

HUNTER VALLEY OPERATIONS

Monthly Environmental Monitoring Report

August 2020

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1.0 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 August 2020.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; 'HVO Corporate' and 'Cheshunt' (Refer to Figure 4: Air Quality Monitoring Location Plan).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1. The 2020 trend and historical trends are shown in Figure 1.

Table 1: Rainfall data - August 2020

2020	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
August	32.6	512.6

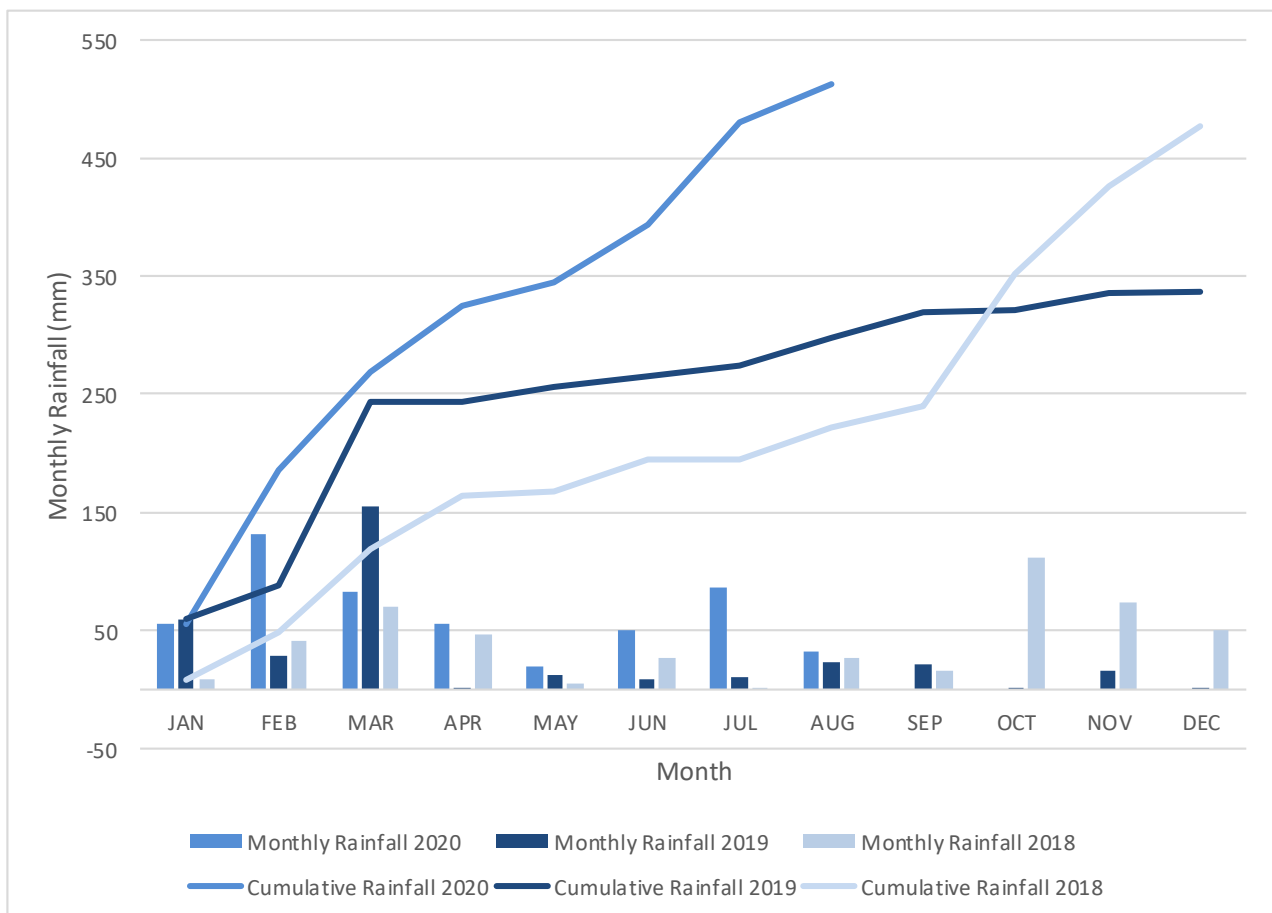


Figure 1: Rainfall Summary 2020

2.1.2 Wind Speed and Direction

West to North Westerly winds were dominant during August as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

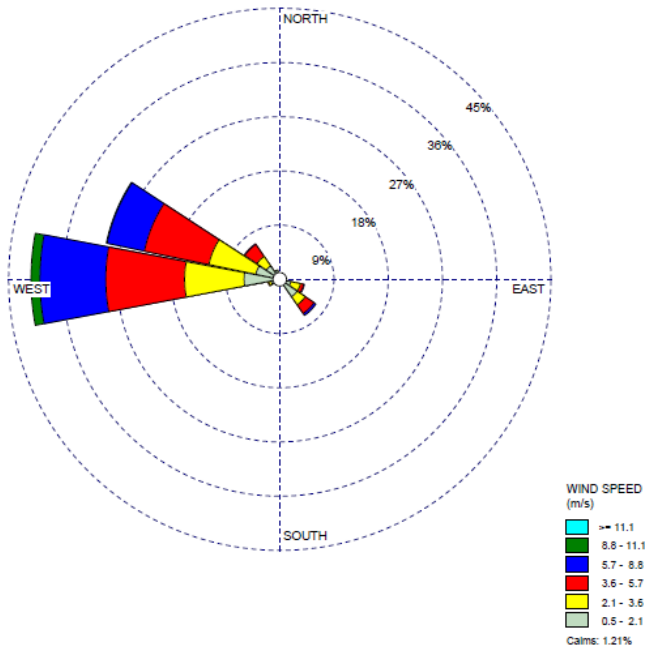


Figure 2: HVO Corporate Wind Rose – August 2020

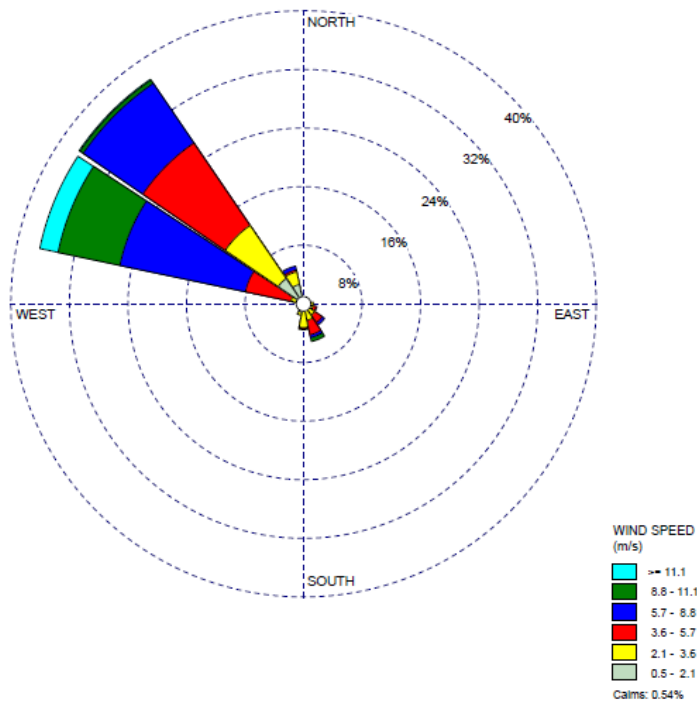


Figure 3: HVO Cheshunt Wind Rose – August 2020

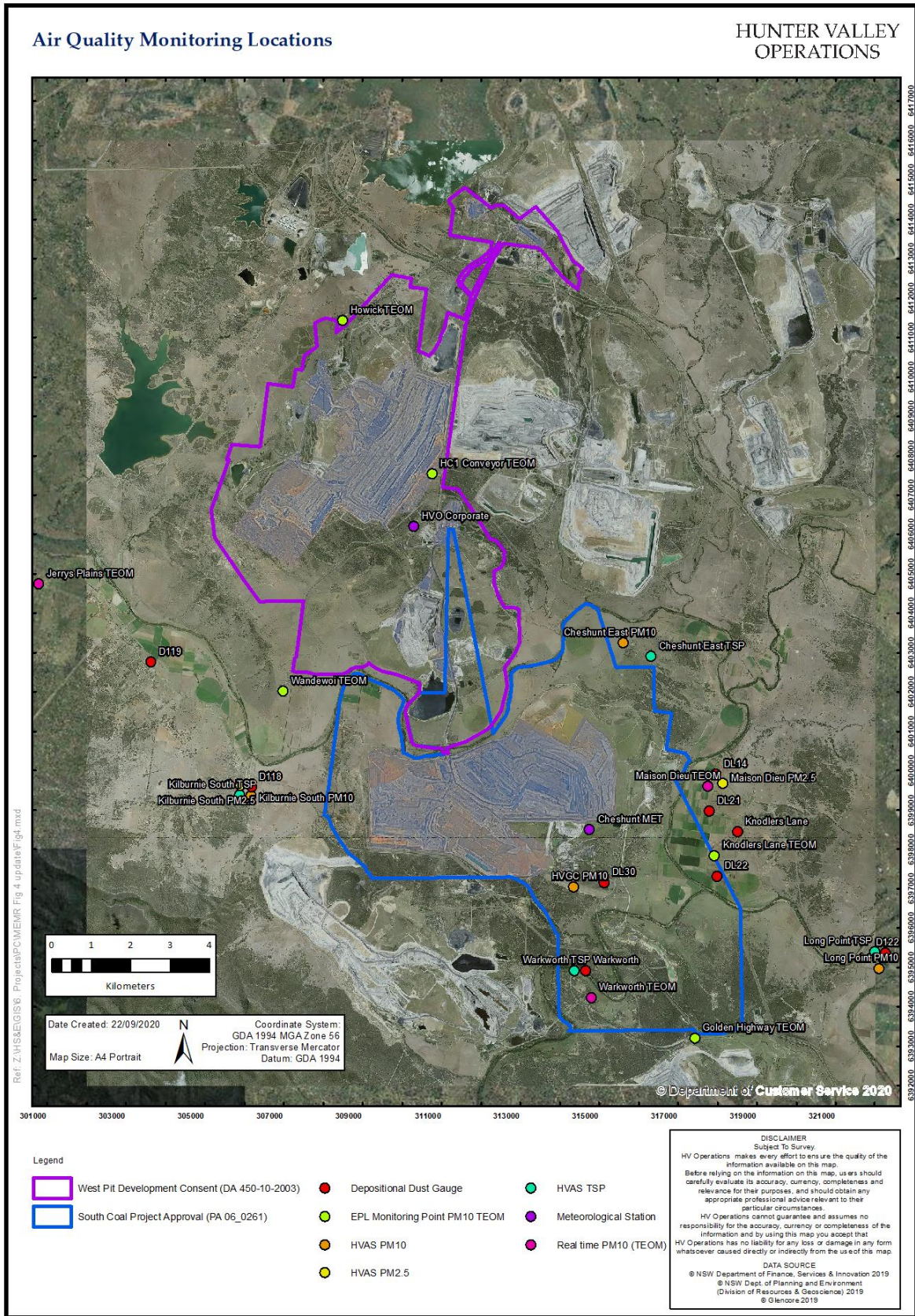


Figure 4: Air Quality Monitoring Location Plan

2.2 Depositional Dust

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

Figure 5 displays insoluble solids results from depositional dust gauges during the reporting period compared against the annual impact assessment criteria.

During the reporting period the DL21 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

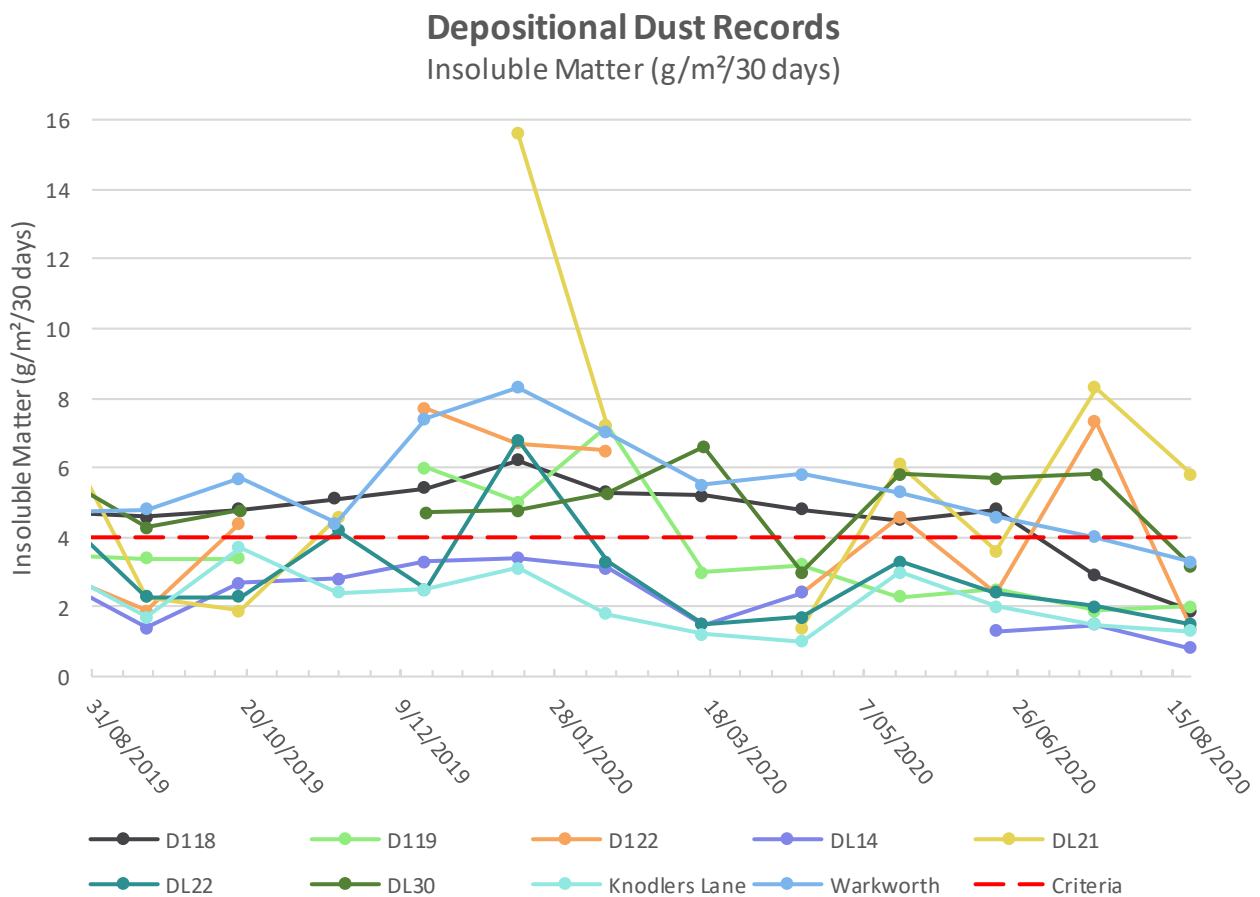


Figure 5: Depositional Dust Results – August 2020

2.3 Suspended Particulates

Suspended particulates 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 found in Figure 4. Each HVAS runs for 24 hours on a six-day cycle.

2.3.1 HVAS PM₁₀ Results

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 50 µg/m³. During the reporting period, no monitors recorded an exceedance above the short term impact assessment criteria of 50 µg/m³.

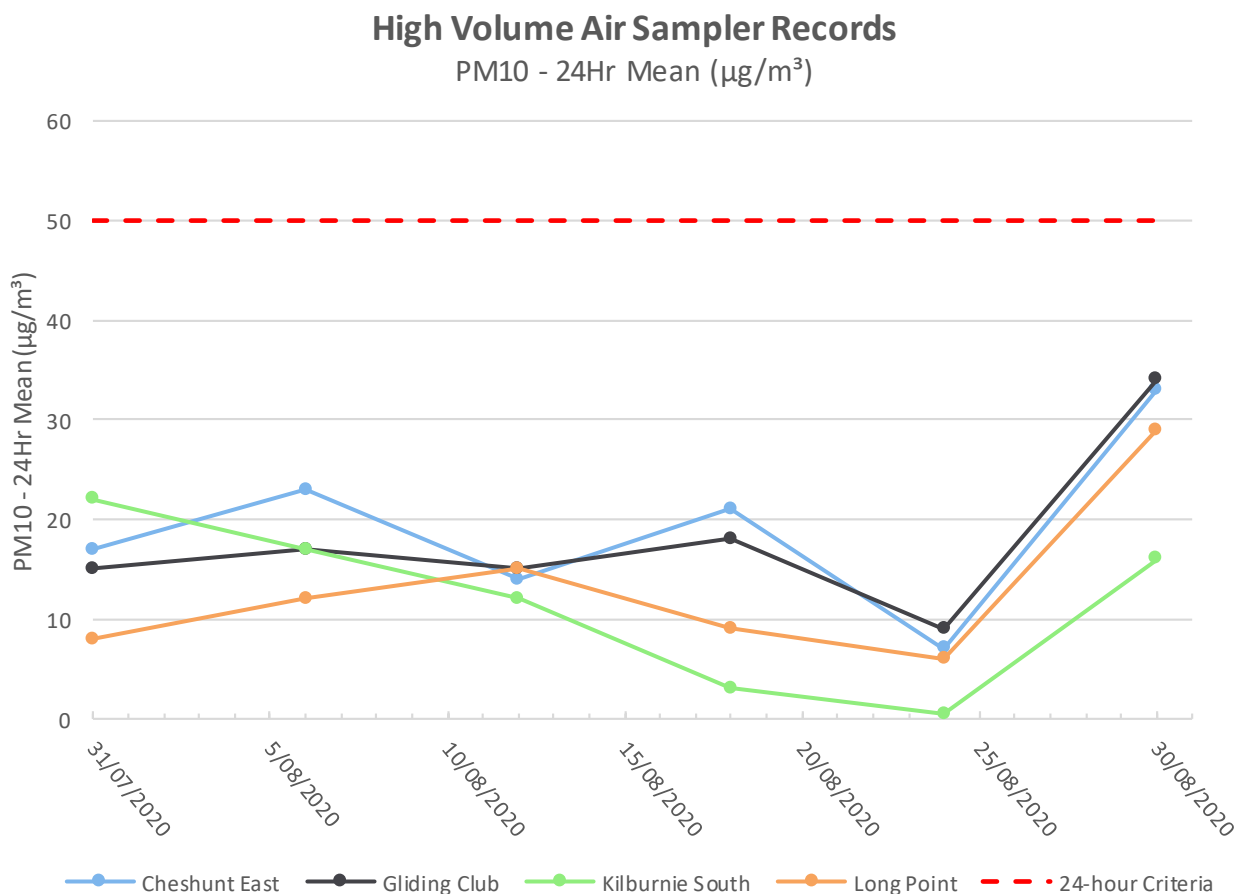


Figure 6: Individual PM₁₀ Results – August 2020

Performance against Long Term Impact Assessment Criteria

Figure 7 shows the year to date annual average PM₁₀ results. During the reporting period the Gliding Club monitor recorded an annual average above the PM₁₀ Annual Rolling Mean criteria of 25µg/m³ for HVO South. All monitors recorded an annual average below the 30µg/m³ criteria for HVO North.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

High Volume Air Sampler Records PM10 - Annual Mean to Date ($\mu\text{g}/\text{m}^3$)

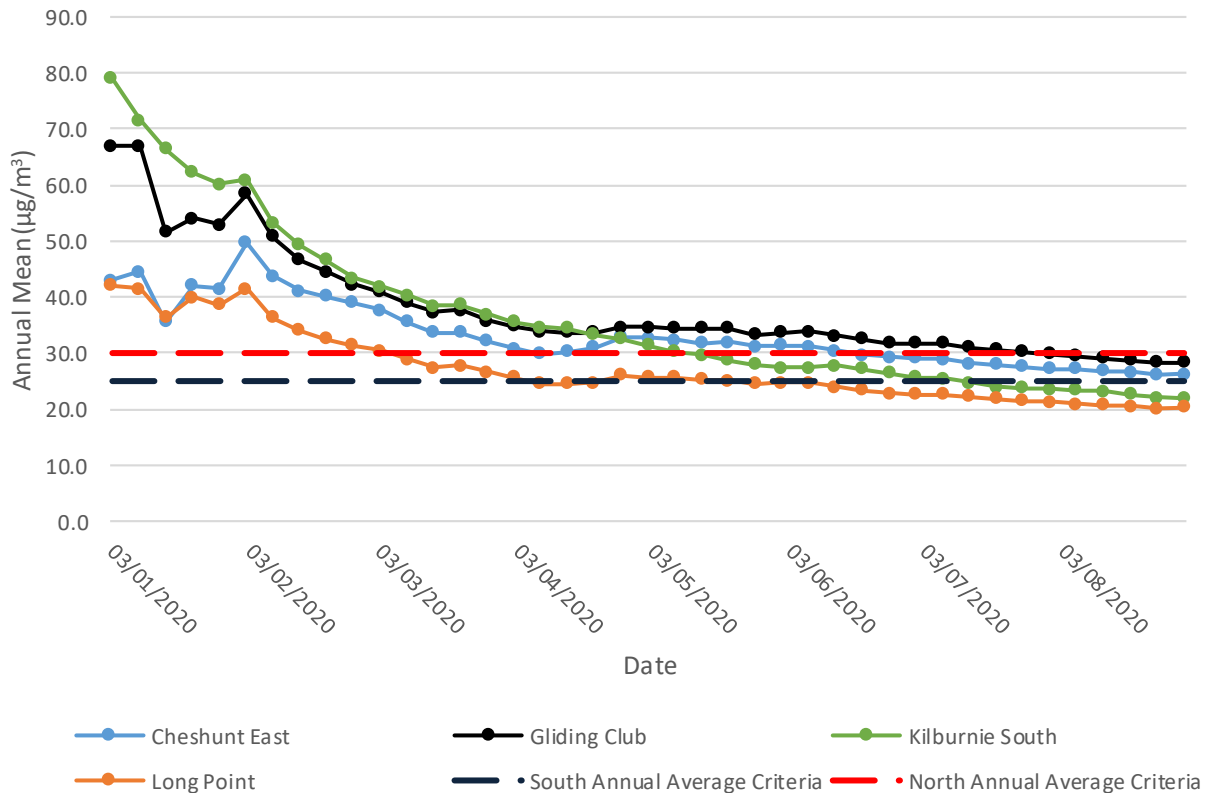


Figure 7: Year to Date Average PM₁₀ – as at end of August 2020

2.3.2 HVAS PM_{2.5} Results

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

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 25 $\mu\text{g}/\text{m}^3$.

During the reporting period, neither monitor recorded an exceedance above the short term impact assessment criteria of 25 $\mu\text{g}/\text{m}^3$. The Kilburnie South monitor failed to collect a sample on the 30th August, an investigation commenced and the incident was reported.

High Volume Air Sampler Records PM2.5 - 24Hr Mean ($\mu\text{g}/\text{m}^3$)

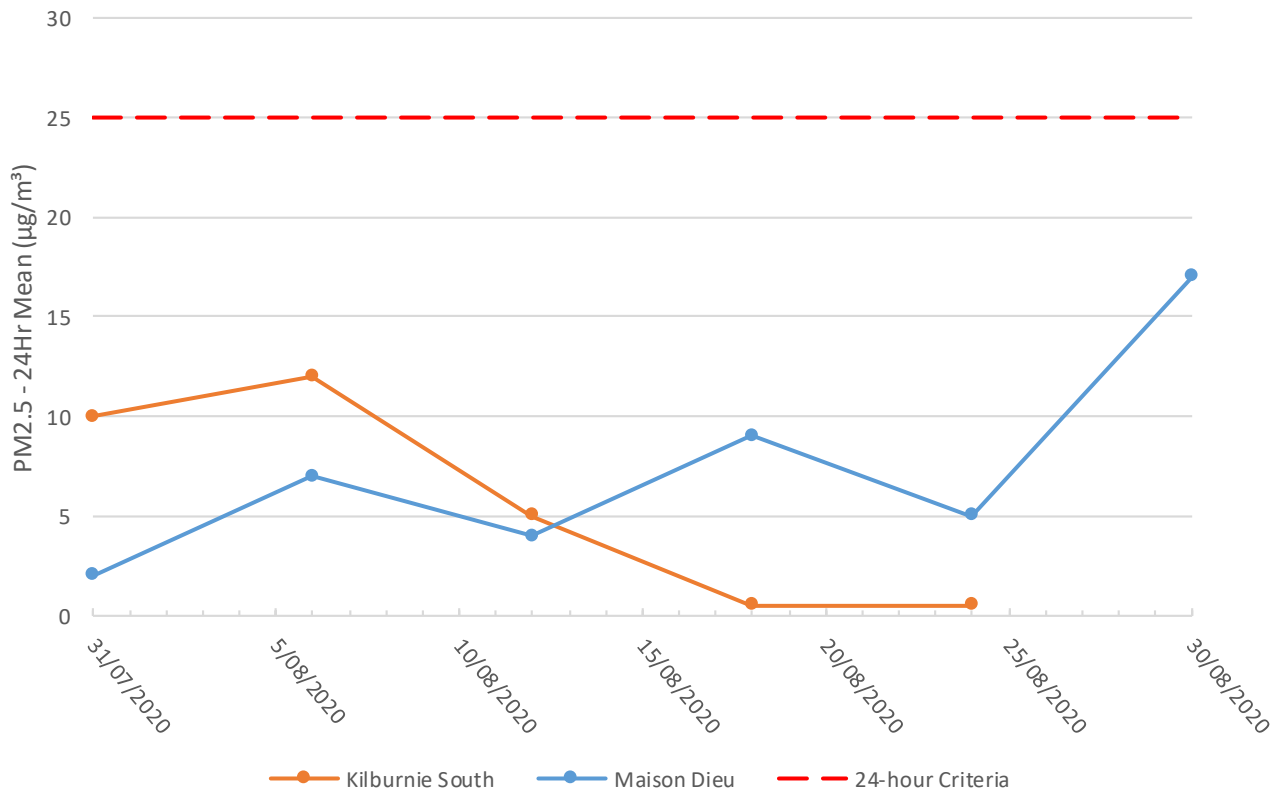


Figure 8: Individual PM_{2.5} Results – August 2020

Performance against Long Term Impact Assessment Criteria

Figure 9 shows the year to date annual average PM_{2.5} results. During the reporting period, both monitors recorded an annual average above the PM_{2.5} Annual Rolling Mean criteria of 8 $\mu\text{g}/\text{m}^3$.

This is likely due to the impact of bushfires smoke and regional air quality in the first months of the year. However, an assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

High Volume Air Sampler Records PM2.5 - Annual Rolling Mean ($\mu\text{g}/\text{m}^3$)

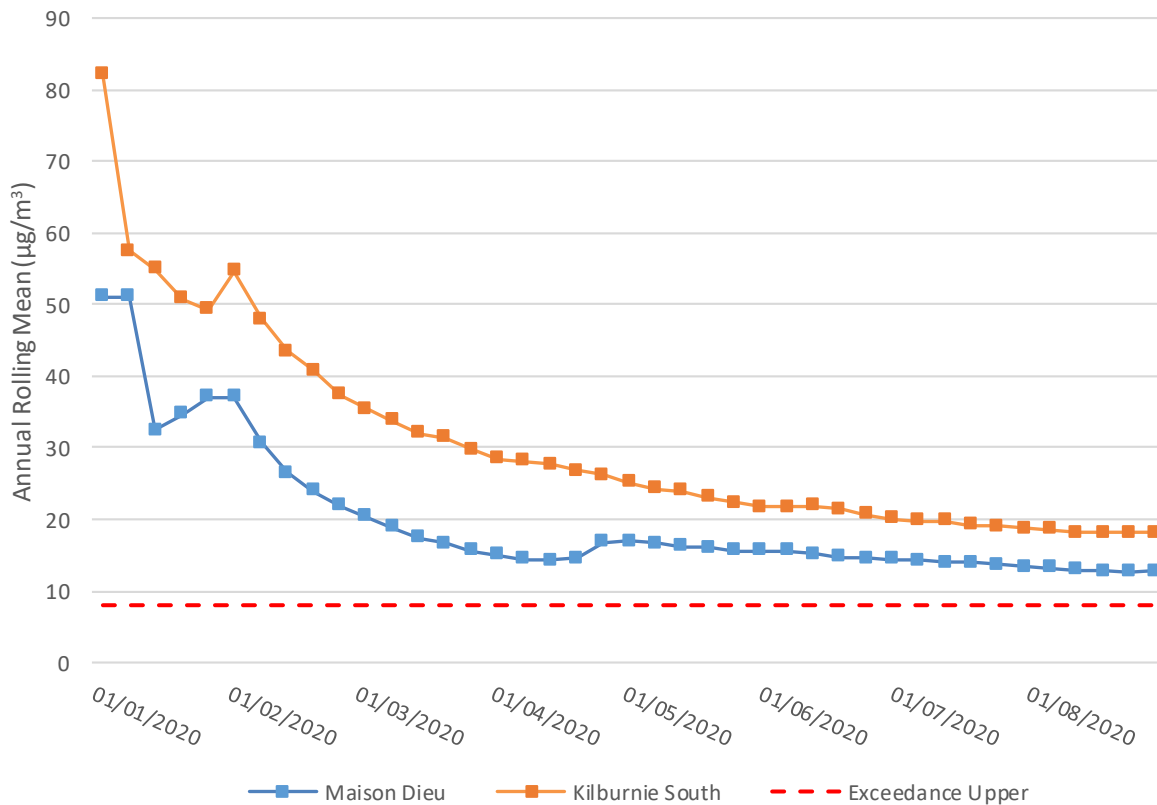


Figure 9: Year to Date Average PM_{2.5} – as at end of August 2020

2.3.3 TSP Results

Performance against Long Term Impact Assessment Criteria

Figure 10 shows the annual average TSP results compared against the long term impact assessment criteria of $90\mu\text{g}/\text{m}^3$.

During the reporting period no monitors recorded an annual average above the long term impact assessment criteria of $90\mu\text{g}/\text{m}^3$.

An assessment of HVO’s contribution against the long term impact assessment criteria will be provided in the 2020 Annual Review.

High Volume Air Sampler Records TSP - Annual Mean to Date ($\mu\text{g}/\text{m}^3$)

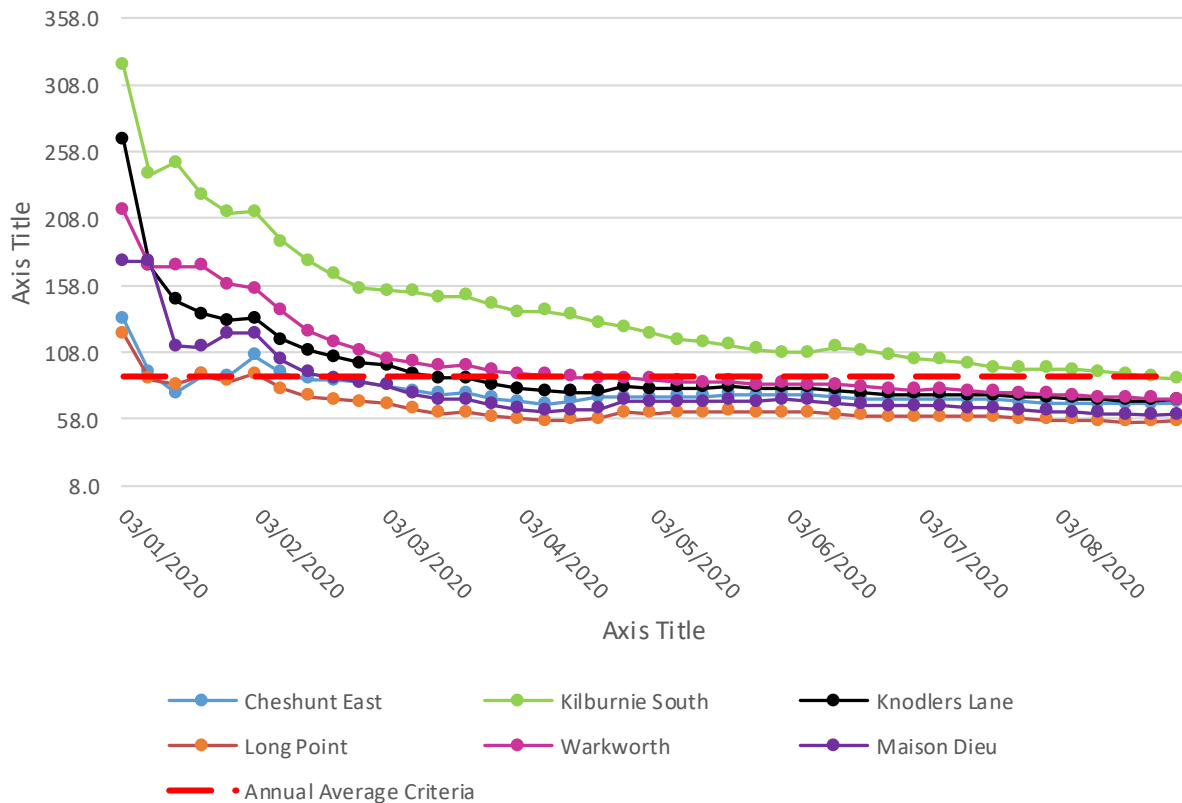


Figure 10: Year to Date Average Total Suspended Particulates – as at end of August 2020

2.3.4 Real Time PM10 Results

Hunter Valley Operations maintains a network of real time PM₁₀ monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. 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, the year to date annual averages for each monitoring site are shown in Figure 12.

On the 19th August, all monitors exceeded the daily 24 hour average PM₁₀ result criteria ($50\mu\text{g}/\text{m}^3$), an investigation determined these exceedances were due to elevated regional dust levels caused by long range dust transport. On the 31st August the Knodlers Lane monitor again exceeded the daily 24 hour average PM₁₀ result, an investigation determined HVO’s contribution to be below the criteria value. No monitors recorded an annual average above the long term impact criteria.

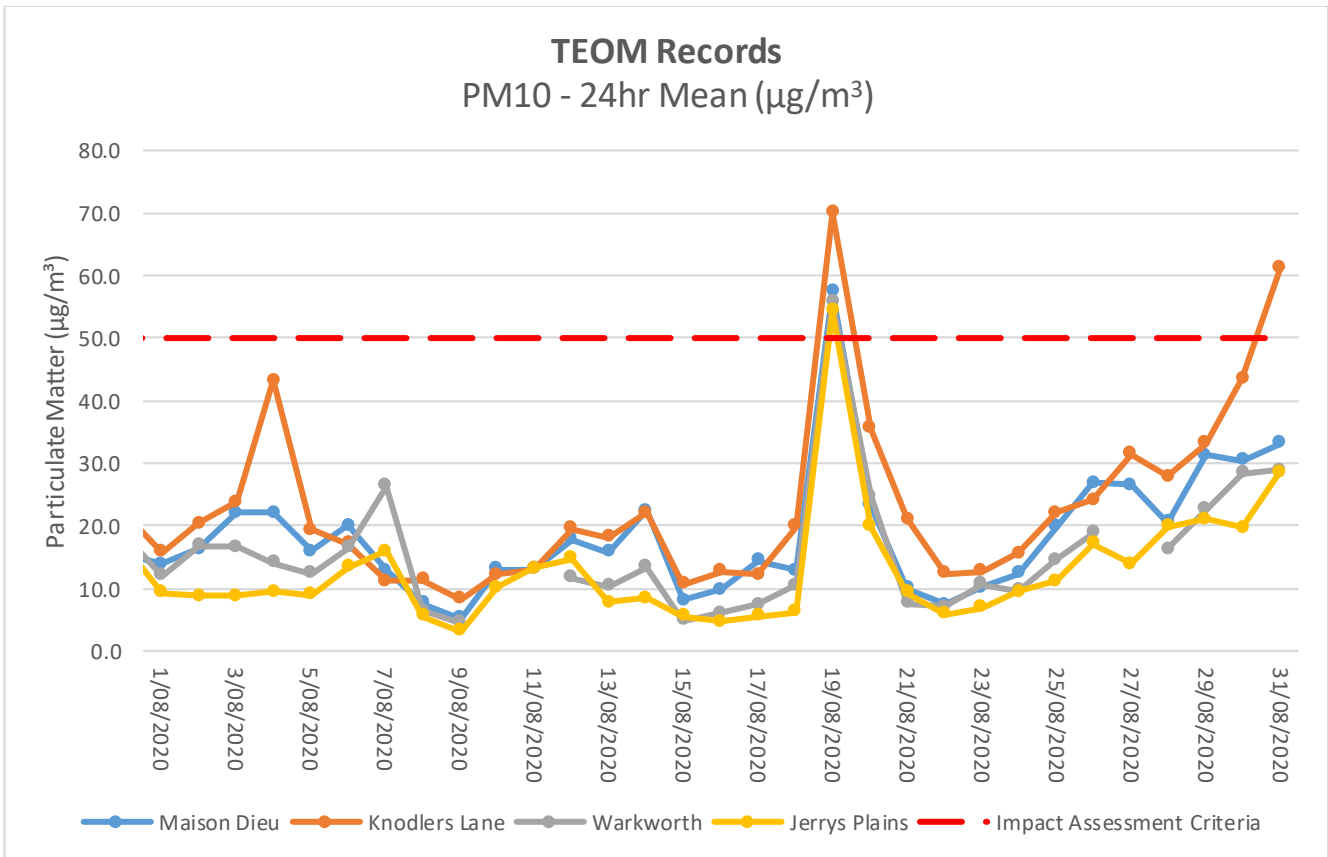


Figure 11: Real Time PM₁₀ 24hr average and YTD average – August 2020

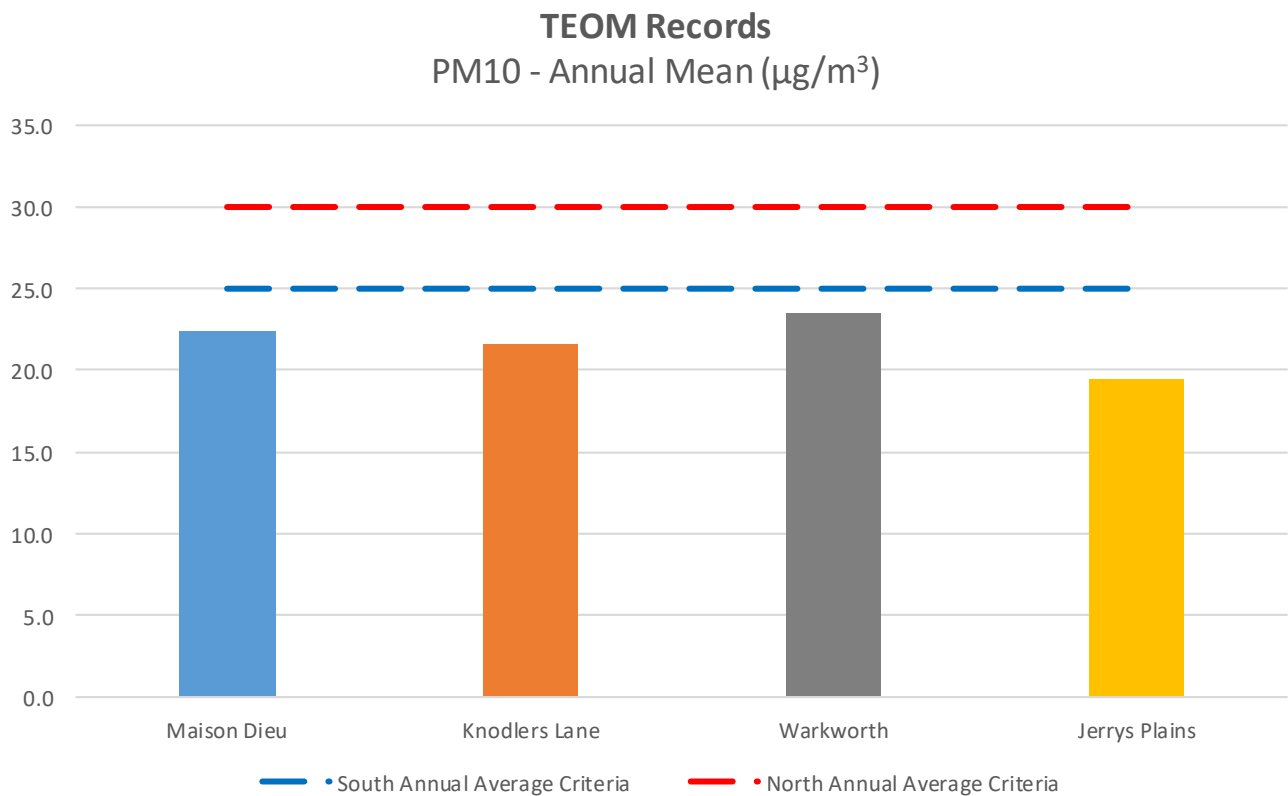


Figure 12: Real Time PM₁₀ Annual Average - August 2020

2.3.5 Real Time Alarms for Air Quality

During August the real time monitoring system generated 207 automated air quality related alarms. 132 alarms were related to adverse weather conditions and 75 alarms were related to dust conditions.

3.0 WATER QUALITY

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

3.1 Surface Water

Surface water courses are sampled on a quarterly sampling regime. Water quality is assessed through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). Results of monitoring on Site Dams and the Hunter River as well as other natural tributaries are provided on a quarterly basis, results will appear in the September 2020 report.

3.2 Site Water Use

Under water allocation licences issued by the Water NSW, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO extracted 1.2 ML of water from the Hunter River.

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. During the reporting period 0ML water was discharged under the HRSTS.

3.4 Groundwater Monitoring Results

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Results of groundwater monitoring are reported quarterly and as such will be reported in the September 2020 report

4.0 BLASTING

HVO have a network of five blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in Figure 13. Blasting criteria are summarised in Table 2.

Table 2: Blasting Criteria

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

4.1 Blast Monitoring Results

During August, 17 blasts were initiated at HVO, Table 3 and Table 4 show the blast monitoring results for the reporting period. On 27/08 a blast exceeded the prescribed criteria at three monitoring locations: Maison Dieu, Warkworth and Knodlers Lane. These exceedances were reported and an investigation has commenced. No exceedance of ground vibration criteria occurred during the reporting period.

Table 3: Overpressure Blast Monitoring Results – August 2020

Event Date/Time	Moses Crossing (dB)	Jerrys Plains Village (dB)	Maison Dieu (dB)	Warkworth (dB)	Knodlers Lane (dB)
3/08/2020 13:31	99.1	105.7	106.6	100.6	112.5
6/08/2020 12:01	95.6	103.5	106.7	104.2	110.3
7/08/2020 14:29	104.0	105.8	90.0	91.6	82.4
7/08/2020 16:15	106.7	105.4	106.6	95.3	92.3
13/08/2020 13:17	95.8	99.0	111.0	111.3	108.9
18/08/2020 08:56	89.6	98.7	101.9	106.7	111.3
19/08/2020 09:11	81.8	91.2	100.8	111.3	101.1
21/08/2020 09:22	103.5	110.7	113.4	107.8	112.5
22/08/2020 07:26	90.9	97.0	103.9	108.1	108.9
24/08/2020 13:21	93.4	99.7	114.5	105.2	107.5
25/08/2020 13:35	98.1	90.6	94.2	99.4	94.5
25/08/2020 15:46	89.6	92.7	95.8	92.3	95.9
26/08/2020 13:39	85.2	89.7	82.1	95.5	81.8
27/08/2020 09:12	93.1	91.1	117.8	115.8	127.2
27/08/2020 16:56	91.8	92.8	103.6	101.8	99.5
28/08/2020 14:41	91.7	86.8	90.2	96.3	92.1
29/08/2020 12:30	92.5	88.8	99.7	95.1	101.1

Table 4: Ground Vibration Blast Monitoring Results - August 2020

Event Date/Time	Moses Crossing (mm/s)	Jerrys Plains Village (mm/s)	Maison Dieu (mm/s)	Warkworth (mm/s)	Knodlers Lane (mm/s)
3/08/2020 13:31	0.24	0.21	0.19	0.27	0.11
6/08/2020 12:01	0.11	0.09	0.15	0.2	0.15
7/08/2020 14:29	0.12	0.05	0.08	0.58	0.06
7/08/2020 16:15	0.28	0.12	0.21	0.45	0.19
13/08/2020 13:17	0.18	0.1	0.08	0.16	0.09
18/08/2020 08:56	0.22	0.08	0.32	0.61	0.18
19/08/2020 09:11	0.11	0.04	0.07	0.13	0.07
21/08/2020 09:22	0.11	0.05	0.06	0.22	0.07
22/08/2020 07:26	0.28	0.09	0.19	0.46	0.15
24/08/2020 13:21	0.19	0.16	0.1	0.16	0.14
25/08/2020 13:35	0.13	0.06	0.08	0.08	0.07
25/08/2020 15:46	0.11	0.05	0.13	0.16	0.12
26/08/2020 13:39	0.16	0.1	0.07	1.01	0.08
27/08/2020 09:12	0.14	0.06	0.28	0.25	0.19
27/08/2020 16:56	0.12	0.06	0.07	0.24	0.08
28/08/2020 14:41	0.17	0.07	0.07	0.15	0.09
29/08/2020 12:30	0.13	0.06	0.14	0.22	0.12

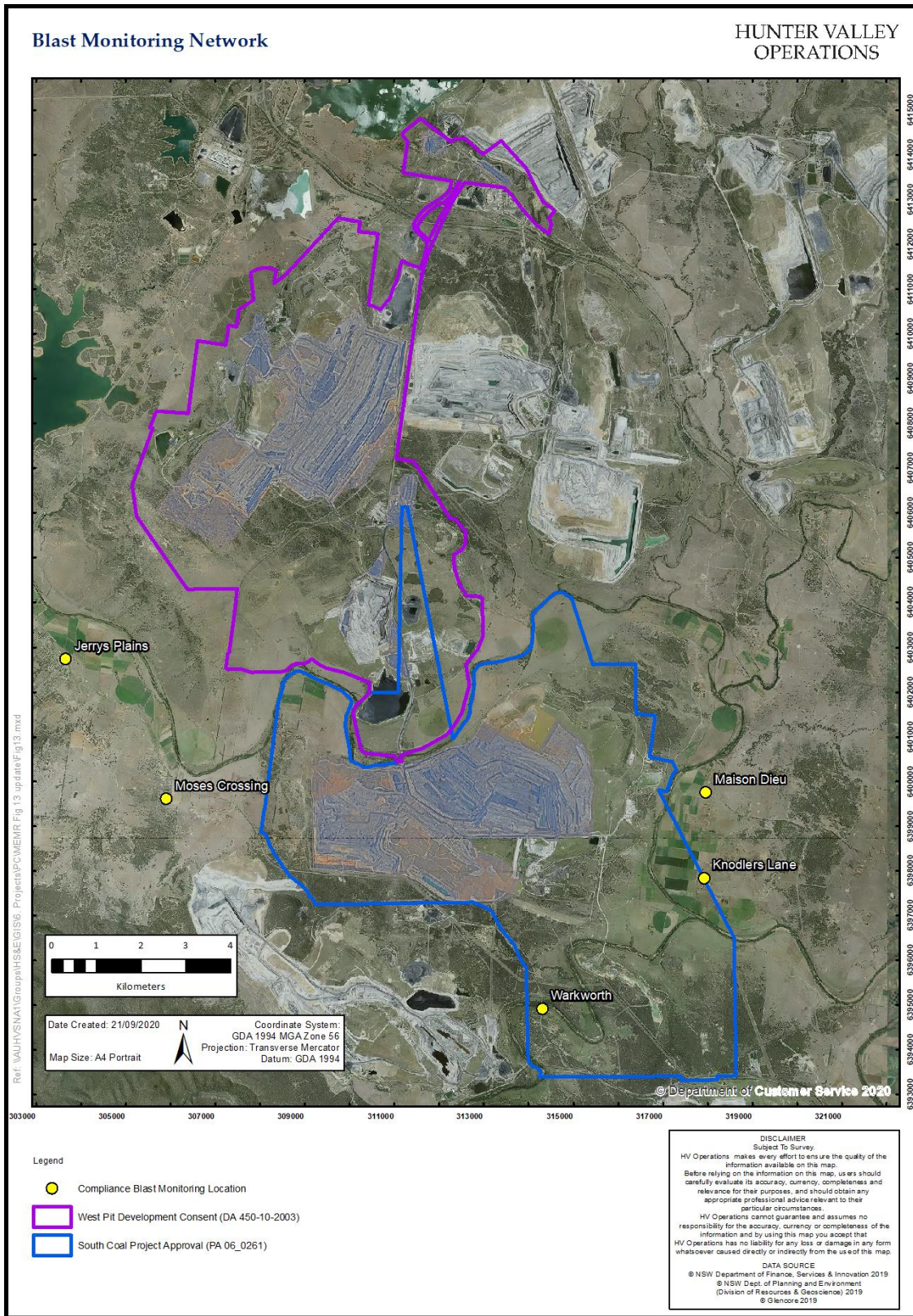


Figure 13: Blast Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out at defined locations around HVO as described in the HVO Noise Monitoring Programme. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Unattended monitoring (real time noise monitoring) also occurs at five sites surrounding HVO. The attended noise monitoring locations are displayed in Figure 14.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the nights of the 24th and 26th August 2020 with no non-compliances recorded. Monitoring results are detailed in Table 5 to Table 9.

Table 5: L_{Aeq}, 15 minute HVO South - Impact Assessment Criteria – August 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO South L _{Aeq} dB ^{3,4,6,7}	Exceedance ^{4,5}
<i>Knodlers Lane</i>	<i>24/08/2020 21:41</i>	<i>3.3</i>	<i>D</i>	<i>39</i>	<i>No</i>	<i><30</i>	<i>NA</i>
<i>Maison Dieu</i>	<i>24/08/2020 21:20</i>	<i>3.2</i>	<i>E</i>	<i>39</i>	<i>No</i>	<i><30</i>	<i>NA</i>
<i>Shearers Lane</i>	<i>24/08/2020 21:00</i>	<i>4.5</i>	<i>D</i>	<i>41</i>	<i>No</i>	<i>31</i>	<i>NA</i>
<i>Kilburnie South</i>	<i>24/08/2020 23:13</i>	<i>3.3</i>	<i>E</i>	<i>39</i>	<i>No</i>	<i>NM</i>	<i>NA</i>
<i>Jerrys Plains Village</i>	<i>24/08/2020 21:30</i>	<i>2.3</i>	<i>F</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains East</i>	<i>24/08/2020 21:10</i>	<i>3.2</i>	<i>E</i>	<i>35</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Long Point Road</i>	<i>24/08/2020 21:00</i>	<i>0.9</i>	<i>F</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>HVGC</i>	<i>24/08/2020 23:44</i>	<i>3.0</i>	<i>E</i>	<i>55</i>	<i>No</i>	<i>33</i>	<i>NA</i>

Notes:

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 for wind speeds up to 3 metres per second (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
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 relevant criterion;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measurable, noise was audible but could not be quantified.

Table 6: LA1, 1 minute HVO South - Impact Assessment Criteria – August 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO South L _{A1, 1min} dB ^{3,4,6,7}	Exceedance ^{4,5}
Knodlers Lane	24/08/2020 21:41	3.3	D	45	No	40	NA
Maison Dieu	24/08/2020 21:20	3.2	E	45	No	35	NA
Shearers Lane	24/08/2020 21:00	4.5	D	45	No	36	NA
Kilburnie South	24/08/2020 23:13	3.3	E	45	No	NM	NA
Jerrys Plains Village	24/08/2020 21:30	2.3	F	45	Yes	IA	Nil
Jerrys Plains East	24/08/2020 21:10	3.2	E	45	No	IA	NA
Long Point Road	24/08/2020 21:00	0.9	F	45	Yes	IA	Nil
HVGC	24/08/2020 23:44	3.0	E	NA	No	NR	NA

Notes:

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 for wind speeds up to 3 metres per second (at a height of 10m), or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LA1, 1 minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of relevant 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 and so criterion is not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measurable, noise was audible but could not be quantified.
8. NR means not recorded, no measurement was taken at the monitoring site.

Table 7: LAeq, 15 minute HVO North – Impact Assessment Criteria – August 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LAeq dB ^{3,4,6,7}	Exceedance ^{4,5}
<i>Knodlers Lane</i>	<i>24/08/2020 21:41</i>	<i>3.0</i>	<i>D</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Maison Dieu</i>	<i>24/08/2020 21:20</i>	<i>3.4</i>	<i>D</i>	<i>35</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Shearers Lane</i>	<i>24/08/2020 21:00</i>	<i>3.5</i>	<i>D</i>	<i>35</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Kilburnie South</i>	<i>24/08/2020 23:13</i>	<i>1.4</i>	<i>F</i>	<i>39</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains Village</i>	<i>24/08/2020 21:30</i>	<i>3.1</i>	<i>D</i>	<i>36</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Jerrys Plains East</i>	<i>24/08/2020 21:10</i>	<i>3.4</i>	<i>D</i>	<i>39</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Long Point Road</i>	<i>24/08/2020 21:00</i>	<i>0.9</i>	<i>F</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>HVGC</i>	<i>24/08/2020 23:44</i>	<i>2.9</i>	<i>D</i>	<i>NA</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Kilburnie South</i>	<i>26/08/2020 21:00</i>	<i>0.8</i>	<i>D</i>	<i>39</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains Village</i>	<i>26/08/2020 21:42</i>	<i>0.3</i>	<i>E</i>	<i>36</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains East</i>	<i>26/08/2020 21:20</i>	<i>1.4</i>	<i>D</i>	<i>39</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise emission limits apply under all meteorological conditions, except during periods of rain or hail, when average winds speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq, 15 minute attributed to HVO North Pit Area, including modifying factors if applicable;
4. Bold results in red indicate exceedance of criteria;
5. NA in criterion column indicates no criterion is applicable at this location. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measurable, noise was audible but could not be quantified.

Table 8: LAeq,15 minute HVO North - Land Acquisition Criteria – August 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO North L _{Aeq} dB ^{3,4,6,7}	Exceedance ^{4,5}
Knodlers Lane	24/08/2020 21:41	3.0	D	41	Yes	IA	Nil
Maison Dieu	24/08/2020 21:20	3.4	D	41	No	IA	NA
Shearers Lane	24/08/2020 21:00	3.5	D	41	No	IA	NA
Kilburnie South	24/08/2020 23:13	1.4	F	41	Yes	IA	Nil
Jerrys Plains Village	24/08/2020 21:30	3.1	D	41	No	IA	NA
Jerrys Plains East	24/08/2020 21:10	3.4	D	41	No	IA	NA
Long Point Road	24/08/2020 21:00	0.9	F	41	Yes	IA	Nil
HVGC	24/08/2020 23:44	2.9	D	NA	Yes	IA	Nil
Kilburnie South	26/08/2020 21:00	0.8	D	41	Yes	IA	Nil
Jerrys Plains Village	26/08/2020 21:42	1.3	E	41	Yes	IA	Nil
Jerrys Plains East	26/08/2020 21:20	1.4	D	41	Yes	IA	Nil

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise emission limits apply under all meteorological conditions, except during periods of rain or hail, when average wind speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LAeq, 15 minute attributed to HVO North Pit Area, including modifying factors if applicable;
4. Bold results in red indicate exceedance of relevant 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 and so criterion is not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measurable, noise was audible but could not be quantified.

Table 9: LA1, 1 Minute HVO North - Impact Assessment Criteria – August 2020

Location	Date and Time	Wind Speed (m/s) ¹	Stability Class ¹	Criterion dB (A)	Criterion Applies? ²	HVO North LA1, 1min dB ^{3,4,6,7}	Exceedance ^{4,5}
Knodlers Lane	24/08/2020 21:41	3.0	D	46	Yes	IA	Nil
Maison Dieu	24/08/2020 21:20	3.4	D	46	No	IA	NA
Shearers Lane	24/08/2020 21:00	3.5	D	46	No	IA	NA
Kilburnie South	24/08/2020 23:13	1.4	F	46	Yes	IA	Nil
Jerrys Plains Village	24/08/2020 21:30	3.1	D	46	No	IA	NA
Jerrys Plains East	24/08/2020 21:10	3.4	D	46	No	IA	NA
Long Point Road	24/08/2020 21:00	0.9	F	46	Yes	IA	Nil
HVGC	24/08/2020 23:44	2.9	D	NA	Yes	IA	Nil
Kilburnie South	26/08/2020 21:00	0.8	D	46	Yes	IA	Nil
Jerrys Plains Village	26/08/2020 21:42	1.3	E	46	Yes	IA	Nil
Jerrys Plains East	26/08/2020 21:20	1.4	D	46	Yes	IA	Nil

Notes:

1. Atmospheric data is sourced from the HVO Corporate (or MTW Charlton Ridge for Long Point) AWS using logged meteorological data;
2. Noise emission limits apply under all meteorological conditions, except during periods of rain or hail, when average winds speed at microphone heights exceeds 5 metres per second, when wind speeds greater than 3 metres per second are measured at 10m above ground level, or during stability class G conditions. Criterion may or may not apply due to rounding of meteorological data values;
3. Site-only LA1, 1 minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of relevant 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 and so criterion is not applicable;
6. IA means inaudible, there was no site noise at the monitoring location; and
7. NM means not measurable, noise was audible but could not be quantified.

5.2 NPfl Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfl), the applicability of the low frequency modification penalty has been assessed. During August 2020 no penalties were applied. The assessments for low frequency noise are shown in Table 10 and Table 9.

Table 10: Modifying Factor Assessment – HVO South – August 2020

Location	Date and Time	Measured HVO South $L_{Aeq} dB^{1,2,3}$	Criterion Applied?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality	Low-frequency Modifying Factor?	Maximum Exceedance of NPfl Reference Spectrum ⁴	Total Penalty dB ⁴
Knodlers Lane	24/08/2020 21:41	<30	No	No	No	NA	No	NA	Nil
Maison Dieu	24/08/2020 21:20	<30	No	No	No	NA	No	NA	Nil
Shearers Lane	24/08/2020 21:00	31	No	No	No	NA	No	NA	Nil
Kilburnie South	24/08/2020 23:13	NM	No	No	No	NA	No	NA	Nil
Jerrys Plains Village	24/08/2020 21:30	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains East	24/08/2020 21:10	IA	No	No	No	NA	No	NA	Nil
Long Point Road	24/08/2020 21:00	IA	Yes	No	No	NA	No	NA	Nil
HVGC	24/08/2020 23:44	33	No	No	No	NA	No	NA	Nil

Notes:

1. NA means not applicable;
2. IA means inaudible, there was no site noise at the monitoring location;
3. NM means not measurable, noise was audible but could not be quantified; and
4. Bold results indicate that NPfl low-frequency modifying factor has been triggered and application of correction is required.

Table 11: Modifying Factor Assessment – HVO North – August 2020

Location	Date and Time	Measure d HVO South L _{Aeq} dB ^{1,2,3}	Criterion Applied ?	Intermittency Modifying Factor?	Tonality Modifying Factor?	Frequency of Tonality	Low-frequency Modifying Factor?	Maximum Exceedance of NPfl Reference Spectrum ⁴	Total Penalty dB ⁴
Knodlers Lane	24/08/2020 21:41	IA	Yes	No	No	NA	No	NA	Nil
Maison Dieu	24/08/2020 21:20	IA	No	No	No	NA	No	NA	Nil
Shearers Lane	24/08/2020 21:00	IA	No	No	No	NA	No	NA	Nil
Kilburnie South	24/08/2020 23:13	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains Village	24/08/2020 21:30	IA	No	No	No	NA	No	NA	Nil
Jerrys Plains East	24/08/2020 21:10	IA	No	No	No	NA	No	NA	Nil
Long Point Road	24/08/2020 21:00	IA	Yes	No	No	NA	No	NA	Nil
HVGC	24/08/2020 23:44	IA	Yes	No	No	NA	No	NA	Nil
Kilburnie South	24/08/2020 21:00	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains Village	24/08/2020 21:42	IA	Yes	No	No	NA	No	NA	Nil
Jerrys Plains East	24/08/2020 21:20	IA	Yes	No	No	NA	No	NA	Nil

Notes:

1. NA means not applicable;
2. IA means inaudible, there was no site noise at the monitoring location;
3. NM means not measurable, noise was audible but could not be quantified; and
4. Bold results indicate that NPfl low-frequency modifying factor has been triggered and application of correction 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. 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 likely to be attributable to HVO.

Noise alarms are investigated and responded to with the appropriate level of operational modification. Changes in response to a noise alarm can include replacing equipment with quieter (noise attenuated) units, changing or relocating tasks, and shutting down equipment. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in Section 5.1, and that real time monitoring data includes non-mine noise sources such as dogs, cows, or more commonly, road traffic.

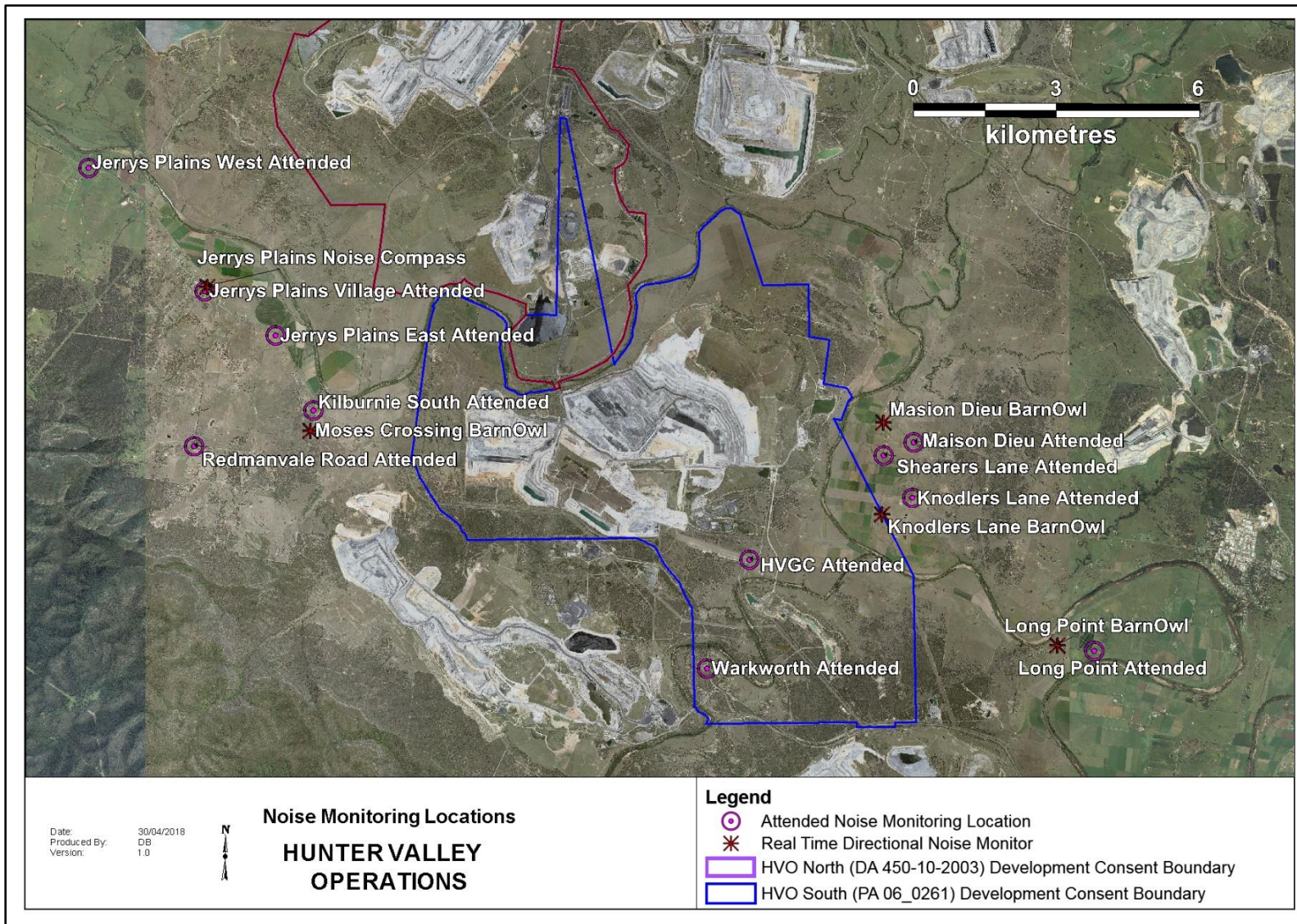


Figure 14: Noise Monitoring Location Plan

6.0 OPERATIONAL DOWNTIME

During August, a total of 22.3 hours of equipment downtime was logged in response to real time monitoring and visual inspections for environmental reasons such as dust, noise and meteorological conditions. Operational downtime by equipment type and reason is shown in Figure 15. 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).

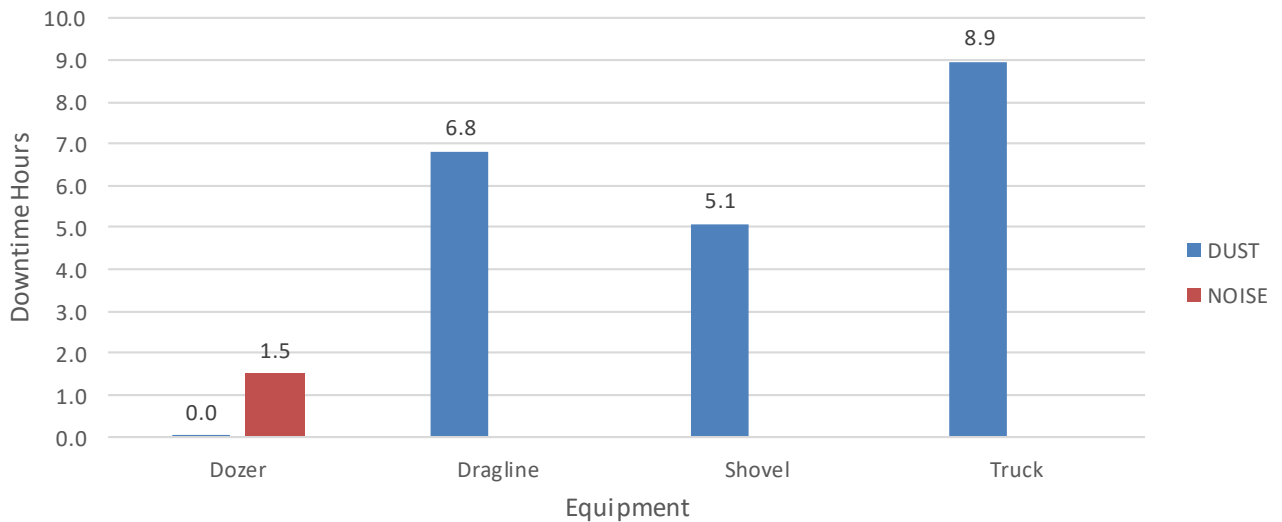


Figure 15: Operational Downtime by Equipment Type – August 2020

7.0 REHABILITATION

During August 12.66Ha of land was bulk shaped, 15.54Ha of land was released, 14.41Ha of land was topsoiled, and 5.55Ha was rehabilitated. Year to date progress can be viewed in Figure 16.

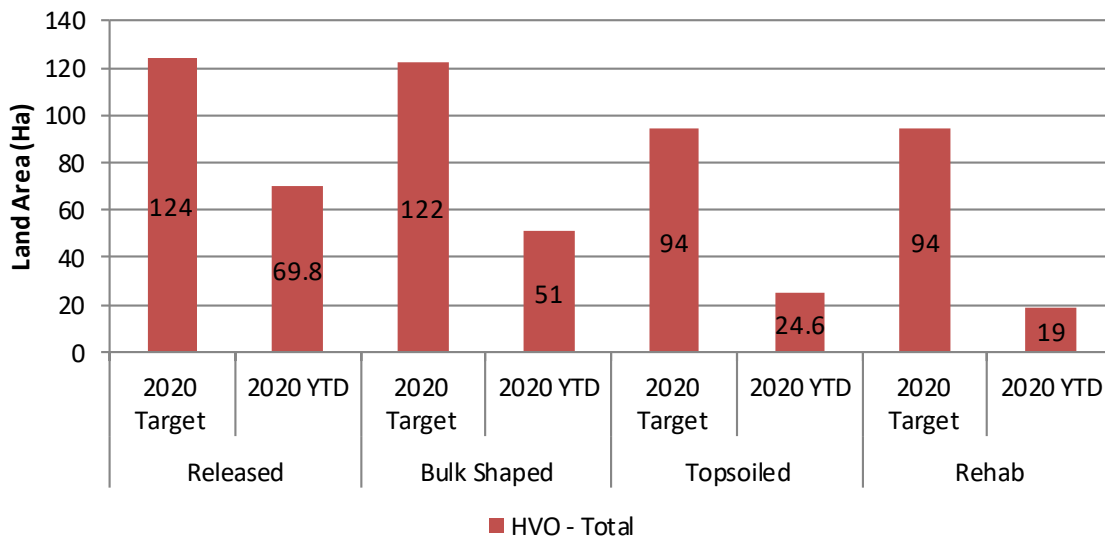


Figure 16: Rehabilitation YTD – August 2020

8.0 COMPLAINTS

A single complaint was received relating to blasting activity during August 2020. Six complaints have been received in 2020. Details of complaints received are shown in Table 12 below.

Table 12: Complaints Summary 2020

Month	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	-	-	-	-	-
April	-	-	-	-	-	-
May	3	-	-	-	-	3
June	2	-	-	-	-	2
July	-	-	-	-	-	-
August	-	-	1	-	-	1
September						
October						
November						
December						
Total	5	0	1	0	0	6

9.0 ENVIRONMENTAL INCIDENTS

During August there were four reportable environmental incidents:

- 11/08/2020 – Missed Sample at Warkworth TEOM**
The TEOM air quality monitor lost power, resulting in insufficient data capture on the 10th and 11th August.
Environmental Consequence: Nil Category
- 27/08/2020 – Overpressure Criteria Exceedance at Knodlers Lane, Maison Dieu and Warkworth Blast Monitors**
A blast on the 27th August recorded environmental results above the 120dB criteria at Knodlers Lane and above the 115dB criteria at Maison Dieu and Warkworth.
Environmental Consequence: Cat 2 Minor
- 27/08/2020 – Missed Sample at Warkworth TEOM**
The TEOM air quality monitor lost power, resulting in insufficient data capture on the 27th August.
Environmental Consequence: Nil Category
- 30/08/2020 – Missed Sample at Kilburnie South PM2.5 HVAS**
The HVAS suffered a blocked filter and motor error, resulting in insufficient data capture on the 30th August.
Environmental Consequence: Cat 1 Negligible

APPENDIX A: METEOROLOGICAL DATA

Table 13: Meteorological Data - HVO Corporate Meteorological Station – August 2020

Date	Air Temp Max (°C)	Air Temp Min (°C)*	Relative Humidity Max (%)	Relative Humidity Min (%)*	Solar Radiation Maximum (W/Sq. M)	Wind Dir. Avg (°)	Wind Speed Avg (m/sec)	Rainfall (mm)
1/08/2020	17.6	-3.0	111.1	41.06	604	269	1.95	0
2/08/2020	20.6	-0.7	99.5	23.68	619	238	2.16	0
3/08/2020	19.3	-0.9	94.1	32.91	774	283	2.98	0
4/08/2020	20.1	0.8	81.2	23.06	672	276	4.00	0
5/08/2020	14.4	-3.2	88.5	24.4	623	279	4.69	0
6/08/2020	15.2	-5.0	91.5	29.89	617	240	2.52	0
7/08/2020	9.9	-0.8	110.9	64.62	209	128	3.21	4
8/08/2020	15.4	0.3	112.7	61.59	950	251	2.94	1.4
9/08/2020	12.3	-1.3	100.0	52.12	742	279	5.22	2.8
10/08/2020	15.9	-0.7	111.9	57.96	965	190	2.60	18.2
11/08/2020	17.0	0.1	100.0	49.4	861	141	1.33	0
12/08/2020	21.0	0.8	109.4	44.75	997	212	1.51	0
13/08/2020	21.4	2.5	100.0	32.09	656	261	2.58	0.4
14/08/2020	14.7	1.3	110.8	65.96	702	221	1.26	4
15/08/2020	16.6	3.5	110.3	54.11	978	275	5.22	0.4
16/08/2020	16.7	2.4	92.3	41.07	991	286	5.44	0
17/08/2020	17.3	1.1	92.9	46.27	720	293	4.90	0
18/08/2020	19.1	0.9	88.2	42.91	897	286	3.90	0
19/08/2020	19.8	1.1	86.0	18.96	983	278	6.42	0
20/08/2020	15.8	0.6	83.0	44.33	1114	279	6.83	0
21/08/2020	16.0	-1.4	88.1	40.14	961	280	5.70	0
22/08/2020	12.4	-1.9	99.8	47.58	985	277	6.77	1.4
23/08/2020	14.1	-1.4	83.4	41.67	1060	285	6.86	0
24/08/2020	16.2	-1.9	83.8	29.24	716	285	4.49	0
25/08/2020	14.6	-4.5	87.1	32.38	1053	255	2.09	0
26/08/2020	17.8	-4.4	91.3	22.13	729	260	1.61	0
27/08/2020	19.7	-3.8	85.3	13.26	854	280	3.58	0
28/08/2020	19.5	-0.2	76.2	20.11	752	221	2.56	0
29/08/2020	21.2	-2.7	96.0	23.05	741	207	1.27	0
30/08/2020	23.1	-1.2	91.2	28.13	729	281	3.40	0
31/08/2020	23.0	3.5	84.7	19.68	724	229	3.97	0