

# HUNTER VALLEY OPERATIONS



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Environment Protection Licence	640
Licensee	HV Operations Pty Ltd
Premises	Hunter Valley Operations Lemington Road, Singleton NSW 2330 Australia
EPL Link	<a href="#">EPL 640 Website Link</a>

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# 1 Introduction

This report has been compiled to provide a summary of environmental monitoring results for Hunter Valley Operations (HVO) in accordance with Environment Protection Licence (EPL) 640. This report includes all monitoring data collected in accordance with the aforementioned Licence for the period 1<sup>st</sup> – 30<sup>th</sup> November 2020.

Monitoring in this report includes:

- Air quality monitoring;
- Surface water monitoring including mine water discharge
- Blast monitoring
- Sewage treatment plant monitoring; and
- Noise monitoring

Monitoring locations are shown in **Figure 1**.

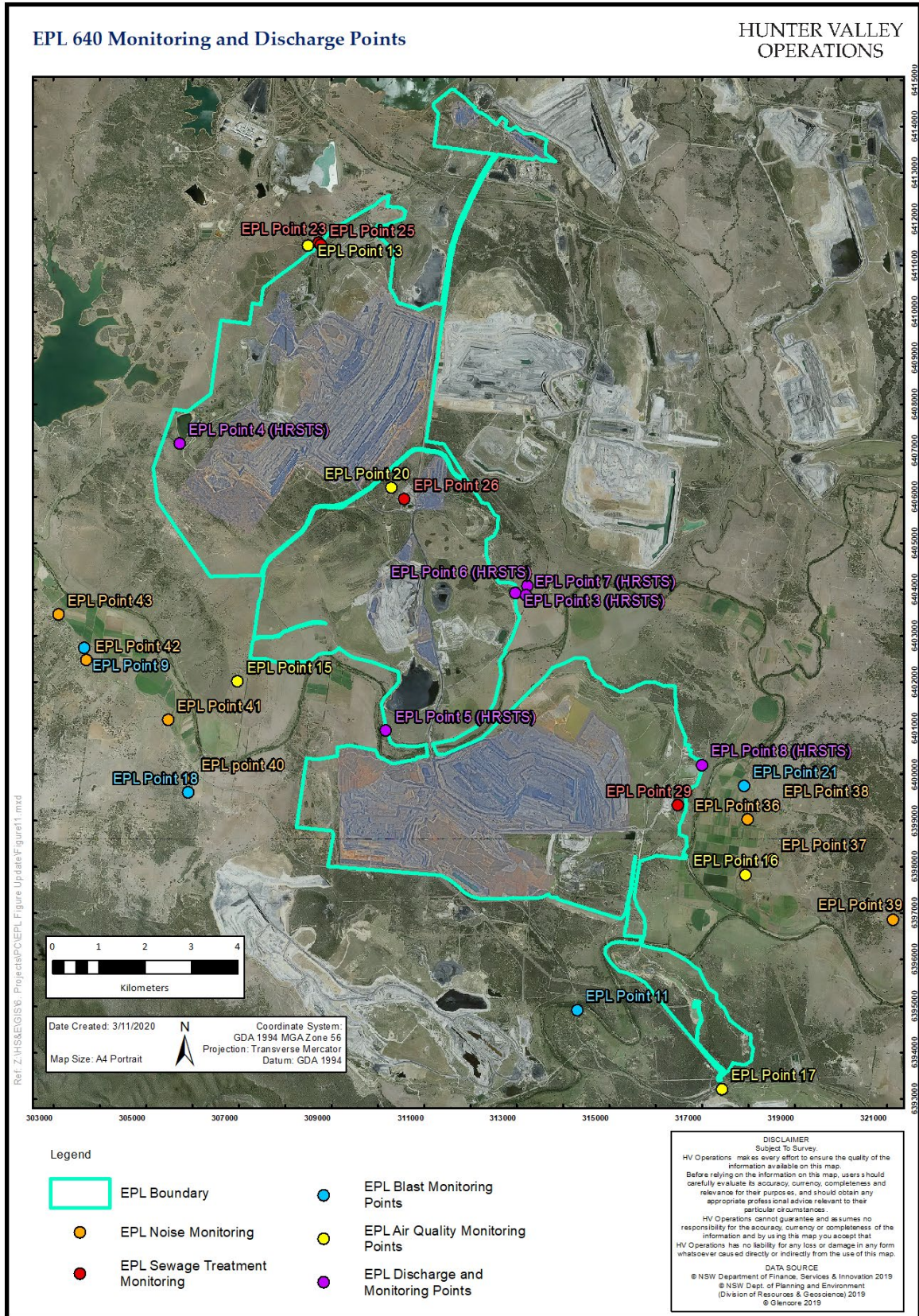


Figure 1 HVO Environmental Monitoring Locations

## 2 Air Quality

In accordance with the requirements of Condition M2.2 (EPL 640), HVO maintains a network of five PM<sub>10</sub> monitors. The following monitoring locations (EPA Monitoring Points 13, 15, 16, 17 and 20) are listed on the Licence for the purpose of monitoring:

- EPA Identification Number 13 – Howick
- EPA Identification Number 15 – Wandewoi
- EPA Identification Number 16 – Knodlers
- EPA Identification Number 17 – Golden Highway
- EPA Identification Number 20 – HVS Proposed

Results of particulate (PM<sub>10</sub>) monitoring are shown in **Table 1**. Results reported represent the 24hr average PM<sub>10</sub>, derived from 10-minute average PM<sub>10</sub> values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 30<sup>th</sup> November 2020; the data was obtained on 1<sup>st</sup> December 2020.

Table 1 Particulate Matter <10µm Monitoring

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
1/11/2020	µg/m <sup>3</sup>	Continuous	10.4	17.9	7.1	14.7	19.4
2/11/2020	µg/m <sup>3</sup>		25.1	31.8	16.3	18.2	26.7
3/11/2020	µg/m <sup>3</sup>		31.1	47.2	17.5	14.7	26.5
4/11/2020	µg/m <sup>3</sup>		28.6	36.8	9.0	23.2	7.8
5/11/2020	µg/m <sup>3</sup>		16.4	38.7	11.8	24.2	10.8
6/11/2020	µg/m <sup>3</sup>		16.4	18.8	11.0	13.5	14.9
7/11/2020	µg/m <sup>3</sup>		34.7	43.1	15.1	20.0	28.9
8/11/2020	µg/m <sup>3</sup>		27.1	28.7	17.7	13.4	16.5
9/11/2020	µg/m <sup>3</sup>		25.2	39.1	13.9	13.5	19.1
10/11/2020	µg/m <sup>3</sup>		26.9	32.9	20.5	14.0	19.3
11/11/2020	µg/m <sup>3</sup>		28.5	42.4	16.2	18.9	22.7
12/11/2020	µg/m <sup>3</sup>		30.0	72.7	26.4	34.8	32.4
13/11/2020	µg/m <sup>3</sup>		23.4	33.3	23.6	20.5	23.3
14/11/2020	µg/m <sup>3</sup>		16.9	27.4	10.1	24.0	13.7
15/11/2020	µg/m <sup>3</sup>		33.0	45.6	24.7	22.6	28.7
16/11/2020	µg/m <sup>3</sup>		37.6	78.6	20.9	22.6	35.5
17/11/2020	µg/m <sup>3</sup>		55.2	57.5	31.1	39.3	46.5
18/11/2020	µg/m <sup>3</sup>		44.4	42.7	22.6	33.9	#
19/11/2020	µg/m <sup>3</sup>		55.0	38.1	26.3	23.5	27.1
20/11/2020	µg/m <sup>3</sup>		70.8	67.3	32.0	34.7	43.3
21/11/2020	µg/m <sup>3</sup>		55.7	47.4	58.3	32.6	37.6
22/11/2020	µg/m <sup>3</sup>		47.6	49.5	25.4	33.0	33.5
23/11/2020	µg/m <sup>3</sup>		34.1	46.0	12.6	32.3	29.3
24/11/2020	µg/m <sup>3</sup>		30.0	29.6	17.5	19.4	17.9
25/11/2020	µg/m <sup>3</sup>		34.1	34.1	20.7	22.1	19.0
26/11/2020	µg/m <sup>3</sup>		42.6	37.1	21.4	27.1	28.1
27/11/2020	µg/m <sup>3</sup>		66.0	62.9	40.0	47.7	36.7
28/11/2020	µg/m <sup>3</sup>		48.5	88.9	25.8	43.5	34.2

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
29/11/2020	µg/m <sup>3</sup>	Continuous	92.3	168.8	44.3	88.0	63.5
30/11/2020	µg/m <sup>3</sup>		45.5	60.1	28.6	27.9	26.6
<b>Monthly Meaningful Data</b>							
<b>November</b>	µg/m <sup>3</sup>	<b>Minimum</b>	10.4	17.9	7.1	13.4	7.8
	µg/m <sup>3</sup>	<b>Mean</b>	37.8	48.8	22.3	27.3	27.2
	µg/m <sup>3</sup>	<b>Maximum</b>	92.3	168.8	58.3	88.0	63.5
	µg/m <sup>3</sup>	<b>Median</b>	33.6	42.6	20.8	23.4	26.7

### 3 Surface Water

HVO participates in the Hunter River Salinity Trading Scheme (HRSTS) and maintains six monitoring locations associated with this scheme (EPA Monitoring Points 3, 4, 5, 6, 7 and 8, Condition M2.4) as follows:

- EPA Identification Number 3 – Discharge Pipe from Dam 11N
- EPA Identification Number 4 – Discharge end of outlet pipe on Parnell's Dam
- EPA Identification Number 5 – At the discharge end of the alluvial lands discharge pipeline
- EPA Identification Number 6 – In Farrell's Creek within 100m, and upstream of the confluence of flow from Point 3
- EPA Identification Number 7 – In Farrell's Creek within 100m, and downstream of the confluence of flow from Point 3
- EPA identification Number 8 – outlet of discharge pipe from Lake James storage dam

The location of these sampling points can be viewed in **Figure 1**.

There were discharge opportunities during the reporting period, however no water was discharged, As HVO did not discharge during the reporting period, no sample collection was required at Monitoring Points 3, 4, 5, 6, 7 and 8 (show in **Table 2**).



Table 2 Mine Water Discharge Monitoring

Discharge Point	Date	Pollutant	Unit of Measure	Licence Limits	No. Samples Required by Licence	No. Samples Collected and Analysed
EPL ID 3	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	6.5-9.5	0	0
		Total Suspended Solids	Milligrams per Litre	120	0	0
EPL ID 4	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	6.5-9.5	0	0
		Total Suspended Solids	Milligrams per Litre	120	0	0
EPL ID 5	N/A	Electrical Conductivity	Microsiemens per Centimetre	400	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0
EPL ID 6	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0
EPL ID 7	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0

Discharge Point	Date	Pollutant	Unit of Measure	Licence Limits	No. Samples Required by Licence	No. Samples Collected and Analysed
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0
EPL ID 8	N/A	Electrical Conductivity	Microsiemens per Centimetre	-	0	0
		pH	pH	-	0	0
		Total Suspended Solids	Milligrams per Litre	-	0	0

## 4 Blast Monitoring

In accordance with the requirements of Condition M8.1, HVO maintains a network of blast monitors to measure Airblast overpressure and ground vibration for all blasts. The following monitoring location (EPA Monitoring Points 9, 11, 18 and 21) are listed on the Licence for the purpose of assessing compliance with the Airblast overpressure and ground vibration criteria as follows:

- EPA Identification Number 9 – Jerrys Plains
- EPA Identification Number 11 – Warkworth
- EPA Identification Number 18 – Moses Crossing
- EPA Identification Number 21 – Maison Dieu

The location of these monitors can be found in **Figure 1**. The last date sampled was 30<sup>th</sup> November 2020; the data was obtained on 7<sup>th</sup> December 2020.

EPA Identification Number 21 'TBA', now referred to as 'Maison Dieu', was installed on 6<sup>th</sup> October 2020; replacing EPA Identification Number 12 'Maison Dieu'.

Blast monitoring results are detailed in **Table 3** and **Table 4**.

Table 3 Blast Monitoring (Airblast Overpressure)

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
P123BR606A	3/11/2020 14:00	dB(L)	All Blasts 100%	115	120	96.5	106.5	98.9	97.8
P123B6P02A	4/11/2020 14:29	dB(L)		115	120	92.4	91.3	84.8	94.9
P207VA104A	4/11/2020 15:22	dB(L)		115	120	97.7	96.4	99.1	103.4
P205BR603B_P205B6P02C	4/11/2020 15:23	dB(L)		115	120	99.0	99.0	94.6	98.9
P20900801_P209W9P01A	7/11/2020 12:39	dB(L)		115	120	91.0	93.8	91.9	97.2
P205BAC02A	11/11/2020 13:25	dB(L)		115	120	93.9	88.7	96.1	100.2
P123BR607	17/11/2020 13:57	dB(L)		115	120	95.9	105.6	99.7	101.6
WN45UAA06A	18/11/2020 13:11	dB(L)		115	120	107.4	106.4	108.2	105.4
WS43ULD01A	21/11/2020 13:00	dB(L)		115	120	88.3	97.1	94.5	100.0
RW32WHG02A	24/11/2020 09:09	dB(L)		115	120	105.6	107.3	96.3	101.2

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
WS43ULD01B_WN43ULP07A	25/11/2020 13:20	dB(L)	All Blasts 100%	115	120	84.9	108.8	89.0	98.8
P123BAC04A	27/11/2020 13:14	dB(L)		115	120	93.2	91.2	88.4	91.0
P123BR302A	28/11/2020 13:12	dB(L)		115	120	89.0	104.0	103.9	100.9
WN45LAA01A	30/11/2020 13:03	dB(L)		115	120	106.2	109.0	104.7	91.1
Monthly Meaningful Data									
November		dB(L)	Minimum	115	120	84.9	88.7	84.8	91.0
		dB(L)	Mean	115	120	95.8	100.4	96.4	98.7
		dB(L)	Maximum	115	120	107.4	109.0	108.2	105.4
		dB(L)	Median	115	120	94.9	101.5	96.2	99.4

Table 4 Blast monitoring (Ground Vibration)

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point			
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth	
P123BR606A	3/11/2020 14:00	mm/s	All Blasts 100%	5	10	0.29	0.13	0.25	0.72	
P123B6P02A	4/11/2020 14:29	mm/s		5	10	0.13	0.07	0.09	0.19	
P207VA104A	4/11/2020 15:22	mm/s		5	10	0.13	0.07	0.14	0.20	
P205BR603B_P205B6P02C	4/11/2020 15:23	mm/s		5	10	0.16	0.1	0.43	0.46	
P20900801_P209W9P01A	7/11/2020 12:39	mm/s		5	10	0.13	0.07	0.18	0.59	
P205BAC02A	11/11/2020 13:25	mm/s		5	10	0.11	0.07	0.18	0.26	
P123BR607	17/11/2020 13:57	mm/s		5	10	0.27	0.10	0.19	0.75	
WN45UAA06A	18/11/2020 13:11	mm/s		5	10	0.12	0.06	0.05	0.75	
WS43ULD01A	21/11/2020 13:00	mm/s		5	10	0.21	0.10	0.11	0.13	

Blast ID	Date & Time	Unit of Measure	Monitoring Frequency & Capture	EPL Limits			Monitoring Point		
				95% of Blasts	100% of Blasts	Moses Crossing	Jerrys Plains	Maison Dieu	Warkworth
RW32WHG02A	24/11/2020 09:09	mm/s	All Blasts 100%	5	10	0.46	0.11	0.14	0.47
WS43ULD01B_WN43ULP07A	25/11/2020 13:20	mm/s		5	10	0.28	0.13	0.14	0.21
P123BAC04A	27/11/2020 13:14	mm/s		5	10	0.15	0.07	0.11	0.11
P123BR302A	28/11/2020 13:12	mm/s		5	10	0.25	0.12	0.23	0.86
WN45LAA01A	30/11/2020 13:03	mm/s		5	10	0.16	0.12	0.10	0.16
Monthly Meaningful Data									
November		mm/s	Minimum	5	10	0.11	0.06	0.05	0.11
		mm/s	Mean	5	10	0.20	0.09	0.17	0.42
		mm/s	Maximum	5	10	0.46	0.13	0.43	0.86
		mm/s	Median	5	10	0.16	0.10	0.14	0.36

# 5 Sewage Treatment Plant Monitoring

Condition M2.4 of the Licence requires that HVO monitor for Faecal Coliforms on a quarterly basis at the following monitoring locations:

- EPA Identification Number 23 – Howick STP
- EPA Identification Number 25 – Howick Secondary Lagoon
- EPA Identification Number 26 – HVO North STP
- EPA Identification Number 29 – HVO South Secondary Lagoon

November sampling occurred on the 10<sup>th</sup> November; the data was obtained on the 18<sup>th</sup> November and is shown in **Table 5** below.

**Table 5 Sewage Treatment Plant Monitoring**

Monitoring Site	Date & Time	Pollutant	Unit of Measure	Monitoring Result
EPA ID 23	10/11/2020 08:35	Faecal Coliforms	Colony forming units/100ml	6600
		pH	pH	7.20
EPA ID 25	10/11/2020 08:40	Faecal Coliforms	Colony forming units/100ml	91
		pH	pH	7.40
EPA ID 26	10/11/2020 09:40	Faecal Coliforms	Colony forming units/100ml	46000
		pH	pH	6.98
EPA ID 29	10/11/2020 10:15	Faecal Coliforms	Colony forming units/100ml	91
		pH	pH	8.50



## 6 Noise

Condition M10.1 of the Licence requires that HVO undertake operator attended noise monitoring on a monthly basis at the following monitoring locations:

- EPA Identification Number 36 – NM1A
- EPA Identification Number 37 – NM1B
- EPA Identification Number 38 – NM1C
- EPA Identification Number 39 – NM2
- EPA Identification Number 40 – NM3
- EPA Identification Number 41 – NM4
- EPA Identification Number 42 – NM5
- EPA Identification Number 43 – NM6

Monitoring for the month of November occurred on the 4<sup>th</sup> November; the data was obtained on the 17<sup>th</sup> November 2020 and is displayed in **Table 6** and **Table 7** below.

**Table 6 Night  $L_{Aeq,15minute}$  Generated by HVO Against EPL Criteria**

Location	Date & Time	Wind Speed (m/s)	Stability Class <sup>1</sup>	Criterion dB	Criterion Applies? <sup>2</sup>	HVO $L_{Aeq}$ dB <sup>3,4</sup>	Exceedance dB <sup>4,5</sup>
EPA ID 36	04/11/2020 21:00	3.8	D	41	No	32	NA
EPA ID 37	04/11/2020 21:43	3.6	D	40	No	30	NA
EPA ID 38	04/11/2020 21:22	4.1	D	39	No	33	NA
EPA ID 39	04/11/2020 22:32	3.5	D	37	No	<25	NA
EPA ID 40	04/11/2020 23:14	2.9	D	39	Yes	Inaudible	Nil
EPA ID 41	04/11/2020 22:52	3.7	D	39	No	<25	NA
EPA ID 42	04/11/2020 21:20	4.1	D	40	No	Inaudible	NA
EPA ID 43	04/11/2020 21:00	3.8	D	40	No	Inaudible	NA

Notes:

1. Atmospheric data is sources from HVO AWS
2. Noise criteria apply under all meteorological conditions except during period of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only  $L_{Aeq,15minute}$  attributed to HVO, including modifying factors if applicable.
4. Bold results in red indicate exceedance of criterion.
5. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion was not applicable.

Table 7 Night LA1,1minute Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s)	Stability Class <sup>1</sup>	Criterion dB	Criterion Applies? <sup>2</sup>	HVO LAeq dB <sup>3,4</sup>	Exceedance dB <sup>4,5</sup>
EPA ID 36	04/11/2020 21:00	3.8	D	46	No	39	NA
EPA ID 37	04/11/2020 21:43	3.6	D	46	No	33	NA
EPA ID 38	04/11/2020 21:22	4.1	D	46	No	40	NA
EPA ID 39	04/11/2020 22:32	3.5	D	46	No	<25	NA
EPA ID 40	04/11/2020 23:14	2.9	D	46	Yes	Inaudible	Nil
EPA ID 41	04/11/2020 22:52	3.7	D	46	No	<25	NA
EPA ID 42	04/11/2020 21:20	4.1	D	46	No	Inaudible	NA
EPA ID 43	04/11/2020 21:00	3.8	D	46	No	Inaudible	NA

Notes:

1. Atmospheric data is sources from HVO AWS
2. Noise criteria apply under all meteorological conditions except during period of rain or hail, wind speeds greater than 3m/s measured at 10 metres above ground level, stability category F conditions and wind speeds greater than 2m/s measured at 10m above ground level, or stability category G conditions.
3. Site-only LAeq,15minute attributed to HVO, including modifying factors if applicable.
4. Bold results in red indicate exceedance of criterion.
5. NA in exceedance column means atmospheric conditions outside specified in approval therefore criterion was not applicable.