

Hunter Valley Operations

Community Consultative Committee

Business Papers – February 2018

Materials ahead of meeting of the committee on 21 February 2018

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1.0 Complaints

Complaints overview for 2017

Complaints overview for 2018 (YTD as at 5 February 2018)

Complaint details for the period 18 October 2017 to 5 February 2018

Date	Time	Type	Location	Method Received	Monitoring Indicates Exceedance?
24/10/2017	17:00	Blast	Maison Dieu	Directly to dispatch	No
29/10/2017	22:45	Noise	Hambledon Hill Road	hotline	No*
3/11/2017	13:32	Blast	Maison Dieu	Community relations specialist	No
3/11/2017	16:16	Blast	Maison Dieu	Community relations specialist	No
22/11/2017	13:05	Blast	Maison Dieu	Community relations specialist	No
16/12/2017	5:58	Noise	Gowrie	hotline	No
16/12/2017	23:11	Noise	Gouldsville	hotline	No
16/12/2017	23:20	Noise	Hambledon Hill Road	hotline	No
17/12/2017	6:05	Noise	Maison Dieu	hotline	No

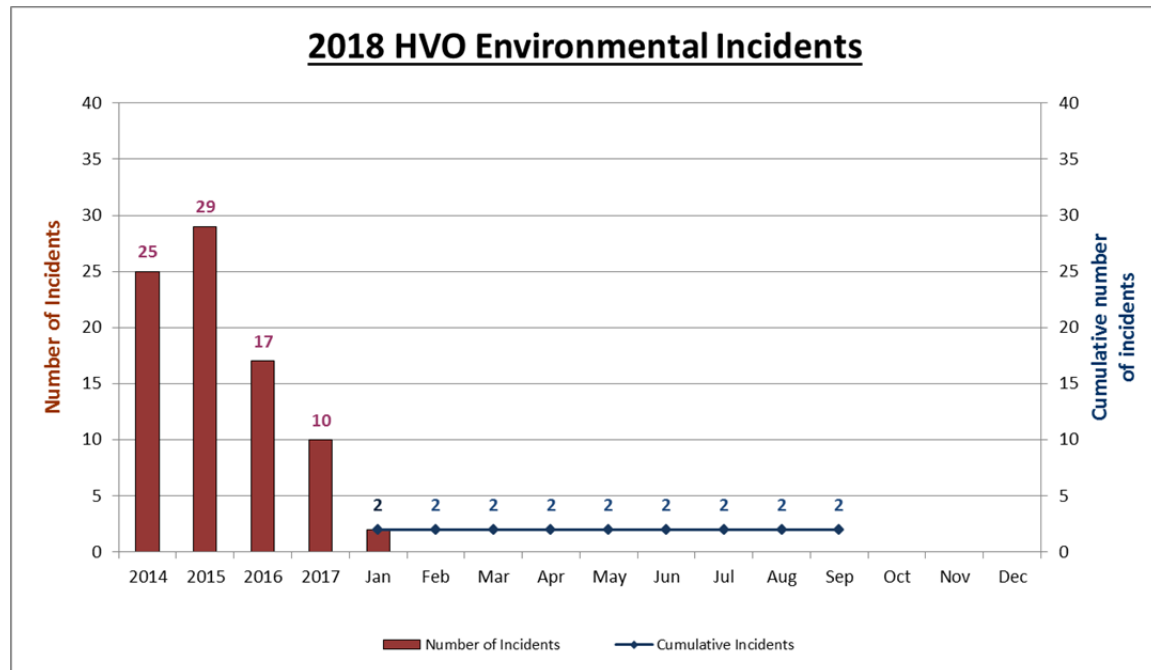
Date	Time	Type	Location	Method Received	Monitoring Indicates Exceedance?
17/12/2017	6:06	Noise	Gouldsville	hotline	No
17/12/2017	6:15	Noise	Hambledon Hill Road	hotline	No
18/12/2017	7:48	Noise	Llanrian Drive	hotline	No
18/12/2017	7:51	Noise	Unknown	hotline	No
30/12/2017	17:03	Other	Long Point	hotline	No
11/01/2018	14:10	Blasting	Gouldsville	hotline	No
17/01/2018	13:43	Air	Unknown	hotline	Yes**
17/01/2018	14:02	Blasting	Jerrys Plains	hotline	Yes**
17/01/2018	14:54	Blasting	Jerrys Plains	Environment Advisor desk phone	Yes**
17/01/2018	15:00	Blasting	Jerrys Plains	hotline	Yes**
19/01/2018	12:05	Air	Jerrys Plains	hotline	Yes**
1/02/2018	15:47	Other	Jerrys Plains	Community relations specialist	No

* Real time noise monitoring alerts were generated from the Maison Dieu monitor prior to the time of complaint. Maison Dieu monitor is the closest monitor to this location however is not close enough to determine exceedance. Noise levels were reduced following the alarm.

** Blast monitoring overpressure exceedance being investigated at Moses Crossing (123.58dBL) and Jerrys Plains (121.75dBL) blast monitors relating to blast RW25WHG01A.

2.0 Incidents

Incident overview for 2018 (YTD as at 5 February 2018)



Incident details for the period 10 October 2017 to 6 February 2018

Date	Details	Key Actions	Aspect
12/1/2018	<p>Breach of ROM pad windrow.</p> <p>The windrow around the northern side of the Howick ROM pad was noticed to have been breached allowing material from the pad to be washed off the pad into a mine diversion drain. All material contained within the mine.</p>	<p>Re-instatement of the windrow.</p> <p>Removal of excess fines washed from pad.</p> <p>Installation of secondary containment bund on ROM extension.</p> <p>Instructions for ROM loader operators informing them of expectations of water management on the ROM.</p>	Water Management

Date	Details	Key Actions	Aspect
17.012018	<p>Blast overpressure exceedance.</p> <p>Blasts RW24BFA01A & RW25WHG01A were fired in Riverview Pit at 13:09 and 13:12 on 17 January. The blast at 13:12 produced an airblast overpressure result that exceeded licence limits at Moses Crossing and Jerrys Plains compliance monitors. The blast also generated visible dust that resulted in four community complaints, local newspaper coverage and subsequent requests for information from the EPA and DP&E.</p> <p>The blast was designed and implemented in accordance with its approved blast management plan and blasting permissions.</p> <p>HVO has been issued a Show Cause notice from the EPA in relation to the blast overpressure exceedance.</p>	<p>Increasing the amount of rock between the edge of the bench and the first line of explosives for blasts in this pit.</p> <p>Review of blasting permissions.</p> <p>Trial of helium balloon release prior to blasting.</p>	Blast

3.0 Community Investment

Our community investment model is currently being reviewed to further enhance our support and commitment to the local area. An update on our community investment program will be communicated over the coming months.

We remain committed to our host communities, our workforces and their families and will continue to invest in local communities to support our existing operations.

Listed below is a breakdown of our projects for 2017.

Community Development Fund Projects

Partner	Programme	Value
Sirolli Institute	Enterprise Facilitation	\$45,000
Upper Hunter Where There's A Will Foundation	Positive Education Programme	\$80,000
University of Newcastle	Science and Engineering Challenge, and SMART Programme (2015-2019)	\$138,493
Upper Hunter Education Fund	HSC Study Camps and Upper Hunter Education Fund Scholarships (2015-2017)	\$84,000
Singleton Business Chamber	Business Development Officer	\$72,000
University of Newcastle	University of Newcastle Scholarships	\$80,000
Outward Bound Australia	Youth Leadership Programme (2015-2017)	\$245,332
Singleton Council	Singleton Economic Development and Funding Coordinator (2015-2017)	\$100,000
Ungooroo Aboriginal Corporation	Health Services Programme (2017-2018)	\$110,000
Bulga Rural Fire Service	Electronic Datasign	\$24,500
Australian Christian College Singleton	STEM Lego Robotics Programme	\$10,420

Jerrys Plains Public School	Ready 4 School Programme (2017-2018)	\$58,000
Tocal College	Tocal Steers Challenge (2015-2017)	\$25,725
Milbrodale Public School	Early Learning Programme (2017-2018)	\$64,000

Hunter Valley Operations (HVO) site donations

In 2017, HVO donated \$45,000 to support 16 local organisations through our site donations and sponsorship programme. We recognise the important role these projects play in helping build vibrant and healthy communities. These initiatives included:

HVO Site Donations

Organisation / Programme	Value
Rotary Club of Singleton on Hunter – 2017 Singleton Art Prize	\$5,000
Australian Families of the Military – Mental Health Retreat	\$600
Wildlife Aid Inc – Injured wildlife rescue	\$2,000
Singleton Business Chamber - International Women's Day event	\$775
Cancer Council NSW – Singleton Relay for Life	\$2,500
Singleton Junior Rugby League Club – Sporting equipment	\$2,500
Singleton Junior Rugby Club – 2017 Season sponsorship	\$2,500
Northern Agriculture Association Inc – 2017 Singleton Show	\$3,125
Glendon Brook Hall Inc – Safety fencing for children's play area	\$2,000
Singleton Pony Club – Club house improvements	\$500
Singleton Theatrical Society – 2017 production	\$1,500
Singleton Historical Society & Museum - Copier and printing consumables	\$1,000
Singleton Hospital Community Trust - Holes 4 Hospital Charity Golf Day 2017	\$2,500
Singleton Council - Christmas on John St - Fireworks	\$2,277

Greta Branxton Wildcats Football Club - Jerseys for junior football teams	\$500
Australian Stock Horse Eastern Branch – Championships	\$1,500
Jerrys Plains School of Arts Hall Committee – Community Christmas Event 2017	\$1,300
NSW Cancer Council – Transport for Treatment program 2018	\$5,000
Singleton Australian Football Club – Strapping Tape for 2018 season	\$1,300
Salvation Army Singleton – Children’s Christmas Party	\$1,000
Singleton Fire Brigade Social Club – Santa’s Lolly Run	\$500
Singleton Red Cross – permanent signage	\$935
Singleton Business Chamber – Hunter Coal Festival 2018	\$5,000
Total	\$45,812

4.0 Environmental monitoring

Monthly summaries of environmental monitoring – June 2017 – August 2017.

September 2017

Attached as **Appendix A**

October 2017

Attached as **Appendix B**

November 2017

Attached as **Appendix C**

5.0 Environmental Documents

Environmental documents uploaded to the HVO Insite website (<https://insite.yancoal.com.au>)

29/09/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Meaningful Summary August 2017
29/09/2017	Hunter Valley Operations Environmental Protection Licence 640 Monthly Obtained Data Summary August 2017
13/10/2017	Hunter Valley Operations Environmental Monitoring Report July 2017
25/10/2017	Hunter Valley Operations Environmental Protection Licence 640 Monitoring Data September 2017
13/11/2017	Hunter Valley Operations Environmental Monitoring Report August 2017
13/11/2017	Hunter Valley Operations Environmental Monitoring Report September 2017
16/11/2017	Hunter Valley Operations South Modification 5 - Information Package
16/11/2017	Hunter Valley Operations Carrington West Wing Environmental Assessment - Vol. 1
16/11/2017	Hunter Valley Operations Carrington West Wing Environmental Assessment - Vol. 2
16/11/2017	Hunter Valley Operations Carrington West Wing Environmental Assessment - Vol. 3
21/11/2017	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data October 2017
21/12/2017	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data November 2017
22/12/2017	HVO Pollution Incident Response Management Plan
11/01/2018	Hunter Valley Operations Environmental Monitoring Report October 2017

11/01/2018	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data December 2017
15/01/2018	Hunter Valley Operations Environmental Monitoring Report November 2017
31/01/2018	EPBC 2016/7640 Annual Compliance Report - 1 November 2016 to 31 October 2017



Business Papers – Appendix A

Environmental Monitoring Report – September 2017



Monthly Environmental Monitoring Report

Yancoal Hunter Valley Operations

September 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	27/10/2017
1.1	Environmental Specialist	Final	9/11/2017

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 September to 30th September.

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)
September	7.4	363.8

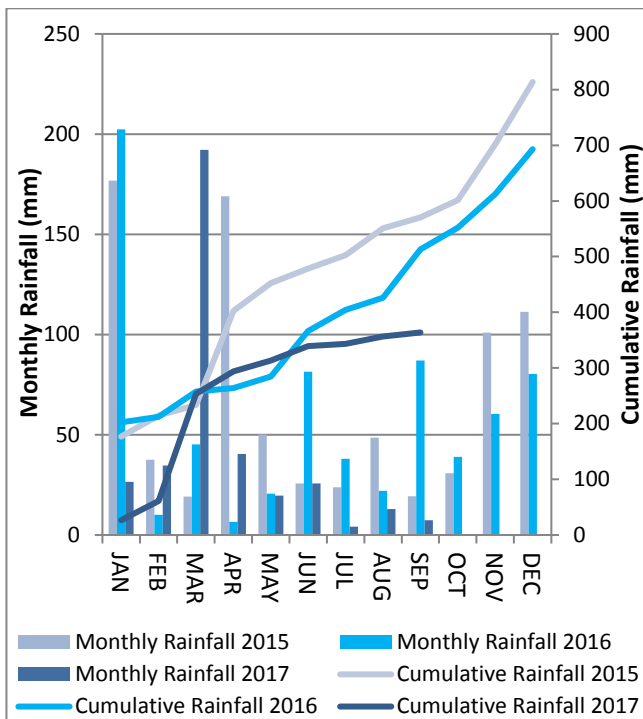


Figure 1: Rainfall Summary 2017

2.1.2 Wind Speed and Direction

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

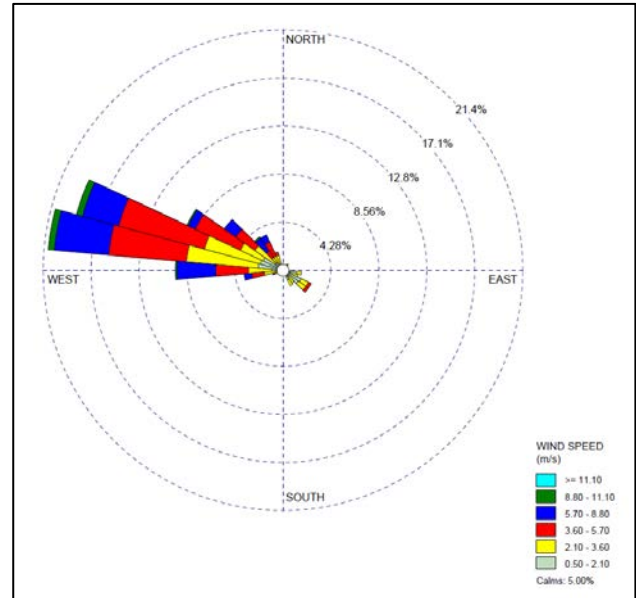


Figure 2: HVO Corporate Wind Rose – September 2017

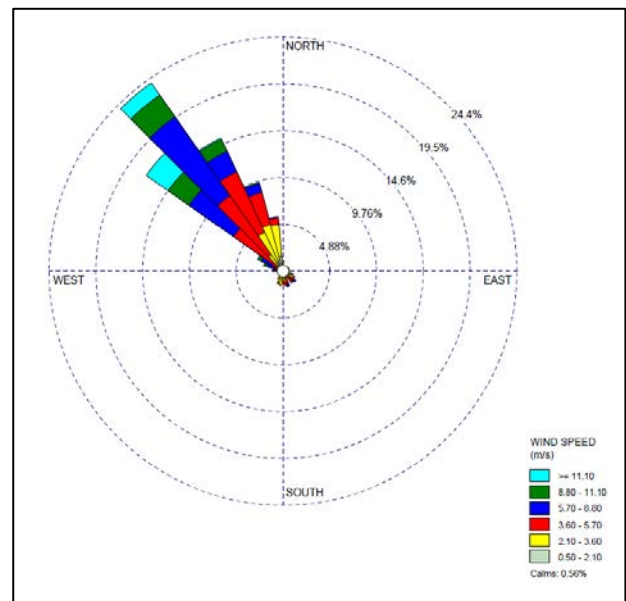


Figure 3: HVO Cheshunt Wind Rose – September 2017

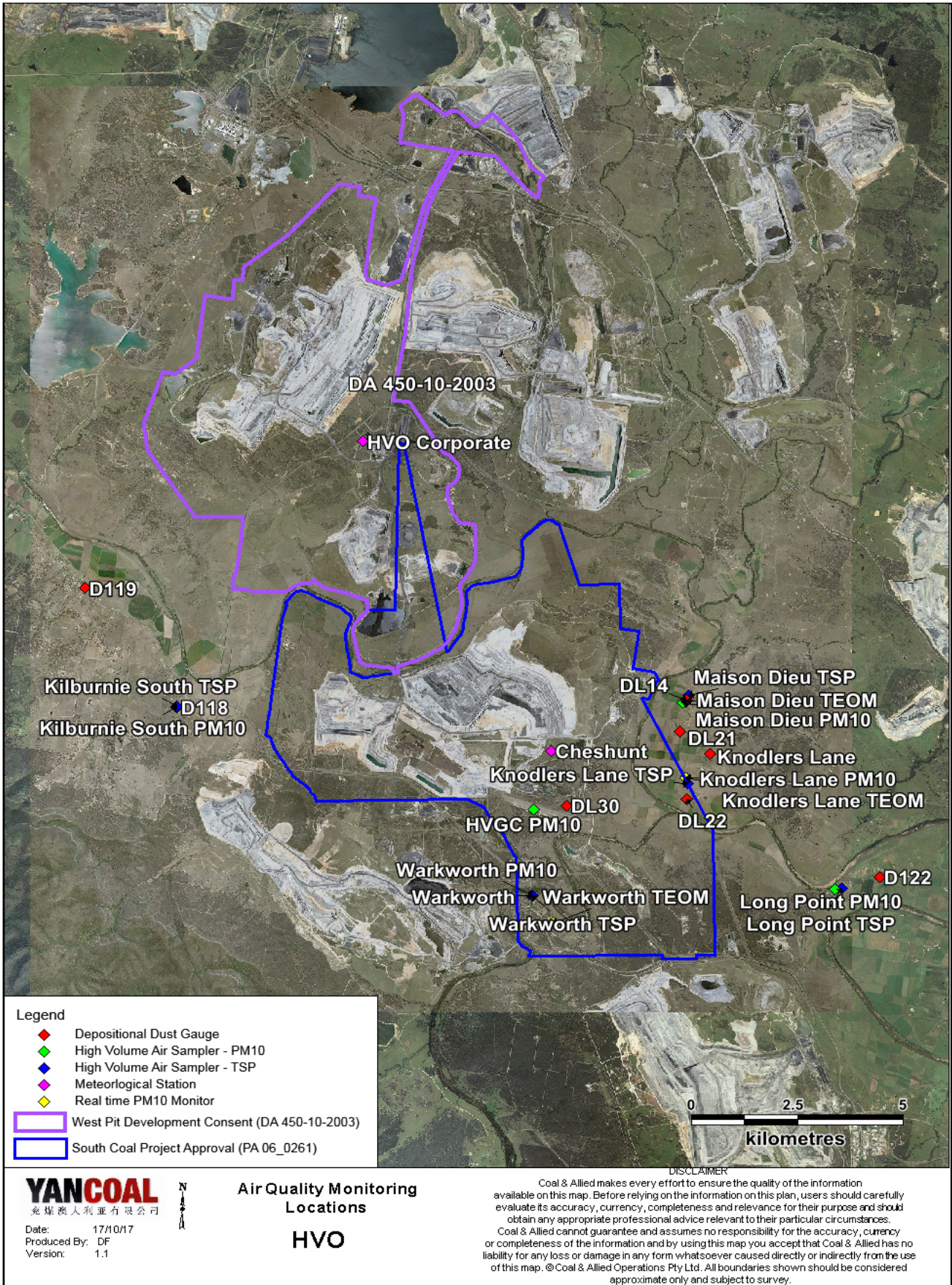


Figure 4: Air Quality Monitoring Location Plan

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 DL21, Knodlers Lane and DL30 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month.

The field notes associated with the DL21, Knodlers Lane and DL30 monitors results confirm the presence of insects and bird droppings. As such the results are considered contaminated and will be excluded from calculation of the annual average.

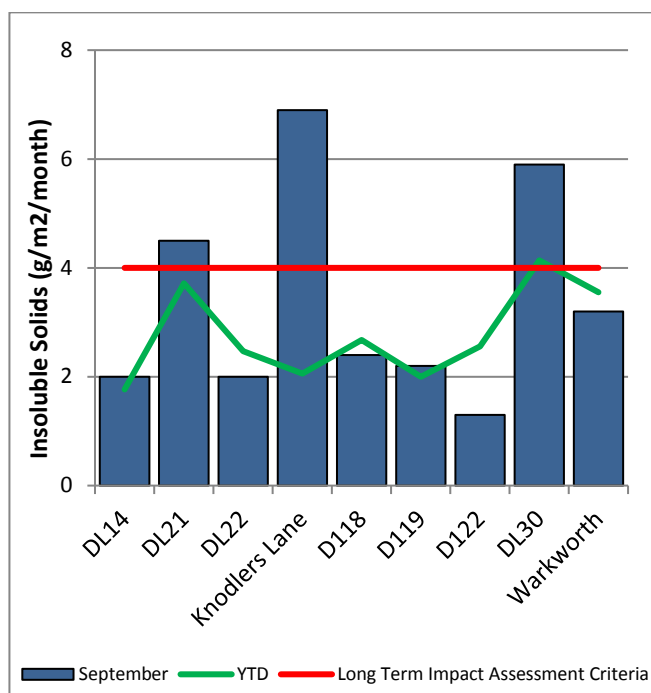


Figure 5: Depositional Dust Results – September 2017

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.

2.3.1 HVAS PM₁₀ Results

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

On 3/09/2017 three HVAS PM₁₀ units recorded results which were greater than the short term (24hr) PM₁₀ impact assessment criteria; Long Point (113 µg/m³), Knodlers Lane (59 µg/m³) and Glider Club (82 µg/m³).

At the time of preparation of this report, the results at Long Point, Knodlers Lane and Glider Club are under external investigation, results of these investigations will be provided in the Annual Environment Report.

On 15/09/2017 one HVAS PM₁₀ unit recorded results which were greater than the short term (24hr) PM₁₀ impact assessment criteria; Glider Club (54 µg/m³).

Investigation determined that HVO's maximum contribution at Glider Club is estimated to be less than 44.5 µg/m³; or less than 82% of the measured result. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

On 21/09/2017 one HVAS PM₁₀ unit recorded results which were greater than the short term (24hr) PM₁₀ impact assessment criteria; Glider Club (62 µg/m³).

Investigation determined that HVO's maximum contribution at Glider Club is estimated to be less than 44.5 µg/m³; or less than 72% of the measured result. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

On 27/09/2017 one HVAS PM₁₀ unit recorded results which were greater than the short term (24hr) PM₁₀ impact assessment criteria; Kilburnie South (62 µg/m³).

Investigation determined that HVO's maximum contribution at Kilburnie South is estimated to be less than 13 µg/m³; or less than 26% of the measured result. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

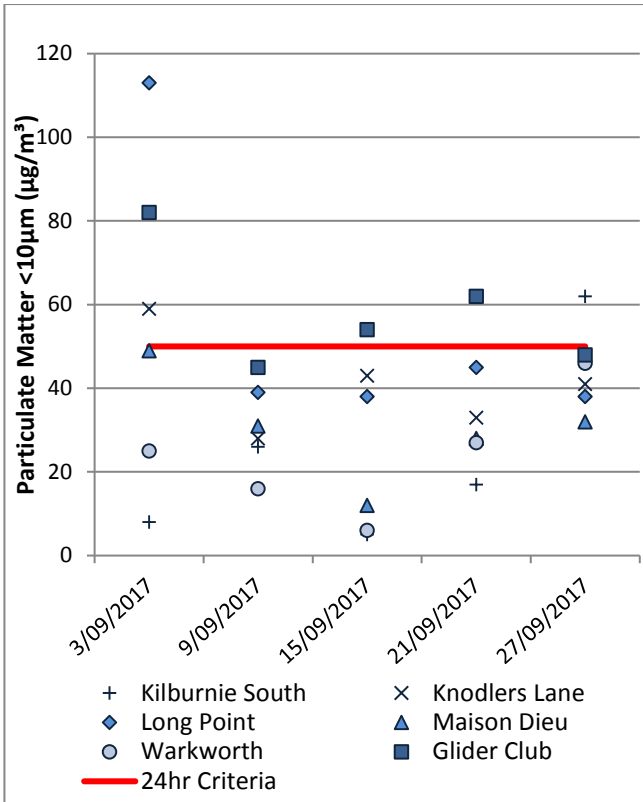


Figure 6: Individual PM₁₀ Results – September 2017

Figure 7 shows the year to date annual average PM₁₀ results.

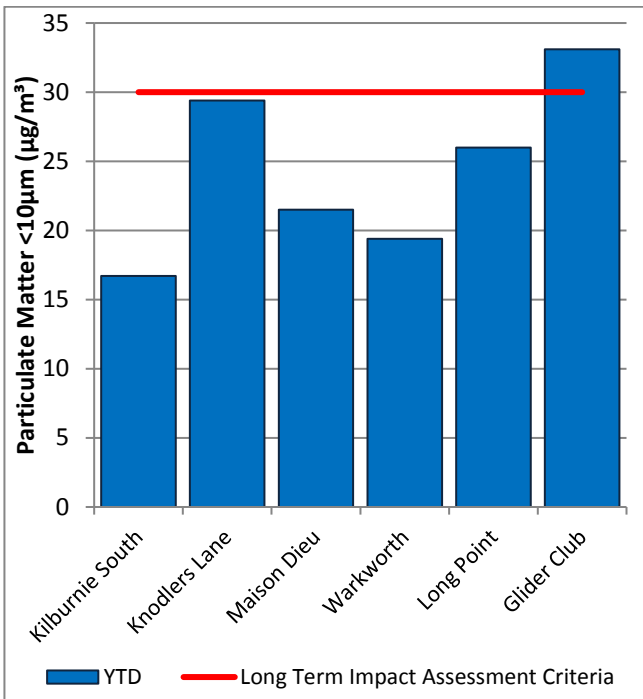


Figure 7: Year to Date Average PM₁₀ – September 2017

2.3.2 TSP Results

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

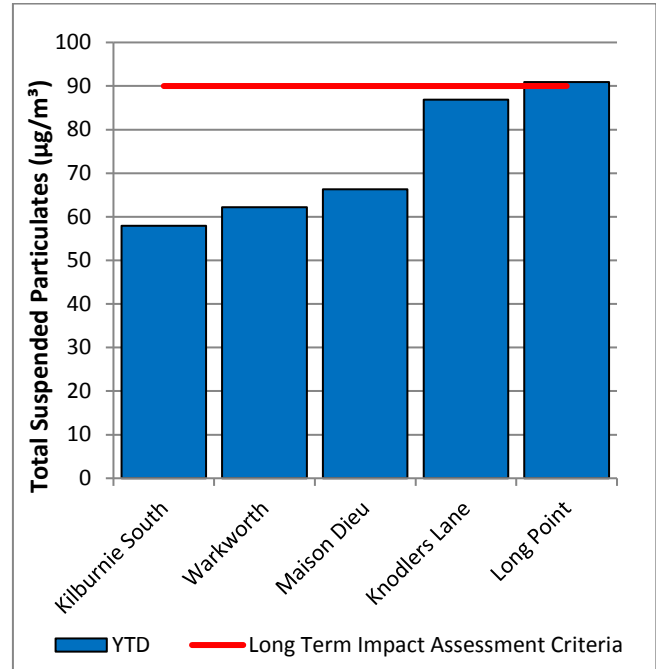


Figure 8: Year to Date Average Total Suspended Particulates – September 2017

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 is shown in Figure 9, including the daily 24 hour average PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

Seven results recorded elevated levels at the Knodlers Lane TEOM which exceeded the short term (24hr) criteria. These measurements were assessed for HVO’s maximum potential contribution based on mining activities and meteorological conditions on these days.

Resulting in the following maximum estimated contributions from the direction of HVO:

- 5 September 2017 – 41 $\mu\text{g}/\text{m}^3$;
- 12 September 2017 – 50 $\mu\text{g}/\text{m}^3$;
- 13 September 2017 – 40 $\mu\text{g}/\text{m}^3$;
- 23 September 2017 – 31 $\mu\text{g}/\text{m}^3$
- 24 September 2017 – 31 $\mu\text{g}/\text{m}^3$
- 25 September 2017 – 40 $\mu\text{g}/\text{m}^3$; and
- 30 September 2017 – 46 $\mu\text{g}/\text{m}^3$
- 13 September 2017 – 41 $\mu\text{g}/\text{m}^3$;
- 22 September 2017 – 34 $\mu\text{g}/\text{m}^3$;
- 23 September 2017 – 15 $\mu\text{g}/\text{m}^3$
- 24 September 2017 – 46 $\mu\text{g}/\text{m}^3$; and
- 25 September 2017 – 41 $\mu\text{g}/\text{m}^3$

2.3.4 Real Time Alarms for Air Quality

Six results recorded elevated levels at the Maison Dieu TEOM which exceeded the short term (24hr) criteria. These measurements were assessed for HVO’s maximum potential contribution based on mining activities and meteorological conditions on these days. Resulting in the following maximum estimated contributions from the direction of HVO:

During September the real time monitoring system generated 176 automated air quality related alarms. 42 were related to adverse weather conditions and 134 alarms relating to PM_{10} .

- 3 September 2017 – 34 $\mu\text{g}/\text{m}^3$;

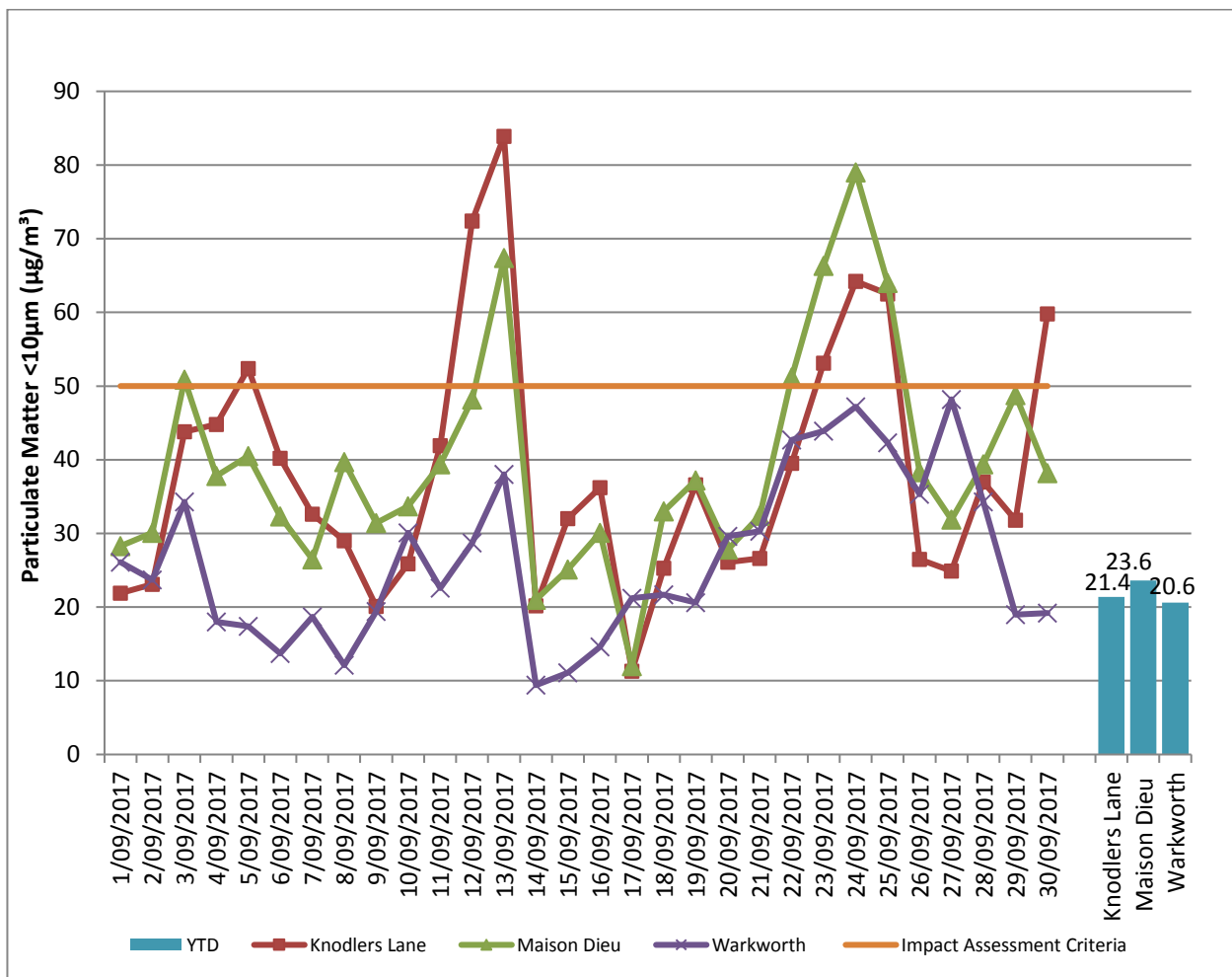


Figure 9: Real Time PM_{10} 24hr average and YTD average – September 2017

3.0 SURFACE WATER

3.1.1 Surface Water Monitoring

Surface water courses are sampled on a quarterly or rain event sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS).

Watercourses are assessed against ANZECC Guidelines for Fresh and Marine Water Quality (2000) for:

- pH (6.5 to 8.5);
- Electrical Conductivity (125 to 2200µS/cm); and
- Total Suspended Solids (maximum 50mg/L)

The location of Surface Water monitoring locations is shown in Figure 22

Figure 10 to Figure 12 show the long term surface water trend (2014 – current) within HVO mine dams. Figure 13 to Figure 21 show the long term surface water trend (2014 – current) in surrounding watercourses.

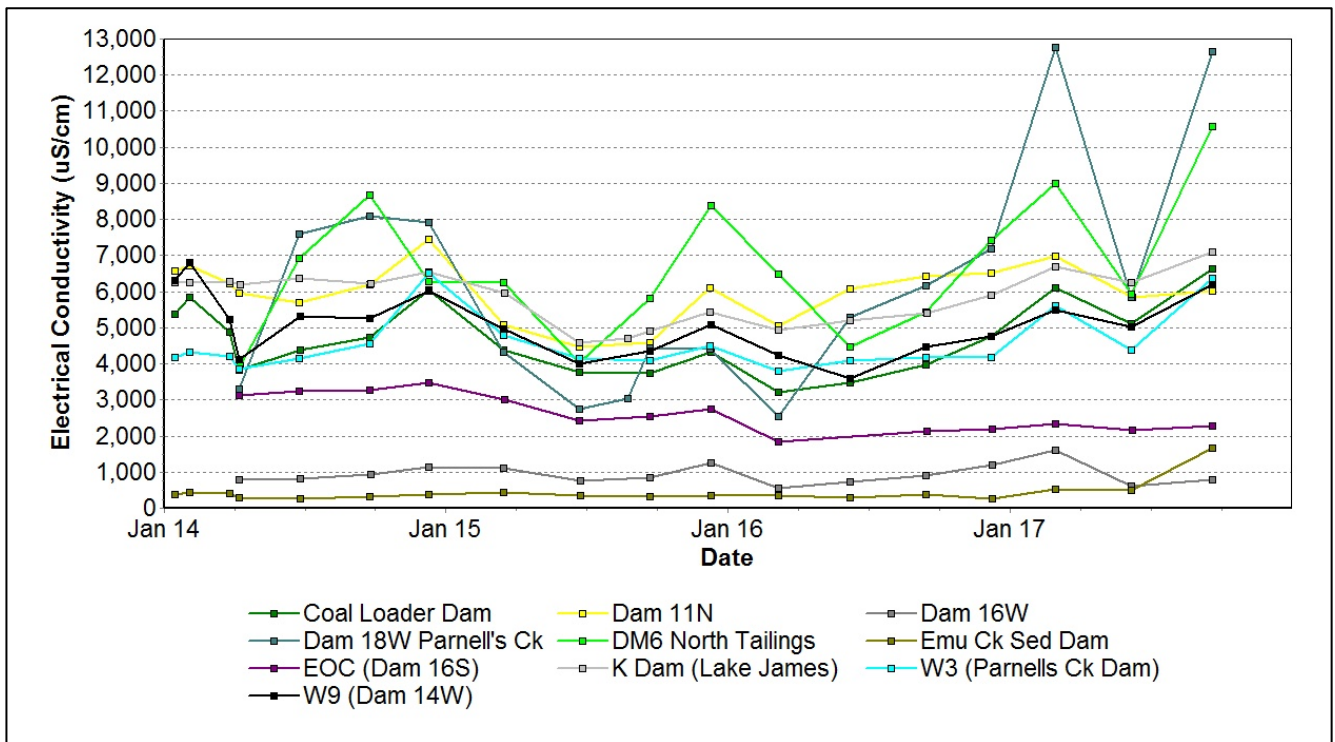


Figure 10: Site Dams Electrical Conductivity Trend – September 2017

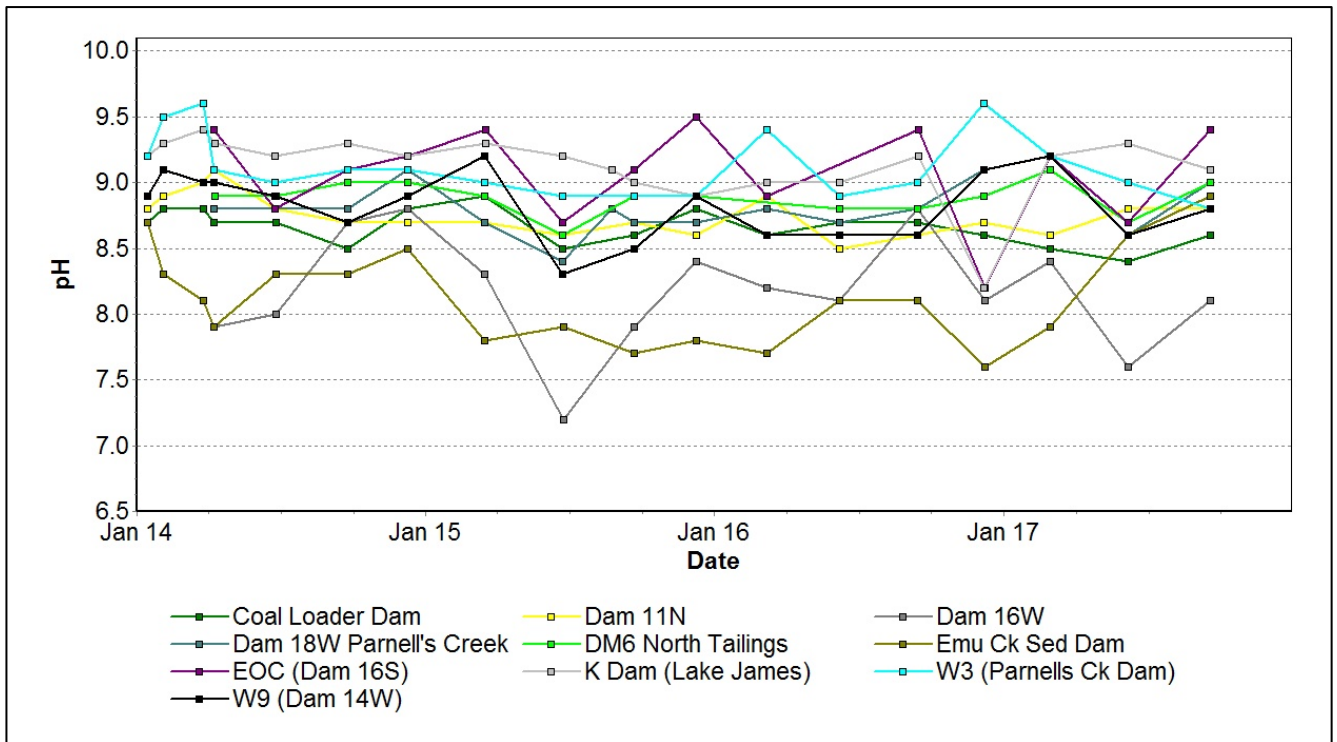


Figure 11: Site Dams pH Trend – September 2017

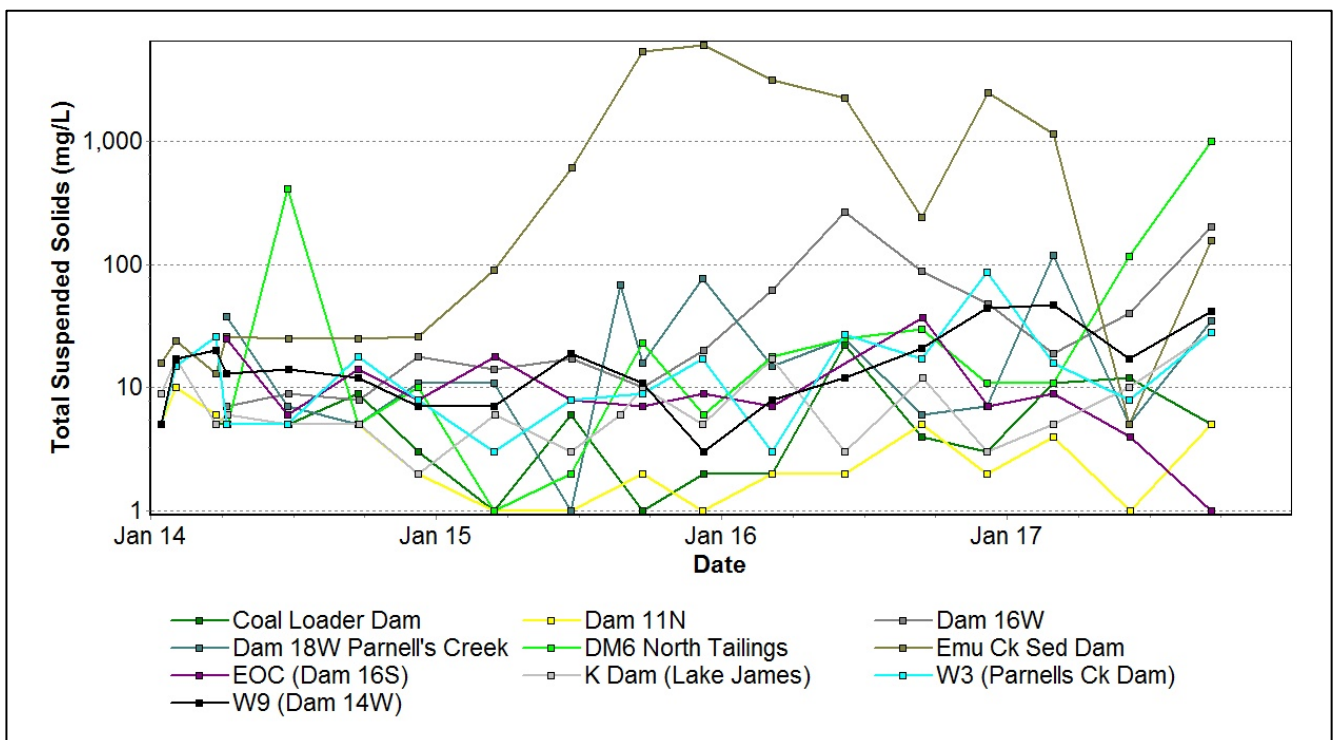


Figure 12: Site Dams Total Suspended Solids Trend – September 2017

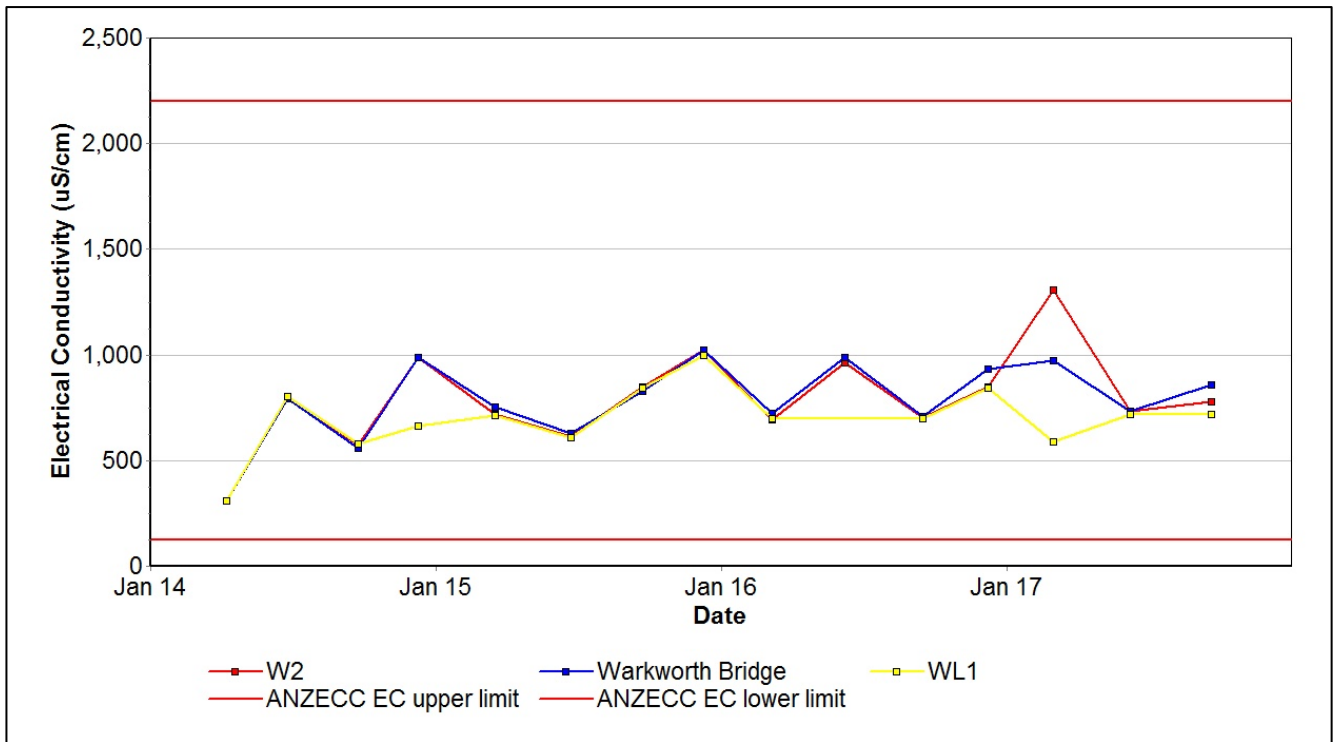


Figure 13: Wollombi Brook Electrical Conductivity Trend - September 2017

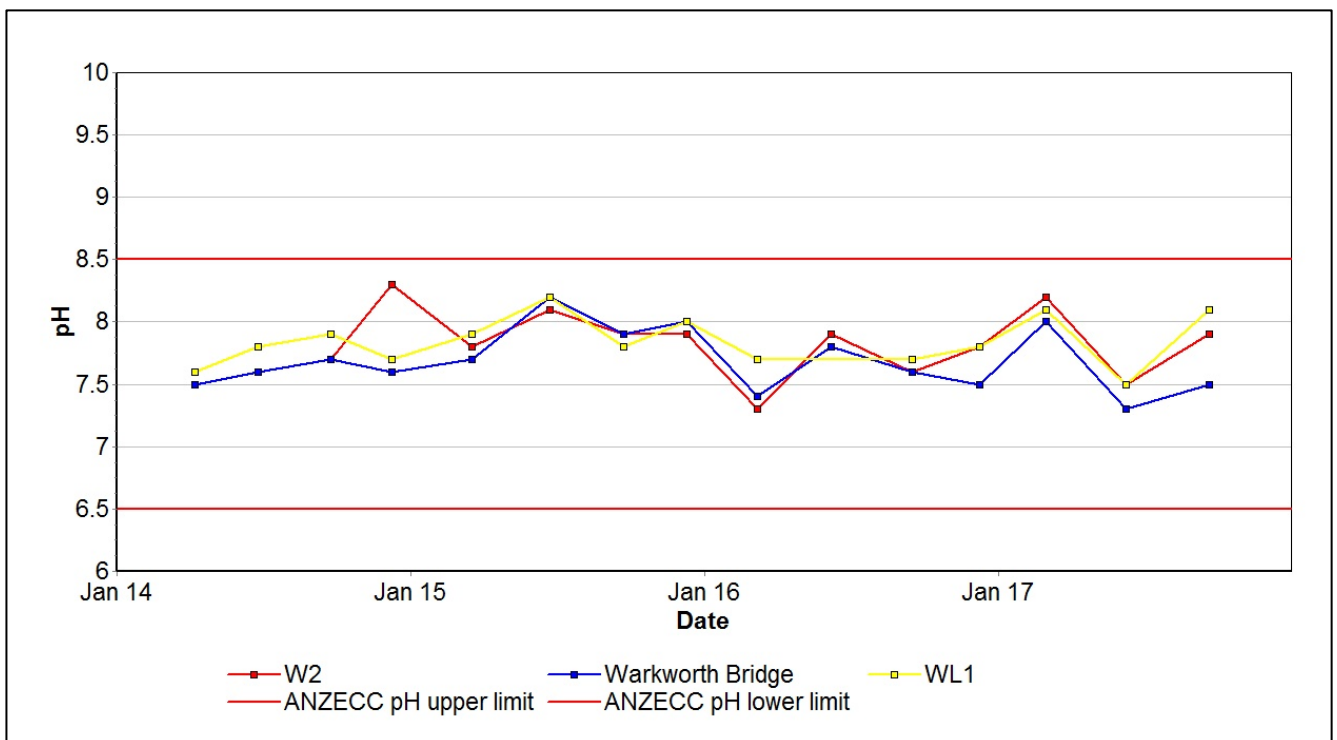


Figure 14: Wollombi Brook pH Trend - September 2017

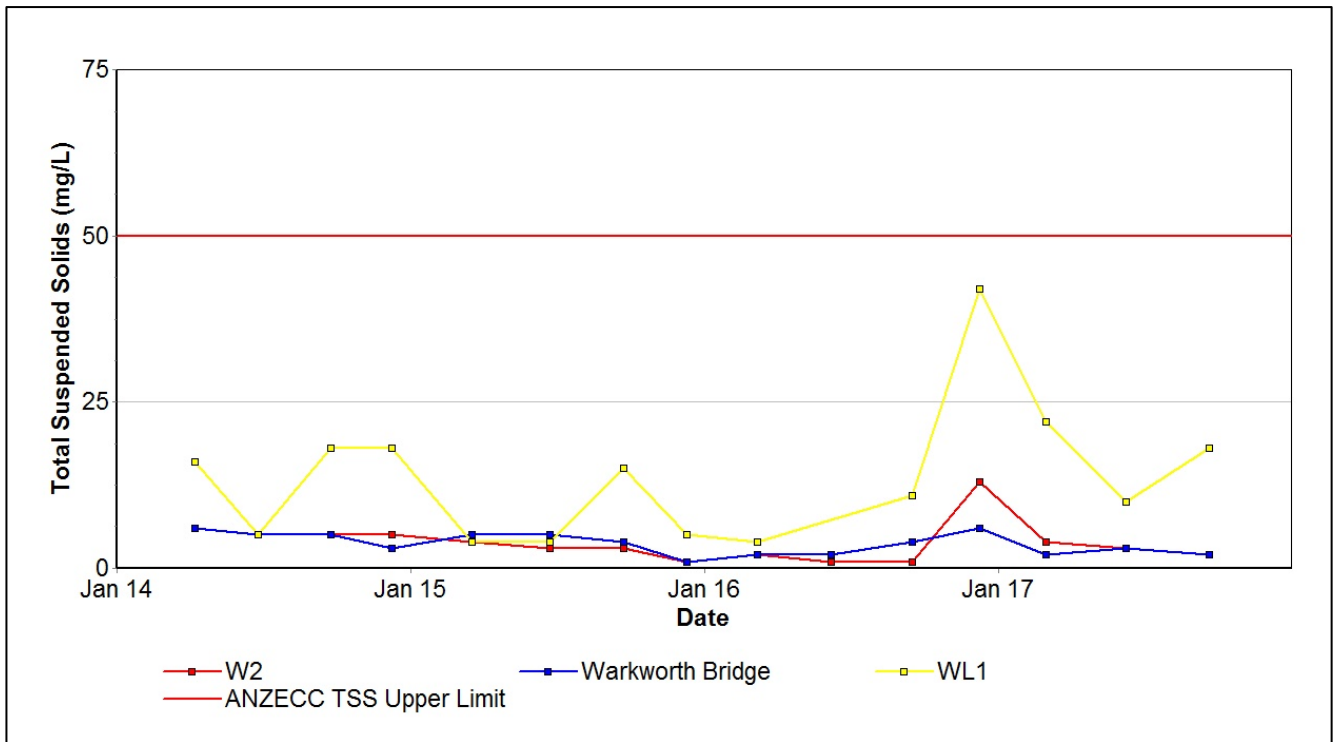


Figure 15: Wollombi Brook Total Suspended Solids Trend - September 2017

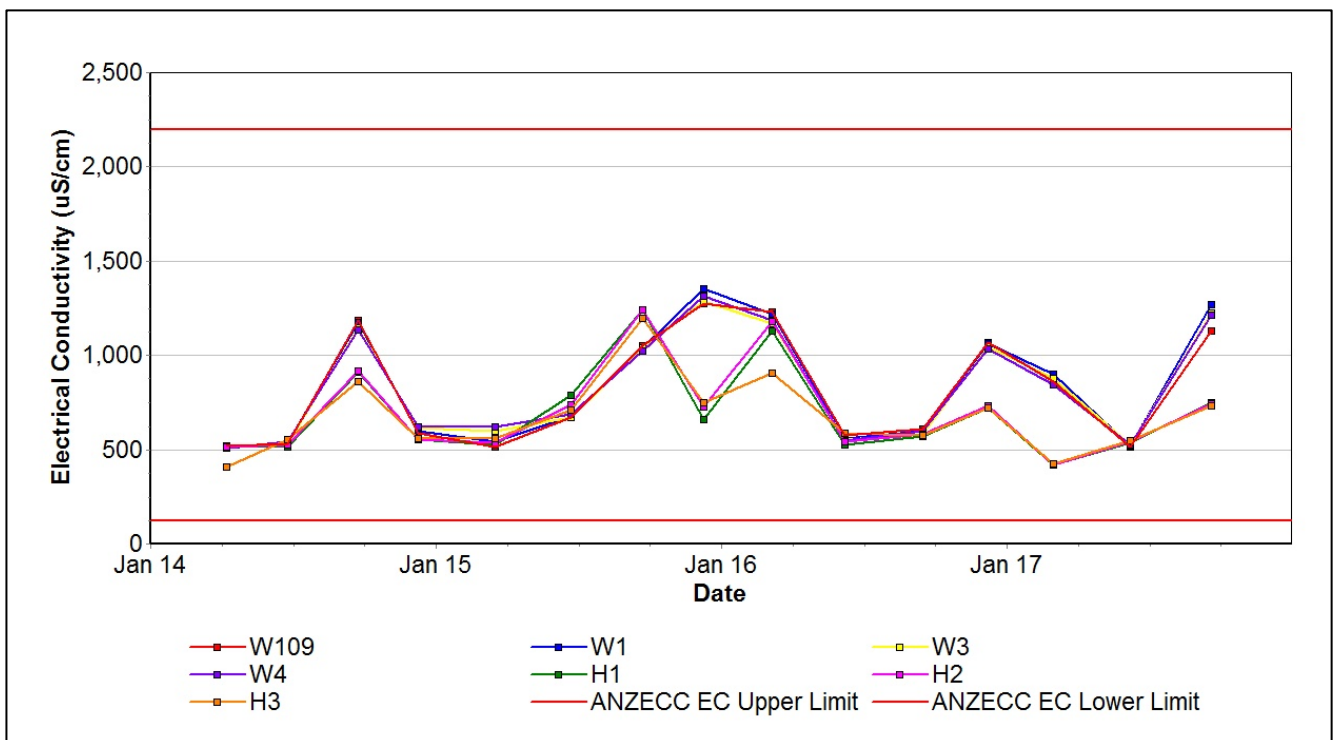


Figure 16: Hunter River Electrical Conductivity Trend - September 2017

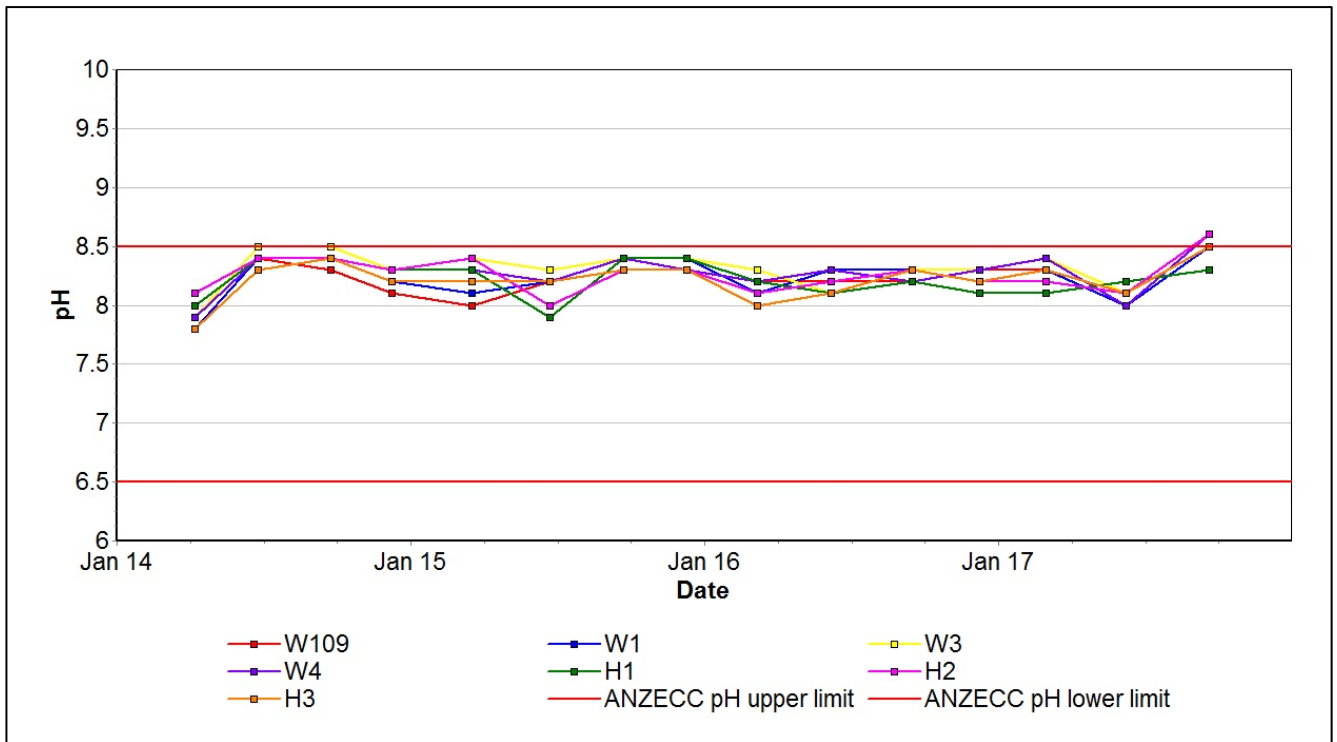


Figure 17: Hunter River pH Trend - September 2017

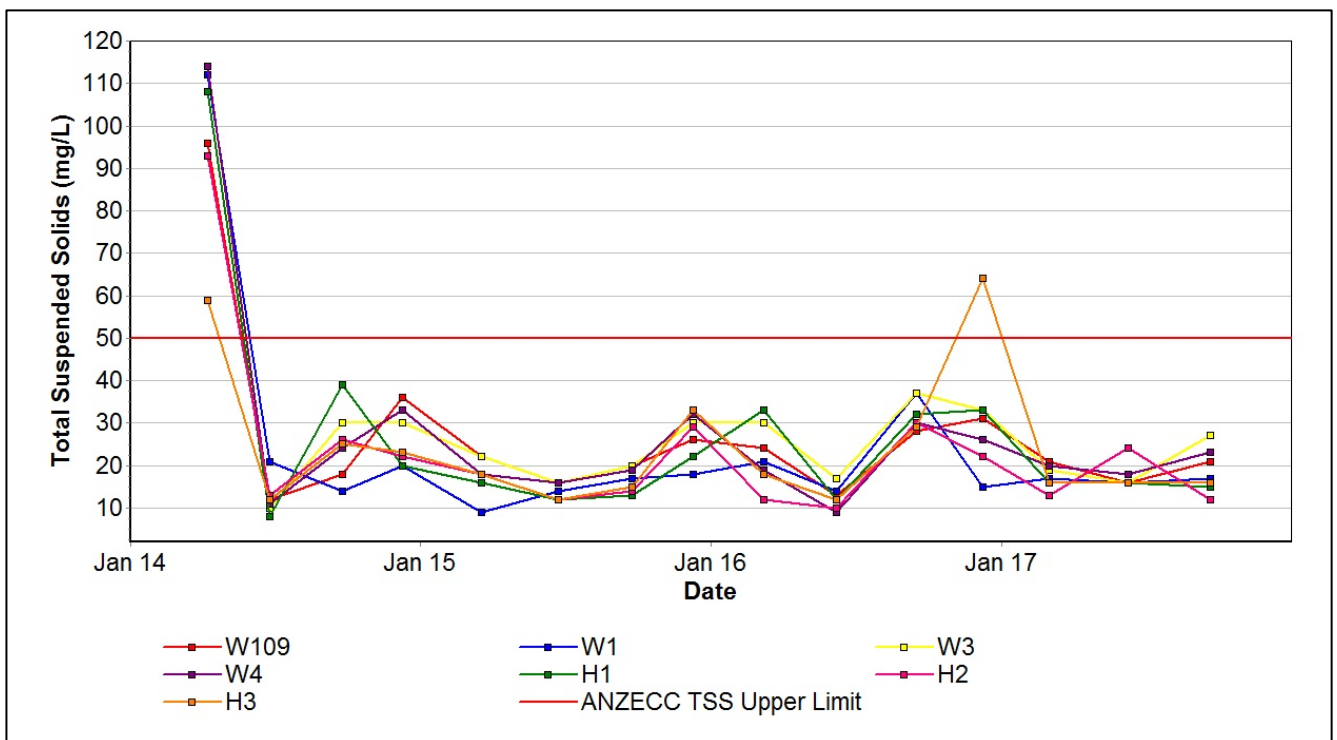


Figure 18: Hunter River Total Suspended Solids - September 2017

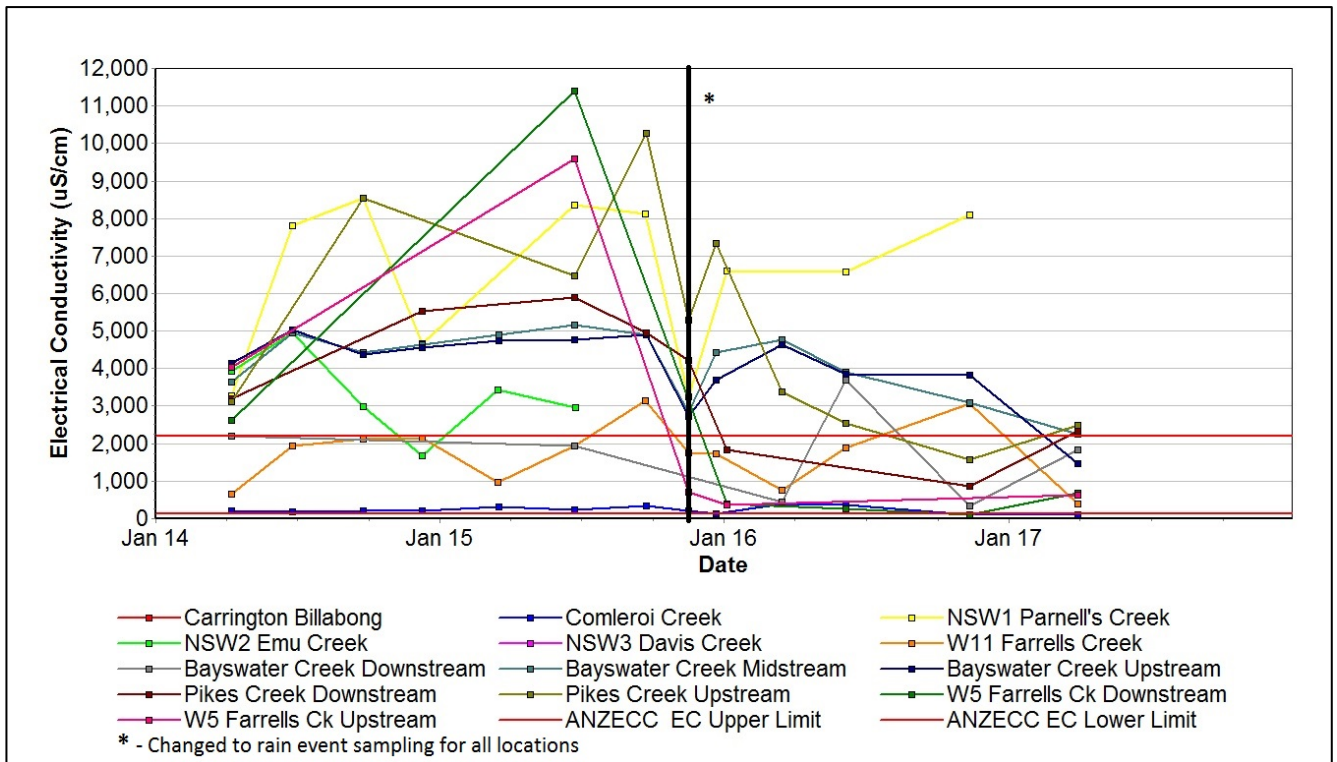


Figure 19: Other Tributaries Electrical Conductivity Trend - September 2017

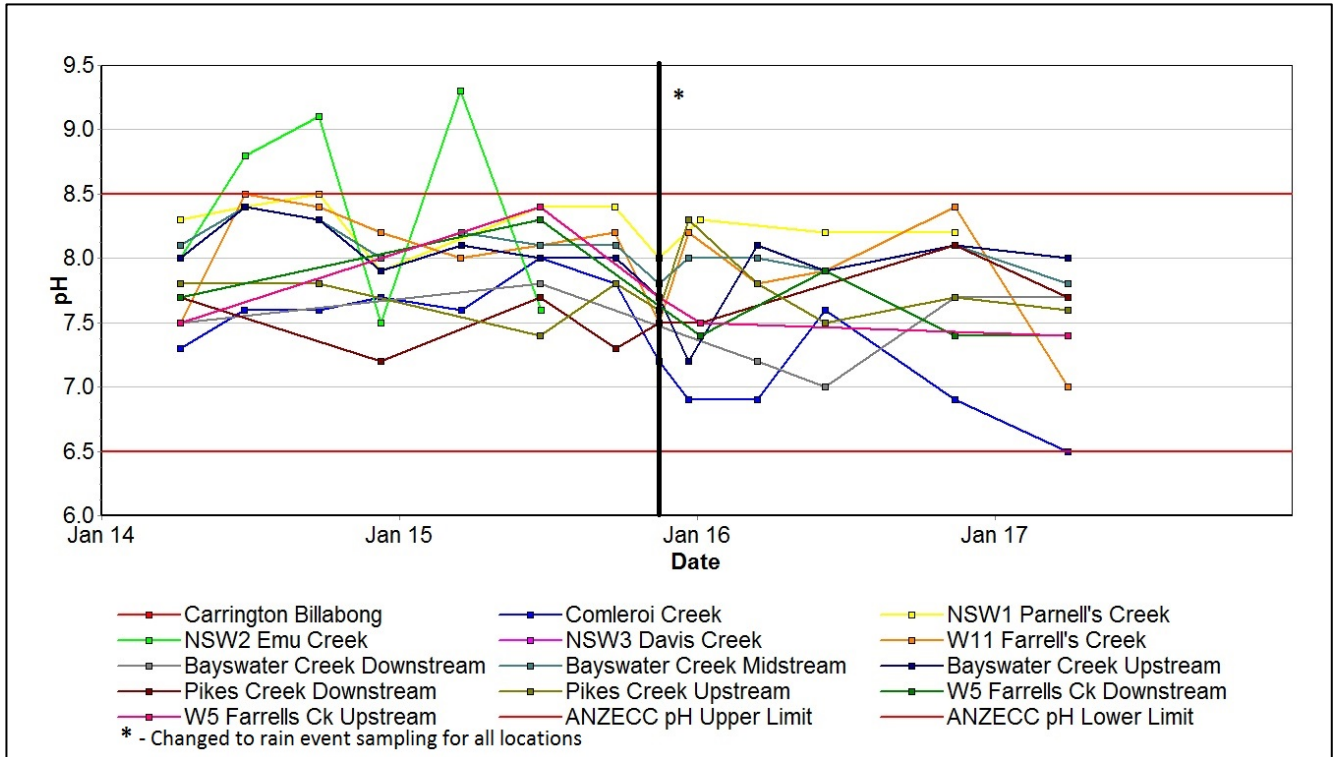


Figure 20: Other Tributaries pH Trend – September 2017

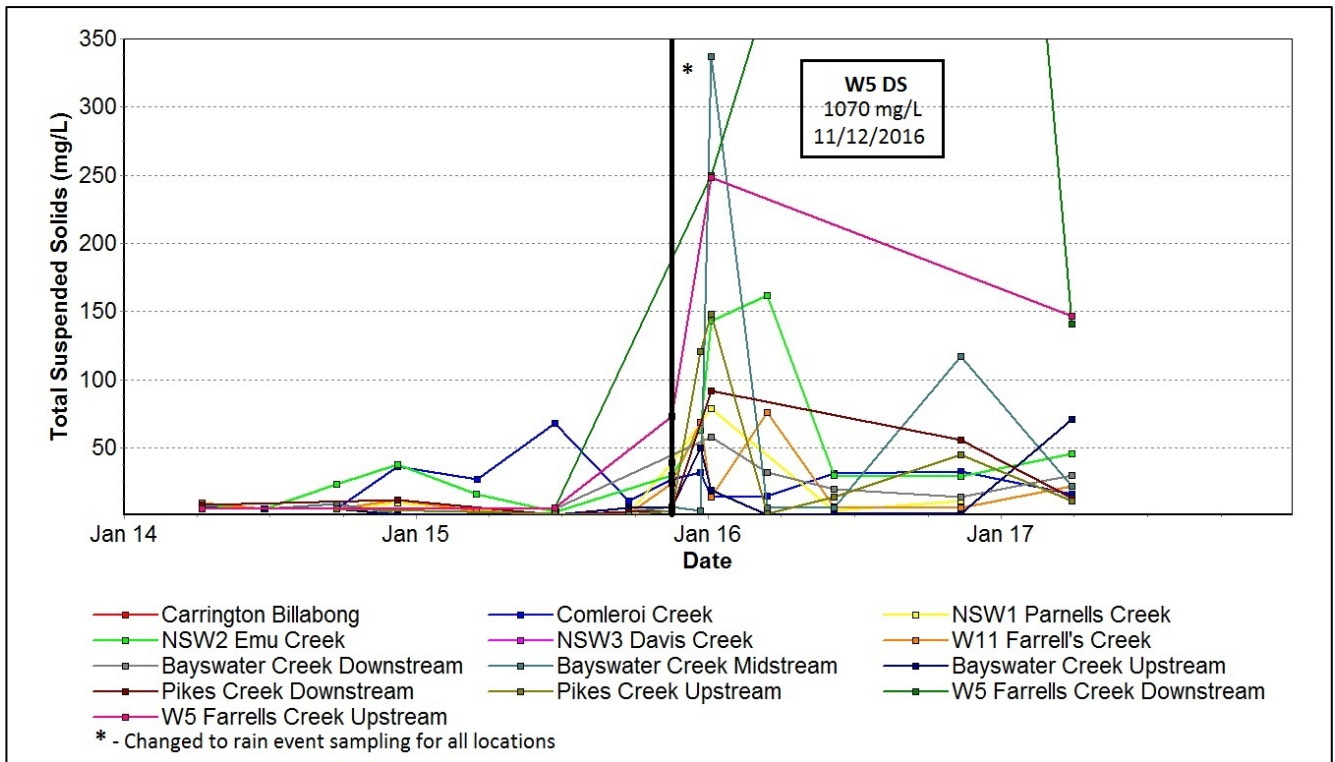


Figure 21: Other Tributaries Total Suspended Solids Trend - September 2017

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 HRSTS, allowing it to 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.

3.1.4 Surface Water Trigger Limits

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse surface water impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan.

During Q3 2017 a range of internal trigger limits were breached, summarised in Table 2.

Table 2: Surface Water Trigger Limit Summary

Site	Date	Trigger Limit Breached	Action taken in response
W1 (Hunter River)	08/06/2017	pH – 5 th Percentile	Watching Brief*

W4 Hunter River	08/06/2017	pH – 5 th Percentile	Watching Brief*
H2	20/09/2017	pH – 95 th Percentile	Watching Brief*
H3	20/09/2017	pH – 95 th Percentile	Watching Brief*
W1 (Hunter River)	20/09/2017	pH – 95 th Percentile	Watching Brief*
W3 Hunter River	20/09/2017	pH – 95 th Percentile	Watching Brief*
W4 Hunter River	20/09/2017	pH – 95 th Percentile	Watching Brief*

* = Watching Brief established pending outcomes of subsequent monitoring events. No further action required.

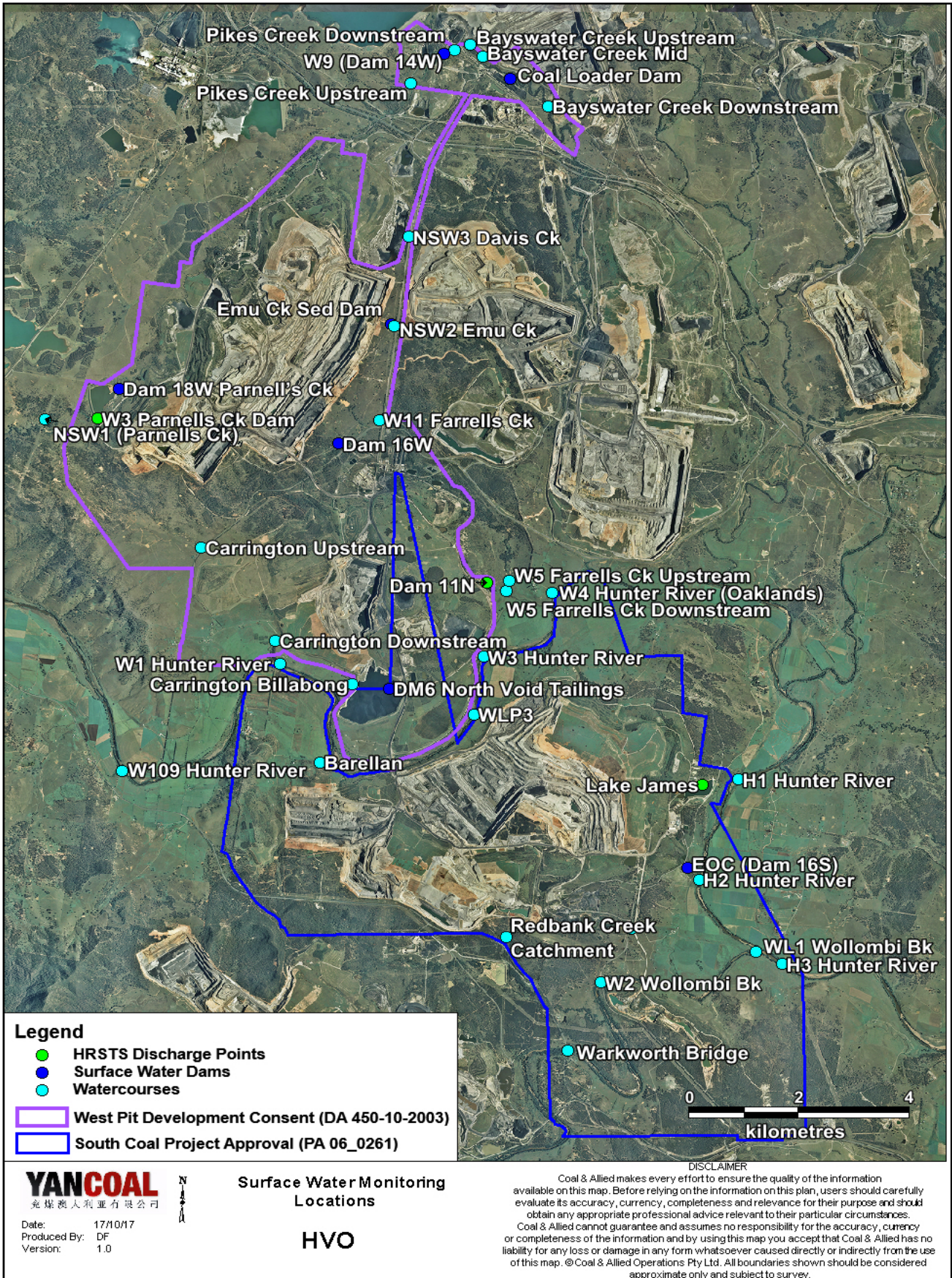


Figure 22: Surface Water Monitoring Location Plan

4.0 GROUNDWATER

4.1.1 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the HVO Water Management Plan and Ground Water Monitoring Programme. Monitoring sites are shown in Figure 77

Figure 23 to Figure 76 show the long term trends (2014 – current) for ground water bores monitored at HVO.

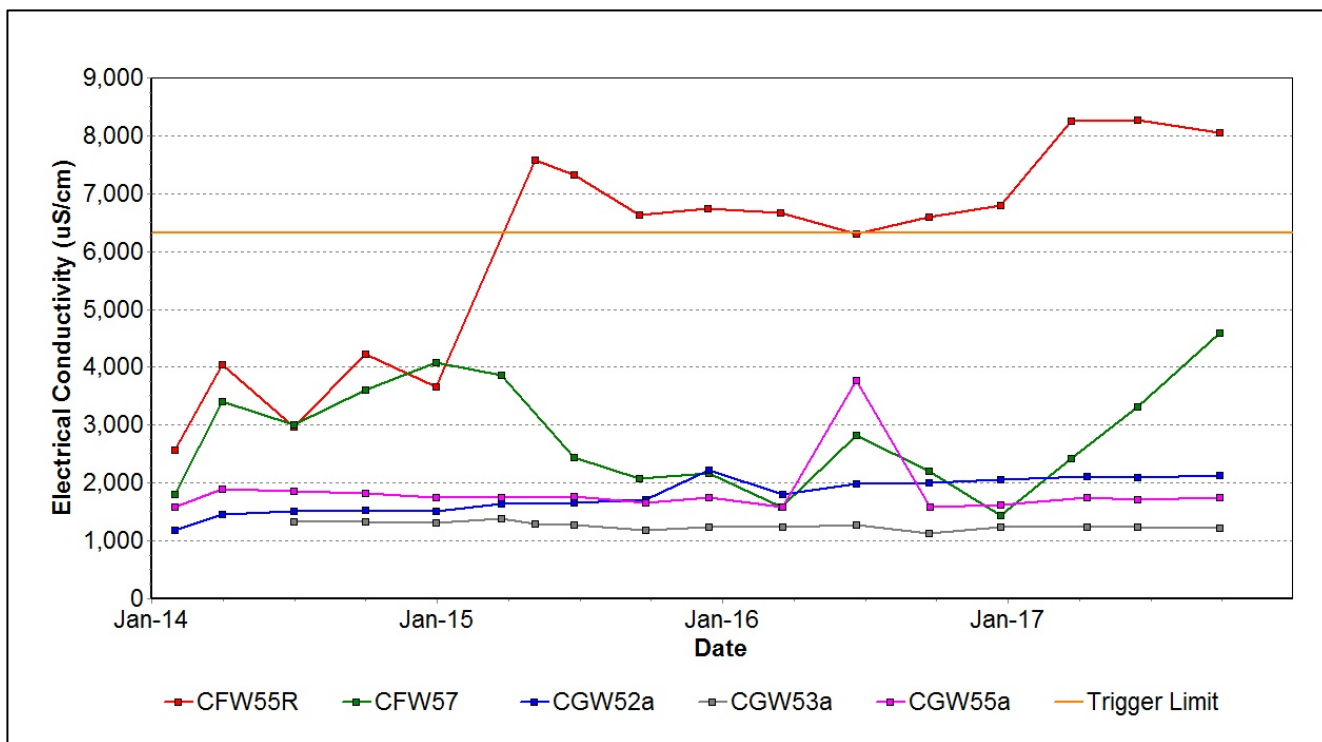


Figure 23: Carrington Alluvium Electrical Conductivity Trend - September 2017

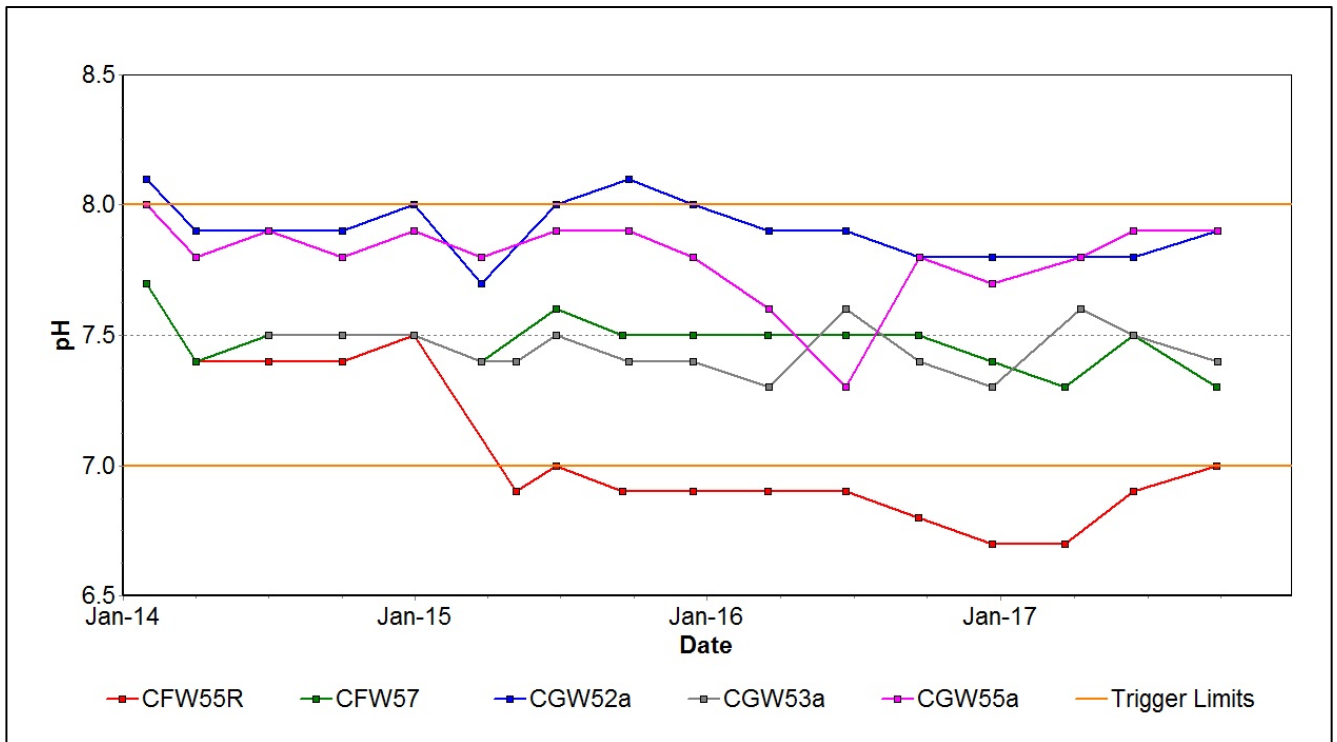


Figure 24: Carrington Alluvium pH Trend – September 2017

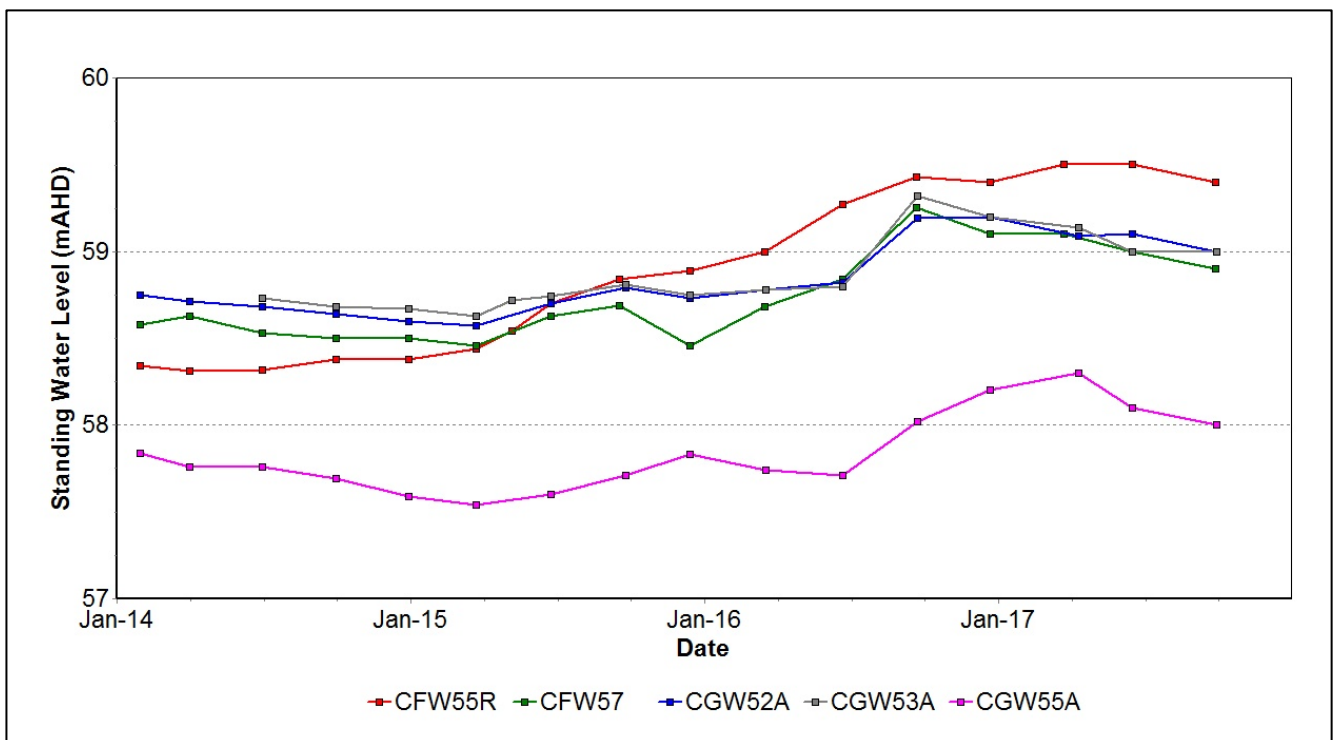


Figure 25: Carrington Alluvium Standing Water Level - September 2017

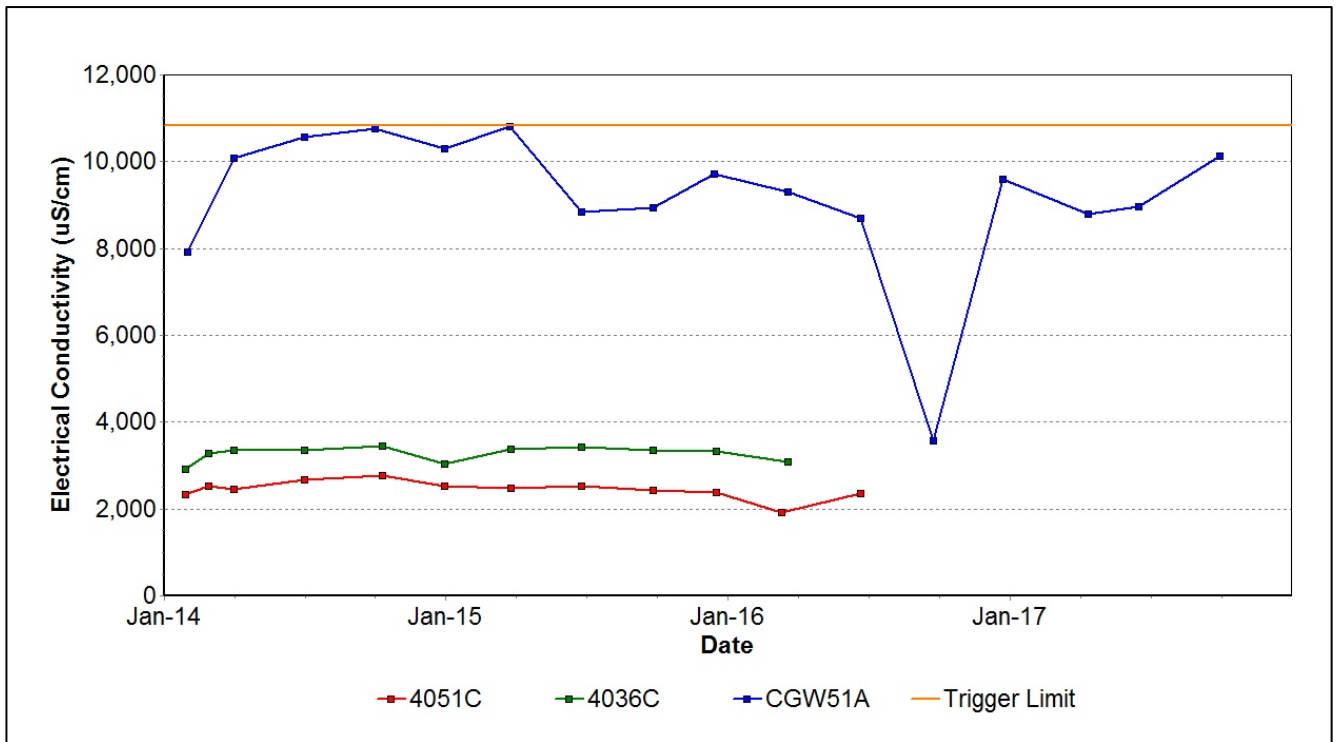


Figure 26: Carrington Interburden Electrical Conductivity Trend - September 2017

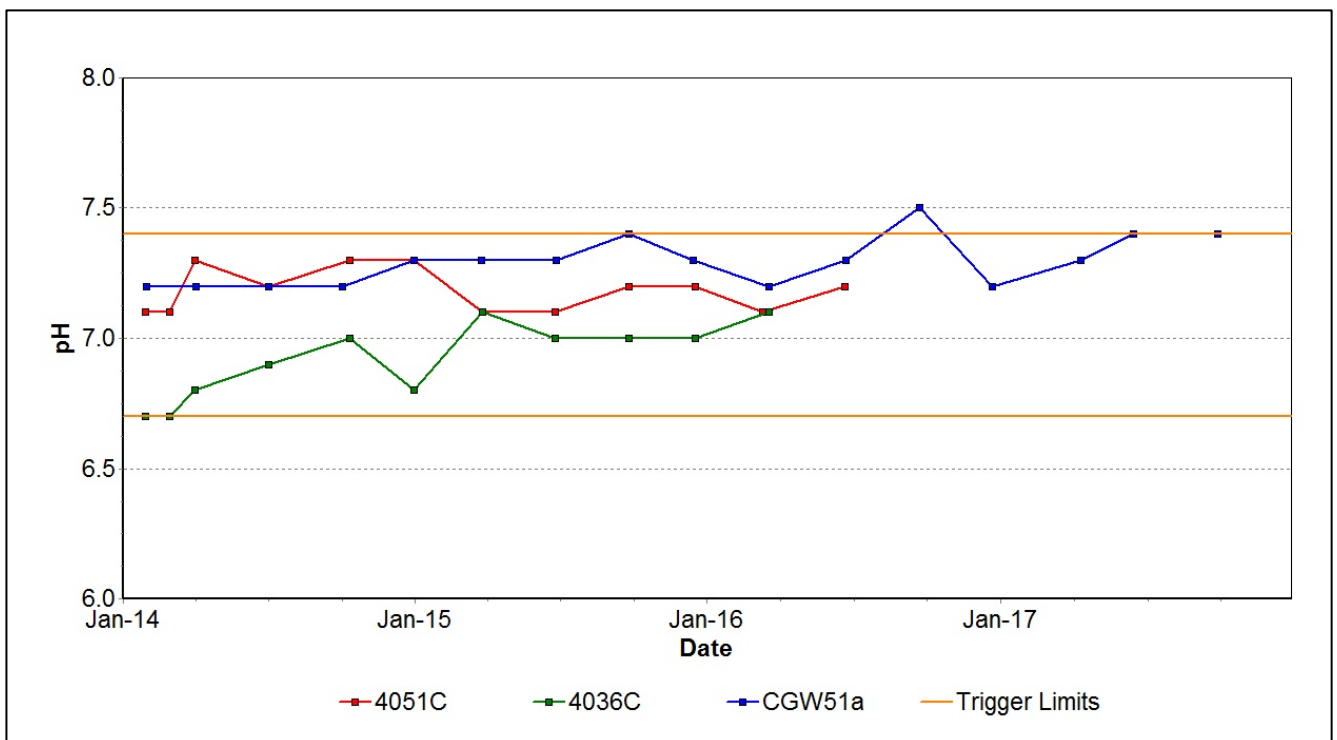


Figure 27: Carrington Interburden pH Trend – September 2017

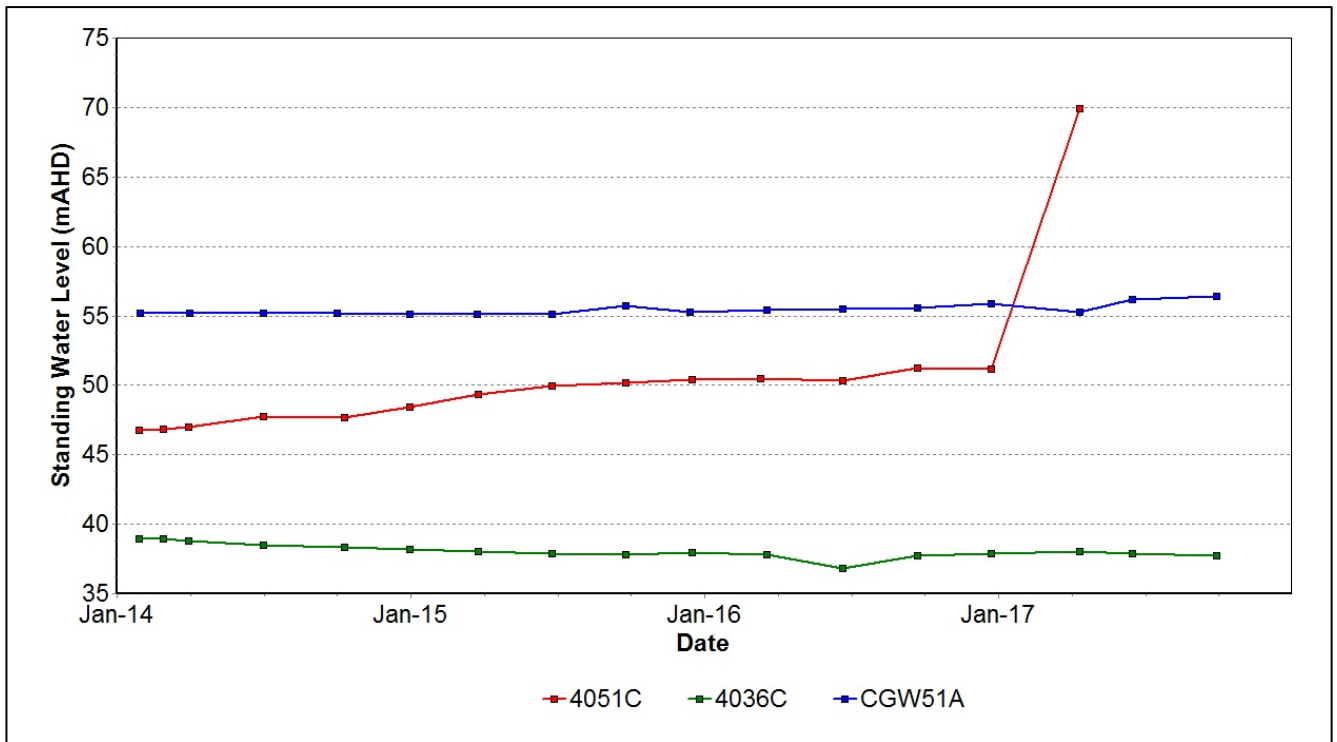


Figure 28: Carrington Interburden Standing Water Level - September 2017

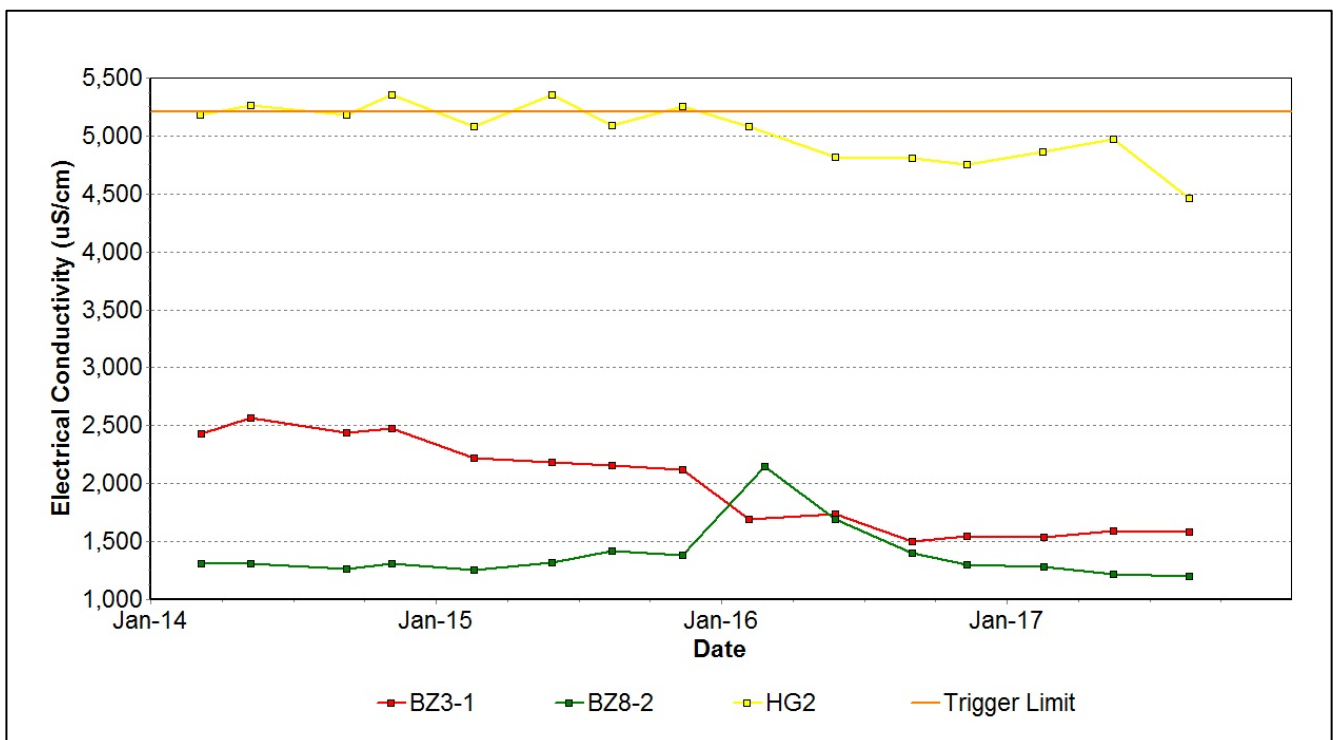


Figure 29: Cheshunt Interburden Electrical Conductivity Trend - September 2017

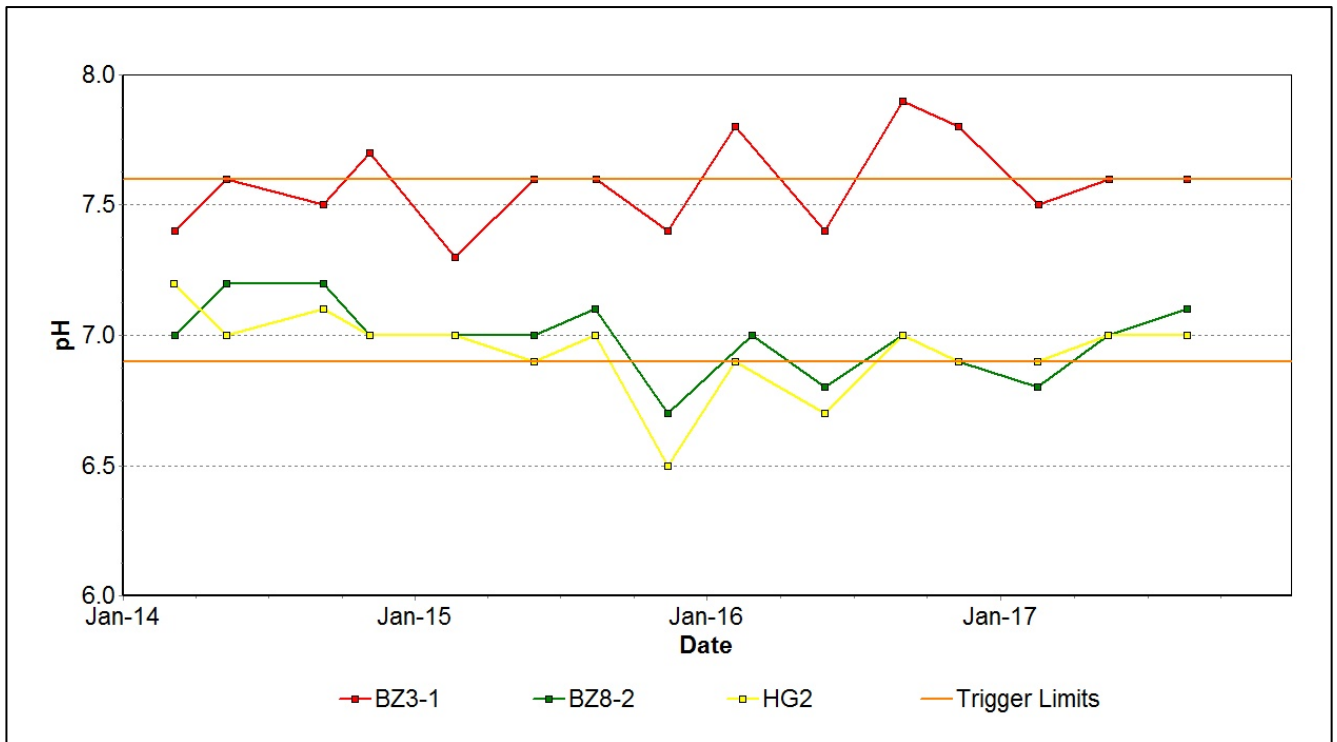


Figure 30: Cheshunt Interburden pH Trend - September 2017

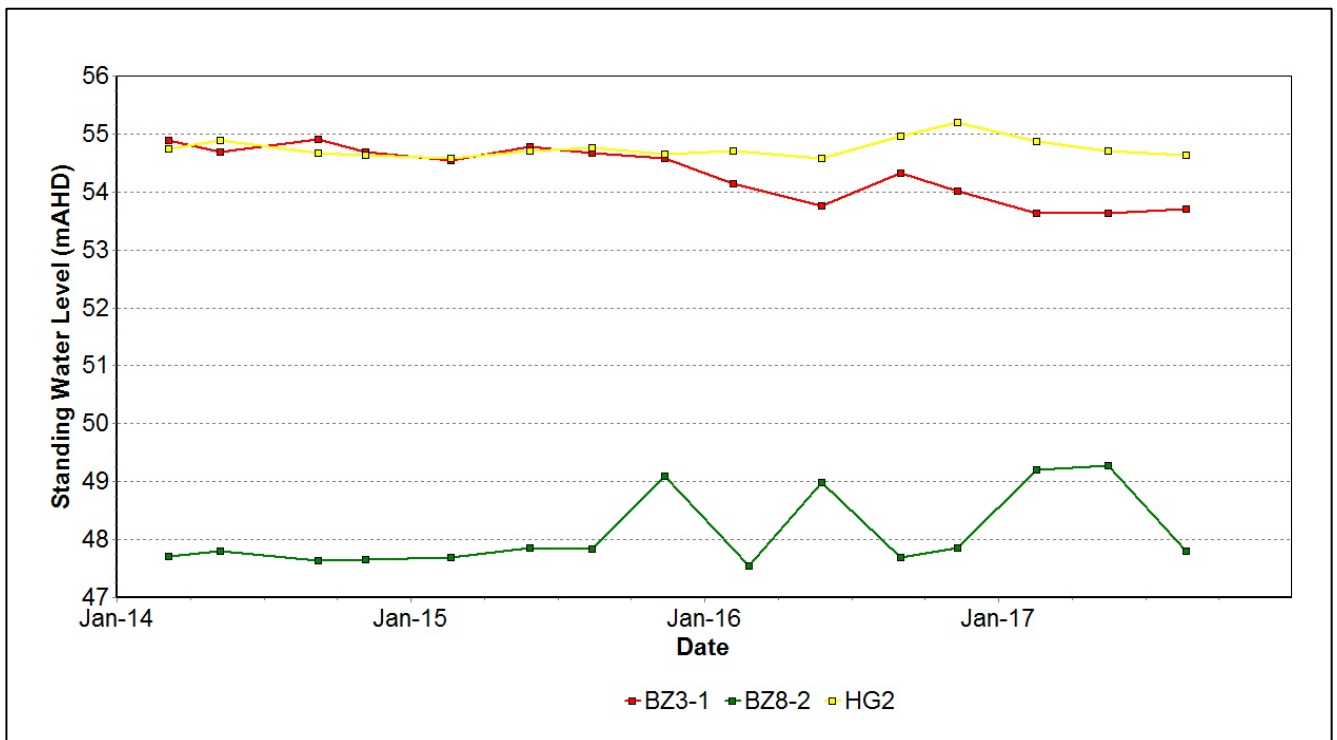


Figure 31: Cheshunt Interburden Standing Water Level – September 2017

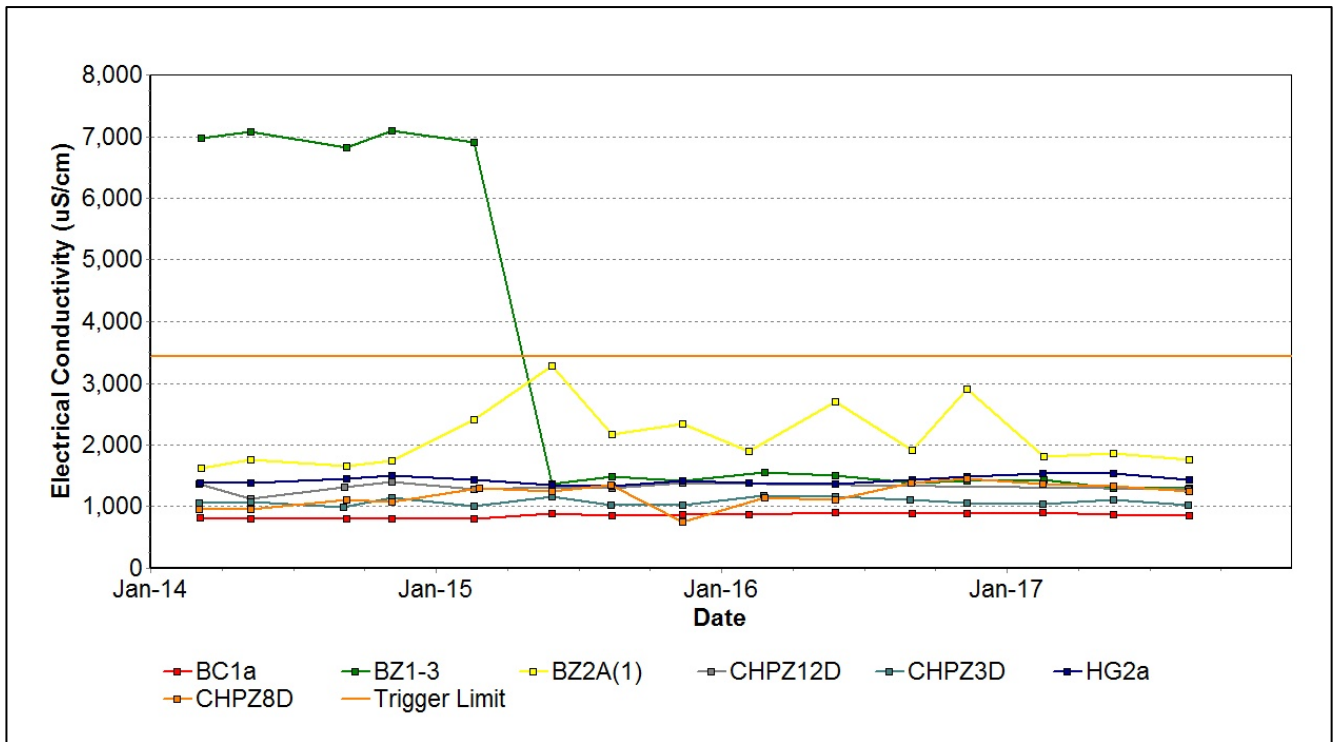


Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend - September 2017

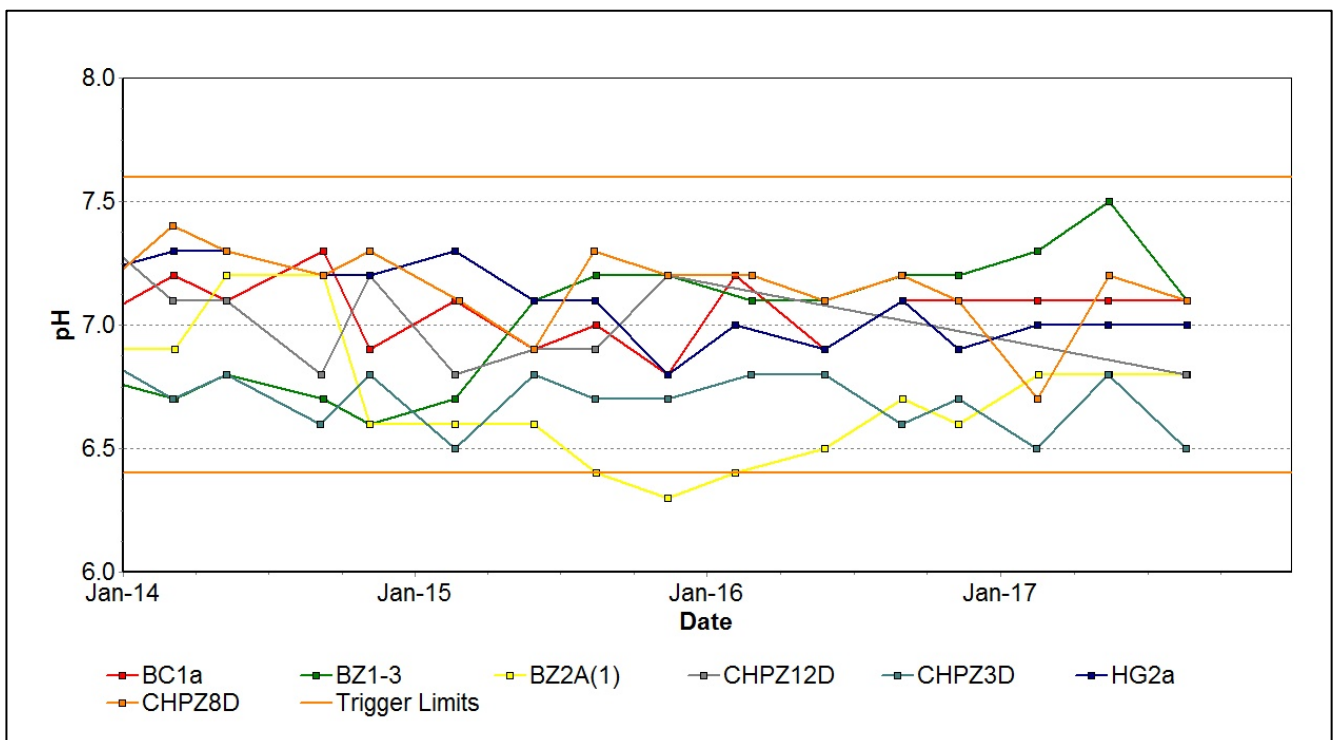


Figure 33: Cheshunt Mt Arthur pH Trend - September 2017

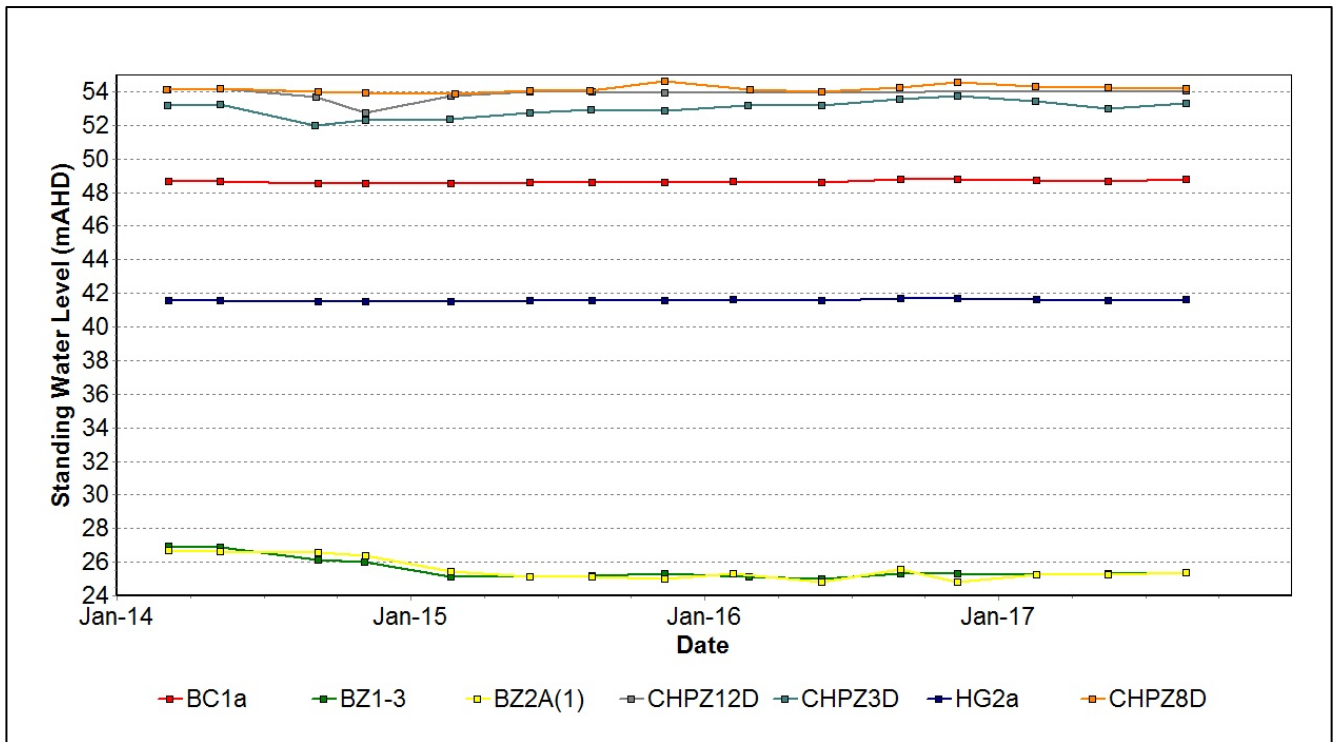


Figure 34: Cheshunt Mt Arthur Standing Water Level – September 2017

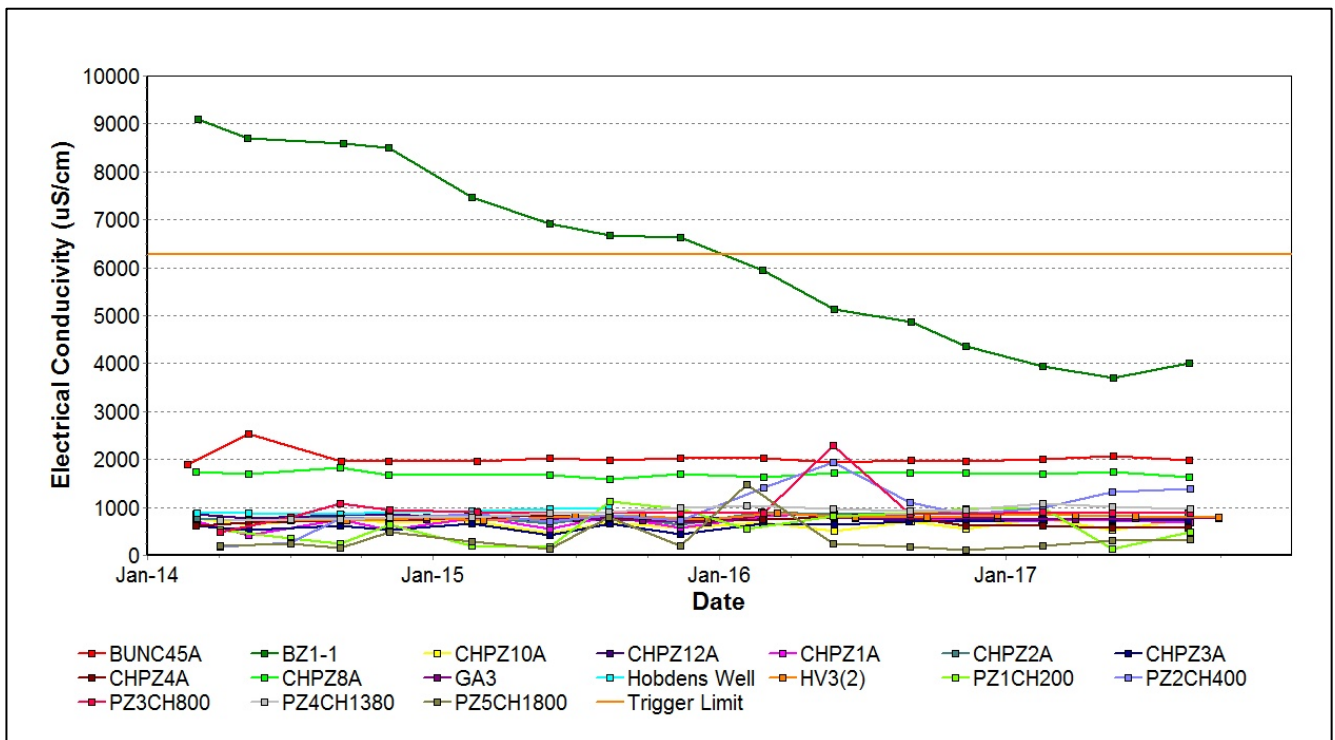


Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend - September 2017

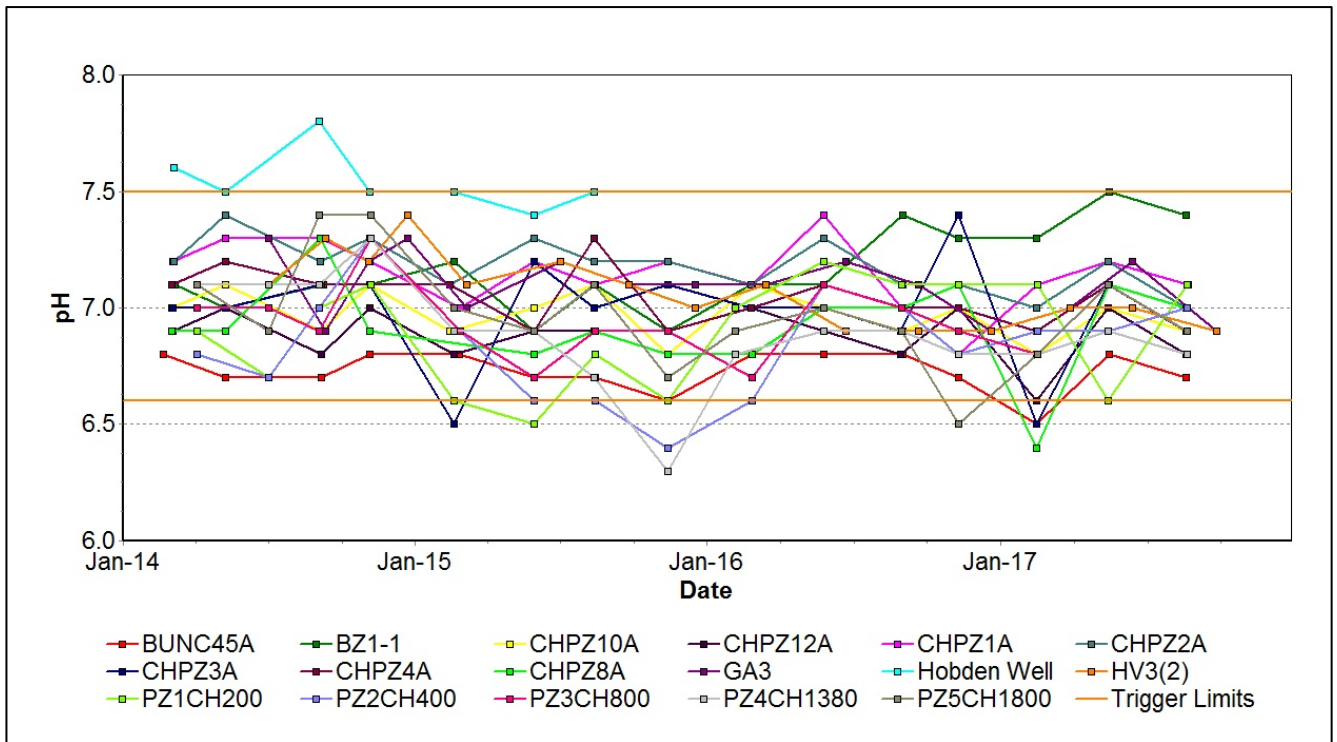


Figure 36: Cheshunt / North Pit Alluvium pH Trend - September 2017

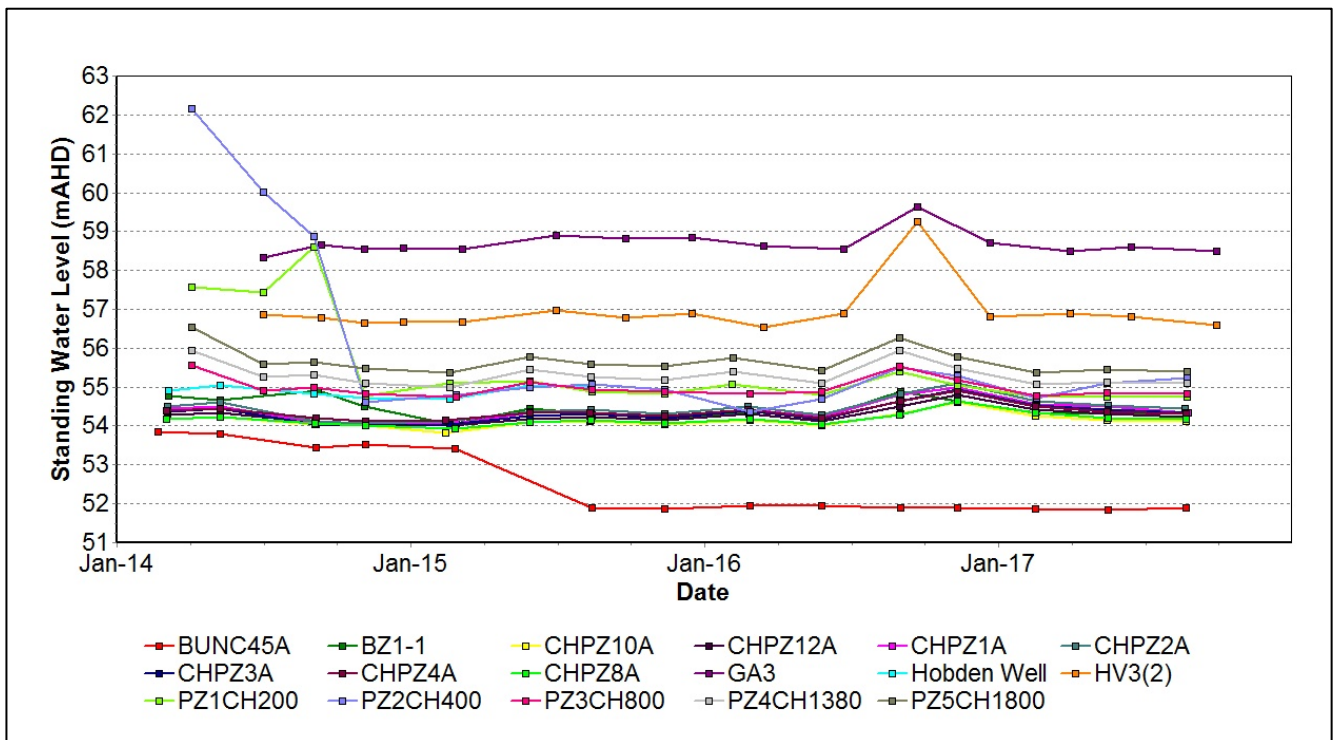


Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – September 2017

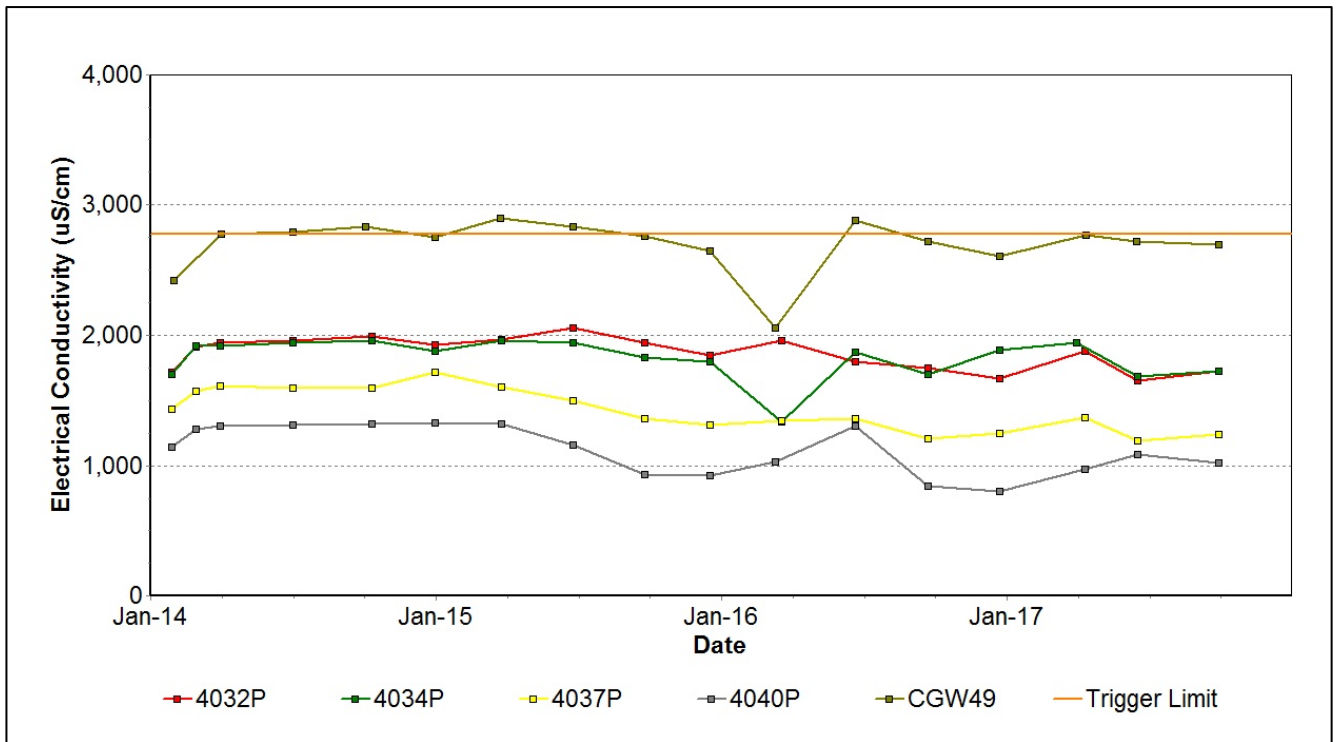


Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend - September 2017

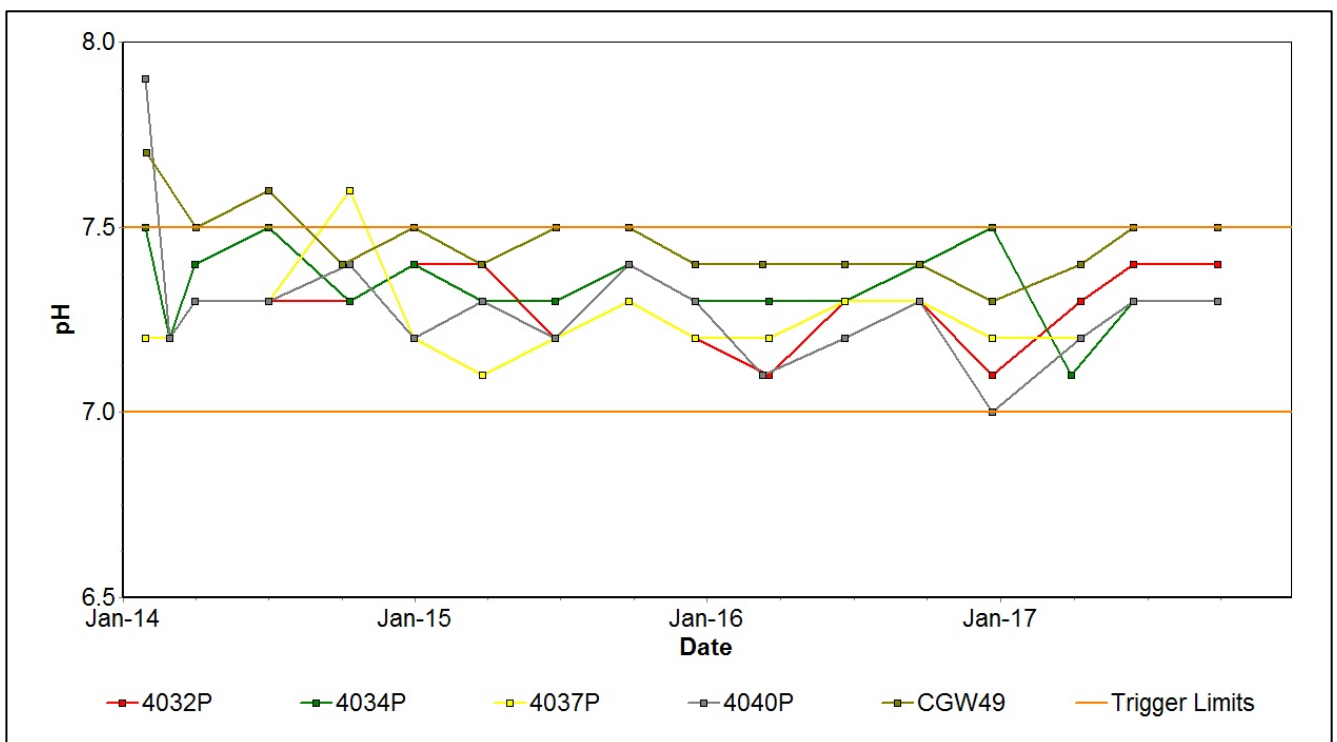


Figure 39: Carrington West Wing Alluvium pH Trend - September 2017

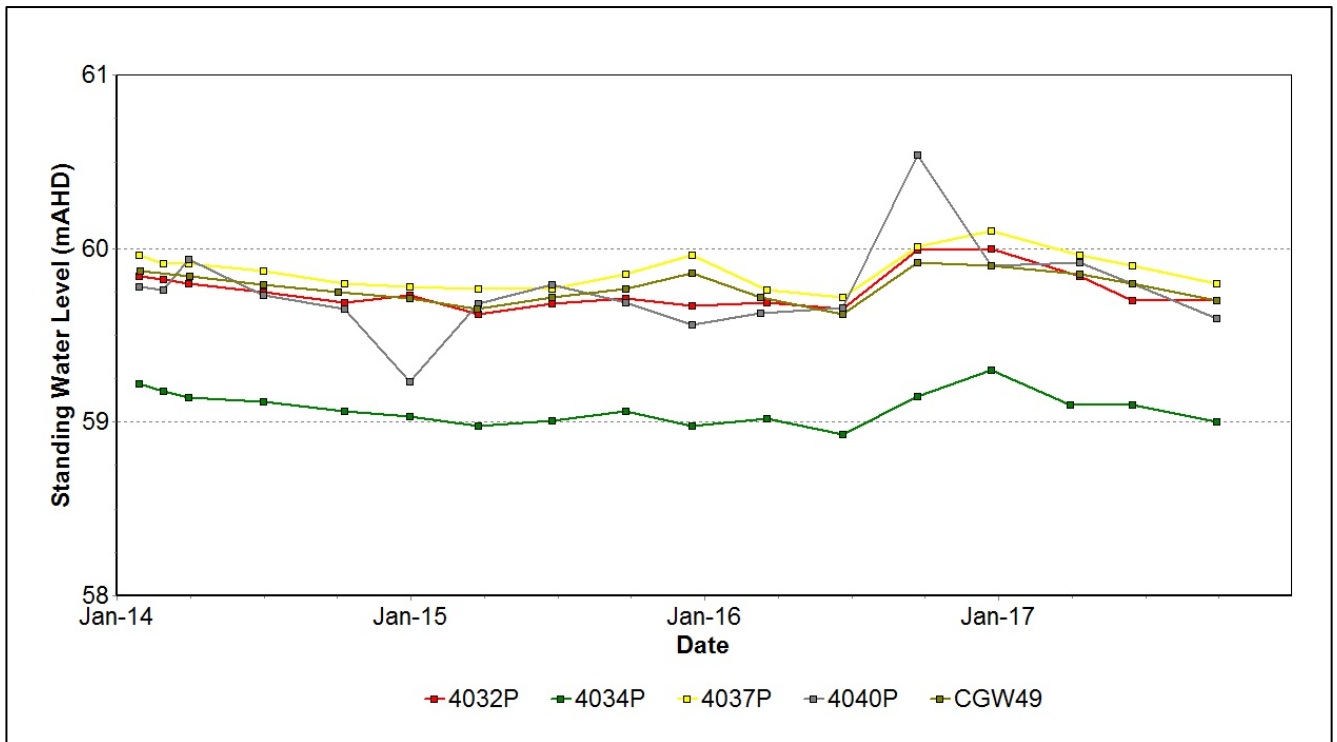


Figure 40: Carrington West Wing Alluvium Standing Water Level – September 2017

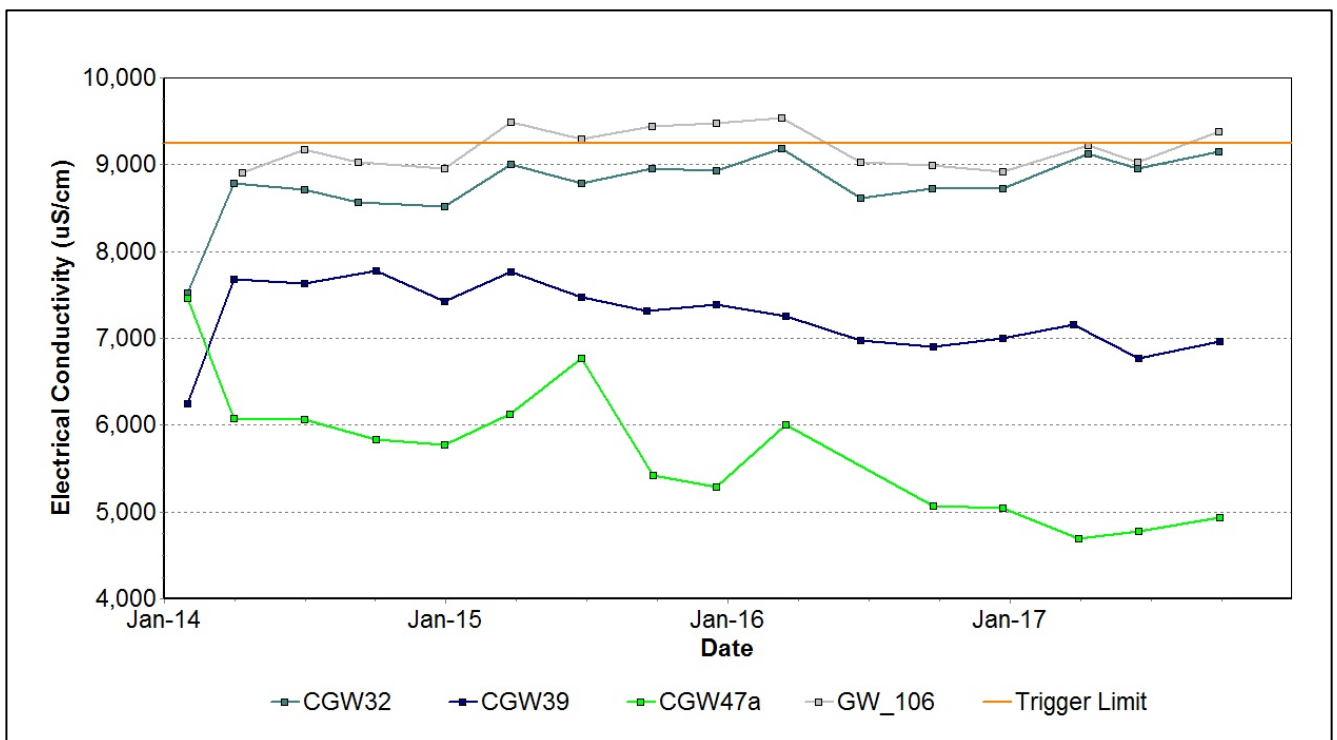


Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend - September 2017

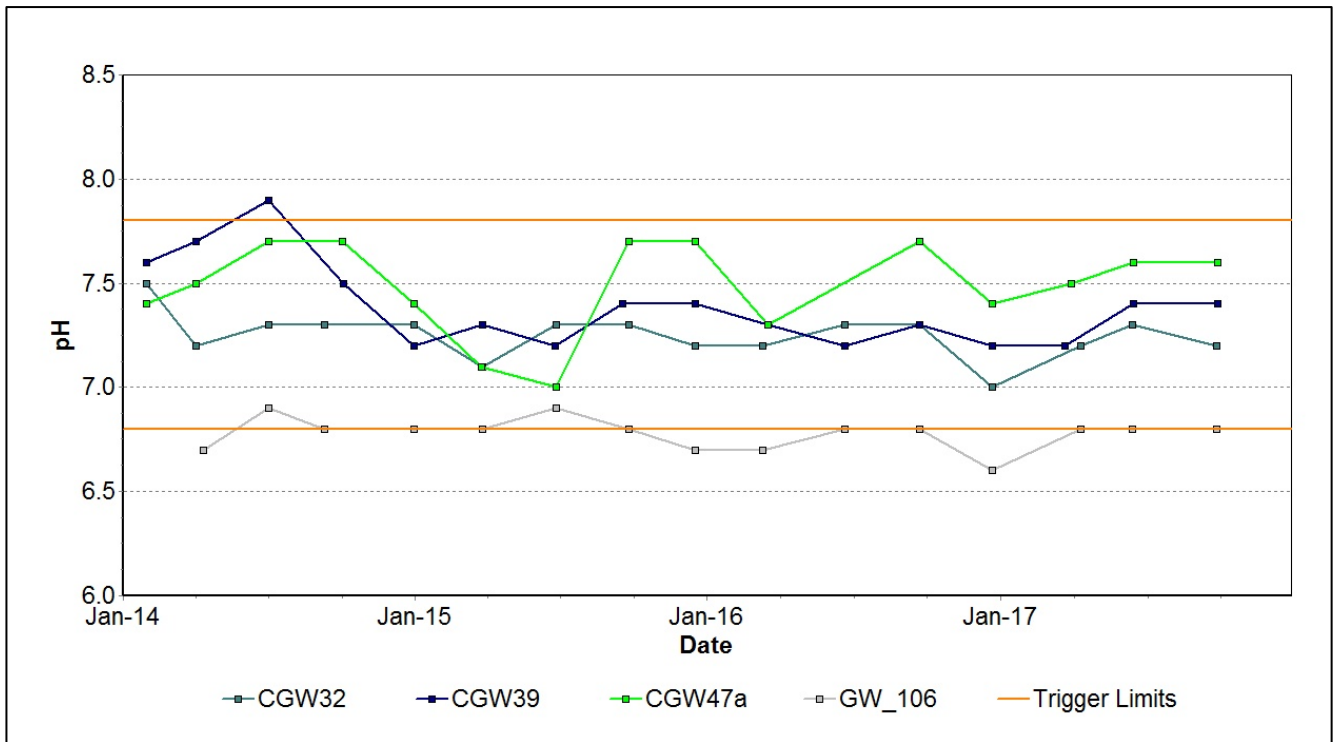


Figure 42: Carrington West Wing Flood Plain pH Trend - September 2017

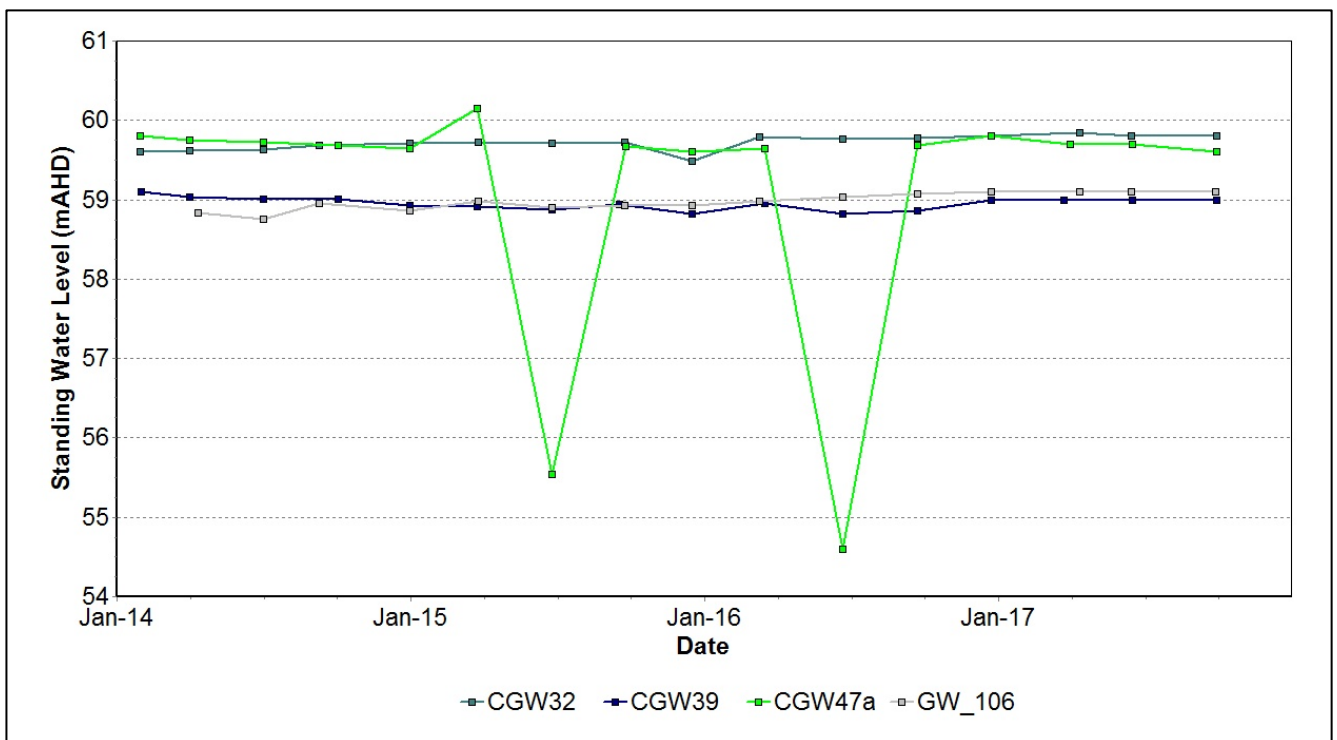


Figure 43: Carrington West Wing Flood Plain Standing Water Level – September 2017

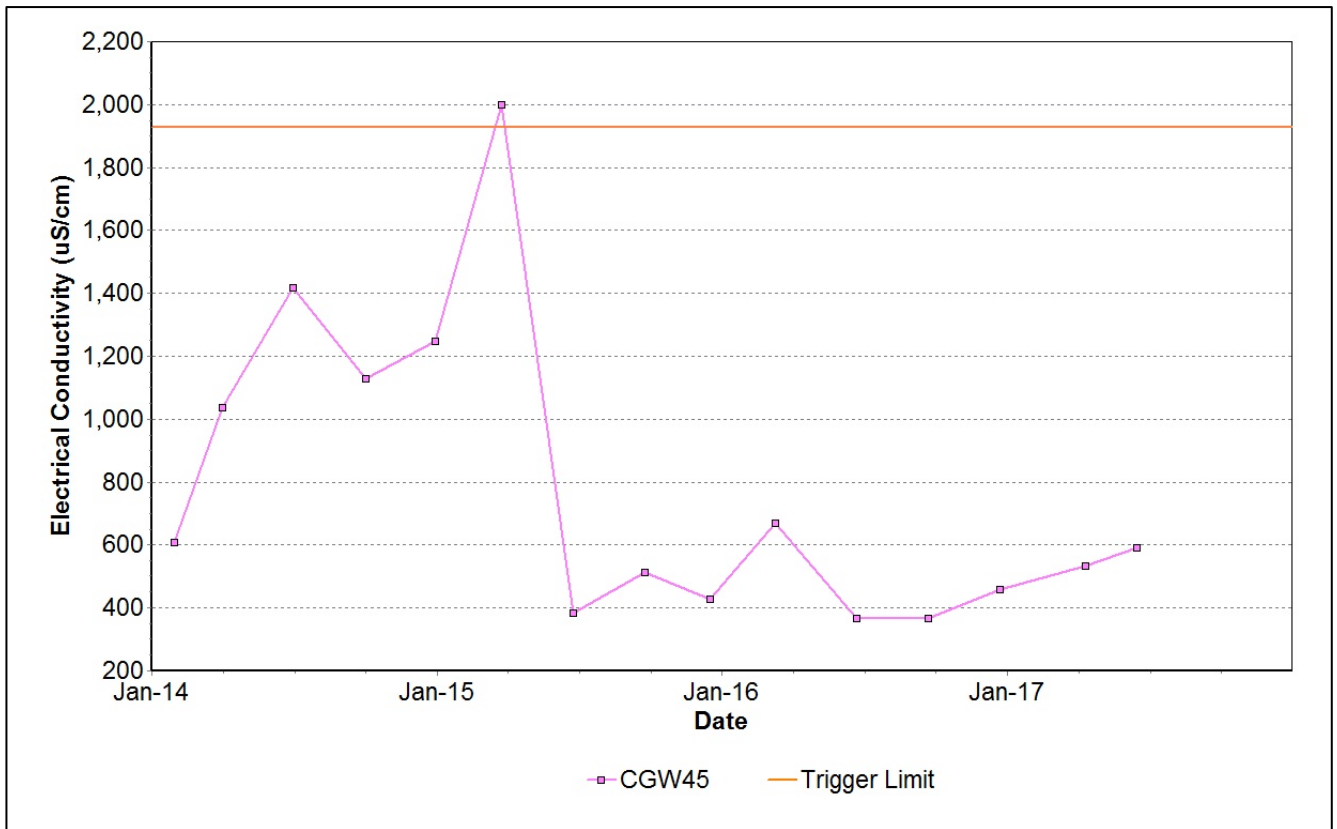


Figure 44: Carrington West Wing LBL Electrical Conductivity Trend - September 2017

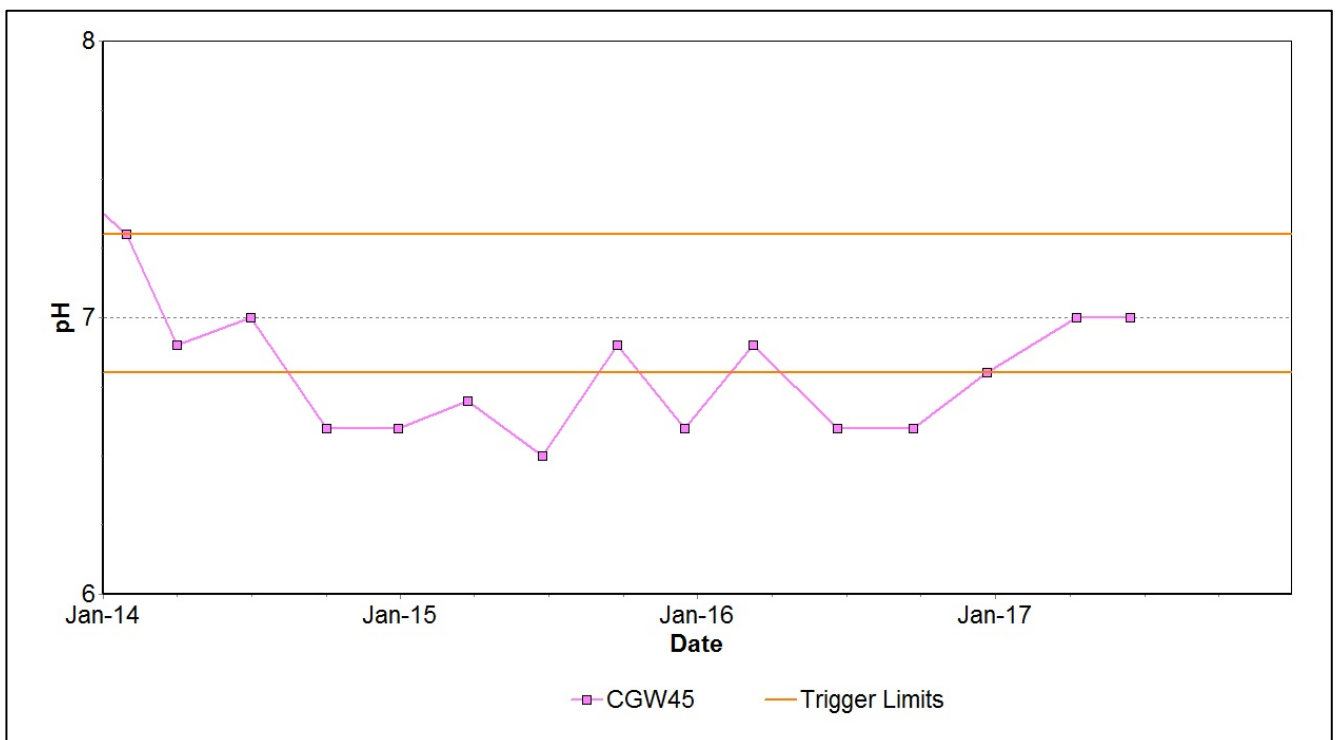


Figure 45: Carrington West Wing LBL pH Trend - September 2017

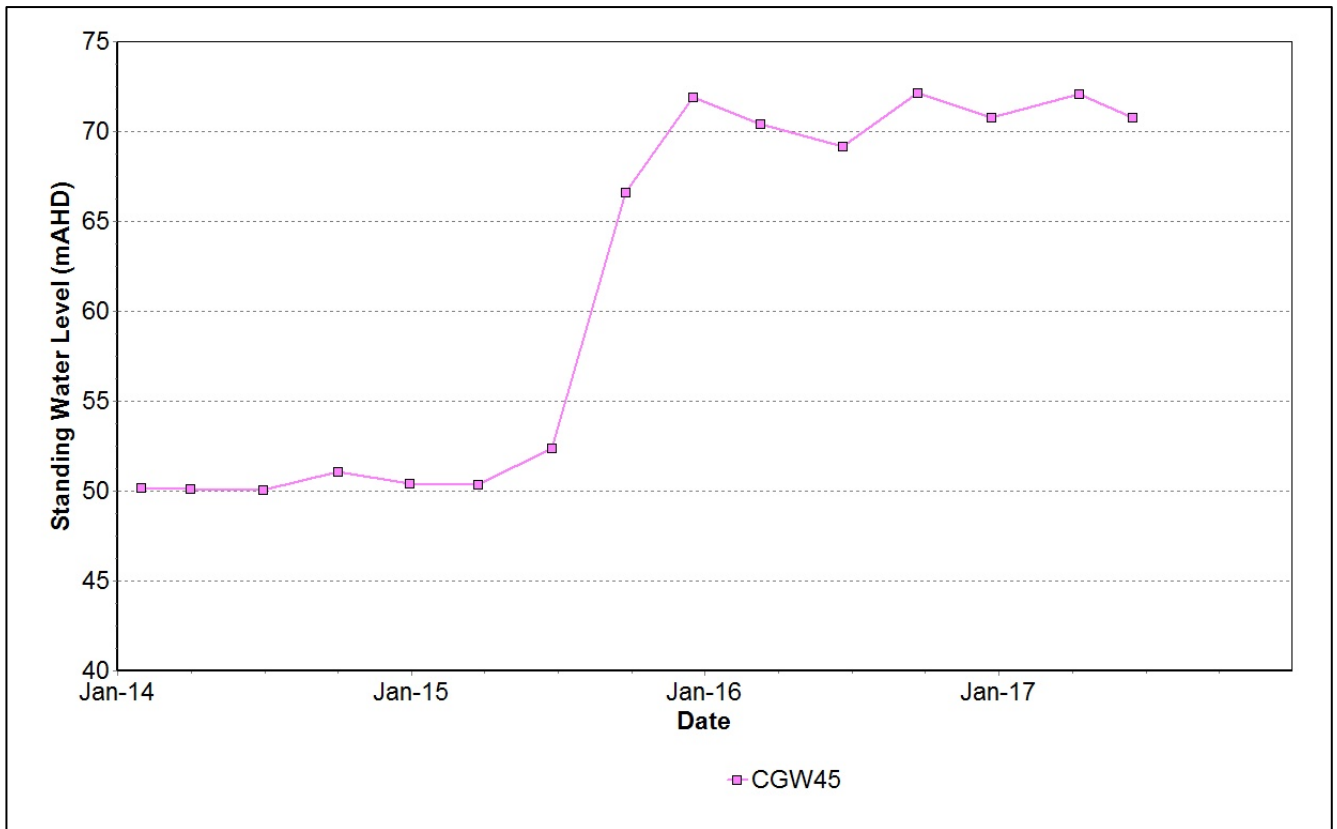


Figure 46: Carrington West Wing LBL Standing Water Level - September 2017

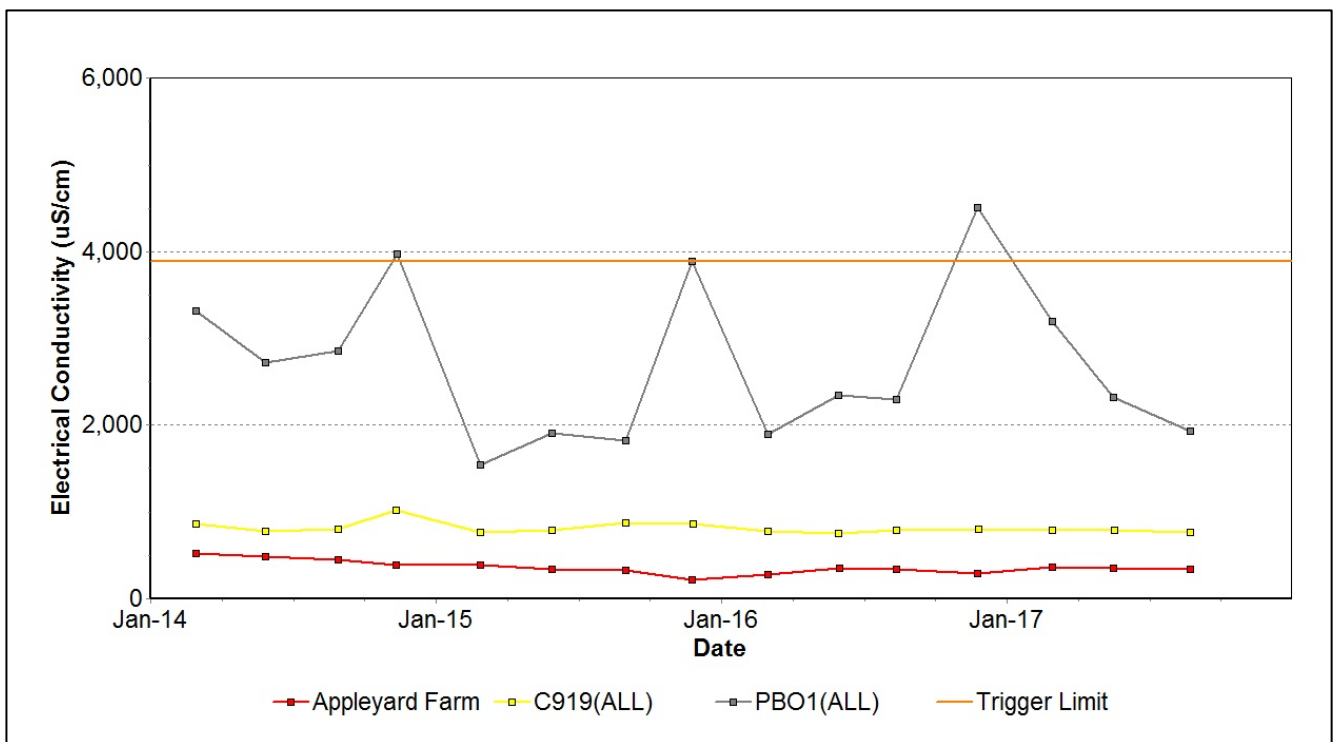


Figure 47: Lemington South Alluvium Electrical Conductivity Trend - September 2017

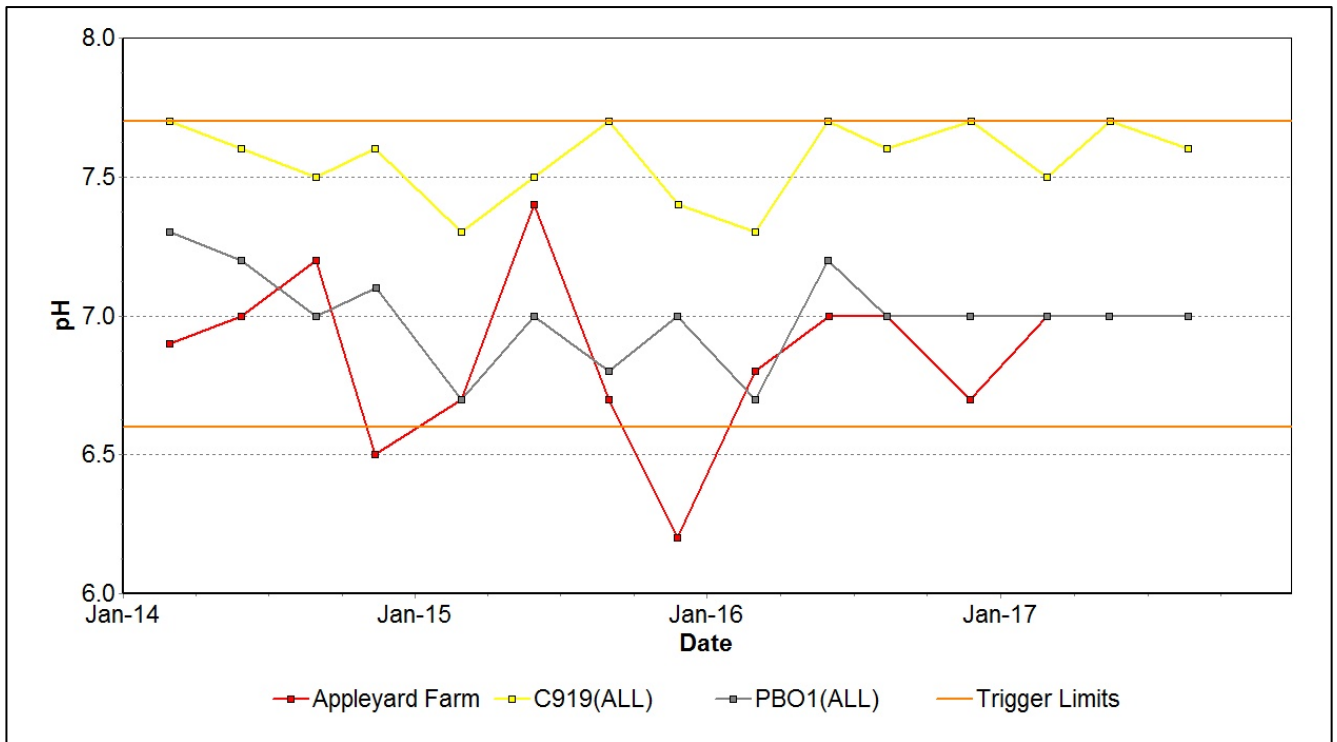


Figure 48: Lemington South Alluvium pH Trend – September 2017

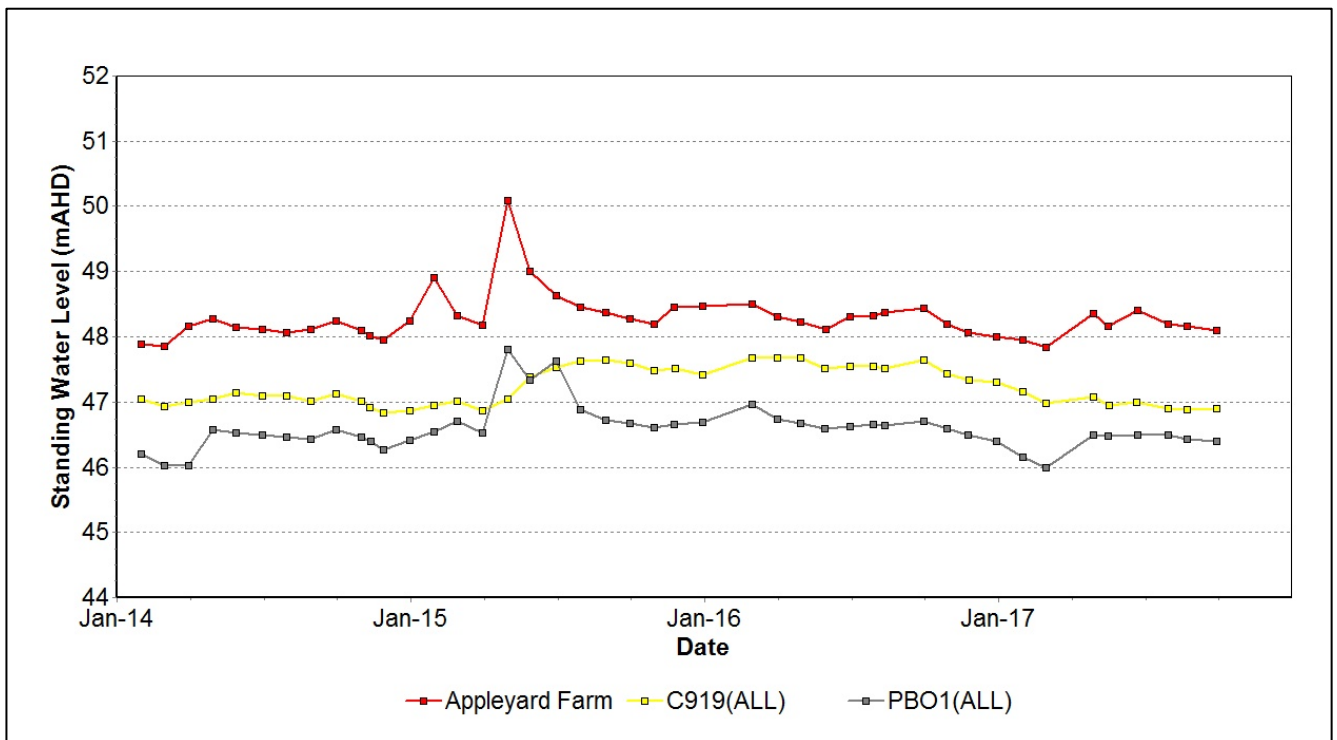


Figure 49: Lemington South Alluvium Standing Water Level Trend – September 2017

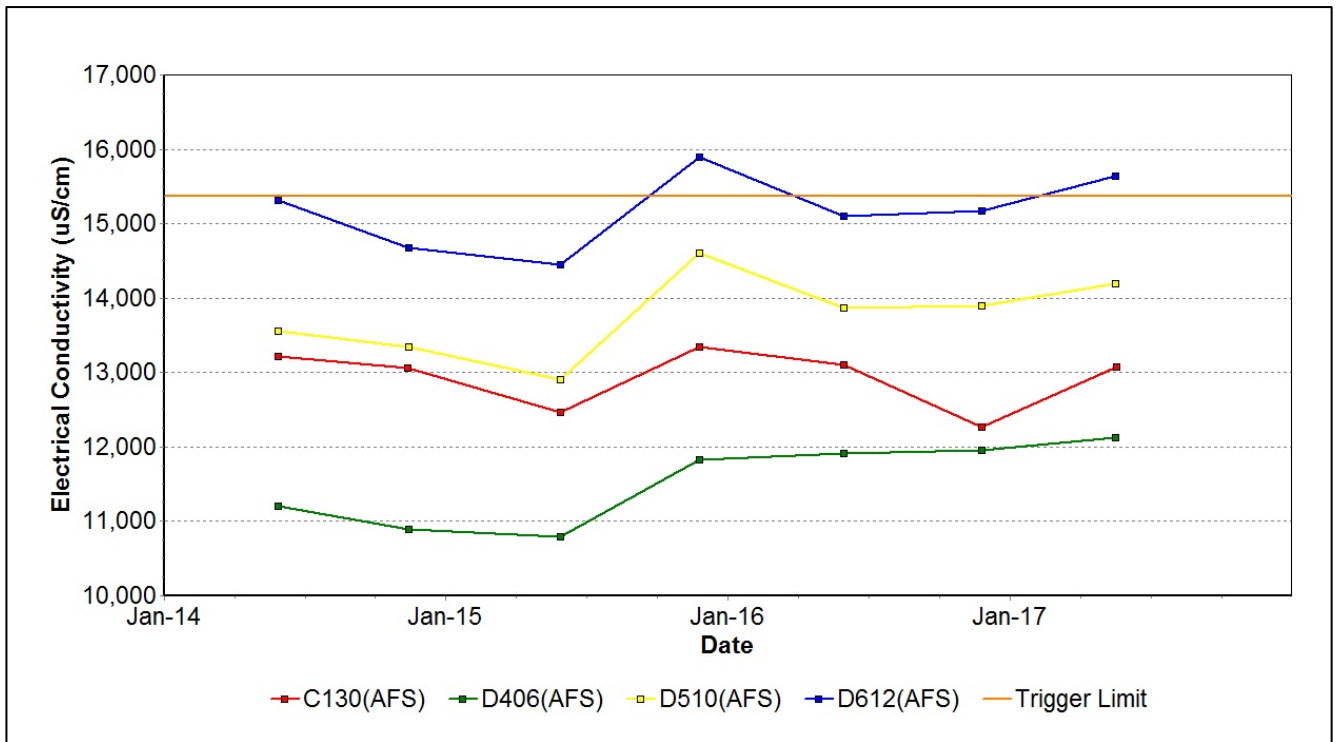


Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – September 2017

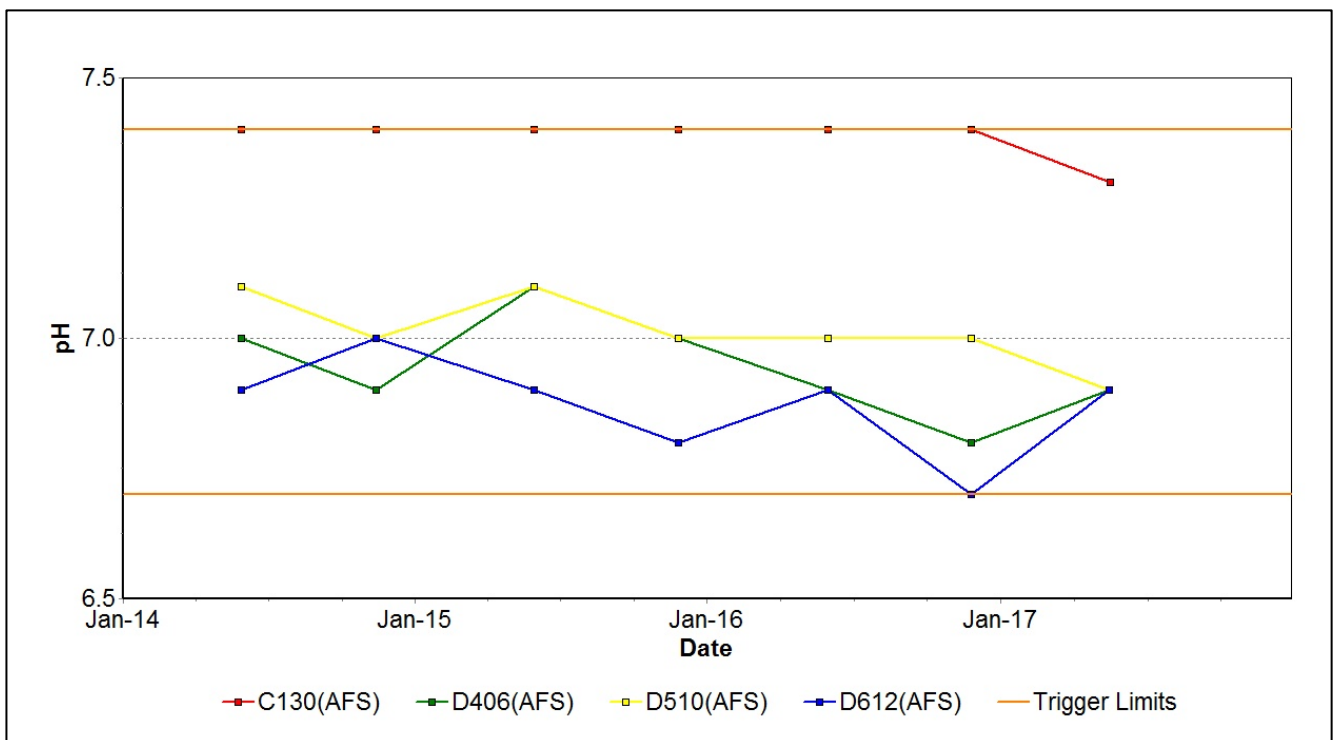


Figure 51: Lemington South Arrowfield pH Trend – September 2017

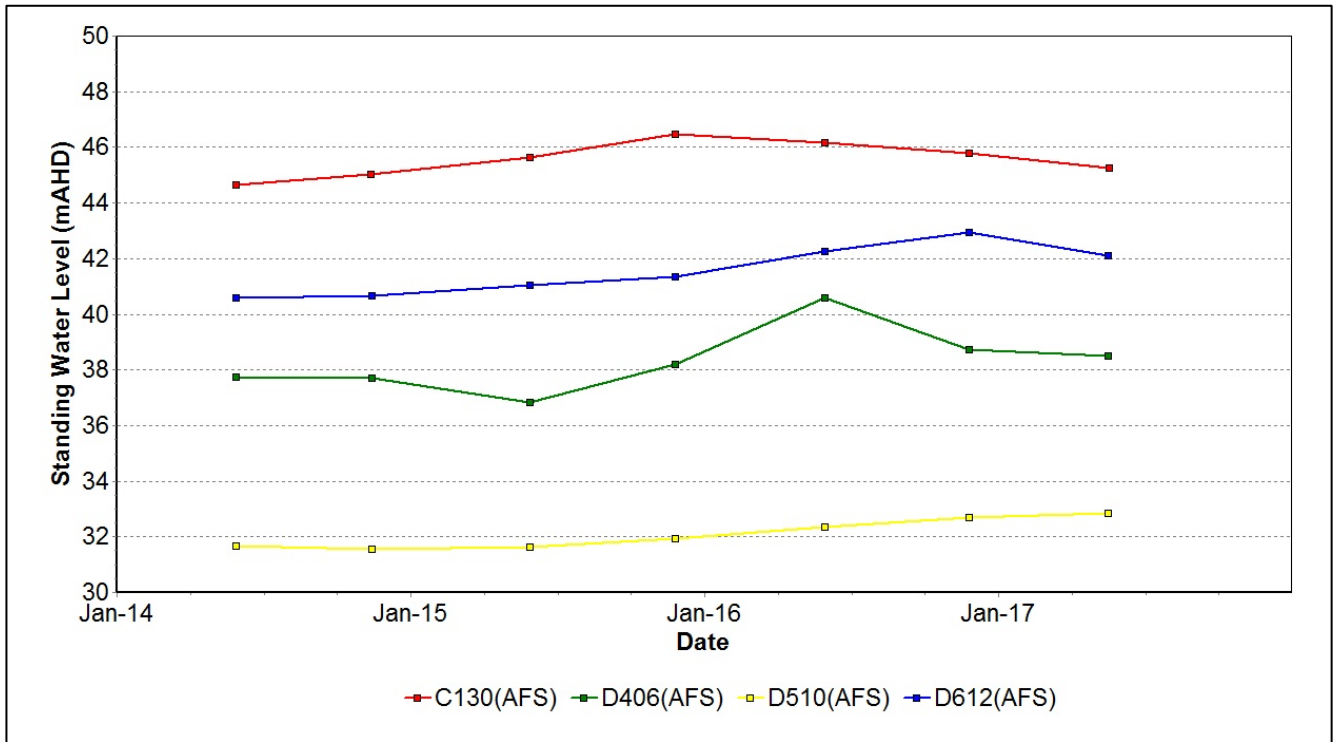


Figure 52: Lemington South Arrowfield Standing Water Level - September 2017

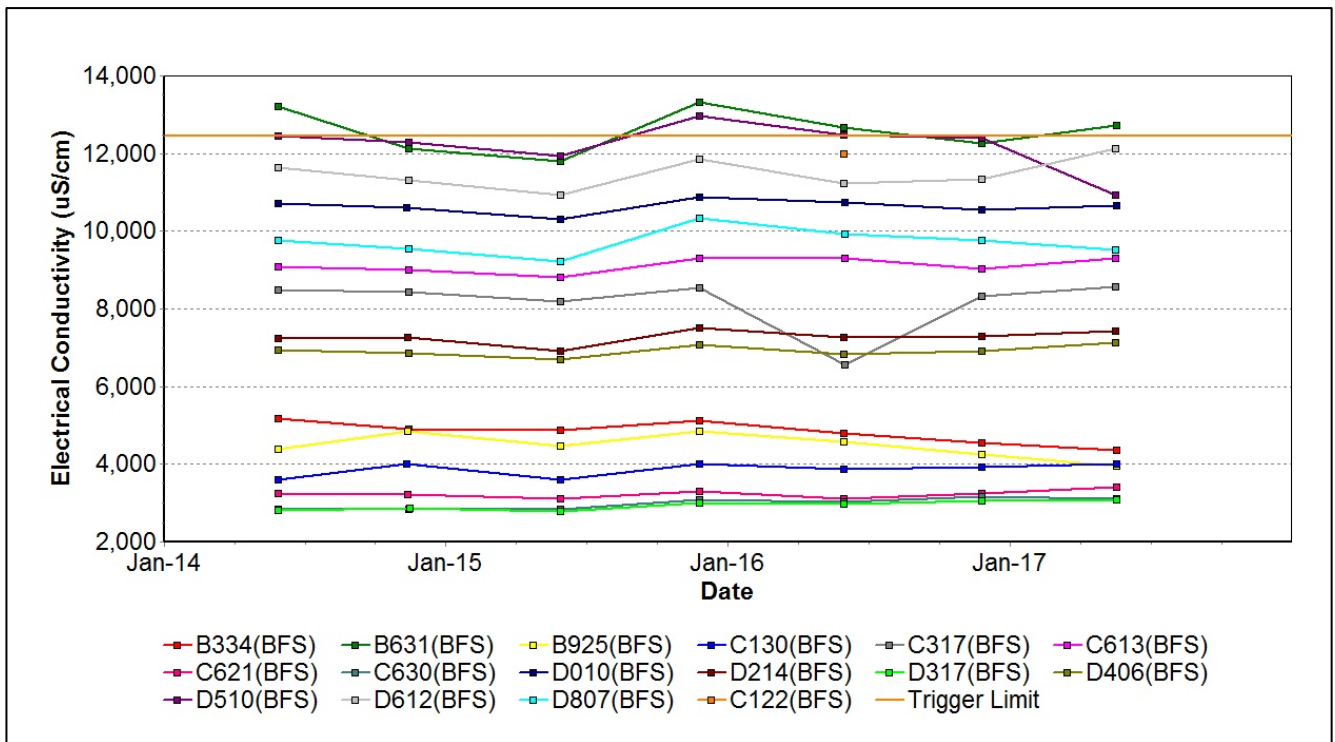


Figure 53: Lemington South Bowfield Electrical Conductivity Trend - September 2017

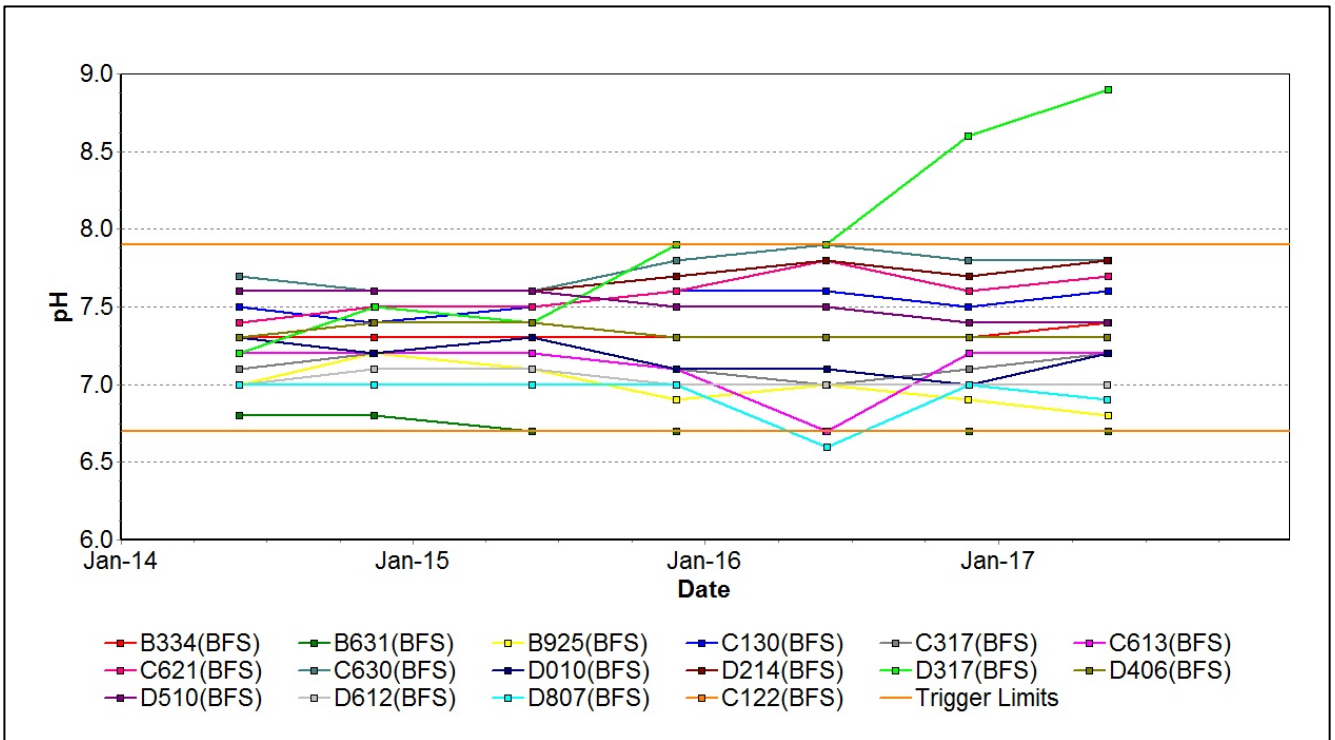


Figure 54: Lemington South Bowfield pH Trend - September 2017

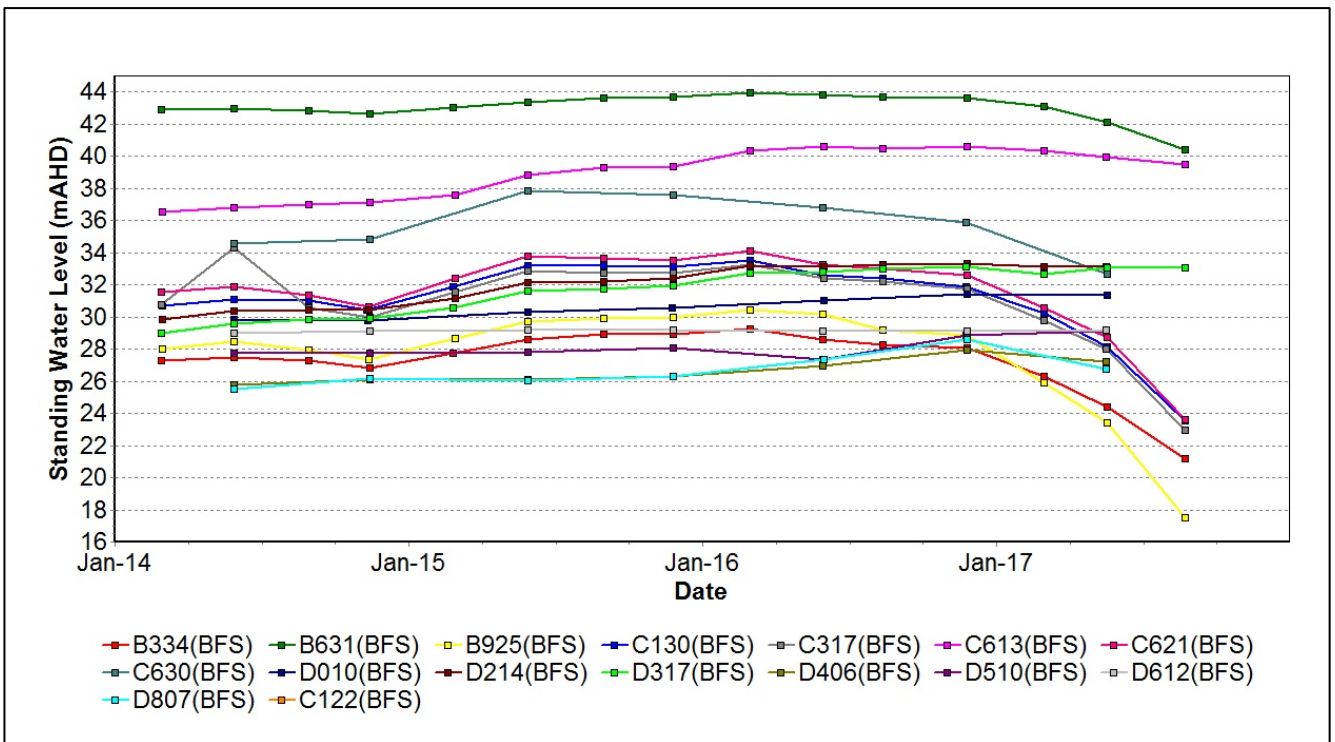


Figure 55: Lemington South Bowfield Standing Water Level - September 2017

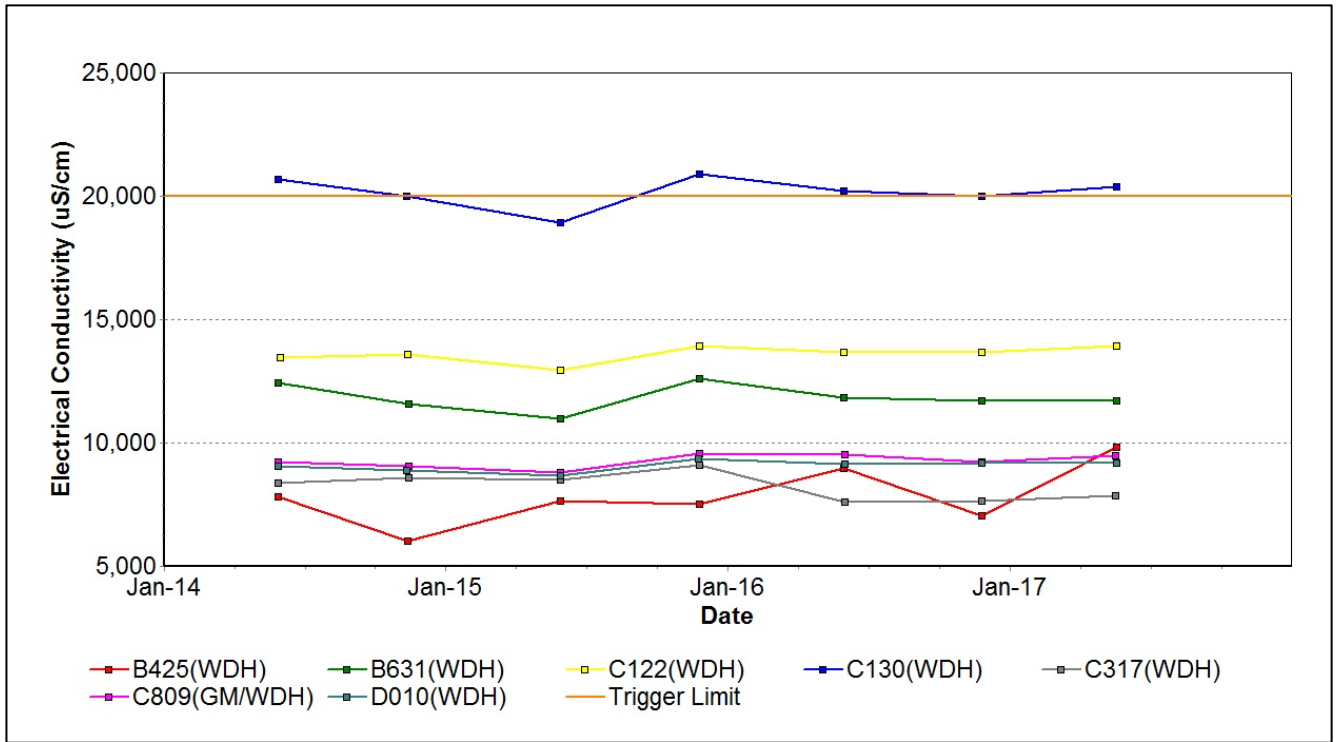


Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend - September 2017

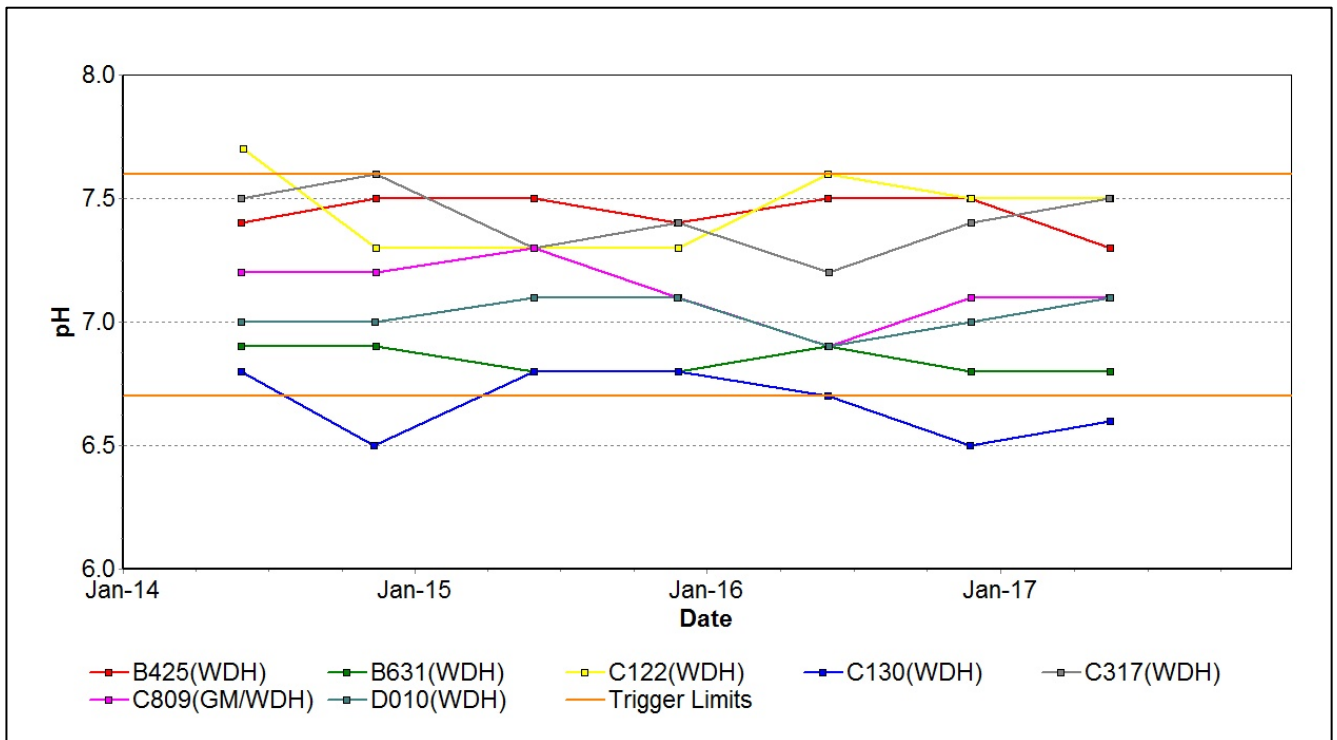


Figure 57: Lemington South Woodlands Hill pH Trend - September 2017

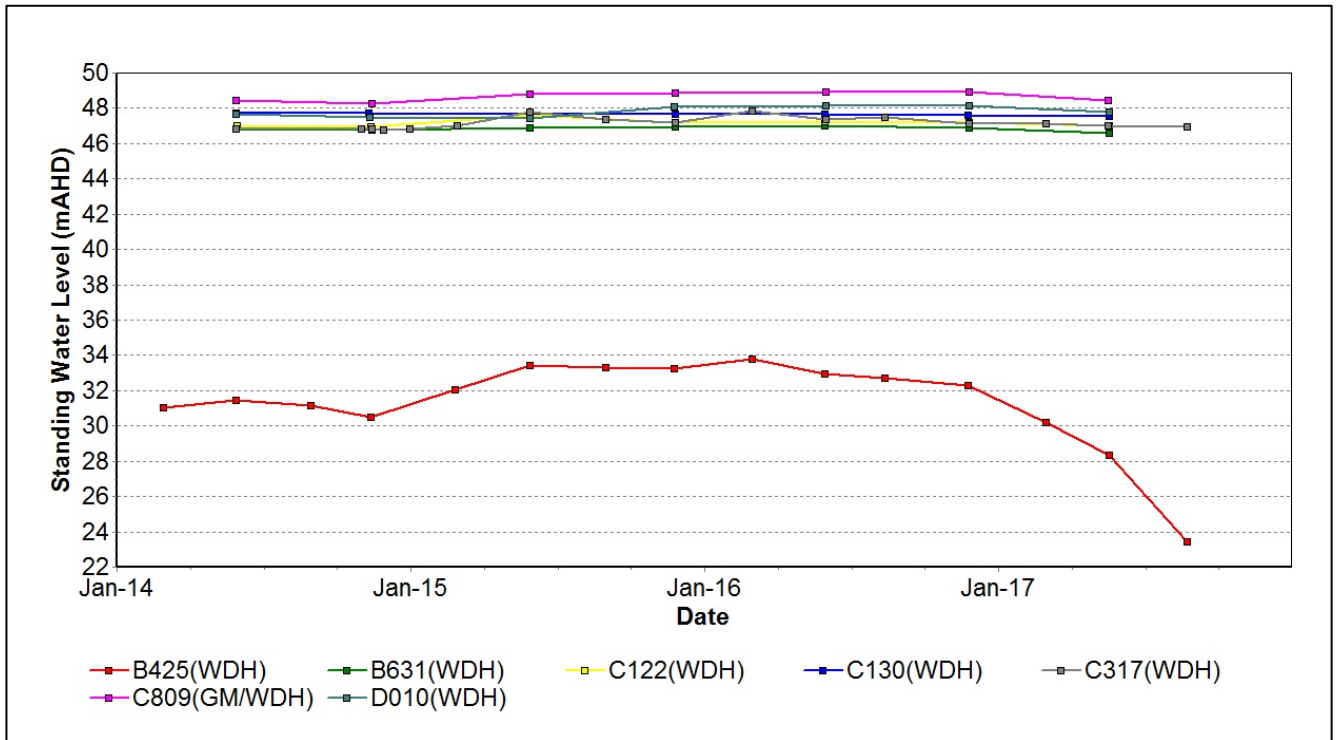


Figure 58: Lemington South Woodlands Hill Standing Water Level – September 2017

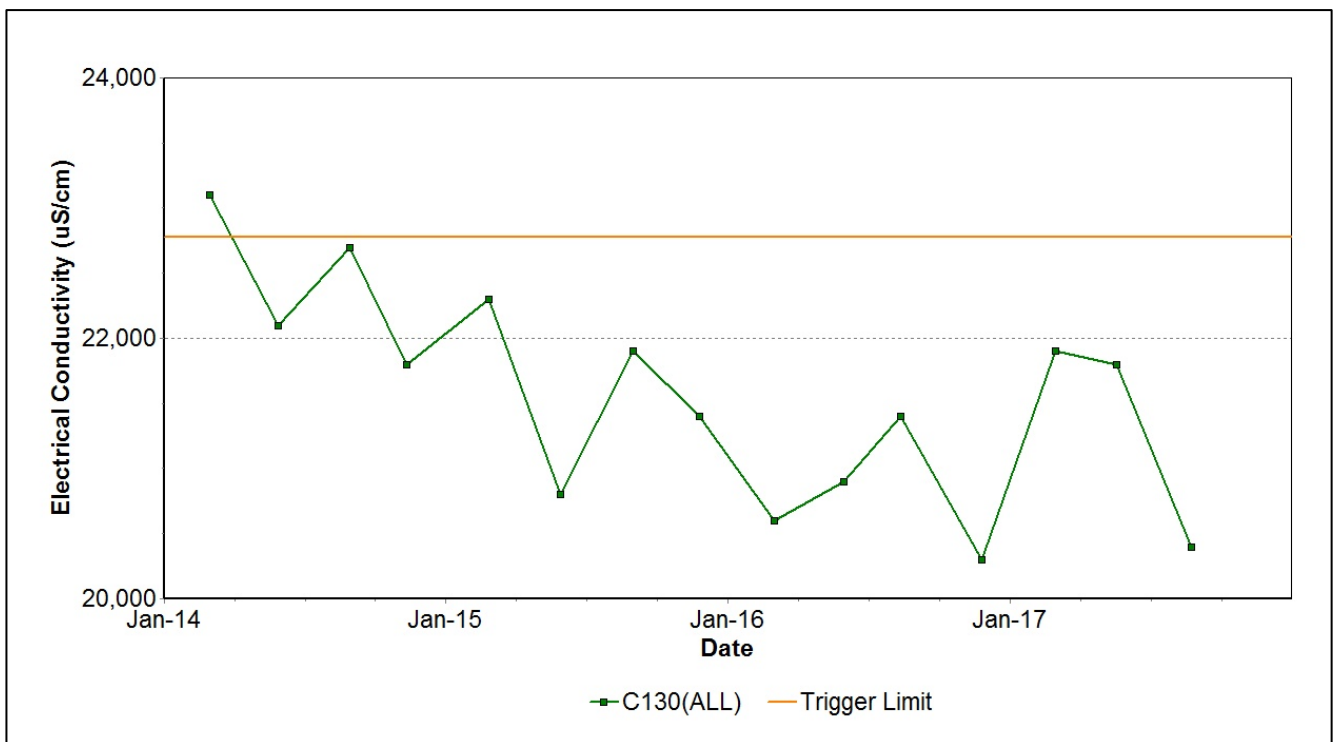


Figure 59: Lemington South Interburden Electrical Conductivity Trend - September 2017

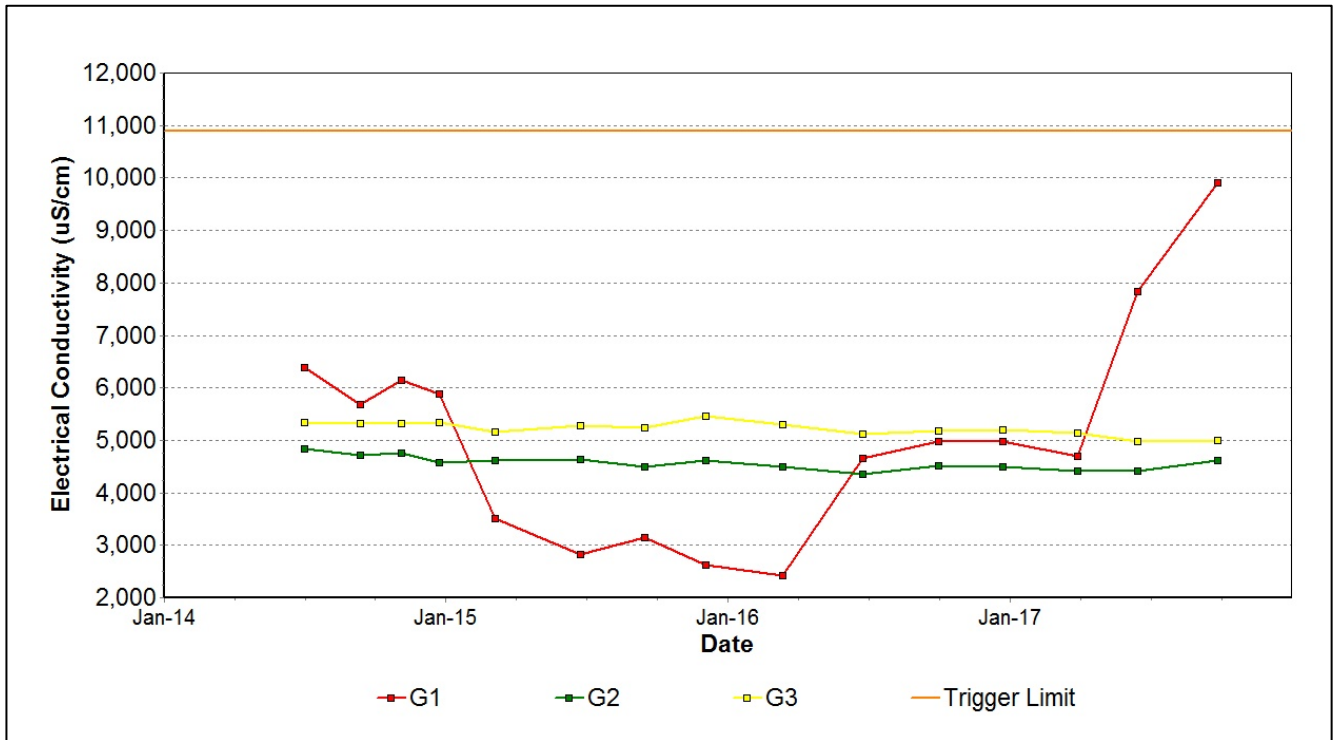


Figure 62: West Pit Alluvium Electrical Conductivity Trend - September 2017

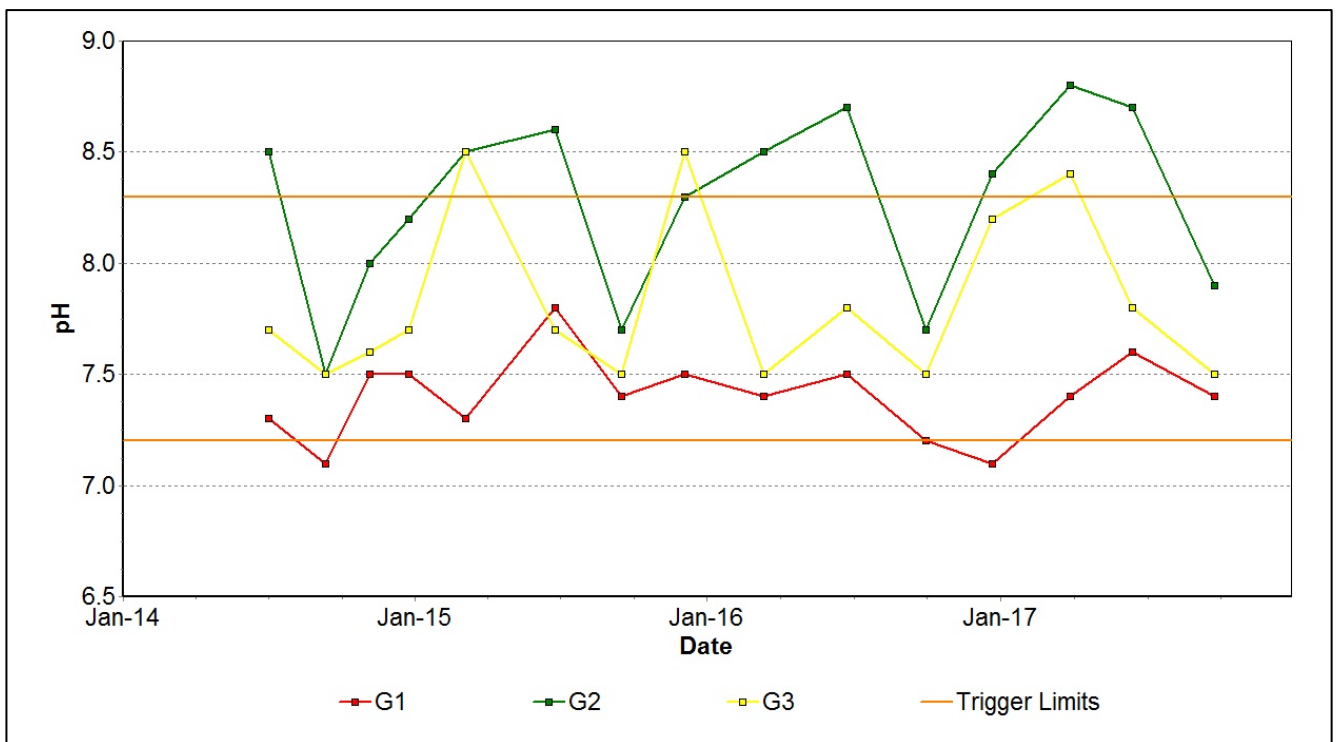


Figure 63: West Pit Alluvium pH Trend - September 2017

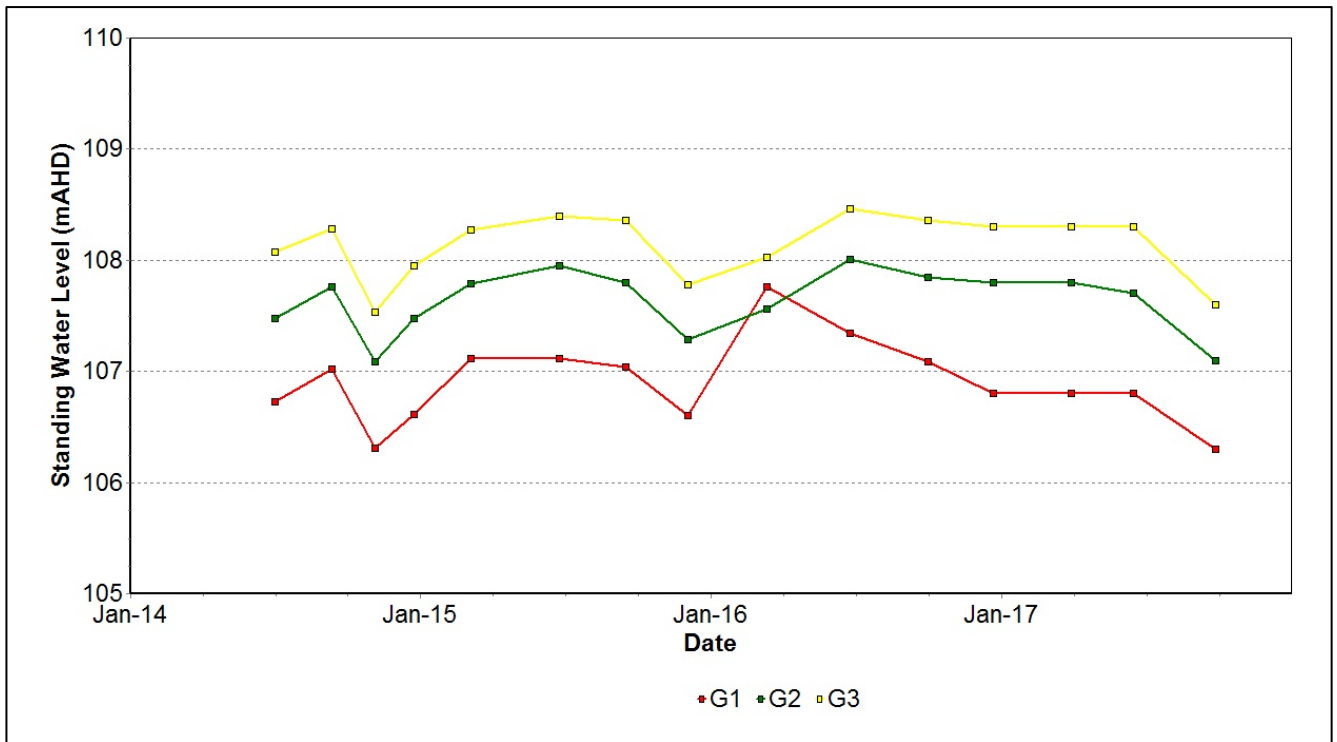


Figure 64: West Pit Alluvium Standing Water Level - September 2017

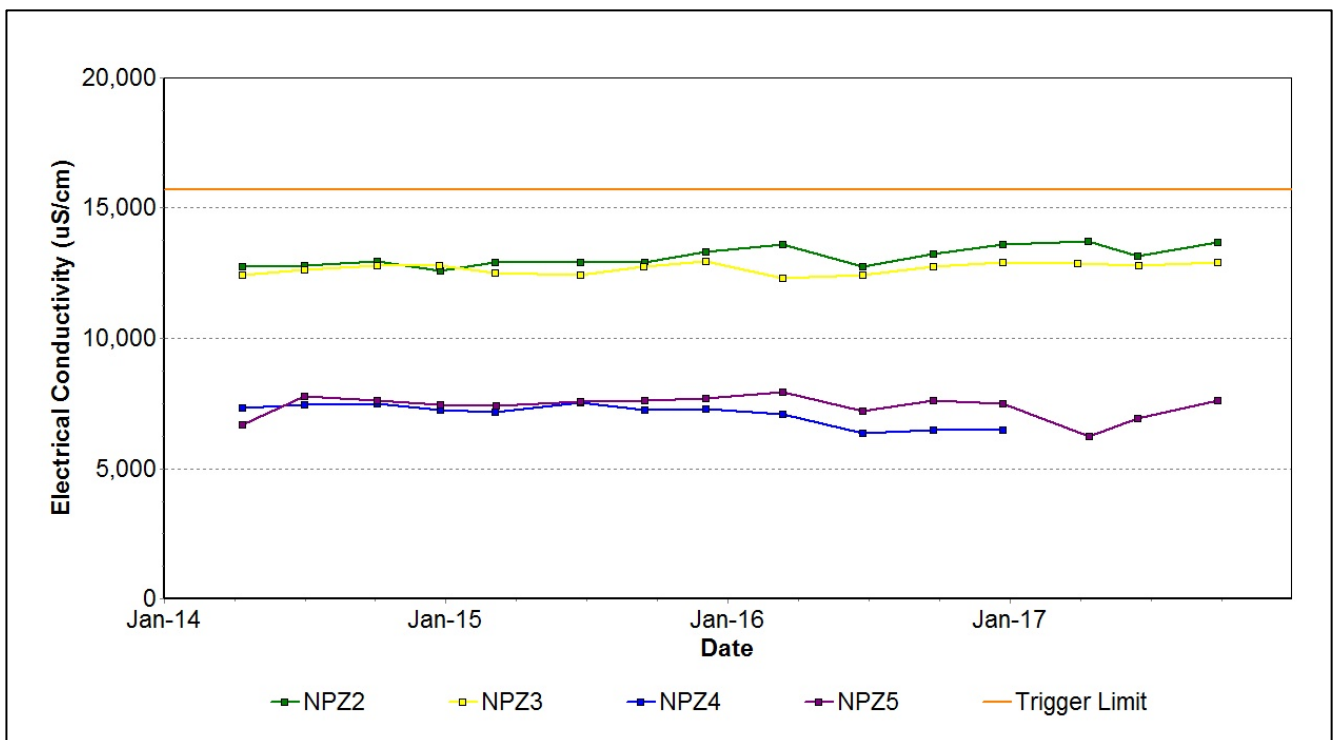


Figure 65: West Pit Siltstone Electrical Conductivity Trend – September 2017

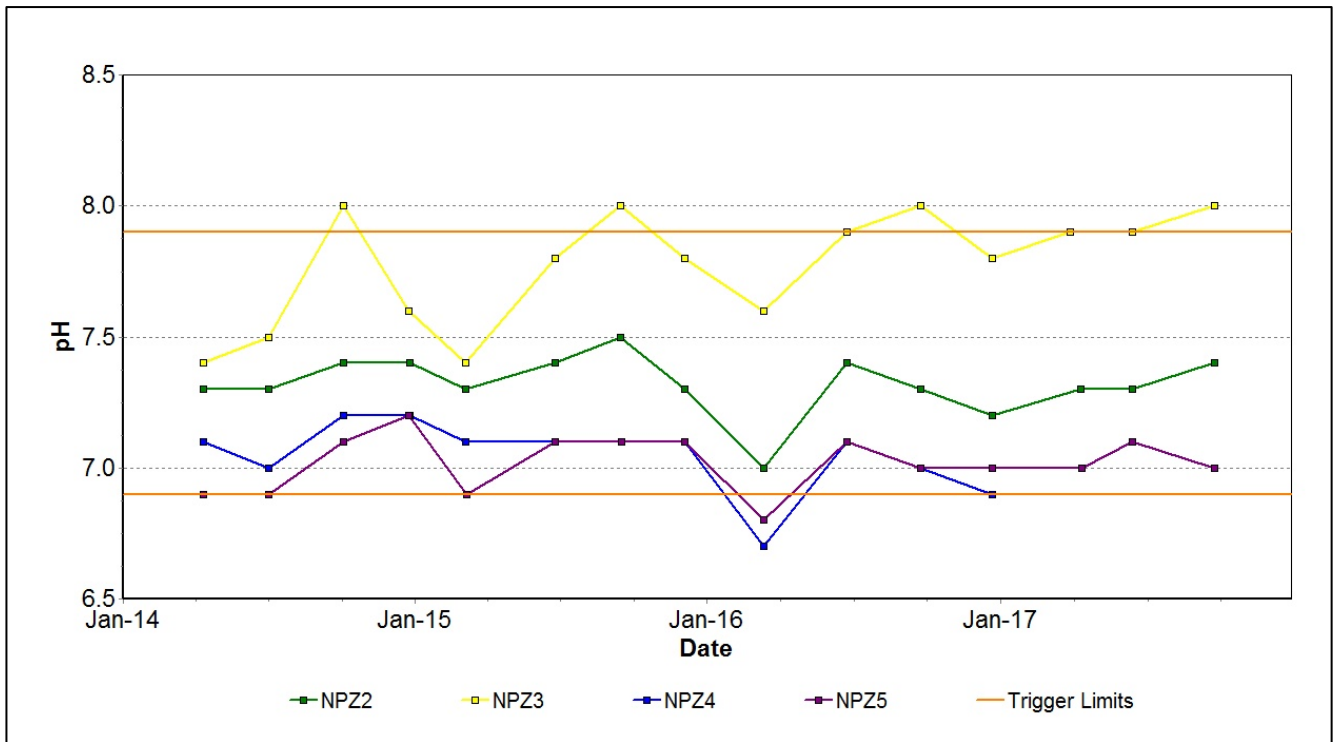


Figure 66: West Pit Siltstone pH Trend – September 2017

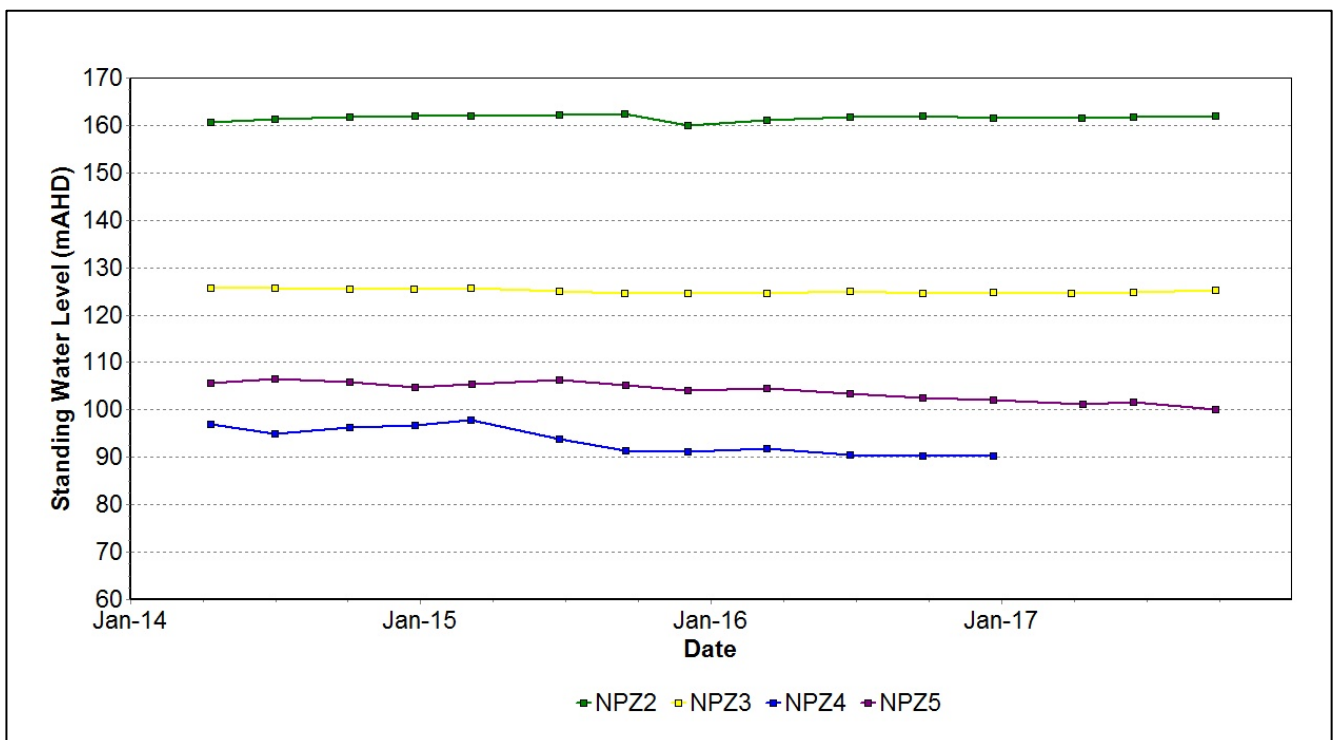


Figure 67: West Pit Siltstone Standing Water Level – September 2017

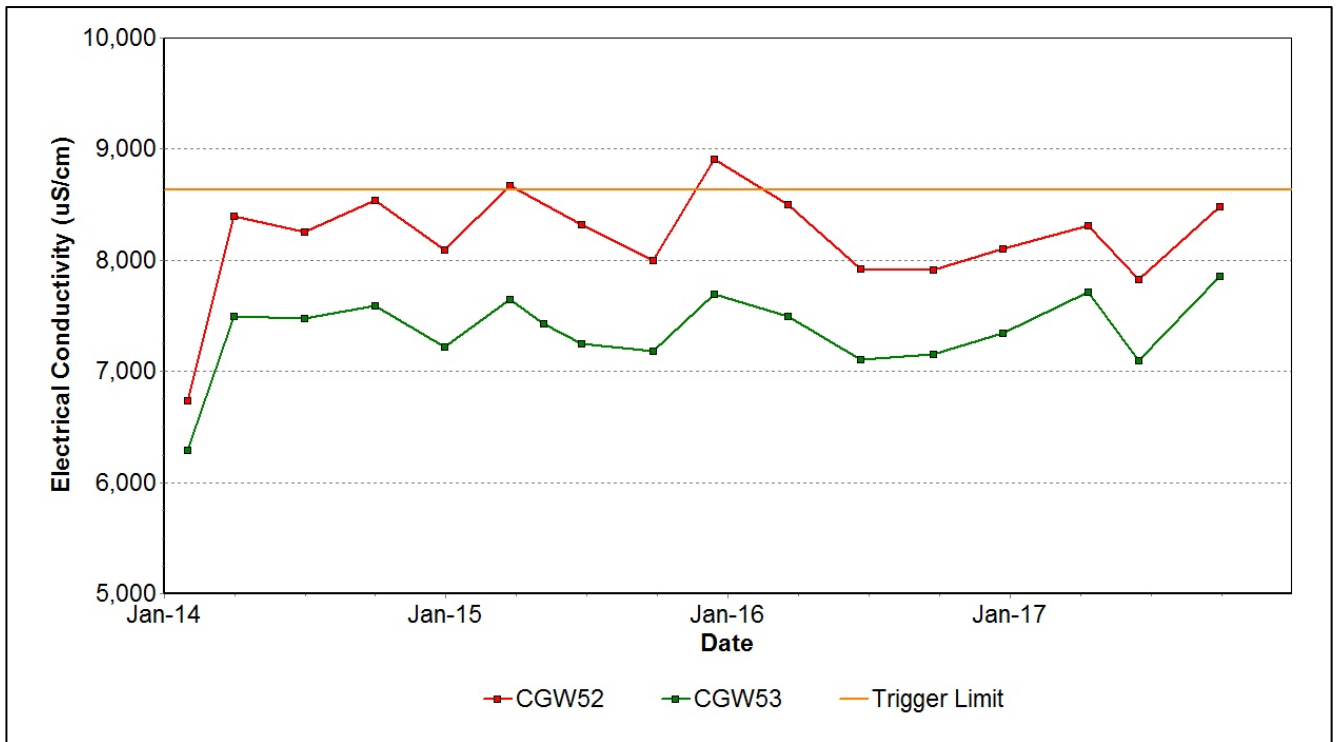


Figure 68: Carrington Broonie Electrical Conductivity Trend - September 2017

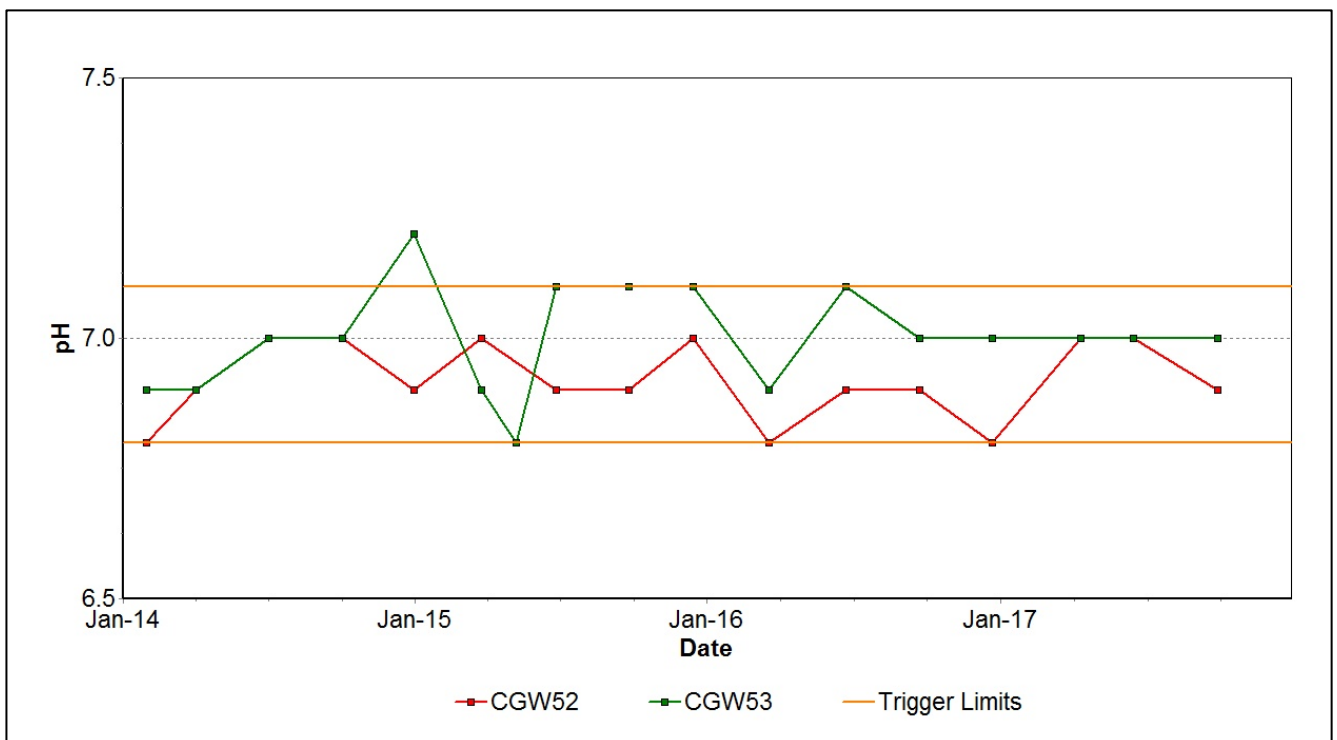


Figure 69: Carrington Broonie pH Trend - September 2017

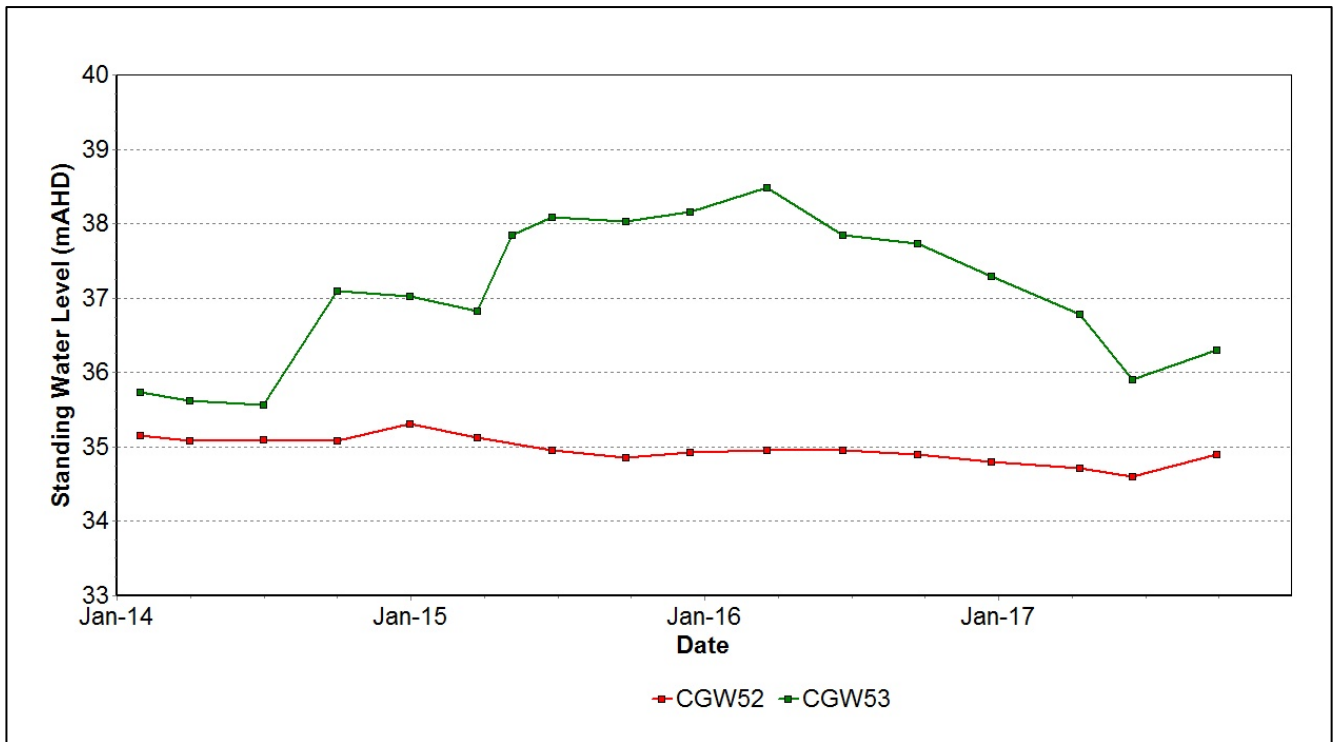


Figure 70: Carrington Broonie Standing Water Level - September 2017

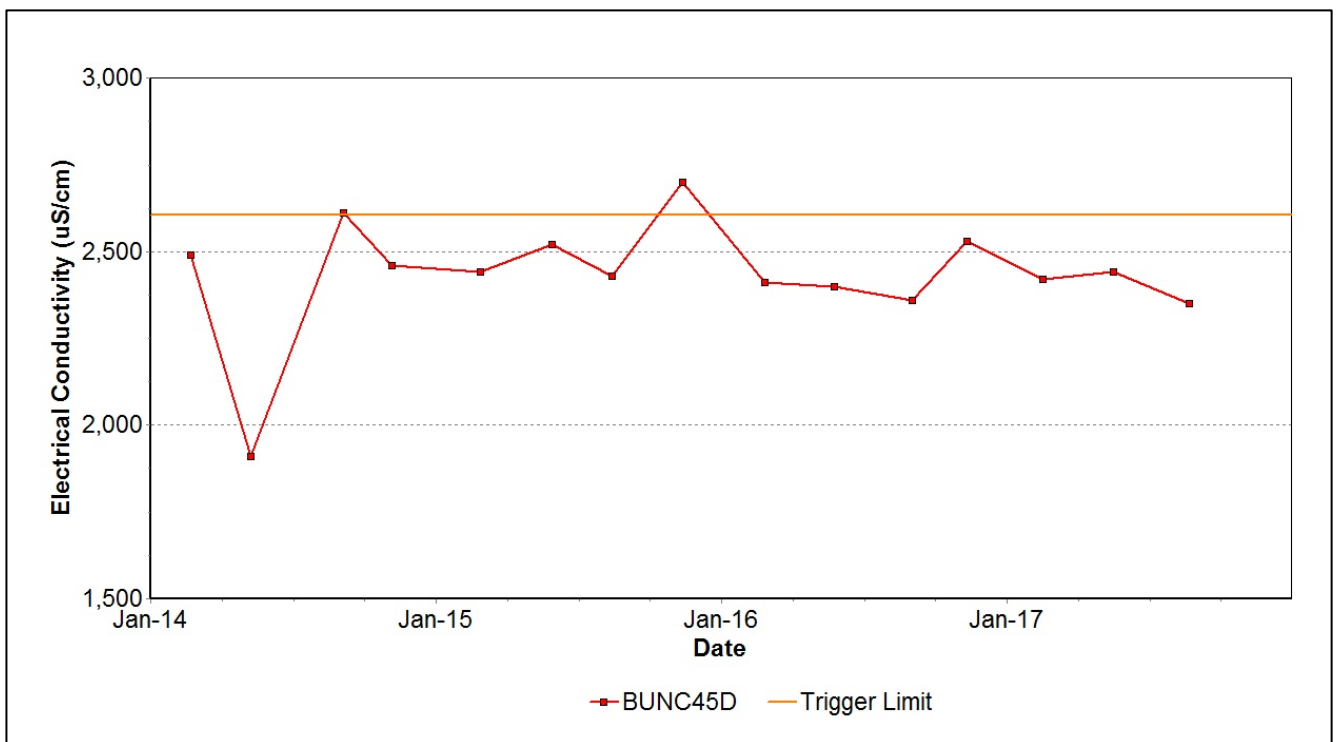


Figure 71: Cheshunt Piercefield Electrical Conductivity Trend – September 2017

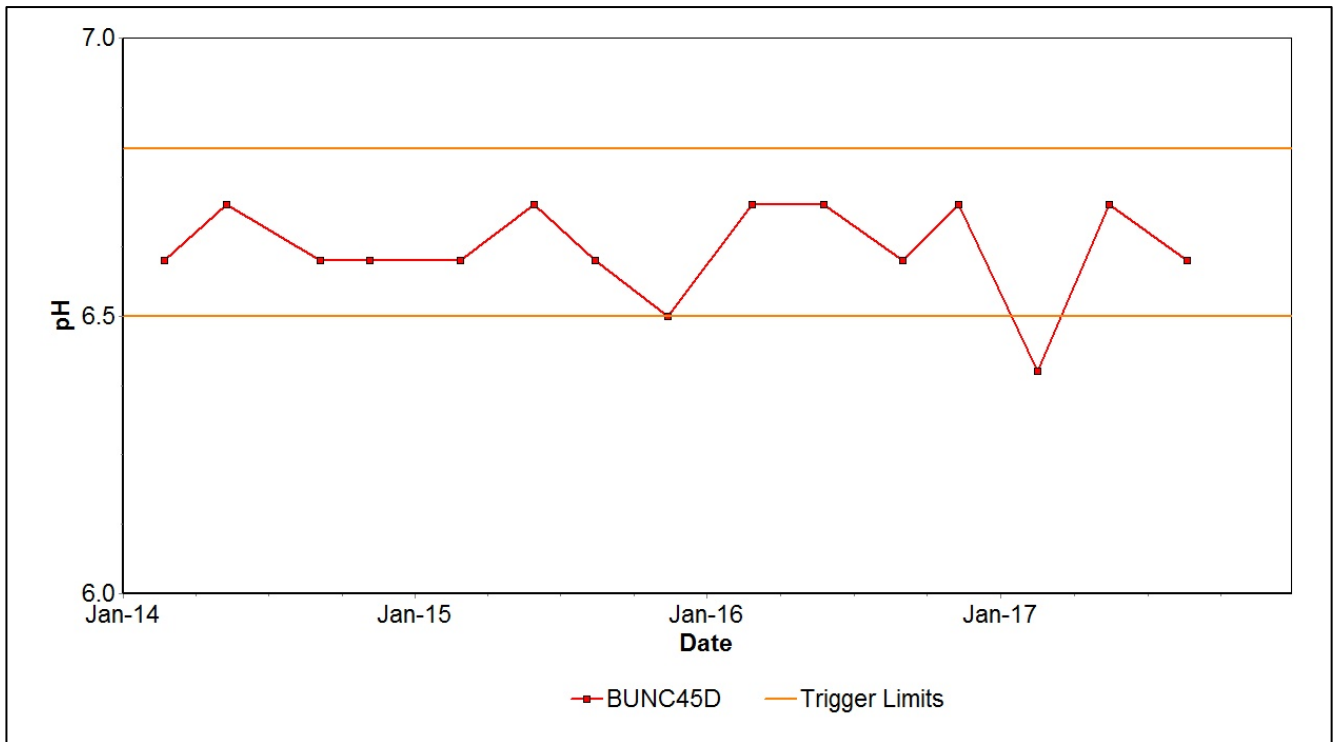


Figure 72: Cheshunt Piercefield pH Trend - September 2017

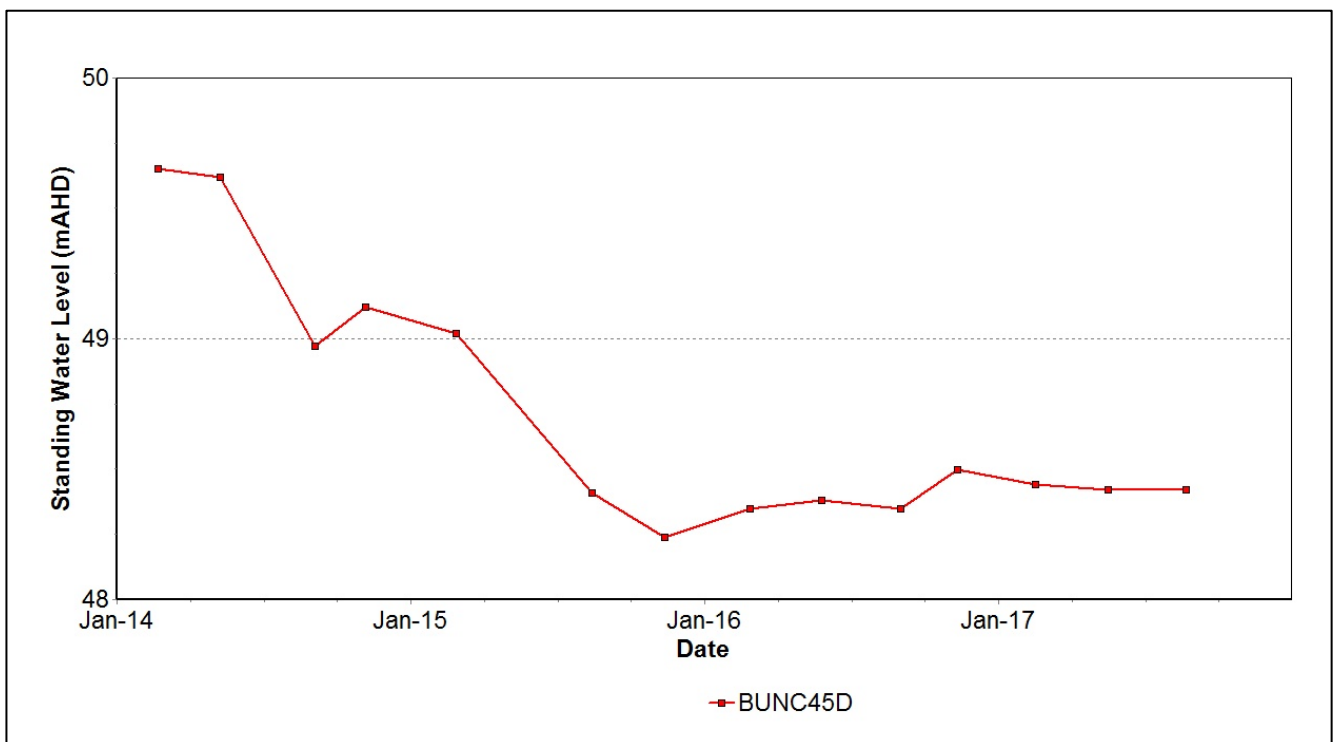


Figure 73: Cheshunt Piercefield Standing Water Level - September 2017

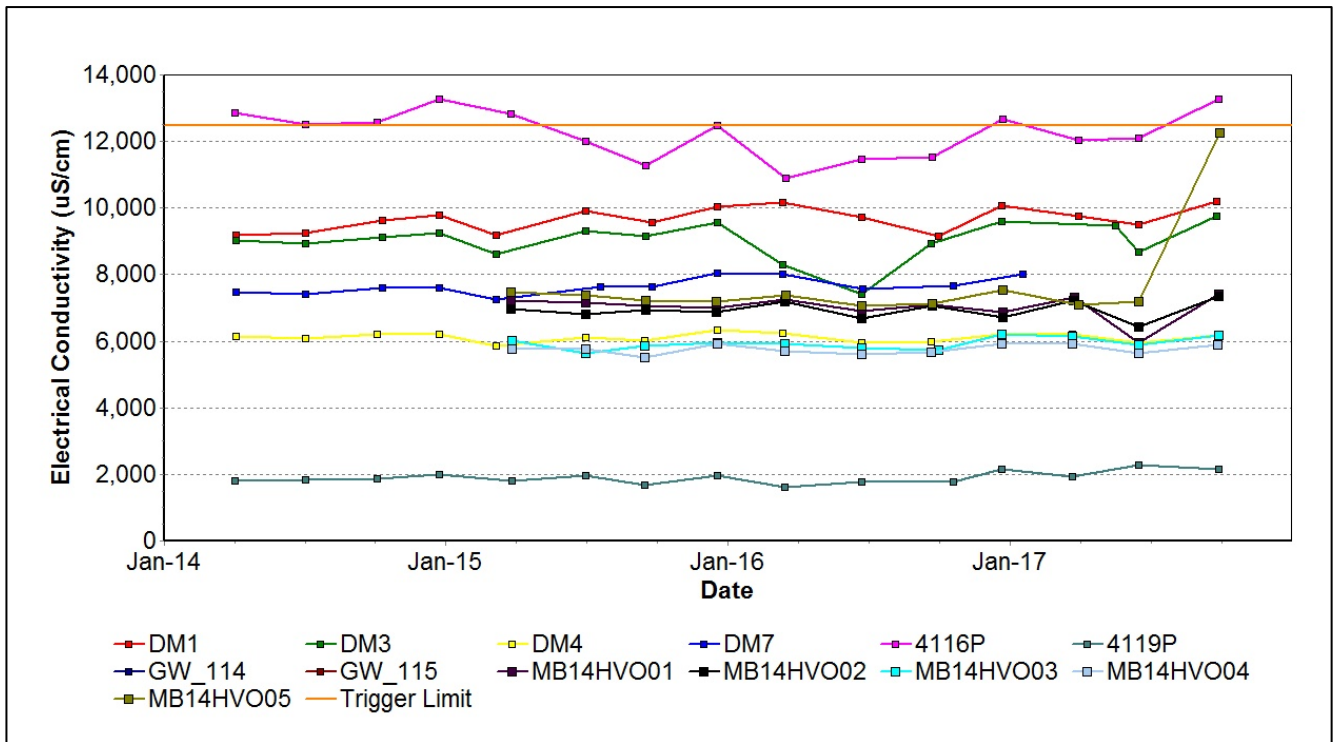


Figure 74: North Pit Spoil Electrical Conductivity Trend - September 2017

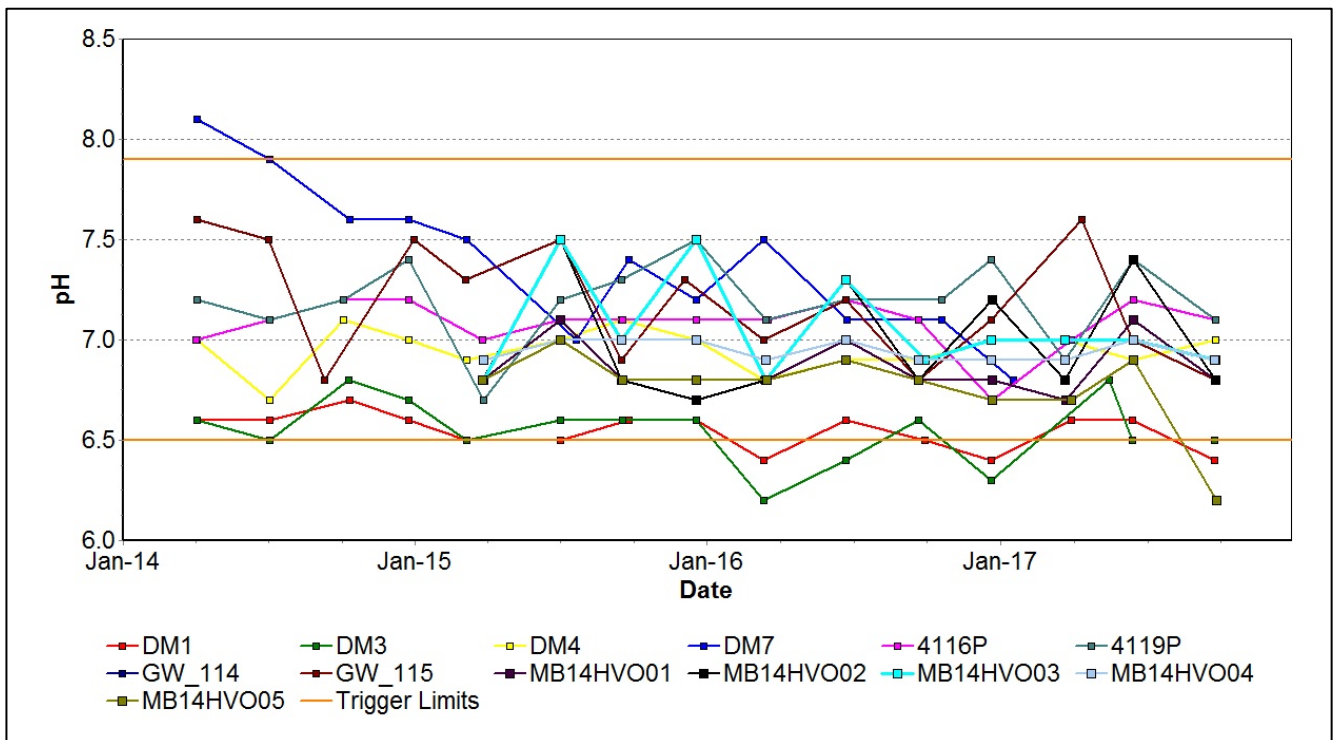


Figure 75: North Pit Spoil pH Trend - September 2017

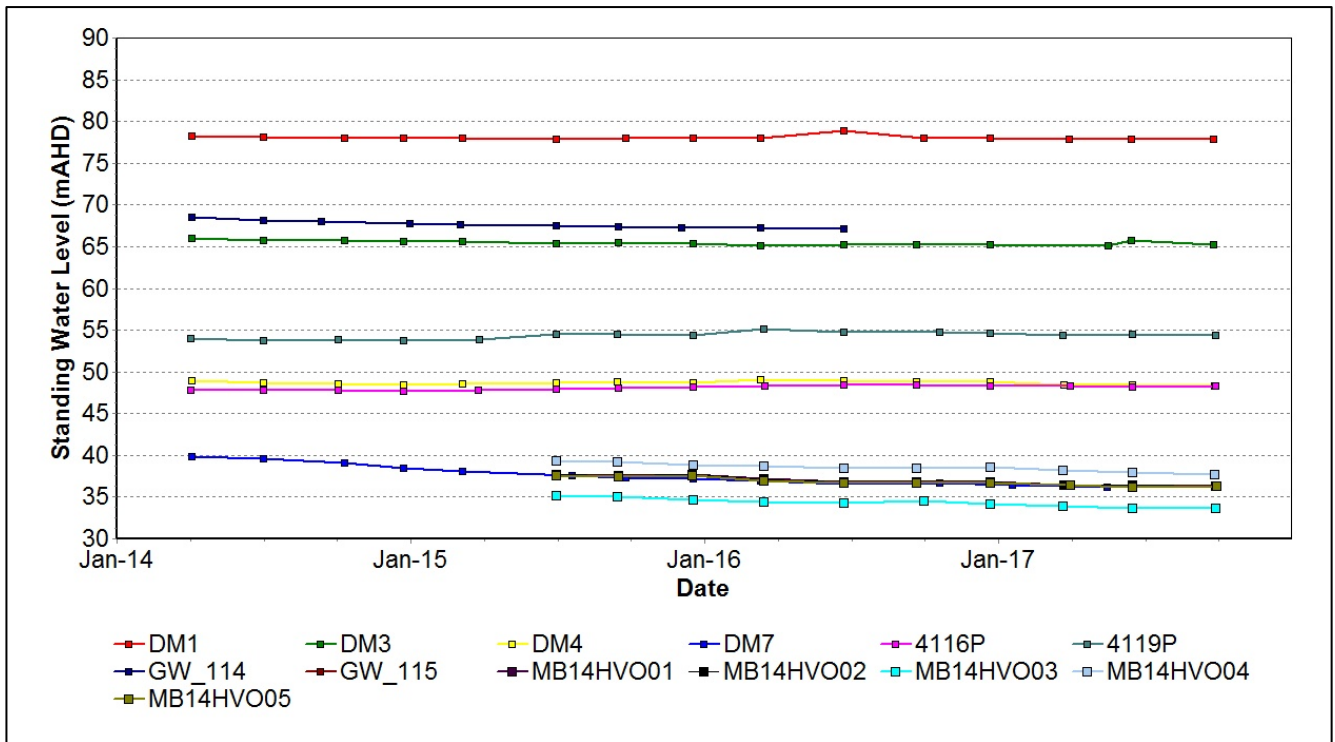


Figure 76: North Pit Spoil Standing Water Level - September 2017

4.2.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan.

During Q3 2017 a range of internal trigger limits were breached, these are summarised in **Table 3**.

Table 3: Groundwater Triggers - 2017

Site	Date	Trigger Limit Breached	Action Taken in Response
B631(BFS)	18/05/2017	EC – 95 th Percentile	Watching Brief*
C130WDH	18/05/2017	EC – 95 th Percentile	Watching Brief*
D612(AFS)	17/05/2017	EC – 95 th Percentile	Watching Brief*
CFW55R	16/06/2017	EC – 95 th Percentile	4 th consecutive exceedance: Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests

the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.

B631(BFS)	18/05/2017	PH – 5 th Percentile	Watching Brief*
BZ2A(2)	16/05/2017	PH – 5 th Percentile	Watching Brief*
C130(WDH)	18/05/2017	PH – 5 th Percentile	Watching Brief*
CGW46	16/06/2017	PH – 95 th Percentile	Watching Brief*
D317(BFS)	18/05/2017	PH – 95 th Percentile	Increasing trend in pH not reflected spatially in neighbouring bores. Water level in bore stable, suggesting water quality changes are not related to any mining-related activity. Continue to watch and monitor.
G2	15/06/2017	PH – 95 th Percentile	Measurements highly variable and consistent with historical range. Watch and monitor.
Hobdens Well	16/05/2017	PH – 95 th Percentile	Watching Brief*
CFW55R	16/06/2017	PH – 5 th Percentile	5 th consecutive exceedance: Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.

* = Watching brief established pending outcomes of subsequent monitoring events. No specific actions required.

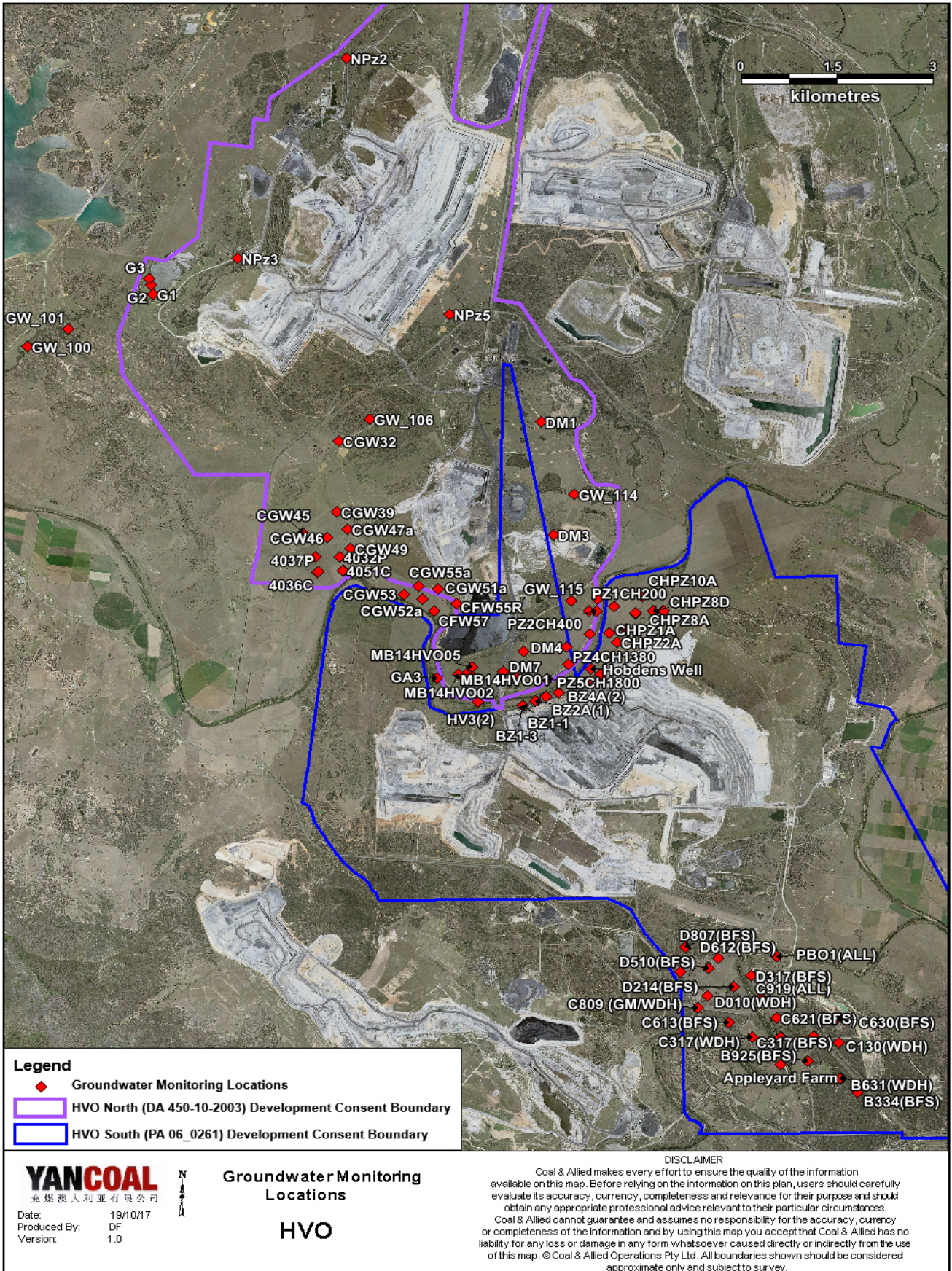


Figure 77: Groundwater Monitoring Location Plan

5.0 BLASTING

5.1.1 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 83.

During September 23 blasts were initiated at HVO. Figure 78 through to Figure 82 show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 4.

Table 4: 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 there were no exceedances of the airblast overpressure or ground vibration criteria.

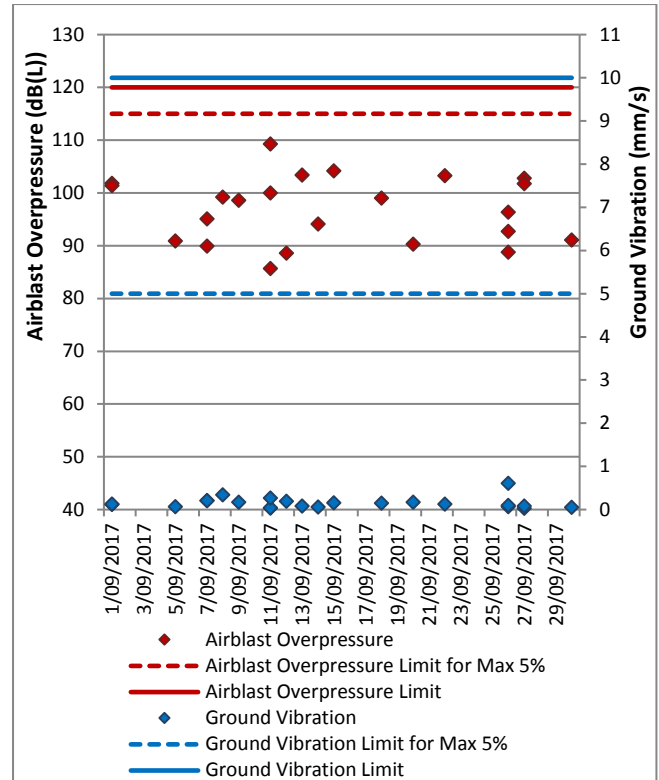


Figure 78: Moses Crossing Blast Monitoring Results – September 2017

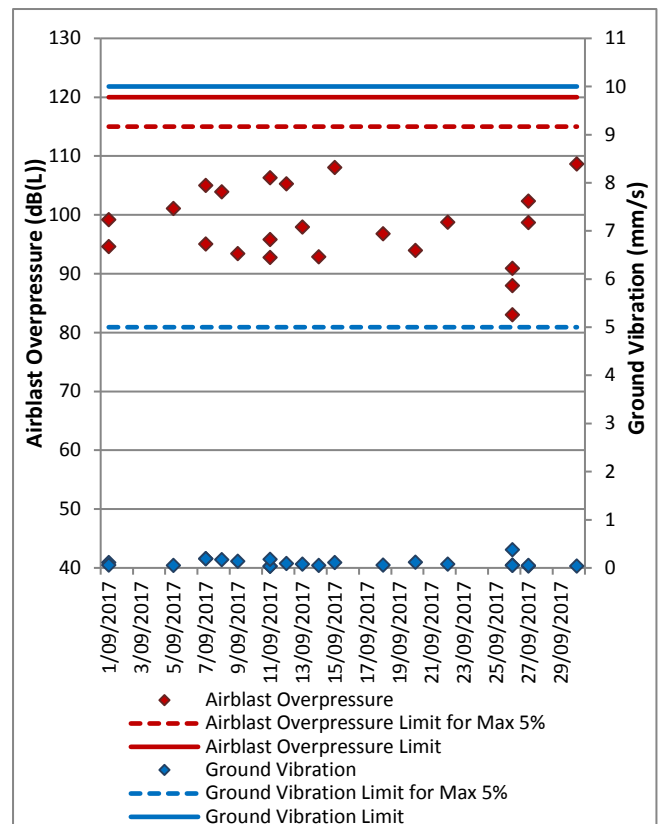


Figure 79: Jerrys Plains Blast Monitoring Results – September 2017

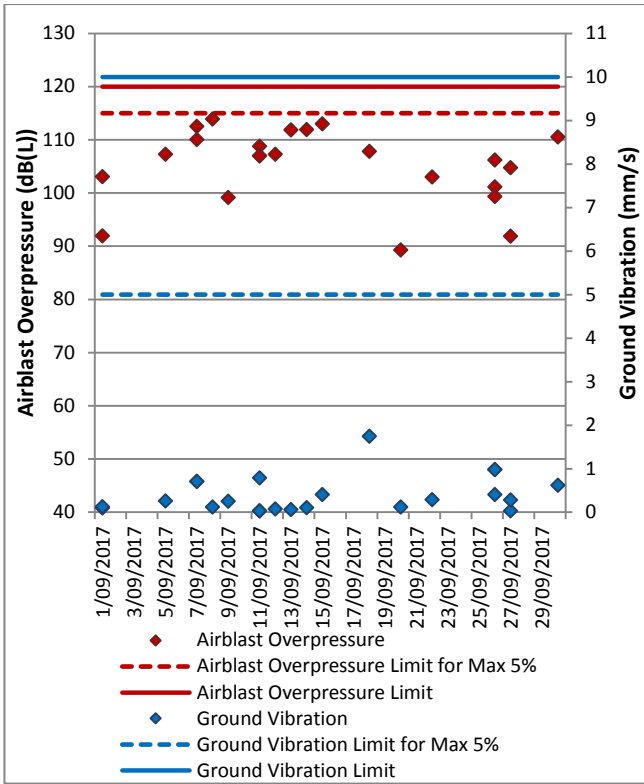


Figure 80: Maison Dieu Blast Monitoring Results – September 2017

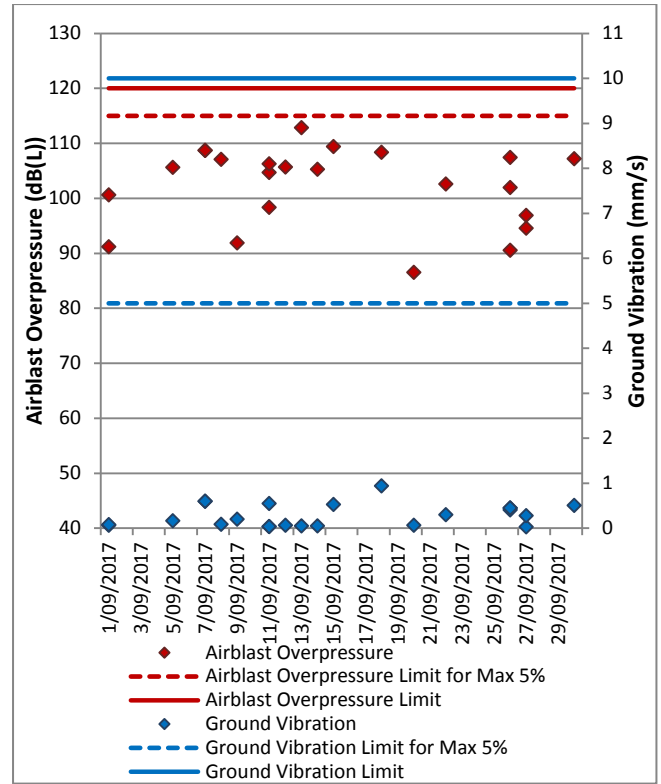


Figure 82: Knodlers Lane Blast Monitoring Results – September 2017

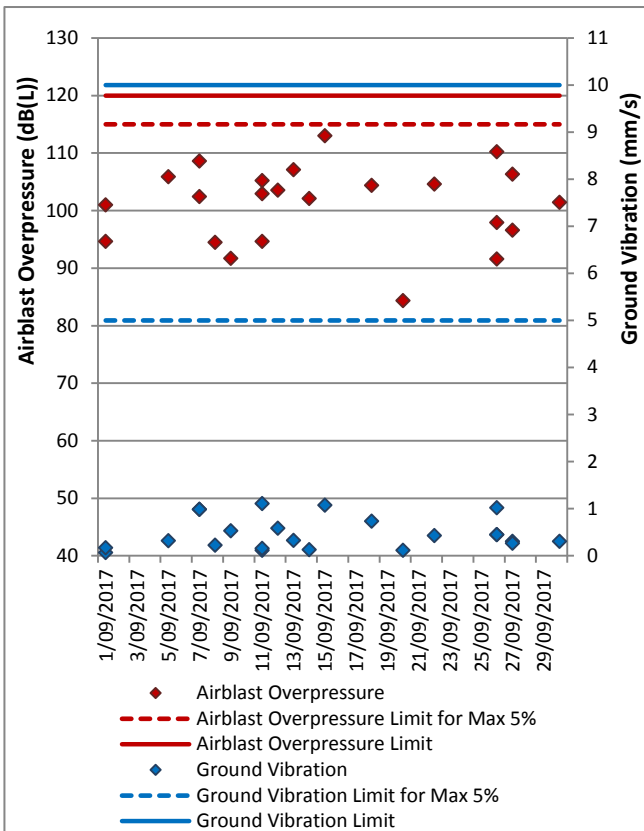


Figure 81: Warkworth Blast Monitoring Results – September 2017

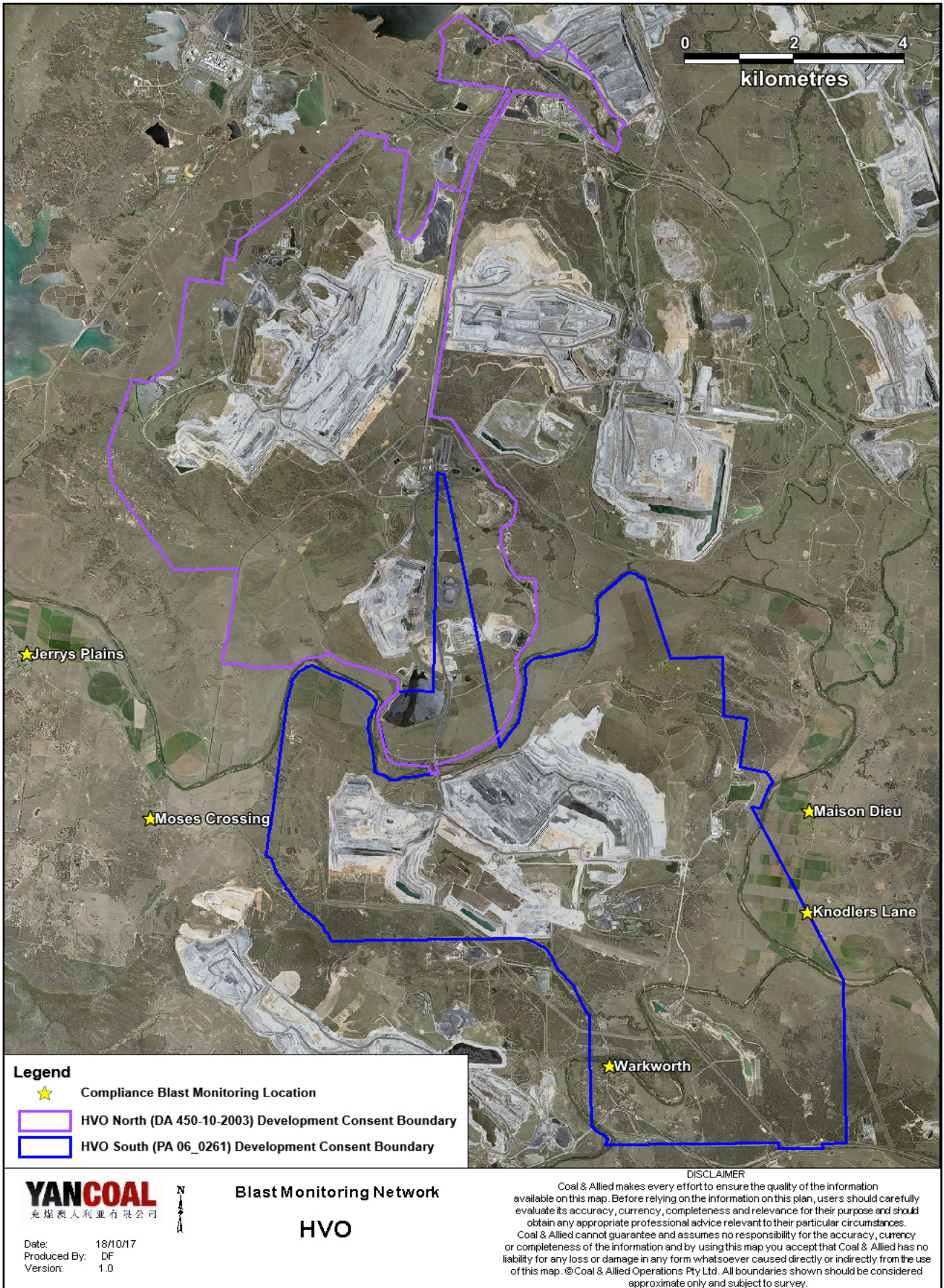


Figure 83: Blast Monitoring Location Plan

6.0 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 84

6.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the nights of 14/09/2017 and 15/09/2017. Monitoring results are detailed in Table 3 to Table 8.

Table 5: L_{Aeq, 15 minute} HVO South - Impact Assessment Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies ^{2,1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	37	No	41	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	37	No	41	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	41	No	42	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	36	No	IA	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	35	No	IA	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	35	No	IA	NA
Long Point Road	14/09/2017 21:00	3.5	-1	35	No	IA	NA
HVGC	14/09/2017 21:02	4	-1	55	No	48	NA

Table 6: L_{Aeq, 15 minute} HVO South - Land Acquisition Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies ^{2,1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	41	No	41	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	41	No	41	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	41	No	42	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	41	No	IA	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	40	No	IA	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	40	No	IA	NA
Long Point Road	14/09/2017 21:00	3.5	-1	40	No	IA	NA
HVGC	14/09/2017 21:02	4	-1	NA	NA	48	NA

Table 7: L_{A1, 1minute} HVO South - Impact Assessment Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	45	No	48	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	45	No	51	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	45	No	52	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	45	No	IA	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	45	No	IA	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	45	No	IA	NA
Long Point Road	14/09/2017 21:00	3.5	-1	45	No	IA	NA
HVGC	14/09/2017 21:02	4	-1	NA	NA	56	NA

Notes

1. 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);
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 8: L_{Aeq, 15minute} HVO North – Impact Assessment Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	35	No	IA	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	35	No	IA	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	35	No	IA	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	39	No	<20	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	36	No	<20	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	39	No	<25	NA
Long Point Road	14/09/2017 21:00	3.5	-1	35	No	IA	NA
HVGC	14/09/2017 21:02	4	-1	NA	NA	IA	NA

Table 9: L_{Aeq,15minute} HVO North - Land Acquisition Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	41	No	IA	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	41	No	IA	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	41	No	IA	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	41	No	<20	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	41	No	<20	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	41	No	<25	NA
Long Point Road	14/09/2017 21:00	3.5	-1	41	No	IA	NA

HVGC	14/09/2017 21:02	4	-1	NA	NA	IA	NA
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Table 10: L_{A1, 1Minute} HVO North - Impact Assessment Criteria – September 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/09/2017 22:41	4.7	-1	46	No	IA	NA
Maison Dieu	14/09/2017 23:29	3.5	-1	46	No	IA	NA
Shearers Lane	15/09/2017 0:06	3.8	-1	46	No	IA	NA
Kilburnie South	14/09/2017 22:56	4.5	-1	46	No	<20	NA
Jerrys Plains Village	14/09/2017 21:35	4.4	-1	46	No	<20	NA
Jerrys Plains East	14/09/2017 22:29	4.4	-1	46	No	<25	NA
Long Point Road	14/09/2017 21:00	3.5	-1	46	No	IA	NA
HVGC	14/09/2017 21:02	4	-1	NA	NA	IA	NA

Notes

1. 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;
2. Estimated or measured LAeq,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

5.2 INP Low Frequency Assessment

In accordance with the requirements of the Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target source is audible. The L_{Ceq} levels reported above are “Total”, or “Total mine noise” at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency penalty is triggered, the penalty has been applied to the dominant mine noise source. There were no exceedances of noise criteria following application of the INP Low Frequency modification factor during September 2017.

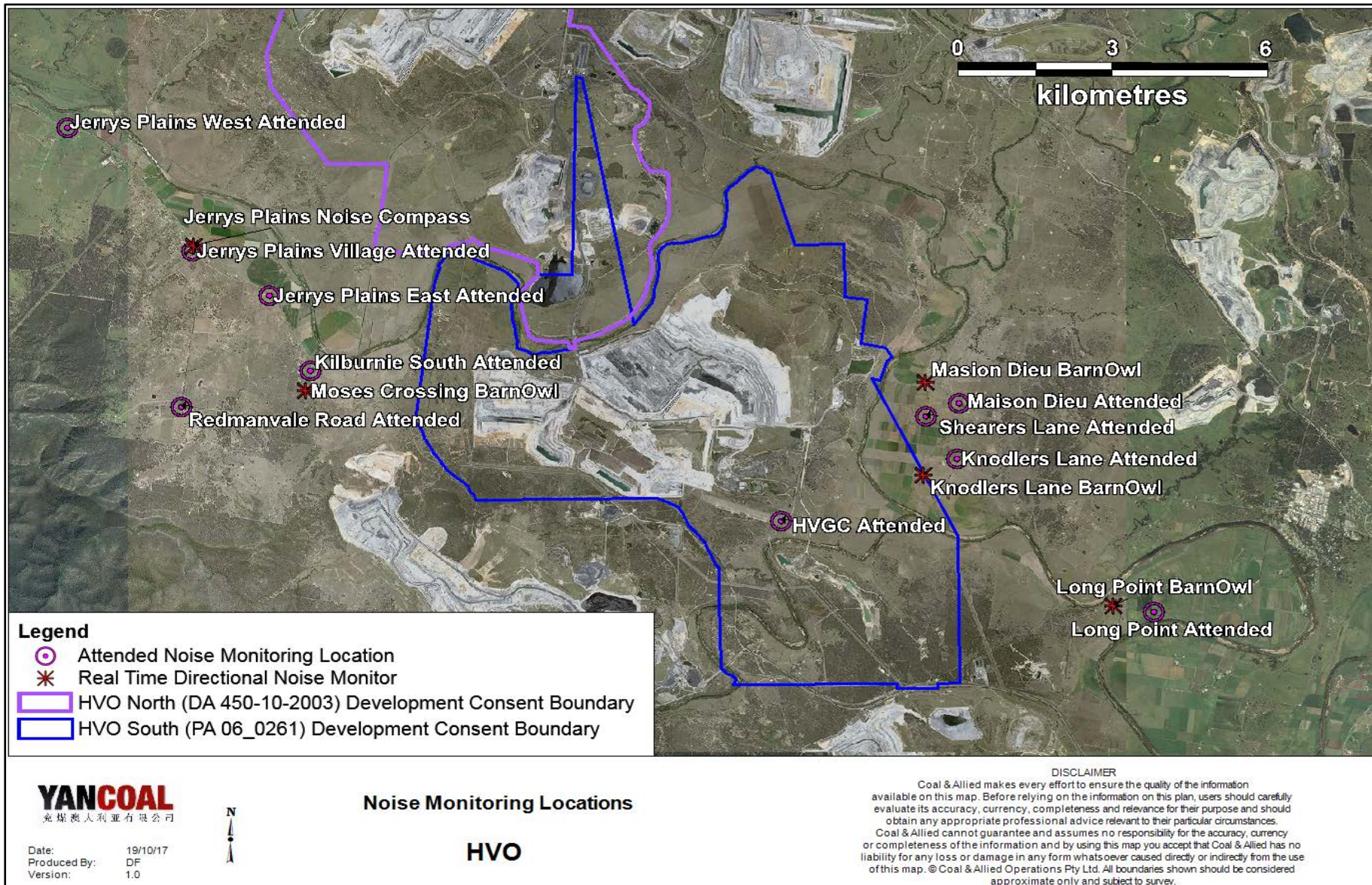


Figure 84: Noise Monitoring Location Plan

6.2 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.

7.0 OPERATIONAL DOWNTIME

During September, a total of 2531.5 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 85.

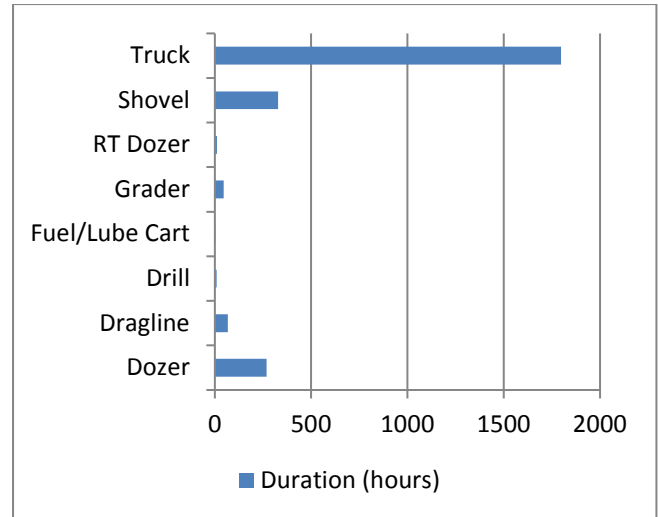


Figure 85: Operational Downtime by Equipment Type – September 2017

8.0 REHABILITATION

During September 23.1 Ha of land was released, 17.1Ha of land was bulk shaped, 15.2 Ha of land was topsoiled and 22.4 Ha of land was composted. Year to date progress can be viewed in Figure 86.

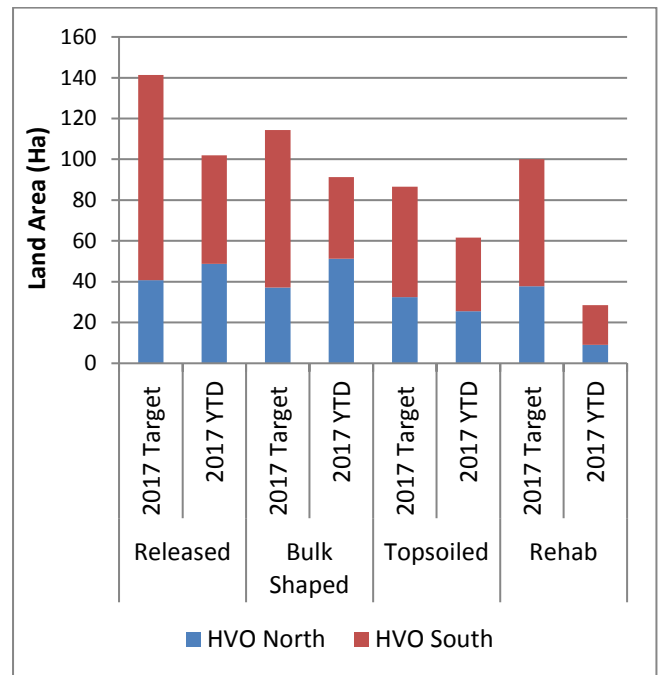


Figure 86: Rehabilitation YTD - September 2017

9.0 COMPLAINTS

7 complaints were received during the reporting period. Details of complaints received YTD are shown in Figure 87 below.

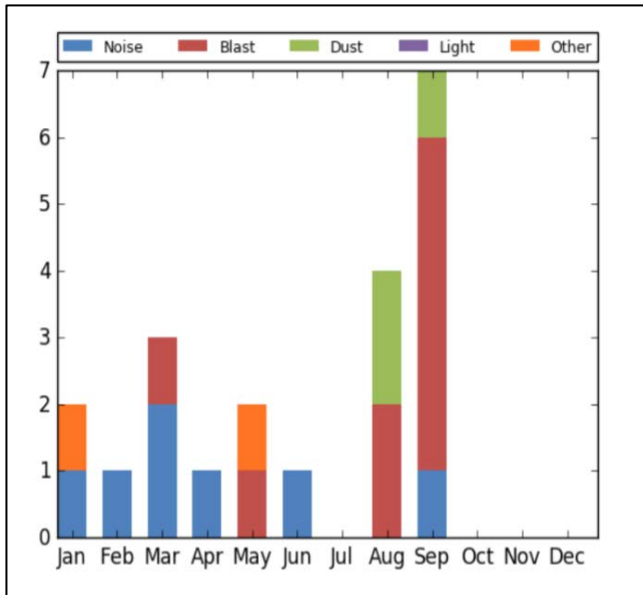


Figure 87: Complaints Graph - September 2017

10.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – September 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)
1/09/2017	18.4	1.7	91.1	25.6	764	159.6	1.0	0.0
2/09/2017	24.8	1.5	100.0	9.0	698	266.6	2.2	0.0
3/09/2017	29.0	8.4	53.1	7.6	702	291.7	4.8	0.0
4/09/2017	20.8	8.7	54.1	15.3	794	289.1	5.6	0.0
5/09/2017	18.3	8.8	44.3	19.4	918	290.7	6.5	0.0
6/09/2017	19.0	7.7	49.4	14.6	807	286.7	6.3	0.0
7/09/2017	20.8	4.2	62.0	18.0	817	288.6	4.0	0.0
8/09/2017	19.8	4.3	61.2	22.6	1012	271.3	4.7	0.0
9/09/2017	19.7	3.0	63.9	15.1	805	207.5	2.3	0.0
10/09/2017	19.8	2.9	81.2	21.1	1160	216.5	1.3	0.0
11/09/2017	25.3	3.1	91.1	8.9	923	283.9	3.0	0.0
12/09/2017	29.6	8.2	39.4	12.1	1174	291.3	3.6	0.0
13/09/2017	32.2	14.4	37.4	5.2	975	282.4	4.9	0.0
14/09/2017	20.9	6.3	98.9	22.8	1062	276.0	5.8	7.4
15/09/2017	21.8	4.9	62.9	24.1	880	297.3	4.2	0.0
16/09/2017	23.1	6.6	84.7	19.0	898	250.5	4.4	0.0
17/09/2017	20.3	3.4	100.0	23.4	872	120.5	1.6	0.0
18/09/2017	26.9	5.1	90.6	13.5	871	286.7	2.6	0.0
19/09/2017	25.3	10.8	44.3	6.7	871	265.9	4.7	0.0
20/09/2017	22.1	5.5	87.6	16.6	854	168.3	0.9	0.0
21/09/2017	29.0	5.4	91.6	6.8	834	278.5	2.4	0.0
22/09/2017	31.3	10.9	35.0	6.5	871	279.2	3.0	0.0
23/09/2017	35.9	14.6	32.0	7.1	1057	280.3	3.9	0.0
24/09/2017	32.2	20.3	23.3	8.1	970	-	5.6	0.0
25/09/2017	28.0	13.8	32.3	6.8	873	276.4	5.3	0.0
26/09/2017	26.7	9.4	79.9	8.0	916	216.8	2.5	0.0
27/09/2017	27.4	7.7	93.6	21.8	852	124.8	1.6	0.0
28/09/2017	25.0	14.3	86.3	22.6	1183	257.2	3.5	0.0
29/09/2017	26.4	10.7	55.4	10.2	916	280.5	4.0	0.0
30/09/2017	24.4	13.3	72.9	6.0	1138	263.5	3.6	0.0

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



Business Papers – Appendix B

Environmental Monitoring Report – October 2017



Monthly Environmental Monitoring Report

Yancoal Hunter Valley Operations

October 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Advisor	Draft	06/12/2017
1.1	Environmental Specialist	Final	08/12/2017

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 October to 31st October.

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)
October	54.6	418.4

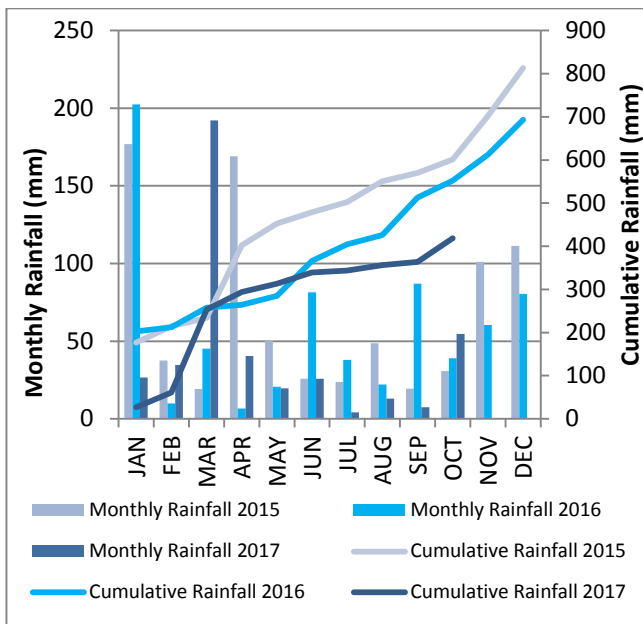


Figure 1: Rainfall Summary 2017

2.1.2 Wind Speed and Direction

South-easterly and North-westerly winds were dominant during October as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

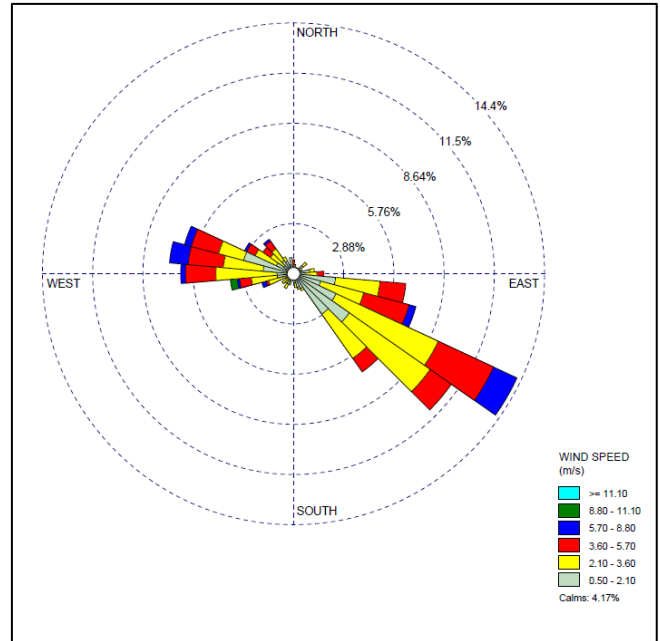


Figure 2: HVO Corporate Wind Rose – October 2017

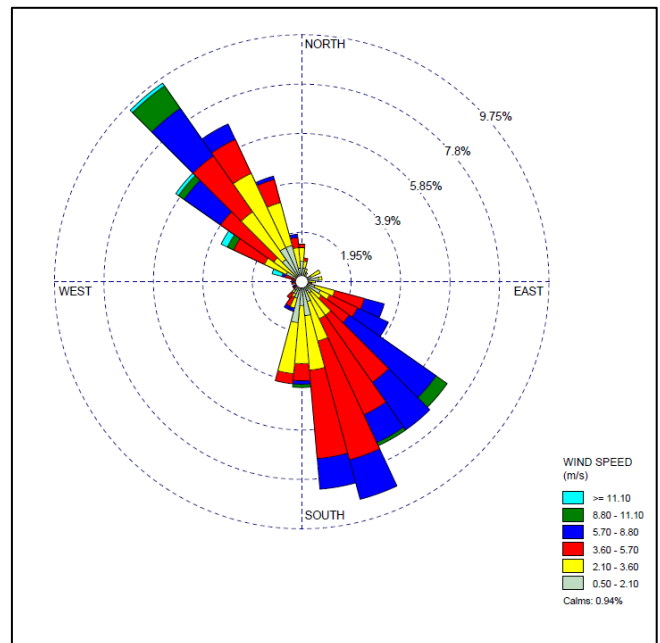


Figure 3: HVO Cheshunt Wind Rose – October 2017

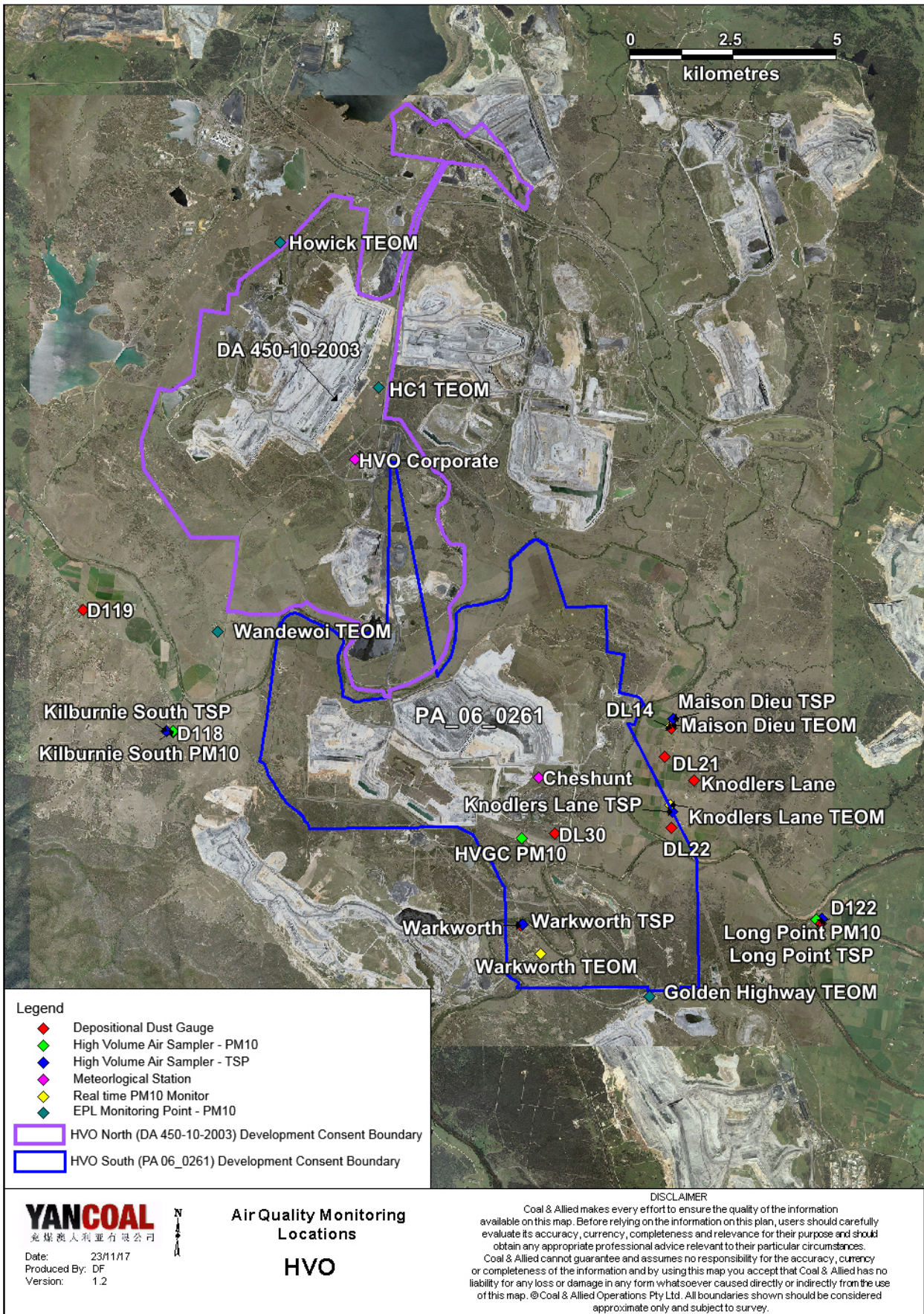


Figure 4: Air Quality Monitoring Location Plan

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 DL30 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m² per month.

The field notes associated with the DL30 monitor result confirms the presence of insects and bird droppings. As such the result is considered contaminated and will be excluded from calculation of the annual average. There is no evidence to suggest that the Warkworth result was contaminated. Accordingly, this result will be included in the annual average calculation.

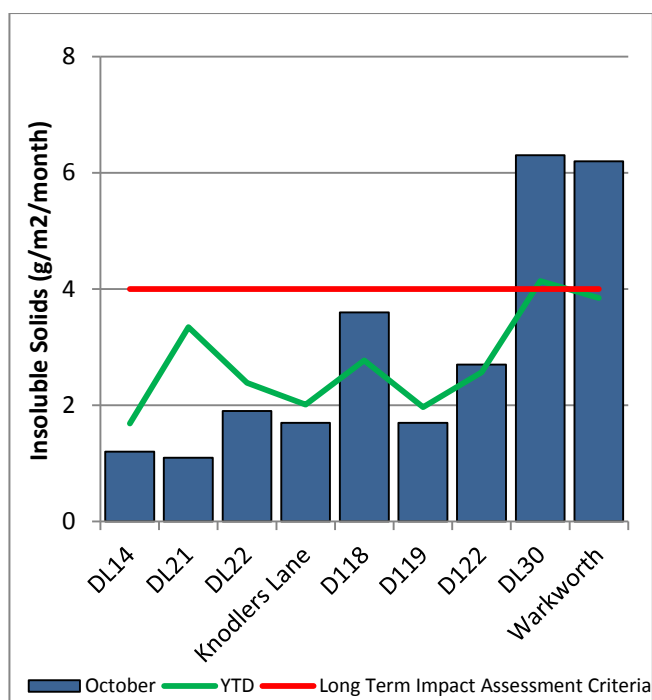


Figure 5: Depositional Dust Results – October 2017

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.

2.3.1 HVAS PM₁₀ Results

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

On 3/10/2017 one HVAS PM₁₀ unit recorded a result which was greater than the short term (24hr) PM₁₀ impact assessment criteria; Long Point (106 µg/m³).

Investigation determined that HVO's maximum contribution at Long Point is estimated to be less than 36 µg/m³; or less than 34% of the measured result. Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

Data was not available on 21/10/2017 and 27/10/2017 at Long Point due to a power outage and an invalid sample respectively and on 27/10/2017 at Glider Club HVAS due to an invalid sample.

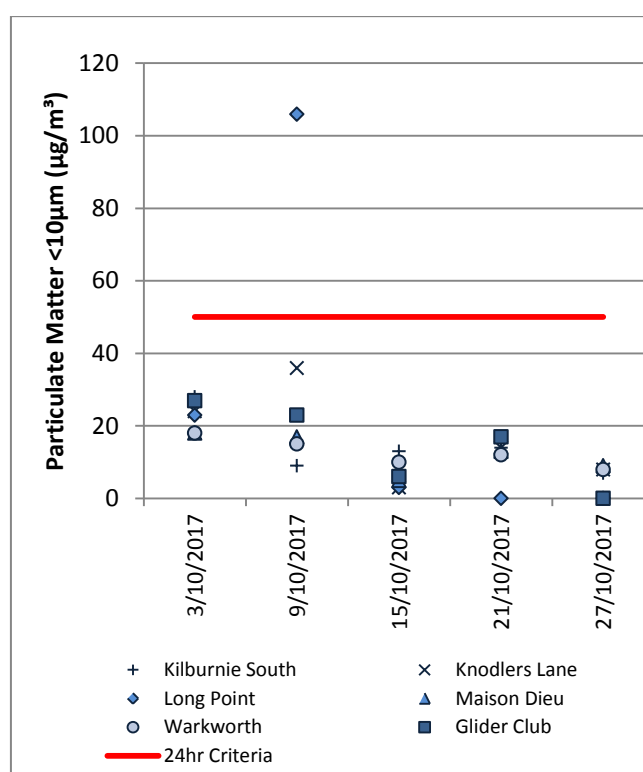


Figure 6: Individual PM₁₀ Results – October 2017

Figure 7 shows the year to date annual average PM₁₀ results.

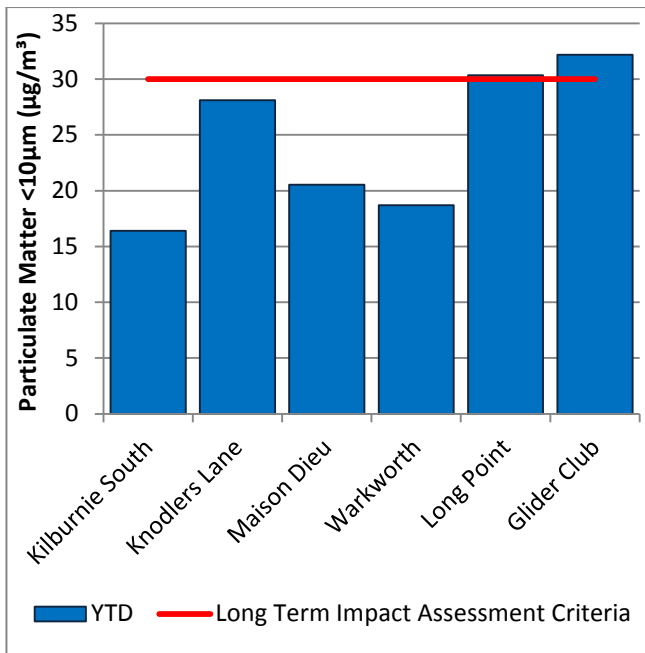


Figure 7: Year to Date Average PM₁₀ – October 2017

2.3.2 TSP Results

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

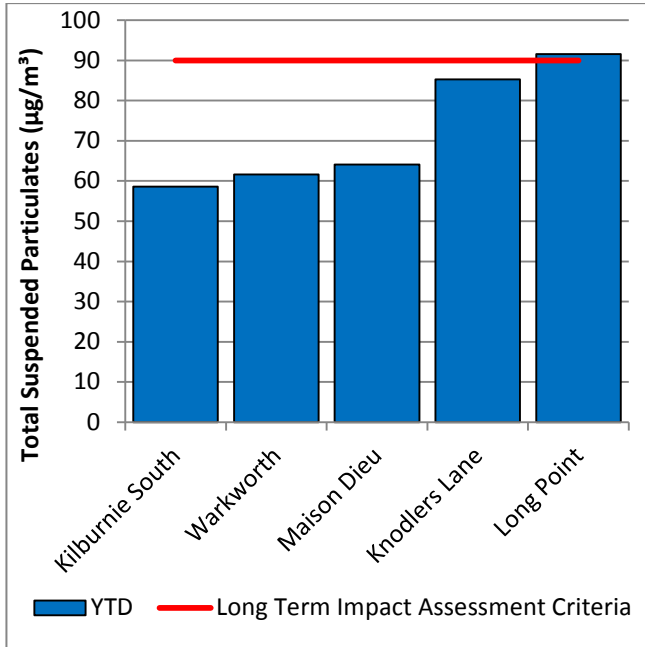


Figure 8: Year to Date Average Total Suspended Particulates – October 2017

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 is shown in Figure 9, including the daily 24 hour average PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

2.3.4 Real Time Alarms for Air Quality

During October the real time monitoring system generated 44 automated air quality related alarms. 4 were related to adverse weather conditions and 40 alarms relating to PM₁₀.

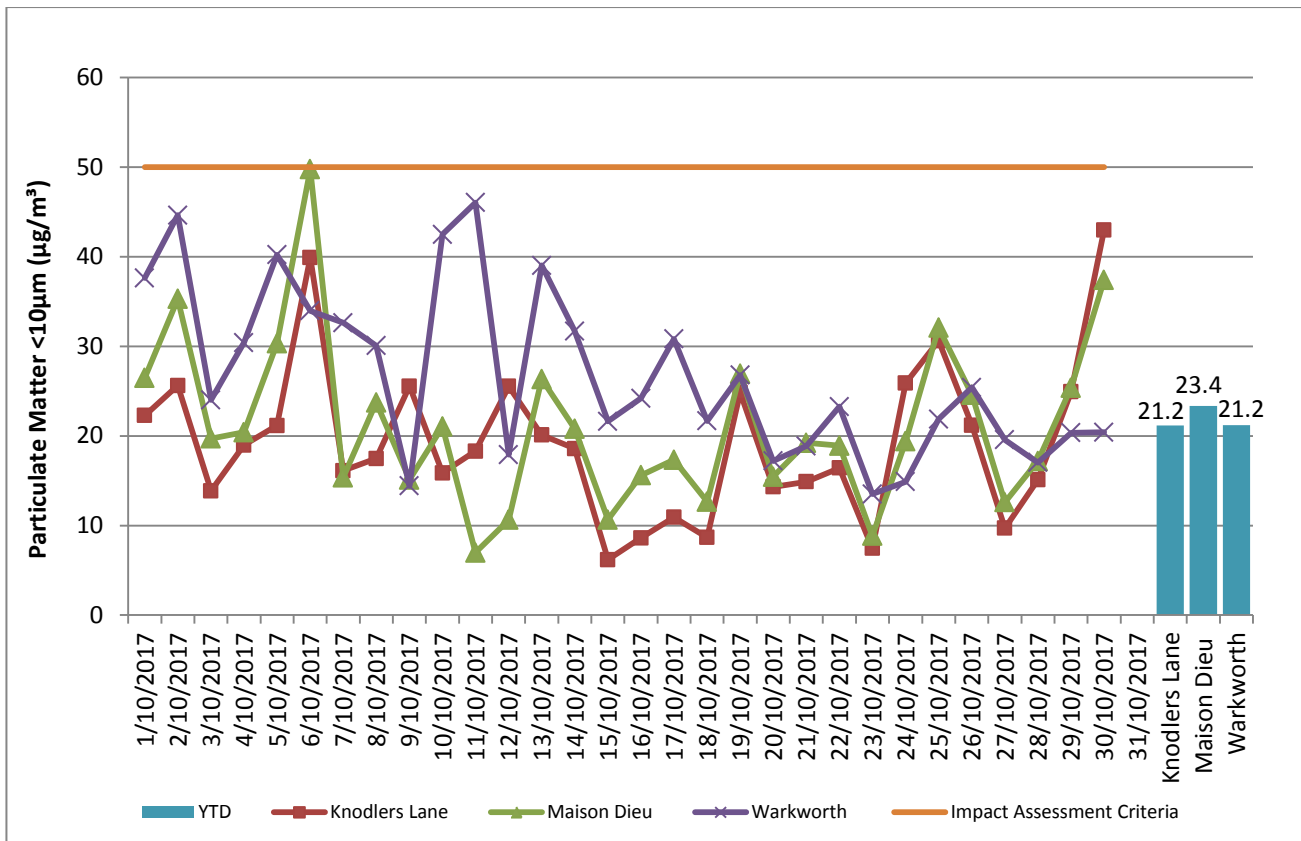


Figure 9: Real Time PM₁₀ 24hr average and YTD average – October 2017

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 December 2017 report.

3.1.2 Site Water Use

Under water allocation licences issued by the NSW DPI 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 December 2017 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.

During October 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%

During the reporting period there were no exceedances of the airblast overpressure or ground vibration criteria.

4.1 Blast Monitoring Results

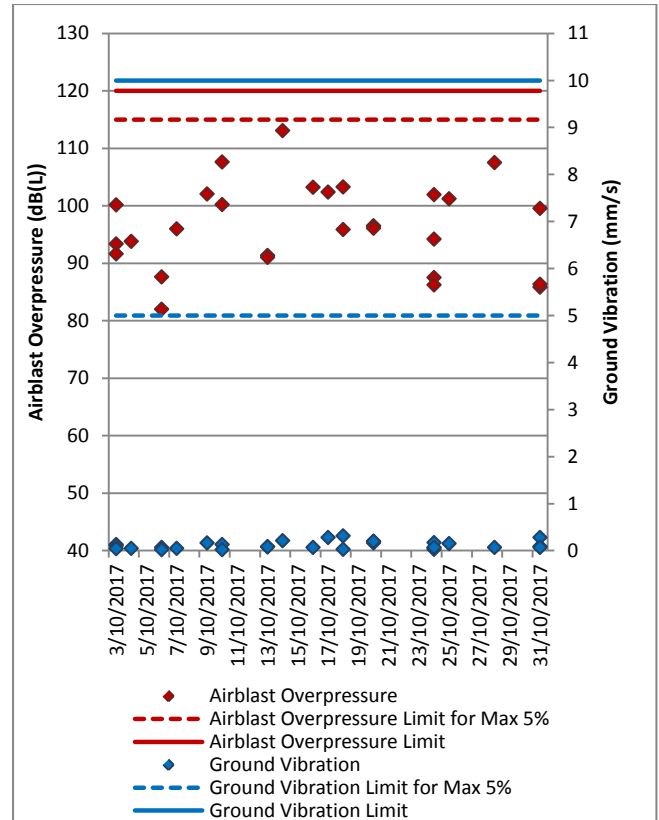


Figure 10: Moses Crossing Blast Monitoring Results – October 2017

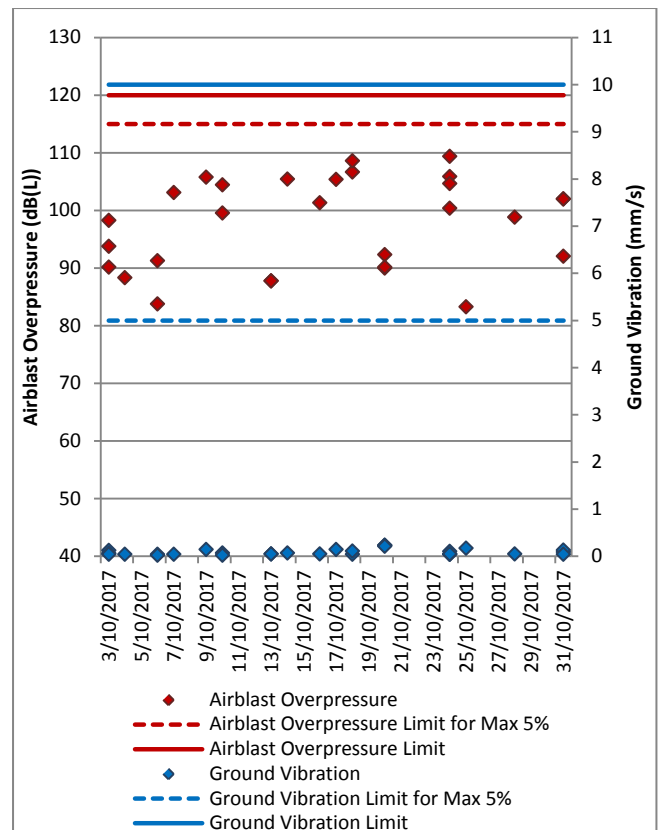


Figure 11: Jerrys Plains Blast Monitoring Results – October 2017

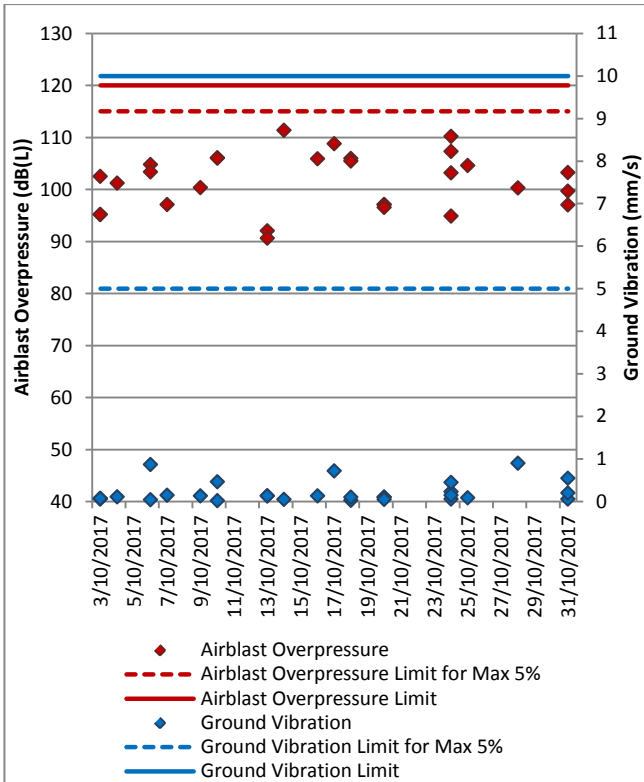


Figure 12: Maison Dieu Blast Monitoring Results – October 2017

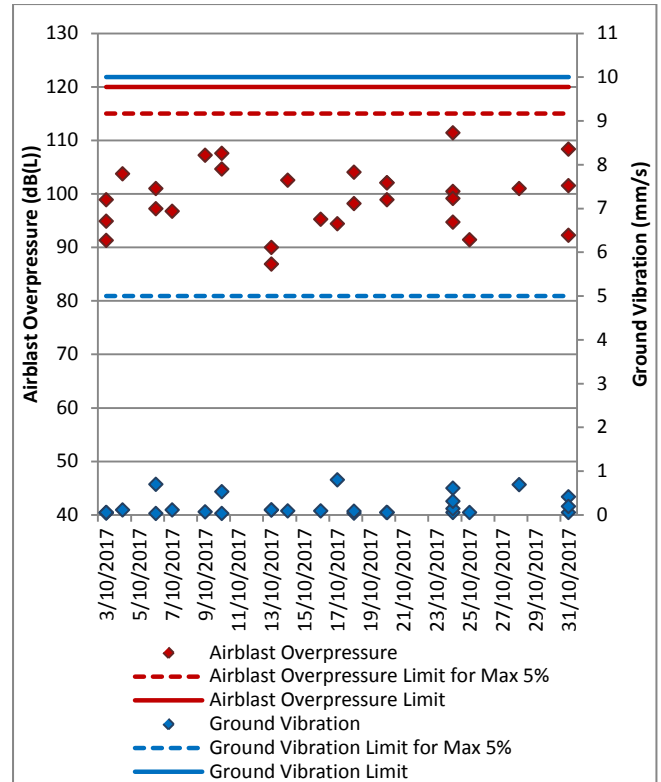


Figure 14: Knodlers Lane Blast Monitoring Results – October 2017

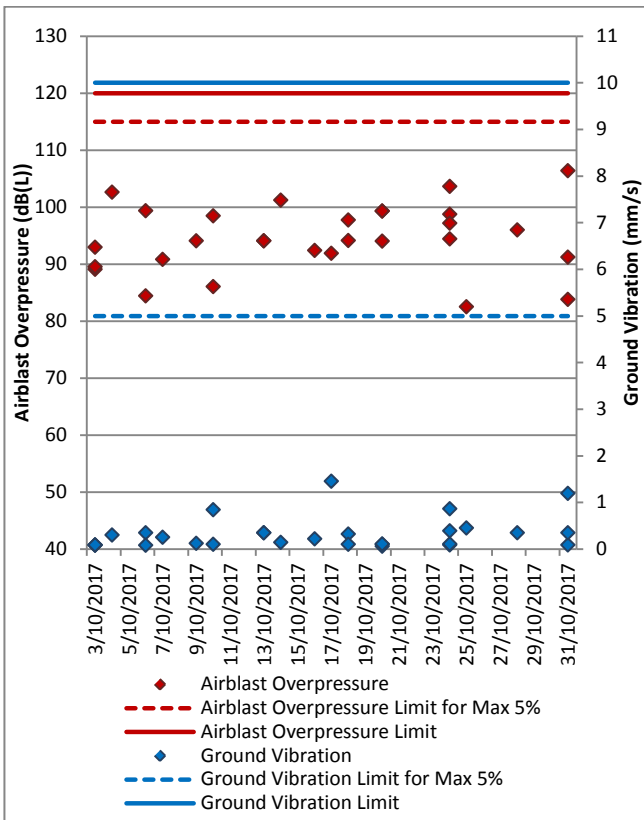


Figure 13: Warkworth Blast Monitoring Results – October 2017

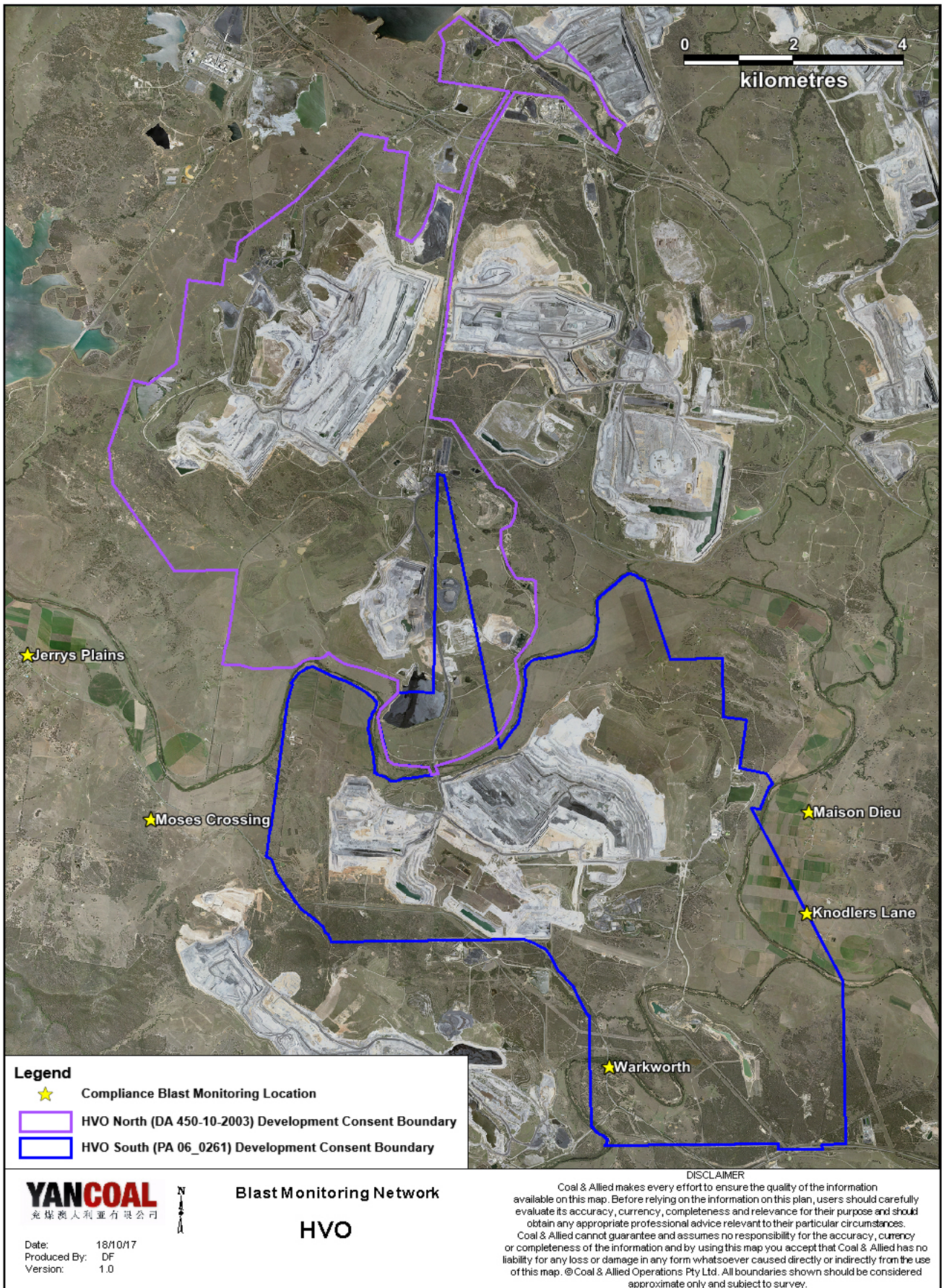


Figure 15: Blast Monitoring Location Plan

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 12-13/10/2017 and 16/10/2017. Monitoring results are detailed in Table 3 to Table 8 .

Table 2: L_{Aeq, 15 minute} HVO South - Impact Assessment Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	3.4	0.5	37	No	41	NA
Maison Dieu	12/10/2017 21:38	3.9	0.5	37	No	36	NA
Shearers Lane	12/10/2017 21:59	3.9	0.5	41	No	33	NA
Kilburnie South	12/10/2017 22:09	3.9	0.5	36	No	38	NA
Kilburnie South ⁷	12/10/2017 23:02	3.7	0.5	36	No	38	NA
Kilburnie South ⁸	16/10/2017 21:04	4.5	-1	36	No	35	NA
Jerrys Plains Village	12/10/2017 23:42	3.3	0.5	35	No	IA	NA
Jerrys Plains East	13/10/2017 0:11	3	0.5	35	No	30	NA
Long Point Road	16/10/2017 22:01	3.1	-1	35	No	IA	NA
HVGC	12/10/2017 22:50	3.3	0.5	55	No	IA	NA

Table 3: L_{Aeq, 15 minute} HVO South - Land Acquisition Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	3.4	0.5	41	No	41	NA
Maison Dieu	12/10/2017 21:38	3.9	0.5	41	No	36	NA
Shearers Lane	12/10/2017 21:59	3.9	0.5	41	No	33	NA
Kilburnie South	12/10/2017 22:09	3.9	0.5	41	No	38	NA
Kilburnie South ⁷	12/10/2017 23:02	3.7	0.5	41	No	38	NA
Kilburnie South ⁸	16/10/2017 21:04	4.5	-1	41	No	35	NA
Jerrys Plains Village	12/10/2017 23:42	3.3	0.5	40	No	IA	NA
Jerrys Plains East	13/10/2017 0:11	3	0.5	40	No	30	NA
Long Point Road	16/10/2017 22:01	3.1	-1	40	No	IA	NA
HVGC	12/10/2017 22:50	3.3	0.5	NA	NA	IA	NA

Table 4: L_{A1, 1minute} HVO South - Impact Assessment Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	3.4	0.5	45	No	49	NA
Maison Dieu	12/10/2017 21:38	3.9	0.5	45	No	40	NA
Shearers Lane	12/10/2017 21:59	3.9	0.5	45	No	40	NA
Kilburnie South	12/10/2017 22:09	3.9	0.5	45	No	46	NA
Kilburnie South ⁷	12/10/2017 23:02	3.7	0.5	45	No	41	NA
Kilburnie South ⁸	16/10/2017 21:04	4.5	-1	45	No	40	NA
Jerrys Plains Village	12/10/2017 23:42	3.3	0.5	45	No	IA	NA
Jerrys Plains East	13/10/2017 0:11	3	0.5	45	No	37	NA
Long Point Road	16/10/2017 22:01	3.1	-1	45	No	IA	NA
HVGC	12/10/2017 22:50	3.3	0.5	NA	NA	IA	NA

Notes

1. 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);
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 or Cheshunt weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values
7. Remeasure; and
8. Follow up measurement.

Table 5: L_{Aeq, 15minute} HVO North – Impact Assessment Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	2.5	0.5	35	Yes	IA	Nil
Maison Dieu	12/10/2017 21:38	2.9	-1	35	Yes	IA	Nil
Shearers Lane	12/10/2017 21:59	2.4	-1	35	Yes	IA	Nil
Kilburnie South	12/10/2017 22:09	2.4	-1	39	Yes	IA	Nil
Kilburnie South ⁷	12/10/2017 23:02	2.4	-1	39	Yes	IA	Nil
Kilburnie South ⁸	16/10/2017 21:04	2.7	-1	39	Yes	<30	Nil
Jerrys Plains Village	12/10/2017 23:42	2	0.5	36	Yes	33	Nil
Jerrys Plains East	13/10/2017 0:11	2.1	0.5	39	Yes	IA	Nil
Long Point Road	16/10/2017 22:01	3.1	-1	35	No	IA	NA
HVGC	12/10/2017 22:50	1.8	0.5	NA	NA	IA	NA

Table 6: L_{Aeq,15minute} HVO North - Land Acquisition Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	2.5	0.5	41	Yes	IA	Nil
Maison Dieu	12/10/2017 21:38	2.9	-1	41	Yes	IA	Nil

Shearers Lane	12/10/2017 21:59	2.4	-1	41	Yes	IA	Nil
Kilburnie South	12/10/2017 22:09	2.4	-1	41	Yes	IA	Nil
Kilburnie South ⁷	12/10/2017 23:02	2.4	-1	41	Yes	IA	Nil
Kilburnie South ⁸	16/10/2017 21:04	2.7	-1	41	Yes	<30	Nil
Jerrys Plains Village	12/10/2017 23:42	2	0.5	41	Yes	33	Nil
Jerrys Plains East	13/10/2017 0:11	2.1	0.5	41	Yes	IA	Nil
Long Point Road	16/10/2017 22:01	3.1	-1	41	No	IA	NA
HVGC	12/10/2017 22:50	1.8	0.5	NA	NA	IA	NA

Table 7: L_{A1, 1Minute} HVO North - Impact Assessment Criteria – October 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	12/10/2017 21:00	2.5	0.5	46	Yes	IA	Nil
Maison Dieu	12/10/2017 21:38	2.9	-1	46	Yes	IA	Nil
Shearers Lane	12/10/2017 21:59	2.4	-1	46	Yes	IA	Nil
Kilburnie South	12/10/2017 22:09	2.4	-1	46	Yes	IA	Nil
Kilburnie South ⁷	12/10/2017 23:02	2.4	-1	46	Yes	IA	Nil
Kilburnie South ⁸	16/10/2017 21:04	2.7	-1	46	Yes	<30	Nil
Jerrys Plains Village	12/10/2017 23:42	2	0.5	46	Yes	42	Nil
Jerrys Plains East	13/10/2017 0:11	2.1	0.5	46	Yes	IA	Nil
Long Point Road	16/10/2017 22:01	3.1	-1	46	No	IA	NA
HVGC	12/10/2017 22:50	1.8	0.5	NA	NA	IA	NA

Notes

1. 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;
2. Estimated or measured LAeq,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 or Cheshunt weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values
7. Remeasure; and
8. Follow up measurement.

5.2 INP Low Frequency Assessment

In accordance with the requirements of the Industrial Noise Policy (INP), the low frequency modification factor has been applied where appropriate. It should be noted that the Industrial Noise Policy does not give guidance on the application of the penalty where more than one target source is audible. The L_{Ceq} levels reported above are “Total”, or “Total mine noise” at best, and cannot be attributed accurately to a single mine. Accordingly, where the INP criteria for the application of the Low Frequency penalty is triggered, the penalty has been applied to the dominant mine noise source. Resulting L_{Aeq} noise levels exceed the HVO North impact assessment criteria at Jerrys Plains Village by 2dB due to the application of a 5 dB penalty to the site only L_{Aeq}.

HVO reports these measurements so as to ensure full disclosure, however it remains HVO's position that the prescribed methodology is unsuitable when applied to receptors at large distances from mine noise sources due to the nature of noise attenuation. Excess attenuation of noise with distance is greater for high frequency noise than it is for low frequency noise. At significant distance from a noise source (such as private residences from HVO) this often results in large differentials between L_{Aeq} and L_{Ceq} . The NSW Industrial Noise Policy requires the penalty to be applied in these instances, irrespective of actual low frequency affectation. As such, HVO does not consider these instances to constitute non-compliance with the conditions of approval. The results have been reported to the Department of Planning and Environment.

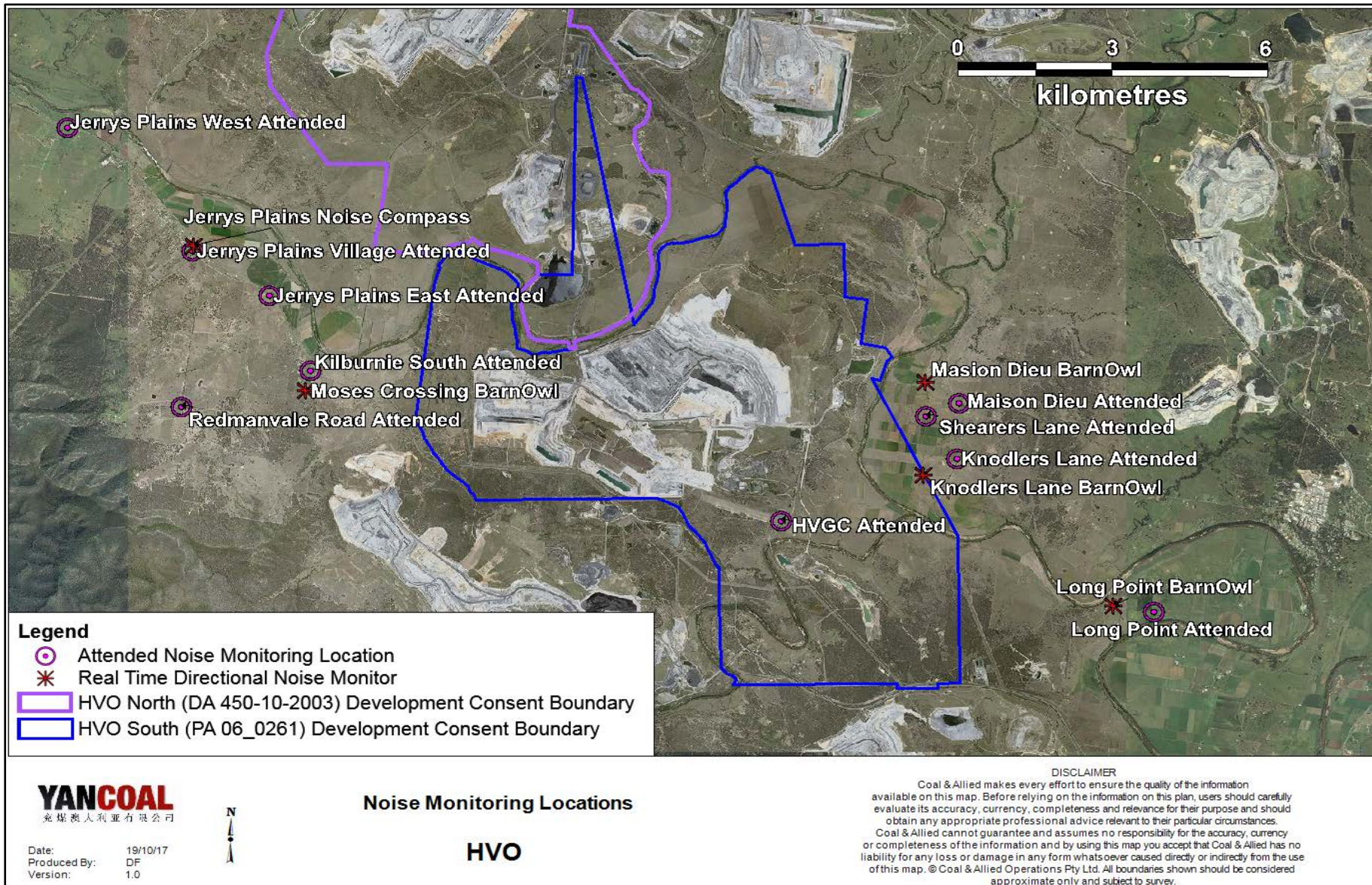


Figure 16: Noise Monitoring Location Plan

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.

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 October, a total of 490.4 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.

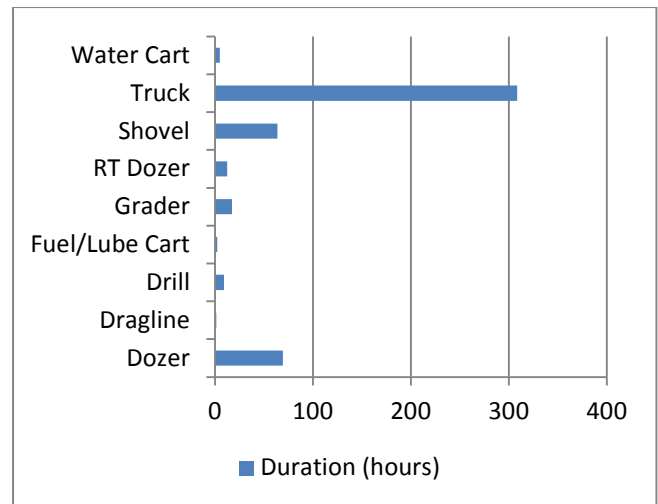


Figure 17: Operational Downtime by Equipment Type – October 2017

7.0 REHABILITATION

During October 3.94 Ha of land was released, 19.55Ha of land was bulk shaped, 4.24 Ha of land was topsoiled, 25.92 Ha of land was composted and 14.85 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 18.

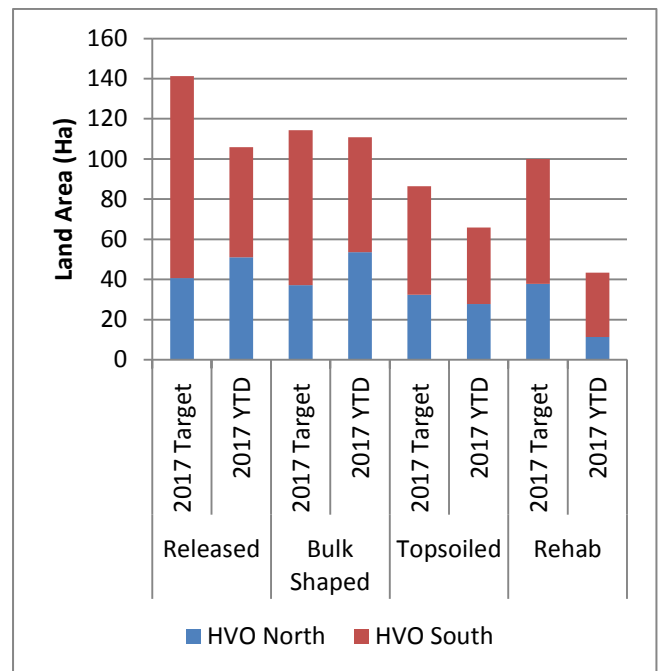


Figure 18: Rehabilitation YTD - October 2017

8.0 COMPLAINTS

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

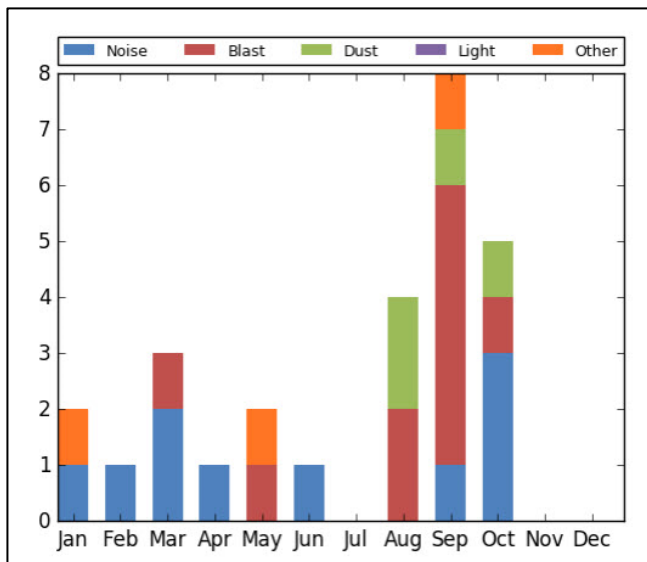


Figure 19: Complaints Graph - October 2017

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were no reportable environmental incidents.

Appendix A: Meteorological Data

Table 8: Meteorological Data - HVO Corporate Meteorological Station – October 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)
1/10/2017	26.3	8.0	88.7	6.4	1080	210.2	1.9	0.0
2/10/2017	21.7	7.0	86.0	30.1	789	157.8	1.2	0.0
3/10/2017	26.8	10.7	100.0	29.7	1323	157.0	1.3	0.0
4/10/2017	28.9	11.2	99.0	24.7	954	165.9	2.1	0.0
5/10/2017	30.8	13.8	94.2	18.4	1168	204.3	1.6	0.0
6/10/2017	25.7	11.8	84.2	7.6	1122	208.3	2.6	0.0
7/10/2017	21.8	9.8	88.6	37.3	1385	116.4	3.0	0.0
8/10/2017	20.3	8.9	100.0	52.9	730	208.4	1.1	1.6
9/10/2017	30.5	15.5	99.0	28.3	1105	280.8	3.7	0.0
10/10/2017	23.4	12.8	89.2	56.0	1301	122.0	3.3	0.0
11/10/2017	32.6	14.4	88.8	21.6	1085	162.9	1.5	0.0
12/10/2017	29.3	13.2	91.6	9.8	1286	267.2	4.7	1.2
13/10/2017	29.9	11.2	100.0	12.2	965	151.2	1.7	0.0
14/10/2017	20.2	11.5	100.0	61.3	1113	129.0	4.0	9.4
15/10/2017	24.9	11.2	100.0	40.3	1586	125.3	3.2	0.6
16/10/2017	24.4	9.6	99.0	32.1	1396	119.0	3.4	0.0
17/10/2017	26.7	10.6	89.1	29.9	1274	118.1	4.0	0.0
18/10/2017	29.7	-	57.1	-	1191	112.0	3.7	0.0
19/10/2017	31.6	-	69.2	-	961	180.1	1.4	0.0
20/10/2017	23.4	10.1	100.0	39.8	262	204.5	2.8	19.6
21/10/2017	20.2	9.1	93.4	40.4	1558	112.3	2.5	0.0
22/10/2017	23.6	6.5	100.0	24.8	1149	183.6	2.1	0.0
23/10/2017	22.0	7.7	100.0	40.9	1316	112.5	2.5	2.2
24/10/2017	29.7	8.5	100.0	17.7	1037	277.7	2.7	0.0
25/10/2017	31.3	16.0	59.2	13.6	1315	-	3.0	0.0
26/10/2017	30.4	9.1	100.0	34.3	1031	115.1	2.5	19.6
27/10/2017	24.6	10.5	100.0	48.8	1453	196.0	2.0	0.2
28/10/2017	28.5	12.3	100.0	27.4	1084	245.3	1.9	0.2
29/10/2017	32.6	18.0	51.6	19.0	1304	-	3.6	0.0
30/10/2017	35.5	15.8	61.8	8.1	1186	249.8	5.0	0.0
31/10/2017	22.2	9.6	67.9	18.5	1466	159.4	2.3	0.0

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



Business Papers – Appendix C

Environmental Monitoring Report – November 2017



Monthly Environmental Monitoring Report

Yancoal Hunter Valley Operations

November 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Advisor	Draft	12/01/2018
1.1	Environmental Specialist	Final	15/01/2018

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 November to 30th November 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)
November	22.4	440.8

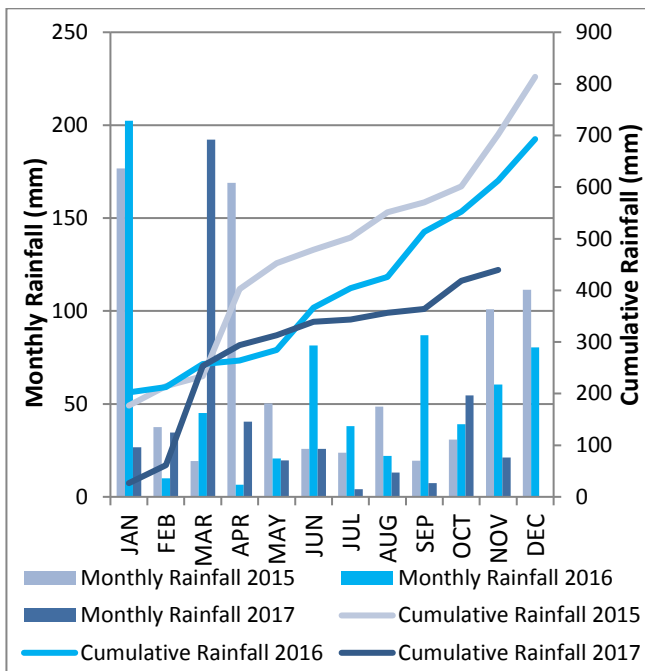


Figure 1: Rainfall Summary 2017

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).

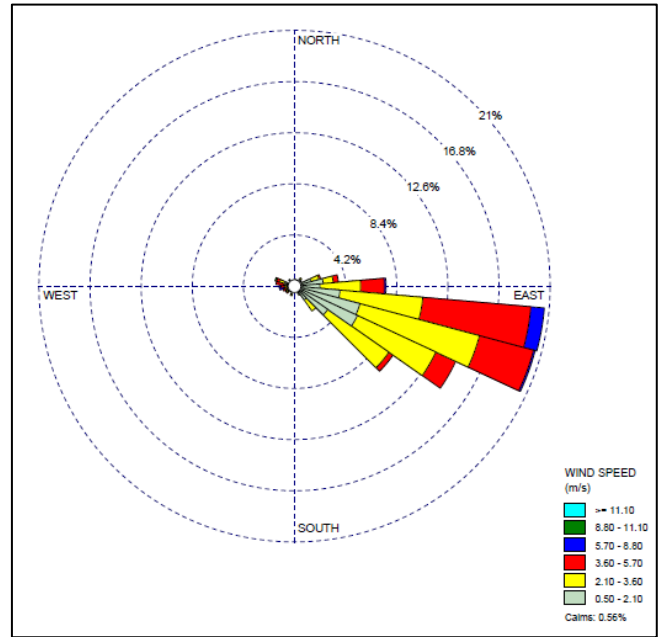


Figure 2: HVO Corporate Wind Rose – November 2017

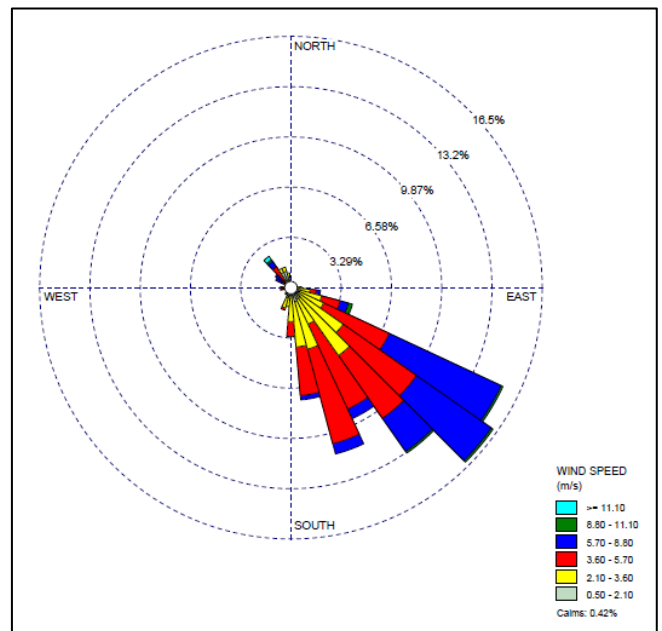


Figure 3: HVO Cheshunt Wind Rose – November 2017

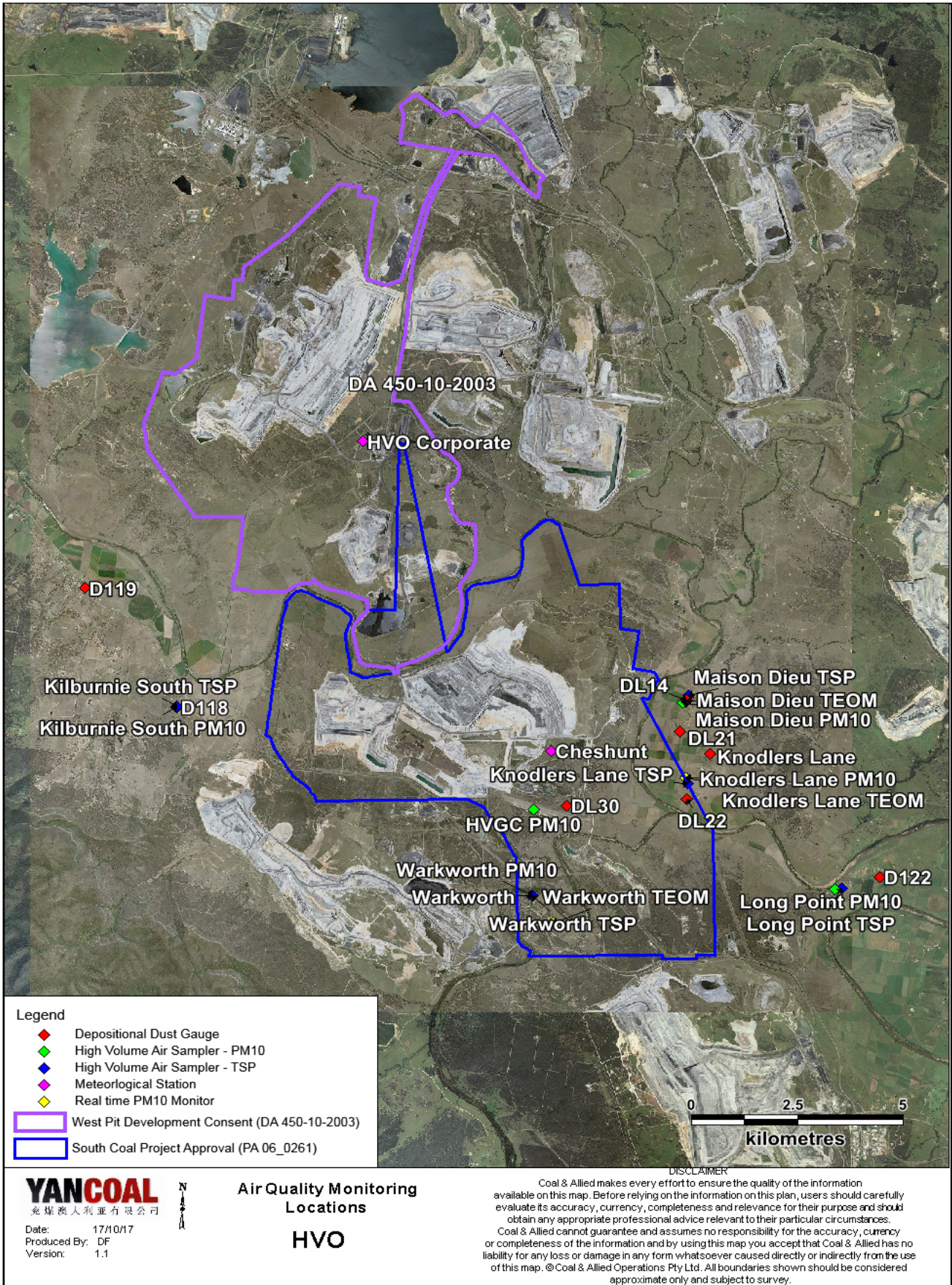


Figure 4: Air Quality Monitoring Location Plan

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 DL30 monitor recorded a monthly result above the long term impact assessment criteria of 4.0 g/m² per month.

The field notes associated with the DL30 monitor result indicates no evidence to suggest that the result was contaminated. Accordingly, this result will be included in the annual average calculation.

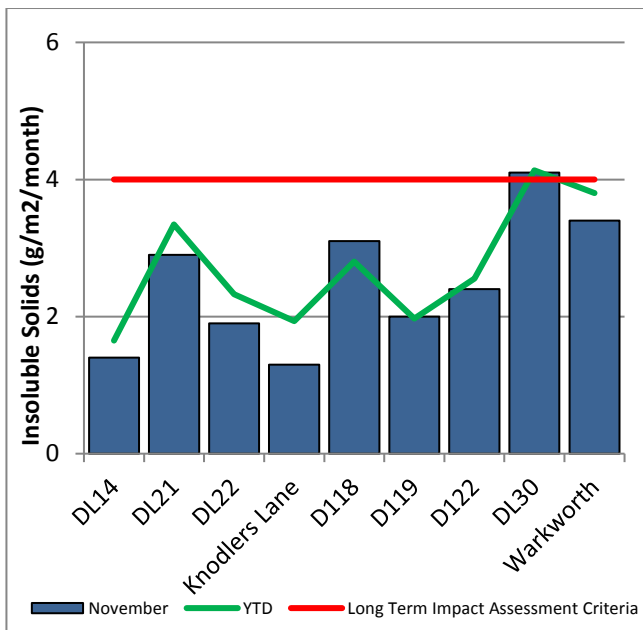


Figure 5: Depositional Dust Results – November 2017

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.

2.3.1 HVAS PM₁₀ Results

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

Data was not available on 26/11/2017 at the Maison Dieu HVAS due to a power outage resulting in an invalid sample.

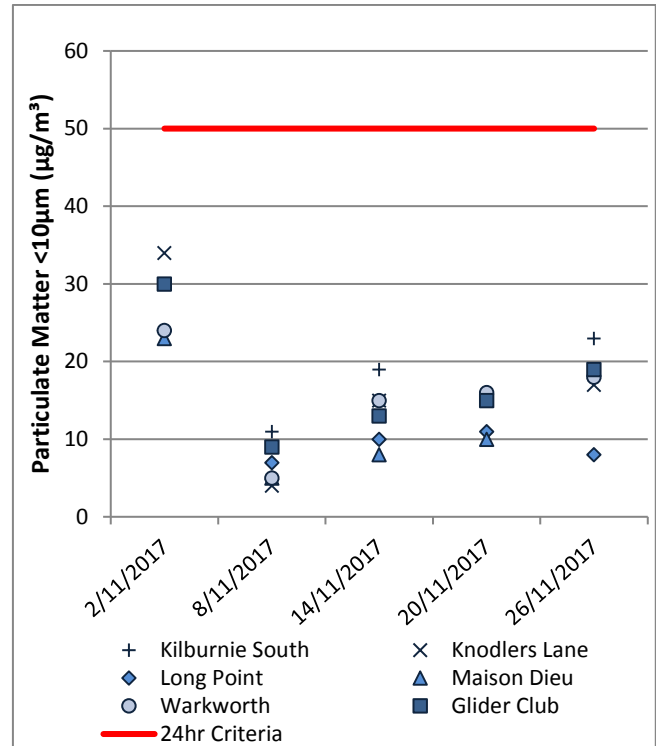


Figure 6: Individual PM₁₀ Results – November 2017

Figure 7 shows the year to date annual average PM₁₀ results.

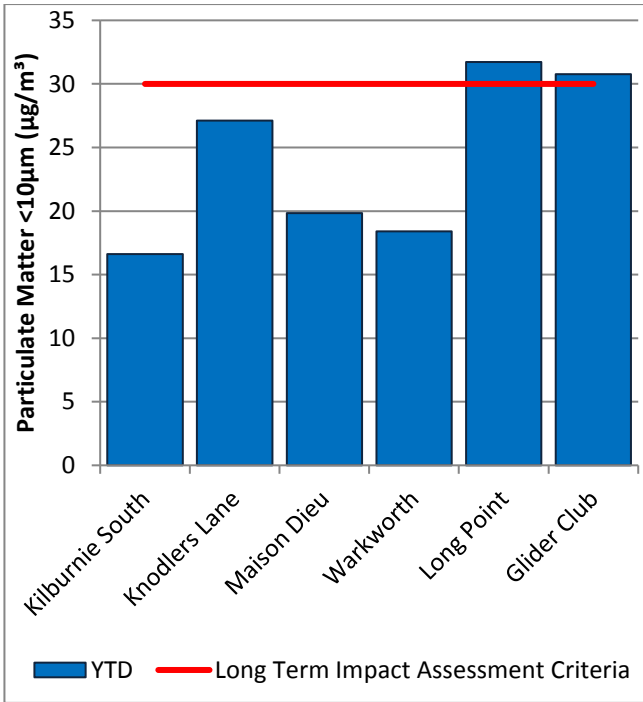


Figure 7: Year to Date Average PM₁₀ – November 2017

2.3.2 TSP Results

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

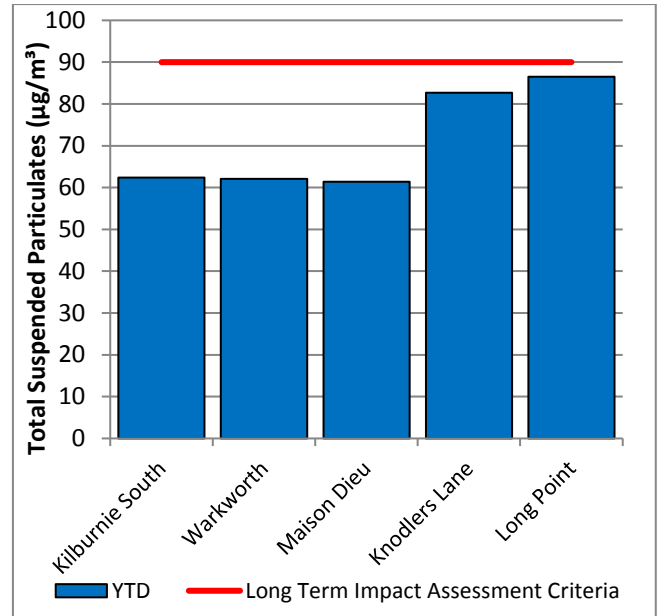


Figure 8: Year to Date Average Total Suspended Particulates – November 2017

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 is shown in Figure 9, including the daily 24 hour average PM₁₀ result and the year to date 24 hour PM₁₀ annual average.

2.3.4 Real Time Alarms for Air Quality

During November the real time monitoring system generated 49 automated air quality related alarms. 32 were related to adverse weather conditions and 17 alarms relating to PM₁₀.

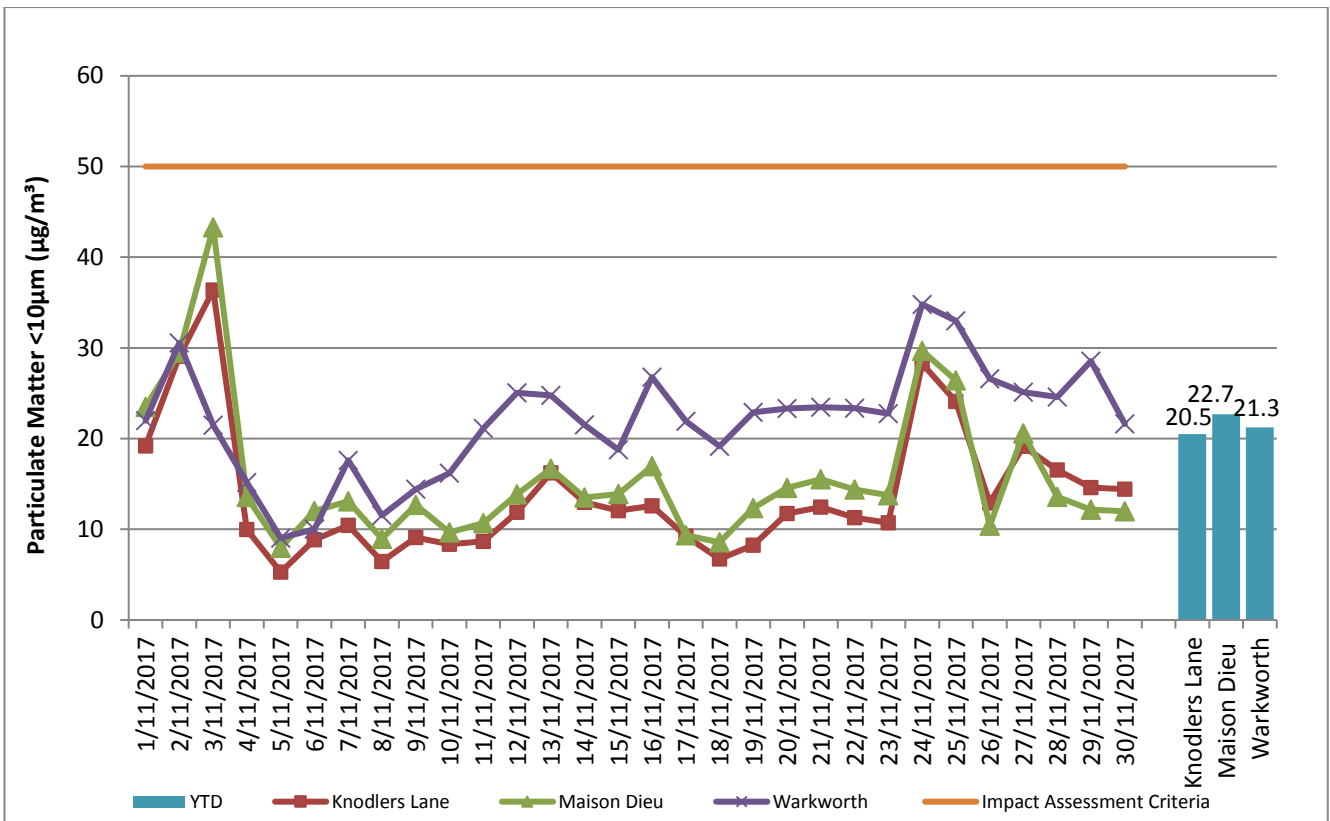


Figure 9: Real Time PM₁₀ 24hr average and YTD average – November 2017

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 December 2017 report.

3.1.2 Site Water Use

Under water allocation licences issued by the NSW DPI 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 December 2017 monthly report.

During the reporting period, HVO did not extract any water from the Hunter River.

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 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 there were no exceedances of the airblast overpressure or ground vibration criteria.

4.1 Blast Monitoring Results

During November 18 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.

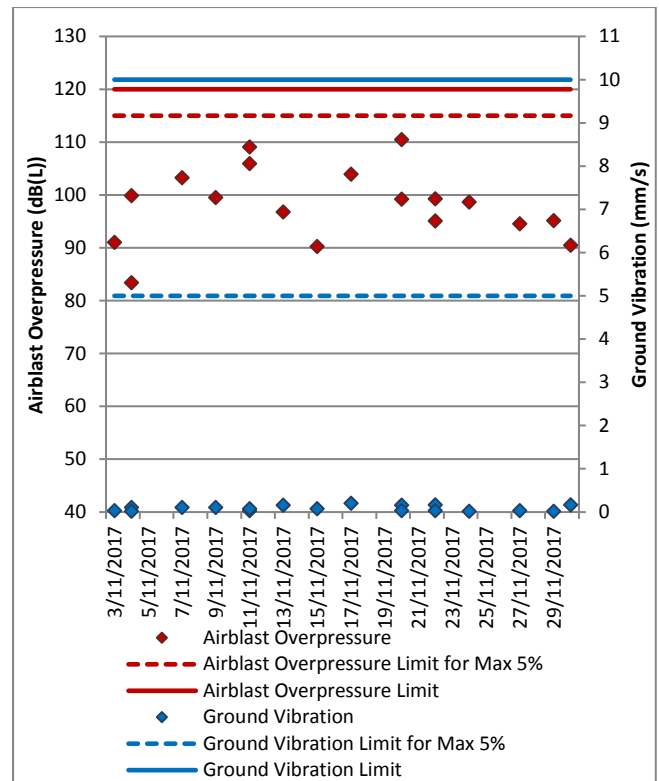


Figure 10: Moses Crossing Blast Monitoring Results – November 2017

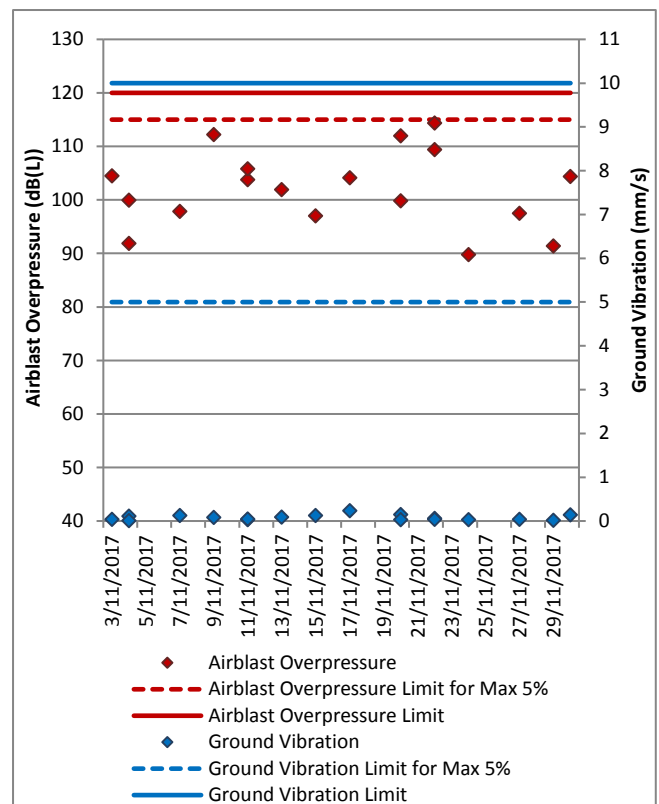


Figure 11: Jerrys Plains Blast Monitoring Results – November 2017

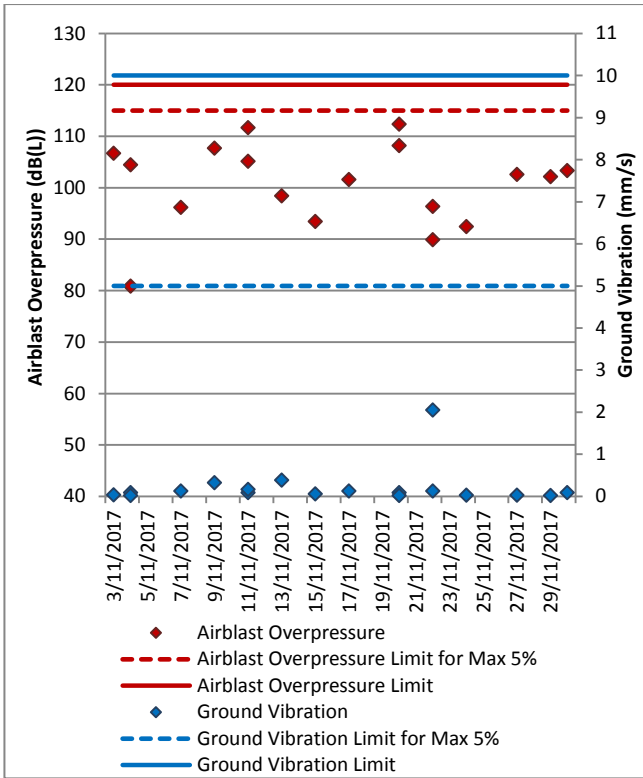


Figure 12: Maison Dieu Blast Monitoring Results – November 2017

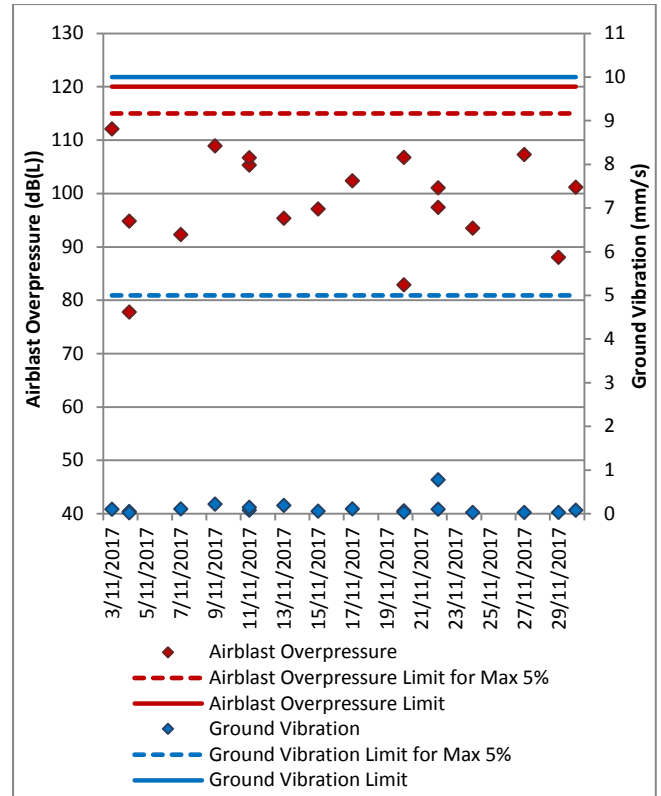


Figure 14: Knodlers Lane Blast Monitoring Results – November 2017

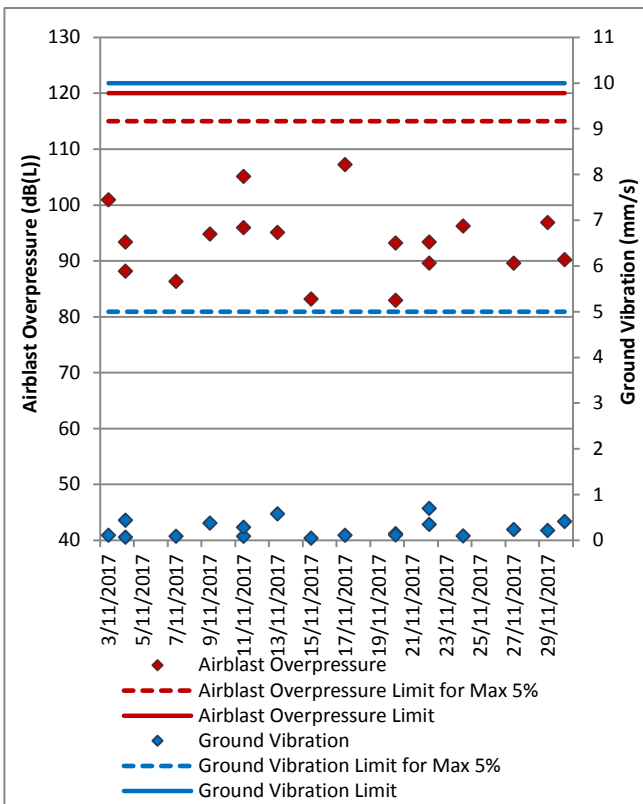


Figure 13: Warkworth Blast Monitoring Results – November 2017

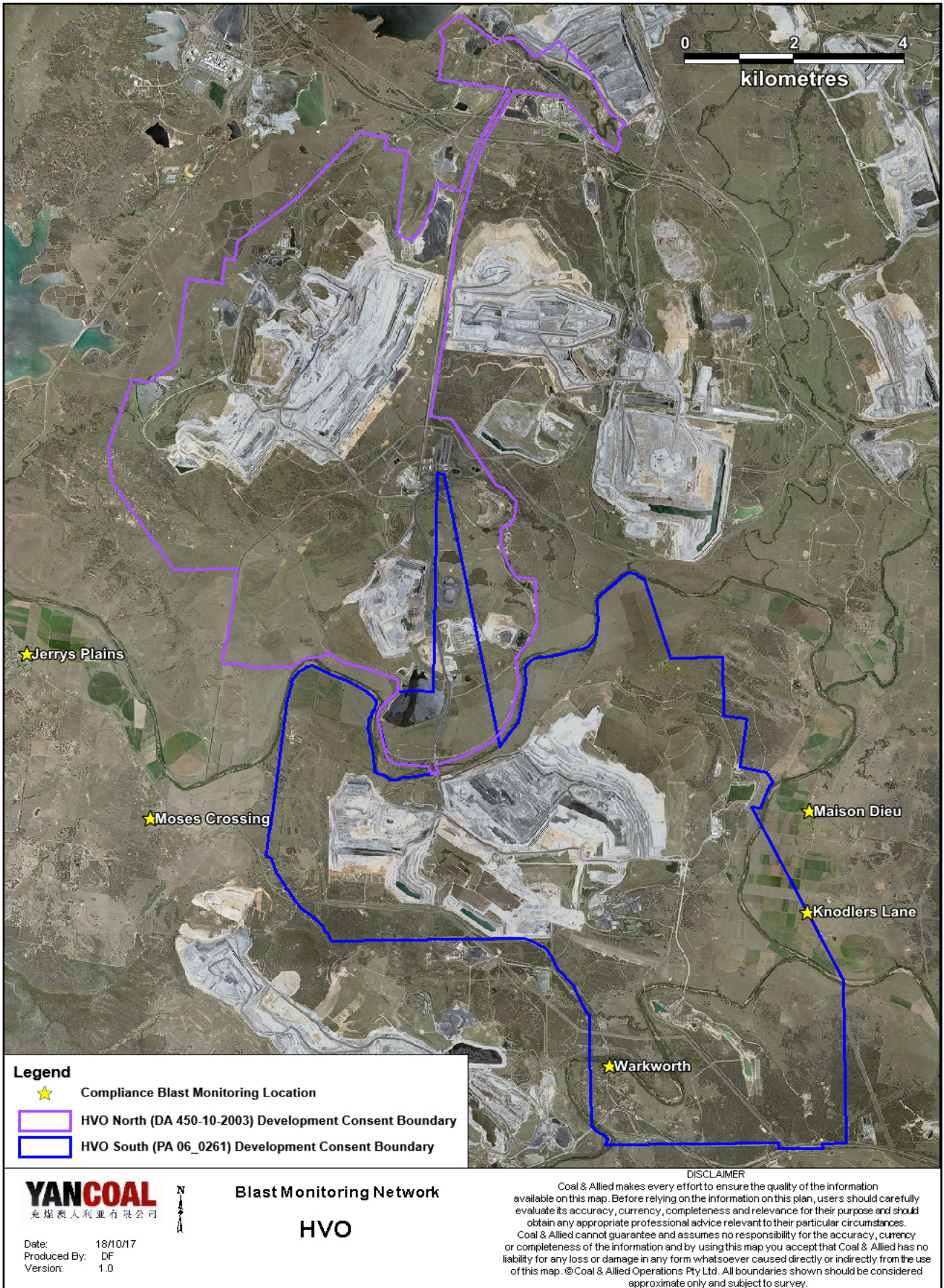


Figure 15: Blast Monitoring Location Plan

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 13-14 November 2017. Monitoring results are detailed in Table 3 to Table 8 .

Table 2: L_{Aeq, 15 minute} HVO South - Impact Assessment Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	5.1	-1	37	No	IA	NA
Maison Dieu	14/11/2017 21:20	5.1	-1	37	No	IA	NA
Shearers Lane	14/11/2017 21:00	5.2	-1	41	No	IA	NA
Kilburnie South	14/11/2017 22:31	4.1	-1	36	No	<35	NA
Jerrys Plains Village	14/11/2017 21:33	4.7	-1	35	No	<25	NA
Jerrys Plains East	14/11/2017 21:05	5.2	-1	35	No	32	NA
Long Point	13/11/2017 21:28	3	-1	35	Yes	IA	Nil
HVGC	14/11/2017 23:09	3.6	-1	55	No	25	NA

Table 3: L_{Aeq, 15 minute} HVO South - Land Acquisition Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	5.1	-1	41	No	IA	NA
Maison Dieu	14/11/2017 21:20	5.1	-1	41	No	IA	NA
Shearers Lane	14/11/2017 21:00	5.2	-1	41	No	IA	NA
Kilburnie South	14/11/2017 22:31	4.1	-1	41	No	<35	NA
Jerrys Plains Village	14/11/2017 21:33	4.7	-1	40	No	<25	NA
Jerrys Plains East	14/11/2017 21:05	5.2	-1	40	No	32	NA
Long Point	13/11/2017 21:28	3	-1	35	Yes	IA	Nil
HVGC	14/11/2017 23:09	3.6	-1	NA	No	25	NA

Table 4: L_{A1, 1minute} HVO South - Impact Assessment Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO South L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	5.1	-1	45	No	IA	NA
Maison Dieu	14/11/2017 21:20	5.1	-1	45	No	IA	NA
Shearers Lane	14/11/2017 21:00	5.2	-1	45	No	IA	NA
Kilburnie South	14/11/2017 22:31	4.1	-1	45	No	38	NA
Jerrys Plains Village	14/11/2017 21:33	4.7	-1	45	No	<25	NA
Jerrys Plains East	14/11/2017 21:05	5.2	-1	45	No	36	NA
Long Point	13/11/2017 21:28	3	-1	45	Yes	IA	Nil
HVGC	14/11/2017 23:09	3.6	-1	NA	No	29	NA

Notes

- 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);
- Estimated or measured L_{Aeq,15minute} dB attributed to HVO South Pit Area;
- NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
- Bolded results in red indicate exceedance of criteria;
- Atmospheric data is sourced from the HVO Corporate or Cheshunt weather station using logged met data;
- Criterion may or may not apply due to rounding of meteorological data values
- Remeasure; and
- Follow up measurement

Table 5: L_{Aeq, 15minute} HVO North – Impact Assessment Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	3.4	-1	35	No	IA	NA
Maison Dieu	14/11/2017 21:20	3	-1	35	Yes	IA	Nil
Shearers Lane	14/11/2017 21:00	3.4	-1	35	No	IA	NA
Kilburnie South	14/11/2017 22:31	3	-1	39	Yes	36	Nil
Jerrys Plains Village	14/11/2017 21:33	3.3	-1	36	No	35	NA
Jerrys Plains East	14/11/2017 21:05	3.4	-1	39	No	30	NA
Long Point	13/11/2017 21:28	3	-1	35	Yes	IA	Nil
HVGC	14/11/2017 23:09	3.2	-1	Nil	No	IA	NA

Table 6: L_{Aeq,15minute} HVO North - Land Acquisition Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{Aeq} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	3.4	-1	41	No	IA	NA
Maison Dieu	14/11/2017 21:20	3	-1	41	Yes	IA	Nil
Shearers Lane	14/11/2017 21:00	3.4	-1	41	No	IA	NA
Kilburnie South	14/11/2017 22:31	3	-1	41	Yes	36	Nil
Jerrys Plains Village	14/11/2017 21:33	3.3	-1	41	No	35	NA
Jerrys Plains East	14/11/2017 21:05	3.4	-1	41	No	30	NA
Long Point	13/11/2017 21:28	3	-1	41	Yes	IA	Nil

HVGC	14/11/2017 23:09	3.2	-1	NA	No	IA	NA
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Table 7: L_{A1, 1Minute} HVO North - Impact Assessment Criteria – November 2017

Location	Date and Time	Wind Speed (m/s) ⁵	VTG ⁵	Criterion dB (A)	Criterion Applies? ^{1,6}	HVO North L _{A1, 1min} dB ^{2,4}	Exceedance ³
Knodlers Lane	14/11/2017 21:39	3.4	-1	46	No	IA	NA
Maison Dieu	14/11/2017 21:20	3	-1	46	Yes	IA	Nil
Shearers Lane	14/11/2017 21:00	3.4	-1	46	No	IA	NA
Kilburnie South	14/11/2017 22:31	3	-1	46	Yes	42	Nil
Jerrys Plains Village	14/11/2017 21:33	3.3	-1	46	No	39	NA
Jerrys Plains East	14/11/2017 21:05	3.4	-1	46	No	32	NA
Long Point	13/11/2017 21:28	3	-1	46	Yes	IA	Nil
HVGC	14/11/2017 23:09	3.2	-1	NA	No	IA	NA

Notes

1. 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;
2. Estimated or measured LAeq,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 or Cheshunt weather station using logged met data;
6. Criterion may or may not apply due to rounding of meteorological data values
7. Remeasure; and
8. Follow up measurement.

5.2 NPfl Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfl), the applicability of the low frequency modification penalty has been assessed. During November 2017 no measurements required the penalty to be applied. The assessment for low frequency noise is shown in Table 8

Table 8: Low Frequency Noise Assessment - November 2017

Location	Date and Time	Measured Site Only LA _{eq} dB (Sth/Nth)	Site Only LC _{eq} dB ⁴ (Sth/Nth)	Site Only LC _{eq} -LA _{eq} dB ^{1,4} (Sth/Nth)	Result Max exceedance of ref spectrum dB ^{2,3,4} (Sth/Nth)	Penalty dB(A)	Exceedance
Knodlers Lane	14/11/2017 21:39	IA/IA	NA/NA	NA/NA	NA/NA	0	Nil
Maison Dieu	14/11/2017 21:20	IA/IA	NA/NA	NA/NA	NA/NA	0	Nil
Shearers Lane	14/11/2017 21:00	IA/IA	NA/NA	NA/NA	NA/NA	0	Nil
Kilburnie South	14/11/2017 22:31	<35/36	NA/NA	NA/NA	NA/NA	0	Nil
Jerrys Plains Village	14/11/2017 21:33	<25/35	NA/NA	NA/NA	NA/NA	0	Nil
Jerrys Plains East	14/11/2017 21:05	32/30	NA/NA	NA/NA	NA/NA	0	Nil
Long Point	13/11/2017 21:28	IA/IA	NA/NA	NA/NA	NA/NA	0	Nil
HVGC	14/11/2017 23:09	25/IA	NA/NA	NA/NA	NA/NA	0	Nil

Notes:

1. As per NPfl, if LC_{eq} - LA_{eq} >= 15 dB further assessment of low frequency noise required.
2. As per NPfl, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required;
3. Bold results and penalties in red are where the relevant modifying factor trigger was exceeded; and
4. 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.

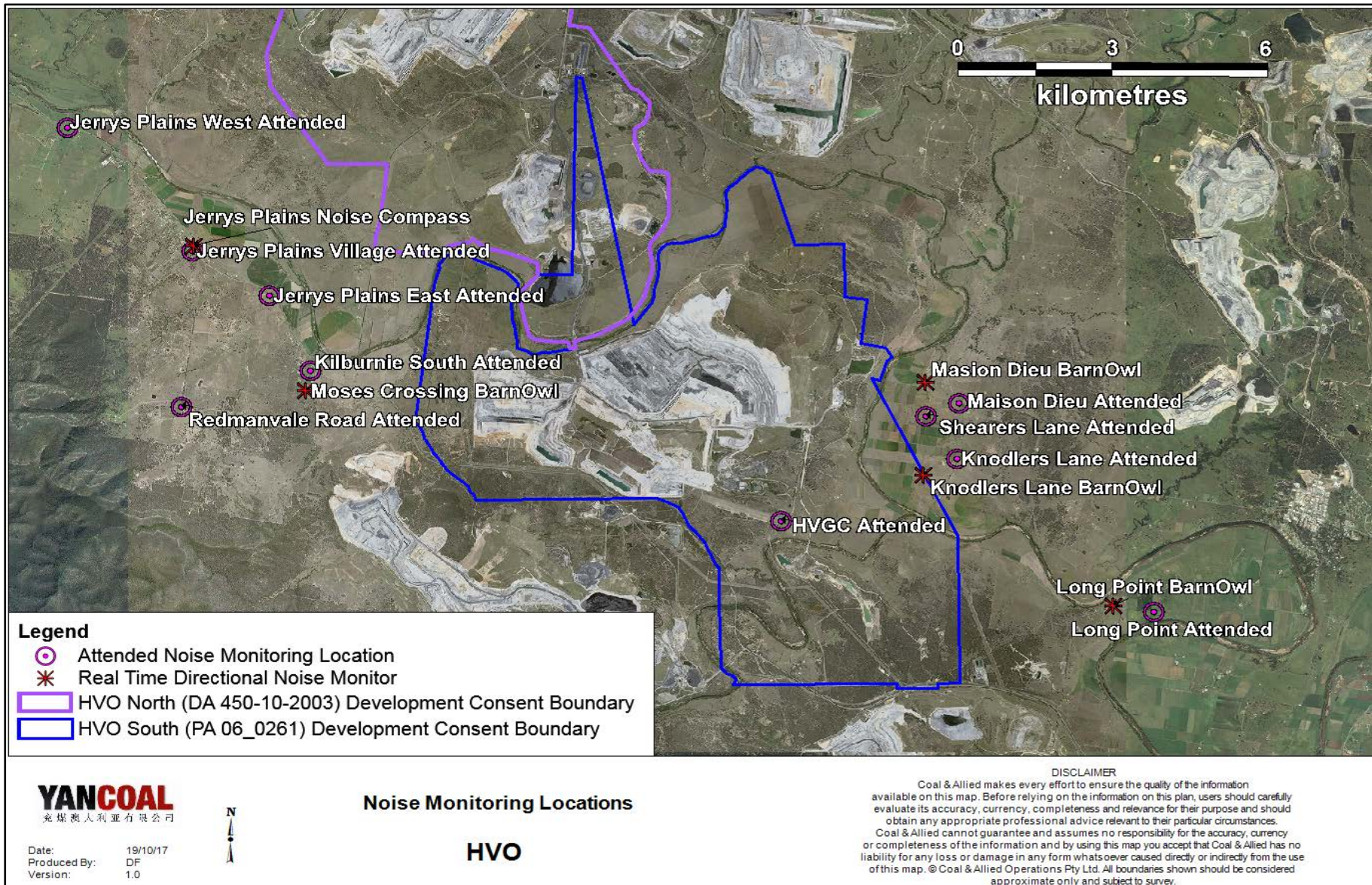


Figure 16: Noise Monitoring Location Plan

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 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 November, a total of 180 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.

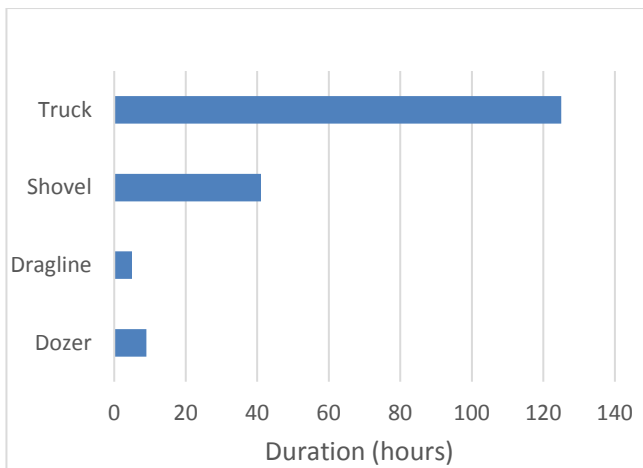


Figure 17: Operational Downtime by Equipment Type – November 2017

7.0 REHABILITATION

During November 5.6 Ha of land was released, 6.7 Ha of land was bulk shaped, 21.8 Ha of land was topsoiled,

19.2 Ha of land was composted and 49.3 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 18.

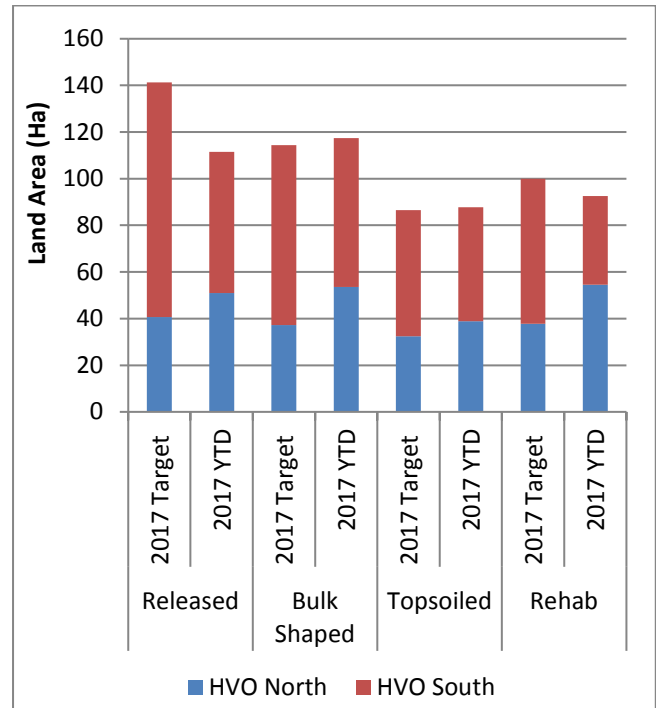


Figure 18: Rehabilitation YTD - November 2017

8.0 COMPLAINTS

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

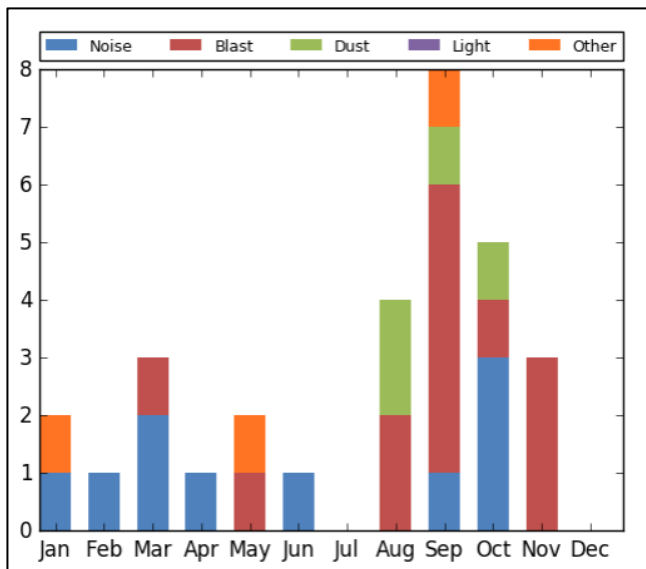


Figure 19: Complaints Graph - November 2017

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 – November 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)
1/11/2017	25.6	9.4	75.9	11.8	1326	192.5	2.2	0.0
2/11/2017	27.1	8.3	79.8	15.8	1074	156.7	2.1	0.0
3/11/2017	31.6	10.4	90.4	12.4	1047	239.8	3.3	0.0
4/11/2017	20.3	10.8	100.0	66.4	1439	118.6	2.1	5.6
5/11/2017	16.7	10.0	100.0	78.7	299	118.4	3.3	1.2
6/11/2017	29.4	10.9	100.0	32.1	1424	222.5	3.8	7.4
7/11/2017	23.1	9.8	94.6	29.6	1512	138.5	2.7	0.4
8/11/2017	20.0	8.8	100.0	50.3	1516	105.3	2.7	3.8
9/11/2017	23.4	6.6	100.0	32.2	1468	115.2	2.5	0.0
10/11/2017	24.3	7.4	100.0	33.0	1466	108.3	2.6	0.0
11/11/2017	24.9	8.8	100.0	29.7	1360	104.2	2.8	0.0
12/11/2017	25.2	8.5	97.5	29.1	1225	106.9	2.7	0.0
13/11/2017	24.3	11.4	83.4	36.5	1471	110.1	2.9	0.0
14/11/2017	25.5	8.6	95.0	31.3	1363	106.2	2.7	0.0
15/11/2017	29.1	10.0	96.8	18.5	1071	130.6	2.3	0.0
16/11/2017	24.2	10.7	98.8	42.9	603	137.2	1.6	0.0
17/11/2017	27.4	13.2	100.0	35.7	1532	101.7	2.6	0.0
18/11/2017	22.9	14.6	99.7	56.7	560	139.5	2.0	4.0
19/11/2017	23.7	11.7	99.8	38.1	1378	105.5	3.1	0.0
20/11/2017	26.2	9.7	96.0	33.1	1438	109.9	3.1	0.0
21/11/2017	26.1	11.9	89.5	28.2	1336	106.7	3.4	0.0
22/11/2017	26.0	10.6	100.0	31.9	1586	98.6	2.7	0.0
23/11/2017	29.7	11.7	100.0	24.2	1154	131.5	1.8	0.0
24/11/2017	32.6	12.4	90.3	15.4	1061	161.9	1.9	0.0
25/11/2017	31.2	12.5	97.4	16.3	1078	107.6	2.9	0.0
26/11/2017	32.8	14.4	99.6	17.3	1081	107.4	2.8	0.0
27/11/2017	25.9	15.8	93.0	51.7	871	144.1	2.1	0.0
28/11/2017	30.9	13.8	100.0	28.7	1259	106.2	2.8	0.0
29/11/2017	30.7	16.3	99.0	34.0	1473	103.3	3.3	0.0
30/11/2017	32.6	17.5	93.7	28.1	1289	108.1	2.8	0.0

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