Hunter Valley Operations

Community Consultative Committee

Business Papers – November 2018

Materials ahead of meeting of the committee on **21 November 2018**

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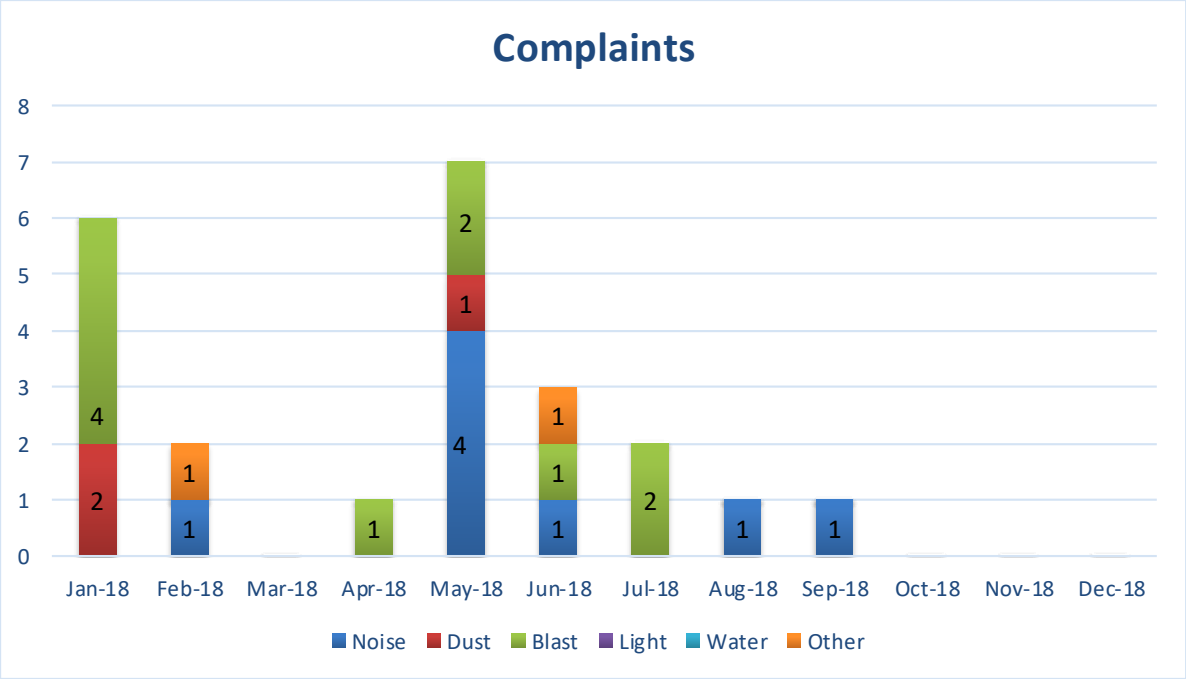
1.0 Complaints

Complaints overview for 2018



Complaint details 2018 YTD (30 September 2018)

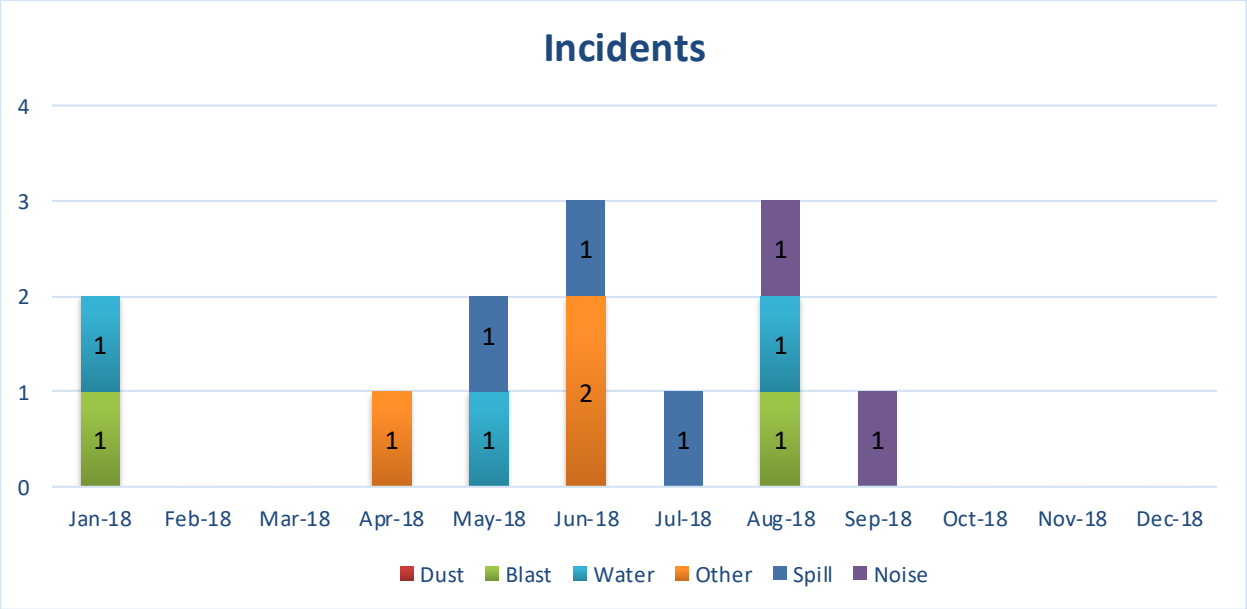
Date	Time	Type	Location	Method Received	Monitoring Indicates Exceedance?
11/01/2018	14:10	Blasting	Gouldsville	hotline	No
17/01/2018	13:43	Air	Unknown	hotline	No
17/01/2018	14:02	Blasting	Jerrys Plains	hotline	Yes**
17/01/2018	14:54	Blasting	Jerrys Plains	Environment Advisor deskphone	Yes**
17/01/2018	15:00	Blasting	Jerrys Plains	hotline	Yes**
19/01/2018	12:05	Air	Jerrys Plains	hotline	No

Date	Time	Type	Location	Method Received	Monitoring Indicates Exceedance?
1/02/2018	15:47	Other	Jerrys Plains	Community relations specialist	No
10/02/2018	06:43	Noise	Gouldsville	Hotline	No
06/04/2018	14:50	Blast	Jerrys Plains	Environmental Manager	No
04/05/2018	13:10	Blast	Maison Dieu	Community relations specialist	No
06/05/2018	23:06	Noise	Jerrys Plains	Regulator	No
12/05/2018	16:30	Blast	Maison Dieu	Community relations specialist	No
19/05/2018	04:30	Noise	Jerrys Plains	Regulator	No
19/05/2018	23:59	Noise	Jerrys Plains	Other	No
21/05/2018	15:00	Blast	Long Point	Hotline	No
29/05/2018	00:43	Noise	Jerrys Plains	Regulator	No
06/06/2018	18:00	Noise	Jerrys Plains	Regulator	No
12/06/2018	12:55	Blast	Jerrys Plains	Hotline	No
18/06/2018	09:09	Flora and Fauna	Jerrys Plains	Hotline	No
17/07/2018	09:40	Blast	Long Point	Hotline	No
17/07/2018	09:58	Blast	Long Point	Hotline	No
28/08/2018	21:20	Noise	Gouldsville	Hotline	No
28/08/2018	23:03	Noise	Jerrys Plains	Hotline	No

** Real time noise monitoring alerts were generated either prior to or around the time of complaint. The alert was received by the shift supervisors. Inspections and changes were made to operations where possible to reduce noise impact.

2.0 Incidents

Incident overview for 2018 YTD September



Incident details for the period YTD (30 September 2018)

Date	Details	Key Actions	Aspect
12/1/2018	**Breach of ROM pad windrow.** 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.	Re-instatement of the windrow. Removal of excess fines washed from pad. Installation of secondary containment bund on ROM extension. Instructions for ROM loader operators informing them of expectations of water management on the ROM.	Water Management
17.01.2018	**Blast overpressure exceedance.** 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.	Increasing the amount of rock between the edge of the bench and the first line of explosives for blasts in this pit. Review of blasting permissions. Trial of helium balloon release prior to blasting.	Blast

	The blast was designed and implemented in accordance with its approved blast management plan and blasting permissions. HVO has been issued a Show Cause notice from the EPA in relation to the blast overpressure exceedance.		
14/04/2018	**Unauthorised Land Clearing by Telstra contractor** On Thursday 12 April 2018 HVO identified that approximately 242 m2 vegetation had been cleared on mine owned land adjoining a Telstra compound. The clearing was identified to have been undertaken by a Telstra contractor for the purpose of upgrading their facility. HVO did not provide authorisation for Telstra or any of its contractors to access this land or clear vegetation. The incident was reported to the NSE Department of Planning and Environment.	HVO directed the contractor to cease all activities on its land. HVO engaged EMM to undertake a vegetation survey to determine the type of vegetation cleared. EMM identified that Bulloak was the main vegetation type and unlikely to meet any of the scientific determinations for threatened ecological communities under the EPBC or NSW Biodiversity Conservation Act.	Land
10/05/2018	**Spill of Diluted Ammonium Nitrate solution** Approximately 250 – 1000L of diluted solution was spilled during filling of tank at Cheshunt Orica Reload Facility. All material contained within Orica facility and within mine site.	Work ceased immediately after identification, solution was contained on site, solution was cleaned up and bunded areas checked and scraped back where necessary. No environmental harm.	Spill
11/05/2018	**Newdell Load Point Fire Tank Overflow** The Newdell fire water tank was found to be overflowing as the water supply (pumped from Dam 14W) continued to supply the tank despite reaching its full cut off level. The overflow water reported via a drainage line to Sump 060. The float operated pump on 060 failed to contain the volume of water in the sump which has then flowed to a culvert under the rail loop and into Bayswater Creek.	Once identified the supply to the fire water tank was stopped, onsite investigation commenced to determine extent and pathway of flow of water. A small pump was installed to stop the flow of water from the culvert, once contained recovery of the water in the creek commenced. Sampling was undertaken to determine water quality at the source and up and down stream of the flow. Incident investigation undertaken. HVO's Pollution Incident Response Management Plan was enacted and relevant authorities notified. Incident is currently under investigation by the EPA.	Water Management
19/06/2018	**Dump 10m over OLS at Glider Pit** Part of an overburden dump in its Glider Pit was approximately 10 m above the Obstade Limitation Surface (OLS) specified in the for the Hunter Valley Gliding Club (HVGC) Amenity Management Plan without prior agreement by the HVGC.	As soon as practicable after becoming aware of the incident HVO notified the HVGC and the Department of Planning and Environment and made arrangements to shape the dump to final landform	Land

		which brought it below OLS., The HVO Technical Services team is implementing an action tracking system within the mine planning process to ensure that actions pertaining to the HVGC and the need to obtain its prior agreement to any exceedances of the OLS are assigned to the correct people, are carried out and can be tracked and monitored.	
22/06/2018	**Expanding a coal pad without a Ground Disturbance Permit** Dozer 570 expanded a coal stockpile area outside the boundary of an approved Ground Disturbance Permit (GDP) boundary impacting a small (~0.2 ha) area of rehabilitation.	Once identified and reported, coal was removed from effected area and isolated. GDP was submitted for the area and is currently being assessed for approval by all key departments before any work can commence.	Land
26/06/2018	**Oil spill in pit** Excavator 313 topside loading deep in pit (HVO South), swung bucket over the low wall windrow and a rock hit the hydraulic tank release valve, spilling hydraulic oil (<2000L).	Operator notified supervisor. Spill contained and cleaned up. Spill entirely contained within the pit. Damaged equipment repaired.	Spill
21/07/2018	**Oil discharge from electric pump seal** Minor spill of oil (~20L) from mechanical seal on electric pump at Cumnock return water dam. A negligible amount of oil (<5L) leaked down the dam liner and into the dam. HVO Pump on Ravensworth property. Spill contained within mine.	Dry sorb used to contain spill at the scene before being cleaned up. Pump shut down and isolated. Inflowing water was requested to be turned off and isolated until pump repaired.	Spill
10/08/2018	**Noise Exceedance – Jerrys Plains** Noise Exceedance measured during compliance monitoring at the Jerrys Plains Village attended monitoring location in relation to haul truck noise from HVO West Pit. Initial noise level measured was 39 dB(A) against a criteria of 36 dB(A).	As per the Noise Management Plan, the monitoring consultant contacted dispatch and advised of the exceedance. Within 75 minutes a remeasure was undertaken measuring 34dB(A which is below the criteria. No non-compliance.)	Noise
21/08/2018	**Blast Overpressure Exceedance (<120dB)** West Pit Blast WN40BAR01A was fired at approximately 13:07, 17/08/2018. Blast recorded a overpressure result of 115.3dB(L) at the Maison Dieu Blast Monitor which triggers internal incident reporting Overpressure validation was undertaken to confirm result.	Reported to Environment Department to confirm YTD rolling percentage against 5% compliance limit (currently 2.9% Calendar Year and 4.3% EPL Year).	Blast

05/09/2018	**Noise Exceedance – Jerrys Plains** Noise Exceedance measured during compliance monitoring at the Jerrys Plains Village attended monitoring location in relation to haul truck noise from HVO North. Initial noise level measured was 39 dB(A) against a criteria of 36 dB(A).	As per the Noise Management Plan, the monitoring consultant contacted dispatch and advised of the exceedance. Within 75 minutes a remeasure was undertaken measuring 34dB(A which is below the criteria. No non-compliance.)	Noise

3.0 Community Investment

We recognise that our long term success requires us to positively contribute to the development and well-being of the communities where we live and work. We do this by working collaboratively with local organisations to identify and support initiatives that build stronger and healthier communities.

Through our newly enhanced Community Grants Program, we will continue to support community groups and organisations which are committed to developing sustainable communities in the areas in which we operate.

In August we opened our 2018 Community Grants Program and called for local community groups and organisations to apply for funding.

The submissions have been assessed and will be presented at the November CCC meeting.

Listed below is a breakdown of local initiatives that have been supported between May – August 2018.

Organisation / Programme	Value
Hunter Valley Campdraft – Annual Campdraft, September 2018	$1,500
Jerrys Plains School of Arts Hall Committee – Air conditioning of hall	$3,718

4.0 Environmental monitoring

Monthly summaries of environmental monitoring; June – August 2018.

June 2018
Attached as **Appendix A**

July 2018
Attached as **Appendix B**

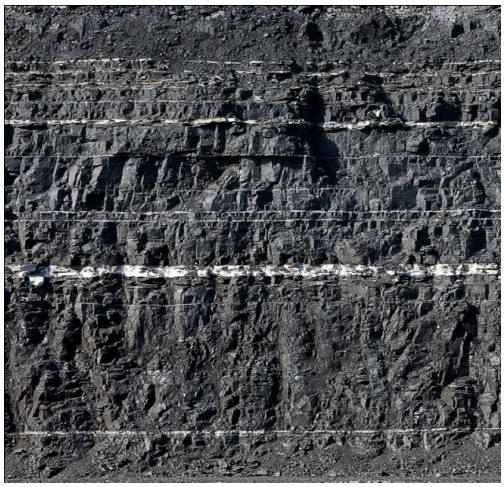
August 2018
Attached as **Appendix C**

5.0 Environmental Documents

Environmental documents uploaded to the HVO Insite website since the last meeting (https://insite.hvo.com.au/)

17/08/2018	Hunter Valley Operations Environmental Monitoring Report May 2018
17/08/2018	Hunter Valley Operations Environment Protection Licence 640 Monitoring Data July 2018
17/09/2018	Hunter Valley Operations Environment Protection Licence 640 Monitoring data August 2018
25/09/2018	Hunter Valley Operations Pollution Incident Response Management Plan

HUNTER VALLEY OPERATIONS



Monthly Environmental Monitoring Report

Hunter Valley Operations

June 2018

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**15/10/2018**
1.1	**Environment & Community Coordinator**	**Final**	**18/10/2018**

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 June to 30th June 2018.

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 2018 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
June	26.4	195.0

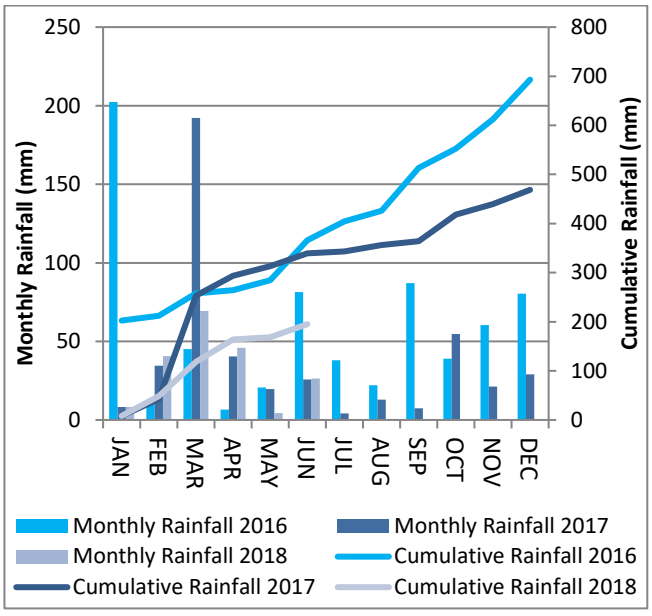


Figure 1: Rainfall Summary 2018

2.1.2 Wind Speed and Direction

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

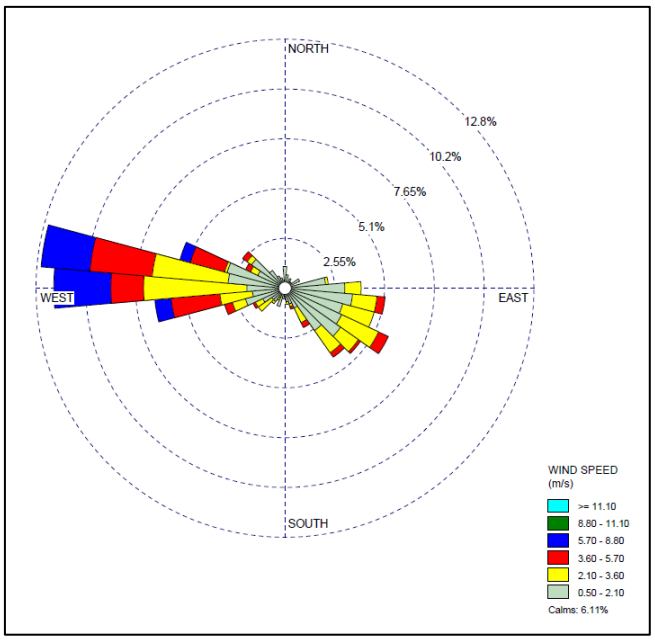


Figure 2: HVO Corporate Wind Rose – June 2018

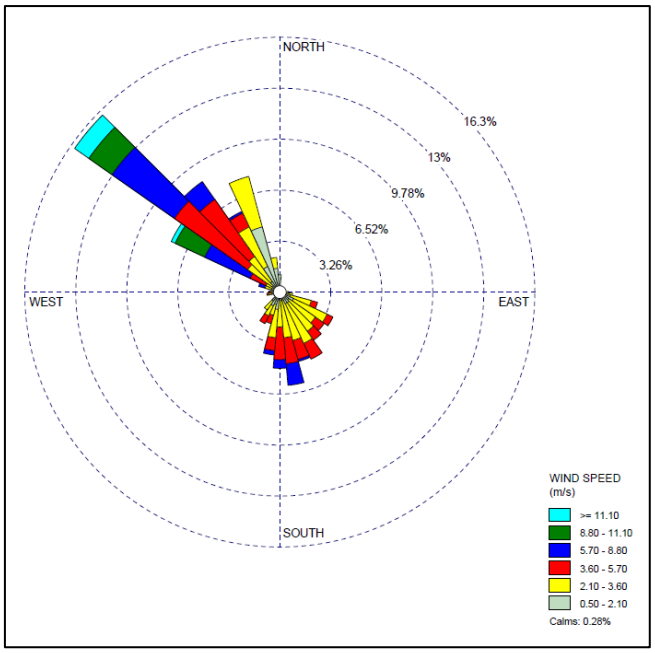


Figure 3: HVO Cheshunt Wind Rose – June 2018

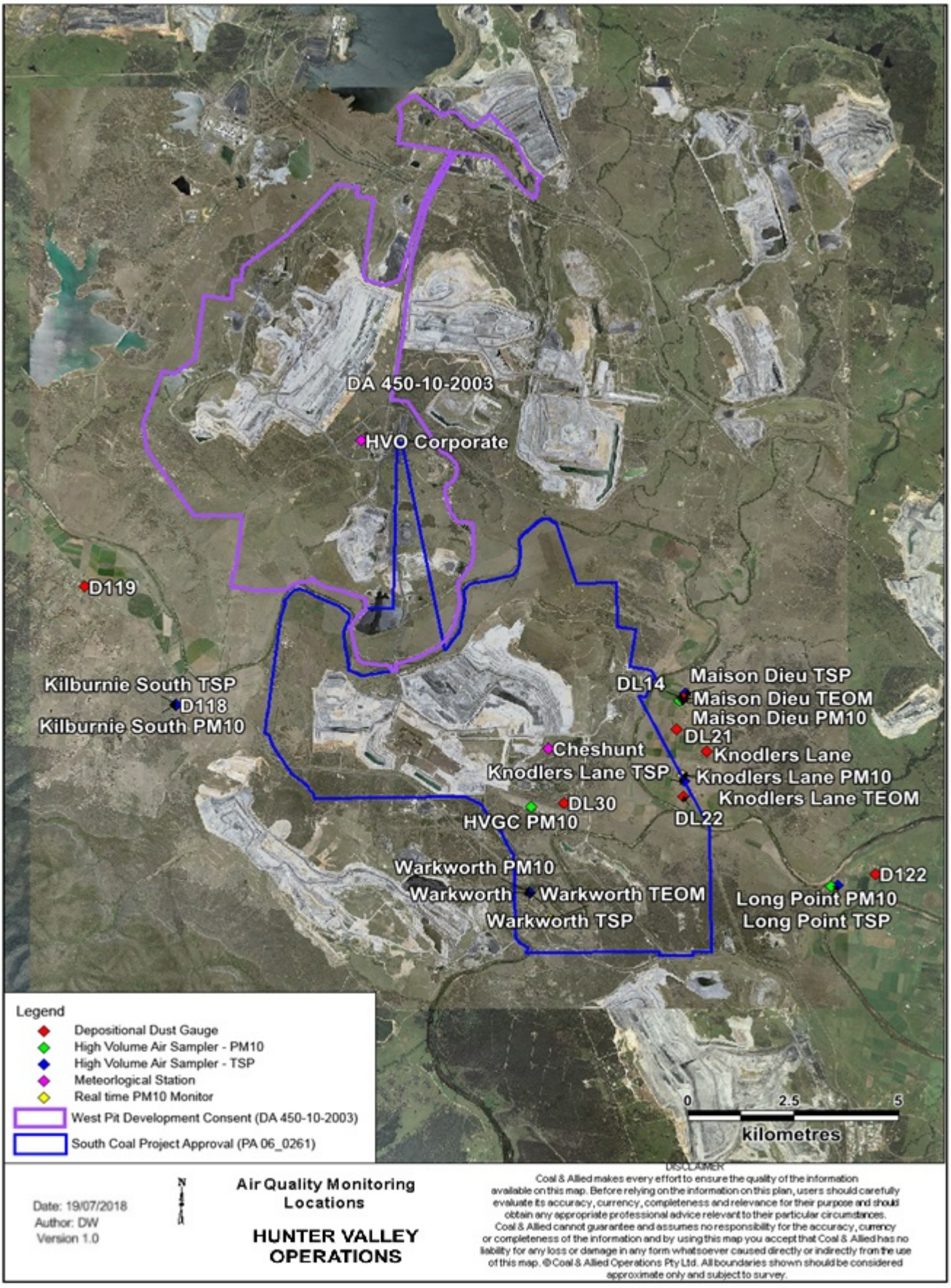


Figure 4: Air Quality Monitoring Location Plan

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 DL14, D118, D122 and DL30 monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month.

The field notes associated with the DL14 monitor's result indicate that the sample was contaminated with bird droppings and insects. Accordingly, this result will not be included in the annual average calculation.

The field notes associated with the D118, D122 and DL30 monitor's result indicates no evidence to suggest that the result was contaminated. Accordingly, this result will be included in the annual average calculation.

During June the DL21 Depositional Dust monitor was unable to produce a result due to it being dislodged from the stand.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

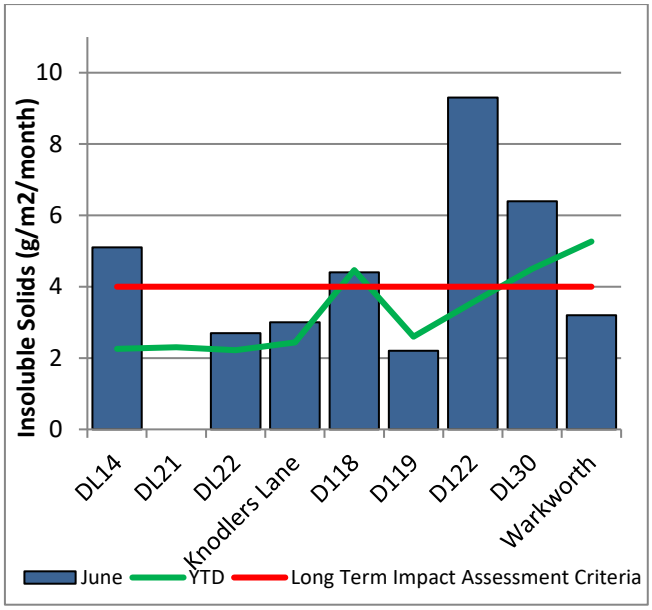


Figure 5: Depositional Dust Results – June 2018

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 (PM_{10}). 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 PM_{10} Results

Figure 6 shows individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50 µg/m3.

The Glider Club HVAS PM_{10} monitor failed to produce a result on the 30/06/2018 due to technical difficulties.

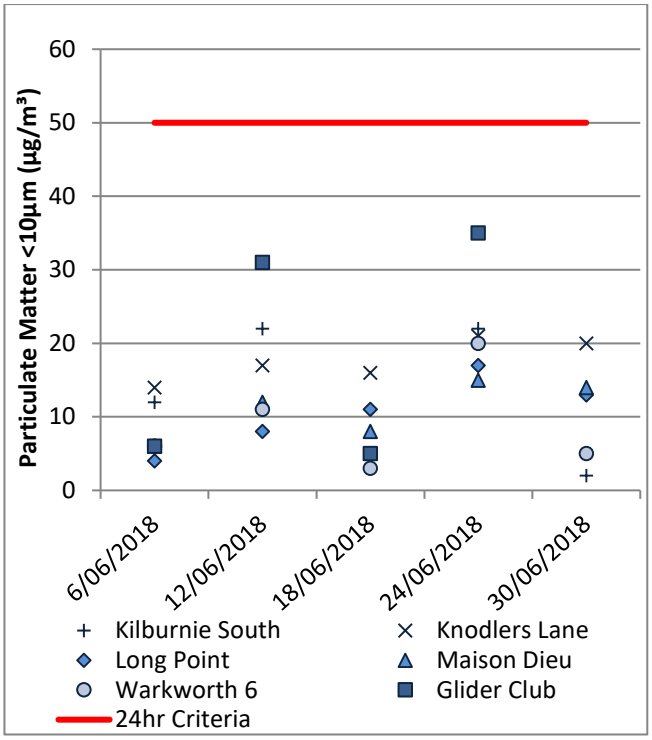


Figure 6: Individual PM_{10} Results – June 2018

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

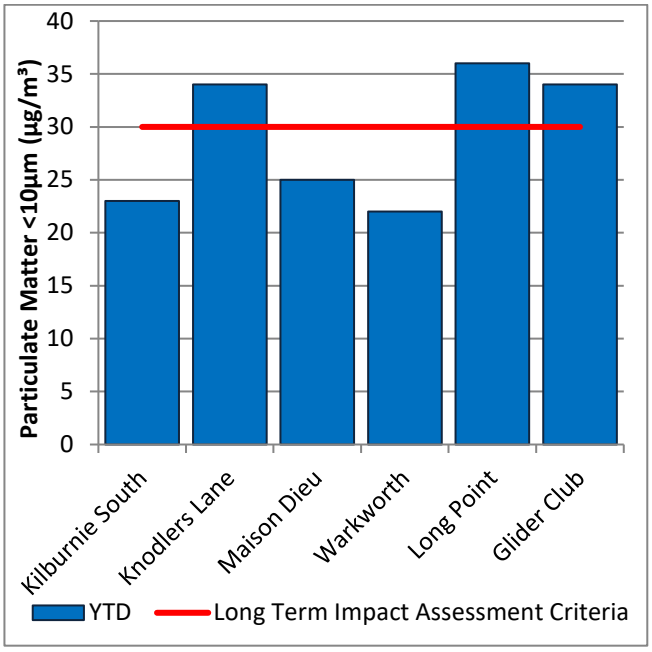


Figure 7: Year to Date Average PM_{10} – June 2018

2.3.2 TSP Results

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

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

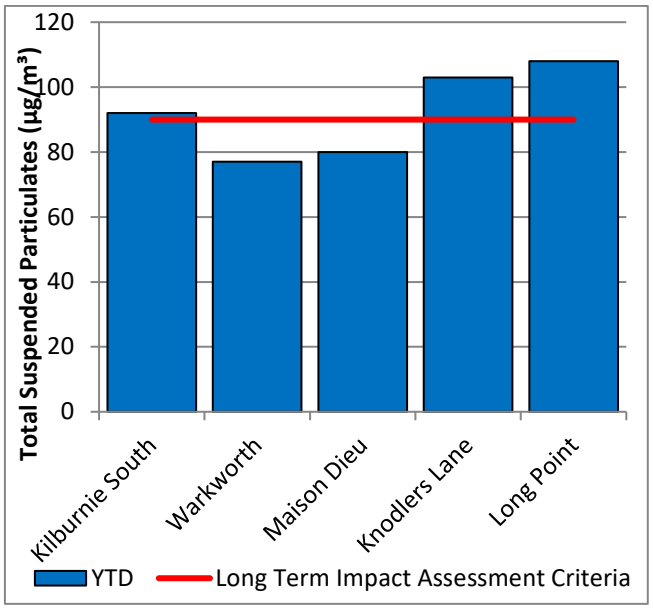


Figure 8: Year to Date Average Total Suspended Particulates – June 2018

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to ensure compliance with the relevant conditions of the project approval.

Results for real time dust sampling is shown in Figure 9, including the daily 24 hour average PM_{10} result and the year to date 24 hour PM_{10} annual average.

2.3.4 Real Time Alarms for Air Quality

During June the real time monitoring system generated 21 automated air quality related alarms. 18 were related to adverse weather conditions and 3 alarms relating to PM_{10}.

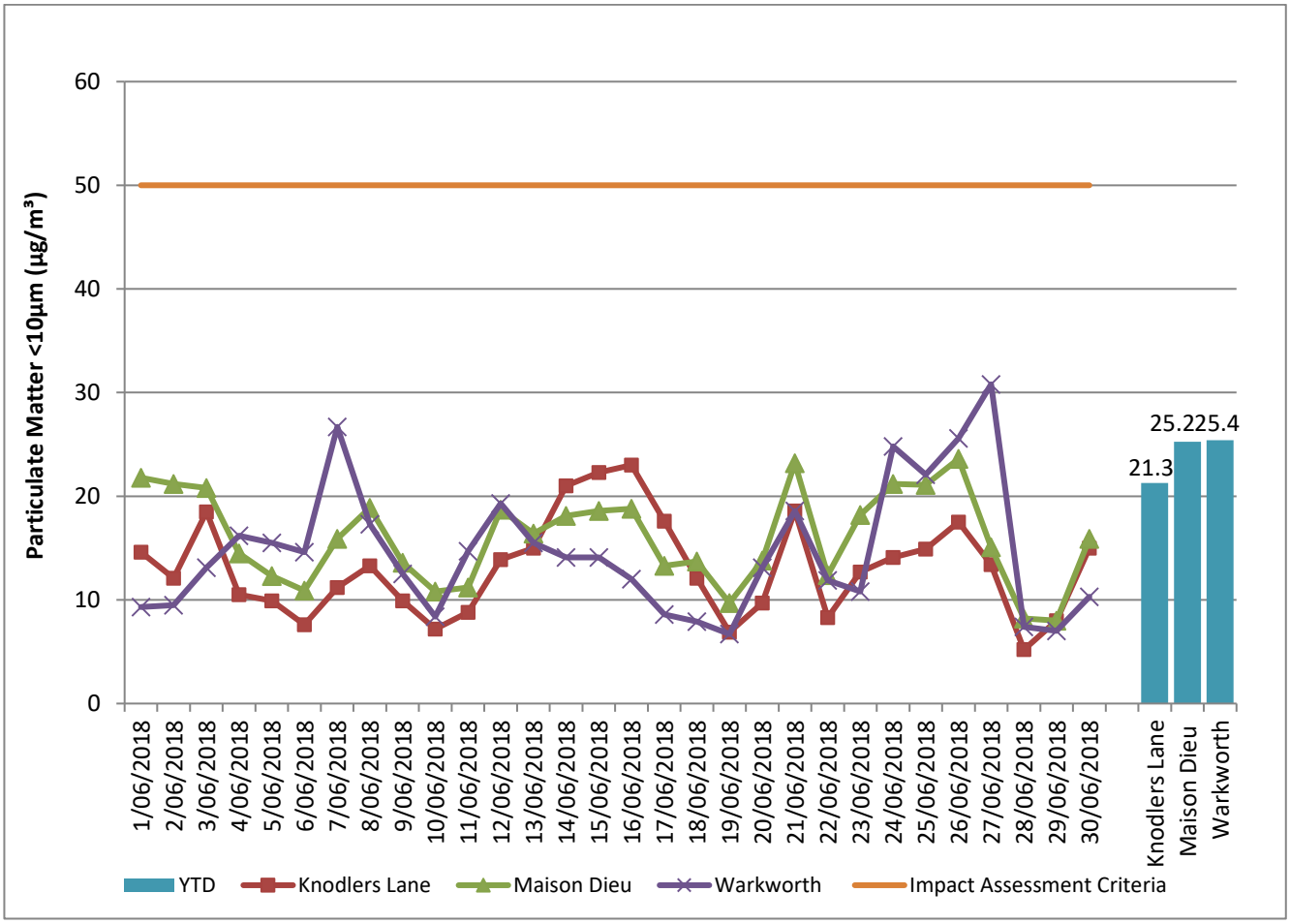


Figure 9: Real Time PM_{10} 24hr average and YTD average – June 2018

Table 2: Real-time PM10 Investigation Results

During June there were no real-time PM_{10} exceedances.

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 (2015 – current) within HVO mine dams. Figure 13 to Figure 21 show the long term surface water trend (2015 – current) in surrounding watercourses.

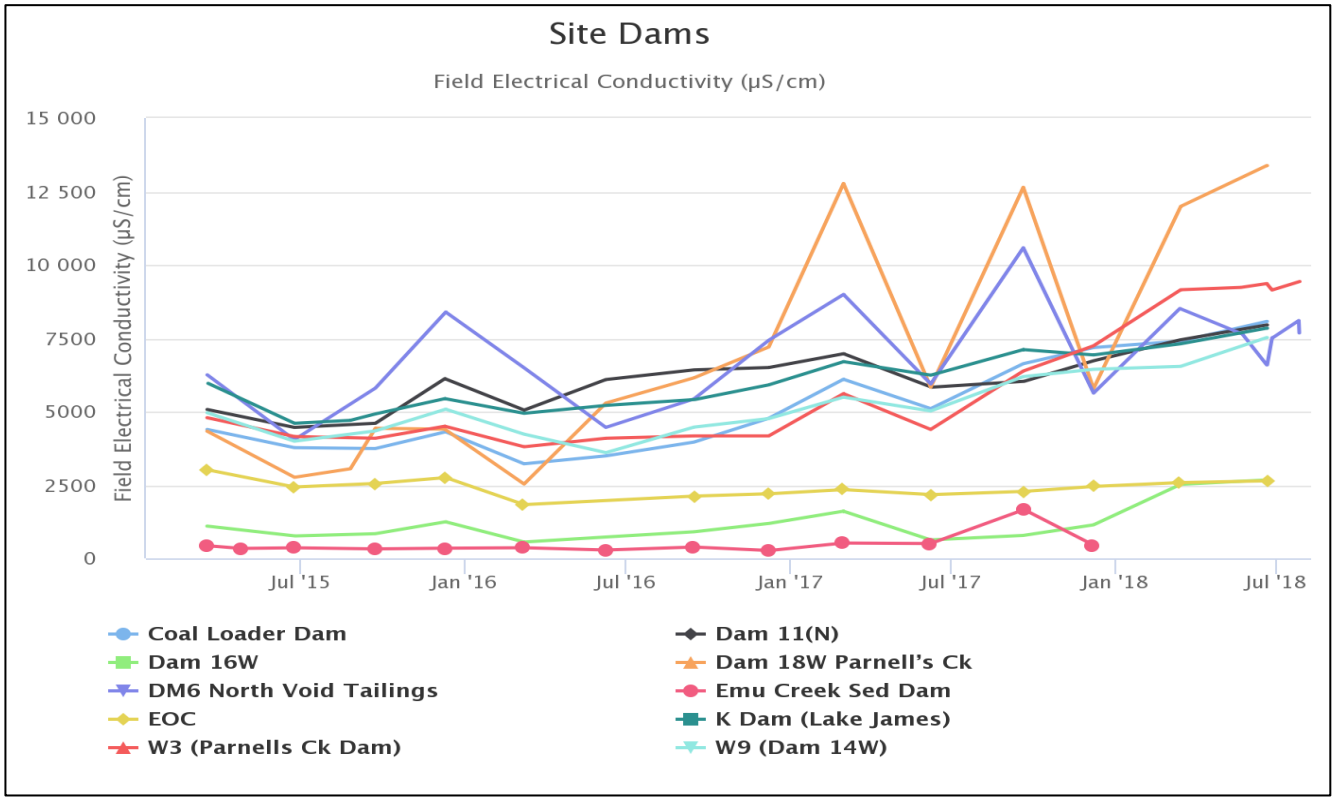


Figure 10: Site Dams Electrical Conductivity Trend – June 2018

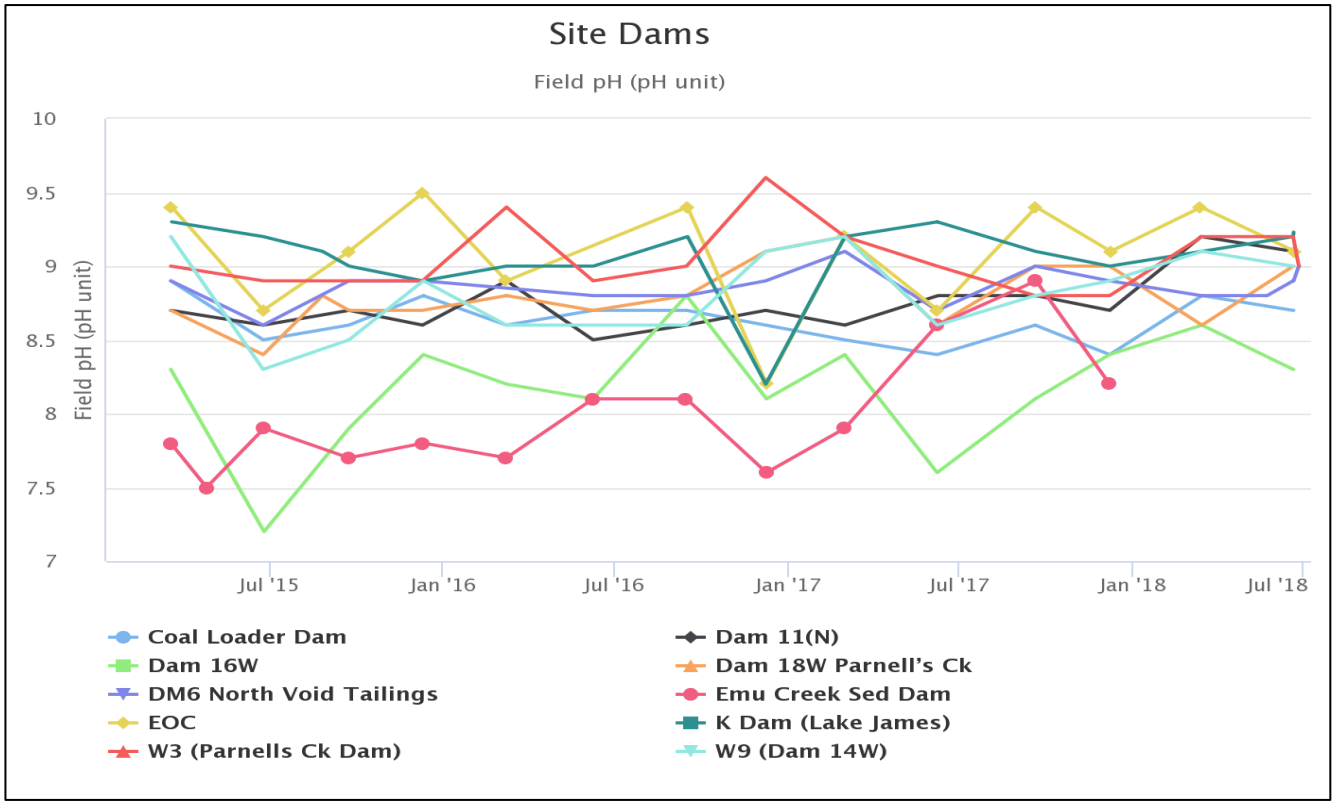


Figure 11: Site Dams pH Trend – June 2018

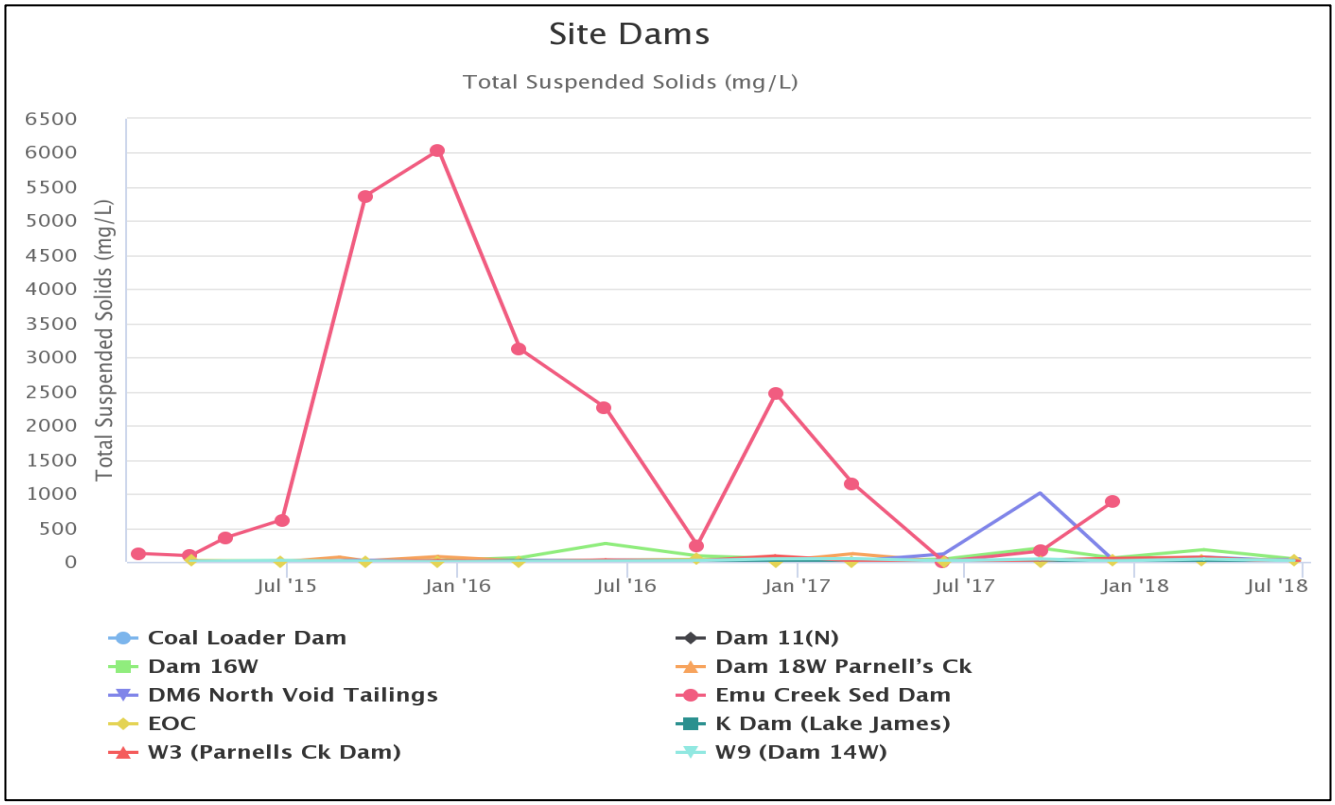


Figure 12: Site Dams Total Suspended Solids Trend – June 2018

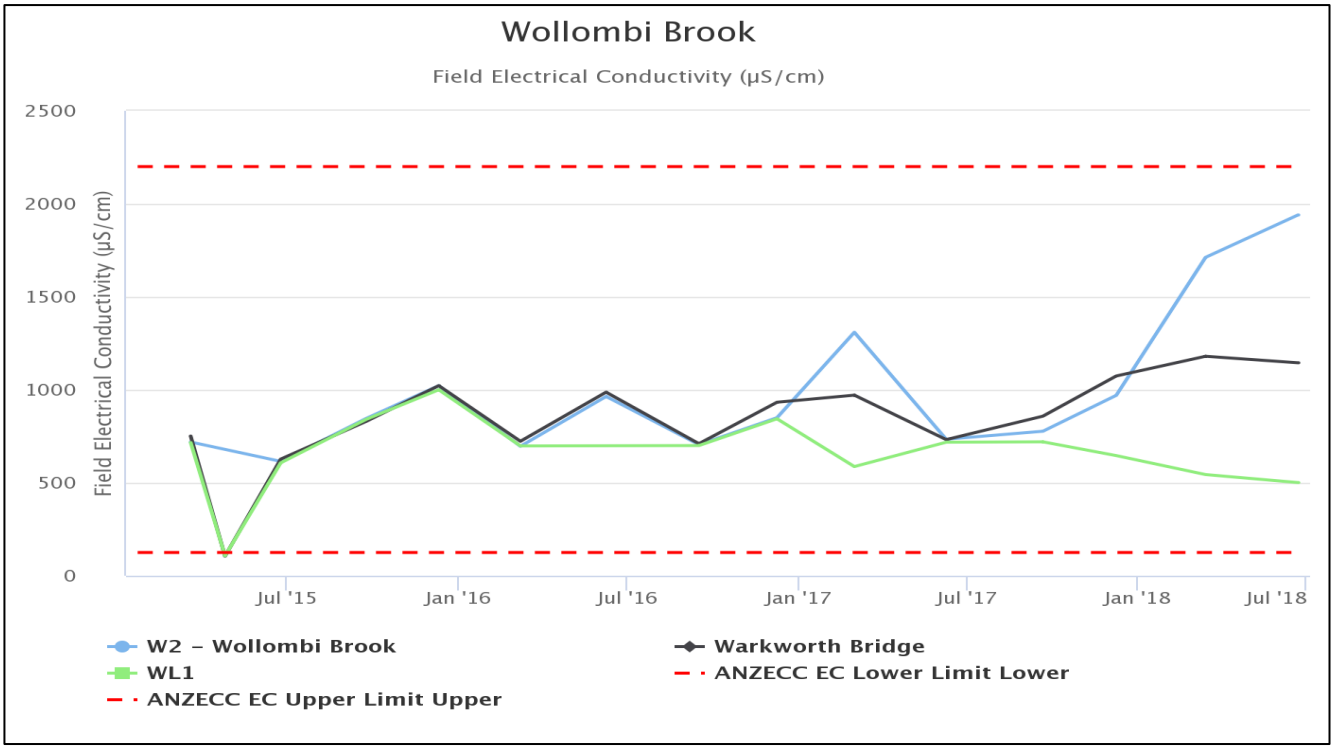


Figure 13: Wollombi Brook Electrical Conductivity Trend – June 2018

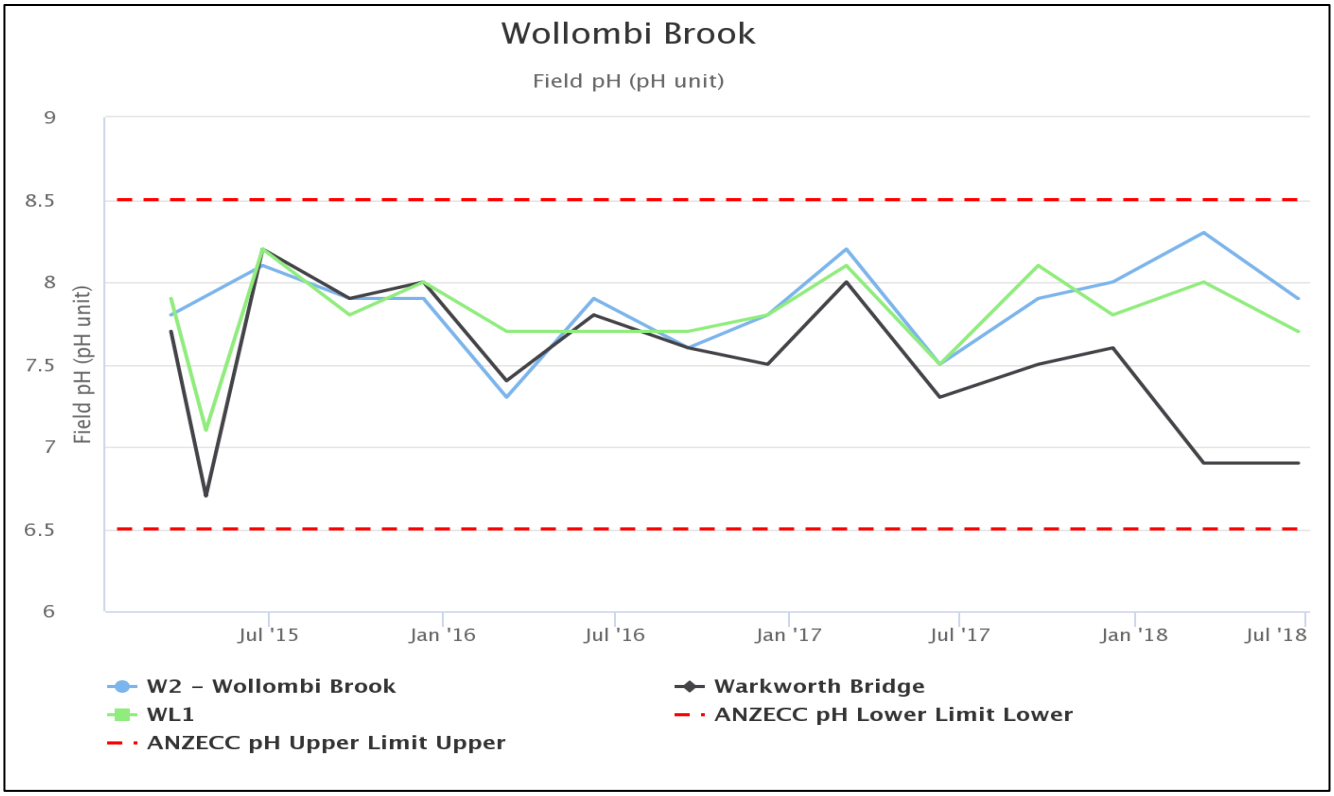


Figure 14: Wollombi Brook pH Trend – June 2018

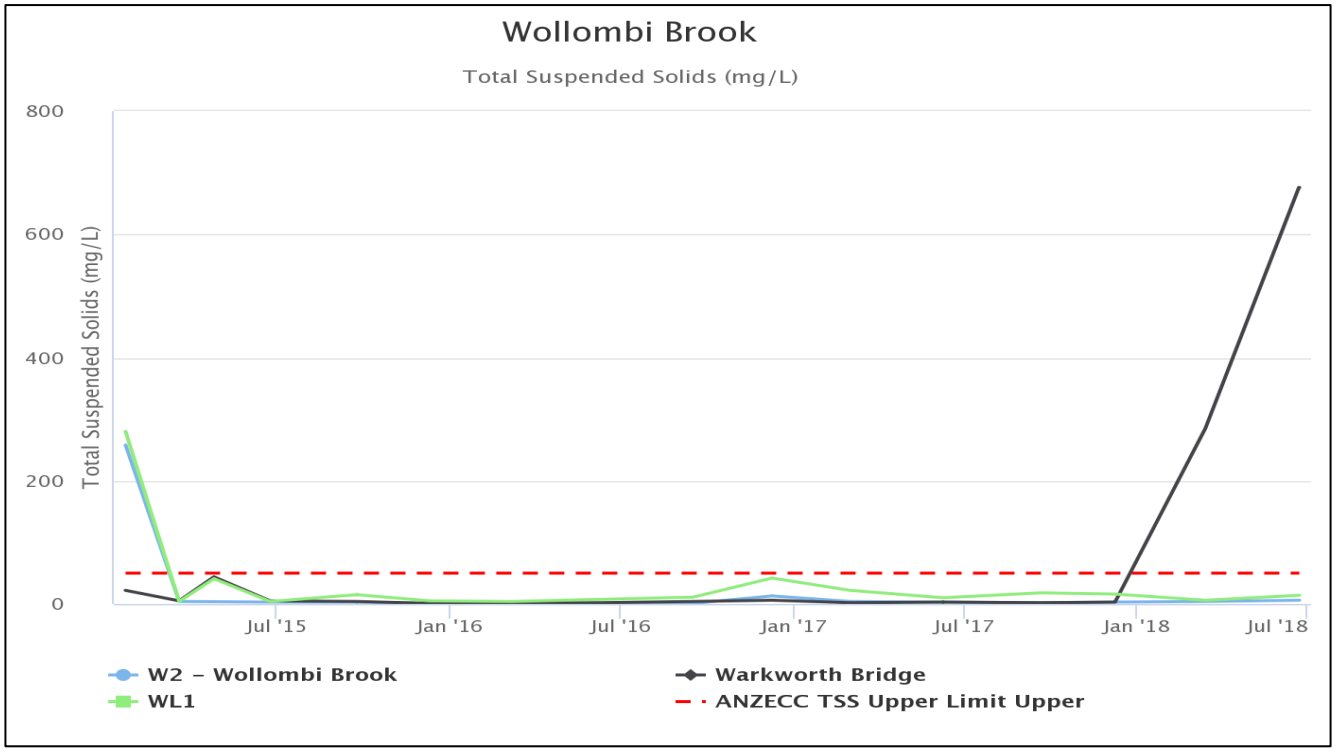


Figure 15: Wollombi Brook Total Suspended Solids Trend – June 2018

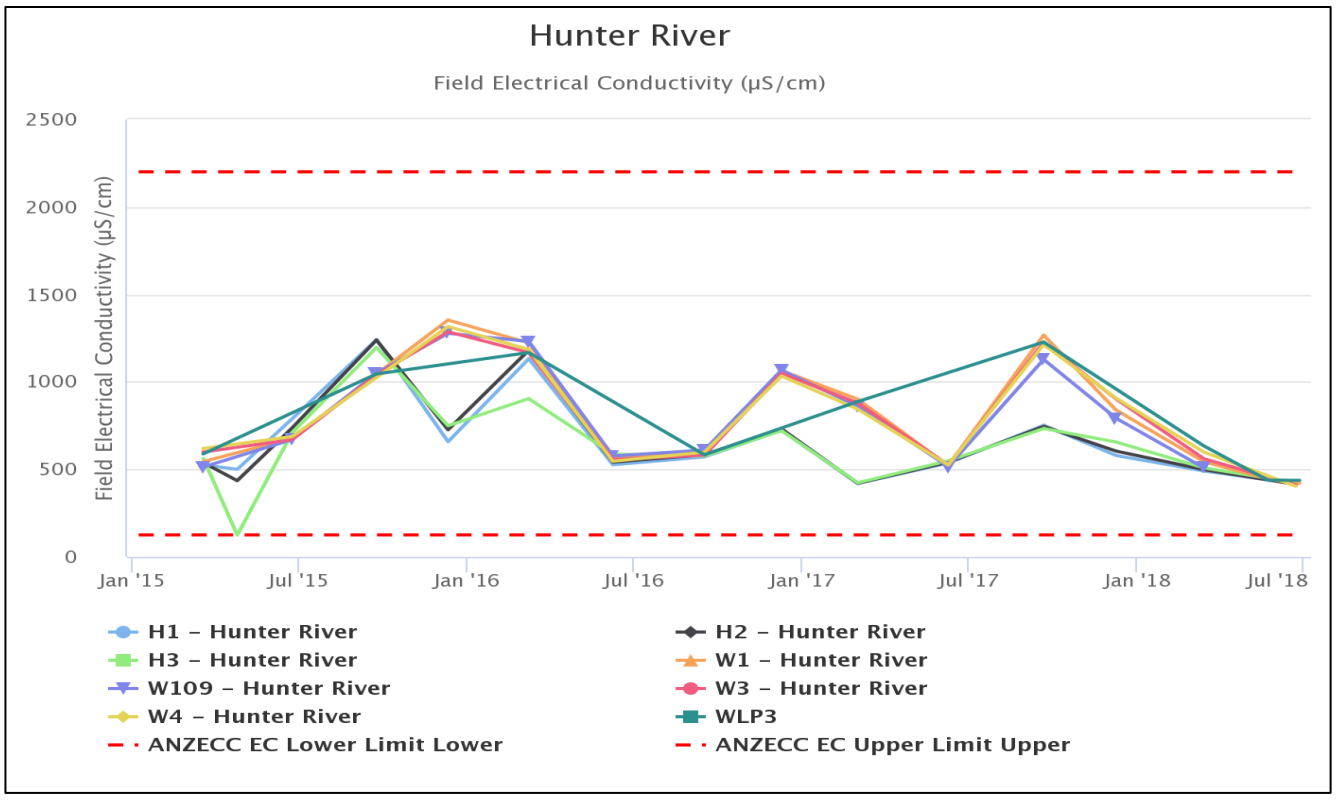


Figure 16: Hunter River Electrical Conductivity Trend – June 2018

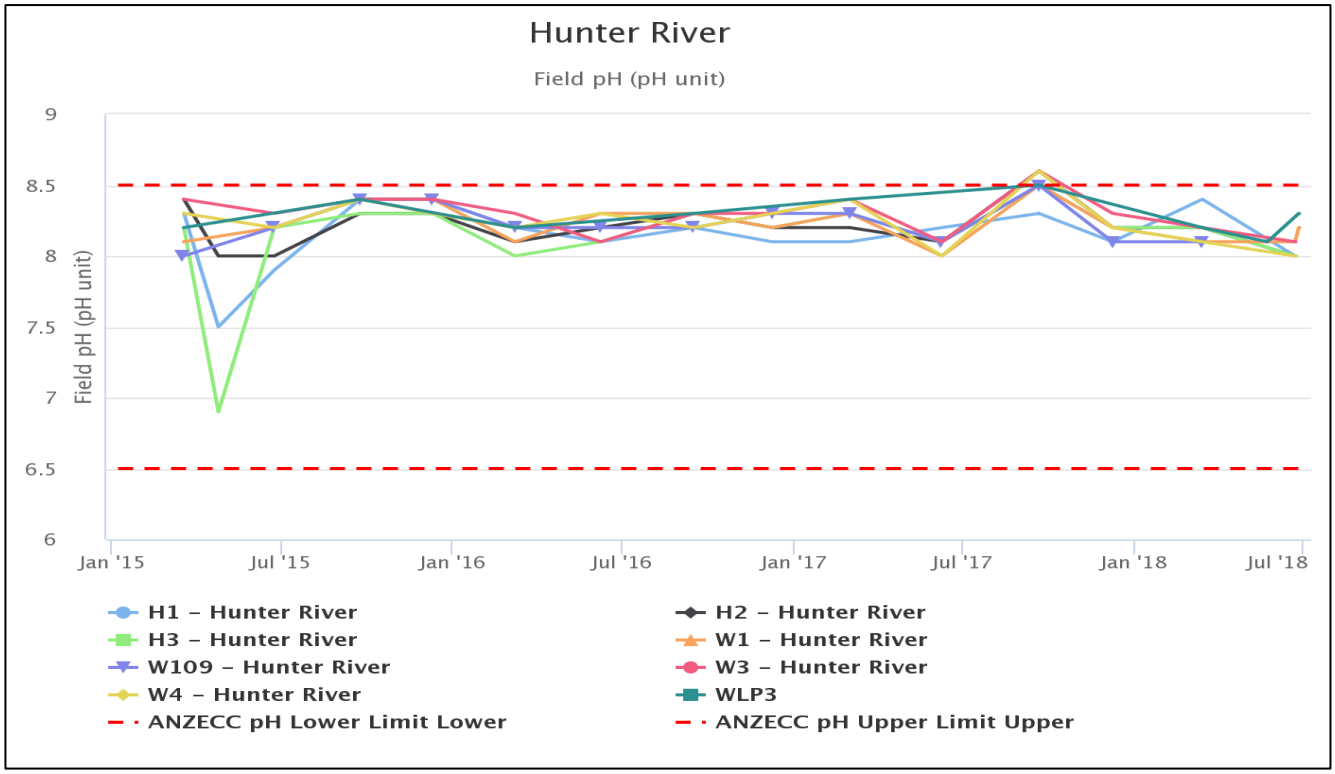


Figure 17: Hunter River pH Trend – June 2018

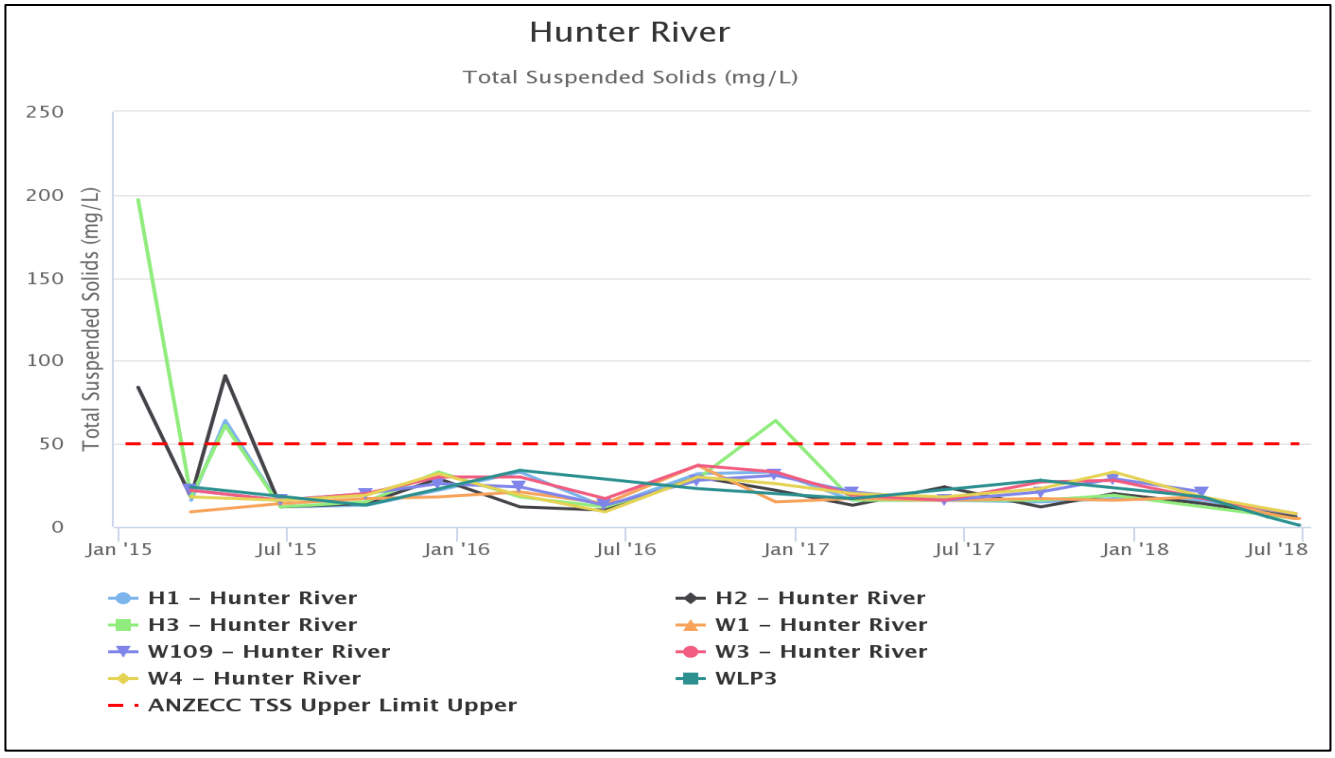


Figure 18: Hunter River Total Suspended Solids – June 2018

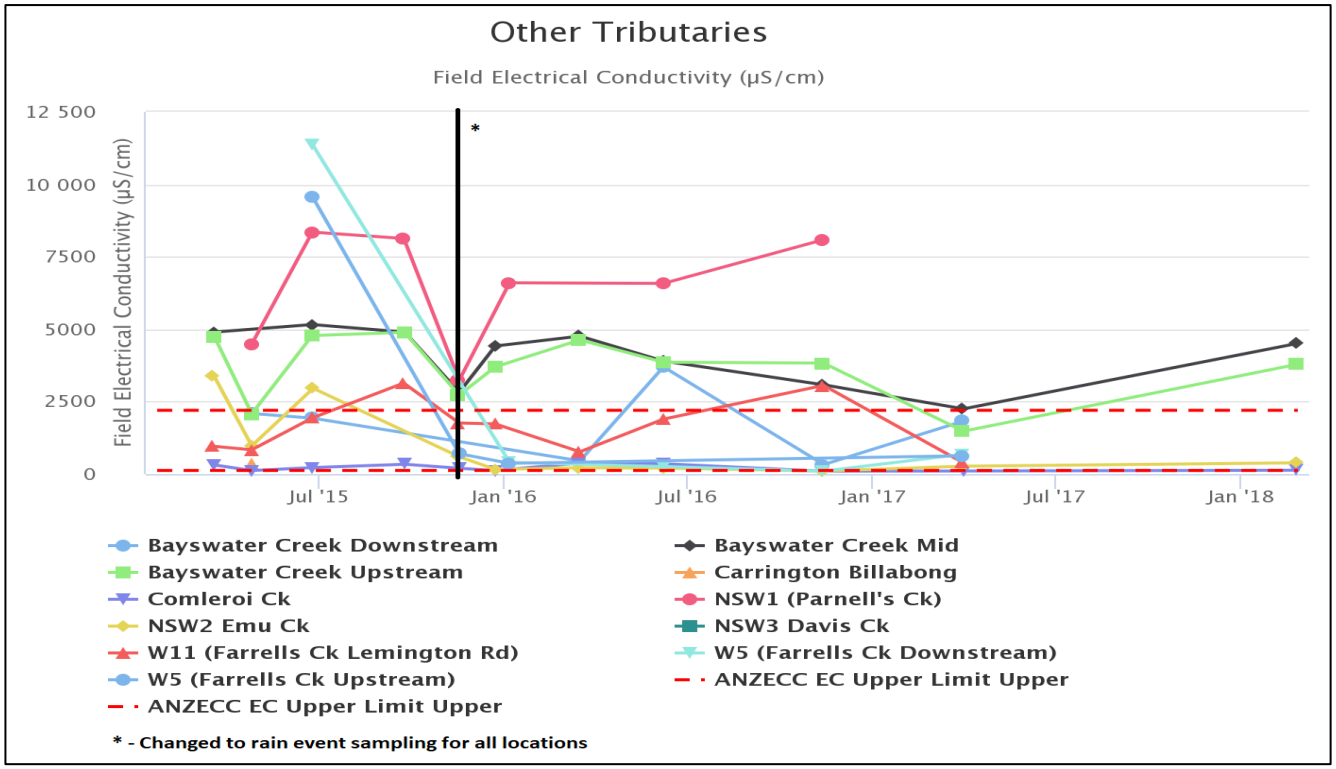


Figure 19: Other Tributaries Electrical Conductivity Trend – June 2018

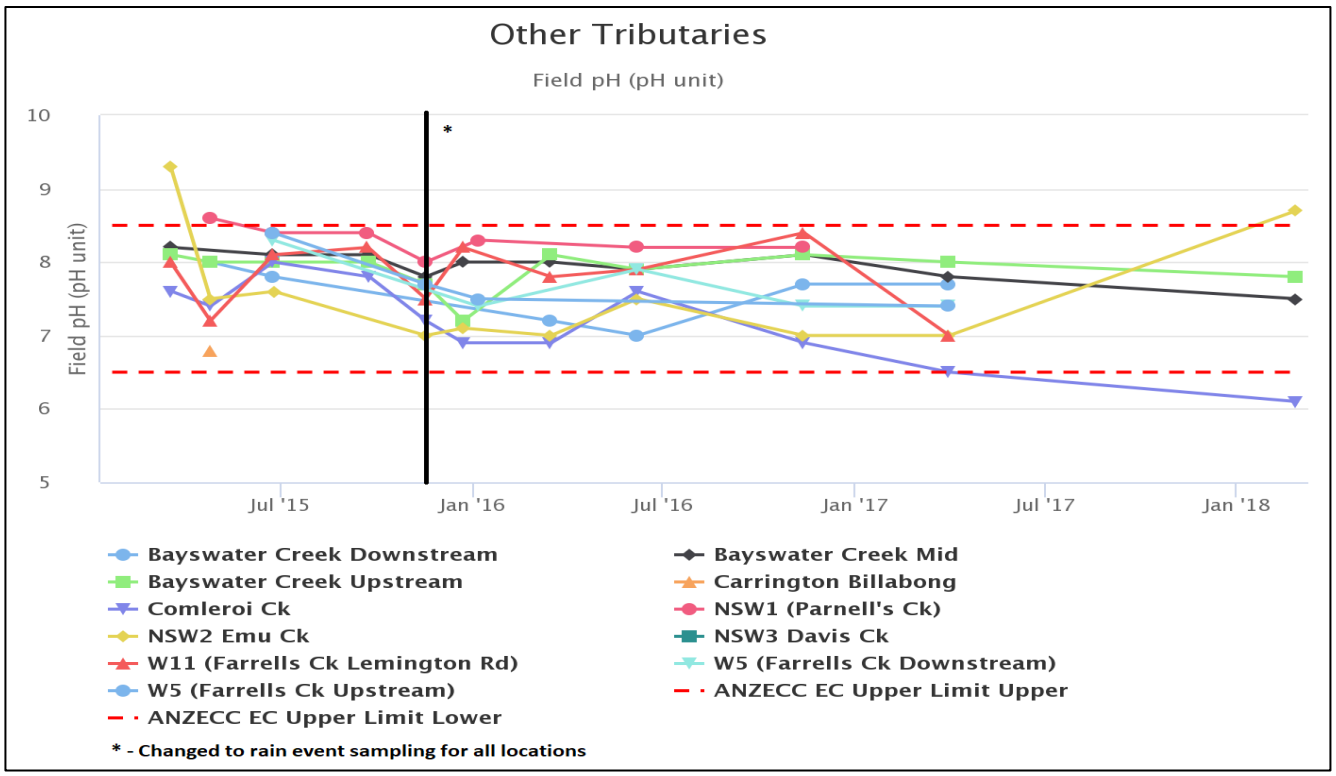


Figure 20: Other Tributaries pH Trend – June 2018

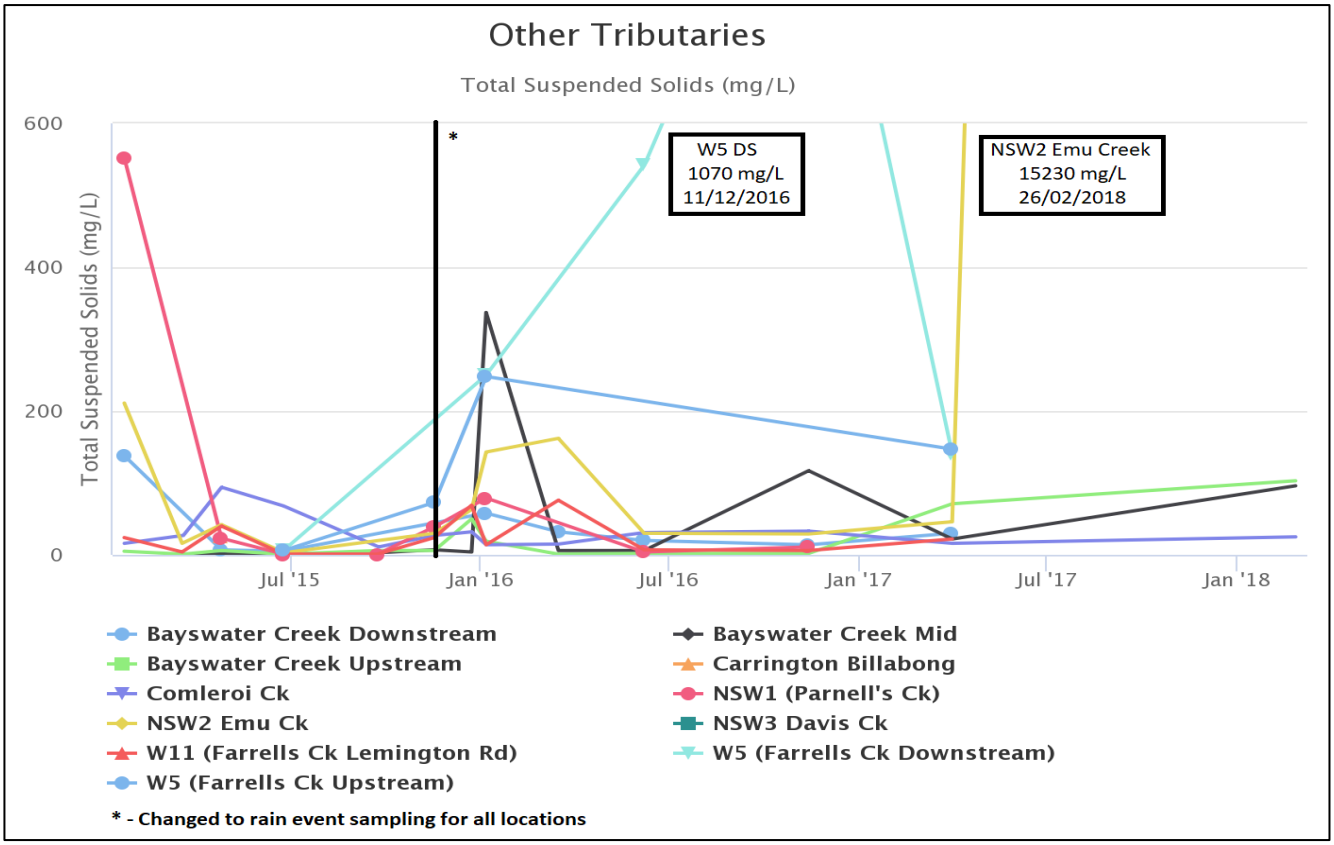


Figure 21: Other Tributaries Total Suspended Solids Trend – June 2018

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 extracted approximately 62.2ML of 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.

Current internal trigger limits that have been breached are summarised in Table 2.

Table 3: Surface Water Trigger Limit Summary

Site	Date	Trigger Limit Breached	Action taken in response
W2	14/03/2018	EC – 95th Percentile	Watching Brief*
W2	14/03/2018	pH – 95th Percentile	Watching Brief*
Warkworth Bridge	14/03/2018	EC – 95th Percentile	Watching Brief*
Warkworth Bridge	14/03/2018	pH – 5th Percentile	Watching Brief*
Warkworth Bridge	14/03/2018	TSS – 50mg/L (ANZECC criteria)	First exceedance of TSS trigger. Investigation identified that sample was collected from turbid pooling water in the Wollombi Brook as there was no flow. Samples taken in the Wollombi Brook further downstream at W2 and WL1 recorded TSS levels at 4 and 6mg/L respectively. Continue Watching Brief.
Warkworth Bridge	22/06/2018	TSS – 50mg/L (ANZECC criteria)	Second exceedance of TSS trigger. Investigation identified that sample was collected from turbid pooling water in the Wollombi Brook as there was no flow. Samples taken in the Wollombi Brook further downstream at W2 and WL1 recorded TSS levels at 6 and 14mg/L respectively. Continue Watching Brief.
Bayswater Creek Upstream	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with rainfall event (35mm 25 - 26/02/2018). Observations indicate that public road runoff likely influencing the sampling location. Downstream location was observed dry. No further action required.
Bayswater Creek Midstream	26/02/2018	pH – 5th Percentile	Watching Brief*
Bayswater Creek Midstream	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with rainfall event (35mm 25 - 26/02/2018). Observations indicate that the sample was taken from polling water in the creek line and no flow was observed. Downstream location was observed dry. No further action required.
Comleroi Ck	26/02/2018	pH – 5th Percentile	Watching Brief*
NSW 2 EMU Creek	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Elevated TSS associated with rainfall event

	(35mm 25 - 26/02/2018). Observations indicate that the sample was taken from pooling water in the creek line and no flow was observed. No further downstream catchment exists during to mining operations. No further action required.

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

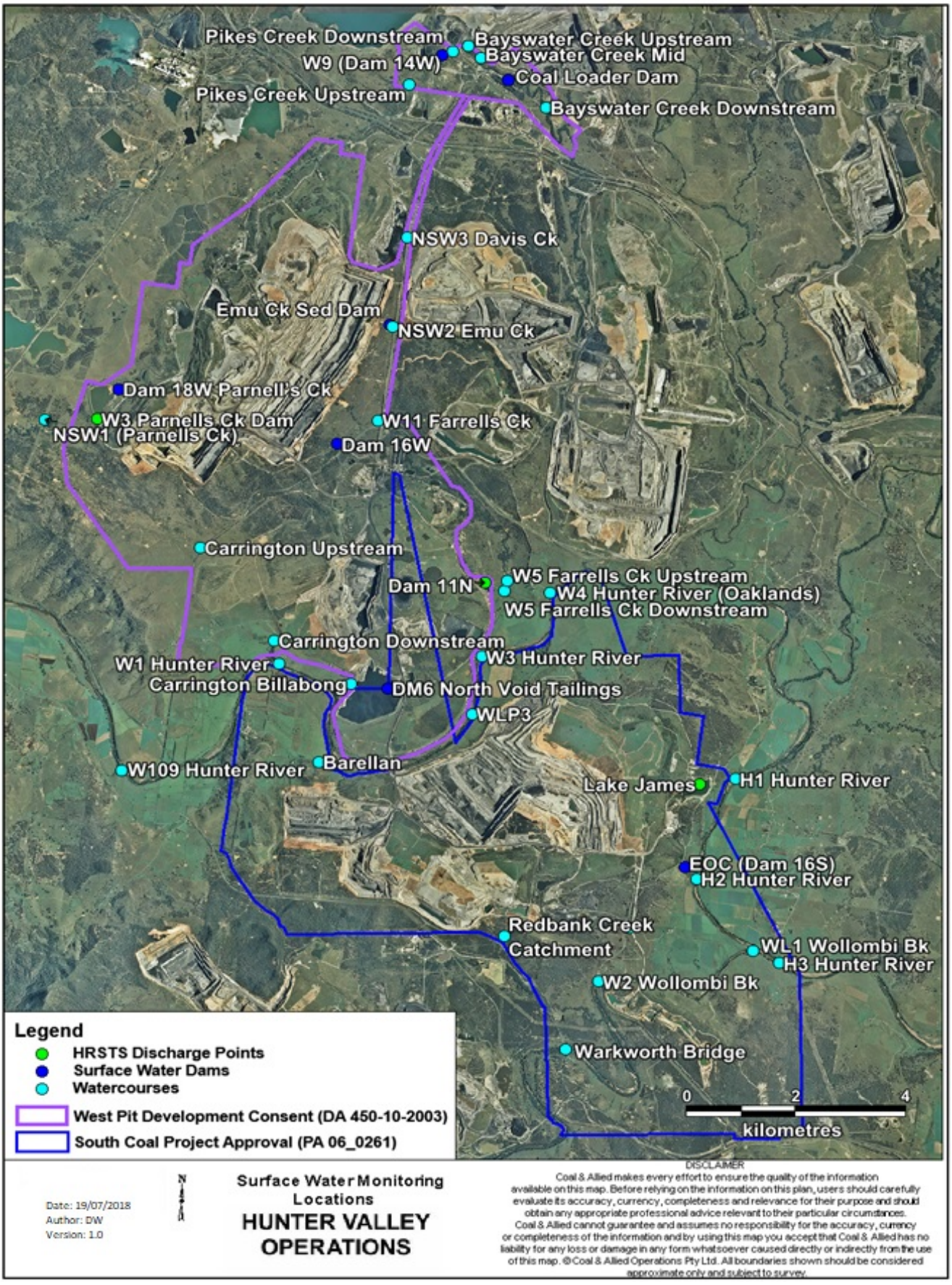


Figure 22: Surface Water Monitoring Location Plan

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 (2016 – current) for ground water bores monitored at HVO.

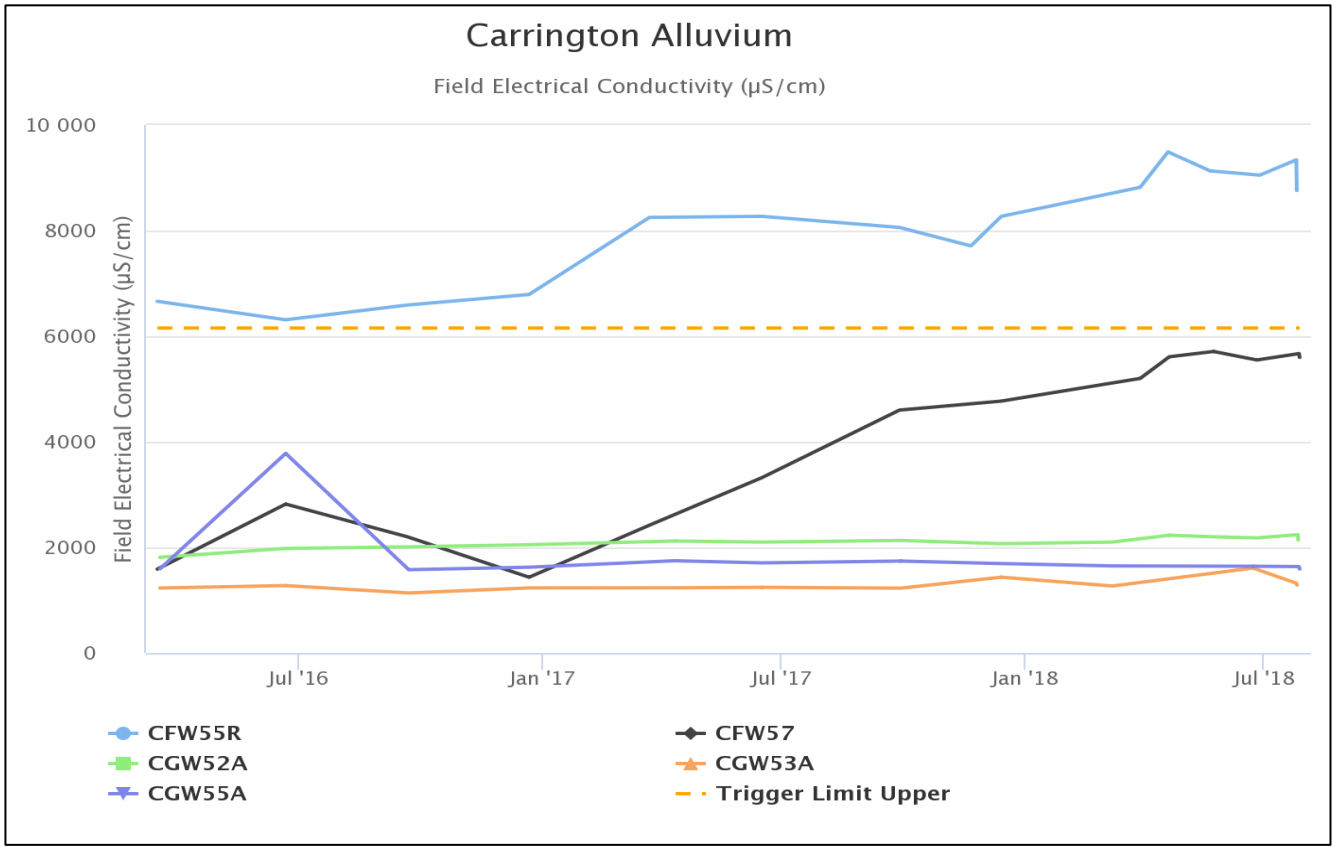


Figure 23: Carrington Alluvium Electrical Conductivity Trend – June 2018

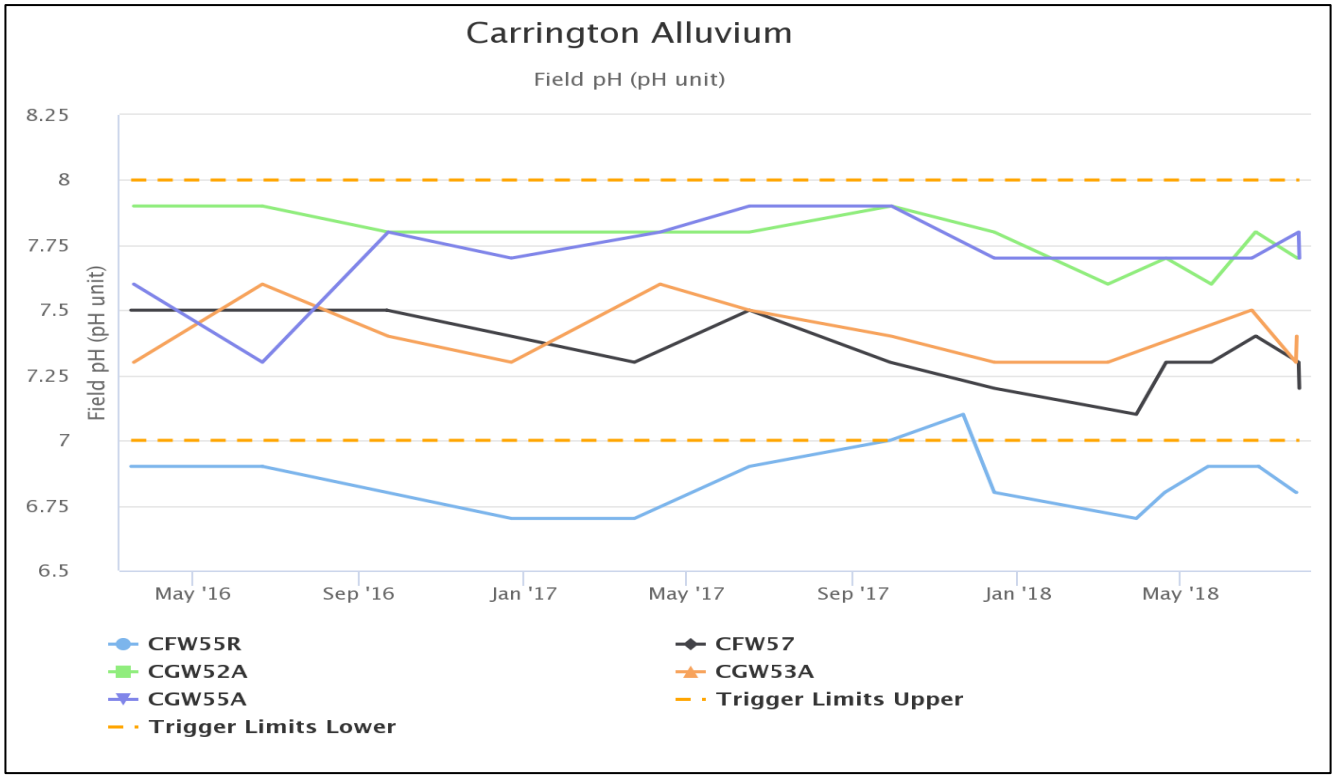


Figure 24: Carrington Alluvium pH Trend – June 2018

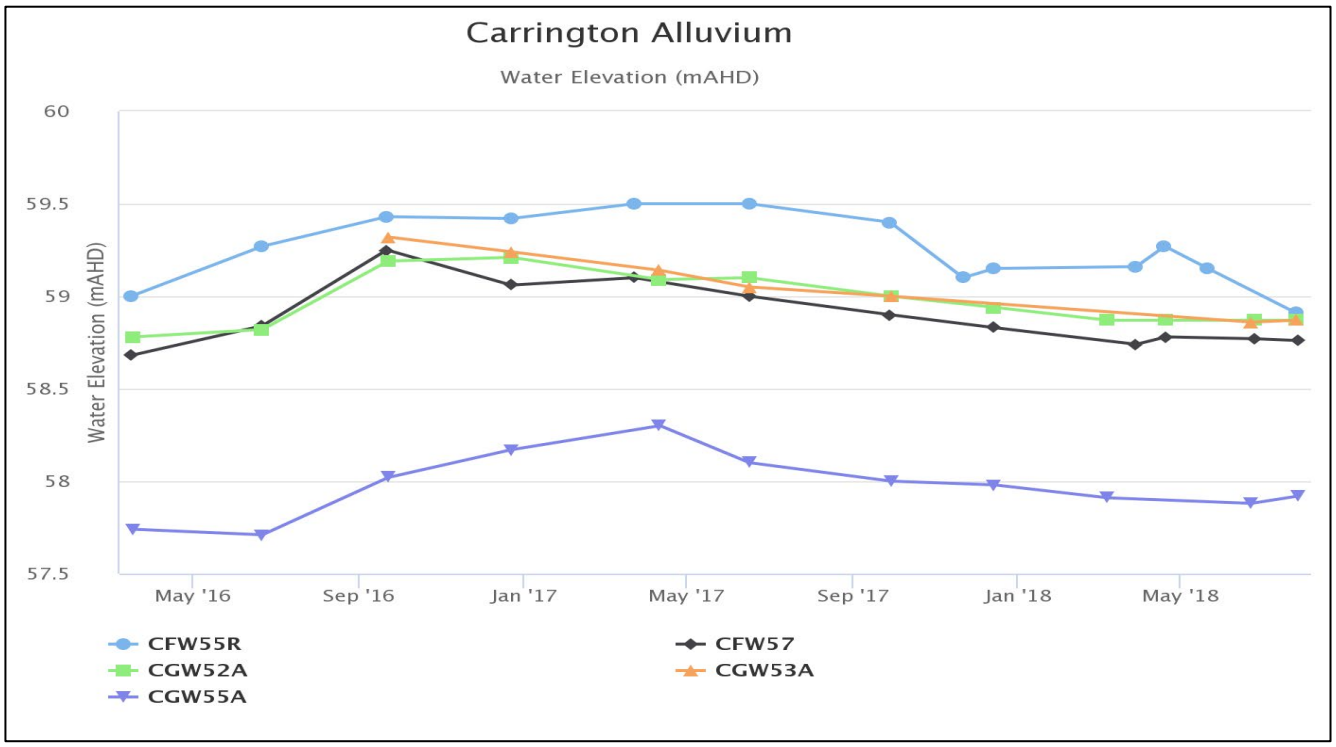


Figure 25: Carrington Alluvium Standing Water Level – June 2017

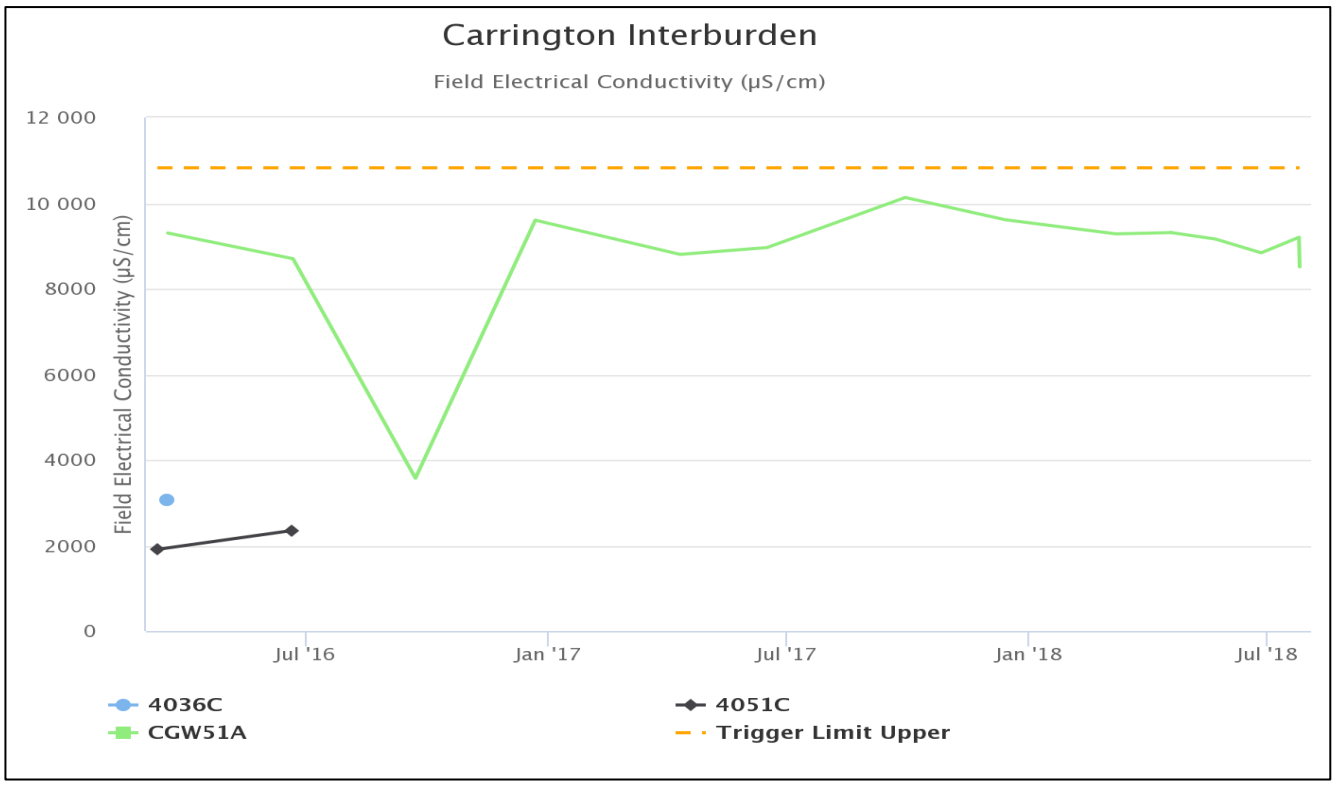


Figure 26: Carrington Interburden Electrical Conductivity Trend – June 2018

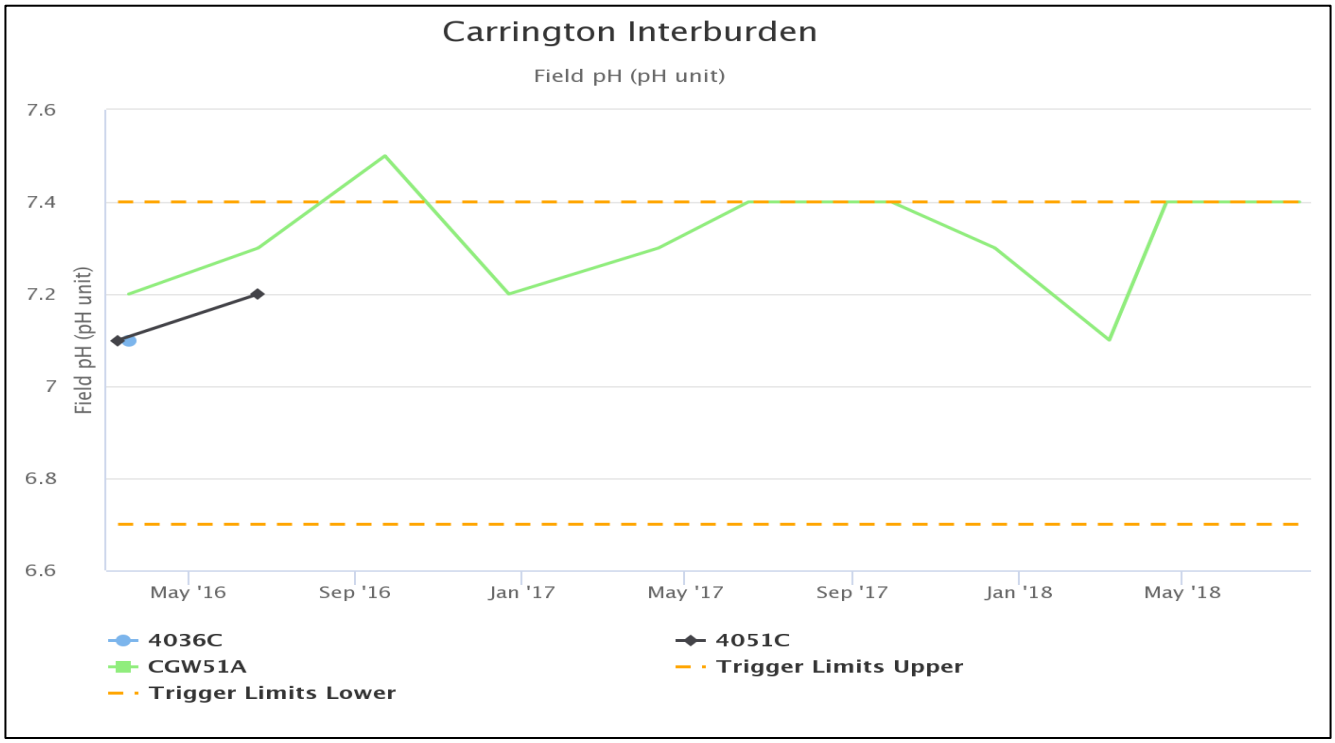


Figure 27: Carrington Interburden pH Trend – June 2018

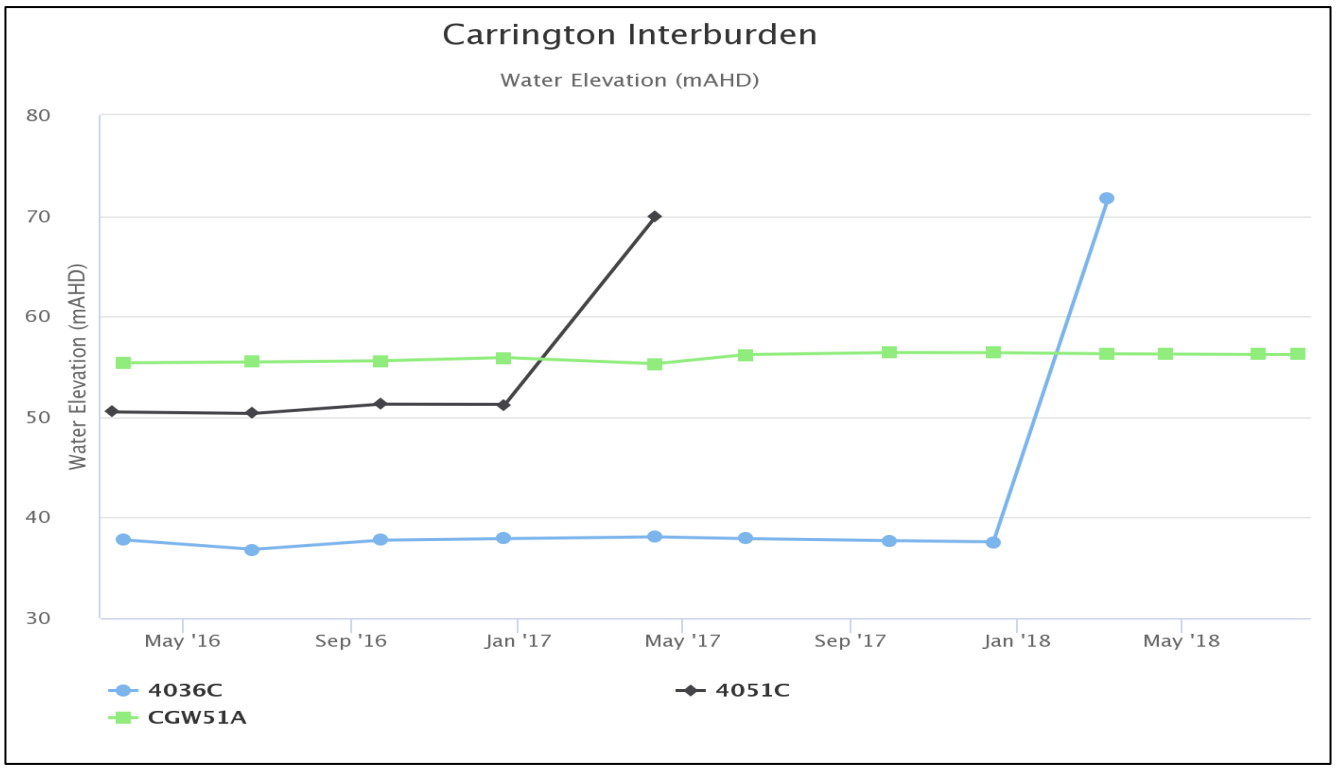


Figure 28: Carrington Interburden Standing Water Level – June 2018

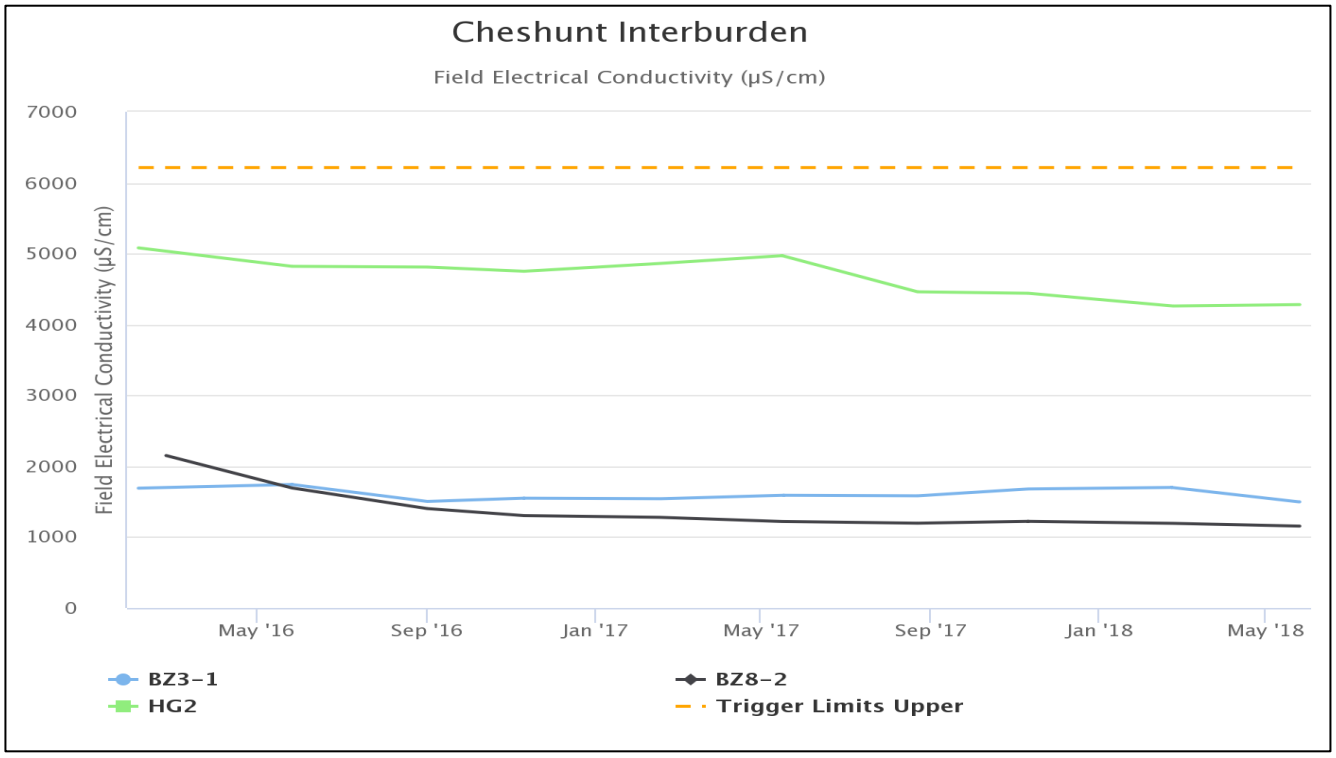


Figure 29: Cheshunt Interburden Electrical Conductivity Trend – June 2018

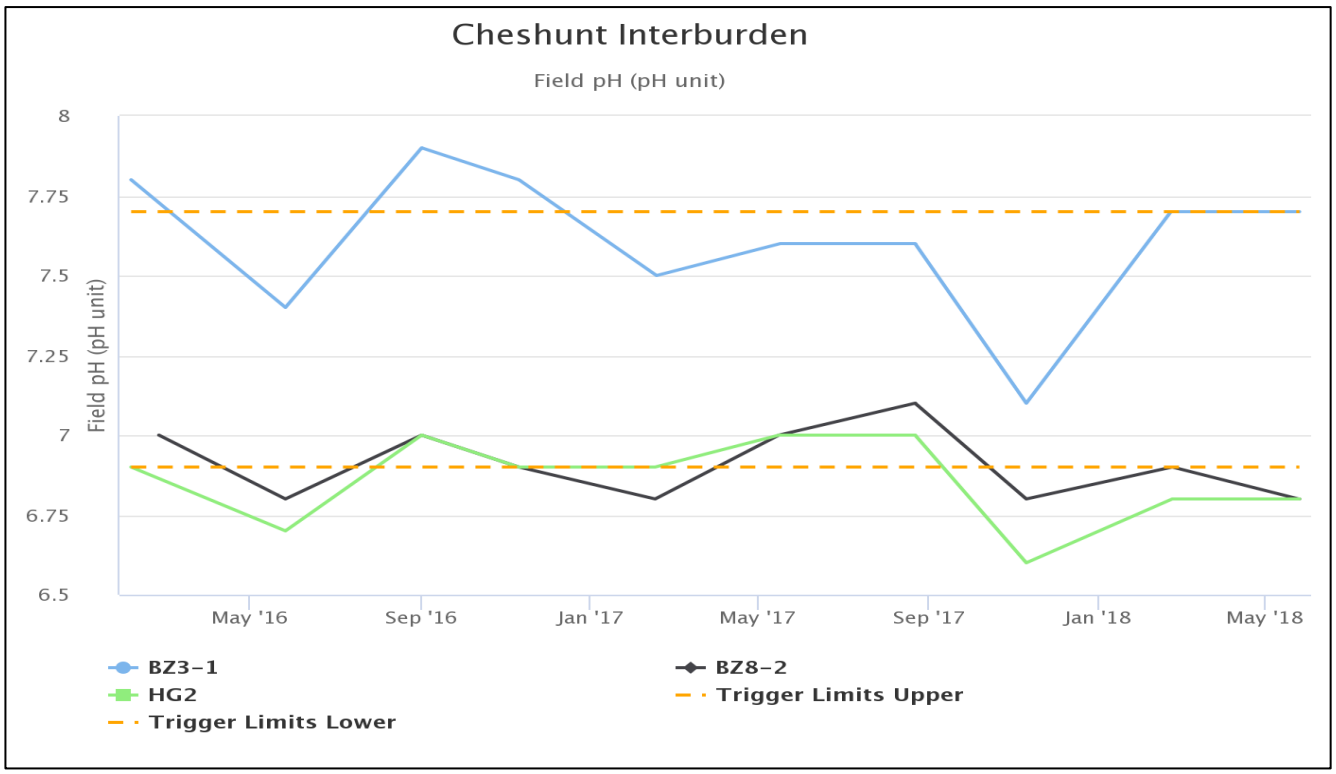


Figure 30: Cheshunt Interburden pH Trend – June 2018

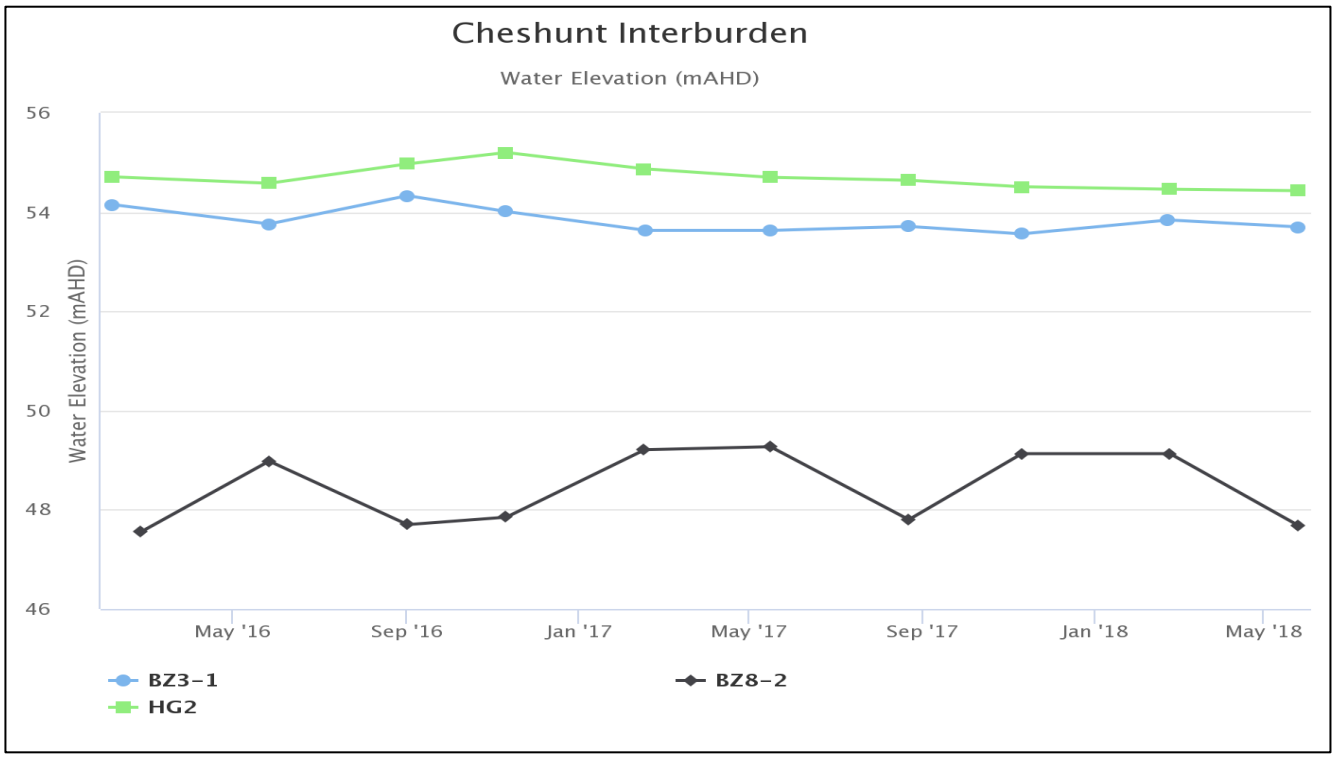


Figure 31: Cheshunt Interburden Standing Water Level – June 2018

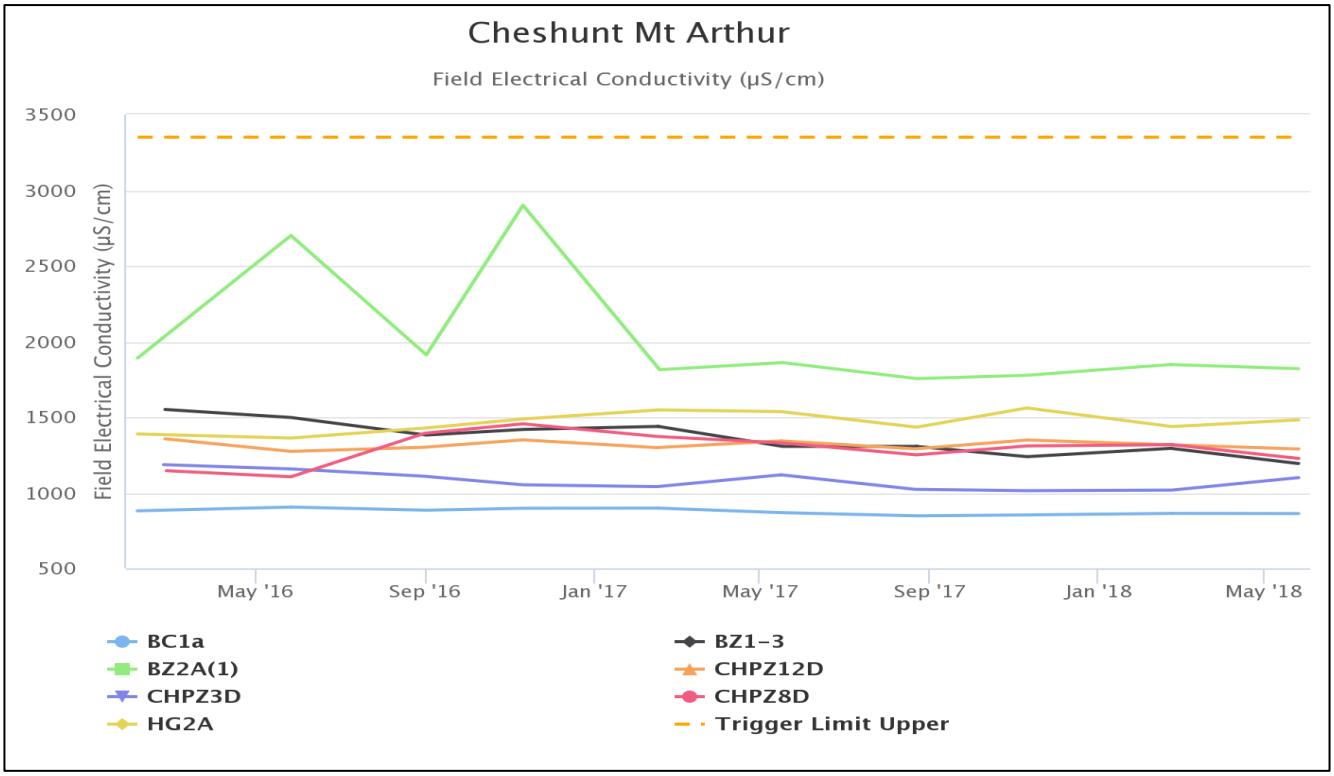


Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend – June 2018

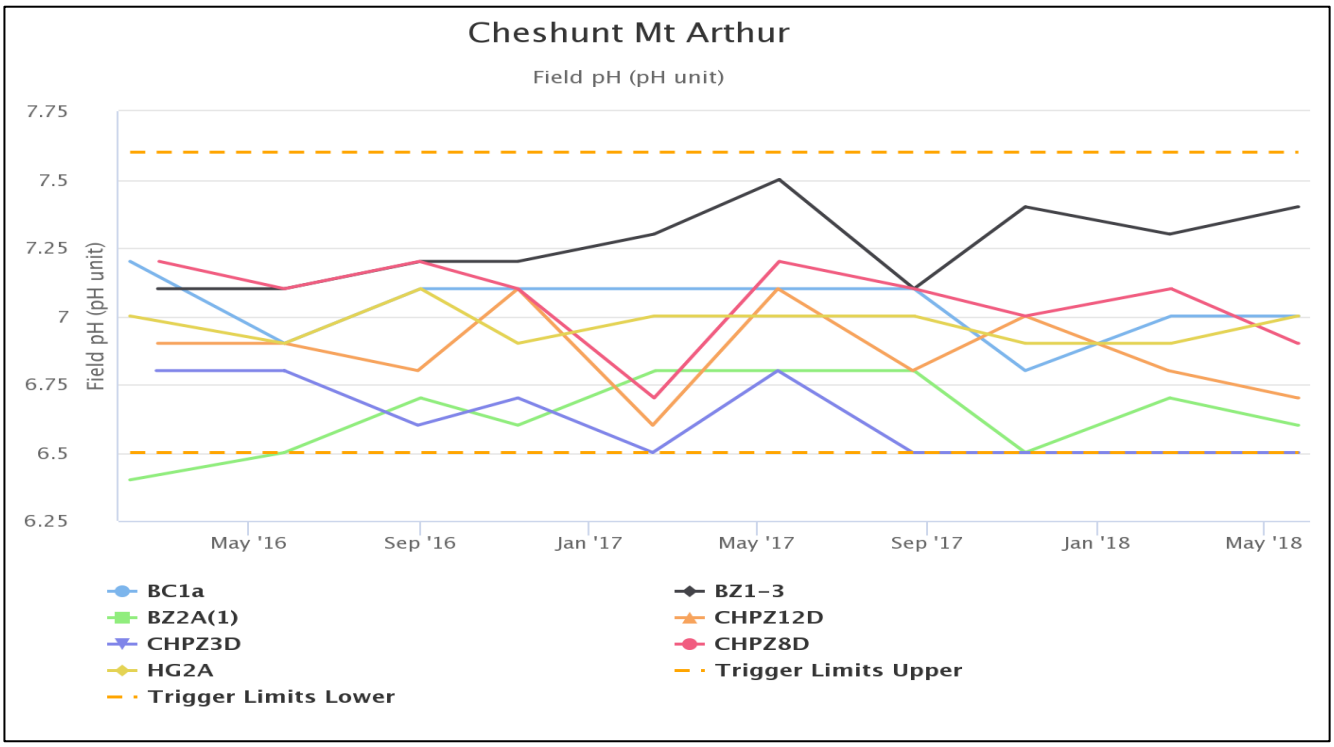


Figure 33: Cheshunt Mt Arthur pH Trend – June 2018

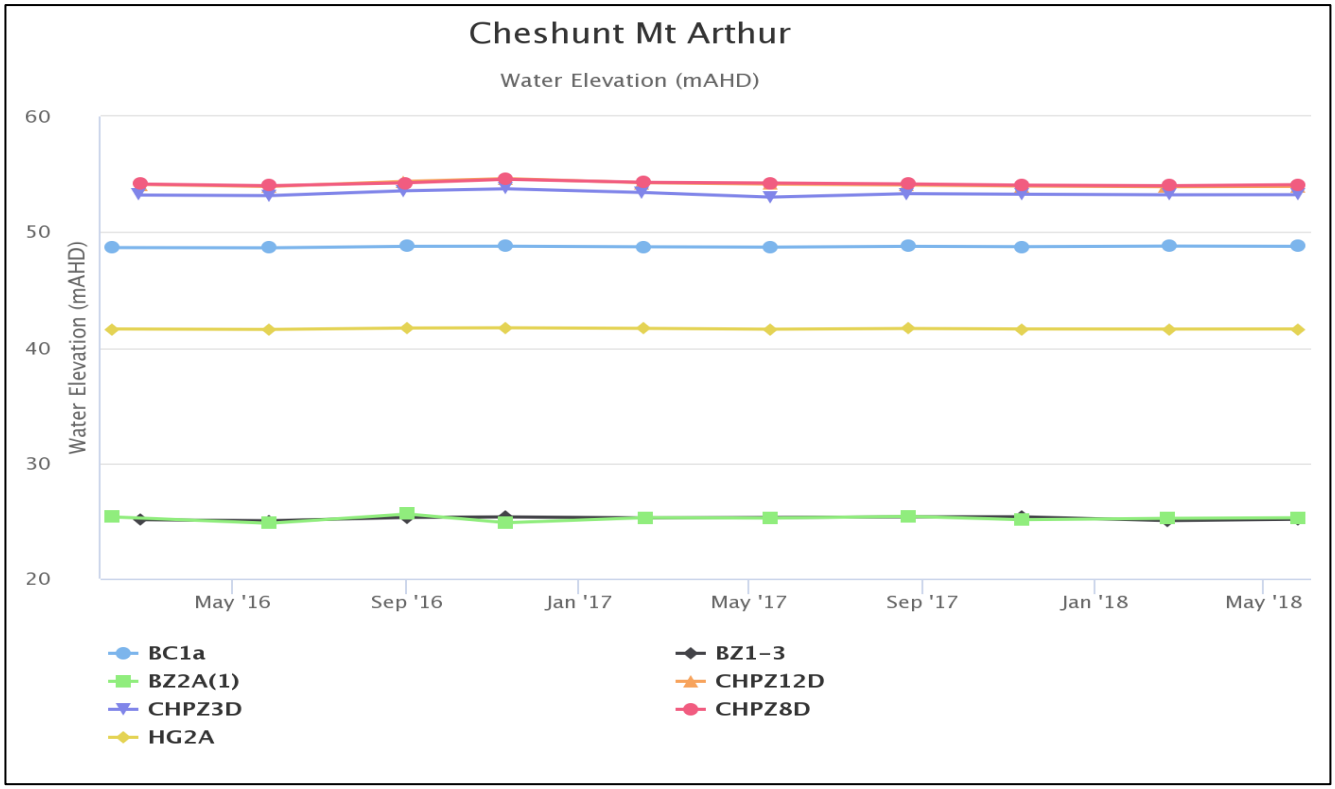


Figure 34: Cheshunt Mt Arthur Standing Water Level – June 2018

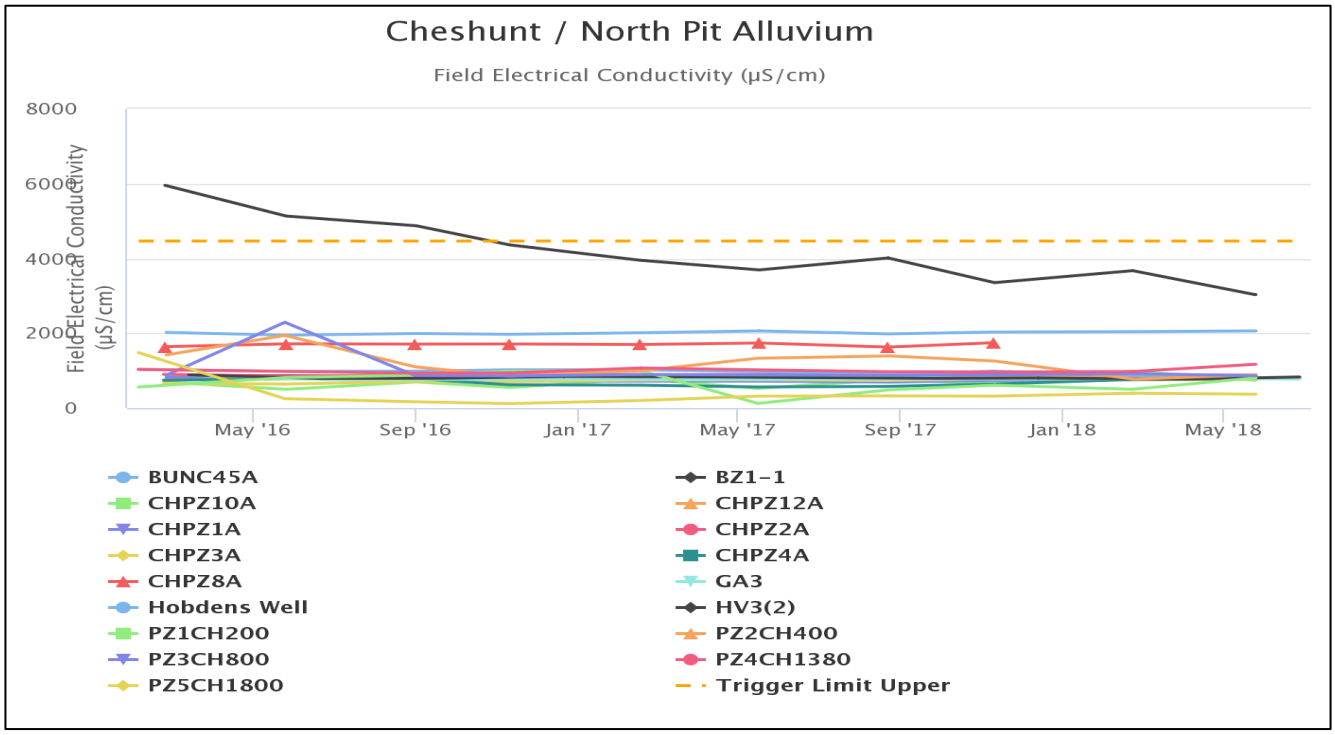


Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend – June 2018

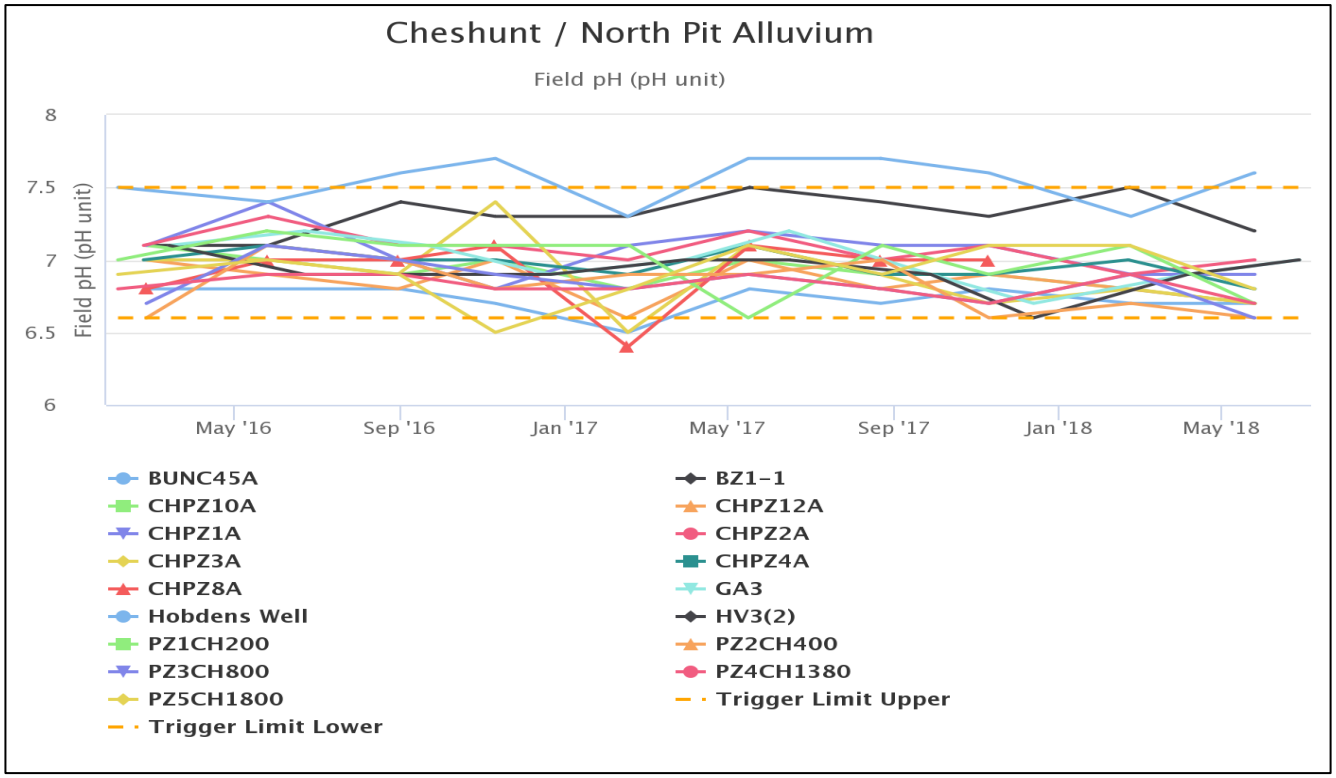


Figure 36: Cheshunt / North Pit Alluvium pH Trend – June 2018

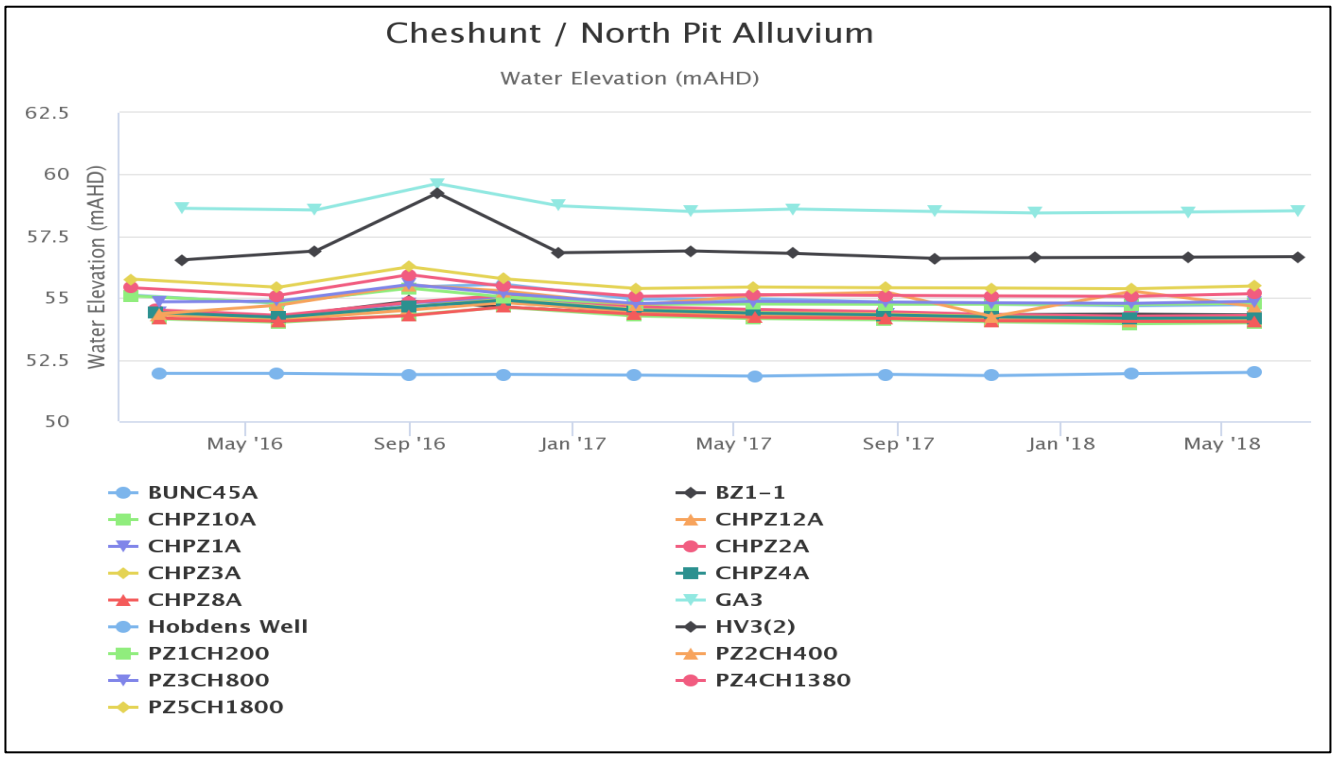


Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – June 2018

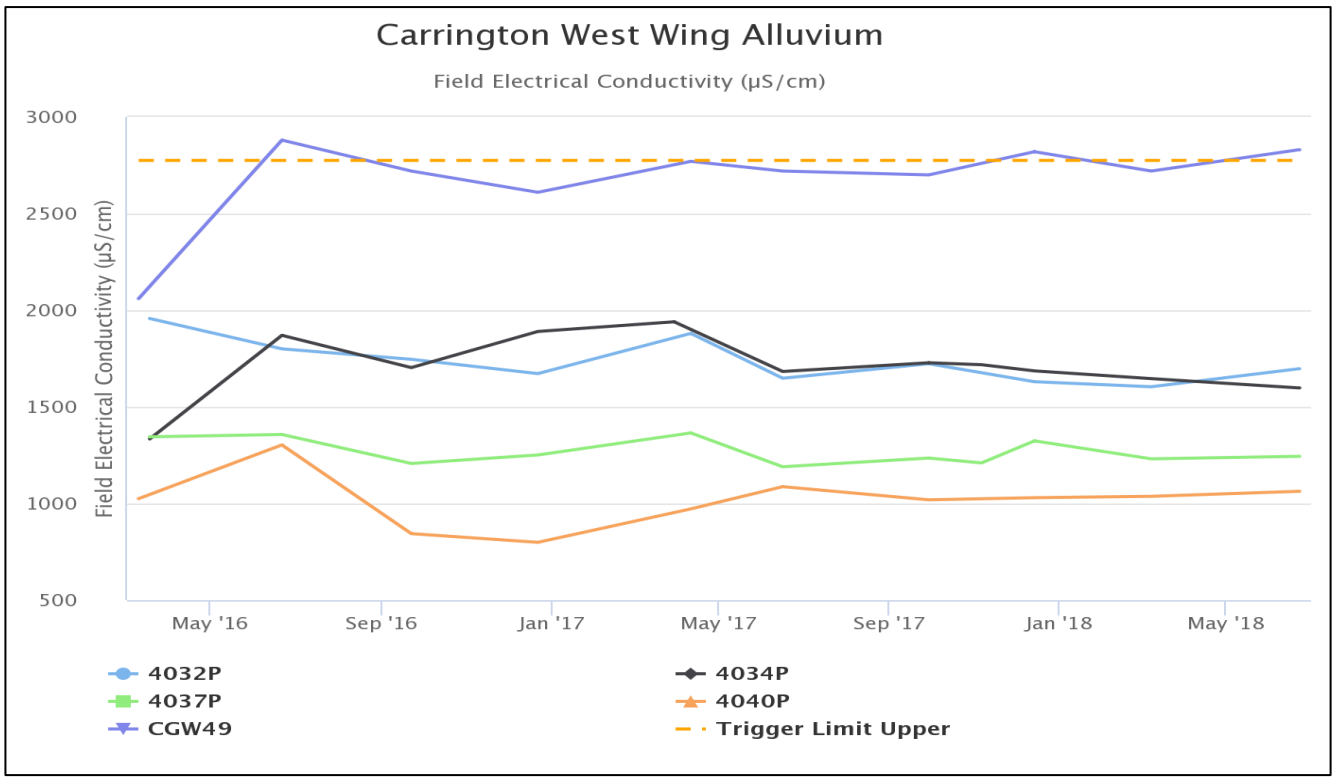


Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend – June 2018

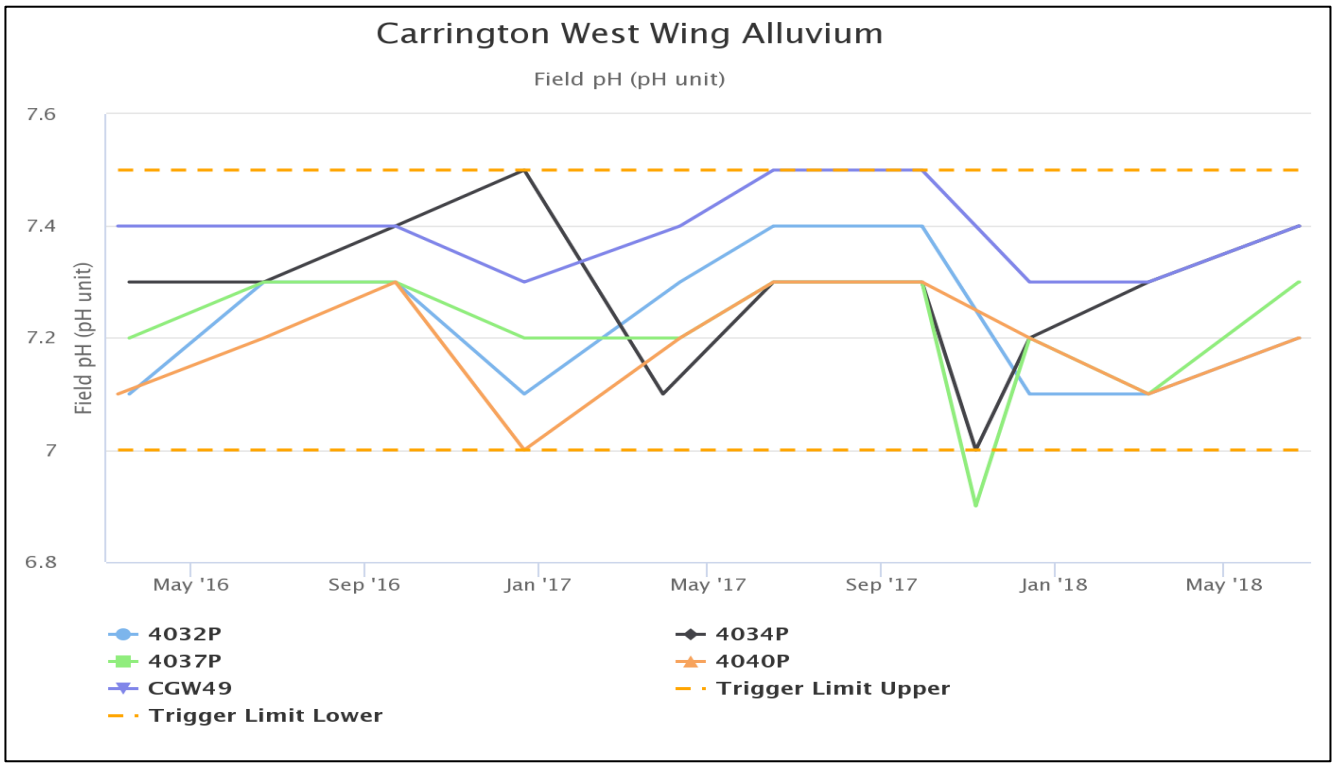


Figure 39: Carrington West Wing Alluvium pH Trend – June 2018

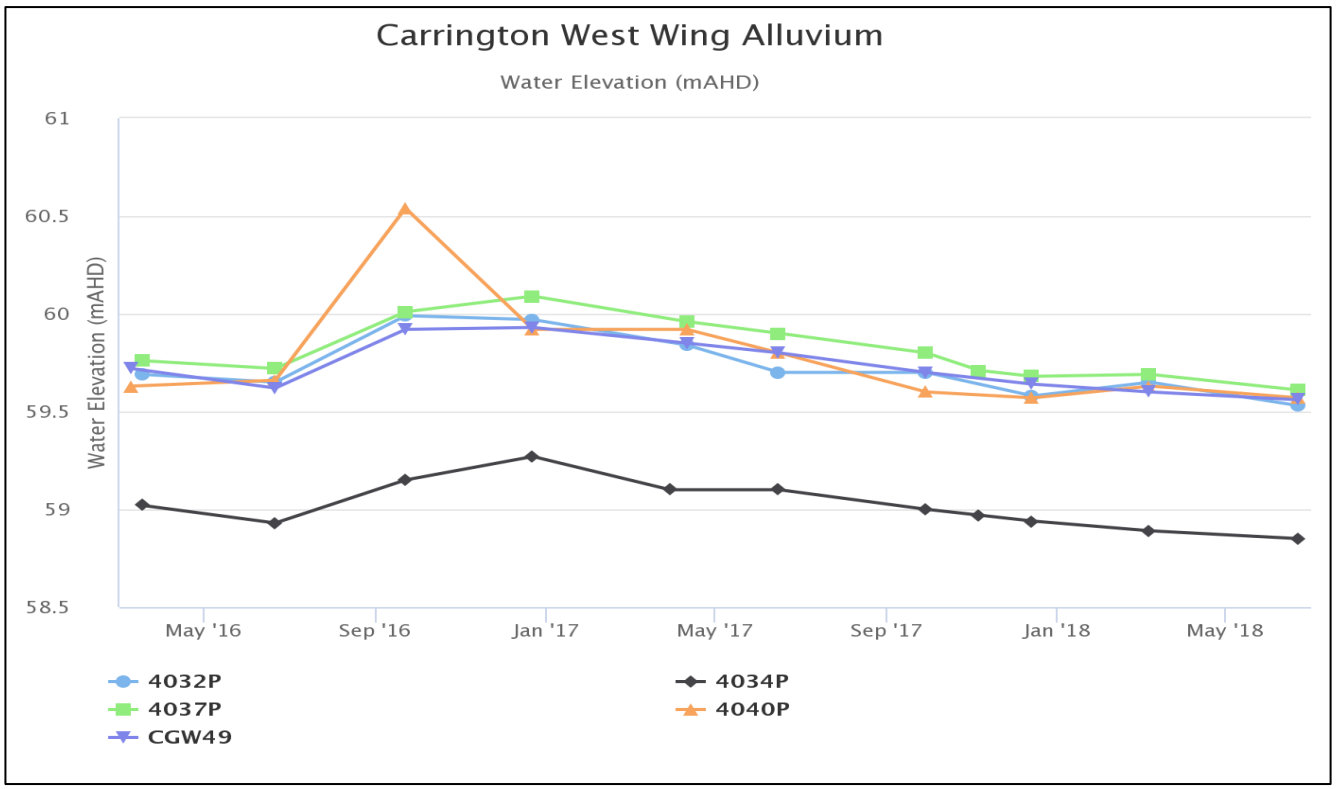


Figure 40: Carrington West Wing Alluvium Standing Water Level – June 2018

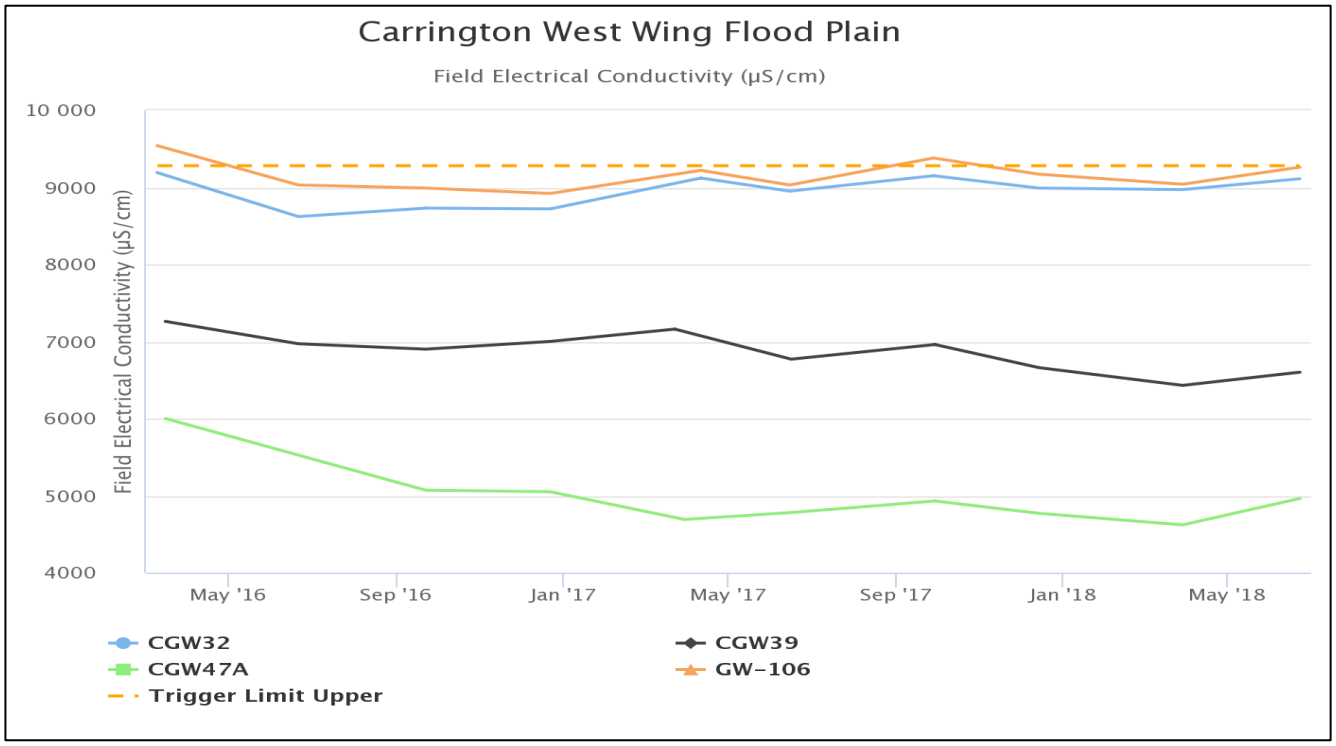


Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend – June 2018

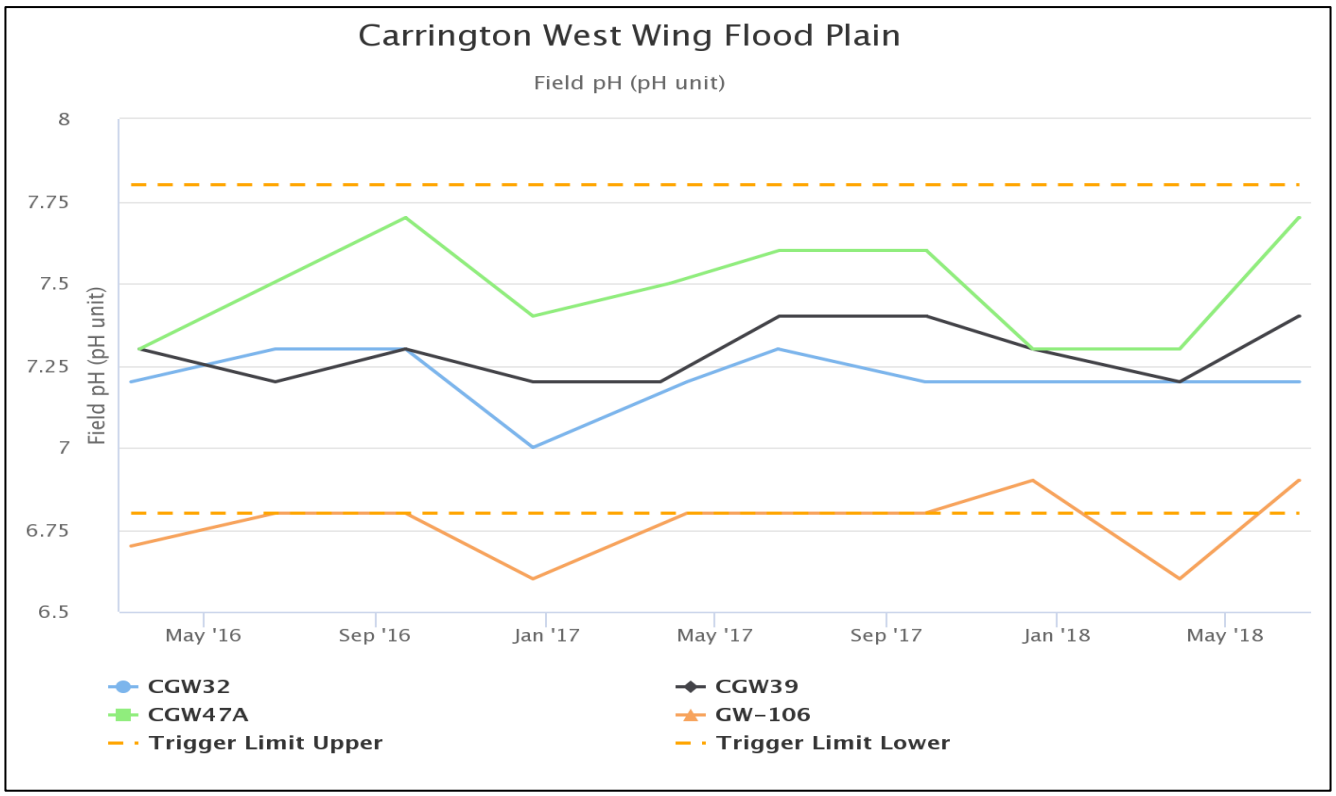


Figure 42: Carrington West Wing Flood Plain pH Trend – June 2018

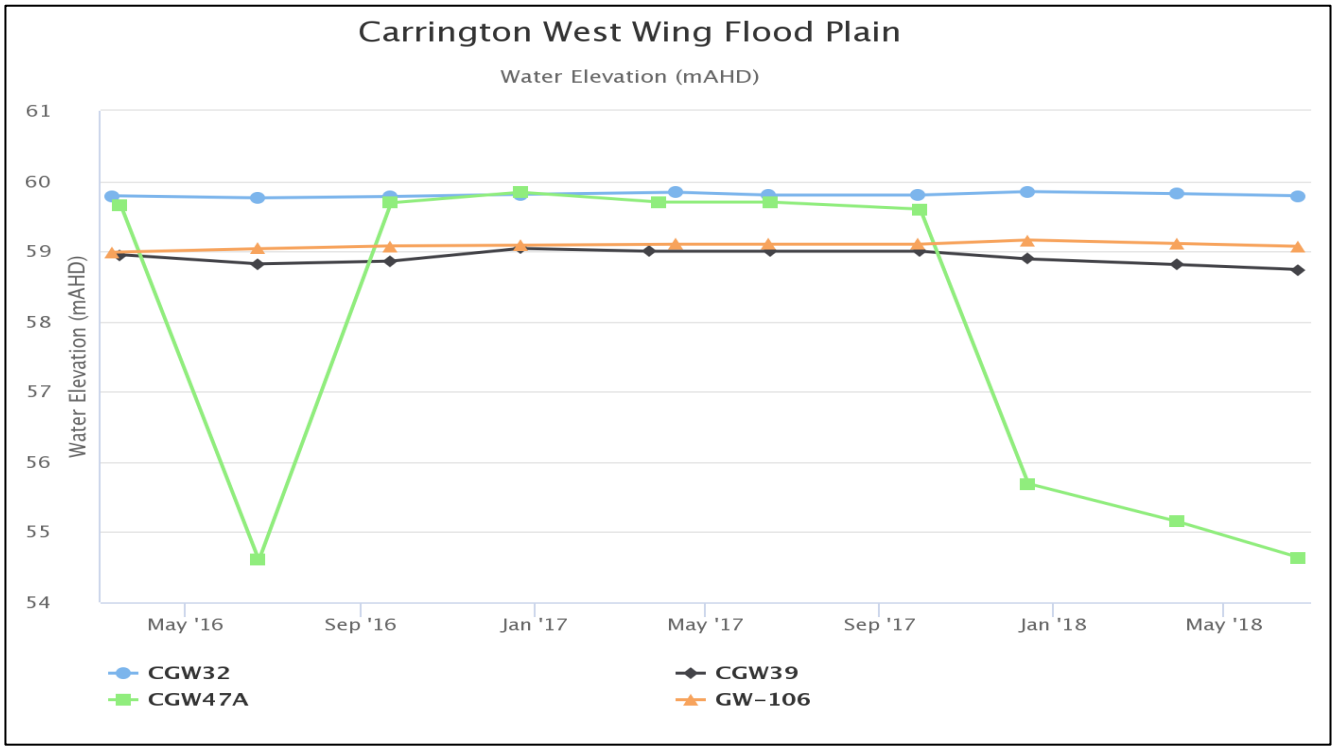


Figure 43: Carrington West Wing Flood Plain Standing Water Level – June 2018

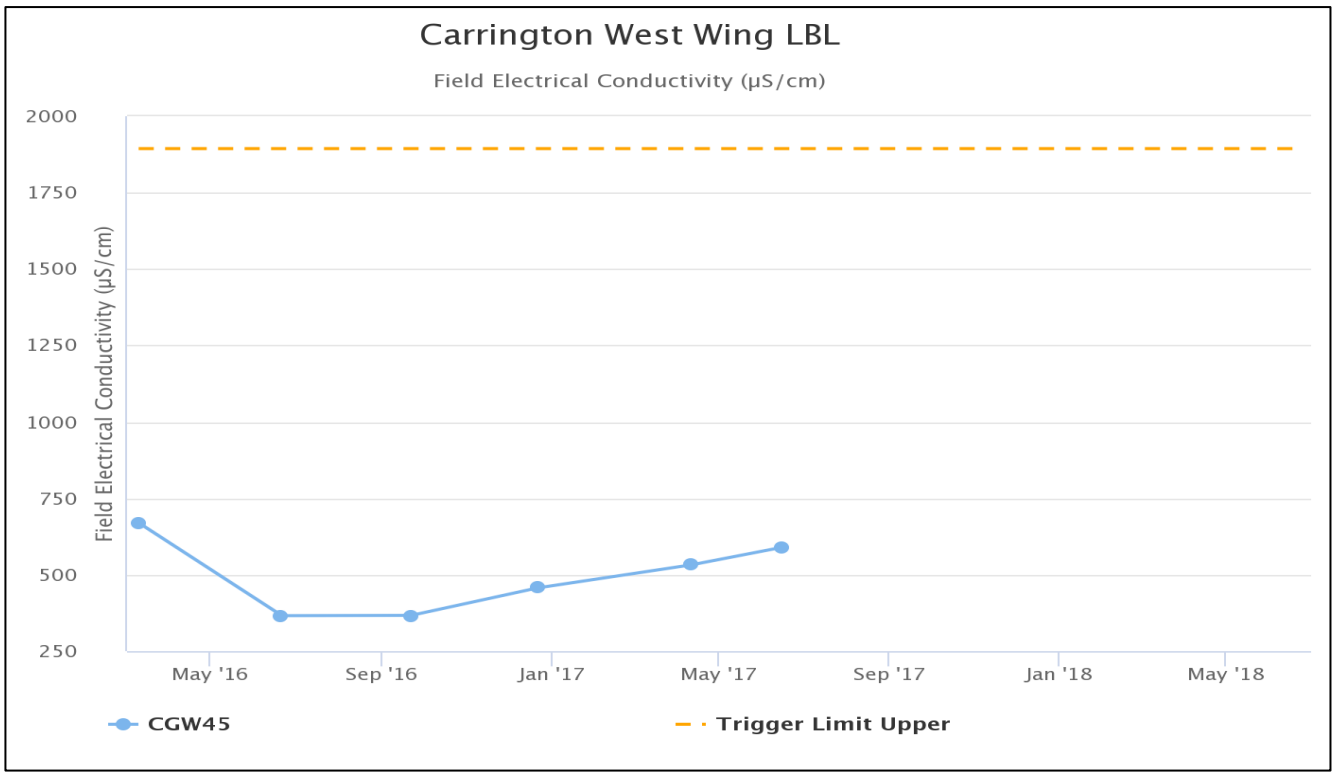


Figure 44: Carrington West Wing LBL Electrical Conductivity Trend – June 2018

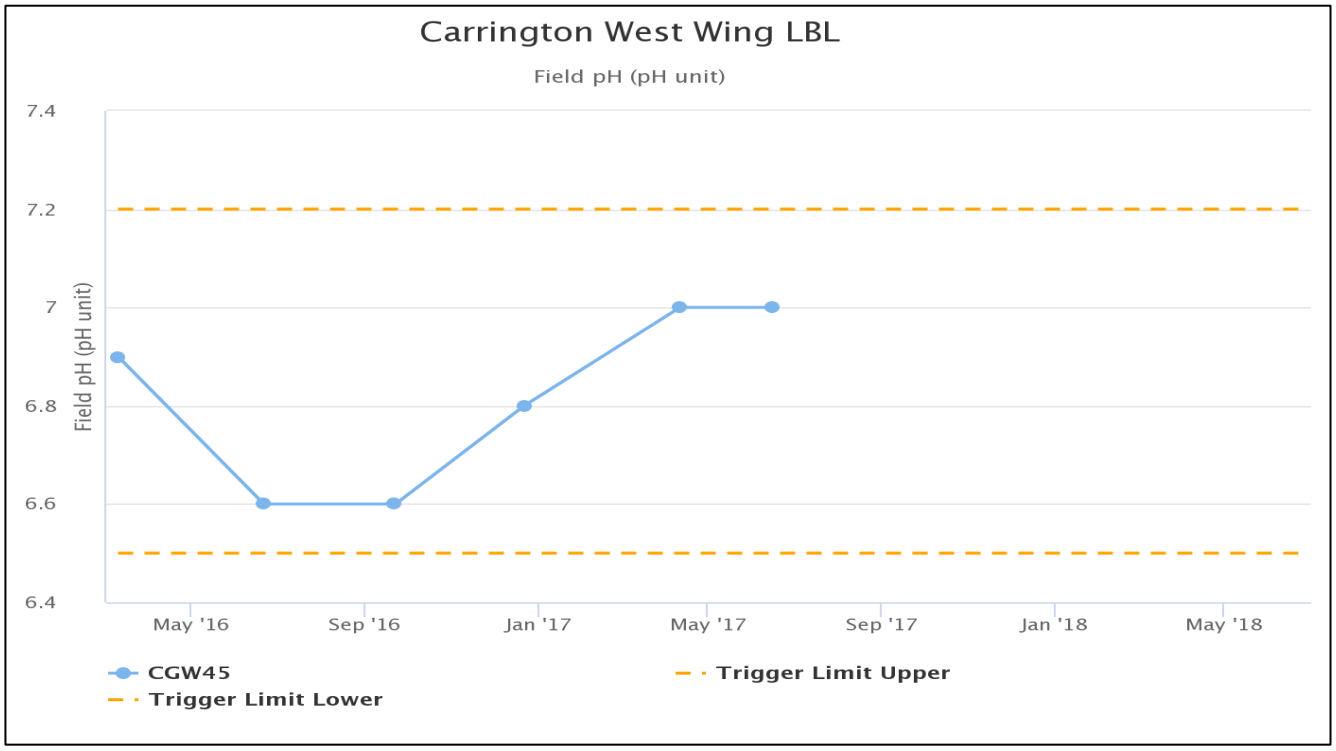


Figure 45: Carrington West Wing LBL pH Trend – June 2018

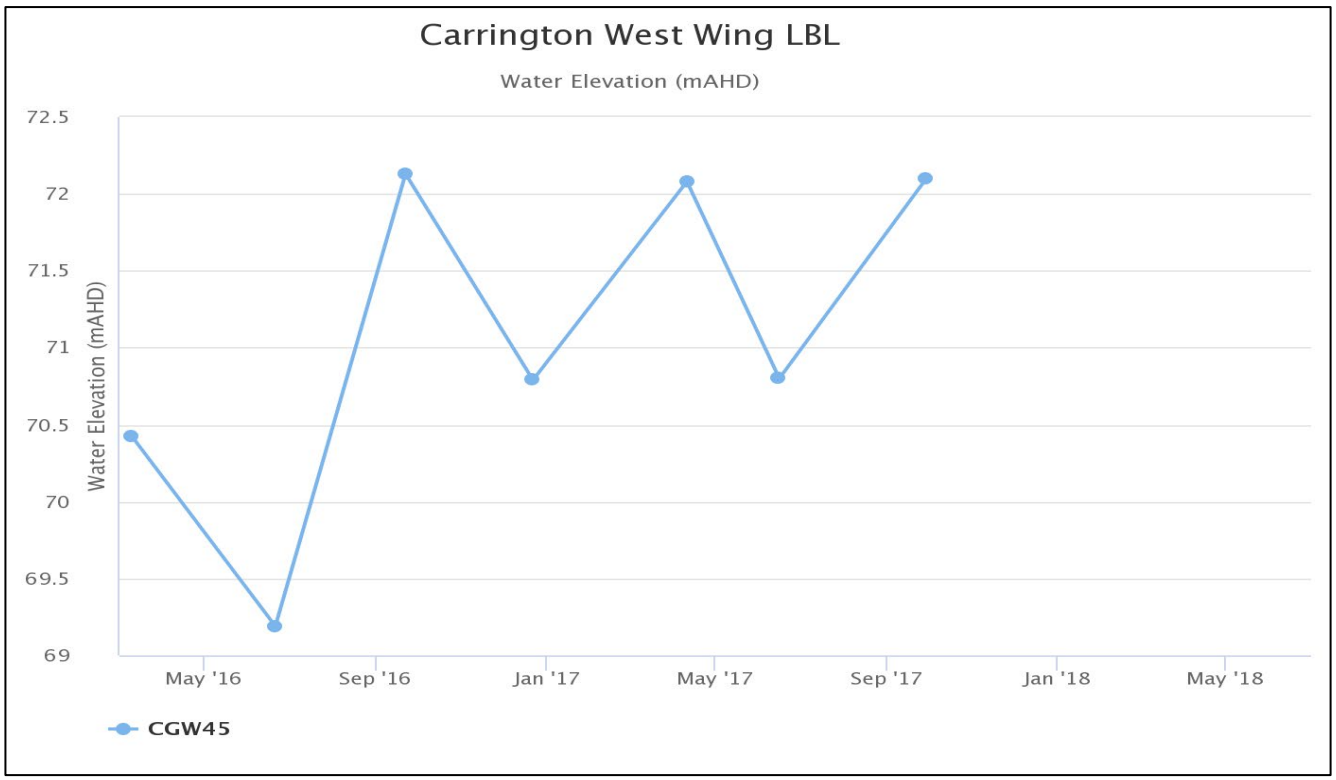


Figure 46: Carrington West Wing LBL Standing Water Level – June 2018

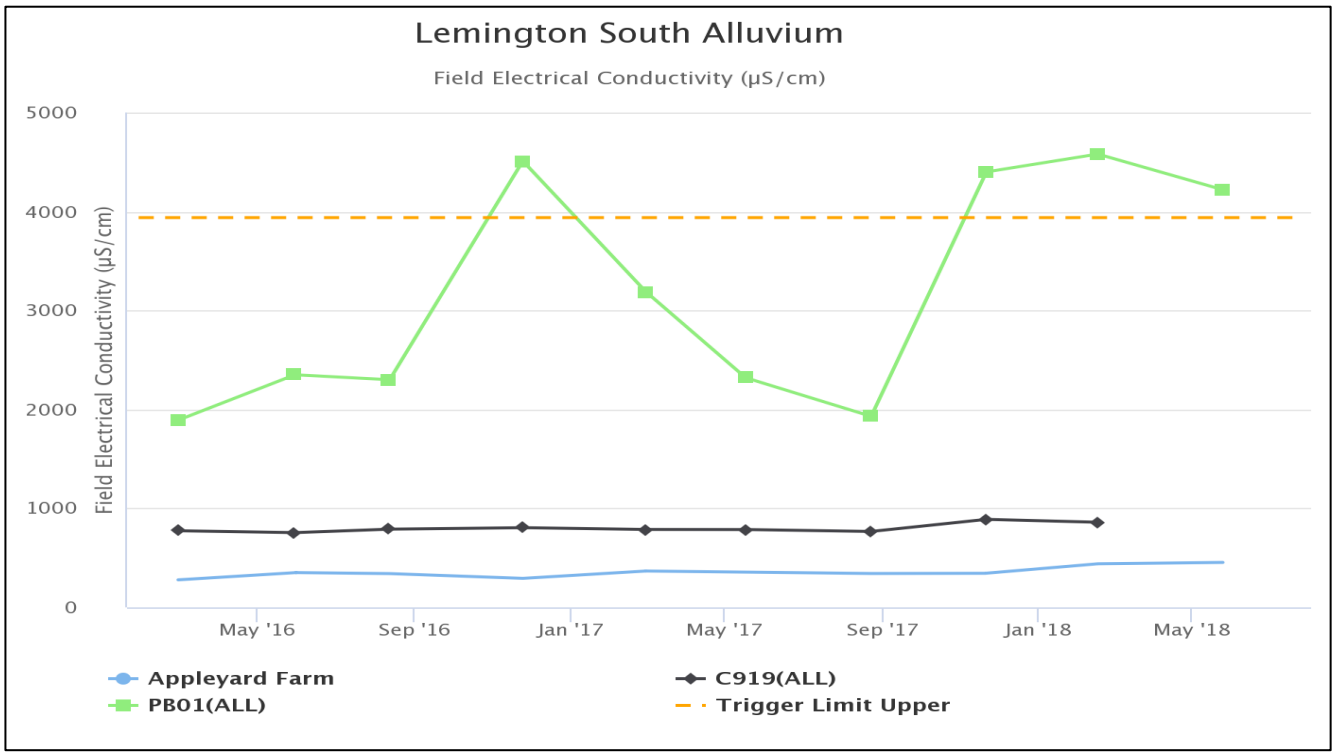


Figure 47: Lemington South Alluvium Electrical Conductivity Trend – June 2018

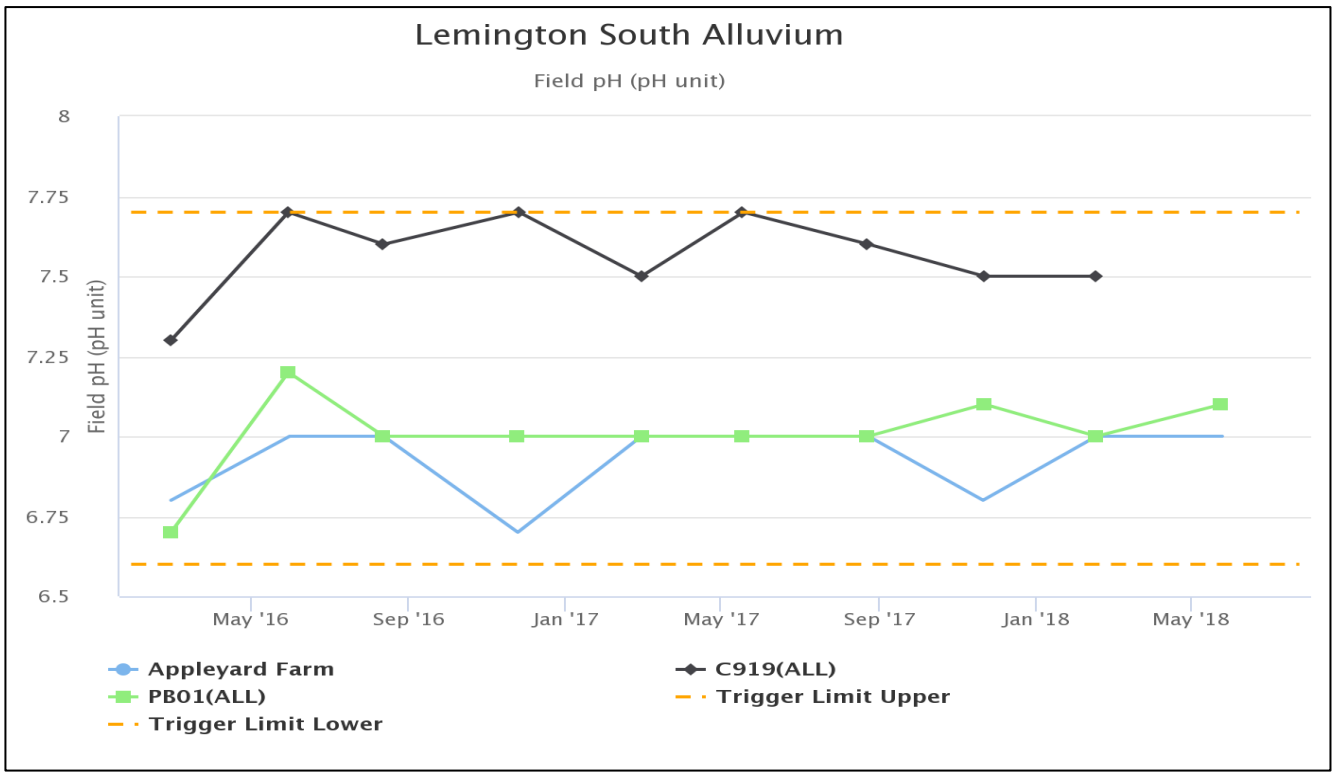


Figure 48: Lemington South Alluvium pH Trend – June 2018

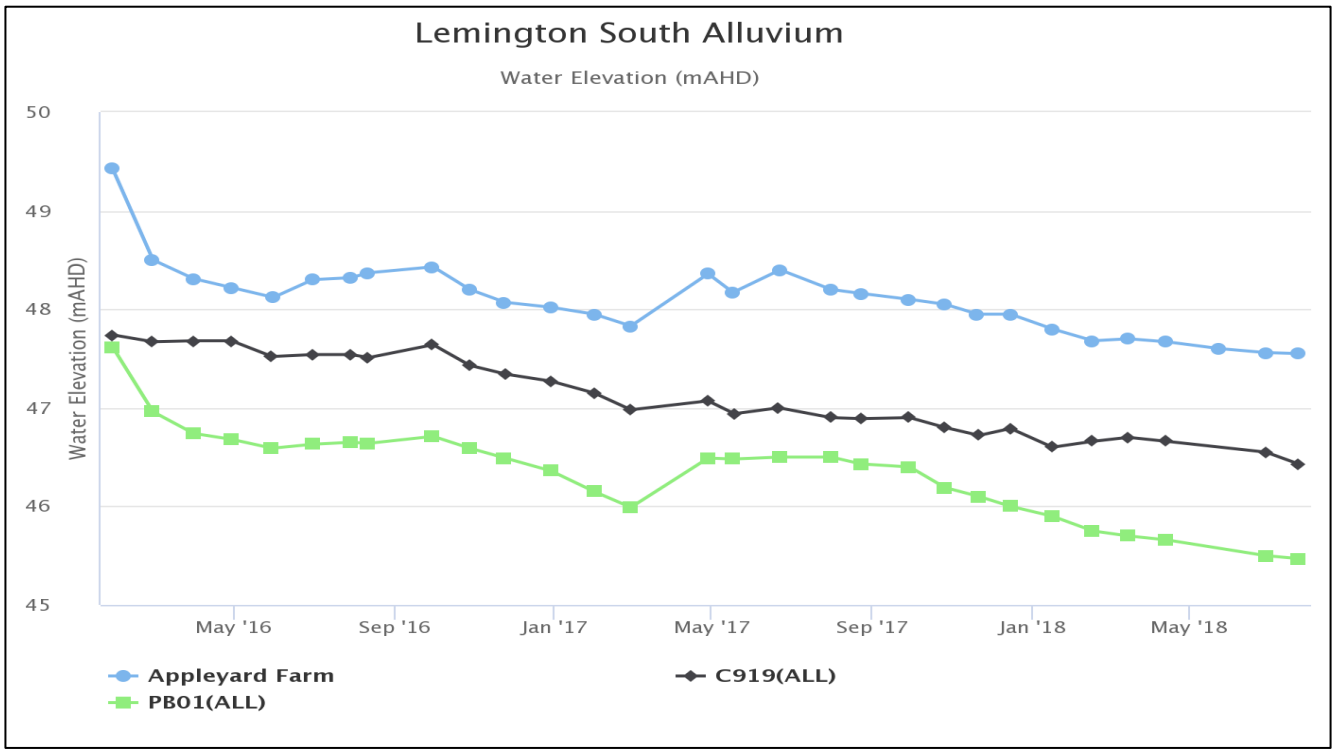


Figure 49: Lemington South Alluvium Standing Water Level Trend – June 2018

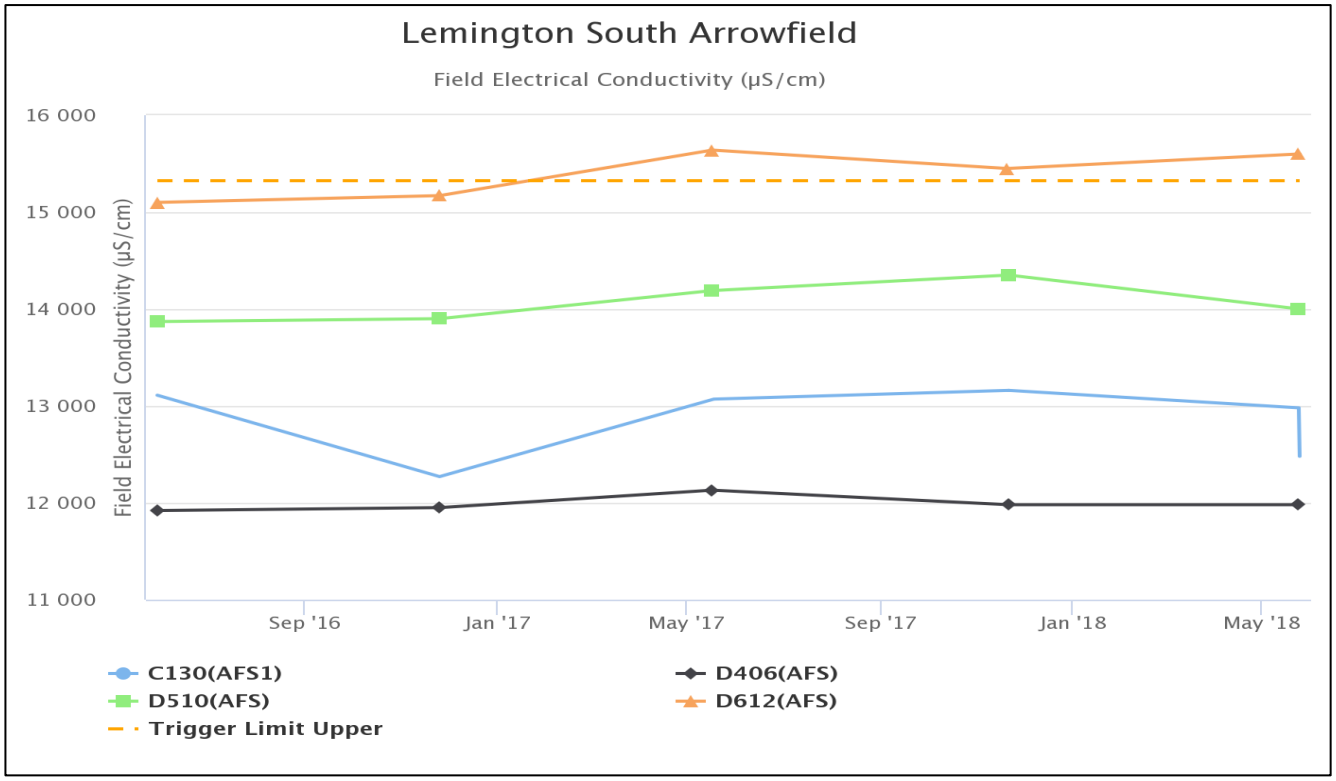


Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – June 2018

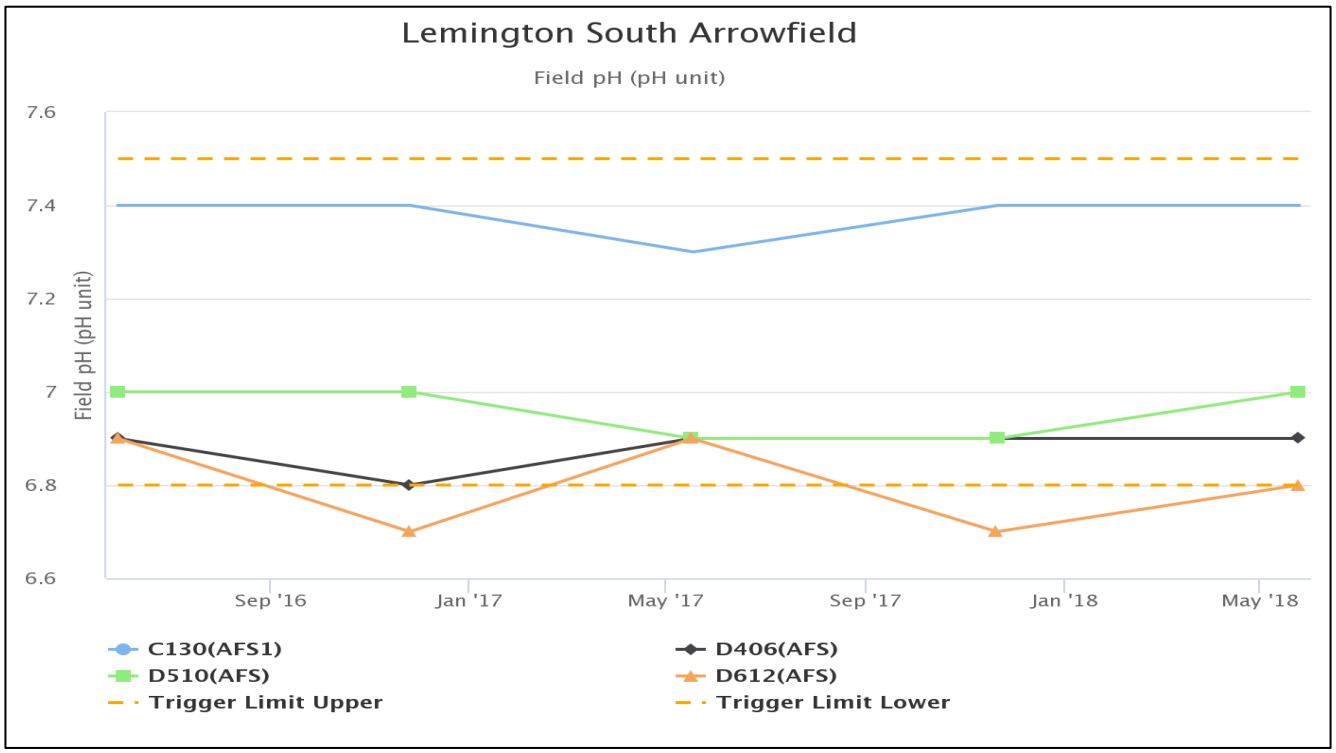


Figure 51: Lemington South Arrowfield pH Trend – June 2018

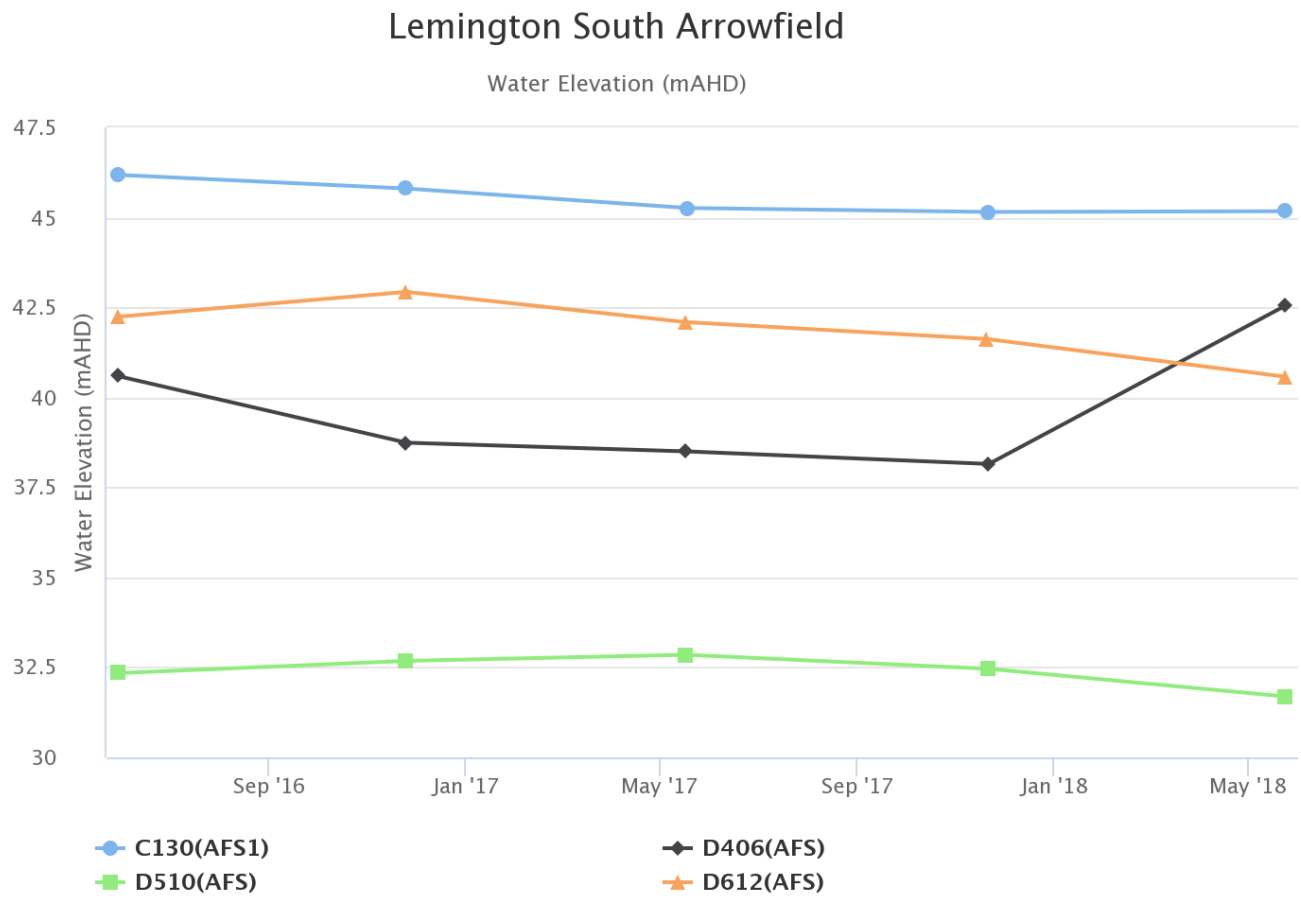


Figure 52: Lemington South Arrowfield Standing Water Level – June 2018

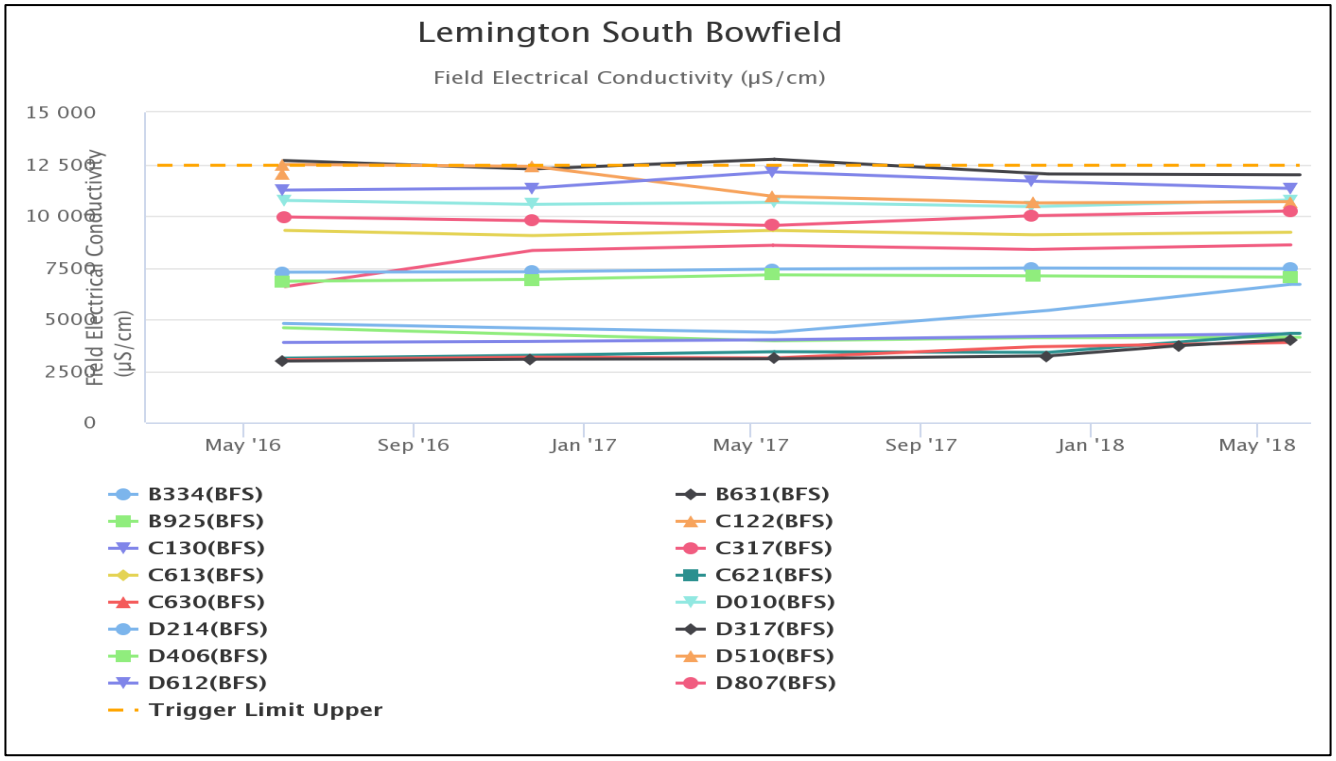


Figure 53: Lemington South Bowfield Electrical Conductivity Trend – June 2018

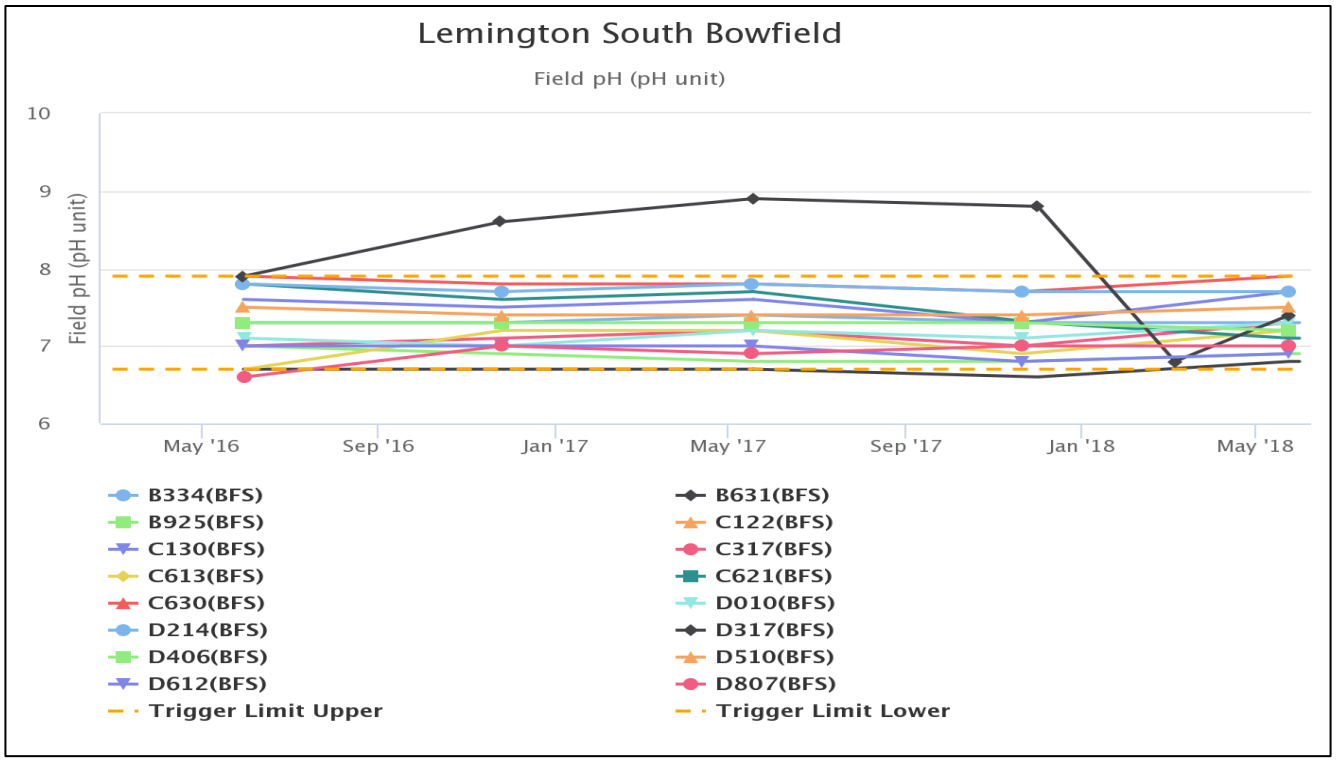


Figure 54: Lemington South Bowfield pH Trend – June 2018

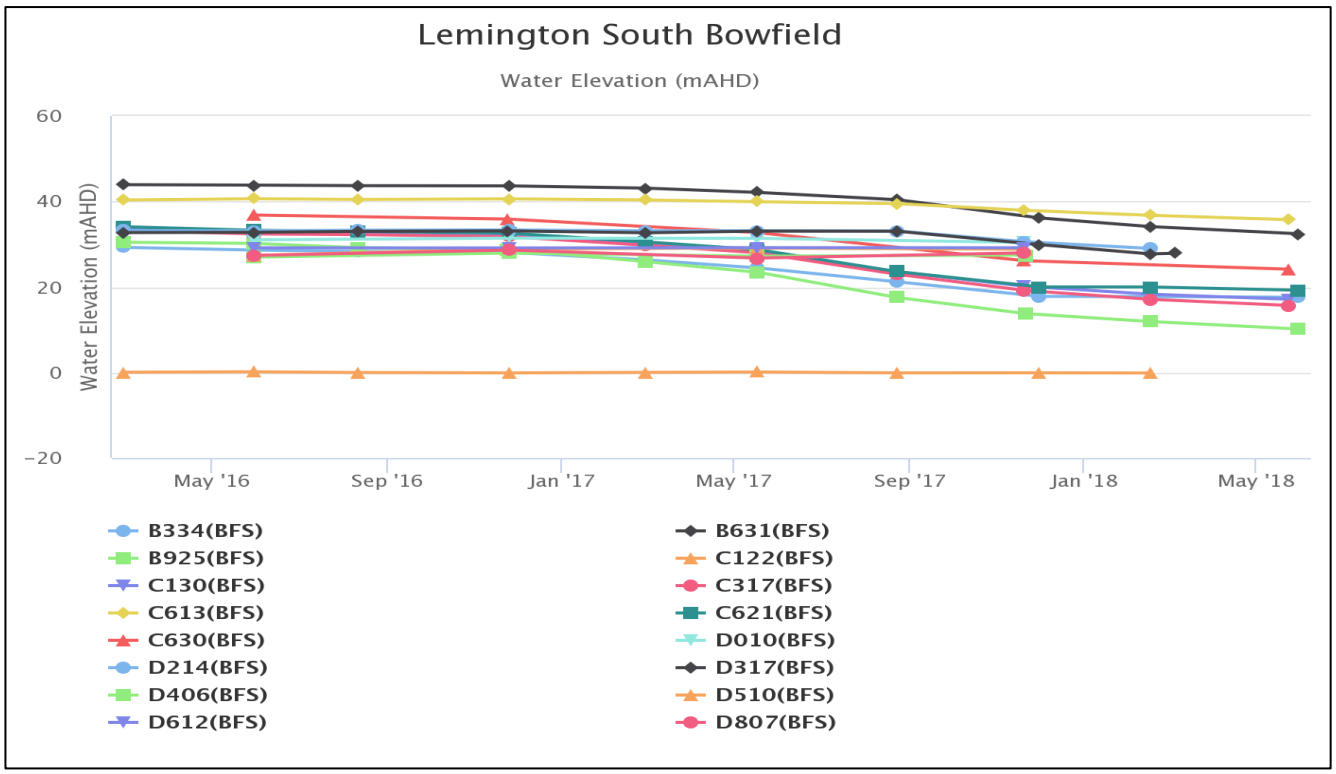


Figure 55: Lemington South Bowfield Standing Water Level – June 2018

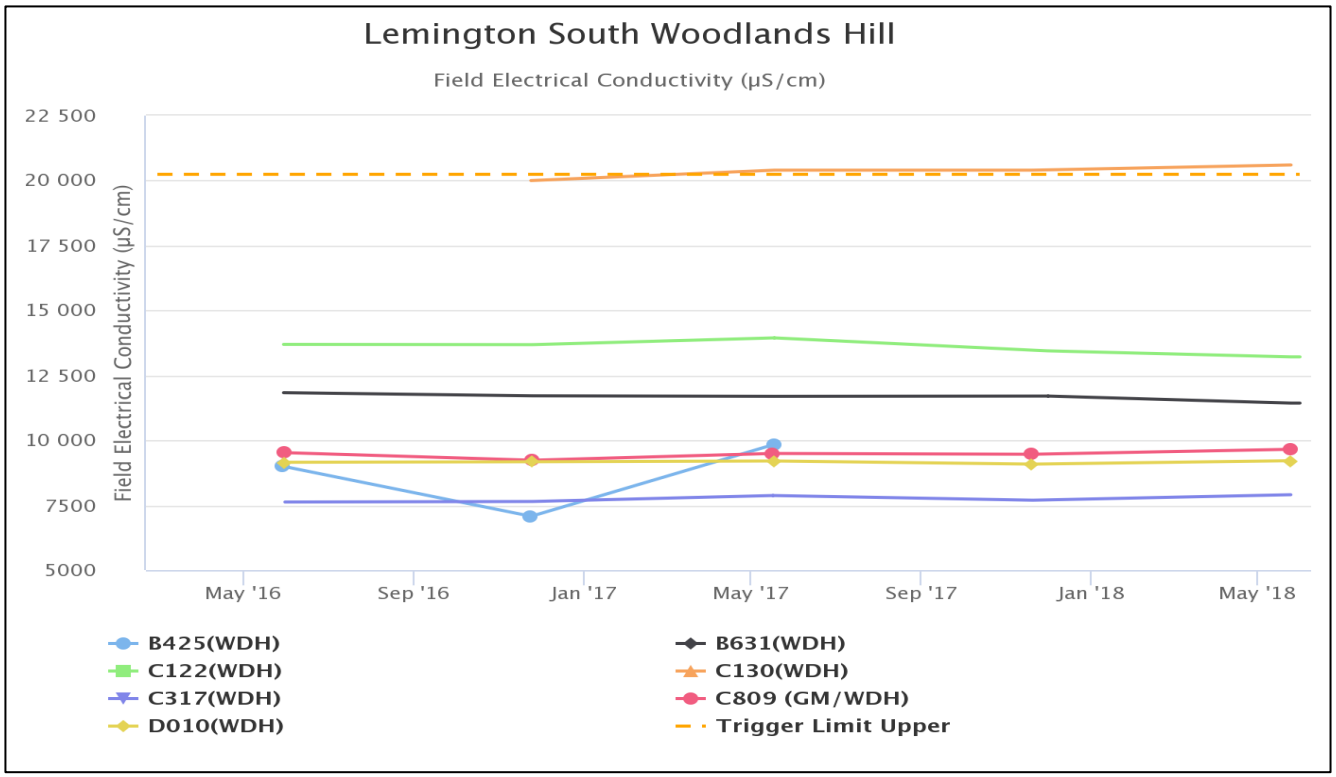


Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend – June 2018

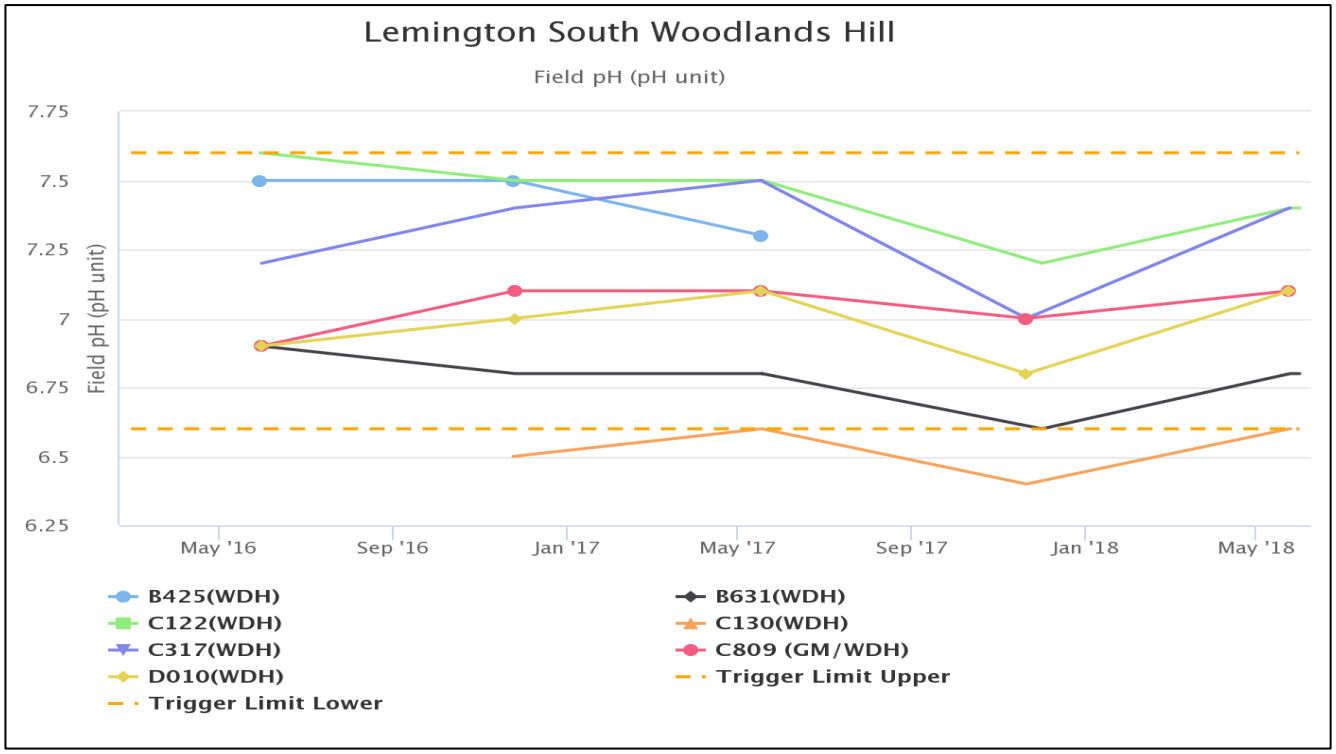


Figure 57: Lemington South Woodlands Hill pH Trend – June 2018

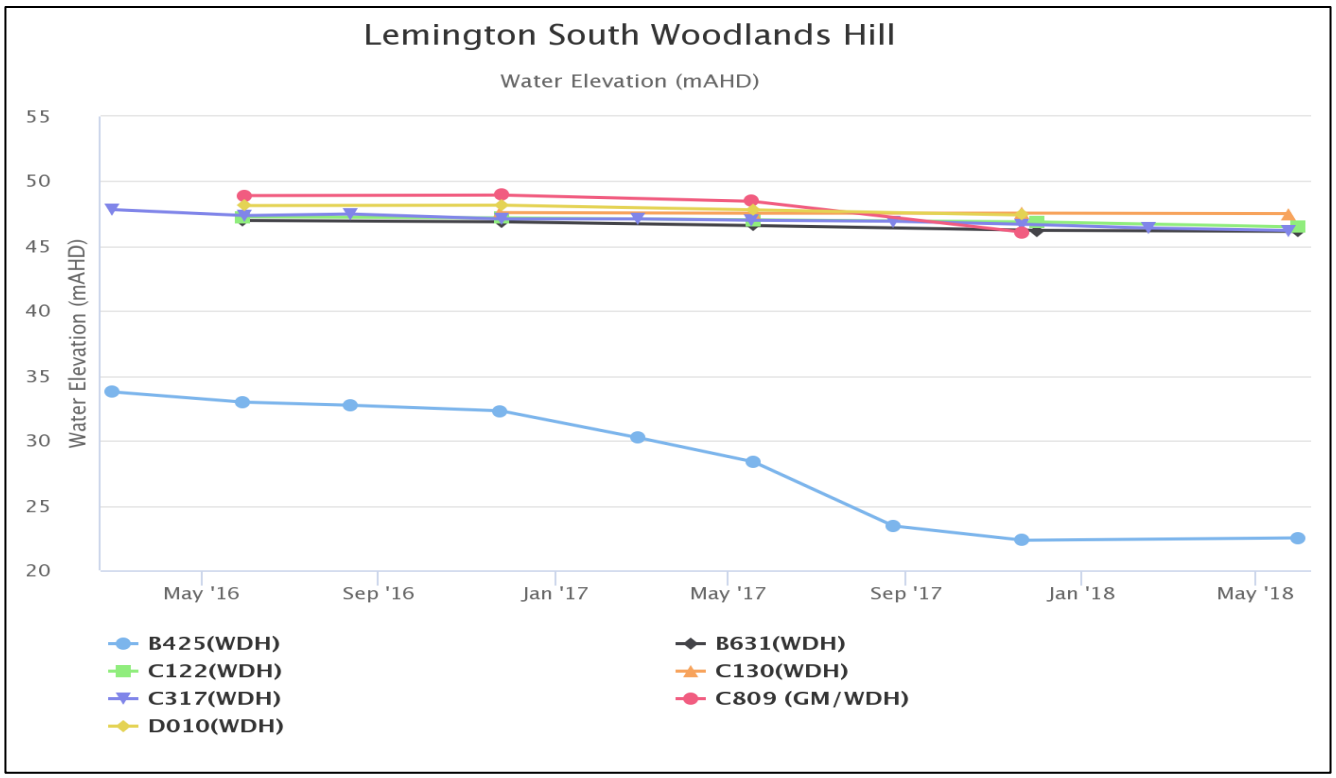


Figure 58: Lemington South Woodlands Hill Standing Water Level – June 2018

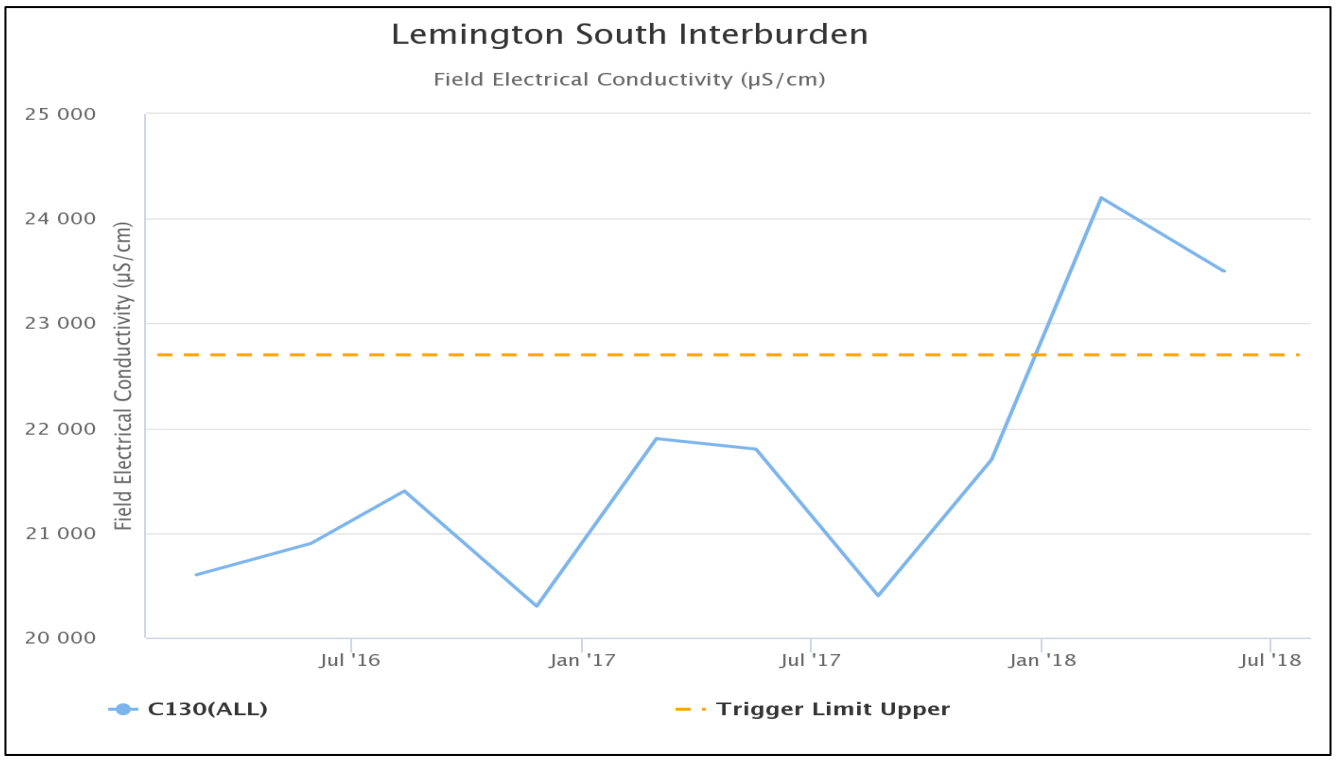


Figure 59: Lemington South Interburden Electrical Conductivity Trend – June 2018

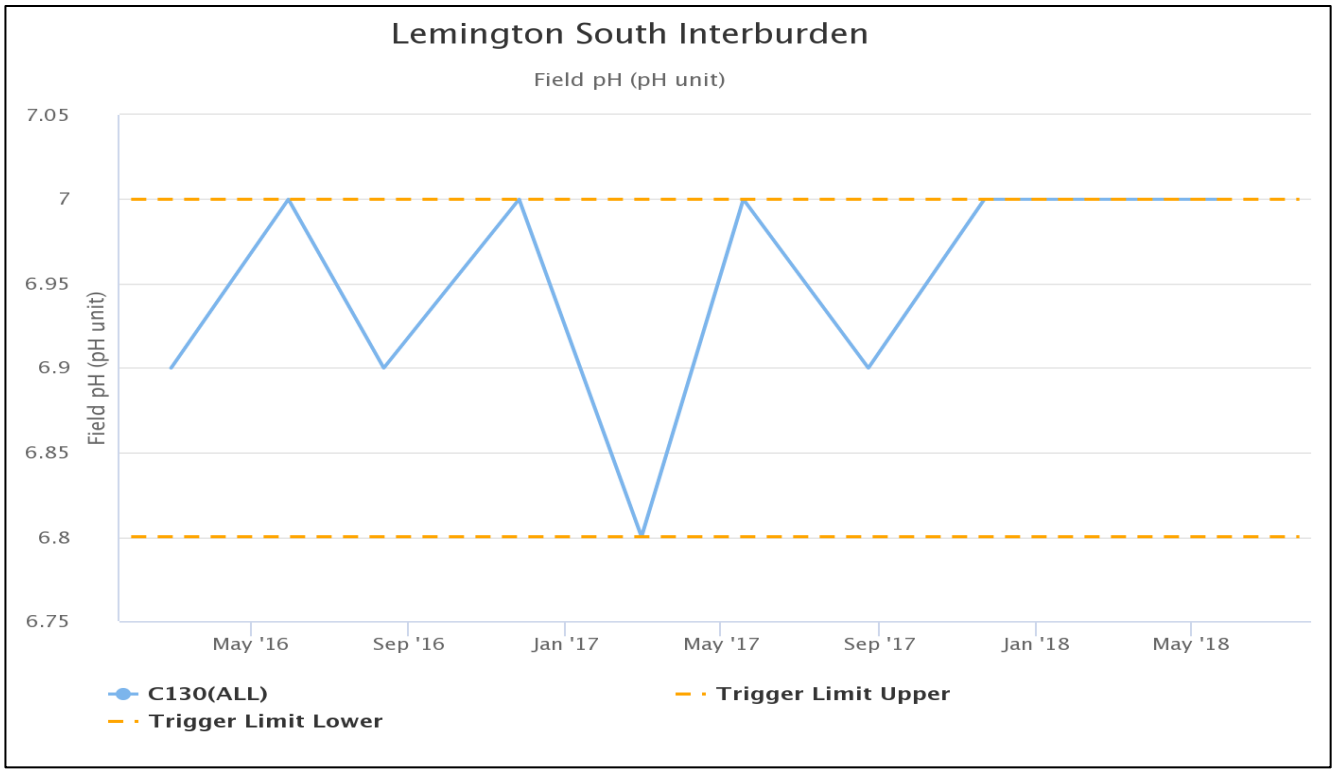


Figure 60: Lemington South Interburden pH Trend – June 2018

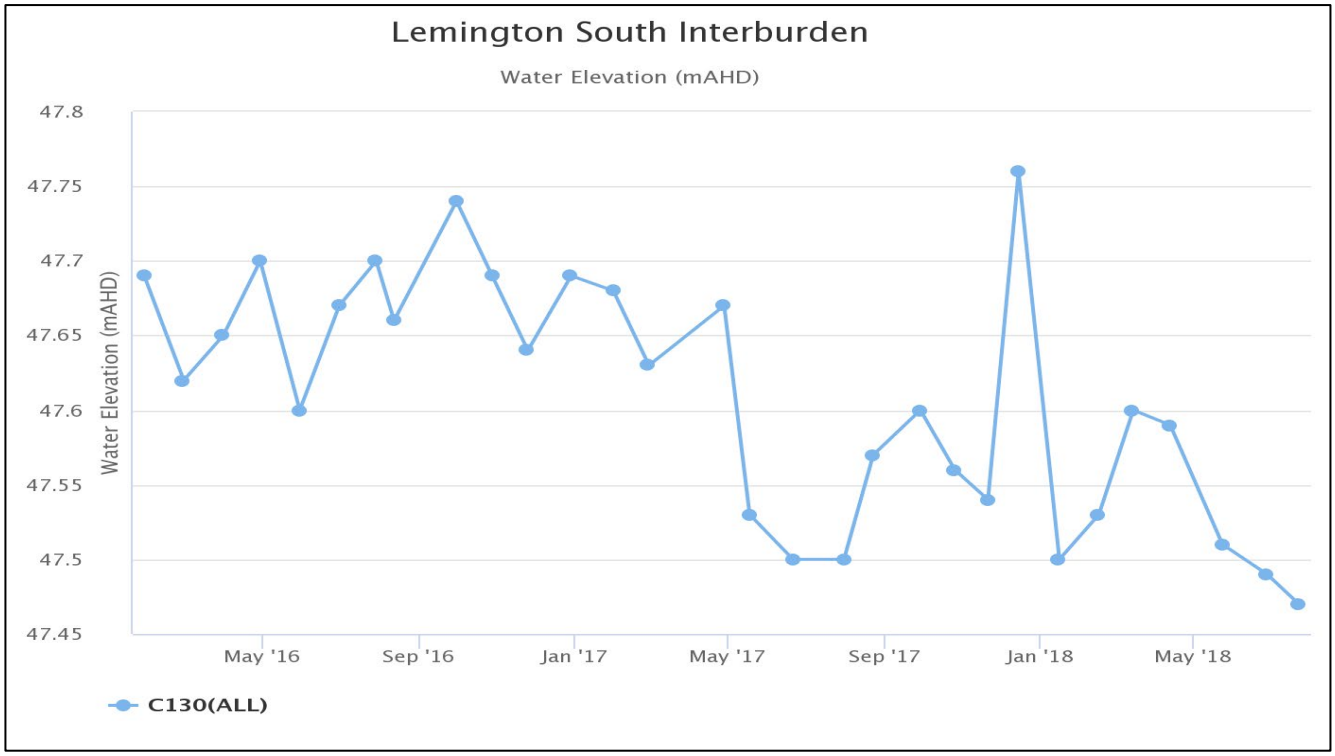


Figure 61: Lemington South Interburden Standing Water Level – June 2018

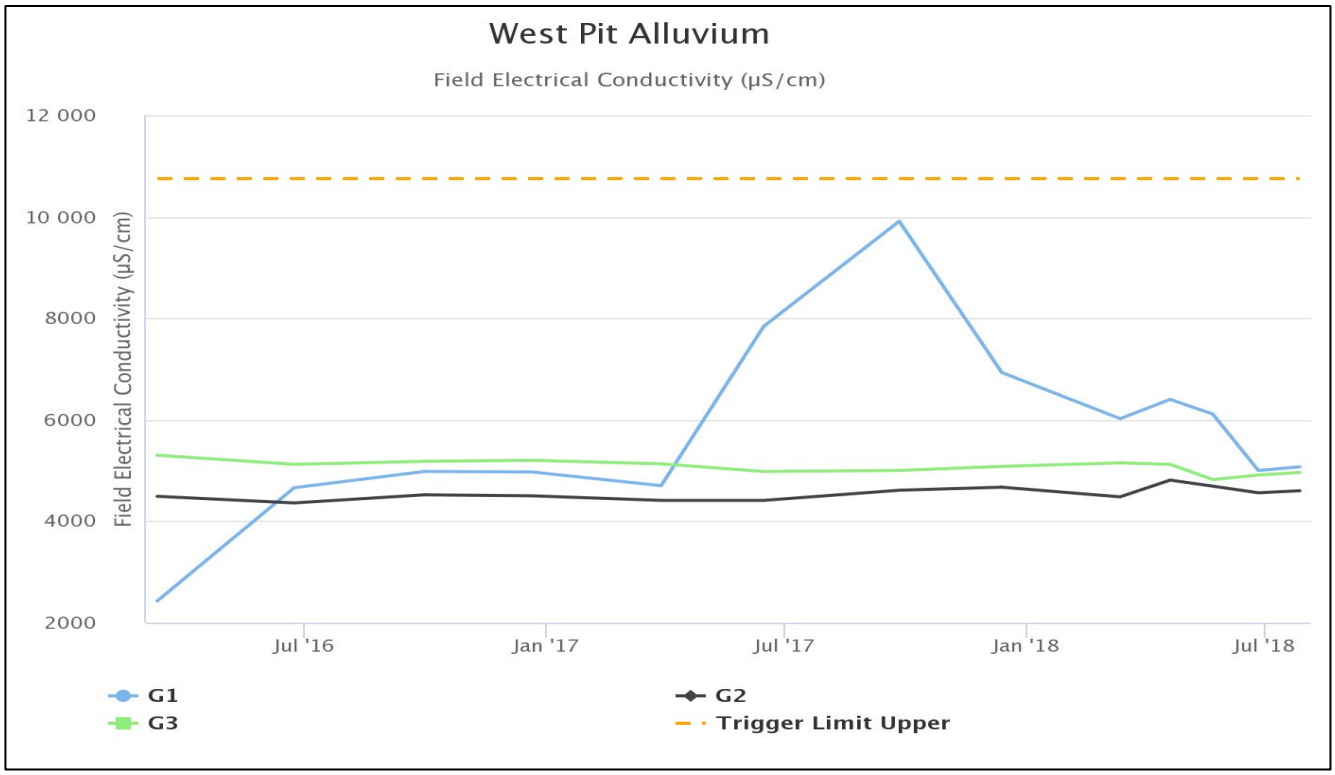


Figure 62: West Pit Alluvium Electrical Conductivity Trend – June 2018

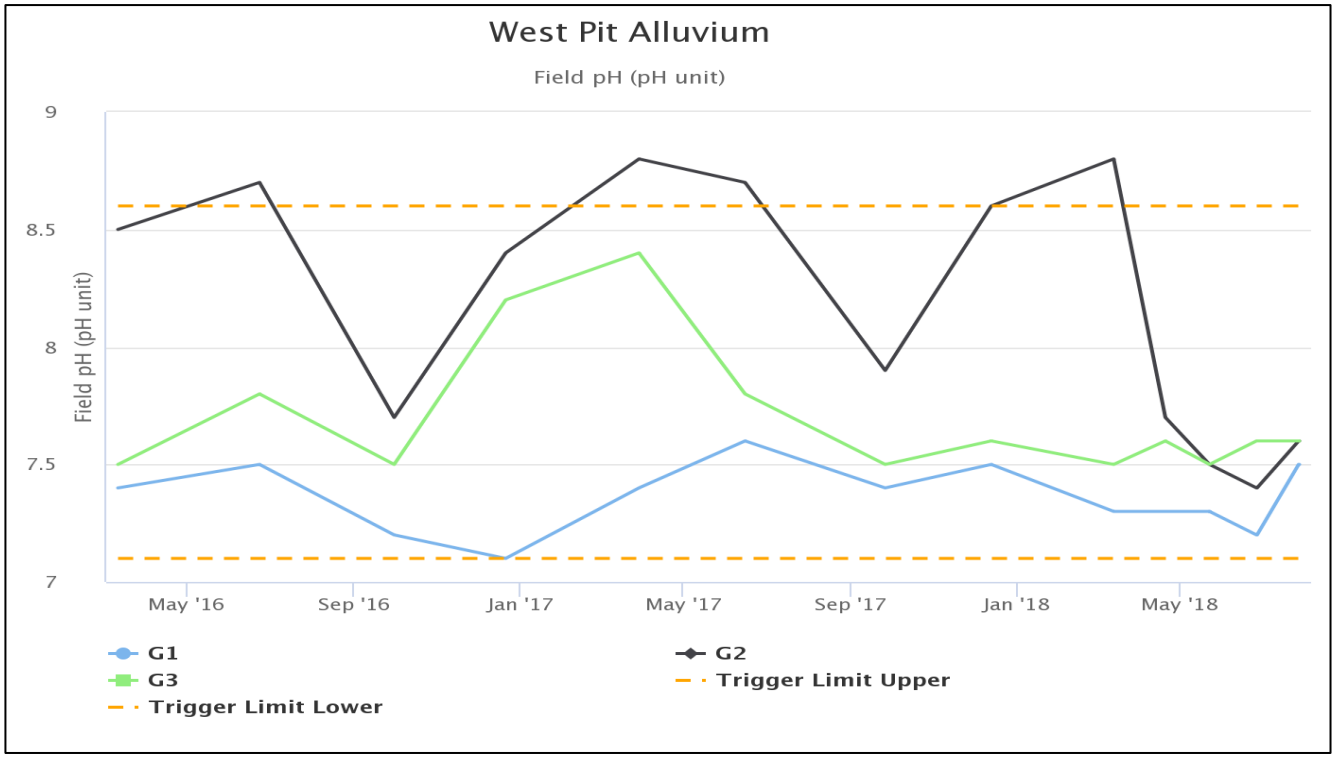


Figure 63: West Pit Alluvium pH Trend – June 2018

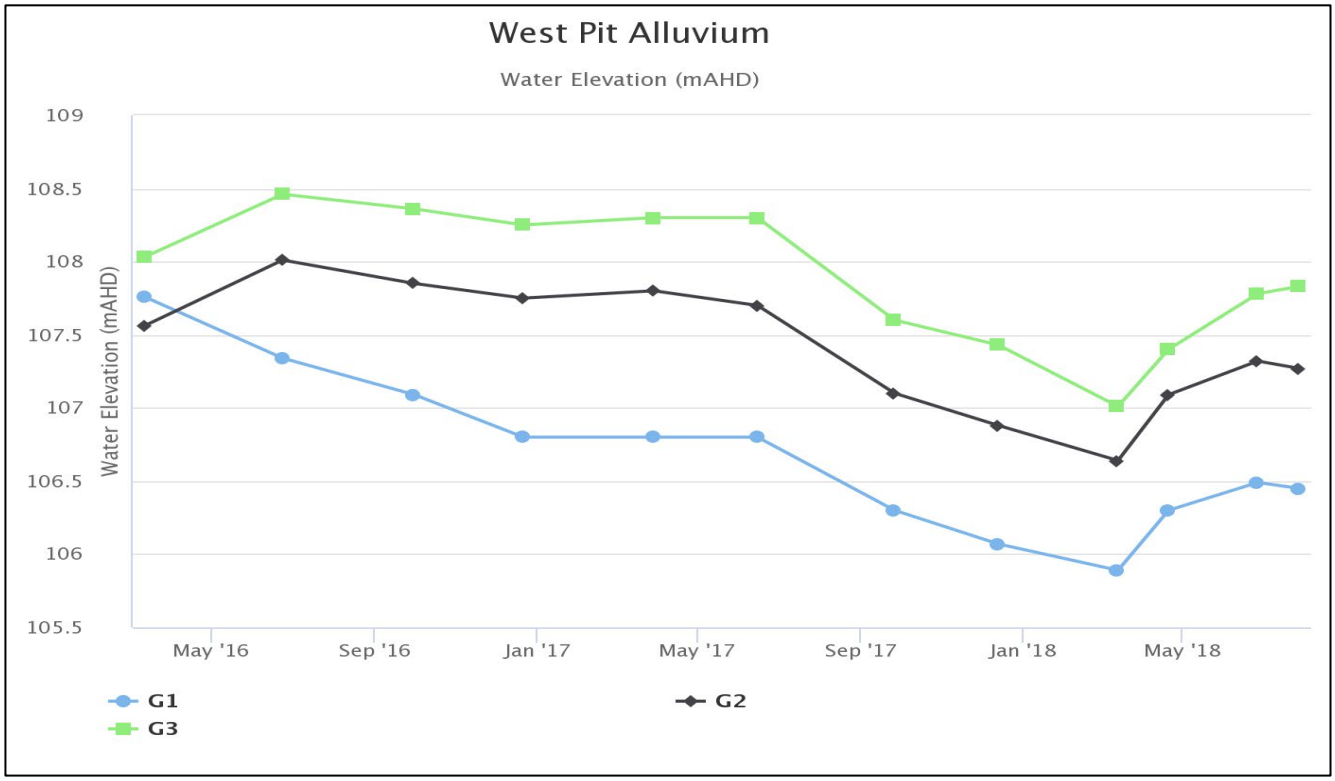


Figure 64: West Pit Alluvium Standing Water Level – June 2018

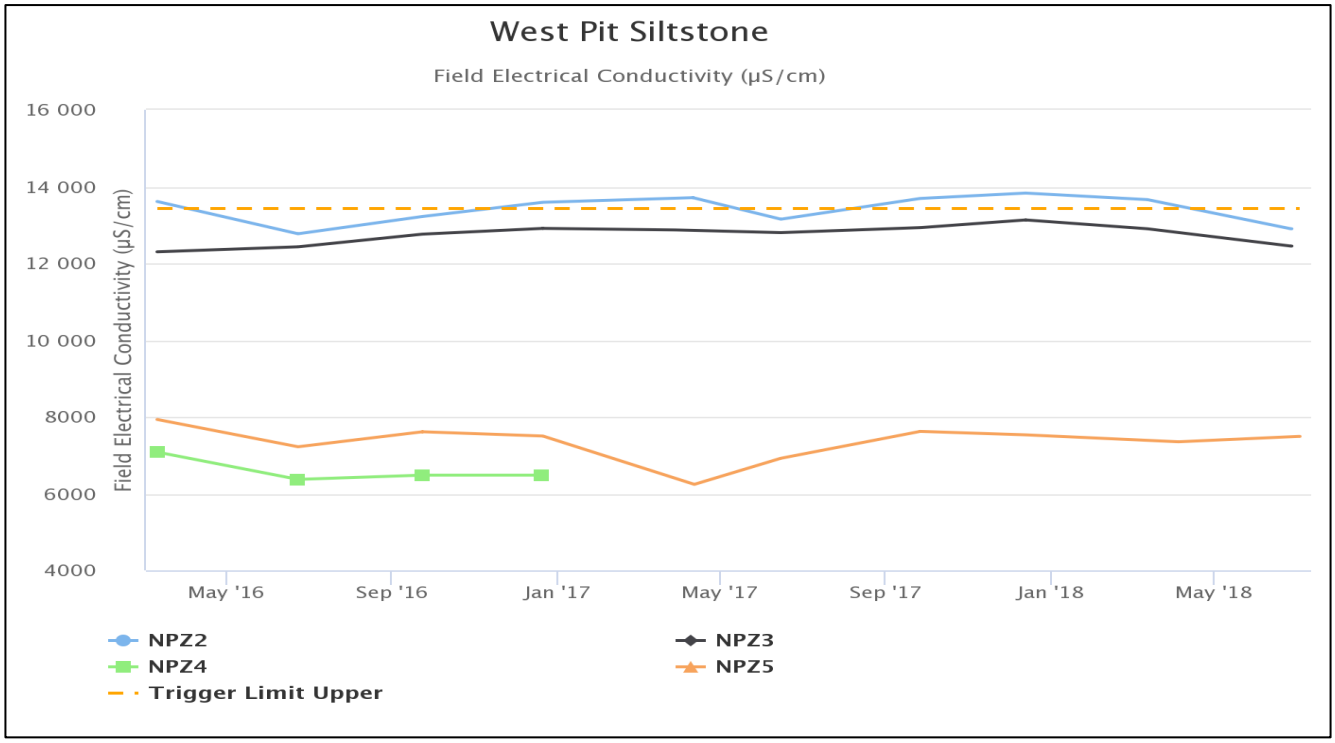


Figure 65: West Pit Siltstone Electrical Conductivity Trend – June 2018

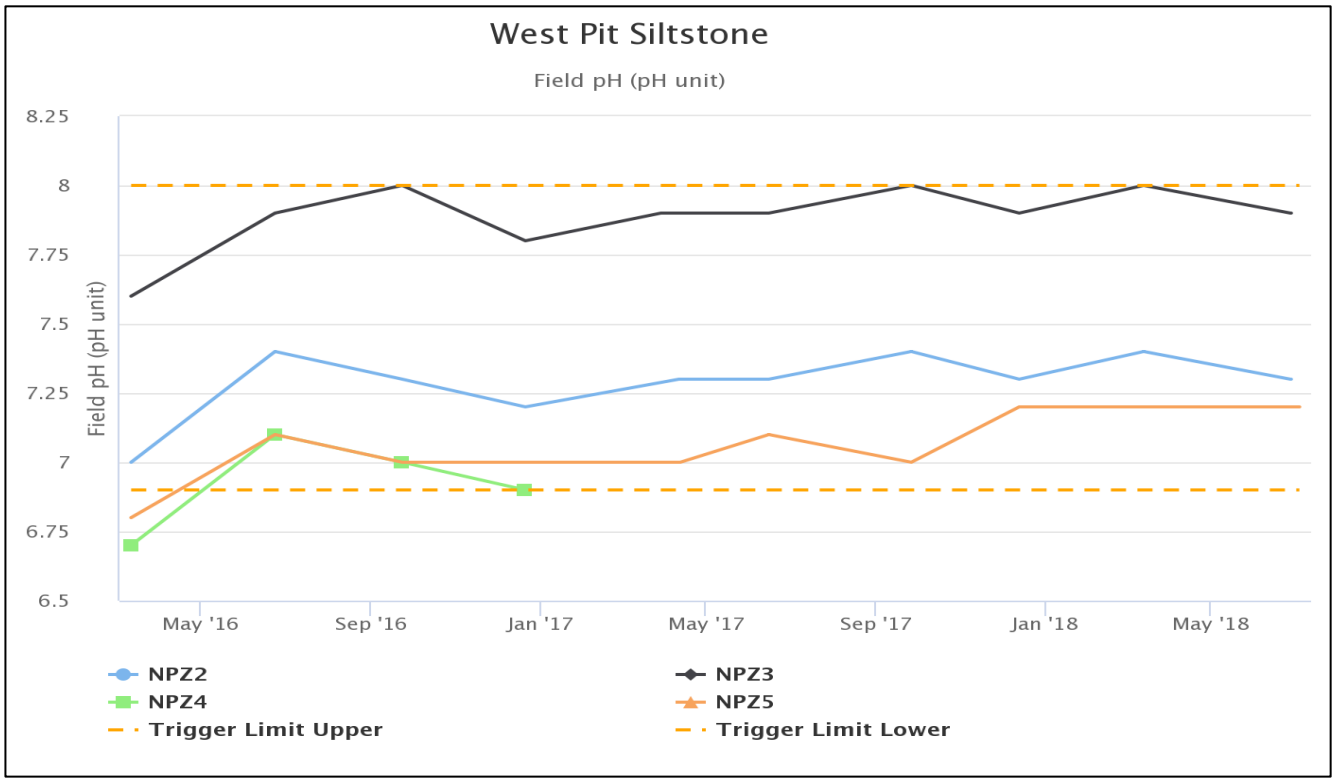


Figure 66: West Pit Siltstone pH Trend – June 2018

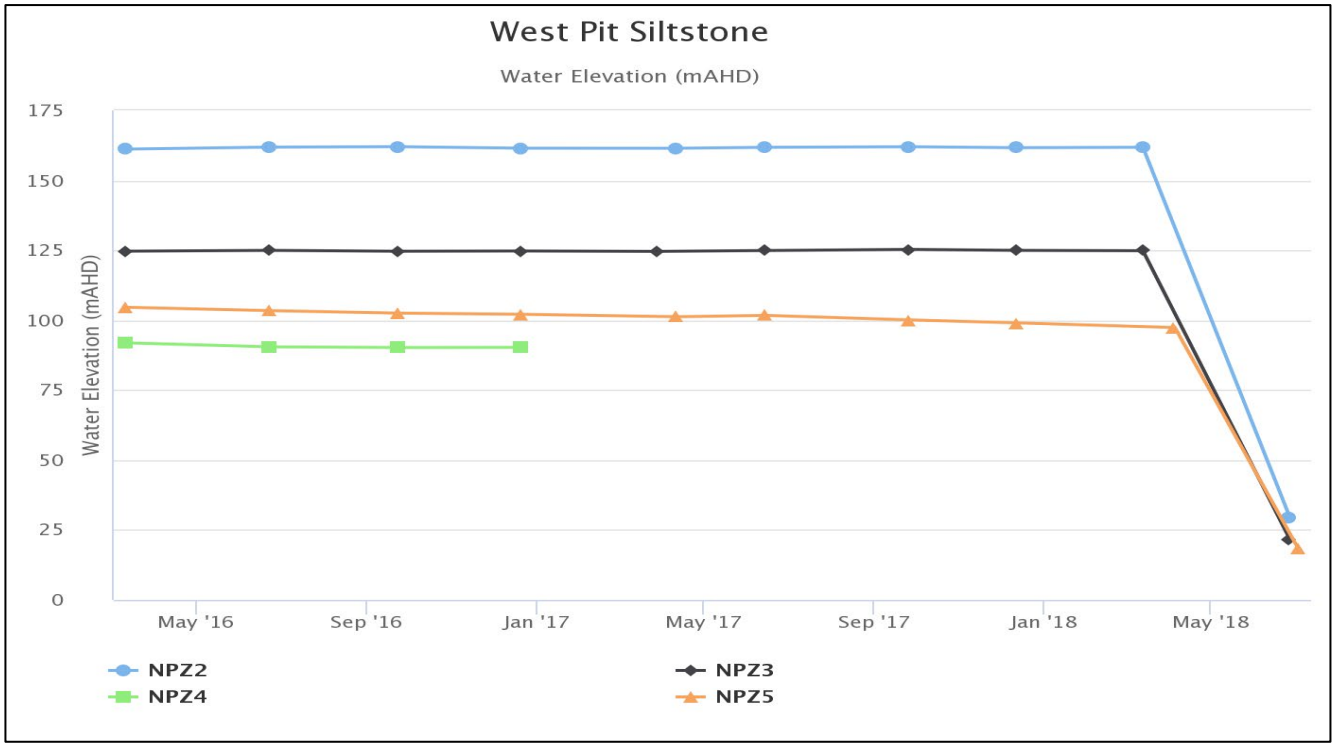


Figure 67: West Pit Siltstone Standing Water Level – June 2018

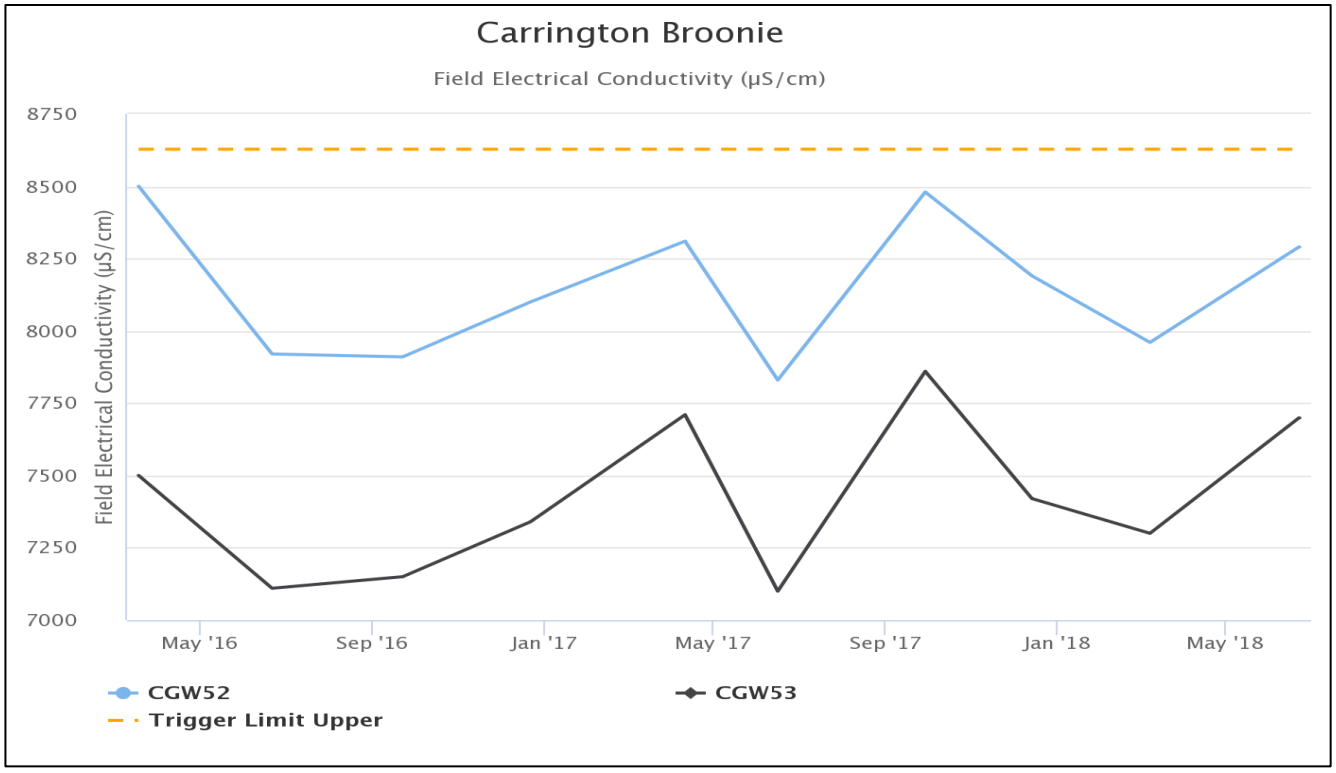


Figure 68: Carrington Broonie Electrical Conductivity Trend – June 2018

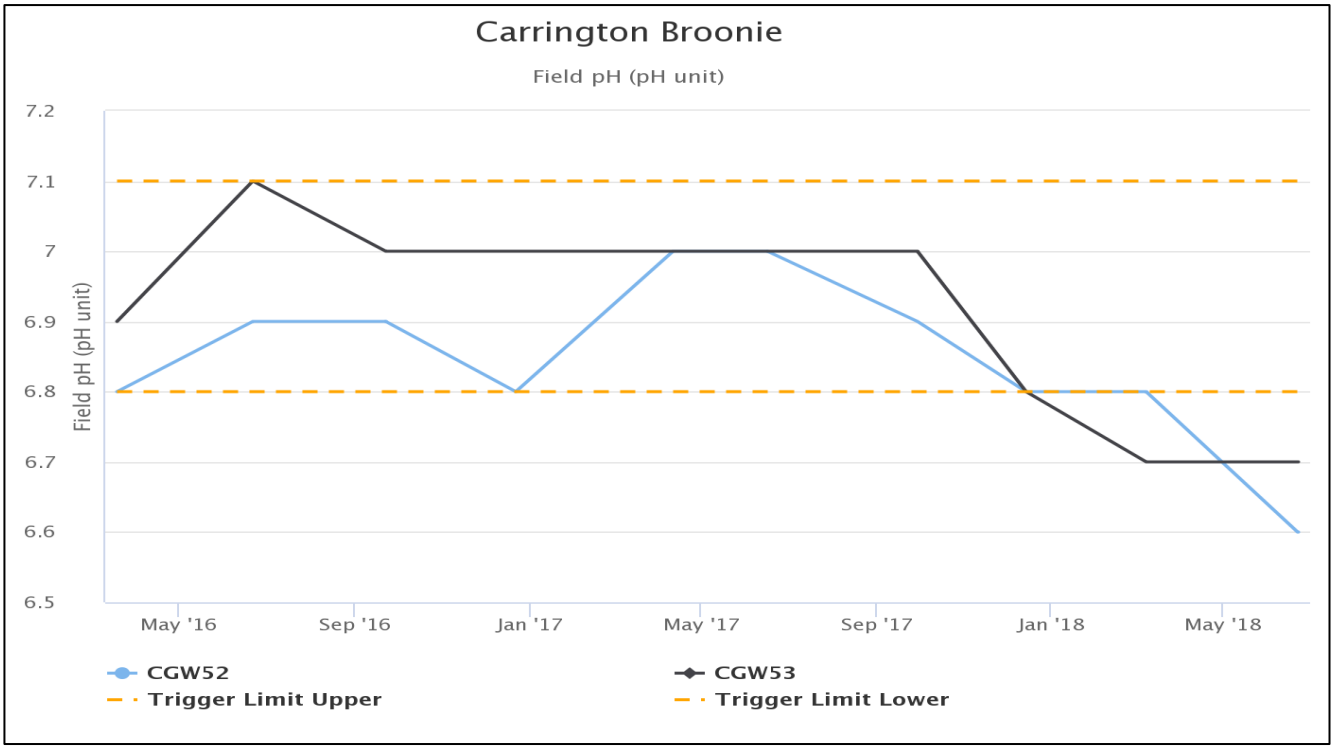


Figure 69: Carrington Broonie pH Trend – June 2018

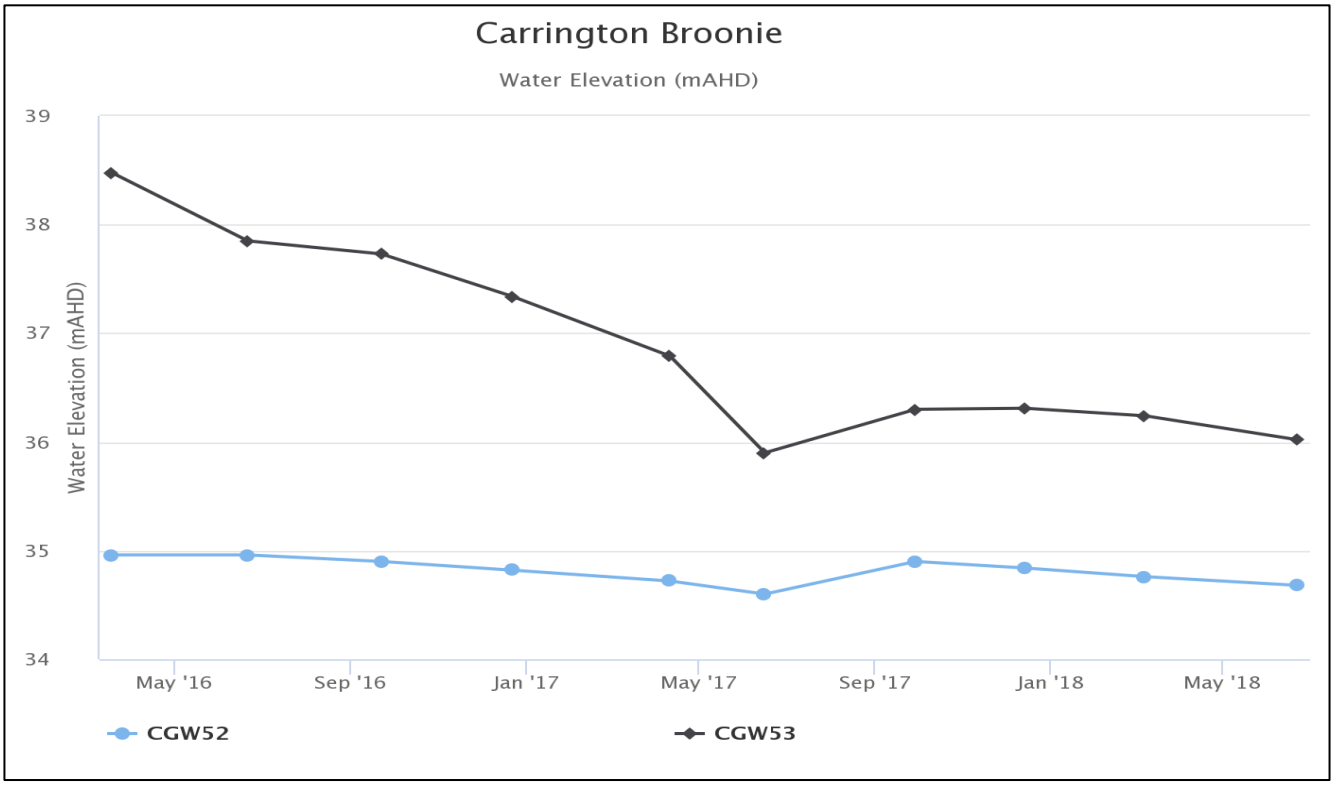


Figure 70: Carrington Broonie Standing Water Level – June 2018

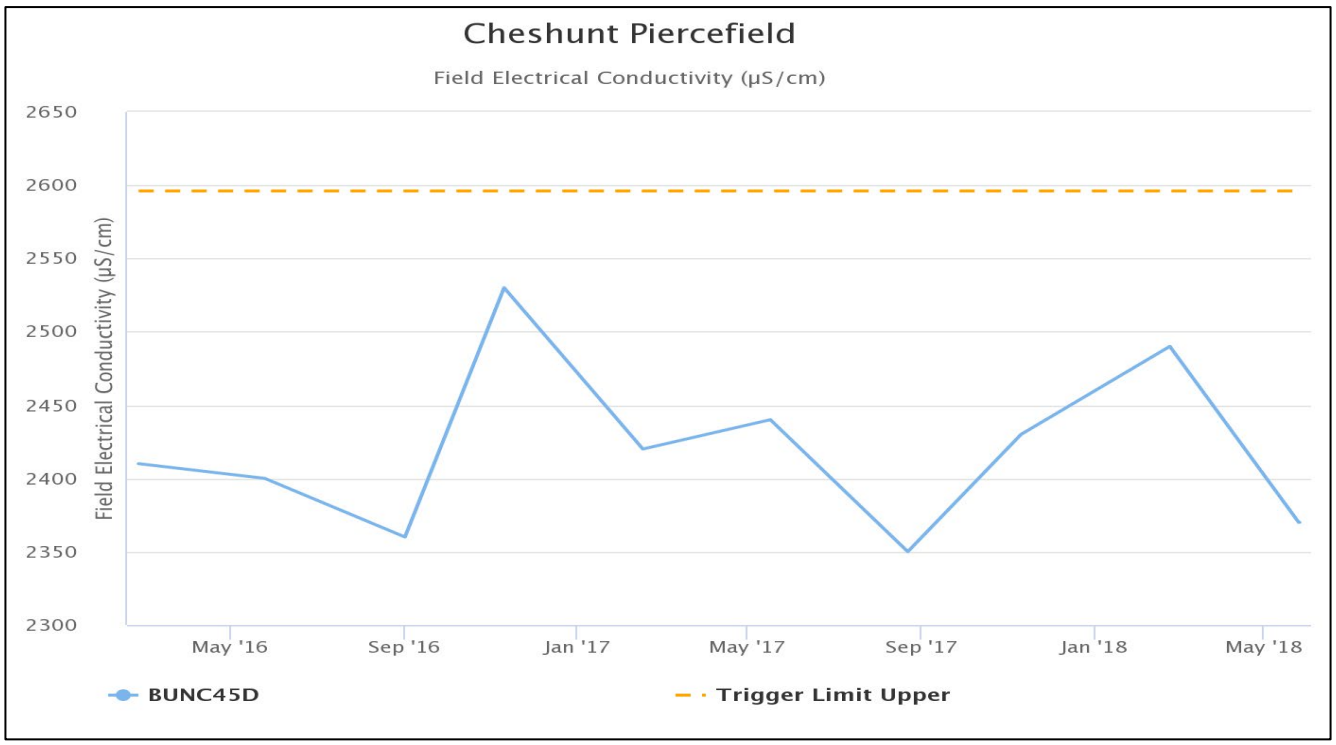


Figure 71: Cheshunt Piercefield Electrical Conductivity Trend – June 2018

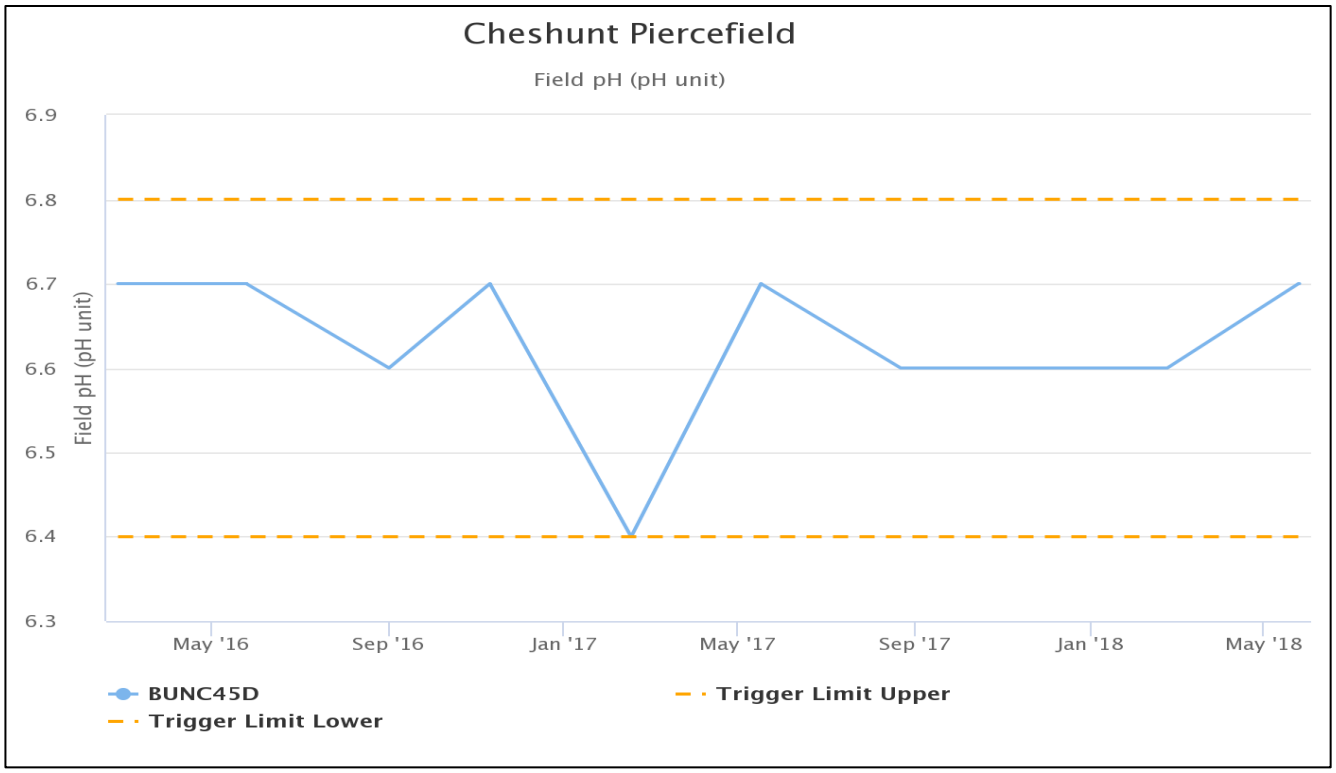


Figure 72: Cheshunt Piercefield pH Trend – June 2018

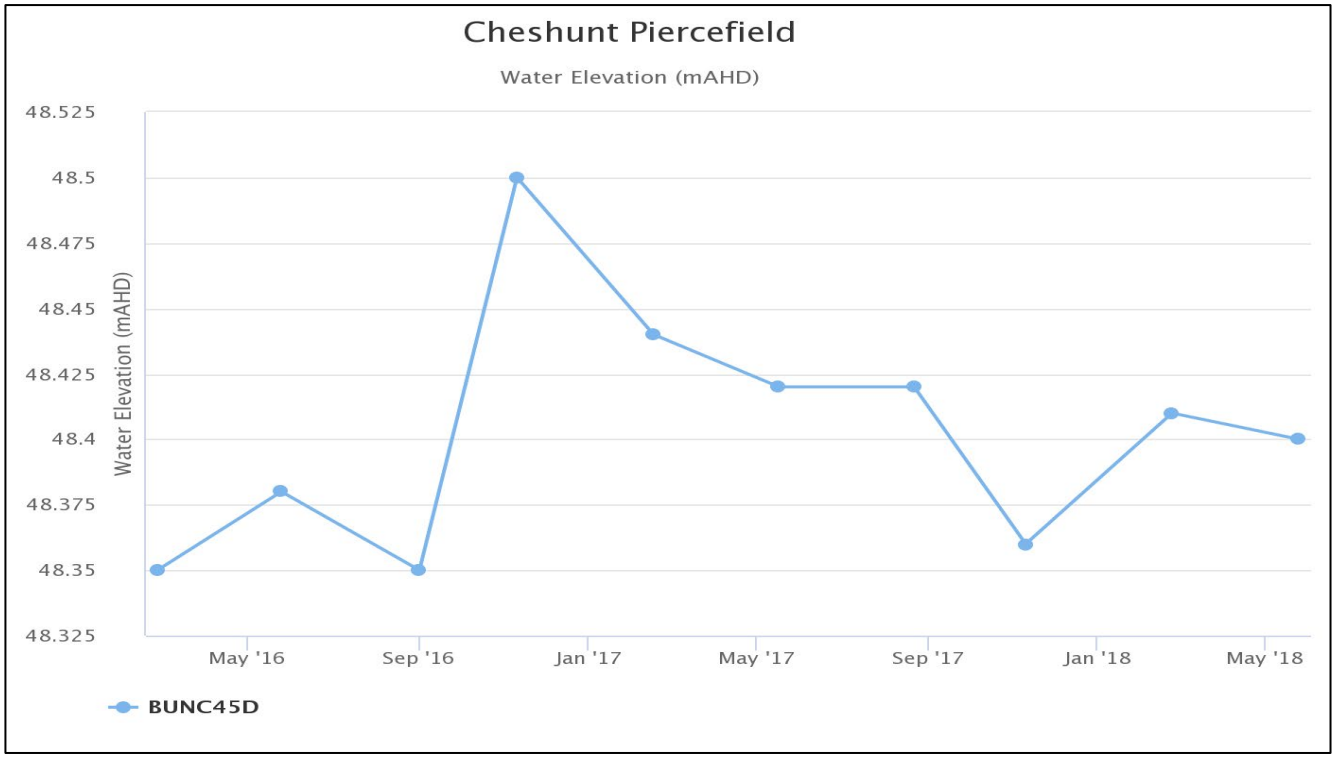


Figure 73: Cheshunt Piercefield Standing Water Level – June 2018

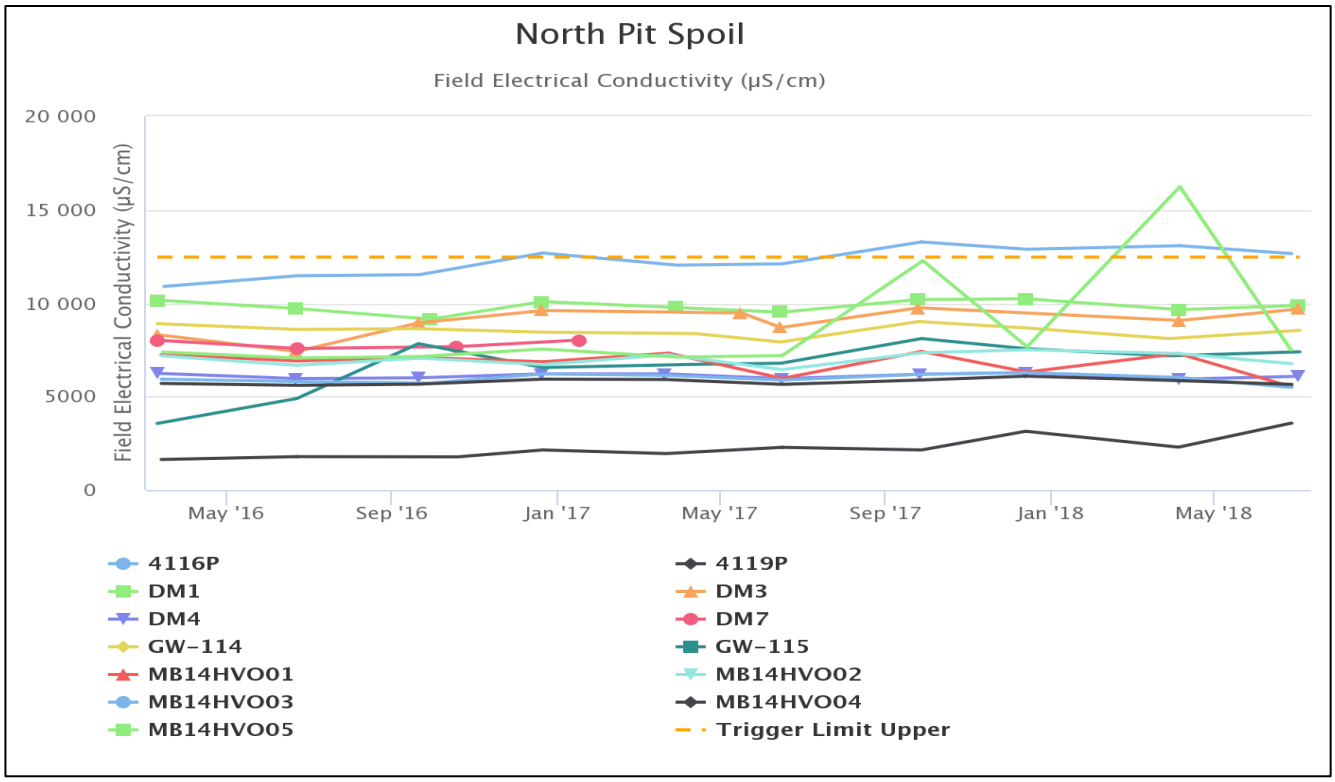


Figure 74: North Pit Spoil Electrical Conductivity Trend – June 2018

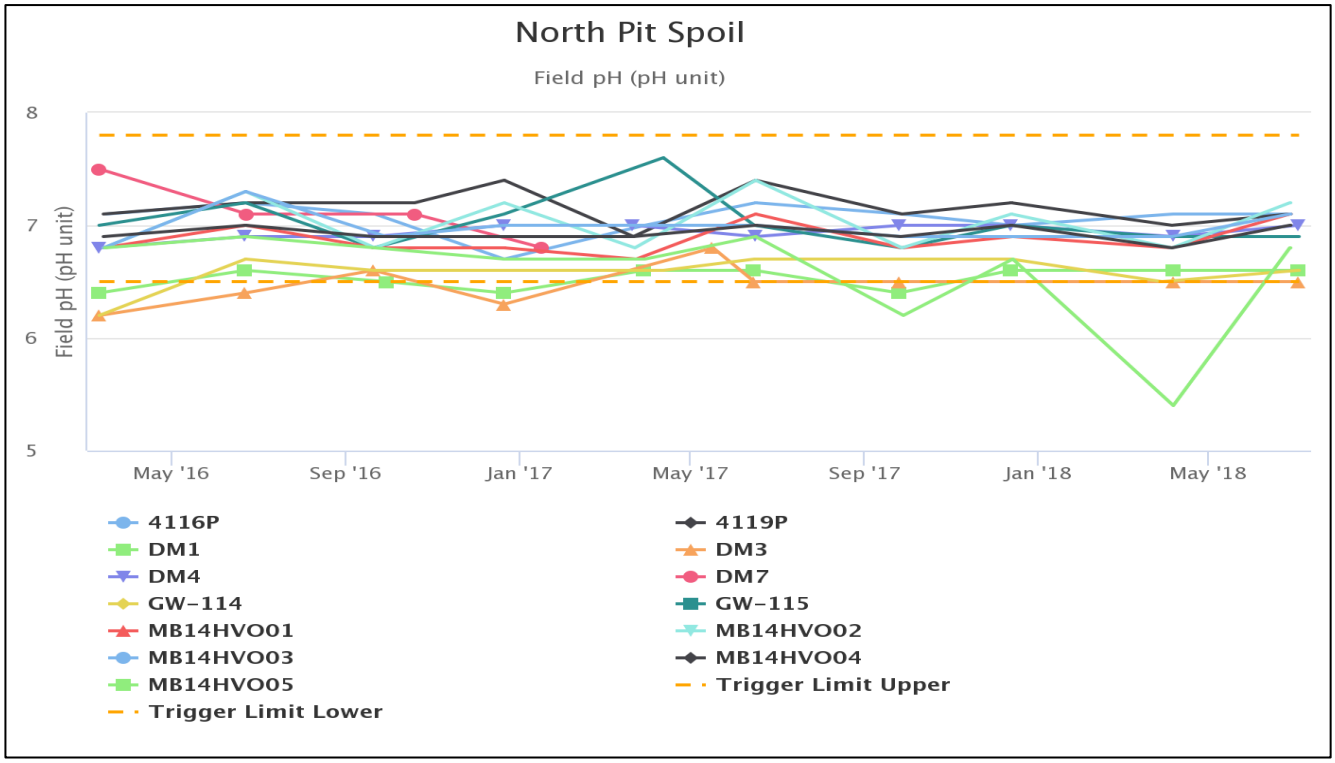


Figure 75: North Pit Spoil pH Trend – June 2018

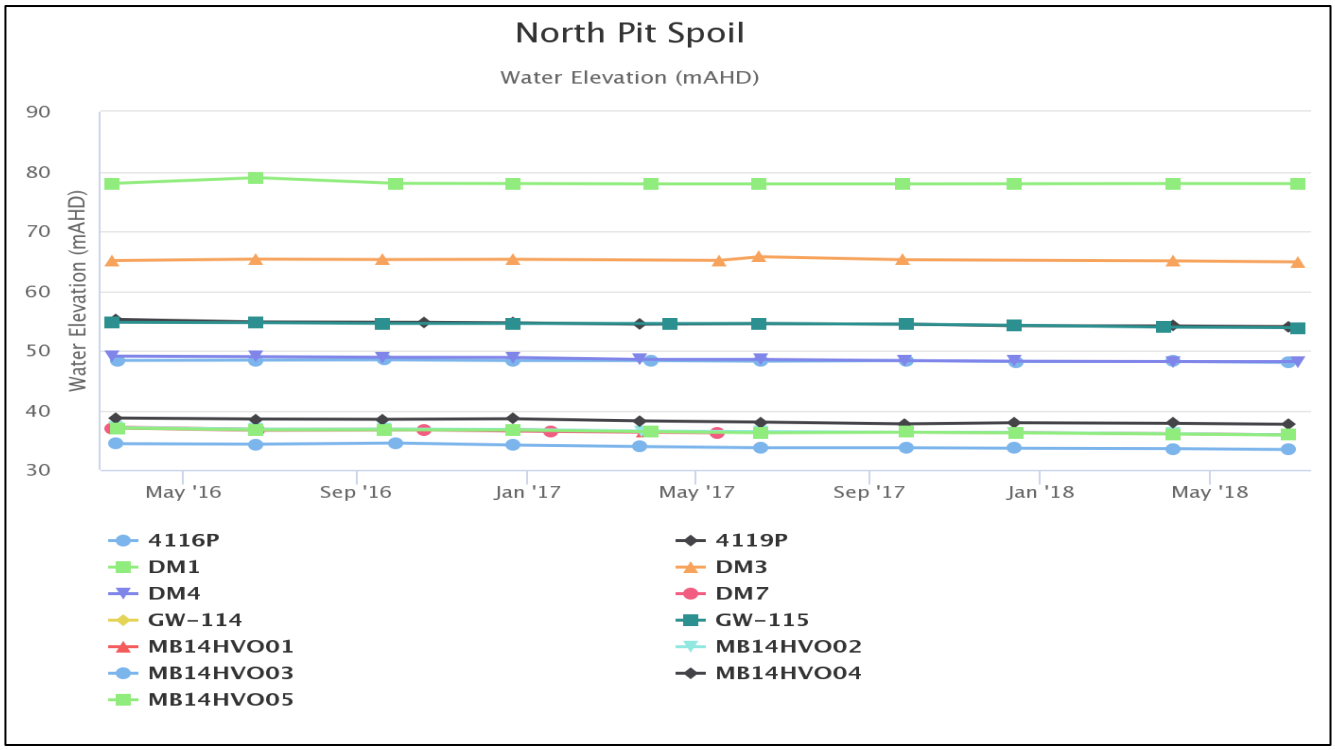


Figure 76: North Pit Spoil Standing Water Level – June 2018

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.

Current internal trigger limits breaches are summarised in Table 4.

Table 4: Groundwater Triggers - 2018

Site	Date	Trigger Limit Breached	Action Taken in Response
CFW55R	29/03/2018	EC – 95th Percentile	Investigation currently in progress
CFW55R	19/04/2018	EC – 95th Percentile	
CFW55R	21/05/2018	EC – 95th Percentile	
CFW55R	27/06/2018	EC – 95th Percentile	
4116P	27/08/2017	EC – 95th Percentile	Watching Brief*
4116P	14/12/2017	EC – 95th Percentile	Watching Brief*
4116P	6/04/2017	EC – 95th Percentile	Watching Brief*
4116P	27/06/2017	EC – 95th Percentile	Investigation commenced
CGW49	22/06/2018	EC – 95th Percentile	Watching Brief*
C130(WDH)	18/05/2017	EC – 95th Percentile	Watching Brief*
C130(WDH)	20/11/2017	EC – 95th Percentile	Watching Brief*
C130(WDH)	24/05/2018	EC – 95th Percentile	Investigation commenced
D612 (AFS)	17/05/2017	EC – 95th Percentile	Watching Brief*
D612 (AFS)	20/11/2017	EC – 95th Percentile	Watching Brief*
D612 (AFS)	24/05/2017	EC – 95th Percentile	Investigation commenced
PB01(ALL)	21/11/2017	EC – 95th Percentile	Watching Brief*
PB01(ALL)	16/02/2018	EC – 95th Percentile	Watching Brief*
PB01(ALL)	24/05/2018	EC – 95th Percentile	Investigation commenced

NPz2	26/09/2017	EC – 95th Percentile	Watching Brief*
NPz2	13/12/2017	EC – 95th Percentile	Watching Brief*
NPz2	13/03/2018	EC – 95th Percentile	Investigation commenced
GW-100	13/03/2018	EC – 95th Percentile	Watching Brief*
C130(ALL)	16/02/2018	EC – 95th Percentile	Watching Brief*
C130(ALL)	24/05/2018	EC – 95th Percentile	Watching Brief*
PB01(ALL)	16/02/2018	EC – 95th Percentile	Watching Brief*
BZ3-1	22/02/2018	pH – 95th Percentile	Watching Brief*
G2	13/12/2017	PH – 95th Percentile	Watching Brief*
G2	13/03/2018	PH – 95th Percentile	Watching Brief*
Hobdens Well	25/05/2018	PH – 95th Percentile	Watching Brief*
NPz3	13/03/2018	pH – 95th Percentile	Watching Brief*
BZ4A(2)	22/02/2018	PH – 5th Percentile	Watching Brief*
BZ8-2	25/05/2018	PH – 5th Percentile	Watching Brief*
CFW55R	14/12/2017	PH – 5th Percentile	Investigation currently in progress
CFW55R	29/03/2018	PH – 5th Percentile	
CFW55R	19/04/2018	PH – 5th Percentile	
CFW55R	21/05/2018	PH – 5th Percentile	
CFW55R	27/06/2018	PH – 5th Percentile	
CGW52	22/06/2018	pH – 5th Percentile	Watching Brief*
CGW53	8/03/2018	pH – 5th Percentile	Watching Brief*
CGW53	22/06/2018	pH – 5th Percentile	Watching Brief*
GW_106	29/03/2018	pH – 5th Percentile	Watching Brief*

HG2	10/11/2017	pH – 5th Percentile	Watching Brief*
HG2	23/02/2018	pH – 5th Percentile	Watching Brief*
HG2	25/05/2018	pH – 5th Percentile	Investigation commenced
MB14HVO05	6/04/2018	pH – 5th Percentile	Watching Brief*

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

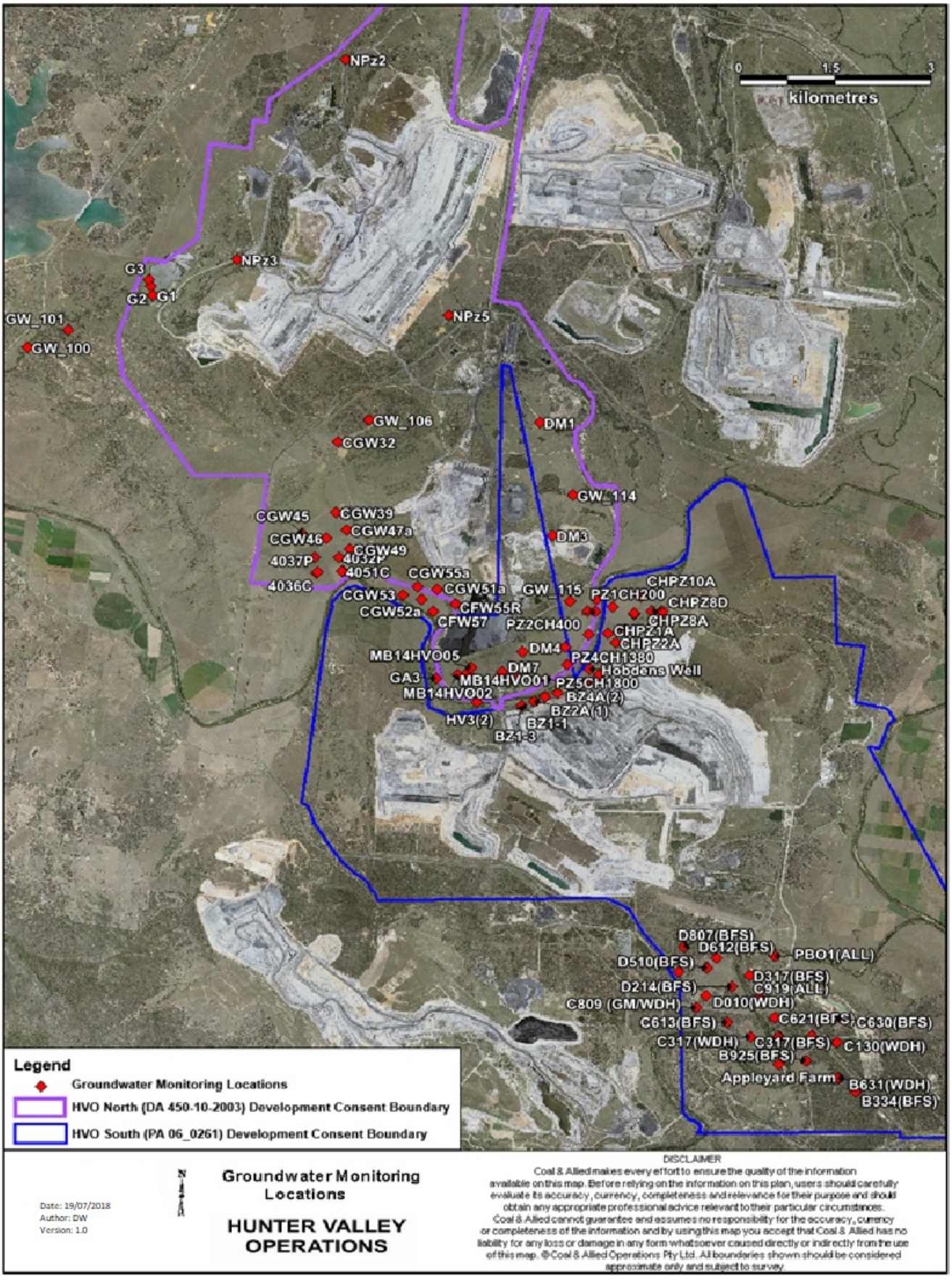


Figure 77: Groundwater Monitoring Location Plan

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 June, 18 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 5.

Table 5: 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.

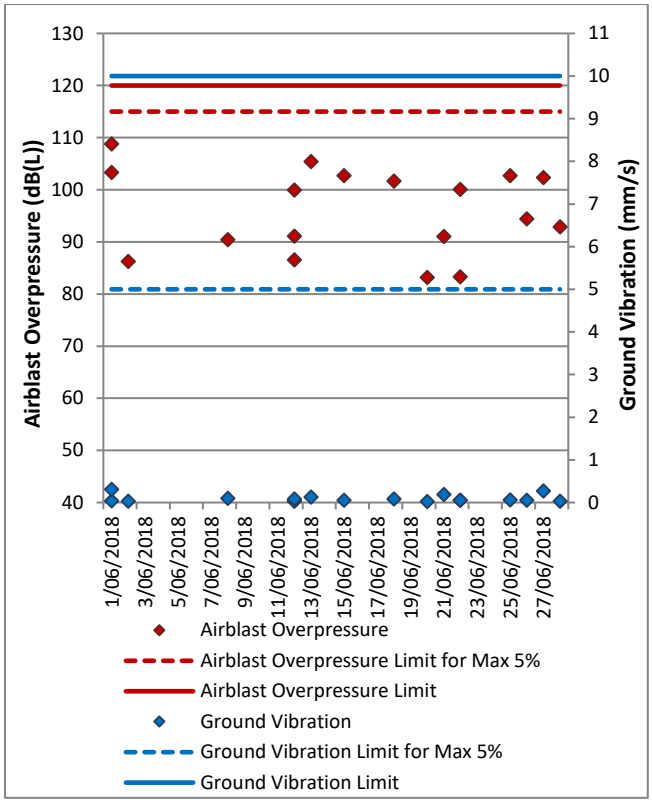


Figure 78: Moses Crossing Blast Monitoring Results – June 2018

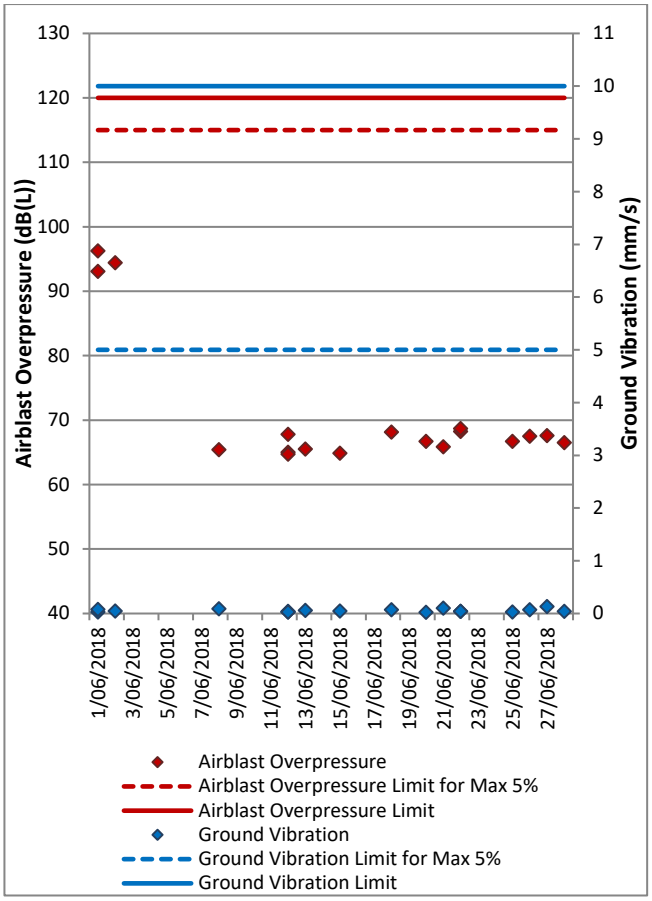


Figure 79: Jerrys Plains Blast Monitoring Results – March 2018

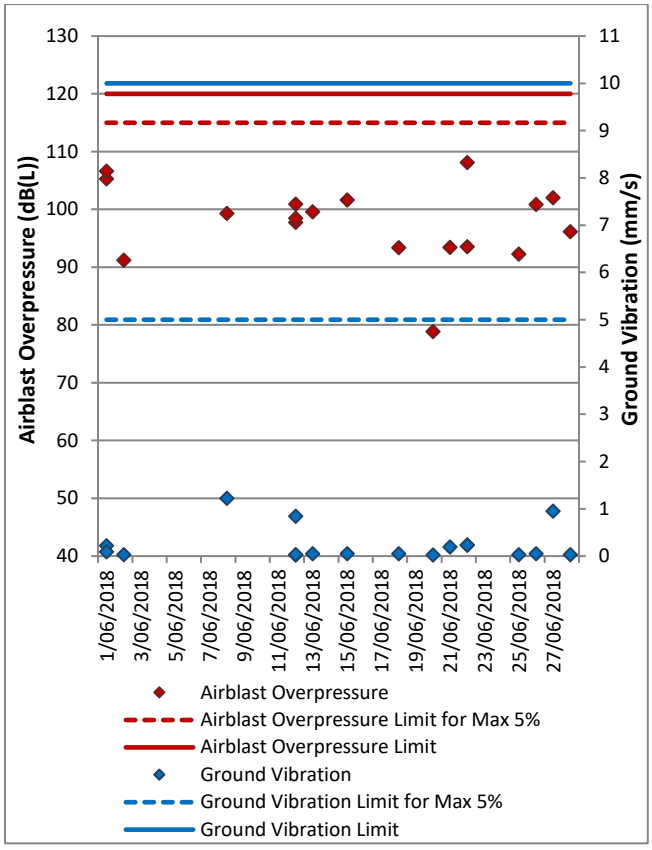


Figure 80: Maison Dieu Blast Monitoring Results – June 2018

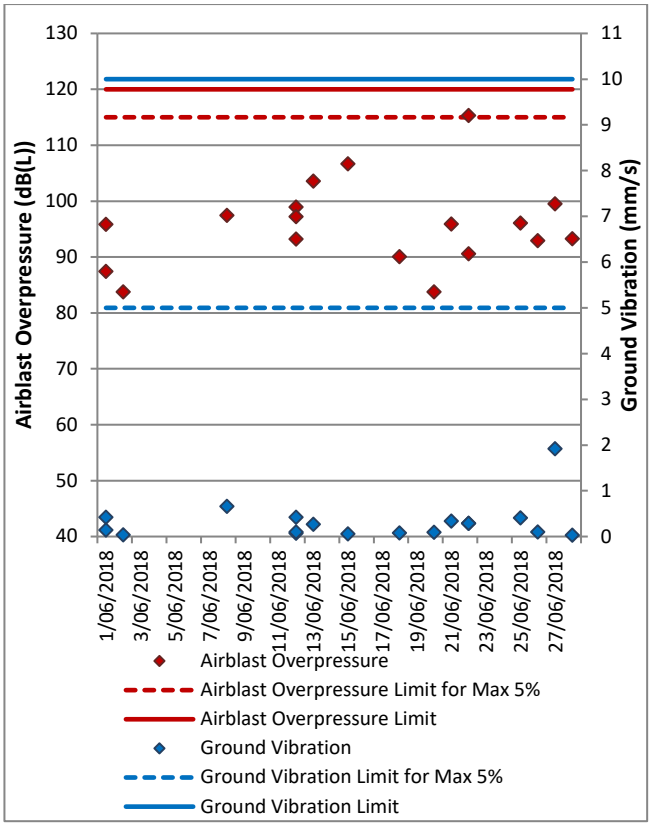


Figure 81: Warkworth Blast Monitoring Results – June 2018

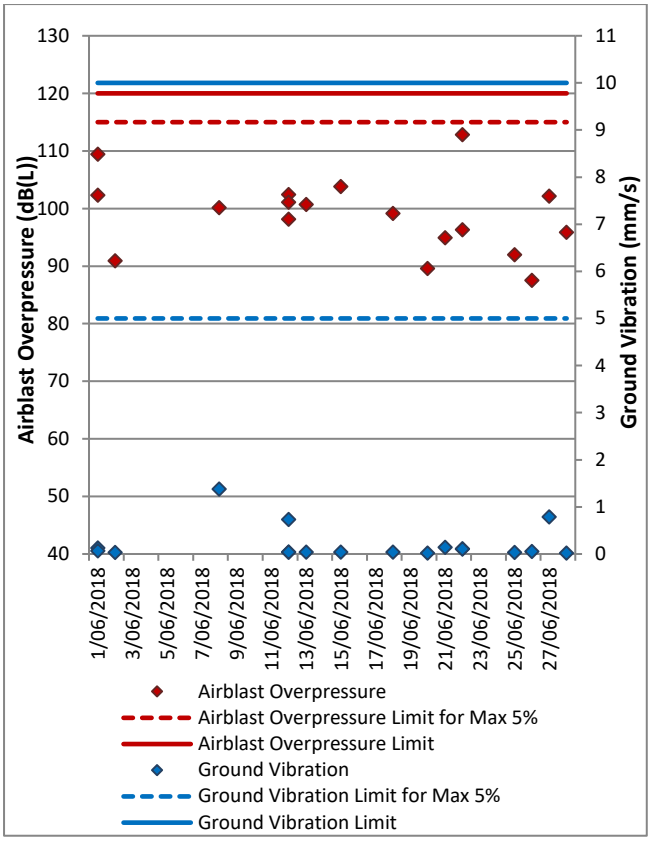


Figure 82: Knodlers Lane Blast Monitoring Results – June 2018

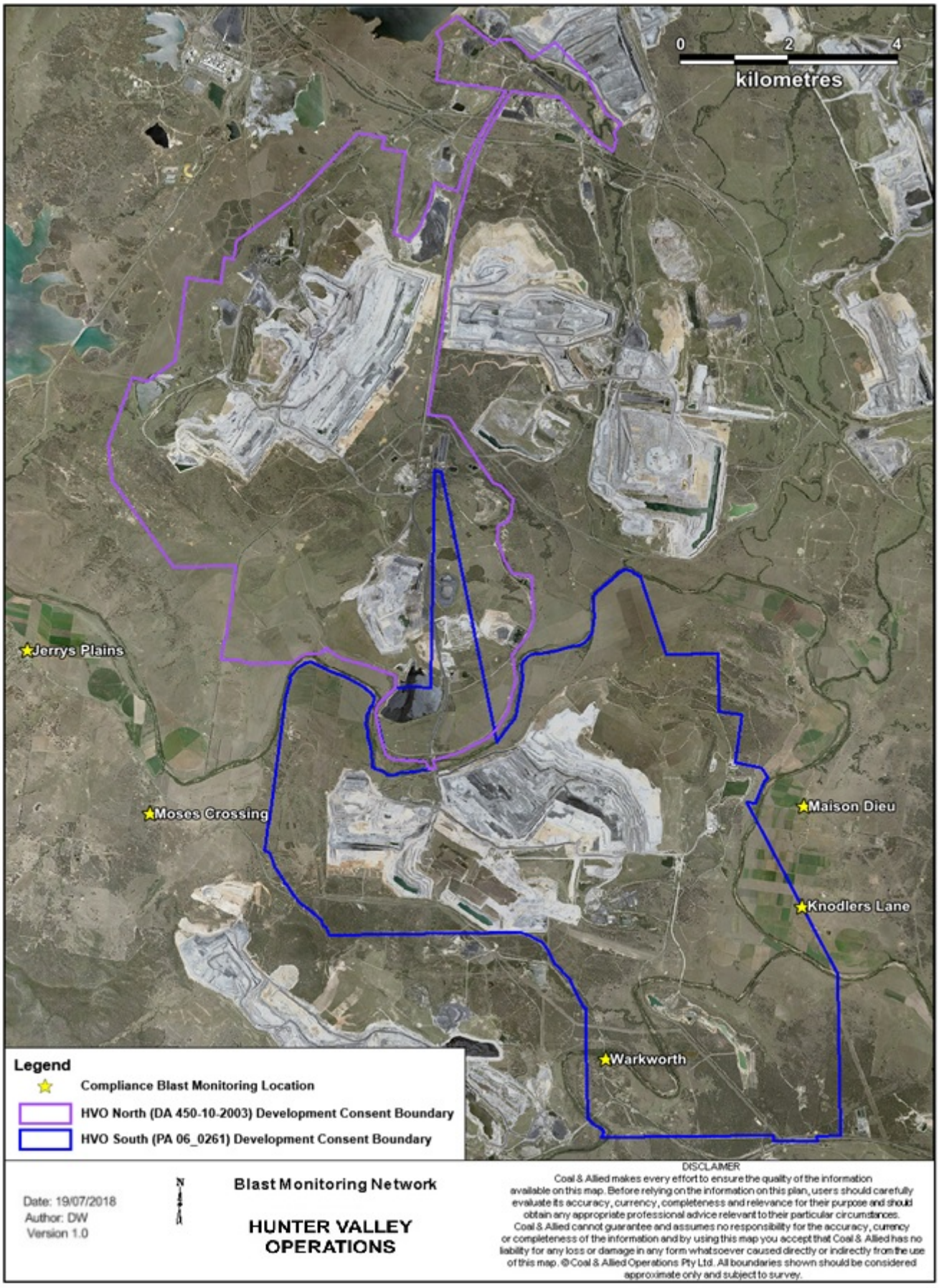


Figure 83: Blast Monitoring Location Plan

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 night shift of 20 and 22 June 2018. Monitoring results are detailed in Table 6 to Table 11 .

Table 6: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB3[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018 22:18	1	-1	37	Yes	27	Nil
Maison Dieu	20/06/2018 21:46	0.8	-1	37	Yes	33	Nil
Shearers Lane	20/06/2018 21:01	0.8	0.5	41	Yes	36	Nil
Kilburnie South	20/06/2018 22:54	0.3	3	36	No	IA	NA
Jerrys Plains Village	20/06/2018 21:29	0.9	-1	35	Yes	<30	Nil
Jerrys Plains East	20/06/2018 21:00	0.8	0.5	35	Yes	<30	Nil
Long Point Road	20/06/2018 23:40	0.2	3	55	No	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	35	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

Table 7: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018 22:18	1	-1	41	Yes	27	Nil
Maison Dieu	20/06/2018 21:46	0.8	-1	41	Yes	33	Nil
Shearers Lane	20/06/2018 21:01	0.8	0.5	41	Yes	36	Nil
Kilburnie South	20/06/2018 22:54	0.3	3	41	No	IA	NA
Jerrys Plains Village	20/06/2018 21:29	0.9	-1	40	Yes	<30	Nil
Jerrys Plains East	20/06/2018 21:00	0.8	0.5	40	Yes	<30	Nil
Long Point Road	20/06/2018 23:40	0.2	3	NA	NA	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	40	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

Table 8: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018 22:18	1	-1	45	Yes	39	Nil
Maison Dieu	20/06/2018 21:46	0.8	-1	45	Yes	36	Nil
Shearers Lane	20/06/2018 21:01	0.8	0.5	45	Yes	42	Nil
Kilburnie South	20/06/2018 22:54	0.3	3	45	No	IA	NA
Jerrys Plains Village	20/06/2018 21:29	0.9	-1	45	Yes	43	Nil
Jerrys Plains East	20/06/2018 21:00	0.8	0.5	45	Yes	35	Nil
Long Point Road	20/06/2018 23:40	0.2	3	NA	NA	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	45	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

Table 9: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018	2.1	-1	35	Yes	IA	Nil
Maison Dieu	20/06/2018	1.1	3	35	Yes	IA	Nil
Shearers Lane	20/06/2018	2.1	0.5	35	Yes	NM	Nil
Kilburnie South	20/06/2018	2.2	0.5	39	No	IA	Nil
Jerrys Plains Village	20/06/2018	1.5	3	36	Yes	IA	Nil
Jerrys Plains East	20/06/2018	2.1	0.5	39	Yes	IA	Nil
Long Point Road	20/06/2018	0.7	3	NA	NA	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	35	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

Table 10: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018 22:18	2.1	-1	41	Yes	IA	Nil
Maison Dieu	20/06/2018 21:46	1.1	3	41	Yes	IA	Nil
Shearers Lane	20/06/2018 21:01	2.1	0.5	41	Yes	NM	Nil
Kilburnie South	20/06/2018 22:54	2.2	0.5	41	Yes	IA	Nil
Jerrys Plains Village	20/06/2018 21:29	1.5	3	41	Yes	IA	Nil
Jerrys Plains East	20/06/2018 21:00	2.1	0.5	41	Yes	IA	Nil
Long Point Road	20/06/2018 23:40	0.7	3	NA	NA	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	41	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

Table 11: $L_{A1, 1Minute}$ HVO North - Impact Assessment Criteria – June 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1, 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	20/06/2018 22:18	2.1	-1	46	Yes	IA	Nil
Maison Dieu	20/06/2018 21:46	1.1	3	46	Yes	IA	Nil
Shearers Lane	20/06/2018 21:01	2.1	0.5	46	Yes	NM	Nil
Kilburnie South	20/06/2018 22:54	2.2	0.5	46	Yes	IA	Nil
Jerrys Plains Village	20/06/2018 21:29	1.5	3	46	Yes	IA	Nil
Jerrys Plains East	20/06/2018 21:00	2.1	0.5	46	Yes	IA	Nil
Long Point Road	20/06/2018 23:40	0.7	3	NA	NA	<30	NA
HVGC	22/06/2018 0:20	2.4	-1	46	Yes	IA	Nil

Notes:
1. Atmospheric data is sourced from the HVO Corporate or MTW Charlton Ridge weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable.

5.2 Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During June 2018 no measurements required the penalty to be applied. The assessment for low frequency noise is shown in Table 11.

Table 12: Low Frequency Noise Assessment – June 2018

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site Only LC_{eq}-LA_{eq} dB [1,2] (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A)[1]	Site LAeq,15min dB with modifying factor (if applicable)
Knodlers Lane	20/06/2018 22:18	27/IA	56/NA	29/NA	0/NA	0/NA	27/NA
Maison Dieu	20/06/2018 21:46	33/IA	56/NA	23/NA	0/NA	0/NA	33/NA
Shearers Lane	20/06/2018 21:01	36/NM	56/NA	20/NA	0/NA	0/NA	36/NA
Kilburnie South	20/06/2018 22:54	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains	20/06/2018 21:29	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	20/06/2018 21:00	<30/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	20/06/2018 23:40	<30/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point	22/06/2018 0:20	IA/<25	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA

Notes:
1. 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;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of this report; and
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

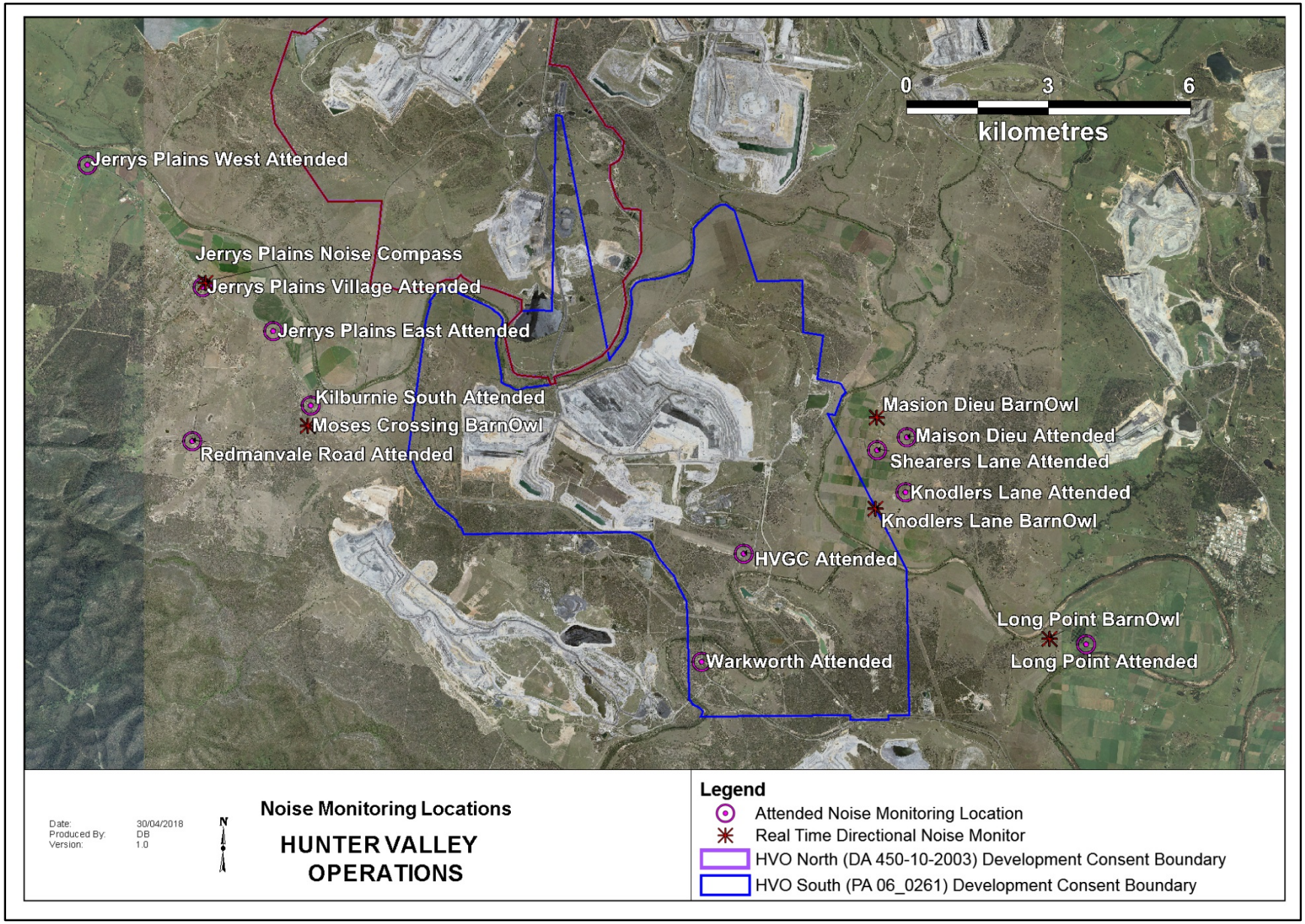


Figure 84: Noise Monitoring Location Plan

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.

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 June, a total of 218 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.

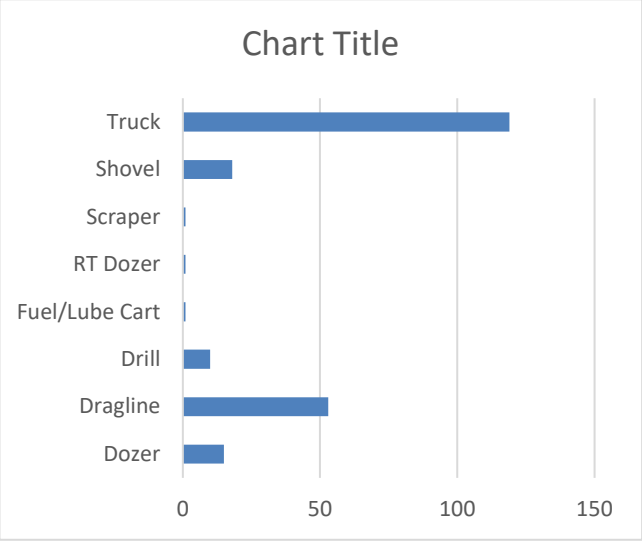


Figure 85: Operational Downtime by Equipment Type – June 2018

8.0 REHABILITATION

During June 32.8 Ha of land was released and 8.7 Ha of land was bulk shaped. Year to date progress can be viewed in Figure 86.

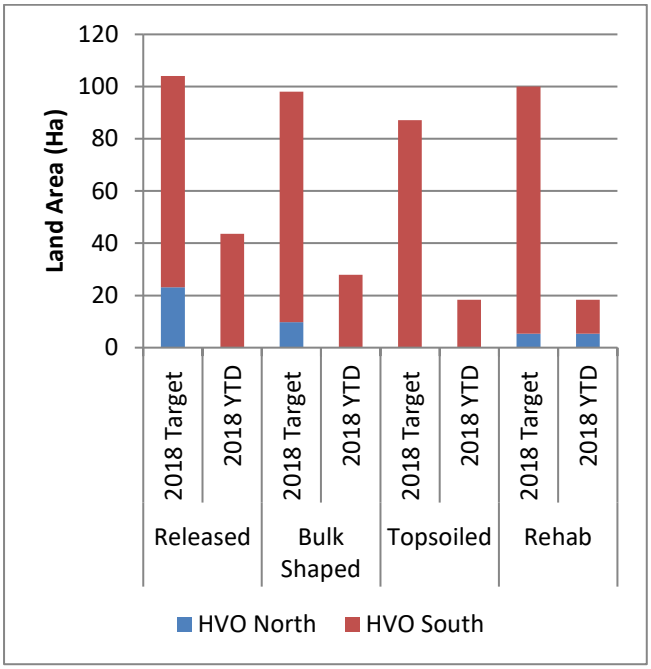


Figure 86: Rehabilitation YTD – June 2018

9.0 COMPLAINTS

During June three complaints were received. Details of complaints received YTD are shown in Table 13.

Table 13: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	2	4	-	-	6
February	1	-	-	-	1	2
March	-	-	-	-	-	0
April	-	-	1	-	-	1
May	4	1	2	-	-	7
June	1	-	1	-	1	3
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	6	3	8	-	2	19

Figure 87: Complaints Graph – June 2018

10.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were two recordable environmental incidents.

22 June 2018 – Ground Disturbance Permit area Breach

During dozer activities to expand a coal stockpile area in the HVO North area, it was observed that the approved disturbance area had been breach. As such the material in the area was retracted. Minor impact occurred within an existing mining area. Further disturbance approval was sort before works continued.

26 June 2018 – Excavator Hydraulic Oil Leak

During excavation works, excavator 313 has sustained damage from a rock which has release approximately 2000L of hydraulic oil in the Cheshunt Pit. Works ceased and the spill was contained in pit. Contaminated soil was removed to the bioremediation area for treatment.

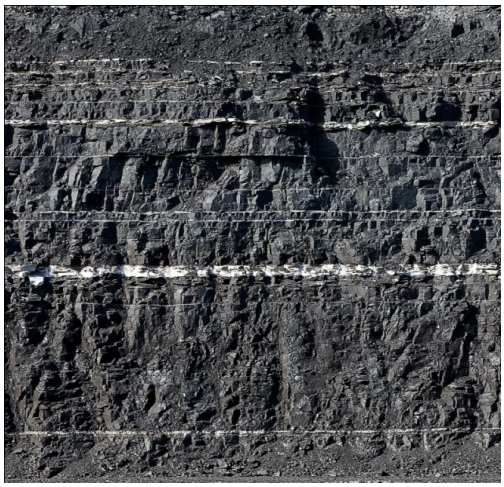
Appendix A: Meteorological Data

Table 14: Meteorological Data - HVO Corporate Meteorological Station – June 2018

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)
1/06/2018	17	5	64	35	813	168	2.2	0.0
2/06/2018	15	8	100	47	493	261	1.9	3.6
3/06/2018	19	8	100	43	628	128	2.1	0.0
4/06/2018	19	8	91	45	746	158	1.5	0.0
5/06/2018	16	7	100	57	705	120	1.4	1.2
6/06/2018	13	7	100	92	246	103	1.2	1.0
7/06/2018	19	7	100	54	865	112	1.9	0.0
8/06/2018	16	7	100	60	260	238	1.3	0.8
9/06/2018	16	9	100	70	227	248	1.4	2.4
10/06/2018	14	5	100	85	544	175	1.0	1.0
11/06/2018	16	9	100	59	819	146	0.7	0.2
12/06/2018	20	7	92	48	347	156	1.0	0.2
13/06/2018	18	4	88	34	661	268	3.2	0.0
14/06/2018	18	3	76	29	705	273	3.5	0.0
15/06/2018	19	5	65	24	578	272	5.1	0.0
16/06/2018	16	6	68	24	616	282	5.4	0.0
17/06/2018	13	3	77	42	794	280	6.6	0.0
18/06/2018	17	7	87	30	632	235	3.8	0.0
19/06/2018	15	5	100	59	802	208	1.8	10.2
20/06/2018	17	6	99	55	761	137	2.2	0.6
21/06/2018	17	6	100	52	675	177	1.0	0.0
22/06/2018	18	4	100	56	670	224	1.2	0.2
23/06/2018	19	5	93	24	525	265	2.7	0.2
24/06/2018	16	1	89	39	510	176	1.2	0.0
25/06/2018	16	2	100	42	518	-	1.3	0.0
26/06/2018	16	1	100	41	515	163	1.2	0.0
27/06/2018	15	1	100	69	771	146	1.3	0.0
28/06/2018	17	4	100	66	808	199	1.3	4.6
29/06/2018	14	1	100	50	638	265	3.3	0.2
30/06/2018	18	4	86	28	657	263	4.4	0.0

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

HUNTER VALLEY
OPERATIONS



Monthly Environmental Monitoring Report

Hunter Valley Operations

July 2018

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**7/09/2018**
1.1	**Environment & Community Coordinator**	**Final**	**18/10/2018**

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 July to 31st July 2018.

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 2018 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
July	0.4	195.4

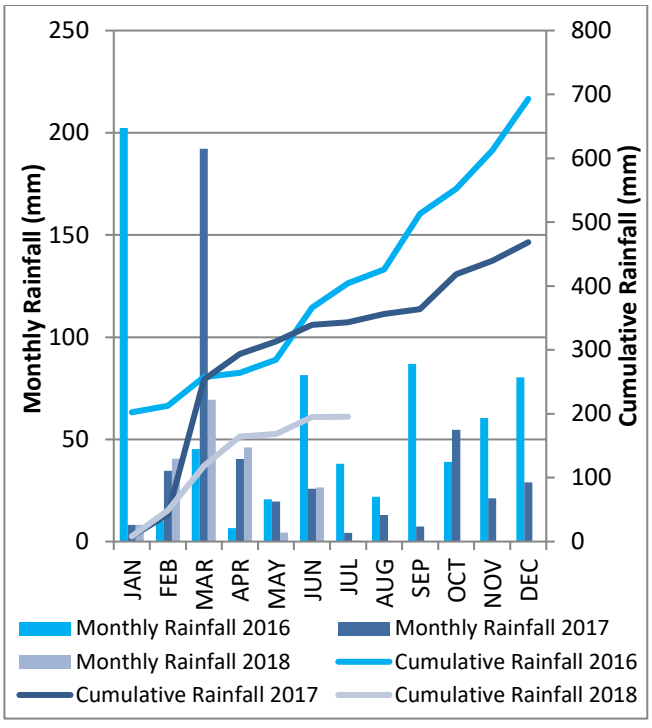

Figure 1: Rainfall Summary 2018

2.1.2 Wind Speed and Direction

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

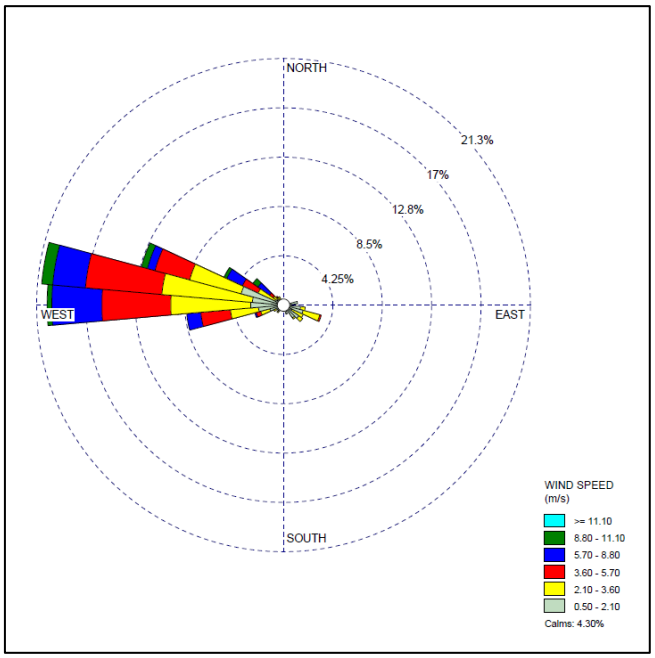

Figure 2: HVO Corporate Wind Rose – July 2018

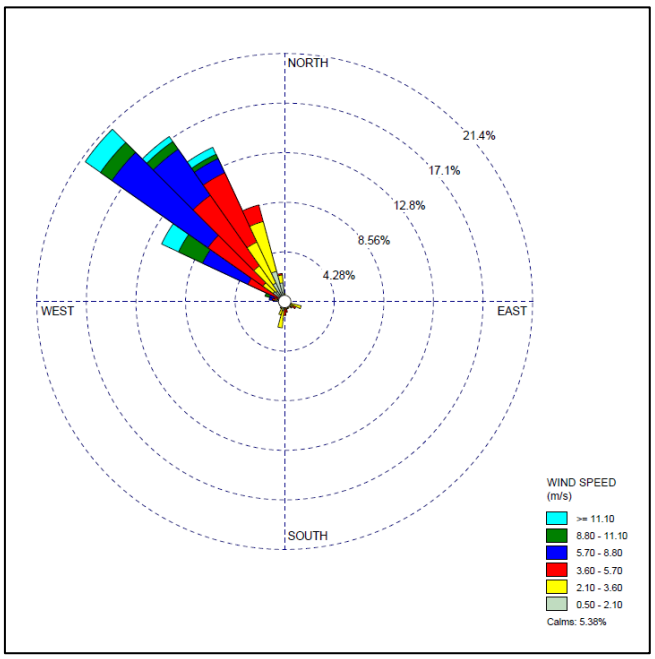

Figure 3: HVO Cheshunt Wind Rose – July 2018

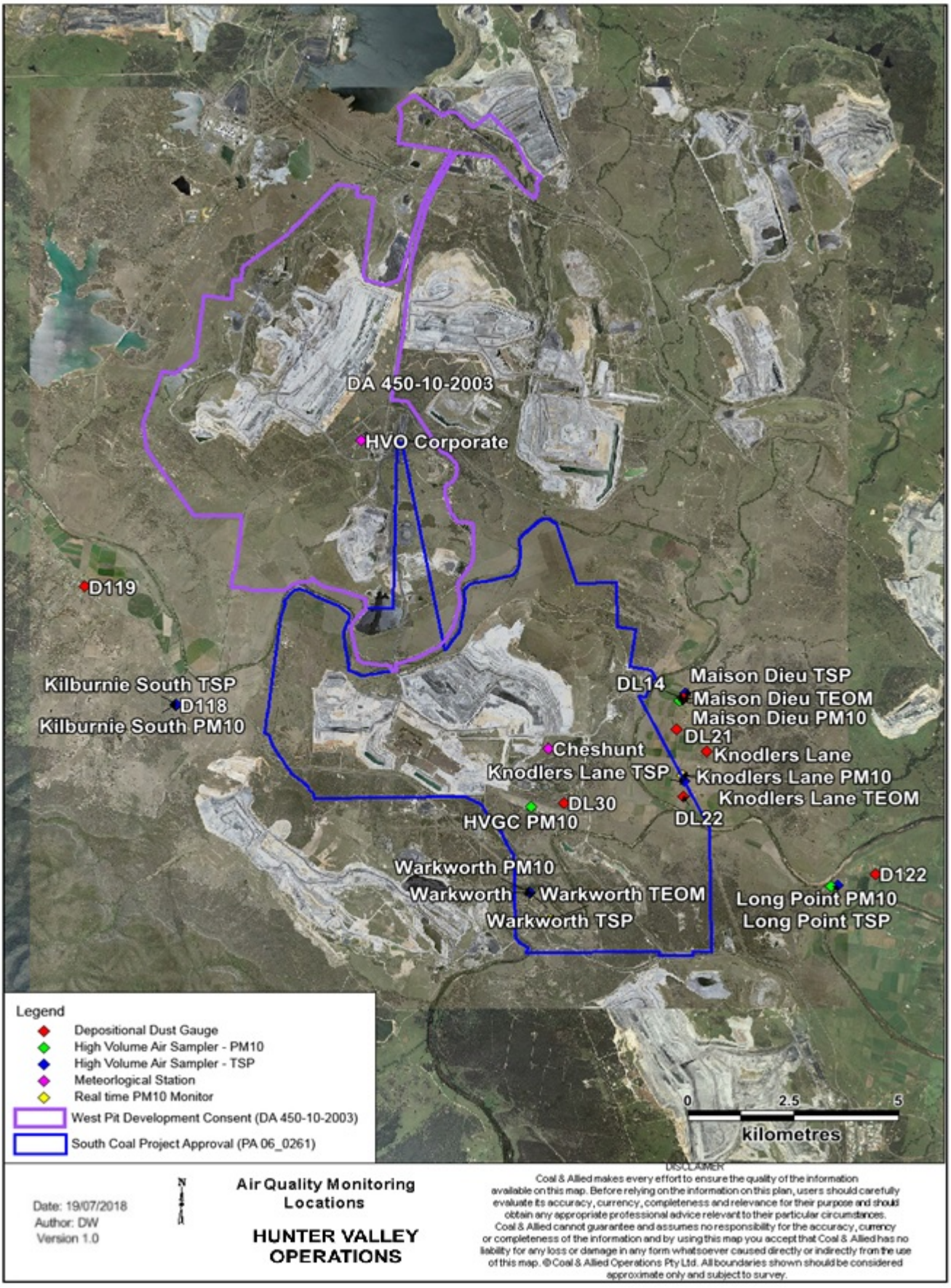

Figure 4: Air Quality Monitoring Location Plan

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 Knodlers Lane, D122 and DL30 monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month.

The field notes associated with the Knodlers Lane and D122 monitor's 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.

There was no evidence to suggest the DL30 monitor's result was contaminated, as such the result will be included in the annual average for that monitor.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

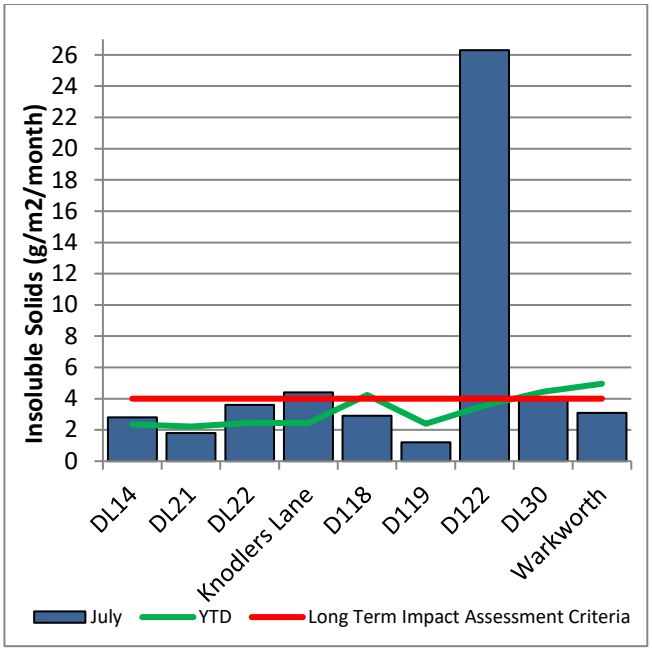

Figure 5: Depositional Dust Results – July 2018

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 (PM_{10}). 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 PM_{10} Results

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

On 6/07/2018 Long Point HVAS PM_{10} unit recorded an elevated 24 hour average of 53µg/m^3. Investigation determined that HVO's maximum contribution to the monitor is estimated to be: 31.5µg/m^3 or 59.4% of the measured result.

On 18/07/2018 two HVAS PM_{10} units recorded elevated 24 hour averages: Knodlers Lane 73µg/m^3 and Long Point 66µg/m^3. HVO's maximum contribution was calculated to be the following:

- Knodlers Lane: 41.0 µg/m^3 or 56.2% of the measured result;
- Long Point: 34.0 µg/m^3 or 51.5% of the measured result.

On 24/07/2018 three HVAS PM_{10} units recorded elevated 24 hour averages: Knodlers Lane 134µg/m^3, Long Point 112µg/m^3 and Maison Dieu 51µg/m^3 HVO's maximum contribution was calculated to be the following:

- Knodlers Lane: <87.8µg/m^3 or <65% of the measured result;
- Long Point: <44µg/m^3 or <39% of the measured result; and
- Maison Deu: 27.0µg/m^3 or 52.9% of the measured result.

On 30/07/2018 Long Point HVAS PM_{10} unit recorded an elevated 24 hour average of 54µg/m^3. Investigation determined that HVO's maximum contribution to the monitor is estimated to be could not have been more than the contribution at Knodlers Lane on this day given Long Point is further

downwind away from HVO. HVO's contribution was estimated to be <32.5 µg/m^3 or <60.2%

Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

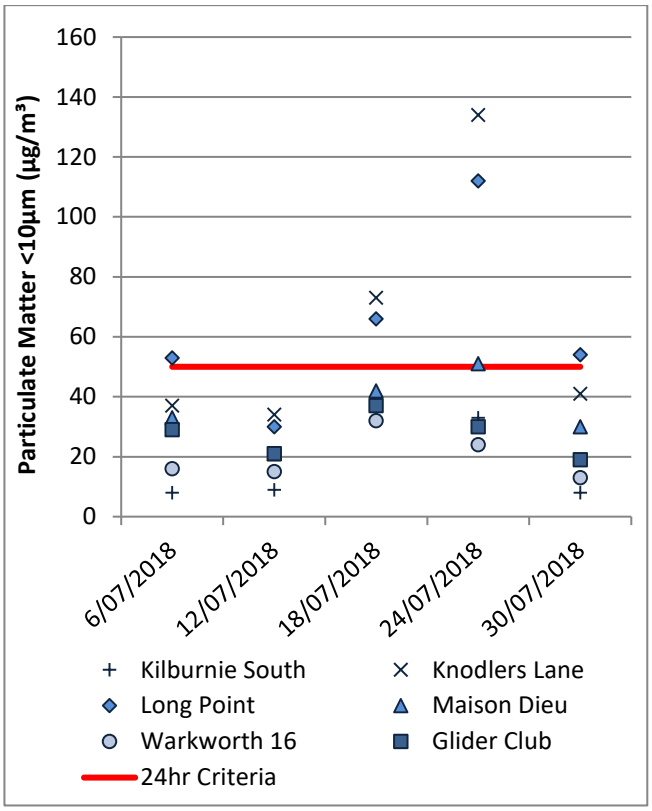

Figure 6: Individual PM_{10} Results – July 2018

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

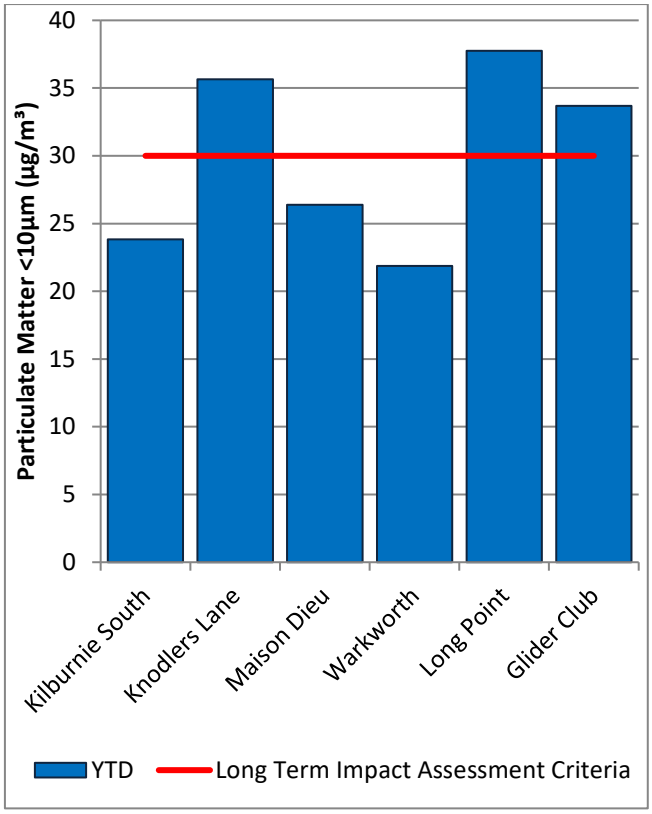

Figure 7: Year to Date Average PM_{10} – July 2018

2.3.2 TSP Results

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

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

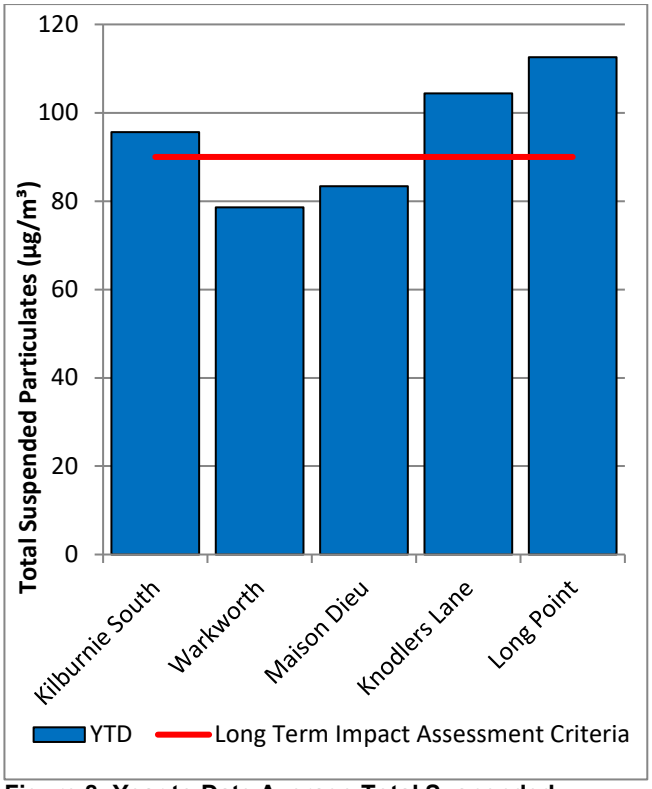

Figure 8: Year to Date Average Total Suspended Particulates – July 2018

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to help achieve 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 PM_{10} result and the year to date 24 hour PM_{10} annual average.

Results from investigations of elevated results are presented in Table 2.

2.3.4 Real Time Alarms for Air Quality

During July the real time monitoring system generated 90 automated air quality related alarms. 26 were related to adverse weather conditions and 64 alarms relating to PM_{10}.

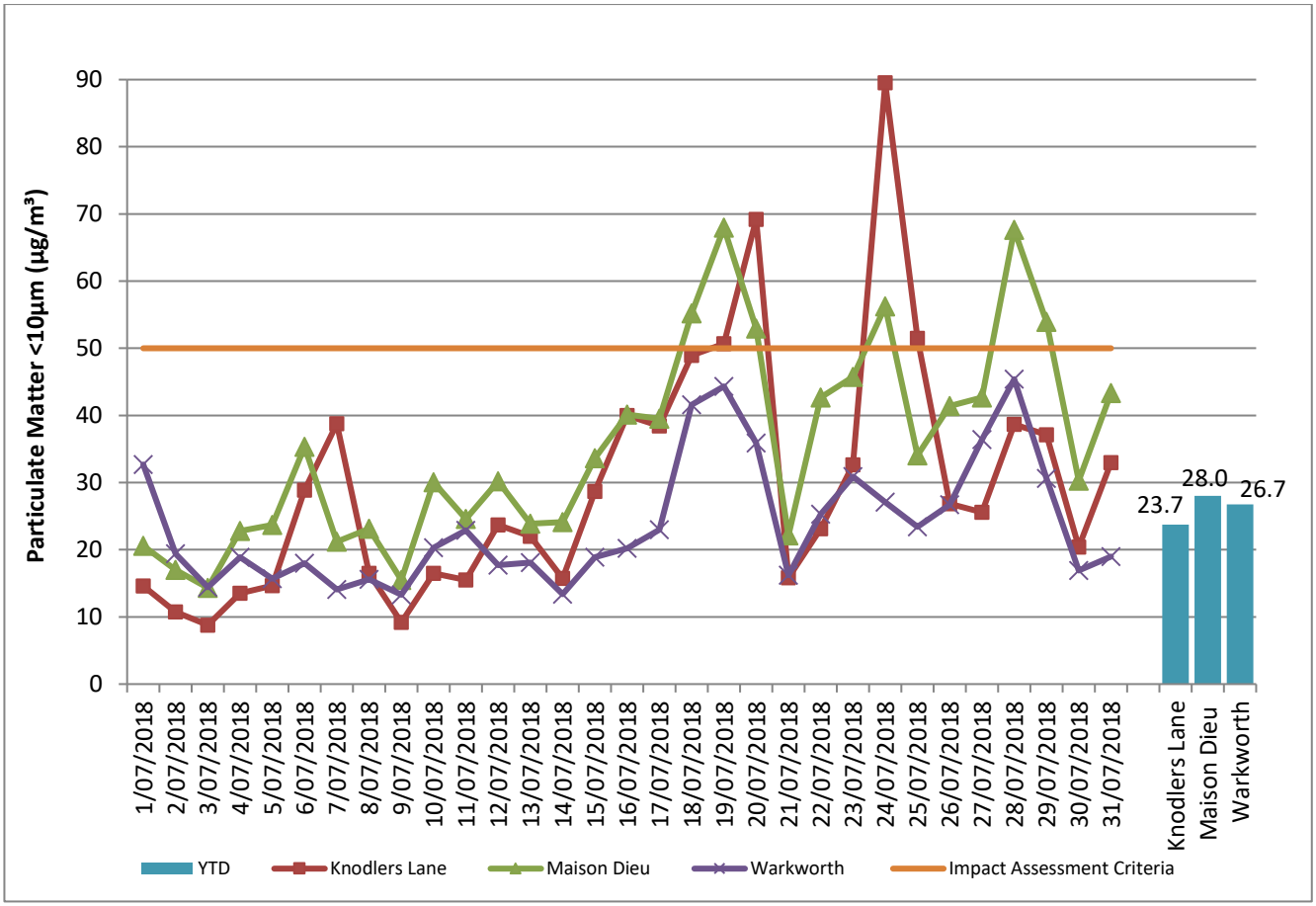

Figure 9: Real Time PM_{10} 24hr average and YTD average – July 2018

Table 2: Real-time PM10 Investigation Results

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Estimated contribution from HVO ($\mu g/m^3$)	Discussion
18/07/2018	Maison Dieu TEOM	55.2	10.0	An internal investigation determined HVO maximum potential contribution to be in the order of 10.0ug/m3 or 18% of the total measured based on prevailing wind conditions and upwind monitoring results.
19/07/2018	Knodlers Lane TEOM	50.7	13.2	An internal investigation determined HVO maximum potential contribution to be in the order of 13.2ug/m3 or 26% of the total measured based on prevailing wind conditions and upwind monitoring results.

19/07/2018	Maison Dieu TEOM	67.9	30.4	An internal investigation determined HVO maximum potential contribution to be in the order of 30.4ug/m3 or 44.8% of the total measured based on prevailing wind conditions and upwind monitoring results.
20/07/2018	Knodlers Lane TEOM	69.2	37.3	An internal investigation determined HVO maximum potential contribution to be in the order of 37.3ug/m3 or 53.9% of the total measured based on prevailing wind conditions and upwind monitoring results.
20/07/2018	Maison Dieu TEOM	52.9	21.1	An internal investigation determined HVO maximum potential contribution to be in the order of 21.1ug/m3 or 39.8% of the total measured based on prevailing wind conditions and upwind monitoring results.
24/07/2018	Knodlers Lane	89.5	59.9	An internal investigation determined HVO maximum potential contribution to be in the order of 59.9ug/m3 or 67.0% of the total measured based on prevailing wind conditions and upwind monitoring results.
24/07/2018	Maison Dieu TEOM	56.2	30.3	An internal investigation determined HVO maximum potential contribution to be in the order of 30.3ug/m3 or 53.9% of the total measured based on prevailing wind conditions and upwind monitoring results.
25/07/2018	Knodlers Lane TEOM	51.5	30.7	An internal investigation determined HVO maximum potential contribution to be in the order of 30.7ug/m3 or 59.7% of the total measured based on prevailing wind conditions and upwind monitoring results.
28/07/2018	Maison Dieu TEOM	67.7	29.2	An internal investigation determined HVO maximum potential contribution to be in the order of 29.2ug/m3 or 43.2% of the total measured based on prevailing wind conditions and upwind monitoring results.

29/07/2018	Maison Dieu TEOM	53.9	34.9	An internal investigation determined HVO maximum potential contribution to be in the order of 34.9ug/m3 or 64.7% of the total measured based on prevailing wind conditions and upwind monitoring results.

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 September 2018 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 extracted 128.4ML of 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 September 2018 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.

Blasting criteria are summarised in Table 3.

Table 3: Blasting Criteria

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period
10	0%

4.1 Blast Monitoring Results

During July, 19 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 3.

On the 31 July 2018, blast WN45LEP02A in HVO West Pit recorded an overpressure result of 115.5dB(L) at the Warkworth Monitoring location. An assessment against the 5% of the total number of blasts in a 12 month period criteria will be reported in the 2018 Annual Review

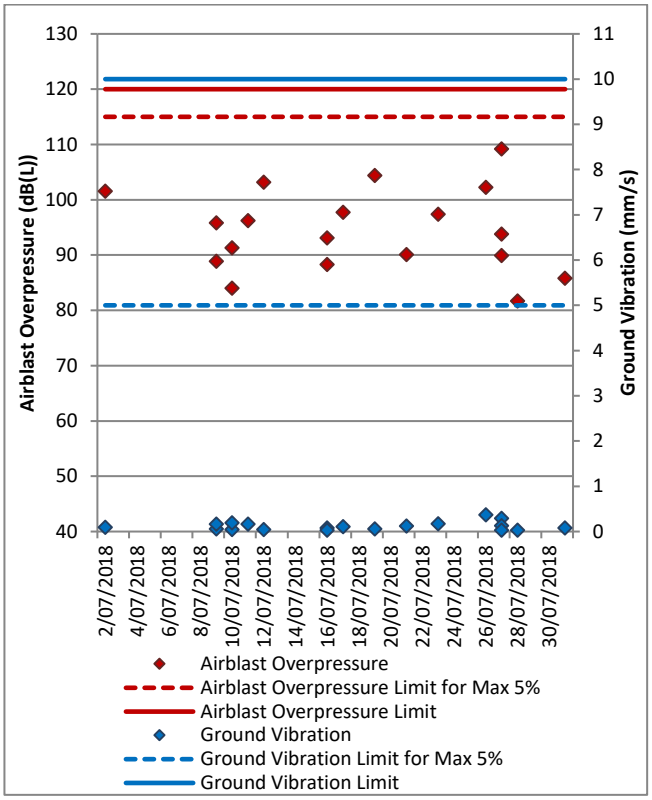

Figure 10: Moses Crossing Blast Monitoring Results – July 2018

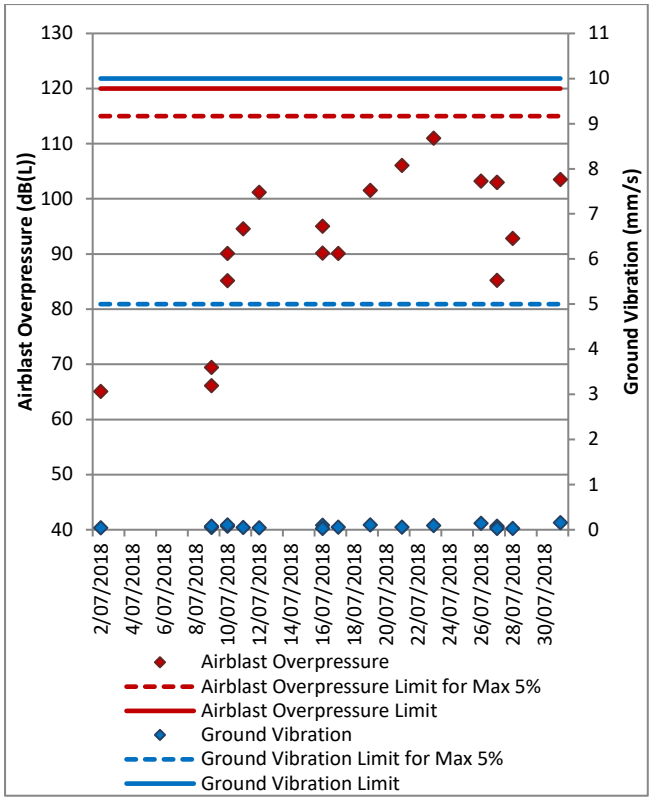

Figure 11: Jerrys Plains Blast Monitoring Results – July 2018

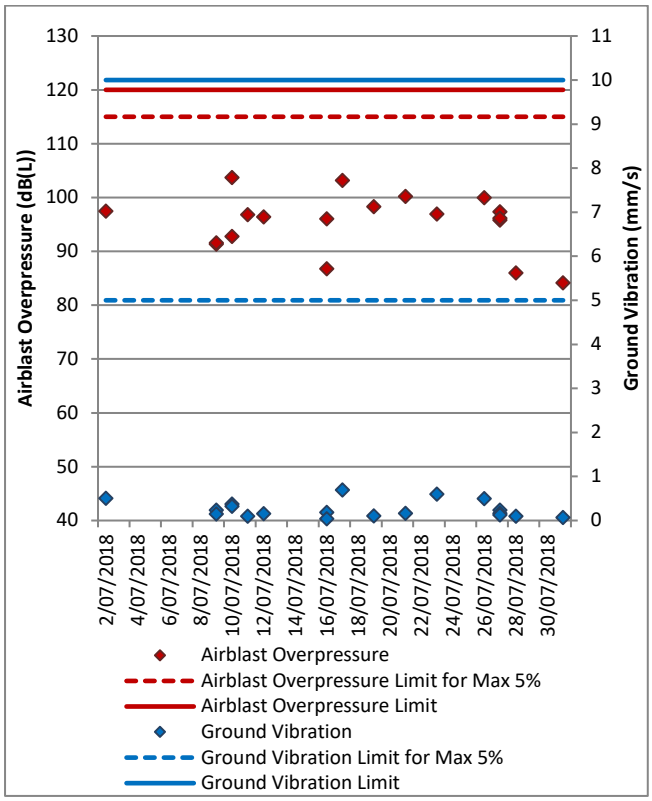

Figure 12: Maison Dieu Blast Monitoring Results – July 2018

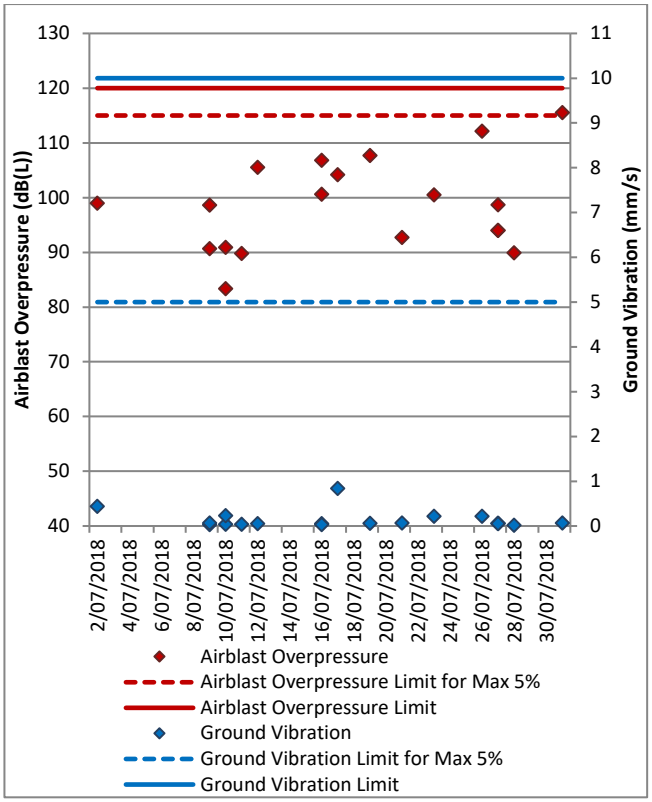

Figure 13: Warkworth Blast Monitoring Results – July 2018

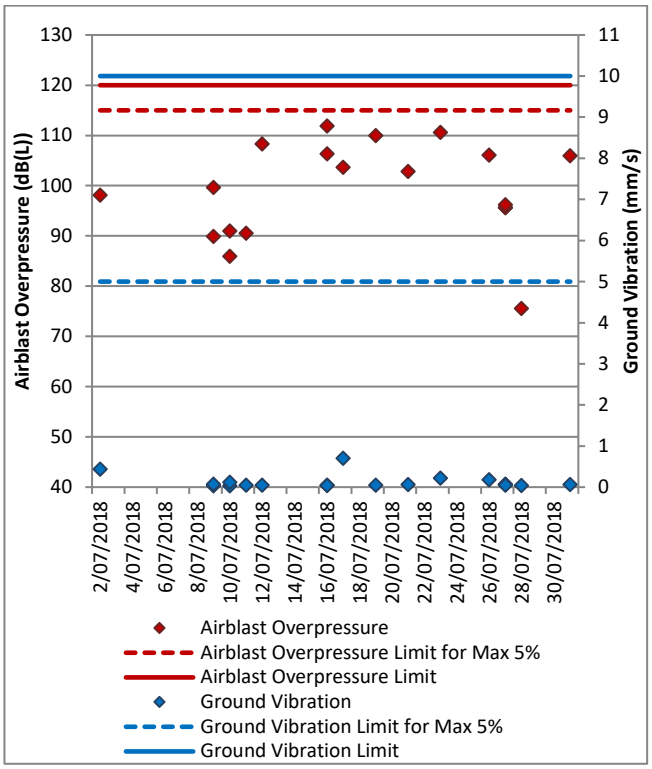

Figure 14: Knodlers Lane Blast Monitoring Results – July 2018

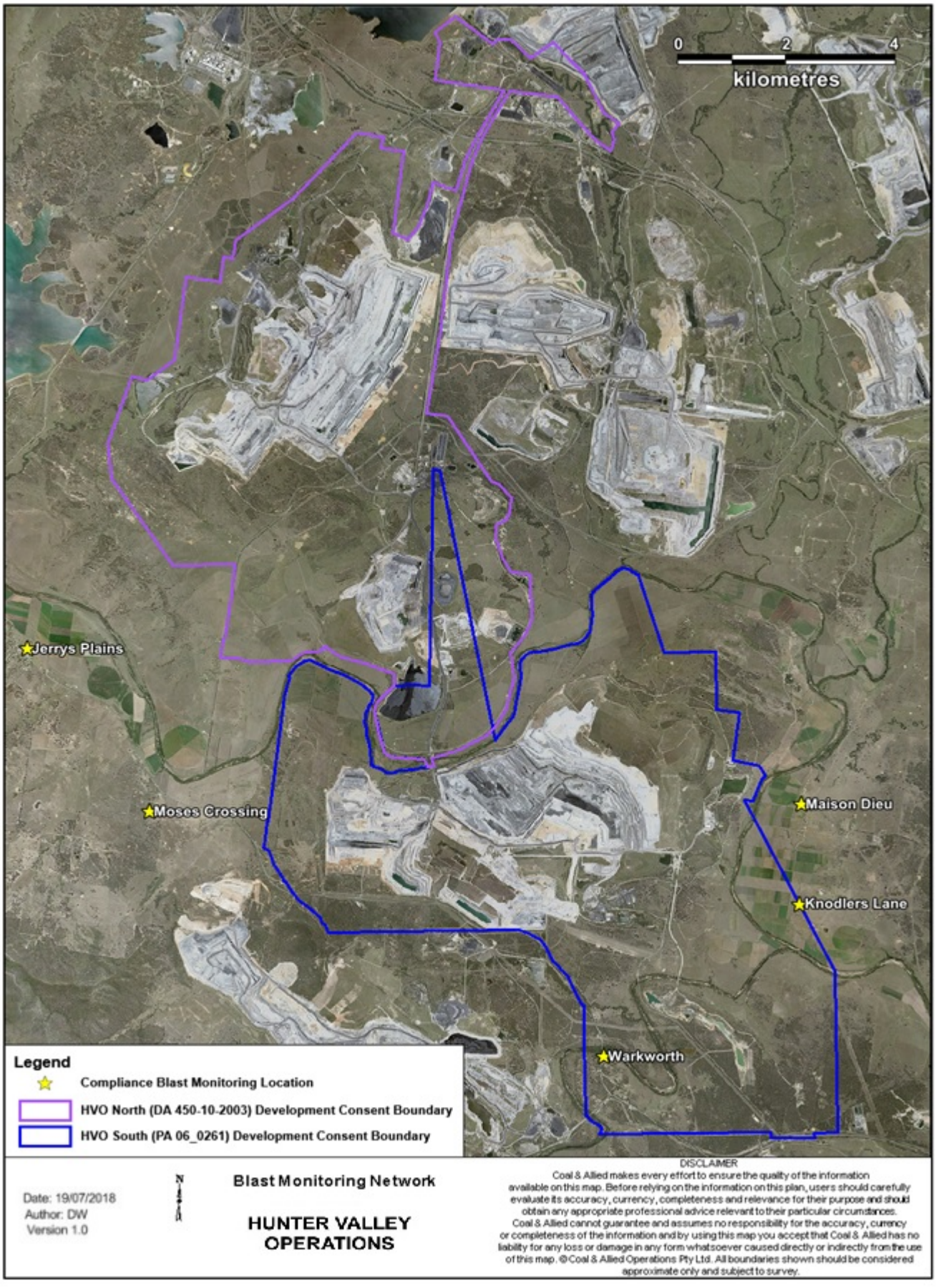

Figure 15: Blast Monitoring Location Plan

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 9 July 2018. Monitoring for additional frequency requirements of the HVO North Consent where conducted on the night of 4 July 2018. Monitoring results are detailed in Table 4 to Table 9 .

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – July 2018

Location	Date and Time	Wind Speed (m/s)[5]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/07/2018 21:00	2.2	0.5	37	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.6	3	37	No	IA	NA
Shearers Lane	9/07/2018 21:27	1.8	0.5	41	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	2.1	0.5	36	Yes	32	Nil
Jerrys Plains Village	9/07/2018 21:21	2	0.5	35	Yes	IA	Nil
Jerrys Plains East	9/07/2018 21:00	2.2	0.5	35	Yes	<30	Nil
HVGC	9/07/2018 22:47	0.6	0.5	35	Yes	IA	Nil
Long Point	9/07/2018 23:55	0.7	3	55	No	<30	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable; and
6. LF modifying factor applied (see Table 4.2)

Table 5: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – July 2018

Location	Date and Time	Wind Speed (m/s)[5]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/07/2018 21:00	2.2	0.5	41	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.6	3	41	No	IA	NA
Shearers Lane	9/07/2018 21:27	1.8	0.5	41	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	2.1	0.5	41	Yes	32	Nil
Jerrys Plains Village	9/07/2018 21:21	2	0.5	40	Yes	IA	Nil
Jerrys Plains East	9/07/2018 21:00	2.2	0.5	40	Yes	<30	Nil
HVGC	9/07/2018 22:47	0.6	0.5	40	Yes	IA	Nil
Long Point	9/07/2018 23:55	0.7	3	NA	NA	<30	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable; and
6. LF modifying factor applied (see Table 4.2)

Table 6: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – July 2018

Location	Date and Time	Wind Speed (m/s)[5]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/07/2018 21:00	2.2	0.5	45	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.6	3	45	No	IA	NA
Shearers Lane	9/07/2018 21:27	1.8	0.5	45	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	2.1	0.5	45	Yes	39	Nil
Jerrys Plains Village	9/07/2018 21:21	2	0.5	45	Yes	IA	Nil
Jerrys Plains East	9/07/2018 21:00	2.2	0.5	45	Yes	30	Nil
HVGC	9/07/2018 22:47	0.6	0.5	45	Yes	IA	Nil
Long Point	9/07/2018 23:55	0.7	3	NA	NA	39	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 7: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – July 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Kilburnie South	4/07/2018 00:59	1.1	0.5	39	Yes	32	Nil
Jerrys Plains Village	4/07/2018 00:33	0.3	3.0	36	Yes	34	Nil
Jerrys Plains East	4/07/2018 00:11	0.6	-1.0	39	Yes	IA	Nil
Knodlers Lane	9/07/2018 21:00	0.9	-1	35	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.7	0.5	35	Yes	IA	Nil
Shearers Lane	9/07/2018 21:27	0.6	3	35	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	0.8	0.5	39	Yes	<25	Nil
Jerrys Plains Village	9/07/2018 21:21	0.8	0.5	36	Yes	31	Nil
Jerrys Plains East	9/07/2018 21:00	0.9	-1	39	Yes	28	Nil
HVGC	9/07/2018 22:47	0.1	3	35	Yes	IA	Nil
Long Point	9/07/2018 23:55	1.1	0.5	NA	NA	<30	NA

Notes:
1. Atmospheric data is sourced from the HVO Corporate or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of
meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria; and
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable.

Table 8: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – July 2018

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]
Kilburnie South	4/07/2018 00:59	1.1	0.5	41	Yes	32	Nil
Jerrys Plains Village	4/07/2018 00:33	0.3	3.0	41	Yes	34	Nil
Jerrys Plains East	4/07/2018 00:11	0.6	-1.0	41	Yes	IA	Nil
Knodlers Lane	9/07/2018 21:00	0.9	-1	41	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.7	0.5	41	Yes	IA	Nil
Shearers Lane	9/07/2018 21:27	0.6	3	41	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	0.8	0.5	41	Yes	<25	Nil
Jerrys Plains Village	9/07/2018 21:21	0.8	0.5	41	Yes	31	Nil
Jerrys Plains East	9/07/2018 21:00	0.9	-1	41	Yes	28	Nil
HVGC	9/07/2018 22:47	0.1	3	41	Yes	IA	Nil
Long Point	9/07/2018 23:55	1.1	0.5	NA	NA	<30	NA

Notes:
1. Atmospheric data is sourced from the HVO Corporate or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute attributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable

Table 9: $L_{A1,\ 1Minute}$ HVO North - Impact Assessment Criteria – July 2018

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]
Kilburnie South	4/07/2018 00:59	1.1	0.5	46	Yes	33	Nil
Jerrys Plains Village	4/07/2018 00:33	0.3	3.0	46	Yes	38	Nil
Jerrys Plains East	4/07/2018 00:11	0.6	-1.0	46	Yes	IA	Nil
Knodlers Lane	9/07/2018 21:00	0.9	-1	46	Yes	IA	Nil
Maison Dieu	9/07/2018 21:53	0.7	0.5	46	Yes	IA	Nil
Shearers Lane	9/07/2018 21:27	0.6	3	46	Yes	IA	Nil
Kilburnie South	9/07/2018 23:18	0.8	0.5	46	Yes	<25	Nil
Jerrys Plains Village	9/07/2018 21:21	0.8	0.5	46	Yes	36	Nil
Jerrys Plains East	9/07/2018 21:00	0.9	-1	46	Yes	34	Nil
HVGC	9/07/2018 22:47	0.1	3	46	Yes	IA	Nil
Long Point	9/07/2018 23:55	1.1	0.5	NA	NA	37	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

5.2 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During July 2018 no measurements required the penalty to be applied. The assessment for low frequency noise is shown in Table 10.

Table 10: Low Frequency Noise Assessment - July 2018

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site Only LC_{eq}-LA_{eq} dB [1,2] (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A) [1]	Site $L_{Aeq,15min}$ dB with modifying factor (if applicable)
Kilburnie South	4/07/2018 00:59	IA/32	NA/NA	NA/NA	NA/0	NA/0	NA/NA
Jerrys Plains Village	4/07/2018 00:33	IA/34	NA/56	NA/22	NA/0	NA/0	NA/34
Jerrys Plains East	4/07/2018 00:11	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Knodlers Lane	9/07/2018 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	9/07/2018 21:53	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	9/07/2018 21:27	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	9/07/2018 23:18	32/<25	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	9/07/2018 21:21	IA/31	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	9/07/2018 21:00	<30/28	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	9/07/2018 22:47	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Long Point	9/07/2018 23:55	<30/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA

Notes:
1. 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;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Section 2.4.2 of this report; and
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required.

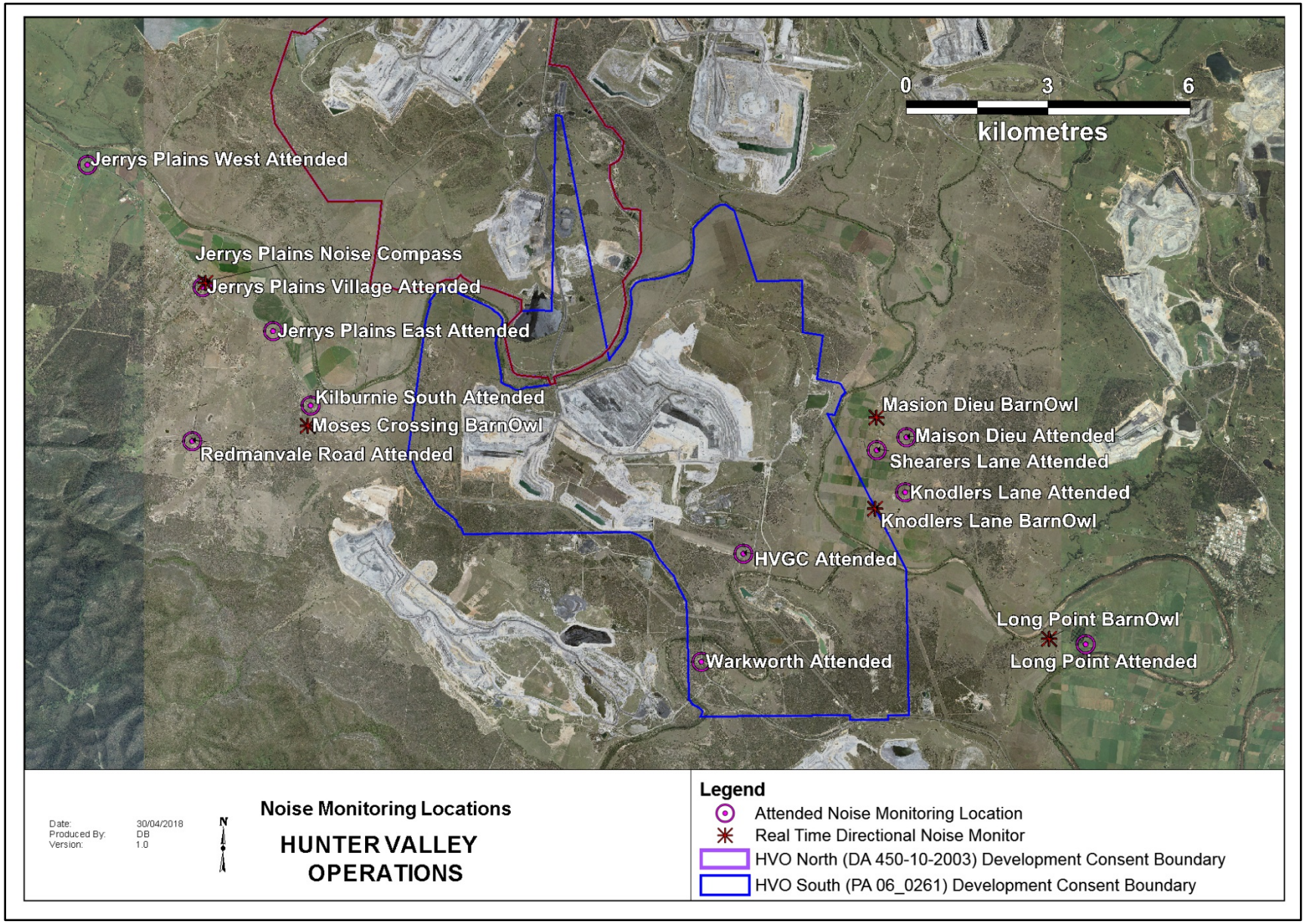

Figure 16: Noise Monitoring Location Plan

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 5.1, 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 July, a total of 444 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.

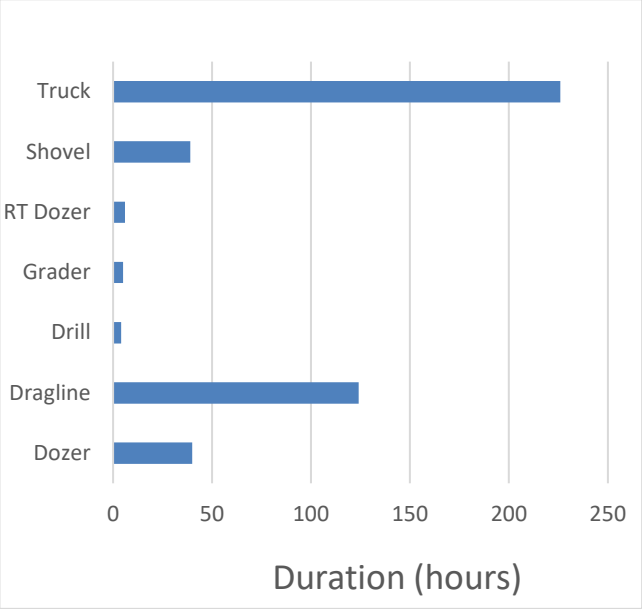

Figure 17: Operational Downtime by Equipment Type – July 2018

7.0 REHABILITATION

During July 5.6 Ha of land was released, 8.3 Ha of land was bulk shaped and 14.5 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 18.

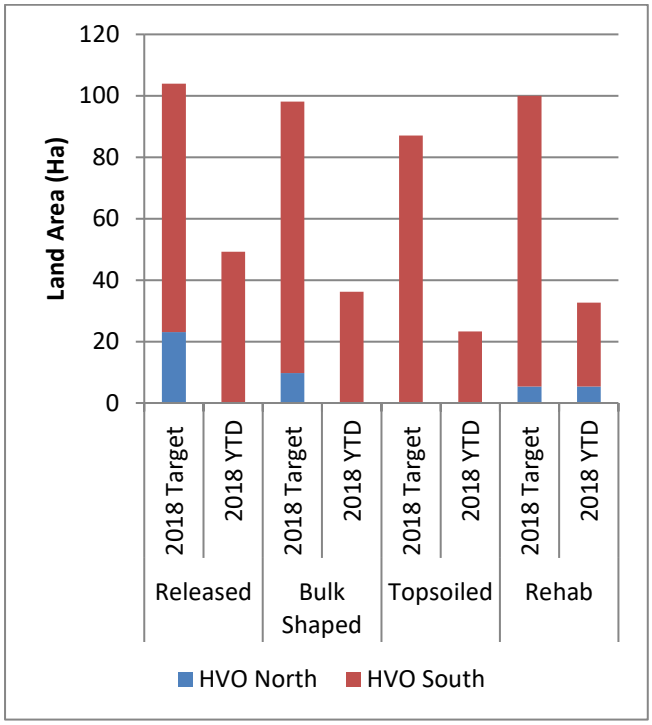

Figure 18: Rehabilitation YTD – July 2018

8.0 COMPLAINTS

Two complaints were received during the reporting period. Details of complaints received YTD are shown in Table 11 below.

Table 11: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	2	4	-	-	6
February	1	-	-	-	1	2
March	-	-	-	-	-	0
April	-	-	1	-	-	1
May	4	1	2	-	-	7
June	1	-	1	-	1	3
July	-	-	2	-	-	2
August	-	-	-	-	-	-
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	6	3	10	-	2	21

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there was one recordable environmental incident.

On 21 July 2018, a minor spill of oil (~20L) from mechanical seal on electric pump at Cumnock return water dam. A negligible amount of oil (<5L) leaked down the dam liner and into the dam. The spill contained within the mine water system.

Dry sorb was used to contain spill before being cleaned up. The pump was shut down, isolated and then reported internally.

Appendix A: Meteorological Data

Table 12: Meteorological Data - HVO Corporate Meteorological Station – July 2018

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)
1/07/2018	14	-1	91	44	648	161	1.8	0.0
2/07/2018	14	6	100	63	465	117	2.5	0.0
3/07/2018	16	4	100	63	682	138	0.9	0.0
4/07/2018	18	4	100	63	772	204	1.1	0.2
5/07/2018	24	8	100	40	507	279	2.8	0.0
6/07/2018	24	12	74	31	688	280	6.6	0.0
7/07/2018	16	7	72	32	677	278	5.8	0.0
8/07/2018	13	4	69	46	564	289	6.7	0.0
9/07/2018	16	1	77	28	543	146	1.5	0.0
10/07/2018	16	-1	85	40	646	172	1.3	0.0
11/07/2018	18	-1	100	32	531	205	1.0	0.0
12/07/2018	18	-1	98	21	591	265	2.3	0.0
13/07/2018	16	2	60	23	537	277	3.5	0.0
14/07/2018	16	-1	77	22	539	287	2.8	0.0
15/07/2018	17	-3	70	12	559	280	3.2	0.0
16/07/2018	15	-2	58	11	556	273	3.8	0.0
17/07/2018	20	1	41	8	545	282	4.9	0.0
18/07/2018	21	6	42	14	549	270	3.8	0.0
19/07/2018	23	1	62	9	560	270	2.8	0.0
20/07/2018	18	4	53	15	734	273	5.7	0.0
21/07/2018	16	0	64	17	574	255	2.8	0.0
22/07/2018	17	-3	73	18	569	216	1.2	0.0
23/07/2018	19	-2	72	10	579	278	2.6	0.0
24/07/2018	23	3	32	8	596	269	4.5	0.0
25/07/2018	21	5	37	12	591	262	3.3	0.0
26/07/2018	21	2	73	17	584	253	2.6	0.0
27/07/2018	21	1	84	18	576	182	0.9	0.0
28/07/2018	22	3	71	19	830	-	0.8	0.0
29/07/2018	21	6	78	30	583	272	5.4	0.2
30/07/2018	17	3	56	19	599	279	4.7	0.0
31/07/2018	19	1	60	17	625	276	4.6	0.0

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

HUNTER VALLEY OPERATIONS

Monthly Environmental Monitoring Report

Hunter Valley Operations

August 2018

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environment & Community Officer**	**Draft**	**05/10/2018**
1.1	**Environment & Community Coordinator**	**Final**	**18/10/2018**

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 1 August to 31 August 2018.

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 2018 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
August	27.4	222.8

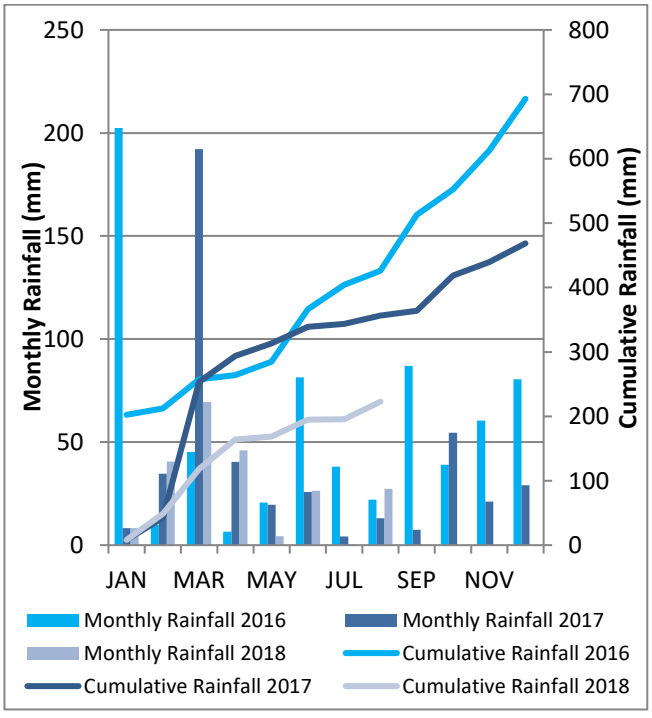

Figure 1: Rainfall Summary 2018

2.1.2 Wind Speed and Direction

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

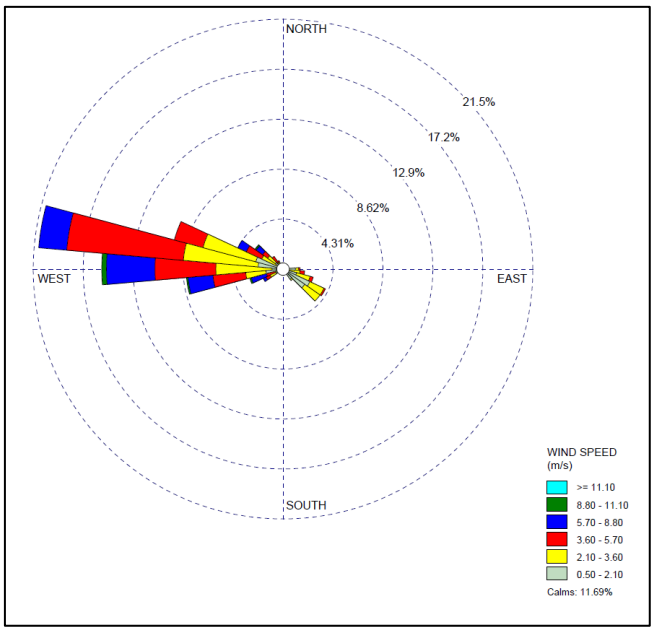

Figure 2: HVO Corporate Wind Rose – August 2018

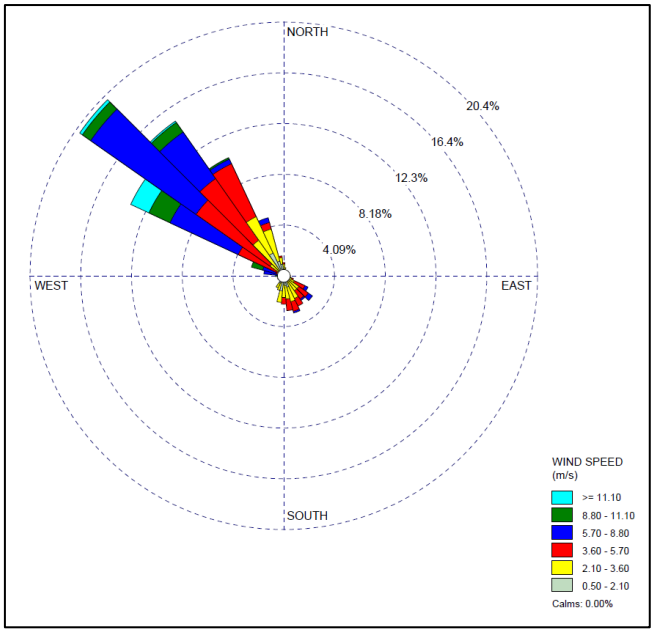

Figure 3: HVO Cheshunt Wind Rose – August 2018

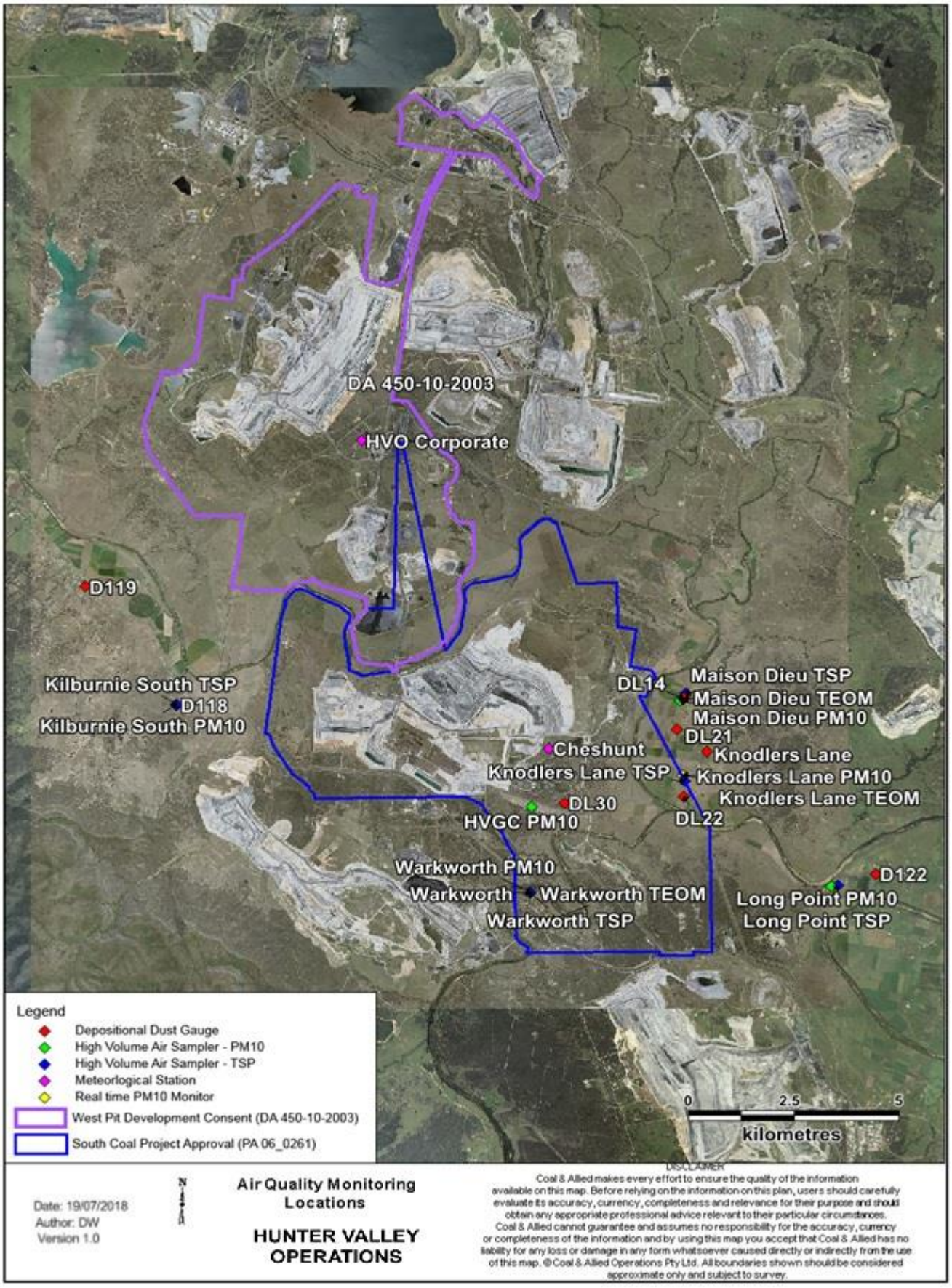

Figure 4: Air Quality Monitoring Location Plan

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, DL30 and Warkworth monitors recorded a monthly result above the long term impact assessment criteria of 4.0 g/m^2 per month.

There was no evidence to suggest the DL21, DL30 and Warkworth monitor's result was contaminated, as such the result will be included in the annual average for those monitors.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

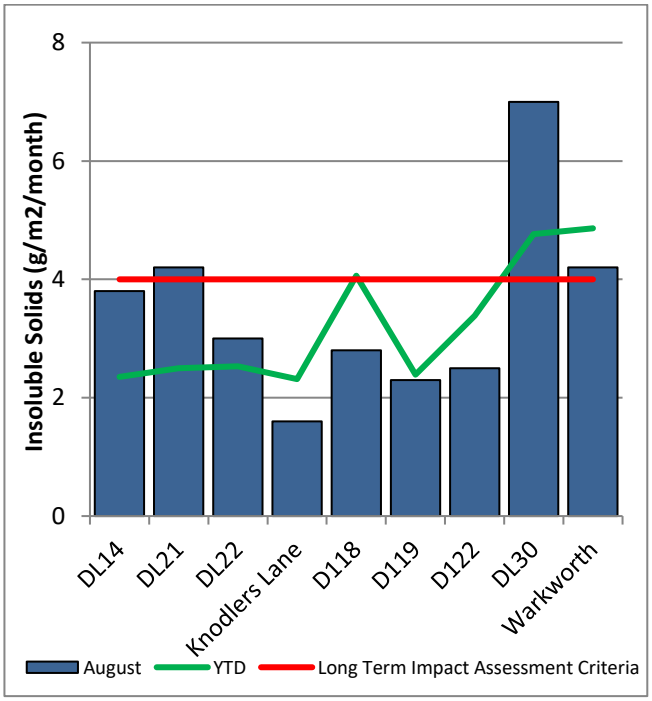

Figure 5: Depositional Dust Results – August 2018

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 (PM_{10}). 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 PM_{10} Results

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

On 5 August 2018 two HVAS PM_{10} units recorded elevated
24 hour averages: Knodlers Lane (53µg/m^3) and Long Point (53µg/m^3). HVO's maximum contribution was calculated to be the following:

- Knodlers Lane: 18.0 µg/m^3 or 34.0% of the measured result;
- Long Point: 18.0 µg/m^{3}Or 34.0% of the measured result.

On 17 August 2018 Knodlers Lane HVAS PM_{10} unit recorded an elevated 24 hour average of 61µg/m^3. An external investigation determined that HVO's maximum contribution to the monitor is estimated to be 32µg/m^3 or 52% of the measured result.

On 23 August 2018 Knodlers Lane HVAS PM_{10} unit recorded an elevated 24 hour average of 51µg/m^3. Wind direction on this day was generally outside of HVO's influence to the Knodlers Lane monitor. However, investigation determined that HVO's maximum contribution to the monitor is estimated to be 15.5µg/m^3 or 30.4% of the measured result.

Accordingly, no further action is required (as per approved Air Quality Monitoring Programme).

A sample was unable to be collected from Knodlers Lane on 11 August 2018 due to damage to the filter paper.

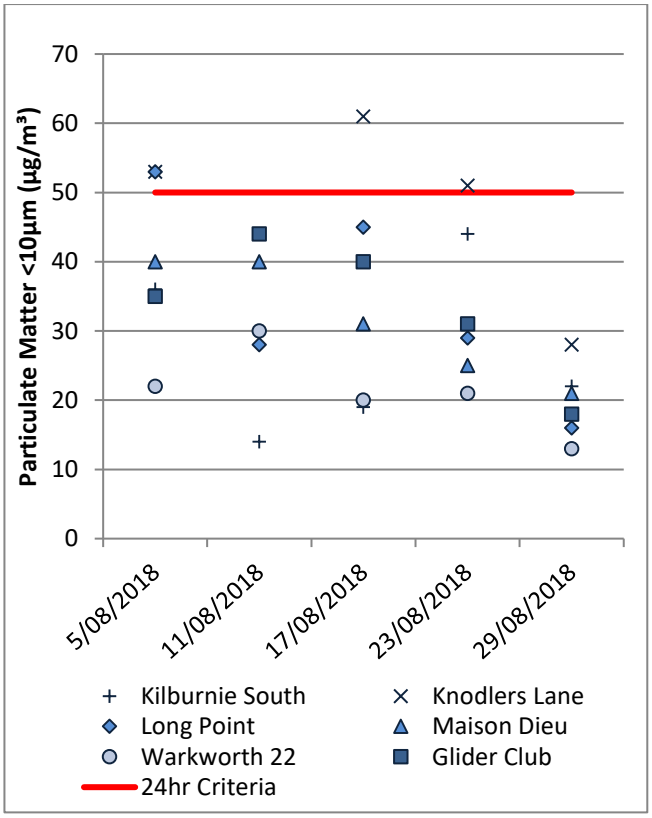

Figure 6: Individual PM_{10} Results – August 2018

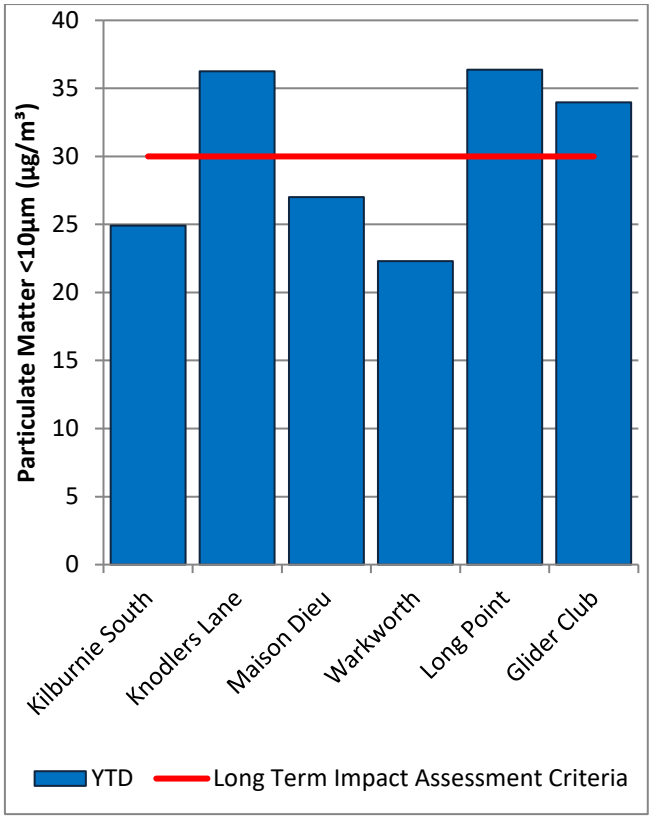

Figure 7: Year to Date Average PM_{10} – August 2018

Figure 7 shows the year to date annual average PM_{10} results.

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

2.3.2 TSP Results

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

An assessment of HVO's contribution against the long term impact assessment criteria will be provided in the 2018 Annual Review.

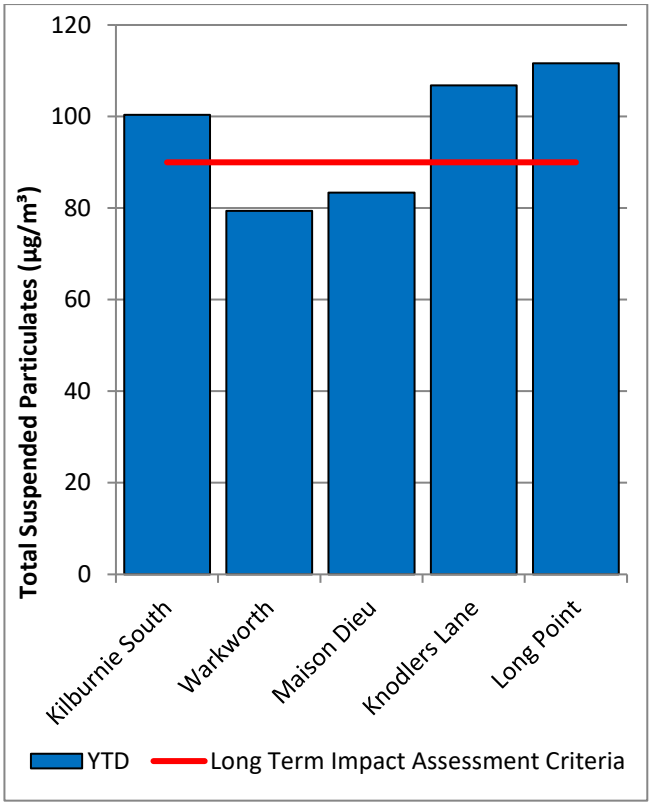

Figure 8: Year to Date Average Total Suspended Particulates – August 2018

2.3.3 Real Time PM_{10} Results

Hunter Valley Operations maintains a network of real time PM_{10} monitors. The real time air quality monitoring stations continuously log information and transmit data to a central database, generating alarms when particulate matter levels exceed internal trigger limits. Results from real time PM_{10} monitoring are used as a reactive measure to guide mining operations to help achieve 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 PM_{10} result and the year to date 24 hour PM_{10} annual average.

Results from investigations of elevated results are presented in Table 2.

2.3.4 Real Time Alarms for Air Quality

During August the real time monitoring system generated 121 automated air quality related alarms. 33 were related to adverse weather conditions and 88 alarms relating to PM_{10}.

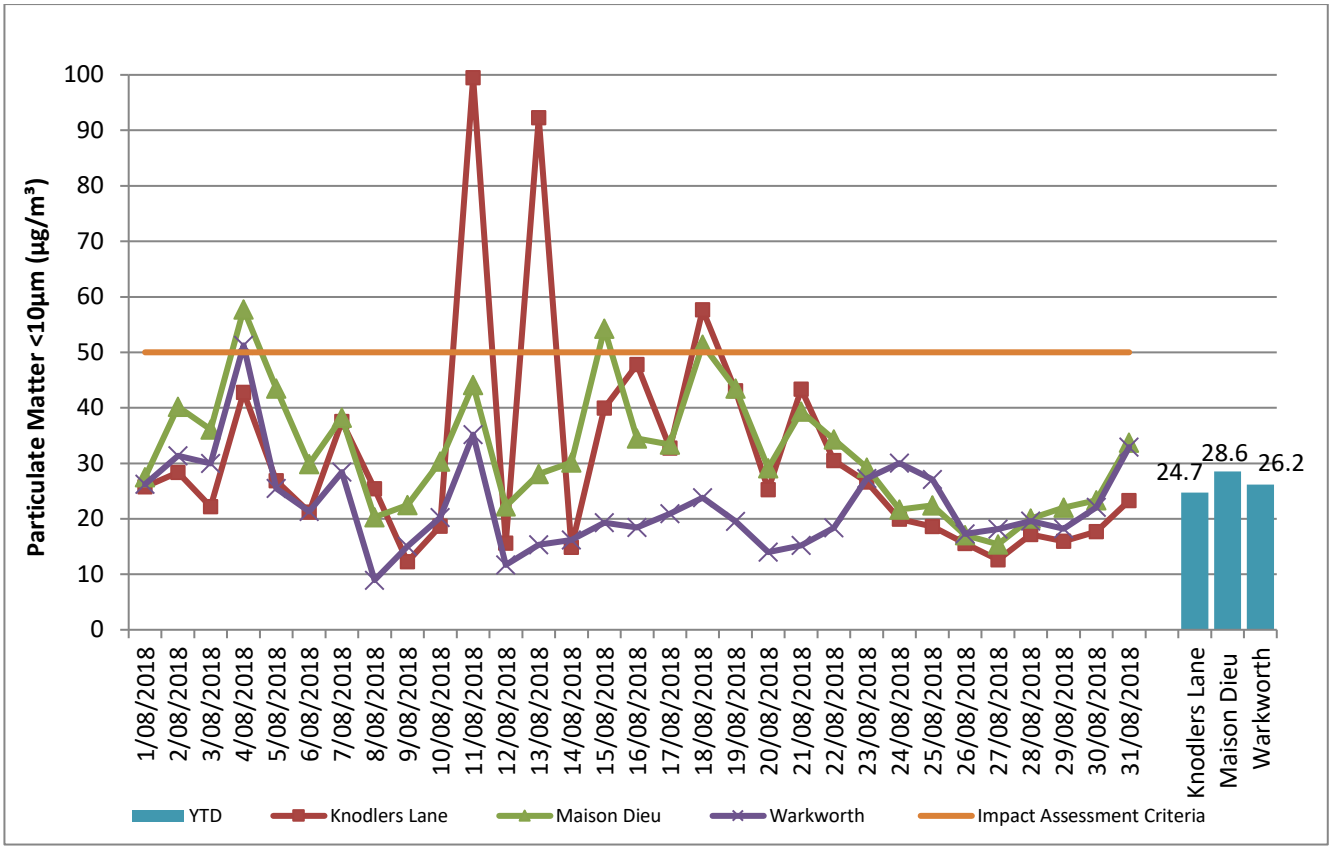

Figure 9: Real Time PM_{10} 24hr average and YTD average – August 2018

Table 2: Real-time PM10 Investigation Results

Date	Site	24hr PM_{10} result ($\mu g/m^3$)	Estimated contribution from HVO ($\mu g/m^3$)	Discussion
4/08/2018	Maison Dieu TEOM	28.4	49.2	An internal investigation determined HVO maximum potential contribution to be in the order of 28.4ug/m3 or 49.2% of the total measured based on prevailing wind conditions and upwind monitoring results.
4/08/2018	Warkworth TEOM	5.2	10.2	An internal investigation determined HVO maximum potential contribution to be in the order of 5.2ug/m3 or 10.2% of the total measured based on prevailing wind conditions and upwind monitoring results.
11/08/2018	Knodlers Lane TEOM	33.4	33.6	An internal investigation determined HVO maximum potential contribution to be in the order of 33.4ug/m3 or 33.6% of the total measured based on removal of erroneous data. Erroneous data is

				suspected to be caused by either a local source or malfunction.
13/08/2018	Knodlers Lane TEOM	19.3	20.1	An internal investigation determined HVO maximum potential contribution to be in the order of 19.3ug/m3 or 20.1% of the total measured based on removal of erroneous data. Erroneous data is suspected to be caused by either a local source or malfunction.
15/08/2018	Maison Dieu TEOM	36.6	67.5	An internal investigation determined HVO maximum potential contribution to be in the order of 36.6ug/m3 or 67.5% of the total measured based on prevailing wind conditions and upwind monitoring results.
18/08/2018	Knodlers Lane	37.7	65.4	An internal investigation determined HVO maximum potential contribution to be in the order of 37.7ug/m3 or 65.4% of the total measured based on prevailing wind conditions and upwind monitoring results.
18/08/2018	Maison Dieu TEOM	32.5	63.2	An internal investigation determined HVO maximum potential contribution to be in the order of 32.5ug/m3 or 63.2% of the total measured based on prevailing wind conditions and upwind monitoring results.

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 September 2018 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 extracted 330.7ML of 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 September 2018 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.

Blasting criteria are summarised in Table 3.

Table 3: Blasting Criteria

Airblast Overpressure (dB(L))	Comments
115	5% of the total number of blasts in a 12 month period
120	0%
Ground Vibration (mm/s)	**Comments**
5	5% of the total number of blasts in a 12 month period
10	0%

4.1 Blast Monitoring Results

During August, 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 3.

On 17 August 2018, blast WN40BAR01A in HVO West Pit recorded an overpressure result of 115.3dB(L) at the Maison Dieu monitoring location . An assessment against the 5% of the total number of blasts in a 12 month period criteria will be reported in the 2018 Annual Review.

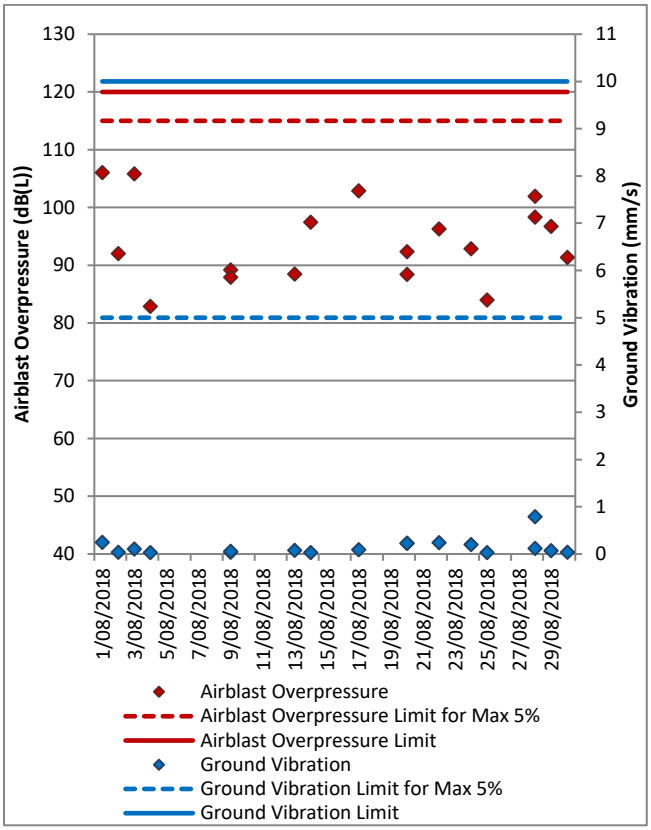

Figure 10: Moses Crossing Blast Monitoring Results – August 2018

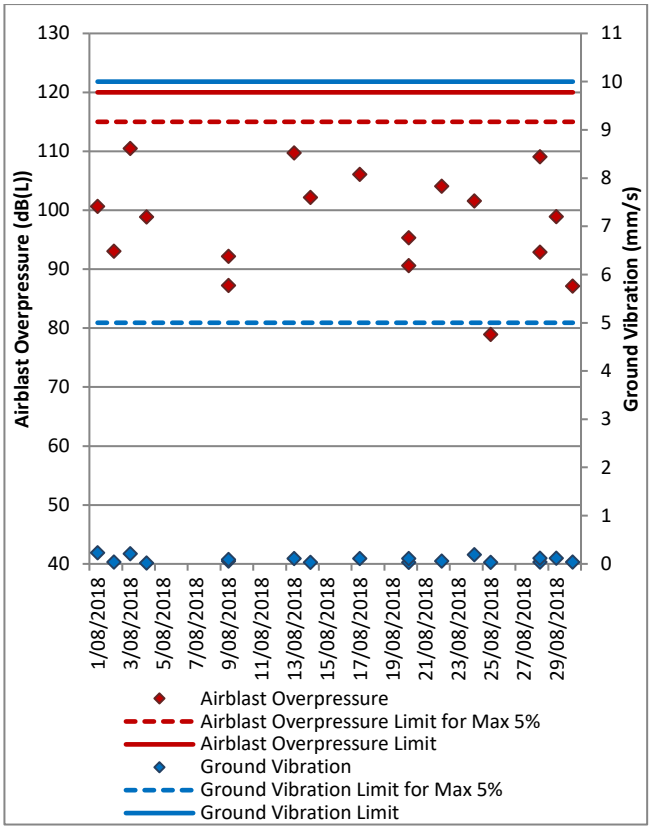

Figure 11: Jerrys Plains Blast Monitoring Results – August 2018

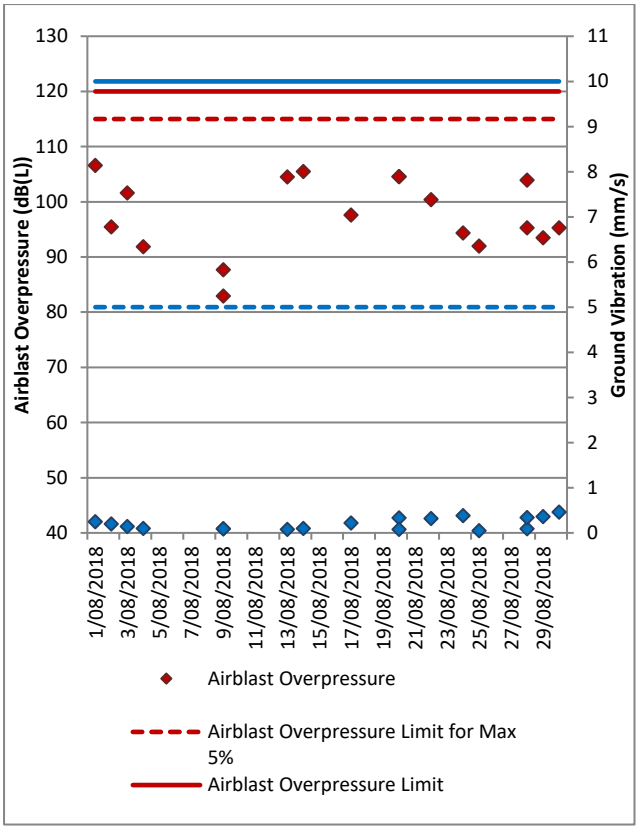

Figure 13: Warkworth Blast Monitoring Results – August 2018

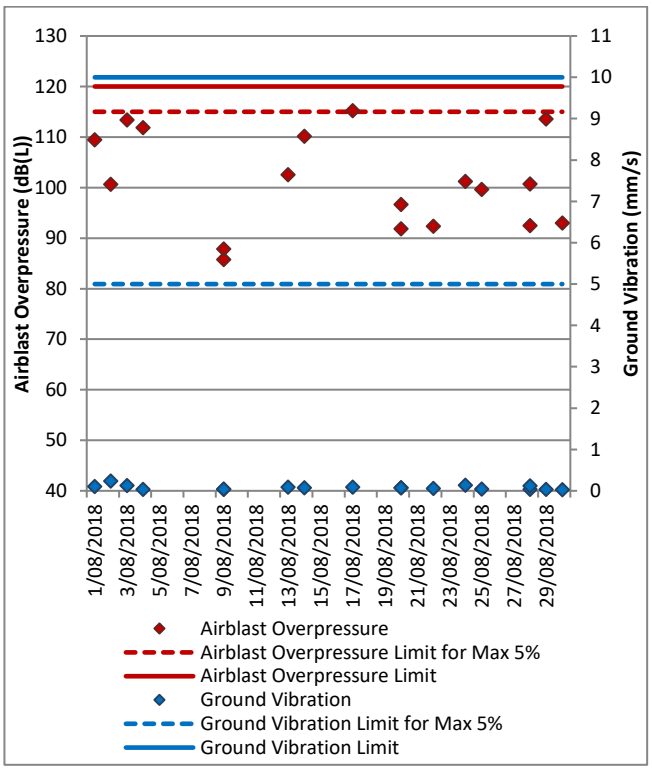

Figure 12: Maison Dieu Blast Monitoring Results – August 2018

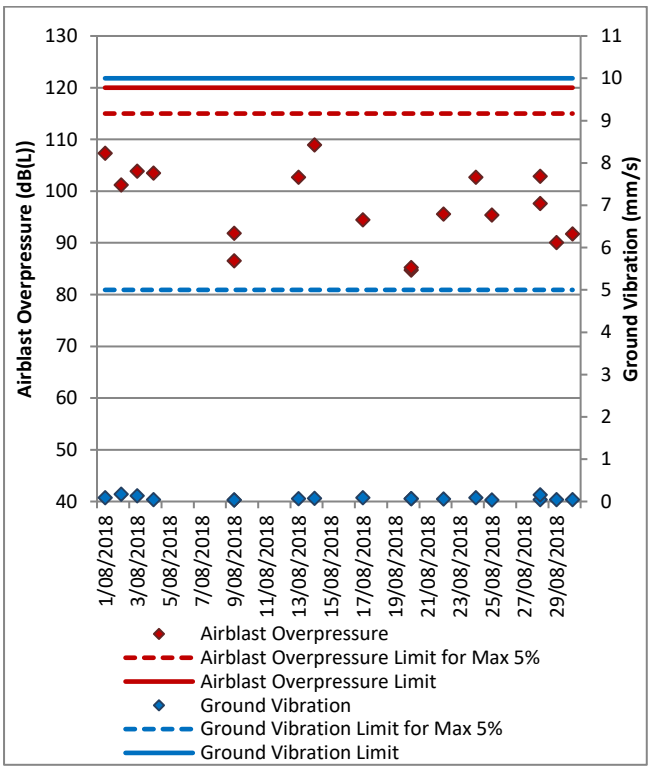

Figure 14: Knodlers Lane Blast Monitoring Results – August 2018

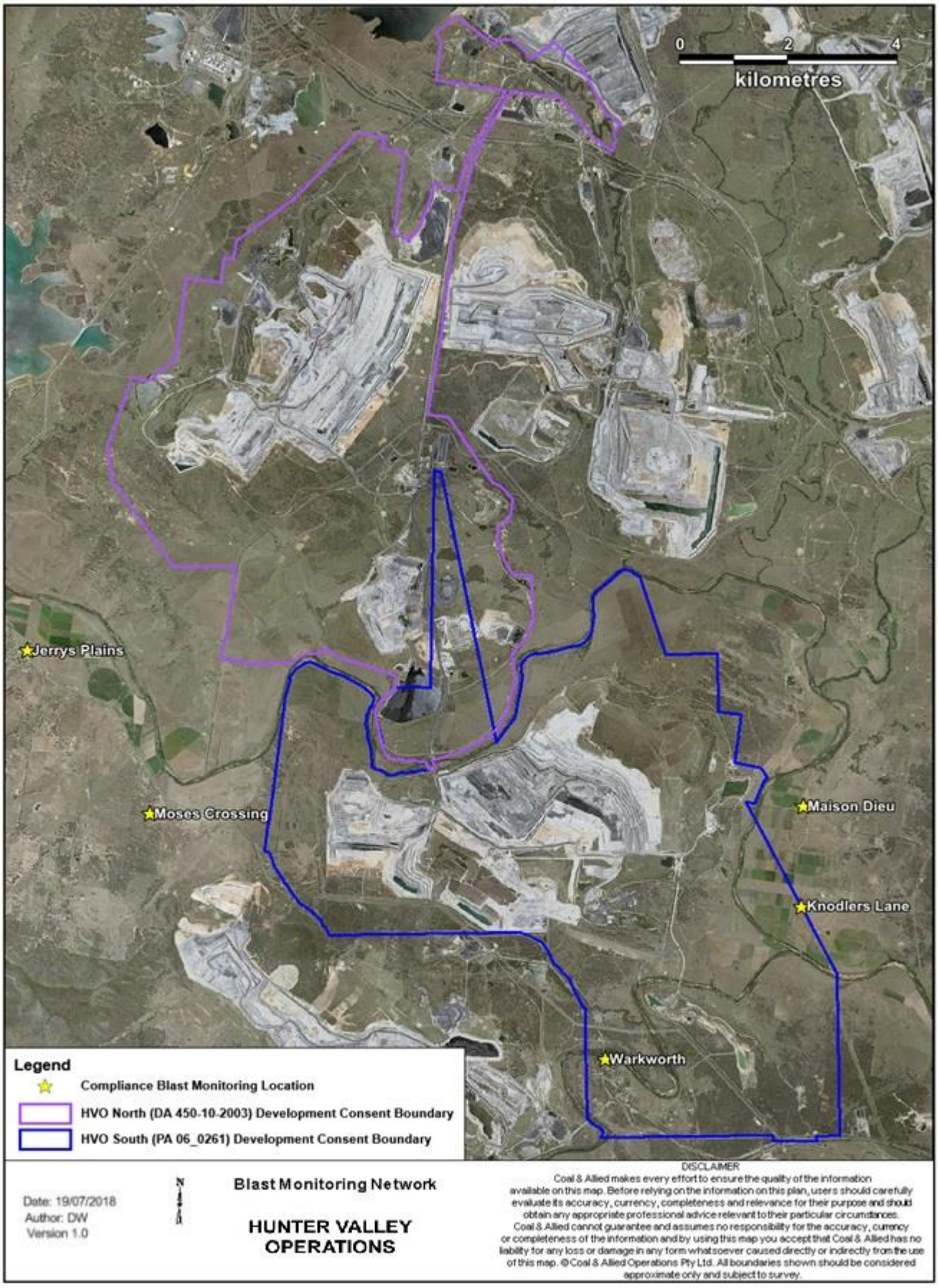

Figure 15: Blast Monitoring Location Plan

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 9 and 13 August 2018. Monitoring results are detailed in Table 4 to Table 9 . During August attended noise monitoring, a single exceedance of the HVO North Impact assessment criteria was measured at the Jerrys Plains Village monitoring location. As per the HVO Noise Management Plan, follow up monitoring was conducted which indicated compliance. The results were reported to the Department of Planning and Environment

Table 4: $L_{Aeq,\ 15\ minute}$ HVO South - Impact Assessment Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m [1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4, 5]
Knodlers Lane	9/08/2018 21:04	3.8	0.5	37	No	IA	NA
Maison Dieu	9/08/2018 21:28	3.5	0.5	37	No	IA	NA
Shearers Lane	9/08/2018 21:50	3.5	0.5	41	No	IA	NA
Kilburnie South	9/08/2018 22:52	2.9	0.5	36	Yes	<30	Nil
Jerrys Plains Village	9/08/2018 21:37	3.5	0.5	35	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	3.8	0.5	35	No	NM	NA
Long Point	10/08/2018 0:10	1.8	0.5	35	Yes	IA	Nil
HVGC	9/08/2018 23:27	1.8	-1	55	Yes	36[8]	Nil
Redmanvale Road	9/08/2018 23:45	1.4	-1	35	Yes	IA	Nil
Jerrys Plains West	9/08/2018 22:32	3.2	0.5	35	No	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Re-measure;
7. Follow-up monitoring; and
8. Includes low frequency penalty

Table 5: $L_{Aeq,\ 15\ minute}$ HVO South - Land Acquisition Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m [1]	Criterion dB (A)	Criterion Applies?[2]	HVO South L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/08/2018 21:04	3.8	0.5	41	No	IA	NA
Maison Dieu	9/08/2018 21:28	3.5	0.5	41	No	IA	NA
Shearers Lane	9/08/2018 21:50	3.5	0.5	41	No	IA	NA
Kilburnie South	9/08/2018 22:52	2.9	0.5	41	Yes	<30	Nil
Jerrys Plains Village	9/08/2018 21:37	3.5	0.5	40	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	3.8	0.5	40	No	NM	NA
Long Point	10/08/2018 0:10	1.8	0.5	40	Yes	IA	Nil
HVGC	9/08/2018 23:27	1.8	-1	NA	Yes	36[8]	Nil
Redmanvale Road	9/08/2018 23:45	1.4	-1	40	Yes	IA	Nil
Jerrys Plains West	9/08/2018 22:32	3.2	0.5	40	No	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.2 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO South Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Re-measure;
7. Follow-up monitoring; and
8. Includes low frequency penalty

Table 6: $L_{A1,\ 1minute}$ HVO South - Impact Assessment Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO South $L_{A1,\ 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/08/2018 21:04	3.8	0.5	45	No	IA	NA
Maison Dieu	9/08/2018 21:28	3.5	0.5	45	No	IA	NA
Shearers Lane	9/08/2018 21:50	3.5	0.5	45	No	IA	NA
Kilburnie South	9/08/2018 22:52	2.9	0.5	45	Yes	33	Nil
Jerrys Plains Village	9/08/2018 21:37	3.5	0.5	45	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	3.8	0.5	45	No	NM	NA
Long Point	10/08/2018 0:10	1.8	0.5	45	Yes	IA	Nil
HVGC	9/08/2018 23:27	1.8	-1	NA	NA	38	NA
Redmanvale Road	9/08/2018 23:45	1.4	-1	45	Yes	IA	Nil
Jerrys Plains West	9/08/2018 22:32	3.2	0.5	45	No	IA	NA

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. Assumed noise emission limits (see Section 2.3 of this report for more information) 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). Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO South Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Re-measure; and
7. Follow-up monitoring.

Table 7: $L_{Aeq, 15minute}$ HVO North – Impact Assessment Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m [1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4, 5]
Knodlers Lane	9/08/2018 21:04	1.7	0.5	35	Yes	IA	Nil
Maison Dieu	9/08/2018 21:28	1.8	0.5	35	Yes	IA	Nil
Shearers Lane	9/08/2018 21:50	1.8	0.5	35	Yes	IA	Nil
Kilburnie South	9/08/2018 22:52	0	-1	39	Yes	30	Nil
Jerrys Plains Village	9/08/2018 21:37	1.8	0.5	36	Yes	**39**[6]	**3**[6]
Jerrys Plains Village Re-measure[7]	9/08/2018 23:02	0.1	3	36	Yes	34	Nil
Jerrys Plains Village Follow up re-measure[8]	13/08/2018 21:00	3.6	-1	36	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	1.7	0.5	39	Yes	34	Nil
Long Point	10/08/2018 0:10	1.8	0.5	35	Yes	IA	Nil
HVGC	9/08/2018 23:27	0.1	0.5	NA	NA	IA	NA
Redmanvale Road	9/08/2018 23:45	0.3	3	35	Yes	<30	Nil
Jerrys Plains West	9/08/2018 22:32	0	0.5	35	Yes	32	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Includes low frequency penalty;
7. Re-measure; and
8. Follow-up monitoring.

Table 8: $L_{Aeq,15minute}$ HVO North - Land Acquisition Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North L_{Aeq} dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/08/2018 21:04	1.7	0.5	41	Yes	IA	Nil
Maison Dieu	9/08/2018 21:28	1.8	0.5	41	Yes	IA	Nil
Shearers Lane	9/08/2018 21:50	1.8	0.5	41	Yes	IA	Nil
Kilburnie South	9/08/2018 22:52	0	-1	41	Yes	30	Nil
Jerrys Plains Village	9/08/2018 21:37	1.8	0.5	41	Yes	39[6]	Nil
Jerrys Plains Village Re-measure[7]	9/08/2018 23:02	0.1	3	41	Yes	34	Nil
Jerrys Plains Village Follow up re-measure[8]	13/08/2018 21:00	3.6	-1	41	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	1.7	0.5	41	Yes	34	Nil
Long Point	10/08/2018 0:10	1.8	0.5	41	Yes	IA	Nil
HVGC	9/08/2018 23:27	0.1	0.5	NA	NA	IA	NA
Redmanvale Road	9/08/2018 23:45	0.3	3	41	Yes	<30	Nil
Jerrys Plains West	9/08/2018 22:32	0	0.5	41	Yes	32	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. Estimated or measured LAeq,15minute atributed to HVO North Pit Area;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Includes low frequency penalty;
7. Re-measure; and
8. Follow-up monitoring.

Table 9: $L_{A1, 1Minute}$ HVO North - Impact Assessment Criteria – August 2018

Location	Date and Time	Wind Speed (m/s)[1]	VTG °C/100m[1]	Criterion dB (A)	Criterion Applies?[2]	HVO North $L_{A1, 1min}$ dB[3,4]	Exceedance[4,5]
Knodlers Lane	9/08/2018 21:04	1.7	0.5	46	Yes	IA	Nil
Maison Dieu	9/08/2018 21:28	1.8	0.5	46	Yes	IA	Nil
Shearers Lane	9/08/2018 21:50	1.8	0.5	46	Yes	IA	Nil
Kilburnie South	9/08/2018 22:52	0	-1	46	Yes	33	Nil
Jerrys Plains Village	9/08/2018 21:37	1.8	0.5	46	Yes	44	Nil
Jerrys Plains Village Re-measure[7]	9/08/2018 23:02	0.1	3	46	Yes	36	Nil
Jerrys Plains Village Follow up re-measure[8]	13/08/2018 21:00	3.6	-1	46	No	IA	NA
Jerrys Plains East	9/08/2018 21:00	1.7	0.5	46	Yes	44	Nil
Long Point	10/08/2018 0:10	1.8	0.5	46	Yes	IA	Nil
HVGC	9/08/2018 23:27	0.1	0.5	NA	NA	IA	NA
Redmanvale Road	9/08/2018 23:45	0.3	3	46	Yes	33	Nil
Jerrys Plains West	9/08/2018 22:32	0	0.5	46	Yes	36	Nil

Notes:
1. Atmospheric data is sourced from the HVO Cheshunt or HVO Corp. weather station using logged meteorological data;
2. 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. Criterion may or may not apply due to rounding of meteorological data values;
3. These are results for HVO North Pit Area in the absence of all other noise sources;
4. Bold results in red indicate exceedance of criteria;
5. NA in exceedance column means atmospheric conditions outside specifed in approval and so criterion is not applicable;
6. Re-measure; and
7. Follow-up monitoring.

5.2 NPfI Low Frequency Assessment

In accordance with the requirements of the EPA's Noise Policy for Industry (NPfI), the applicability of the low frequency modification penalty has been assessed. During August 2018 two measurements required the penalty to be applied. The assessment for low frequency noise is shown in Table 10.

Table 10: Low Frequency Noise Assessment - August 2018

Location	Date and Time	Measured Site Only LA_{eq} dB (Sth/Nth)	Site Only LC_{eq} dB[1] (Sth/Nth)	Site Only LC_{eq}-LA_{eq} dB [1,2] (Sth/Nth)	Result Max exceedance of ref spectrum dB[1,3] (Sth/Nth)	Penalty dB(A) [1]	Site $L_{Aeq,15min}$ dB with modifying factor (if applicable)
Knodlers Lane	9/08/2018 21:04	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Maison Dieu	9/08/2018 21:28	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Shearers Lane	9/08/2018 21:50	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Kilburnie South	9/08/2018 22:52	<30/30	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village	9/08/2018 21:37	IA/37	NA/55	NA/18	NA/1	NA/2	NA/**39**
Jerrys Plains Village Re-measure[7]	9/08/2018 23:02	NM/34	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains Village Follow up re-measure[8]	13/08/2018 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains East	9/08/2018 21:00	NM/34	NA/53	NA/19	NA/Nil	NA/Nil	NA/NA
Long Point	10/08/2018 0:10	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
HVGC	9/08/2018 23:27	34/IA	54/NA	20/NA	2/NA	2/NA	36/NA
Redmanvale Road	9/08/2018 23:45	IA/<30	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
Jerrys Plains West	9/08/2018 22:32	IA/32	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA

Notes:
1. 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;
2. As per NPfI, if LCeq – LAeq ≥ 15 dB further assessment of low frequency noise required as detailed in Sections 2.4 and 3.3 of this report;
3. As per NPfI, compare measured spectrum against reference spectrum to determine if the low frequency modifying factor is triggered and application of penalty is required;
4. Re-measure; and
5. Follow-up measurement.

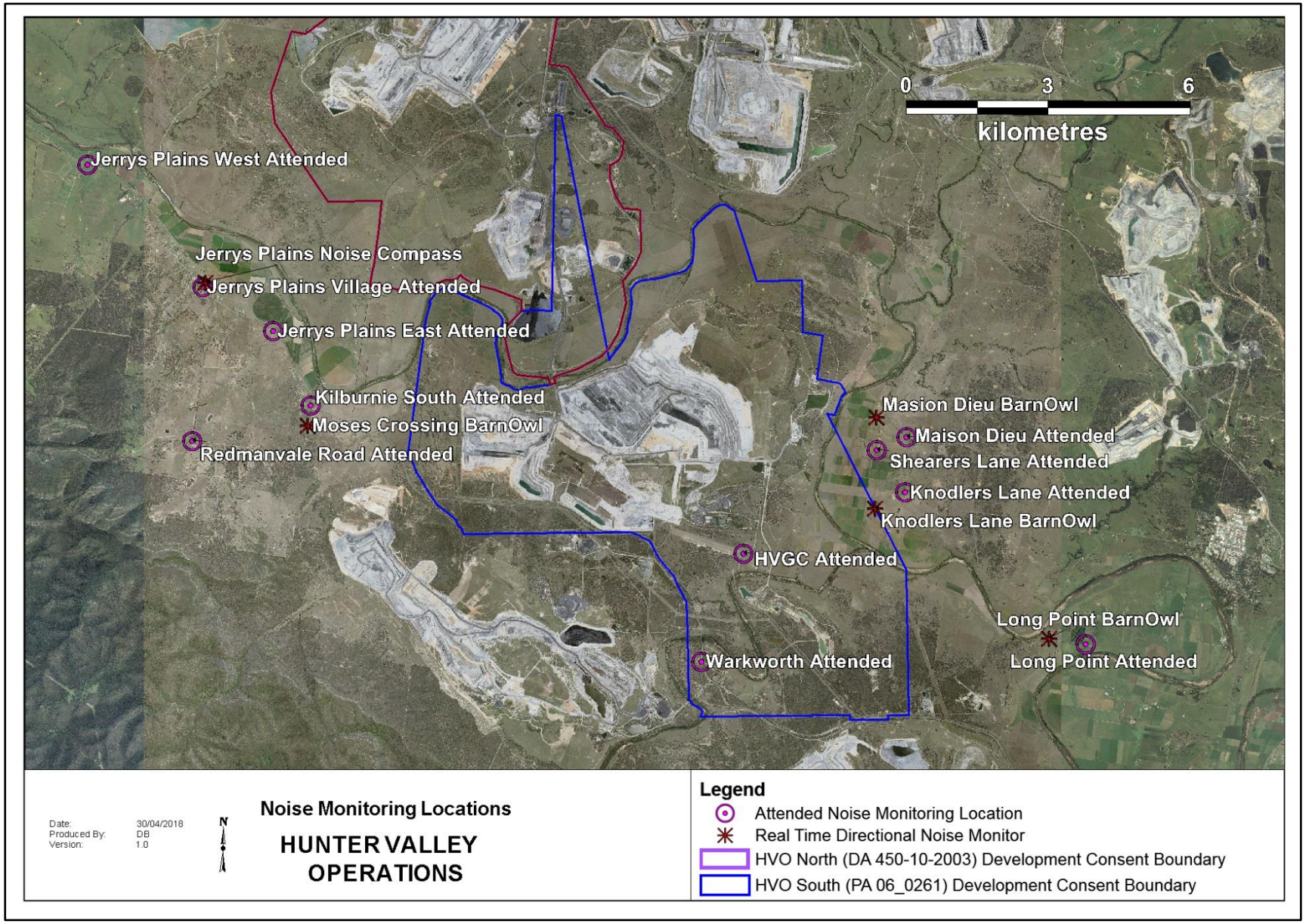

Figure 16: Noise Monitoring Location Plan

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 5.1, 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 August, a total of 445 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.

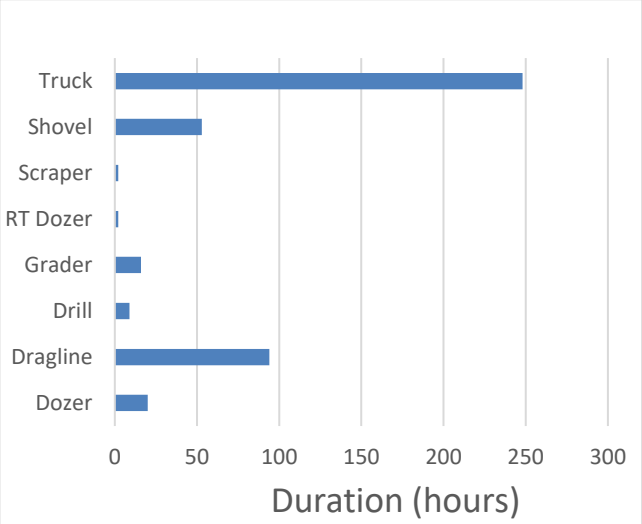

Figure 17: Operational Downtime by Equipment Type – August 2018

7.0 REHABILITATION

During August 32.2 Ha of land was released, 3.7 Ha of land was bulk shaped and 5.9 Ha of land was rehabilitated. Year to date progress can be viewed in Figure 18.

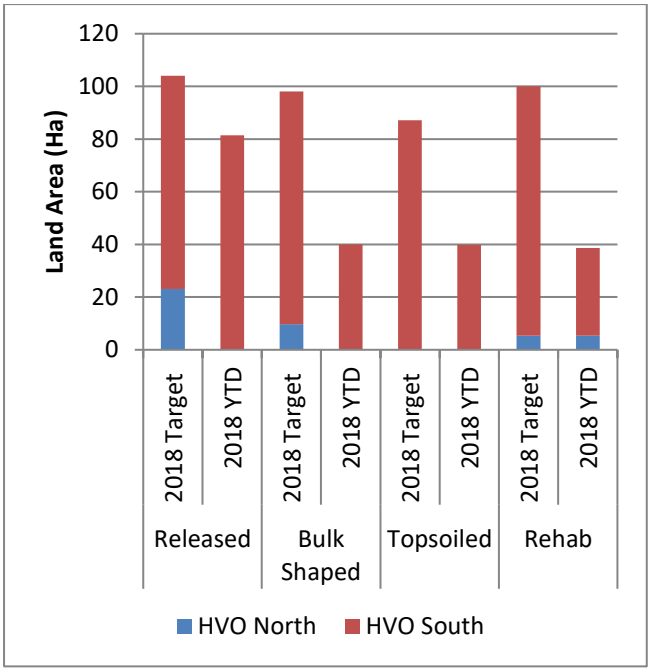

Figure 18: Rehabilitation YTD – August 2018

8.0 COMPLAINTS

One complaint was received during the reporting period. Details of complaints received YTD are shown in Table 11 below.

Table 11: Complaints Summary YTD

	Noise	Dust	Blast	Lighting	Other	Total
January	-	2	4	-	-	6
February	1	-	-	-	1	2
March	-	-	-	-	-	0
April	-	-	1	-	-	1
May	4	1	2	-	-	7
June	1	-	1	-	1	3
July	-	-	2	-	-	2
August	1	-	-	-	-	1
September	-	-	-	-	-	-
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total	7	3	10	-	2	22

9.0 ENVIRONMENTAL INCIDENTS

During the reporting period there were three recordable environmental incidents;

9 August 2018 – Noise Exceedance
Noise Exceedance measured at the Jerrys Plains Village attended monitoring location in relation to haul truck noise from HVO West Pit.

As per the Noise Management Plan, the monitoring consultant contacted dispatch and advised of the exceedance, within 75 minutes a re-measure was undertaken and a follow up measurement within a week was also undertaken. Both follow up measurements resulted in compliant measurements.

The results were reported to the Department of Planning and Environment

17 August 2018 – Blast Overpressure exceedance (>115dB)
On 17 August 2018, blast WN40BAR01A in HVO West Pit recorded an overpressure result of 115.3 dB(L) at the Maison Dieu monitoring location . An assessment against the 5% of the total number of blasts in a 12 month period criteria will be reported in the 2018 Annual Review.

23 August 2018 – Leak from Hunter River Pump Pipeline
On 23 August 2018, a pipeline from the Oaklands Hunter River pumping station to HVO CHPP receiving dam was observed to have developed a leak when transferring river water. Pumping ceased immediately and repairs were made to the pipeline before recommencing the pump.

Appendix A: Meteorological Data

Table 12: Meteorological Data - HVO Corporate Meteorological Station – August 2018

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)
1/08/2018	20	4	51	16	606	246	2.9	0.0
2/08/2018	17	5	88	46	12	125	2.2	0.0
3/08/2018	22	1	100	19	593	261	2.5	0.6
4/08/2018	18	3	86	26	677	282	4.2	0.2
5/08/2018	22	0	76	10	634	256	2.1	0.0
6/08/2018	15	2	100	40	586	275	3.6	9.0
7/08/2018	16	3	62	23	947	275	5.4	0.0
8/08/2018	18	0	69	18	672	273	4.0	0.0
9/08/2018	20	3	86	20	657	-	2.3	0.0
10/08/2018	22	2	84	10	662	260	1.8	0.0
11/08/2018	24	3	58	13	646	283	4.7	0.0
12/08/2018	16	2	67	16	825	270	4.8	0.0
13/08/2018	19	-1	63	21	647	281	4.2	0.0
14/08/2018	21	1	74	18	676	279	4.1	0.0
15/08/2018	22	4	57	3	685	280	5.6	0.0
16/08/2018	23	5	69	10	759	243	5.0	0.0
17/08/2018	18	1	75	15	683	276	2.8	0.0
18/08/2018	21	1	50	10	690	265	5.2	0.0
19/08/2018	15	1	52	14	781	261	6.2	0.0
20/08/2018	16	0	60	8	701	256	2.9	0.0
21/08/2018	16	0	52	22	677	273	4.7	0.0
22/08/2018	18	1	76	21	908	243	2.7	0.0
23/08/2018	18	-1	93	22	817	145	1.6	0.0
24/08/2018	19	1	100	26	828	113	1.7	0.0
25/08/2018	18	4	91	37	794	128	1.5	0.0
26/08/2018	15	4	100	65	917	207	1.2	5.8
27/08/2018	17	2	93	47	979	176	2.2	5.0
28/08/2018	16	0	86	27	924	157	1.3	0.2
29/08/2018	18	-2	88	8	742	243	2.1	0.0
30/08/2018	19	-3	88	7	765	196	1.4	0.0
31/08/2018	16	2	92	40	859	206	2.0	6.6

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