicted. As mentioned above, this may be due to the distances between blast locations, receivers and blast monitors and also a difference in site conditions, compared to the empirical data used to establish the predictions. Blast monitoring data will continue to be collected and a site-specific empirical prediction model will continue to be refined to assist blast planning and performance review.



IMAC:18-03 AR 2021_2044
Resource Strategies

- LEGEND**
- Mining Lease Boundary (Mount Pleasant Operation)
 - Mount Pleasant-controlled
 - Bengalla-controlled
 - Dartbrook-controlled
 - Mangoola-controlled
 - Muswellbrook Coal-controlled
 - Mt Arthur-controlled
 - Crown
 - The State of NSW
 - Muswellbrook Shire Council
 - Privately-owned Land
 - Muswellbrook and Upper Hunter LEP Zones B2, B5, R1, R5
 - Muswellbrook and Upper Hunter LEP Zones IN1, SP2, RE1, RE2, W1

Category of Rural Residence under DA92/97

- Mine-owned
- Privately-owned - Acquisition on Request
- Privately-owned - Mitigation on Request
- Privately-owned - Mitigation/Acquisition on Request*
- Other Privately-owned

Monitoring Sites

- Blasting (Vibration/Overpressure)

* Mitigation on Request - rail noise/Acquisition on Request - air quality.
MACH is only required to acquire and/or install air quality mitigation measures at this property if not reasonably achievable under a separate approval for the Bengalla Mine.

Source: MACH (2022); NSW Spatial Services (2022)

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Blast Monitoring Sites

Figure 4

Complaints

A total of 4 blasting-related complaints were received by MACH Energy during 2021 (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>). The number of blasting-related complaints received during the reporting period was 77% less than that received in the previous reporting period. In response to the complaints, blasting activities were reviewed for compliance. All blasting results for the reporting period were compliant with relevant blast overpressure and vibration criteria (Section 5.3.1). Following the compliance review, the ERM made further contact with the complainants to provide an update of the blasting activities.

5.3.3 Trends and Key Management Implications

There were 106 blasts recorded during 2021, compared with 74 in 2020. Blasting-related complaints decreased in 2021 compared to 2020 due to the continued progression of mining activities away from Muswellbrook and nearby residences.

Airblast overpressure and ground vibration levels recorded during 2021 generally decreased compared with 2020 as blasting occurred further from Muswellbrook and nearby receivers as mining activities progressed west during the reporting period. All overpressure and vibration measurements during the reporting period complied with the relevant criteria within Development Consent DA 92/97 and EPL 20850.

5.3.4 Implemented or Proposed Management Actions

Notifications of upcoming blasts were provided on MACH Energy's and MSC's websites. In addition, MACH Energy notified private landholders or residents who expressed an interest in being informed of the MPO blasting schedule and were, therefore, on the MPO pre-blast notification register.

Any blasts within 500 m of Wybong, Kayuga, Castlerock and Dorset Roads triggered a road closure and implementation of relevant mitigation measures. In 2021, eight road closures occurred on Wybong Road due to blasting activities within Pit A. No other roads were closed due to blasting activities.

All appropriate steps to reduce dust generation from blasting and ensure best practice blasting techniques were undertaken in accordance with the MPO BMP. MACH Energy will continue to implement these measures.

As a result of the blast fume incident in June 2020, the mining contractor amended key pre-blast procedures to reduce the potential for a similar event to occur in the future. This included adjustment of the fume probability prediction model, additional surveillance cameras/drones and updates to the blasting Trigger Action Response Plan. MACH Energy received and paid a Penalty Infringement Notice for the incident and the incident was closed out during the reporting period.

5.4 AIR QUALITY

Air quality criteria for the MPO are presented in Tables 8, 9 and 10 of Development Consent DA 92/97 (Condition 20, Schedule 3) and EPL 20850 (Condition O3.4). Additional conditions relating to operating conditions, greenhouse gas emissions, odour, acquisition criteria and preparation of the AQGGMP are also provided in Development Consent DA 92/97 and EPL 20850.

5.4.1 Approval Criteria and Management Plan Requirements

Development Consent DA 92/97

In accordance with Condition 20, Schedule 3 of Development Consent DA 92/97, MACH Energy must ensure that all reasonable and feasible avoidance mitigation measures are employed so that particulate matter emissions generated by the MPO do not exceed the criteria summarised in Table 16 at any residence on privately-owned land (excluding land subject to acquisition upon request for potential air quality impacts).

Table 16
Approval Criteria for Particulate Matter

	Pollutant	Averaging Period	^d Criterion
Long-term Impact Assessment Criteria	TSP	Annual	^a 90 µg/m ³
	PM ₁₀	Annual	^a 25 µg/m ³
	PM _{2.5}	Annual	^a 8 µg/m ³
	Deposited Dust ^{c,d}	Annual	^b 2 g/m ² /month ^a 4 g/m ² /month
Short-term Impact Assessment Criteria	PM ₁₀	24 hour	^b 50 µg/m ³
	PM _{2.5}	24 hour	^b 25 µg/m ³

Source: Development Consent DA 92/97 (Condition 20, Schedule 3).

Note: TSP = Total Suspended Particulates;

PM₁₀ = particulate matter less than or equal to 10 micrometres in diameter;

PM_{2.5} = particulate matter less than or equal to 2.5 micrometres in diameter;

µg/m³ = micrograms per cubic metre; and

g/m²/month = grams per square metre per month.

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

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

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

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

Environment Protection Licence 20850

Air quality criteria and other air quality related conditions stipulated in EPL 20850 are generally consistent with those prescribed in Development Consent DA 92/97, with the exception of Conditions O3.4 to O3.9, which state:

O3 Dust

...

O3.4 The Licensee must cease all dust generating activities during adverse conditions being the occurrence of both:

- the adverse wind conditions set out in Condition O3.5 (b), and
- the adverse PM₁₀ concentrations set out in Condition O3.5 (c).

O3.5 For the purpose of Condition O3.4 the following definitions apply:

- 'dust generating activities' means drilling, blasting, earthworks, construction activities, all hauling activities on unsealed haul roads, all overburden and coal extraction operations including loading and dumping activities and grader, loader, dozer and dragline operations.

- (b) 'adverse wind conditions' means the 1-hour average wind direction between 250 degrees and 340 degrees (inclusive) measured at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitor. Australian Standard AS3580.14-2014 is to be used to calculate the 1 hour average wind direction.
- (c) 'adverse PM10 concentrations' means a rolling 24-hour average PM10 concentration of equal to or greater than 44 micrograms per cubic metre measured at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station.
- (d) Operation of watercarts is permitted at all times.
- (e) Activities within the Coal Handling and Preparation Plant and Materials Handling Area, including run-of-mine (ROM) coal, product coal handling (including dozer/loader operations) and train loading operations as identified in blue on plan titled 'Mt Pleasant Coal Mine Materials Handling Area Dust Exclusion Zone General Arrangement' drawing number MP001-0000-GEN-DRG-0026 (EPA ref Doc19/282883) are not included as dust generating activities provided all automated dust suppression spray systems at the ROM hopper, conveyor transfer points and product stockpiles are in use, at least one water cart is in use on the ROM stockpile and an adjustable hood is lowered onto rail wagons loadings.

O3.6 Shutdown of dust generating activities required by Condition O3.4 must be completed within 1 hour of receiving data that triggers action required by Condition O3.4.

O3.7 The licensee may resume dust generating activities at the premises when:

- (a) adverse wind conditions as defined in Condition O3.5(b); or
- (b) adverse PM10 concentrations as defined in Condition O3.5(c) are not measured for a minimum time period of 1 hour from the time that cessation of dust generation activities is completed.

O3.8 At any time when there is no access to the meteorological data or PM10 data from the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station, definitions of 'adverse wind conditions' and 'adverse PM10 concentrations' in condition O3.5 are replaced with:

- 'adverse wind conditions' means a 1-hour average wind direction between 245 and 345 degrees (inclusive) measured at EPA Monitoring Point 11, identified in condition P1.3
- 'adverse PM10 concentrations' means a rolling 24-hour average PM10 concentration of equal to or greater than 44 micrograms per cubic metre measured at the EPA Monitoring Point 1, identified in condition P1.3

Note: If at any time, there is no access to the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitoring station and to either 1-hour average wind direction data from monitoring point 11 or PM 10 data from monitoring point 1 the licensee must cease dust generating activities at the premises.

O3.9 For the purpose of condition O3.5 (e), dust suppression systems must be operated in a manner to ensure that there is no visible dust emissions emitted from the premises.

Air Quality and Greenhouse Gas Management Plan

MACH Energy prepared an AQGGMP which was approved on 24 May 2019. The AQGGMP was revised to reflect the approval of MOD 3 and 4 and update the real-time response triggers to align with the amended dust conditions within EPL 20850 as described above.

The AQGGMP outlines the reasonable and feasible mitigation and management measures adopted at the MPO in accordance with Condition 20, Schedule 3 of Development Consent DA 92/97. The reasonable and feasible mitigation measures include:

- specific management measures for adverse weather conditions (e.g. ceasing all dust generating activities during specific weather conditions as required by Conditions O3.4 to O3.9 of EPL 20850);
- general dust management measures (e.g. use of water carts to minimise wheel-generated dust);
- the use of predictive modelling to assist in day-to-day planning;

- real-time response protocols with tiered management actions based on several alert levels;
- odour and fume management measures;
- greenhouse gas emission reduction strategies; and
- cumulative air quality management, including a protocol for communication with representatives of other mining operations.

5.4.2 Performance During the Reporting Period

Dust Deposition

During the reporting period, dust deposition levels were collected at 13 dust deposition gauges situated around the MPO boundary (Figure 5). The gauges were sited in accordance with AS 3580.1.1:2007 and analysed for mass of total insoluble matter and ash in accordance with AS 3580.10.1-2003.

Annual average levels of insoluble solids (i.e. dust deposition) are presented in Chart 4. Chart 5 provides a comparison between annual average dust deposition levels at each of the monitoring sites from 2014 to 2021.

Monthly data that is highly contaminated (e.g. from bird droppings, insects or proximal construction works) has been excluded from annual average dust deposition levels. Notably, the calculated levels for gauge D3 exclude six monthly recordings, the calculated levels for gauge D4 excludes one monthly recording and the calculated levels for gauge D7 excludes four monthly recordings.

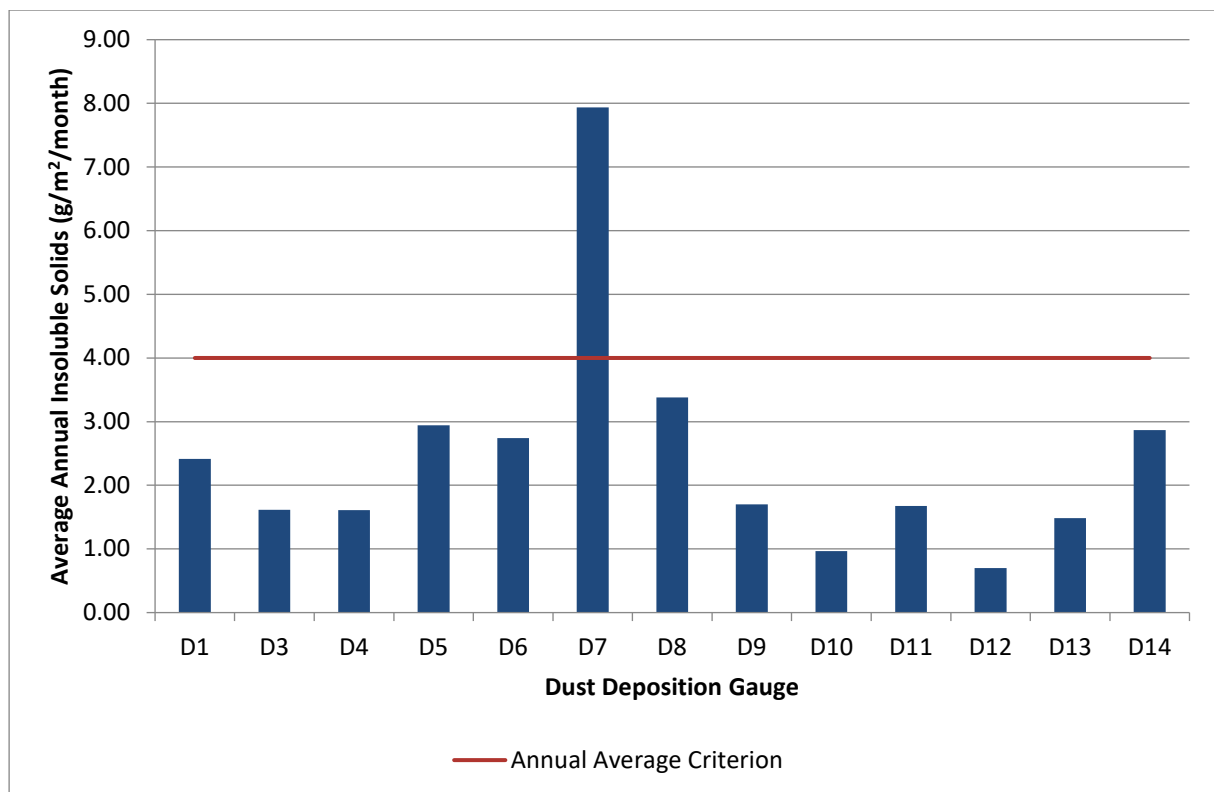
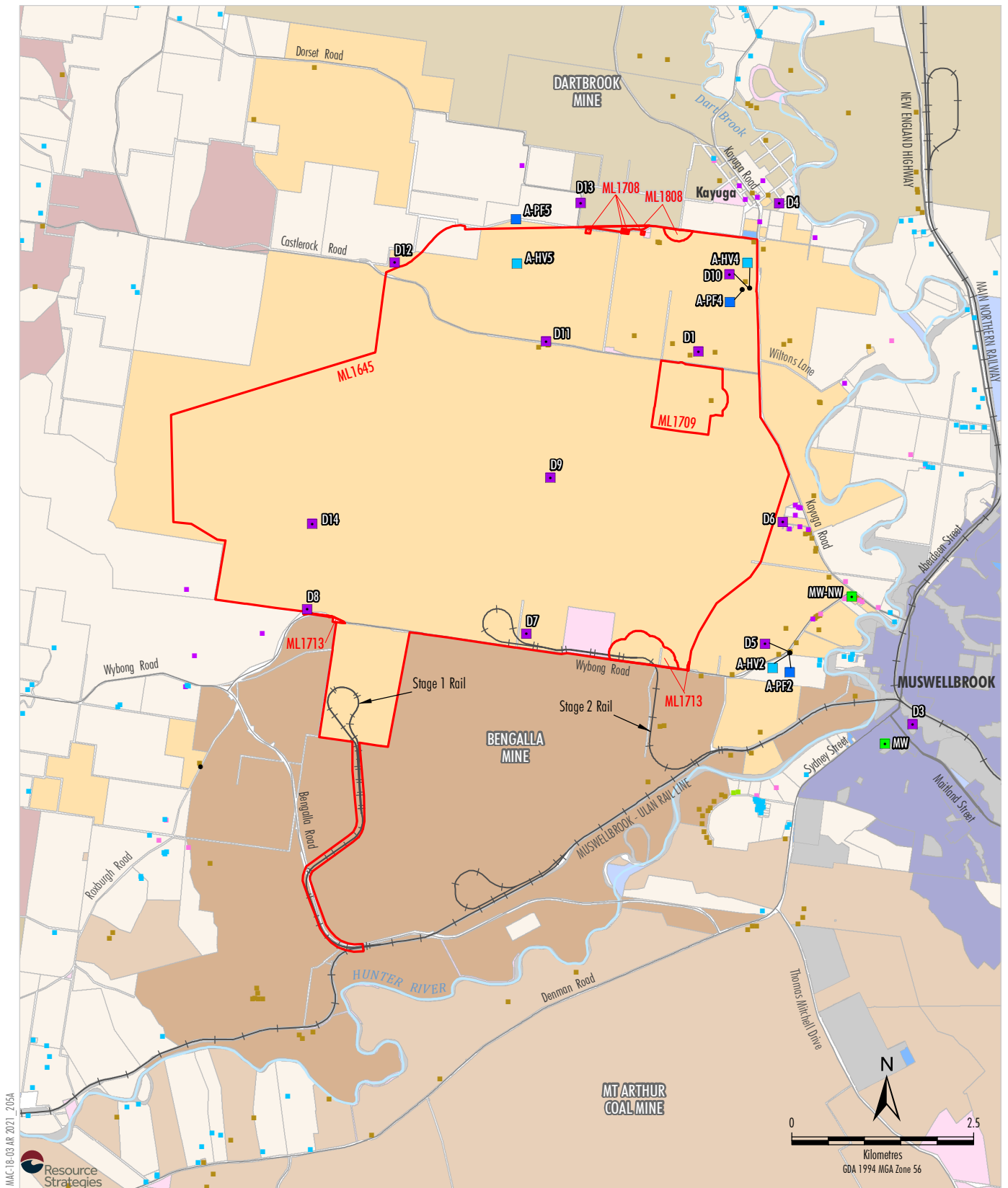


Chart 4: 2021 Annual Average Insoluble Solids



IMAC:18-03 AR 2021 - 205A
Resource Strategies

Source: MACH (2022); NSW Spatial Services (2022)

- LEGEND**
- Mining Lease Boundary (Mount Pleasant Operation)
 - Mount Pleasant-controlled
 - Bengalla-controlled
 - Dartbrook-controlled
 - Mangoola-controlled
 - Muswellbrook Coal-controlled
 - Mt Arthur-controlled
 - Crown
 - The State of NSW
 - Muswellbrook Shire Council
 - Privately-owned Land
 - Muswellbrook and Upper Hunter LEP Zones B2, B5, R1, R5
 - Muswellbrook and Upper Hunter LEP Zones IN1, SP2, RE1, RE2, W1

Category of Rural Residence under DA92/97

- Mine-owned
- Privately-owned - Acquisition on Request
- Privately-owned - Mitigation on Request
- Privately-owned - Mitigation/Acquisition on Request*
- Other Privately-owned

Monitoring Sites

- Air Quality - High Volume Sampler
- Air Quality - Palas Fidas
- Dust Deposition Gauge
- Upper Hunter Air Quality Monitoring Network

* Mitigation on Request - rail noise/Acquisition on Request - air quality.
MACH is only required to acquire and/or install air quality mitigation measures at this property if not reasonably achievable under a separate approval for the Bengalla Mine.

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Air Quality Monitoring Sites

Figure 5

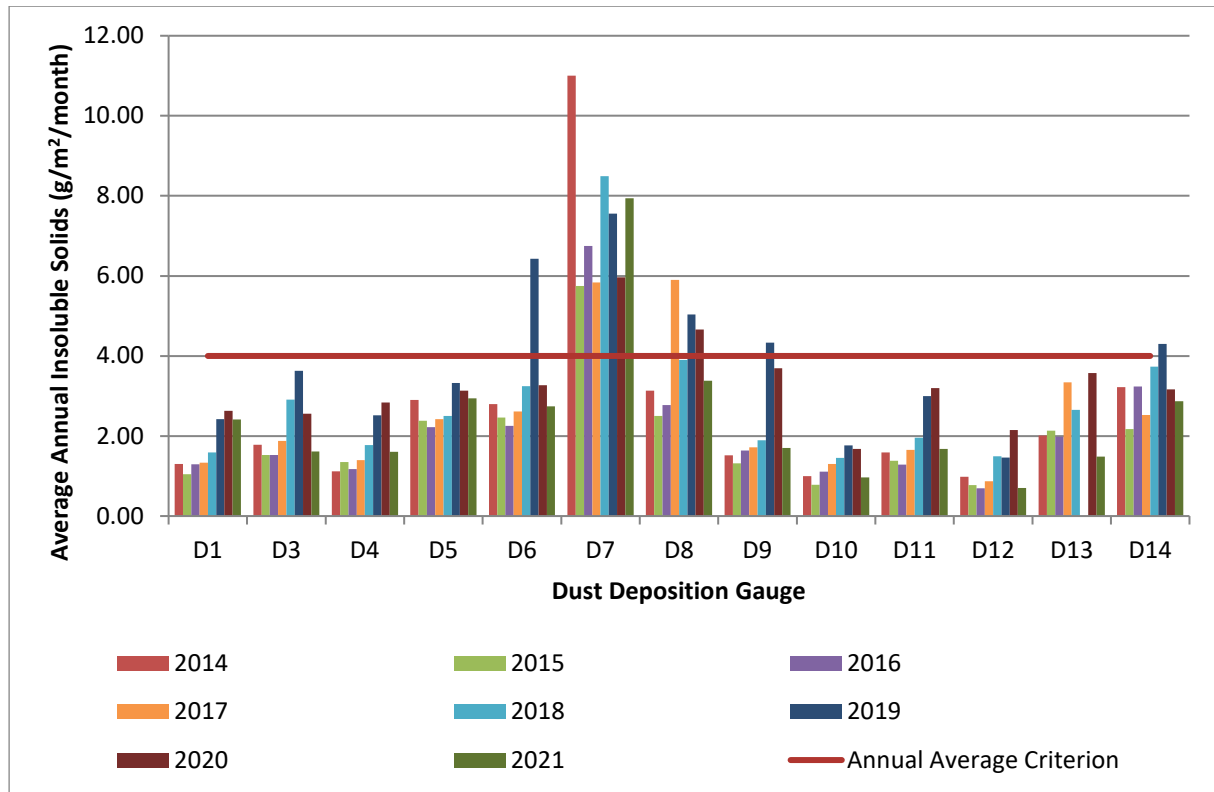


Chart 5: 2014 - 2021 Annual Average Insoluble Solids

PM₁₀ and PM_{2.5}

Palas Fidas monitoring systems were installed at three locations (Figure 5) in late 2016. The Palas Fidas systems collected PM₁₀ and PM_{2.5} data continuously, which was averaged over 24 hours (Chart 6 and Chart 7) and annually (Chart 8 and Chart 9).

The data presented excludes 'extraordinary events', consistent with Condition 20, Schedule 3 of Development Consent DA 92/97. There were no days specifically considered to be extraordinary events in 2021.

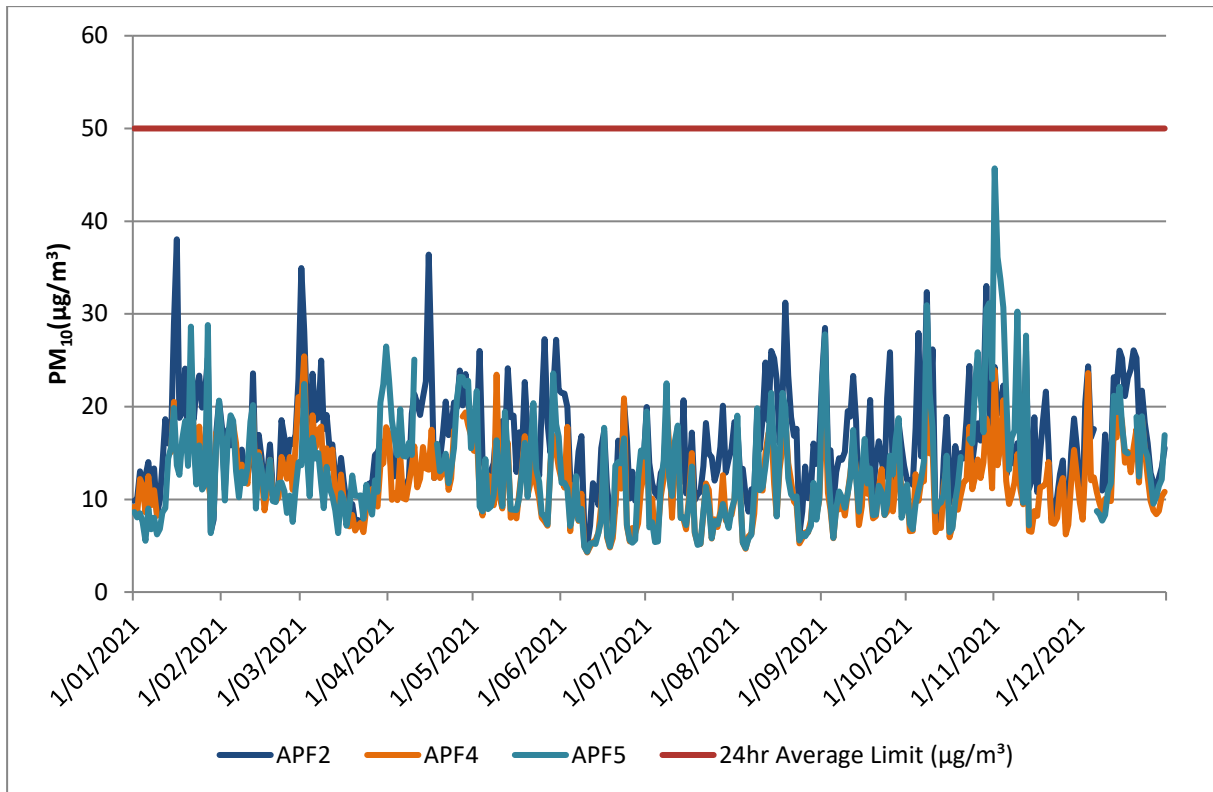


Chart 6: 24-hour Average PM₁₀ Levels

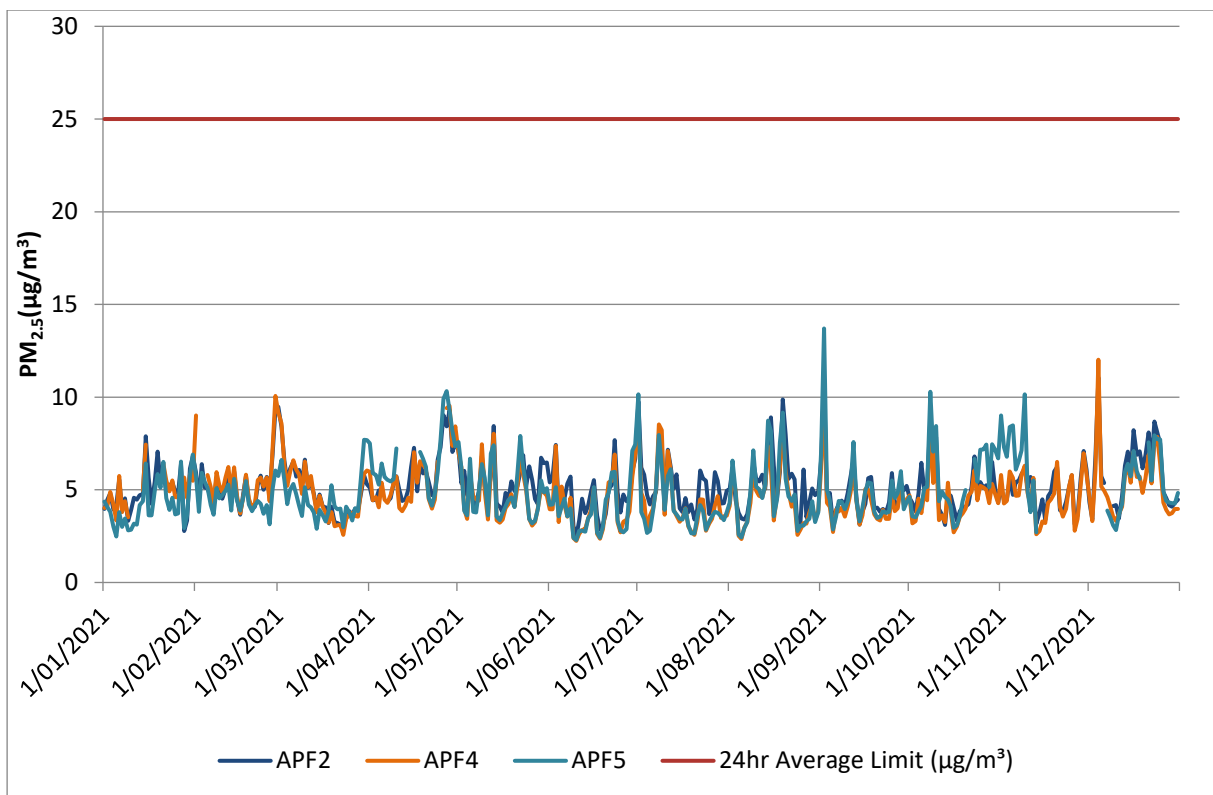


Chart 7: 24-hour Average PM_{2.5} Levels

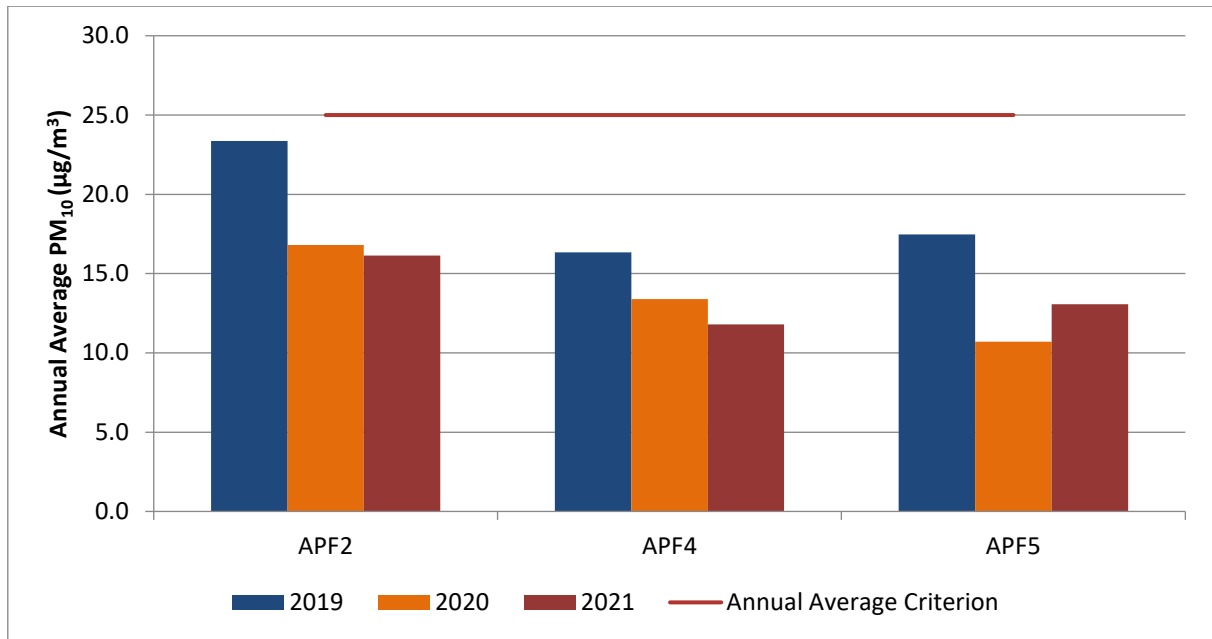


Chart 8: Annual Average PM₁₀ Levels

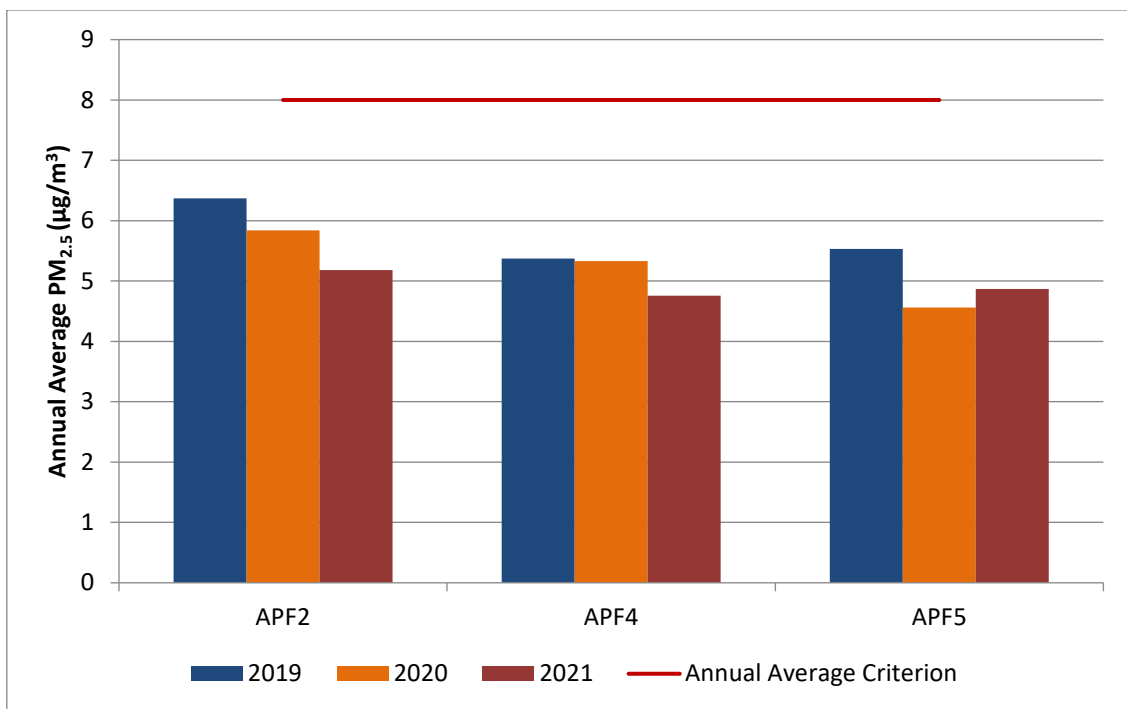


Chart 9: Annual Average PM_{2.5} Levels

Total Suspended Particulate

TSP levels were recorded at the three High Volume Air Sampler (HVAS) systems (A-HV2, A-HV4 and A-HV5) located adjacent to the three Palas Fidas monitors (Figure 5). These HVAS systems were sited in conjunction with the Palas Fidas monitors in late 2016. Annual average TSP levels are presented in Chart 10.

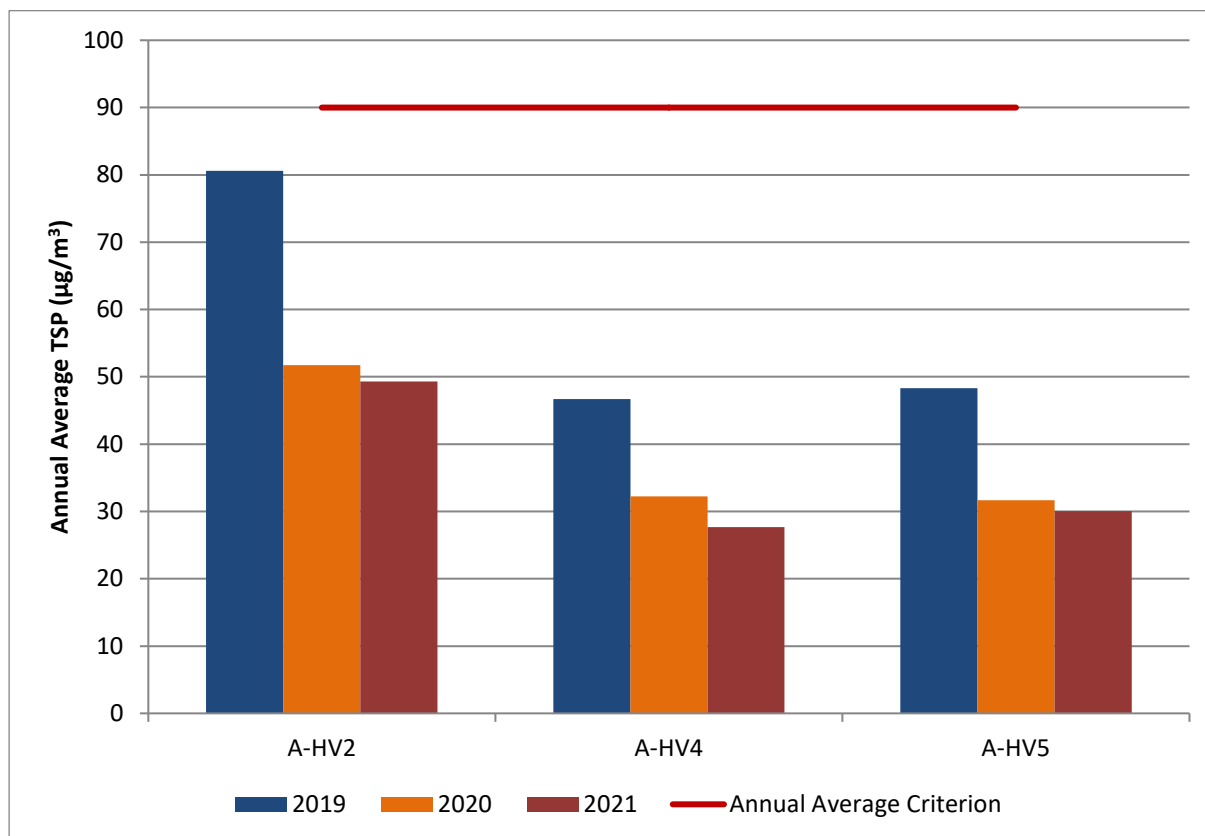


Chart 10: Annual Average TSP Levels

Complaints

A total of 22 air quality-related complaints were received by MACH Energy during 2021 (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>). The number of air quality-related complaints received during the reporting period was 38% more than that received in the previous reporting period. In response to the complaints, particulate matter levels at nearby monitoring locations were reviewed. For all complaints, the air quality levels at nearby monitoring stations were below the relevant criteria when the complaint was received.

5.4.3 Trends and Key Management Implications

Dust Deposition

Dust deposition levels decreased between 2020 and 2021 at most dust deposition gauges at the MPO. The decrease in dust deposition levels is likely to have been influenced, at least in part, by the weakening of drought conditions in late 2020 and above average rainfall across 2021. Annual average levels of deposited dust were recorded above the long-term impact assessment criteria of 4 g/m²/month at D7.

D7 is located within the MPO boundary between the MPO and a neighbouring mining operation (Figure 5). Due to its proximity to the northern boundary of the main pit of the neighbouring mining operation, D7 is directly influenced by both the MPO and the neighbouring mining operation. Therefore, whilst this site has continued to be monitored, it is not used to assess compliance or to represent residential receivers in the area.

Todoroski Air Sciences (TAS) reported in the 2021 Annual Air Quality Review that the MPO was generally compliant with the relevant criterion for dust deposition (Table 16) for this reporting period (TAS, 2022).

PM₁₀ and PM_{2.5}

The measured 24-hour average PM₁₀ levels were below the Project-only criterion during the reporting period.

Chart 6 shows that PM₁₀ levels fluctuated at the three monitors throughout the year, with no apparent trends other than APF2 generally recording higher levels than APF4 and APF5. Chart 8 indicates annual average PM₁₀ levels slightly decreased between 2020 and 2021.

Real-time monitoring of PM_{2.5} was also undertaken during the reporting period at the three monitors (Figure 5). The measured cumulative 24-hour average PM_{2.5} levels were below the relevant criteria during the reporting period.

Chart 7 shows that PM_{2.5} levels fluctuated at the three monitors throughout the year, with no apparent trends. Chart 9 indicates annual average PM_{2.5} levels slightly decreased between 2020 and 2021.

TAS reported in the 2021 Annual Air Quality Review that the MPO was generally compliant with the relevant criteria for both annual and 24-hour average levels for PM₁₀ and PM_{2.5} (Table 16) for this reporting period (TAS, 2022).

Total Suspended Particulate

The annual average TSP levels based on the measured TSP levels were compliant with the annual average TSP criterion during the reporting period. Chart 10 indicates annual average TSP levels slightly decreased between 2020 and 2021.

TAS reported in the 2021 Annual Air Quality Review that the MPO was generally compliant with the relevant criterion for TSP (Table 16) for this reporting period (TAS, 2022).

Greenhouse Gas Emissions

A summary of ROM production, diesel consumption, use of oil and grease and the greenhouse gas emissions reported under the National Greenhouse and Energy Reporting Scheme (NGERs) for 2021 financial year are shown in Table 17. The associated estimated GHG emissions presented in MOD 3 EA (*Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse Gas Assessment* [TAS, 2017]) are also shown in Table 18.

NGERs is based upon financial year reporting, and the TAS (2017) greenhouse gas estimates are based on calendar years. This Annual Review reports on the 2021 financial year data, as reported in NGERs. Table 17 includes references to the fugitive emission factors adopted in the TAS (2017) assessment and those reported in the NGERs, which vary materially.

A discussion of the comparative ROM production, diesel consumption, use of oil and grease and the greenhouse gas emissions reported under the NGERs for 2021 financial year and MOD 3 predictions is provided below.

Comparison to MOD 3 Predictions

MOD 3 predictions for air quality were modelled for three scenarios during the mine life (i.e. Year 2018, Year 2021 and Year 2025). Monitored annual average levels of insoluble solids, TSP, PM₁₀ and PM_{2.5} were generally below the MOD 3 Scenario 1 and 2 predictions.

Any inconsistencies observed between the monitoring results and the MOD 3 predictions are likely to be due to the inherent uncertainty associated with predictive modelling (e.g. activities may not occur in the same location, or at the same magnitude, as anticipated when developing predictive models). Further, the sensitive receptors (residences) are generally not located immediately adjacent the nearest monitoring sites (e.g. monitoring sites may be located closer to mining activity).

Greenhouse Gas Emissions

ROM coal production was generally below the rate estimated in TAS (2017) (MOD 3 EA), as the ramp up in coal production in practice was slower than anticipated. This was due to a number of factors, including a longer than anticipated construction period for the CHPP.

Site diesel emissions are similar between the TAS (2017) estimates and actual consumption rate (Tables 17 and 18) and the oil and grease consumption were materially less than predicted in the TAS (2017) assessment.

It is noted that the delay in commissioning of the CHPP necessarily altered the sequence of mining to prioritise coals that could be sold as a CHPP bypass product, and this contributed to lower mining efficiency, and hence may have contributed to more diesel consumption per ROM tonne.

For an open cut coal mine, the predicted fugitive greenhouse gas emissions are calculated by multiplying the estimated ROM coal production by an emissions factor.

The MOD 3 EA predicted fugitive greenhouse gas emissions using a site-specific average emissions factor of 0.012 tonnes of carbon dioxide equivalent per ROM tonne of coal (tCO₂-e/ROM t) (Rio Tinto Coal Australia Pty Limited, 2012).

This emissions factor was derived from data collected from some 13 gas-content boreholes completed by the former owner of the project (two gas holes drilled in 2006, seven in 2010 and four holes in the adjacent Bengalla Mine) (Rio Tinto Coal Australia Pty Limited, 2012). It is noted that this estimate was based on a methane Global Warming Potentials (GWP) of 21, which was the relevant warming potential adopted at that time.

In accordance with *Method 1 National Greenhouse and Energy Reporting (Measurement) Determination 2008*, the fugitive greenhouse gas emissions reported by the MPO via NGERs were estimated using default emission factors from the National Greenhouse Accounts Factors (NGA Factors). MACH Energy is undertaking additional drilling and gas analysis to enable a transition to Method 2 reporting.

For open cut coal mines in NSW, the default emission factor was 0.054 (tCO₂-e/ROM t) in the NGA Factors 2015 to 2019 and was increased to 0.061 (tCO₂-e/ROM t) in the NGA Factors 2020. These NGA default factors are significantly higher than the site-specific factor (i.e. 0.012 tCO₂-e/ROM t) calculated by Rio Tinto in 2012, and used in TAS 2017. The base data supporting the site-specific factor is being reviewed and additional data is being acquired to refine the estimate.

Table 17
MPO Emissions Summary Financial Year 2021

Financial Year	ROM (t)	Diesel Consumption (kL)	Fuel Oil/Petroleum Based Oils and Greases Consumption (kL)	Fugitive Scope 1 emissions (t CO ₂ -e)	Diesel Scope 1 emissions (t CO ₂ -e)	Fuel Oil/Petroleum Based Oils and Greases Scope 1 emissions (t CO ₂ -e)
2021	9,563,149	34,151	708	583,352 ¹	92,540	329

Note:

t = tonnes; kL = kilolitres and tCO₂-e = tonne of Carbon Dioxide equivalent.

¹ Fugitive emission factor was 0.061 (NGA Factors, 2020).

Table 18
MOD 3 Predictions Emissions Summary 2020 and 2021

MOD 3 EA Prediction Year	ROM (t)	Diesel Consumption (kL)	Fuel Oil/Petroleum Based Oils and Greases Consumption (kL)	Fugitive Scope 1 emissions (t CO ₂ -e)	Diesel Scope 1 emissions (t CO ₂ -e)	Fuel Oil/Petroleum Based Oils and Greases Scope 1 emissions (t CO ₂ -e)
2020	10,500,001	24,578	1,090	126,000 ¹	66,883	3,194
2021	10,500,000	31,279	1,387	126,000 ¹	85,120	4,065

Note:

¹ Fugitive emission factor was 0.012, calculated inclusive of a GWP for methane of 21 (Rio Tinto Coal Australia Pty Limited, 2012).

The differences in the fugitive emission estimates between TAS (2017) and MACH's NGERS reporting arise primarily due to differing methodologies and associated emission factors being employed under the differing regulatory systems (i.e. NGERS reporting under the *Commonwealth National Greenhouse and Energy Reporting Act 2007* using NGA default emission factors, and environmental assessment under the NSW *Environmental Planning and Assessment Act 1979* using site-specific emissions data), plus periodic revisions to the GWP of methane, which is a large component of the fugitive emissions from coal mines.

Independent Air Quality Reviews

Two independent air quality reviews were completed by DPE and air quality technical expert Jacobs for 7 Sheppard Avenue, Muswellbrook and 10 Racecourse Road, Muswellbrook during the reporting period, following a request from a private landowner under Condition 3, Schedule 4 of Development Consent DA 92/97 (request received on 17 May 2019).

The independent air quality reviews were determined to be warranted by DPE in June 2019 and reporting was finalised in July 2021. The MPO was included in these reviews along with the neighbouring mining operations, including Mt Arthur Mine and the Bengalla Mine. Both independent reviews analysed five years of air quality monitoring data (including PM₁₀, PM_{2.5}, TSP and deposited dust) and meteorological data to assess compliance against the relevant development consent conditions. Additional PM₁₀ and PM_{2.5} monitoring was also undertaken to satisfy the independent review requirements and to verify the outcomes determined from the analysis of historical data.

Both independent reviews concluded that the MPO was fully compliant with the relevant air quality criteria (Condition 20, Schedule 3 of Development Consent DA 92/97).

5.4.4 Implemented or Proposed Management Actions

In accordance with Conditions O3.4 and O3.5 of EPL 20850, all dust generating activities at the MPO must be ceased when specific adverse conditions are identified at the on-site meteorological station and/or at the Muswellbrook NW Upper Hunter Air Quality Monitoring Network monitor.

No discontinuation of dust generating activities in accordance with Conditions O3.4 and O3.5 of EPL 20850 occurred during 2021. Operations were ceased on several other occasions in response to the generation of visible dust, for a total of 13 hours across the mining fleet. The reduction in these hours compared to the previous reporting period was due to the above average rainfall received during the reporting period.

All appropriate steps to reduce dust generation were undertaken in accordance with the MPO AQGGMP, consistent with Condition 20, Schedule 3 of Development Consent DA 92/97. MACH Energy will continue to implement these dust mitigation measures.

Per the 2020 IEA recommendations, analysis of air quality results was undertaken by a third-party specialist and is provided in Appendix D.

5.5 BIODIVERSITY

A BioMP was prepared by MACH Energy in accordance with Condition 32, Schedule 3 of Development Consent DA 92/97 and approved on 14 January 2019.

5.5.1 Approval Criteria and Management Plan Requirements

MACH Energy implements biodiversity management actions in accordance with the approved BioMP. In order to ensure appropriate management actions are applied, and to evaluate the vegetation and fauna habitat condition at the MPO, the BioMP implements a Biodiversity Monitoring Program. The program includes the following components:

- tree clearing supervision;
- fauna relocation / spotter catcher;
- weed monitoring;
- vertebrate pest monitoring;
- monitoring of access; and
- rehabilitation monitoring.

5.5.2 Implemented or Proposed Management Actions

In 2021, the following biodiversity related management actions were undertaken:

- Weed control measures carried out by Enright Land Management and other contractors on various properties within MPO and adjoining properties. Weeds found on the properties were sprayed or manually removed. These included *Galenia Pubescens*, Saffron Thistle, Mother of Millions, Fat Hen and White Goosefoot.
- Pest control measures implemented by Enright Land Management and other contractors on various properties within the MPO and adjoining properties. These included wild dog and feral pig baiting.
- Pre-clearance surveys undertaken by MACH Energy Environmental Advisor and/or an ecologist consultant including:
 - surveys for the ongoing mining operation;
 - surveys for the MOD 4 construction works areas; and
 - surveys undertaken prior to disturbance as part of all Ground Disturbance Permits (GDPs) throughout 2021.
- Clearing supervision was undertaken by a MACH Energy Environmental Advisor and/or an ecologist consultant, which included fauna management (i.e. spotter catching) and habitat tree felling supervision.
- No threatened fauna species were recorded during clearing activities.
- A Tiger Orchid (*Cymbidium canaliculatum*) translocation program was undertaken in 2021 and included the relocation of three Tiger Orchids from the Fines Emplacement Stage 1 Lift area (Narla Environmental, 2021).
- The annual Tiger Orchid monitoring program was undertaken in 2021, with no issues identified.
- Connectivity planting between the site rehabilitation and the Hunter River riparian zone vegetation was undertaken.
- Annual, bi-annual and regular monitoring was carried out by MACH Energy.

5.6 HERITAGE

MACH Energy manages Aboriginal heritage on-site in accordance with Aboriginal Heritage Impact Permits (AHIPs) (i.e. AHIPs #C0002053, #C0002092 and #C0004783) issued by the Heritage NSW within the NSW Department of Premier and Cabinet, and in accordance with the approved AHMP, prepared in accordance with Condition 36, Schedule 3 of Development Consent DA 92/97.

5.6.1 Approval Criteria and Management Plan Requirements

During the reporting period, all Aboriginal heritage management activities were carried out in accordance with the AHMP. The AHMP contains a range of management measures related to recording and surface collection, archaeological excavation, artefact analysis, artefact management, archaeological salvage, archaeological monitoring, and an Aboriginal conservation strategy.

5.6.2 Implemented or Proposed Management Actions

During the reporting period, the following on-ground management measures relevant to heritage (Aboriginal and historic heritage) were undertaken at the MPO:

- Surface salvage collection for Aboriginal artefacts within AHIP #C0002053 and AHIP #C0002092 area were undertaken in June, July and August 2021.
- The following Aboriginal Objects Due Diligence Assessments were undertaken:
 - Assessments for the MOD 4 infrastructure undertaken by Niche Environment and Heritage (Niche) in July and August 2021.
 - Assessment for the proposed demolition of Belgrave Homesteads undertaken by Niche in August 2021.
- The annual meeting with Registered Aboriginal Parties (RAPs) was undertaken to provide a general update on the management of Aboriginal heritage in May 2021.
- Annual inspection of cultural heritage sites in November 2021.
- Ongoing progression of suitable arrangements to provide appropriate long-term security for the Aboriginal Heritage Conservation Area (Area A).
- Ongoing progression of suitable arrangements to provide appropriate long-term security for the Aboriginal Heritage Conservation Area (Areas B and C), including liaison with Heritage NSW and the RAPs for an alternative artefact keeping place and proposing Aboriginal Cultural Heritage survey of select biodiversity offset areas to potentially identify alternatives.
- Ongoing conservation management works at the Negoa Homestead including structural works and removal of non-heritage components.
- Ongoing update of the MPO Aboriginal Site Database and Geographic Information System (GIS) data.

During the next reporting period, MACH Energy anticipates undertaking the following heritage works:

- Annual inspection of cultural heritage sites.
- Ongoing surface salvages as required.
- Continue to progress appropriate long-term security for the Aboriginal Heritage Conservation Area (Area A).
- Continuation of consultation regarding the Aboriginal Heritage Conservation Areas B and C.

- Continue to undertake appropriate conservation management works at the Negoa Homestead.
- Cultural Cool Burn in partnership with the Rural Fire Service and the Firestick Alliance (dependent on burn conditions).

5.7 EXPLORATION

MACH Energy commenced a pre-production drilling program in November 2021 within the proposed three-year mining footprint, with 8 boreholes being drilled in ML 1645 and ML 1709 during the reporting period. This program was significantly delayed due to the pandemic. Drilling was undertaken using the water injection method, which generates minimal dust and noise emissions. The boreholes were located within the open cut/overburden emplacement area footprint and involved open hole (non-core) drilling. The pre-production drilling program will continue in the next reporting period.

5.8 WASTE

Operational waste data was collected during the reporting period by the waste contractor and is presented in Table 19. A waste tyre in-pit burial campaign was undertaken in January 2021 and October 2021 with approximately 40 tyres disposed of in Pit B, 55 tyres disposed of in Pit D and 39 tyres utilised around on-site laydown areas. All waste tyres were disposed in accordance with Condition O6 of EPL 20850. Some waste tyres were used at in pit laydown areas for vehicle stationing and at 'Go-line'.

All waste levels have remained generally consistent between 2020 and 2021.

The WasteMP contains management measures on waste storage, segregation, transport and disposal, as well as provisions for waste monitoring. The latest version of the WasteMP was approved by DPE on 14 January 2019.

The Fines Emplacement Area Review was undertaken in 2021 as per the approved Waste MP. The review found that the implementation of the adopted fine rejects emplacement strategy based on hydraulic transport and deposition into the current FEA has been broadly effective. Currently, it is not feasible to undertake an in-pit fines emplacement area nor to use mechanical dewatering to support the co-disposal of tailings with coarse rejects. However, it was recommended that MACH Energy consider additional dewatering with any subsequent CHPP upgrades (ATC Williams, 2021).

5.9 TOPSOIL MANAGEMENT

During the reporting period, topsoil stockpiles were located adjacent to active disturbance areas and areas to be rehabilitated, as shown on Figure 6. A total of approximately 2,629,032 cubic metres (m³) of topsoil was stored in stockpiles during the reporting period. This, in accordance with the MOP, is approximately 394,298 m³ ahead of topsoil budgeted for the end of the MOP Period (30 June 2023). A topsoil register with individual volumes for each stockpile is kept and maintained on-site.

Topsoil was stripped ahead of disturbance activities and where possible, placed onto rehabilitation areas immediately. Where it was impractical to respread topsoil immediately it was stockpiled, and sign posted. The stockpiles were then shaped, ripped and direct seeded with a species mix containing sterile pasture species, native grass and shrub tree seed to maintain seed reserves and microbial soil associations.

During the reporting period, MACH Energy continued the topsoil stockpile research trial that aims to assess the effectiveness of the MPO's 'Soil Stockpile Management' practices and the 'Soil Replacement on Rehabilitation Areas' practices as outlined in the MPO MOP. The overarching aim for soil stockpile management at the MPO is to maintain soil viability, seed reserves and microbial soil associations to assist successful rehabilitation outcomes at the MPO.

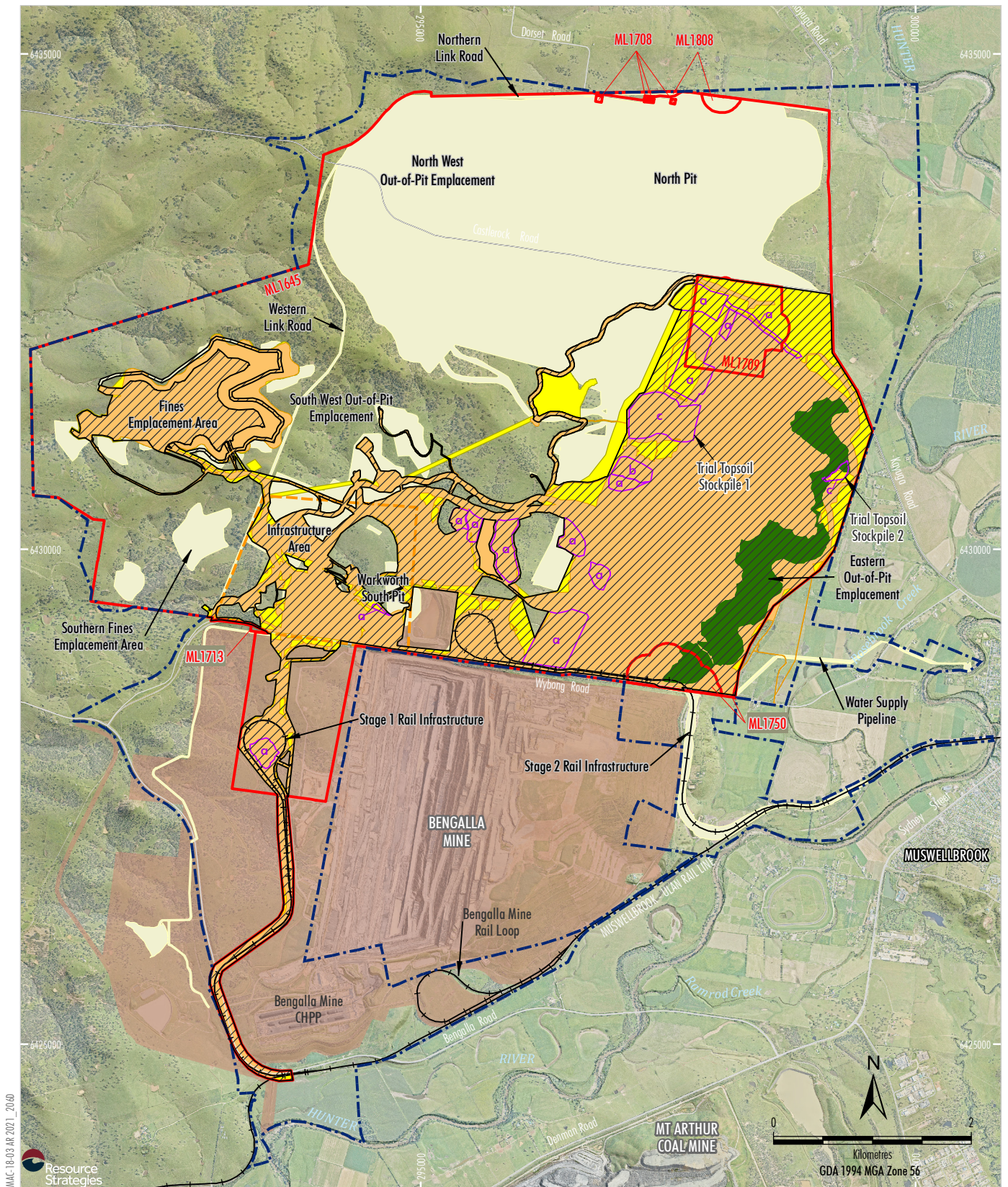
Table 19
MPO Waste Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
General Waste (t)	22.41	12.96	25.81	17.14	17.56	19.70	14.58	18.66	18.95	17.41	23.26	16.95	225.37
ACM ¹ (t)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recycled Waste (t)	39.71	21.14	25.09	85.35	25.65	16.80	31.80	31.04	36.03	24.87	23.68	41.37	402.51
Liquid Effluent (kL)	56.00	71.10	56.00	68.40	97.60	170.50	149.50	162.50	116.55	243.00	117.20	115.00	1423.35

Note:

t = tonnes; kL = kilolitres.

¹ Asbestos is managed in accordance with an internal Asbestos Control Plan. All asbestos removal work is handled with appropriate respiratory protective equipment and is supervised by a competent person approved by SafeWork NSW. Asbestos is transported off-site and disposed of at a lawful disposal facility licensed by EPA.



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Topsoil Stockpile Locations

Figure 6

MACH Energy has engaged the University of Newcastle to design and undertake the topsoil stockpile trial. The trial involves microbial sampling and soil testing at two 5 m high Trial Topsoil Stockpile's (refer Trial Topsoil Stockpiles 1 and 2 on Figure 6) and at six other 3 m high control topsoil stockpiles. The study involves a comparison of the results from 5 m high trial stockpiles against the results from the 3 m high control stockpiles. The results from the trial will be used to inform soil stockpile management practices at the MPO and improve the soil ecosystem on MPO rehabilitation areas.

Microbial and soil sampling and analysis has commenced for four control 3 m high soil stockpiles, one 5 m high Trial Topsoil Stockpile, and a recently stripped site. Topsoil stockpiles were sampled using hammer and core method (except recently stripped site which was bulk sampled). Sampled stockpile depth ranged from 1 m to greater than five meters during the sampling. The late 2021 sampling rounds are awaiting results from the laboratory.

The 2021 results of the topsoil stockpile research trial indicate that the sampled stockpiles are generally low in nutrients, however total soil nutrient parameters are within standard agricultural reference ranges. Soil structural results generally indicate poor soil structure within the control stockpiles sampled and lower soil indicators compared to the undisturbed reference sites. However, there is a large degree of confidence that these will improve as the vegetation cover increases. Significant differences in the soil indicators between the 3 m high soil stockpiles and the 5 m high Trial Topsoil Stockpile are not yet clear based on the data collected thus far and as such conclusions cannot be made. At time of reporting the preliminary data indicates that there is a relationship between depth of topsoil stockpiled and soil health. The topsoil stockpile trial will continue during the next reporting period.

The results from the 2021 sampling and additional 2022 sampling rounds are expected to be available in the next reporting period.

5.10 VISUAL AMENITY AND LIGHTING

A VIMP was prepared by MACH Energy in accordance with Condition 47, Schedule 3 of Development Consent DA 92/97 and approved on 31 October 2019.

The VIMP describes MACH Energy's management approach to minimising visual amenity and lighting impacts on surrounding receivers.

Visual landscaping activities were undertaken during the reporting period. These included:

- tree planting of over 10,000 trees in the following areas:
 - tree screen infill planting along key roads with views of the MPO such as Kayuga and Wybong Roads;
 - tree planting along the main MPO site entrance, access road, operations office carpark and infrastructure areas;
 - tree planting along the eastern portion of ML 1645; and
 - tree planting along the Hunter River fauna connectivity area;
- implementation of visual bunding/tree screen planting along the CHPP road on the western edge of the ROM coal storage area;
- continued extension of visual barrier fencing along Wybong Road adjacent to the CHPP; and
- general maintenance of the abovementioned areas.

Targets for visual landscaping growth and survival rates were achieved for 2021 as a result increased rainfall. However, in some areas, the abundance of weeds had an impact on survival rates. During the reporting period, contractors were employed to undertake maintenance of visual landscaping including weeding, slashing, and re-tying more mature trees that are exposed to wind (near the entrance to the Mining Infrastructure Area) to stakes.

During the reporting period, MACH Energy commissioned an external consultant to undertake lighting audits as part of the commissioning of the MOD 4 rail. The VIMP will be updated to incorporate the outcomes of the final lighting audit during the next reporting period.

Consistent with the previous reporting period, a total of 16 visual-related complaints were received by MACH Energy during 2021 (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>). In response to each complaint, an investigation was triggered. Following the investigation, the ERM made further contact with the complainant to provide an update on how MACH Energy has addressed the issue of the complaint.

5.11 CONTAMINATED LAND

No contaminated land was found during the reporting period.

5.12 SPONTANEOUS COMBUSTION MANAGEMENT

Inspections of coal stockpiles for spontaneous combustion were undertaken regularly. There was one reportable spontaneous combustion event at the MPO during the reporting period.

The first spontaneous combustion event occurred in the Pit A dump system on 26 February 2021. The area was continually inspected, with dozers tasked to cover the heated material. The area has since been covered and the event eliminated.

A total of four complaints that mentioned spontaneous combustion were received by MACH Energy during 2021 (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>). No spontaneous combustion complaints were received in the previous reporting period. In response to each complaint, an investigation was triggered. Following the investigation, the ERM made further contact with the complainant to provide an update on how MACH Energy has addressed the issue of the complaint.

5.13 GEOCHEMISTRY

MACH Energy undertook Acid Mine Drainage (AMD) test assessment works during the reporting period. The testing program supported the results of the geochemical characterisation completed at the MPO during 2020 (RGS, 2020), which indicated that most samples representing overburden and interburden materials were classified as Non-Acid Forming (NAF) materials. The materials represented by these samples were confirmed to have a low risk of generating AMD (Klohn Crippen Berger [KCB], 2021). Consistent with the known depositional environment, the occurrence of Potentially Acid Forming (PAF) material was limited to the Bayswater-Wynn interburden (Archerfield Sandstone), Wynn interburden (roof, floor and parting) and coarse rejects derived from processing the Wynn seam (KCB, 2021).

The test assessment works will be continued during the next reporting period.

In 2021, the following management actions were undertaken:

- Covering PAF interburden material with NAF waste material within timeframes determined by the relative reactivity of the material.
- Ensuring that PAF material is not emplaced within 10 m of the outer surface of the final landform by maintaining two separate types of waste emplacement areas (Unrestricted emplacement areas and NAF Only areas).
- Regularly reviewing the designation between the Unrestricted and NAF Only emplacement areas within the waste rock emplacement (the “PAF line”).
- Periodically adjusting the “PAF line” based on the latest geomorphic landform designs to maintain a minimum of 10 m of NAF cover over Unrestricted waste disposal areas.

6 WATER MANAGEMENT

A WMP was prepared by MACH Energy in accordance with Condition 28, Schedule 3 of Development Consent DA 92/97 and approved on 31 October 2019.

The WMP includes the following monitoring network (Figure 7):

- 17 surface water monitoring locations (W1 – W17);
- nine stream health monitoring locations (HR1 – HR6, DB, MC and SC); and
- groundwater monitoring bores covering all major hydrogeological units.

Mining activities and MOD 4 construction activities in 2021 were undertaken in accordance with the erosion and sediment control provisions of the approved WMP and CEMP.

There were no water discharges from the MPO in 2021. Any future discharges of mine water will be undertaken in accordance with Development Consent DA 92/97 (Condition 26, Schedule 3), Development Consent SSD-5170 (i.e. Bengalla Mine's Development Consent) and EPL 20850.

6.1 SURFACE WATER

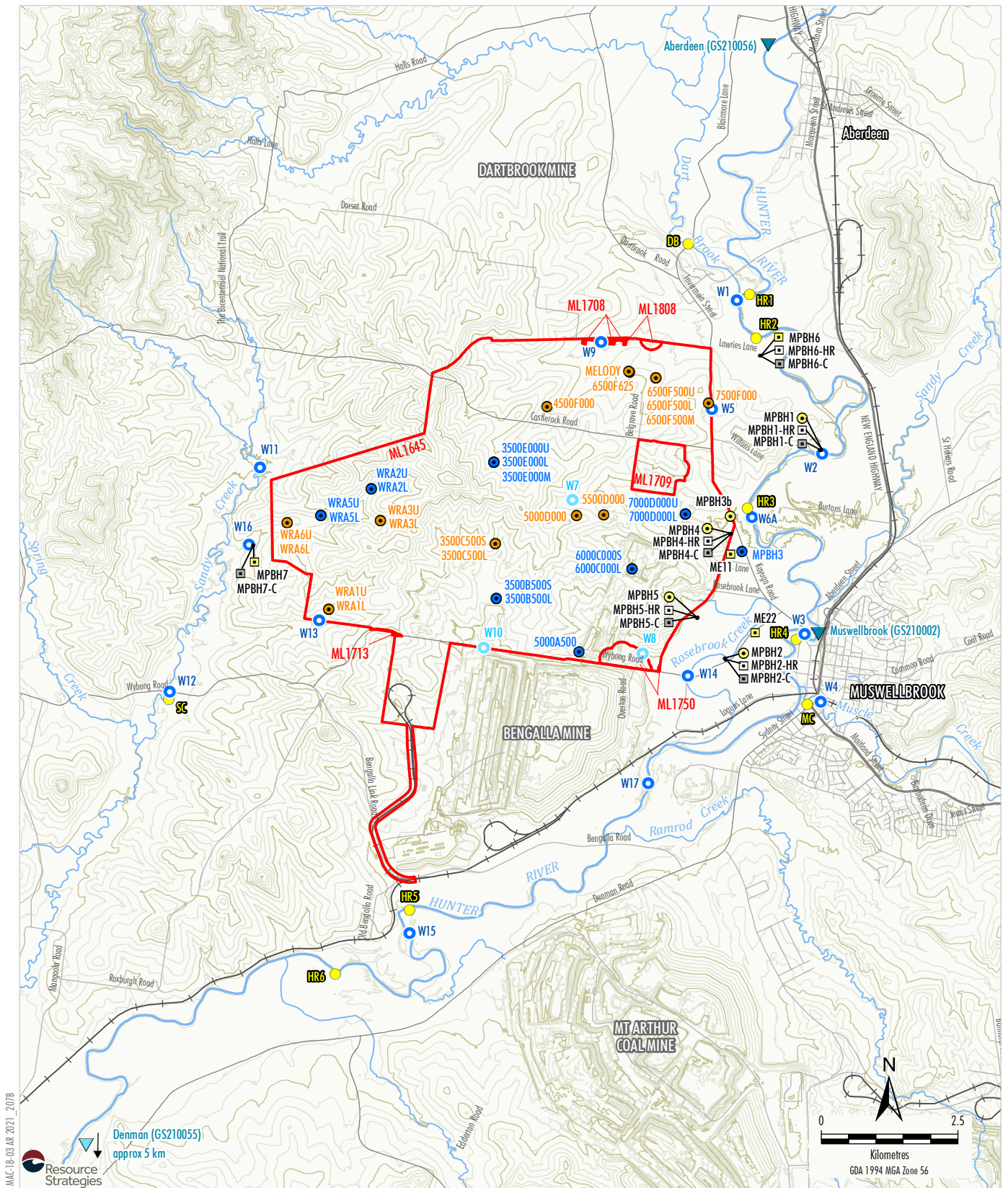
6.1.1 Approval Criteria

Surface Water Quality

Surface water monitoring is undertaken monthly and/or event based at 17 locations (Figure 7) for pH, EC, Total Suspended Solids (TSS) and total dissolved solids (TDS). Water samples are also collected quarterly at these sites for laboratory analysis. Monitoring at sites W7 and W8 have been discontinued due to being disturbed by mining activities. Monitoring at site W10 has been discontinued as the site is located on Dry Creek directly downstream of the Bengalla Mine Dry Creek Diversion Project.

Establishment of the baseline conditions of key watercourses prior to the commencement of coal extraction was undertaken through surface water monitoring. Monitoring data has been reviewed against site-specific surface water quality triggers, developed using the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand [ANZECC & ARMICANZ], 2000).

Trigger levels have not been established for sites upstream of the MPO (i.e. W1 and W4) because these cannot be affected by the MPO. Sites located on the Hunter River and the unnamed drainage line (monitored adjacent to Wybong Road) (i.e. W2 and W6) contain sufficient data to develop trigger levels (with the exception of TDS trigger levels for these sites). Updated trigger levels have been proposed for sites W2 and W6 as part of the WMP update undertaken during the previous reporting period (Section 2.1). Once approved, reporting against the new trigger levels will be provided in the next Annual Review. Some sites (i.e. W5 and W9) are located on ephemeral drainage lines that are frequently dry and do not have sufficient data to develop site-specific trigger levels. ANZECC & ARMICANZ (2000) default trigger levels for these sites have been adopted, until such time as sufficient data is available to develop site-specific triggers.



Source: MACH (2022); NSW Spatial Services (2022); NSW Department of Primary Industries - Water (2016)

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MOUNT PLEASANT OPERATION
Surface Water and Groundwater
Monitoring Locations

Figure 7

- LEGEND**
- Mining Lease Boundary
 - Contour (10 m Intervals)
 - ▲ DPI Water Gauging Station
 - Surface Water Monitoring
 - Stream Health Monitoring Site
 - Surface Water Monitoring Site
 - Historical Surface Water Monitoring Site
 - Newly Established Mount Pleasant Monitoring
 - Standpipe - Coal Seam
 - Standpipe - Interburden
 - Standpipe - Alluvium
 - Mount Pleasant Monitoring
 - Standpipe
 - Standpipe - Alluvium
 - Standpipe - Historical

W17 has been assigned preliminary trigger values from the Bengalla Water Management Plan (Bengalla Mining Company [BMC], 2017). MACH Energy has established preliminary triggers at this site as it is the only site downstream of MPO's footprint on the Hunter River that is not also downstream of the Bengalla Mine footprint. MACH Energy therefore considers this site particularly important for assessing potential surface water impacts associated with the MPO (i.e. in the absence of any potential influence from Bengalla Mine).

Trigger levels for the remaining water monitoring sites (i.e. W11-W16 [Figure 7]) have been proposed as part of the WMP update undertaken during the previous reporting period (Section 2.1). Once approved, reporting against the new trigger levels will be provided in the next Annual Review. The site-specific trigger levels are listed in Table 20.

Table 20
Surface Water Quality Trigger Levels

Site	pH	EC (µS/cm)	TSS (mg/L)
	20 th – 80 th Percentile Trigger Levels	80 th Percentile Trigger Level	80 th Percentile Trigger Level
Site Specific Trigger Levels			
W2	7.8 – 8.3	539	18
W6A*	7.8 – 8.4	496	19
Default Trigger Levels[^]			
W5	6.5 – 7.5	350	-
W7	6.5 – 7.5	350	-
W9	6.5 – 7.5	350	-
Bengalla Mine Trigger Levels[#]			
W17	6.5 – 8.1	650	40

Note:

µS/cm = microSiemens per centimetre and mg/L = milligrams per litre.

* Due to safe access no longer being available at site W6, triggers developed for this site will now be used at the new monitoring location W6A, approximately 500 m downstream of W6.

[^] Default trigger levels are based on the ANZECC & ARMCANZ (2000) guideline values for upland rivers in south-east Australia. ANZECC & ARMCANZ (2000) does not provide guideline values for TSS.

[#] Preliminary trigger values have been sourced from the Bengalla Water Management Plan (BMC, 2017), which have been established from baseline data for monitoring sites adjacent to W17 (e.g. Bengalla sites W01, W02 and W03), as well as the ANZECC & ARMCANZ (2000) guideline.

Trigger levels are not regarded as assessment criteria, rather they are used as an indicator of potential impacts and to initiate investigations into the surface water quality as reported by the monitoring program.

An investigation is triggered when both:

- a water quality indicator at a downstream receiving water monitoring location is above (or outside the range of) the trigger levels for three consecutive sampling events; and
- a water quality indicator at a downstream receiving water monitoring location is above (or below in event of a trigger of the lower pH limit) the indicator of the corresponding upstream monitoring location (where such a monitoring location exists) sampled on the same day.

The majority of sites are located on ephemeral drainage lines and therefore do not regularly experience flow for sampling.

Stream Health

Stream health monitoring continued during the reporting period at six sites outlined in the WMP located on the Hunter River (HR1, HR2, HR3, HR4, HR5 and HR6), as well as three additional sites located on Sandy Creek (SC), Dart Brook (DB) and Muscle Creek (MC) (Figure 7).

Stream health is monitored bi-annually during spring and autumn using the Australian River Assessment System (AusRivAS) aquatic invertebrate monitoring protocol. In addition to the aquatic macro invertebrate sampling, monitoring also includes: fish observations, site water quality, stream condition and presence of aquatic and riparian edge plants. Two rounds of monitoring were undertaken during the reporting period, in May 2021 (autumn) and October 2021 (spring).

Trigger levels have been developed at two of the Hunter River stream health monitoring sites, as outlined in Table 21.

Table 21
Stream Health Trigger Levels

Site ID	Baseline Band of Impairment Score	Trigger Level (O/E Taxa)
Hunt 571	B	0.54
Hunt 854	A	0.84

O/E = Observed/Expected.

Should a measured O/E taxa value at a particular site deteriorate below the range for its baseline band of impairment score at two successive monitoring rounds, the stream health investigation protocol (refer to the WMP) would be initiated.

Revised stream health trigger levels and the stream health investigation protocol were proposed as part of the WMP update undertaken during the previous reporting period (Section 2.1). Once approved, reporting against the new trigger levels will be provided in the next Annual Review.

6.1.2 Performance During the Reporting Period

Surface Water Monitoring

Surface water monitoring for the reporting period has been split into three groups:

- monitoring in the Hunter River (sites W1, W2, W3, W6A, W15 and W17);
- monitoring in Sandy, Muscle and Rosebrook Creeks (sites W4, W11, W12, W13, W14 and W16); and
- monitoring in other ephemeral creeks and gullies.

When there is no data available (e.g. due to prolonged dry conditions), charts are not presented in the following sub-sections.

Additional event-based monitoring was carried out in February, March, June, November and December, resulting in multiple monitoring records instead of one (2 February and 15 February, 15 March and 22 March, 4 June and 9 June, 9 November and 22 November, and 1 December and 9 December, respectively).

Hunter River

Monitored pH values for the Hunter River monitoring sites during the reporting period are shown in Chart 11. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 pH values is provided in Chart 12.

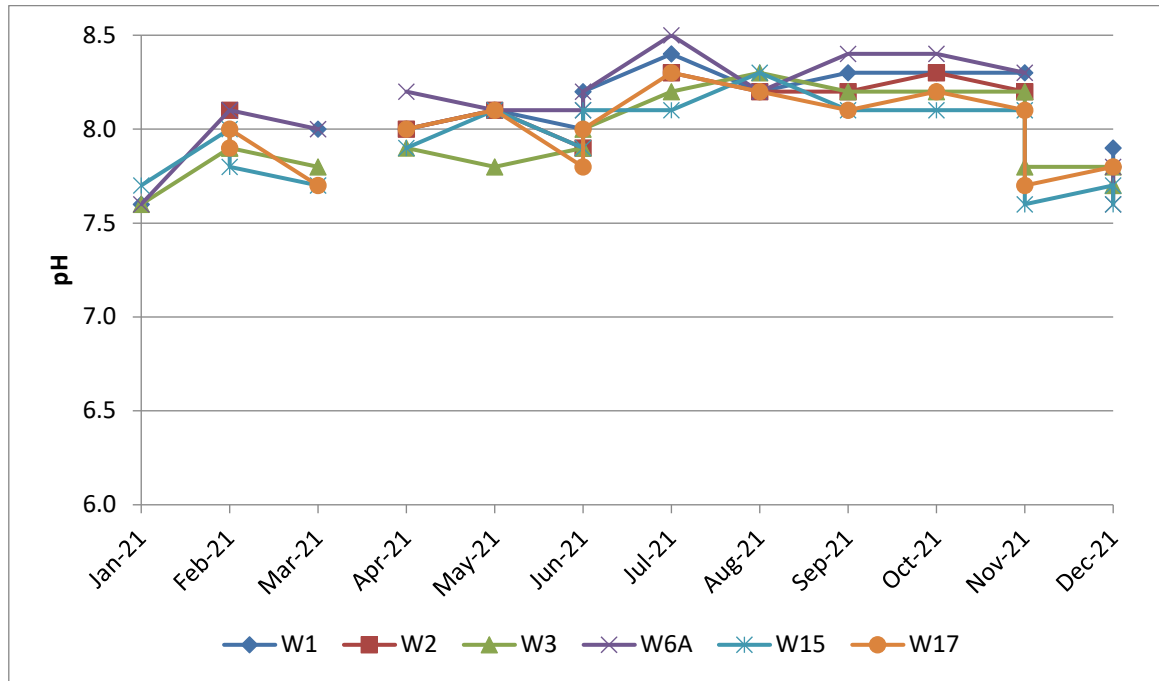


Chart 11: Hunter River pH Levels 2021

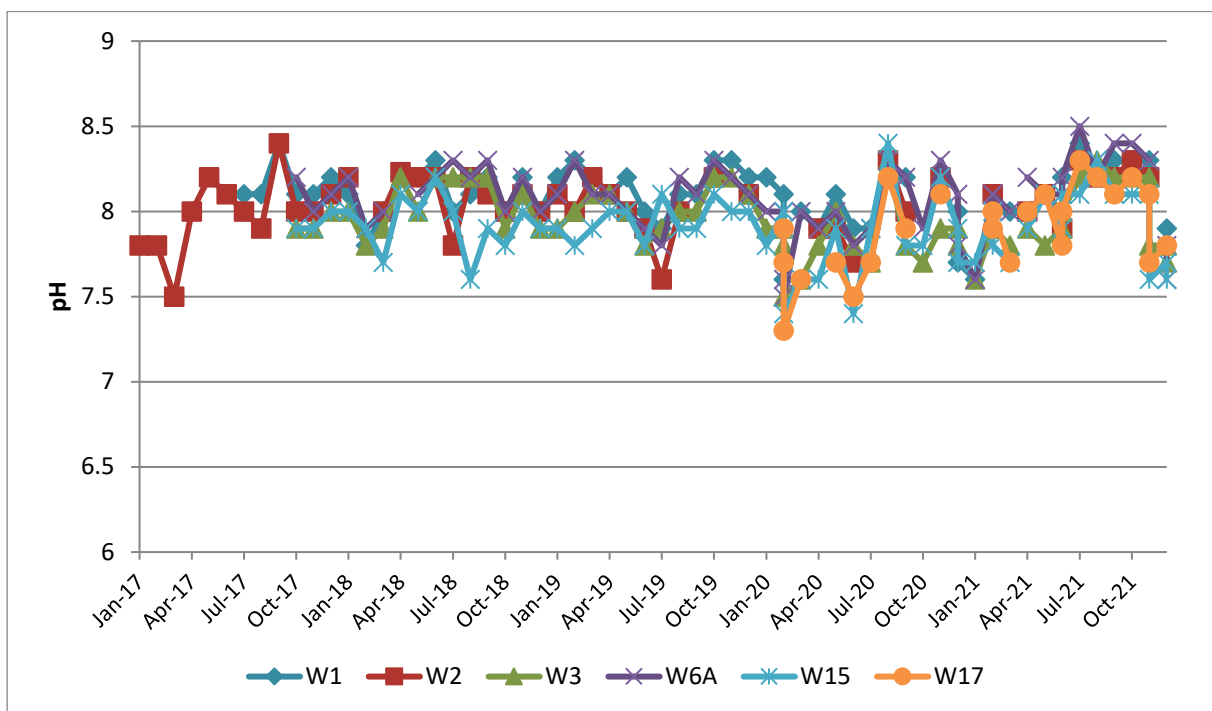


Chart 12: Hunter River pH Levels 2017 – 2021

EC values for the 2021 monitoring period are shown in Chart 13. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 EC values is provided in Chart 14.

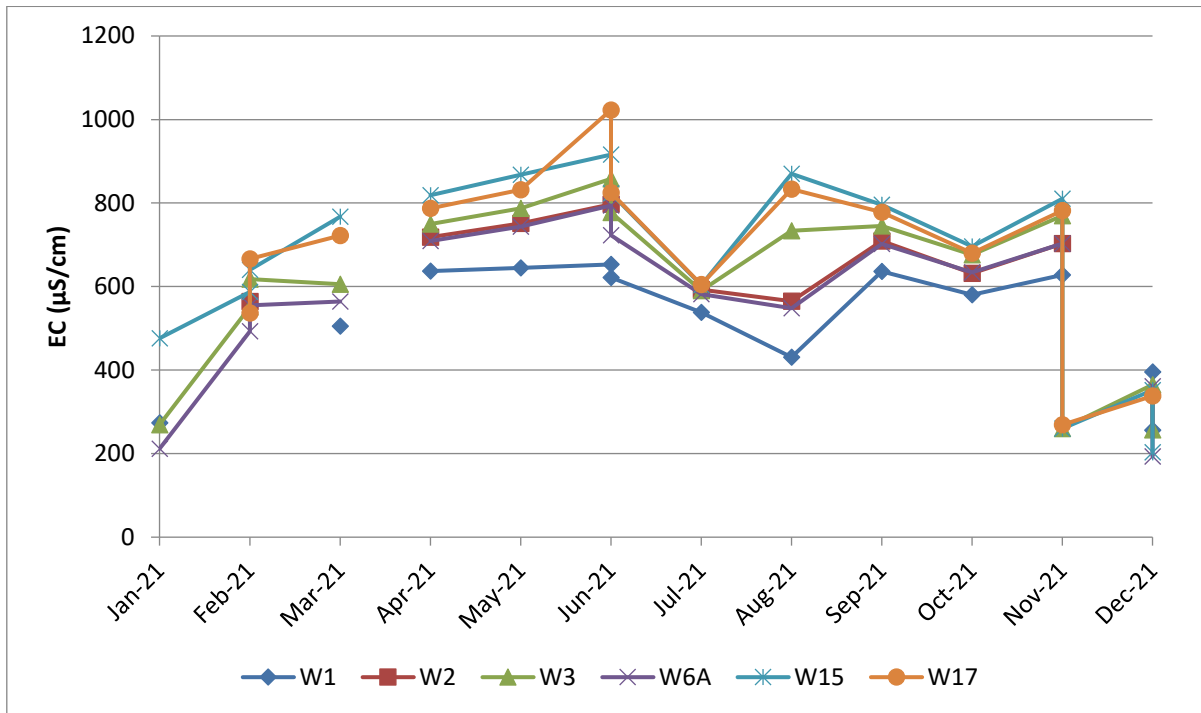


Chart 13: Hunter River EC Levels 2021

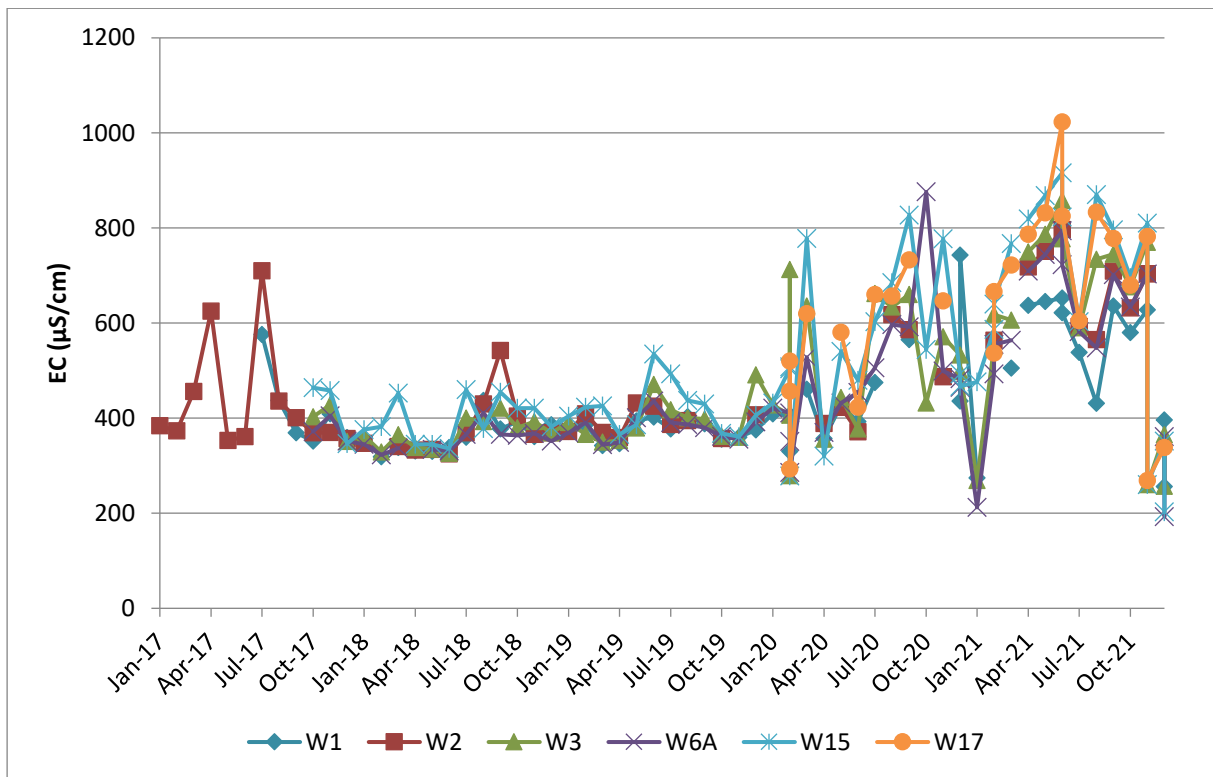


Chart 14: Hunter River EC Levels 2017 – 2021

TSS values for the 2021 monitoring period are shown in Chart 15. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 TSS values is provided in Chart 16.

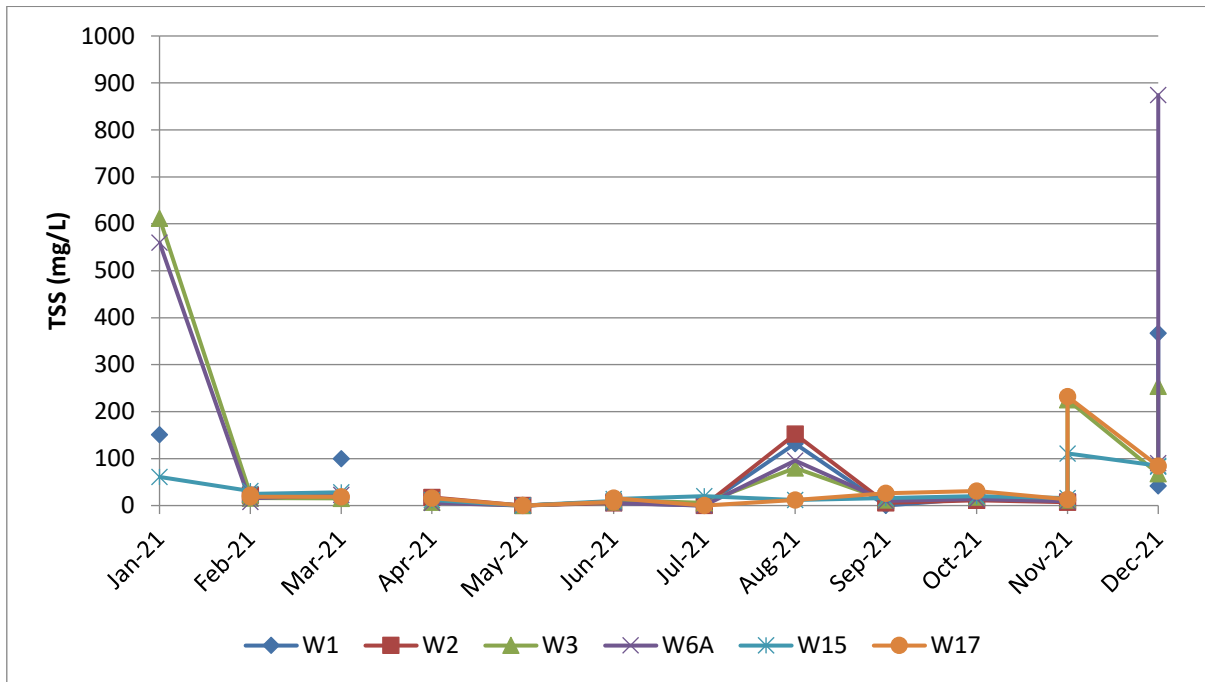


Chart 15: Hunter River TSS Levels 2021

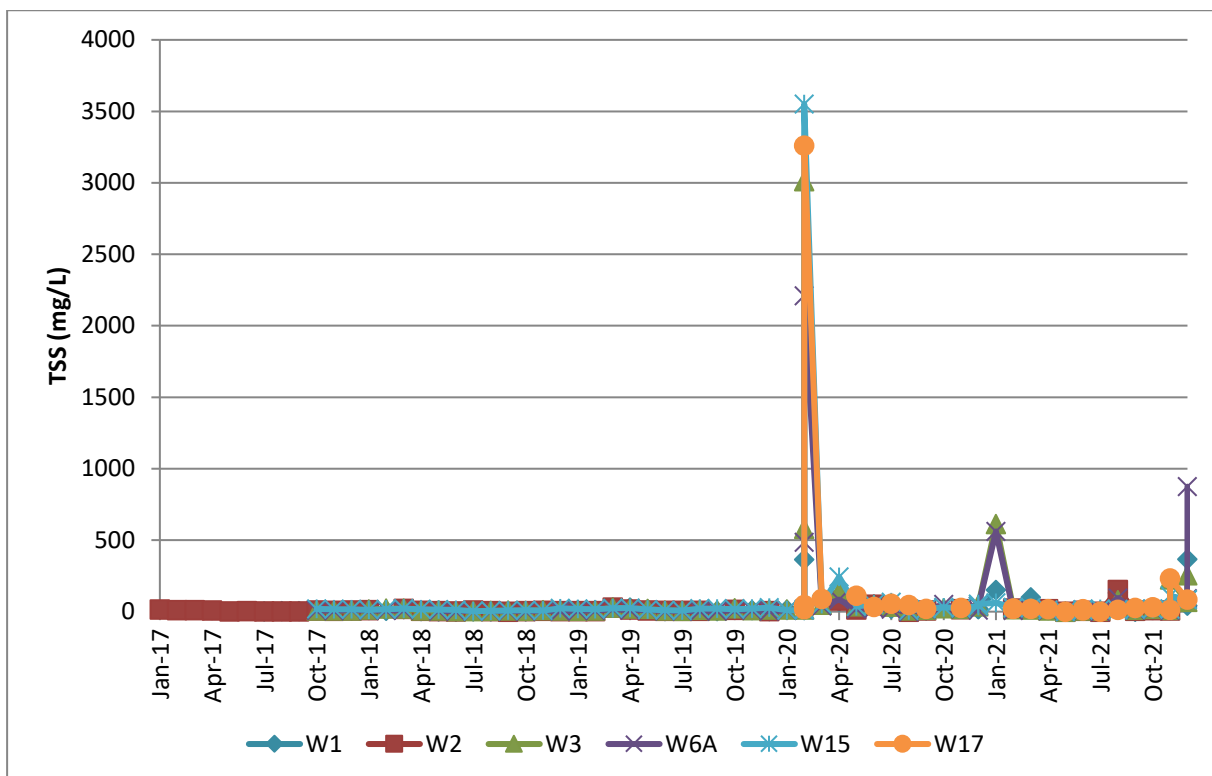


Chart 16: Hunter River TSS Levels 2017 – 2021

TDS values for the 2021 monitoring period are shown in Chart 17. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 TDS values is provided in Chart 18.

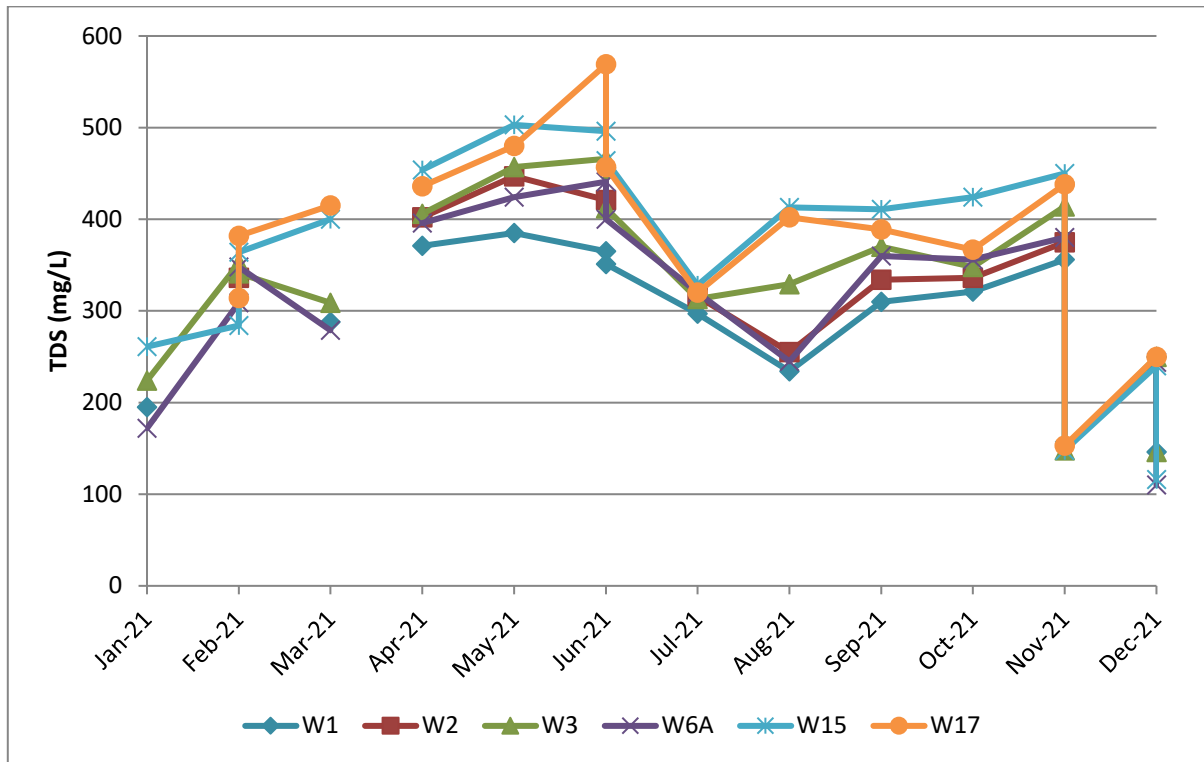


Chart 17: Hunter River TDS Levels 2021

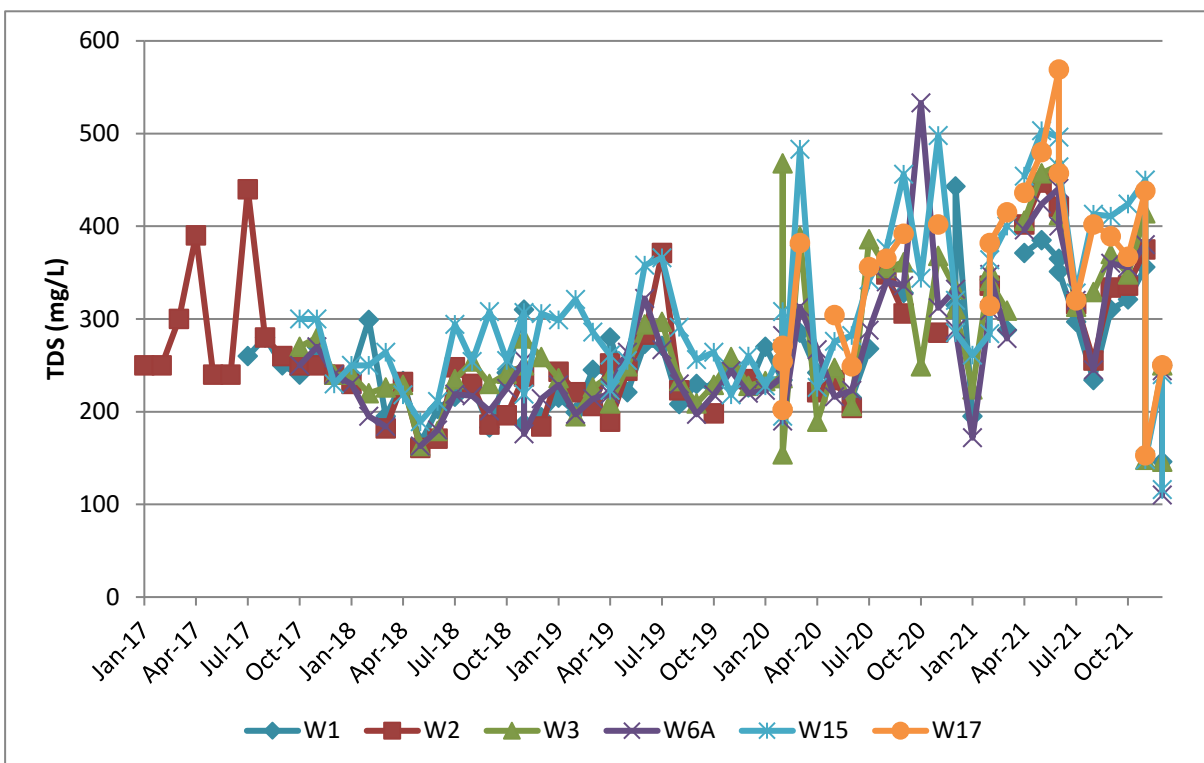


Chart 18: Hunter River TDS Levels 2017 – 2021

Sandy, Muscle and Rosebrook Creeks

Monitored pH values for the Sandy, Muscle and Rosebrook Creek monitoring sites during the reporting period are shown in Chart 19. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 pH values is provided in Chart 20.

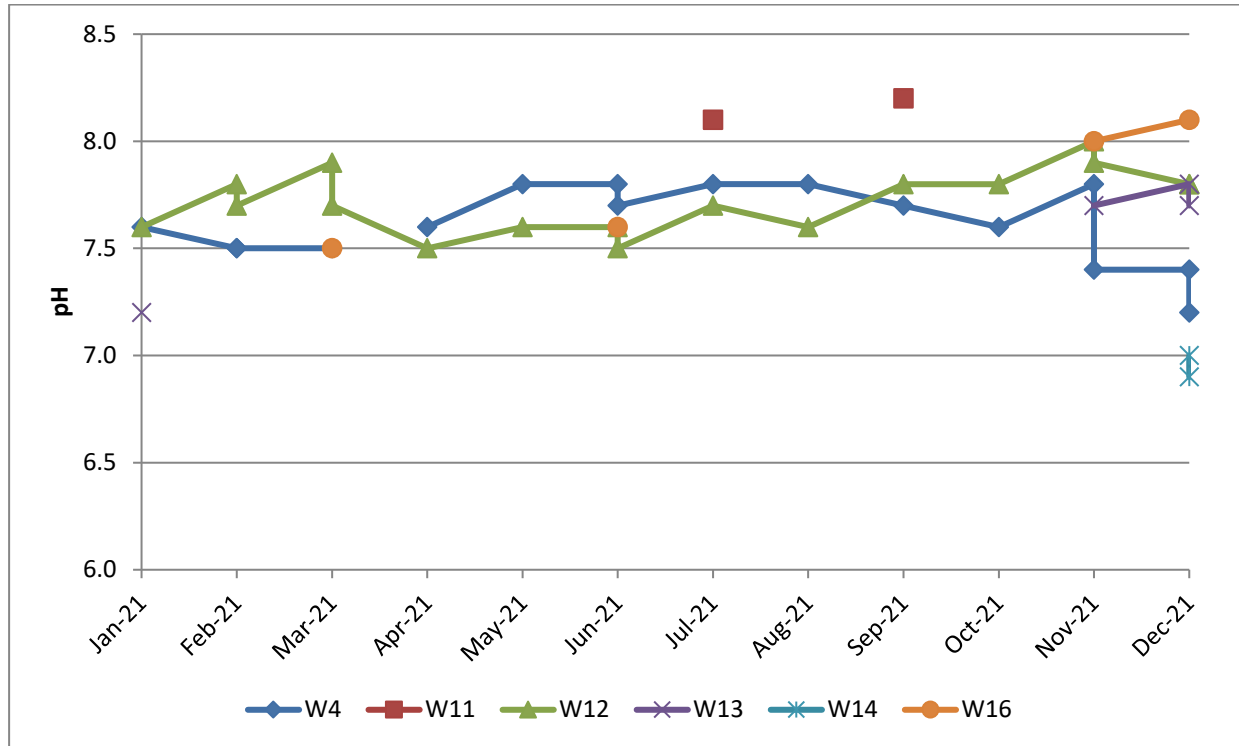


Chart 19: Sandy, Muscle and Rosebrook Creeks pH Levels 2021

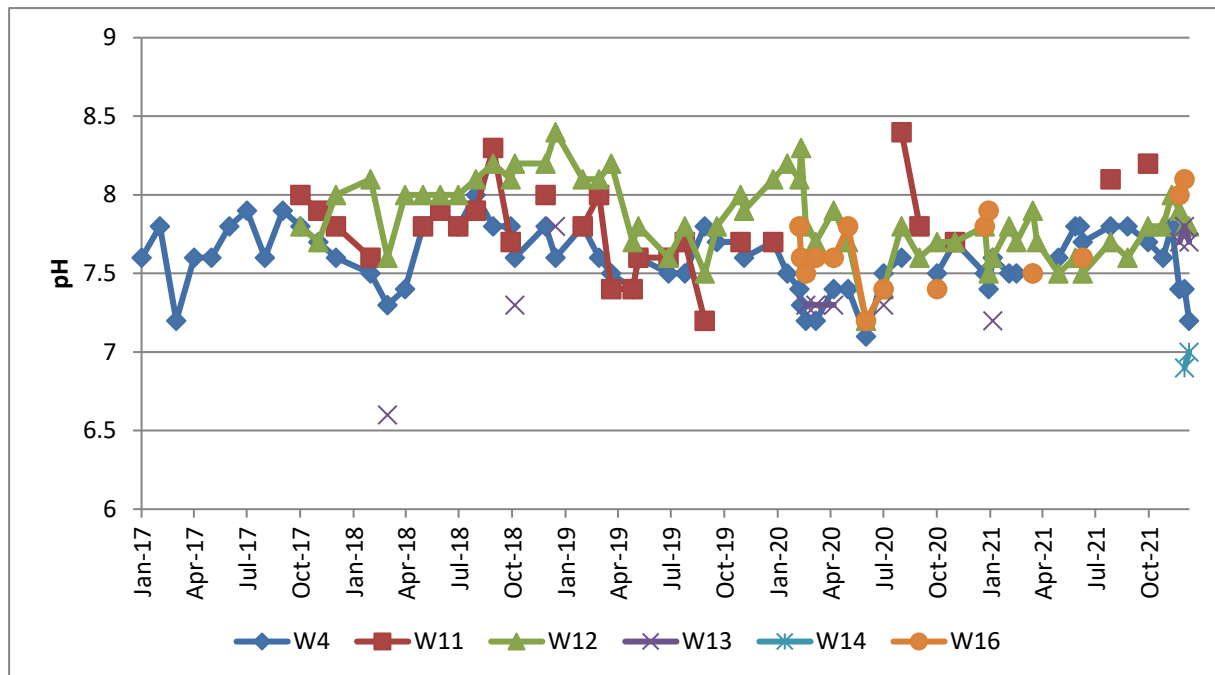


Chart 20: Sandy, Muscle and Rosebrook Creeks pH Levels 2017 – 2021

EC values for the 2021 monitoring period are shown in Chart 21. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 EC values is provided in Chart 22.

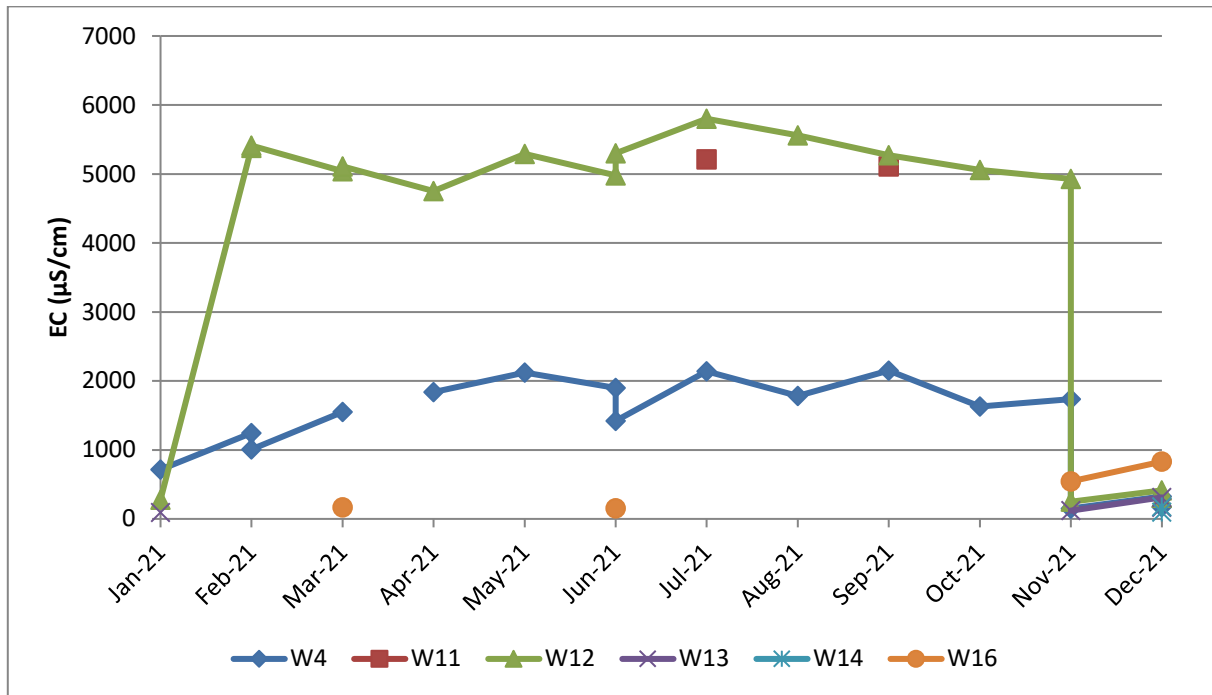


Chart 21: Sandy, Muscle and Rosebrook Creeks EC Levels 2021

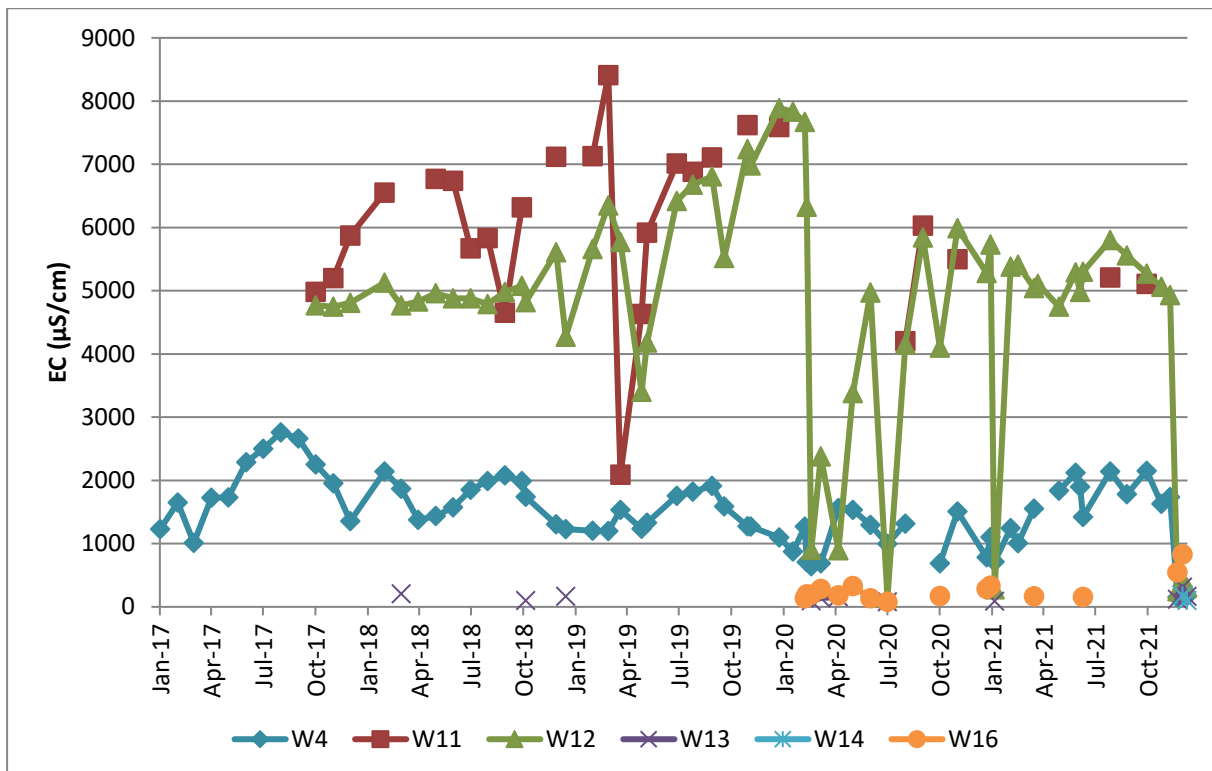


Chart 22: Sandy, Muscle and Rosebrook Creeks EC Levels 2017 – 2021

TSS values for the 2021 monitoring period are shown in Chart 23. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 TSS values is provided in Chart 24.

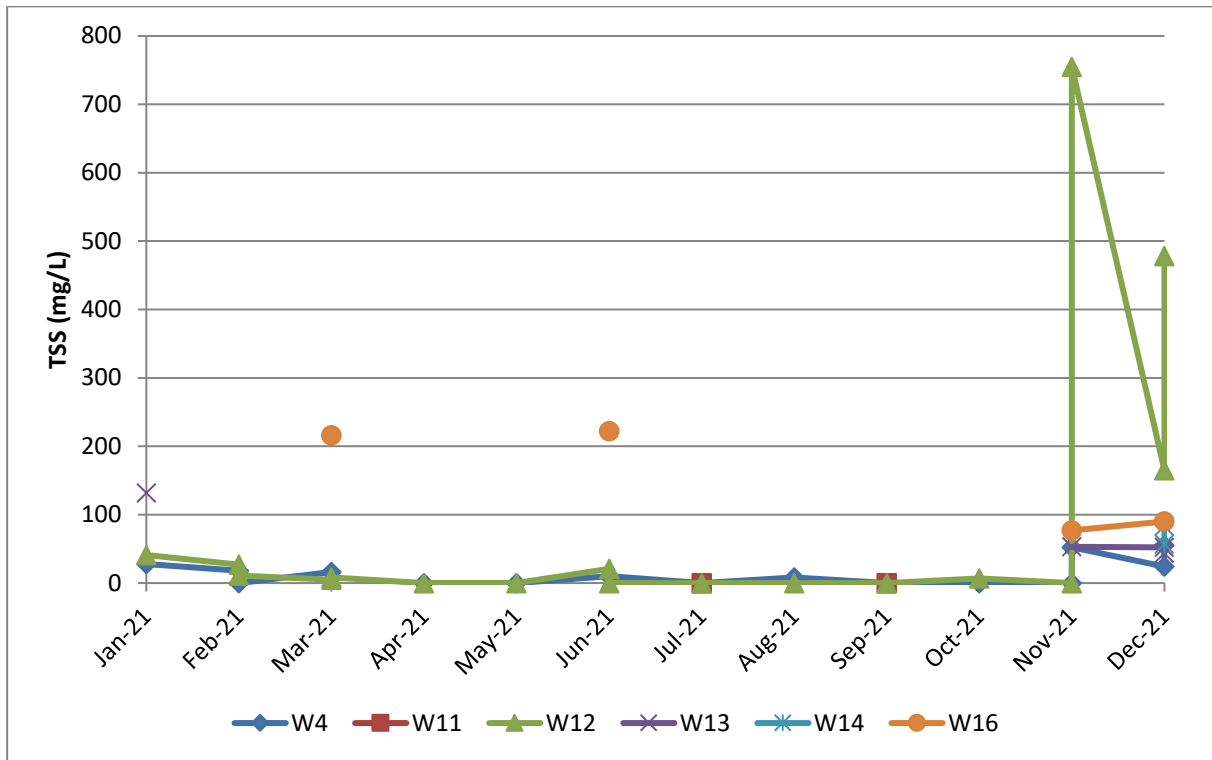


Chart 23: Sandy, Muscle and Rosebrook Creeks TSS Levels 2021

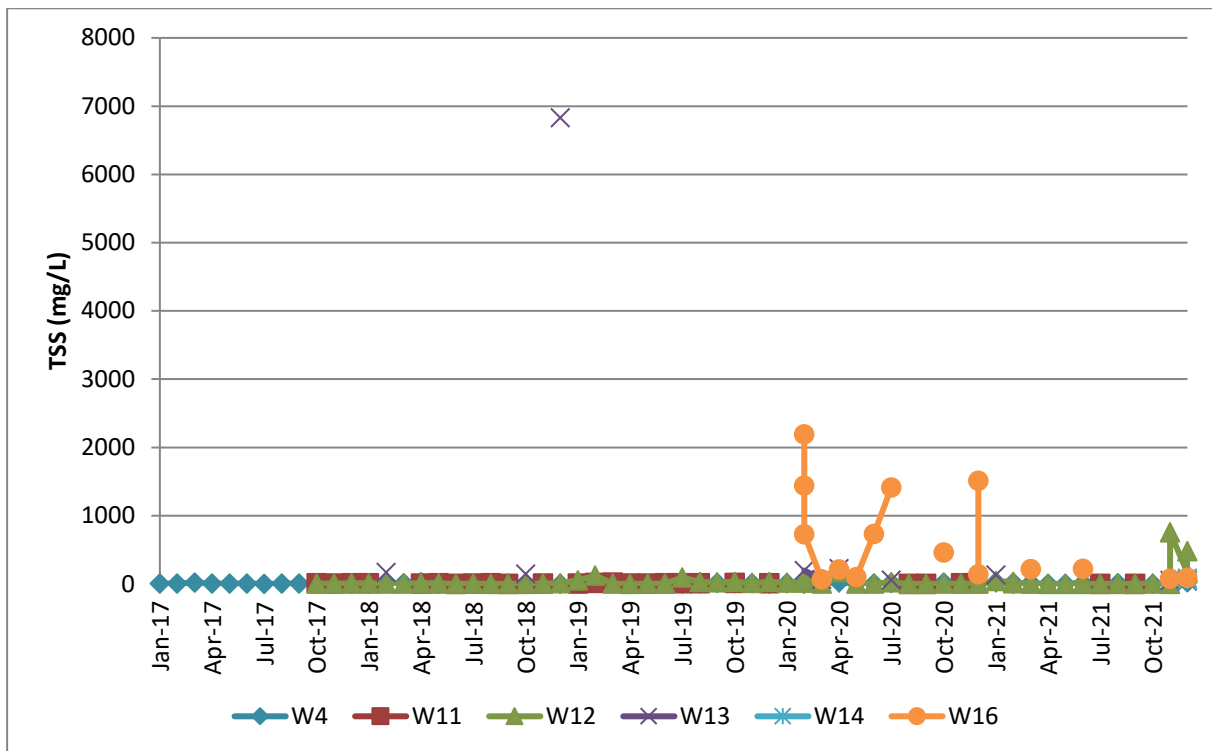


Chart 24: Sandy, Muscle and Rosebrook Creeks TSS Levels 2017 - 2021

Recorded TDS values for the 2021 monitoring period are shown in Chart 25. Additionally, a comparison between 2017, 2018, 2019, 2020 and 2021 TDS values is provided in Chart 26.

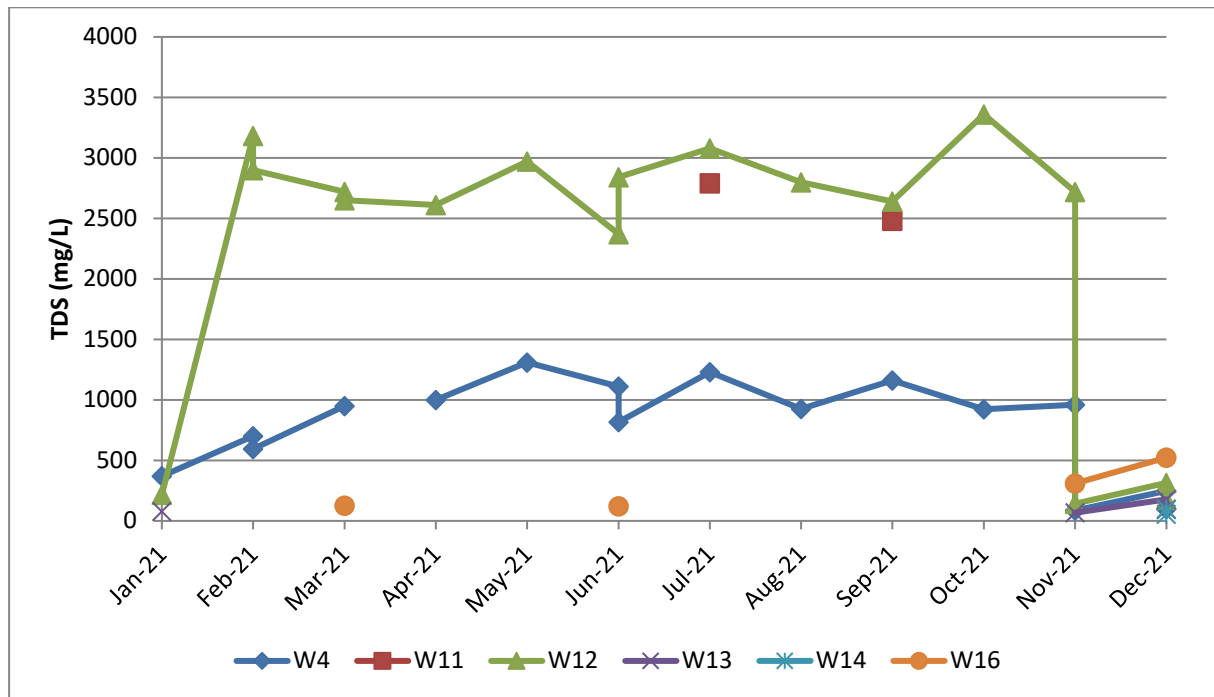


Chart 25: Sandy, Muscle and Rosebrook Creeks TDS Levels 2021

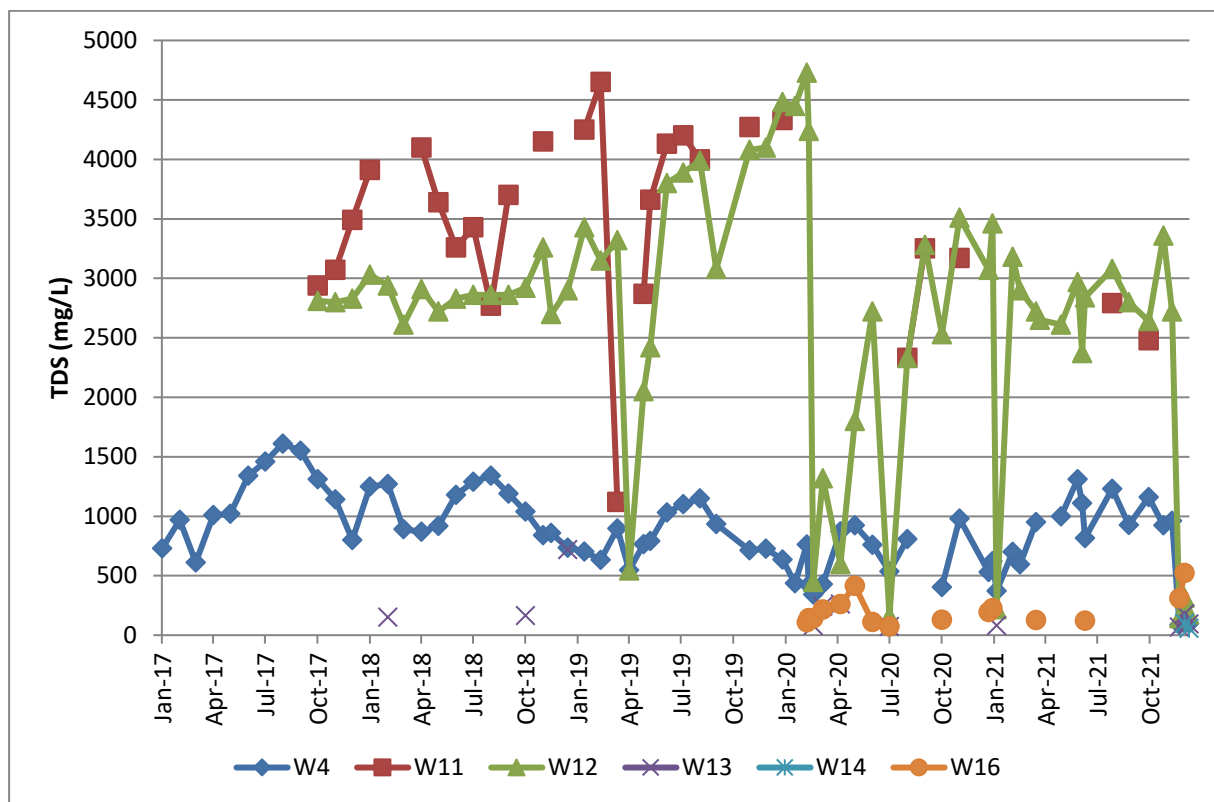


Chart 26: Sandy, Muscle and Rosebrook Creeks TDS Levels 2017–2021

6.1.3 Trends and Key Management Implications

Surface Water Monitoring

Hunter River Sites (W1, W2, W3, W6A, W15 & W17)

During the reporting period, pH levels at the Hunter River sites ranged from 7.6 to 8.5. The Hunter River sites stayed within their relevant pH investigation trigger levels, with the exception of a number of slightly higher readings at sites W15 and W17, and one higher reading at site W6A in July 2021. Only site W2 has been consistently monitored for water quality since 2017. A comparison with 2017, 2018, 2019 and 2020 pH levels show that pH levels have stayed consistently between 7.3 and 8.5 to date.

EC monitoring results for sites W1 and W3 remained below trigger levels and relatively consistent throughout the reporting period. Sites W2, W6A, W15 and W17 generally showed elevated EC readings throughout the reporting period. Following exceedance of the EC trigger levels for three consecutive sampling events at site W17, the Surface Water Quality Response Protocol (SWQRP) was implemented in accordance with the WMP, which indicated that the elevated EC levels at site W17 was not attributed to MPO activities.

During the 2020 reporting period, the SWQRP was implemented following exceedance of the EC trigger levels at sites W6A for three consecutive sampling rounds. As per the correspondence with DPE on 10 December 2020, MACH Energy continued monitoring of EC results at site W6A until June 2021 and provided the investigation findings report to DPE, EPA and DPIE – Water on 10 September 2021. The continued monitoring of EC results showed persistent elevated EC readings at the monitoring site (Table 22).

Table 22
W6A Results Summary: EC

Sampling Event	Sample date	Maximum beneficial use trigger value (EC) ($\mu\text{S}/\text{cm}$) ¹	Electrical Conductivity (EC) ($\mu\text{S}/\text{cm}$)
July 2020	27/7/2020	496	506
August 2020	28/8/2020		597
September 2020	29/9/2020		592
October 2020	26/10/2020		876
November 2020	26/11/2020		499
December 2020	22/12/2020		483
January 2021	5/1/2021		212
February 2021	2/2/2021		493
March 2021	15/3/2021		564
April 2021	28/4/2021		709
May 2021	27/5/2021		744
June 2021	4/6/2021		794
July 2021	27/7/2021		582

Note: Results shown in **bold** indicate that the surface water sample has exceeded the adopted assessment criterion

The investigation findings (including a review of EC data logged by Water NSW at Muswellbrook Bridge) indicated a natural variability of water quality in the Hunter River at the Muswellbrook Bridge likely due to the impacts of low-flow, high-flow and first flush processes associated with rainfall and Glenbawn Dam releases, and this is reflected in the EC results from Site W6A. No mine water has been discharged from the MPO to date. On this basis, MACH Energy requested further fluctuations in EC levels from site W6A to be exempt from the trigger levels until the MPO undertakes licenced discharges under EPL 20850.

TSS levels for sites W2, W6A, W15 and W17 exceeded the trigger levels on a number of occasions during the reporting period. W2 had elevated TSS levels in February and August 2021. TSS values at W2 returned to values below the trigger levels in subsequent monitoring rounds. Site W6A showed elevated TSS measurements in January, March, August and December. TSS values at W6A returned to values below the trigger levels in subsequent monitoring rounds. TSS levels recorded at W6A in March and August were lower than the levels recorded at an upstream site W1 during these months. TSS levels for site W15 recorded elevated measurements in January, February, March, November and December. Following exceedance of the TSS trigger levels for three consecutive sampling events at site W15, the SWQRP was implemented in accordance with the WMP, this investigation indicated that the elevated TSS levels at site W15 was not attributed to MPO activities. TSS levels for site W17 stayed within the relevant trigger levels with the exception of elevated readings in November and December 2021. The TSS results may have been influenced by external factors such as heavier rainfall than other sites received, and topography of the area which allows additional runoff from surrounding farmland (AECOM, 2020) after an extended period of drought conditions.

TDS levels for all Hunter River sites generally fluctuated between approximately 110 mg/L and 570 mg/L.

Sandy, Muscle and Rosebrook Creek Sites (W4, W11, W12, W13, W14 & W16)

Monitored pH values during the reporting period at the Sandy, Muscle and Rosebrook Creek sites ranged from 6.9 to 8.2. Only site W4 has been consistently measured for water quality since 2017. Monitoring since 2017 shows generally consistent values of pH for site W4.

EC monitoring results at sites W4, W11, W12, W13 and W14 remained generally consistent during the reporting period. Site W16 showed elevated measurements in November and December. W11, W13 and W14 were not accessible for most of the reporting period due to wet conditions, resulting in a limited number of samples collected. The monitored EC levels for the sites were generally consistent with, or lower than, the levels recorded between 2017 – 2020. EC results may have been influenced by external factors such as heavier rainfall after an extended period of drought conditions.

TSS values were generally consistent in sites W4, W11, W13, W14 and W16 during the reporting period. W12 showed elevated samples in January, November and December. TSS results may have been influenced by external factors such as heavier rainfall after an extended period of drought conditions. TDS values generally stayed consistent throughout the reporting period at the Sandy, Muscle and Rosebrook Creek sites, and generally correlated with the trend recorded for EC levels at the sites.

The 2017 – 2021 trends for pH and TSS for site W4 were generally consistent with observations made in the EIS (ERM Mitchell McCotter, 1997). EC and TDS levels at site W4 have increased since recordings made in the EIS. This site is located on Muscle Creek within Muswellbrook, upstream of the MPO and therefore any increase is not associated with MPO activities. This site has naturally occurring salts in surrounding soils and rocks, and data from previous annual reviews indicates that large fluctuations at this site are not unusual (Coal & Allied, 2016; MACH Energy, 2017b; MACH Energy, 2018; MACH Energy, 2019; MACH Energy, 2020a).

Stream Health Monitoring

The Autumn 2021 Stream Health Monitoring Report was prepared following the May 2021 monitoring round. The key findings of the report were as follows:

- Sites within Dart Brook, Muscle Creek and Sandy Creek indicate these catchments have been degraded by historical land use. Water quality data, particularly elevated salinity and low dissolved oxygen, reflects the condition of their catchments.
- Despite above average rainfall within the catchment for the majority of 2020 and 2021, no flow was recorded within ephemeral waters that drain from the eastern portion of the MPO to the Hunter River, including Rosebrook Creek.
- Results from the AusRivAS analyses indicate that macroinvertebrate assemblages at all of the sites sampled were dominated by pollution-tolerant taxa.
- No aquatic species of conservation significance were recorded at the monitoring sites.
- Species composition of fish sampled in Autumn 2021 was comparable with that observed in previous surveys.
- Measurements taken up to the present survey (Autumn 2021) have not detected any statistically significant changes that could be indicative of an impact associated with the MPO.

The Spring 2021 Stream Health Monitoring Report was prepared following the October 2021 monitoring round. The findings of the report were as follows:

- Sites within Dart Brook, Muscle Creek and Sandy Creek indicate these catchments have been degraded by historical land use. Water quality data, particularly elevated salinity and low dissolved oxygen, reflects the condition of their catchments.
- Despite above average rainfall within the catchment for the majority of 2021, no flow was recorded within ephemeral waters that drain from the eastern portion of the MPO to the Hunter River, including Rosebrook Creek.
- No aquatic species of conservation significance were recorded at the monitoring sites.
- Results from the AusRivAS analyses indicate that macroinvertebrate assemblages at all of the sites sampled were dominated by pollution-tolerant taxa.
- Band levels remained steady between the Autumn and Spring 2021 surveys.
- Overall, examination results from the 2021 Spring survey did not detect any measurable change that could indicate an impact associated with the MPO.

The stream health trigger levels established within the WMP were exceeded on each sampling occasion since 2017. These consecutive exceedances trigger the stream health investigation protocol in accordance with the Surface and Groundwater Response Protocol (SGWRP). However, as previously stated in the Spring and Autumn 2020 Stream Health Monitoring Reports prepared by Bio-Analysis Pty Ltd, the investigation is not considered warranted as:

- the trigger levels developed within the SWMP are based on historical data presented in Hose and Turak (2004), which were collected on one sampling occasion at the sites;
- the MPO has been a nil discharge site in accordance with EPL 20850 throughout the monitoring period;

- external influences including rural and urban run-off and flow regulations are likely to have impacted aquatic biota within the monitoring sites since the baseline survey was carried out; and
- seasonal variation of the structure of assemblages of macroinvertebrates occurred (Stark and Phillips, 2009).

MACH Energy will continue to monitor stream health during autumn and spring in future monitoring periods. As recommended in the previous stream health monitoring reports for the MPO, revised stream health trigger levels and the stream health investigation protocol were proposed as part of the WMP update undertaken during the previous reporting period (Section 2.1). Once approved, monitoring and reporting against the new trigger levels will be undertaken.

6.2 GROUNDWATER

6.2.1 Approval Criteria and Management Plan Requirements

Groundwater monitoring is undertaken at a network of bores which are broadly distributed across the MPO area (Figure 7) and which cover all major hydrogeological units.

Groundwater monitoring includes:

- manually monitoring of water levels on a quarterly basis;
- quarterly sampling of pH and EC;
- annual sampling of a suite of laboratory parameters; and
- regular groundwater inflows as recorded from flow meters or recording of pumping times and rates.

Groundwater trigger levels have been developed for the MPO, based on the NSW Aquifer Interference Policy and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000). These trigger levels include standing water level (SWL) triggers for the eastern groundwater sites, and EC and pH for all sites, as presented in the WMP and in Tables 23 and 24.

Beneficial use categories have been assigned to each monitoring bore based on its 80th percentile baseline EC and the EC ranges specified in the WMP. Should a measured EC value exceed the beneficial use quality range EC for a particular bore at three successive monitoring rounds (as defined in the WMP), the groundwater investigation protocol, as detailed in the SGWRP, would be initiated.

Following the trigger of the Groundwater Quality Response Protocol in 2018, EC trigger levels for 6500F500 M&L, 4500F500 and 5500D000 and pH trigger levels for all groundwater monitoring sites were updated in 2019, as presented in the WMP.

Table 23
Groundwater Triggers – Water Level

Bore	Screened Interval (mbgl)	Observed Groundwater Level (mbgl)		Trigger Level (mbgl)
		Minimum	80 th percentile	
MPBH1	12.6 – 18.6	8.8	9.7	11.7
MPBH2	11.5 – 17.5	11.6	12.2	14.2
MPBH3b	Well to 14 m	11.6	12.0	Dry (or 14.0 m)

Note: mbgl = metres below ground level.

Table 24
Groundwater Triggers – Water Quality

Site	pH		pH Trigger Range	EC		
	20 th %ile	80 th %ile		80 th %ile (µS/cm)	Beneficial Use Category	Trigger (µS/cm)
3500B500U	7.2	9.6*	6 – 8.5	3,530	Irrigation	7,800
3500B500L	7.1	7.4		5,826	Irrigation	7,800
3500C500U	7.1	7.4		5,664	Irrigation	7,800
3500C500L	7.2	7.4		5,590	Irrigation	7,800
4500F000	6.5	6.9		6,904	Saline	22,000
5000D000	6.7	7.0		703	Potable	800
5500D000	6.4	6.9		1,570	Irrigation	7,800
6000C000U	6.4	7.1		4,984	Irrigation	7,800
6000C000L	7.0	7.2		5,474	Irrigation	7,800
6500F500U	6.8	7.0		5,778	Irrigation	7,800
6500F500M	6.9	7.2		2,804	Irrigation	7,800
6500F500L	6.5	7.0		1,526	Irrigation	7,800
6500F625	6.7	7.0		4,086	Irrigation	7,800
7000D000U	6.6	7.6		6,730	Irrigation	7,800
7000D000L	6.6	6.8		1,370	Marginal Potable	2,350
7500F000	6.7	7.6		5,918	Irrigation	7,800
WRA1U	-	-		-	-	-
WRA1L	7.2	7.7		4,496	Irrigation	7,800
WRA2U	6.7	7.0		4,108	Irrigation	7,800
WRA2L	7.0	7.3		6,086	Irrigation	7,800
WRA3U	7.1	7.5		9,020	Saline	22,000
WRA3L	6.6	6.9		16,734	Saline	22,000
WRA5U	7.1	7.4		4,772	Irrigation	7,800
WRA5L	7.1	7.8		7,034	Irrigation	7,800
WRA6U	6.8	7.0		11,240	Saline	22,000
WRA6L	7.2	7.7		5,970	Irrigation	7,800
MPBH1	6.8	7.1		590	Potable	800
MPBH2	6.8	7.1		930	Marginal Potable	930**
MPBH3	6.6	6.9		1,083	Marginal Potable	1,083**
MPBH3b	7.4	7.7		4,420	Irrigation	7,800
MPBH4 (formerly A1)^	-	-		-	-	-
MPBH5 (formerly B1)^	-	-		-	-	-
Melody Bore^	-	-		-	-	-

Notes:

* pH values for bore 3500B500S exceed the pH trigger range of 6 – 8.5 however, this bore was mined through in August 2018.

** Existing 80th percentile values have been adopted for these bores given the baseline water quality is close to potable and these sites are representative of the Hunter River alluvium.

^ Sufficient data is not yet available to develop baseline trigger ranges for new alluvial bores MPBH4 and MPBH5, or Melody Bore. This table will be revised with the appropriate values once the data becomes available. For more information on these bores refer to the WMP.

The pH trigger levels were updated to apply a single trigger range of 6 – 8.5. This decision was made as the proposed 20th to 80th percentile trigger ranges proved to be too narrow and resulted in exceedances of the triggers under neutral pH conditions. The adopted range of 6 – 8.5 pH units is consistent with the pH recommended by ANZECC & ARMCANZ (2000) to prevent corrosion of infrastructure associated with the groundwater, as well as the recommend range for drinking water as outlined in the Australian Drinking Water Quality Guidelines (National Health and Medical Research Council [NHMRC] & National Resource Management Ministerial Council [NRMMC], 2011).

At any bore where a monitored pH value is outside the applicable baseline range at three successive monitoring rounds, the groundwater investigation protocol would be initiated.

6.2.2 Performance During the Reporting Period

Monitoring bores are split into three categories:

- Groundwater Central Bores: representative of the hard rock aquifer (3500B500L&S, 3500C500L&S, 4500F000, 5500D000, 5000D000, 6000C000L&S, 6500F500L,M&U, 7000D000L&U, 7500F000, 6500F625 and Melody).
- Groundwater Eastern Bores: representative of the alluvial aquifer (MPBH1, MPBH1-C&HR, MPBH2, MPBH2-C&HR, MPBH3b, MPBH4, MPBH4-C&HR, MPBH5, MPBH5-C&HR, MPBH6 and MPBH6-C&HR).
- Groundwater Western Bores: representative of the hard rock aquifer in, or in the vicinity of, the Fine Rejects Dam (WRA1L&U, WRA2L&U, WRA3L&U, WRA5L&U, WRA6L&U, MPBH7 and MPBH7-C).

Bores 3500B500L&S, 6000C000L&S, 7000D000L&U, WRA2L&U and WRA5L&U were decommissioned prior to the reporting period. Notwithstanding, the data collected from these bores during previous years has been included to assist with trend analysis.

The results of monitoring SWL (measured in mbgl), EC and pH from 2015 to 2021 for the groundwater central bores are shown in Charts 27, 28 and 29 respectively.

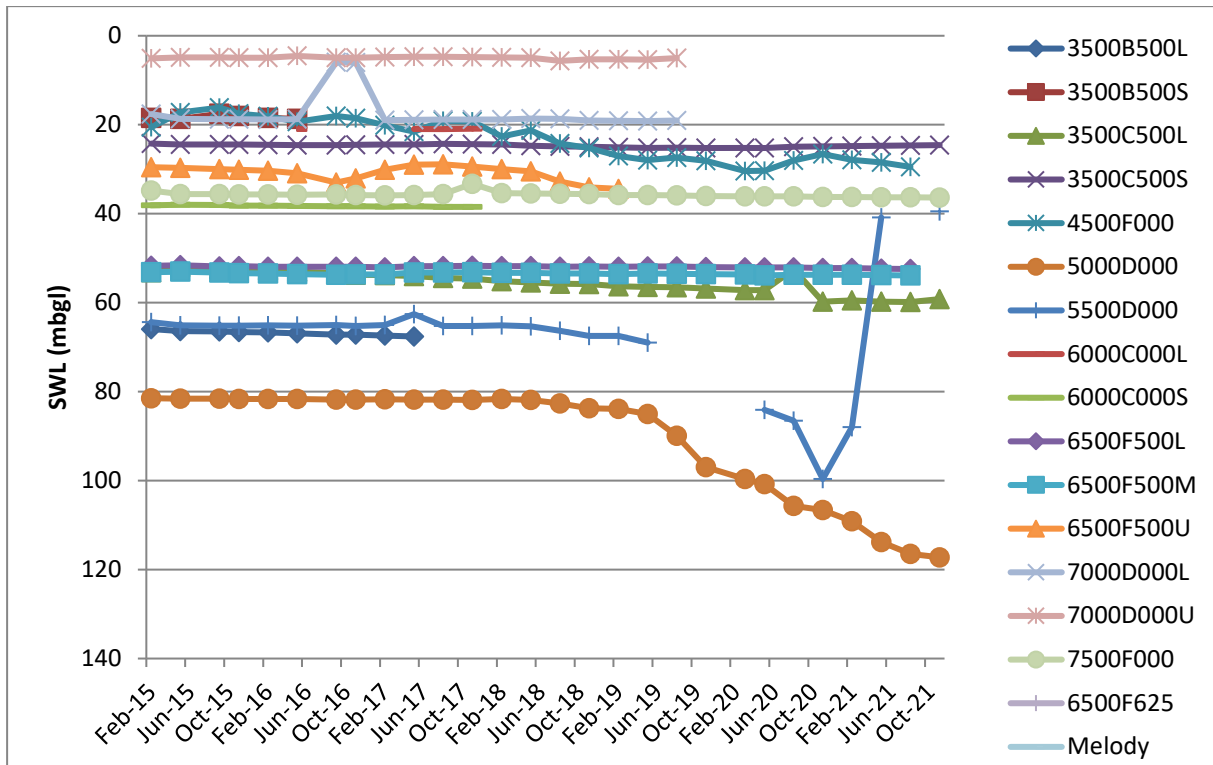


Chart 27: Groundwater Central Bores SWL 2015 – 2021

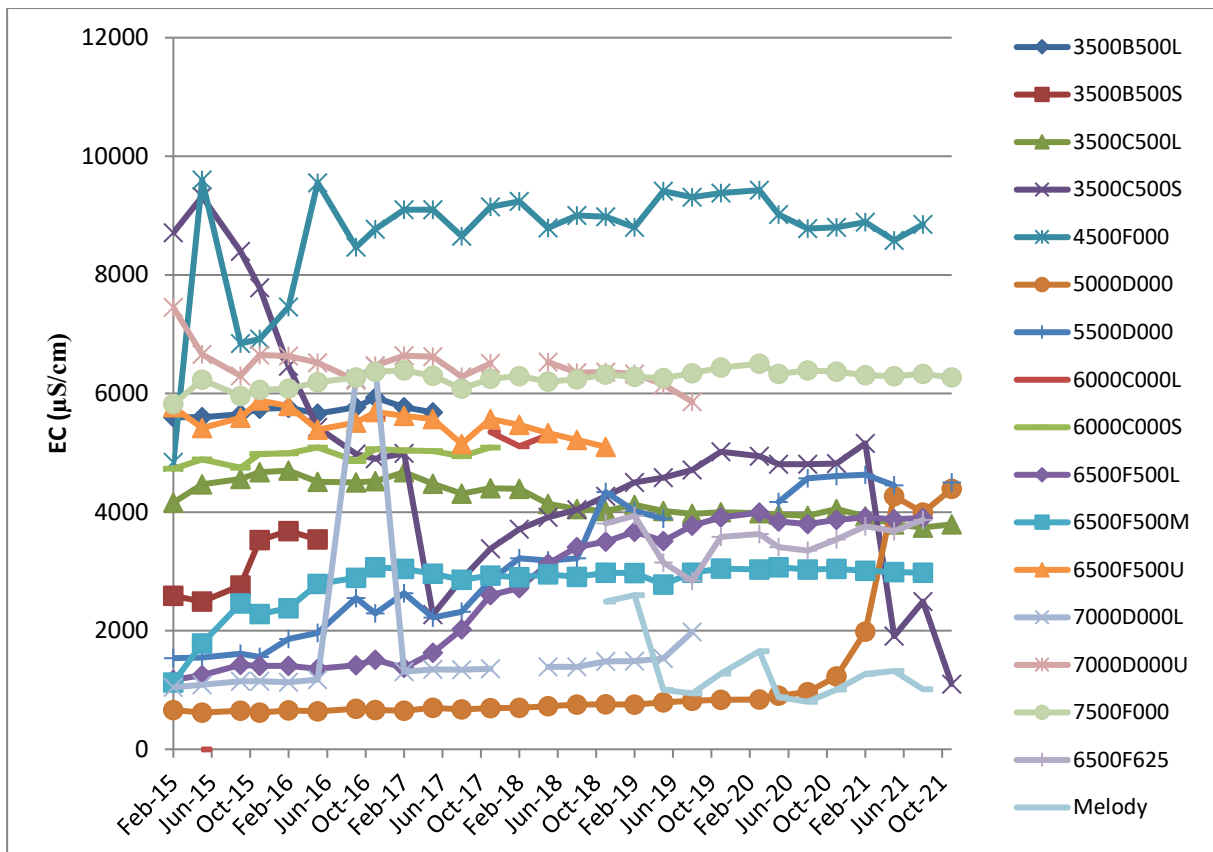


Chart 28: Groundwater Central Bores EC 2015 – 2021

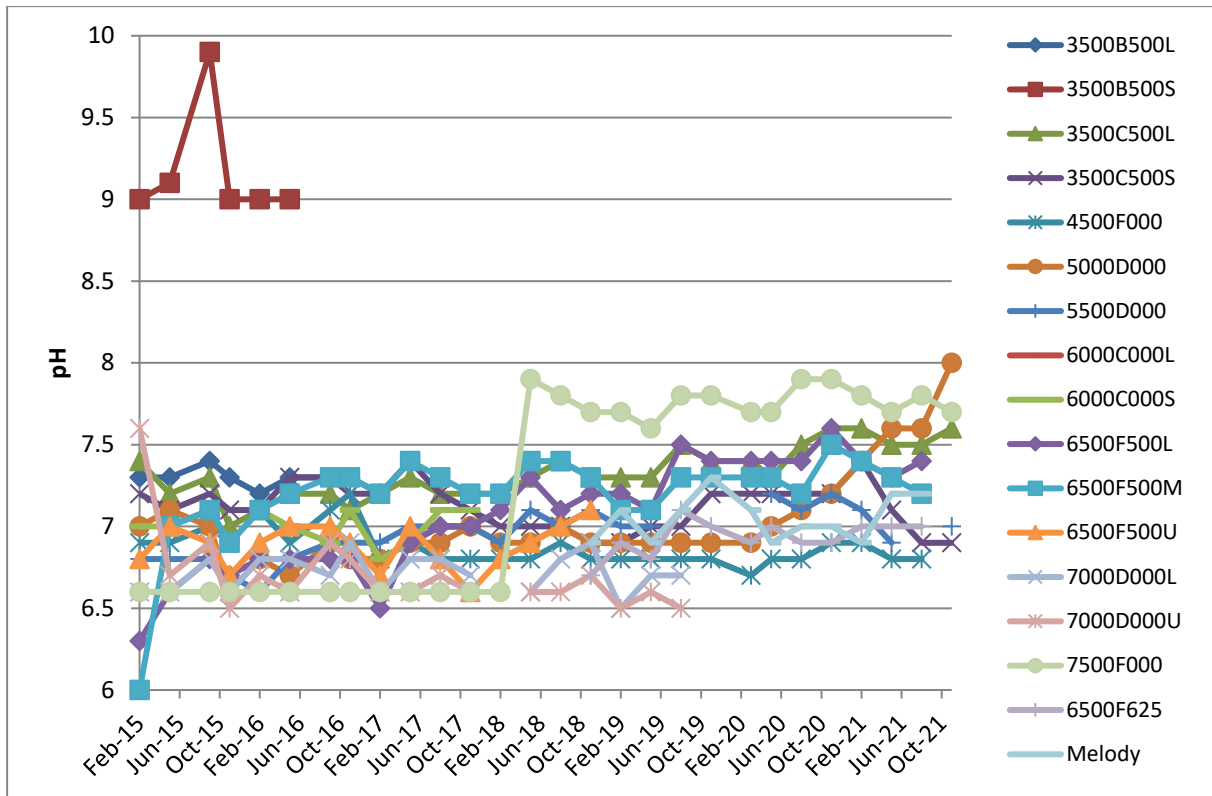


Chart 29: Groundwater Central Bores pH 2015 – 2021

The results of monitoring SWL, EC and pH from 2015 to 2021 for the groundwater eastern bores are shown in Charts 30, 31 and 32 respectively.

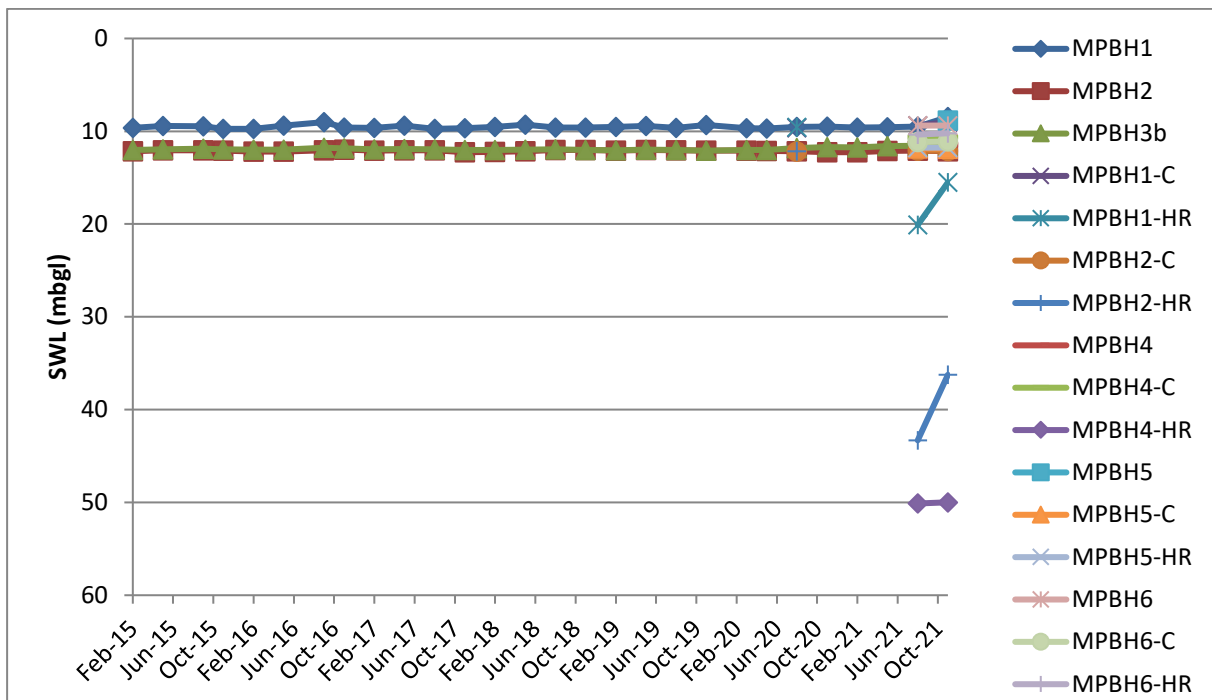


Chart 30: Groundwater Eastern Bores SWL 2015 – 2021

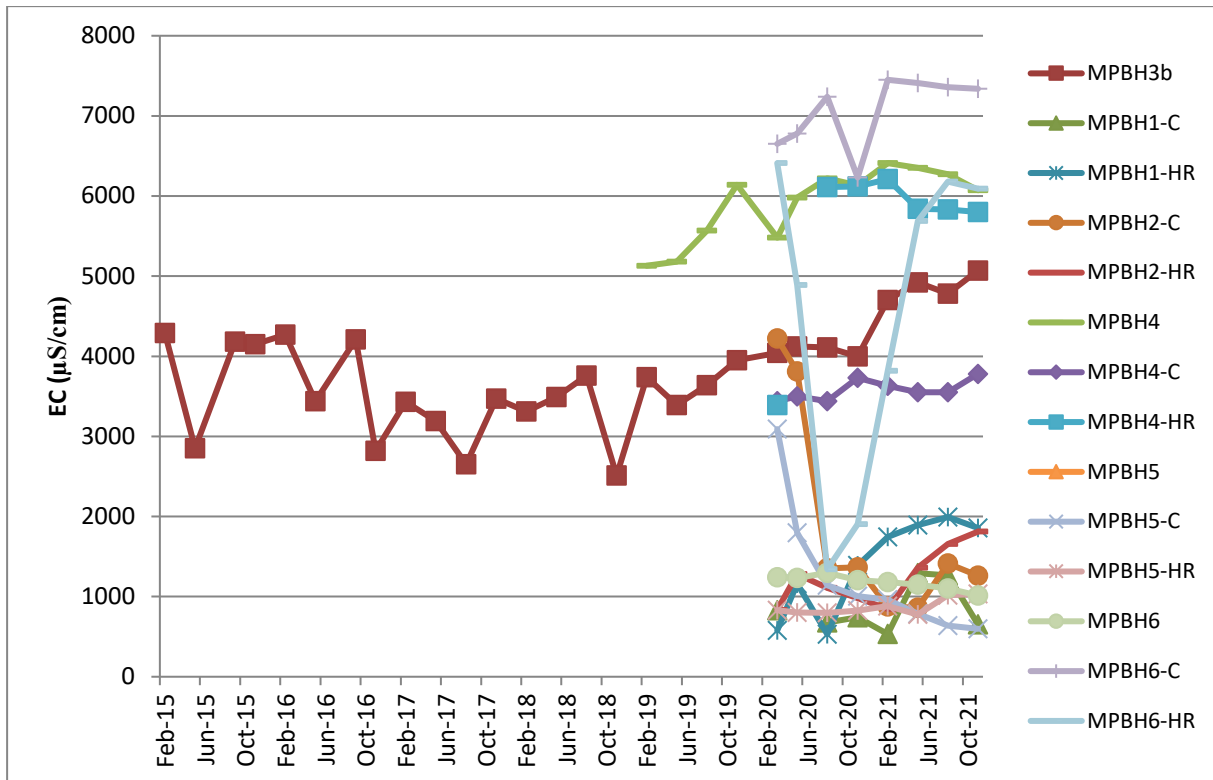


Chart 31: Groundwater Eastern Bores EC 2015 – 2021

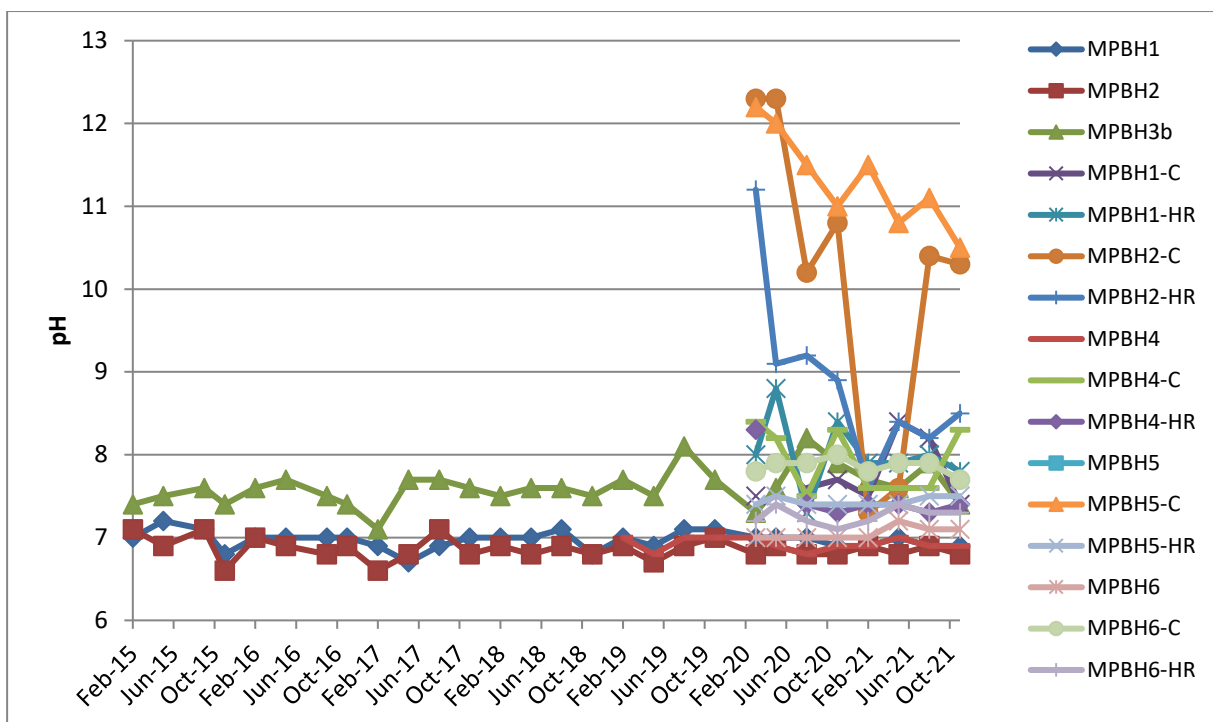


Chart 32: Groundwater Eastern Bores pH 2015 – 2021

The results of monitoring SWL, EC and pH from 2015 to 2021 for the groundwater western bores are shown in Charts 33, 34 and 35 respectively.

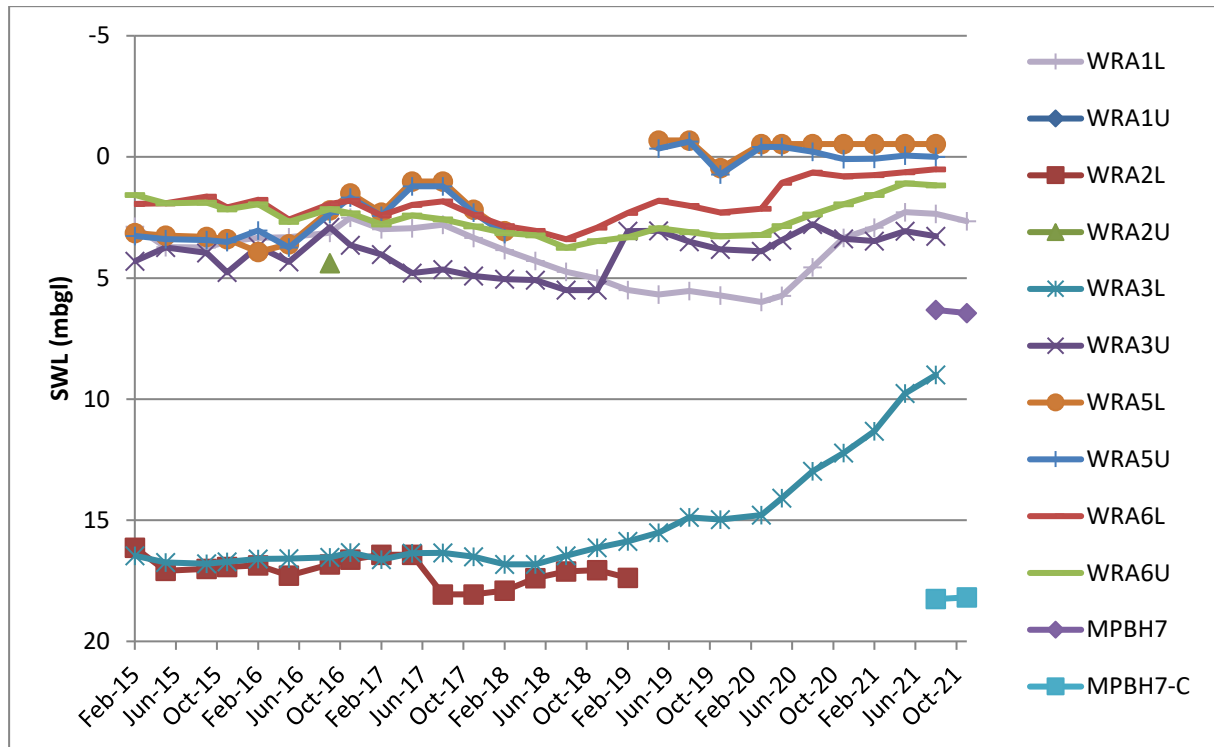


Chart 33: Groundwater Western Bores SWL 2015 – 2021

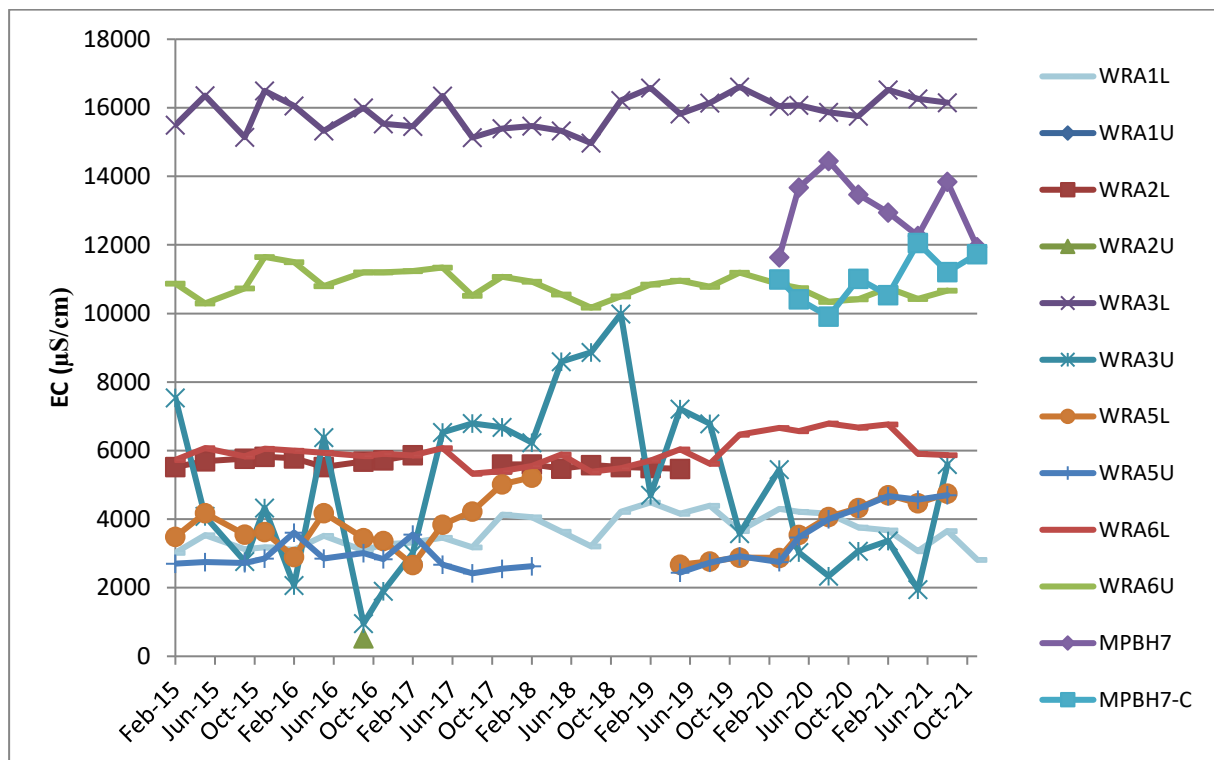


Chart 34: Groundwater Western Bores EC 2015 – 2021

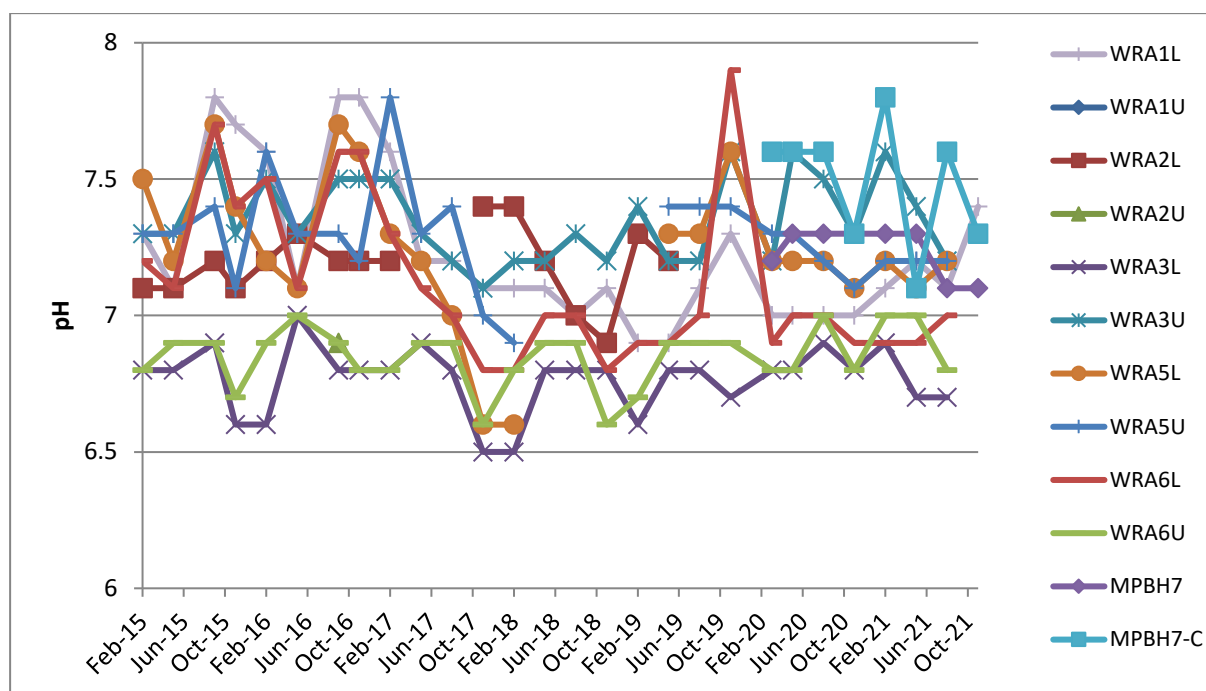


Chart 35: Groundwater Western Bores pH 2015 – 2021

During the reporting period, sites 3500B500L and 3500B500S continued to be blocked on all monitoring rounds. Monitoring was also not undertaken at 6000C000L due to insufficient water levels, and at 6000C000S, due to disturbance. No samples were taken in sites MPBH5 and WRA1U due to dry conditions.

Sites MPBH1-C&HR, MPBH2-C&HR, MPBH4, MPBH4-C&HR, MPBH5, MPBH5-C&HR, MPBH6, MPBH6-C&HR, MPBH7 and MPBH7-C were newly added to the monitoring program during the previous reporting period to the east and west of the MPO (Figure 7). Monitoring at the sites commenced on March 2020.

6.2.3 Trends and Key Management Implications

Monitored SWLs have stayed generally consistent from 2015 – 2021. SWL monitoring results remained generally consistent at all sites for the central and eastern bores. This is with the exception of sites 5000D000, where a decrease in water levels has been observed since May 2019, and sites WRA3L and 5500D000 where the recorded water levels increased during the reporting period. Site 5000D000 monitors the Wynn and Edderton Seams to the west of the open cut pit, and therefore this decline is to be expected due to depressurisation in these strata.

The majority of EC values for the central bores have trended slightly downwards (Chart 28). Monitored EC values remained within historic ranges for the central bore sites.

EC values at eastern bores, which have been consistently measured for water quality since 2015, remained generally within historic ranges during the reporting period (Chart 31). The newly installed bores (i.e. MPBH1-C&HR, MPBH2-C&HR, MPBH4, MPBH4-C&HR, MPBH5, MPBH5-C&HR, MPBH6, MPBH6-C&HR, MPBH7 and MPBH7-C) remained generally steady during the reporting period. This is with the exception of site MPBH5-C, which declined during the reporting period and site MPBH6-HR which increased during the reporting period. Continuing from trends observed in the 2015, 2016, 2017, 2018, 2019 and 2020 Annual Reviews (Coal & Allied, 2016; MACH Energy, 2017b; MACH Energy, 2018; MACH Energy 2019; MACH Energy, 2020a; MACH Energy, 2021), site WRA3U showed the most variation during the reporting period.

Long term trends at the western bores indicate that yearly fluctuations in EC are most common at the western bores compared to the eastern and central bores (Coal & Allied, 2016; MACH Energy, 2017b; MACH Energy, 2018; MACH Energy, 2020a). Site WRA3L showed higher EC levels than other western bores during the reporting period, which is consistent with recent years.

Consistent with trends observed in the 2015, 2016, 2017, 2018, 2019 and 2020 Annual Reviews (Coal & Allied, 2016; MACH Energy, 2017b; MACH Energy, 2018; MACH Energy, 2019, MACH Energy, 2020a, MACH Energy 2021), the pH values for the majority of sites have generally remained within the pH range of 6.5 to 8.0 during the reporting period, with the exception of sites MPBH2-C and MPBH5-C which recorded elevated pH levels during the reporting period. The pH for these two bores has maintained a downward trend (approaching neutral) since installation in March 2020. MACH will continue to monitor this trend and will establish trigger levels once the pH of the bores has equilibrated. The pH values recorded at site MPBH2-HR decreased during the reporting period compared with 2020 reporting period, remaining within the pH range of 6.5 to 8.0.

As described in Section 6.2.1, trigger levels have been developed as part of the approved WMP for EC and pH for all groundwater bores, with the exception of bores MPBH4, MPBH5, Melody and the newly installed monitoring bores¹. As defined in Appendix 5 of the WMP (i.e. the Surface and Groundwater Response Protocol), monitored values outside the range of trigger levels for three consecutive monitoring rounds initiate the groundwater investigation protocol.

MPO complied with all SWL and pH criteria presented in the WMP during the reporting period.

During the 2020 reporting period, the Groundwater Quality Response Protocol was implemented following exceedance of the EC trigger levels at bore 5000D000 for three consecutive sampling rounds (August 2019, November 2019 and March 2020), in accordance with the WMP. MACH Energy undertook all investigation and response procedures set out in the Groundwater Quality Response Protocol. Additional groundwater monitoring was undertaken at bore 5000D000 during the February, May, August and September 2021 monitoring rounds, which showed persistent elevated readings at the bore (Table 25). A suitably qualified hydrogeologist was engaged and provided the following advice (AGE, 2021):

- There is no risk of environmental harm as a result of the elevated EC in the bore.
- The bore is compromised due to an obstruction at depth that prevents best practice water monitoring.
- The bore will be mined out due to the progressing pit.
- Bore 5000D000 is to be excluded from compliance monitoring.
- A new monitoring bore is to be installed to replace bore 5000D000 for interpretative purposes only (not to be used for compliance as the new bore will also be within the expected mining drawdown extent).

The new monitoring bore and updated groundwater monitoring program will be included in the next update of the WMP.

The remainder of the MPO groundwater monitoring sites complied with the EC criteria presented in the WMP during the reporting period.

¹ Baseline trigger ranges for new bores will be developed once sufficient data (two years of monitoring) becomes available, and will be included in the next update of the WMP.

Table 25
5000D000 Groundwater Monitoring Results Summary

Sampling Event	Maximum beneficial use trigger value (EC) (µS/cm)	Electrical Conductivity (EC) (µS/cm)	Electrical Conductivity (EC) (µS/cm) (Laboratory QA/QC Sample)	Depth to Water (DTW) metres below ground (mBG)
August 2019	800	820	-	90.85
November 2019		834	-	97.89
March 2020		840	-	100.52
May 2020		906	897	100.82
August 2020		966	957	105.67
November 2020		1231	1270	106.65
February 2021		1983	-	109.15
May 2021		4270	-	113.85
August 2021		3990	-	116.47
November 2021		4390	-	117.24

Note: Results shown in **bold** indicate that the bore has exceeded the adopted assessment criterion.

6.3 HUNTER RIVER SALINITY TRADING SCHEME DISCHARGES

MACH Energy has a total of 46 credits under the Hunter River Salinity Trading Scheme (HRSTS), however, no discharges to the Hunter River occurred during the reporting period.

6.4 WATER TAKE

A total of 752.12 megalitres (ML) of water was taken from Hunter Regulated River Water Source for use at the MPO during the water reporting period (1 July 2020 – 30 June 2021) (Table 26). This was 1,816.7 ML less than the previous water reporting period. The water take from the Hunter Regulated River Water Source was 2,887.9 ML less than the MPO total entitlement (3,640 ML) (Table 26).

Table 26
MPO Water Take

Water Sharing Plan	Water Licence Number*	Entitlement	Total Pumping (ML)
Hunter Regulated River Water Source	1230	8	752.12
	1259	33	
	1227	99	
	1258	5	
	992	75	
	7808	36	
	702	267	
	1260	5	
	993	265	
	1308	15	
	604	183	
	605	8	
	677	24	
	1338	18	
	662	9	
	663	16	
	10775	243	
	41438	455	
	638	225	
	639	134	
	879	243	
	880	124	
	1113	366	
	973	3	
	974	210	
	975	8	
	988	156	
	989	8	
	1307	38	
	1229	480	

Note:

* several temporary licences were also used during the reporting period.

6.5 SITE WATER BALANCE

The Site Water Balance for the reporting period (i.e. 1 January 2021 to 31 December 2021) is provided in Table 27 in comparison to the 2020 site water balance.

The CHPP water demand increased from the previous reporting year due to an increase in ROM coal production and an increase in the volume and quality of product coal to be washed and prepared for rilling. Continued increase in fine rejects bleed water was also associated with increase in fine rejects deposition from the CHPP. Surface water runoff also increased compared to the 2020 reporting period, due to the increased rainfall during the period and establishment of the expansion of the open cut pit footprint. Dust suppression was increased during the reporting period due to ongoing mine development and associated increases in haul road and stockpile areas, as well as dust suppression requirements associated with construction of MOD 4 infrastructure.

The recorded site water balance for the reporting period was generally consistent with MOD 3 predictions, with the exception of surface water runoff and fine rejects bleed water. Surface water runoff was greater than the MOD 3 predictions due to the above average rainfall across the year. Fine rejects bleed water was greater than the MOD 3 predictions due to the ramping up of the CHPP production rates due to the CHPP upgrades.

The initial five-year mine plan site water balance for the MPO was undertaken in 2019 and was updated in 2021 to be representative of current mine plan, catchment areas, new dam and water infrastructure, dam storages.

Table 27
MPO Annual Water Balance

	2020	2021
Water Sources	Volume (ML/yr)	Volume (ML/yr)
Surface Water Runoff	2040*	3929*
Groundwater	8*	8*
Fine Rejects Bleed Water	885	1442*
Hunter River Pumping (via WALs)	1540	1135
Water Usage	Volume (ML/yr)	Volume (ML/yr)
CHPP Demand	2222	4004
Dust Suppression (Haul Road and Stockpiles)	1283	1838
Vehicle Wash Demand	35*	93.2
Water Loss	Volume (ML/yr)	Volume (ML/yr)
Discharge to Hunter River (via HRSTS)	0	0
Evaporation	942*	1109.5*
Non-Sediment Dam Spillage	0	0
Sediment Dam Spillage	0	0

Note: ML/yr = Megalitres per year.

* This volume is calculated based on the current mine plan site water balance and adjusted accordingly with calculated rainfall over the reporting period(s); and MPO dam & open cut storage data.

7 REHABILITATION

Proposed rehabilitation activities for the MPO are defined in the approved MOP, which has been developed to also meet the requirements for an RMP (Condition 56, Schedule 3 of Development Consent DA 92/97).

Details of the activities completed during the reporting period are outlined in Section 3.1. At the end of the reporting period, the total mine disturbance area was approximately 1,145 hectares (ha), which was 32 ha less than the forecast disturbance area. The total rehabilitation area was approximately 98 ha, which was around 23 ha more than the rehabilitation area forecasted in the 2021 Annual Review.

The MPO at the time of reporting is on schedule to meet rehabilitation targets set out in the approved MOP by the end of the term (30 June 2023), as was the case for the 2021 reporting period and previous MOP term (1 July 2020 – 30 June 2021).

Table 28 summarises the approximate disturbance and rehabilitation areas from the 2020 and 2021 reporting periods and provides an estimate of the forecast areas for the 2022 reporting period.

Table 28
Rehabilitation Status

Mine Area Type	Previous Reporting Period (ha Actual)	This Reporting Period (ha Actual)	Next Reporting Period (ha Forecast)
	2020	2021	2022
Total Mine Footprint ^{1,6}	1,052	1,145	1173
Total Active Disturbance ^{2,6}	1,052	1,047	1044
Land being prepared for Rehabilitation ³	17	32	33
Land under active rehabilitation ⁴	65	98.5	129.5
Completed rehabilitation ⁵	0	0	0

¹ Total mine footprint includes all areas within a mining lease that either have posed at some point in time, or continue to pose, a rehabilitation liability due to mining and associated activities. As such, it is the sum of total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in the Division of Resources and Geoscience within the DPE [DRG] MOP Guidelines).

² Total active disturbance includes all areas ultimately requiring rehabilitation, such as: on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, overburden emplacements (active/unshaped/in or out-of-pit), and the FEA (active/unshaped/uncapped).

³ Land being prepared for rehabilitation includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DRG MOP Guidelines).

⁴ Land under active rehabilitation includes areas under rehabilitation and being managed to achieve relinquishment - includes the following rehabilitation phases as described in the DRG MOP Guidelines – ‘ecosystem and land use establishment’ (area seeded OR surface developed in accordance with final land use) and ‘ecosystem and land use sustainability’ (revegetation assessed as showing signs of trending towards relinquishment OR infrastructure development).

⁵ Completed rehabilitation – requires formal sign-off by the DRG that the area has successfully met the rehabilitation land use objectives and completion criteria.

⁶ Includes topsoil stockpiles.

Rehabilitation of the Eastern Out of Pit Emplacement continued in 2021. An additional 40.0 ha was rehabilitated (Plate 1), which included:

- bulk and detailed re-shaping of overburden material to final landform;
- installation of habitat features such as stag trees and rock piles;
- topsoil spreading to a minimum depth of 100 mm;
- gypsum application at a rate of 10 tonnes per hectare (t/ha);
- deep ripping/tining along the contour of the final landform to a depth of 500 mm;
- direct/hand seeding of endangered ecological community tree/shrub/grass indicative species plus an additional grass cover crop; and
- planting of approximately 100 native trees per ha.

Rehabilitation areas were subject to ongoing weed and pest control measures throughout the reporting period to facilitate and promote successful vegetation establishment.



Plate 1: Eastern Out of Pit Emplacement Rehabilitation

Figure 2 shows the extent of active disturbance and rehabilitated areas at the end of the reporting period, as well as the forecast disturbance areas proposed in 2022.

The final land use goals for the MPO (as outlined within the MOP) are as follows:

- successful design and rehabilitation of landforms to ensure structural stability, revegetation success and containment of wastes; and
- post-mining land use compatible with surrounding land uses.

The conceptual final landform across the MPO is an undulating, free draining and a less 'engineered' landform with an optimum post-mining land capability that supports low and high intensity agricultural land uses as well as grassland and woodland vegetation communities, as per the approved MOD 4 and current MOP. The MSC, the community and other stakeholders have indicated their preference for a landform that further integrates with the surrounding landscape. The MSC also indicated a preference for intensive agricultural/industrial post-mining land uses that provide employment for the local community.

The overarching objective for rehabilitation of the FEA is to establish a safe, stable and non-polluting landform with a sustainable surface cover that minimises erosion (to prevent exposure of the underlying fines material) and sustains grassland vegetation in the long-term. During the reporting period, MACH Energy operated the FEA using sub-aerial deposition which involves an extended period of air drying that maximises in-situ tailings densities, and in turn, maximises the storage efficiency of the facility as well as providing a more competent fines surface for future rehabilitation purposes.

During the reporting period, several former residential dwellings were demolished, and associated hazardous materials were removed and disposed off-site in accordance with the WasteMP.

7.1 EROSION AND SEDIMENT MANAGEMENT

General erosion and sediment management measures were undertaken during the reporting period in accordance with the erosion and sediment control provisions of the approved WMP and CEMP, and included:

- installation and management of sediment fencing around disturbance areas of soil stockpiles and sediment dams;
- implementation and management of progressive erosion and sediment control measures for the MOD 4 construction works, including:
 - use of sediment fences and filters to intercept and filter small volumes of non-concentrated construction runoff;
 - construction of rock check dams across swales and diversion channels to reduce the velocity of flow;
 - use of sediment basins to capture sediment and associated pollutants in construction runoff; and
 - use of scour protections where feasible;
- construction of diversion drains and bunds;
- regular inspections of the completed dams and erosion and sediment control structures; and
- sowing of all verges and drains.

MACH Energy also undertook additional internal erosion and sediment control audits during the reporting period with a focus on the MOD 4 construction areas, as per the IEA recommendations completed during the previous reporting period (Section 9).

7.2 BUSHFIRE MANAGEMENT

The main objectives of bushfire management at the MPO are to minimise the risk of bushfires and to rapidly control any outbreaks that might occur. Control measures are in place to:

- minimise potential spreading of bushfires in and around the MPO;
- protect people, property and assets;
- protect areas of heritage value; and
- protect threatened fauna and/or flora.

The control measures implemented to prevent and manage bushfires focus on minimising the amount of fuel available at the MPO and its surrounding land. These measures include:

- slashing of vegetation along roads and internal tracks that are used as fire trails and assist in dividing the site into control zones;
- the use of livestock to reduce pasture-based fuel loads on land suitable for grazing; and
- maintaining a network of water supply points to assist the NSW Rural Fire Service with logistical support.

During the reporting period, a range of activities were undertaken in respect to fire preparation in accordance with the Bushfire Management Plan, including:

- maintenance of property, boundary and roadside firebreaks;
- updating signage along the fire trail;
- monthly inspections of the firebreaks and firefighting equipment at MPO during the fire season;
- update of the Bushfire Management Plan;
- Site visit with the NSW Rural Fire Service to drive the fire trail with the local fire truck; and
- the use of livestock to reduce pasture-based fuel loads on land suitable for grazing.

There were no major outbreaks of fire at the MPO during the reporting period.

7.3 REHABILITATION MONITORING

Various ecological works were undertaken at the MPO during the reporting period, including as part of the GDP process, and as part of flora and fauna surveys and assessments in support of a proposed State Significant Development (SSD) application. These works included mapping vegetation communities, searching for threatened flora species, communities and populations, and detailed floristic data collection at numerous survey plots.

The 2021 rehabilitation monitoring program was undertaken in March 2021, which was limited by heavy rainfall. Additional survey effort was completed in May 2021. Both surveys included monitoring of analogue and the MPO rehabilitation sites. The 2021 rehabilitation monitoring program was undertaken in accordance with the MPO Rehabilitation Monitoring Manual (Ausecology, 2020). The MPO adopts a systems-based approach to rehabilitation monitoring (e.g. use of Ecosystem Function Analysis [Tongway and Ludwig, 2011]) to determine progress towards a self-sustaining ecosystem, including comparison to the analogue sites.

The rehabilitation research program at the MPO aims to incorporate management practices that have resulted from industry research into the establishment of woodland and grassland communities across mined landscapes, in particular in the Hunter Valley region.

MACH Energy is collaborating with the University of Newcastle on several rehabilitation related research projects including:

- a research project that aims to convert fines material into suitable topsoil material;
- a research project that analyses viability of various topsoil stockpile heights; and
- a research project that analyses MPO topsoil characteristics for input into the SIBERIA software program that supports geomorphic landform design modelling.

During the reporting period, the aforementioned programs were ongoing. Initial results for the topsoil characteristics project are discussed in Section 5.9.

Further information regarding MPO rehabilitation monitoring methodologies is provided in the approved MOP.

7.4 LAND MANAGEMENT

Landscape management included removal, erection and general maintenance of fence lines in the MPO.

During the reporting period, extensive tree planting was undertaken along the visual tree screen and other areas in accordance with the VIMP, to assist in shielding the site as outline in Section 5.10. General maintenance of these areas was also carried out throughout the reporting period.

Weed and pest control measures undertaken during the reporting period are outlined in Section 5.5.2. Topsoil management is discussed in Section 5.9.

8 COMMUNITY

MACH Energy's approach to community relations is focused on extending and strengthening the relationships that MACH Energy representatives have already formed with the local community.

MACH Energy released a community newsletter in May 2021 and December 2021 outlining the community activities undertaken during the reporting period. MACH Energy plans to continue to release regular community newsletters in the next reporting period to inform stakeholders/interested parties of activities at the MPO. MACH Energy also commenced distribution of the Rail Loop Project Community Newsletters in September 2020, which continued to be distributed to the local communities on a monthly basis throughout 2021 to keep residents informed of construction activities.

During the reporting period, MACH Energy undertook community relations in four key areas: communication, consultation and engagement, community development, and relationships with the local Aboriginal community. These activities are outlined in detail in the following sections.

8.1 COMMUNICATION

A number of points of communication have been established with the community. Members of the local community are encouraged to engage MACH Energy in the way that proves most convenient for them.

MACH Energy maintains a website (<https://machenergyaustralia.com.au/>) which is used to provide information to stakeholders and interested parties about the operation and environmental performance of the MPO. Information provided on the website includes key environmental management documentation, monthly environmental monitoring reports, an environmental complaints register (which is updated on a monthly basis), previous community newsletters, a new Projects Tab and CCC meeting minutes.

MACH Energy maintains a Community Hotline (1800 886 889), which is dedicated to the receipt of community complaints. The Community Hotline is publicly advertised in a variety of MACH Energy's public communication tools and is available during operating hours (i.e. 24/7), to receive any complaints. Communication received from the hotline is recorded in a Community and Stakeholder Engagement Database. This database records all necessary information regarding the nature of the communication, and if necessary, any action taken by MACH Energy as a result of the communication. A separate General Enquiries Hotline (1800 931 872) and Blasting Hotline (1800 931 873) have been in operation since 2018 and provide callers with general information about MACH Energy and blasting times and location.

A total of 119 community complaints were received during the reporting period (see Complaints Summary 2021: <https://machenergyaustralia.com.au/mount-pleasant/documentation/>) compared with 116 complaints received during the last reporting period and 240 complaints received during the 2019 reporting period. The community complaints for the reporting period related to:

- air quality (22);
- noise (67);
- blasting (4);
- visual (16); and
- others (10) (related to odour, use of radios and traffic management).

Most of the complaints were received via the Community Hotline, however some complaints were made directly to the ERM, the Environmental Superintendent, the MACH Energy Rail 2 Project team members, the DPE, and the EPA. Since the commencement of mining operations in 2017, the total number of complaints increased each year until 2019. This is likely due to the expansion of mining operations and the particularly intense bushfire and drought conditions that occurred in 2019. The total number of complaints has risen slightly during the reporting period compared to 2020, likely due to the MACH Energy Rail 2 Project construction activities. Chart 36 shows the total number of complaints since 2017. Chart 37 shows the total number of complaints by location and type during the reporting period.

The highest number of complaints received in 2021 were related to noise.

Complaints regarding blasting also decreased in 2021 in comparison to 2020. This can be attributed to the advancement of mining operations away from the community of Muswellbrook.

Thorough investigations were undertaken in response to all complaints. For noise-, air quality- and blasting-related complaints, real-time monitors were reviewed and alarms were examined. Following the investigation, the ERM made contact with the complainant in a timely manner to describe the MPO activities that may have been causing the issue and the response/s from MACH Energy. Activities were modified or ceased where necessary.

8.2 CONSULTATION AND ENGAGEMENT

A CCC is administered by MACH Energy, with a membership comprised of an independent chair, and appropriate representation from MACH Energy and the general community. The CCC is operated in general accordance with the *Community Consultative Committee Guidelines* (DPIE, 2016).

In 2021, due to the Global COVID-19 pandemic, the approach to meetings was altered to accommodate the need for members to meet via “on-line” methods. Despite the pandemic, the CCC met four times during April, June, September and December, two of which included a site tour (Plate 2). These meetings provided regular updates about the MPO, as well as an avenue to discuss aspects of the MPO that concerned community stakeholders. General discussions from these meetings related to:

- general overview of MPO progress;
- current status of approvals, management plans, modifications and supporting environmental documents;
- environmental monitoring and management;
- progress of land management activities at the MPO; and
- updates on community sponsorships, events, interactions and initiatives.

During the site visit undertaken during the reporting period, the CCC members visited the CHPP with the Senior Process Engineer and observed the rehabilitation progress (Plates 2 and 3).

MACH Energy invites a range of its team members to present updates to the committee as direct contact enhances the two-way communication between both parties.

Full meeting minutes for the 2021 CCC meetings are provided on the MACH Energy website (<https://machenergyaustralia.com.au/mount-pleasant/documentation/>).

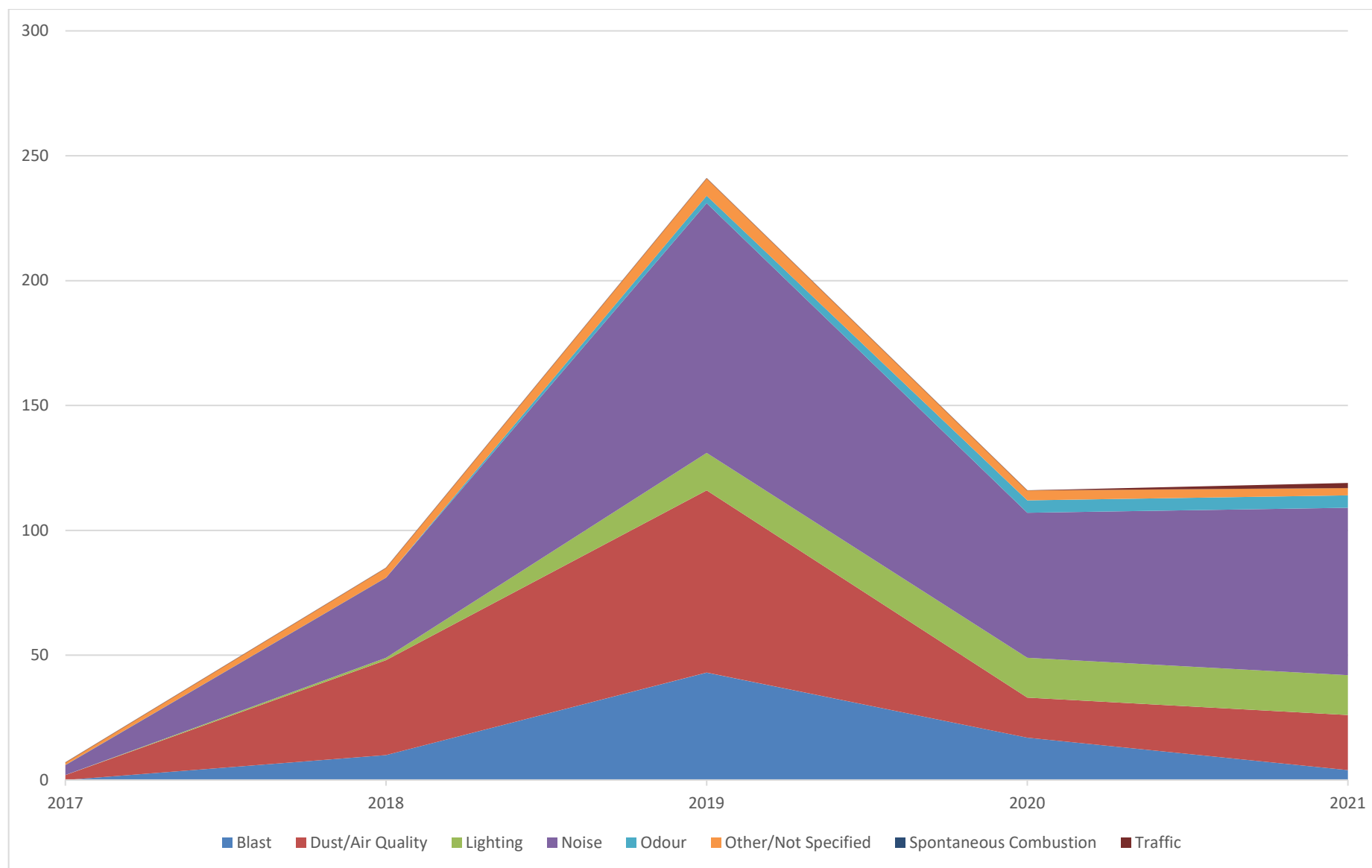


Chart 36: Complaints Analysis 2017-2021

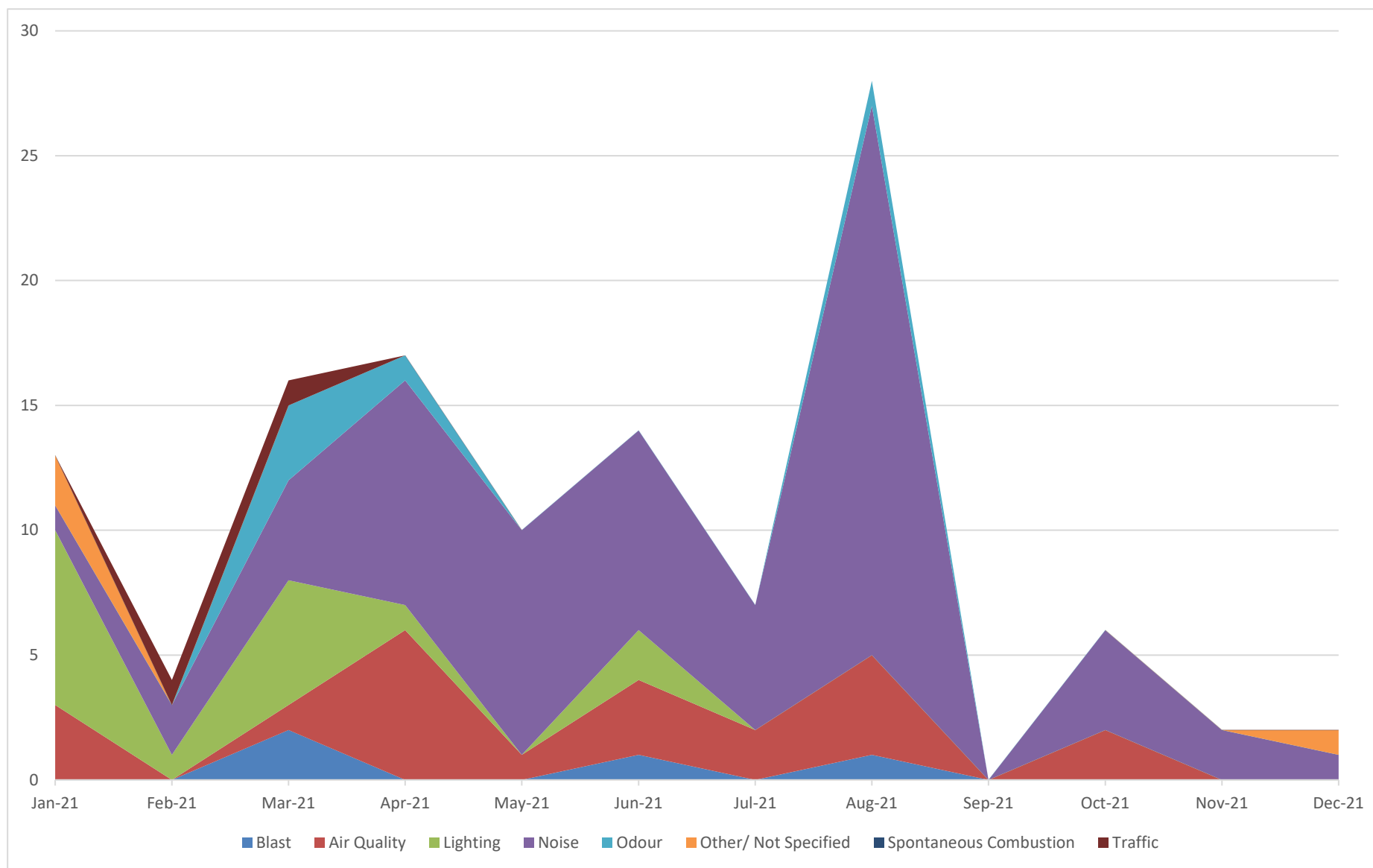


Chart 37: Complaints by Type 2021



Plate 2: The CCC visit to observe the Rail 2 Project.

8.3 COMMUNITY DEVELOPMENT

As part of acquisition of the MPO, MACH Energy has maintained the Aboriginal Community Development Fund (ACDF) developed by Coal & Allied. The fund was a community benefit specified in the Native Title Agreement made with the Wonnarua People in 2005. Since its commencement in 2006, the ACDF has contributed more than \$4 million into projects that benefit the Upper Hunter Valley Aboriginal community.

Since the acquisition, the MPO representatives have joined the existing ACDF community members to administer funds, manage its current projects and to seek-out new partnerships. An example of some of the key partnerships that were maintained during the reporting period as part of the ACDF are presented in Table 29.

Table 29
Aboriginal Community Development Fund Partnerships

Partner	Description
The Gundi Program	The Gundi Program was launched in 2011 and is even stronger in 2021. Gundi aims to help Aboriginal inmates gain trades skills in custody and secure jobs once released. The Gundi Program builds housing for remote communities, offices and abolition blocks for many local companies. The Gundi Program provides building qualifications and work experience for inmates whilst in custody.
Polly Farmer Foundation – Enrichment Centre	Graham (Polly) Farmer Foundation assists aspiring Aboriginal students who have the capacity to complete school but, potentially in the absence of additional support, are unlikely to do so. Project staff work closely with students to provide them with intensive and targeted support throughout their secondary schooling.
Ungooroo Health Program for Muswellbrook & Singleton	The ACDF funding enables Ungooroo Aboriginal Corporation to address the current gaps in Health Service provision for Aboriginal people in the Muswellbrook & Singleton area. The current focusses are on addressing gaps in mental health and cycles of care in addressing chronic disease management.
The Aboriginal Oral History Project “In our own Words” (Plate 3)	A Project to preserve the stories of Aboriginal people who make up the fabric of the Muswellbrook Aboriginal Community. The Project was launched in January 2020 and includes a hard cover book, web site and interviews with participants.



Plate 3: ACDF Oral History

The MPO sponsored NAIDOC Week 2021, however, the Global Pandemic saw many local events in both Singleton and Muswellbrook postponed until 2022. The funds will be distributed across a range of activities, from primary schools through to the Upper Hunter NAIDOC Week Awards (MACH Energy, 2020b).

8.4 RELATIONSHIPS WITH LOCAL ABORIGINAL COMMUNITY

MACH Energy works closely with the local Aboriginal community, including undertaking regular consultation with the RAPs. MACH Energy maintains a contact register, containing up to date contact details for the 88 RAPs, and is committed to maintaining ongoing consultation with these RAPs throughout the life of the MPO.

As outlined in Section 5.6.2, during 2021 archaeological salvages were carried out under AHIP #C0002092, AHIP #C0002053 and AHIP#4783 in accordance with the AHMP. RAPs had a strong presence in these salvage activities.

8.5 OTHER CONTRIBUTIONS TO COMMUNITY

- Community sponsorships including Westpac Rescue Helicopter – Annual Charity Golf Day, Merriwa Race Club, Merriwa Polocrosse, Upper Hunter Youth Services – Family Fun Day, McCully's Gap Community Hall, Scone Junior Soccer Club, NAIDOC Week Awards and Community Activities, NAIDOC Small Schools Events, Muswellbrook Fires Santa Run 2021.
- Sponsorship for Muswellbrook Chamber of Commerce "Locals Supporting Locals" Care Packs for businesses throughout COVID-19 lockdown.

- Sport sponsorships including Merriwa Campdraft and new equipment, Muswellbrook Cats AFL Men's and Women's, Upper Hunter District Cricket Association, Aberdeen Rugby League Club, Muswellbrook Little Athletics, Muswellbrook Junior Touch Association, Denman Senior & Junior Cricket Association.
- School sponsorships including St James' Primary School End of Year Presentation, Muswellbrook High School End of Year Presentation, Denman Primary School End of Year Presentation, Muswellbrook Toastmasters.
- National Breast Cancer Awareness.
- Presented at World Environment Day.
- Assisted facilitation of UHMD school mine tours.
- Wybong Rural Fire Service - contributed to new restroom facilities along with two neighbouring operations (Plate 4).



Plate 4: Wybong Rural Fire Service New Facilities

9 INDEPENDENT ENVIRONMENTAL AUDIT

No IEA was undertaken during the reporting period.

Notwithstanding, some recommendations from the IEA completed during the previous reporting period (submitted to DPE on 18 June 2020) were addressed during this reporting period. A summary of the IEA recommendations addressed during the reporting period and the actions taken by MACH Energy in response to these recommendations are provided in Table 30.

In accordance with Condition 9, Schedule 5 of Development Consent DA 92/97, MACH Energy will commission, commence and pay for the full cost of an IEA in the next reporting period.

Table 30
Summary of the Outstanding Actions from the 2020 Independent Environmental Audit Recommendations and MACH Energy's Responses

Item No.	Audit Recommendation	MACH Energy Response
Development Consent DA 92/97 S3 C 22 and 23 EPL 20850 O 3.1 – O 3.4	Cameras of the pits could be more widely distributed to key MACH Energy Staff. Investigate establishing a series of video cameras to enable monitoring of key areas at the site which have high potential for dust and visual impacts. These would include the pits and higher areas of the site. All required personnel have access to cameras.	Mount Pleasant Operation has multiple cameras within site, including those that cover the mining area. Additional cameras were installed across site during the reporting period. Key MACH Energy staff have access to cameras. MACH Energy has also installed five TV screens in the MACH Energy office showing live streams of the cameras.
Development Consent DA 92/97 S3 C 26	<p>Issue ID8</p> <p>There is an area where a drainage structure has failed near the MIA/workshop areas. This area flows into the mine water management system and does not go off site. This requires replacement and engineering advice.</p> <p>Issue ID9</p> <p>The CHPP requires erosion and sediment control review. SLR Consulting Australia Pty Ltd (SLR) understand a significant amount of money has been set aside for this work and engineering designs are progressing. This area flows into the mine water management system and does not go off site.</p> <p>Implement the actions of the engineering review.</p> <p>Ensure the designs also include a review of the drains that fall just outside the CHPP area (near the Rejects Road). These are older degraded drainage lines.</p> <p>Note, since the Audit inspection some of these areas have been remediated. However additional work is still required in this area.</p>	<p>Remediation of the MIA drainage structures was completed during the reporting period. An internal audit was undertaken upon completion of the remediation works.</p> <p>Works to update the mine water management and erosion and sediment control systems at the CHPP commenced during the reporting period and will continue during the next reporting period.</p>
Development Consent DA 92/97 S3 C 26	<p>Issue ID13</p> <p>Review engineering controls to reduce the likelihood of any tailings spill going into the cleanwater dam. Possible use of sleeve to contain tailings pipeline.</p> <p>Note, evidence provided since the Audit inspection of the installation of end of line burst protection flow meters.</p>	<p>The fines emplacement pipeline has end of line burst protection flow meters which will trigger an alarm in the case of a spill.</p> <p>Pipeline burst sleeves were installed during the reporting period at the section of the fines emplacement pipeline that goes over the clean water diversion drain.</p>

Table 30 (Continued)
Summary of the Outstanding Actions from the 2020 Independent Environmental Audit Recommendations and MACH Energy's Responses

Item No.	Audit Recommendation	MACH Energy Response
Development Consent DA 92/97 S3 C 33	REC: Continue the process of progressing the covenant for the Aboriginal Conservation Area.	MACH Energy has progressed the covenant during the reporting period. The security of Aboriginal Heritage Conservation Area A is being finalised in consultation with DPE and it is anticipated that this process will be completed during the next reporting period.
Development Consent DA 92/97 S3 C 47	REC: It would be beneficial to have a camera in town pointing at the site for use of MACH Energy and contractors. This would assist in determining the impacts such as visual and dust.	MPO has multiple cameras within site, including those that cover the mining area. Additional cameras were installed across site during the reporting period. Key MACH Energy staff have access to cameras. MACH Energy has also installed five TV screens in the MACH Energy office showing live streams of the cameras.
Development Consent DA 92/97 S3 C 54	REC: Update the relevant document (MOP/RMP or Rehabilitation Strategy) to ensure there are no inconsistencies with the documents.	MOP was prepared and approved by the NSW Resources Regulator on 24 June 2021. The revised Rehabilitation Strategy was also prepared to incorporate updates to maintain consistency with the MOP and lodged with DPE on 16 October 2021. As at 31 December 2021, the revised Rehabilitation Strategy was awaiting approval.

10 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

10.1 ENVIRONMENTAL INCIDENTS

The following reportable incident occurred during the reporting period:

- MOD 4 out of hours construction works on 21 January 2021 and 31 March 2021 (Section 5.2.3).
- A noise exceedance event on 27 August 2021 (Section 5.2).
- Water discharge events on 8 March 2021, 9 June 2021, 12 November 2021, 8 December 2021 and 9 December 2021 (Section 10.2).
- Elevated EC levels at surface water site W17 on three consecutive monitoring rounds notified on 11 June 2021 (Section 6.1.3).

10.2 NON-COMPLIANCES

A summary of non-compliances and potential non-compliances during the reporting period (i.e. 1 January – 31 December 2021), and, if applicable, the actions taken in response to the non-compliances, is outlined in Table 31.

Table 31
Compliance Summary

Approval Document Reference	Observation	Action/Comment
Development Consent DA 92/97 Condition S3 44f	A concrete pour at a pillar for the rail loop viaduct, part of the MPO MOD 4 construction works located outside of the Mining Lease Boundary, continued past 6pm on 21 January 2021 to ensure the engineering structural integrity of the MOD 4 rail loop viaduct pillar. No heavy vehicles (including the concrete agitator truck) were working after 6pm.	<p>MACH Energy referred the non-compliance to DPE on 22 January 2021.</p> <p>No real-time noise alarms or noise complaints received during the event. No adverse noise impacts to the surrounding community were observed and no environmental harm occurred due to the activity.</p> <p>MACH Energy undertook investigation of the incident and submitted the investigation report to DPE on 5 February 2021.</p> <p>A warning letter was issued from DPE on 19 February 2021.</p> <p>MACH Energy has since implemented additional measures to reduce the risk of reoccurrence of unauthorised out of hours works.</p> <p>OHWP was approved by DPE on 15 March 2021.</p>
Development Consent DA 92/97 S3 C26 3	Intense rainfall occurred on 8 March 2021 (14.8 mm in a 50 minute period). During an environmental inspection immediately following the rainfall event, MACH Energy identified a small section of erosion and sediment controls that had been impacted by the event. In this section there was evidence that runoff had travelled downstream through an active construction area, into the Wybong Road reserve and through further sediment controls before reporting to the Wybong Road swale drain where the sediment ceased.	<p>Following the incident, MACH Energy undertook an investigation into the cause and self-reported the incident to the DPE and EPA. Reinstatement of erosion and sediment controls were undertaken on the same day.</p> <p>Regular inspections of erosion and sediment controls were implemented and undertaken prior to and during forecasted heavy rainfall events, in addition to a regular third party inspections by a Certified Professional in Erosion & Sediment Control (CPESC).</p> <p>No environmental harm occurred and no complaints were received.</p>
Development Consent DA 92/97 Condition S3 44f	<p>A concrete pour part of the MPO MOD 4 construction works located outside of the Mining Lease Boundary occurred past 6pm on 31 March 2021, prior to notifying the nearby residents as required by the OHWP.</p> <p>Attended noise monitoring was undertaken at two representative locations during the works, which indicated that the construction noise levels complied with all relevant Development Condition DA 92/97, NPfi and EPL 20850 conditions.</p>	<p>Following the incident, MACH Energy undertook an investigation into the cause and self-reported the incident to the DPE.</p> <p>The OHWP, including the requirement for notification, was recommunicated to the team.</p> <p>No environmental harm occurred and no complaints were received.</p>

Table 31 (Continued)
Compliance Summary

Approval Document Reference	Observation	Action/Comment
Development Consent DA 92/97 Condition S3 C26	Intense rainfall occurred on 8 June 2021 (28.3 mm) which resulted in two separate discharges of sediment-laden water from MOD 4 construction area and into Wybong Road swale drains, where it ceased.	<p>Following the incident, MACH Energy undertook an investigation into the cause and self-reported the incident to the DPE and EPA. Reinstatement of erosion and sediment controls were undertaken as soon as practicable.</p> <p>Water quality monitoring was undertaken in accordance with the approved WMP.</p> <p>Regular inspections of erosion and sediment controls were implemented and undertaken prior to and during forecasted heavy rainfall events, in addition to regular third party audits by a CPESC.</p> <p>The water discharge was confined to the Wybong Road upgrade construction area and road reserve within the MPO Development Consent DA 92/97 boundary.</p> <p>There were no adverse impacts to the surrounding community or any environmental harm due to the two water discharges. No complaints were received.</p> <p>DPE confirmed in writing on 9 July 2021 that no further action was required.</p>
Development Consent DA 92/97 Condition S3 28	Elevated EC readings at surface water monitoring site W17 was recorded on three consecutive monitoring rounds in April, May and June 2021.	<p>MACH Energy undertook all steps outlined in the SWQRP in accordance with the approved WMP. The investigation indicated that the elevated EC levels at site W17 was not attributed to MPO activities.</p> <p>DPE confirmed in writing that no further action was required.</p>

Table 31 (Continued)
Compliance Summary

Approval Document Reference	Observation	Action/Comment
Development Consent DA 92/97 Condition S3 C3	Attended monitoring on 27 August 2021 identified a sustained exceedance (measurements at 00:18 and 00:54) of the LA _{1(1 minute)} criterion at monitoring location N-AT4.	<p>Following the incident, MACH Energy notified the DPE and EPA of the potential exceedances of noise criteria on 1 September 2021.</p> <p>MACH Energy followed the NMP procedure and modified operations upon notification of the exceedance. MACH Energy also notified (in writing) the affected landowners and tenants of the potential exceedance and undertook additional LA_{1(1 minute)} monitoring during September – November 2021 monitoring rounds closer to the affected landowners and tenants. The outcomes of the additional LA_{1(1 minute)} monitoring surveys were communicated to DPE and the affected landowners and tenants in December 2021.</p> <p>Warning letter was received from DPE for non-compliance on 24 November 2021.</p> <p>Final outcomes of the investigation are to be determined, and will be reported in the next Annual Review.</p>

Table 31 (Continued)
Compliance Summary

Approval Document Reference	Observation	Action/Comment
Development Consent DA 92/97 Condition S3 C26	<p>Intense rainfall occurred on 12 November 2021 (41mm in a 5 hour period) resulting in a discharge of sediment-laden water from the Rail 2 Project Area and into Wybong Road swale drains.</p> <p>The closest meteorological station to the incident (A-PF2 / EPL Point 1) recorded 46.8mm between the hours of 20:00 on 11 November and 07:00 on 12 November, 30.8mm of which occurred within 3 hours up to 01:00am on 12 November.</p>	<p>Following the incident, MACH Energy undertook an investigation into the cause and self-reported the incident to the DPE and EPA.</p> <p>Water quality sampling was undertaken during the event, with water quality showing negligible changes in release water in pH, EC and TSS.</p> <p>Reinstatement of erosion and sediment controls were undertaken as soon as practicable (same day).</p> <p>Regular inspections of erosion and sediment controls were implemented and undertaken prior to and during forecasted heavy rainfall events, in addition to regular third party audits by a CPESC.</p> <p>The water discharge was confined to the Wybong Road upgrade construction area and road reserve within the MPO Development Consent DA 92/97 boundary.</p> <p>There were no adverse impacts to the surrounding community or any environmental harm due to the water discharge. DPE confirmed that no further action was required on 7 December 2021.</p>

Table 31 (Continued)
Compliance Summary

Approval Document Reference	Observation	Action/Comment
Development Consent DA 92/97 Condition S3 C26	Intense rainfall occurred on 8 December 2021 (24.2 mm in a 30 minute period with a total of 47.8 mm in a 9 hour period) causing four sediment basins (namely Sediment Dams [SD] 4, 6 and 7 and Environmental Dam [ED] 2.) to spill water offsite.	<p>Following the rainfall events, MACH Energy undertook an investigation into the cause and self-reported the incidents to the DPE and EPA.</p> <p>Water quality sampling was undertaken during the events, with water quality showing negligible changes in release water in pH, EC and TSS.</p> <p>MACH Energy undertook actions to mitigate the impact of discharges prior to the rainfall event, including regular inspections and dewatering of sediment dams through pumping to the mine water system.</p> <p>Regular inspections of erosion and sediment controls were implemented and undertaken prior to and during forecasted heavy rainfall events, in addition to regular third party inspections by a CPESC.</p> <p>Immediate actions following the incidents included pumping to reduce the quantity and duration of the discharge event, with pumping already having commenced on 3 of the 4 dams prior to the event.</p> <p>The initial investigation indicated that no environmental harm occurred. No complaints were received.</p>
Development Consent DA 92/97 Condition S3 C26	Intense rainfall occurred on 9 December 2021 (47.8 mm with a 1 in 10 year event triggered) causing four sediment basins at the MPO, namely SD 4, 6 and 7 and ED 2 to spill water offsite.	<p>Final outcomes of the investigation are to be determined, and will be reported in the next Annual Review.</p> <p>Notwithstanding, MACH Energy expects that the outcomes of the investigation will be that there was no non-compliance as the sediment dams were managed in accordance with the relevant guidelines/plans and that the rainfall event was above the required design criteria of sediment dams.</p>

11 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

Key activities to be completed during the next reporting period include:

- Installation of a new bore to replace bore 5000D000.
- Finalisation of the updated WMP with DPE.
- Continued consultation regarding the potential Aboriginal Heritage Conservation Areas.
- Continued collaboration with the University of Newcastle on various rehabilitation related research projects as described in Section 7.3.
- Completion of MOD 4 construction activities.
- IEA to occur in accordance with Condition 9, Schedule 5 of Development Consent DA 92/97.

12 REFERENCES

- AECOM (2020) *Monthly Environmental Monitoring Report. Mount Pleasant Operation – May 2020*. Prepared for MACH Energy.
- ATC Williams (2021) *MPO Review Management of Fines Emplacement 2021*.
- Ausecology (2019) *Mount Pleasant Operations – Rehabilitation Monitoring Manual 2019 – 2020*.
- Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
- Australian Groundwater & Environmental Consultants (2021) *Mount Pleasant Operation Trigger Level Investigation for Monitoring Bore 5000D000 (Electrical Conductivity)*.
- Bengalla Mining Company Pty Ltd (2017) *Water Management Plan*.
- Coal & Allied Operations Pty Ltd (2014) *Mount Pleasant Project Annual Review 2013*.
- Coal & Allied Operations Pty Ltd (2015) *Mount Pleasant Project Annual Review 2014*.
- Coal & Allied Operations Pty Ltd (2016) *Mount Pleasant Project Annual Review 2015*.
- Department of Planning and the Environment (2015) *Post-approval requirements for State significant mining developments - Annual Review Guideline – October 2015*.
- Department of Planning and the Environment (2016) *Community Consultative Committee Guidelines*.
- Environment Protection Authority (2000) *New South Wales Industrial Noise Policy*.
- Environment Protection Authority (2019) *Dust Assessment Handbook 2019*.
- Environmental Resources Management Mitchell McCotter (1997) *Mt Pleasant Mine Environmental Impact Statement*.
- Hose, G. & Turak, E. (2004) *River Health in the New South Wales Lower North Coast, Hunter and Central Coast Catchments*. Report prepared for the NSW Environment Protection Authority.
- Klohn Crippen Berger (2021) *Mount Pleasant In-field Analysis Site Report and Geochemical Test Results*.
- MACH Energy Australia Pty Ltd (2017a) *Mount Pleasant Operation – South Pit Haul Road Modification*.
- MACH Energy Australia Pty Ltd (2017b) *Mount Pleasant Operation 2016 Annual Review*.
- MACH Energy Australia Pty Ltd (2018) *Mount Pleasant Operation 2017 Annual Review*.
- MACH Energy Australia Pty Ltd (2019) *Mount Pleasant Operation 2018 Annual Review*.
- MACH Energy Australian Pty Ltd (2020a) *Mount Pleasant Operation 2019 Annual Review*.
- MACH Energy Australia Pty Ltd (2020b) *Mount Pleasant Operation Community Newsletter – December 2020*.
- MACH Energy Australian Pty Ltd (2021) *Mount Pleasant Operation 2020 Annual Review*.
- National Health and Medical Research Council, Natural Resource Management Ministerial Council (2011) *Australian Drinking Water Guidelines, Paper 6 National Water Quality Management Strategy*.

- Narla Environmental (2021) *Tiger Orchid (Cymbidium canaliculatum) Translocation Report – Mount Pleasant Operation, August 2021.*
- RGS (2020) *Geochemistry Assessment, Mount Pleasant Optimisation Project.*
- Rio Tinto Coal Australia Pty Limited (2012) *Mt Pleasant Fugitive Emissions Evaluation.*
- Stark, J.D., Phillips, N. (2009) *Seasonal variability in the Macroinvertebrate Community Index: Are seasonal correction factors required?* New Zealand Journal of Marine and Freshwater Research.
- Todoroski Air Sciences (2017) *Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse Gas Assessment.*
- Todoroski Air Sciences (2022) *Mount Pleasant Operation – 2021 Annual Air Quality Review.*
- Tongway, D. J. & Ludwig, J. A. (2011) *Restoring disturbed landscapes, putting principles into practice.* Washington: Society for Ecological Restoration International, Island Press.

APPENDIX A
NOISE MONITORING SUMMARY 2021

Table A1
L_{Aeq,15minute} Attended Noise Monitoring Summary 2021

Monitoring Location/Period		Jan ¹	Feb ²	Mar ³	Apr ⁴	May ⁵	Jun ⁶	Jul ⁷	Aug ⁸	Sep ⁹	Oct ¹⁰	Nov ¹¹	Dec ¹²
N-AT1	Night	<20 dBA	<25 dBA	NM	<30 dBA	28 dBA	IA	IA	IA	IA	28 dBA	35 dBA	IA
N-AT2	Night	IA	<25 dBA	<25 dBA	22 dBA	IA	<25 dBA	24 dBA	IA	30 dBA	IA	<20 dBA	27 dBA
N-AT3	Night	32 dBA	38 dBA	35 dBA	35 dBA	37 dBA	NM	38 dBA 29 dBA*	43 dBA	46 dBA	44 dBA	IA	IA
N-AT4	Night	35 dBA	IA	35 dBA	31 dBA	42 dBA	40 dBA	32 dBA	39 dBA 42 dBA*	IA	35 dBA	IA	IA
N-AT5	Night	37 dBA	IA	IA	<30 dBA	38 dBA	36 dBA	NM	38 dBA	<30 dBA	35 dBA	IA	IA
N-AT6	Night	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

Note:

dBA = A-weighted decibels.

IA = Inaudible.

NM = Not measurable.

Indicates criteria were not applicable due to meteorological conditions at the time of measurement.

Bold values indicate exceedance of criterion.

Measurements undertaken on the following dates:

¹: 18 and 19 January. ²: 4 and 5 February. ³: 4 and 5 March. ⁴: 12 and 13 April. ⁵: 10 May. ⁶: 7 and 8 June. ⁷: 12 and 13 July. ⁸: 26 and 27 August. ⁹: 21 and 22 September. ¹⁰: 18 and 19 October. ¹¹: 9 November. ¹²: 6 and 7 December.

* A second measurement was taken for July at N-AT3 and August at N-AT4 due to low-frequency modifying factors being applicable at the time.

Table A2
L_{A1,1minute} Attended Noise Monitoring Summary 2021

Monitoring Location/Period		Jan ¹	Feb ²	Mar ³	Apr ⁴	May ⁵	Jun ⁶	Jul ⁷	Aug ⁸	Sep ⁹	Oct ¹⁰	Nov ¹¹	Dec ¹²
N-AT1	Night	25 dBA	<25 dBA	NM	44 dBA	41 dBA	IA	IA	IA	IA	40 dBA	39 dBA	IA
N-AT2	Night	IA	<25 dBA	28 dBA	26 dBA	IA	<25 dBA	30 dBA	IA	38 dBA	IA	<20 dBA	32 dBA
N-AT3	Night	35 dBA	43 dBA	38 dBA	37 dBA	44 dBA	33 dBA	47 dBA 33 dBA*	52 dBA	59 dBA	52 dBA	IA	IA
N-AT4	Night	40 dBA	IA	40 dBA	34 dBA	45 dBA	45 dBA	35 dBA	56 dBA 48 dBA*	IA	45 dBA	IA	IA
N-AT5	Night	42 dBA	IA	IA	<30 dBA	43 dBA	43 dBA	38 dBA	41 dBA	<30 dBA	38 dBA	IA	IA
N-AT6	Night	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

Note:

dBA = A-weighted decibels.

IA = Inaudible.

NM = Not measurable.

Indicates criteria were not applicable due to meteorological conditions at the time of measurement.

Bold values indicate exceedance of criterion.

Measurements undertaken on the following dates:

¹: 18 and 19 January. ²: 4 and 5 February. ³: 4 and 5 March. ⁴: 12 and 13 April. ⁵: 10 May. ⁶: 7 and 8 June. ⁷: 12 and 13 July. ⁸: 26 and 27 August. ⁹: 21 and 22 September. ¹⁰: 18 and 19 October. ¹¹: 9 November. ¹²: 6 and 7 December.

* A second measurement was taken for July at N-AT3 and August at N-AT4 due to low-frequency modifying factors being applicable at the time.

Table A3
Cumulative Mining Noise Monitoring Summary 2021

Monitoring Location/Period		Jan ¹	Feb ²	Mar ³	Apr ⁴	May ⁵	Jun ⁶	Jul ⁷	Aug ⁸	Sep ⁹	Oct ¹⁰	Nov ¹¹	Dec ¹²
N-AT1	Night	Nil	32 dBA	Nil	36 dBA	29 dBA	Nil	Nil	Nil	Nil	Nil	37 dBA	Nil
N-AT2	Night	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
N-AT3	Night	Nil	Nil	Nil	Nil	Nil	Nil	40 dBA Nil*	Nil	Nil	Nil	Nil	Nil
N-AT4	Night	35 dBA	Nil	38 dBA	36 dBA	Nil	Nil	Nil	Nil Nil*	Nil	38 dBA	Nil	Nil
N-AT5	Night	37 dBA	Nil	Nil	31 dBA	Nil	39 dBA	Nil	Nil	37 dBA	39 dBA	Nil	Nil
N-AT6	Night	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Note:

dBA = A-weighted decibels.

IA = Inaudible.

NM = Not measurable.

Nil = Only one source of noise present, or MPO did not contribute to total mining noise levels.

Indicates criteria were not applicable due to meteorological conditions at the time of measurement.

Bold values indicate exceedance of criterion.

Measurements undertaken on the following dates:

¹: 18 and 19 January. ²: 4 and 5 February. ³: 4 and 5 March. ⁴: 12 and 13 April. ⁵: 10 May. ⁶: 7 and 8 June. ⁷: 12 and 13 July. ⁸: 26 and 27 August. ⁹: 21 and 22 September. ¹⁰: 18 and 19 October. ¹¹: 9 November. ¹²: 6 and 7 December.

* A second measurement was taken for July at N-AT3 and August at N-AT4 due to low-frequency modifying factors being applicable at the time.

APPENDIX B

BLASTING SUMMARY 2021

MPO Blast Monitoring Summary – 2021

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BVO2
8/01/2021	15:24	0.410 mm/s	109 DBL	0.270 mm/s	100.1 DBL	0.460 mm/s	94.7 DBL
12/01/2021	13:07	0.240 mm/s	95.5 DBL	0.120 mm/s	88.9 DBL	0.330 mm/s	96.7 DBL
14/01/2021	13:12	0.270 mm/s	93.2 DBL	0.150 mm/s	87.1 DBL	0.400 mm/s	100.8 DBL
15/1/2021	12:05	0.040 mm/s	90.6 DBL	0.010 mm/s	95.1 DBL	0.010 mm/s	81.9 DBL
22/01/2021	11:33	0.180 mm/s	94.3 DBL	0.100 mm/s	93.4 DBL	0.100 mm/s	94.5 DBL
1/02/2021	13:00	0.300 mm/s	93.6 DBL	0.130 mm/s	88.6 DBL	0.440 mm/s	95.1 DBL
3/02/2021	13:00	0.400 mm/s	95.6 DBL	0.27mm/s	88.5 DBL	0.450 mm/s	95.7 DBL
6/02/2021	10:43	0.260 mm/s	101.2 DBL	0.130 mm/s	89.1 DBL	0.300 mm/s	99 DBL
11/02/2021	1:28	0.290 mm/s	96.9 DBL	0.100 mm/s	97.3 DBL	0.210 mm/s	97 DBL
11/02/2021	1:28	0.310 mm/s	93.9 DBL	0.200 mm/s	97.3 DBL	0.290 mm/s	97 DBL
19/02/2021	12:12	0.570 mm/s	106.8 DBL	0.200 mm/s	102.6 DBL	0.430 mm/s	102.8 DBL
24/02/2021	15:06	0.420 mm/s	100.1 DBL	0.310 mm/s	102.2 DBL	0.390 mm/s	100.6 DBL
19/02/2021	12:12	0.570 mm/s	106.8 DBL	0.200 mm/s	102.6 DBL	0.430 mm/s	102.8 DBL
24/02/2021	15:06	0.420 mm/s	100.1 DBL	0.310 mm/s	102.2 DBL	0.390 mm/s	100.6 DBL
26/02/2021	12:17	0.170 mm/s	95.9 DBL	0.150 mm/s	87.9 DBL	0.370 mm/s	97.7 DBL
4/03/2021	12:18	0.960 mm/s	92.8 DBL	0.510 mm/s	91.7 DBL	0.730 mm/s	96.1 DBL
4/03/2021	12:18	0.960 mm/s	92.8 DBL	0.510 mm/s	91.7 DBL	0.730 mm/s	96.1 DBL
5/03/2021	12:42	0.160 mm/s	90.8 DBL	0.100 mm/s	85.3 DBL	0.200 mm/s	90.4 DBL
11/03/2021	1:08	0.750 mm/s	98.8 DBL	0.460 mm/s	98 DBL	0.720 mm/s	100 DBL
11/03/2021	1:08	0.750 mm/s	98.8 DBL	0.460 mm/s	98 DBL	0.720 mm/s	100 DBL
16/03/2021	1:26	0.090 mm/s	104.2 DBL	0.050 mm/s	99 DBL	0.140 mm/s	101.1 DBL
16/03/2021	1:26	0.090 mm/s	104.2 DBL	0.050 mm/s	99 DBL	0.140 mm/s	101.1 DBL
25/03/2021	1:36	0.400 mm/s	103.9 DBL	0.270 mm/s	112.7 DBL	0.420 mm/s	106.9 DBL
30/03/2021	14:03	0.400 mm/s	96.3 DBL	0.360 mm/s	98.1 DBL	0.980 mm/s	98.4 DBL

MPO Blast Monitoring Summary – 2021 (continued)

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BVO2
30/03/2021	14:03	0.400 mm/s	96.3 DBL	0.360 mm/s	98.1 DBL	0.980 mm/s	98.4 DBL
1/04/2021	13:35	0.280 mm/s	97.2 DBL	0.190 mm/s	103.2 DBL	0.540 mm/s	94.1 DBL
8/04/2021	13:06	0.010 mm/s	89.4 DBL	0.010 mm/s	91.4 DBL	0.000 mm/s	82.1 DBL
14/04/2021	13:23	0.140 mm/s	107.7 DBL	0.080 mm/s	100.3 DBL	0.260 mm/s	112.1 DBL
16/04/2021	12:27	1.770 mm/s	105.9 DBL	0.780 mm/s	97.9 DBL	1.060 mm/s	97 DBL
19/04/2021	13:00	0.170 mm/s	94.3 DBL	0.100 mm/s	82.7 DBL	0.170 mm/s	95.7 DBL
21/04/2021	13:05	0.210 mm/s	89.3 DBL	0.180 mm/s	94.6 DBL	0.260 mm/s	92.5 DBL
21/04/2021	13:05	0.210 mm/s	89.3 DBL	0.180 mm/s	94.6 DBL	0.260 mm/s	92.5 DBL
29/04/2021	15:02	0.070 mm/s	98.4 DBL	0.050 mm/s	86.8 DBL	0.110 mm/s	94.7 DBL
27/04/2021	12:56	0.510 mm/s	99.3 DBL	0.240 mm/s	91.3 DBL	0.360 mm/s	97.2 DBL
29/04/2021	14:48	0.300 mm/s	93.3 DBL	0.260 mm/s	93.6 DBL	0.680 mm/s	93.8 DBL
29/04/2021	14:48	0.300 mm/s	93.3 DBL	0.260 mm/s	93.6 DBL	0.680 mm/s	93.8 DBL
4/05/2021	13:06	0.050 mm/s	84.5 DBL	0.020 mm/s	74.8 DBL	0.090 mm/s	92 DBL
18/05/2021	13:09	2.030 mm/s	106.1 DBL	0.850 mm/s	97.6 DBL	0.740 mm/s	99.5 DBL
12/05/2021	13:08	0.070 mm/s	92.1 DBL	0.060 mm/s	81.7 DBL	0.180 mm/s	88.9 DBL
20/05/2021	13:12	0.140 mm/s	100.9 DBL	0.070 mm/s	105.9 DBL	0.190 mm/s	96.4 DBL
20/05/2021	13:12	0.140 mm/s	100.9 DBL	0.070 mm/s	105.9 DBL	0.190 mm/s	96.4 DBL
26/05/2021	15:08	0.730 mm/s	97.1 DBL	0.300 mm/s	103.4 DBL	0.360 mm/s	100.3 DBL
26/05/2021	15:08	0.730 mm/s	97.1 DBL	0.300 mm/s	103.4 DBL	0.360 mm/s	100.3 DBL
27/05/2021	13:08	0.220 mm/s	90.8 DBL	0.250 mm/s	101.1 DBL	0.300 mm/s	95.1 DBL
2/06/2021	13:04	0.420 mm/s	96.8 DBL	0.290 mm/s	86.3 DBL	0.210 mm/s	89.8 DBL

MPO Blast Monitoring Summary – 2021 (continued)

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BVO2
5/06/2021	10:12	0.790 mm/s	107.6 DBL	0.460 mm/s	102.2 DBL	1.000 mm/s	103.3 DBL
9/06/2021	9:32	0.070 mm/s	92.9 DBL	0.060 mm/s	94.9 DBL	0.150 mm/s	106.2 DBL
9/06/2021	9:32	0.070 mm/s	92.9 DBL	0.060 mm/s	94.9 DBL	0.150 mm/s	106.2 DBL
18/06/2021	12:07	0.920 mm/s	107 DBL	0.420 mm/s	110.2 DBL	1.230 mm/s	111.3 DBL
23/06/2021	12:59	0.870 mm/s	101.5 DBL	0.440 mm/s	99.8 DBL	0.620 mm/s	99.5 DBL
24/06/2021	13:05	0.490 mm/s	105.1 DBL	0.220 mm/s	105.8 DBL	0.500 mm/s	102.6 DBL
25/06/2021	11:46	0.200 mm/s	91.1 DBL	0.070 mm/s	98.5 DBL	0.260 mm/s	96.6 DBL
30/06/2021	13:11	0.100 mm/s	93.9 DBL	0.080 mm/s	90.6 DBL	0.250 mm/s	92.7 DBL
1/07/2021	13:09	0.120 mm/s	98.5 DBL	0.060 mm/s	93 DBL	0.230 mm/s	97.2 DBL
1/07/2021	13:09	0.120 mm/s	98.5 DBL	0.060 mm/s	93 DBL	0.230 mm/s	97.2 DBL
7/07/2021	13:27	0.320 mm/s	92.8 DBL	0.220 mm/s	88.2 DBL	0.510 mm/s	96.9 DBL
7/07/2021	13:27	0.320 mm/s	92.8 DBL	0.220 mm/s	88.2 DBL	0.510 mm/s	96.9 DBL
8/07/2021	16:55	0.410 mm/s	109.4 DBL	0.220 mm/s	105.4 DBL	0.190 mm/s	100 DBL
8/07/2021	16:55	0.410 mm/s	109.4 DBL	0.220 mm/s	105.4 DBL	0.190 mm/s	100 DBL
8/07/2021	16:55	0.410 mm/s	109.4 DBL	0.220 mm/s	105.4 DBL	0.190 mm/s	100 DBL
15/07/2021	13:31	0.26 mm/s	95.5 DBL	0.170 mm/s	109.2 DBL	0.310 mm/s	102.1 DBL
19/07/2021	14:05	0.080 mm/s	98.5 DBL	0.060 mm/s	105.9 DBL	0.170 mm/s	103.6 DBL
26/07/2021	14:23	0.350 mm/s	117.9 DBL	0.190 mm/s	110 DBL	0.510 mm/s	113 DBL
29/07/2021	13:32	0.400 mm/s	96.6 DBL	0.29 mm/s	105 DBL	0.410 mm/s	98.3 DBL
29/07/2021	13:32	0.400 mm/s	96.6 DBL	0.29 mm/s	105 DBL	0.410 mm/s	98.3 DBL
5/08/2021	13:02	0.880 mm/s	97.9 DBL	0.300 mm/s	105 DBL	1.140 mm/s	104 DBL
5/08/2021	13:02	0.880 mm/s	97.9 DBL	0.300 mm/s	105 DBL	1.140 mm/s	104 DBL
13/08/2021	12:49	0.420 mm/s	92 DBL	0.290 mm/s	83.4 DBL	1.130 mm/s	93.8 DBL
17/08/2021	13:09	0.100 mm/s	92.6 DBL	0.100 mm/s	86 DBL	0.200 mm/s	92.9 DBL

MPO Blast Monitoring Summary – 2021 (continued)

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BVO2
19/08/2021	12:59	0.570 mm/s	98.7 DBL	0.600 mm/s	85.8 DBL	0.580 mm/s	99.5 DBL
26/08/2021	13:10	0.670 mm/s	95.9 DBL	0.440 mm/s	92.5 DBL	0.360 mm/s	101.8 DBL
30/08/2021	13:09	0.050 mm/s	104.5 DBL	0.010 mm/s	87.8 DBL	0.070 mm/s	98.5 DBL
1/09/2021	13:11	0.560 mm/s	108.3 DBL	0.420 mm/s	97.8 DBL	0.490 mm/s	99.3 DBL
2/09/2021	13:16	0.310 mm/s	99.9 DBL	0.220 mm/s	97.8 DBL	0.640 mm/s	94.6 DBL
9/09/2021	13:07	0.710 mm/s	102.4 DBL	0.310 mm/s	97.7 DBL	0.410 mm/s	96.7 DBL
10/09/2021	12:10	0.560 mm/s	108.3 DBL	0.440 mm/s	97.8 DBL	0.490 mm/s	99.3 DBL
10/09/2021	12:10	0.560 mm/s	108.3 DBL	0.440 mm/s	97.8 DBL	0.490 mm/s	99.3 DBL
15/09/2021	1:05	0.150 mm/s	95.2 DBL	0.190 mm/s	101.3 DBL	0.210 mm/s	97.4 DBL
21/09/2021	13:05	0.760 mm/s	100.8 DBL	0.610 mm/s	100.1 DBL	0.750 mm/s	104.4 DBL
23/09/2021	14:23	0.610 mm/s	102.3 DBL	0.780 mm/s	99.1 DBL	0.780 mm/s	98.9 DBL
27/09/2021	14:33	1.180 mm/s	114.3 DBL	0.850 mm/s	102 DBL	0.900 mm/s	95.1 DBL
30/09/2021	13:00	0.820 mm/s	98 DBL	0.420 mm/s	102.5 DBL	0.640 mm/s	97.7 DBL
6/10/2021	13:02	0.180 mm/s	101.4 DBL	0.150 mm/s	94.9 DBL	0.510 mm/s	95.9 DBL
9/10/2021	13:36	0.050 mm/s	95.3 DBL	0.020 mm/s	102.1 DBL	0.070 mm/s	99.5 DBL
19/10/2021	13:15	0.030 mm/s	87.3 DBL	0.030 mm/s	94.2 DBL	0.160 mm/s	85.9 DBL
22/10/2021	14:02	0.350 mm/s	92.8 DBL	0.260 mm/s	95.1 DBL	0.560 mm/s	92.1 DBL
29/10/2021	09:14	0.280 mm/s	108.5 DBL	0.100 mm/s	105.2 DBL	0.240 mm/s	115.7 DBL
3/11/2021	12:58	0.030 mm/s	94.9 DBL	0.010 mm/s	96 DBL	0.000 mm/s	81.3 DBL
4/11/2021	12:59	0.070 mm/s	93.9 DBL	0.010 mm/s	80.8 DBL	0.010 mm/s	72.7 DBL
5/11/2021	12:00	0.030 mm/s	83.8 DBL	0.010 mm/s	73.4 DBL	0.000 mm/s	65.5 DBL
10/11/2021	14:29	0.440 mm/s	101.6 DBL	0.270 mm/s	104 DBL	0.550 mm/s	100.9 DBL

MPO Blast Monitoring Summary – 2021 (continued)

Date Fired	Time Fired	Vibration BVOA	Overpressure BVOA	Vibration BVOC	Overpressure BVOC	Vibration BVO2	Overpressure BVO2
11/11/2021	13:07	0.300 mm/s	91.4 DBL	0.160 mm/s	83 DBL	0.350 mm/s	94.7 DBL
17/11/2021		0.220 mm/s	97.1 DBL	0.190 mm/s	99.7 DBL	0.230 mm/s	91 DBL
18/11/2021	13:12	0.010 mm/s	86.1 DBL	0.010 mm/s	79.8 DBL	0.000 mm/s	82.2 DBL
19/11/2021	1:45	0.270 mm/s	96.3 DBL	0.120 mm/s	90 DBL	0.220 mm/s	93.7 DBL
25/11/2021	12:17	0.240 mm/s	97.6 DBL	0.110 mm/s	88.9 DBL	0.230 mm/s	94.3 DBL
1/12/2021	11:28	0.080 mm/s	86.3 DBL	0.300 mm/s	83.4 DBL	0.310 mm/s	72.7 DBL
2/12/2022	14:22	0.730 mm/s	106.3 DBL	0.420 mm/s	107.5 DBL	0.500 mm/s	99.9 DBL
2/12/2021	14:22	0.730 mm/s	106.3 DBL	0.420 mm/s	107.5 DBL	0.500 mm/s	99.9 DBL
2/12/2021	14:22	0.730 mm/s	106.3 DBL	0.420 mm/s	107.5 DBL	0.500 mm/s	99.9 DBL
8/12/2021	9:25	0.610 mm/s	100.7 DBL	0.630 mm/s	94.9 DBL	0.420 mm/s	94.9 DBL
16/12/2021	13:00	1.040 mm/s	102 DBL	0.820 mm/s	95.1 DBL	0.550 mm/s	100 DBL
16/12/2021	13:00	1.040 mm/s	102 DBL	0.820 mm/s	95.1 DBL	0.550 mm/s	100 DBL
22/12/2021	13:17	0.350 mm/s	92.9 DBL	0.190 mm/s	92.3 DBL	0.440 mm/s	99.6 DBL
22/12/2021	13:17	0.350 mm/s	92.9 DBL	0.190 mm/s	92.3 DBL	0.440 mm/s	99.6 DBL
23/12/2021	15:36	0.210 mm/s	104.7 DBL	0.130 mm/s	103.2 DBL	0.230 mm/s	98.8 DBL

Note no time was recorded during the blast event occurring on 17 November 2021.

APPENDIX C
RAIL MOVEMENT SUMMARY 2021

Train Movement - Time in	Train Movement - Time Out
Thu, 31 Dec 2020, 23:31	Fri, 1 Jan 2021, 05:23
Fri, 1 Jan 2021, 04:31	Fri, 1 Jan 2021, 10:03
Fri, 1 Jan 2021, 11:51	Fri, 1 Jan 2021, 15:53
Sat, 2 Jan 2021, 03:50	Sat, 2 Jan 2021, 07:40
Sat, 2 Jan 2021, 00:00	
Sat, 2 Jan 2021, 17:31	Sat, 2 Jan 2021, 21:21
Sat, 2 Jan 2021, 23:05	Sun, 3 Jan 2021, 03:07
Sun, 3 Jan 2021, 11:13	Sun, 3 Jan 2021, 15:03
Sun, 3 Jan 2021, 19:55	Sun, 3 Jan 2021, 23:45
Mon, 4 Jan 2021, 00:11	Mon, 4 Jan 2021, 04:37
Mon, 4 Jan 2021, 14:31	Mon, 4 Jan 2021, 18:26
Mon, 4 Jan 2021, 23:03	Tue, 5 Jan 2021, 02:53
Tue, 5 Jan 2021, 04:41	Tue, 5 Jan 2021, 08:43
Tue, 5 Jan 2021, 10:15	Tue, 5 Jan 2021, 14:05
Tue, 5 Jan 2021, 14:31	Tue, 5 Jan 2021, 18:45
Tue, 5 Jan 2021, 23:35	Wed, 6 Jan 2021, 03:37
Wed, 6 Jan 2021, 06:51	Wed, 6 Jan 2021, 10:41
Thu, 7 Jan 2021, 08:05	Thu, 7 Jan 2021, 23:10
Fri, 8 Jan 2021, 00:34	Fri, 8 Jan 2021, 04:36
Fri, 8 Jan 2021, 05:22	Fri, 8 Jan 2021, 09:16
Fri, 8 Jan 2021, 09:41	Fri, 8 Jan 2021, 12:26
Fri, 8 Jan 2021, 17:21	Fri, 8 Jan 2021, 21:11
Fri, 8 Jan 2021, 23:03	Sat, 9 Jan 2021, 01:28
Sat, 9 Jan 2021, 08:21	Sat, 9 Jan 2021, 12:23
Sat, 9 Jan 2021, 14:31	Sat, 9 Jan 2021, 16:51
Sat, 9 Jan 2021, 16:05	Sat, 9 Jan 2021, 21:31
Sun, 10 Jan 2021, 00:11	Sun, 10 Jan 2021, 04:13
Sun, 10 Jan 2021, 06:57	Sun, 10 Jan 2021, 09:17
Sun, 10 Jan 2021, 08:51	Sun, 10 Jan 2021, 13:57
Sun, 10 Jan 2021, 15:31	Sun, 10 Jan 2021, 19:21
Sun, 10 Jan 2021, 20:11	Sun, 10 Jan 2021, 22:56
Sun, 10 Jan 2021, 22:17	Mon, 11 Jan 2021, 03:36
Mon, 11 Jan 2021, 03:50	Mon, 11 Jan 2021, 08:16
Mon, 11 Jan 2021, 12:22	Mon, 11 Jan 2021, 14:42
Mon, 11 Jan 2021, 14:31	Mon, 11 Jan 2021, 19:34
Mon, 11 Jan 2021, 23:03	Tue, 12 Jan 2021, 03:05
Tue, 12 Jan 2021, 06:51	Tue, 12 Jan 2021, 09:11
Tue, 12 Jan 2021, 08:32	Tue, 12 Jan 2021, 14:03
Tue, 12 Jan 2021, 16:25	Tue, 12 Jan 2021, 20:27
Tue, 12 Jan 2021, 23:50	Wed, 13 Jan 2021, 02:10
Wed, 13 Jan 2021, 21:12	Wed, 13 Jan 2021, 23:32
Wed, 13 Jan 2021, 23:03	Thu, 14 Jan 2021, 04:12
Thu, 14 Jan 2021, 06:01	Thu, 14 Jan 2021, 09:51
Thu, 14 Jan 2021, 13:01	Thu, 14 Jan 2021, 15:21
Thu, 14 Jan 2021, 16:06	Thu, 14 Jan 2021, 20:13
Thu, 14 Jan 2021, 19:11	Fri, 15 Jan 2021, 00:53
Fri, 15 Jan 2021, 03:01	Fri, 15 Jan 2021, 05:21
Fri, 15 Jan 2021, 04:31	Fri, 15 Jan 2021, 10:13
Fri, 15 Jan 2021, 09:41	Fri, 15 Jan 2021, 15:05
Fri, 15 Jan 2021, 19:21	Fri, 15 Jan 2021, 22:55
Fri, 15 Jan 2021, 22:17	Sat, 16 Jan 2021, 03:47
Sat, 16 Jan 2021, 03:50	Sat, 16 Jan 2021, 08:39
Sat, 16 Jan 2021, 18:20	Sat, 16 Jan 2021, 22:22
Sat, 16 Jan 2021, 22:31	Sun, 17 Jan 2021, 03:02
Sun, 17 Jan 2021, 04:12	
Sun, 17 Jan 2021, 00:00	
Sun, 17 Jan 2021, 08:51	Sun, 17 Jan 2021, 12:42
Mon, 18 Jan 2021, 07:11	Mon, 18 Jan 2021, 11:13
Mon, 18 Jan 2021, 11:10	Mon, 18 Jan 2021, 16:31
Tue, 19 Jan 2021, 12:01	Tue, 19 Jan 2021, 16:03
Tue, 19 Jan 2021, 17:21	Tue, 19 Jan 2021, 21:11
Wed, 20 Jan 2021, 03:11	Wed, 20 Jan 2021, 07:13
Wed, 20 Jan 2021, 23:03	Thu, 21 Jan 2021, 03:05
Thu, 21 Jan 2021, 02:24	Thu, 21 Jan 2021, 08:05
Thu, 21 Jan 2021, 07:21	Thu, 21 Jan 2021, 12:45
Thu, 21 Jan 2021, 16:25	Thu, 21 Jan 2021, 20:15
Thu, 21 Jan 2021, 20:41	

Month End	Total Tonnage Transported from MPO (t)
2021	7,257,344
January	668,468
February	474,925
March	611,663
April	507,768
May	619,553
June	632,261
July	616,978
August	610,811
September	523,384
October	730,848
November	554,383
December	706,303

Fri, 22 Jan 2021, 07:37	
Fri, 22 Jan 2021, 16:05	Fri, 22 Jan 2021, 19:55
Fri, 22 Jan 2021, 23:35	Sat, 23 Jan 2021, 03:25
Sat, 23 Jan 2021, 03:21	Sat, 23 Jan 2021, 08:05
Sat, 23 Jan 2021, 12:31	Sat, 23 Jan 2021, 16:21
Sat, 23 Jan 2021, 16:15	Sat, 23 Jan 2021, 21:13
Sun, 24 Jan 2021, 00:31	Sun, 24 Jan 2021, 04:21
Sun, 24 Jan 2021, 11:07	Sun, 24 Jan 2021, 15:22
Sun, 24 Jan 2021, 17:31	Sun, 24 Jan 2021, 21:33
Sun, 24 Jan 2021, 23:41	Mon, 25 Jan 2021, 03:31
Mon, 25 Jan 2021, 04:51	Mon, 25 Jan 2021, 08:41
Mon, 25 Jan 2021, 12:23	Mon, 25 Jan 2021, 16:13
Mon, 25 Jan 2021, 23:45	Tue, 26 Jan 2021, 02:11
Tue, 26 Jan 2021, 09:30	Tue, 26 Jan 2021, 14:11
Tue, 26 Jan 2021, 23:31	Wed, 27 Jan 2021, 06:11
Wed, 27 Jan 2021, 06:11	Wed, 27 Jan 2021, 11:03
Wed, 27 Jan 2021, 10:25	Wed, 27 Jan 2021, 15:43
Wed, 27 Jan 2021, 18:16	Wed, 27 Jan 2021, 20:36
Fri, 29 Jan 2021, 07:51	Fri, 29 Jan 2021, 11:41
Thu, 28 Jan 2021, 08:34	Thu, 28 Jan 2021, 23:10
Fri, 29 Jan 2021, 14:31	Fri, 29 Jan 2021, 16:51
Sat, 30 Jan 2021, 07:11	Sat, 30 Jan 2021, 09:31
Sat, 30 Jan 2021, 08:21	Sat, 30 Jan 2021, 14:11
Sat, 30 Jan 2021, 20:11	Sat, 30 Jan 2021, 22:31
Sun, 31 Jan 2021, 04:31	Sun, 31 Jan 2021, 08:21
Sun, 31 Jan 2021, 11:51	Sun, 31 Jan 2021, 14:11
Sun, 31 Jan 2021, 19:55	Mon, 1 Feb 2021, 00:26
Mon, 1 Feb 2021, 03:11	Mon, 1 Feb 2021, 07:55
Mon, 1 Feb 2021, 05:31	Mon, 1 Feb 2021, 13:14
Mon, 1 Feb 2021, 14:21	Mon, 1 Feb 2021, 18:35
Tue, 2 Feb 2021, 06:01	Tue, 2 Feb 2021, 10:41
Tue, 2 Feb 2021, 14:31	Tue, 2 Feb 2021, 21:03
Wed, 3 Feb 2021, 19:11	Thu, 4 Feb 2021, 00:22
Thu, 4 Feb 2021, 02:24	Thu, 4 Feb 2021, 07:20
Fri, 5 Feb 2021, 00:31	Fri, 5 Feb 2021, 05:00
Fri, 5 Feb 2021, 09:11	Fri, 5 Feb 2021, 13:57
Fri, 5 Feb 2021, 20:51	Sat, 6 Feb 2021, 01:17
Sat, 6 Feb 2021, 03:50	Sat, 6 Feb 2021, 08:36
Sat, 6 Feb 2021, 11:06	Sat, 6 Feb 2021, 16:43
Sat, 6 Feb 2021, 20:11	Sun, 7 Feb 2021, 00:21
Sun, 7 Feb 2021, 00:31	Sun, 7 Feb 2021, 06:32
Sun, 7 Feb 2021, 06:57	Sun, 7 Feb 2021, 11:32
Sun, 7 Feb 2021, 18:52	Mon, 8 Feb 2021, 00:26
Sun, 7 Feb 2021, 23:07	Mon, 8 Feb 2021, 03:57
Mon, 8 Feb 2021, 06:01	Mon, 8 Feb 2021, 10:34
Fri, 12 Feb 2021, 07:01	Fri, 12 Feb 2021, 13:14
Fri, 12 Feb 2021, 15:26	Fri, 12 Feb 2021, 23:54
Fri, 12 Feb 2021, 20:41	Sat, 13 Feb 2021, 03:50
Sat, 13 Feb 2021, 02:11	Sat, 13 Feb 2021, 12:36
Sat, 13 Feb 2021, 08:21	Sat, 13 Feb 2021, 14:57
Sat, 13 Feb 2021, 18:37	Sat, 13 Feb 2021, 23:25
Sun, 14 Feb 2021, 00:51	Sun, 14 Feb 2021, 05:28
Sun, 14 Feb 2021, 12:11	Sun, 14 Feb 2021, 18:07
Sun, 14 Feb 2021, 17:31	Sun, 14 Feb 2021, 22:22
Mon, 15 Feb 2021, 00:11	Mon, 15 Feb 2021, 07:55
Mon, 15 Feb 2021, 03:31	Mon, 15 Feb 2021, 10:34
Mon, 15 Feb 2021, 08:51	Mon, 15 Feb 2021, 13:57
Mon, 15 Feb 2021, 23:21	Tue, 16 Feb 2021, 06:48
Tue, 16 Feb 2021, 09:21	Tue, 16 Feb 2021, 13:57
Tue, 16 Feb 2021, 17:21	Tue, 16 Feb 2021, 22:08
Wed, 17 Feb 2021, 00:31	Wed, 17 Feb 2021, 12:40
Wed, 17 Feb 2021, 07:45	Wed, 17 Feb 2021, 13:14
Wed, 17 Feb 2021, 18:16	Wed, 17 Feb 2021, 23:22
Wed, 17 Feb 2021, 20:51	Thu, 18 Feb 2021, 03:50
Thu, 18 Feb 2021, 20:41	Mon, 1 Feb 2021, 01:46
Thu, 18 Feb 2021, 23:31	Fri, 19 Feb 2021, 06:10
Fri, 19 Feb 2021, 12:31	Fri, 19 Feb 2021, 17:00
Fri, 19 Feb 2021, 20:21	Sat, 20 Feb 2021, 00:58
Fri, 19 Feb 2021, 23:35	Sat, 20 Feb 2021, 05:44

Sat, 20 Feb 2021, 05:58	Sat, 20 Feb 2021, 10:42
Sat, 20 Feb 2021, 12:31	Sat, 20 Feb 2021, 16:43
Sat, 20 Feb 2021, 22:31	Sun, 21 Feb 2021, 02:53
Sun, 21 Feb 2021, 05:21	Sun, 21 Feb 2021, 10:10
Sun, 21 Feb 2021, 18:20	Mon, 22 Feb 2021, 00:26
Mon, 22 Feb 2021, 07:51	Mon, 22 Feb 2021, 13:42
Mon, 22 Feb 2021, 13:17	Mon, 22 Feb 2021, 17:48
Tue, 23 Feb 2021, 03:01	Tue, 23 Feb 2021, 07:36
Tue, 23 Feb 2021, 20:41	Wed, 24 Feb 2021, 01:02
Wed, 24 Feb 2021, 22:01	Thu, 25 Feb 2021, 02:38
Thu, 25 Feb 2021, 01:32	Thu, 25 Feb 2021, 07:05
Thu, 25 Feb 2021, 12:11	Thu, 25 Feb 2021, 17:48
Thu, 25 Feb 2021, 20:41	Fri, 26 Feb 2021, 01:46
Fri, 26 Feb 2021, 11:13	Fri, 26 Feb 2021, 16:51
Sat, 27 Feb 2021, 00:03	Sat, 27 Feb 2021, 04:31
Sat, 27 Feb 2021, 04:46	Sat, 27 Feb 2021, 09:03
Sat, 27 Feb 2021, 16:21	Sat, 27 Feb 2021, 21:02
Sun, 28 Feb 2021, 05:21	Sun, 28 Feb 2021, 10:28
Sun, 28 Feb 2021, 12:31	Sun, 28 Feb 2021, 21:32
Sun, 28 Feb 2021, 20:31	Mon, 1 Mar 2021, 01:59
Mon, 1 Mar 2021, 00:11	Mon, 1 Mar 2021, 07:55
Mon, 1 Mar 2021, 12:31	Mon, 1 Mar 2021, 17:05
Mon, 1 Mar 2021, 19:01	Tue, 2 Mar 2021, 00:08
Tue, 2 Mar 2021, 09:21	Tue, 2 Mar 2021, 13:55
Tue, 2 Mar 2021, 14:31	Tue, 2 Mar 2021, 19:47
Tue, 2 Mar 2021, 18:16	Tue, 2 Mar 2021, 23:54
Wed, 3 Mar 2021, 18:16	Wed, 3 Mar 2021, 22:52
Thu, 4 Mar 2021, 00:51	Thu, 4 Mar 2021, 05:17
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Wed, 31 Mar 2021, 03:45	Wed, 31 Mar 2021, 11:41
Wed, 31 Mar 2021, 06:01	Wed, 31 Mar 2021, 13:28
Fri, 2 Apr 2021, 16:05	Fri, 2 Apr 2021, 21:34
Fri, 2 Apr 2021, 20:41	Sat, 3 Apr 2021, 02:02
Sat, 3 Apr 2021, 07:11	Sat, 3 Apr 2021, 12:36
Sat, 3 Apr 2021, 11:13	Sat, 3 Apr 2021, 16:12
Sun, 4 Apr 2021, 00:30	Sun, 4 Apr 2021, 05:57
Sun, 4 Apr 2021, 09:41	Sun, 4 Apr 2021, 14:57
Mon, 5 Apr 2021, 02:24	Mon, 5 Apr 2021, 09:02
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Sun, 25 Apr 2021, 21:11	Mon, 26 Apr 2021, 02:49
Mon, 26 Apr 2021, 03:11	Mon, 26 Apr 2021, 07:36
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Mon, 26 Apr 2021, 12:31	Mon, 26 Apr 2021, 17:05
Fri, 30 Apr 2021, 02:20	Fri, 30 Apr 2021, 06:55
Fri, 30 Apr 2021, 18:05	Fri, 30 Apr 2021, 22:26
Sat, 1 May 2021, 03:50	Sat, 1 May 2021, 08:18
Sat, 1 May 2021, 11:13	Sat, 1 May 2021, 16:53
Sat, 1 May 2021, 17:31	Sat, 1 May 2021, 22:55
Sun, 2 May 2021, 02:40	Sun, 2 May 2021, 07:49
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Mon, 3 May 2021, 05:51	Mon, 3 May 2021, 12:50
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Mon, 24 May 2021, 12:31	Mon, 24 May 2021, 17:05
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APPENDIX D

MOUNT PLEASANT OPERATION – 2021 ANNUAL AIR QUALITY REVIEW

10 February 2022

Chris Masters
MACH Energy Australia
Via email: chris.masters@machenergy.com.au

RE: Mount Pleasant Operation – 2021 Annual Air Quality Review

Dear Chris,
Todoroski Air Sciences have conducted a review and analysis of the annual average deposited dust, TSP, PM₁₀ and PM_{2.5} levels recorded at Mount Pleasant Operation (MPO) in 2021.

Annual air quality criteria

As per consent DA 92/97 Schedule 3 Condition 20 "Except for the air-affected land referred to in Table 1, the Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that the particulate matter emissions generated by the development do not exceed the criteria listed in Tables 8, 9 or 10 at any residence on privately-owned land." The criteria from Tables 8 to 10 are set out below:

Table 8: Long term criteria for particulate matter

Pollutant	Averaging period	^a Criterion
Total suspended particulate (TSP) matter	Annual	^a 90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	^a 25 µg/m ³
Particulate matter < 2.5 µm (PM _{2.5})	Annual	^a 8 µg/m ³

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

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed to by the Secretary.

Table 9: Short term criteria for particulate matter

Pollutant	Averaging period	^a Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50 µg/m ³
Particulate matter < 2.5 µm (PM _{2.5})	24 hour	^b 25 µg/m ³

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

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed to by the Secretary.

Table 10: Long term criteria for deposited dust

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

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

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

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

When the measured cumulative annual average deposited dust level at compliance monitors is below the criterion of $4\text{g}/\text{m}^2/\text{month}$ in Table 10, it is inferred that compliance is achieved. If this criterion is exceeded, the applicant must demonstrate compliance with the maximum increase in the deposited dust level of $2\text{g}/\text{m}^2/\text{month}$.

Extraordinary event days

The criteria set out in Table 8 and Table 9 excludes "extraordinary events" as per Condition 20 Schedule 3. There were no days specifically considered to be extraordinary events at the MPO in 2021, however it has been identified by the Department of Planning, Industry and Environment (DPIE) that a dust storm impacted some monitors in the Upper Hunter region on 29/10/2021. It is noted that all MPO PM_{10} and $\text{PM}_{2.5}$ monitors recorded 24-hour average readings below the relevant criteria on this day. For the purpose of this assessment, no extraordinary event days have been considered for MPO in 2021.

Dust Deposition

This review has analysed dust deposition data recorded at the MPO monitors for the 2021 year.

Figure 1 presents a plan of the dust gauge monitoring locations for both compliance and non-compliance monitors in the area around MPO and the annual average deposited dust levels. The figure includes annual windrose plots of the meteorological data collected at the M-WM1, M-WM2, M-WS4 and M-WM5 stations during 2021. In general, winds were predominately from the southeast and northwest quadrants.

Table 1 summarises the MPO dust deposition monitoring data for the 2021 period.

The D7 monitor recorded a level above $4\text{g}/\text{m}^2/\text{month}$, however per the MPO Air Quality and Greenhouse Gas Management Plan (**MACH Energy, 2019**), D7 is not used to assess compliance against the deposited dust criteria as the monitor is located in close proximity to the northern boundary of a neighbouring mining operation open cut pit, and there are no privately-owned receivers in the vicinity of this monitoring location.

The data indicate that the annual average deposited dust levels measured at the MPO monitors representative of residences on privately-owned land were below the cumulative criterion of $4\text{g}/\text{m}^2/\text{month}$ in 2021, and as such it is considered that compliance with the relevant criterion in Table 10 of DA 92/97 Schedule 3 Condition 20 has been achieved.

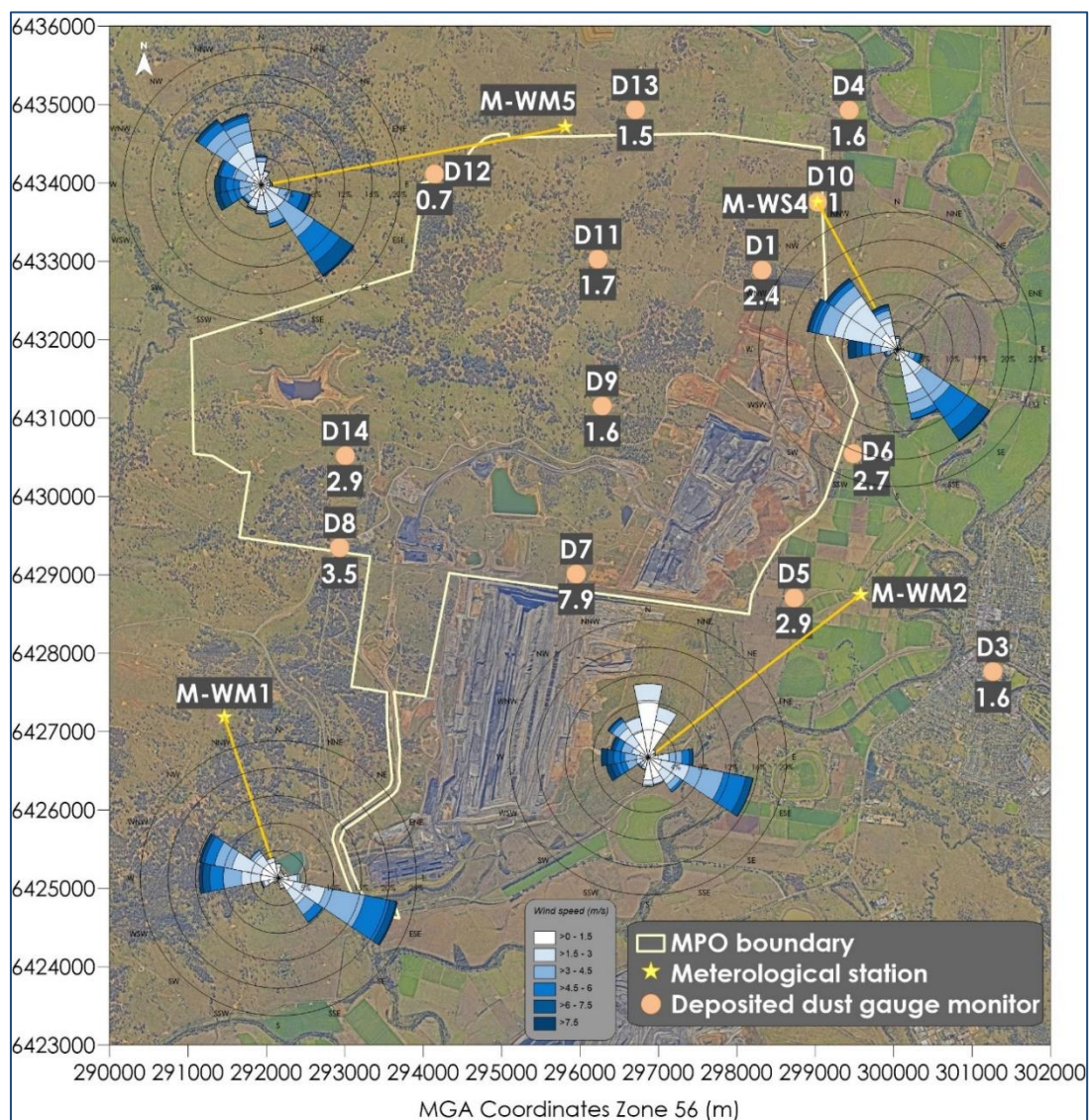


Figure 1: Annual average deposited dust results for 2021

Table 1: Deposited dust monthly average compliance monitoring data for 2021 (g/m²/month)

Date	D1	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Jan	1.3	55.0c	3.2	0.8	2.3	5.2	3.6	2.2	1.3	2.9	1.9	1.3	3.3
Feb	2.0	8.7c	1.7	2.0	1.9	6.1	6.2	2.2	0.8	3.1	0.5	2.9	4.9
Mar	2.0	12.8c	1.1	2.0	2.3	-	4.0	2.0	0.6	2.1	0.7	2.3	3.9
Apr	1.5	0.4	1.0	4.1	2.6	17.8c	2.4	0.7	0.4	0.9	0.4	0.9	1.7
May	4.6	2.1	2.0	3.9	2.8	17.5c	5.2	2.2	2.7	1.5	0.5	2.8	2.6
Jun	2.2	1.9	0.9	4.0	3.1	18.6c	4.2	1.5	0.6	1.2	0.4	1.2	2.4
Jul	3.2	1.4	0.6	2.5	2.4	8.3	2.6	1.0	0.7	1.6	0.3	0.9	1.9
Aug	2.0	-	1.0	4.3	3.2	9.5	2.3	1.0	0.5	1.0	0.6	0.8	2.2
Sep	1.8	-	0.6	3.5	2.6	9.9	2.8	1.3	0.6	0.6	0.5	0.8	2.2
Oct	2.0	-	4.7	3.5	4.7	10.3	2.2	1.6	1.0	1.6	0.5	1.0	3.4
Nov	4.5	2.7	0.9	1.8	2.7	6.1	4.6	1.9	1.4	2.0	1.0	2.0	3.7
Dec	1.9	1.2	-	2.9	2.3	8.1	2.3	1.7	1.0	1.6	1.1	0.9	2.2
Annual average	2.4	1.6	1.6	2.9	2.7	7.9	3.5	1.6	1.0	1.7	0.7	1.5	2.9

- not available

c - contaminated

Annual Average TSP

This review has analysed the TSP monitoring data recorded at the MPO High Volume Air Sampler (HVAS) monitors in 2021.

Figure 2 presents the 24-hour average TSP levels for 2021. The figure shows that APF-2 generally recorded higher levels than the other monitors from April to October 2021.

Table 2 presents a summary of the annual average TSP monitoring data for the area around MPO in 2021.

Figure 3 presents a plan of the HVAS monitoring locations in the area around MPO and the annual average TSP levels. The figure includes annual windrose plots of the meteorological data collected at the M-WM1, M-WM2, M-WS4 and M-WM5 stations during 2021.

The data show that the annual average TSP levels for all the MPO HVAS monitors are below the relevant criterion of $90\mu\text{g}/\text{m}^3$. As such, it is considered that compliance with the relevant criterion in Table 8 of DA 92/97 Schedule 3 Condition 20 is achieved.

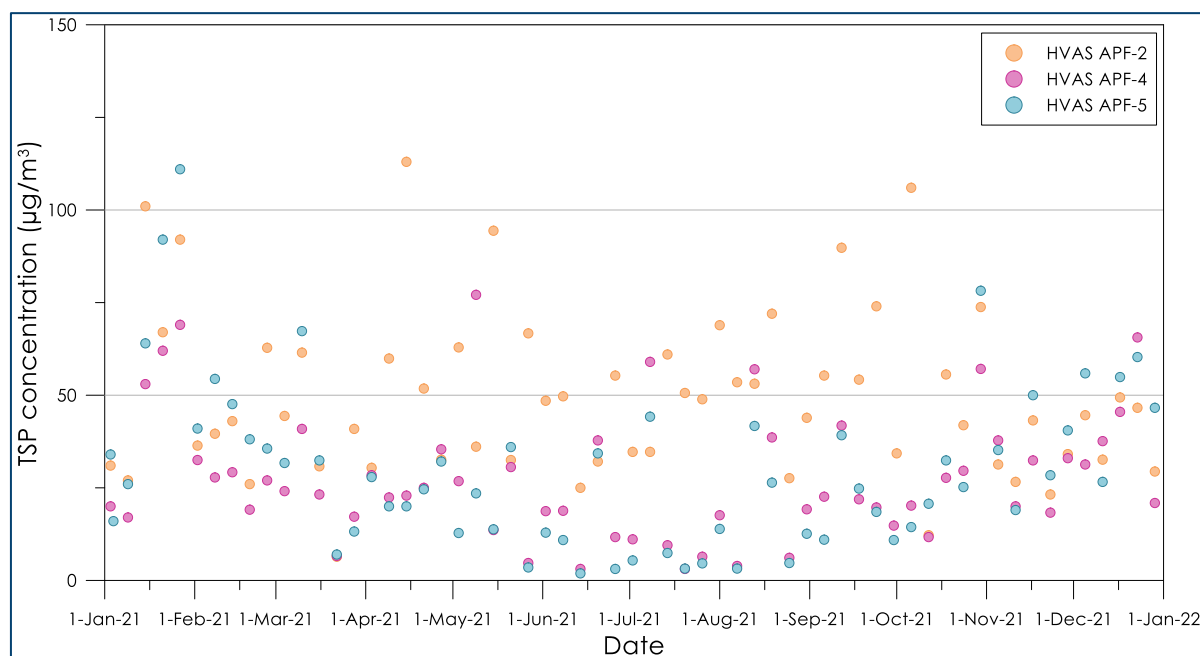


Figure 2: 24-hour average TSP HVAS records for 2021

Table 2: Annual average TSP monitoring data for 2021

Location	Annual average TSP level - all days ($\mu\text{g}/\text{m}^3$)
HVAS APF-2	49.3
HVAS APF-4	27.6
HVAS APF-5	29.8

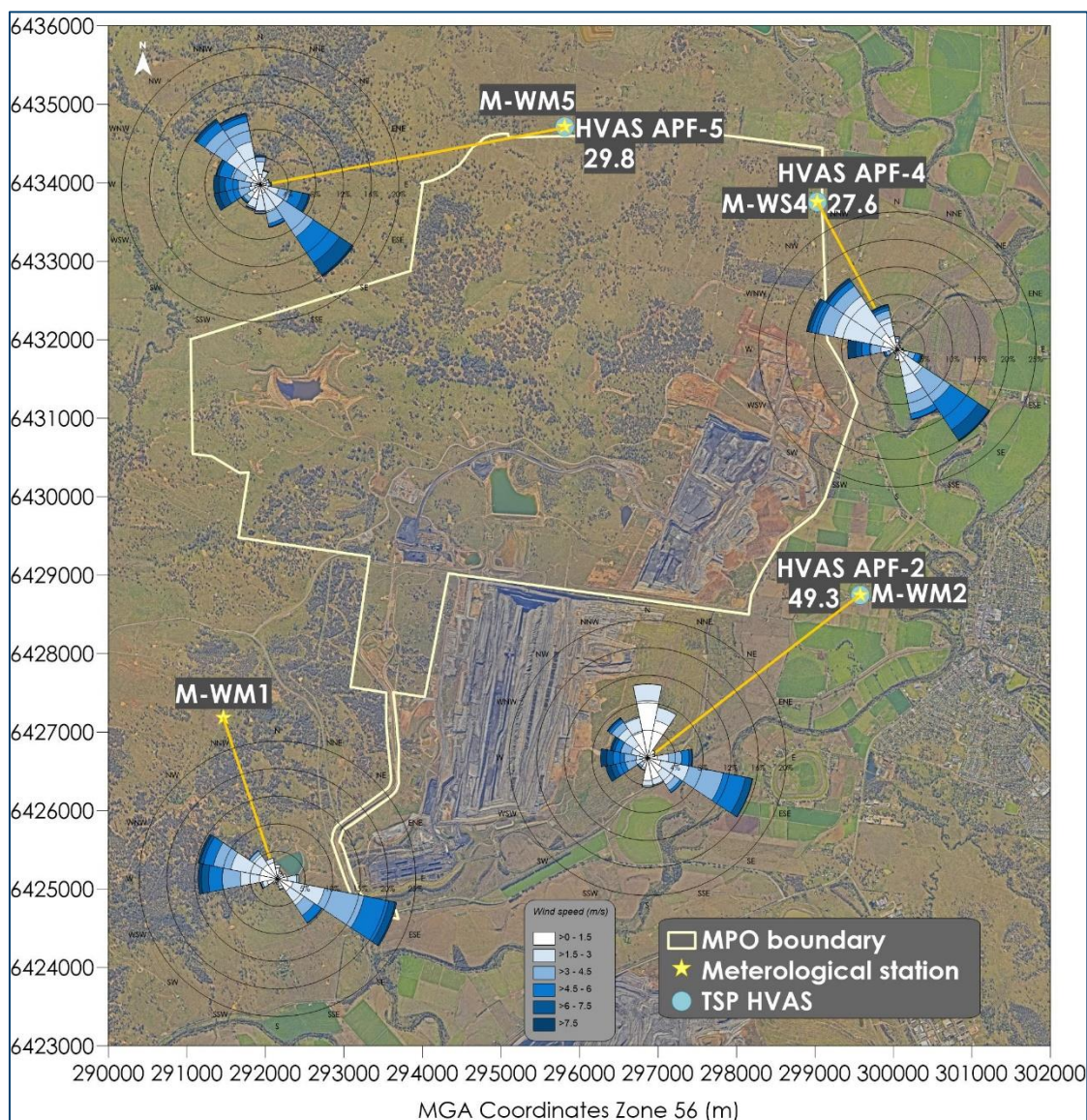


Figure 3: Annual average TSP results for 2021

Annual Average PM₁₀

This review has analysed the annual average PM₁₀ monitoring data recorded at the MPO Palas Fidas monitors in 2021.

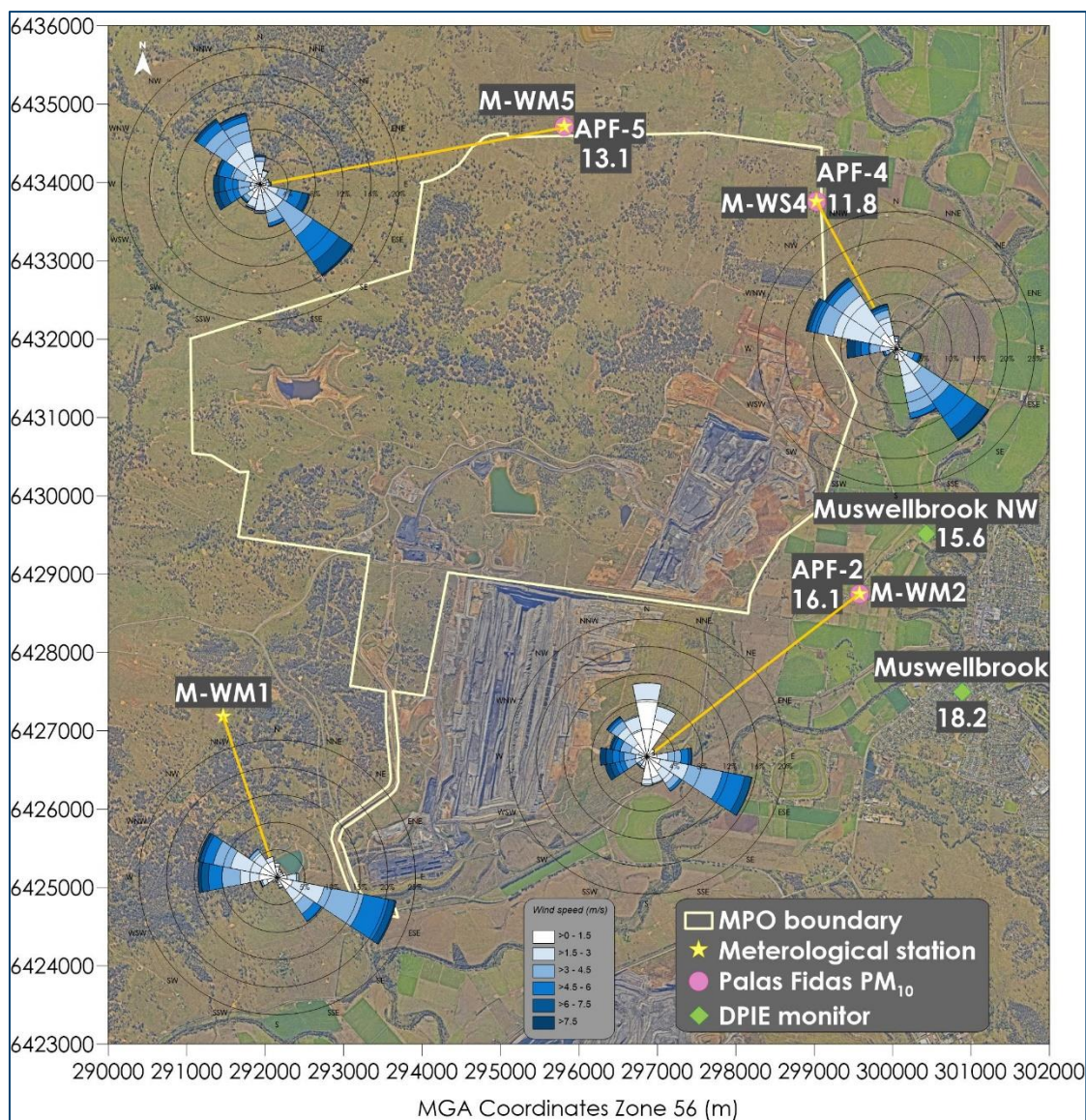
Table 3 includes a summary of the annual average PM₁₀ monitoring data for the area around MPO in 2021.

Figure 4 presents a plan of the monitoring locations in the area around MPO and the measured annual average PM₁₀ levels.

The annual average PM₁₀ levels at the MPO Palas Fidas and DPIE monitors were below the relevant criterion of 25µg/m³ in 2021 and as such, it is considered that compliance with the relevant criterion in Table 8 of DA 92/97 Schedule 3 Condition 20 has been achieved.

Table 3: Annual average PM₁₀ monitoring data for 2021

Location	Annual average PM ₁₀ (µg/m ³)
APF -2	16.1
APF -4	11.8
APF-5	13.1
Muswellbrook	18.2
Muswellbrook NW	15.6

Figure 4: Annual average PM₁₀ results for 2021

24-hour Average PM₁₀

This review has analysed the 24-hour average PM₁₀ monitoring data recorded at the MPO Palas Fidas monitors in 2021.

Figure 5 presents the 24-hour average PM₁₀ levels around MPO for 2021. The data indicate that the 24-hour average PM₁₀ levels were generally low throughout 2021.

Table 4 includes a summary of the 24-hour average PM₁₀ monitoring data for the area around MPO in 2021. The maximum 24-hour average PM₁₀ concentrations at the MPO and DPIE monitors were below 50µg/m³ in 2021, and thus it is considered that compliance with the relevant criterion in Table 9 of DA 92/97 Schedule 3 Condition 20 is achieved.

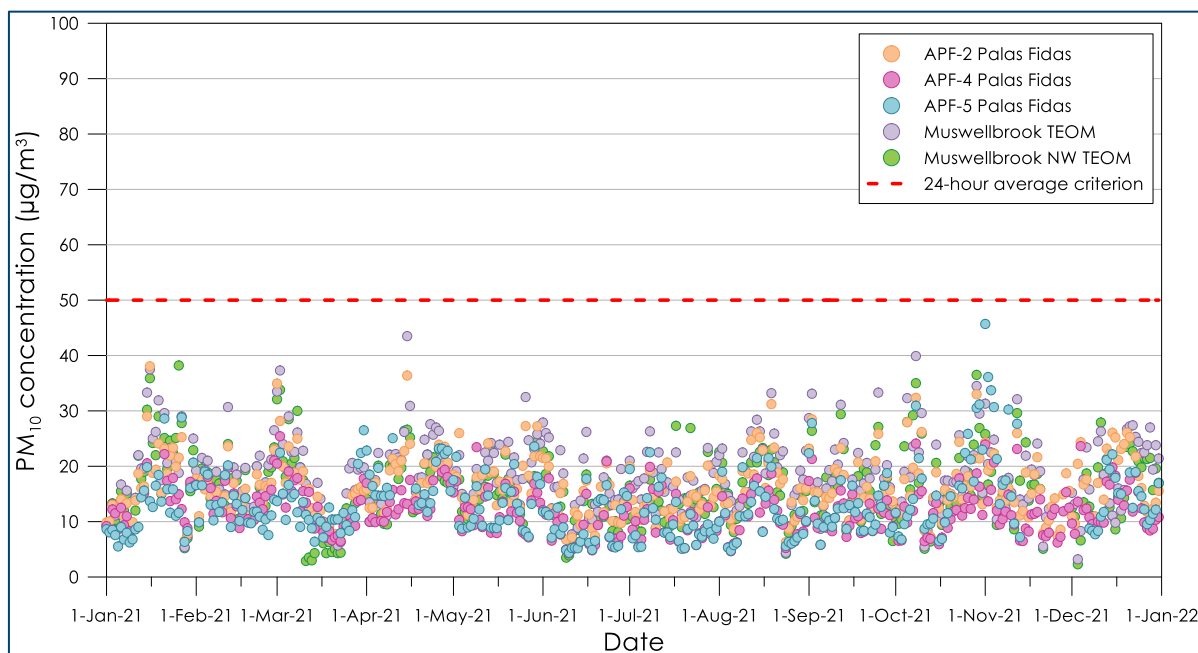


Figure 5: 24-hour average PM₁₀ records for 2021

Table 4: 24-hour average PM₁₀ monitoring data for 2021

Location	Maximum 24-hour PM ₁₀ (µg/m ³)	Number of 24-hour PM ₁₀ levels above criterion (50µg/m ³)
APF -2	38.0	0
APF -4	25.4	0
APF-5	45.7	0
Muswellbrook	43.5	0
Muswellbrook NW	38.2	0

Annual Average PM_{2.5}

This review has analysed the annual average PM_{2.5} monitoring data recorded at the MPO Palas Fidas monitors in 2021.

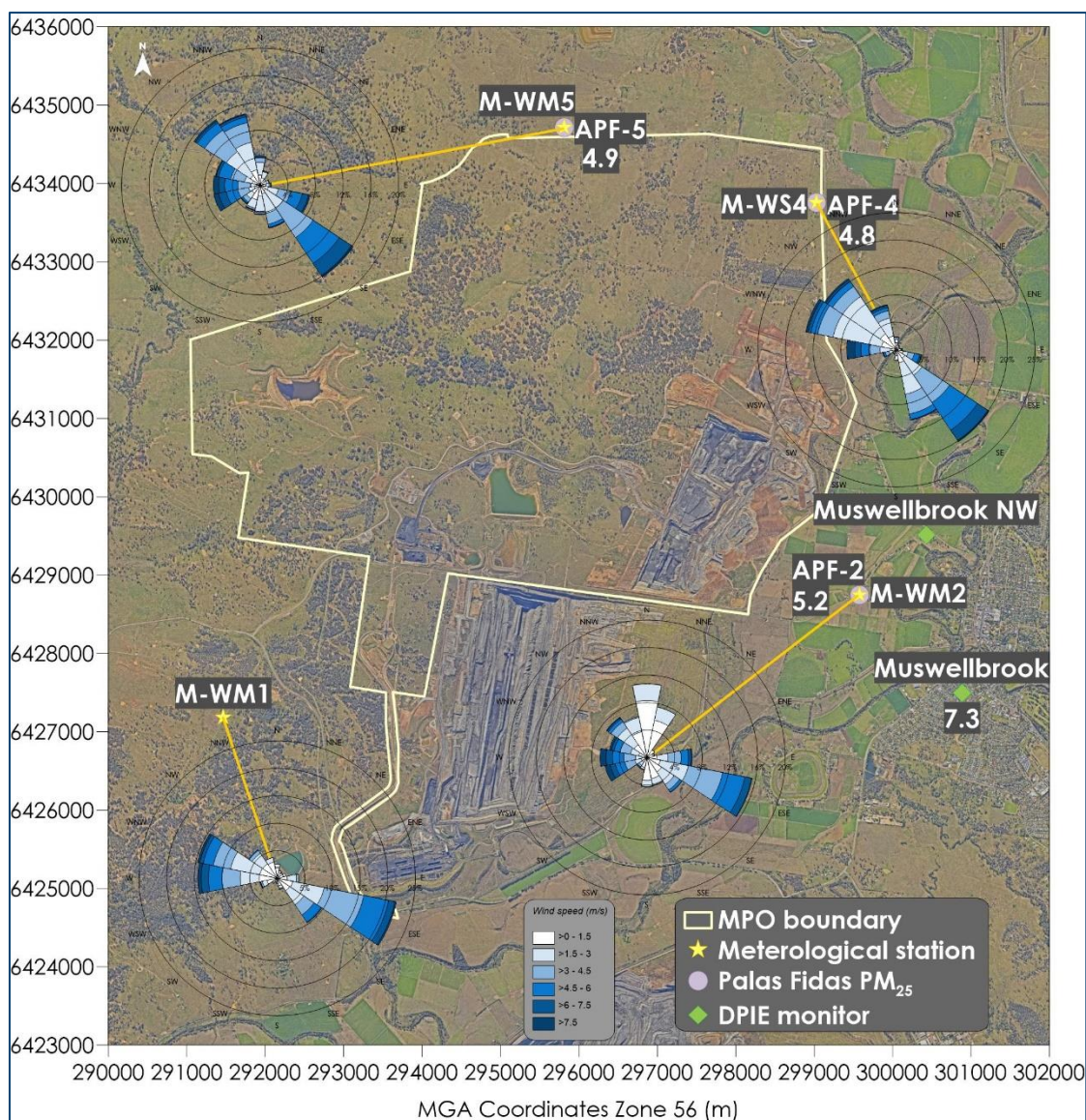
Table 5 includes a summary of the annual average PM_{2.5} monitoring data for the area around MPO in 2021.

Figure 6 presents a plan of the monitoring locations in the area around MPO and the measured annual average PM_{2.5} levels.

The annual average PM_{2.5} levels at the MPO Palas Fidas and DPIE monitors were below the relevant criterion of 8µg/m³ in 2021 and as such it is considered that compliance with the relevant criterion in Table 8 of DA 92/97 Schedule 3 Condition 20 has been achieved.

Table 5: Annual average PM_{2.5} monitoring data for 2021

Location	Annual average PM _{2.5} (µg/m ³)
APF-2	5.2
APF-4	4.8
APF-5	4.9
Muswellbrook	7.3

Figure 6: Annual average PM_{2.5} results for 2021

24-hour Average PM_{2.5}

This review has analysed the 24-hour average PM_{2.5} monitoring data recorded at the MPO Palas Fidas monitors in 2021.

Figure 7 presents the 24-hour average PM_{2.5} levels around MPO for 2021. The DPIE Muswellbrook monitor recorded significantly higher levels than the Palas Fidas monitors in winter, likely due to domestic wood heater smoke near the monitor.

Table 6 includes a summary of the 24-hour average PM_{2.5} monitoring data for the area around MPO in 2021. The maximum 24-hour average PM_{2.5} concentrations at the MPO and DPIE monitors were below 25µg/m³ in 2021, and thus it is considered that compliance with the relevant criterion in Table 9 of DA 92/97 Schedule 3 Condition 20 is achieved.

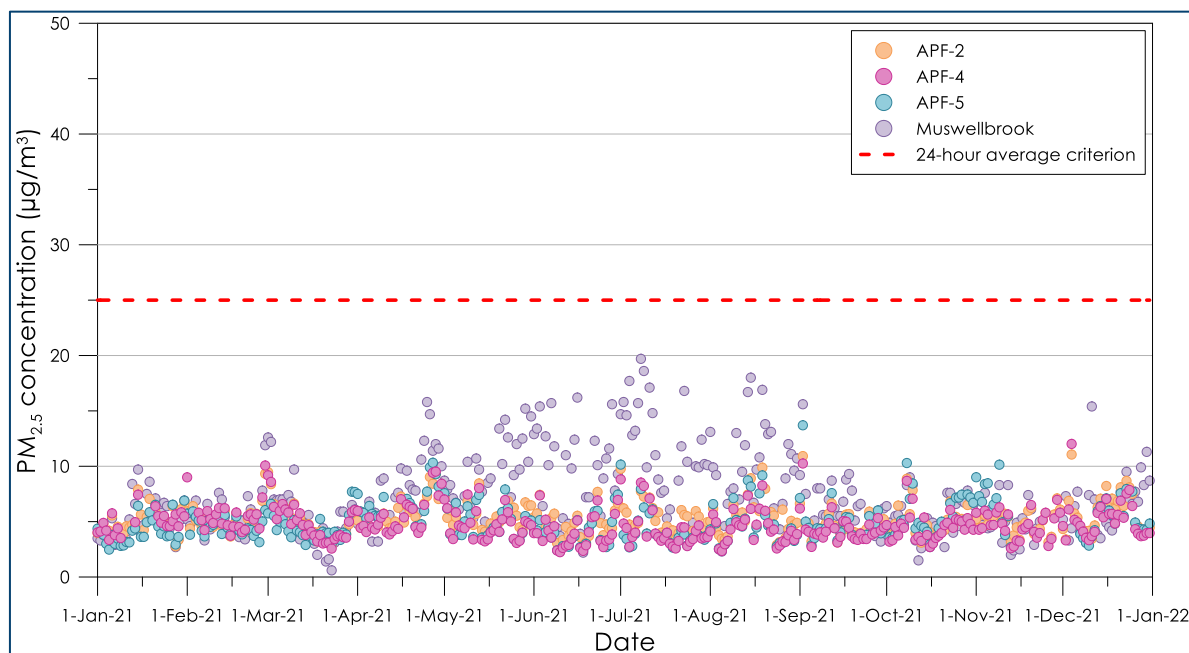


Figure 7: 24-hour average PM_{2.5} records for 2021

Table 6: 24-hour average PM_{2.5} monitoring data for 2021

Location	Maximum 24-hour PM _{2.5} (µg/m ³)	Number of 24-hour PM _{2.5} levels above criterion (25µg/m ³)
APF-2	11.1	0
APF -4	12.0	0
APF -5	13.7	0
Muswellbrook	19.7	0

Conclusions

This report has analysed the deposited dust, TSP, PM₁₀ and PM_{2.5} monitoring data recorded at MPO in 2021.

The analysis shows that the annual average and 24-hour average levels were below the relevant criteria in 2021 and therefore MPO is considered to be compliant with the air quality criteria per DA 92/97 Schedule 3 Condition 20.

Please feel free to contact us in relation to any aspect of this analysis.

Yours faithfully,
Todoroski Air Sciences

Katie Trahair

Dan Kjellberg

References

MACH Energy (2019)

"Mount Pleasant Operation Air Quality and Greenhouse Gas Management Plan", MACH Energy Australia Pty Ltd, May 2019.

