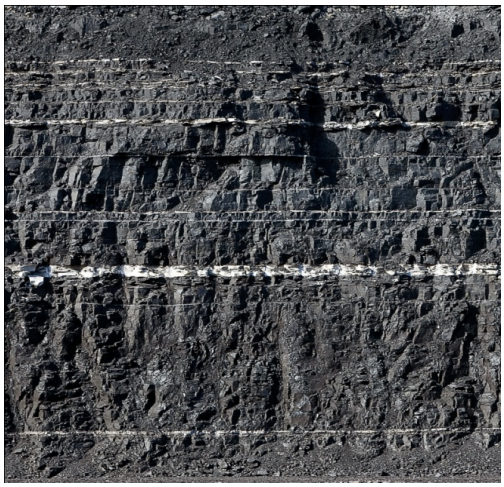
HUNTER VALLEY
OPERATIONS



Monthly Environmental Monitoring Report

Hunter Valley Operations

November 2018

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**10/12/2018**
1.1	**Environment & Community Coordinator**	**Final**	**25/01/2019**

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 November to 30 November 2018.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; '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 2018 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
November	74.6	426.4

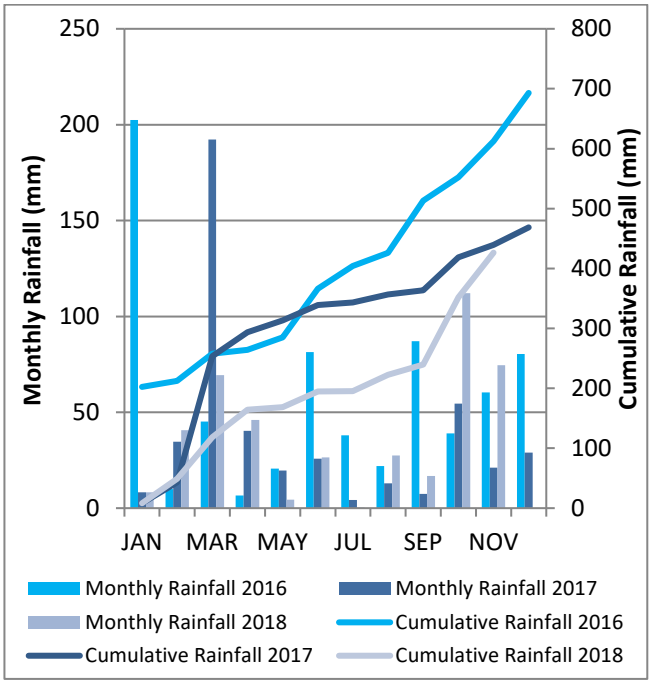

Figure 1: Rainfall Summary 2018

2.1.2 Wind Speed and Direction

South-Easterly winds were dominant during November as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

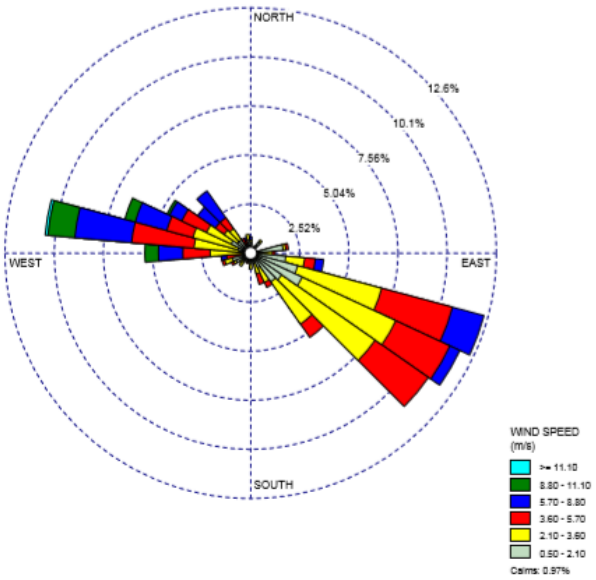

Figure 2: HVO Corporate Wind Rose – November 2018

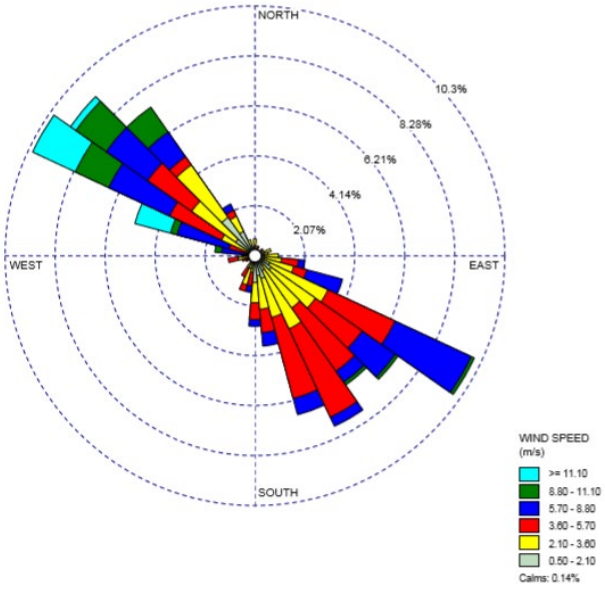

Figure 3: HVO Cheshunt Wind Rose – November 2018

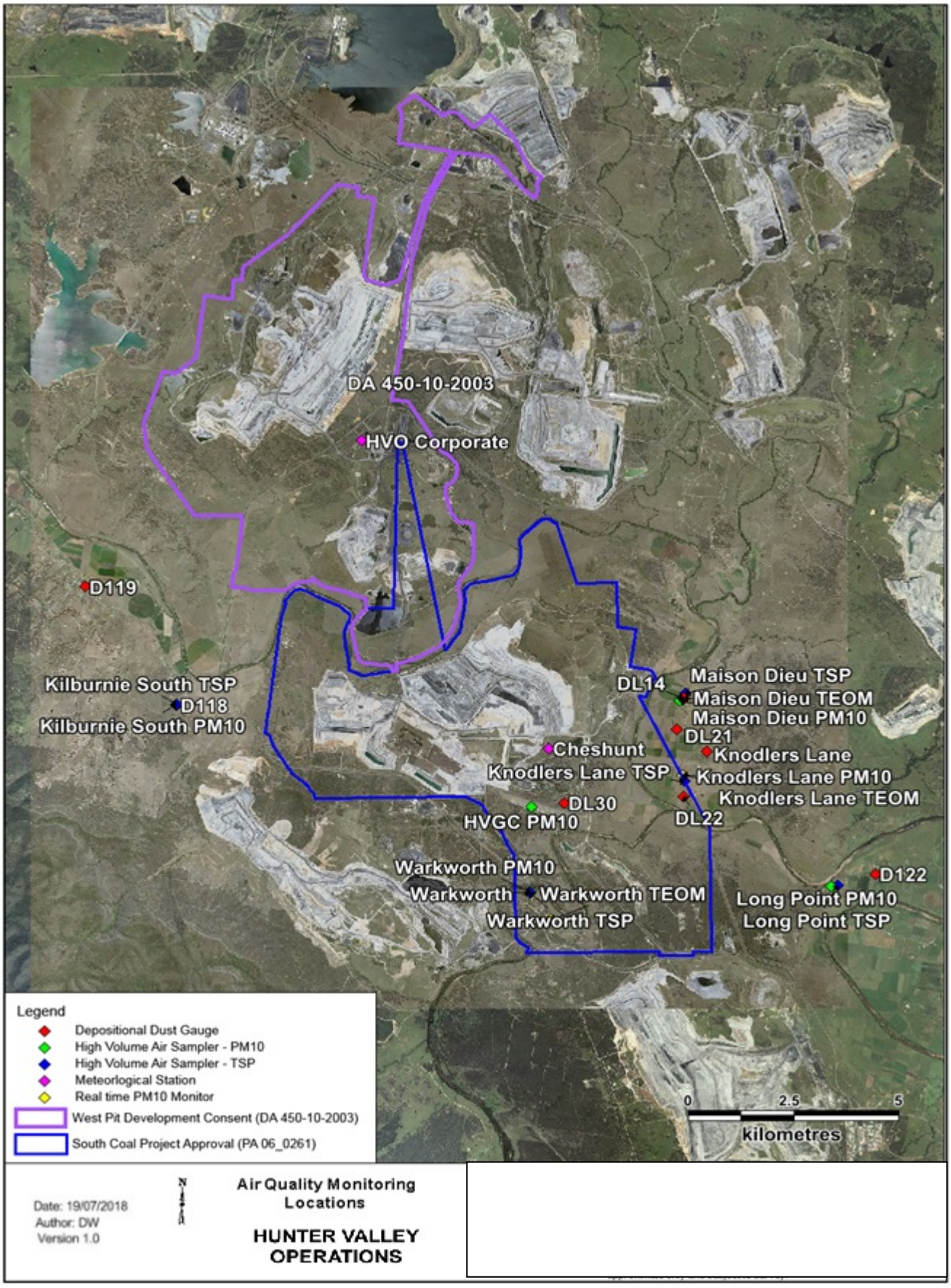

Figure 4: Air Quality Monitoring Location Plan

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 year-to-date average and the annual impact assessment criteria.

During the reporting period the DL22 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month.

No sample was collected for DL21 as the dust gauge pole had been knocked over.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

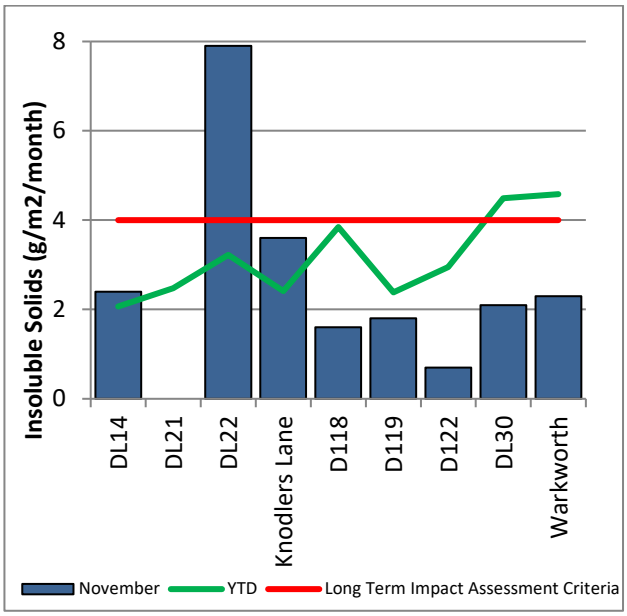

Figure 5: Depositional Dust Results – November 2018

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_{10}). 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_{10} Results

Figure 6 shows individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50 µg/m^3.

On 3 November 2018, two HVAS units recorded elevated 24 hour averages, Long Point (57µg/m^3) and Knodlers Lane (58 µg/m^3). HVO's maximum contribution was calculated to be the following:

- Long Point: 32.0 µg/m^3 or 56.1% of the total measured result.
- Knodlers Lane: 33.0 µg/m^3 or 56.9% of the total measured result.

On 21 November 2018, all HVAS units with the exception of Kilburnie South recorded elevated 24 hour averages over the 24 hour criteria, Knodlers Lane (54 µg/m^3), Long Point (120 µg/m^3), Maison Dieu (61 µg/m^3), Warkworth (62 µg/m^3) and Glider Club (68 µg/m^3). HVO's maximum contribution was calculated to be the following:

- Knodlers Lane: 4.5 µg/m^3 or 8.3% of the total measured result
- Long Point: <4.5 µg/m^3 or <3.8% of the total measured result
- Maison Dieu: 11.5 µg/m^3 or 18.9% of the total measured result
- Warkworth: 12.5 µg/m^3 or 23.1% of the total measured result
- Glider Club: 18.5 µg/m^3 or 34.3% of the total measured result.

It should be noted that 21 - 23 November 2018 experienced high dust levels being recorded across the Hunter Valley as a dust storm approached from Western NSW and passed over the region. Across this period HVO recorded significant operational downtime as shown in Section 6.

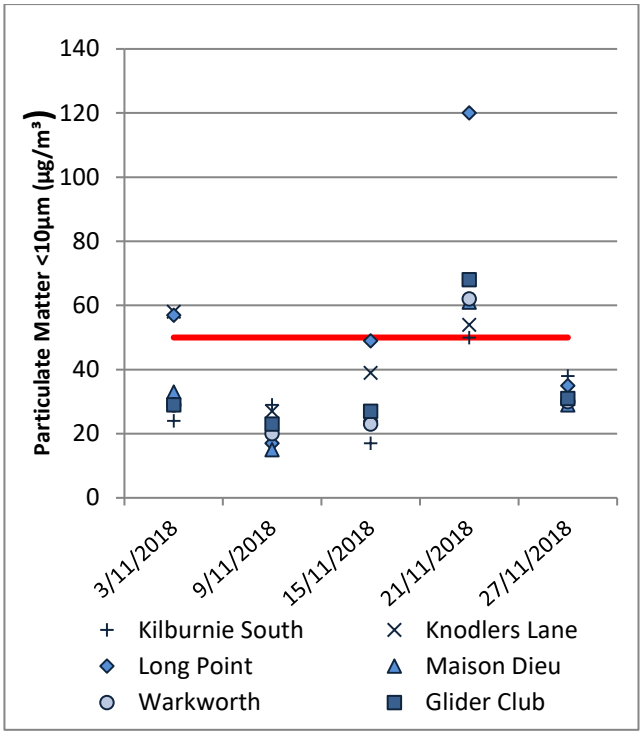

Figure 6: Individual PM_{10} Results – November 2018

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

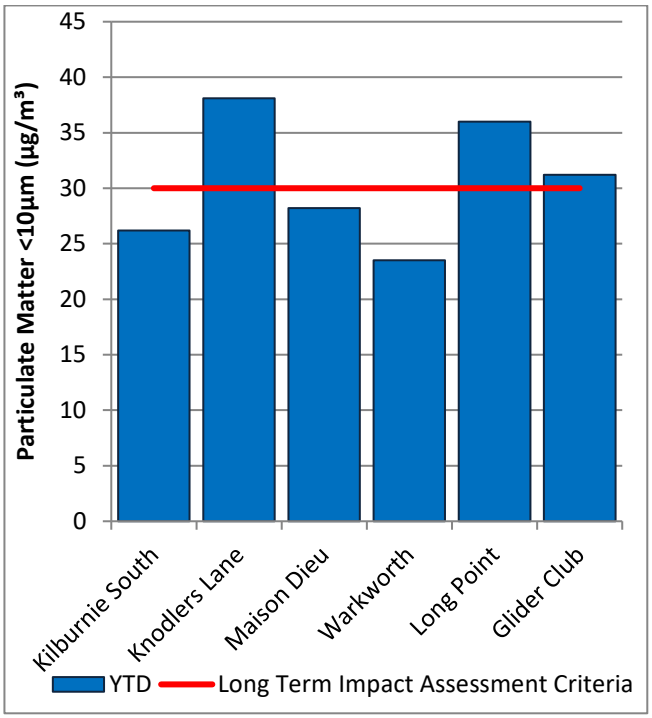

Figure 7: Year to Date Average PM_{10} – November 2018

2.3.2 TSP Results

Figure 8 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

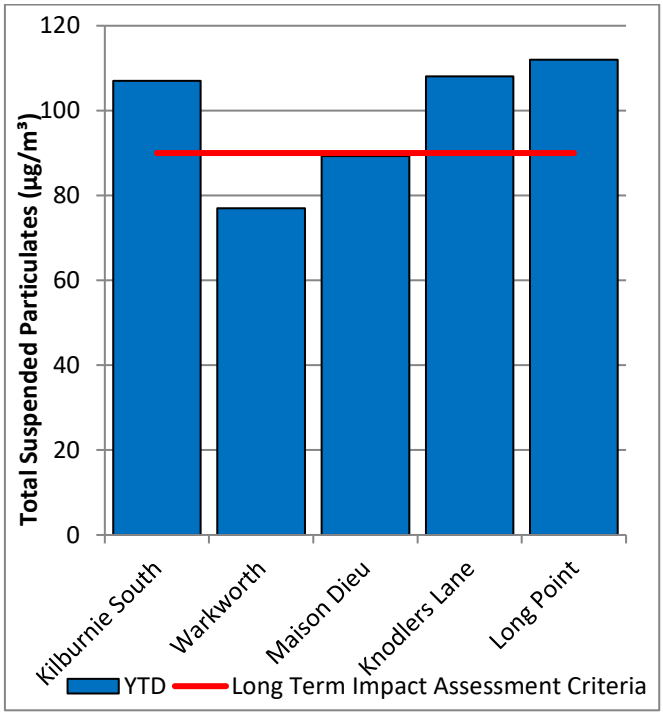

Figure 8: Year to Date Average Total Suspended Particulates – November 2018

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} 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_{10} 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_{10} result and the year to date 24 hour PM_{10} annual average.

Results from investigations of elevated results are presented in Table 2.

2.3.4 Real Time Alarms for Air Quality

During November the real time monitoring system generated 277 automated air quality related alarms. 15 were related to adverse weather conditions and 262 alarms relating to PM_{10}.

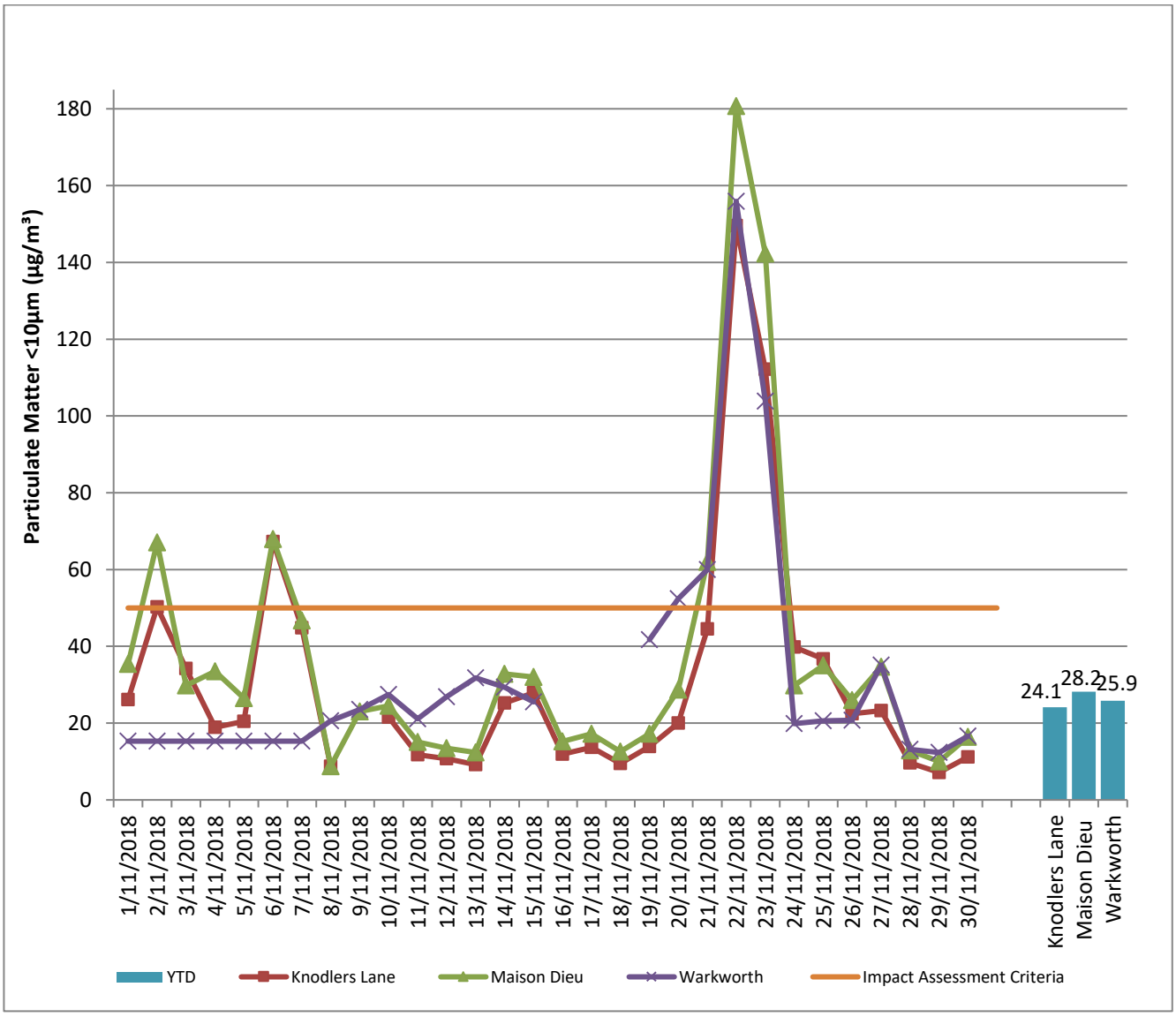

Figure 9: Real Time PM_{10} 24hr average and YTD average – November 2018

Table 2: Real-time PM10 Investigation Results

Date	Site	Total Measured Result (µg/m3)	Estimated contribution from HVO (µg/m3 / %)	Discussion
2/11/2018	Maison Dieu TEOM	67.0	26.2 µg/m3 Or 39.1%	An internal investigation determined HVO maximum potential contribution to be in the order of 26.2ug/m3 or 39.1% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
2/11/2018	Knodlers Lane TEOM	50.3	9.4 µg/m3 Or 18.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 9.4ug/m3 or 18.8% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
6/11/2018	Maison Dieu TEOM	67.9	23.5 µg/m3 Or 34.6%	An internal investigation determined HVO maximum potential contribution to be in the order of 23.5ug/m3 or 34.6% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
6/11/2018	Knodlers Lane TEOM	67.3	22.9 µg/m3 Or 34.0%	An internal investigation determined HVO maximum potential contribution to be in the order of 22.9ug/m3 or 34.0% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
20/11/2018	Warkworth TEOM	52.4	5.1 µg/m3 Or 9.8%	Wind direction on this day was generally not from the direction of HVO. Approximately 6.3hrs of the day experienced wind blowing towards the monitor from HVO. HVO contribution during this period was calculated to be 5.1 µg/m3 or 9.8% of the total measured result based on prevailing winds and upwind TEOM monitoring results.

21/11/2018	Warkworth TEOM	60.0	18.6 µg/m3 Or 31.0%	An internal investigation determined HVO maximum potential contribution to be in the order of 18.6ug/m3 or 31.0% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
21/11/2018	Maison DIeu	62.0	20.6 µg/m3 Or 33.2%	An internal investigation determined HVO maximum potential contribution to be in the order of 20.6ug/m3 or 33.2% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
22/11/2018	Warkworth TEOM	155.9	44.6 µg/m3 Or 28.6%	An internal investigation determined HVO maximum potential contribution to be in the order of 44.6ug/m3 or 28.6% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
22/11/2018	Maison Dieu TEOM	180.7	69.4 µg/m3 Or 38.4%	An internal investigation determined HVO maximum potential contribution to be in the order of 69.4ug/m3 or 38.4% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
22/11/2018	Knodlers Lane TEOM	149.6	38.3 µg/m3 Or 25.6%	An internal investigation determined HVO maximum potential contribution to be in the order of 38.3ug/m3 or 25.6% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
23/11/2018	Masion Dieu TEOM	142.3	71.4 µg/m3 Or 50.2%	An internal investigation determined HVO maximum potential contribution to be in the order of 71.4ug/m3 or 50.2% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
23/11/2018	Warkworth TEOM	103.8	33.0µg/m3 Or 31.7%	Although average wind direction on this day was out of the arc of influence, wind was generally from the direction of HVO to the monitor, as such an internal investigation determined HVO maximum potential contribution to be in the order of

				33.0ug/m3 or 31.7% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.
23/11/2018	Knodlers Lane TEOM	112.2	41.3 µg/m3 Or 36.8%	An internal investigation determined HVO maximum potential contribution to be in the order of 41.3ug/m3 or 36.8% of the total measured based on prevailing wind conditions and upwind TEOM monitoring results.

3.0 WATER QUALITY

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

3.1.1 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 December 2018 report.

3.1.2 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 251ML of water from the Hunter River.

3.1.3 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

3.2.1 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 December 2018 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 15.

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 November, 19 blasts were initiated at HVO Figure 10 through to Figure 14 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 3.

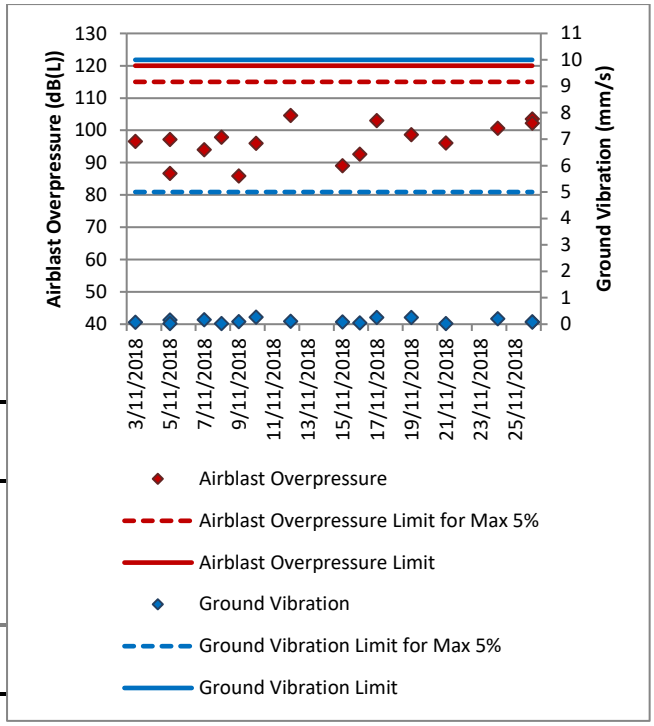

Figure 10: Moses Crossing Blast Monitoring Results – November 2018

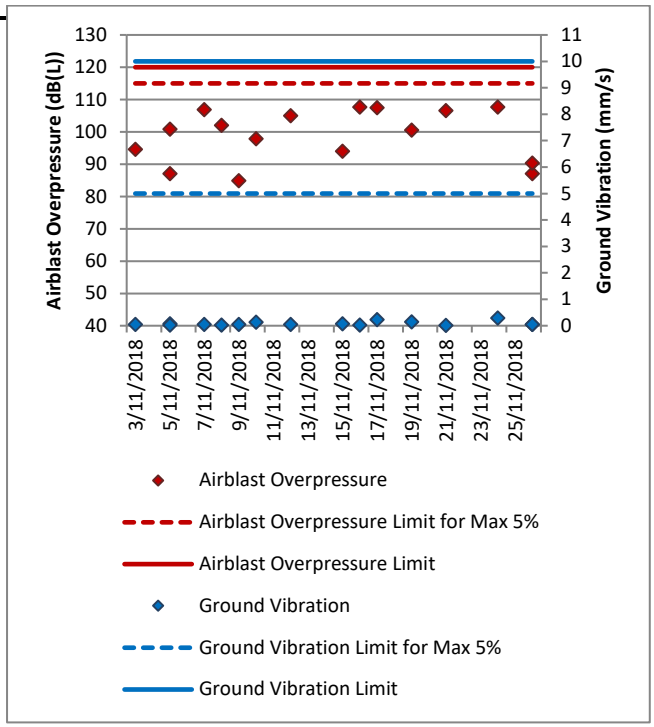

Figure 11: Jerrys Plains Blast Monitoring Results – November 2018

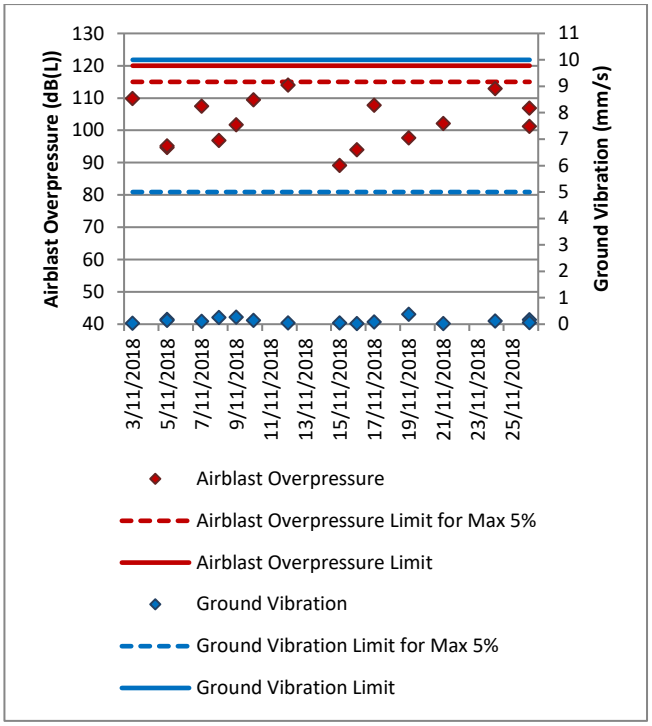

Figure 12: Maison Dieu Blast Monitoring Results – November 2018

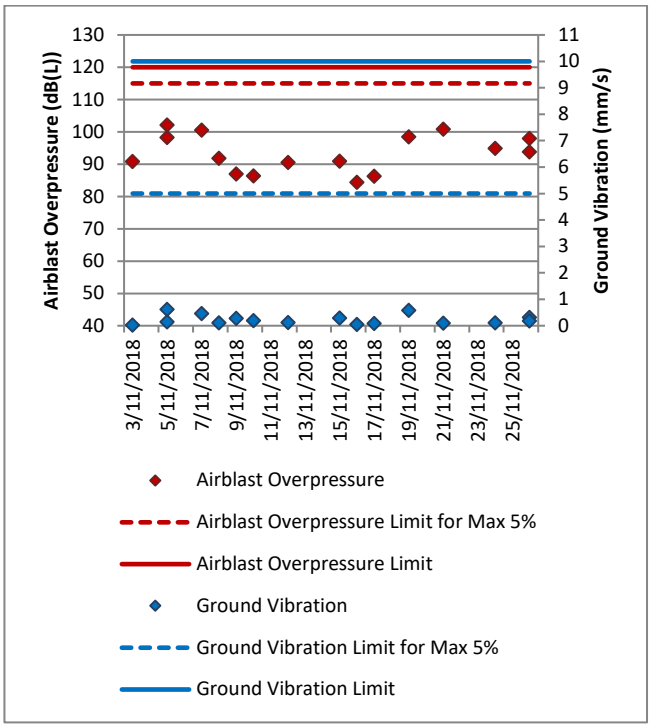

Figure 13: Warkworth Blast Monitoring Results – November 2018

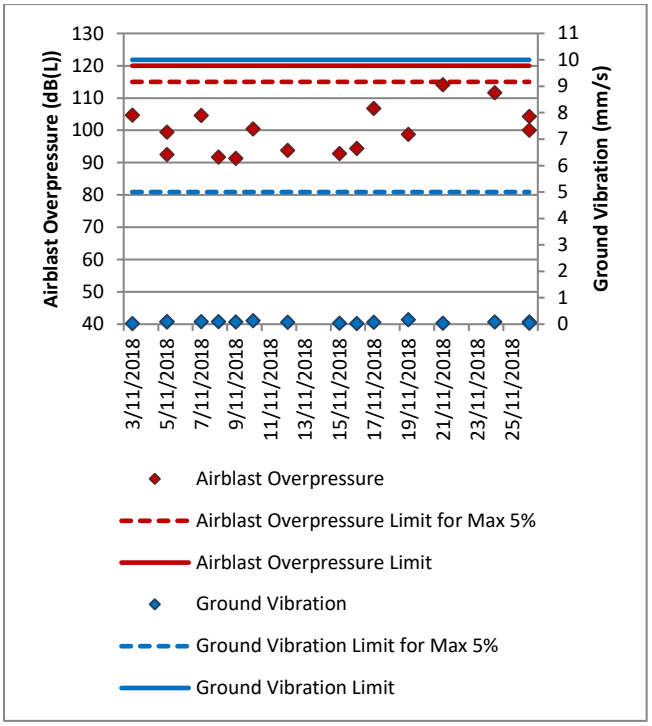

Figure 14: Knodlers Lane Blast Monitoring Results – November 2018

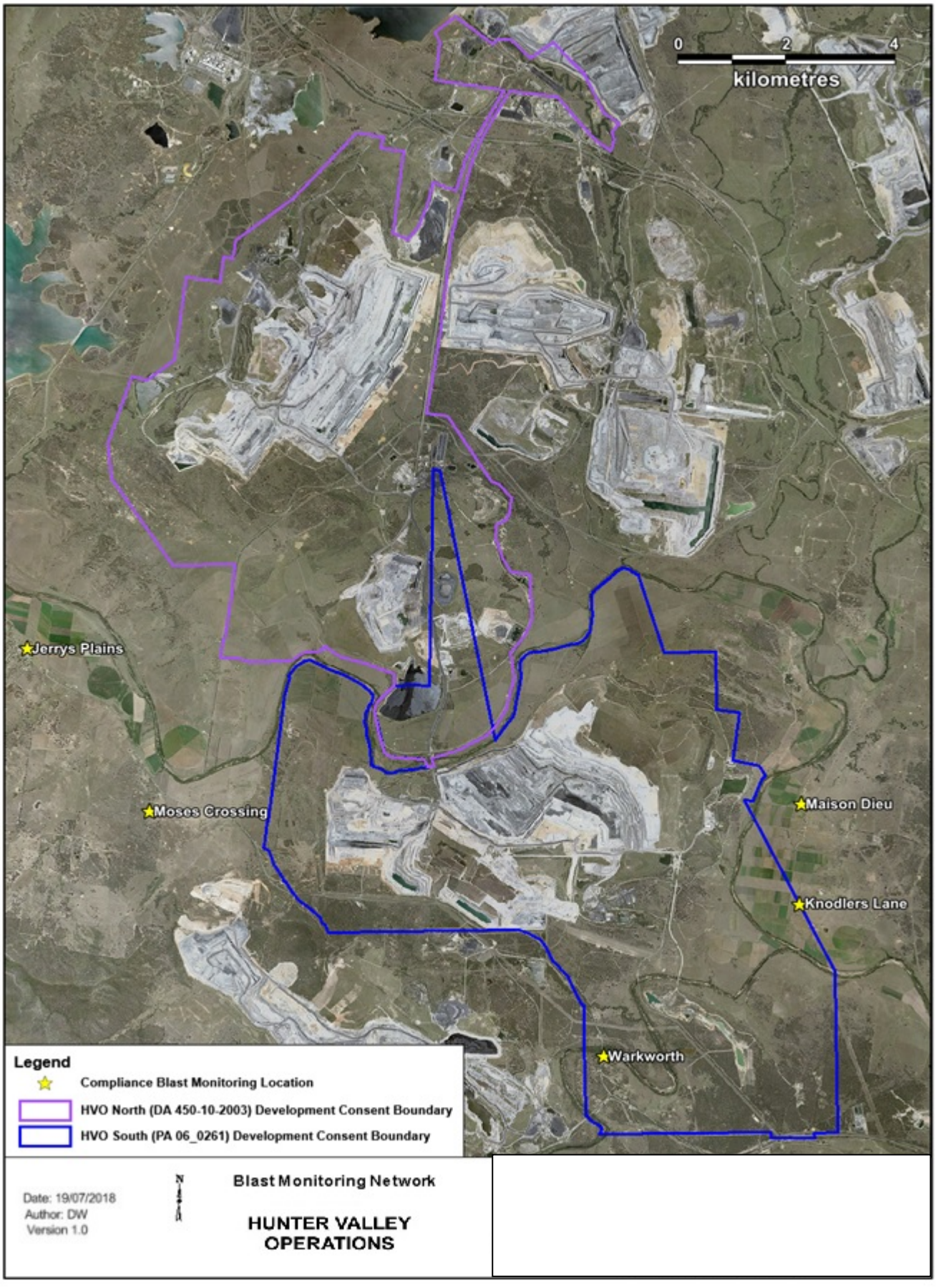

Figure 15: Blast Monitoring Location Plan

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 16.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of 1-2 November 2018. Monitoring results are detailed in Table 4 to Table 9 . During November attended noise monitoring, noise levels complied with the relevant development consent noise limits at all monitoring locations.

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m [1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4, 5]
Knodlers Lane	1/11/2018 21:42	2.1	3.0	37	No	33	NA
Maison Dieu	1/11/2018 21:21	2.0	0.5	37	Yes	<30	Nil
Shearers Lane	1/11/2018 21:00	2.1	-1.0	41	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	36	Yes	IA	Nil
Jerrys Plains Village	1/11/2018 21:23	2.0	0.5	35	Yes	IA	Nil
Jerrys Plains East	1/11/2018 21:00	2.1	-1.0	35	Yes	IA	Nil
Long Point	1/11/2018 23:07	2.0	0.5	35	Yes	IA	Nil
HVGC	1/11/2018 23:43	2.0	0.5	55	Yes	37[6]	Nil

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 inversion conditions of up to 3 degrees/100m (at a height of 10m). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. Result includes the application of a low frequency penalty determined in Table 4.2 of attended monitoring report.

Table 5: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	1/11/2018 21:42	2.1	3.0	41	No	33	NA
Maison Dieu	1/11/2018 21:21	2.0	0.5	41	Yes	<30	Nil
Shearers Lane	1/11/2018 21:00	2.1	-1.0	41	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	41	Yes	IA	Nil
Jerrys Plains Village	1/11/2018 21:23	2.0	0.5	40	Yes	IA	Nil
Jerrys Plains East	1/11/2018 21:00	2.1	-1.0	40	Yes	IA	Nil
Long Point	1/11/2018 23:07	2.0	0.5	40	Yes	IA	Nil
HVGC	1/11/2018 23:43	2.0	0.5	NA	NA	37[6]	NA

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 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 may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
6. Result includes the application of a low frequency penalty determined in Table 4.2 of attended monitoring report.

Table 6: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	1/11/2018 21:42	2.1	3.0	45	No	37	NA
Maison Dieu	1/11/2018 21:21	2.0	0.5	45	Yes	33	Nil
Shearers Lane	1/11/2018 21:00	2.1	-1.0	45	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	45	Yes	IA	Nil
Jerrys Plains Village	1/11/2018 21:23	2.0	0.5	45	Yes	IA	Nil
Jerrys Plains East	1/11/2018 21:00	2.1	-1.0	45	Yes	IA	Nil
Long Point	1/11/2018 23:07	2.0	0.5	45	Yes	IA	Nil
HVGC	1/11/2018 23:43	2.0	0.5	NA	NA	42	NA

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 may or may 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 7: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	1/11/2018 21:42	1.4	0.5	35	Yes	IA	Nil
Maison Dieu	1/11/2018 21:21	1.2	0.5	35	Yes	IA	Nil
Shearers Lane	1/11/2018 21:00	0.8	3.0	35	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	39	Yes	31	Nil
Jerrys Plains Village	1/11/2018 21:23	1.2	0.5	36	Yes	32	Nil
Jerrys Plains East	1/11/2018 21:00	0.8	3.0	39	Yes	<25	Nil
Long Point	1/11/2018 23:07	2.0	0.5	35	Yes	IA	Nil
HVGC	1/11/2018 23:43	0.2	3.0	NA	NA	IA	NA

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 may or may 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 8: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	1/11/2018 21:42	1.4	0.5	41	Yes	IA	Nil
Maison Dieu	1/11/2018 21:21	1.2	0.5	41	Yes	IA	Nil
Shearers Lane	1/11/2018 21:00	0.8	3.0	41	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	41	Yes	31	Nil
Jerrys Plains Village	1/11/2018 21:23	1.2	0.5	41	Yes	32	Nil
Jerrys Plains East	1/11/2018 21:00	0.8	3.0	41	Yes	<25	Nil
Long Point	1/11/2018 23:07	2.0	0.5	41	Yes	IA	Nil
HVGC	1/11/2018 23:43	0.2	3.0	NA	NA	IA	NA

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 may or may 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;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;

Table 9: $L_{A1,\ 1Minute}$ HVO North - Impact Assessment Criteria – November 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	1/11/2018 21:42	1.4	0.5	46	Yes	IA	Nil
Maison Dieu	1/11/2018 21:21	1.2	0.5	46	Yes	IA	Nil
Shearers Lane	1/11/2018 21:00	0.8	3.0	46	Yes	IA	Nil
Kilburnie South	1/11/2018 23:02	1.6	0.5	46	Yes	36	Nil
Jerrys Plains Village	1/11/2018 21:23	1.2	0.5	46	Yes	42	Nil
Jerrys Plains East	1/11/2018 21:00	0.8	3.0	46	Yes	28	Nil
Long Point	1/11/2018 23:07	2.0	0.5	46	Yes	IA	Nil
HVGC	1/11/2018 23:43	0.2	3.0	NA	NA	IA	Nil

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 may or may 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;
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 November 2018 one measurement at the HVGC required the penalty to be applied however remained compliant. The assessment for low frequency noise is shown in Table 10.

Table 10: Low Frequency Noise Assessment – November 2018

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site Only LC_{eq}-LA_{eq} dB [1,2] (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A) [1]
Knodlers Lane	1/11/2018 21:42	33/IA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	1/11/2018 21:21	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	1/11/2018 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	1/11/2018 23:02	IA/31	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	1/11/2018 21:23	IA/32	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	1/11/2018 21:00	IA/<25	NA/NA	NA/NA	NA/NA	NA/NA
Long Point	1/11/2018 23:07	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	1/11/2018 23:43	35/IA	54/NA	19/NA	1/NA	2/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 LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of the attended noise report;
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.

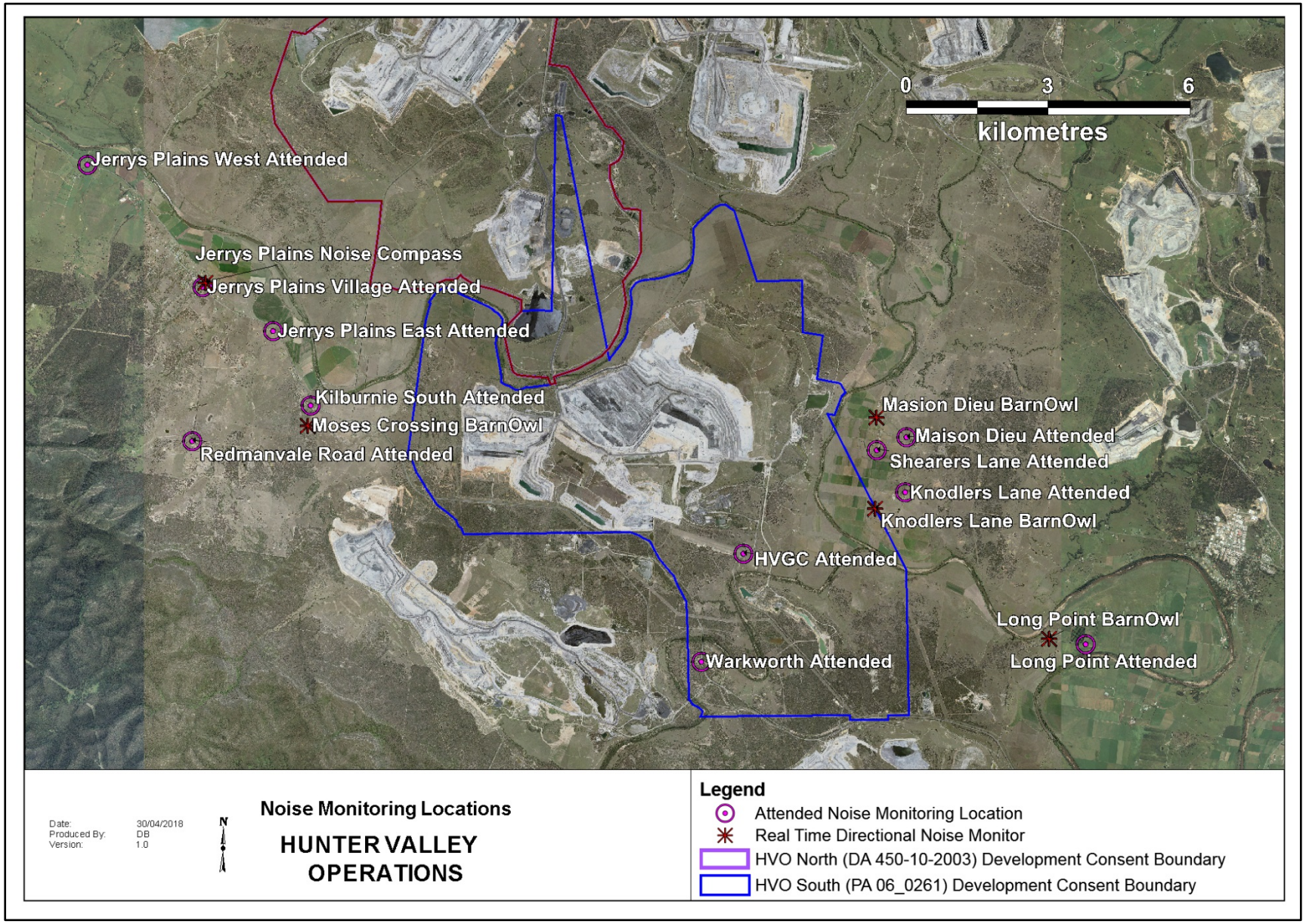

Figure 16: Noise Monitoring Location Plan

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 November, a total of 2211 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 17.

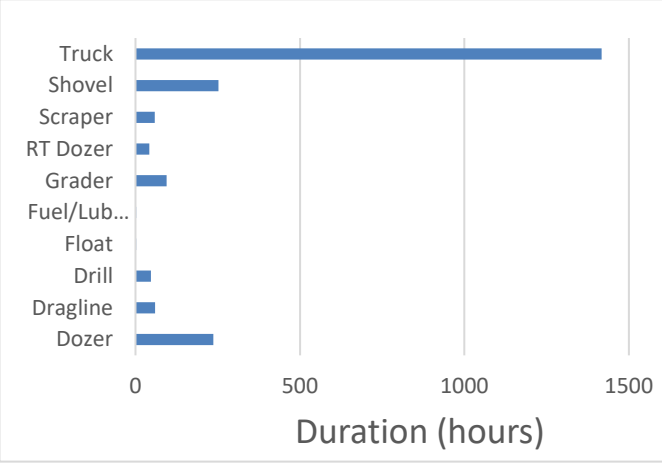

Figure 17: Operational Downtime by Equipment Type – November 2018

7.0 REHABILITATION

During November 4.7 Ha of land was released, 10.4 Ha of land was bulk shaped and 12.5 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 18.

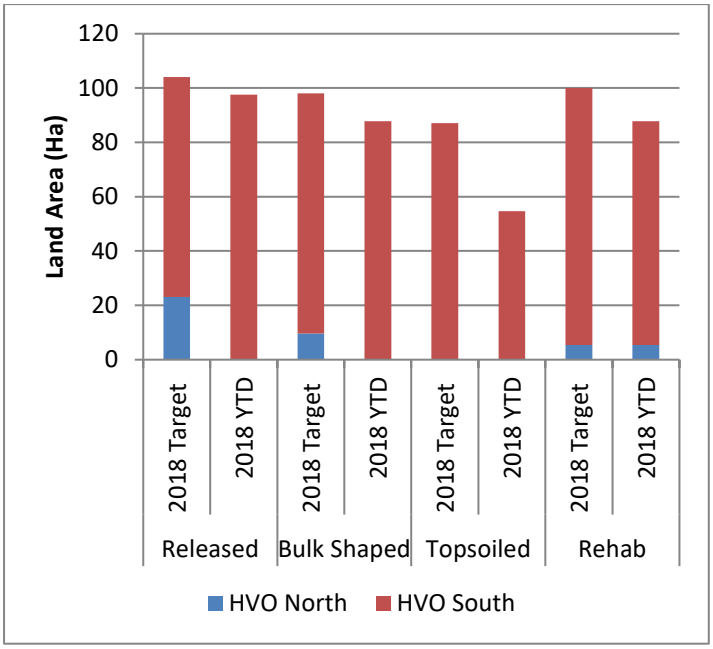

Figure 18: Rehabilitation YTD – November 2018

8.0 COMPLAINTS

Two complaints were received during the reporting period. Details of complaints received YTD are shown in Table 11 below.

Table 11: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	2	4	-	-	6
February	1	-	-	-	1	2
March	-	-	-	-	-	0
April	-	-	1	-	-	1
May	4	1	2	-	-	7
June	1	-	1	-	1	3
July	-	-	2	-	-	2
August	1	-	-	-	-	1
September	1	-	-	-	-	1
October	-	-	-	-	-	0
November	-	2	-	-	-	2
December	-	-	-	-	-	-
Total	8	5	10	-	2	25

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were three recordable environmental incidents;

11 November 2018 – Mine water leak from secondary floc plant

The North Void secondary floc plant water storage tanks overflowed due to a faulty auto valve that failed to close when tanks where full. The water was all contained onsite. Immediate actions included isolation of the leaking tank and repair of the faulty valve.

17 November 2018 – GDP non compliance

As part of replacement of 330KV high voltage, transmission tower being performed by the easement holder in the Goat West Rehabilitation area a transmission tower foundation material stockpile was established outside the ground disturbance boundary defined in the Ground Disturbance Permit (GDP). The HVO Environment Team inspected the area and had installed sediment control measures around the material.

21 November 2018 – Oil Spill from Truck

Truck 407 was identified in West Pit to have a blown a steering hose causing a minor oil leak. The oil was contained and cleaned up and the truck was taken for repairs.

Appendix A: Meteorological Data

Table 12: Meteorological Data - HVO Corporate Meteorological Station – November 2018

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/11/2018	34	22	67	18	1048	204	2.4	0.0
2/11/2018	35	22	65	10	1483	297	5.7	0.0
3/11/2018	35	16	82	14	1091	249	5.3	0.2
4/11/2018	30	15	95	23	1162	126	2.6	0.0
5/11/2018	33	13	100	11	1365	226	2.1	0.0
6/11/2018	36	17	63	9	1303	236	3.1	0.0
7/11/2018	29	15	100	25	492	276	3.6	9.4
8/11/2018	22	8	100	23	1368	190	2.9	7.4
9/11/2018	24	7	87	21	1225	147	1.8	0.0
10/11/2018	26	9	83	14	1356	132	2.5	0.0
11/11/2018	28	9	100	16	1047	123	2.6	0.0
12/11/2018	27	10	90	29	1029	122	3.3	0.0
13/11/2018	29	10	89	11	1292	117	2.3	0.0
14/11/2018	26	13	89	36	1064	200	1.7	0.0
15/11/2018	31	12	100	18	1271	195	3.6	4.0
16/11/2018	20	10	100	65	1182	126	3.3	0.0
17/11/2018	24	12	90	42	1518	119	3.6	0.0
18/11/2018	23	10	99	33	1563	114	4.4	0.2
19/11/2018	27	10	89	27	1267	121	3.1	0.0
20/11/2018	33	11	80	20	1160	NAN	1.9	0.0
21/11/2018	28	16	87	40	1129	NAN	5.3	0.2
22/11/2018	25	15	76	4	1215	288	7.3	0.0
23/11/2018	23	11	45	16	1357	279	7.9	0.0
24/11/2018	26	10	44	13	1164	283	5.4	0.0
25/11/2018	28	12	74	12	1548	245	4.2	0.0
26/11/2018	28	10	80	18	1445	162	2.7	0.0
27/11/2018	31	10	98	15	1369	137	2.1	0.8
28/11/2018	26	11	100	35	1496	188	3.3	52.4
29/11/2018	24	11	80	39	1677	139	3.1	0.0
30/11/2018	28	11	86	26	1537	185	1.4	0.0

"-" Indicates that data was not available due to technical issues.