

HUNTER VALLEY OPERATIONS



Environment Protection License 640 Monitoring Data – January 2021 Published 17th February 2021

Document Number: HVOOC-1797567310-3623

Status: Approved

Version: 1.0

Effective: 17/02/2021

Owner: Environment and Community Coordinator

Name of Operation	Hunter Valley Operations
Environment Protection Licence	640
Licensee	HV Operations Pty Ltd
Premises	Hunter Valley Operations Lemington Road Singleton NSW 2330 Australia
EPL Link	EPL 640 Website Link

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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 1st – 31st January 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**.

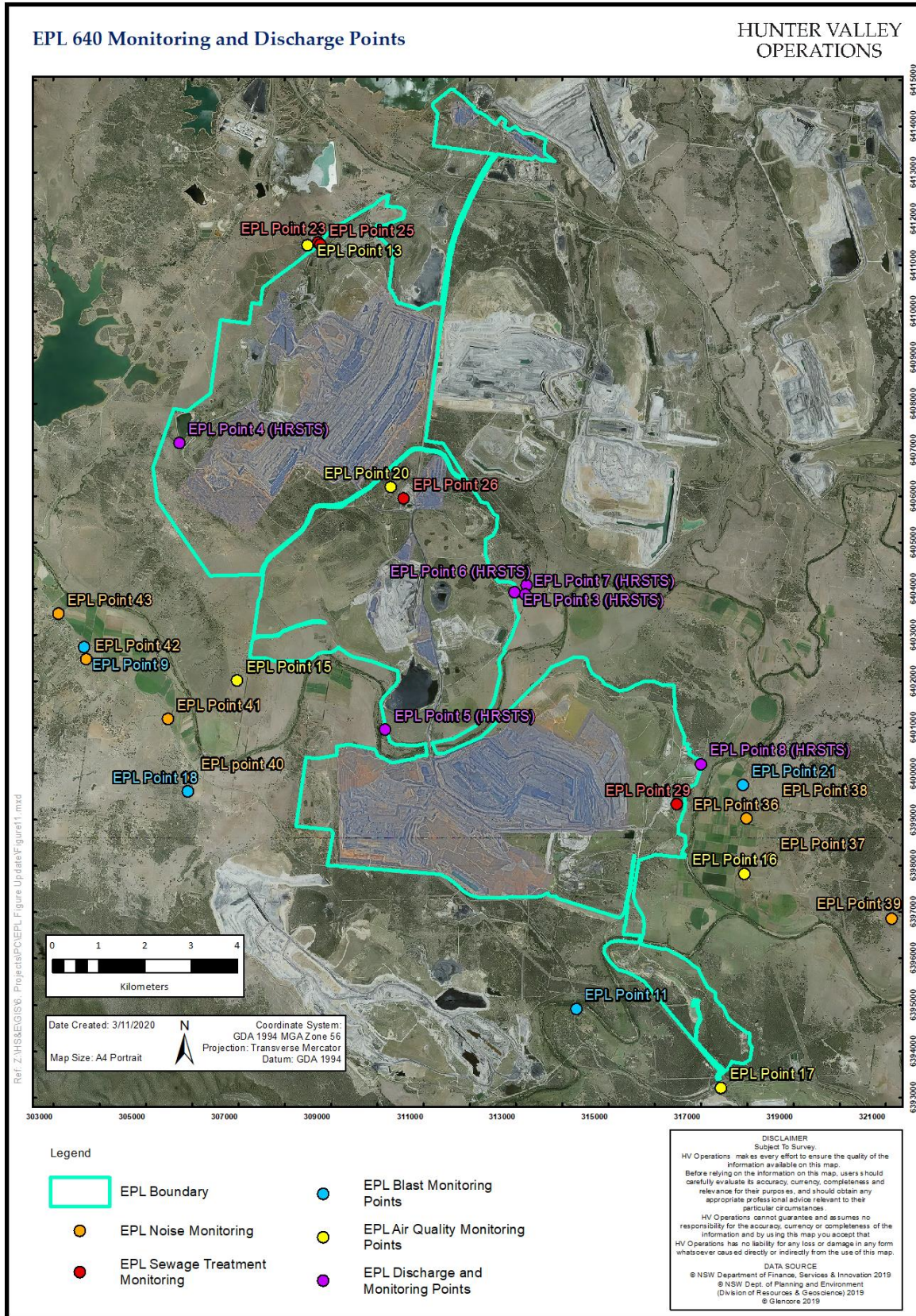


Figure 1 HVO Environmental Monitoring Locations

2 Air Quality

In accordance with the requirements of Condition M2.2 (EPL 640), HVO maintains a network of five PM₁₀ 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 (PM₁₀) monitoring are shown in **Table 1**. Results reported represent the 24hr average PM₁₀, derived from 10-minute average PM₁₀ values for the period midnight to midnight, for each calendar date during the reporting period. The last sampling date was 31st January 2021; the data was obtained on 1st February 2021.

Table 1 Particulate Matter <10µm Monitoring

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
1/1/2021	µg/m³	Continuous	9.8	3.7	8.0	10.2	10.8
2/1/2021	µg/m³		10.4	10.1	8.6	10.2	9.7
3/1/2021	µg/m³		17.1	16.0	12.5	12.5	10.4
4/1/2021	µg/m³		13.3	20.3	11.4	15.3	13.4
5/1/2021	µg/m³		9.7	23.7	9.5	16.0	13.2
6/1/2021	µg/m³		23.2	29.9	14.1	17.3	21.5
7/1/2021	µg/m³		14.9	17.1	9.6	13.7	15.2
8/1/2021	µg/m³		21.3	26.8	13.7	17.6	19.4
9/1/2021	µg/m³		9.1	14.3	10.7	9.9	9.5
10/1/2021	µg/m³		17.4	22.0	15.1	11.5	13.7
11/1/2021	µg/m³		24.2	25.3	14.2	12.9	11.0
12/1/2021	µg/m³		31.0	42.3	19.7	22.0	21.9
13/1/2021	µg/m³		33.5	31.3	19.1	17.4	16.9
14/1/2021	µg/m³		28.6	51.9	20.5	28.8	28.4
15/1/2021	µg/m³		40.4	69.6	26.6	48.7	33.0
16/1/2021	µg/m³		19.4	41.4	19.8	35.2	33.8
17/1/2021	µg/m³		31.2	47.5	24.8	29.7	26.3
18/1/2021	µg/m³		28.9	66.4	25.3	34.8	30.9
19/1/2021	µg/m³		54.3	84.4	29.9	43.6	34.6
20/1/2021	µg/m³		39.9	40.9	16.2	15.4	21.5
21/1/2021	µg/m³		56.0	30.9	27.4	26.9	21.8
22/1/2021	µg/m³		74.3	62.1	25.3	26.8	27.2
23/1/2021	µg/m³		83.0	70.1	24.7	40.0	30.8
24/1/2021	µg/m³		111.3	67.1	33.1	32.7	35.6
25/1/2021	µg/m³		56.1	58.2	27.3	30.8	24.9
26/1/2021	µg/m³		31.7	64.4	24.1	31.0	22.7
27/1/2021	µg/m³		53.3	53.1	18.5	33.7	41.2
28/1/2021	µg/m³		9.3	13.3	4.5	10.2	10.4

Date	Unit of Measure	Monitoring Frequency & Capture	Monitoring Point				
			Howick	HVS Proposed	Wandewoi	Knodlers	Golden Highway
29/1/2021	µg/m ³	Continuous	10.5	12.2	7.5	6.7	7.7
30/1/2021	µg/m ³		20.5	26.8	15.3	16.8	14.5
31/1/2021	µg/m ³		35.4	39.0	15.1	20.9	32.5
Monthly Meaningful Data							
January	µg/m ³	Minimum	9.1	3.7	4.5	6.7	7.7
	µg/m ³	Mean	32.9	38.1	17.8	22.6	21.4
	µg/m ³	Maximum	111.3	84.4	33.1	48.7	41.2
	µg/m ³	Median	28.6	31.3	16.2	17.6	21.5

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**.

During the reporting period HVO discharged 517ML through seven discharge blocks from the 8th–14th January. Discharge occurred solely through Lake James, this required samples to be collected from Monitoring Point 8.

Table 2 Mine Water Discharge Monitoring

Discharge Point	Pollutant	Unit of Measure	Licence Limits	Samples Required by Licence	Samples Collected and Analysed	Lowest Sample Value	Mean Sample Value	Highest Sample Value
EPL ID 8	Electrical Conductivity	Microsiemens/ Centimetre	-	Continuous	Continuous	948	1396	5537
	pH	pH	6.5 – 9.5	7	7	8.8	8.9	9
	Total Suspended Solids	Milligrams/Litre	120	7	7	2	5	7

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 28th January 2021; the data was obtained on 2nd February 2021.

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
P207BR101A	08/01/2021 13:05	dB(L)	All Blasts 100%	115	120	101.9	98.2	105.5	90.4
WN45LAA01B_WN45LAA02C	12/01/2021 11:38	dB(L)		115	120	96.2	86.2	90.5	84.9
RW34GMA01A	12/01/2021 13:02	dB(L)		115	120	94.3	93.1	92.4	95.2
WS43LLD01A_WS43BAP01A	14/01/2021 14:19	dB(L)		115	120	100.7	95.5	110.6	89.8
P205BAC04A	16/01/2021 13:03	dB(L)		115	120	97.8	99.2	97.1	92.2
WS34LLD01B_BAP01B	20/01/2021 13:07	dB(L)		115	120	102.5	103.0	103.9	86.5
P123B5P04A	22/01/2021 12:54	dB(L)		115	120	96.6	98.2	91.7	104.9
P124W5P01A	23/01/2021 13:01	dB(L)		115	120	96.0	99.2	94.2	94.5
WN43LAA03A	25/01/2021 13:01	dB(L)		115	120	91.2	101.1	97.9	89.4
RW34WHG01A	25/01/2021 15:03	dB(L)		115	120	110.7	95.4	102.7	93.3

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
P123N8201(BR5)	27/01/2021 13:28	dB(L)	All Blasts 100%	115	120	107.2	110.9	103.7	92.1
P124WK502	27/01/2021 13:29	dB(L)		115	120	104.3	103.8	101.0	98.0
WN4709001_WN4710001	28/01/2021 13:14	dB(L)		115	120	100.6	107.9	99.9	90.3
Monthly Meaningful Data									
January		dB(L)	Minimum	115	120	91.2	86.2	90.5	84.9
		dB(L)	Mean	115	120	100.0	99.4	99.3	92.4
		dB(L)	Maximum	115	120	110.7	110.9	110.6	104.9
		dB(L)	Median	115	120	100.6	99.2	99.9	92.1

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
P207BR101A	08/01/2021 13:05	mm/s	All Blasts 100%	5	10	0.19	0.09	0.5	1.08
WN45LAA01B_WN45LAA02C	12/01/2021 11:38	mm/s		5	10	0.15	0.15	0.07	0.22
RW34GMA01A	12/01/2021 13:02	mm/s		5	10	0.2	0.07	0.07	0.25
WS43LLD01A_WS43BAP01A	14/01/2021 14:19	mm/s		5	10	0.33	0.16	0.13	0.22
P205BAC04A	16/01/2021 13:03	mm/s		5	10	0.11	0.06	0.15	0.3
WS34LLD01B_BAP01B	20/01/2021 13:07	mm/s		5	10	0.21	0.09	0.08	0.11
P123B5P04A	22/01/2021 12:54	mm/s		5	10	0.29	0.22	0.22	0.71
P124W5P01A	23/01/2021 13:01	mm/s		5	10	0.14	0.07	0.1	0.27
WN43LAA03A	25/01/2021 13:01	mm/s		5	10	0.13	0.11	0.09	0.31

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
RW34WHG01A	25/01/2021 15:03	mm/s	All Blasts 100%	5	10	0.45	0.16	0.16	0.48
P123N8201(BR5)	27/01/2021 13:28	mm/s		5	10	0.14	0.05	0.08	0.21
P124WK502	27/01/2021 13:29	mm/s		5	10	0.15	0.05	0.1	0.67
WN4709001_WN4710001	28/01/2021 13:14	mm/s		5	10	0.13	0.14	0.07	0.11
Monthly Meaningful Data									
January		mm/s	Minimum	5	10	0.11	0.05	0.07	0.11
		mm/s	Mean	5	10	0.20	0.11	0.14	0.38
		mm/s	Maximum	5	10	0.45	0.22	0.5	1.08
		mm/s	Median	5	10	0.15	0.09	0.1	0.27

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

January sampling occurred on the 19th January; the data was obtained on the 10th February 2021 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	19/01/2021 10:15	Faecal Coliforms	Colony forming units/100ml	160,000
		pH	pH	7.19
EPA ID 25	19/01/2021 10:25	Faecal Coliforms	Colony forming units/100ml	-
		pH	pH	-
EPA ID 26	19/01/2021 08:50	Faecal Coliforms	Colony forming units/100ml	2,300,000
		pH	pH	7.64
EPA ID 29	19/01/2021 13:00	Faecal Coliforms	Colony forming units/100ml	91
		pH	pH	9.47

No sample was collected or analysed from EPA ID 25 in January as the sampling location was dry.

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 reporting period occurred on the 20th January; the data was obtained on the 15th February 2021 and is displayed in **Table 6** and **Table 7** below.

Table 6 Night LAeq,15minute Generated by HVO Against EPL Criteria

Location	Date & Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO LAeq dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	20/01/2021 21:00	3.7	D	41	No	IA	NA
EPA ID 37	20/01/2021 21:47	2.9	D	40	Yes	IA	Nil
EPA ID 38	20/01/2021 21:24	2.8	D	39	Yes	IA	Nil
EPA ID 39	20/01/2021 22:39	1.6	E	37	Yes	IA	Nil
EPA ID 40	20/01/2021 23:34	2.0	D	39	Yes	NM	Nil
EPA ID 41	20/01/2021 23:05	2.0	D	39	Yes	29	Nil
EPA ID 42	20/01/2021 21:29	2.8	D	40	Yes	<30	Nil
EPA ID 43	20/01/2021 21:04	3.7	D	40	No	IA	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.

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

Location	Date & Time	Wind Speed (m/s)	Stability Class ¹	Criterion dB	Criterion Applies? ²	HVO LAeq dB ^{3,4}	Exceedance dB ^{4,5}
EPA ID 36	20/01/2021 21:00	3.7	D	46	No	IA	NA
EPA ID 37	20/01/2021 21:47	2.9	D	46	Yes	IA	Nil
EPA ID 38	20/01/2021 21:24	2.8	D	46	Yes	IA	Nil
EPA ID 39	20/01/2021 22:39	1.6	E	46	Yes	IA	Nil
EPA ID 40	20/01/2021 23:34	2.0	D	46	Yes	<30	Nil
EPA ID 41	20/01/2021 23:05	2.0	D	46	Yes	34	Nil
EPA ID 42	20/01/2021 21:29	2.8	D	46	Yes	<30	Nil
EPA ID 43	20/01/2021 21:04	3.7	D	46	No	IA	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.