

**HUNTER VALLEY  
OPERATIONS**

**Monthly Environmental Monitoring Report**

**AUGUST 2019**

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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 1 August to 31 August 2019.

## 2.0 AIR QUALITY

### 2.1 Meteorological Monitoring

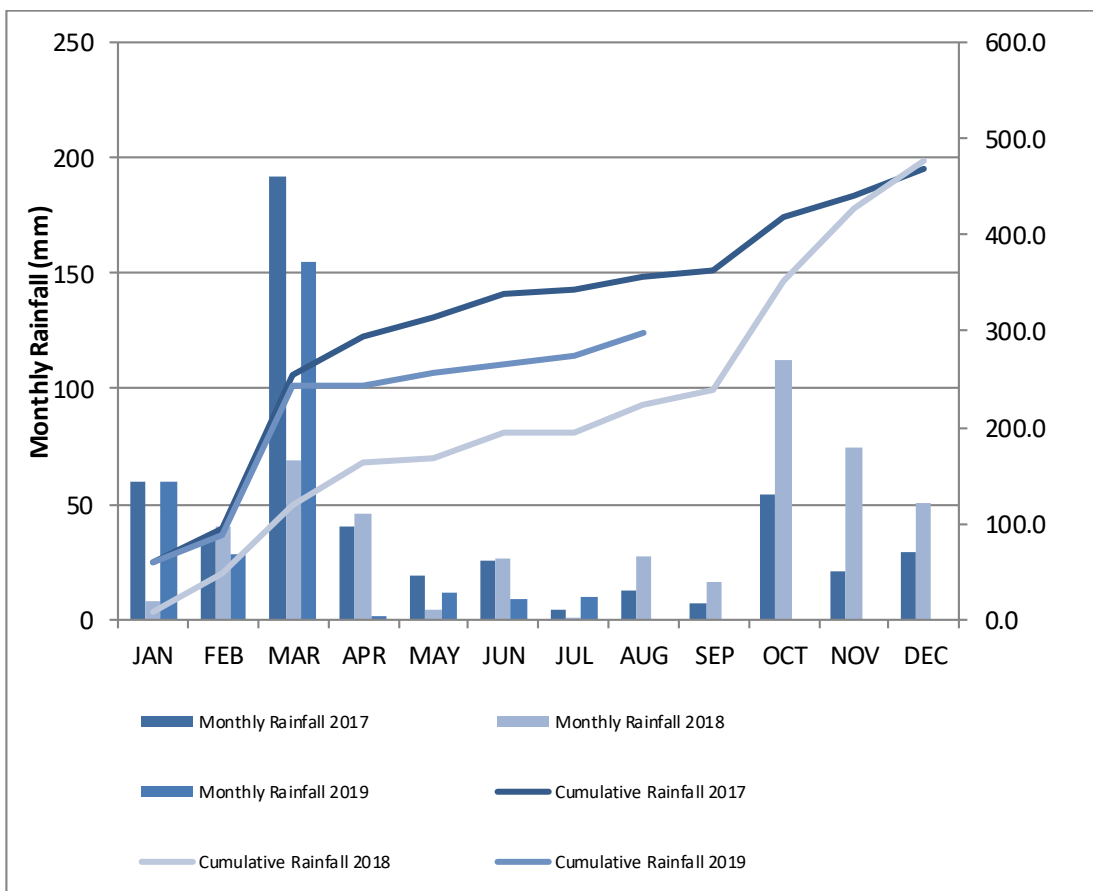
HVO maintains two meteorological stations; 'HVO Corporate' and 'Cheshunt' (Refer to Figure 4: Air Quality Monitoring Location Plan).

#### 2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the 2019 trend and historical trend are shown in Figure 1.

**Table 1: Rainfall data - August 2019**

2019	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
August	23.4	298.2



**Figure 1: Rainfall Summary 2019**

### 2.1.2 Wind Speed and Direction

North-westerly winds were dominant during August as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

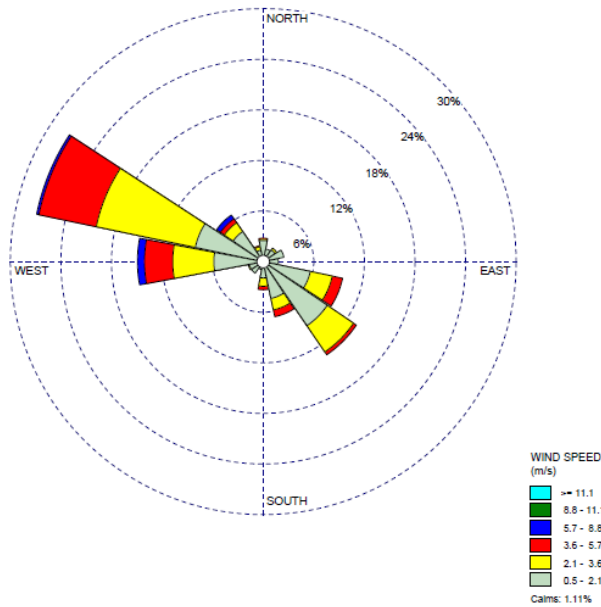


Figure 2: HVO Corporate Wind Rose – August 2019

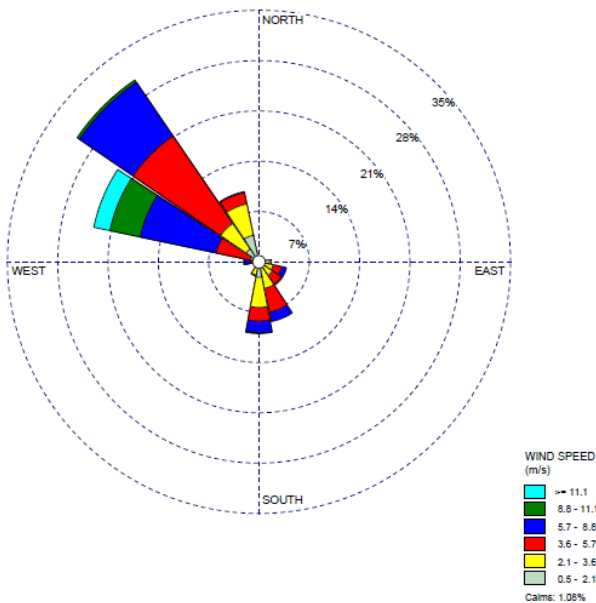


Figure 3: HVO Cheshunt Wind Rose – August 2019

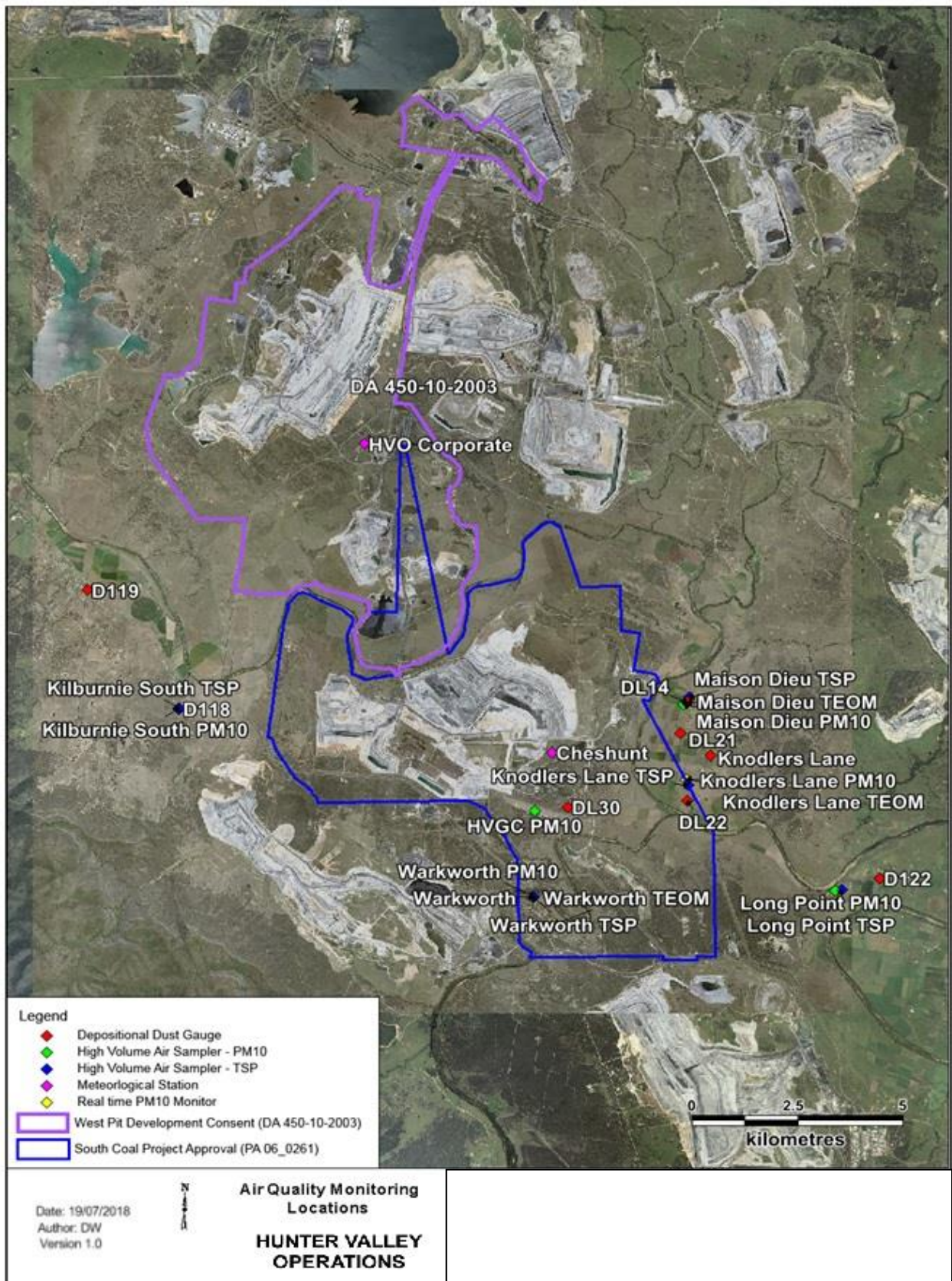


Figure 4: Air Quality Monitoring Location Plan

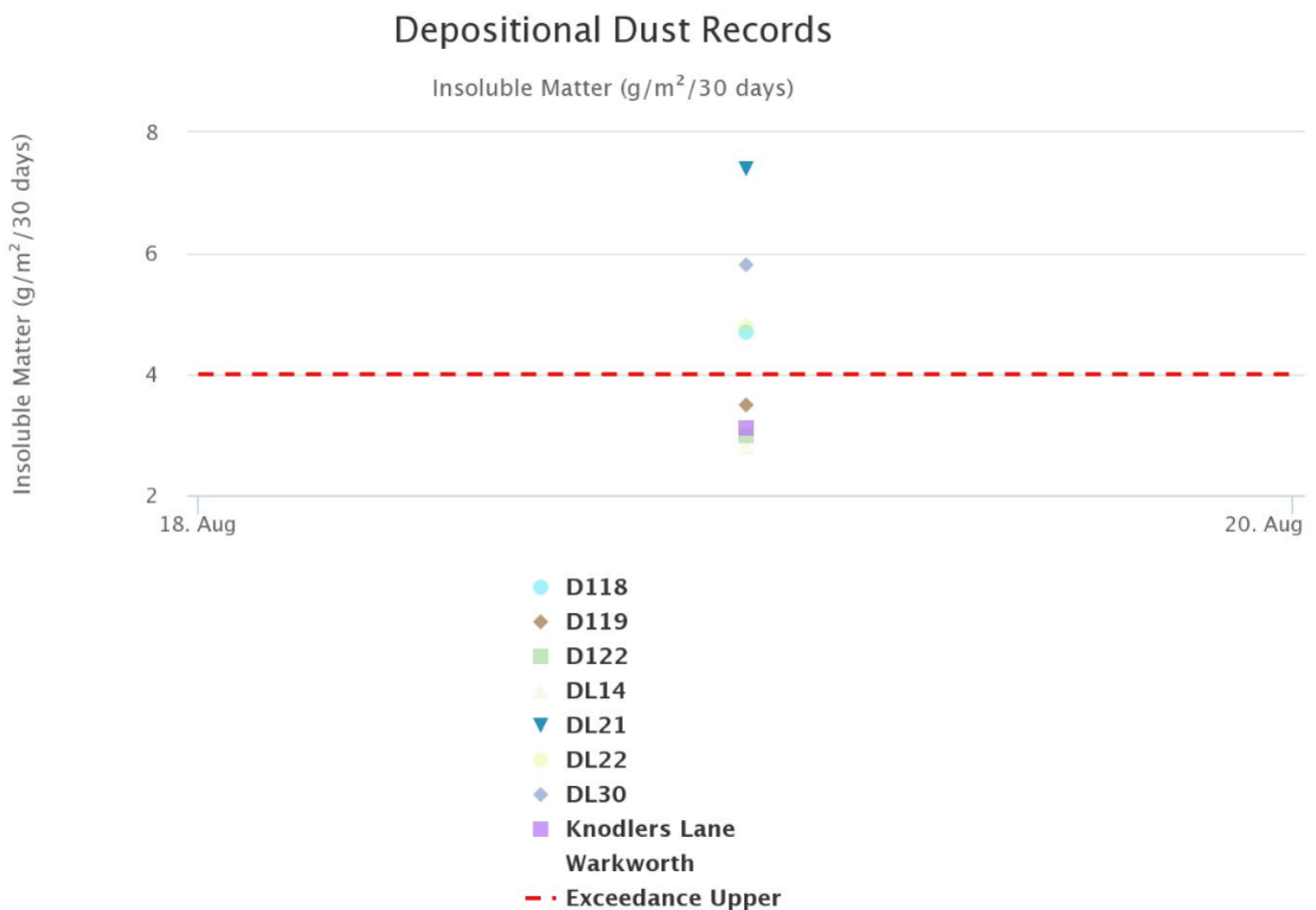
## 2.2 Depositional Dust

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 DL118, DL21, DL22, DL30 and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m<sup>2</sup> per month.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.



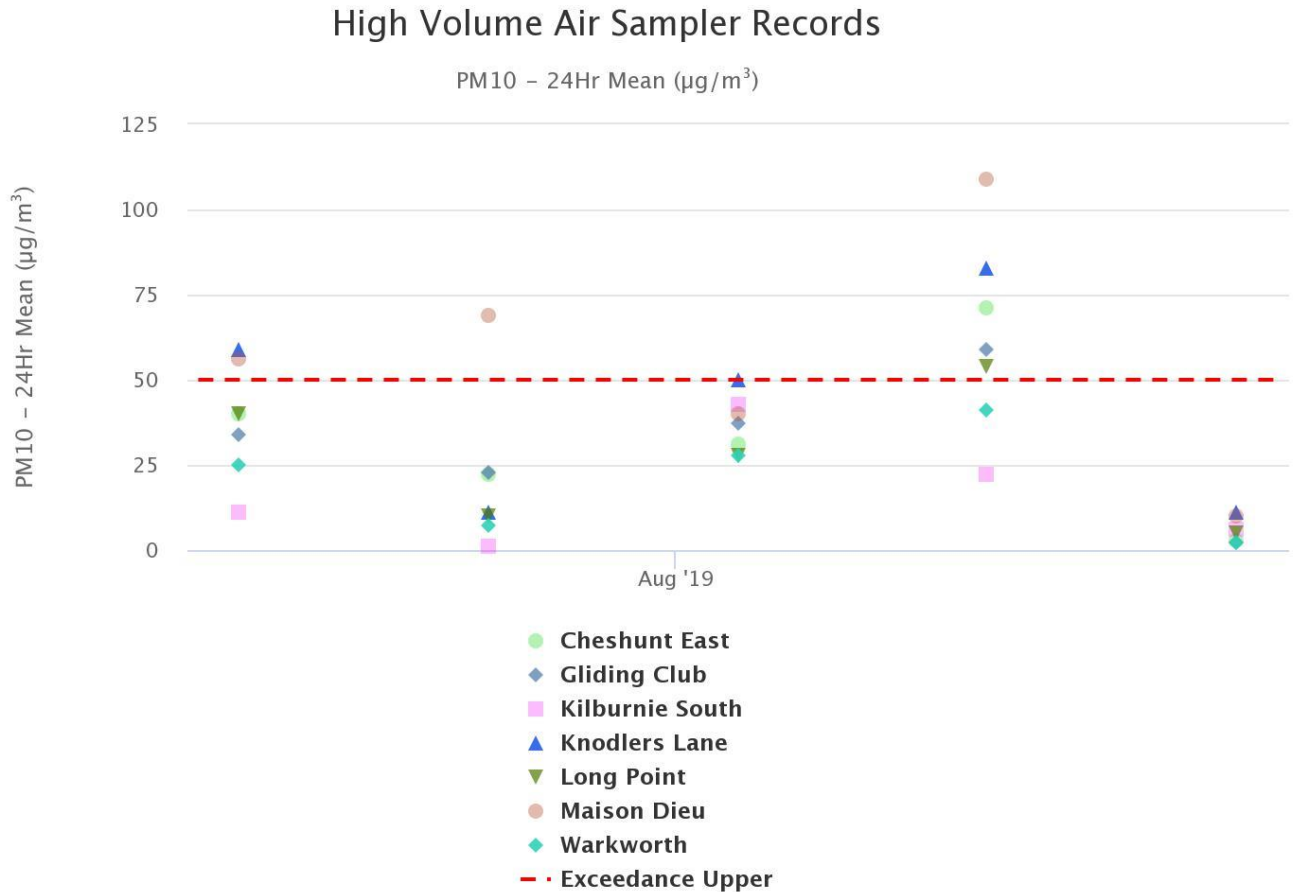
**Figure 5: Depositional Dust Results – August 2019**

## 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 (PM<sub>10</sub>). The location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle.

### 2.3.1 HVAS PM<sub>10</sub> Results

Figure 6 shows individual PM<sub>10</sub> results at each monitoring station against the short term impact assessment criteria of 50 µg/m<sup>3</sup>. During the reporting period the Maison Dieu, Knodlers Lane, Gliding Club and Long Point monitors recorded an exceedance above the short term impact assessment criteria of 50 µg/m<sup>3</sup>.



**Figure 6: Individual PM<sub>10</sub> Results – August 2019**



Figure 7 shows the year to date annual average PM10 results. During the reporting period, the Knodlers Lane monitor recorded an exceedance above the PM10 Annual Rolling Mean of 30µg/m<sup>3</sup>. An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2019 Annual Review.

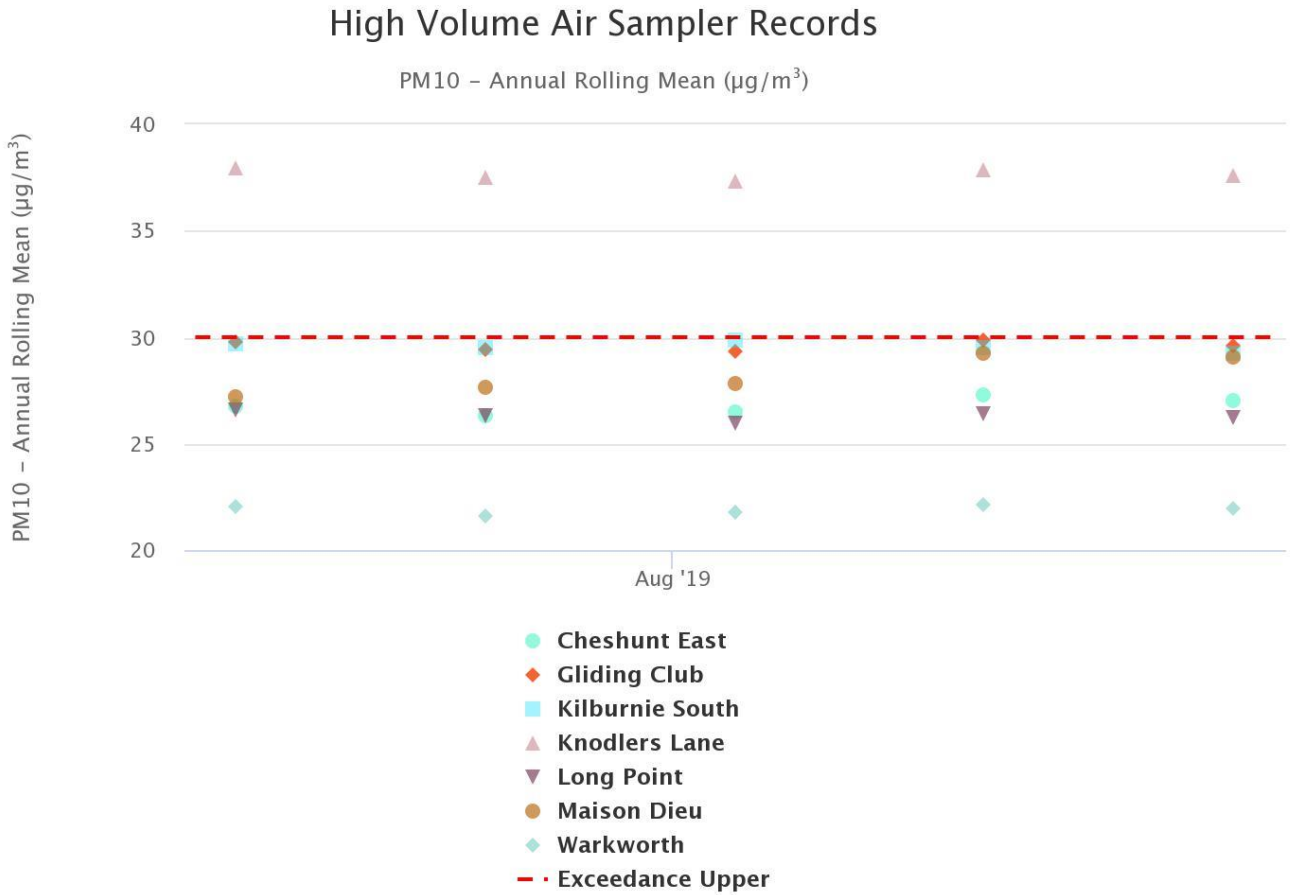
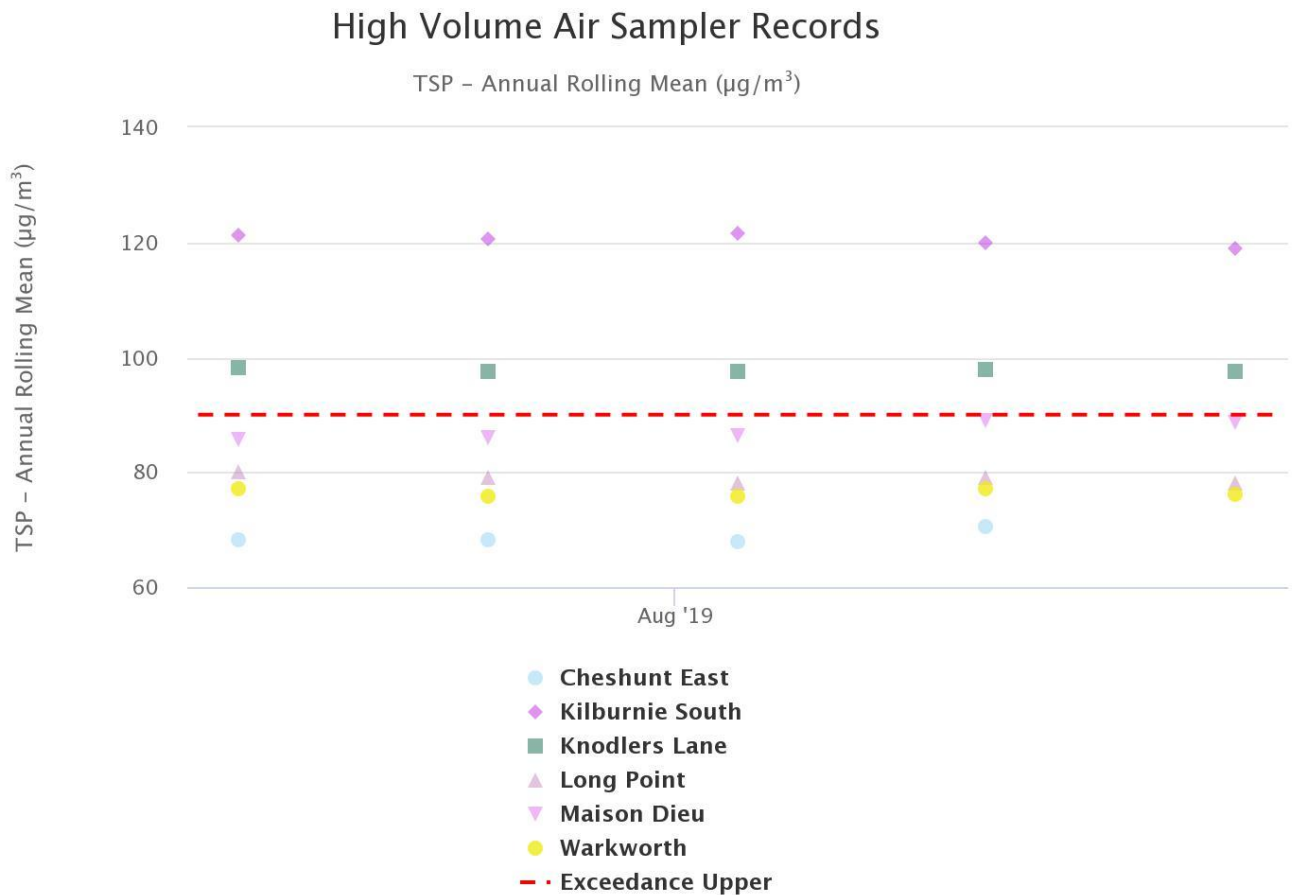


Figure 7: Year to Date Average PM<sub>10</sub> – as at end of August 2019

### 2.3.2 TSP Results

Figure 8 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, the Kilburnie South and Knodlers Lane monitors recorded exceedances 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 2019 Annual Review.



**Figure 8: Year to Date Average Total Suspended Particulates – as at end of August 2019**

### 2.3.3 Real Time PM10 Results

Hunter Valley Operations maintains a network of real time PM<sub>10</sub> 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 PM<sub>10</sub> monitoring are used as a reactive measure to guide mining operations to help achieve compliance with the relevant conditions of the project approval.

Results for real time dust sampling is shown in Figure 9, including the daily 24 hour average PM<sub>10</sub> result and the year to date 24 hour PM<sub>10</sub> annual average.

During the reporting period, the Maison Dieu, Knodlers Lane and Warkworth monitors exceeded the daily 24 hour average PM<sub>10</sub> result ( $50\mu\text{g}/\text{m}^3$ ).

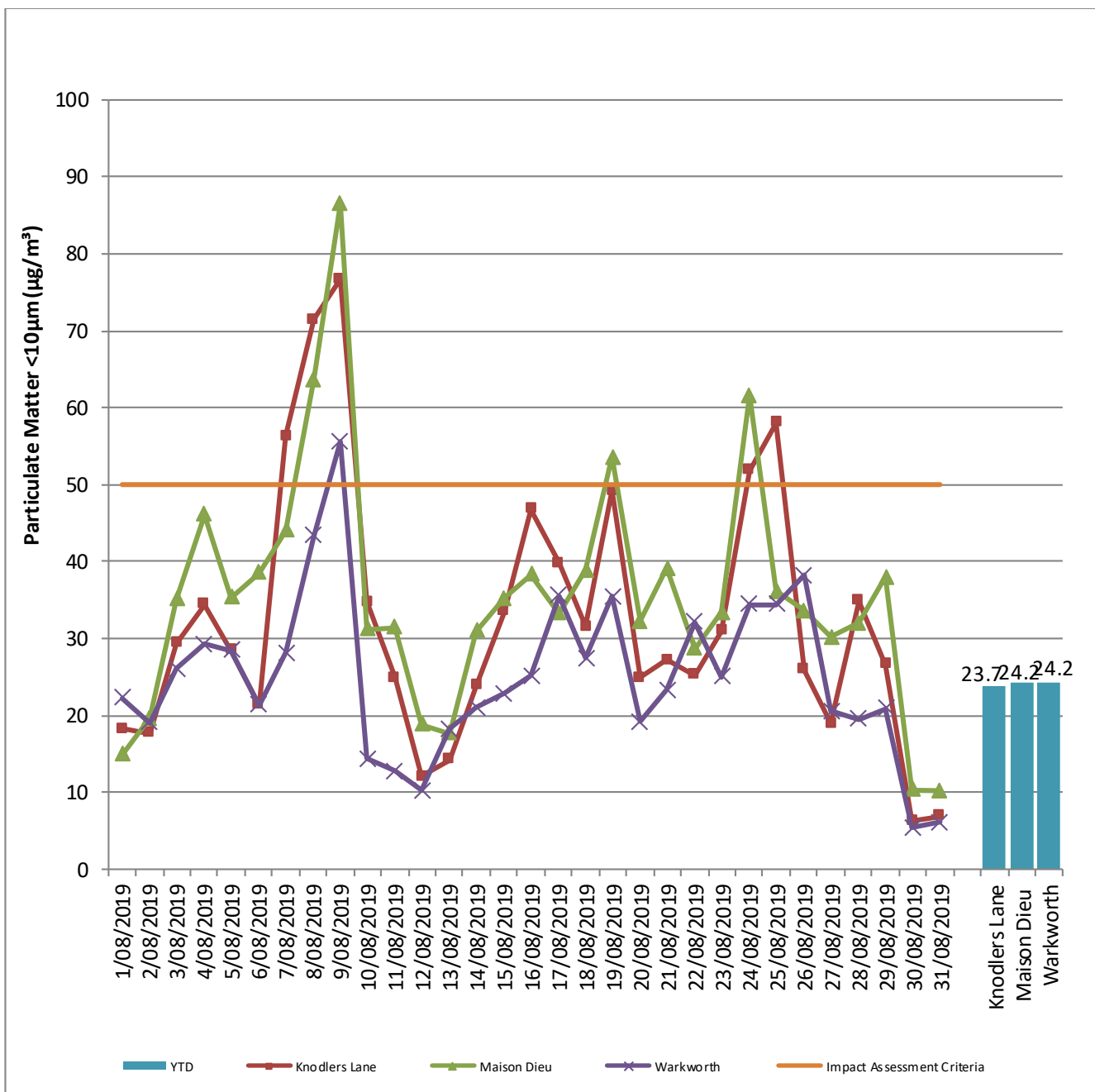


Figure 9: Real Time PM<sub>10</sub> 24hr average and YTD average – August 2019

**Table 2: Real-time PM10 Investigation Results**

Date	Site	Total Measured Result ( $\mu\text{g}/\text{m}^3$ )	Estimated contribution from HVO ( $\mu\text{g}/\text{m}^3$ / %)	Discussion
07/08/2019	Knodlers Lane TEOM	56.3	28.0 $\mu\text{g}/\text{m}^3$ Or 49%	An internal investigation determined HVO maximum potential contribution to be in the order of 28 $\mu\text{g}/\text{m}^3$ or 49% of the total measured based on prevailing wind conditions.
08/08/2019	Maison Dieu TEOM	63.7	27.4 $\mu\text{g}/\text{m}^3$ Or 43%	An internal investigation determined HVO maximum potential contribution to be in the order of 27.4 $\mu\text{g}/\text{m}^3$ or 43% of the total measured based on prevailing wind conditions.
08/08/2019	Knodlers Lane TEOM	71.4	35.2 $\mu\text{g}/\text{m}^3$ Or 49%	An internal investigation determined HVO maximum potential contribution to be in the order of 35.2 $\mu\text{g}/\text{m}^3$ or 49% of the total measured based on prevailing wind conditions.
09/08/2019	Maison Dieu TEOM	86.5	50.7 $\mu\text{g}/\text{m}^3$ Or 58%	An internal investigation determined HVO maximum potential contribution to be in the order of 50.7 $\mu\text{g}/\text{m}^3$ or 58% of the total measured based on prevailing wind conditions.
09/08/2019	Knodlers Lane TEOM	76.5	40.8 $\mu\text{g}/\text{m}^3$ Or 53%	An internal investigation determined HVO maximum potential contribution to be in the order of 40.8 $\mu\text{g}/\text{m}^3$ or 53% of the total measured based on prevailing wind conditions.
09/08/2019	Warkworth TEOM	55.5	19.7 $\mu\text{g}/\text{m}^3$ Or 35%	An internal investigation determined HVO maximum potential contribution to be in the order of 19.7 $\mu\text{g}/\text{m}^3$ or 35% of the total measured based on prevailing wind conditions.
09/08/2019	Jerrys Plan TEOM	55.2	N/A	HVO Could not have been a contributor as wind direction was from HVO for 0% of the time during the day.
19/08/2019	Maison Dieu TEOM	53.5	23.3 $\mu\text{g}/\text{m}^3$ Or 43%	An internal investigation determined HVO maximum potential contribution to be in the order of 23.3 $\mu\text{g}/\text{m}^3$ or 43% of the total measured based on prevailing wind conditions.
24/08/2019	Maison Dieu TEOM	61.6	30.3 $\mu\text{g}/\text{m}^3$ Or 48%	An internal investigation determined HVO maximum potential contribution to be in the order of 30.3 $\mu\text{g}/\text{m}^3$ or 48% of the total measured based on prevailing wind conditions.
24/08/2019	Knodlers Lane TEOM	51.9	20.3 $\mu\text{g}/\text{m}^3$ Or 39%	An internal investigation determined HVO maximum potential contribution to be in the order of 20.3 $\mu\text{g}/\text{m}^3$ or 39% of the total measured based on prevailing wind conditions.
25/08/2019	Knodlers Lane TEOM	58.1	26.0 $\mu\text{g}/\text{m}^3$ Or 44%	An internal investigation determined HVO maximum potential contribution to be in the order of 26.0 $\mu\text{g}/\text{m}^3$ or 44% of the total measured based on prevailing wind conditions.

### 2.3.4 Real Time Alarms for Air Quality

During August the real time monitoring system generated 362 automated air quality related alarms. 36 alarms were related to adverse weather conditions and 326 alarms relating to PM<sub>10</sub>.

### **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 evaluated 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 2019 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 407.2 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 no 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 2019 monthly 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 12. Blasting criteria are summarised in Table 3.

**Table 3: 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, 26 blasts were initiated at HVO.

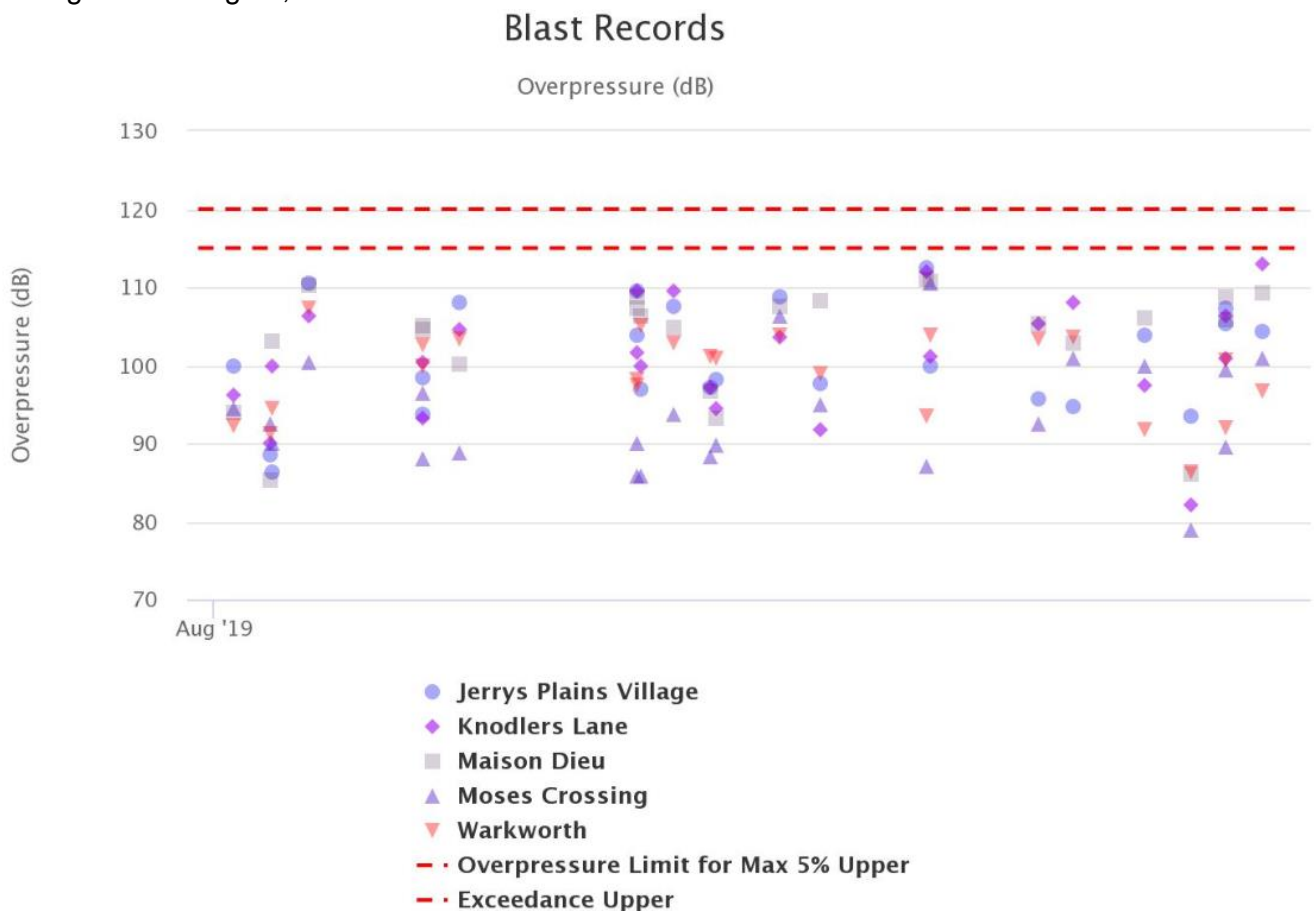
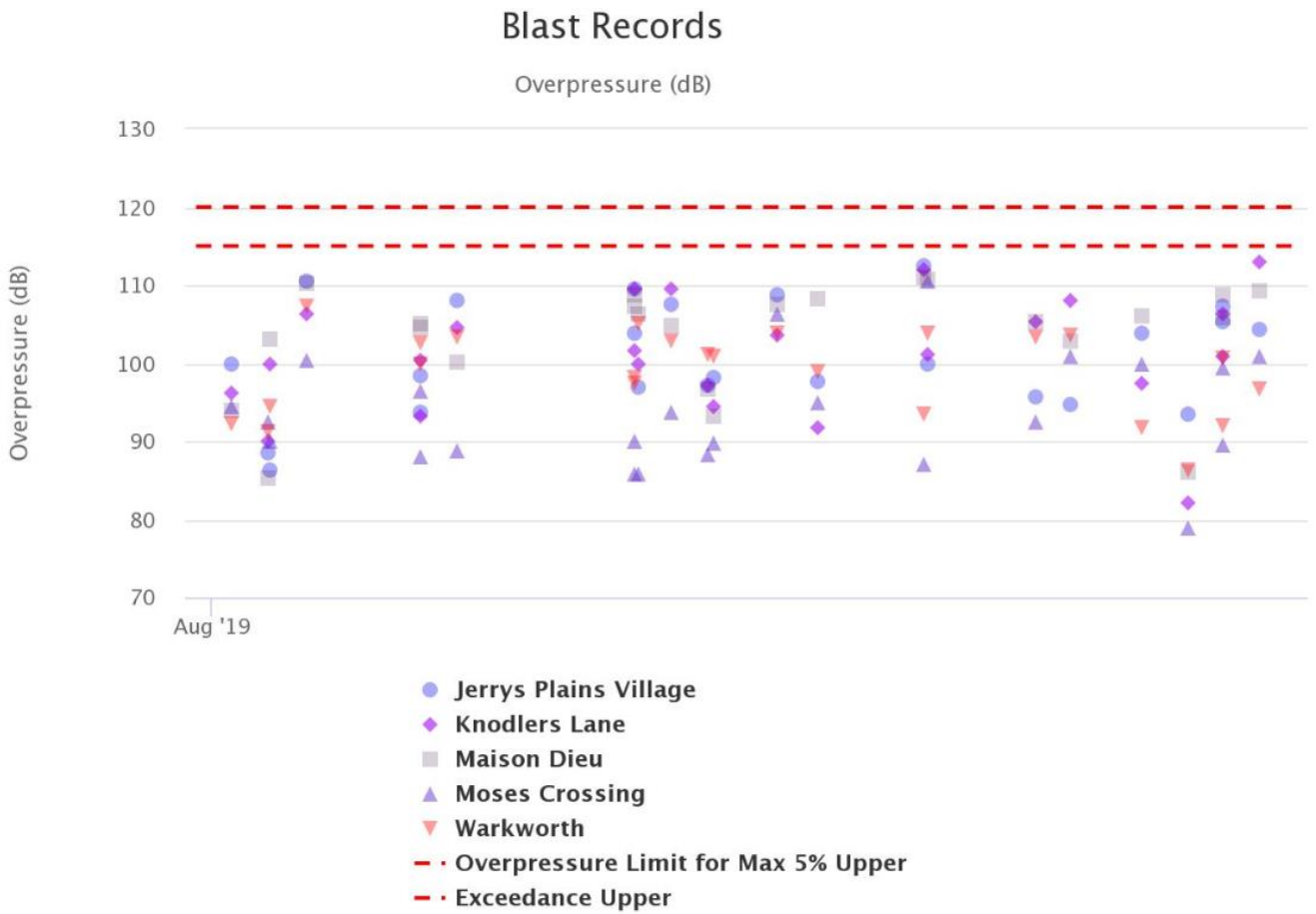
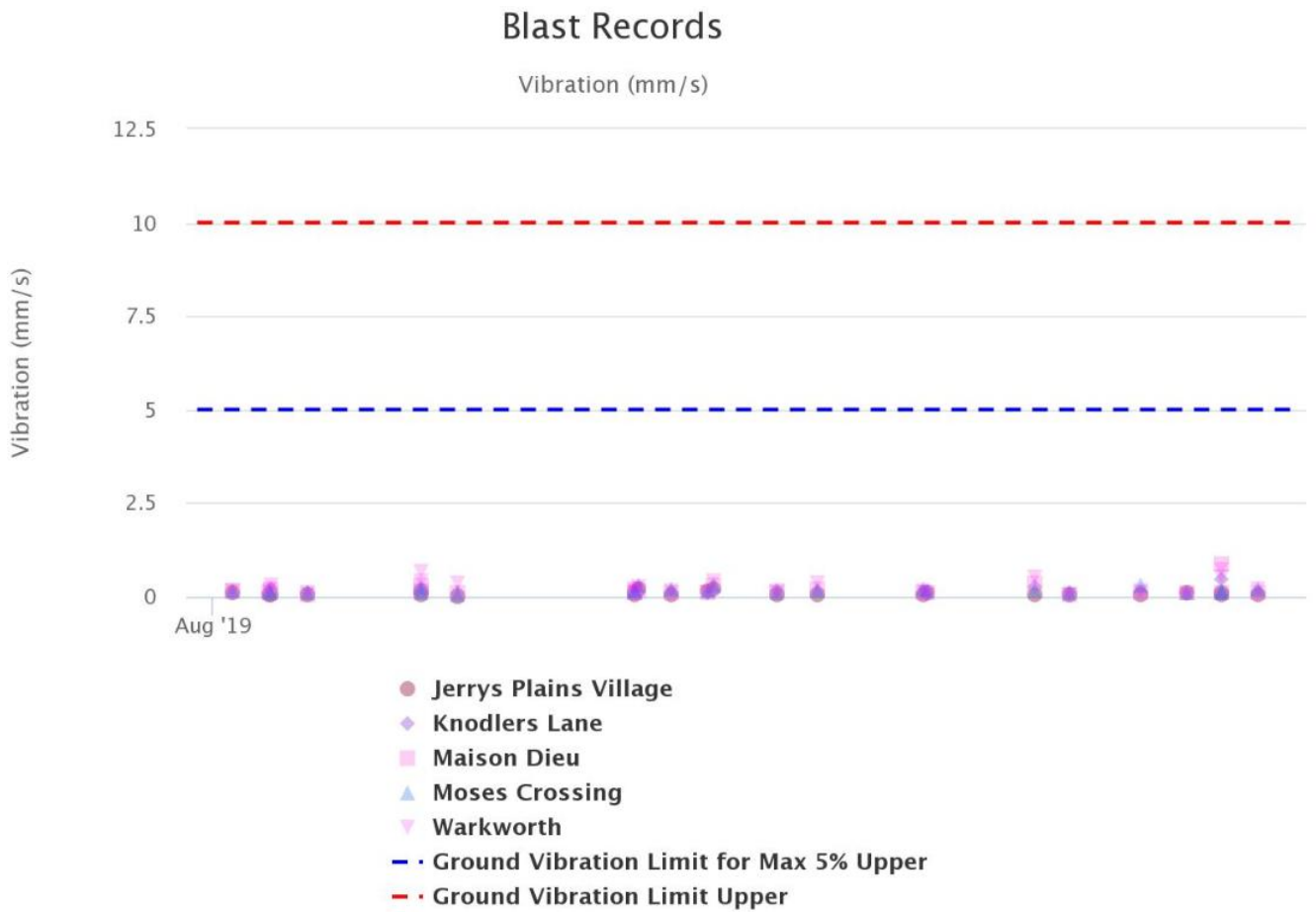


Figure 10 and Figure 11 show the blast monitoring results for the reporting period against the impact assessment criteria.



**Figure 10: Overpressure Blast Monitoring Results – August 2019**



**Figure 11: Ground Vibration Blast Monitoring Results – August 2019**





Figure 12: 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 13.

### 5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 5 and 6 August 2019 with no non-compliances recorded. Monitoring results are detailed in Table 4 to Table 8.

**Table 4: L<sub>Aeq</sub>, 15 minute HVO South - Impact Assessment Criteria – August 2019**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	VTG °C/100m <sup>1</sup>	Criterion dB (A)	Criterion Applies? <sup>2</sup>	HVO South L <sub>Aeq</sub> dB <sup>3,4</sup>	Exceedance <sup>4,5</sup>
Knodlers Lane	05/08/2019 21:00	0.9	-1.0	39	Yes	33	Nil
Maison Dieu	05/08/2019 21:26	3.1	0.5	39	No	33	NA
Shearers Lane	05/08/2019 21:50	3.3	0.5	41	No	37	NA
Kilburnie South	06/08/2019 00:08	5.3	-1.0	39	No	IA	NA
Jerrys Plains Village	05/08/2019 22:27	4.3	0.5	35	No	IA	NA
Jerrys Plains East	05/08/2019 22:02	4.0	0.5	35	No	IA	NA
Long Point Road	05/08/2019 21:01	2.2	0.5	35	Yes	IA	Nil
HVGC	06/08/2019 00:40	4.6	0.5	55	No	38	NA

**Notes:**

1. Atmospheric data is sourced from the HVO Cheshunt weather station (MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Assumed noise emission limits apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversi on conditions of up to 3 degrees/100m (at a height of 10m). Criterion August or August not apply due to rounding of meteorological data values;
3. Estimated or measured L<sub>Aeq</sub>, 15 minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

**Table 5: LA1, 1 minute HVO South - Impact Assessment Criteria – August 2019**

Location	Date Time and	Wind Speed (m/s) <sup>1</sup>	VTG °C/100m <sup>1</sup>	Criterion dB (A)	Criterion Applies? <sup>2</sup>	HVO South LA1, 1min dB <sup>3,4</sup>	Exceedance <sup>4,5</sup>
<i>Knodlers Lane</i>	<i>05/08/2019 21:00</i>	<i>0.9</i>	<i>-1</i>	<i>45</i>	<i>Yes</i>	<i>36</i>	<i>Nil</i>
<i>Maison Dieu</i>	<i>05/08/2019 21:26</i>	<i>3.1</i>	<i>0.5</i>	<i>45</i>	<i>No</i>	<i>36</i>	<i>NA</i>
<i>Shearers Lane</i>	<i>05/08/2019 21:50</i>	<i>3.3</i>	<i>0.5</i>	<i>45</i>	<i>No</i>	<i>45</i>	<i>NA</i>
<i>Kilburnie South</i>	<i>06/08/2019 00:08</i>	<i>5.3</i>	<i>-1.0</i>	<i>45</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Jerrys Plains Village</i>	<i>05/08/2019 22:27</i>	<i>4.3</i>	<i>0.5</i>	<i>45</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Jerrys Plains East</i>	<i>05/08/2019 22:02</i>	<i>4.0</i>	<i>0.5</i>	<i>45</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Long Point Road</i>	<i>05/08/2019 21:01</i>	<i>2.2</i>	<i>0.5</i>	<i>45</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>HVGC</i>	<i>06/08/2019 00:40</i>	<i>4.6</i>	<i>0.5</i>	<i>NA</i>	<i>NA</i>	<i>46</i>	<i>NA</i>

Notes:

1. Atmospheric data is sourced from the HVO Cheshunt weather station (or MTW Charlton Ridge for Long Point) using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) apply for wind speeds up to 3 metres per second (at a height of 10m), or temperature inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion August or August not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

**Table 6: LAeq, 15 minute HVO North – Impact Assessment Criteria – August 2019**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	VTG °C/100m <sup>1</sup>	Criterion dB (A)	Criterion Applies? <sup>2</sup>	HVO South LAeq dB <sup>3,4</sup>	Exceedance <sup>4,5</sup>
<i>Knodlers Lane</i>	<i>05/08/2019 21:00</i>	<i>3.1</i>	<i>-1.0</i>	<i>35</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Maison Dieu</i>	<i>05/08/2019 21:26</i>	<i>2.0</i>	<i>3.0</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Shearers Lane</i>	<i>05/08/2019 21:50</i>	<i>1.6</i>	<i>3.0</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Kilburnie South</i>	<i>06/08/2019 00:08</i>	<i>2.9</i>	<i>-1.0</i>	<i>39</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains Village</i>	<i>05/08/2019 22:27</i>	<i>2.3</i>	<i>3.0</i>	<i>36</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains East</i>	<i>05/08/2019 22:02</i>	<i>2.3</i>	<i>0.5</i>	<i>39</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Long Point Road</i>	<i>05/08/2019 21:01</i>	<i>2.2</i>	<i>0.5</i>	<i>35</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>HVGC</i>	<i>06/08/2019 00:40</i>	<i>3.9</i>	<i>-1.0</i>	<i>NA</i>	<i>No</i>	<i>IA</i>	<i>NA</i>

Notes:

1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion August or August not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq, 15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

**Table 7: LAeq,15 minute HVO North - Land Acquisition Criteria – August 2019**

Location	Date and Time	Wind Speed (m/s) <sup>1</sup>	VTG °C/100m <sup>1</sup>	Criterion dB (A)	Criterion Applies? <sup>2</sup>	HVO North LAeq dB <sup>3,4</sup>	Exceedance <sup>4,5</sup>
<i>Knodlers Lane</i>	<i>05/08/2019 21:00</i>	<i>3.1</i>	<i>-1.0</i>	<i>41</i>	<i>No</i>	<i>IA</i>	<i>NA</i>
<i>Maison Dieu</i>	<i>05/08/2019 21:26</i>	<i>2.0</i>	<i>3.0</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Shearers Lane</i>	<i>05/08/2019 21:50</i>	<i>1.6</i>	<i>3.0</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Kilburnie South</i>	<i>06/08/2019 00:08</i>	<i>2.9</i>	<i>-1.0</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains Village</i>	<i>05/08/2019 22:27</i>	<i>2.3</i>	<i>3.0</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Jerrys Plains East</i>	<i>05/08/2019 22:02</i>	<i>2.3</i>	<i>0.5</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>Long Point Road</i>	<i>05/08/2019 21:01</i>	<i>2.2</i>	<i>0.5</i>	<i>41</i>	<i>Yes</i>	<i>IA</i>	<i>Nil</i>
<i>HVGC</i>	<i>06/08/2019 00:40</i>	<i>3.9</i>	<i>-1.0</i>	<i>NA</i>	<i>NA</i>	<i>IA</i>	<i>NA</i>

Notes:

1. Atmospheric data is sourced from the HVO Corp. weather station (or MTW Charlton Ridge for Long Point) 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion August or August not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq, 15 minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

**Table 8: LA1, 1 Minute HVO North - Impact Assessment Criteria – August 2019**

<b>Location</b>	<b>Date and Time</b>	<b>Wind Speed (m/s)<sup>1</sup></b>	<b>VTG °C/100m<sup>1</sup></b>	<b>Criterion dB (A)</b>	<b>Criterion Applies?<sup>2</sup></b>	<b>HVO North LA1, 1min dB<sup>3,4</sup></b>	<b>Exceedance<sup>4,5</sup></b>
Knodlers Lane	05/08/2019 21:00	3.1	-1	46	No	IA	NA
Maison Dieu	05/08/2019 21:26	2.0	3.0	46	Yes	IA	Nil
Shearers Lane	05/08/2019 21:50	1.6	3.0	46	Yes	IA	Nil
Kilburnie South	06/08/2019 00:08	2.9	-1.0	46	Yes	IA	Nil
Jerrys Plains Village	05/08/2019 22:27	2.3	3.0	46	Yes	IA	Nil
Jerrys Plains East	05/08/2019 22:02	2.3	0.5	46	Yes	IA	Nil
Long Point Road	05/08/2019 21:01	2.2	0.5	46	Yes	IA	Nil
HVGC	06/08/2019 00:40	3.9	-1.0	NA	NA	IA	NA

Notes:

1. Atmospheric data is sourced from the HVO Corp. (or MTW Charlton Ridge for Long Point) weather station 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 temperature inversion conditions greater than 3 degrees C/100m. Criterion August or August not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

## 5.2 NPfI 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. During August 2019 no penalties were applied. The assessment for low frequency noise is shown in Table 9.

**Table 9: Low Frequency Noise Assessment – August 2019**

<b>Location</b>	<b>Date and Time</b>	<b>Measured Site Only LA<sub>eq</sub> dB (Sth/Nth)</b>	<b>Site Only LC<sub>eq</sub> dB<sup>1</sup> (Sth/Nth)</b>	<b>Site-Only LC<sub>eq</sub> – LA<sub>eq</sub> dB<sup>1,2</sup> (Sth/Nth)</b>	<b>Result Max exceedance of ref spectrum dB<sup>1,3</sup> (Sth/Nth)</b>	<b>Penalty dB(A)<sup>1</sup> (Sth/Nth)</b>
Knodlers Lane	05/08/2019 21:00	IA/33	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	05/08/2019 21:26	IA/33	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	05/08/2019 21:50	IA37	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	06/08/2019 00:08	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	05/08/2019 22:27	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	05/08/2019 22:02	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point Road	05/08/2019 21:01	IA/38	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	06/08/2019 00:40	IA/38	NA/NA	NA/NA	NA/NA	NA/NA

Notes:

1. Where it is not possible to determine the site only result due to the presence of other low frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, this is noted as NA (not available) and no further assessment has been undertaken;
2. As per NPfI, if  $LC_{eq} - LA_{eq} \geq 15$  dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of the attended noise report; and
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

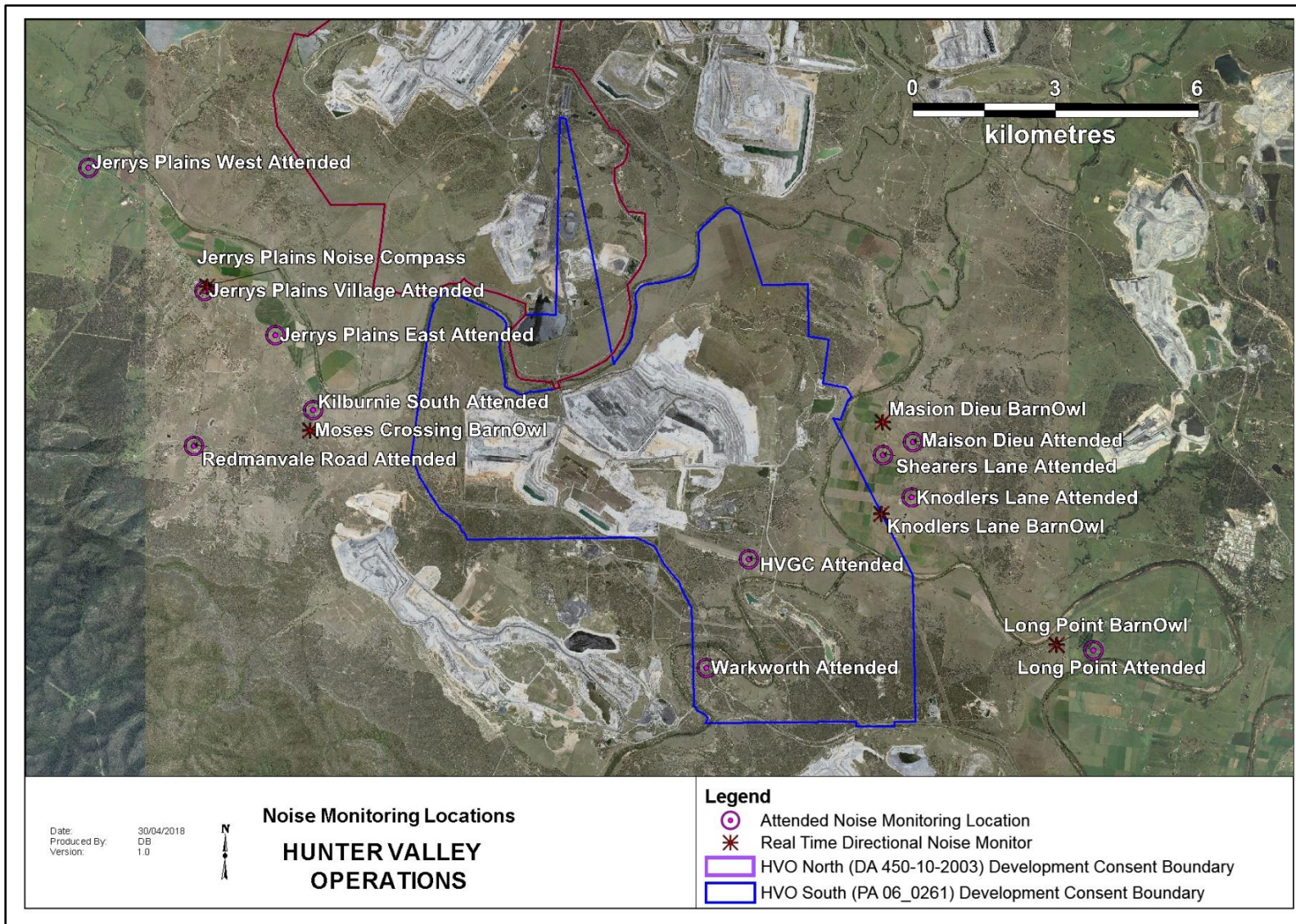


Figure 13: Noise Monitoring Location Plan



### 5.2.1 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.

### 6.0 OPERATIONAL DOWNTIME

During August, a total of 1372 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 is shown in Figure 14.

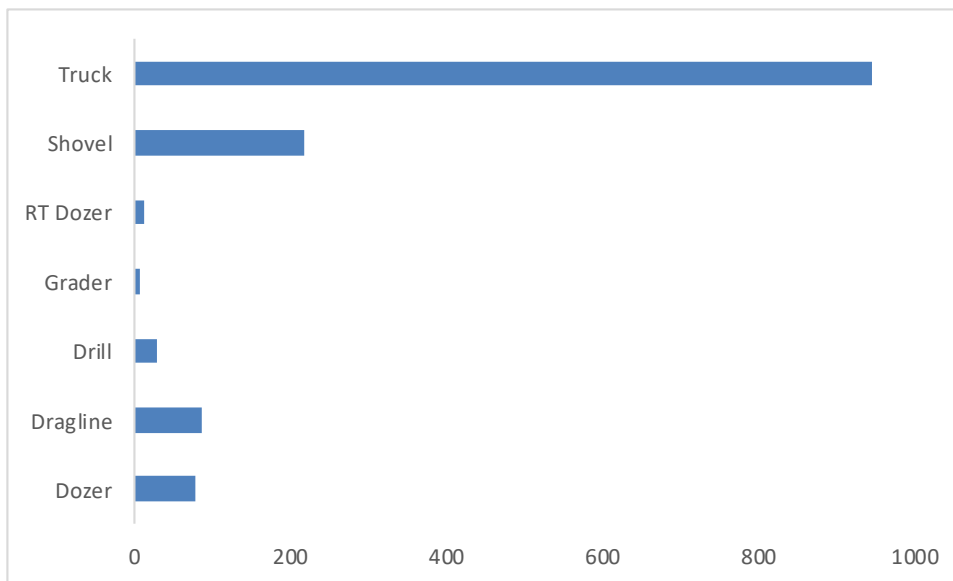


Figure 14: Operational Downtime by Equipment Type – August 2019

## 7.0 REHABILITATION

During August 7.61 Ha of land was released, 8.05 Ha of land was bulk shaped and 16.36 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 15.

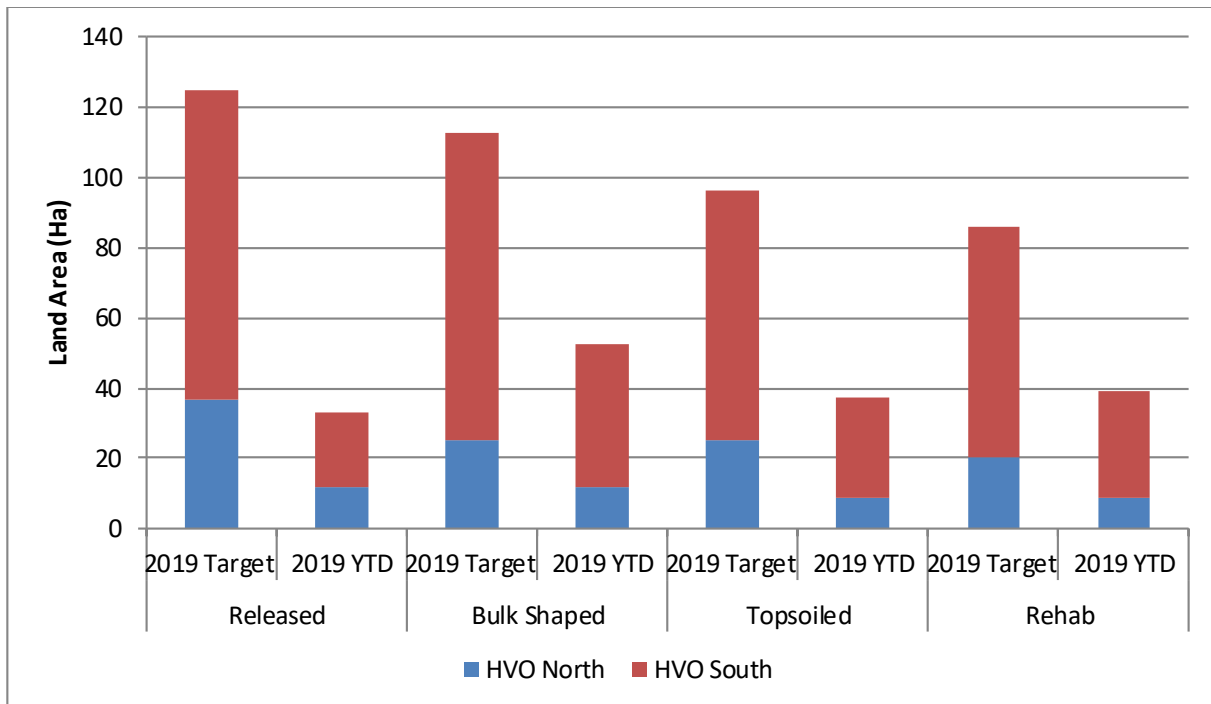


Figure 15: Rehabilitation YTD – August 2019

## 8.0 COMPLAINTS

One compliant was received during August 2019. Details of complaints received YTD are shown in Table 10 below.

Table 10: Complaints Summary YTD 2019

Month	Noise	Dust	Blast	Lighting	Other	Total
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	-	1	-	-	-	1
April	-	1	-	-	-	1
May	-	2	-	-	-	2
June	-	1	-	-	1	2
July	-	-	-	-	-	-
August	-	-	-	-	1	1
September						
October						
November						
December						
<b>Total</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>7</b>

## **9.0 ENVIRONMENTAL INCIDENT**

During the reporting period there were no reportable environmental incidents.

**APPENDIX A: METEOROLOGICAL DATA**

**Table 11: Meteorological Data - HVO Corporate Meteorological Station – August 2019**

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)
1/8/2019	15.6	12.0	87.9	46.7	867	128.1	2.1	0
2/8/2019	18.7	10.7	97.8	29.3	607.6	189.5	1.2	0
3/8/2019	18.0	12.4	100	33.4	737	177.7	1.2	0
4/8/2019	21.1	11.3	99.2	5.3	571.3	282.2	3.0	0
5/8/2019	19.7	12.4	96	2.0	571.2	212.6	1.9	0
6/8/2019	20.5	13.0	100	4.4	570.9	279.8	1.7	0
7/8/2019	21.5	12.8	42.2	-2.5	586.1	281.4	2.8	0
8/8/2019	22.2	13.7	41.1	-219.4	591.9	NAN	3.7	0
9/8/2019	20.7	11.5	60.5	11.1	823	276.9	4.8	0
10/8/2019	16.1	7.4	66.2	28.6	794.5	290.9	7.5	0
11/8/2019	11.7	6.3	93.9	31.9	878	289	6.1	0.2
12/8/2019	11.9	8.7	100	39.6	898	288.8	6.7	3
13/8/2019	16.1	9.6	87.2	31.7	626.3	292.3	3.8	0
14/8/2019	18.0	9.8	92.7	5.4	683.2	265.6	2.8	0
15/8/2019	18.6	11.1	73.0	2.5	691.7	277.3	2.1	0
16/8/2019	19.8	13.6	49.6	5.8	686.7	278.8	3.2	0
17/8/2019	22.9	14.0	53.0	0.7	687.3	277.3	3.7	0
18/8/2019	20.6	13.6	88.2	9.1	679.2	191.1	3.2	0
19/8/2019	23.4	11.6	100	15.9	647	187.7	1.2	0
20/8/2019	17.6	10.4	54.5	10.7	915	279.8	5.1	0
21/8/2019	19	12.7	65.4	11.5	688.2	294.4	5.2	0
22/8/2019	18.5	13.3	65.7	26.5	692.7	293.4	6.3	0
23/8/2019	19.8	10.5	68.2	14.8	917	222.7	4.8	0
24/8/2019	17.1	13.9	75.6	16.3	706.6	164	1.1	0
25/8/2019	23.1	16.0	70.7	12.4	695.5	290.9	3.7	0
26/8/2019	23.8	13.6	87.2	-4.1	723	237.9	3.6	0
27/8/2019	19.6	13.3	88.9	38.4	875	128.3	2.7	0
28/8/2019	19.6	13.95	97.9	26.0	885	117.8	2.3	0
29/8/2019	21.0	10.5	98.1	6.7	713.6	218	2.3	0
30/8/2019	17.1	9.2	94.8	26.0	929	196.5	2.7	0
31/8/2019	12.7	10.9	110.5	62.9	1006	154	2.6	14.2

\*NAN – data not available