



Managed by Rio Tinto Coal Australia

Hunter Valley Operations

Monthly Environmental Report

May 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	23/06/2017
1.0	Environmental Specialist	Final	29/06/2017

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 May to 31st May 2017.

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 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
May	19.6	313.4

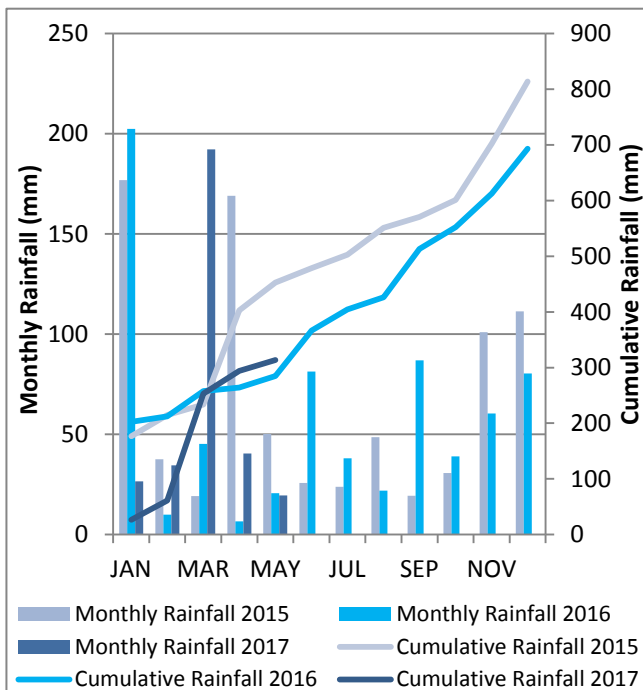


Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

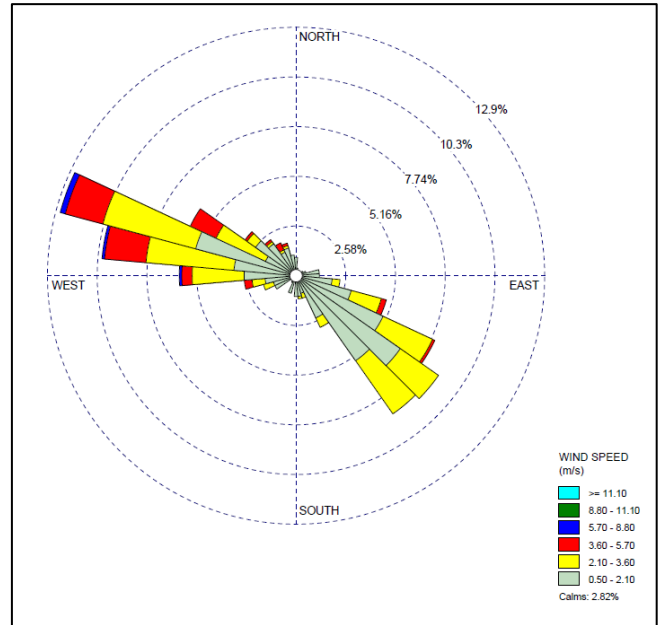


Figure 2: HVO Corporate Wind Rose – May 2017

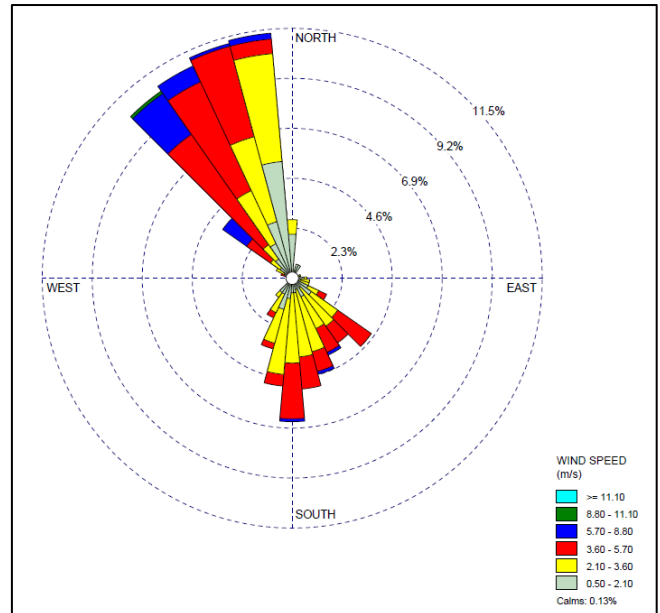


Figure 3: HVO Cheshunt Wind Rose – May 2017

Hunter Valley Operations
Air Quality Monitoring Locations

Date: 160223
Plan By: DF
Version: 1.1

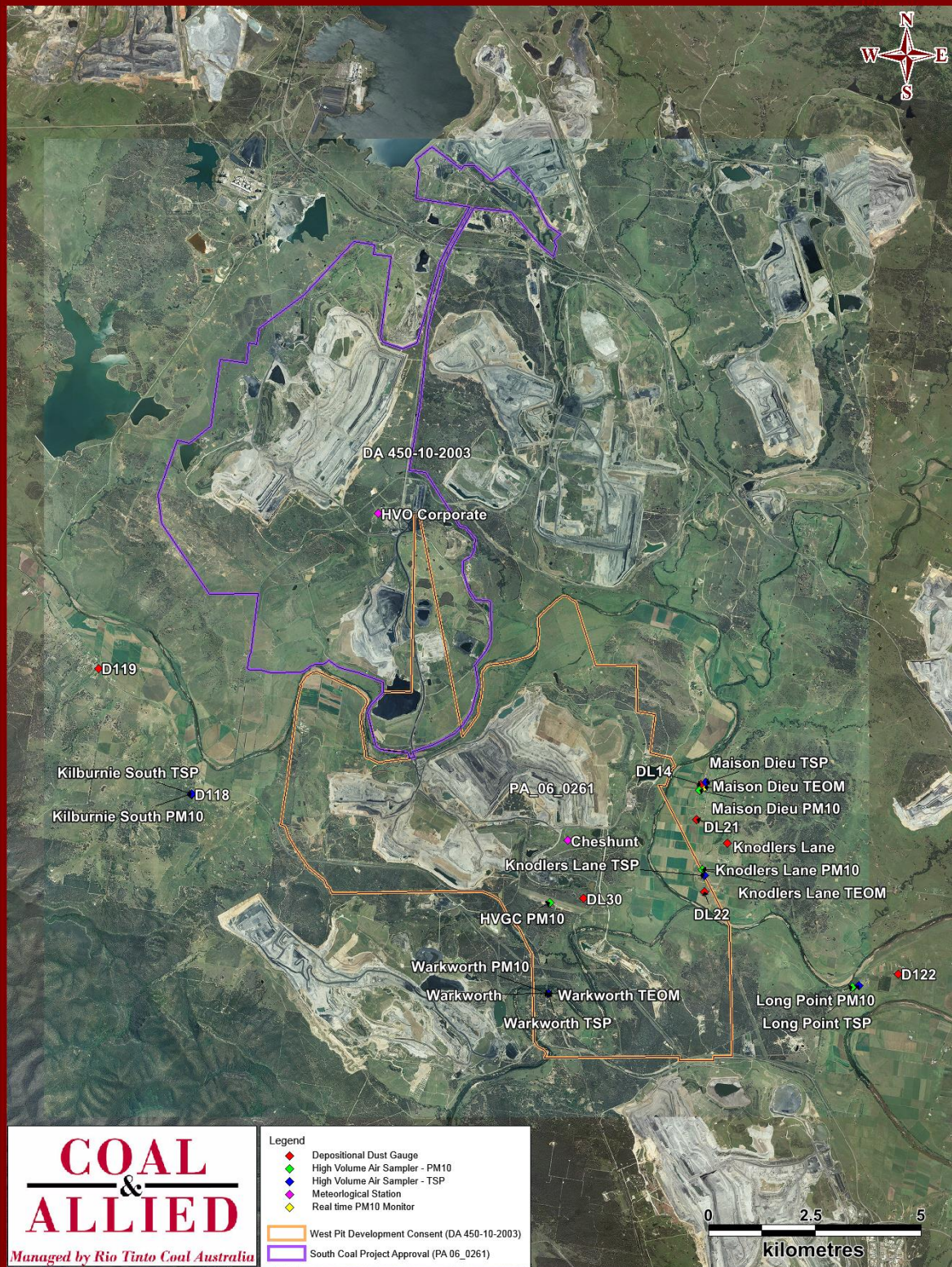


Figure 4: Air Quality Monitoring Location Plan

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 D118, DL30 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month. There is no evidence to suggest that the D118, DL30 or Warkworth results are contaminated. Accordingly, this result will be included in the annual average calculation.

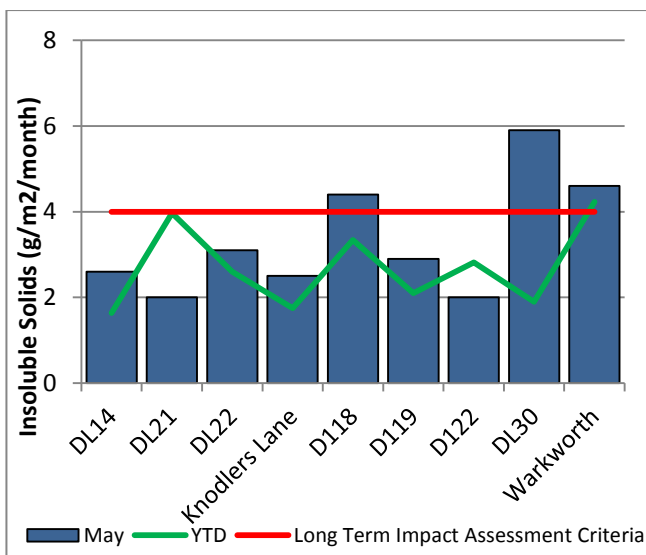


Figure 5: Depositional Dust Results – May 2017

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 location of these monitors can be found in Figure 4. Each HVAS was run for 24 hours on a six-day cycle in accordance with EPA requirements.

2.3.1 HVAS PM₁₀ Results

Figure 6 shows individual PM₁₀ results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

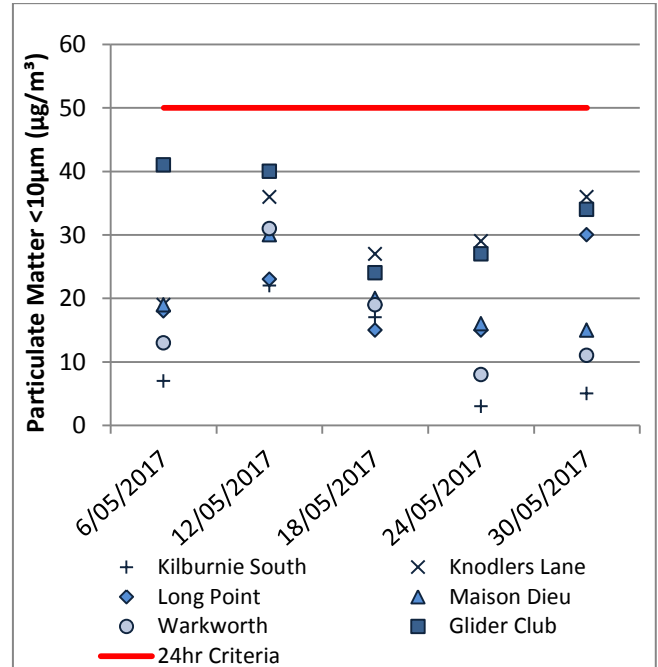


Figure 6: Individual PM₁₀ Results – May 2017

Figure 7 shows the annual average PM₁₀ results.

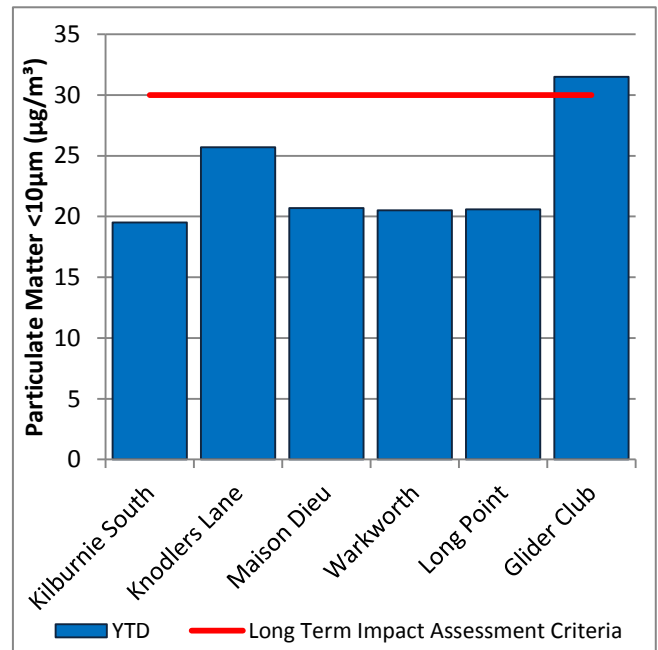


Figure 7: Year To Date Average PM₁₀ – May 2017

2.3.2 TSP Results

Figure 8 shows the annual average TSP results compared against the long term impact assessment criteria of $90\mu\text{g}/\text{m}^3$.

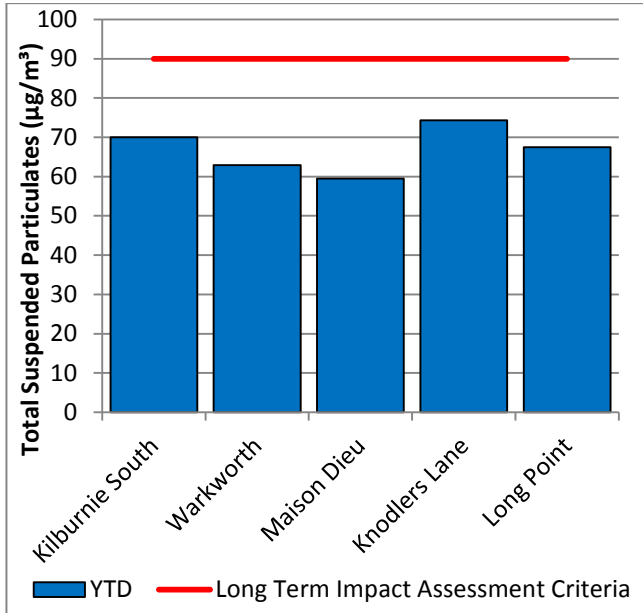


Figure 8: Year To Date Average Total Suspended Particulates - May 2017

2.3.3 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 ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Error! Reference source not found., including the daily 24 hour average PM₁₀ result and the 24 hour YTD PM₁₀ average. There were no results recorded which exceeded the short term (24hr) criteria in the approvals.

2.3.4 Real Time Alarms for Air Quality

During May, the real time monitoring system generated 14 automated air quality related alarms. 4 alarms were related to adverse weather conditions and 10 alarms related to PM₁₀.

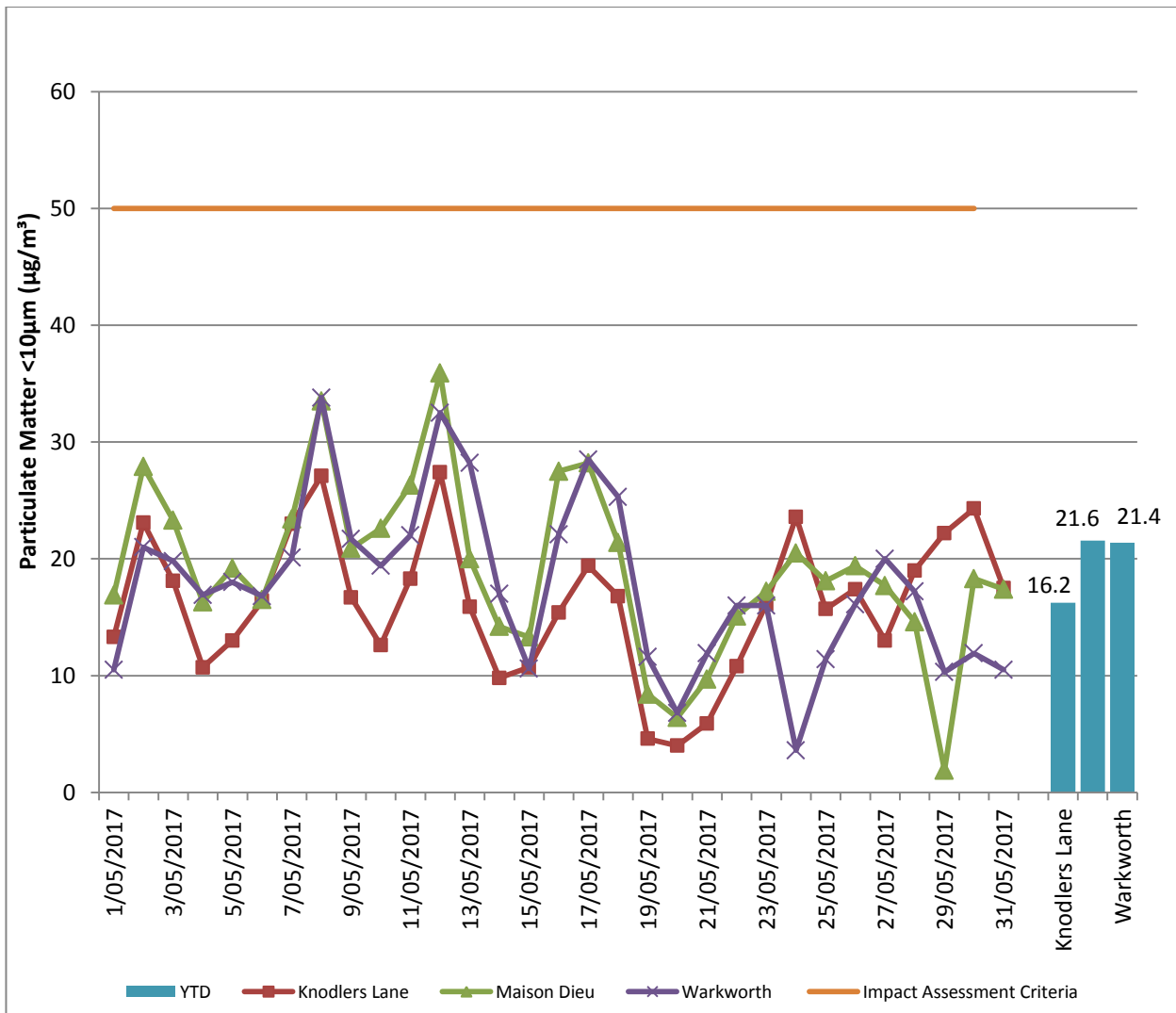


Figure 9: Real Time PM₁₀ 24hr average and YTD Average – May 2017

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 June 2017 report.

3.1.2 Site Water Use

Under water allocation licences issued by the NSW Office Of Water, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO did not extract any 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 June 2017 monthly report.

4.0 BLAST MONITORING

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.

During May, 29 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 2.

Table 2: Blasting Limits

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

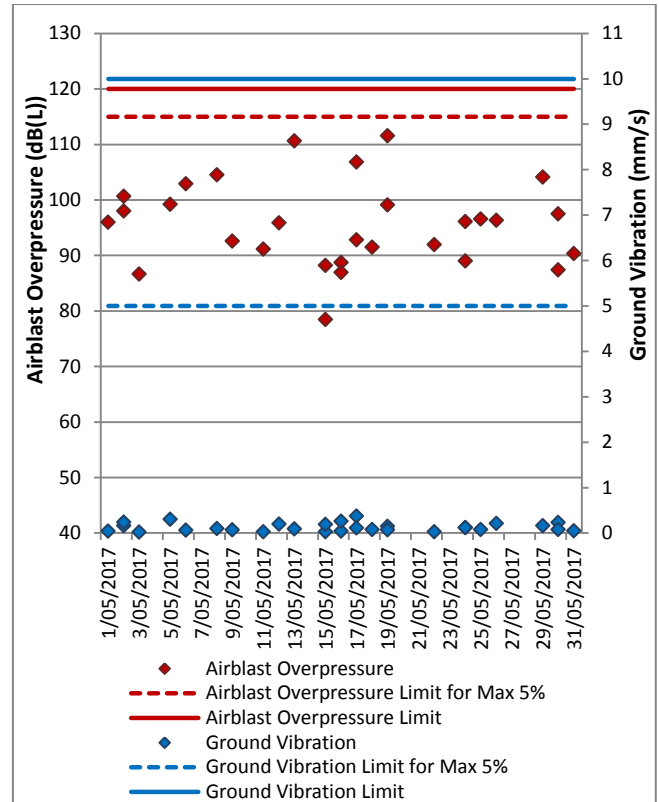


Figure 10: Moses Crossing Blast Monitoring Results – May 2017

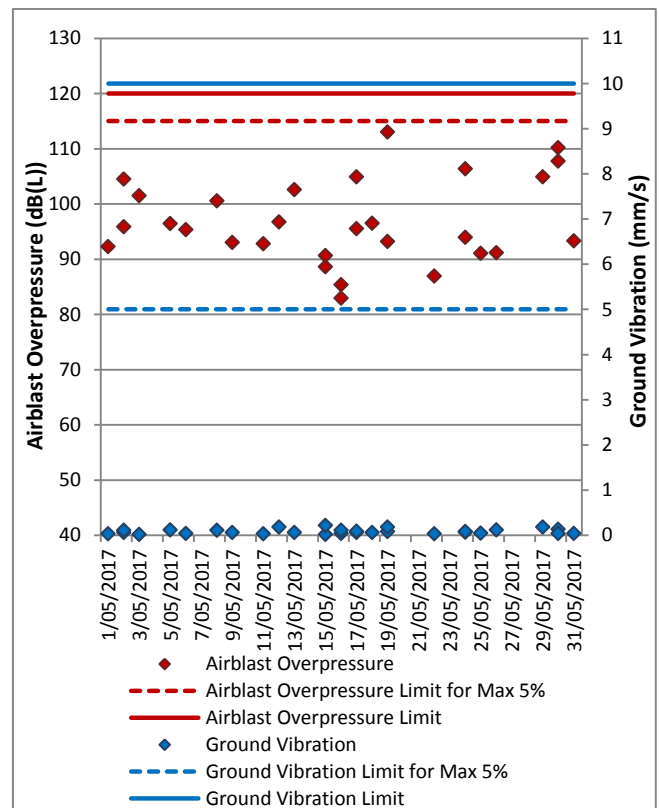


Figure 11: Jerrys Plains Blast Monitoring Results – May 2017

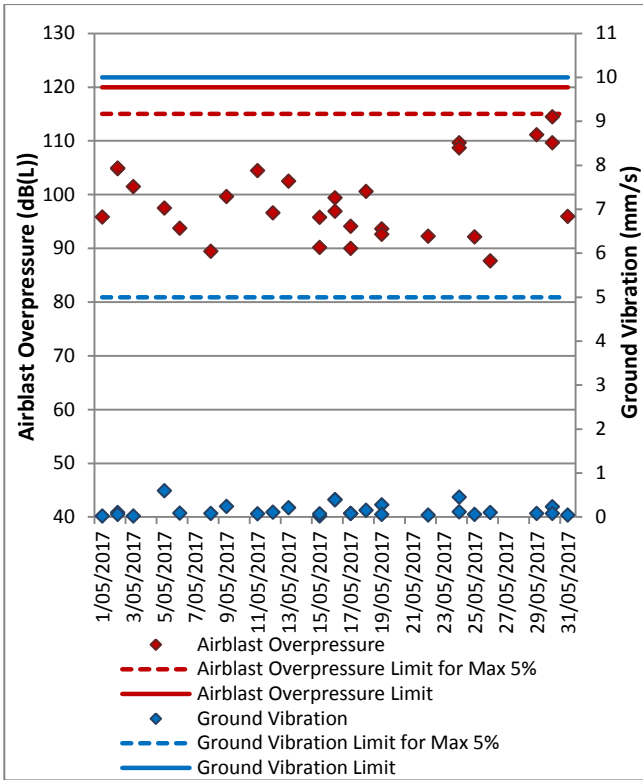


Figure 12: Maison Dieu Blast Monitoring Results – May 2017

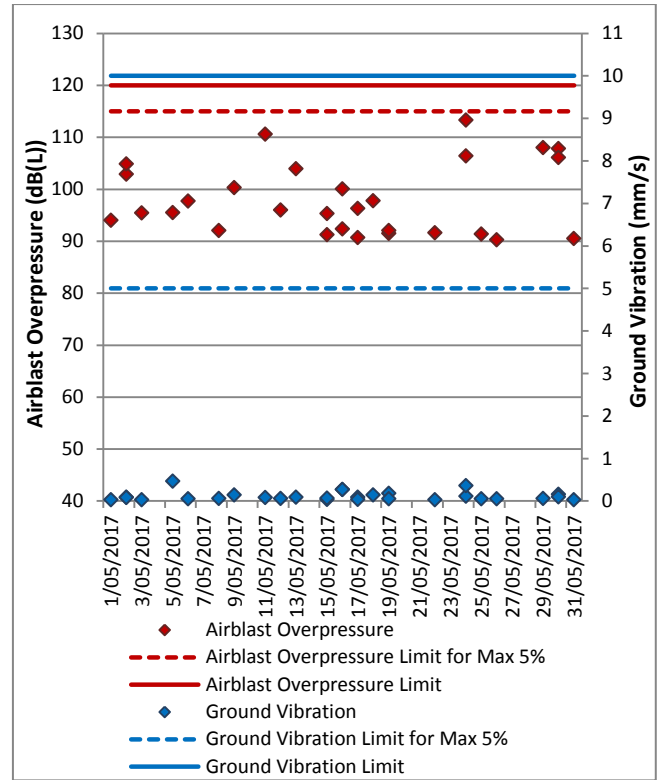


Figure 14: Knodlers Lane Blast Monitoring Results – May 2017

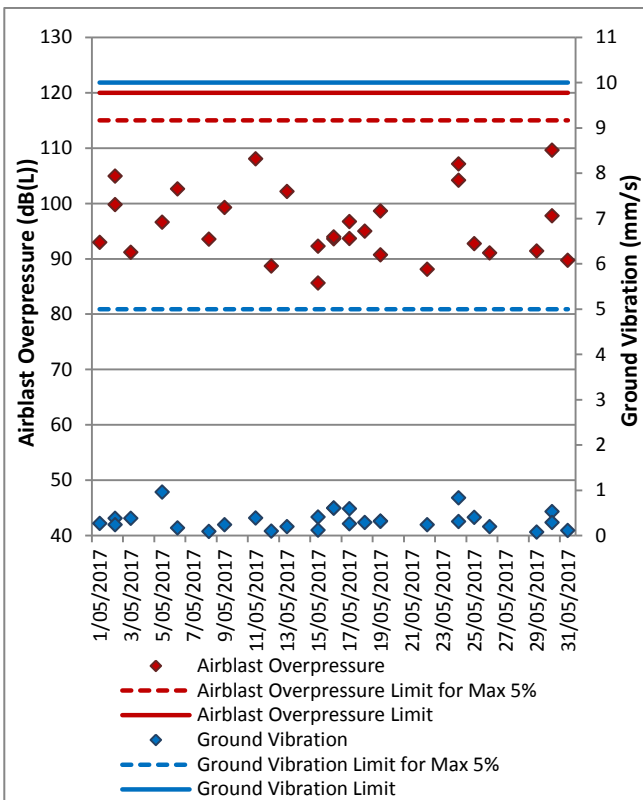


Figure 13: Warkworth Blast Monitoring Results - May 2017



RTCA - NSW Environmental Services

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 nights of 15th and 18th of May 2017. Monitoring results are detailed in Table 3 to

Table 8.

Table 3: L_{Aeq, 15 minute} HVO South - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	37	Yes	29	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	37	Yes	26	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	36	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	36	No	32	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	35	Yes	28	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	35	No	30	NA
Long Point Road	18/05/2017 21:02	3.6	-1	35	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	55	Yes	46	Nil

Table 4: L_{Aeq, 15 minute} HVO South - Land Acquisition Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	41	Yes	29	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	41	Yes	26	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	36	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	41	No	32	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	40	Yes	28	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	40	No	30	NA
Long Point Road	18/05/2017 21:02	3.6	-1	40	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	46	NA

Table 5: L_{A1, 1minute} HVO South - Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO South L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	45	Yes	35	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	45	Yes	32	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	45	Yes	43	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	45	No	39	NA
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	45	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	45	No	33	NA
Long Point Road	18/05/2017 21:02	3.6	-1	45	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	60	NA

Notes

1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);

2. Estimated or measured L_{Aeq,15minute} dB attributed to HVO South Pit Area;

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

4. Bolded results in red indicate exceedance of criteria;

5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;

6. Criterion may or may not apply due to rounding of meteorological data values

Table 6: L_{Aeq, 15minute} HVO North – Impact Assessment Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	35	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	35	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	35	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	39	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	36	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	39	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	35	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Table 7: L_{Aeq,15minute} HVO North - Land Acquisition Criteria – May 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	41	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	41	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	41	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	41	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	41	Yes	30	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	41	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	41	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Table 8: LA_{1, 1Minute} HVO North - Impact Assessment Criteria – May 2017

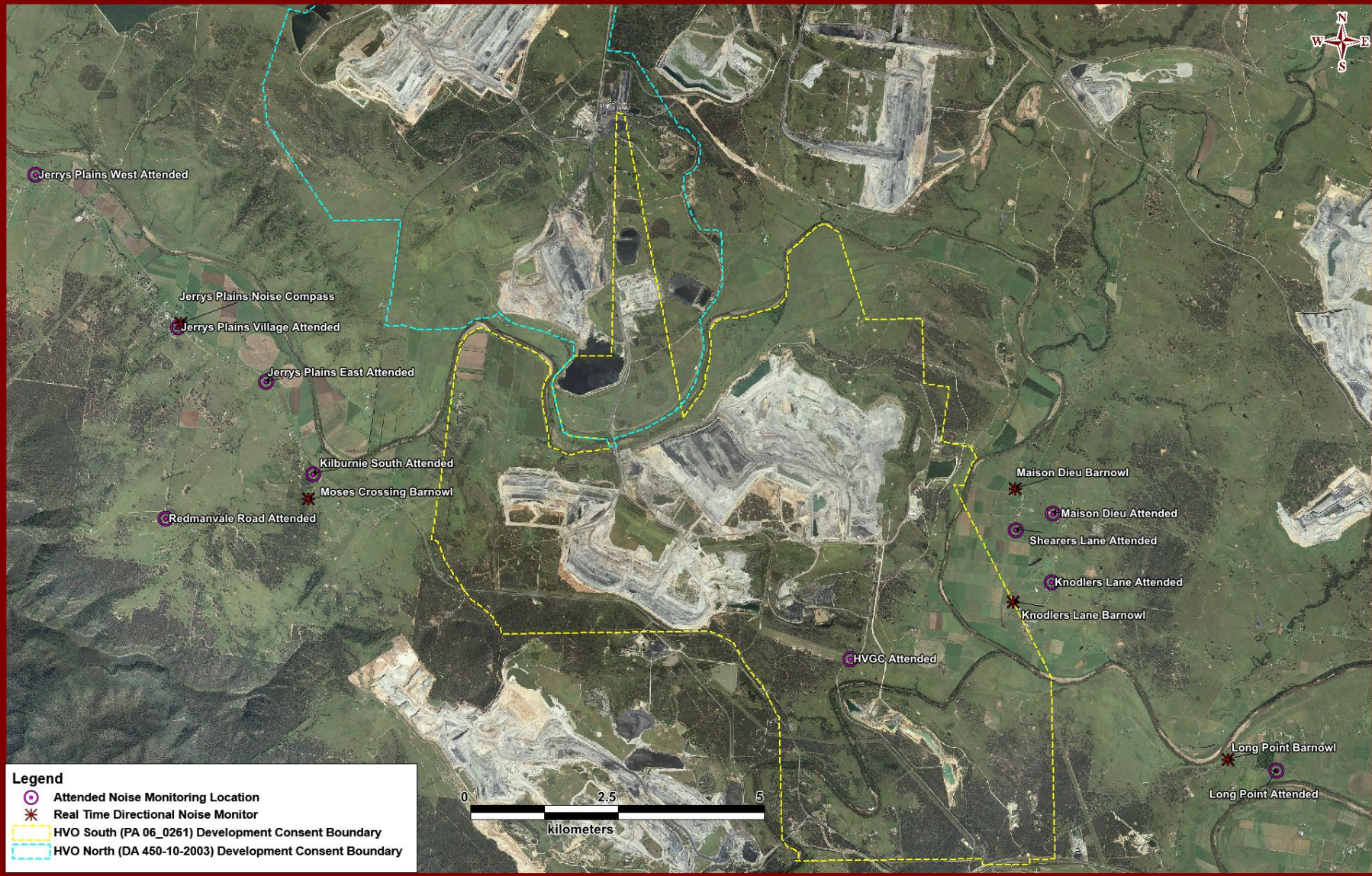
Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB	Criterion Applies? ^{1,6}	HVO North LA _{1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	15/05/2017 21:00	1.3	0.5	46	Yes	IA	Nil
Maison Dieu	15/05/2017 21:23	0.9	0.5	46	Yes	IA	Nil
Shearers Lane	15/05/2017 21:44	2.1	-1	46	Yes	IA	Nil
Kilburnie South	15/05/2017 22:48	1.5	3	46	Yes	IA	Nil
Jerrys Plains Village	15/05/2017 21:53	2.1	-1	46	Yes	34	Nil
Jerrys Plains East	15/05/2017 21:31	1.3	3	46	Yes	NM	Nil
Long Point Road	18/05/2017 21:02	3.6	-1	46	No	IA	NA
HVGC	15/05/2017 21:03	1.3	0.5	NA	NA	IA	NA

Notes

1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured L_{Aeq,15minute} dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values

Hunter Valley Operations
Noise Monitoring Locations

Date: 161027
Plan By: DF
Version: 2.0



RTCA - NSW Environmental Services

Figure 16: Noise Monitoring Location Plan

5.2 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.

HVO's Planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "*seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time*".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in Section 6.1, 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 May, a total of 13.9 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.

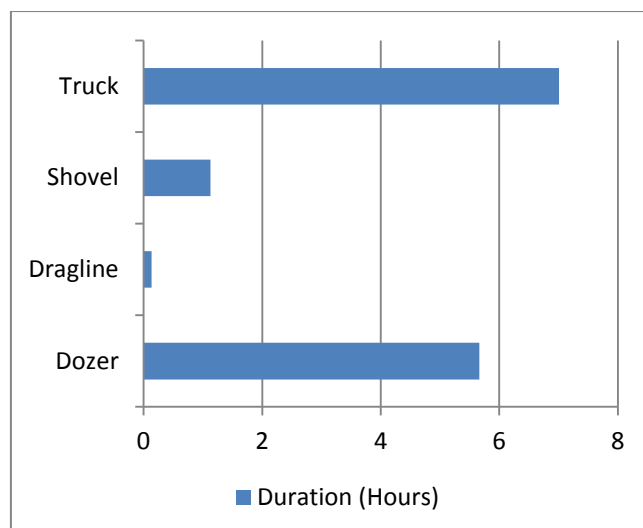


Figure 17: Operational Downtime by Equipment Type – May 2017

7.0 REHABILITATION

During May, 17.1 Ha of land was released, 14.9 Ha of land was bulk shaped and 8.7 Ha of land was topsoiled. Year to date progress can be viewed in Figure 18.

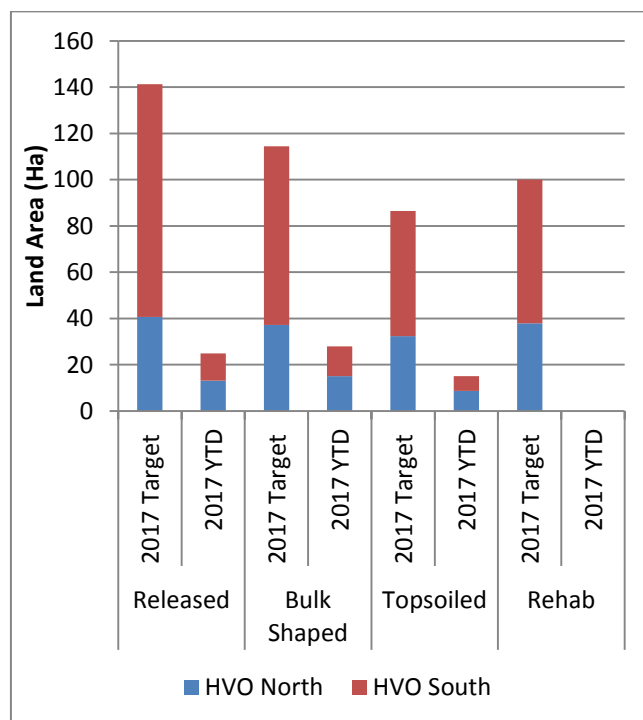


Figure 18: Rehabilitation YTD - May 2017

8.0 COMPLAINTS

Two complaints were received during the reporting period. Details of complaints received YTD are shown in Figure 19 below.

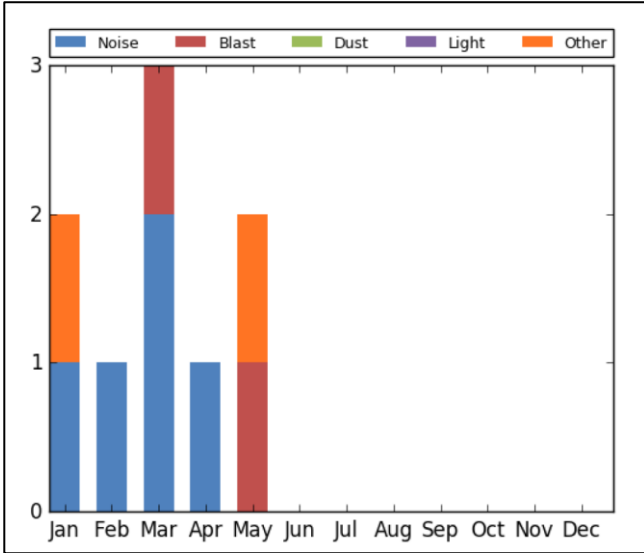


Figure 19: Complaints Graph – May 2017

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 9: Meteorological Data - HVO Corporate Meteorological Station – May 2017

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)
1/05/2017	21.9	7.3	100.0	47.3	817	159.9	1.3	0.0
2/05/2017	23.9	8.7	100.0	48.8	862	246.5	1.6	0.0
3/05/2017	25.0	11.7	81.9	34.0	627	240.0	2.3	0.0
4/05/2017	18.3	9.8	88.1	60.0	1010	131.7	2.5	0.0
5/05/2017	19.5	9.0	89.6	56.6	889	128.5	2.4	0.0
6/05/2017	21.3	6.2	100.0	42.5	636	174.7	1.0	0.0
7/05/2017	23.4	6.9	100.0	38.4	726	270.5	1.9	0.2
8/05/2017	22.8	8.5	72.4	25.5	627	242.2	2.8	0.0
9/05/2017	19.6	5.1	82.3	41.5	613	160.7	1.6	0.0
10/05/2017	20.0	6.7	89.4	41.7	652	109.6	1.4	0.0
11/05/2017	20.7	5.5	100.0	37.7	610	186.7	1.0	0.0
12/05/2017	21.5	4.4	100.0	33.4	578	196.1	1.3	0.0
13/05/2017	18.4	7.8	100.0	70.0	725	169.6	1.1	1.0
14/05/2017	20.1	8.4	100.0	63.3	807	146.1	0.8	0.0
15/05/2017	20.0	9.7	100.0	64.3	766	173.8	1.5	0.2
16/05/2017	19.8	9.1	100.0	51.3	761	250.5	1.7	0.2
17/05/2017	22.1	6.8	100.0	28.3	578	220.2	1.8	0.2
18/05/2017	20.4	4.3	100.0	41.7	572	174.0	1.3	0.0
19/05/2017	20.5	7.0	100.0	58.6	641	156.5	1.7	0.0
20/05/2017	17.8	10.6	100.0	84.7	814	132.1	1.8	13.4
21/05/2017	21.8	11.5	100.0	68.6	838	224.9	1.6	3.6
22/05/2017	22.8	12.1	100.0	63.1	827	193.3	1.4	0.2
23/05/2017	21.3	11.7	99.7	62.0	852	124.2	1.3	0.0
24/05/2017	21.9	10.7	100.0	58.8	702	265.9	1.7	0.0
25/05/2017	-	-	-	-	-	-	-	-
26/05/2017	21.0	6.2	84.8	38.2	820	269.9	2.8	0.0
27/05/2017	19.9	5.1	93.4	45.5	557	210.0	2.0	0.0
28/05/2017	20.9	4.6	100.0	51.2	534	210.1	1.0	0.0
29/05/2017	21.2	6.4	100.0	48.3	747	283.5	2.9	0.6
30/05/2017	17.1	4.6	74.4	26.8	558	291.4	3.4	0.0
31/05/2017	15.8	0.1	87.1	34.5	571	288.5	3.3	0.0

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