

HUNTER VALLEY OPERATIONS



Monthly Environmental Monitoring Report October 2021

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1 Introduction

This report has been compiled to provide a monthly summary of environmental monitoring results for Hunter Valley Operations (HVO). This report includes all monitoring data collected for the period 1st to 31st October 2021 (the 'Reporting Period').

2 Air Quality

2.1 Meteorological Monitoring

HVO maintains two meteorological stations: 'HVO Corporate' and 'Cheshunt' (refer to **Figure 4**)

2.1.1 Rainfall

Rainfall for the period is summarised in **Table 1**. The 2019, 2020 and 2021 trends are shown in **Figure 1**.

Table 1 - Rainfall data for the reporting period

2021	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
January	50.6	50.6
February	106.4	157.0
March	178.0	335.0
April	12.8	347.8
May	28.2	376
June	60.2	436.2
July	22.8	459.0
August	38.0	497.0
September	26.0	523.0
October	56.2	579.2

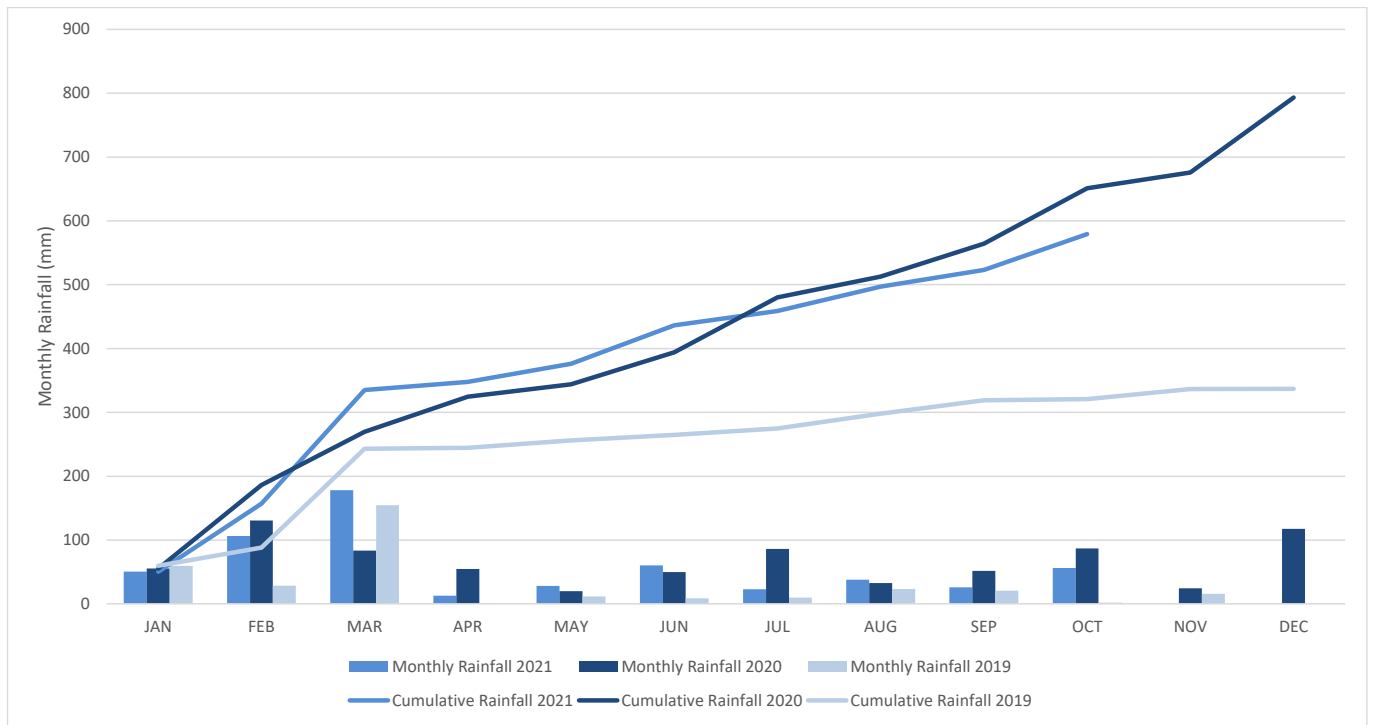


Figure 1 - Rainfall Summary 2021

2.1.2 Wind Speed and Direction

North Westerly to Westerly winds were prevailing during the reporting period as shown in **Figure 2** (HVO Corporate) and **Figure 3** (HVO Cheshunt).

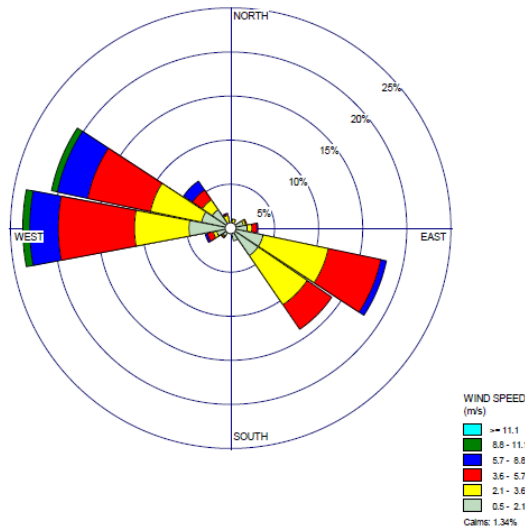


Figure 2 - HVO Corporate Wind Rose for the Reporting Period

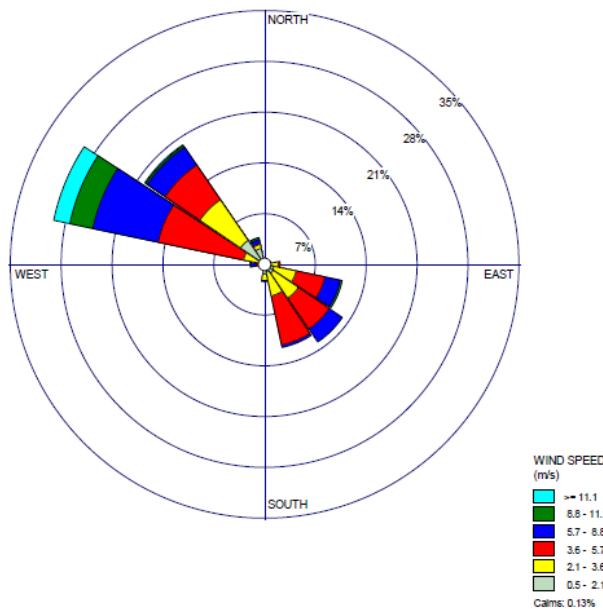


Figure 3 - HVO Cheshunt Wind Rose for the Reporting Period

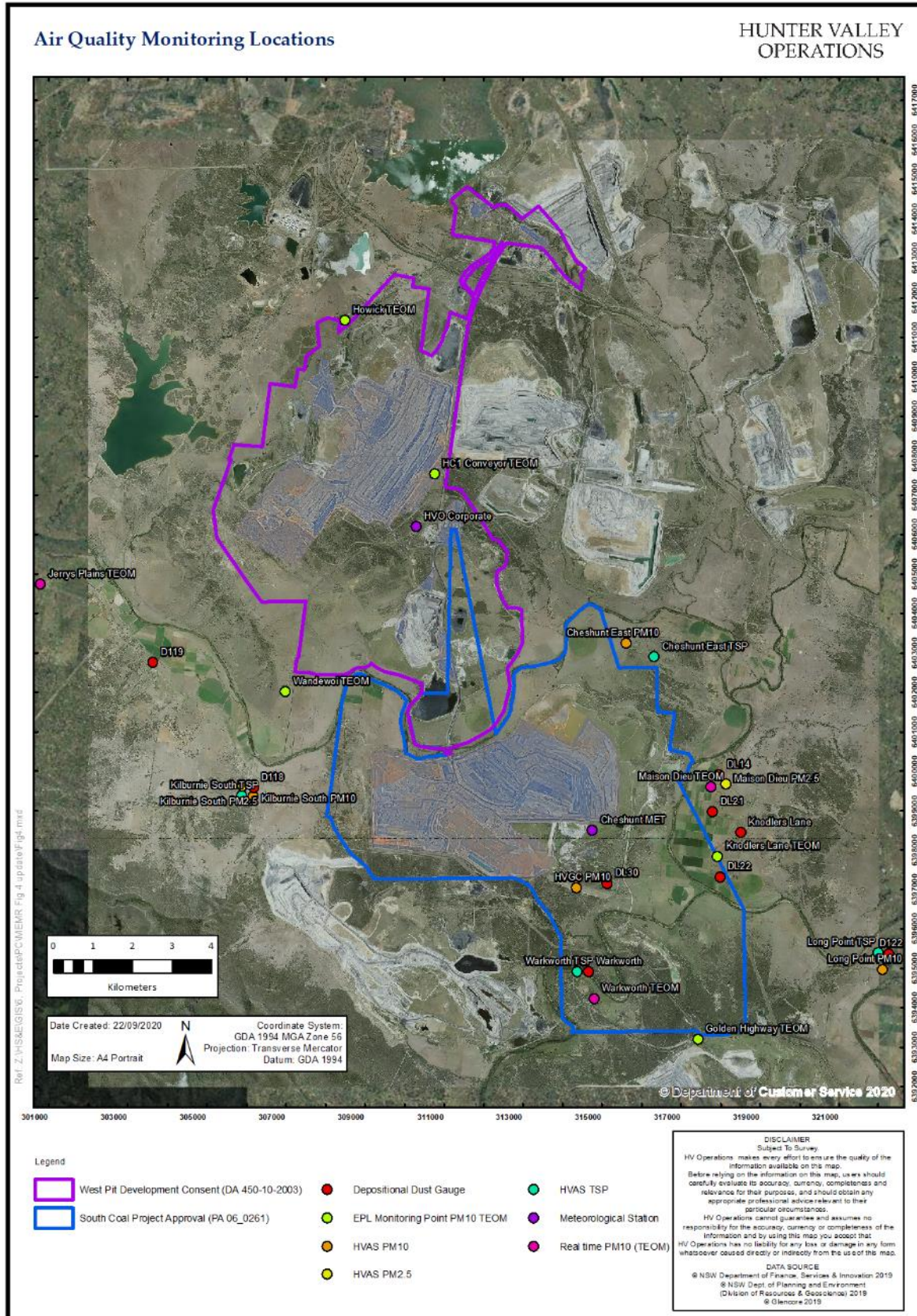


Figure 4 - Air Quality Monitoring Location Plan

2.2 Depositional Dust

HVO operates and maintains a network of nine depositional dust gauges situated on private and mine owned land surrounding HVO to monitor regional air quality.

Figure 5 displays insoluble solids results from depositional dust gauges during the reporting period compared against the annual impact assessment criteria. Any monthly results deemed to be contaminated (due to presence of bird droppings, insects, etc.) are not displayed. An assessment of HVO’s contribution against the long-term impact assessment criteria will be provided in the 2021 Annual Review.

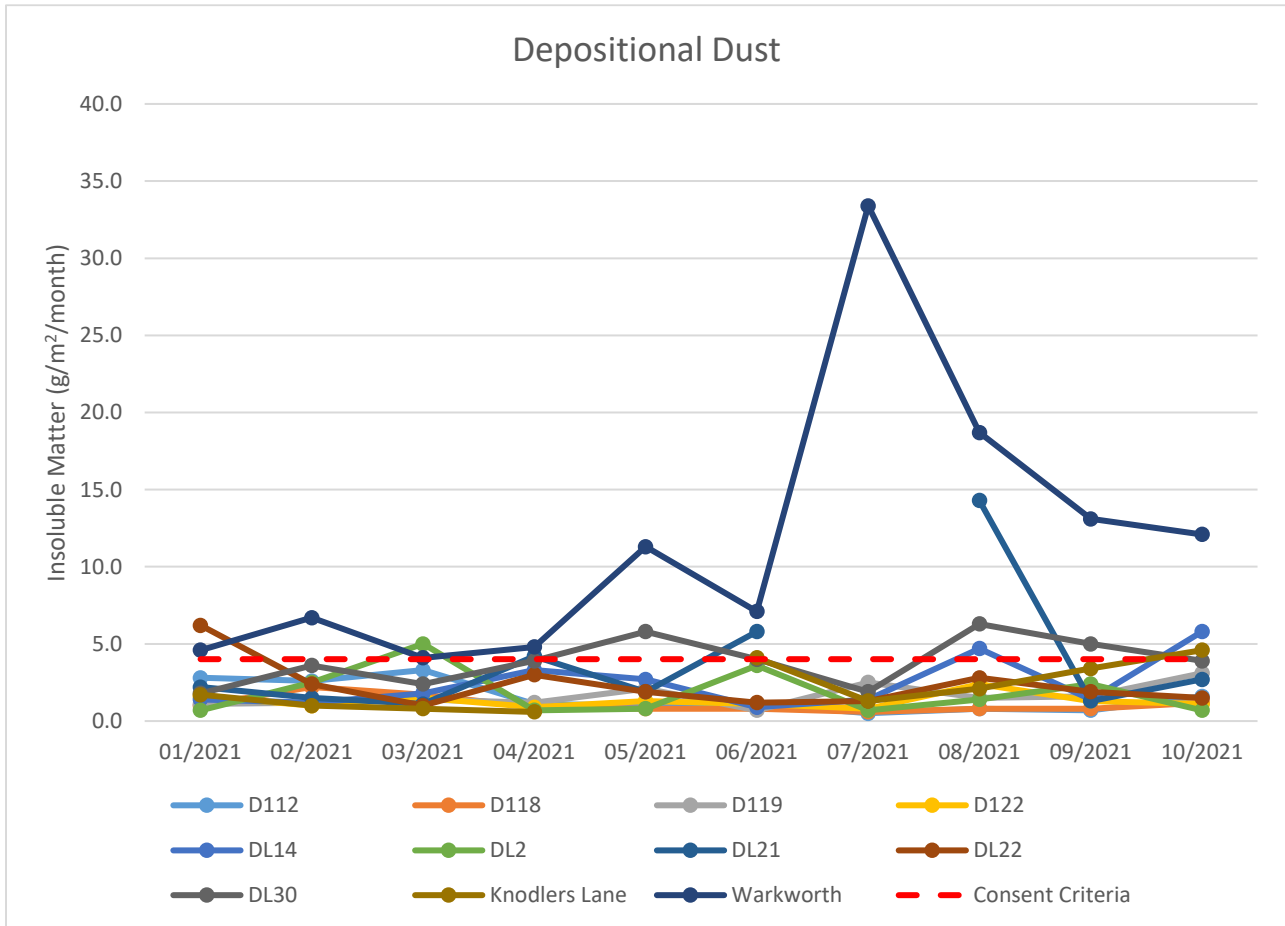


Figure 5 - Depositional Dust Results for the Reporting Period

2.3 Suspended Particles

Suspended particles are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (PM₁₀). The Kilburnie South and Maison Dieu HVAS also monitor Particulate Matter <2.5µm (PM_{2.5}). The location of these monitors can be seen in Figure 4. Each HVAS runs for 24-hours on a six-day cycle.

2.3.1 HVAS PM₁₀ Results

2.3.1.1 Performance against short term impact assessment criteria

Figure 6 shows individual PM₁₀ results at each monitoring station against the short-term impact assessment criteria of 50µg/m³. The Glider Club HVAS was above the relevant short-term impact assessment criteria during the reporting period however following investigation, the HVO contribution was found to be 29.7µg/m³.

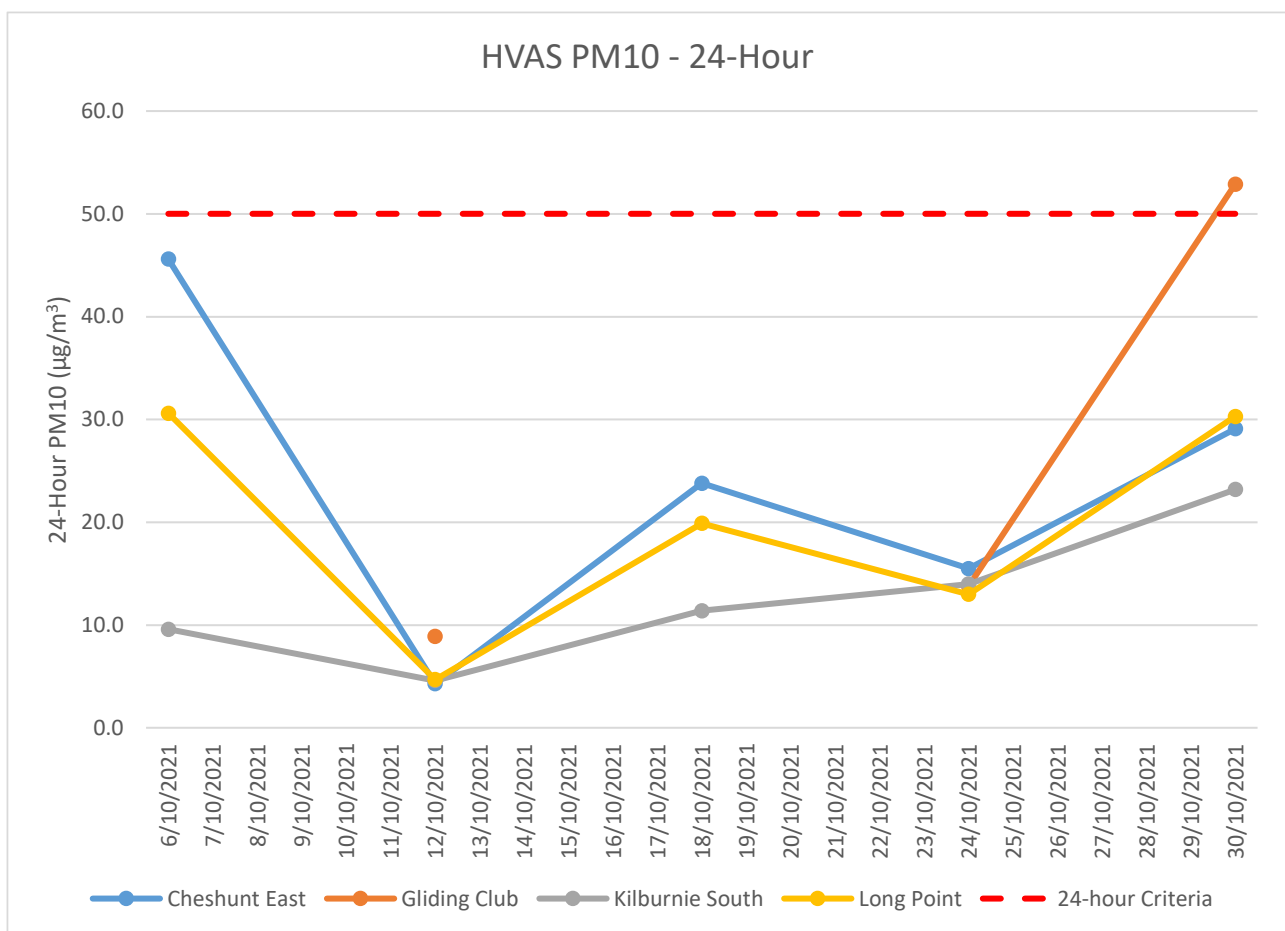


Figure 6 - Individual PM₁₀ Results for the Reporting Period

2.3.1.2 Performance against long term impact assessment criteria

Figure 7 shows the year to date annual average PM₁₀ results. All monitors were below the relevant long term impact assessment criteria during the reporting period. An assessment of HVO's contribution against the long-term impact assessment criteria will be provided in the 2021 Annual Review.

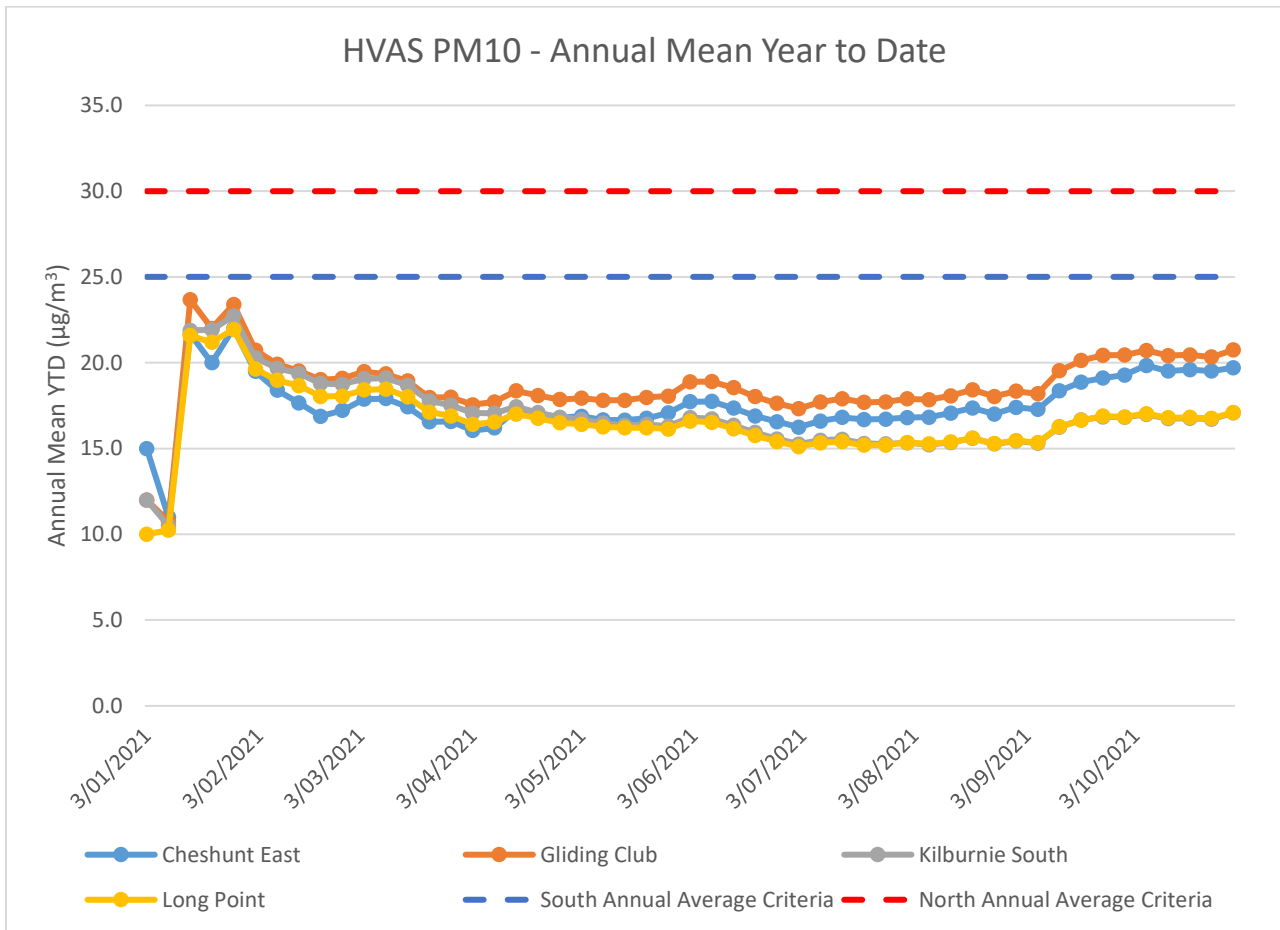


Figure 7 - Year to Date Average PM₁₀ as at end of the Reporting Period

2.3.2 HVAS PM_{2.5} Results

HVO monitors PM_{2.5} at two HVAS locations, Kilburnie South and Maison Dieu.

2.3.2.1 Performance against short term impact assessment criteria

Figure 8 shows individual PM_{2.5} results at each monitoring station against the HVO South short-term impact assessment criteria of 25µg/m³.

All monitors were below the relevant short-term impact assessment criteria during the reporting period.

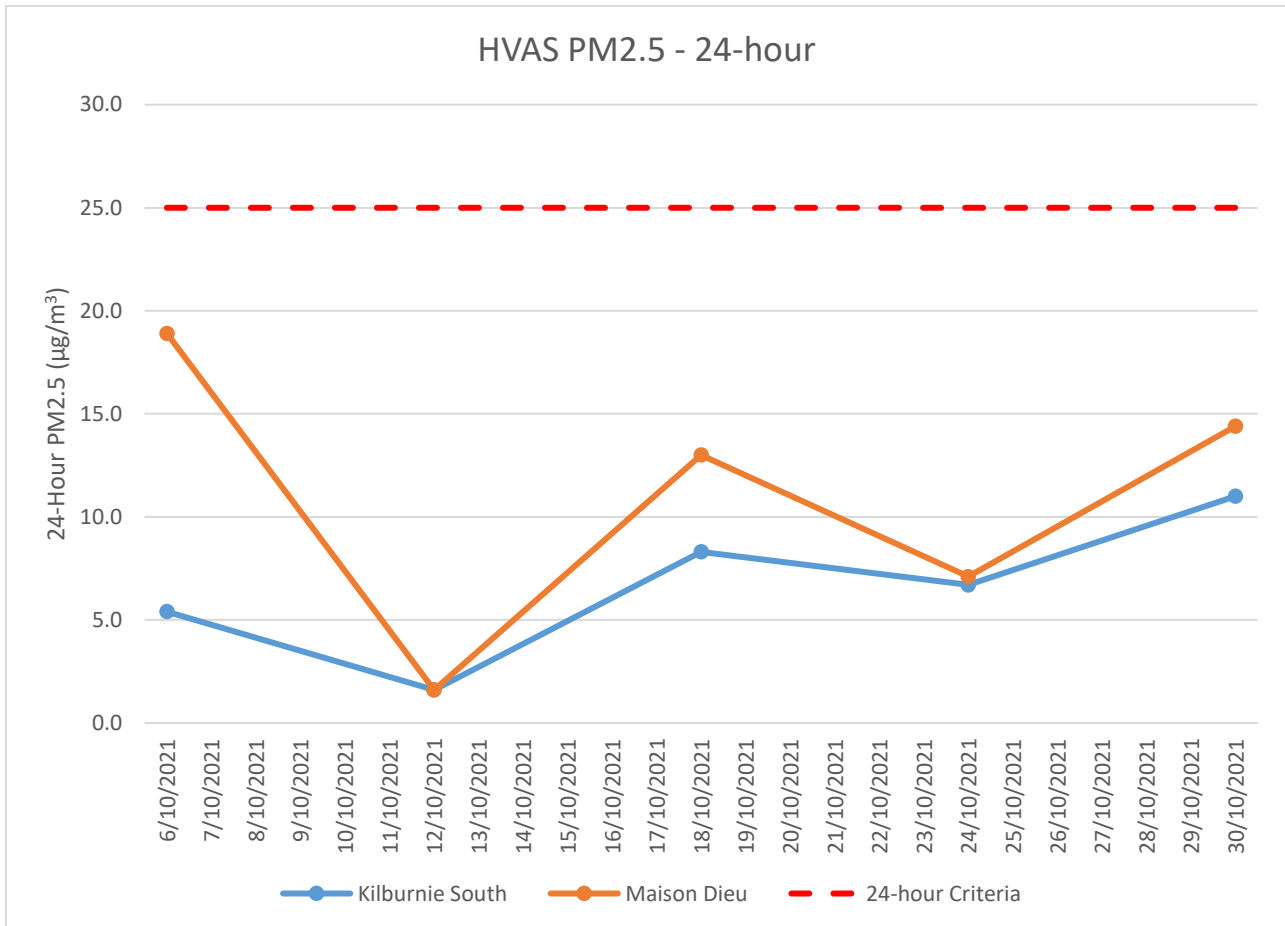


Figure 8 - Individual PM_{2.5} Results for the Reporting Period

2.3.2.2 Performance against long term impact assessment criteria

Figure 9 shows the year to date annual average PM_{2.5} results. During the reporting period, the Maison Dieu monitor annual average year to date was above the PM_{2.5} Annual Rolling Mean criteria of 8µg/m³.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2021 Annual Review.

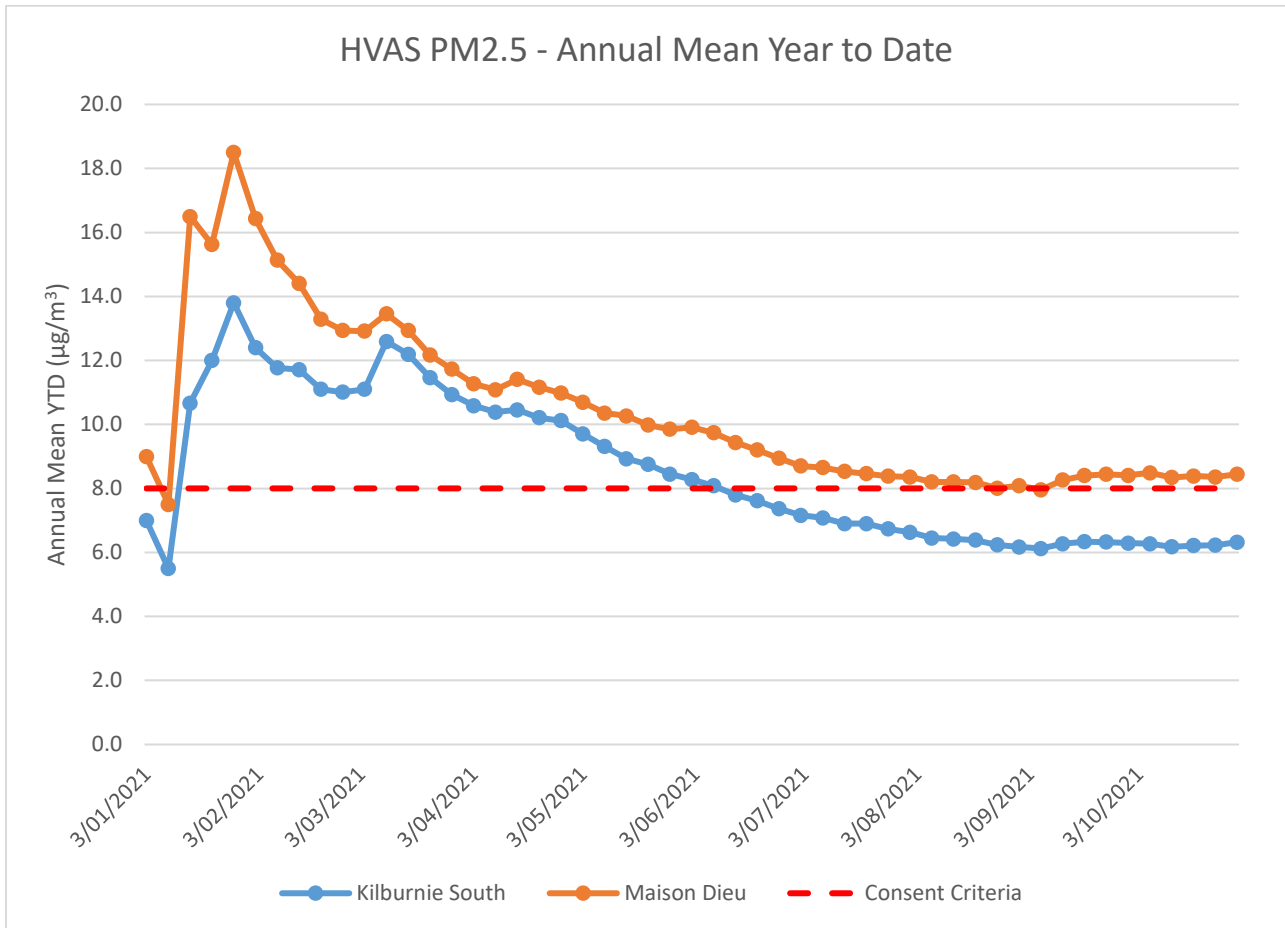


Figure 9 - Year to Date Average PM_{2.5} as at end of the Reporting Period

2.3.3 TSP Results

2.3.3.1 Performance against long term impact assessment criteria

Figure 10 shows the annual average TSP results compared against the long-term impact assessment criteria of 90µg/m³.

All monitors were below the relevant long-term impact assessment criteria during the reporting period.

An assessment of HVO’s contribution against the long-term impact assessment criteria will be provided in the 2021 Annual Review.

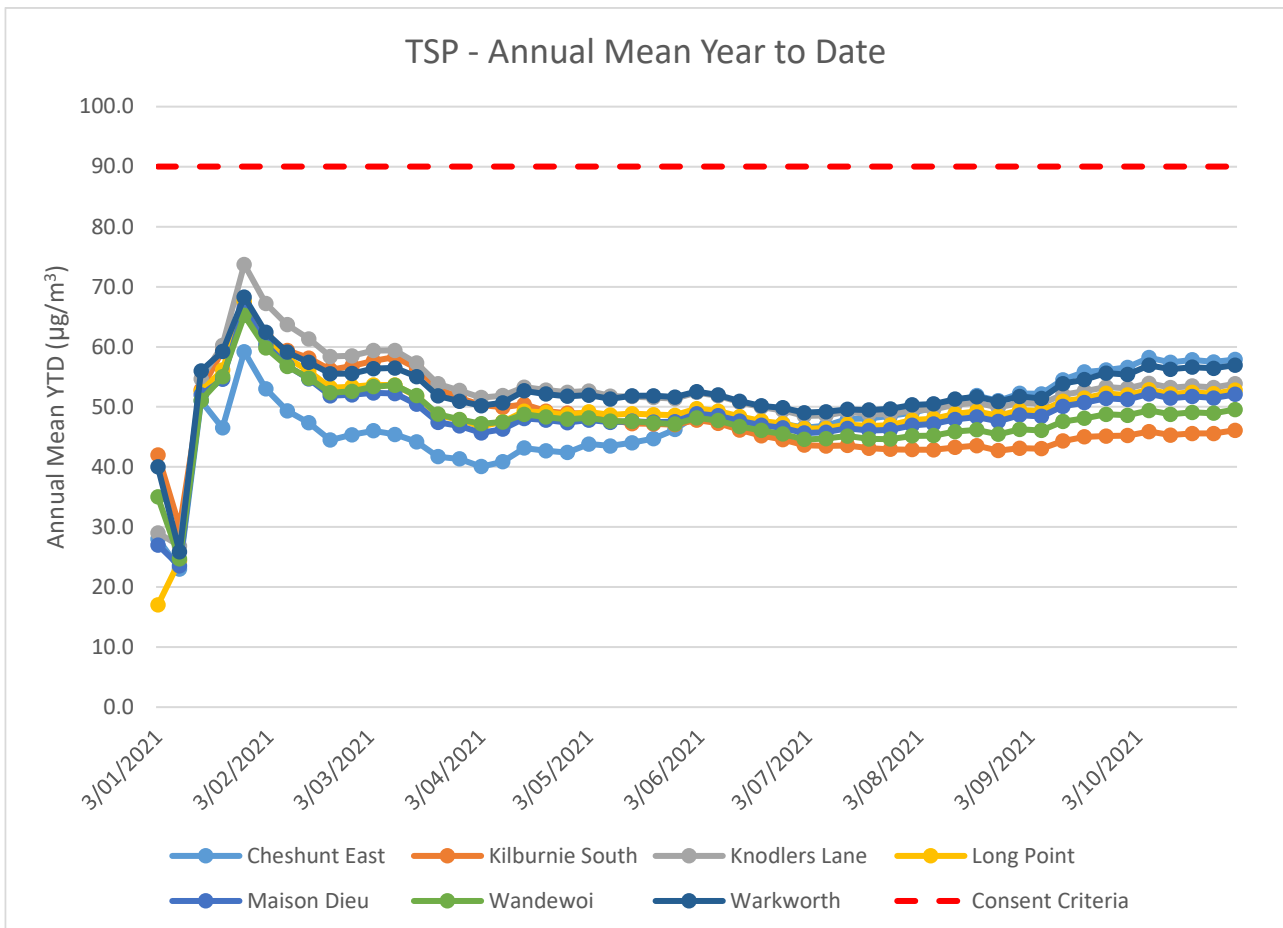


Figure 10 - Year to Date Average Total Suspended Particulates as at end of the Reporting Period

2.3.4 Real Time PM₁₀ Results

HVO maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously record information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger levels. Results from real time PM₁₀ monitoring are used as a reactive measure to guide mining operations to help achieve compliance with the relevant conditions of the project approval.

Figure 11 shows the daily 24-hour average PM₁₀ result from the real time monitoring sites which shows:

- Knodlers Lane TEOM exceeded the PM10 24 hour average on 5 October with a calculated maximum site contribution of 46.50 µg/m³
- Knodlers Lane TEOM and Warkworth TEOM exceeded the PM10 24 hour average on 7 October with respective calculated maximum site contributions of 26.60 µg/m³ and 27.51 µg/m³
- Warkworth TEOM exceeded the PM10 24 hour average on 10 October with a calculated maximum site contribution of 7.44 µg/m³
- Knodlers Lane TEOM, Maison Dieu TEOM and Warkworth TEOM exceeded the PM10 24 hour average on 29 October with respective calculated maximum site contributions of 37.69 µg/m³, 16.44 µg/m³, and 17.44 µg/m³

The year to date annual averages for each monitoring site are shown in Figure 12.

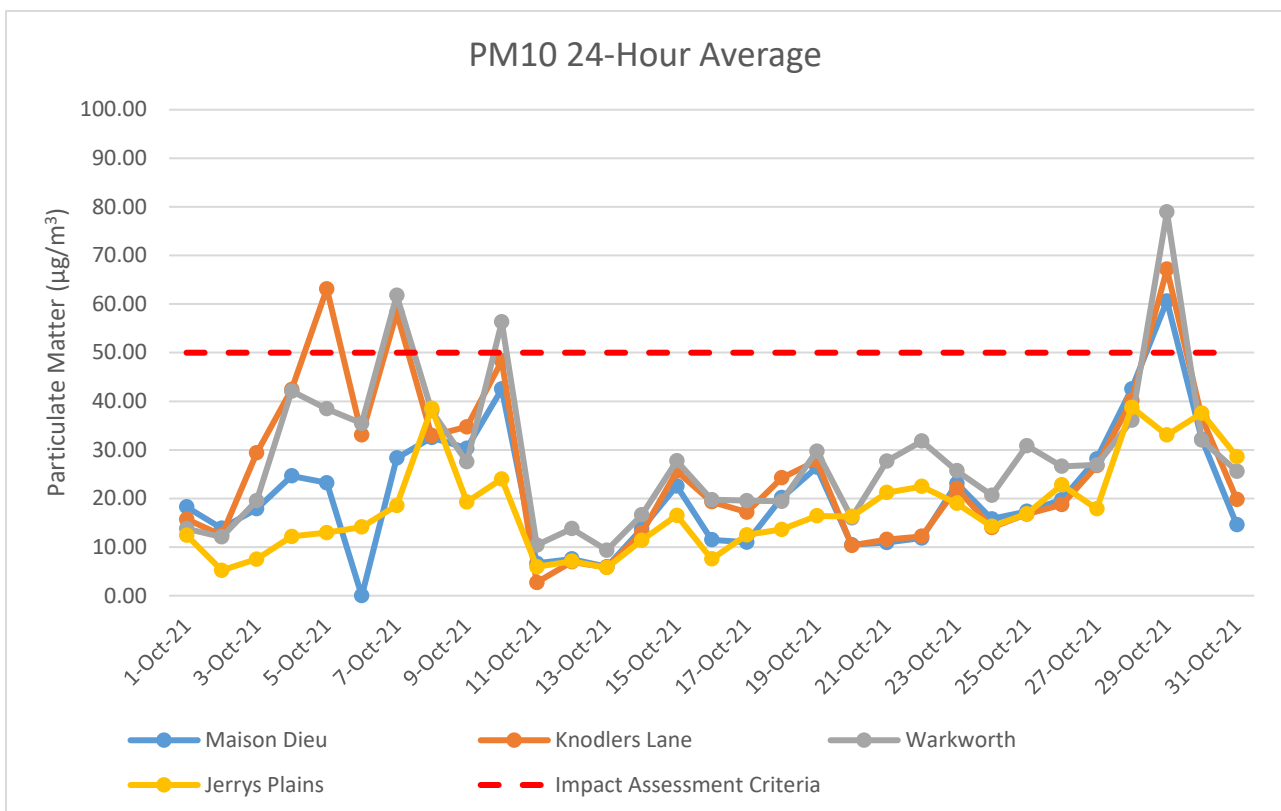


Figure 11 - Real Time PM₁₀ 24hr for the Reporting Period

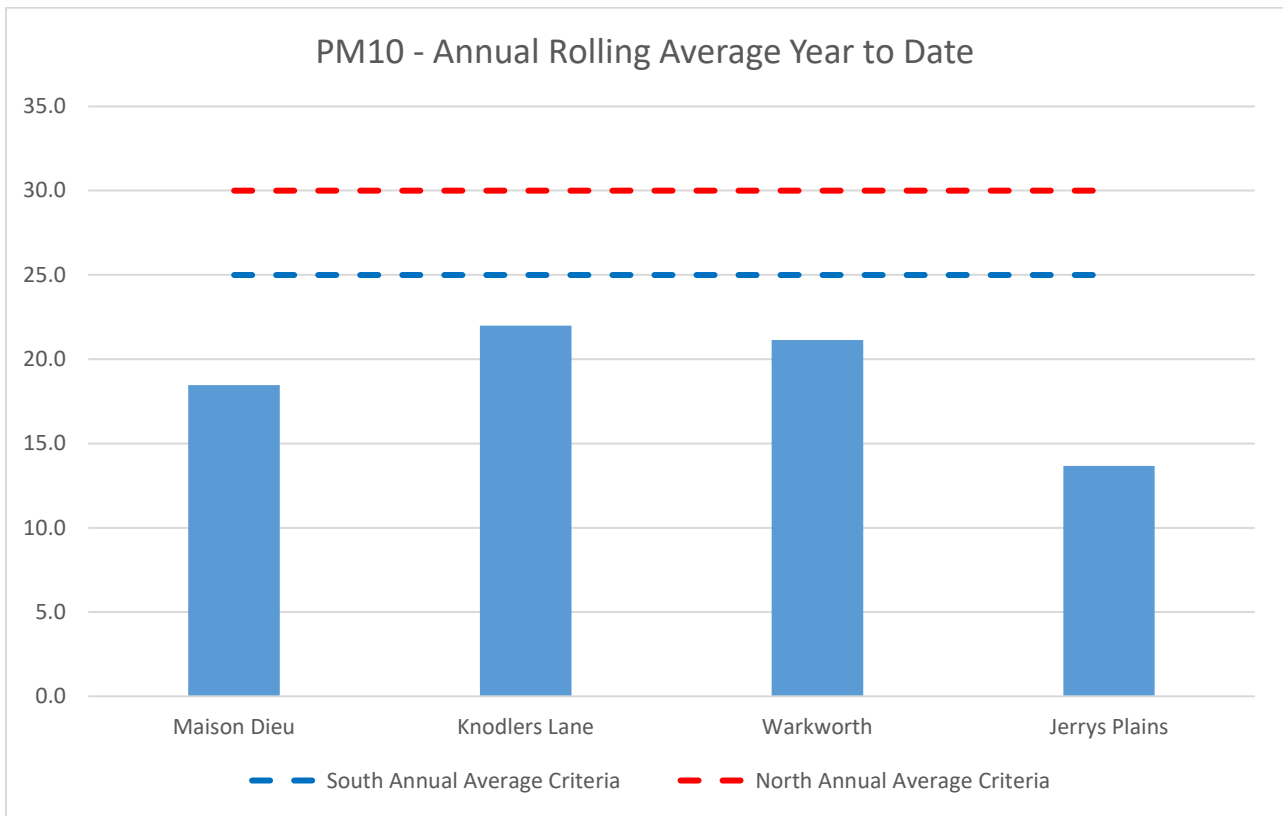


Figure 12 - Real Time PM₁₀ Annual Average October 2021

2.3.5 Real Time Alarms for Air Quality

The real time monitoring system generated 111 automated air quality related alarms during the reporting period. 68 alarms related to adverse weather conditions and 43 alarms related to dust conditions.

3 Water Quality

HVO maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Surface watercourses are sampled on a quarterly sampling regime. Water quality is assessed through the parameters of pH, electrical conductivity (EC) and Total Suspended Solids (TSS). The location of surface water monitoring points across HVO are shown in **Figure 13**.

Results from monitoring on site dams, the Hunter River and other natural tributaries are provided on a quarterly basis. Results will be provided in the December 2021 Monthly Environmental Monitoring Report.

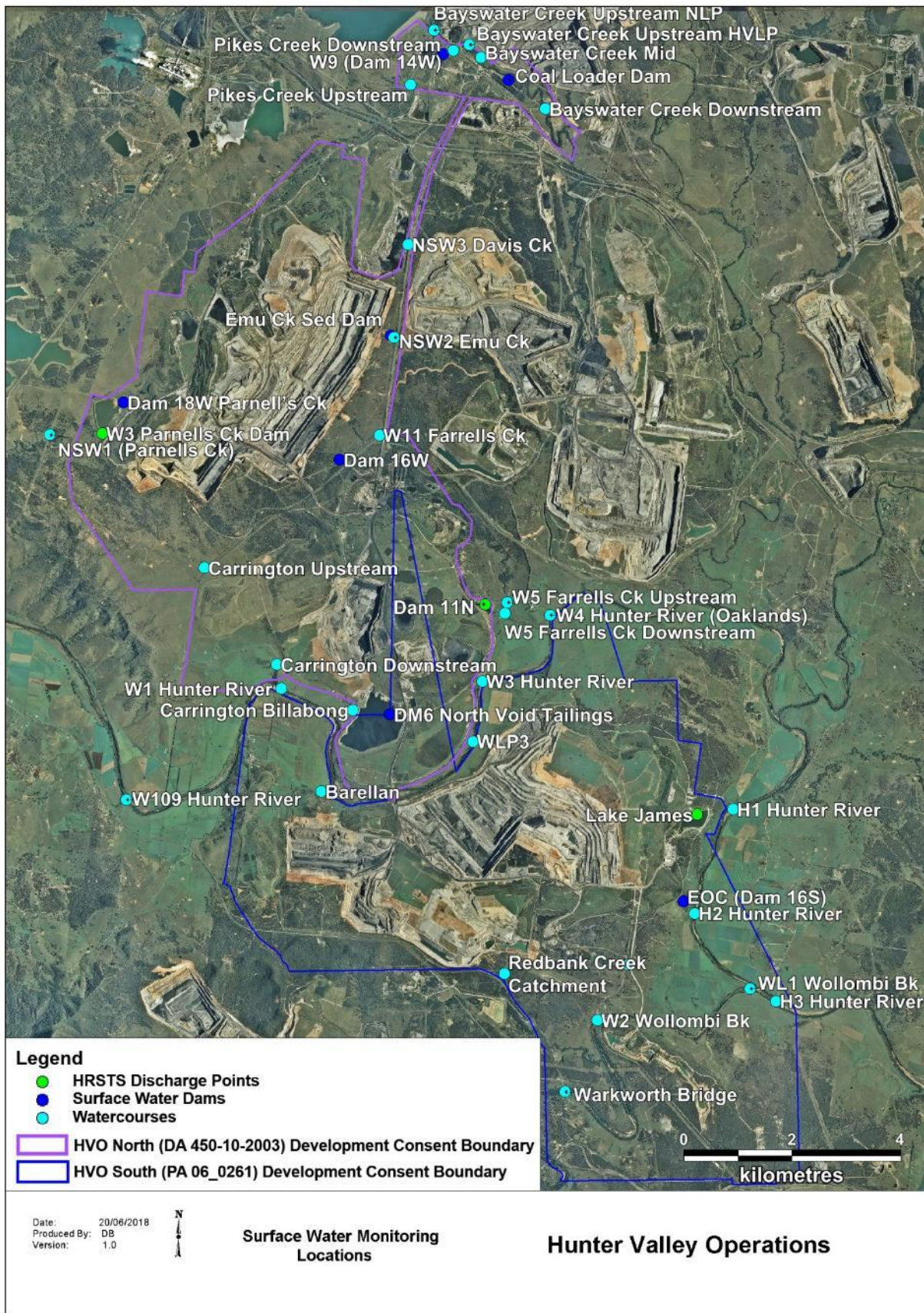


Figure 13 - HVO Surface Water Monitoring Locations

3.1.1 Surface Water Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis and to highlight potentially adverse surface water impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan.

Surface water trigger tracking results are provided on a quarterly basis; results will appear in the December 2021 report.

3.2 Site Water Use

HVO is permitted to extract water from the Hunter River under water allocation licenses issued by Water NSW.

HVO did not extract water from the Hunter River during the reporting period.

3.3 HRSTS Discharge

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS), allowing discharge from licensed discharge points Dam 11N (to Farrell's Creek), Lake James (to the Hunter River) and Parnell's Dam (to Parnell's Creek). Discharges can only take place subject to HRSTS regulations.

HVO discharged 24.3 ML under the HRSTS during the reporting period.

3.4 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Groundwater Monitoring Program. The location of groundwater monitoring points across HVO are show in **Figure 14**.

Groundwater monitoring results are provided on a quarterly basis. Results will be provided in the December 2021 Monthly Environmental Monitoring Report.

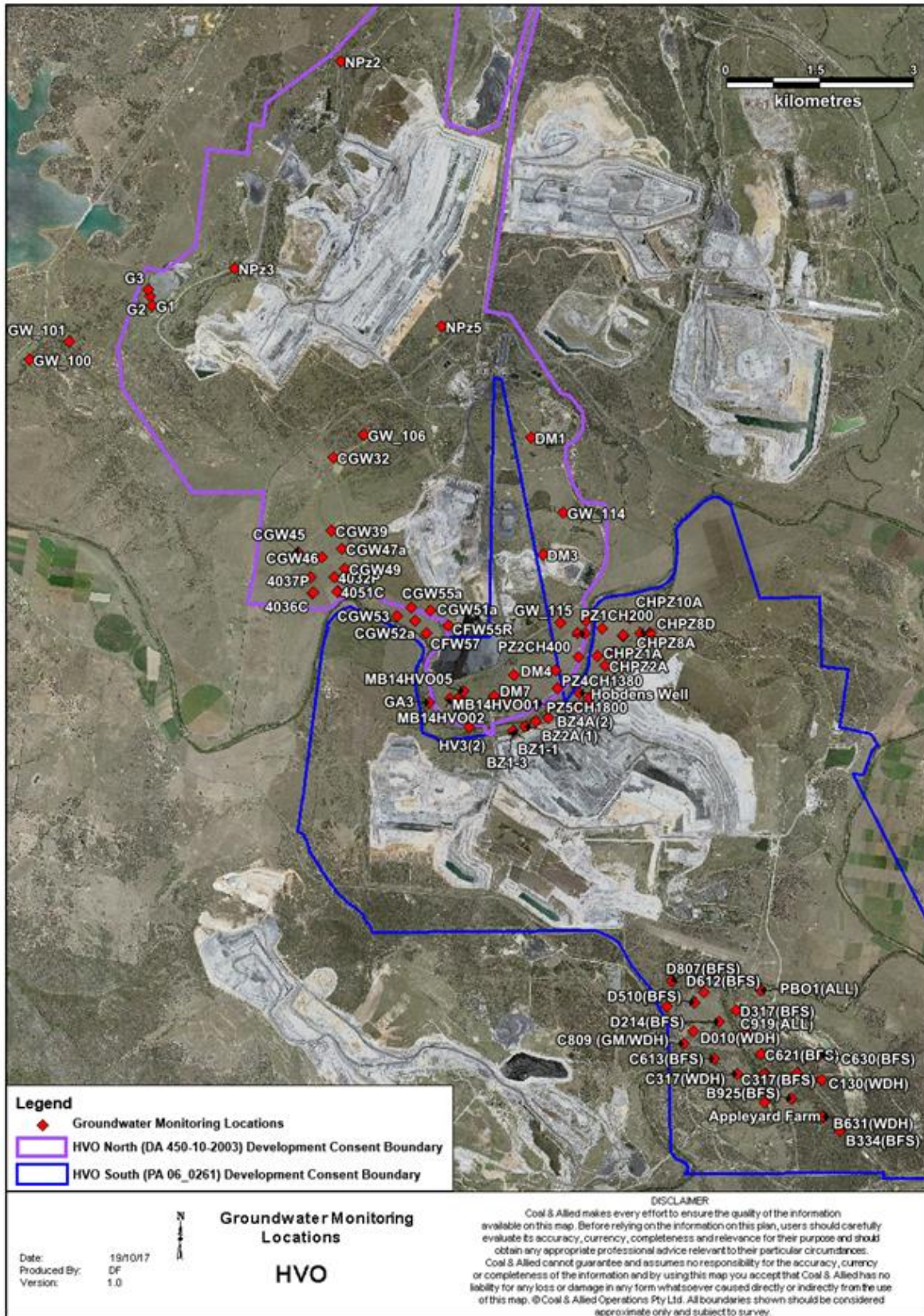


Figure 14 Groundwater monitoring Locations at HVO

3.4.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses is outlined in the HVO Water Management Plan.

Groundwater trigger tracking results are provided on a quarterly basis. Results will be provided in the December 2021 Monthly Environmental Monitoring Report.

4 Blasting

HVO maintains a network of blast monitoring units located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in **Figure 15**. Blasting criteria for HVO are summarised in **Table 2**.

Table 2 - Blasting Criteria

Airblast Overpressure ((L))	Comments
115	5% of the total number of blasts in a 12-month period
120	0% of blasts
Ground Vibration (mm/s)	Comments
5	5% of the total number of blasts in a 12-month period
10	0% of blasts

4.1 Blast Monitoring Results

Twenty-one (21) blasts were initiated at HVO during the reporting period. Blast monitoring results for the period are shown in **Table 3** and **Table 4**.

Table 3 - Overpressure Blast Monitoring Results for the reporting period

Date and Time	Moses Crossing (dB)	Jerrys Plains Village (dB)	Maison Dieu (dB)	Warkworth (dB)	Knodlers Lane (dB)
1/10/2021 12:45	92.32	78.99	100.52	97.76	103.19
2/10/2021 13:30	104.65	109.35	109.65	100.08	112.17
6/10/2021 13:20	93.78	98.47	100.62	102.83	105.69
8/10/2021 10:13	96.00	97.17	90.93	91.06	91.01
8/10/2021 13:13	86.69	94.30	85.42	92.70	85.52
8/10/2021 13:16	92.44	92.27	84.22	83.00	97.89
9/10/2021 14:06	89.04	100.44	103.67	96.63	101.77
9/10/2021 14:07	91.04	93.88	101.68	96.87	111.09
11/10/2021 13:06	92.33	98.44	93.79	89.41	105.50
14/10/2021 10:07	93.07	89.71	92.26	101.86	91.54
15/10/2021 14:16	105.25	106.95	101.74	110.64	107.81
19/10/2021 13:29	100.87	91.25	98.51	101.63	104.31
19/10/2021 13:31	104.98	87.23	97.22	93.94	101.62
20/10/2021 10:00	99.41	98.90	98.53	97.87	104.02
21/10/2021 13:05	85.01	96.69	87.77	99.62	86.04
21/10/2021 15:54	101.16	111.10	103.69	91.46	109.85
22/10/2021 13:37	89.37	93.84	87.24	86.72	88.61
25/10/2021 15:46	91.45	106.41	101.75	101.67	100.14
25/10/2021 15:48	97.83	106.01	104.71	101.17	101.59
26/10/2021 14:24	89.75	87.57	92.69	98.63	93.41
28/10/2021 13:01	88.24	96.25	94.61	92.09	99.96

Table 4 - Ground Vibration Blast Monitoring Results for the reporting period

Date and Time	Moses Crossing (mm/s)	Jerrys Plains Village (mm/s)	Maison Dieu (mm/s)	Warkworth (mm/s)	Knodlers Lane (mm/s)
1/10/2021 12:45	0.11	0.05	0.14	0.82	0.15
2/10/2021 13:30	0.17	0.16	0.08	0.19	0.11
6/10/2021 13:20	0.15	0.07	0.20	0.53	0.22
8/10/2021 10:13	0.18	0.05	0.05	0.18	0.09
8/10/2021 13:13	0.16	0.12	0.11	0.18	0.10
8/10/2021 13:16	0.14	0.10	0.07	0.22	0.10
9/10/2021 14:06	0.20	0.11	0.25	0.60	0.26
9/10/2021 14:07	0.13	0.07	0.07	0.23	0.12
11/10/2021 13:06	0.11	0.03	0.05	0.07	0.08
14/10/2021 10:07	0.11	0.04	0.12	0.74	0.10
15/10/2021 14:16	0.11	0.05	0.04	0.29	0.08
19/10/2021 13:29	0.11	0.05	0.09	0.44	0.17
19/10/2021 13:31	0.11	0.04	0.15	0.45	0.17
20/10/2021 10:00	0.27	0.07	0.10	0.24	0.10
21/10/2021 13:05	0.24	0.11	0.22	0.85	0.20
21/10/2021 15:54	0.10	0.06	0.04	0.49	0.08
22/10/2021 13:37	0.18	0.17	0.11	0.23	0.11
25/10/2021 15:46	0.10	0.05	0.06	0.14	0.10
25/10/2021 15:48	0.12	0.05	0.13	0.32	0.20
26/10/2021 14:24	0.17	0.08	0.27	0.49	0.25
28/10/2021 13:01	0.23	0.22	0.13	0.21	0.11

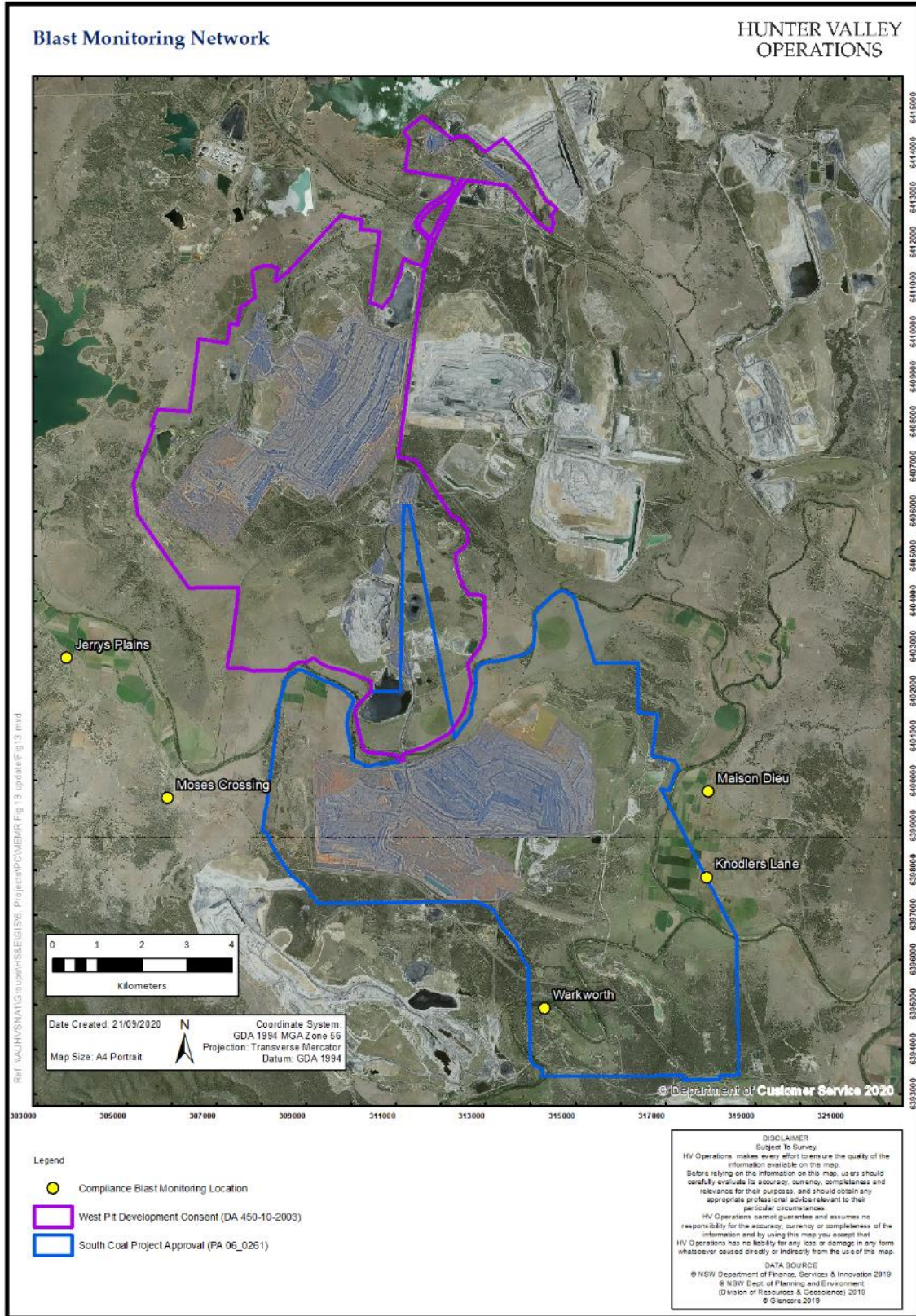


Figure 15 - Blast Monitoring Location Plan

5 Noise

Routine attended noise monitoring occurs at defined locations around HVO, as described in the HVO Noise Monitoring Program. The noise monitoring aims to quantify and describe the acoustic environment around the site and compare results with specified limits. The attended noise monitoring locations are displayed in **Figure 16**.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations around HVO on the night of 27 October 2021.

Monitoring results are detailed in **Table 7** to **Table 11**.

Table 5 - LAeq,15minute HVO North Against Impact Assessment Criteria for the Reporting Period

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class	Criterion (A)	Criterion Applies ²	HVO North LAeq ^{3,4,5,6}	Exceedance ^{4,5}
Shearers Lane	27/10/2021 21:00	1.3	F	35	Yes	IA	Nil
Knodlers Lane	27/10/2021 21:48	1.9	D	35	Yes	IA	Nil
Maison Dieu	27/10/2021 21:22	1.4	F	35	Yes	IA	Nil
Long Point (Dights Crossing)	27/10/2021 22:45	1.8	D	35	Yes	IA	Nil
Kilburnie South	27/10/2021 23:20	0.7	F	39	Yes	IA	Nil
Jerrys Plains East	27/10/2021 22:56	0.7	F	39	Yes	<25	Nil
Jerrys Plains Village	27/10/2021 21:00	1.3	F	40	Yes	IA	Nil
Jerrys Plains West	27/10/2021 21:22	1.4	F	40	Yes	IA	Nil
HVGC	27/10/2021 23:54	0.7	F	NA	Yes	IA	Nil

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;

2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 10 metres above ground level, or temperature inversion conditions greater than 3°C/100m (G stability class);

3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicate exceedance of criterion;

5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion not applicable;

Table 6 - LAeq,15minute HVO North Against Land Acquisition Criteria for the Reporting Period

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class	Criterion (A)	Criterion Applies ²	HVO North LAeq ^{3,4,6}	Exceedance ^{4,5}
Shearers Lane	27/10/2021 21:00	1.3	F	41	Yes	IA	Nil
Knodlers Lane	27/10/2021 21:48	1.9	D	41	Yes	IA	Nil
Maison Dieu	27/10/2021 21:22	1.4	F	41	Yes	IA	Nil
Long Point (Dights Crossing)	27/10/2021 22:45	1.8	D	41	Yes	IA	Nil
Kilburnie South	27/10/2021 23:20	0.7	F	41	Yes	IA	Nil
Jerrys Plains East	27/10/2021 22:56	0.7	F	41	Yes	<25	Nil
Jerrys Plains Village	27/10/2021 21:00	1.3	F	41	Yes	IA	Nil
Jerrys Plains West	27/10/2021 21:22	1.4	F	41	Yes	IA	Nil
HVGC	27/10/2021 23:54	0.7	F	NA	Yes	IA	Nil

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;

2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 10 metres above ground level, or temperature inversion conditions greater than 3°C/100m (G stability class);

3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicate exceedance of criterion;

5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion not applicable;

Table 7 - LA1,1minute HVO North Against Impact Assessment Criteria for the Reporting Period

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class	Criterion (A)	Criterion Applies ²	HVO North L _{Aeq} ^{3,4,6}	Exceedance ^{4,5}
Shearers Lane	27/10/2021 21:00	1.3	F	46	Yes	IA	Nil
Knodlers Lane	27/10/2021 21:48	1.9	D	46	Yes	IA	Nil
Maison Dieu	27/10/2021 21:22	1.4	F	46	Yes	IA	Nil
Long Point (Dights Crossing)	27/10/2021 22:45	1.8	D	46	Yes	IA	Nil
Kilburnie South	27/10/2021 23:20	0.7	F	46	Yes	IA	Nil
Jerrys Plains East	27/10/2021 22:56	0.7	F	46	Yes	<25	Nil
Jerrys Plains Village	27/10/2021 21:00	1.3	F	46	Yes	IA	Nil
Jerrys Plains West	27/10/2021 21:22	1.4	F	46	Yes	IA	Nil
HVGC	27/10/2021 23:54	0.7	F	NA	Yes	IA	Nil

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;

2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 10 metres above ground level, or temperature inversion conditions greater than 3°C/100m (G stability class);

3. Site-only L_{Aeq} 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicate exceedance of criterion;

5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion not applicable;

Table 8 - LAeq,15minute HVO South Against Impact Assessment Criteria for the Reporting Period

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class	Criterion (A)	Criterion Applies ²	HVO South LAeq ^{3,4,6}	Exceedance ^{4,5}
Shearers Lane	27/10/2021 21:00	1.5	F	41	Yes	28	Nil
Knodlers Lane	27/10/2021 21:48	2.8	E	40	Yes	38	Nil
Maison Dieu	27/10/2021 21:22	3	E	39	No	36	NA
Long Point (Dights Crossing)	27/10/2021 22:45	2.8	D	37	Yes	<30	Nil
Kilburnie South	27/10/2021 23:20	2.9	E	39	Yes	IA	Nil
Jerrys Plains East	27/10/2021 22:56	2.9	E	38	Yes	<25	Nil
Jerrys Plains Village	27/10/2021 21:00	1.5	F	38	Yes	IA	Nil
Jerrys Plains West	27/10/2021 21:22	3	E	35	No	IA	NA
HVGC	27/10/2021 23:54	1.7	F	55	Yes	IA	Nil

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;

2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 10 metres above ground level, or temperature inversion conditions greater than 3°C/100m (G stability class);

3. Site-only LAeq 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicate exceedance of criterion;

5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion not applicable;

Table 9 - LA1,1minute HVO South Against Impact Assessment Criteria for the Reporting Period

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class	Criterion (A)	Criterion Applies ²	HVO South L _{Aeq} ^{3,4,6,7}	Exceedance ^{4,5}
Shearers Lane	27/10/2021 21:00	1.5	F	45	Yes	32	Nil
Knodlers Lane	27/10/2021 21:48	2.8	E	45	Yes	43	Nil
Maison Dieu	27/10/2021 21:22	3	E	45	No	41	NA
Long Point (Dights Crossing)	27/10/2021 22:45	2.8	D	45	Yes	<30	Nil
Kilburnie South	27/10/2021 23:20	2.9	E	45	Yes	IA	Nil
Jerrys Plains East	27/10/2021 22:56	2.9	E	45	Yes	<25	Nil
Jerrys Plains Village	27/10/2021 21:00	1.5	F	45	Yes	IA	Nil
Jerrys Plains West	27/10/2021 21:22	3	E	45	No	IA	NA
HVGC	27/10/2021 23:54	1.7	F	NA	Yes	IA	Nil

1. Atmospheric data is sourced from the HVO Cheshunt (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;

2. Noise criteria apply under all meteorological conditions except during periods of rain or hail, wind speeds greater than 3 m/s measured at 10 metres above ground level, or temperature inversion conditions greater than 3°C/100m (G stability class);

3. Site-only L_{Aeq} 15 minute attributed to HVO South Pit Area, including modifying factors if applicable;

4. Bold results in red indicate exceedance of criterion;

5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion not applicable;

5.2 Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. No penalties were applied for monitoring undertaken through the reporting period. The assessments for the low frequency noise are shown in **Table 10** and **Table 11**.

Table 10 - Modifying Factor Assessment HVO North for the Reporting Period

Location	Date and Time	Measured HVO North L_{Aeq}	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality ¹	Low-frequency Modifying Factor?	Maximum Exceedance of NPfI Reference Spectrum ^{1,2}	Total Penalty ²
Shearers Lane	27/10/2021 21:00	IA	Yes	No	No	NA	No	NA	Nil
Knodlers Lane	27/10/2021 21:48	IA	Yes	No	No	NA	No	NA	Nil
Maison Dieu	27/10/2021 21:22	IA	Yes	No	No	NA	No	NA	Nil
Long Point (Dights Crossing)	27/10/2021 22:45	IA	Yes	No	No	NA	No	NA	Nil
Kilburnie South	27/10/2021 23:20	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains East	27/10/2021 22:56	<25	Yes	No	No	NA	No	NA	Nil
Jerrys Plains Village	27/10/2021 21:00	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains West	27/10/2021 21:22	IA	Yes	No	No	NA	No	NA	Nil
HVGC	27/10/2021 23:54	IA	Yes	No	No	NA	No	NA	Nil

1. NA denotes 'not applicable'; and

2. Bold results indicate that application of NPfI modifying factor/s is required

Table 11 - Modifying Factor Assessment HVO South for the Reporting Period

Location	Date and Time	Measured HVO South L _{Aeq}	Criterion Applies?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality ¹	Low-frequency Modifying Factor?	Maximum Exceedance of NPfI Reference Spectrum ^{1,2}	Total Penalty ²
Shearers Lane	27/10/2021 21:00	28	Yes	No	No	NA	No	NA	Nil
Knodlers Lane	27/10/2021 21:48	38	Yes	No	No	NA	No	NA	Nil
Maison Dieu	27/10/2021 21:22	36	No	No	No	NA	No	NA	Nil
Long Point (Dights Crossing)	27/10/2021 22:45	<30	Yes	No	No	NA	No	NA	Nil
Kilburnie South	27/10/2021 23:20	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains East	27/10/2021 22:56	<25	Yes	No	No	NA	No	NA	Nil
Jerrys Plains Village	27/10/2021 21:00	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains West	27/10/2021 21:22	IA	No	No	No	NA	No	NA	Nil
HVGC	27/10/2021 23:54	IA	Yes	No	No	NA	No	NA	Nil

1. NA denotes 'not applicable'; and

2. Bold results indicate that application of NPfI modifying factor/s is required

5.3 Real Time Noise Monitoring

HVO utilises a network of real-time directional noise monitors to manage noise impacts on a continuous basis, shown in **Figure 16**. Noise alarms are in place at five monitoring locations (Knodlers Lane, Maison Dieu, Jerrys Plains, Moses Crossing, and Long Point) which alert HVO staff to elevated noise levels that require investigation.

HVO investigates and responds to noise alarms with appropriate modification to operations. Changes in response to a noise alarm can include replacing equipment with alternative units, changing or relocating tasks, or shutting down equipment. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in **Section 5.1**. Real time monitoring data includes non-mine noise sources such as animals, road traffic and weather.

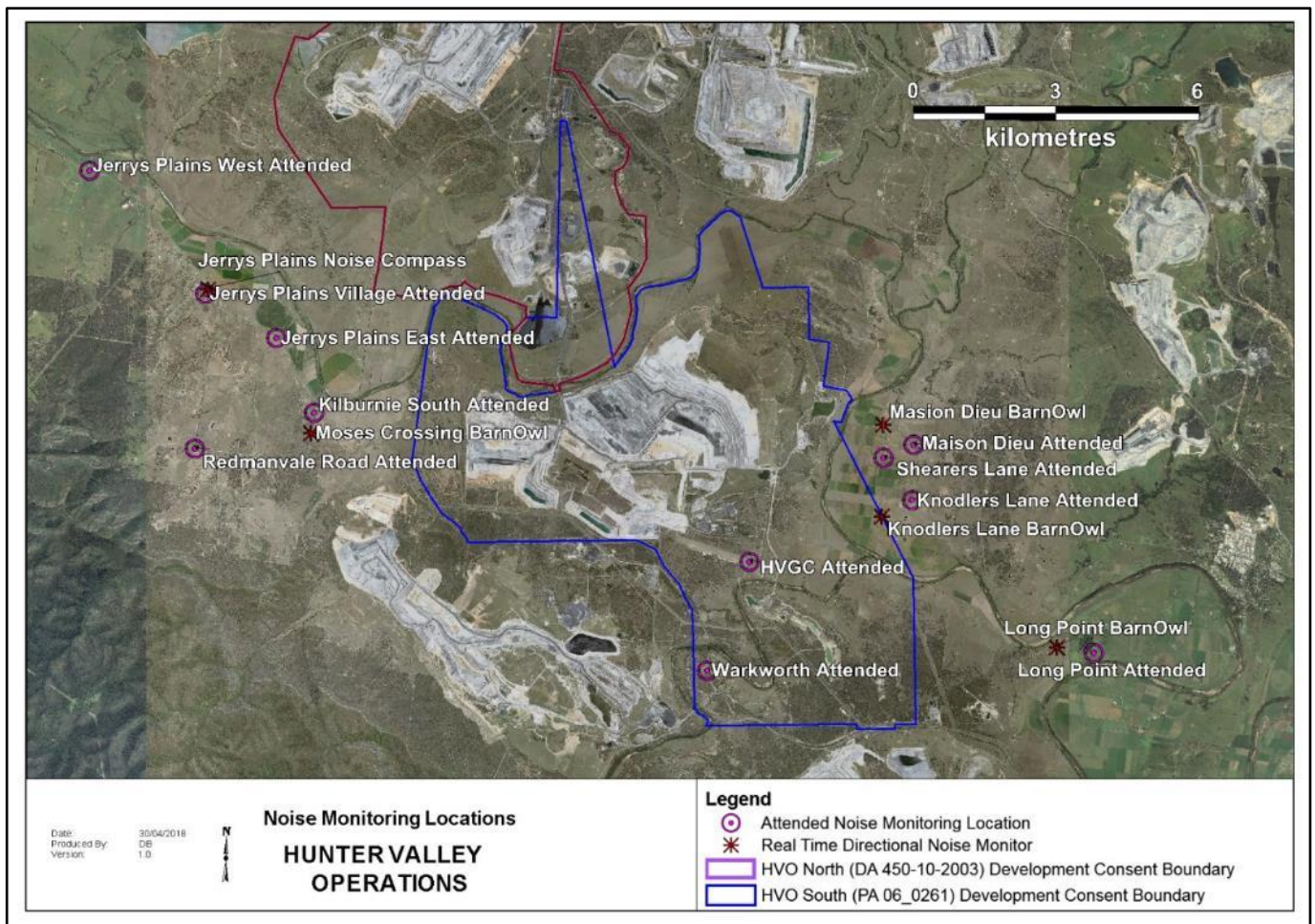


Figure 16 - Noise Monitoring Location Plan

6 Operational Downtime

A total of 158.9 hours of equipment downtime were logged in response to real time monitoring and inspections for environmental factors such as noise and dust during the reporting period. Operational downtime by equipment type is show in

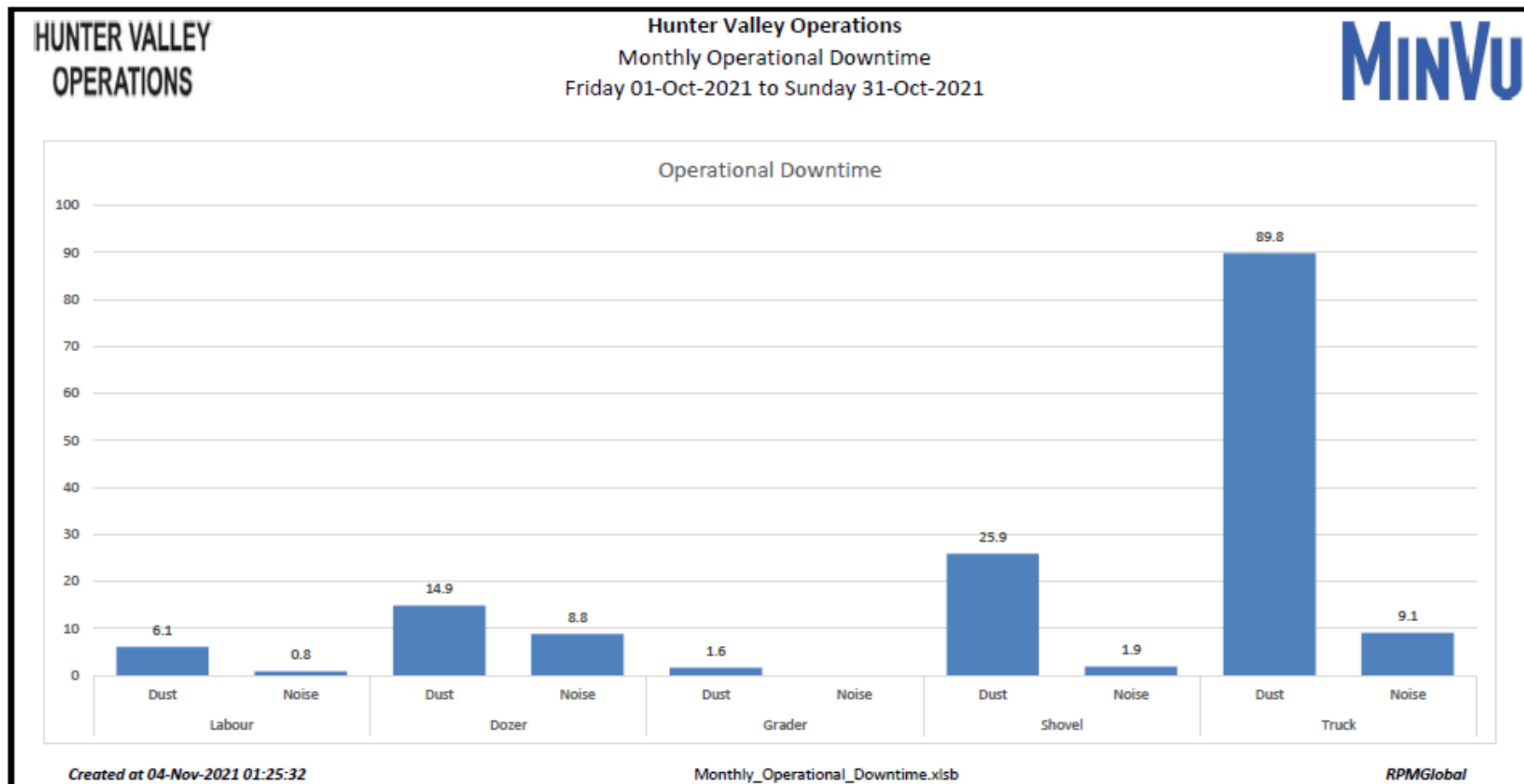


Figure 17. Note that these delays are instances where operations were completely stopped and does not include occasions where operations were changed/modified but not stopped (e.g. changed from exposed dump to in-pit dump).

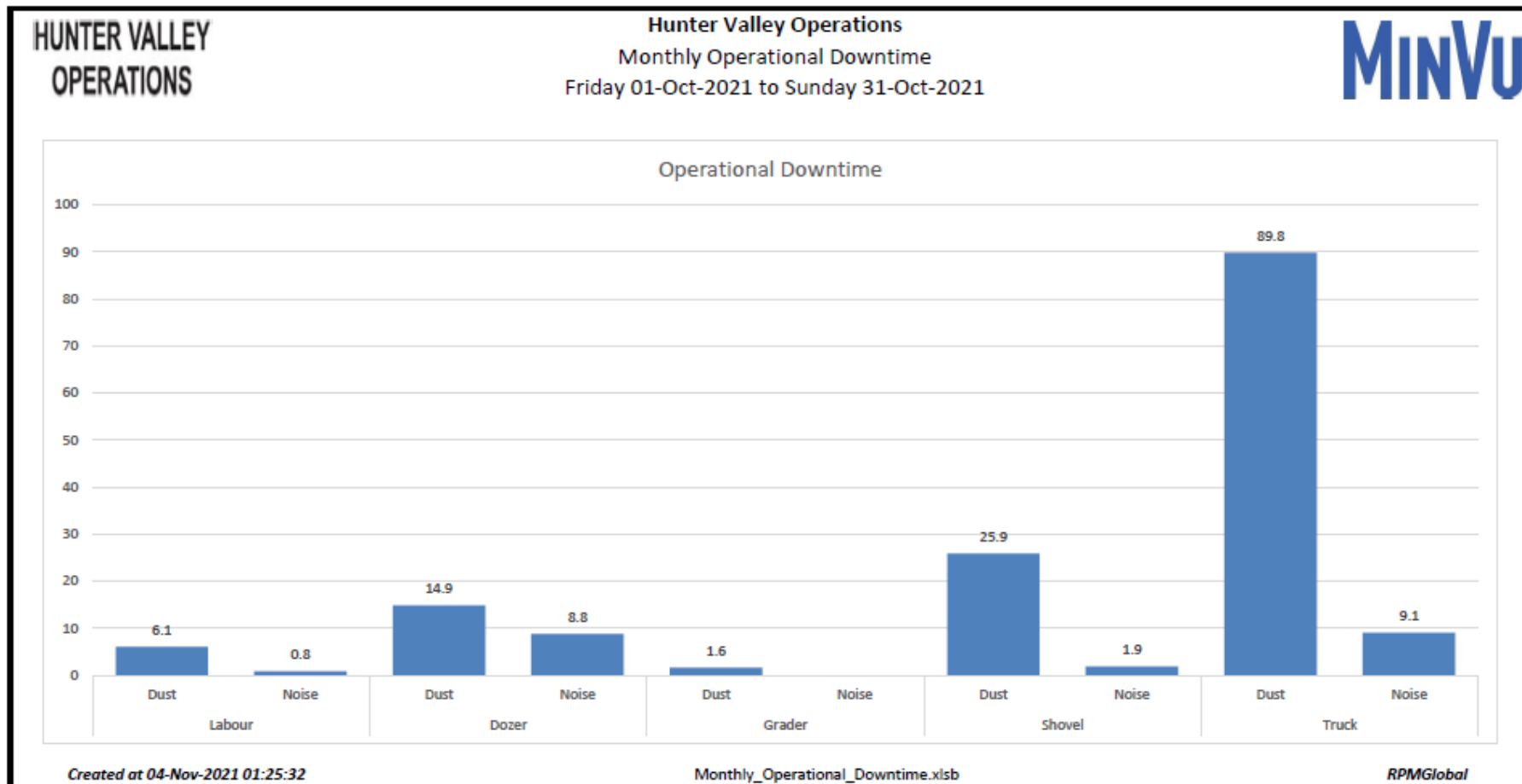


Figure 17 - Operational Downtime by Equipment Type for the reporting period

7 Rehabilitation

The following activities related to rehabilitation were completed during the reporting period:

- 19.53 Ha of land was reshaped
- 19.53 Ha of land was released (became available for the application of topsoil)
- 4.07 Ha of land was topsoiled
- 9.08 Ha of land was rehabilitated

Year to date progress is shown in **Figure 18**.

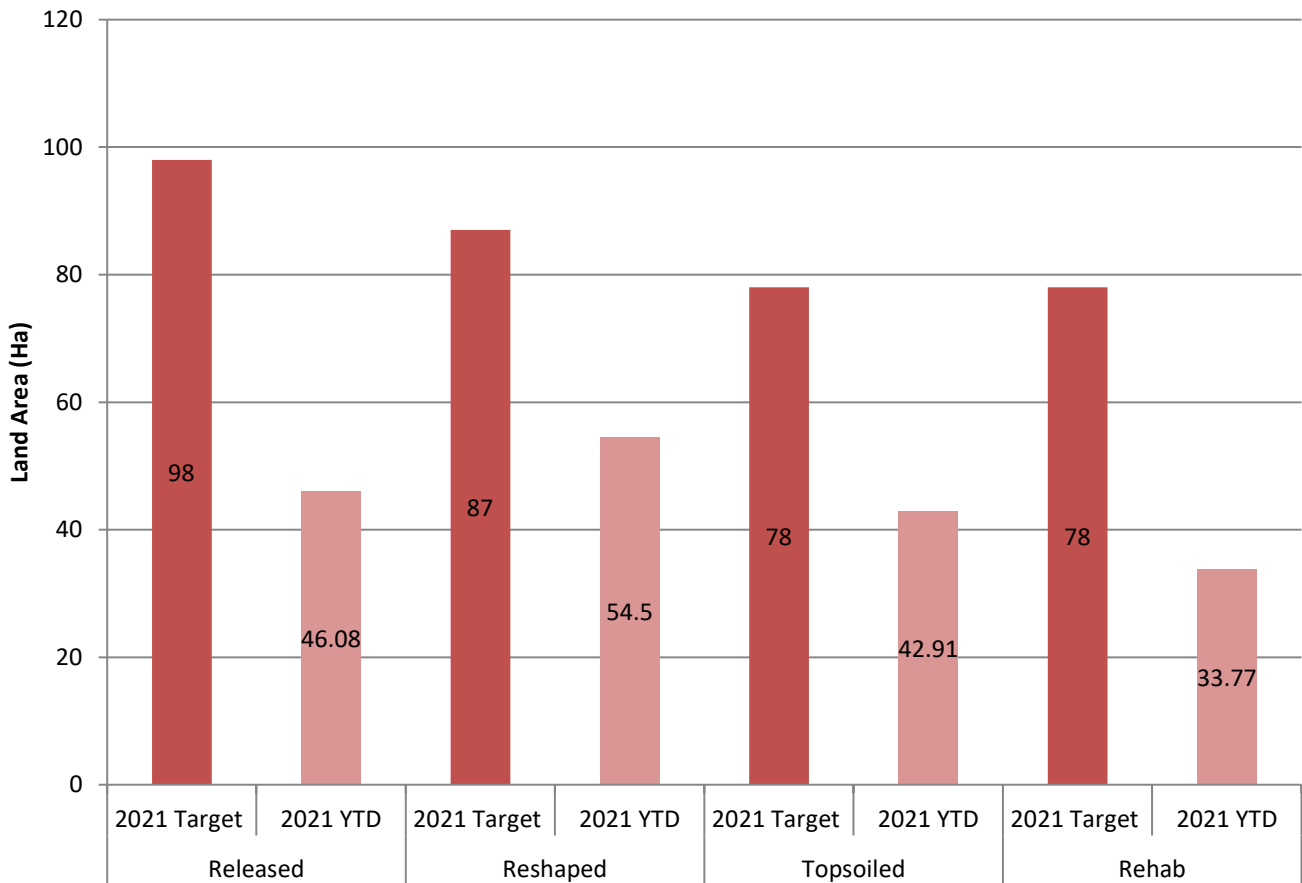


Figure 18 - Rehabilitation YTD October 2021

8 Complaints

Two complaints were received during the reporting period. Details of complaints received are shown in **Table 12**.

Table 12 - Complaints Summary 2021

Month	Noise	Dust	Blast	Lighting	Other	Total
January	1	-	-	1	-	2
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	3	1	-	4
May	2	-	2	1	-	5
June	1	-	3	-	-	4
July	-	1	-	-	-	1
August	-	2	-	-	1	3
September	1	-	2	-	-	3
October	-	-	2	-	-	2
November						
December						
Total	5	3	12	3	1	24

9 Environmental Incidents

There were two reportable environmental incidents during the reporting period:

- **6/10/2021 – Hunter Valley Gliding Club HVAS mis-capture**

On 8 October, HVO was notified that the PM10 High Volume Air Sampler (HVAS) at the HVGC site did not run for the full 24 hour period on 6 October, with the HVAS recording for 17 hours, less than the required 75%. The cause of the failure was identified as a localised power outage due to construction works at the HVGC inadvertently interrupting power supply to the HVAS. Notification was sent to the DPIE advising of the incident.

- **18/10/2021 – Hunter Valley Gliding Club HVAS mis-capture**

HVO was notified that the PM10 High Volume Air Sampler (HVAS) at the HVGC site did not run for the full 24 hour period on 18 October, running for approximately 14 hours, less than the required 75%. The cause of the failure was identified as a localised power outage due to construction works at the HVGC inadvertently interrupting power supply to the HVAS. Notification was sent to the DPIE advising of the incident. A services scan of the area is being investigated to prevent further occurrences of this incident.

Appendix A - Meteorological Data

Date	Air Temp Max (°C)	Air Temp Min (°C)	Relative Humidity (Max %)	Relative Humidity (Min %)	Solar Radiation Maximum (W/Sq. M)	Average Wind Direction (°)	Average Wind Speed (m/sec)	Rainfall (mm)
1/10/2021	25	5	100	40.83	1151	223.7	2	8.4
2/10/2021	22	4	109.6	40.19	1386	277.4	4	0
3/10/2021	23	13	96.5	40.7	1079	282.8	4	0
4/10/2021	25	6	97.2	20.89	1381	269.2	4	0
5/10/2021	21	6	65.23	24.15	1336	278.5	5	0
6/10/2021	25	3	74.31	10.54	1001	289.4	4	0
7/10/2021	27	5	81.2	16.81	994	*	4	0
8/10/2021	24	7	89.3	36.26	1196	116.7	2	0
9/10/2021	30	4	100	19.67	973	218.2	2	0
10/10/2021	32	10	110.7	27.73	1341	255.5	4	6
11/10/2021	17	4	110.9	82.7	307.5	171.2	3	3.4
12/10/2021	15	3	111.1	82.3	517.3	121.8	4	21.4
13/10/2021	14	-193	119.5	-161.3	1390	122.6	3	6.4
14/10/2021	28	-204	73.93	-168.2	1292	198.8	2	1.2
15/10/2021	21	3	94.9	33.07	1425	282.6	5	2.2
16/10/2021	19	3	89.3	41.96	1381	285.6	6	0
17/10/2021	24	3	83.4	19.8	1044	256.2	3	0
18/10/2021	26	3	96.4	19.64	1145	243.8	2	0
19/10/2021	29	6	93.9	16.15	1027	229.7	3	0
20/10/2021	21	4	100	44.82	1386	111.3	3	0
21/10/2021	24	4	100	45.96	1531	110.7	3	0
22/10/2021	26	7	109.3	40.71	1223	112.8	2	0
23/10/2021	33	7	112	28.64	1414	190.9	2	7.4
24/10/2021	25	7	100	20.84	1073	234.2	3	0
25/10/2021	24	5	100	13.87	1141	230.7	3	0

Date	Air Temp Max (°C)	Air Temp Min (°C)	Relative Humidity (Max %)	Relative Humidity (Min %)	Solar Radiation Maximum (W/Sq. M)	Average Wind Direction (°)	Average Wind Speed (m/sec)	Rainfall (mm)
26/10/2021	25	4	96.8	24.63	1180	121.3	2	0
27/10/2021	29	5	100	20.25	1066	222.9	2	0
28/10/2021	30	8	94.7	11.85	1387	248.4	2	0
29/10/2021	30	11	62.18	25.88	1319	271.8	5	0
30/10/2021	25	5	87.5	26.3	1381	150.7	3	0
31/10/2021	22	5	100	30.54	1349	112.4	3	0