DECEMBER 2021 AIR, WATER, NOISE AND METEOROLOGICAL MONITORING

PINE DALE MINE, BLACKMANS FLAT

Prepared for Pine Dale Mine Community Consultative Committee

Prepared by RCA Australia

RCA ref 6880-1872/1

JANUARY 2022

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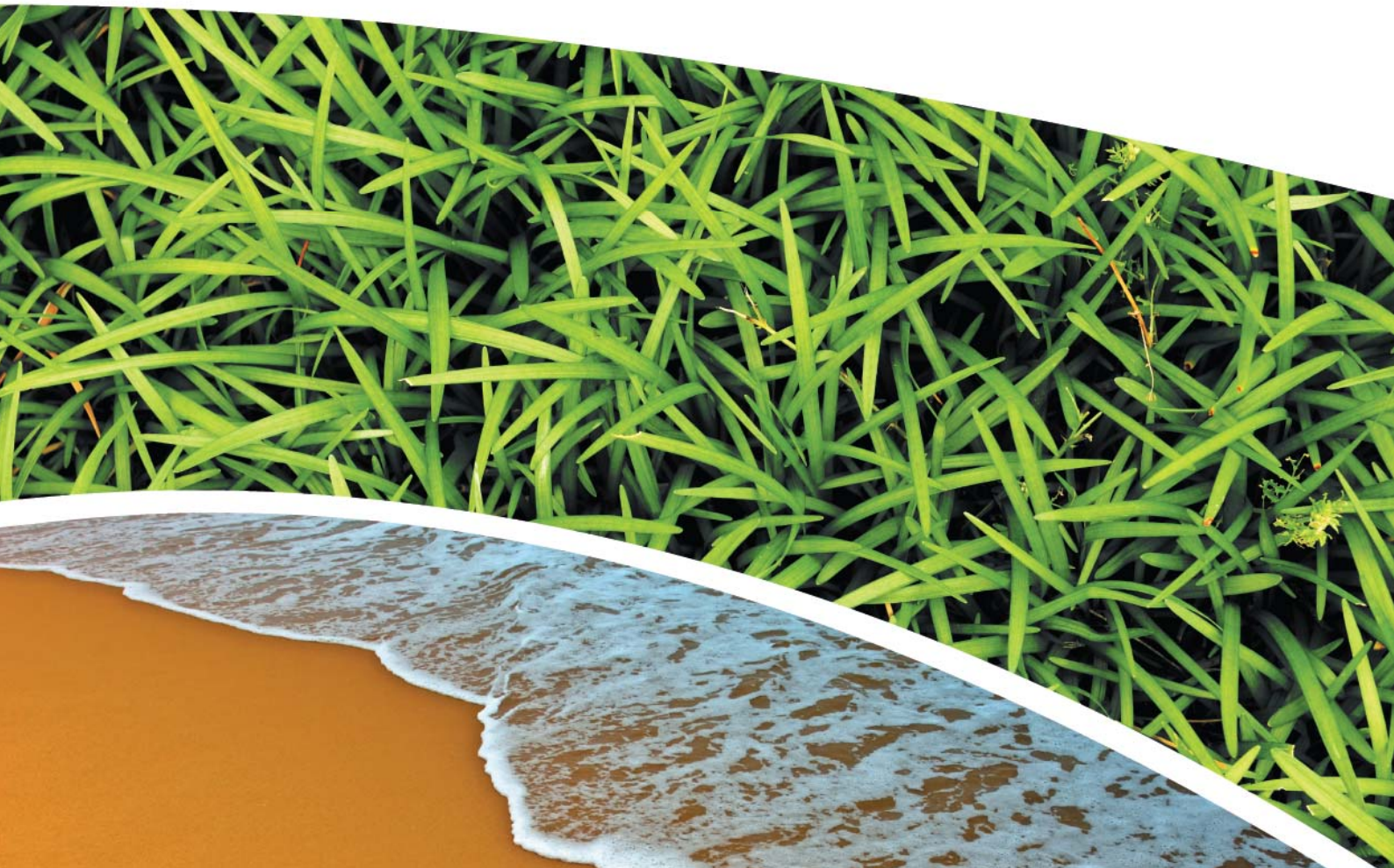

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Contents

1 INTRODUCTION 1

2 ANALYTICAL PROCEDURES 1

3 WATER MONITORING RESULTS 2

3.1 GROUNDWATER 2

3.2 SURFACE WATER MONITORING 4

4 AIR QUALITY RESULTS 4

4.1 HIGH VOLUME AIR SAMPLERS (HVAS) 4

4.2 DEPOSITIONAL DUST MONITORING 4

4.2.1 ALLOWABLE DEPOSITIONAL DUST LIMITS 5

5 METEOROLOGICAL MONITORING 5

6 BLASTING RESULTS 5

7 NOISE MONITORING RESULTS 5

8 OPERATIONAL ACTIVITIES 5

9 SUMMARY 5

10 LIMITATIONS 6

APPENDIX A

MONITORING LOCATIONS

APPENDIX B

DEPOSITIONAL DUST GRAPH

APPENDIX C

METEOROLOGICAL DATA (MT PIPER WEATHER STATION)

RCA ref 6880-1872/1

12 January 2022

Enhance Place Pty Ltd
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Attention: Mr Graham Goodwin

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REPORT COMPILED FOR COMMUNITY CONSULTATIVE COMMITTEE DETAILING AIR, WATER AND METEOROLOGICAL MONITORING AT PINE DALE UNDERTAKEN IN DECEMBER 2021

1 INTRODUCTION

This report presents the results of air, water, noise and meteorological monitoring undertaken at Pine Dale Mine, Blackmans Flat during the month of December 2021.

Air and water samples were collected by RCA Laboratories – Environmental staff. Meteorological data was obtained from the site weather station.

This report satisfies the requirements to monitor environmental parameters as presented in the Pine Dale Mine Environmental Protection Licence (EPL 4911).

2 ANALYTICAL PROCEDURES

The analytical procedures used by RCA Laboratories – Environmental (NATA Accreditation number 9811) are based on established internationally recognised procedures such as APHA and Australian Standards. Analytical test methods are detailed in **Table 1**.

Table 1 *Analytical Test Methods*

Analysis	Method	Units	Analysing Laboratory	NATA Accreditation Status
Determination of Suspended Particulate Matter	ENV-LAB003	µg/m3	RCA Laboratories – Environmental	NATA Analysis
Determination of Particulate Matter – Deposited Matter	ENV-LAB004	g/m2 per month	RCA Laboratories – Environmental	NATA Analysis
pH	ENV-LAB006	pH	RCA Laboratories – Environmental	NATA Analysis
Conductivity	ENV-LAB010	µS/cm	RCA Laboratories – Environmental	NATA Analysis
Total Suspended Solids	ENV-LAB009	mg/L	RCA Laboratories – Environmental	NATA Analysis
Turbidity	ENV-LAB037	NTU	RCA Laboratories - Environmental	NATA Analysis
Oil and Grease	ENV-LAB022	mg/L	RCA Laboratories - Environmental	Non-NATA Analysis
Major Anions (Alkalinity, Cl, SO4)	ED037, ED041, ED045	mg/L	ALS	NATA Analysis
Major Cations (Ca, Mg, Na, K)	ED093	mg/L	ALS	NATA Analysis
Dissolved Metals	EG020F	mg/L	ALS	NATA Analysis

ALS Environmental has been used to obtain analysis of anions, cations and dissolved metals (NATA Accreditation number 825).

3 WATER MONITORING RESULTS

3.1 GROUNDWATER

A total of two (2) groundwater samples were collected from within the Pine Dale Mine site during December 2021. Water quality analysis results are shown in **Table 2**. Groundwater monitoring locations are shown in **Appendix A**.

Table 2 *Groundwater Analysis Results*

ANALYSIS	UNITS	P6	P7
Sample Number	-	12216880012	12216880013
Date Sampled	-	6/12/21	6/12/21
Time Sampled	-	16:28	17:11
Depth to Water from Surface	m	22.16	4.59
Water Level (AHD)	m	894.79	889.81
Temperature	°C	16.0	14.4
pH	pH	6.53	6.90
Conductivity	µS/cm	***1370***	826
Turbidity	NTU	12	
Dissolved Oxygen	mg/L	2.1	
Total Suspended Solids	mg/L	24.0	
Oil and Grease	mg/L	<5	
Bicarbonate Alkalinity (CaCO3)	mg/L	120	
Total Alkalinity (CaCO3)	mg/L	120	
Sulphate (as SO4)	mg/L	576	
Chloride	mg/L	42	
Calcium	mg/L	146	
Magnesium	mg/L	59	
Sodium	mg/L	59	
Potassium	mg/L	21	
Cobalt (dissolved)	mg/L	0.05	
Manganese (dissolved)	mg/L	2.2	
Nickel (dissolved)	mg/L	0.095	
Zinc (dissolved)	mg/L	0.03	
Iron (dissolved)	mg/L	26.5	
Trigger Values			
pH trigger level[a]	pH	6.2 – 8.0	6.3 – 8.0
Conductivity trigger level	µS/cm	1180	852
Water Level (AHD)[b]	m	887.90	883.28
Revised Trigger Values[c]			
pH trigger level[d]	pH	5.6	6.3
Water Level (AHD)[b]	M	887.9	--

Indicates analysis was not required.

[a] pH trigger value is exceeded if the pH is outside the nominated range.

[b] Water Level trigger is exceeded if the AHD water level drops below the nominated trigger level.

[c] Proposed trigger values to be used alongside the currently approved trigger values.

[d] pH trigger value is exceeded if pH is below the nominated value.

Results shown in ***bold italics*** indicates exceedance of trigger value.

Results shown in <u>underline</u> indicates exceedance of revised trigger value.

3.2 SURFACE WATER MONITORING

Quarterly ambient surface water monitoring was undertaken during November 2021 and as such is not required until February 2022.

4 AIR QUALITY RESULTS

4.1 HIGH VOLUME AIR SAMPLERS (HVAS)

Monitoring for TSP and PM_{10} using HVAS was removed from Environment Protection Licence 4911 in November 2020. The Pine Dale Mine Air Quality and Greenhouse Gas Management Plan (AQGGMP) was reviewed and updated to reflect this change. The updated AQGGMP was submitted to the Department of Planning, Industry and Environment (DPIE) for endorsement. The AQGGMP was endorsed by DPIE on 4 December 2020 and was subsequently uploaded onto the Pine Dale Mine website.

4.2 DEPOSITIONAL DUST MONITORING

The depositional dust monitoring exposure period for December 2021 was 4 November 2021 – 6 December 2021. Depositional dust gauges at this facility conform to AS/NZS 3580.10.1:2016 and AS/NZS 3580.1.1:2016. The December exposure period was 32 days which is within the 30 ± 2 days dust exposure period stipulated in AS/NZS 3508.10.1:2016. Depositional dust monitoring results are shown in **Table 3**. Depositional dust monitoring locations are shown in **Appendix A**.

Table 3 *Depositional Dust Monitoring*

Deposit Gauge	Number of Days	Notes	Insoluble Solids	Ash	Combustible Matter
D1	32	I	0.3	<0.1	0.3
D3	32	I	6.6	0.1	6.5
D4	32	I	0.1	0.1	<0.1
D5	32	I	0.1	<0.1	0.1
D6	32	IT	1.8	1.1	0.7

All units are g/m^2/month

I – Insects (eg, Ants, Spiders)

T – Tree litter (leaves, gumnuts)

Results of D3 have been influenced by the presence of organic matter, comprising 98% of the insoluble solids concentration. Field sheets note that the organic matter contamination was caused by insects collected in the dust gauge bottle. Rainfall for the exposure period was 164.6mm, with wet conditions throughout. In addition to this, there were no dust generating activities at Pine Dale Mine throughout the exposure period. Therefore it is considered unlikely that the December D3 result was caused by dust fallout.

4.2.1 ALLOWABLE DEPOSITIONAL DUST LIMITS

The EPA long term (annual average) deposited dust limit is 4g/m^2 per month. The rolling annual average depositional dust results for all sites within the period (January 2021 – December 2021) are in compliance with consent conditions. The annual average for dust gauges D1, D3, D4, D5 and D6 are all less than or equal to 1.0g/m^2 per month. Annual averages are shown in the depositional dust gauge graphs provided in **Appendix B**.

5 METEOROLOGICAL MONITORING

As of 10 November 2021, as authorised via an approved variation to the EPL, the location of the meteorological monitoring has been moved to the weather station situated at Mt Piper power station. Details of the weather data recorded during the period 1 to 31 December 2021 are shown in **Appendix C**: data capture was 100%.

6 BLASTING RESULTS

No blasting was undertaken during this month as mining operations have ceased since the end of March 2014.

7 NOISE MONITORING RESULTS

Quarterly noise monitoring was undertaken on 13 December. Results are contained within the Pine Dale Mine Environmental Noise Survey Report (RCA Report 13856-414/0). There were no measured noise contribution from Pine Dale Mine identified during the noise survey.

The next monitoring round is due before the end of March 2022.

8 OPERATIONAL ACTIVITIES

All of the approved minable reserves at the Pine Dale Mine have now been exhausted. Operational mining and the last coal sales ceased as of the end of March 2014.

Pine Dale Mine has been placed in care and maintenance since April 2014. All former operators have been made redundant; however, some statutory positions still remain.

9 SUMMARY

During the month of December 2021 groundwater and surface water monitoring results were found to be generally in compliance with stipulated criteria with the exception of the electrical conductivity at onsite groundwater location P6 which was above the site-specific trigger value. The pH at P6 and P7 were both compliant with the respective revised site-specific trigger values; there is no limit for electrical conductivity as part of the revised trigger values and therefore the electrical conductivity concentration at P7 is compliant.

All depositional dust gauge results are well below the EPA Long Term (annual average) criteria of 4g/m^2.month based upon a rolling average of the past 12 months.

Meteorological monitoring was undertaken for the entire month of December with 100% data capture at the Mt Piper Weather Station.

Quarterly noise monitoring was undertaken during December 2021. The noise monitoring survey results show no noise contribution from Pine Dale Mine. The next monitoring round is due before the end of March 2022.

Pine Dale Mine ceased operation in March 2014 and therefore no blasting occurred at the site.

10 LIMITATIONS

This report has been prepared for Enhance Place Pty Ltd in accordance with an agreement with RCA Australia (RCA). The services performed by RCA have been conducted in a manner consistent with that generally exercised by members of its profession and consulting practice.

This report has been prepared for the sole use of Enhance Place. The report may not contain sufficient information for purposes of other uses or for parties other than Enhance Place. This report shall only be presented in full and may not be used to support objectives other than those stated in the report without written permission from RCA Australia.

The information in this report is considered accurate at the date of issue with regard to the current conditions of the site. Conditions can vary across any site that cannot be explicitly defined by investigation.

Environmental conditions including contaminant concentrations can change in a limited period of time. This should be considered if the report is used following a significant period of time after the date of issue.

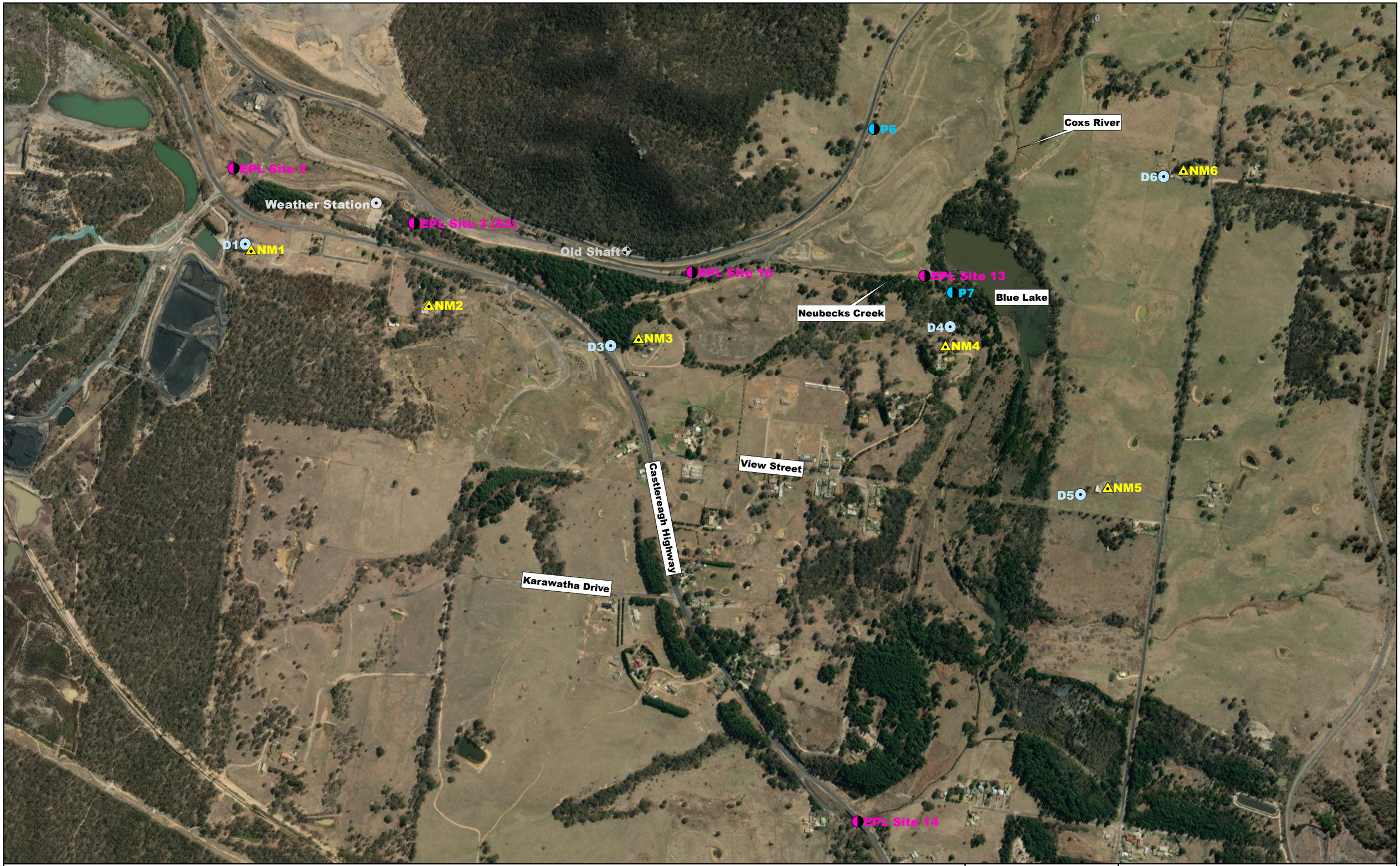
Yours faithfully

RCA AUSTRALIA

Fiona Brooker
Manager of Environmental Services
RCA Australia

Appendix A

Monitoring Locations



LEGEND

- Noise Monitoring Location
- Depositional Dust Monitoring Location
- Groundwater Monitoring Location
- Historic Metorological Monitoring Location
- Surface Water Monitoring Location
- Historical groundwater monitoring location

Note: Aerial taken from ArcGis Base Map, September 10 2018

0 62.5 125 250 375 500

1:10000 (metres)

N

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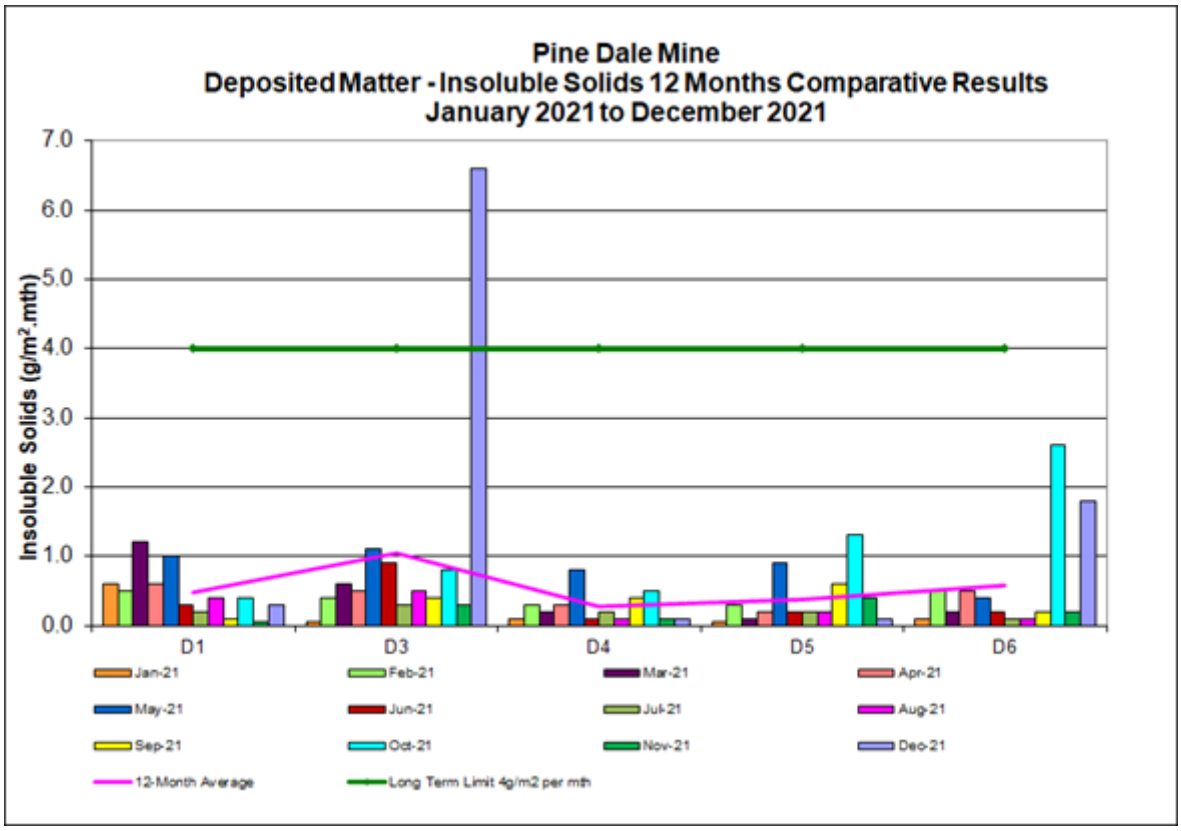
PINE DALE MINE
ENVIRONMENTAL MONITORING LOCATION PLAN

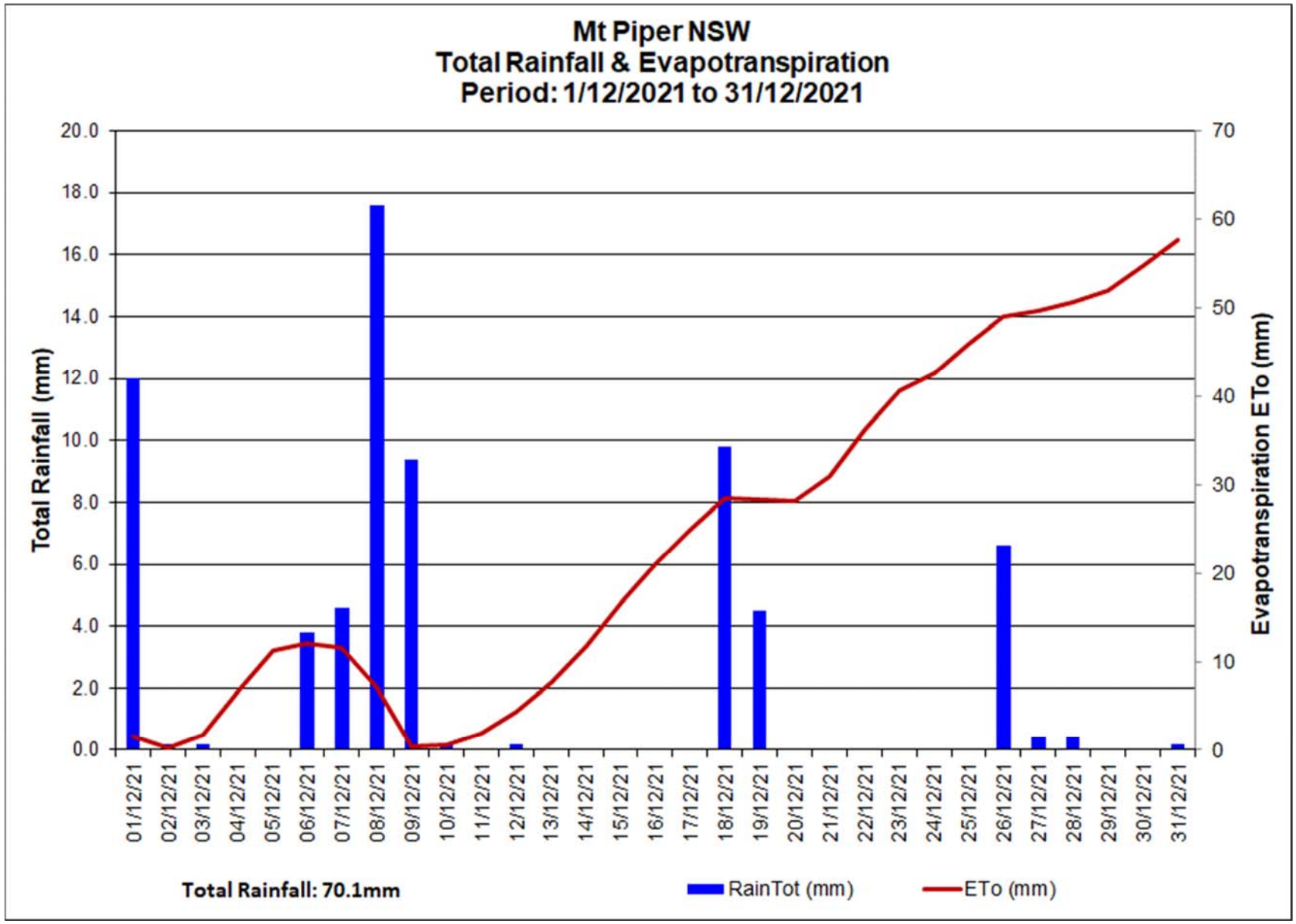
Appendix B

Depositional Dust Graph


Pine Dale Mine
Deposited Matter - Insoluble Solids 12 Months Comparative Results
January 2021 to December 2021
Insoluble Solids (g/m².mth)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
D1
D3
D4
D5
D6
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
12-Month Average
Long Term Limit 4g/m2 per mth

Appendix C

Meteorological Data (Mt Piper weather station)


Mt Piper NSW
Total Rainfall & Evapotranspiration
Period: 1/12/2021 to 31/12/2021
Total Rainfall (mm)
Evapotranspiration ETo (mm)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
70
60
50
40
30
20
10
0
01/12/21
02/12/21
03/12/21
04/12/21
05/12/21
06/12/21
07/12/21
08/12/21
09/12/21
10/12/21
11/12/21
12/12/21
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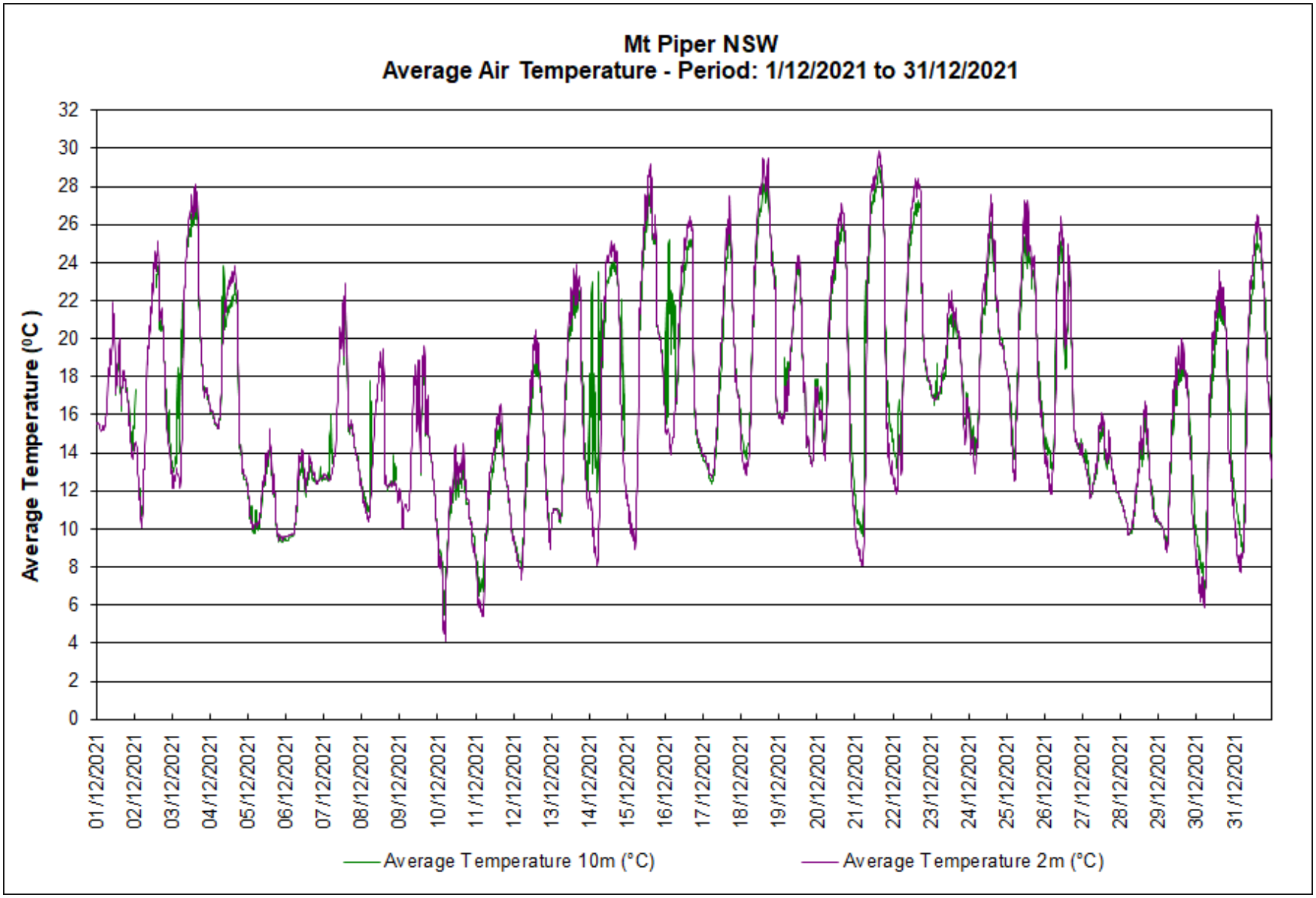
22/12/21
23/12/21
24/12/21
25/12/21
26/12/21
27/12/21
28/12/21
29/12/21
30/12/21
31/12/21
Total Rainfall: 70.1mm
RainTot (mm)
ETo (mm)


Mt Piper NSW
Average Air Temperature - Period: 1/12/2021 to 31/12/2021
Average Temperature (°C)
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
01/12/2021
02/12/2021
03/12/2021
04/12/2021
05/12/2021
06/12/2021
07/12/2021
08/12/2021
09/12/2021
10/12/2021
11/12/2021
12/12/2021
13/12/2021
14/12/2021
15/12/2021
16/12/2021
17/12/2021
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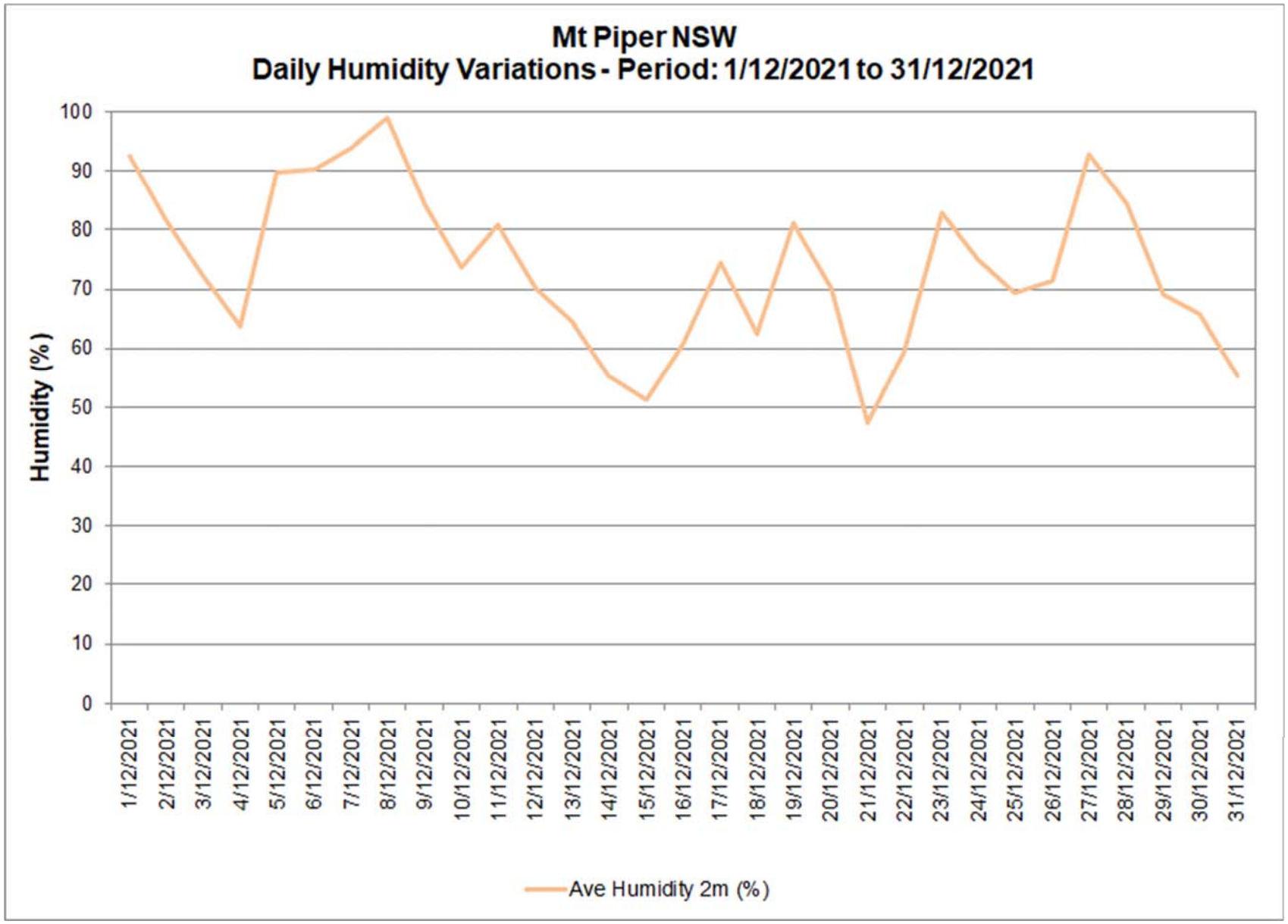
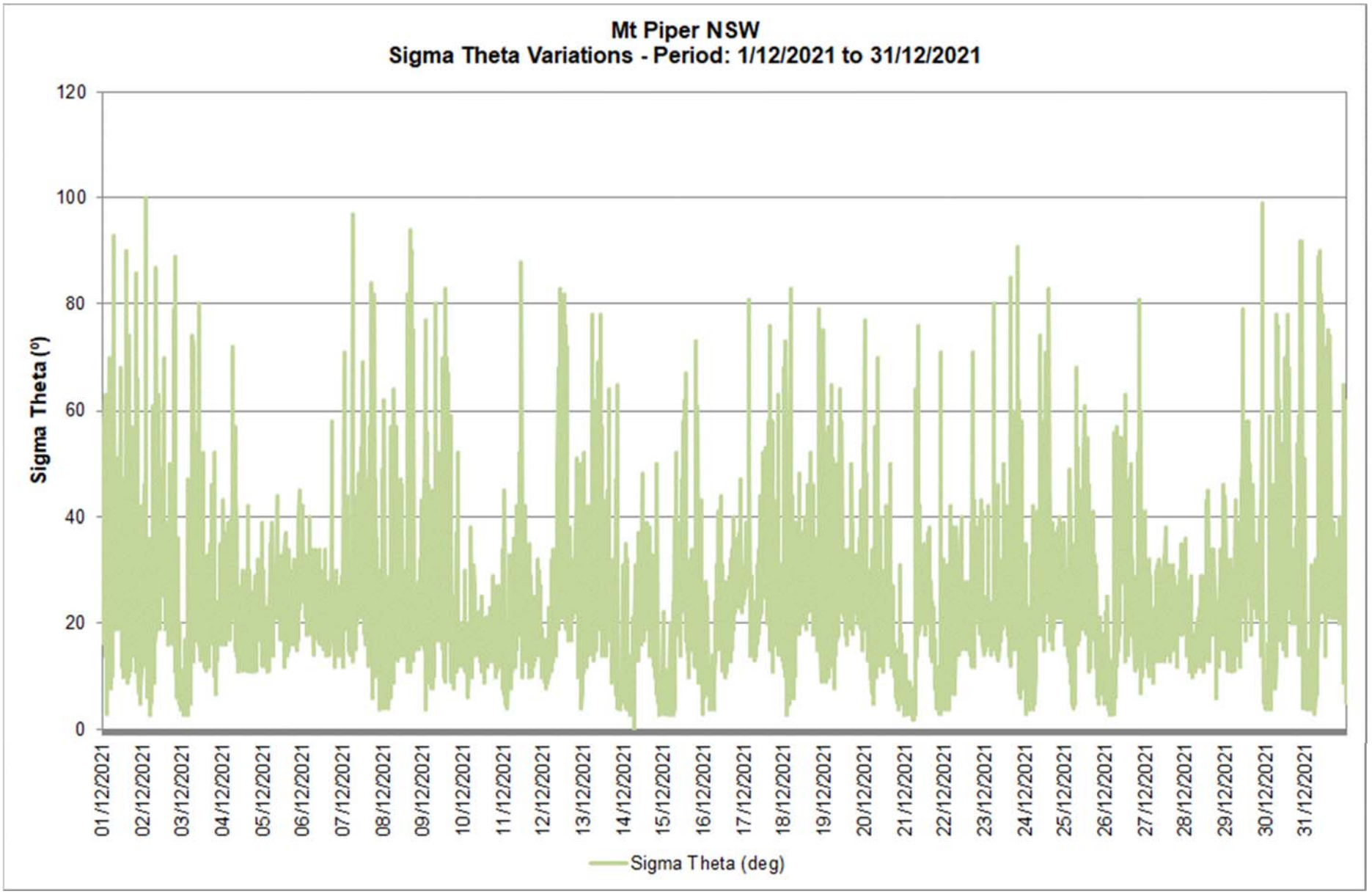
24/12/2021
25/12/2021
26/12/2021
27/12/2021
28/12/2021
29/12/2021
30/12/2021
31/12/2021
Average Temperature 10m (°C)
Average Temperature 2m (°C)




Mt Piper NSW
Sigma Theta Variations - Period: 1/12/2021 to 31/12/2021
Sigma Theta (°)
120
100
80
60
40
20
0
01/12/2021
02/12/2021
03/12/2021
04/12/2021
05/12/2021
06/12/2021
07/12/2021
08/12/2021
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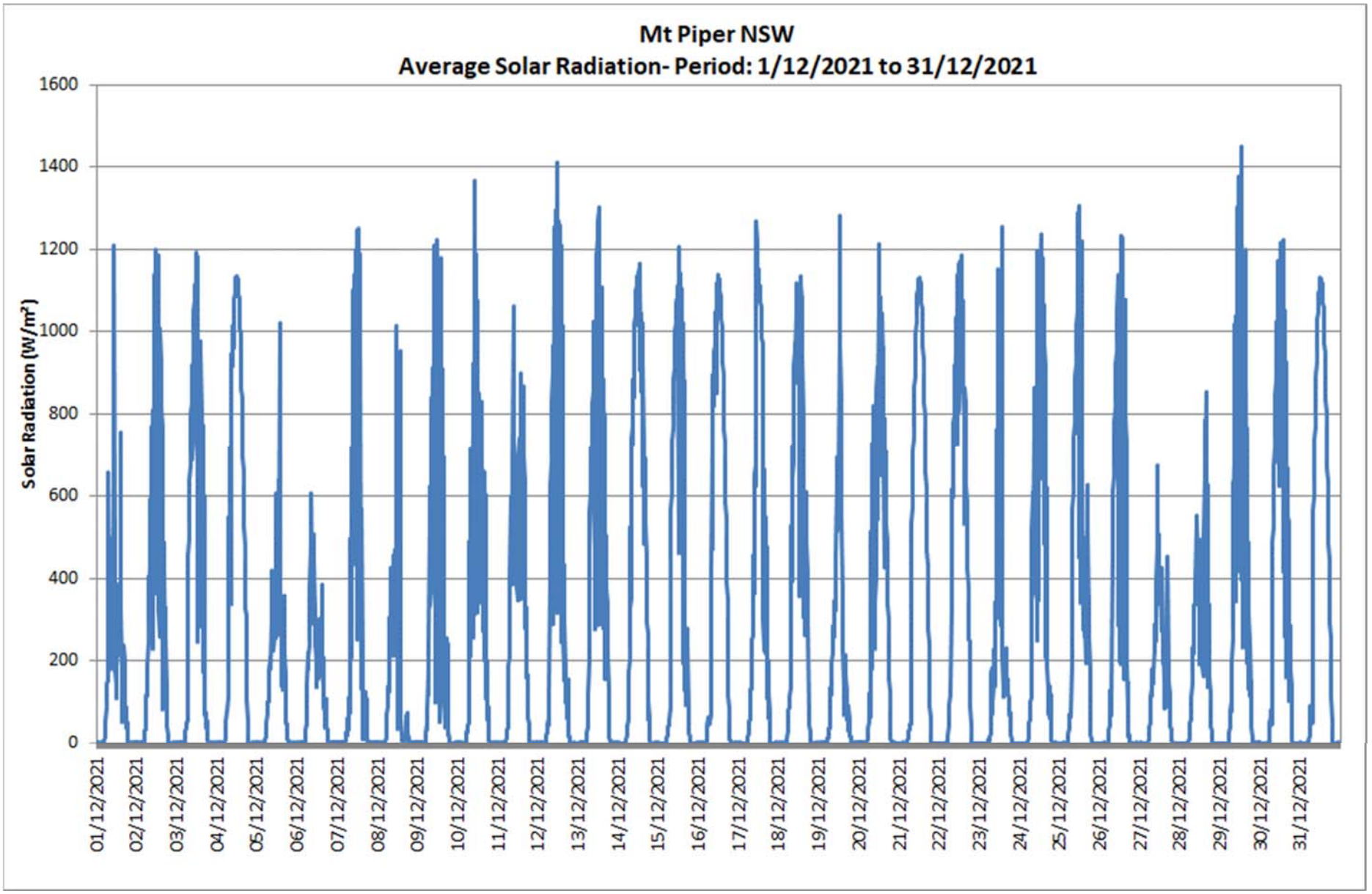
20/12/2021
21/12/2021
22/12/2021
23/12/2021
24/12/2021
25/12/2021
26/12/2021
27/12/2021
28/12/2021
29/12/2021
30/12/2021
31/12/2021
Sigma Theta (deg)


Mt Piper NSW
Average Solar Radiation- Period: 1/12/2021 to 31/12/2021
Solar Radiation (W/m²)
1600
1400
1200
1000
800
600
400
200
0
01/12/2021
02/12/2021
03/12/2021
04/12/2021
05/12/2021
06/12/2021
07/12/2021
08/12/2021
09/12/2021
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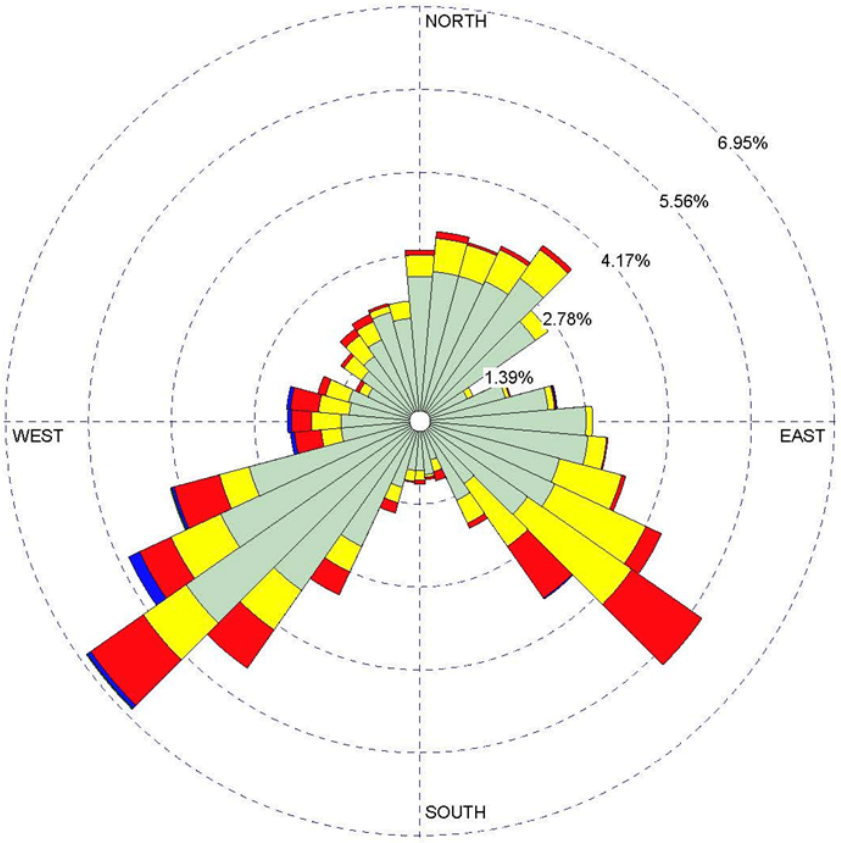
19/12/2021
20/12/2021
21/12/2021
22/12/2021
23/12/2021
24/12/2021
25/12/2021
26/12/2021
27/12/2021
28/12/2021
29/12/2021
30/12/2021
31/12/2021

WIND ROSE PLOT:
Pine Dale
December 2021

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)

- >= 11.10
- 8.80 - 11.10
- 5.70 - 8.80
- 3.60 - 5.70
- 2.10 - 3.60
- 0.50 - 2.10

Calms: 1.59%

COMMENTS:	DATA PERIOD: **Start Date: 1/12/2021 - 00:00** **End Date: 31/12/2021 - 23:50**	COMPANY NAME: **Pine Dale Mine**	
		MODELER: **S. Bamber, RCA Australia**	RCA AUSTRALIA GEOTECHNICAL • ENVIRONMENTAL
	CALM WINDS: **1.59%**	TOTAL COUNT: **744hrs.**	
	AVG. WIND SPEED: **1.85 m/s**	DATE: **10/01/2022**	PROJECT NO.: **6880**