COAL & ALLIED

Managed by Rio Tinto Coal Australia

Hunter Valley Operations

Monthly Environmental Report

June 2017

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	Environmental Graduate	Draft	8/08/2017
1.1	Environmental Specialist	Final	10/07/2017

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Hunter Valley Operations (HVO).This report includes all monitoring data collected for the period 1st June 2017 to 30th June 2017.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

HVO maintains two meteorological stations; 'Corporate' and 'Cheshunt' (Refer to Figure 4: Air Quality Monitoring Location Plan).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the 2017 trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall HVO

2017	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
June	25.8	339.2

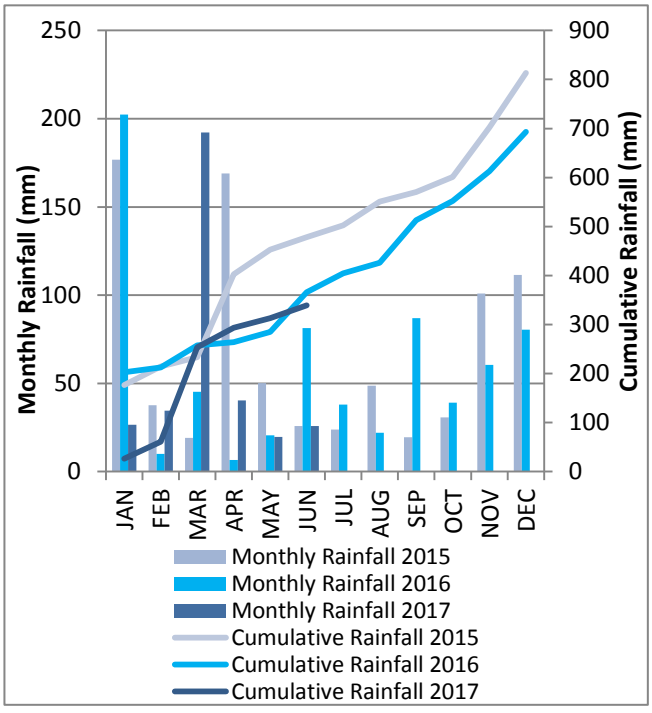

Figure 1: Year to Date Rainfall Summary 2017

2.1.2 Wind Speed and Direction

Dominant winds varied throughout June as shown in Figure 2 (HVO Corporate) and Figure 3 (HVO Cheshunt).

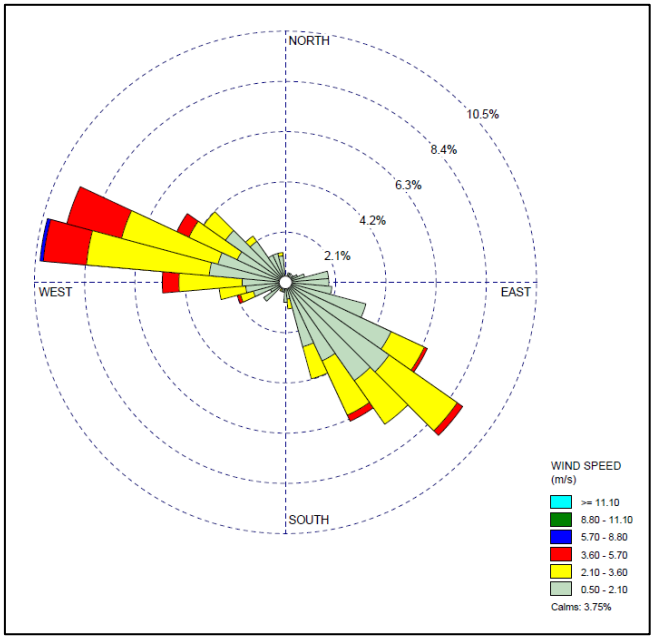

Figure 2: HVO Corporate Wind Rose – June 2017

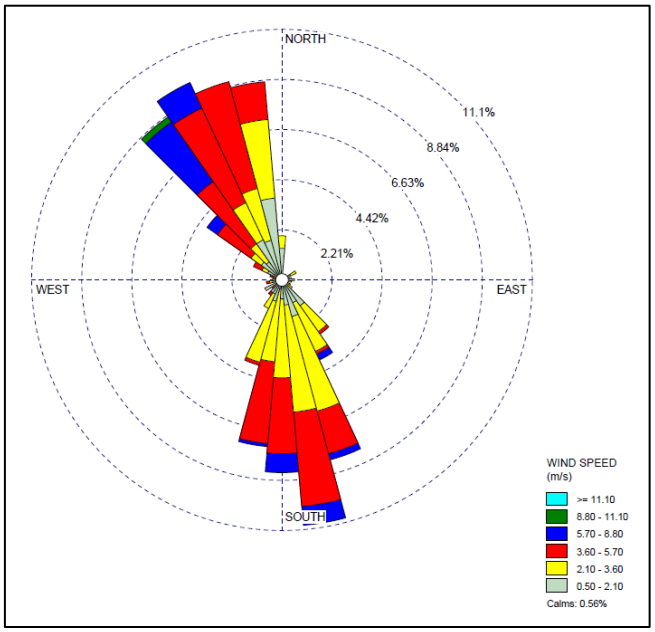

Figure 3: HVO Cheshunt Wind Rose – June 2017

Figure 4: Air Quality Monitoring Location Plan

2.2 Depositional Dust

To monitor regional air quality, HVO operates and maintains a network of nine depositional dust gauges, situated on private and mine owned land surrounding HVO.

Figure 5 displays insoluble solids results from depositional dust gauges during the reporting period compared against the year-to-date average and the annual impact assessment criteria.

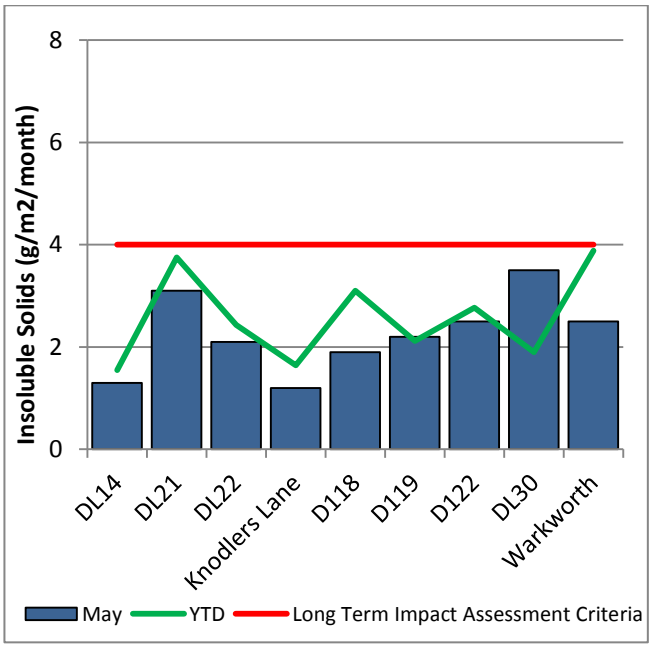

Figure 5: Depositional Dust Results – June 2017

2.3 Suspended Particulates

Suspended particulates are measured by a network of High Volume Air Samplers (HVAS) measuring Total Suspended Particulates (TSP) and Particulate Matter <10µm (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 in accordance with EPA requirements.

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 50µg/m³.

The Warkworth HVAS monitor failed to collect a valid sample on the 23rd and 29th of June due to a power outage.

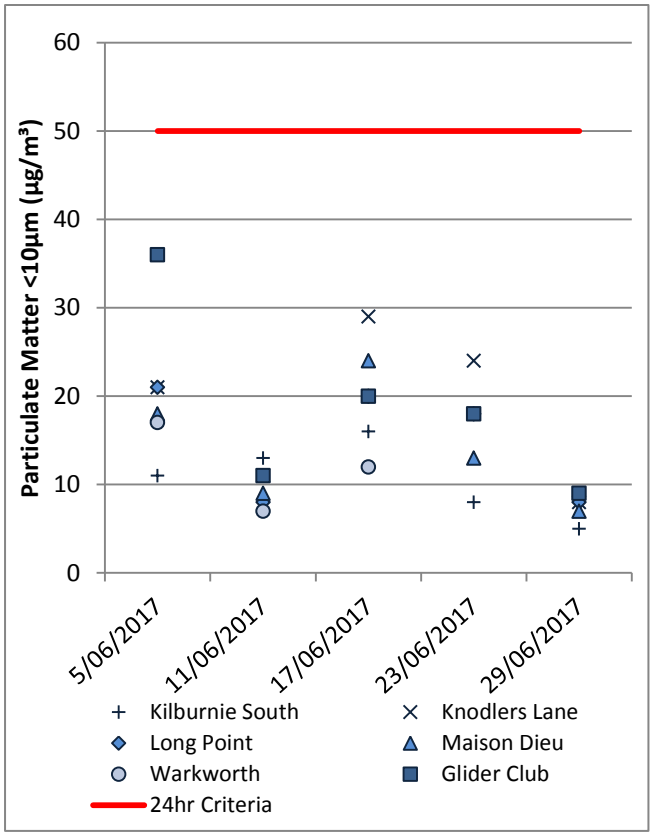

Figure 6: Individual PM_{10} Results – June 2017

Figure 7 shows the annual average PM_{10} results. During the reporting period, all PM_{10} results were below the long term impact assessment criteria.

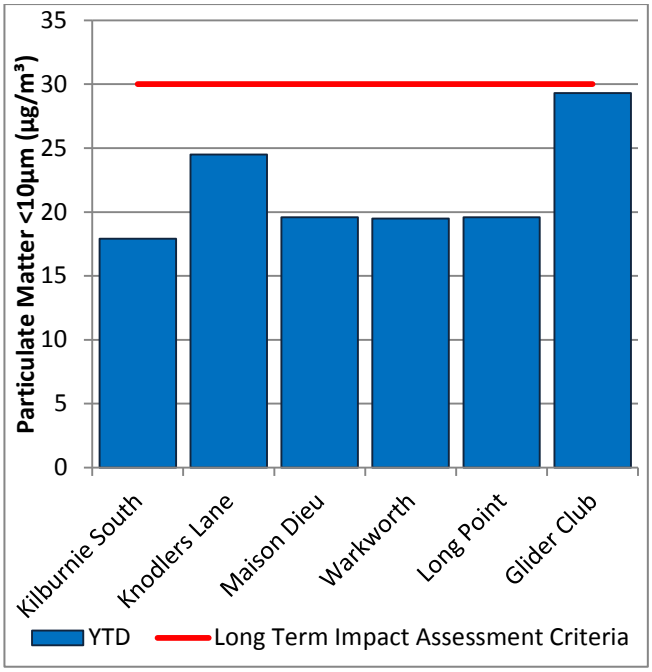

Figure 7: Year to Date Average PM_{10} – June 2017

2.3.2 TSP Results

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

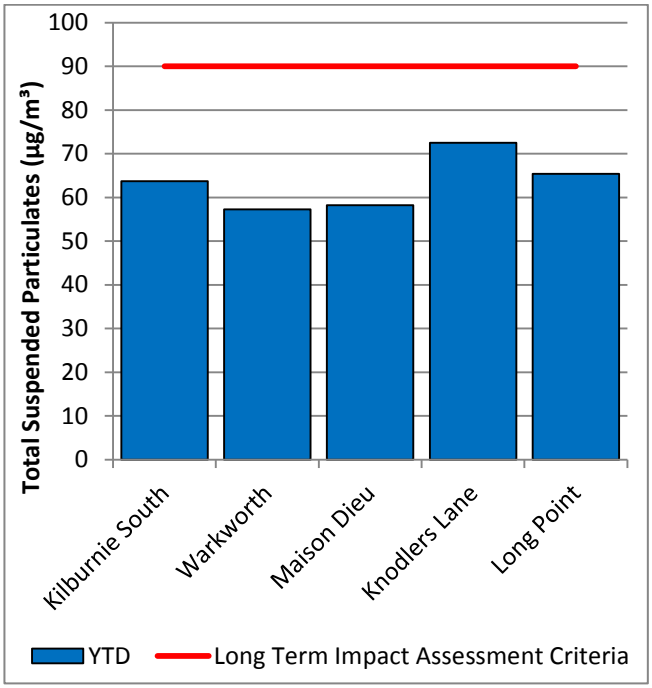

Figure 8: Annual Average Total Suspended Particulates – June 2017

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 are shown in Error! eference source not found., including the daily 24 hour average PM_{10} result and the 24 hour YTD PM_{10} average. There were no results recorded which exceeded the short term (24hr) criteria of 50 µg/m³.

2.3.4 Real Time Alarms for Air Quality

During June, the real time monitoring system generated 7 automated air quality related alarms. 3 alarms were related to adverse weather conditions and 4 alarms related to PM_{10}.

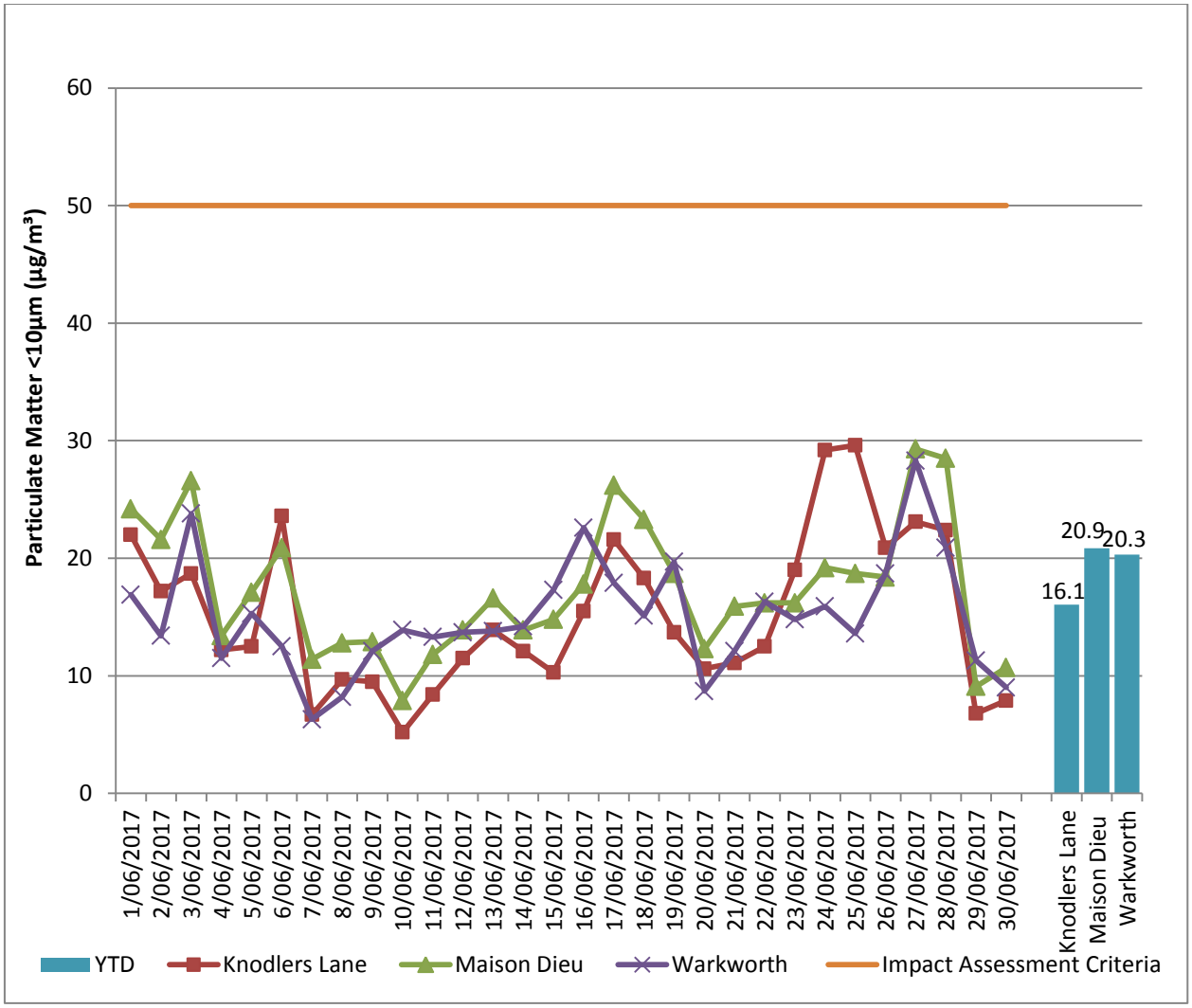

Figure 9: Real Time PM_{10} 24hr average and YTD average – June 2017

3.0 SURFACE WATER

3.1.1 Surface Water Monitoring

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

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

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

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

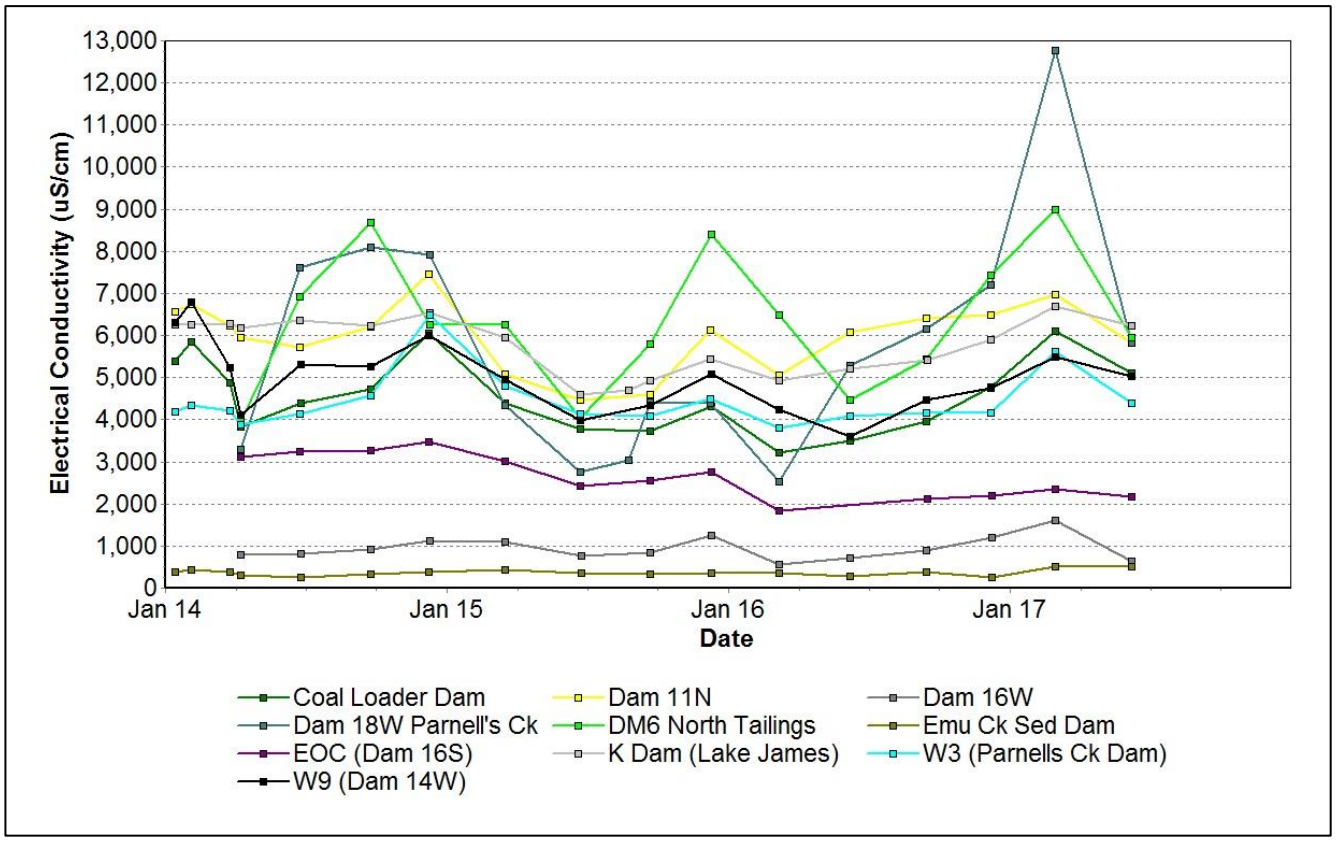

Figure 10: Site Dams Electrical Conductivity Trend - June 2017

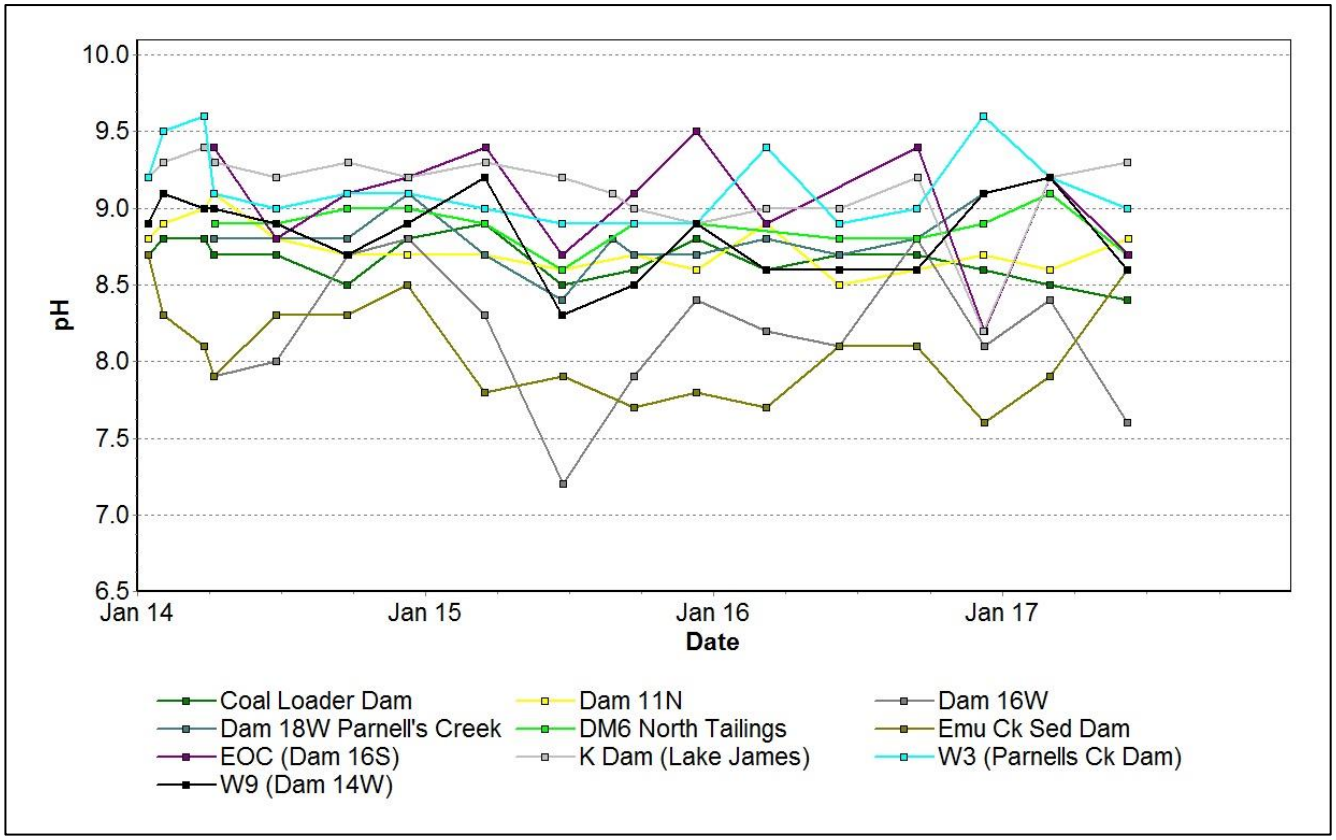

Figure 11: Site Dams pH Trend - June 2017

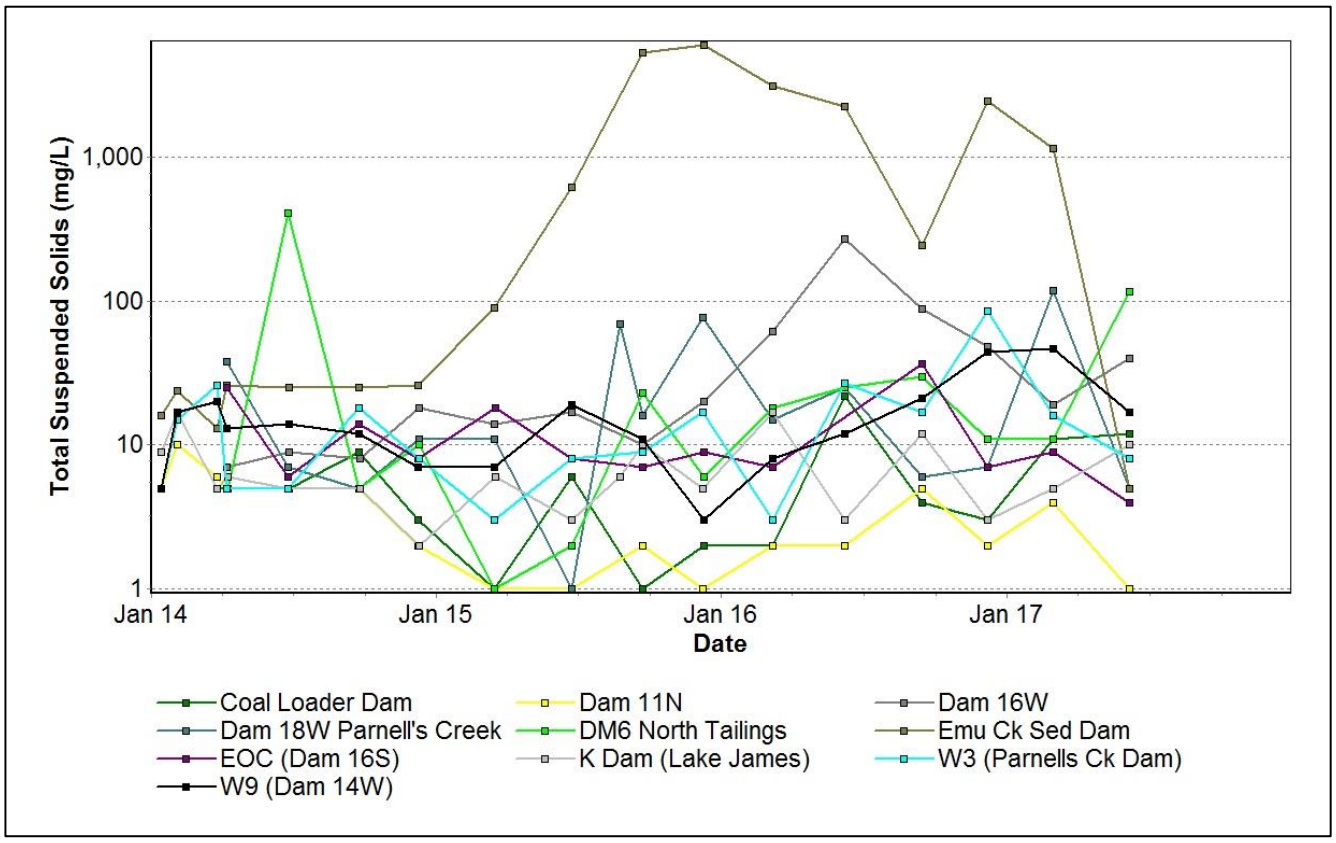

Figure 12: Site Dams Total Suspended Solids Trend – June 2017

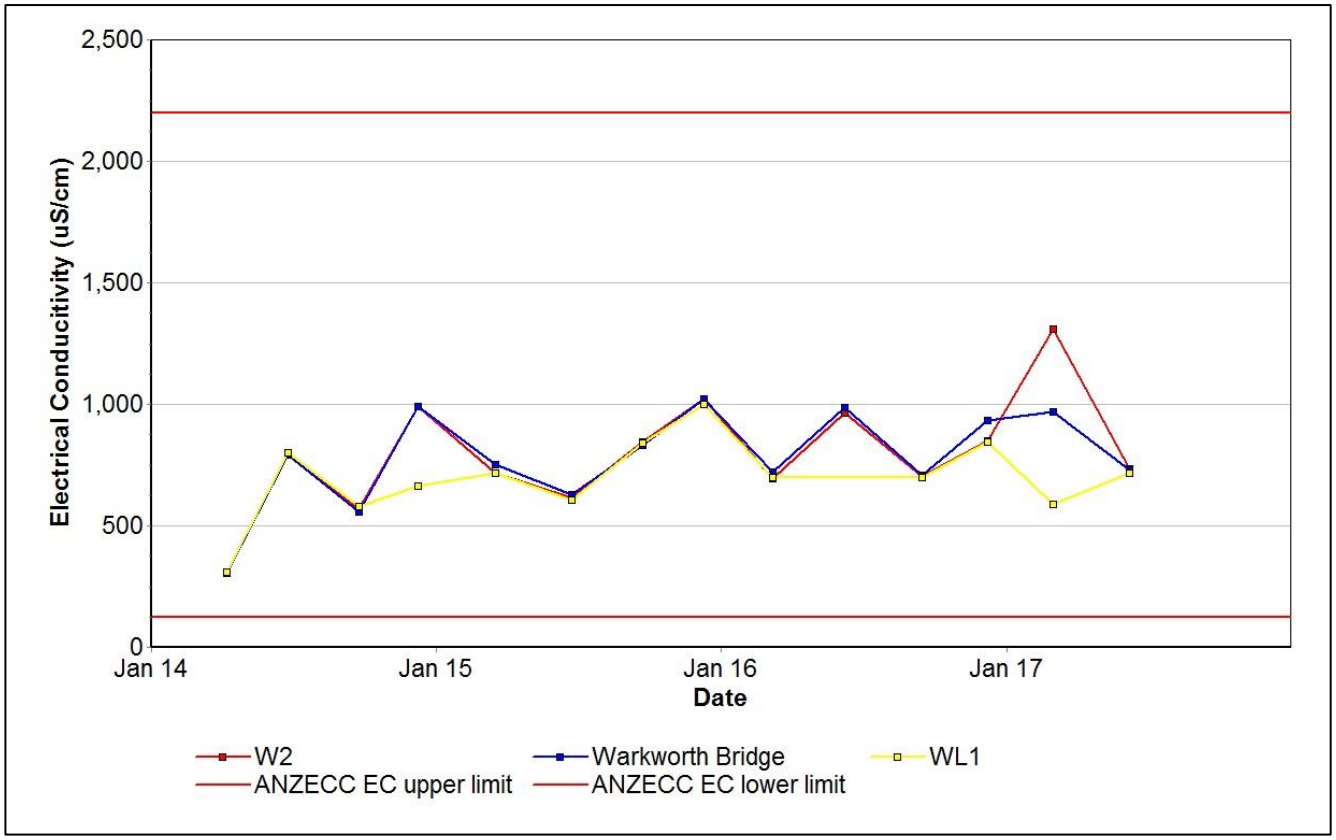

Figure 13: Wollombi Brook Electrical Conductivity Trend - June 2017

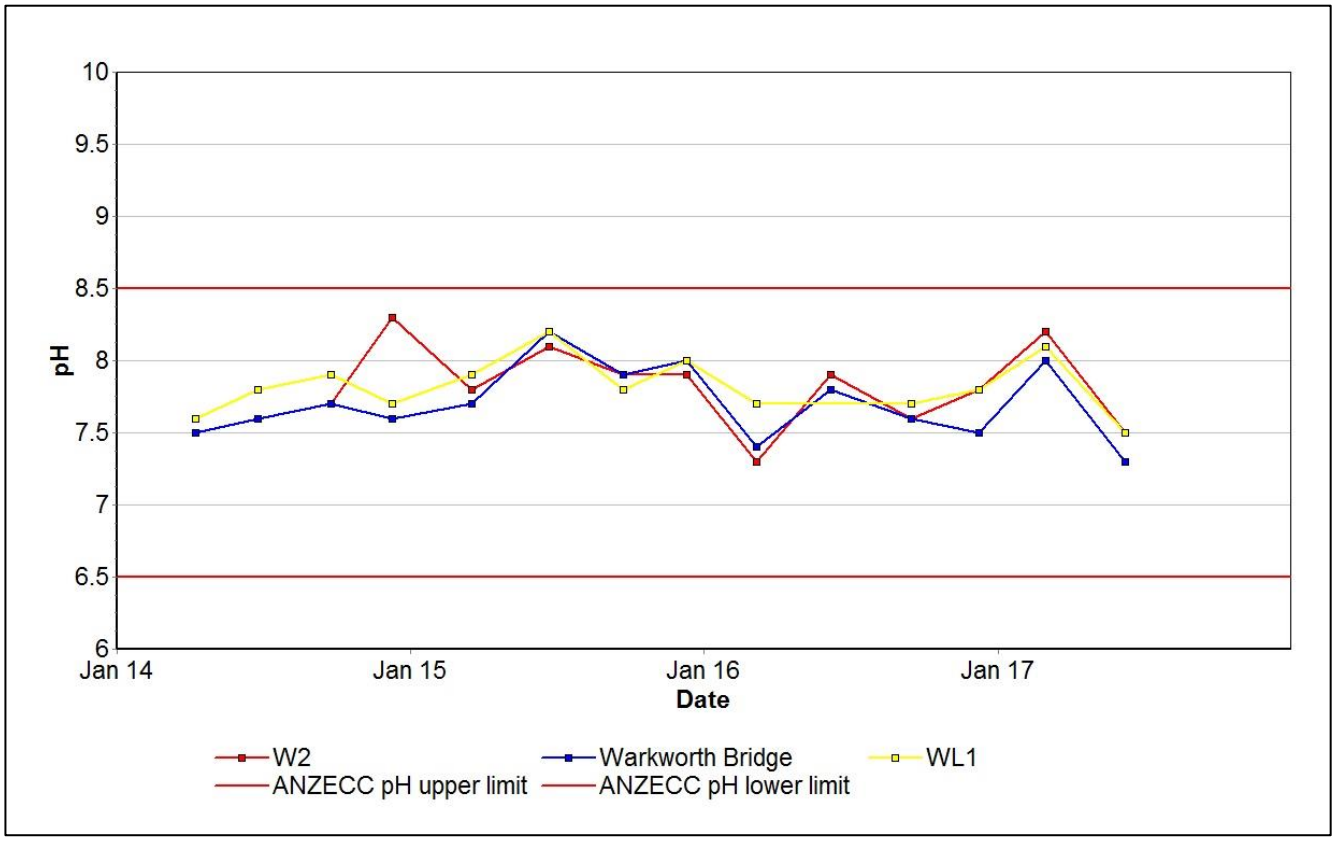

Figure 14: Wollombi Brook pH Trend - June 2017

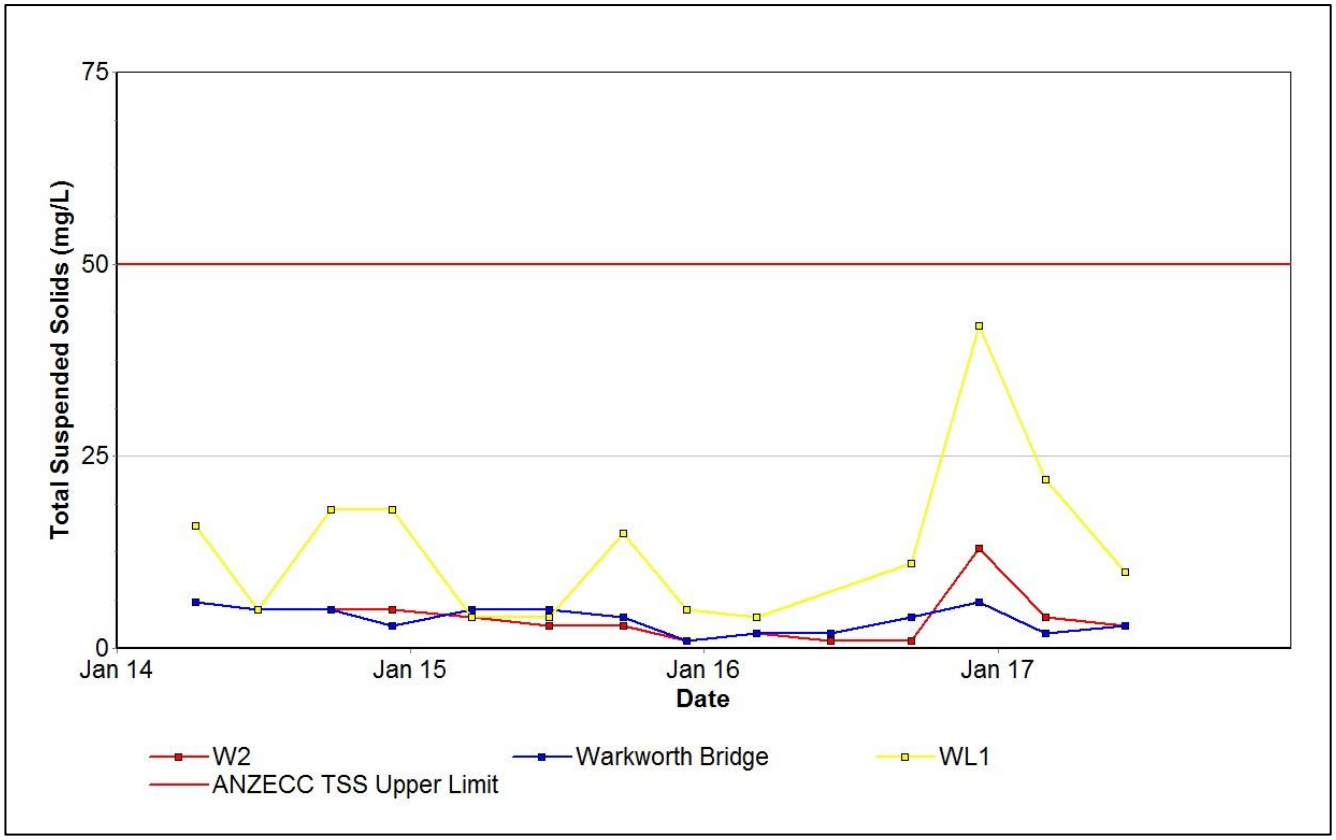

Figure 15: Wollombi Brook Total Suspended Solids Trend - June 2017

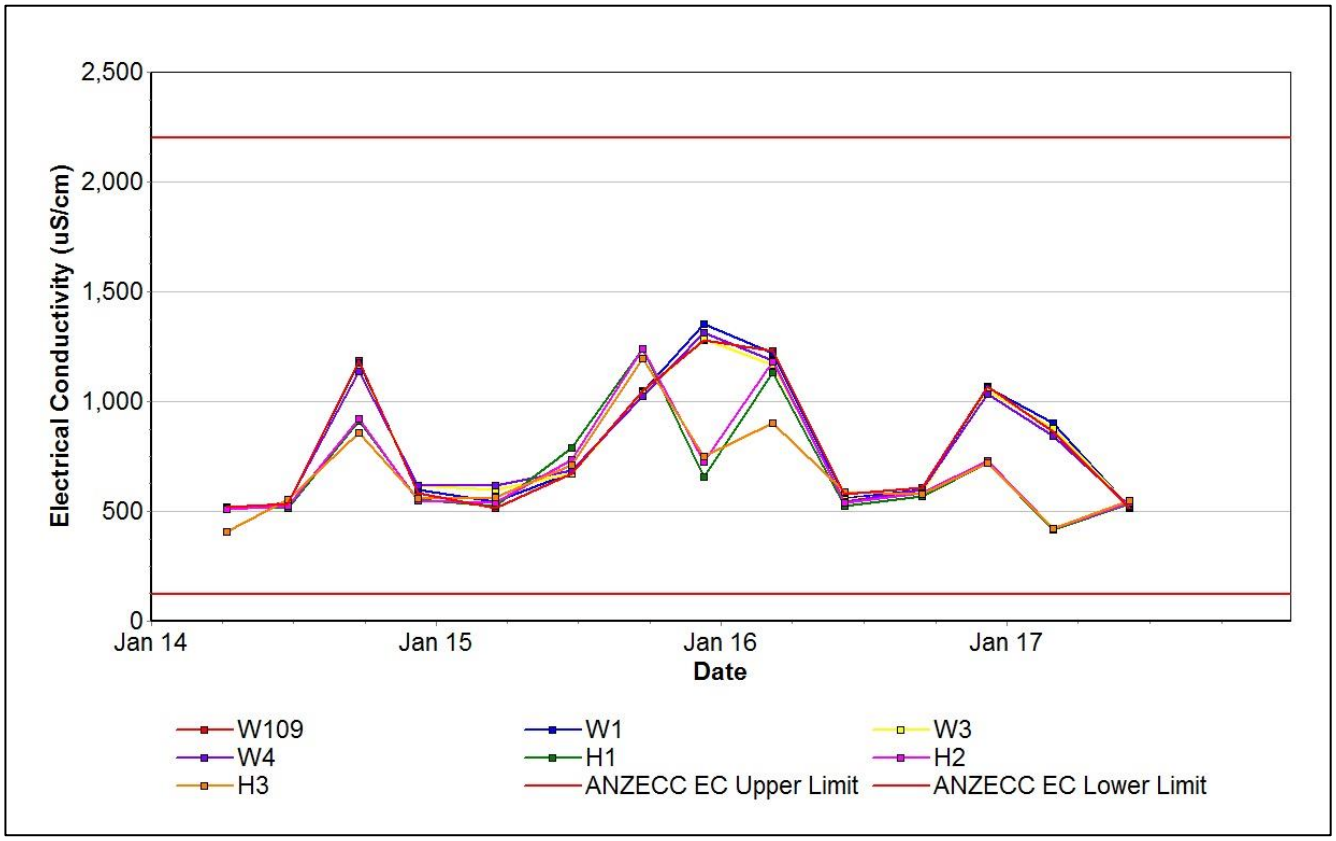

Figure 16: Hunter River Electrical Conductivity Trend - June 2017

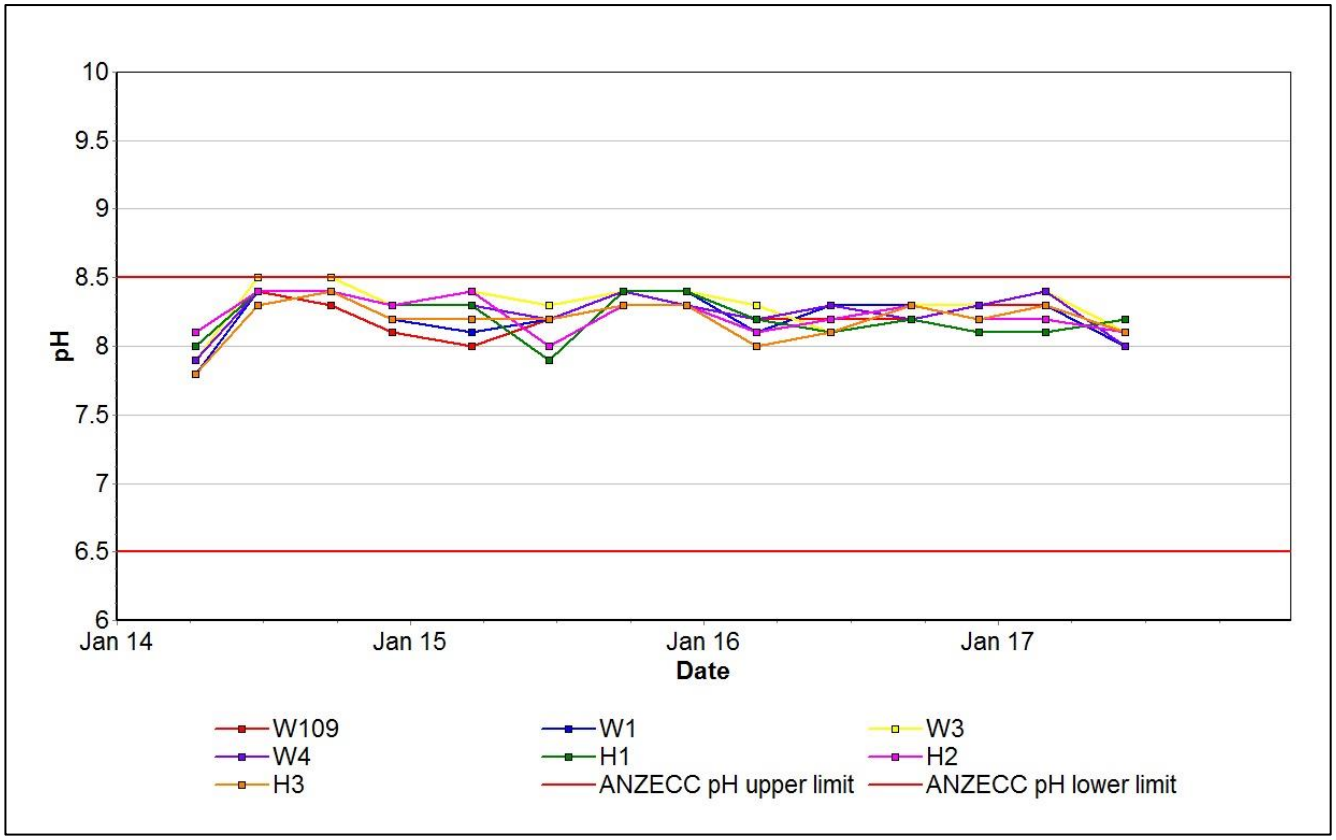

Figure 17: Hunter River pH Trend - June 2017

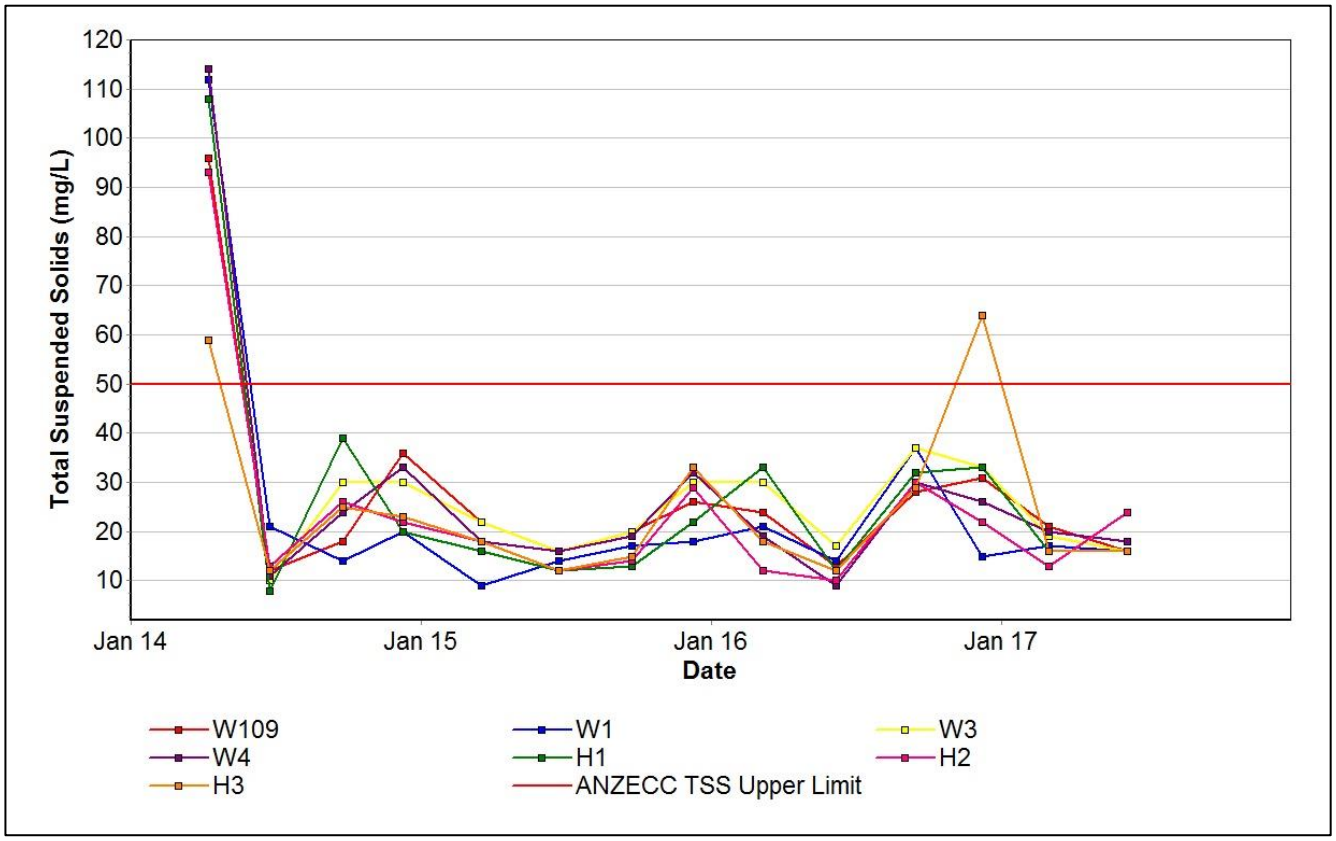

Figure 18: Hunter River Total Suspended Solids - June 2017

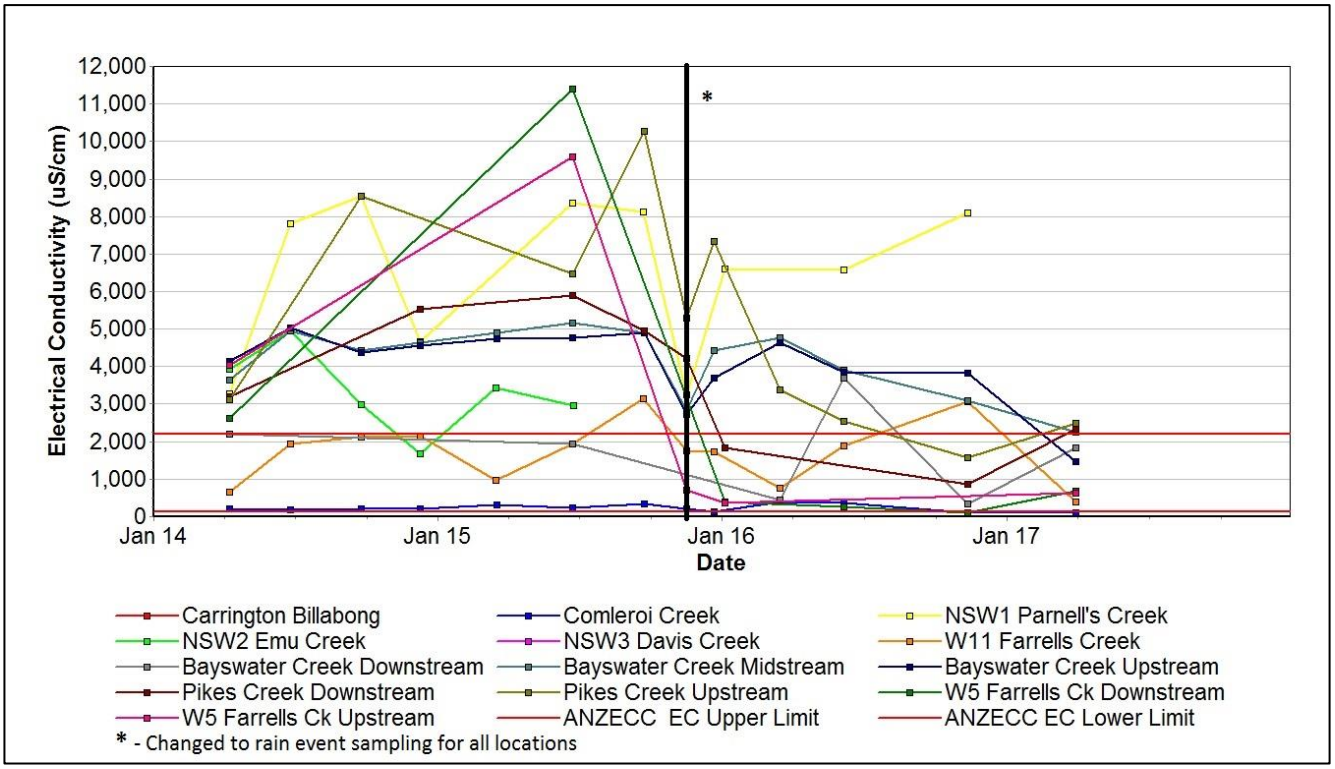

Figure 19: Other Tributaries Electrical Conductivity Trend - June 2017

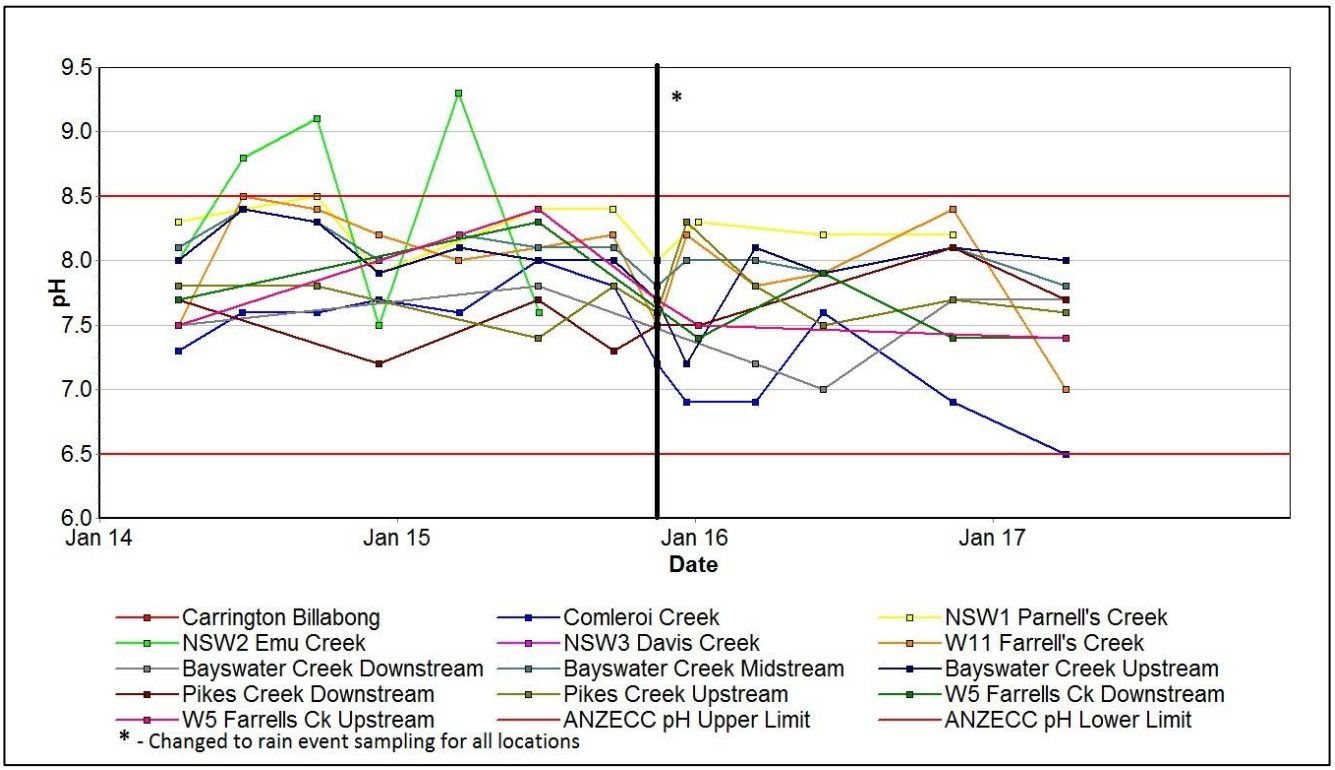

Figure 20: Other Tributaries pH Trend – June 2017

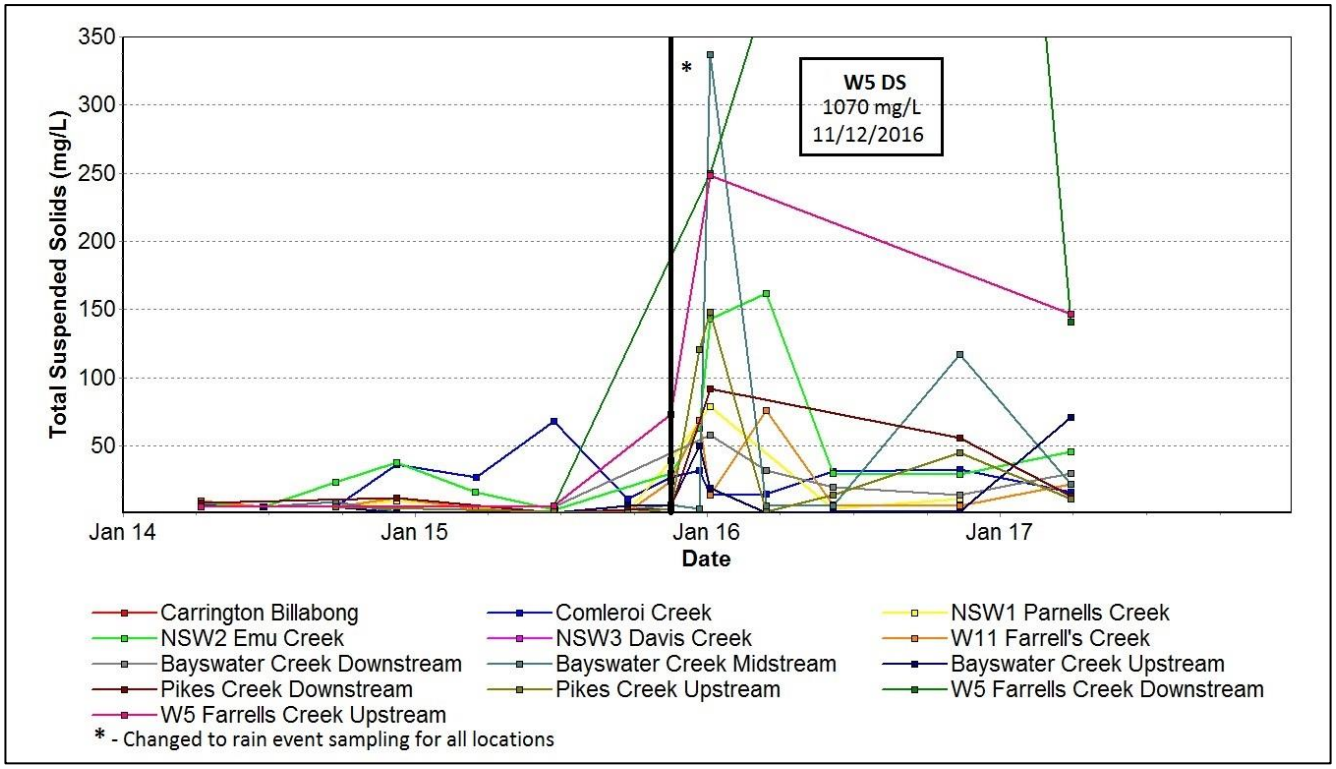

Figure 21: Other Tributaries Total Suspended Solids Trend - June 2017

3.1.2 Site Water Use

Under water allocation licences issued by the NSW Office of Water, HVO is permitted to extract water from the Hunter River. During the reporting period, HVO did not extract any water from the Hunter River.

3.1.3 HRSTS Discharge

HVO participates in the HRSTS, allowing it to discharge from licensed discharge points Dam 11N (to Farrell's Creek), Lake James (to the Hunter River) and Parnell's Dam (to Parnell's Creek). Discharges can only take place subject to HRSTS regulations.

During the reporting period no water was discharged under the HRSTS.

3.1.4 Surface Water Trigger Limits

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

During Q2 2017 2 internal trigger limits were breached, summarised in Table 2.

Table 2: Surface Water Trigger Limit Summary

Site	Date	Trigger Limit Breached	Action taken in response
W1 (Hunter River)	08/06/2017	pH – 5th Percentile	Watching Brief*
W4 Hunter River	08/06/2017	pH – 5th Percentile	Watching Brief*

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

Figure 22: Surface Water Monitoring Location Plan

4.0 GROUNDWATER

4.1.1 Groundwater Monitoring

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

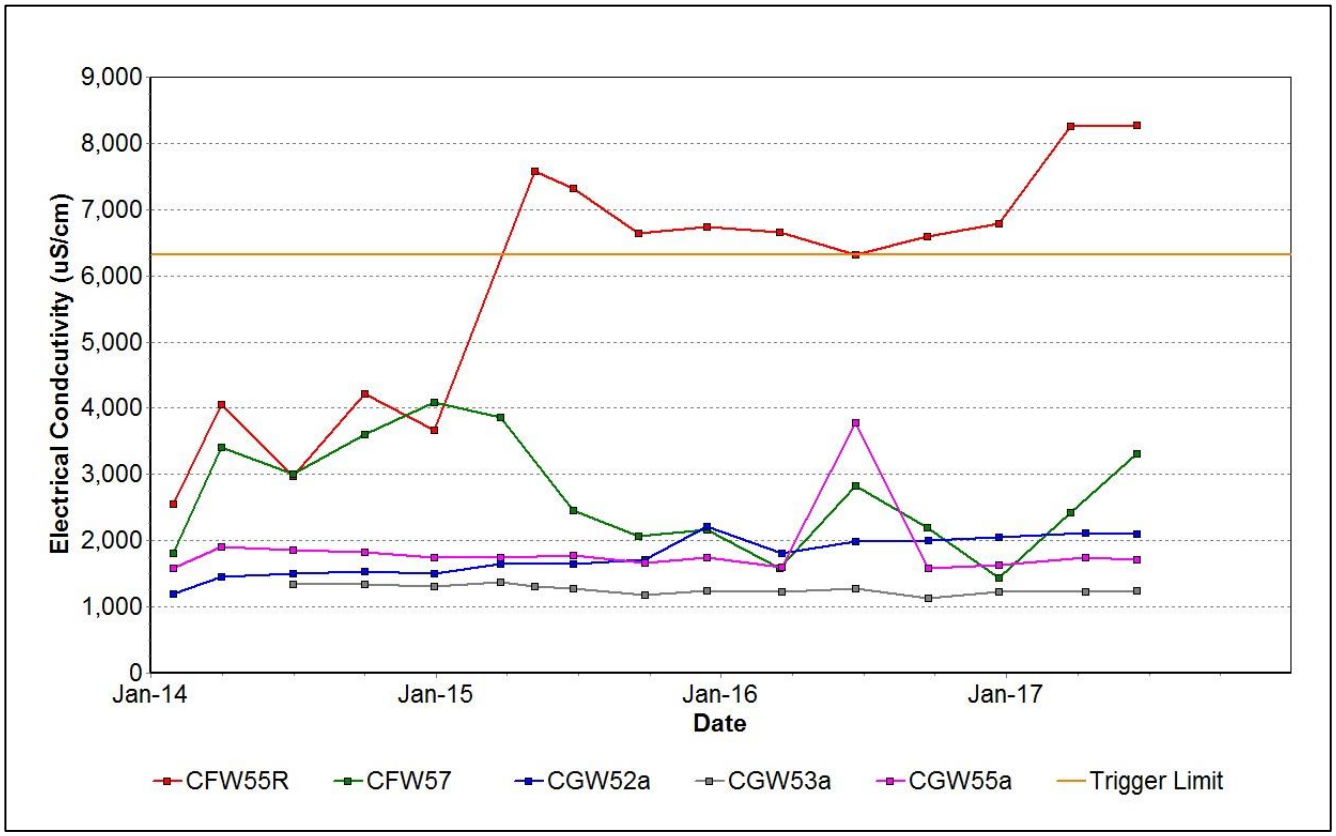

Figure 23: Carrington Alluvium Electrical Conductivity Trend - June 2017

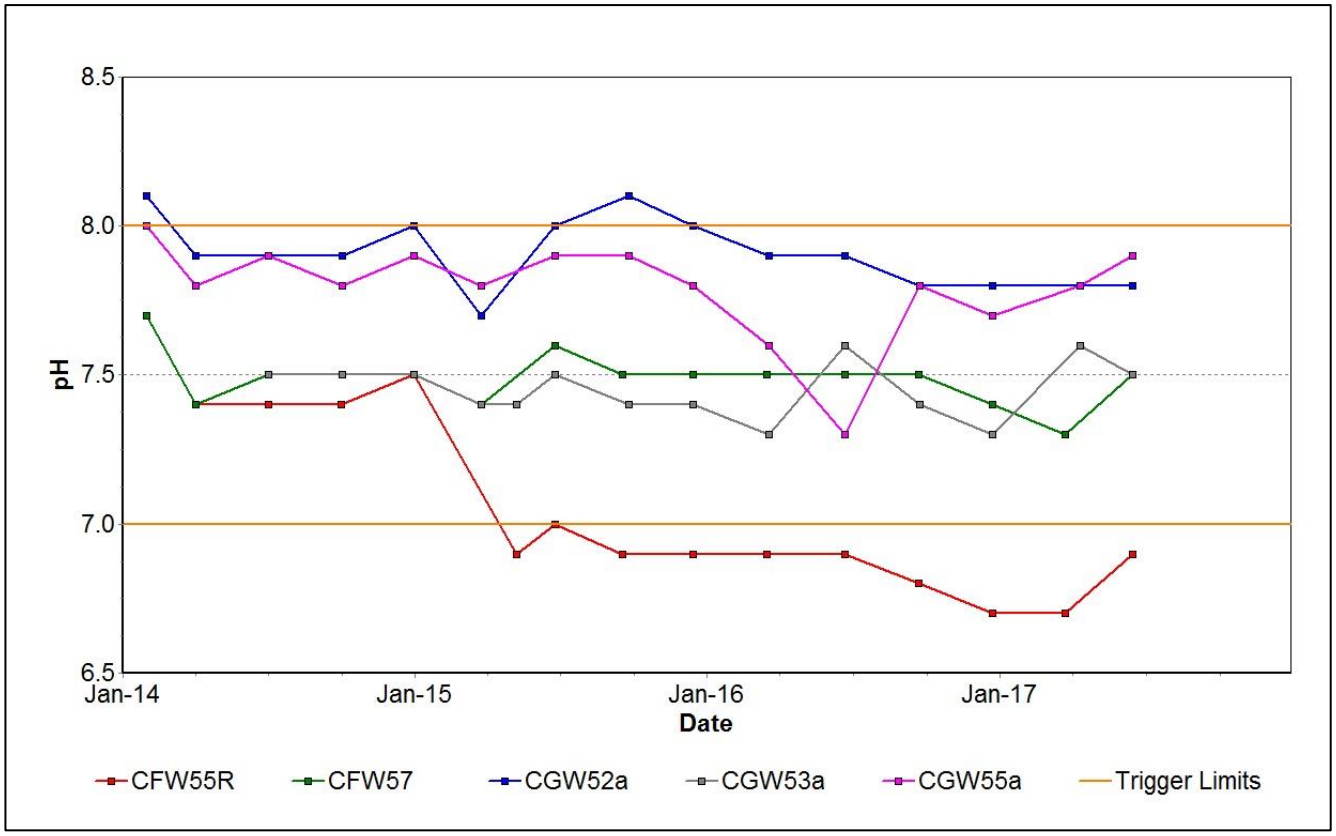

Figure 24: Carrington Alluvium pH Trend – June 2017

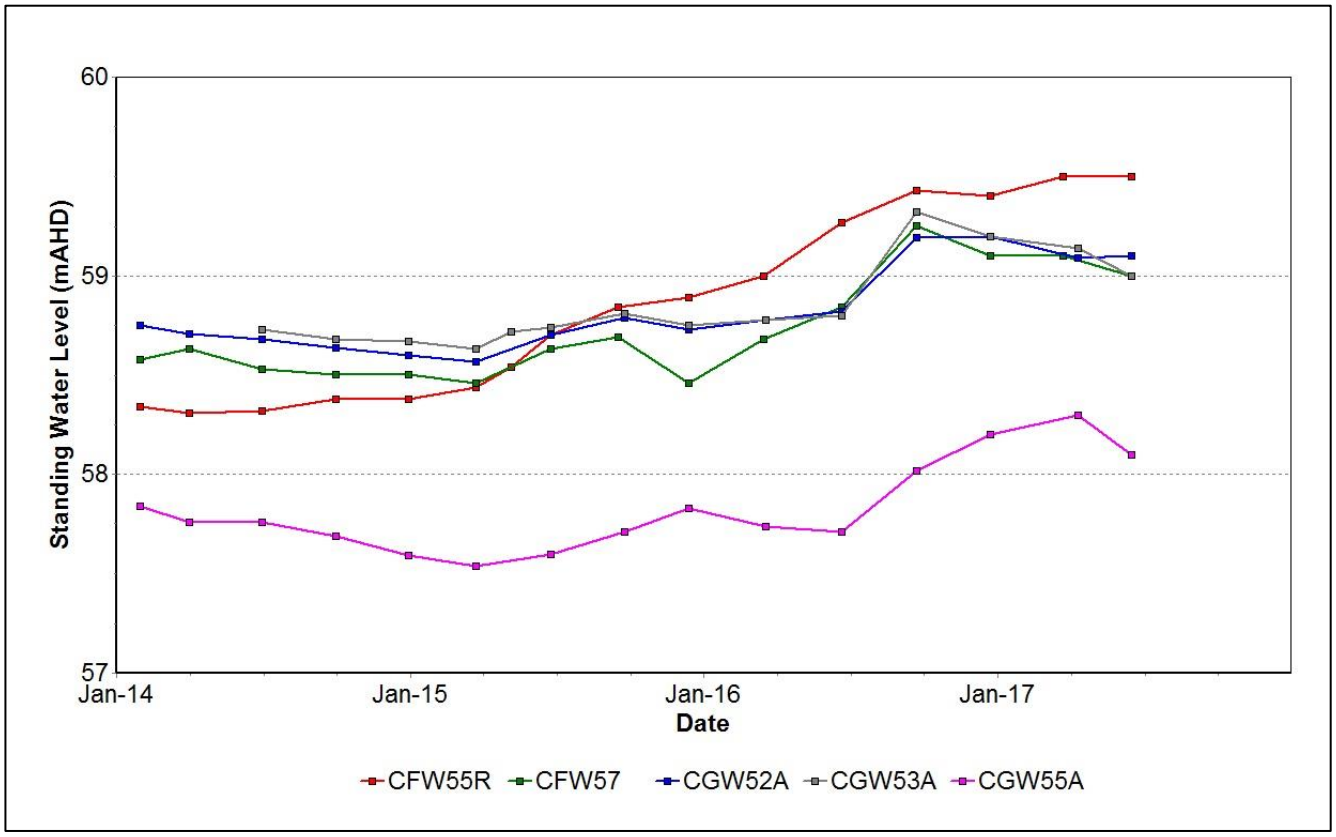

Figure 25: Carrington Alluvium Standing Water Level - June 2017

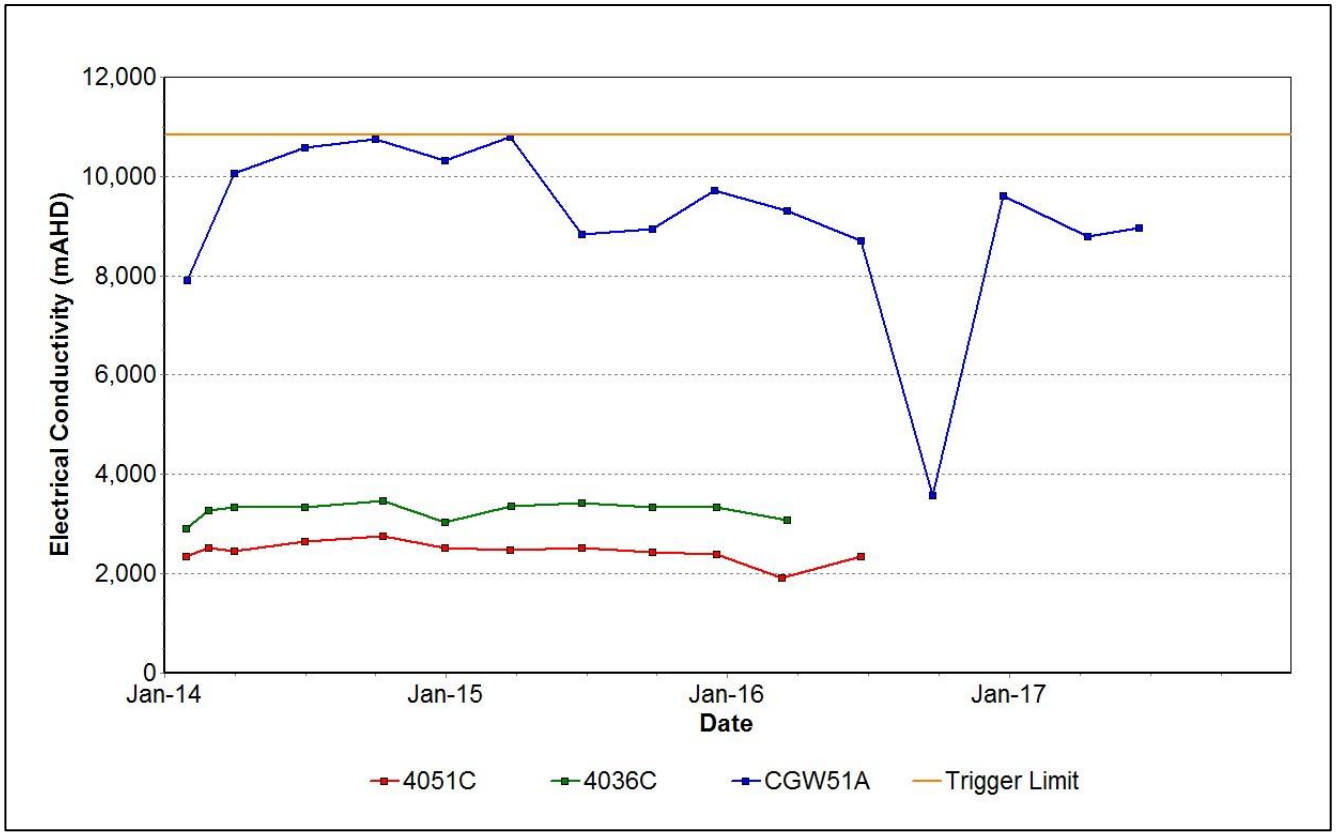

Figure 26: Carrington Interburden Electrical Conductivity Trend - June 2017

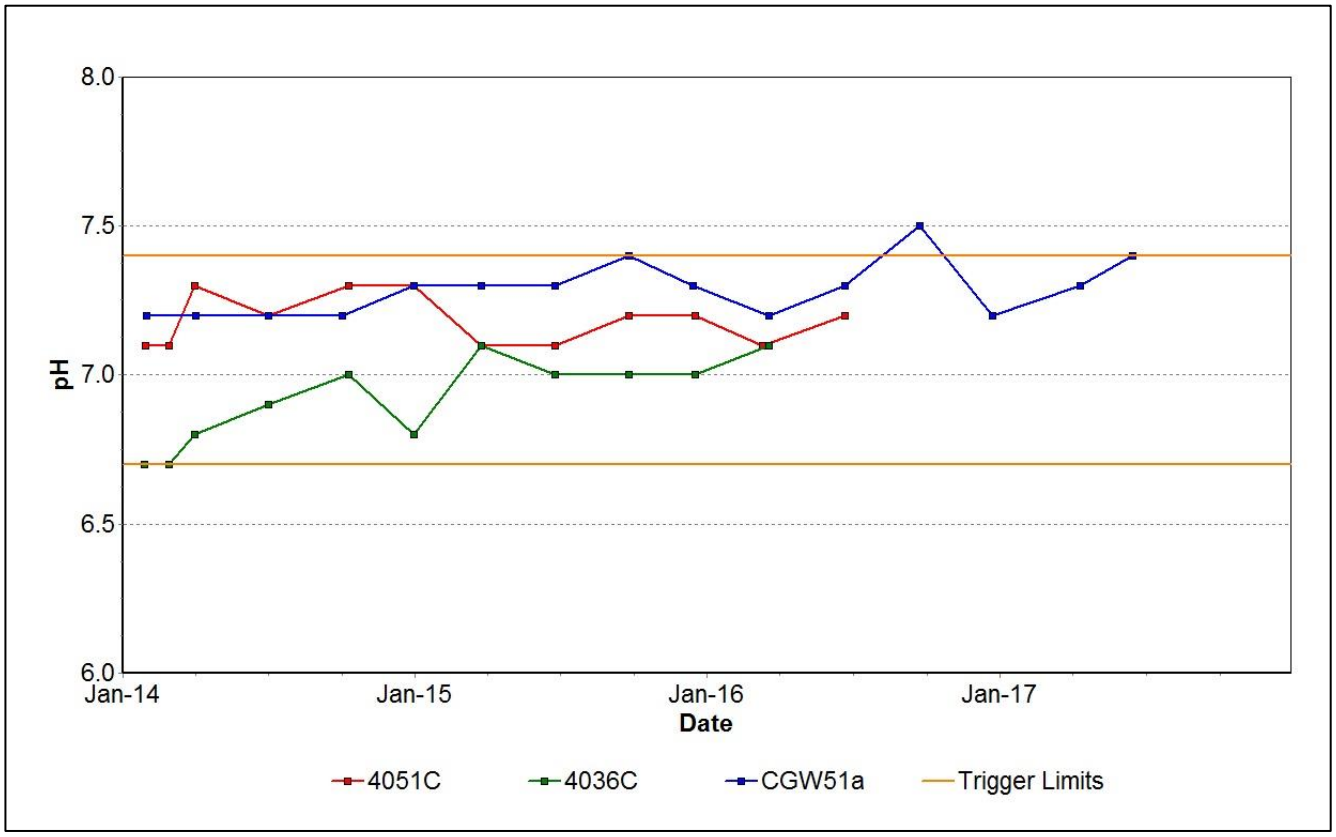

Figure 27: Carrington Interburden pH Trend – June 2017

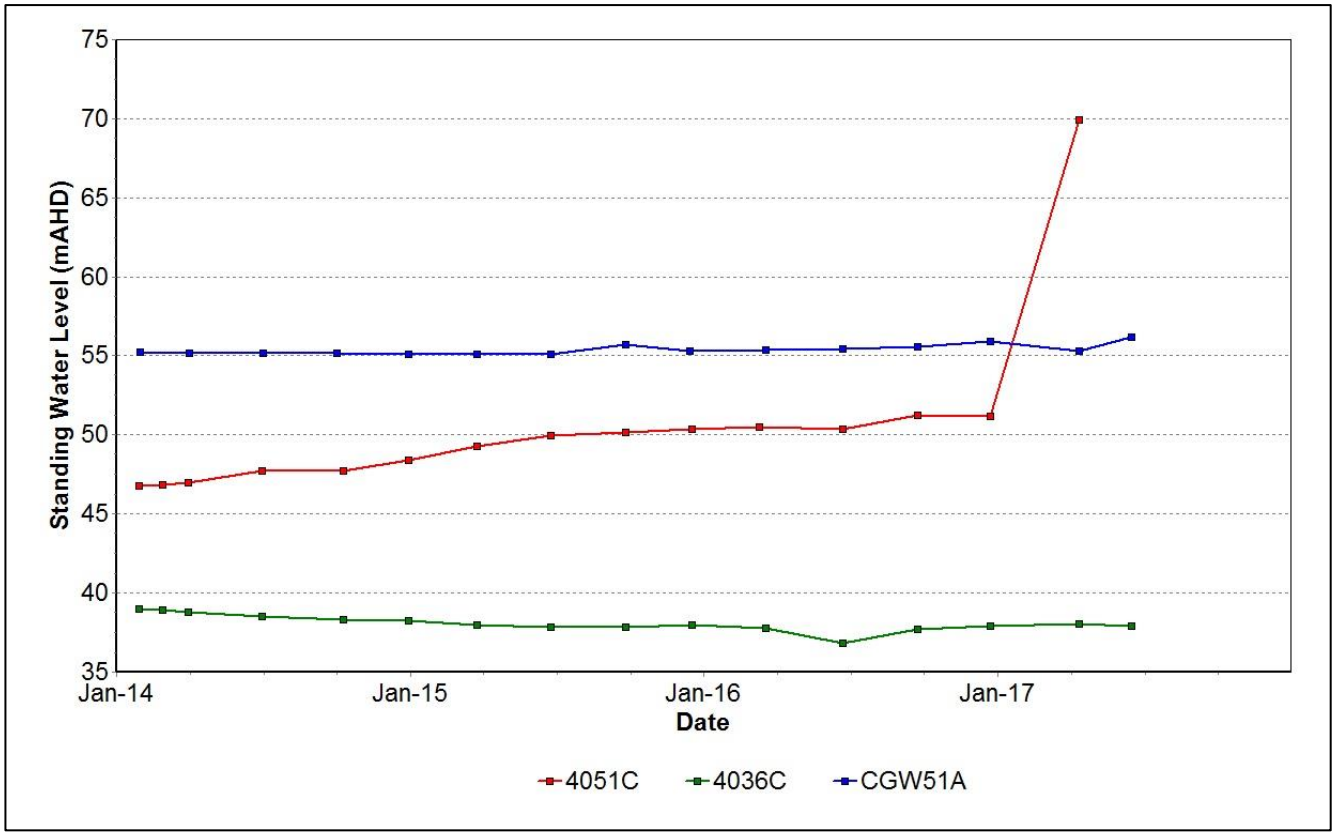

Figure 28: Carrington Interburden Standing Water Level - June 2017

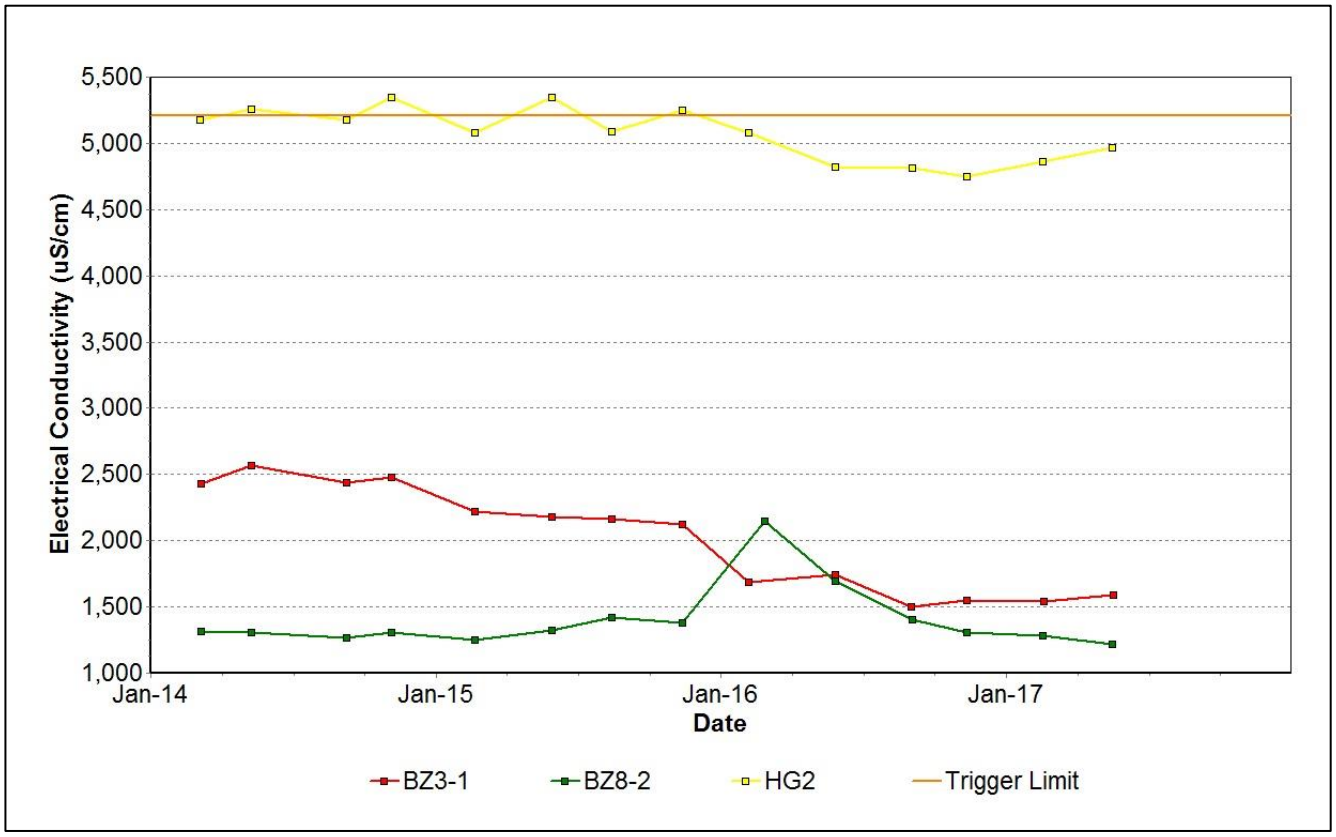

Figure 29: Cheshunt Interburden Electrical Conductivity Trend - June 2017

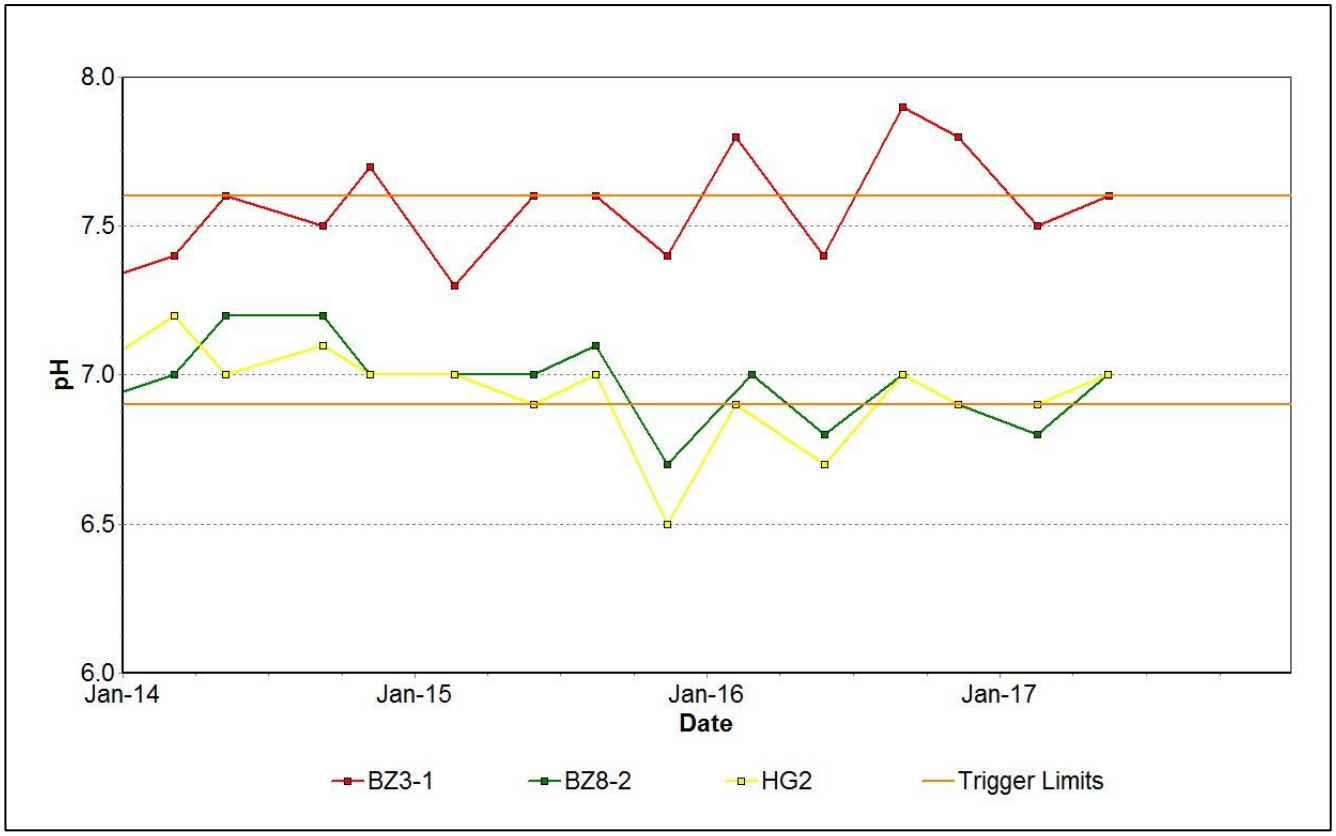

Figure 30: Cheshunt Interburden pH Trend - June 2017

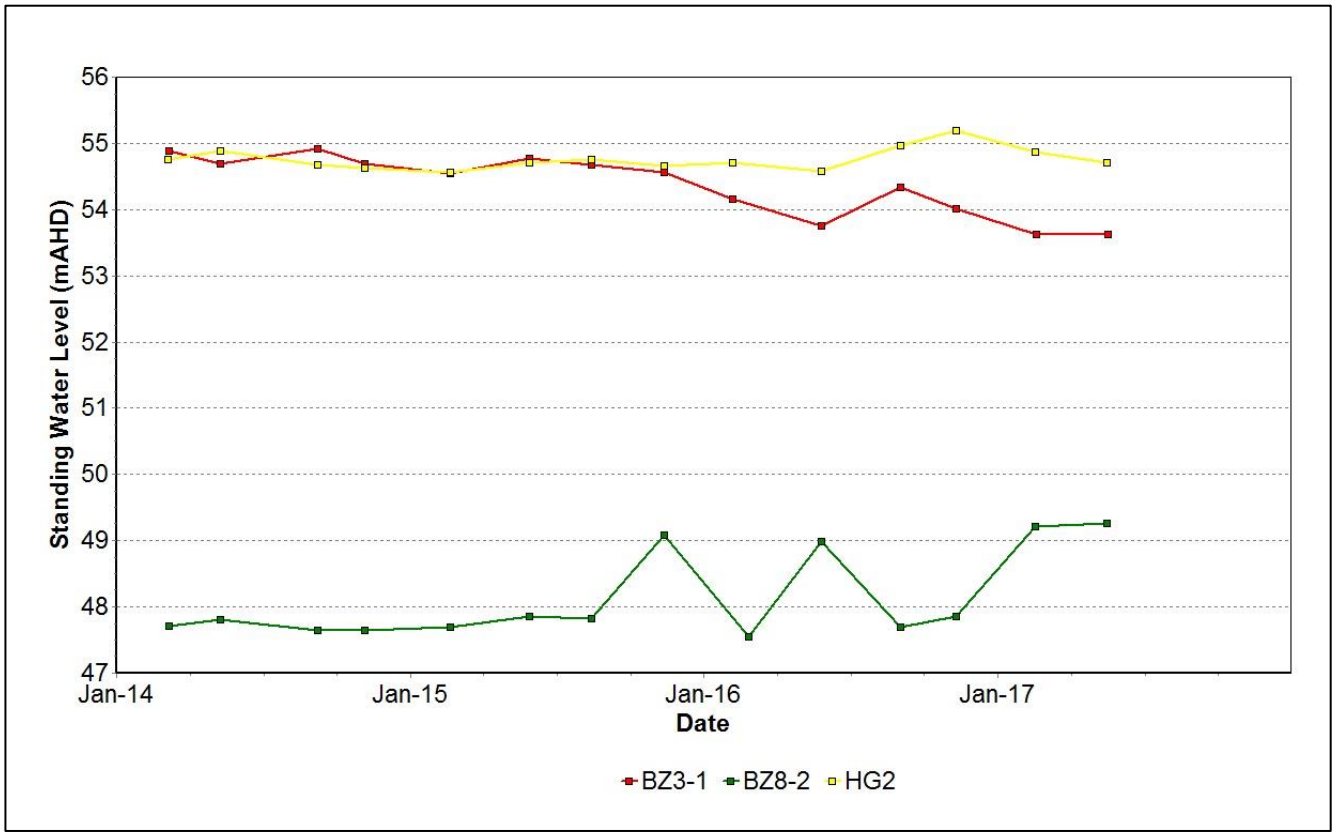

Figure 31: Cheshunt Interburden Standing Water Level – June 2017

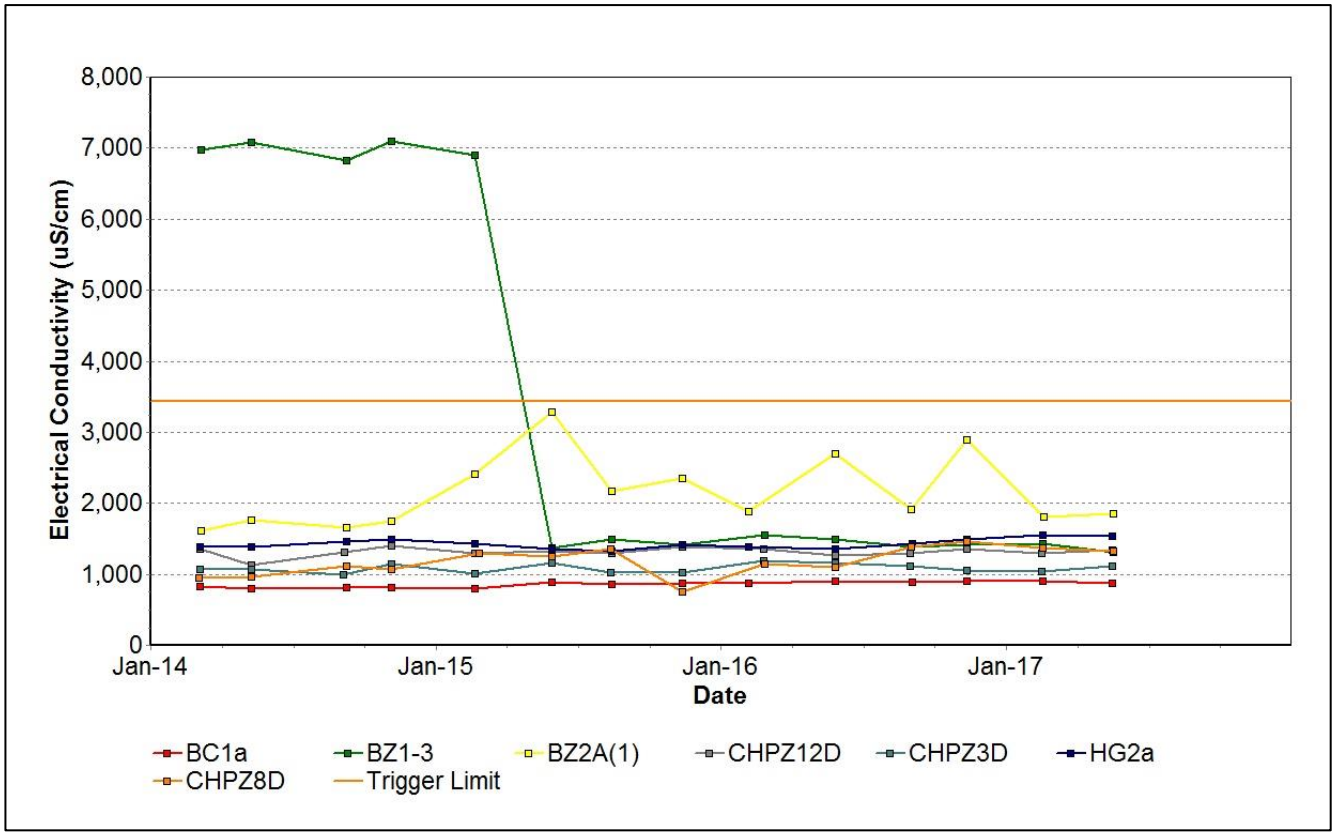

Figure 32: Cheshunt Mt Arthur Electrical Conductivity Trend - June 2017

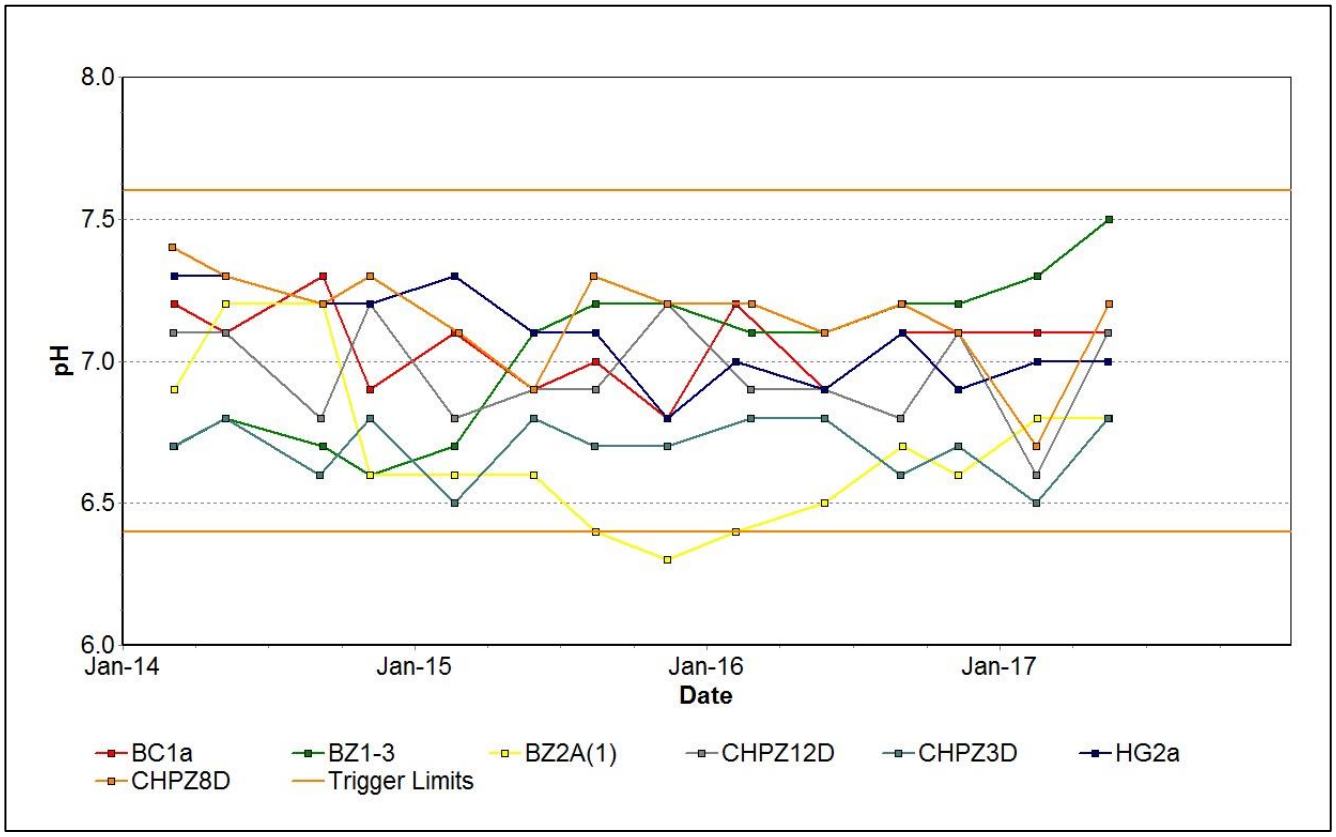

Figure 33: Cheshunt Mt Arthur pH Trend - June 2017

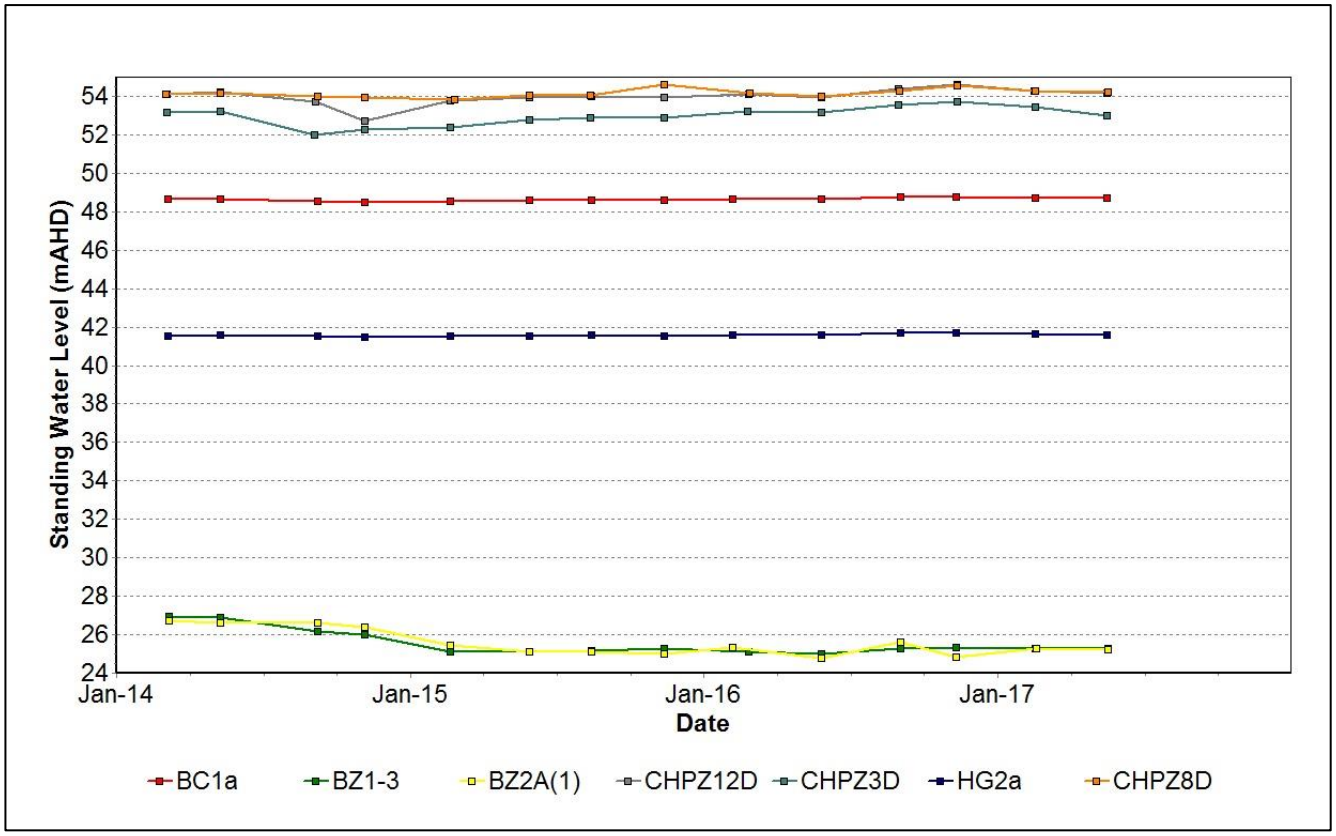

Figure 34: Cheshunt Mt Arthur Standing Water Level – June 2017

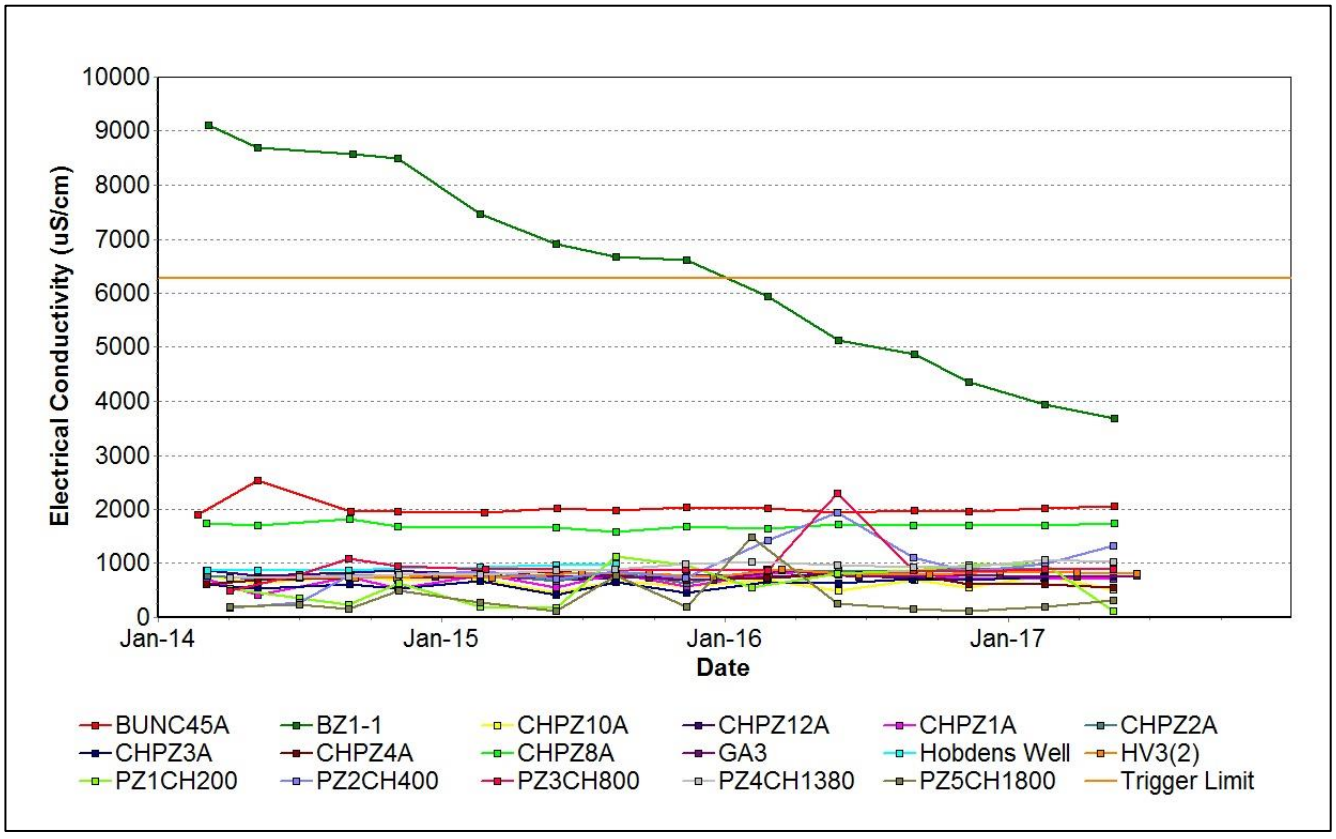

Figure 35: Cheshunt / North Pit Alluvium Electrical Conductivity Trend - June 2017

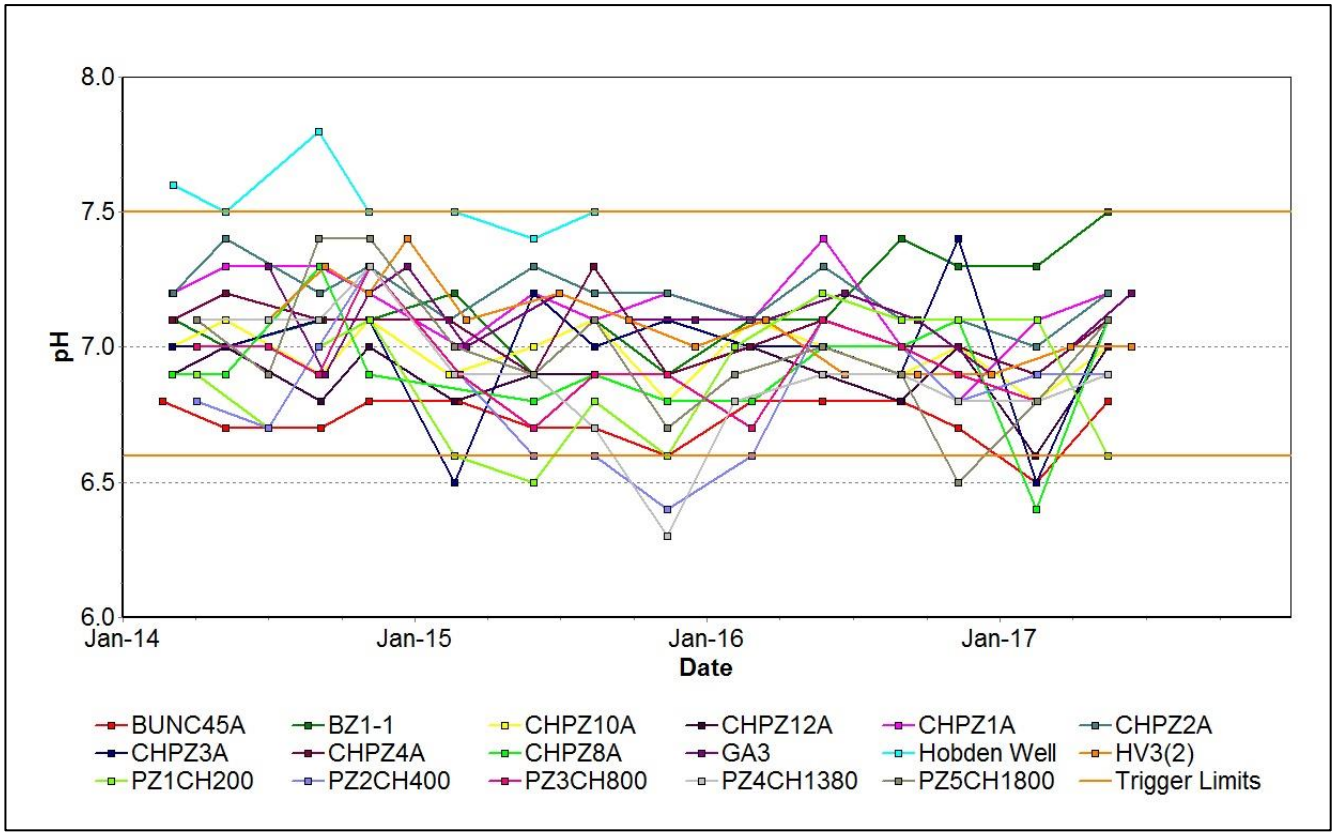

Figure 36: Cheshunt / North Pit Alluvium pH Trend - June 2017

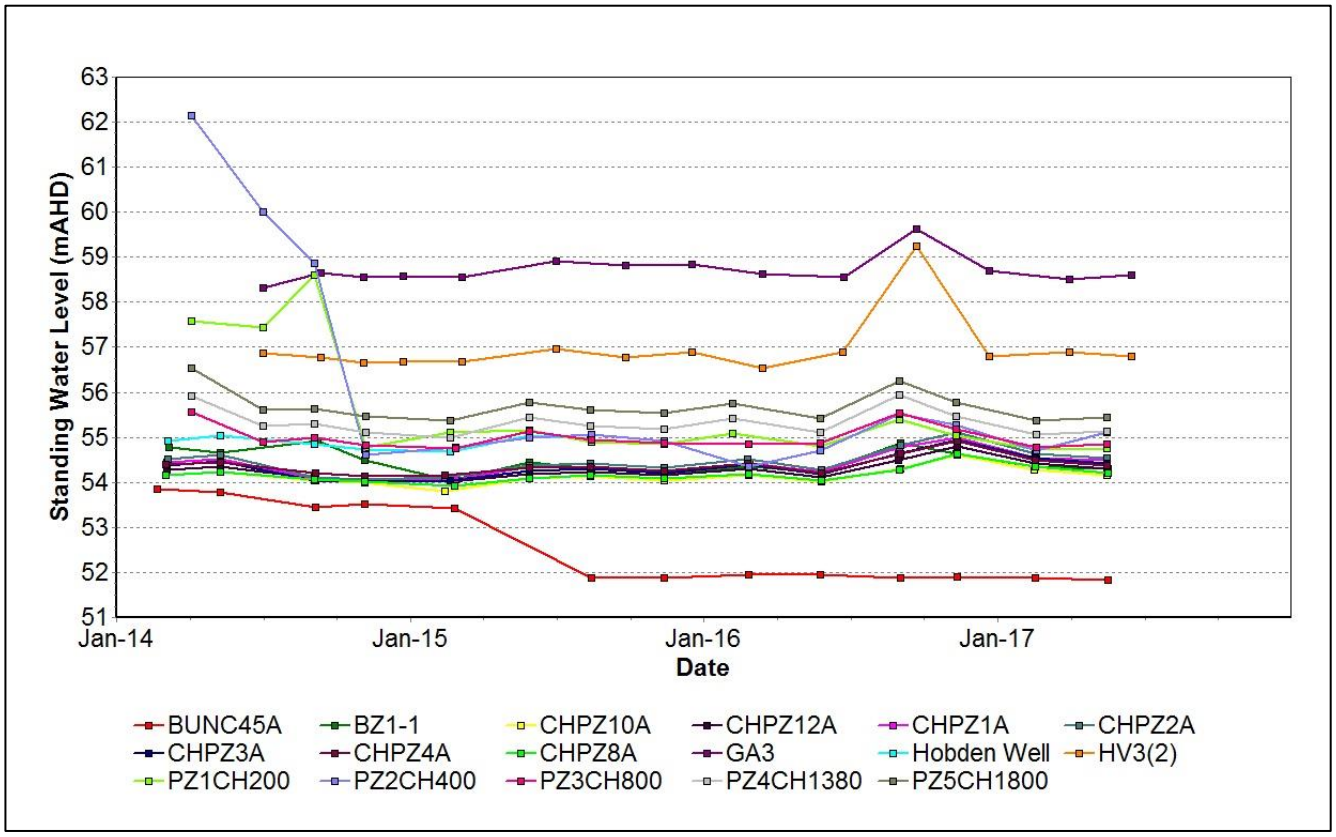

Figure 37: Cheshunt / North Pit Alluvium Standing Water Level – June 2017

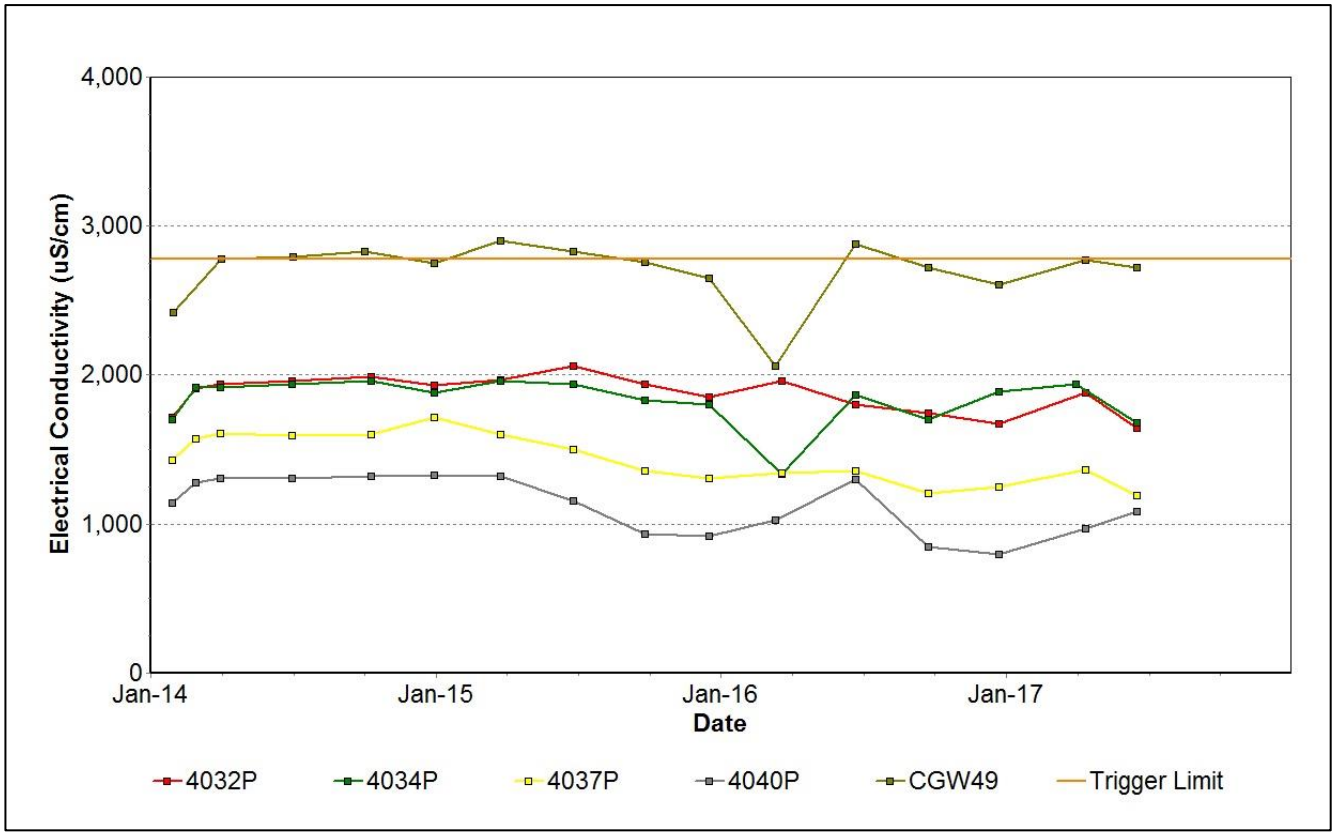

Figure 38: Carrington West Wing Alluvium Electrical Conductivity Trend - June 2017

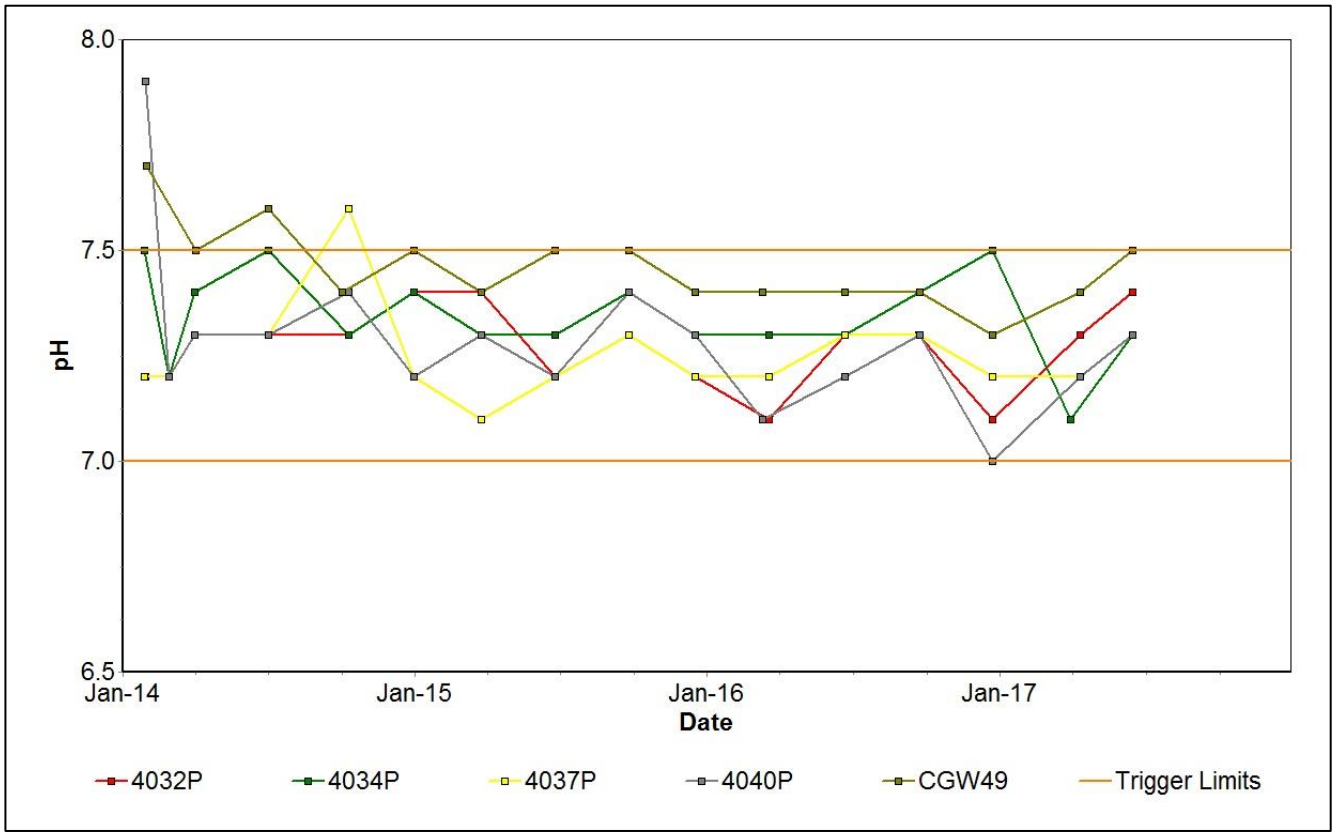

Figure 39: Carrington West Wing Alluvium pH Trend - June 2017

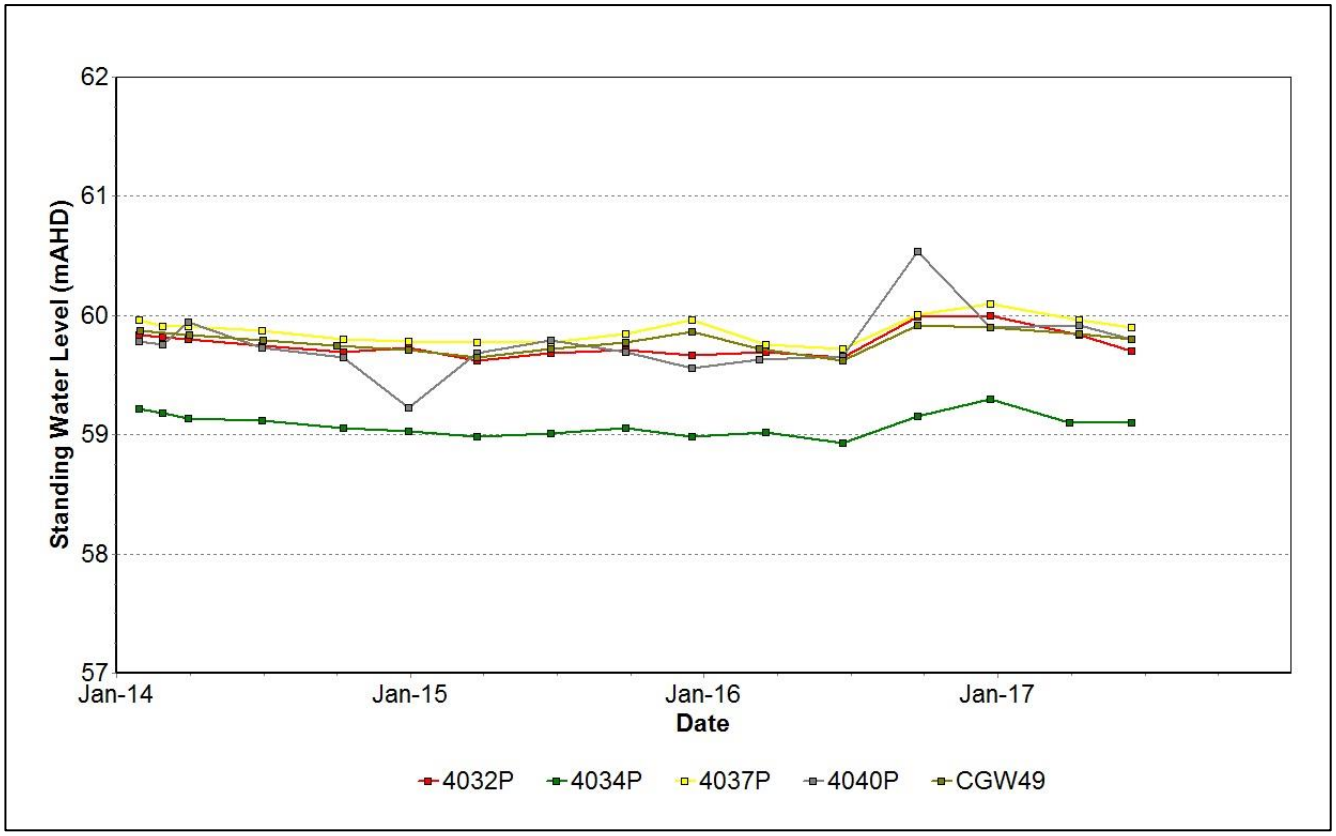

Figure 40: Carrington West Wing Alluvium Standing Water Level – June 2017

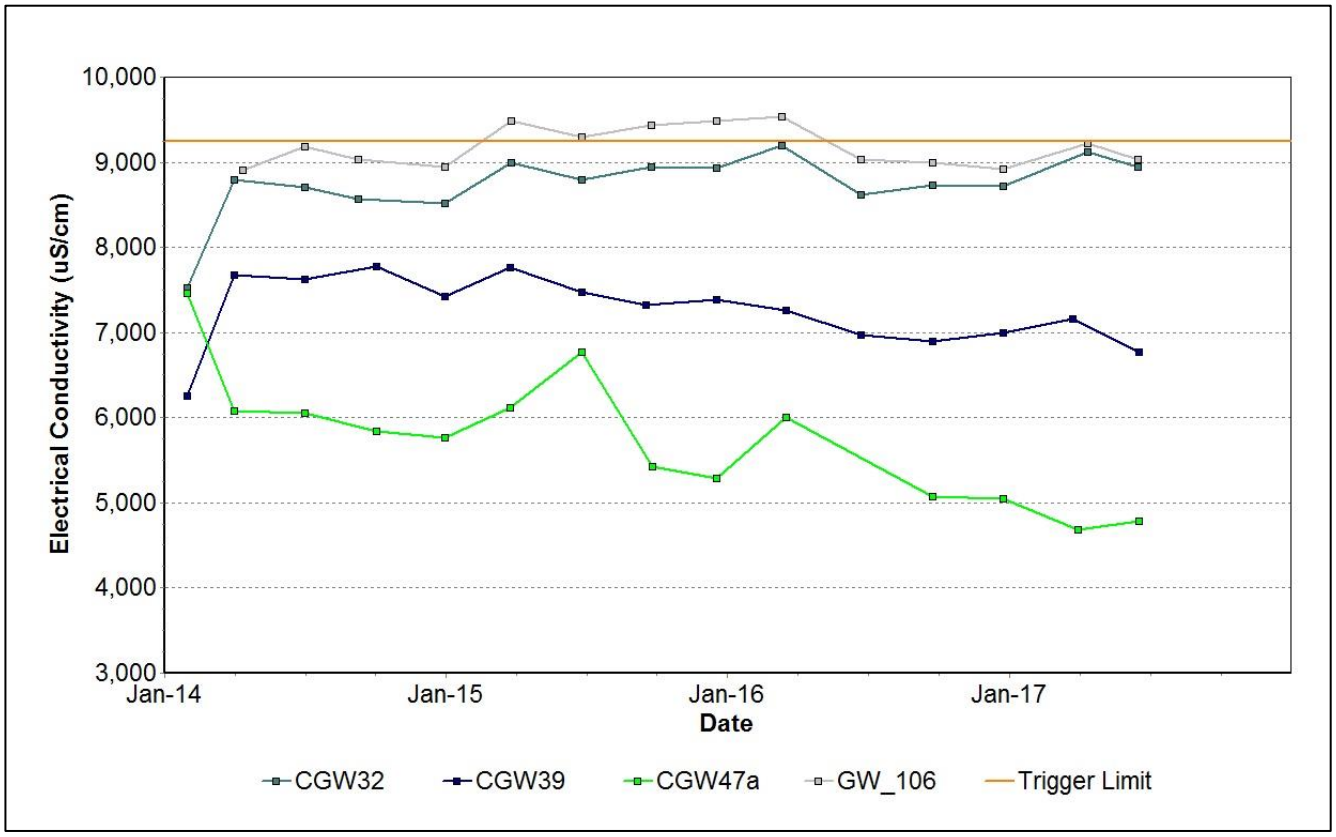

Figure 41: Carrington West Wing Flood Plain Electrical Conductivity Trend - June 2017

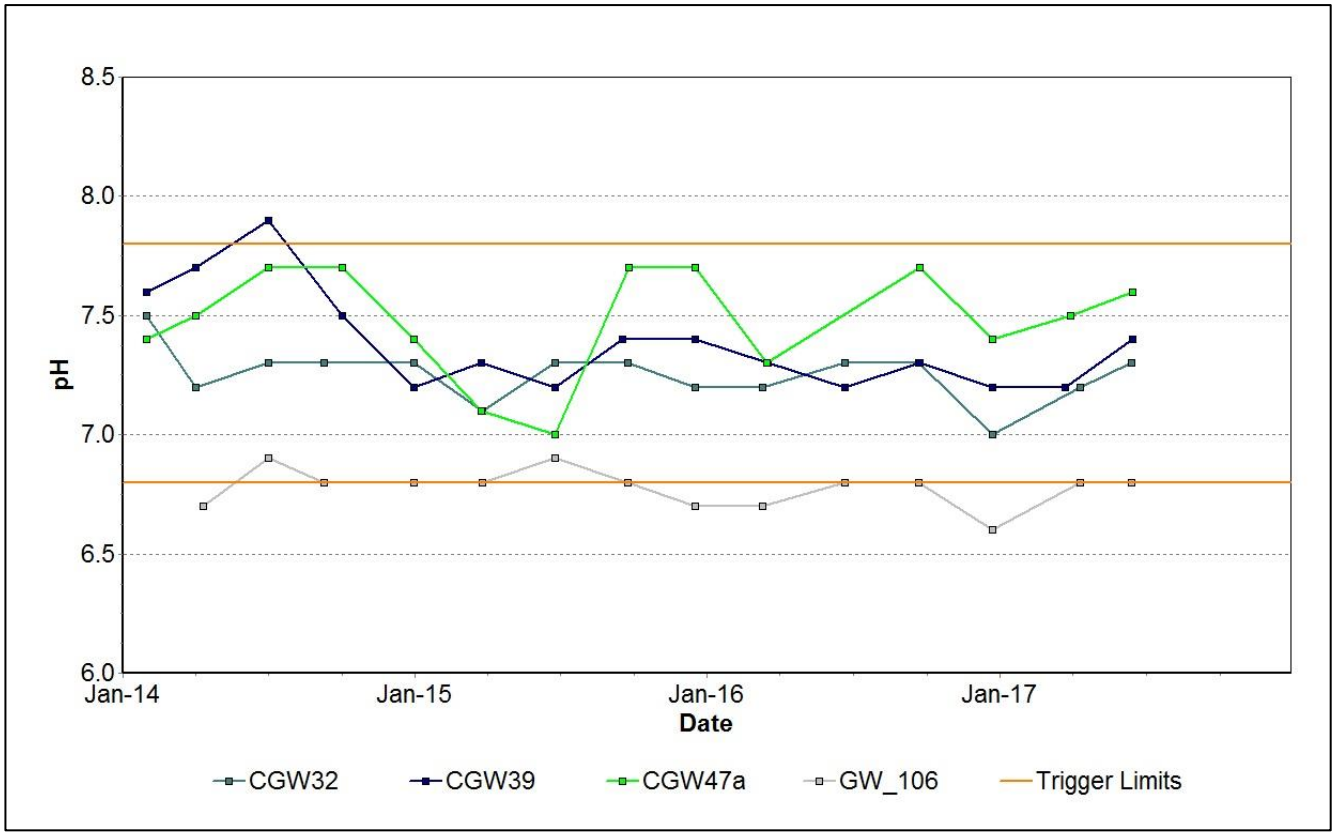

Figure 42: Carrington West Wing Flood Plain pH Trend - June 2017

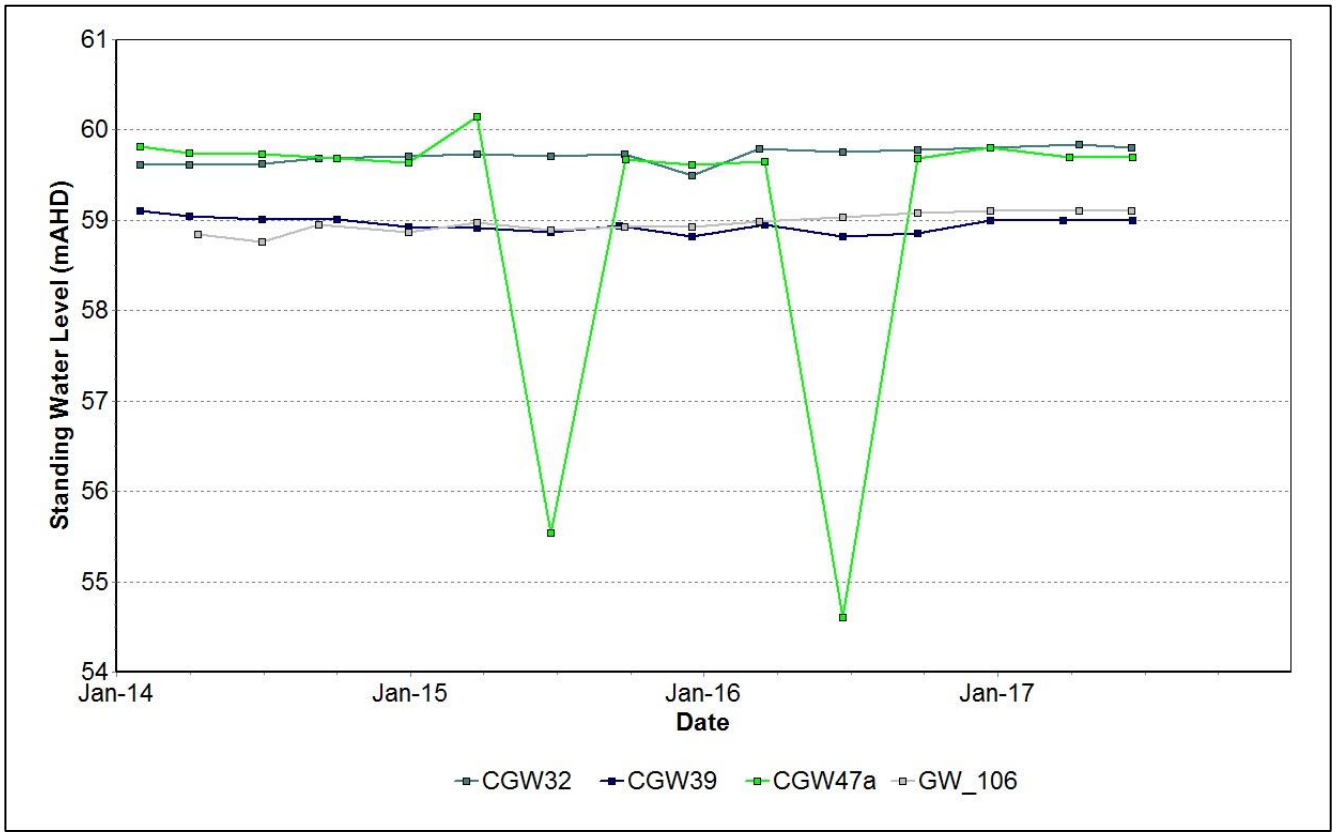

Figure 43: Carrington West Wing Flood Plain Standing Water Level – June 2017

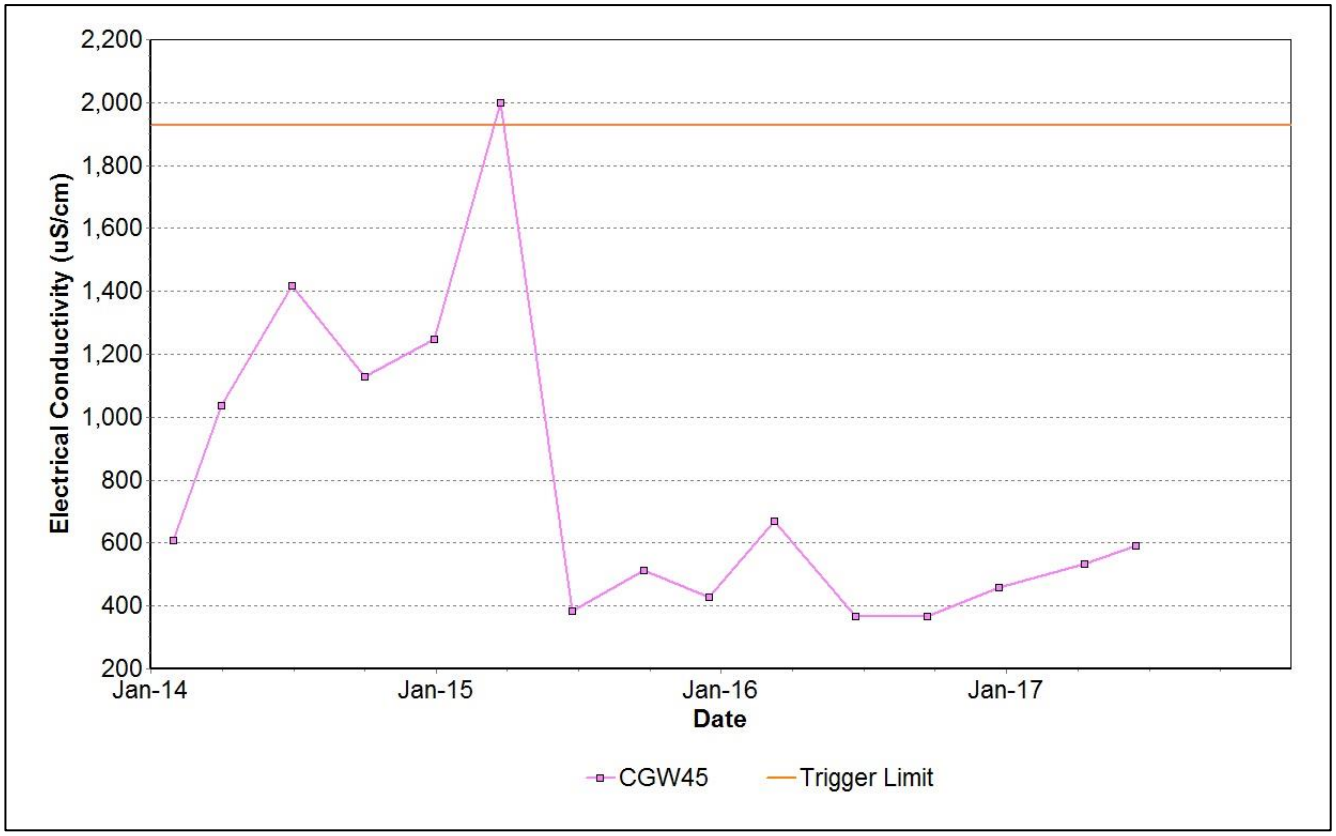

Figure 44: Carrington West Wing LBL Electrical Conductivity Trend - June 2017

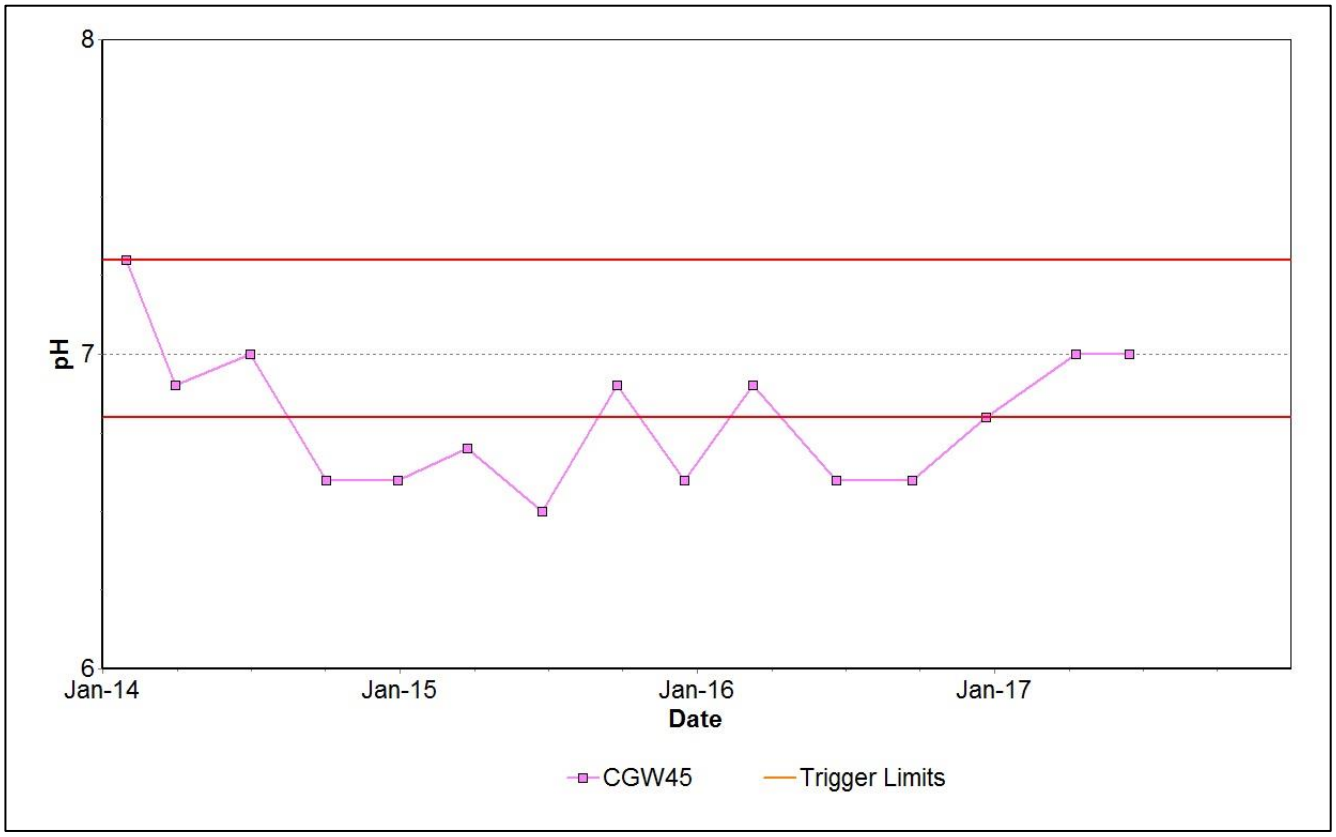

Figure 45: Carrington West Wing LBL pH Trend - June 2017

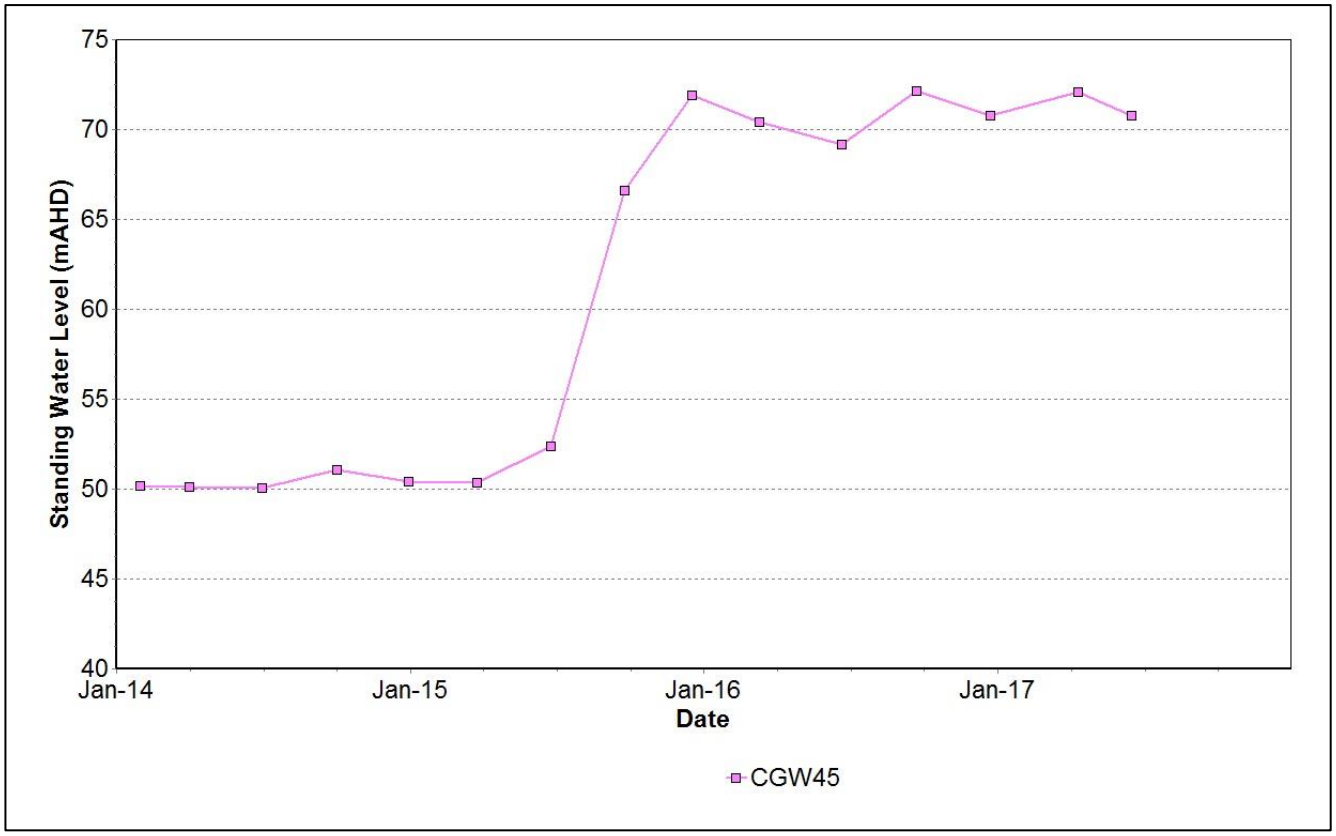

Figure 46: Carrington West Wing LBL Standing Water Level - June 2017

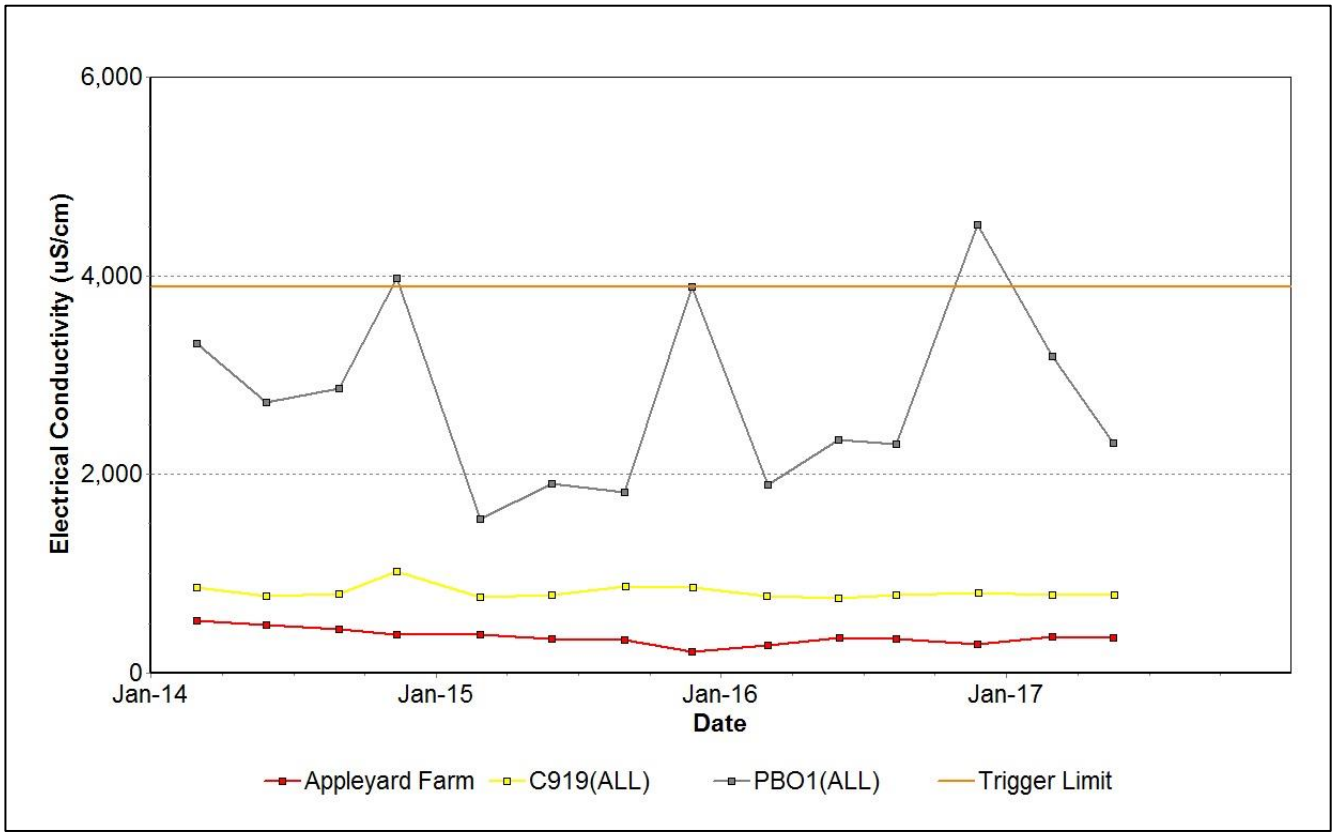

Figure 47: Lemington South Alluvium Electrical Conductivity Trend - June 2017

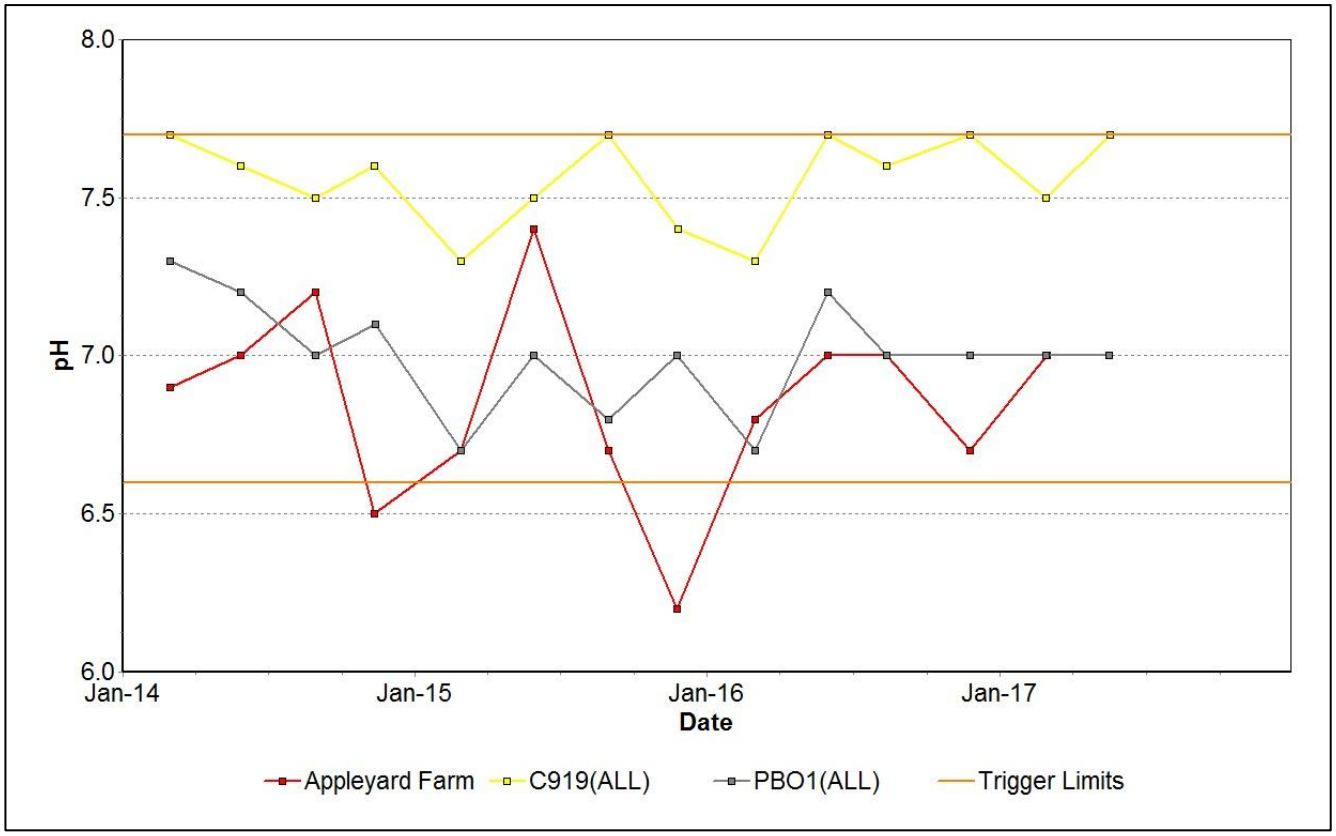

Figure 48: Lemington South Alluvium pH Trend – June 2017

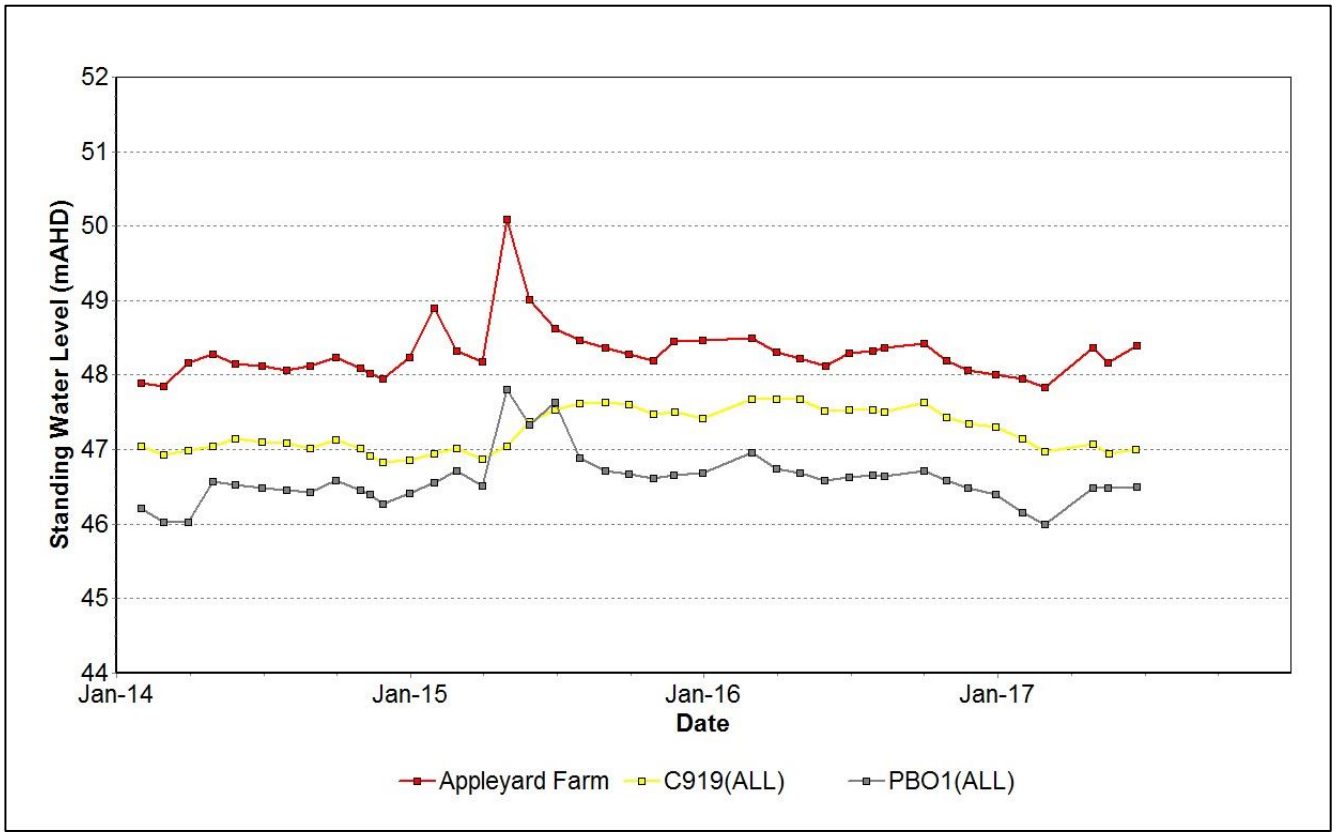

Figure 49: Lemington South Alluvium Standing Water Level Trend – June 2017

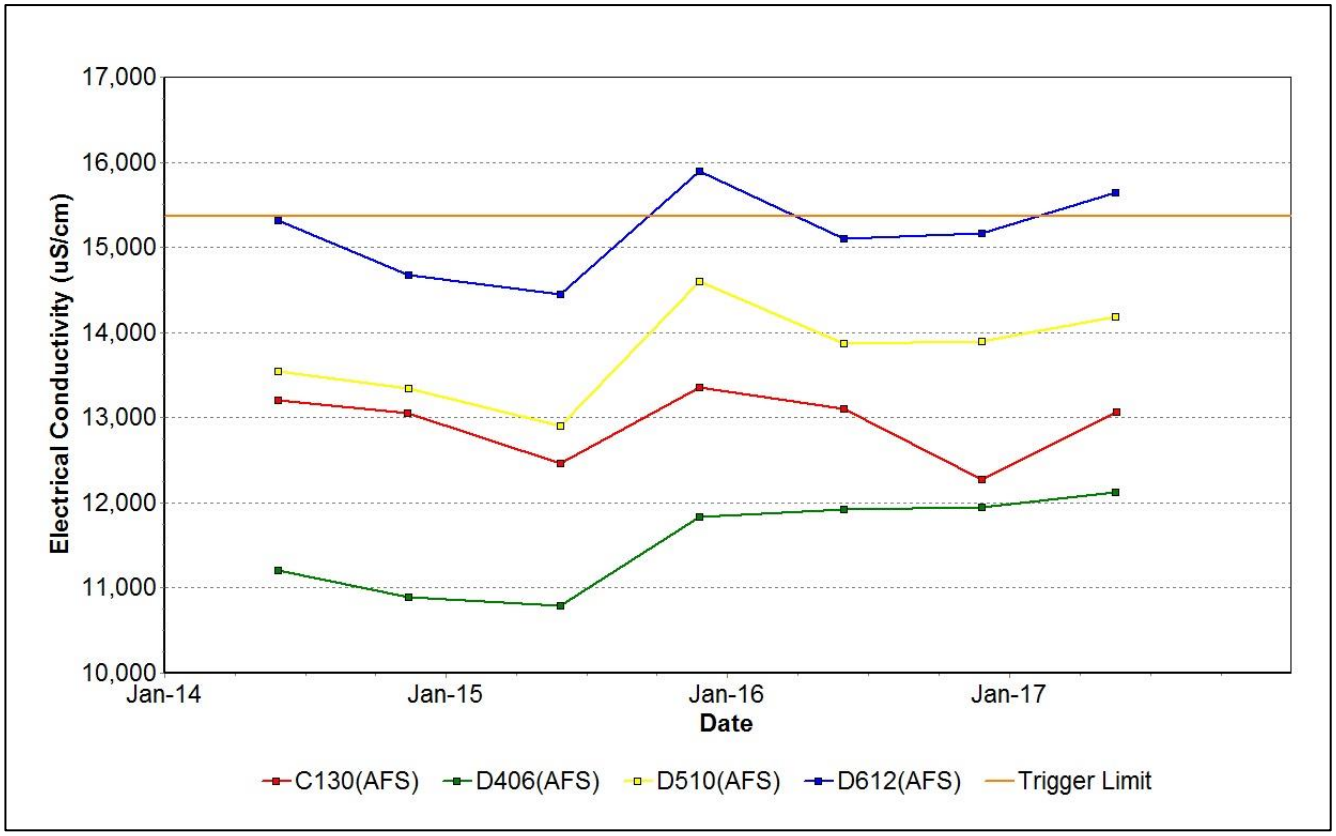

Figure 50: Lemington South Arrowfield Electrical Conductivity Trend – June 2017

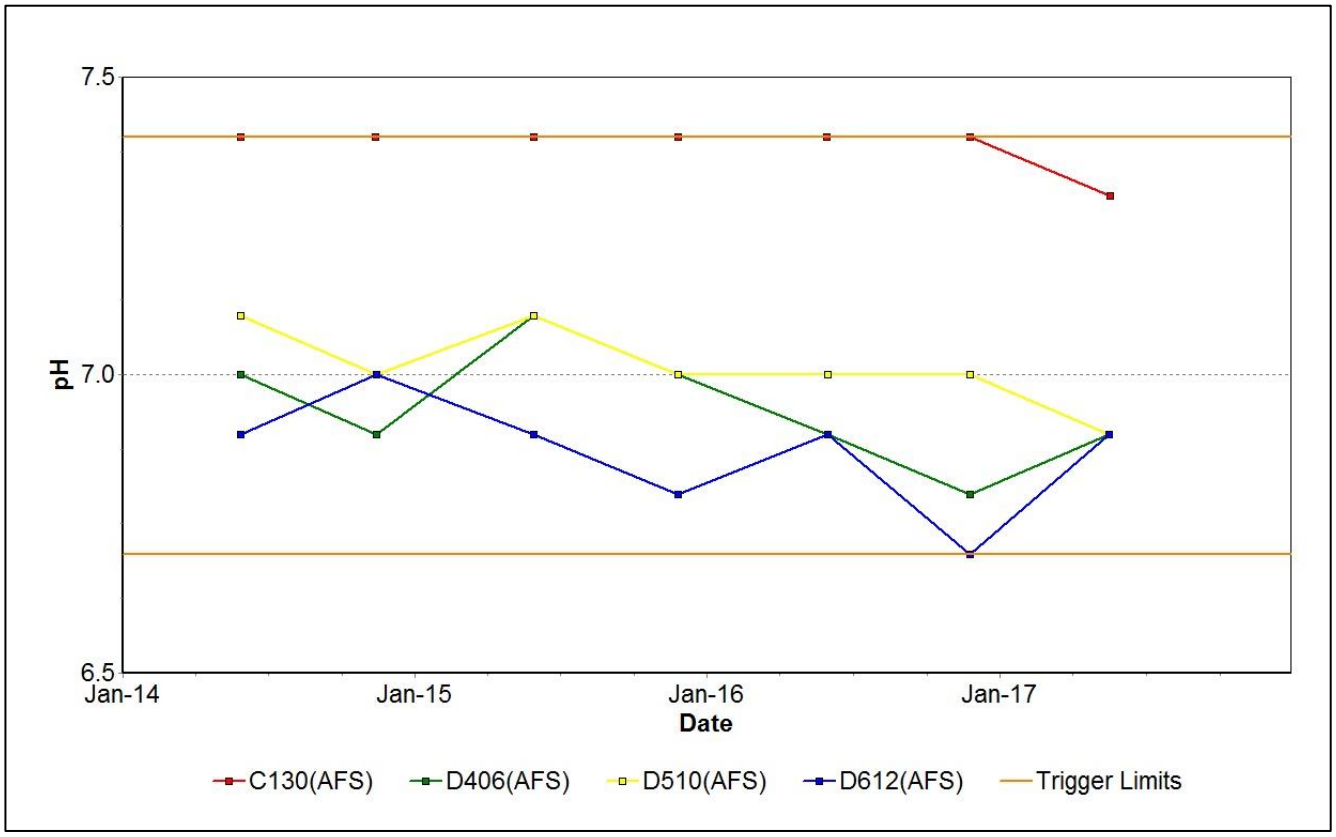

Figure 51: Lemington South Arrowfield pH Trend – June 2017

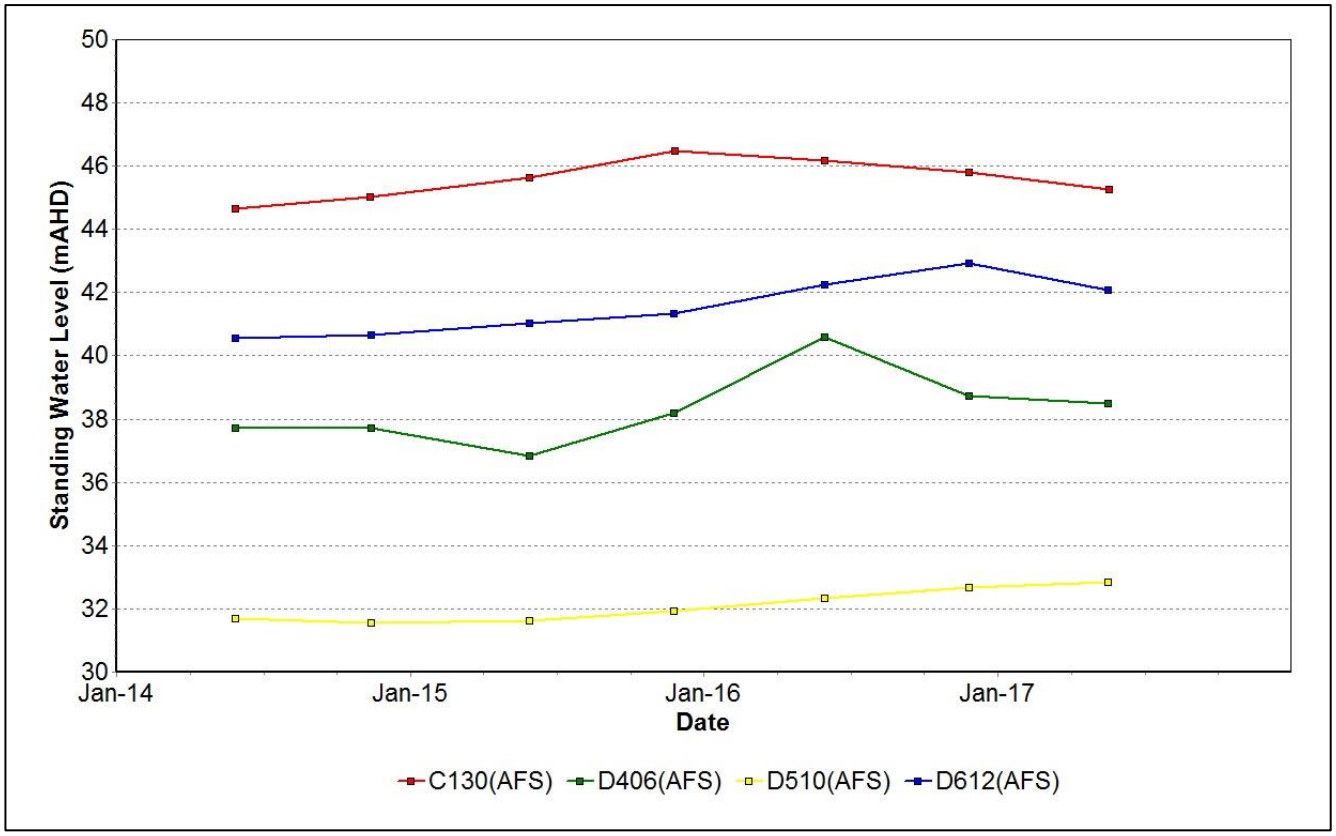

Figure 52: Lemington South Arrowfield Standing Water Level - June 2017

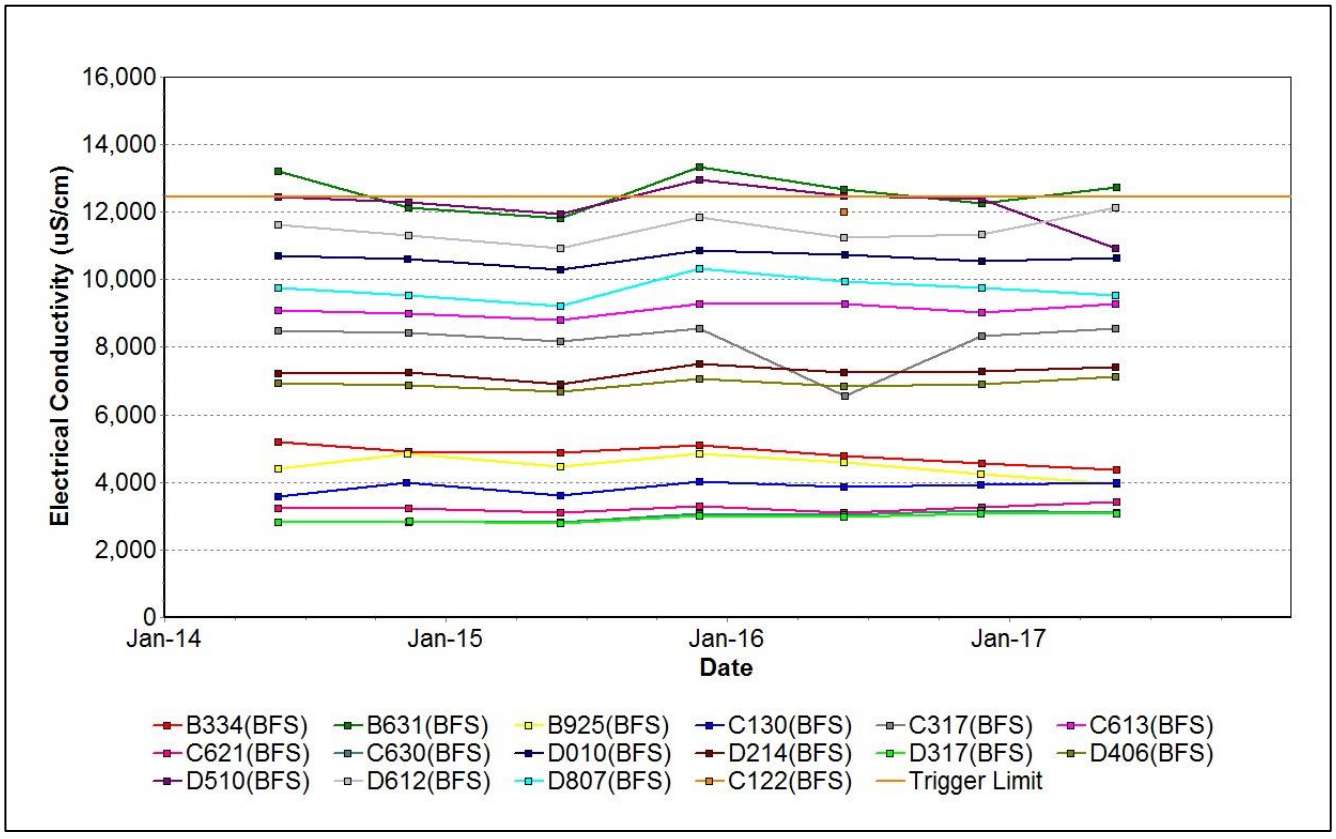

Figure 53: Lemington South Bowfield Electrical Conductivity Trend - June 2017

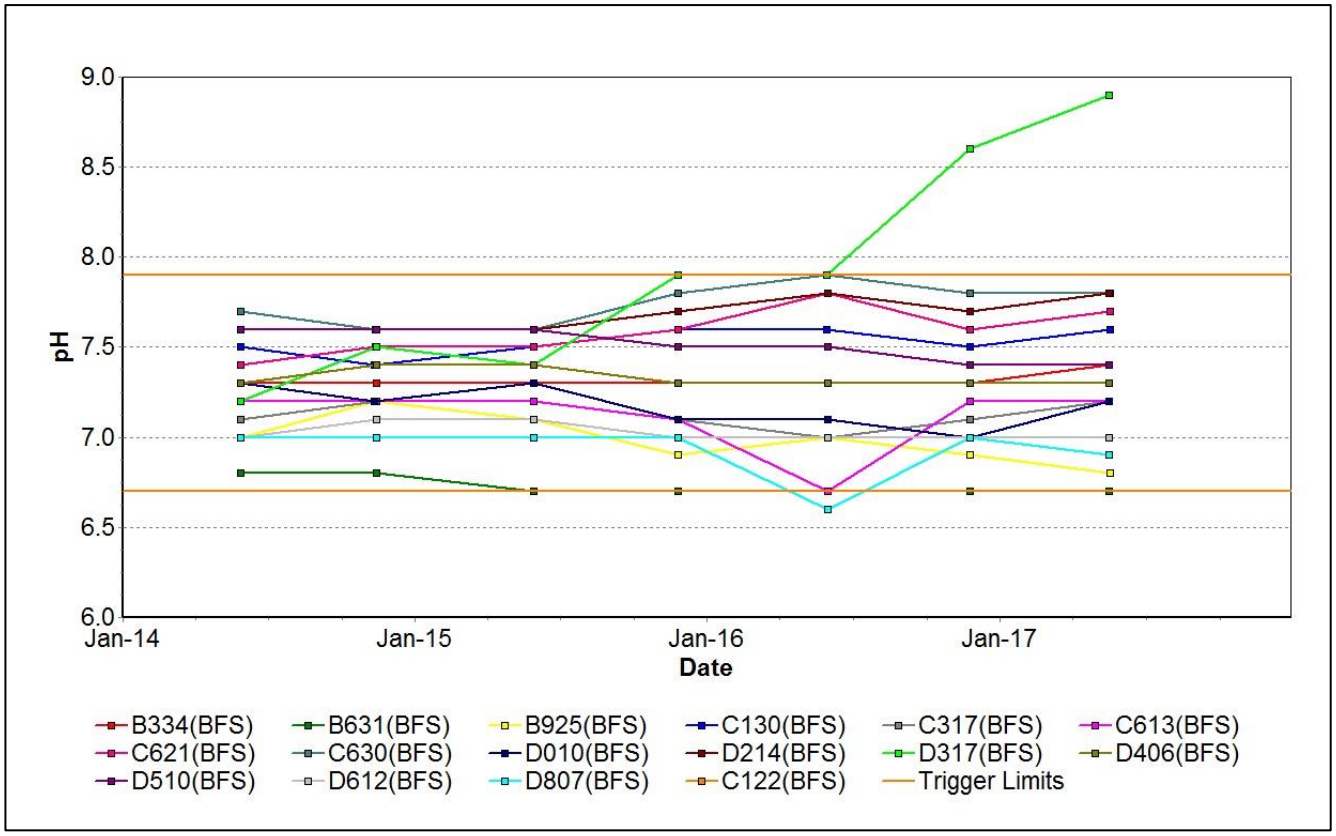

Figure 54: Lemington South Bowfield pH Trend - June 2017

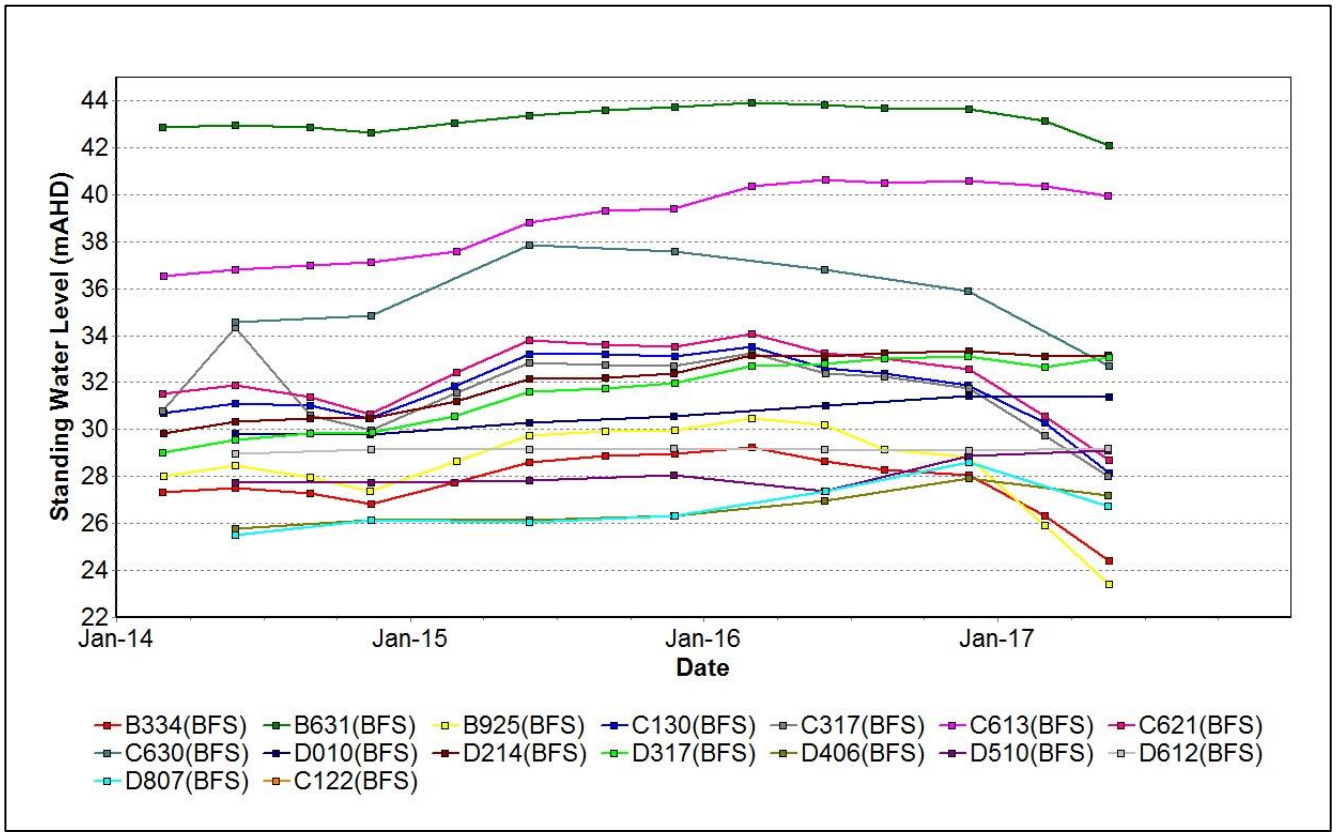

Figure 55: Lemington South Bowfield Standing Water Level - June 2017

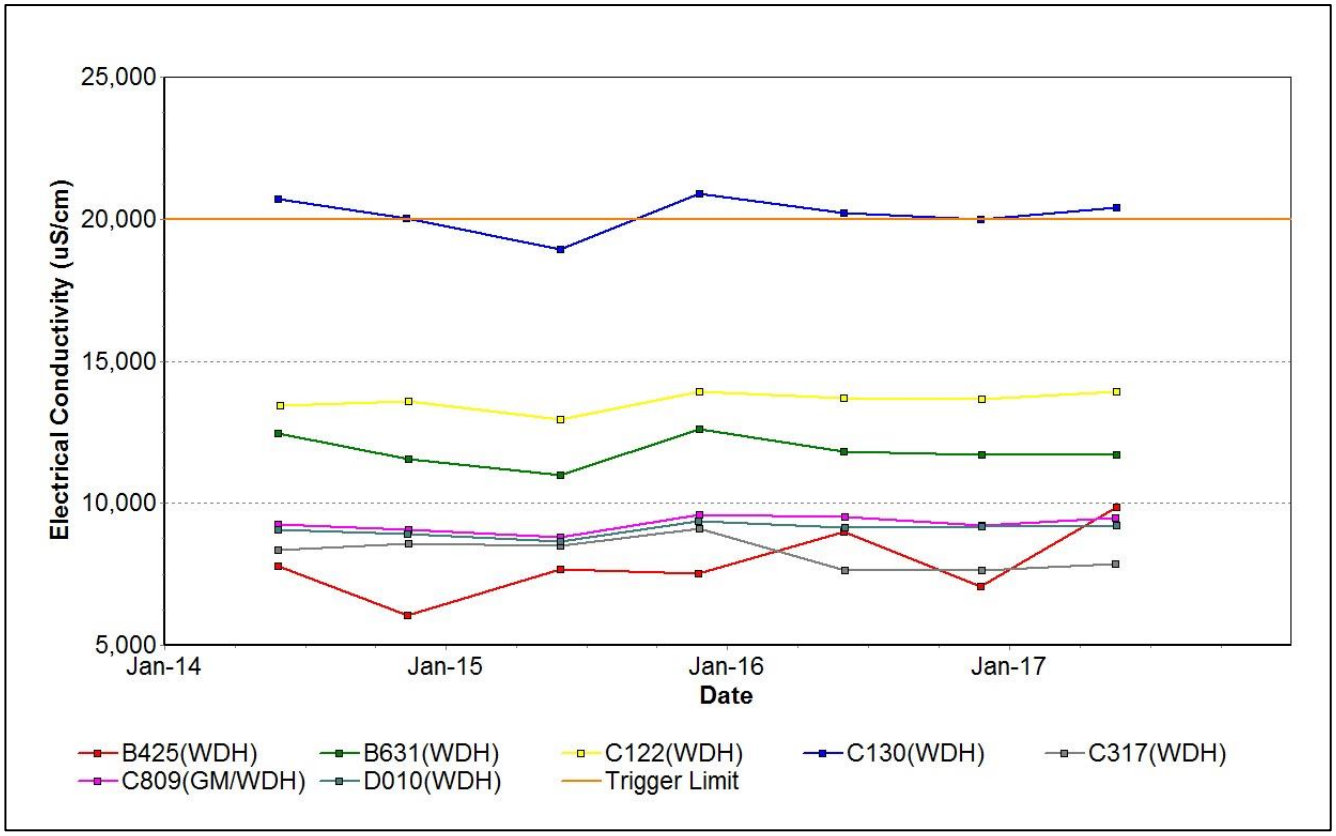

Figure 56: Lemington South Woodlands Hill Electrical Conductivity Trend - June 2017

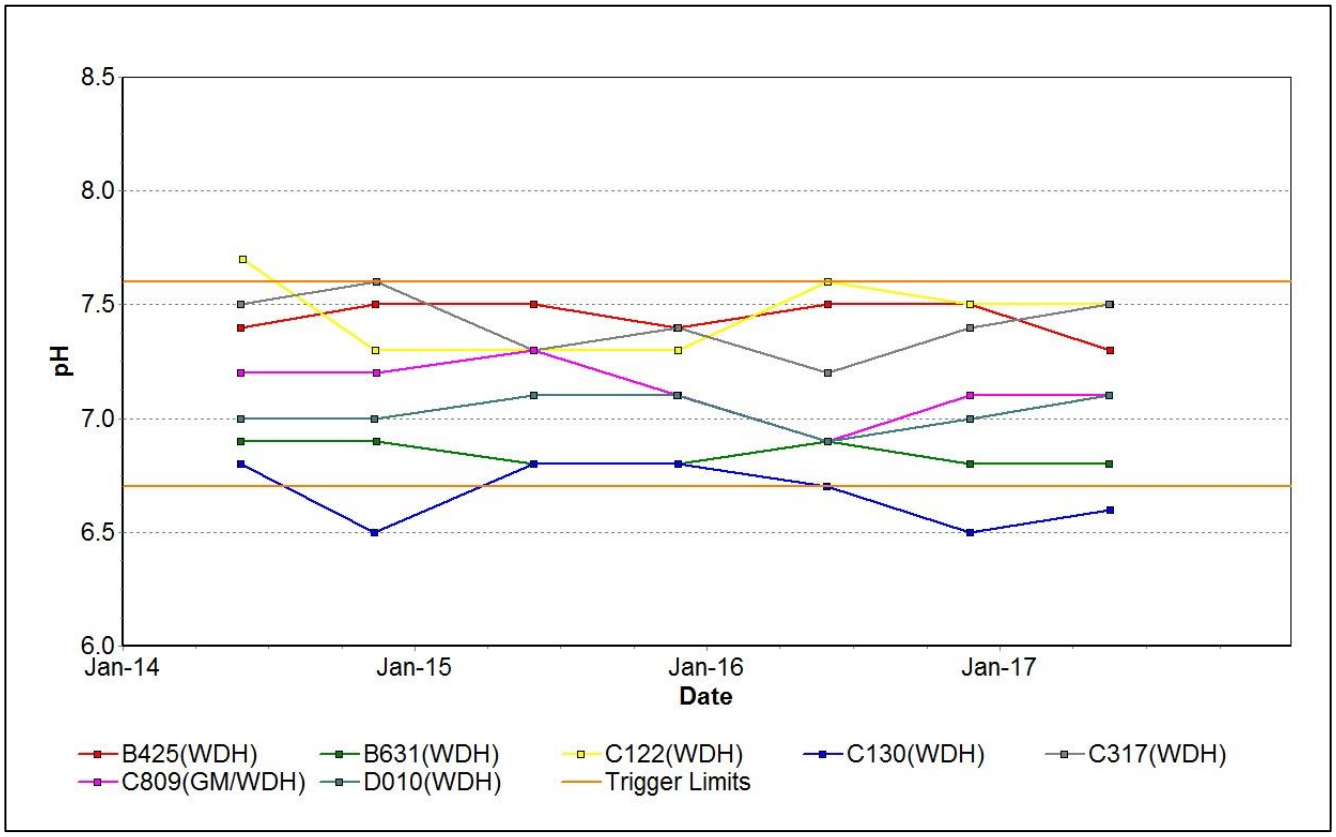

Figure 57: Lemington South Woodlands Hill pH Trend - June 2017

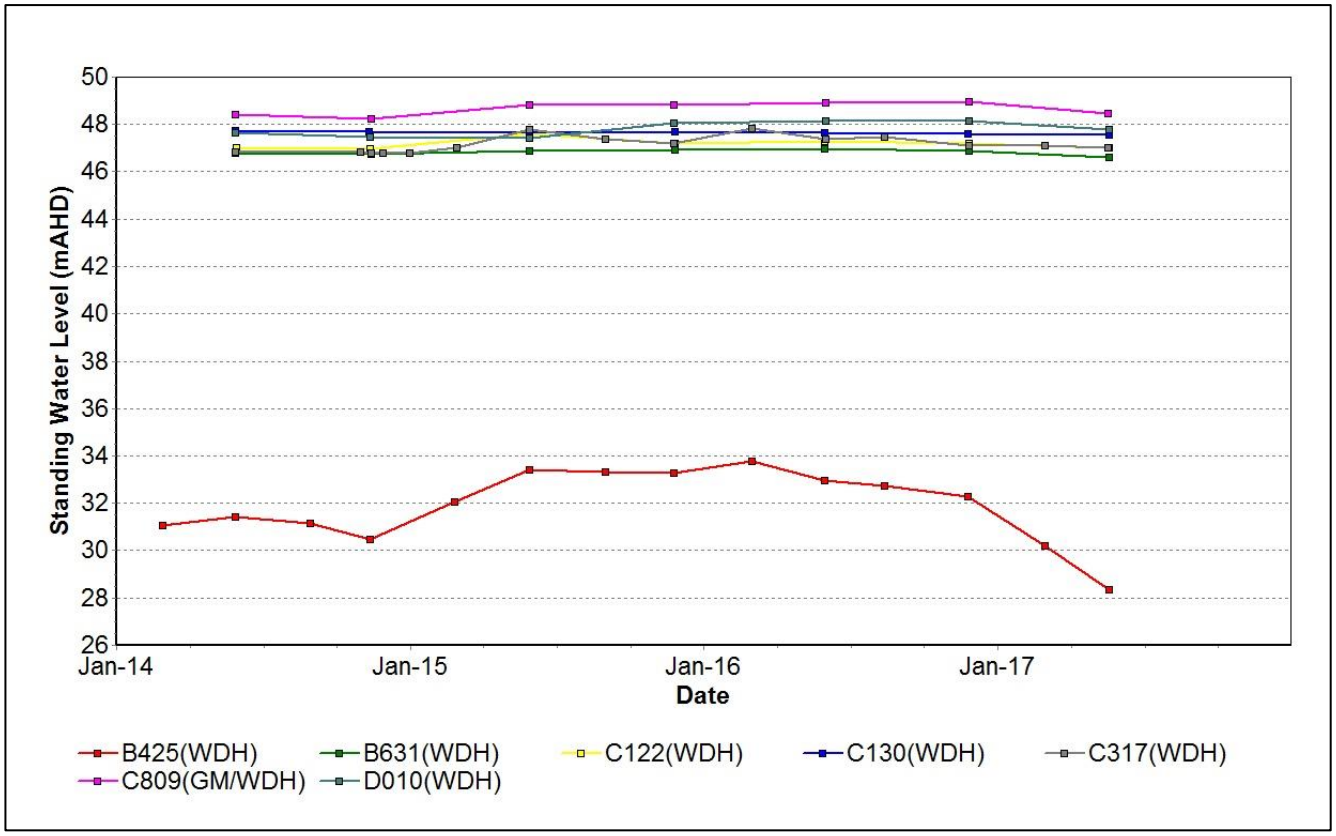

Figure 58: Lemington South Woodlands Hill Standing Water Level – June 2017

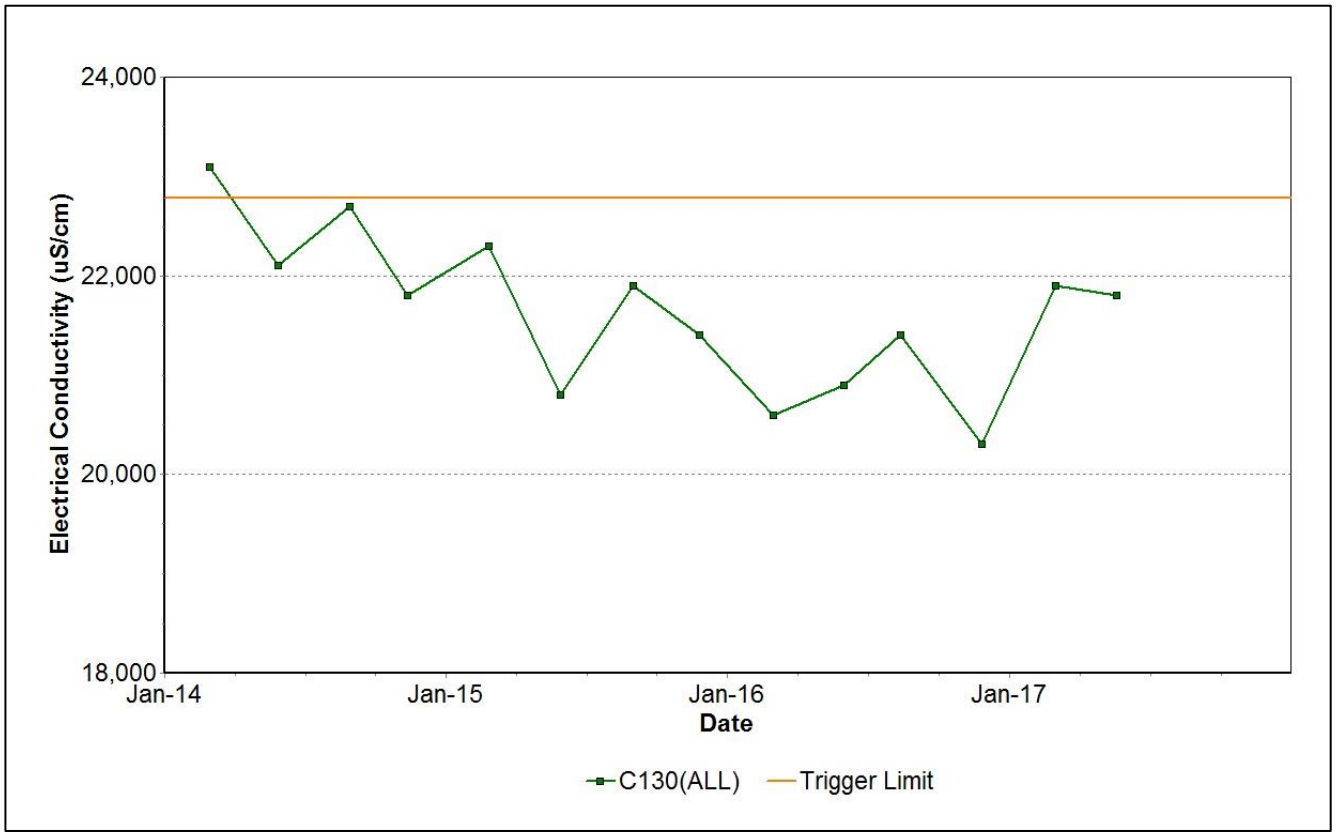

Figure 59: Lemington South Interburden Electrical Conductivity Trend - June 2017

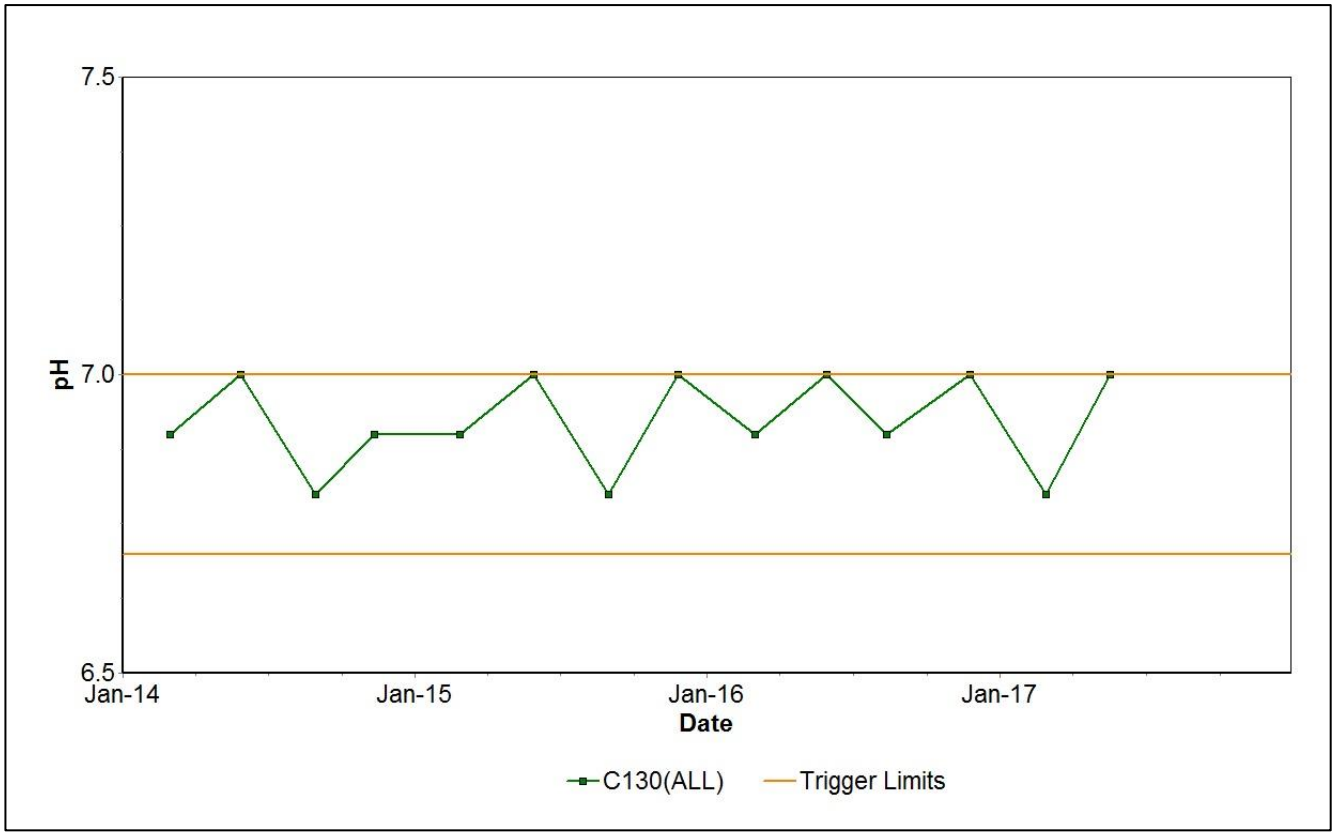

Figure 60: Lemington South Interburden pH Trend - June 2017

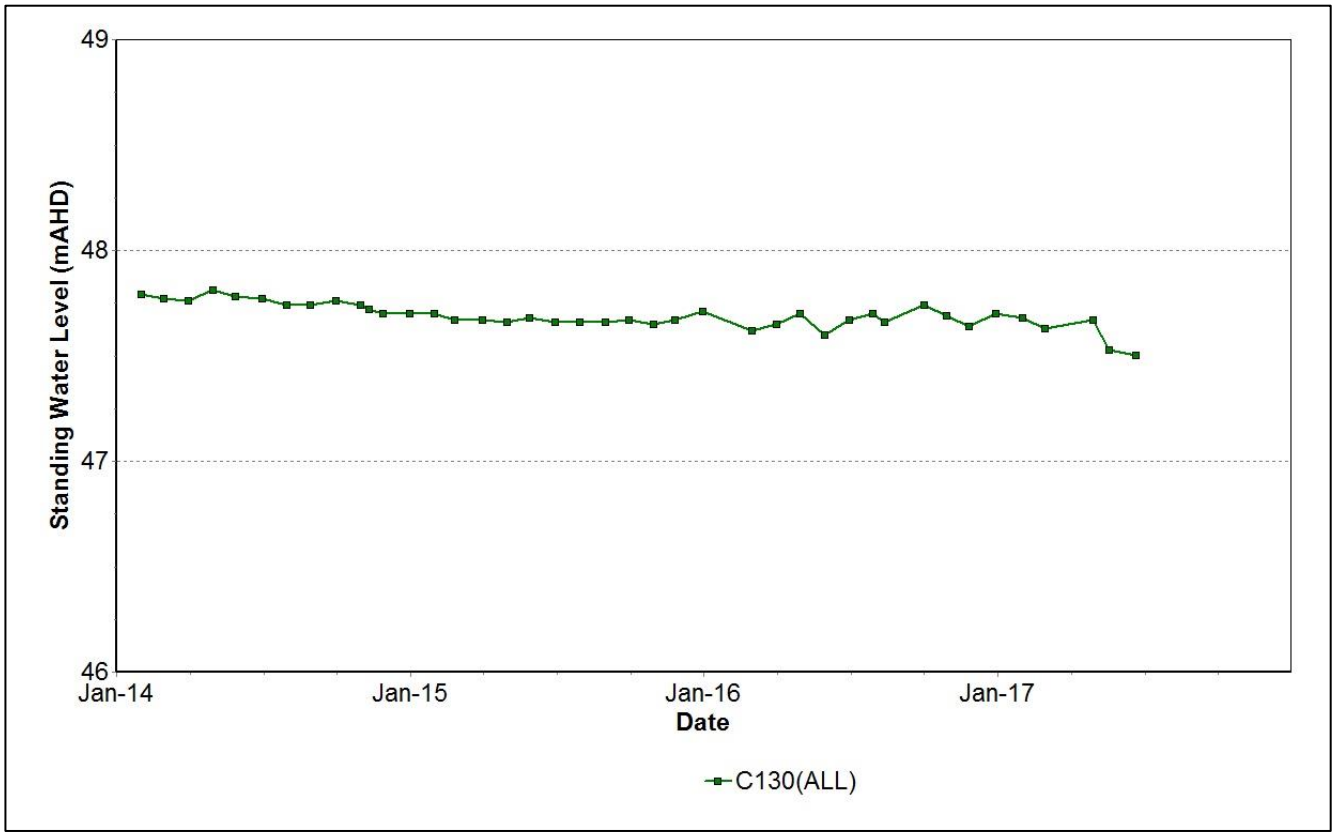

Figure 61: Lemington South Interburden Standing Water Level - June 2017

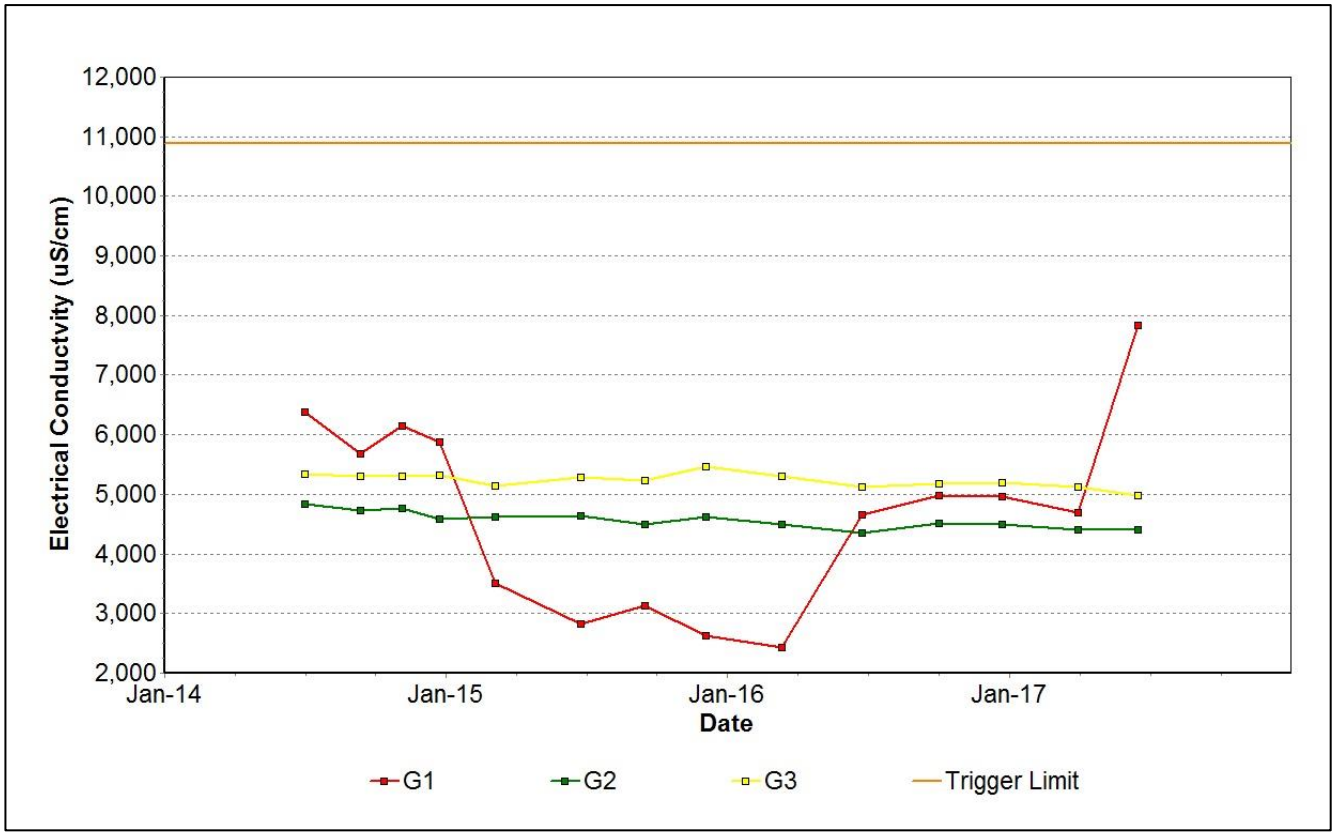

Figure 62: West Pit Alluvium Electrical Conductivity Trend - June 2017

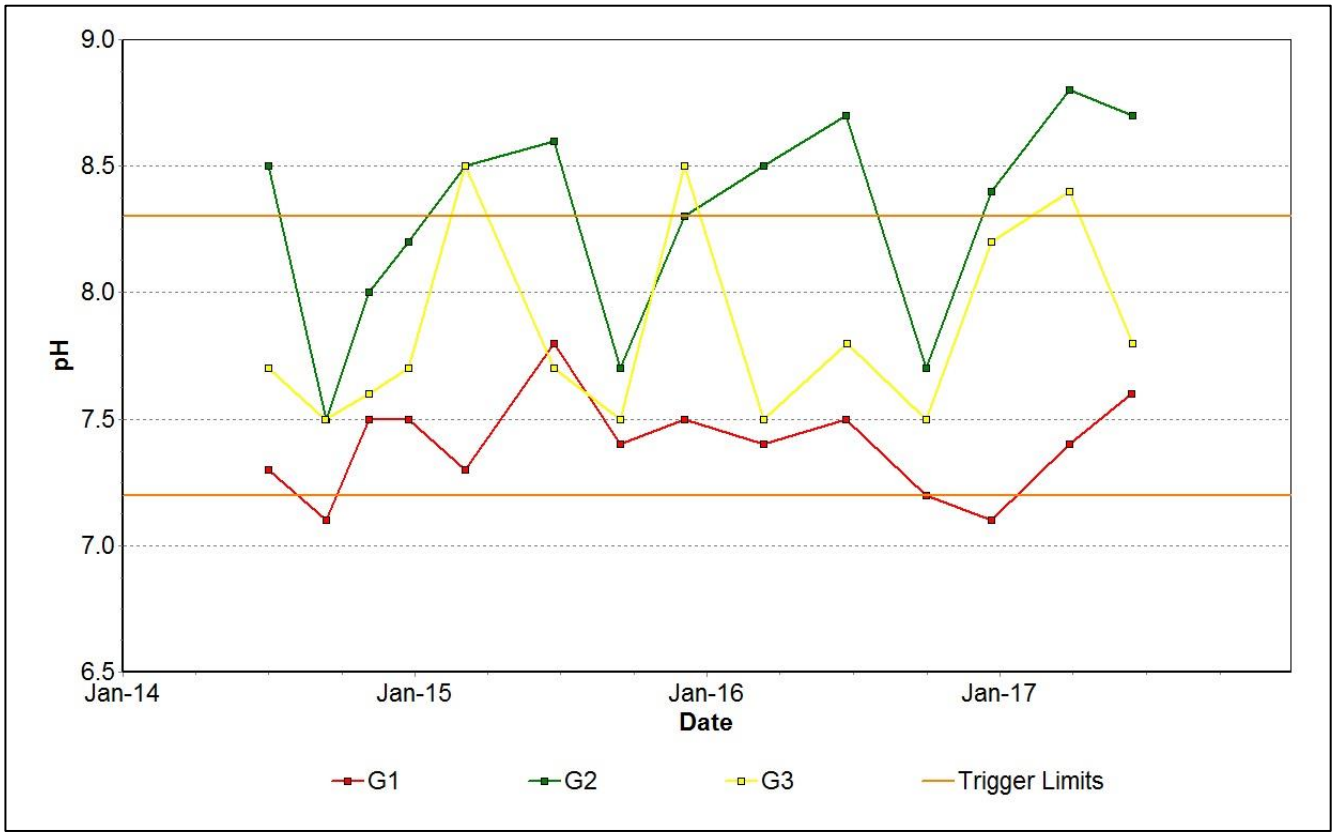

Figure 63: West Pit Alluvium pH Trend – June 2017

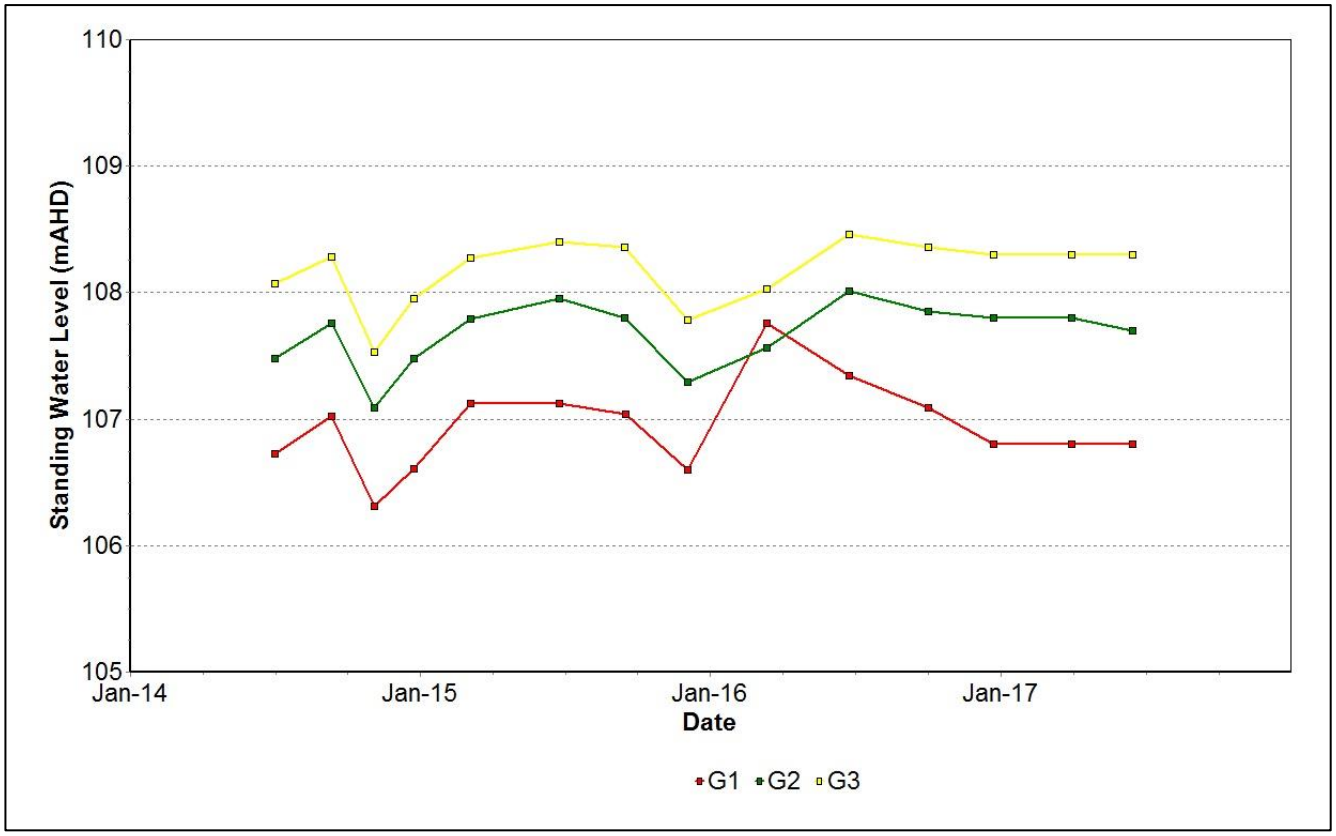

Figure 64: West Pit Alluvium Standing Water Level - June 2017

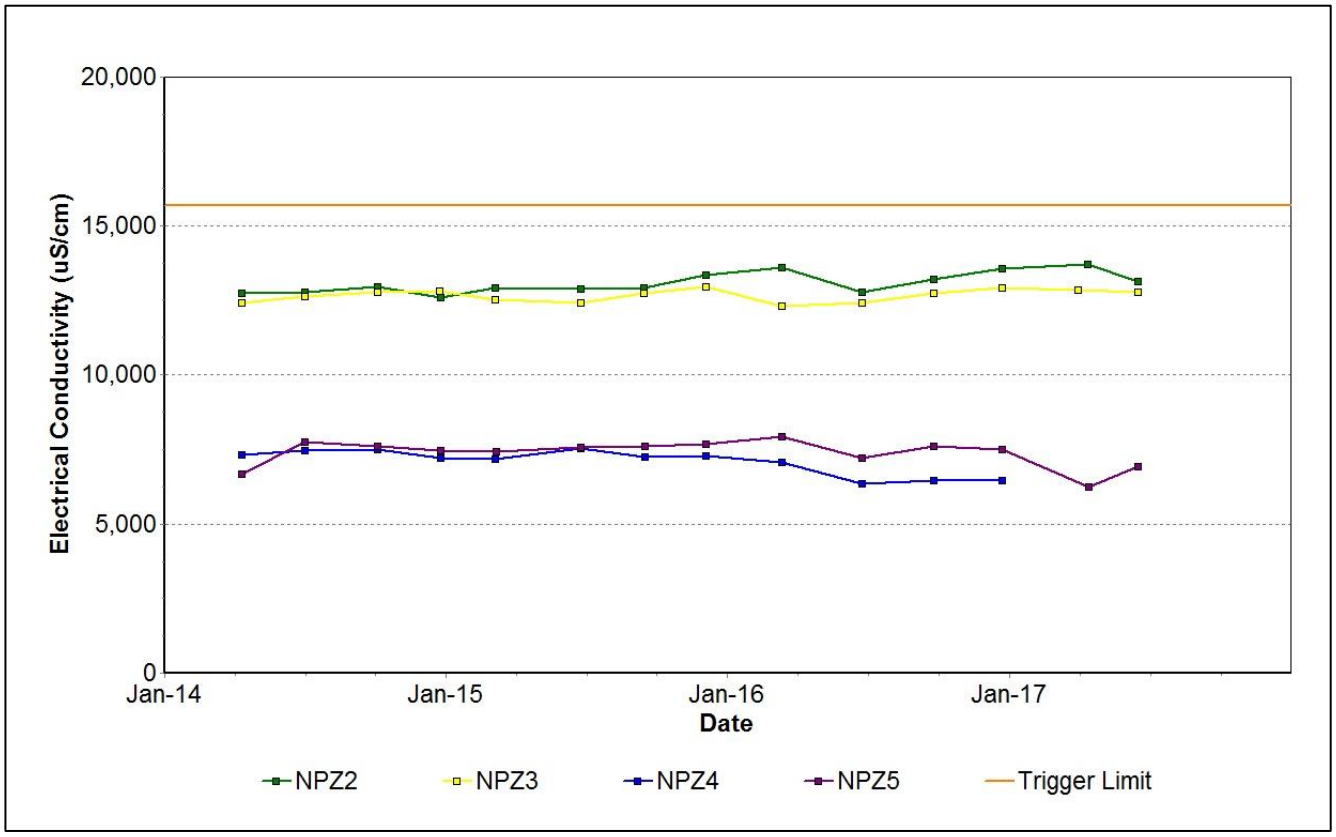

Figure 65: West Pit Siltstone Electrical Conductivity Trend – June 2017

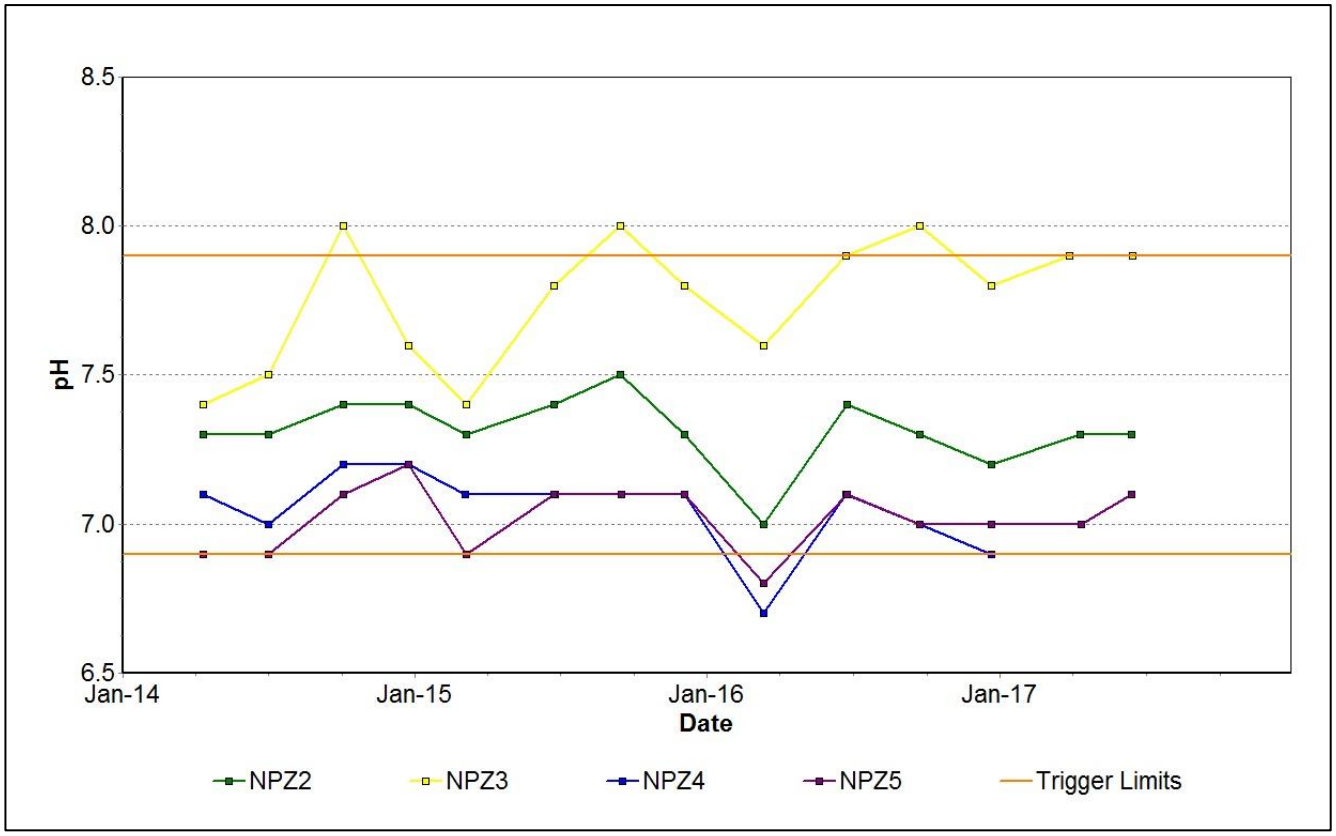

Figure 66: West Pit Siltstone pH Trend – June 2017

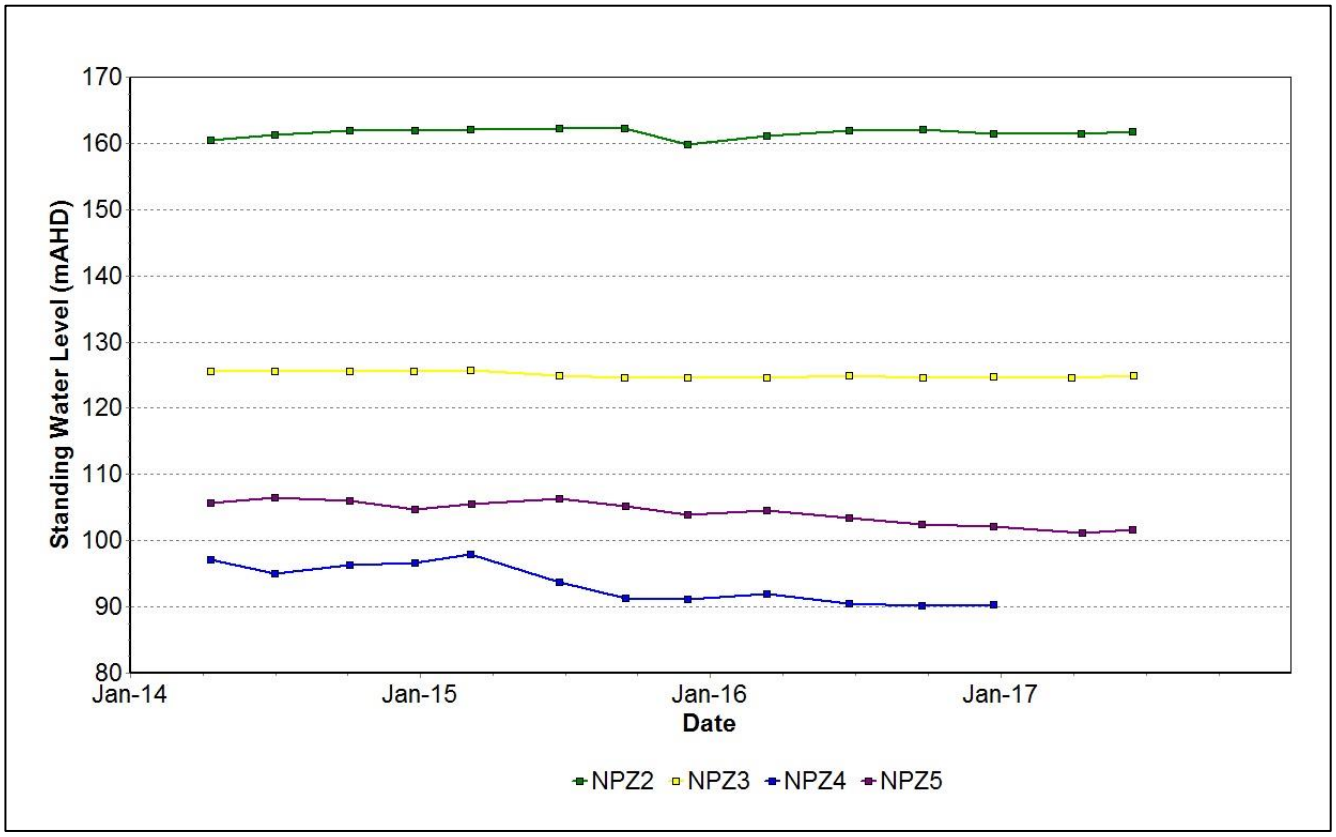

Figure 67: West Pit Siltstone Standing Water Level – June 2017

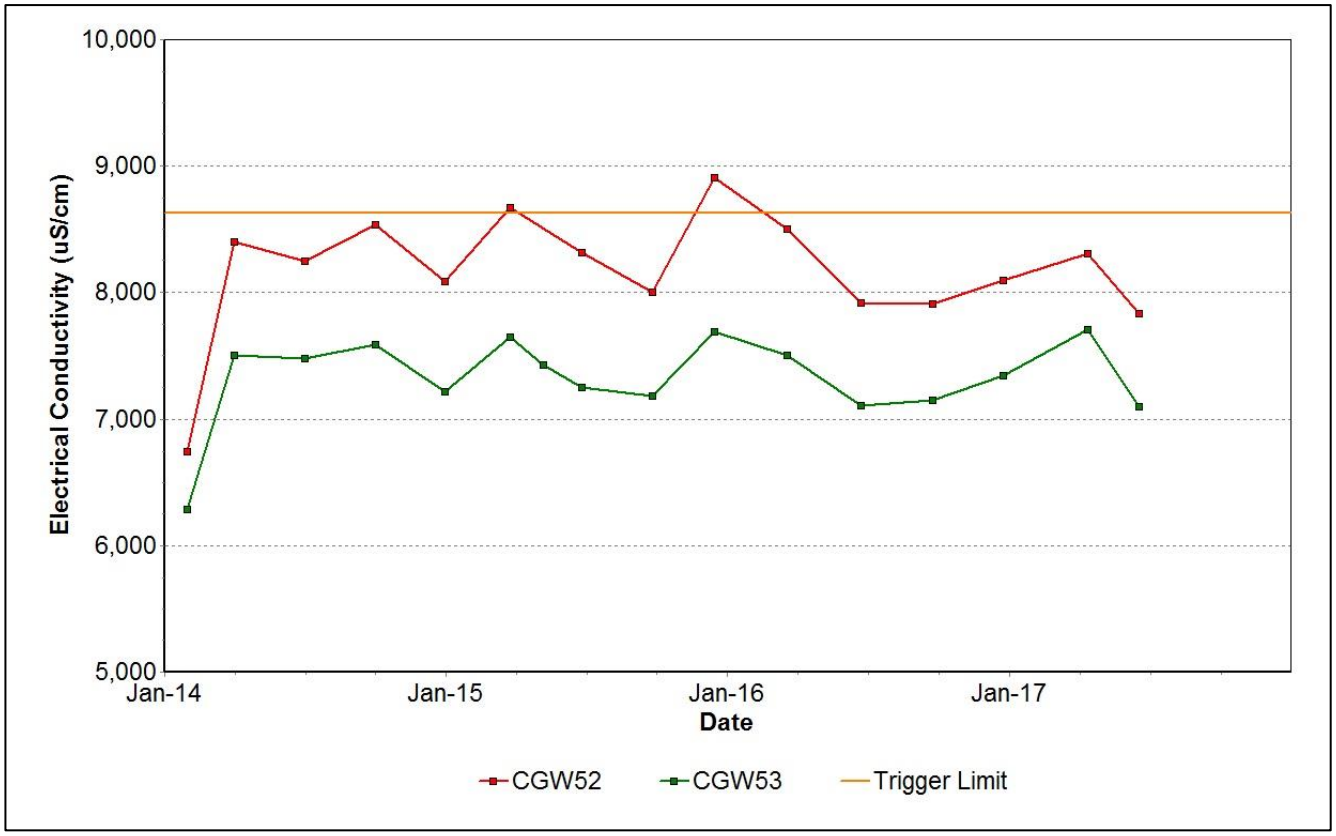

Figure 68: Carrington Broonie Electrical Conductivity Trend - June 2017

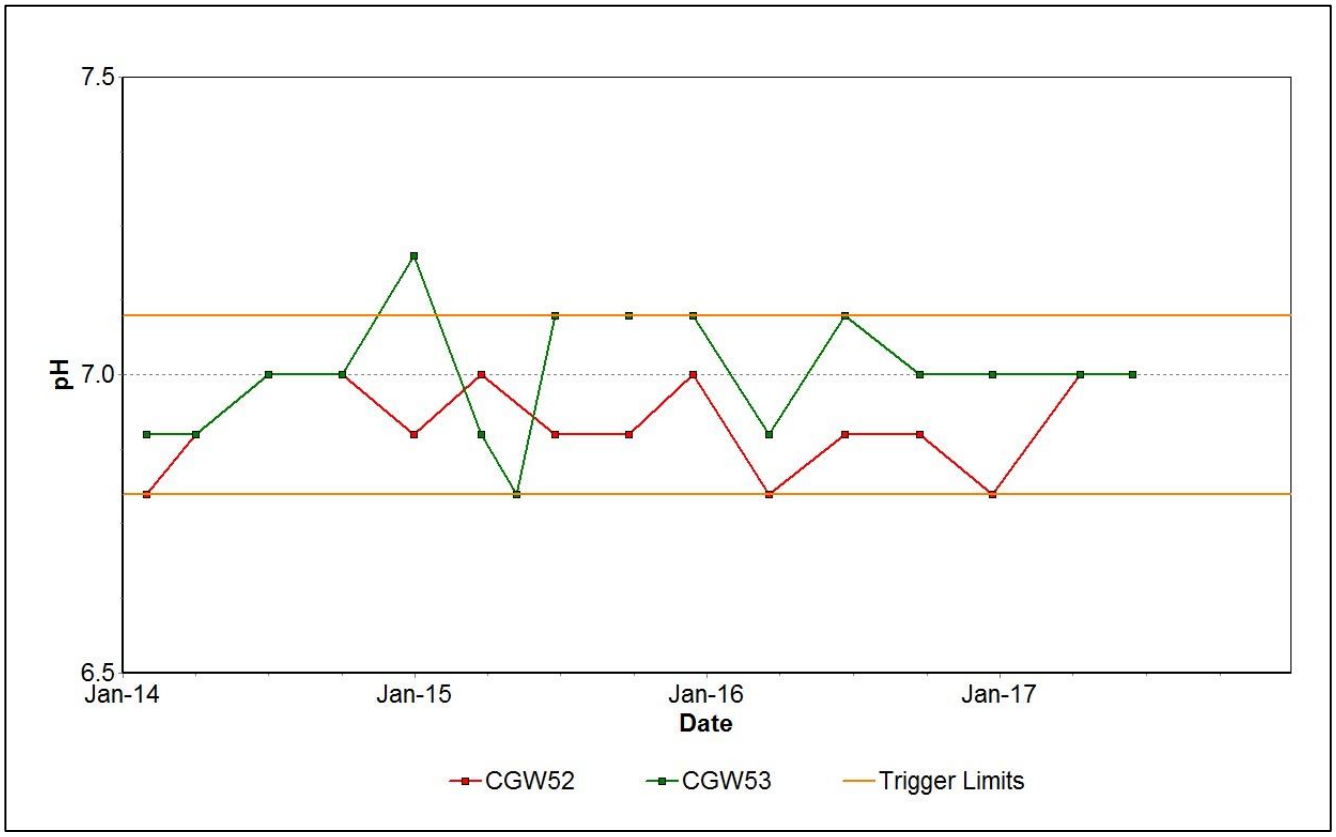

Figure 69: Carrington Broonie pH Trend - June 2017

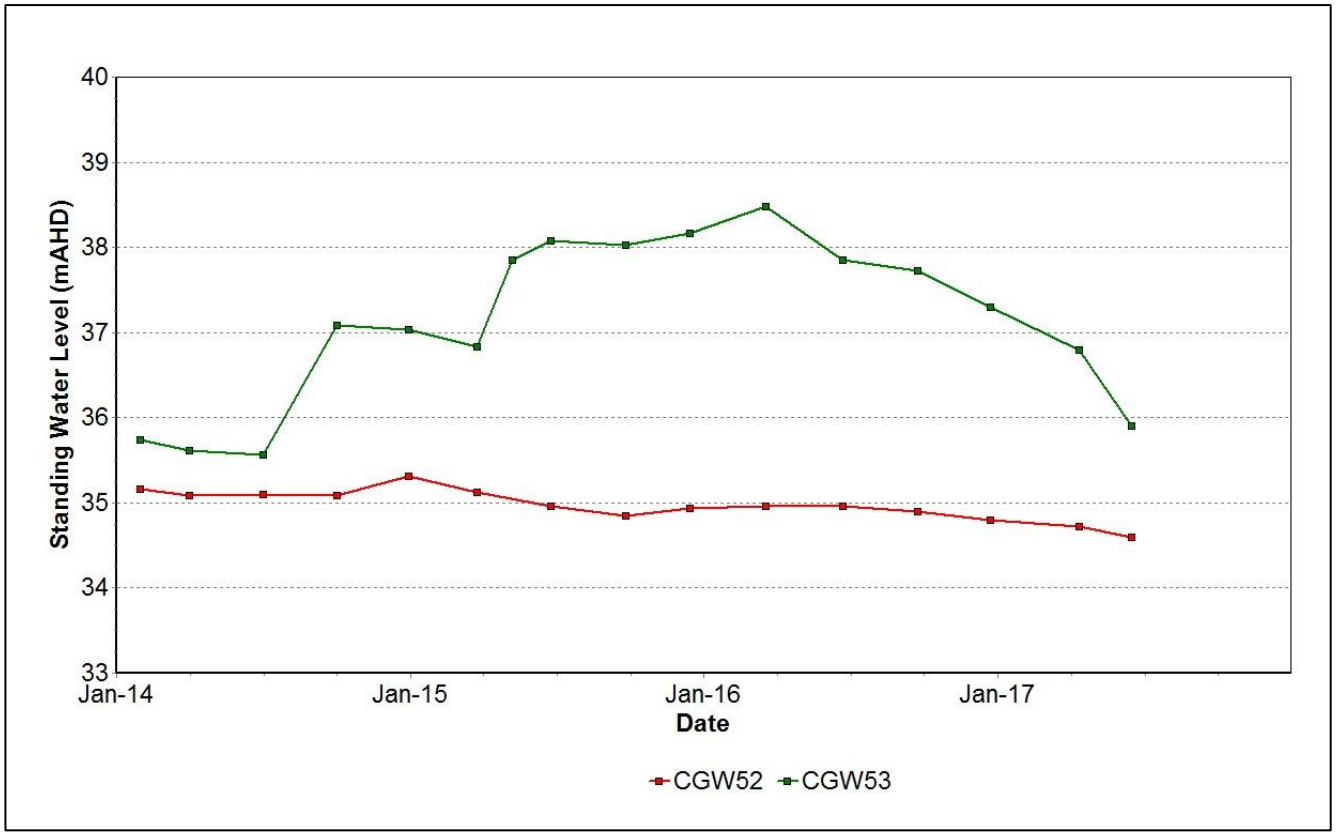

Figure 70: Carrington Broonie Standing Water Level - June 2017

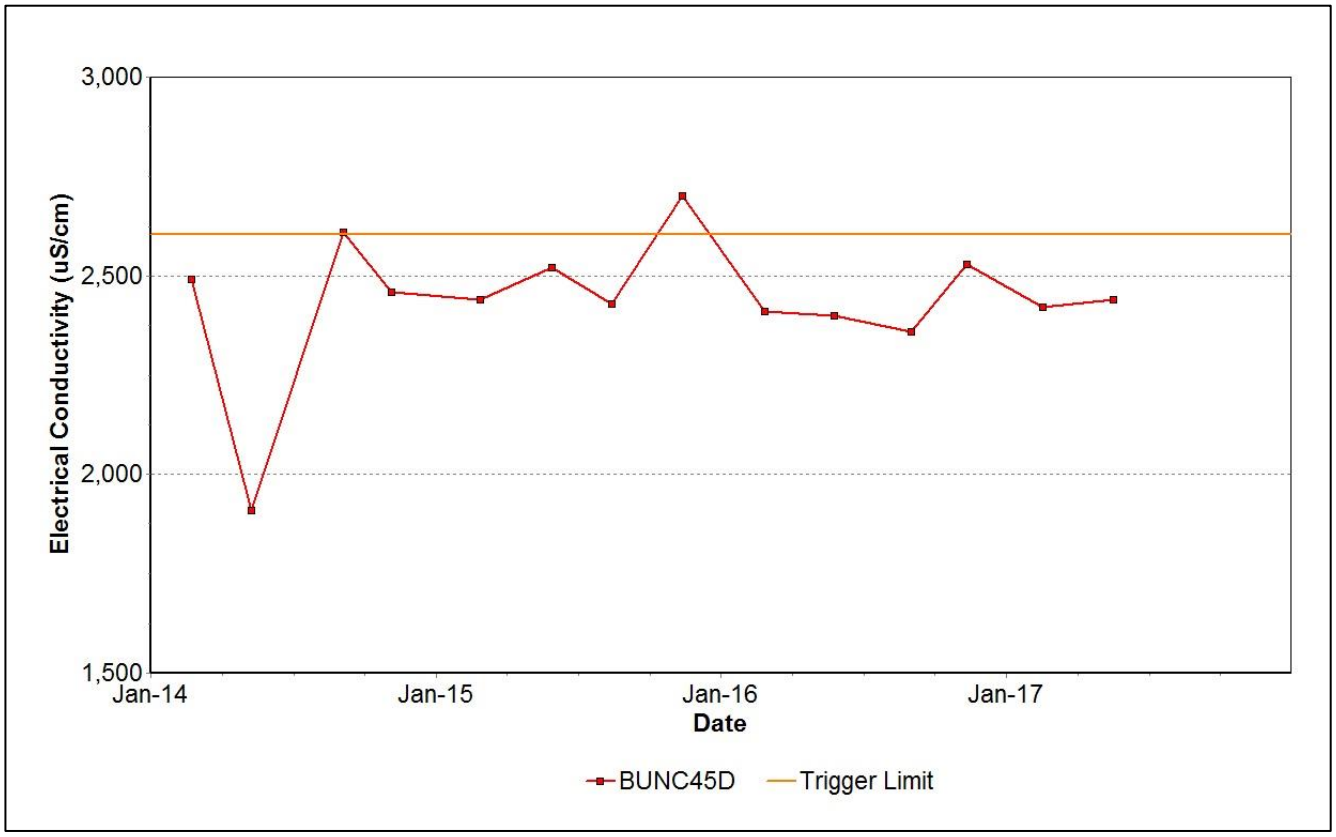

Figure 71: Cheshunt Piercefield Electrical Conductivity Trend – June 2017

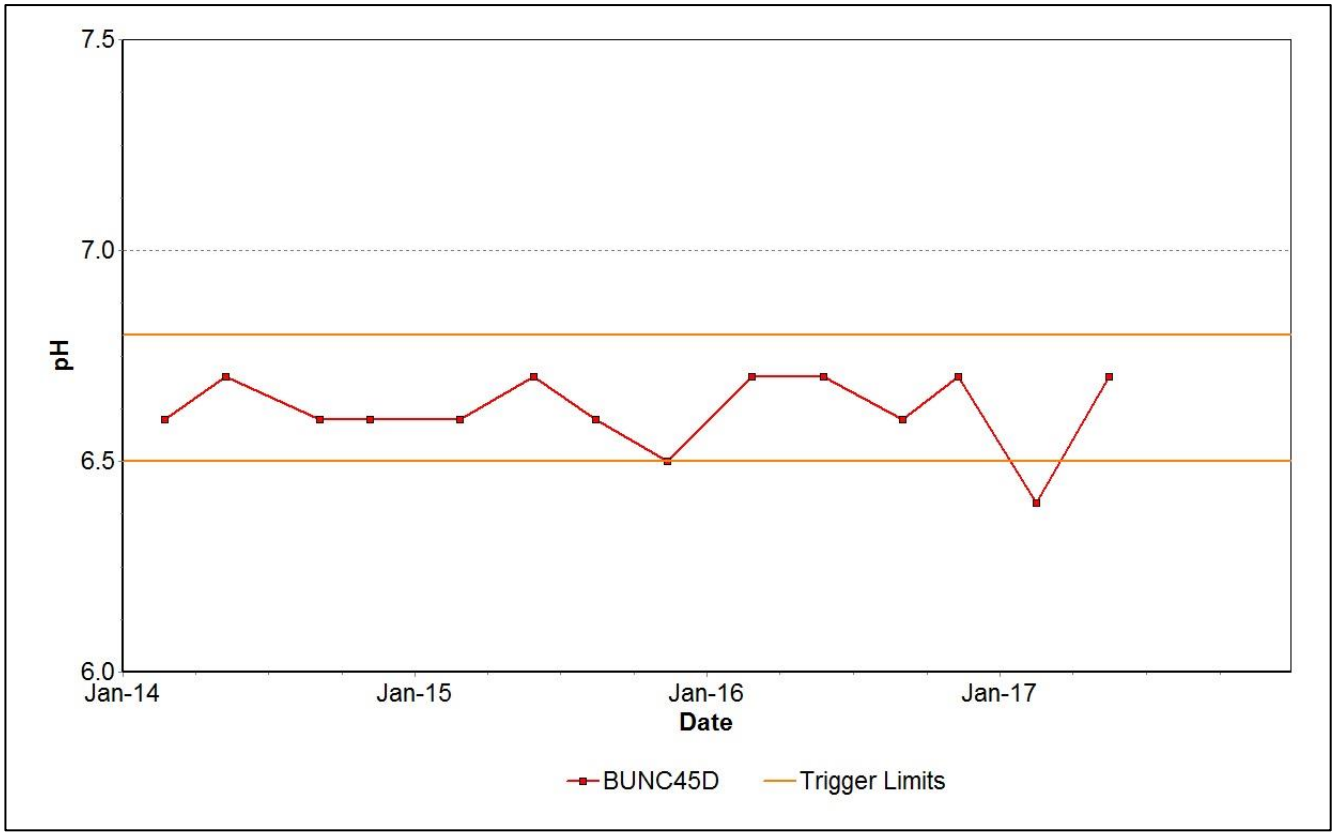

Figure 72: Cheshunt Piercefield pH Trend - June 2017

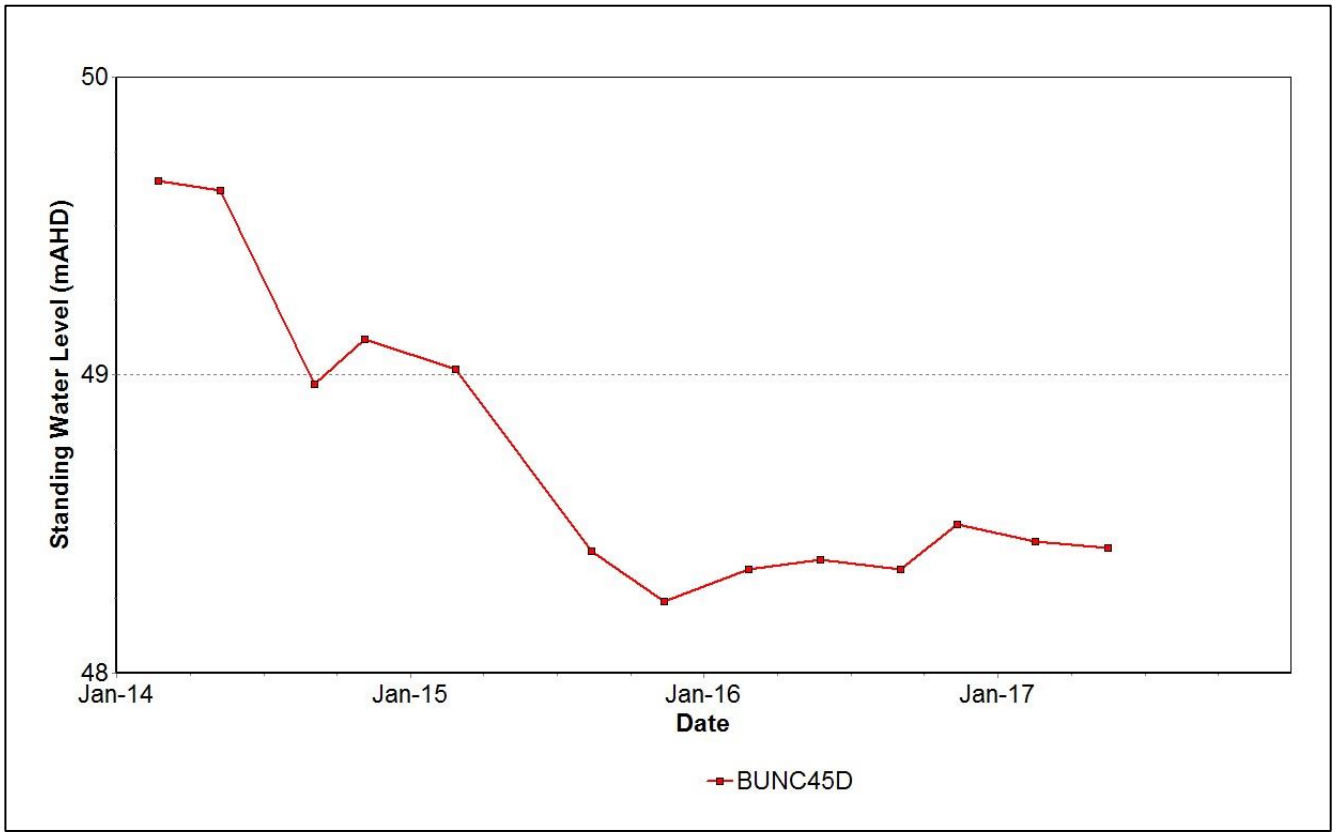

Figure 73: Cheshunt Piercefield Standing Water Level - June 2017

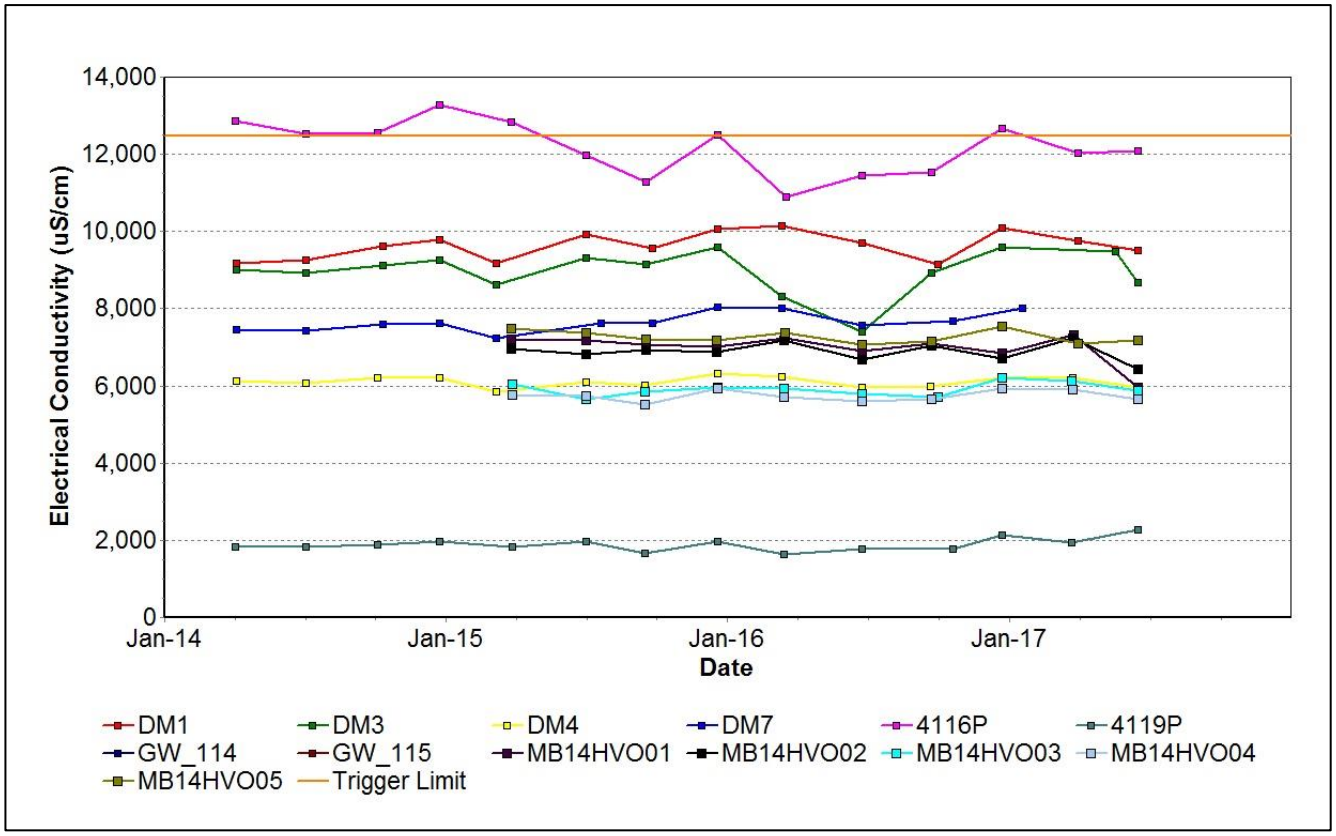

Figure 74: North Pit Spoil Electrical Conductivity Trend - June 2017

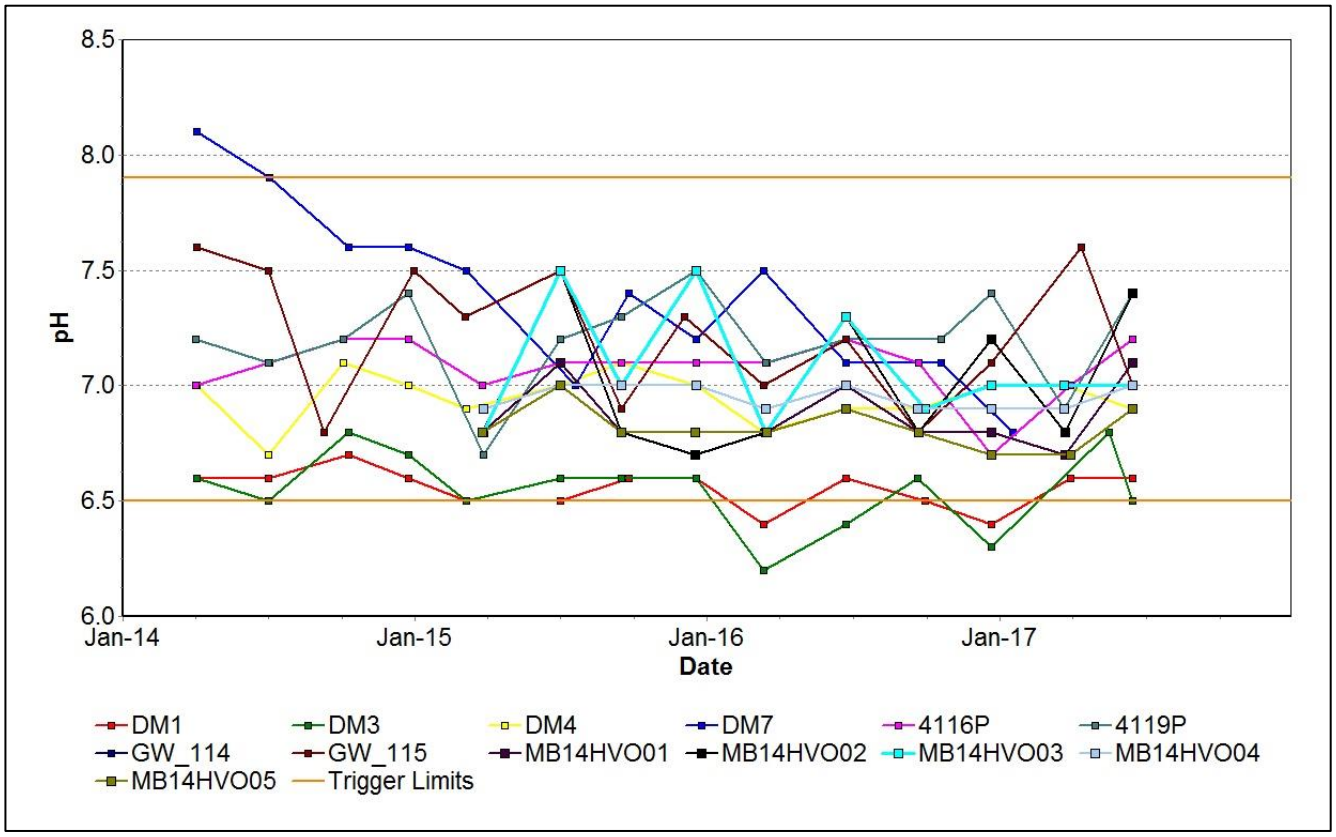

Figure 75: North Pit Spoil pH Trend - June 2017

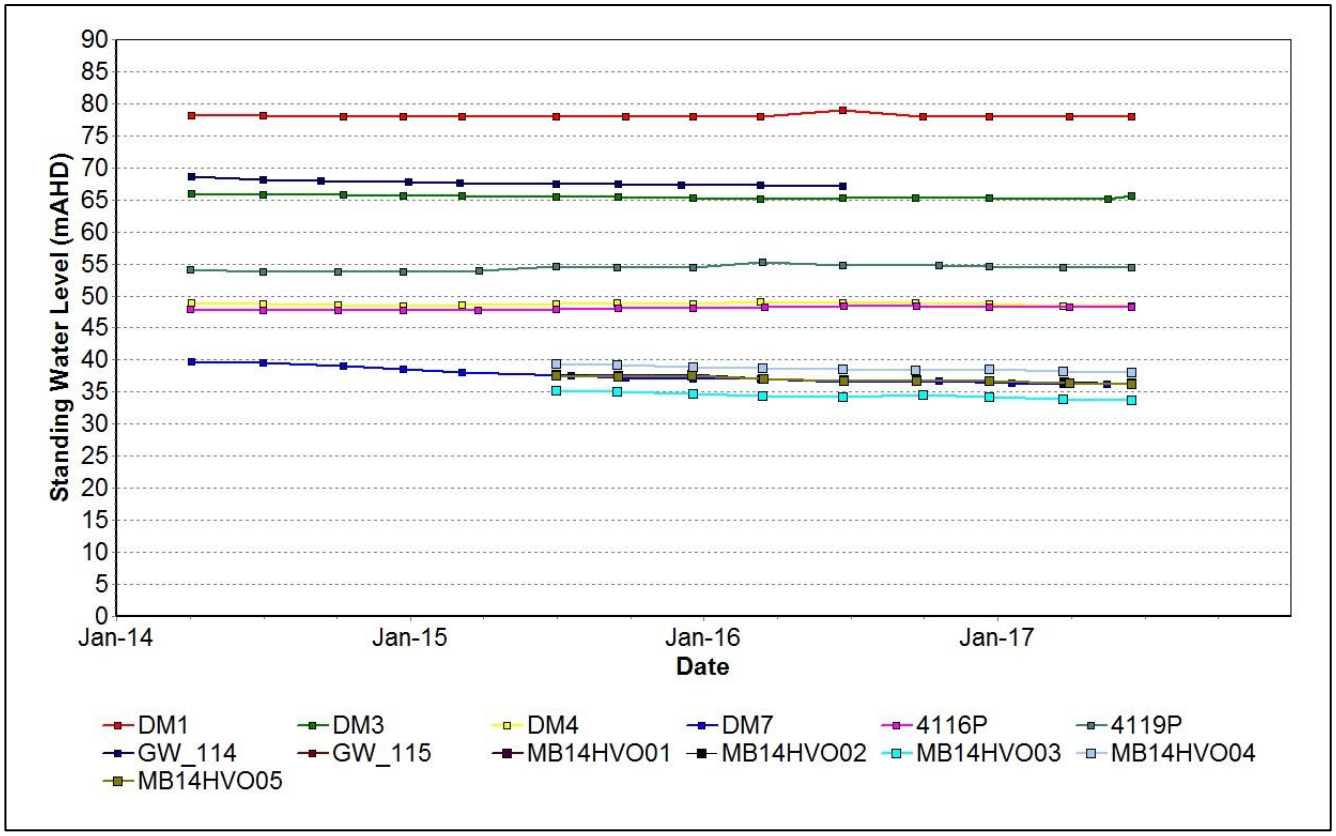

Figure 76: North Pit Spoil Standing Water Level - June 2017

4.2.1 Groundwater Trigger Tracking

Internal trigger limits have been developed to assess monitoring data on an on-going basis, and to highlight potentially adverse groundwater impacts. The process for evaluating monitoring results against the internal triggers and subsequent responses are outlined in the HVO Water Management Plan. Locations of groundwater bores are shown in Figure 77.

During Q2 2017 a range of internal trigger limits were breached, these are summarised in Table 3.

Table 3: Groundwater Triggers - 2017

Site	Date	Trigger Limit Breached	Action Taken in Response
B631(BFS)	18/05/2017	EC – 95th Percentile	Watching Brief*
C130WDH	18/05/2017	EC – 95th Percentile	Watching Brief*
D612(AFS)	17/05/2017	EC – 95th Percentile	Watching Brief*
CFW55R	16/06/2017	EC – 95th Percentile	4th consecutive exceedance: Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.
B631(BFS)	18/05/2017	PH – 5th Percentile	Watching Brief*
BZ2A(2)	16/05/2017	PH – 5th Percentile	Watching Brief*
C130(WDH)	18/05/2017	PH – 5th Percentile	Watching Brief*
CGW46	16/06/2017	PH – 95th Percentile	Watching Brief*
D317(BFS)	18/05/2017	PH – 95th Percentile	Increasing trend in pH not reflected spatially in neighbouring bores. Water level in bore stable, suggesting water quality changes are not related to any mining-related activity. Continue to watch and monitor.
G2	15/06/2017	PH – 95th Percentile	Measurements highly variable and consistent with historical range. Watch and monitor.
Hobdens Well	16/05/2017	PH – 95th Percentile	Watching Brief*
CFW55R	16/06/2017	PH – 5th Percentile	4th consecutive exceedance: Previous investigation determined that hydro geochemical speciation has not changed and that water quality is consistent with nearby bore CFW57. This, coupled with historical data showing similar elevated EC and depressed pH, suggests the variations are natural and unlikely to be due to anthropogenic impact. Watching brief, no further action required.

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

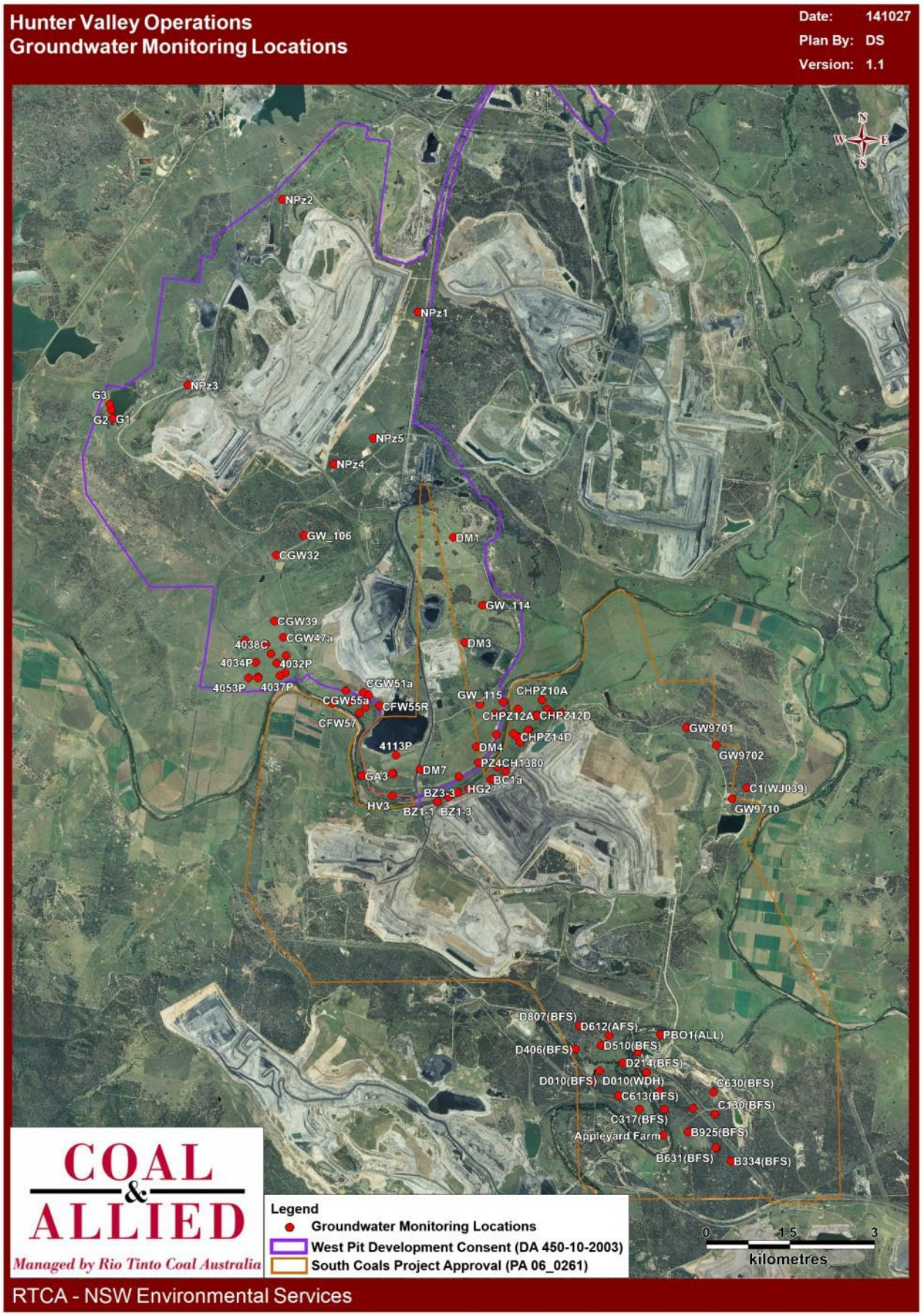

Figure 77: Groundwater Monitoring Location Plan

5.0 BLASTING

5.1.1 Blast Monitoring

HVO have a network of five blast monitoring units. These are located at nearby privately owned residences and function as regulatory compliance monitors. The location of these monitors can be found in **Figure 83.**

During June, 24 blasts were initiated at HVO. **Figure 78** through to **Figure 82** show the blast monitoring results for the reporting period against the impact assessment criteria. The criteria are summarised in Table 4.

Table 4: Blasting Limits

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

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

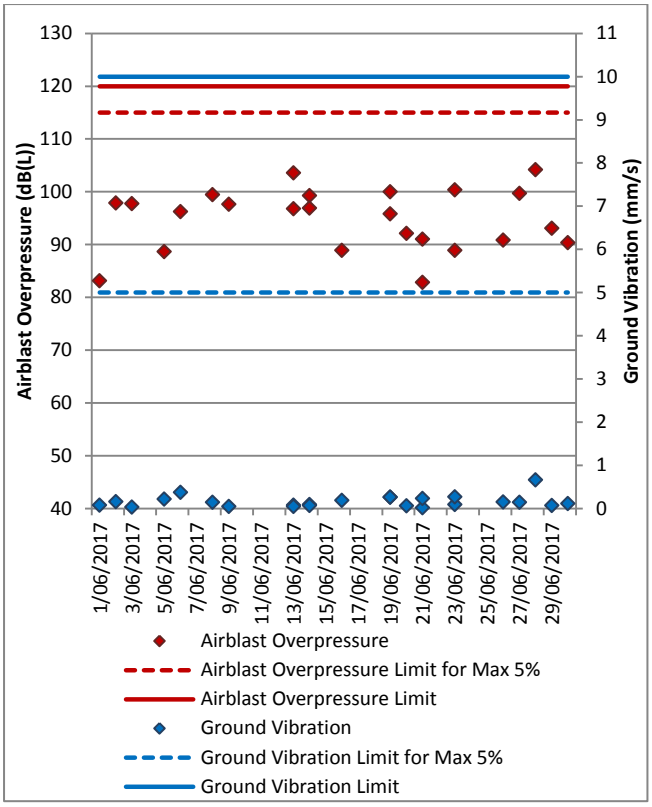

Figure 78: Moses Crossing Blast Monitoring Results – June 2017

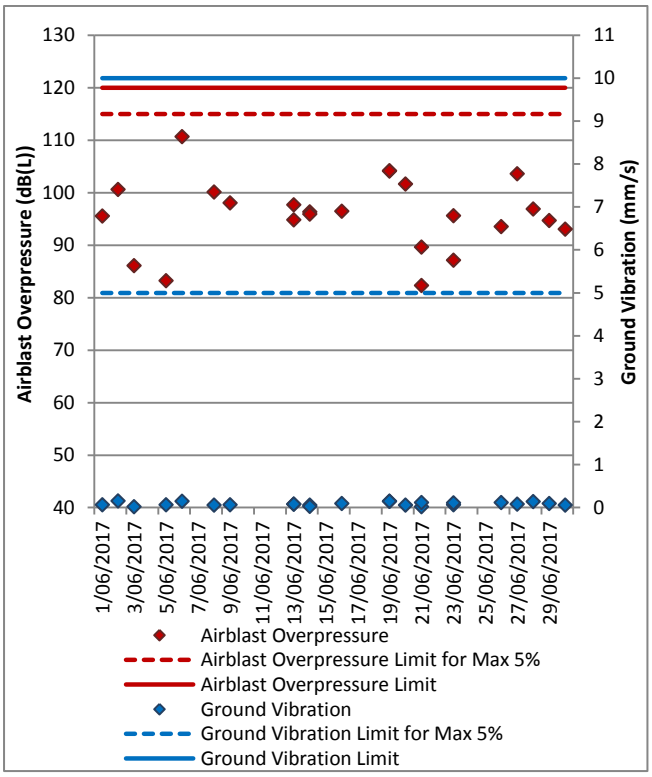

Figure 79: Jerrys Plains Blast Monitoring Results – June 2017

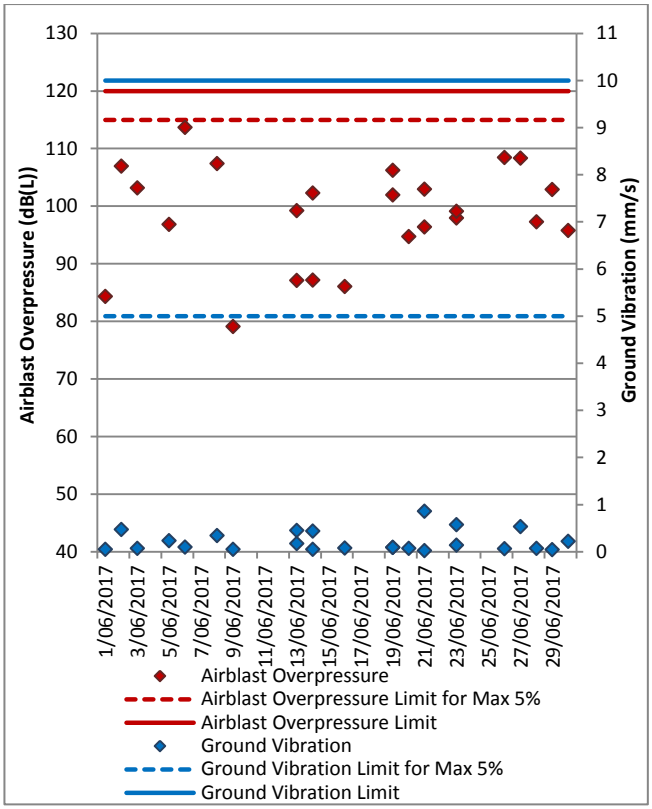

Figure 80: Maison Dieu Blast Monitoring Results – June 2017

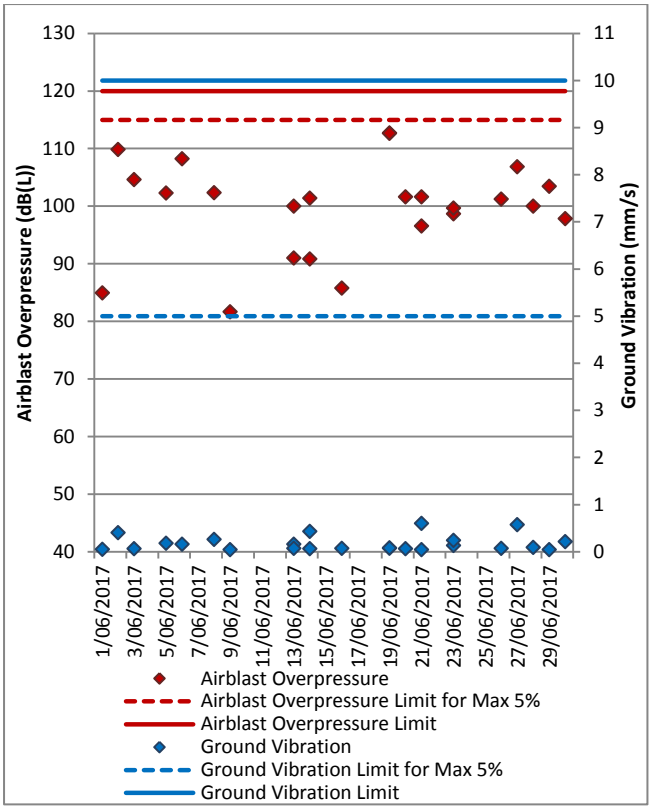

Figure 82: Knodlers Lane Blast Monitoring Results – June 2017

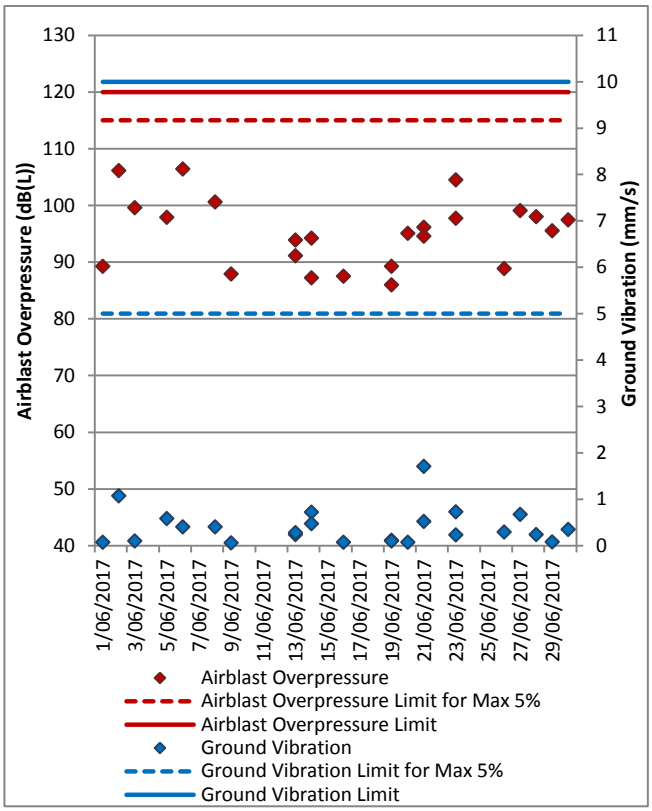

Figure 81: Warkworth Blast Monitoring Results – June 2017

Figure 83: Blast Monitoring Location Plan

6.0 NOISE

Routine attended noise monitoring is carried out at defined locations around HVO as described in the HVO Noise Monitoring Programme. The purpose of the noise surveys is to quantify and describe the acoustic environment around the site and compare results with specified limits. Unattended monitoring (real time noise monitoring) also occurs at five sites surrounding HVO. The attended noise monitoring locations are displayed in **Table 5 to Table 10**.

6.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding HVO on the night of the 13th and 15thof June 2017. Monitoring results are detailed in Table 5 to

Table 10.

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

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	37	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	37	No	<30	NA
Shearers Lane	13/06/2017 21:55	1.7	3	41	No	<30	NA
Kilburnie South	13/06/2017 22:40	0.4	3	36	No	IA	NA
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	35	Yes	IA	Nil
Jerrys Plains East	13/06/2017 21:20	1.1	0.5	35	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	35	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	55	No	IA	NA

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

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	41	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	41	No	<30	NA
Shearers Lane	13/06/2017 21:55	1.7	3	41	No	<30	NA
Kilburnie South	13/06/2017 22:40	0.4	3	41	No	IA	NA
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	40	Yes	IA	Nil
Jerrys Plains East	13/06/2017 21:20	1.1	0.5	40	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	40	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	NA	NA	IA	NA

Table 7: $L_{A1,\ 1minute}$ HVO South – Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO South $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	45	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	45	No	33	NA
Shearers Lane	13/06/2017 21:55	1.7	3	45	No	32	NA
Kilburnie South	13/06/2017 22:40	0.4	3	45	No	IA	NA
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	45	Yes	IA	Nil
Jerrys Plains East	13/06/2017 21:20	1.1	0.5	45	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	45	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	NA	NA	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured $L_{Aeq,15minute}$ dB attributed to HVO South Pit Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data; and
6. Criterion may or may not apply due to rounding of meteorological data values

Table 8: $L_{Aeq,\ 15minute}$ HVO North – Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	35	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	35	Yes	IA	Nil
Shearers Lane	13/06/2017 21:55	1.7	3	35	Yes	IA	Nil
Kilburnie South	13/06/2017 22:40	0.4	3	39	Yes	IA	Nil
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	36	Yes	IA	Nil
Jerrys Plains East	13/06/2017 21:20	1.1	0.5	39	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	35	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	NA	NA	IA	NA

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

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North L_{Aeq} dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	41	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	41	Yes	IA	Nil
Shearers Lane	13/06/2017 21:55	1.7	3	41	Yes	IA	Nil
Kilburnie South	13/06/2017 22:40	0.4	3	41	Yes	IA	Nil
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	41	Yes	IA	Nil

Jerrys Plains East	13/06/2017 21:20	1.1	0.5	41	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	41	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	NA	NA	IA	NA

Table 10: $L_{A1,\ 1Minute}$ HVO North – Impact Assessment Criteria – June 2017

Location	Date and Time	Wind Speed (m/s)[5]	VTG[5]	Criterion dB	Criterion Applies?[1,6]	HVO North $L_{A1,\ 1min}$ dB[2,4]	Exceedance[3]
Knodlers Lane	13/06/2017 21:11	1.1	0.5	46	Yes	IA	Nil
Maison Dieu	13/06/2017 21:33	0.8	3	46	Yes	IA	Nil
Shearers Lane	13/06/2017 21:55	1.7	3	46	Yes	IA	Nil
Kilburnie South	13/06/2017 22:40	0.4	3	46	Yes	IA	Nil
Jerrys Plains Village	13/06/2017 21:43	1.1	0.5	46	Yes	IA	Nil
Jerrys Plains East	13/06/2017 21:20	1.1	0.5	46	Yes	IA	Nil
Long Point Road	15/06/2017 21:00	2.5	0.5	46	Yes	IA	Nil
HVGC	13/06/2017 22:53	0.5	3	NA	NA	IA	NA

Notes
1. Noise emission limits apply for winds up to 3 metres per second (at a height of 10m), or vertical temperature gradients of up to 3 degrees/100m and wind speeds of up to 2 m/s (at a height of 10m);
2. Estimated or measured LAeq,15minute dB attributed to HVO North Area;
3. NA in exceedance column means atmospheric conditions outside specified in approval and so criterion is not applicable;
4. Bolded results in red indicate exceedance of criteria;
5. Atmospheric data is sourced from the HVO Corporate weather station using logged met data; and
6. Criterion may or may not apply due to rounding of meteorological data values.

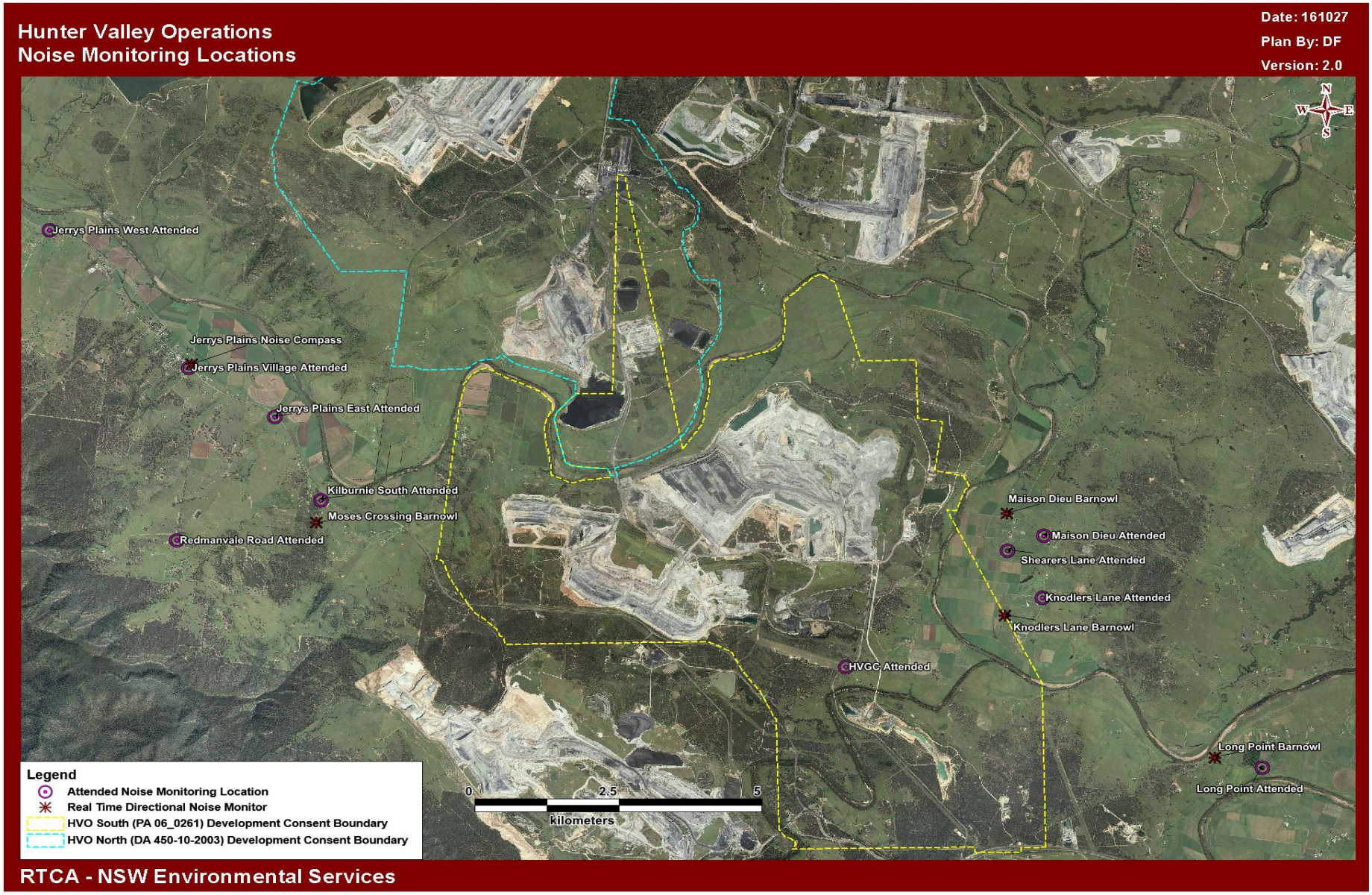

Figure 84: Noise Monitoring Location Plan

6.2 Real Time Noise Monitoring

HVO utilises a network of real-time directional noise monitors to manage noise impacts on a continuous basis. Noise alarms are in place at five monitoring locations (Knodlers Lane, Maison Dieu, Jerrys Plains, Moses Crossing, and Long Point), which alert HVO staff to elevated noise levels likely to be attributable to HVO. Noise alarms are investigated and responded to with the appropriate level of operational modification. Changes in response to a noise alarm can include replacing equipment with quieter (noise attenuated) units, changing or relocating tasks, and shutting down equipment.

HVO's planning approvals stipulate noise criteria which must be met during the life of the development(s). The approvals however do not stipulate requirements or give guidance on noise affectation, or the frequency of any elevated noise event which would constitute noise affectation. Page 6 of the NSW Industrial Noise Policy (INP) comments that criteria "seek to restrict the risk of people being highly annoyed to less than 10 percent, and to meet this for at least 90 percent of the time".

For the purposes of assessing the effectiveness of the noise management system, HVO applies a similar approach with regard to the frequency of any elevated noise event. It should be noted that this assessment does not compliment or conflict with attended noise monitoring detailed in Section 6.1, and that real time monitoring data includes non-mine noise sources such as dogs, cows, or more commonly, road traffic.

7.0 OPERATIONAL DOWNTIME

During June, a total of 0.9 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**.

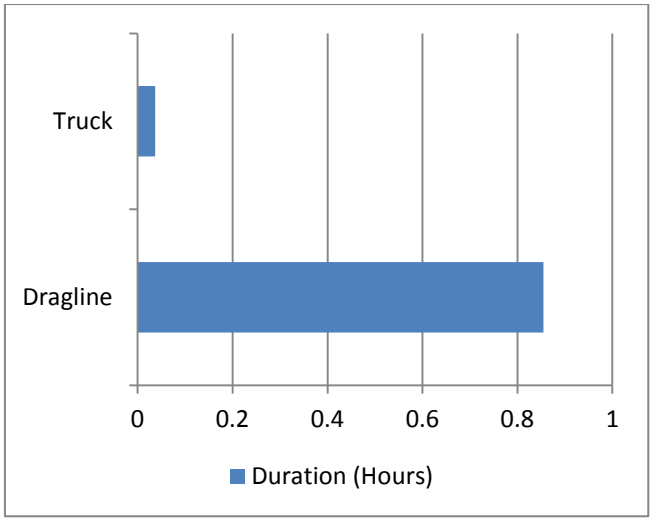

Figure 85: Operational Downtime by Equipment Type –June 2017

8.0 REHABILITATION

During June, 7.6Ha of land was released, 6.1Ha of land was bulk shaped, 7.8 Ha was topsoiled, 9.5 Ha was composted and 2.3 Ha was rehabilitated. Year to date progress can be viewed in **Figure 86**.

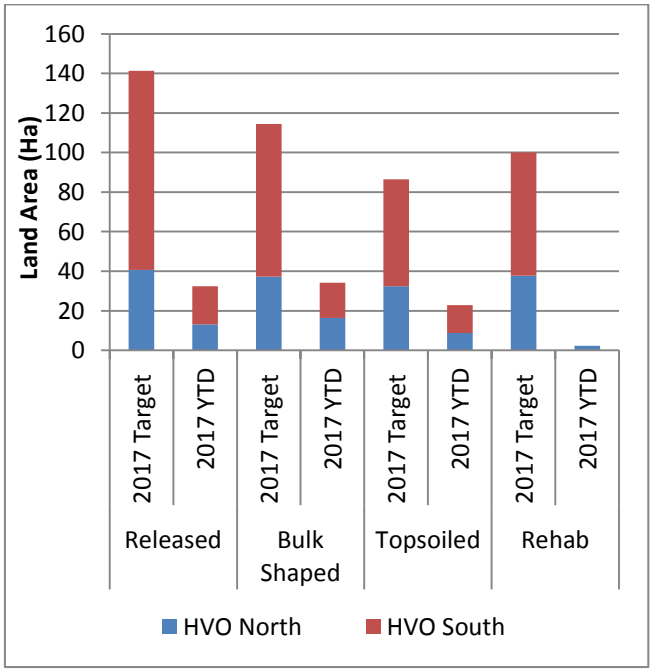

Figure 86: Rehabilitation YTD – June 2017

9.0 COMPLAINTS

One complaint was received during the reporting period. Details of this complaint are shown in **Figure 87** below.

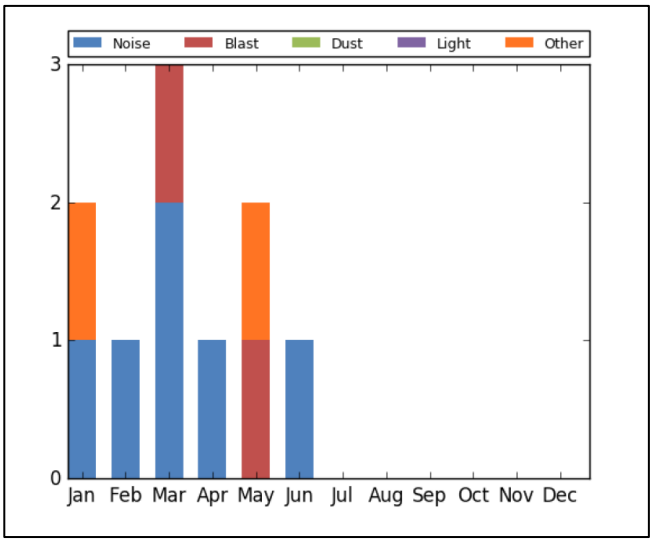

Figure 87: Complaints Graph – June 2017

10.0 ENVIRONMENTAL INCIDENTS

No reportable environmental incidents occurred during the reporting period.

Appendix A: Meteorological Data

Table 11: Meteorological Data - HVO Corporate Meteorological Station – June 2017

Date	Air Temperature Maximum (°C)	Air Temperature Minimum (°C)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Solar Radiation Maximum (W/Sq. M)	Wind Direction Average (°)	Wind Speed Average (m/sec)	Rainfall(mm)
1/06/2017	14.4	4.6	81.8	46.6	868	239	2.1	0.0
2/06/2017	16.4	2.4	85.9	37.0	549	232	1.7	0.0
3/06/2017	16.7	1.5	92.5	40.8	587	234	1.6	0.0
4/06/2017	17.5	7.2	82.3	52.4	888	169	1.1	0.0
5/06/2017	18.6	6.3	93.5	48.4	744	178	0.9	0.0
6/06/2017	16.9	3.6	100.0	54.6	647	281	2.1	0.0
7/06/2017	16.1	3.6	90.0	37.1	745	280	4.0	0.0
8/06/2017	12.4	5.1	100.0	65.6	430	233	1.5	10.6
9/06/2017	17.1	6.8	100.0	69.9	872	199	1.9	3.0
10/06/2017	16.3	8.3	100.0	73.8	824	125	1.5	4.8
11/06/2017	16.5	7.3	100.0	78.7	471	120	2.1	1.0
12/06/2017	16.6	8.3	100.0	81.0	641	116	1.2	0.4
13/06/2017	18.8	9.9	100.0	65.0	640	151	1.1	0.0
14/06/2017	18.0	10.2	97.5	63.7	773	141	2.2	0.0
15/06/2017	17.6	9.7	100.0	77.4	740	133	1.4	0.4
16/06/2017	18.8	9.0	100.0	62.7	754	193	1.1	0.0
17/06/2017	17.2	6.2	100.0	73.6	682	168	1.0	0.0
18/06/2017	16.2	7.8	100.0	76.6	279	178	1.0	0.0
19/06/2017	17.3	7.9	100.0	62.4	716	147	2.1	0.0
20/06/2017	18.8	9.6	98.3	53.7	717	129	1.9	0.0
21/06/2017	18.3	8.5	100.0	62.2	744	137	1.2	0.0
22/06/2017	17.3	4.8	100.0	49.4	620	208	2.0	0.2
23/06/2017	18.0	5.8	99.7	55.1	626	198	1.0	0.0
24/06/2017	18.0	5.3	100.0	48.6	639	282	2.6	0.2
25/06/2017	19.1	6.1	64.2	33.7	577	276	3.0	0.0
26/06/2017	18.9	6.8	73.3	35.9	493	280	3.4	0.0
27/06/2017	17.9	5.5	82.2	31.2	507	238	2.3	0.0
28/06/2017	13.9	0.6	100.0	56.9	499	176	1.0	0.0
29/06/2017	-	-	-	-	-	-	-	-
30/06/2017	13.3	6.7	100.0	78.2	363	270	1.8	5.2

"-" Data unavailable due to equipment or communications issue