

## **Hunter Valley Operations**

## Monthly Environmental Report

February 2017

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## **Revision History**

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	23/03/2017
1.0	Acting Environmental Specialist	Final	30/03/2017

## **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 1<sup>st</sup> February to 28<sup>th</sup> February 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)
February	34.6	61.2



Figure 1: Year to Date Rainfall Summary 2017

#### 2.1.2 Wind Speed and Direction

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



Figure 2: HVO Corporate Wind Rose – February 2017



Figure 3: HVO Cheshunt Wind Rose – February 2017



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 D122 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m<sup>2</sup> per month. There is no evidence to suggest that the D122 result is contaminated. Accordingly, this result will be included in the annual average calculation.



Figure 5: Depositional Dust Results – February 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 <10 $\mu$ m (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 in accordance with EPA requirements.

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

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

The Kilburnie South, Maison Dieu, Warkworth and Gliding Club HVAS monitors failed to collect valid samples on the 17th of February due to a power outage (likely related to storm activity).

On 05/02/2017 two HVAS  $PM_{10}$  units recorded results greater than the short term (24hr)  $PM_{10}$  impact assessment criteria; Long Point (57 µg/m<sup>3</sup>) and Gliding Club (60 µg/m<sup>3</sup>).

Investigation indicates that that the likely HVO contribution to the results at Long Point and Gliding Club on the 5<sup>th</sup> February is less than 75%. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

On 11/02/2017 two HVAS  $PM_{10}$  units recorded results greater than the short term (24hr)  $PM_{10}$  impact assessment criteria; Knodlers Lane (58  $\mu g/m^3$ ) and Gliding Club (67  $\mu g/m^3$ ).

Investigation indicates that that the likely HVO contribution to the results at Knodlers Lane and Gliding Club on the 11<sup>th</sup> February is less than 75%. Accordingly, no further action is required.



Figure 6: Individual PM10 Results – February 2017

Figure 7 shows the annual average PM<sub>10</sub> results.



Figure 7: Year To Date Average PM<sub>10</sub> – February 2017

#### 2.3.2 TSP Results

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



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

#### 2.3.3 Real Time PM<sub>10</sub> 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 ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling are shown in Figure 9, including the daily 24 hour average  $PM_{10}$  result and the 24 hour YTD  $PM_{10}$  average. There were three results recorded which exceeded the short term (24hr) criteria in the approvals. A measurement of 50.3µg/m<sup>3</sup> was recorded at the Knodlers Lane TEOM location, a measurement of 61.2 µg/m<sup>3</sup> was recorded at the Maison Dieu TEOM and a measurement of 52.3µg/m<sup>3</sup> was recorded at Warkworth TEOM location on the 12<sup>th</sup> February.

An investigation was undertaken to assess air quality and meteorological conditions on the day, and to assess the maximum potential HVO contribution to the measured result. The investigation determined that HVO's maximum potential contribution to measured levels at Knodlers Lane, Maison Dieu and Warkworth is estimated at less than 75%. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme). Data was not available on the 18<sup>th</sup> February (Maison Dieu) due to technical issues.

#### 2.3.4 Real Time Alarms for Air Quality

During February, the real time monitoring system generated 102 automated air quality related alarms. 27 alarms were related to adverse weather conditions and 75 alarms related to  $PM_{10}$ .



Figure 9: Real Time PM<sub>10</sub> 24hr average and YTD Average – February 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 March 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 March 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 February, 24 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%

During the reporting period one blast exceeded the 115 dB(L) threshold for airblast overpressure. A blast recorded on the 25<sup>st</sup> February at 12:37pm, recorded an elevated airblast overpressure reading of 115.19dB(L) at the Knodlers Lane blast monitoring location. No blasts exceeded the 5mm/s criterion for ground vibration.

## 4.1 Blast Monitoring Results







Figure 11: Jerrys Plains Blast Monitoring Results – February 2017



Figure 12: Maison Dieu Blast Monitoring Results -February 2017



Figure 13: Warkworth Blast Monitoring Results -February 2017



Figure 14: Knodlers Lane Blast Monitoring Results – February 2017

# 150527 Hunter Valley Operations Blast Monitoring Network Date: Plan By: DF Version: 1.0 4. 62 Lerrys Plains Moses Crossing <mark>☆</mark>Maison Dieu Knodlers Lane Warkworth Legend HVO South (PA 06\_0261) Development Consent Boundary HVO North (DA 450-10-2003) Development Consent Boundary kilometres Compliance Blast Monitoring Location **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 night of 9th of February 2017. Monitoring results are detailed in Table 3 to Table 8.

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	VTG <sup>5</sup>	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO South L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2	3	37	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	37	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	41	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	36	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	35	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	35	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	35	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	55	No	32	NA

Table 3: LAeq, 15 minute HVO South - Impact Assessment Criteria – February 2017

#### Table 4: LAeq, 15 minute HVO South - Land Acquisition Criteria – February 2017

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	VTG5	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO South L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2	3	41	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	41	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	41	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	41	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	40	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	40	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	40	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	NA	No	32	NA

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	VTG <sup>5</sup>	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO South L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2	3	45	No	IA	NA
Maison Dieu	9/02/2017 21:25	1.5	3	45	No	IA	NA
Shearers Lane	9/02/2017 21:48	1.7	3	45	No	IA	NA
Kilburnie South	9/02/2017 22:36	0.9	3	45	No	IA	NA
Jerrys Plains Village	9/02/2017 21:30	1.5	3	45	No	IA	NA
Jerrys Plains East	9/02/2017 21:07	2	3	45	No	IA	NA
Long Point Road	9/02/2017 21:32	2.3	3	45	No	IA	NA
HVGC	9/02/2017 23:10	0.9	3	NA	No	NA	NA

#### Table 5: LA1, 1minute HVO South - Impact Assessment Criteria – February 2017

Notes

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 Laeq. tsminute 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 up to apply due to the two providence for the tape.

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

#### Table 6: LAeq, 15minute HVO North – Impact Assessment Criteria – February 2017

Location	Date and Time	Wind Speed (m/s) <sup>5</sup>	VTG <sup>5</sup>	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO North L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2.0	3	35	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	35	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	35	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	39	Yes	34	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	36	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	39	Yes	<30	Nil
Long Point Road	9/02/2017 21:32	2.3	3	35	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

#### Table 7: LAeq,15minute HVO North - Land Acquisition Criteria – February 2017

Location	Date and Time	Wind Speed (m/s)⁵	VTG <sup>5</sup>	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO North L <sub>Aeq</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2	3	41	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	41	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	41	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	41	Yes	34	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	41	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	41	Yes	<30	Nil
Long Point Road	9/02/2017 21:32	2.3	3	41	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

Location	Date and Time	Wind Speed (m∕s)⁵	VTG <sup>5</sup>	Criterion dB	Criterion Applies? <sup>1,6</sup>	HVO North L <sub>A1, 1min</sub> dB <sup>2,4</sup>	Exceedance <sup>3</sup>
Knodlers Lane	9/02/2017 21:02	2	3	46	Yes	IA	Nil
Maison Dieu	9/02/2017 21:25	1.5	3	46	Yes	IA	Nil
Shearers Lane	9/02/2017 21:48	1.7	3	46	Yes	IA	Nil
Kilburnie South	9/02/2017 22:36	0.9	3	46	Yes	40	Nil
Jerrys Plains Village	9/02/2017 21:30	1.5	3	46	Yes	IA	Nil
Jerrys Plains East	9/02/2017 21:07	2	3	NA	Yes	35	NA
Long Point Road	9/02/2017 21:32	2.3	3	46	Yes	IA	Nil
HVGC	9/02/2017 23:10	0.9	3	NA	No	IA	NA

#### Table 8: LA1, 1Minute HVO North - Impact Assessment Criteria – February 2017

 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<sub>Aeq, Isminute</sub> 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



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 February, a total of 991.3 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 is shown in Figure 17.



Figure 17: Operational Downtime by Equipment Type – February 2017

## 7.0 REHABILITATION

During February, 35.8 Ha of land was released, 15.8 Ha of land was bulk shaped, 5.1 Ha of land was topsoiled and 5.1 Ha of land was composted. Year to date progress can be viewed in Figure 86.



Figure 18: Rehabilitation YTD - February 2017

## 8.0 COMPLAINTS

One complaint was received during the reporting period. Details of complaints received YTD are shown in Figure 19 below.



Figure 19: Complaints Graph – February 2017

# 9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

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)
1/02/2017 0:00	33.6	19.4	88.4	38.6	1210	122.3	3.2	0.0
2/02/2017 0:00	33.3	19.1	95.2	33.0	1529	143.3	3.2	0.0
3/02/2017 0:00	29.9	18.3	95.1	52.7	1365	133.8	2.7	0.0
4/02/2017 0:00	39.9	19.4	100.0	26.0	1354	209.6	2.4	0.0
5/02/2017 0:00	40.3	23.6	57.9	20.2	1124	259.8	2.9	0.0
6/02/2017 0:00	42.7	24.1	76.2	9.6	1012	230.7	3.8	0.0
7/02/2017 0:00	32.3	19.3	86.4	40.4	1331	126.7	3.9	0.0
8/02/2017 0:00	30.4	18.4	100.0	46.7	1632	117.9	3.6	2.0
9/02/2017 0:00	35.8	18.6	100.0	21.1	1048	135.9	1.6	0.0
10/02/2017 0:00	44.8	19.2	84.5	7.7	998	200	2.0	0.0
11/02/2017 0:00	46.4	21.5	79.2	6.0	1196	225.5	2.9	0.0
12/02/2017 0:00	44.8	19.1	86.5	3.4	1134	180.2	4.3	0.0
13/02/2017 0:00	33.3	16.8	100.0	20.6	1082	125.2	3.0	0.0
14/02/2017 0:00	29.3	15.6	89.5	32.1	1437	117.3	4.2	0.0
15/02/2017 0:00	30.9	14.8	92.7	31.0	1419	124.2	2.4	0.0
16/02/2017 0:00	38.2	15.4	85.7	12.3	1274	202.4	1.9	0.0
17/02/2017 0:00	39.1	17.3	99.4	17.0	1183	-	2.4	16.0
18/02/2017 0:00	38.1	19.4	85.7	20.0	1159	209.9	3.9	0.4
19/02/2017 0:00	25.5	17.6	100.0	46.3	1561	140.1	2.0	0.0
20/02/2017 0:00	29.1	13.9	55.6	9.9	1037	254.3	3.4	0.0
21/02/2017 0:00	31.2	11.3	75.3	9.8	1010	149.1	2.2	0.0
22/02/2017 0:00	34.1	14.1	82.5	16.6	969	126.7	2.2	0.0
23/02/2017 0:00	36.7	14.0	90.3	11.4	948	127.6	1.7	0.0
24/02/2017 0:00	34.4	16.0	84.1	18.4	992	117.2	3.0	0.0
25/02/2017 0:00	26.5	14.8	100.0	52.0	1230	132.1	3.5	1.2
26/02/2017 0:00	26.8	15.6	100.0	34.6	1452	132.1	3.6	0.2
27/02/2017 0:00	27.7	13.4	100.0	34.3	1285	126.5	3.1	6.4
28/02/2017 0:00	26.6	15.5	100.0	53.2	1335	127.9	2.8	8.4

## Table 9: Meteorological Data - HVO Corporate Meteorological Station – February 2017