YANCOAL
兖煤澳大利亚有限公司

Monthly Environmental Monitoring Report

Yancoal Mt Thorley Warkworth

March 2018

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Revision History

Version No.	Person Responsible	Document Status	Date
1.0	**Environmental Advisor**	**Draft**	**24/04/2018**
1.1	**Environmental Specialist**	**Final**	**26/04/2018**

1.0 INTRODUCTION

This report has been compiled to provide a monthly summary of environmental monitoring results for Mt Thorley Warkworth (MTW). This report includes all monitoring data collected for the period 1 March to 31 March 2018.

2.0 AIR QUALITY

2.1 Meteorological Monitoring

Meteorological data is collected at MTW's 'Charlton Ridge' meteorological station (refer to Figure 3: Air Quality Monitoring Locations).

2.1.1 Rainfall

Rainfall for the period is summarised in Table 1, the year-to-date trend and historical trend are shown in Figure 1.

Table 1: Monthly Rainfall MTW

2018	Monthly Rainfall (mm)	Cumulative Rainfall (mm)
March	73.2	152.6

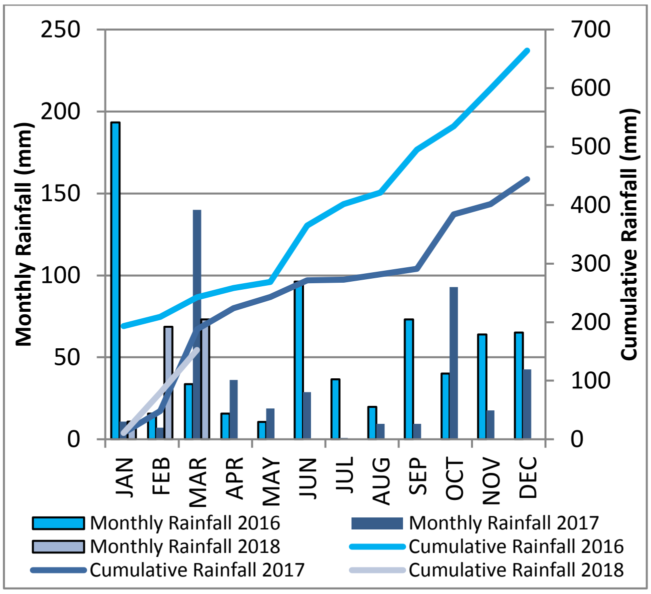


Figure 1: Rainfall Trends YTD

2.1.2 Wind Speed and Direction

Winds from the South were dominant throughout the reporting period as shown in Figure 2.

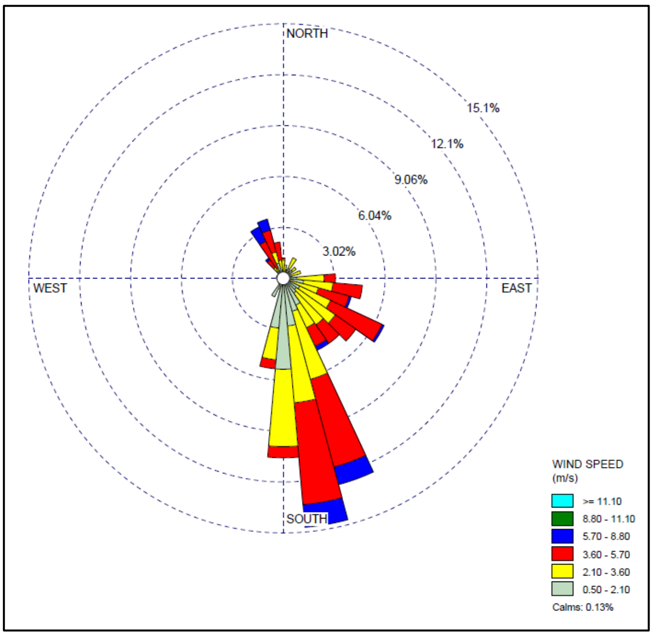


Figure 2: Charlton Ridge Wind Rose –March 2018

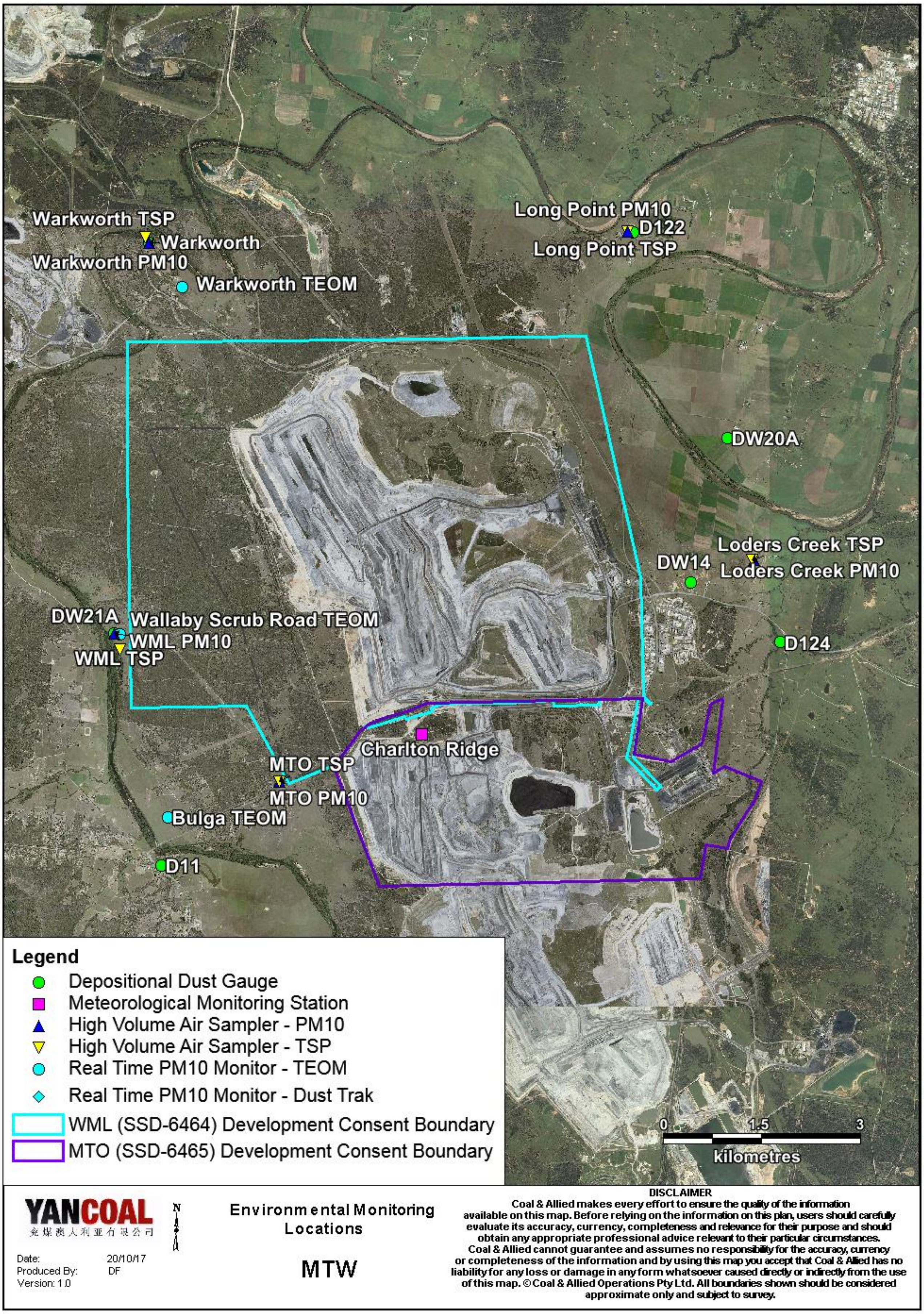


Figure 3: Air Quality Monitoring Locations

2.2 Depositional Dust

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

Figure 4 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 DW21a, D124 and Warkworth monitors recorded monthly results above the long term impact assessment criteria of 4.0 g/m^2 per month. Field notes associated with monitor DW21a results confirm the presence of insects. As such the results are considered contaminated and will be excluded from calculation of the annual average.

There is no evidence to suggest that the D124 and Warkworth results are contaminated. Accordingly, the results will be included in the annual average calculation.

An annual assessment of MTW's compliance with the Long Term Impact Assessment Criteria will be provided in the 2018 Annual Review.

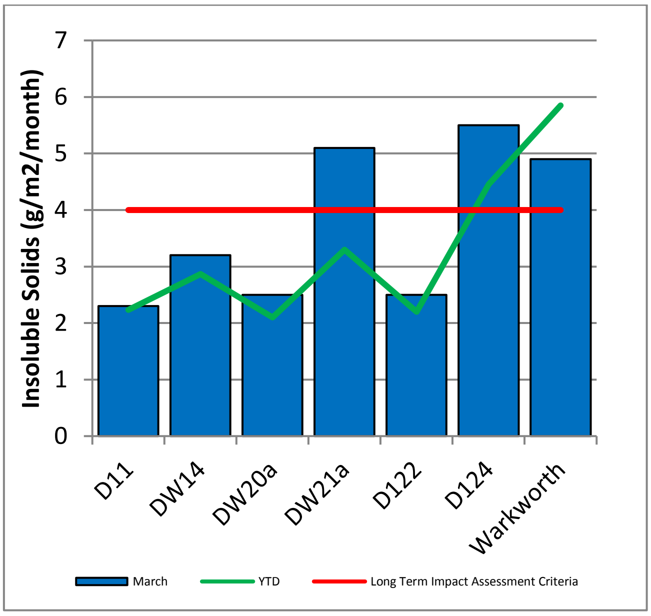


Figure 4: Depositional Dust – March 2018

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 3. 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 5 shows the individual PM_{10} results at each monitoring station against the short term impact assessment criteria of 50µg/m³.

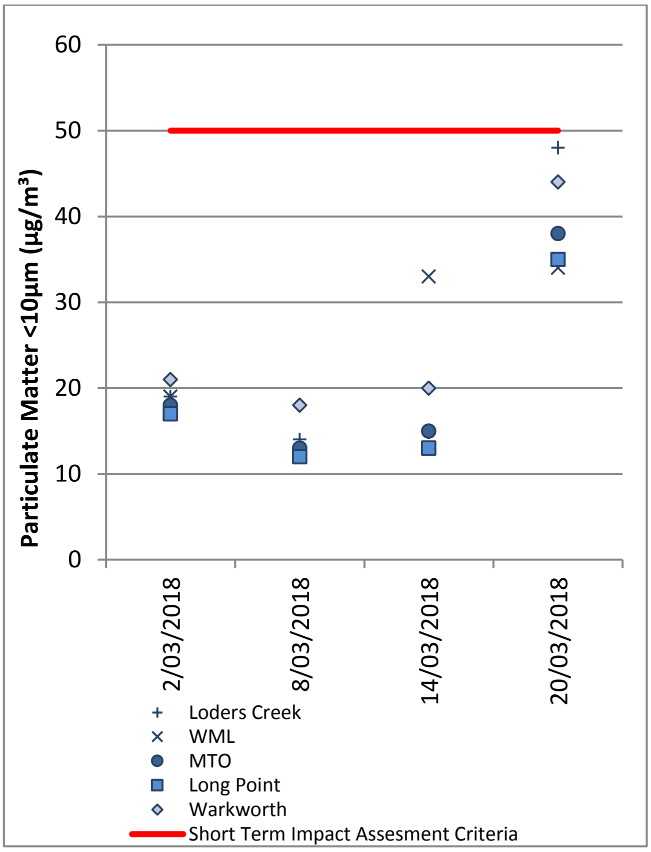


Figure 5: Individual PM_{10} Results – March 2018

Figure 6 shows the annual average PM_{10} results against the long term impact assessment criteria. An annual assessment of MTW's compliance with the Long Term Impact Assessment Criteria will be provided in the 2018 Annual Review.

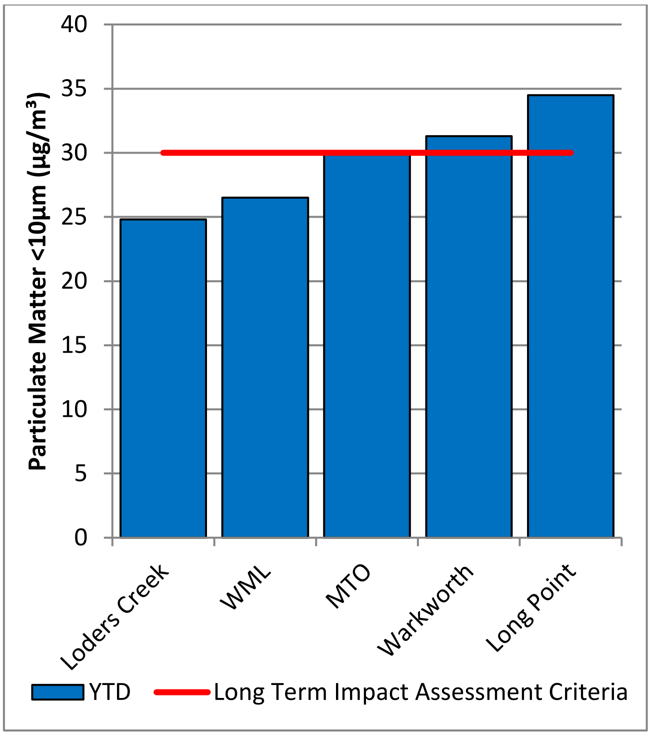


Figure 6: Annual Average PM_{10} –March 2018

2.3.2 TSP Results

Figure 7 shows the annual average TSP results compared against the long term impact assessment criteria of 90µg/m³. An annual assessment of MTW's compliance with the Long Term Impact Assessment Criteria will be provided in the 2018 Annual Review.

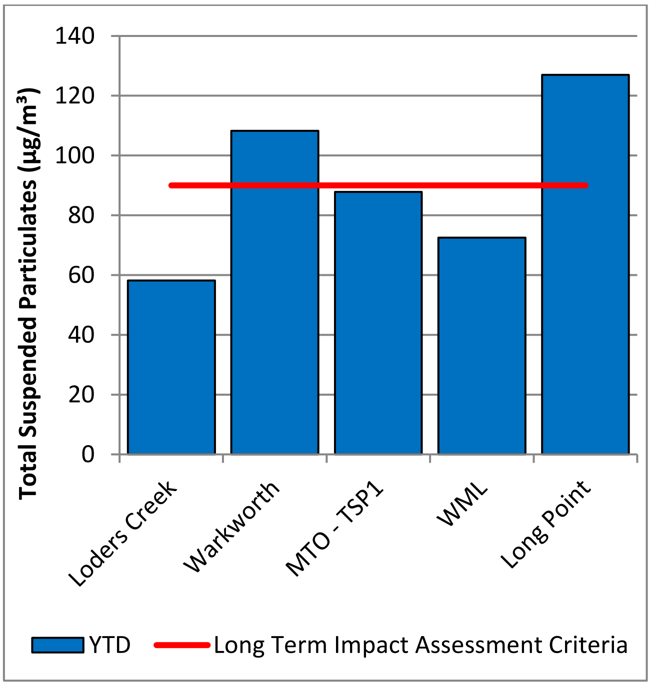


Figure 7: Annual Average Total Suspended Particulates – March 2018

2.3.3 Real Time PM_{10} Results

Mt Thorley Warkworth 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 for real time dust sampling are shown in

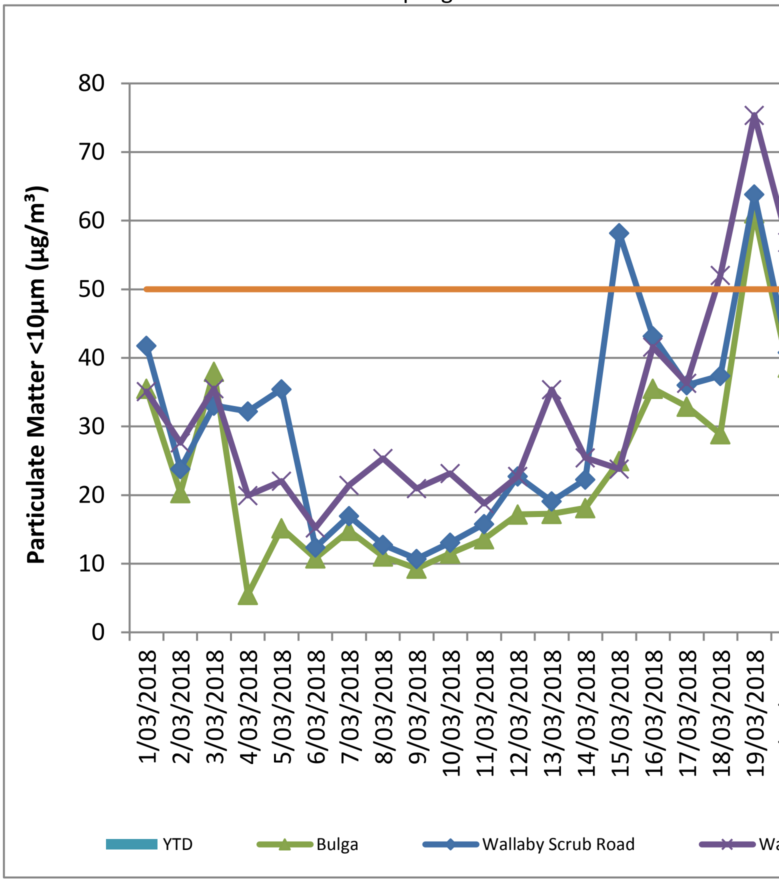


Figure 8, including the daily 24 hour average PM_{10} result and the year to date annual average PM_{10} result.

Six TEOM PM_{10} measurements exceeded the 24 hour short term impact assessment criteria during the reporting period. Each was investigated to determine the level of contribution from MTW activities in accordance with the compliance protocol outlined in the MTW Air Quality Management Plan. All recorded exceedances were determined to be compliant with the relevant criterion.

A summary of the investigations undertaken for each short term PM_{10} exceedance are provided in Table 2.

Note: Where reliable data was unable to be collected from the Bulga TEOM, data from the nearby OEH operated TEOM was sourced.

2.3.3 Real Time PM_{10} Results

Table 2: 24hr PM_{10} Investigations

Date	**Site**	**24hr PM_{10} result (µg/m³)**	**Estimated contribution from MTW (µg/m³)**	**Discussion**
15/03/2018	Wallaby Scrub Road TEOM	58.2	4.6	An analysis of meteorological data has determined the maximum potential MTW contribution to the result to be in the order of 4.6µg/m3 or 8% of the measured result. As the calculated contribution was less than 75% of the measured result MTW is not considered to be a significant contributor to the result as described in the MTW Air Quality Management Plan.
18/03/2018	Warkworth OEH TEOM	52.1	8.8	An analysis of meteorological data has determined the maximum potential MTW contribution to the result to be in the order of 8.8µg/m3 or 16.9% of the measured result. As the calculated contribution was less than 75% of the measured result MTW is not considered to be a significant contributor to the result as described in the MTW Air Quality Management Plan.
19/03/2018	Bulga OEH TEOM	61.1	N/A	An analysis of meteorological data has determined that the Bulga OEH monitoring location was predominantly upwind of MTW throughout the day. Therefore, it is unlikely that MTW was a significant contributor to the result and thus an estimation of contribution has not been calculated.
19/03/2018	Wallaby Scrub Road TEOM	63.8	23.0	An analysis of meteorological data has determined the maximum potential MTW contribution to the result to be in the order of 23µg/m3 or 36.1% of the measured result. As the calculated contribution was less than 75% of the measured result MTW is not considered to be a significant contributor to

				the result as described in the MTW Air Quality Management Plan.
19/03/2018	Warkworth OEH TEOM	75.4	34.9	An analysis of meteorological data has determined the maximum potential MTW contribution to the result to be in the order of 34.9µg/m3 or 46.3% of the measured result. As the calculated contribution was less than 75% of the measured result MTW is not considered to be a significant contributor to the result as described in the MTW Air Quality Management Plan.
20/03/2018	Warkworth OEH TEOM	56.8	30.6	An analysis of meteorological data has determined the maximum potential MTW contribution to the result to be in the order of 30.6µg/m3 or 53.9% of the measured result. As the calculated contribution was less than 75% of the measured result MTW is not considered to be a significant contributor to the result as described in the MTW Air Quality Management Plan.

2.3.4 Real Time Alarms for Air Quality

During March, the real time monitoring system generated 80 automated air quality related alerts, including 5 alerts for adverse meteorological conditions and 75 alerts for elevated PM_{10} levels.

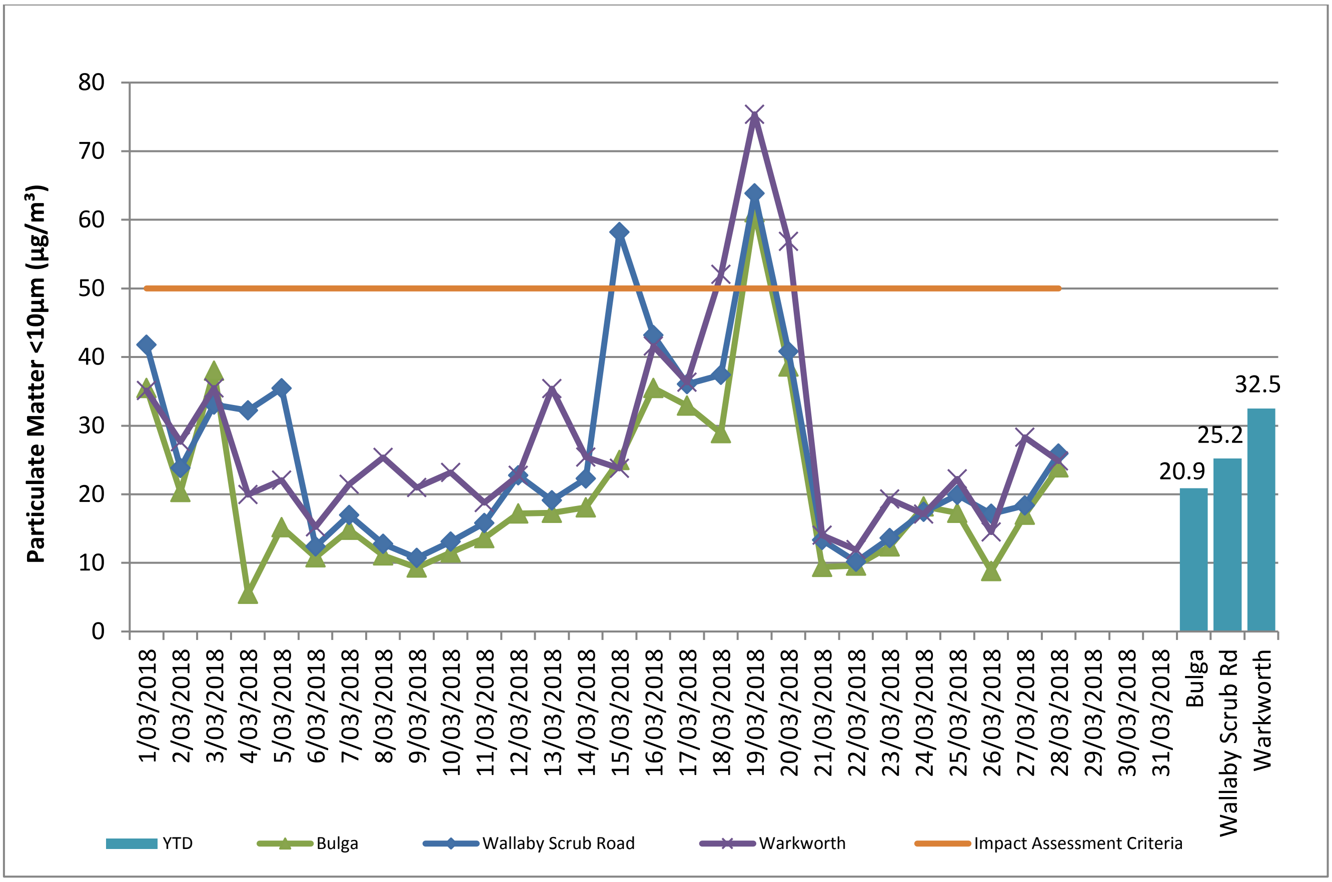


Figure 8: Real Time PM_{10} 24hr average and Year-to-date average – March 2018

3.0 WATER QUALITY

MTW maintains a network of surface water and groundwater monitoring sites.

3.1 Surface Water

Monitoring is conducted at mine site dams and surrounding natural watercourses. The surface water monitoring locations are outlined in Figure 15.

Surface water courses are sampled on a monthly or quarterly sampling regime. Water quality is evaluated through the parameters of pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS). The Hunter River and the Wollombi Brook are sampled both upstream and downstream of mining operations, to monitor the potential impact of mining. Other Hunter River tributaries are also monitored.

3.1.1 Surface Water Monitoring Results

Figure 9 to Figure 11 show the long term surface water trend (2015 – current) within MTW mine dams. Figure 12 to Figure 14 show the long term surface water trend (2015 - current) in surrounding watercourses.

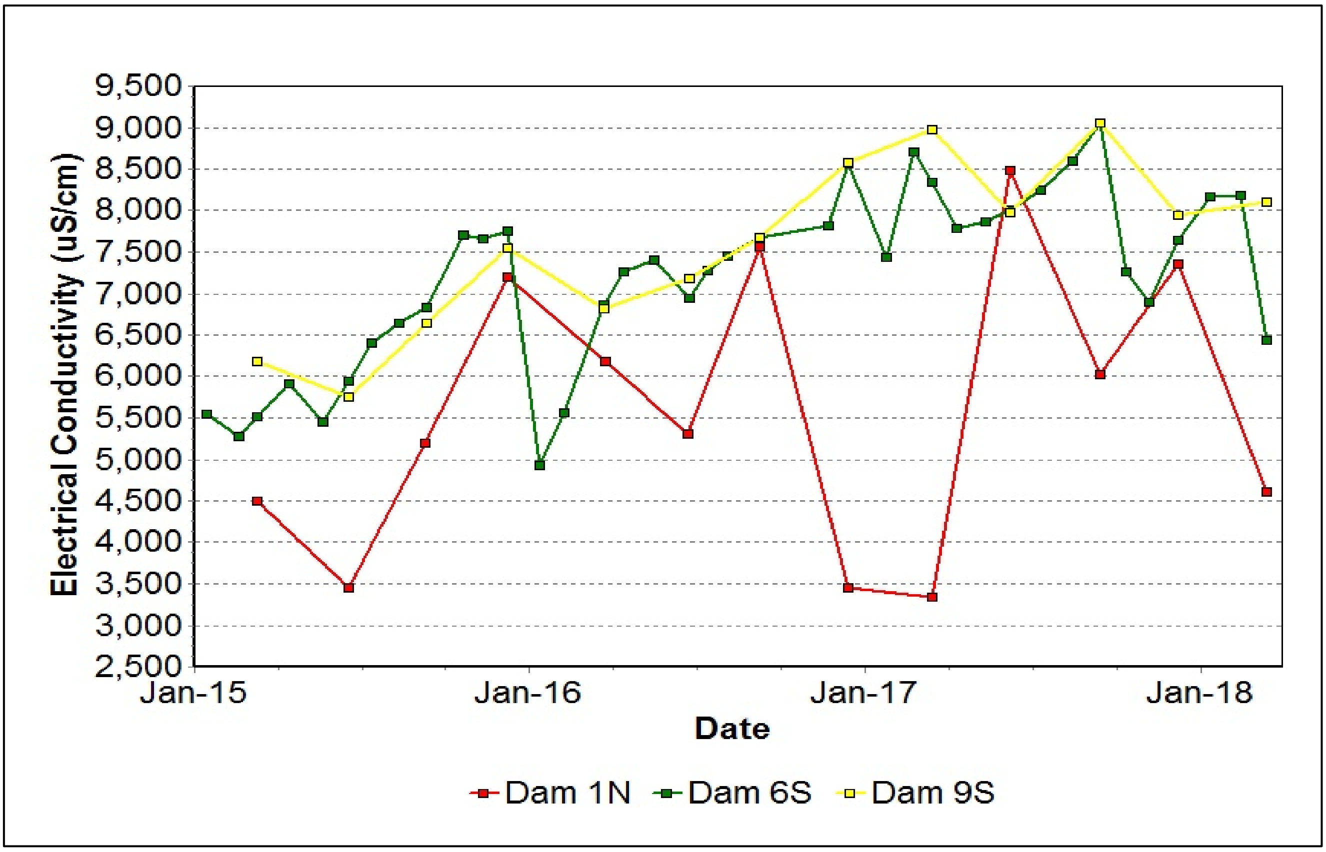


Figure 9: Site Dams Electrical Conductivity Trend – March 2018

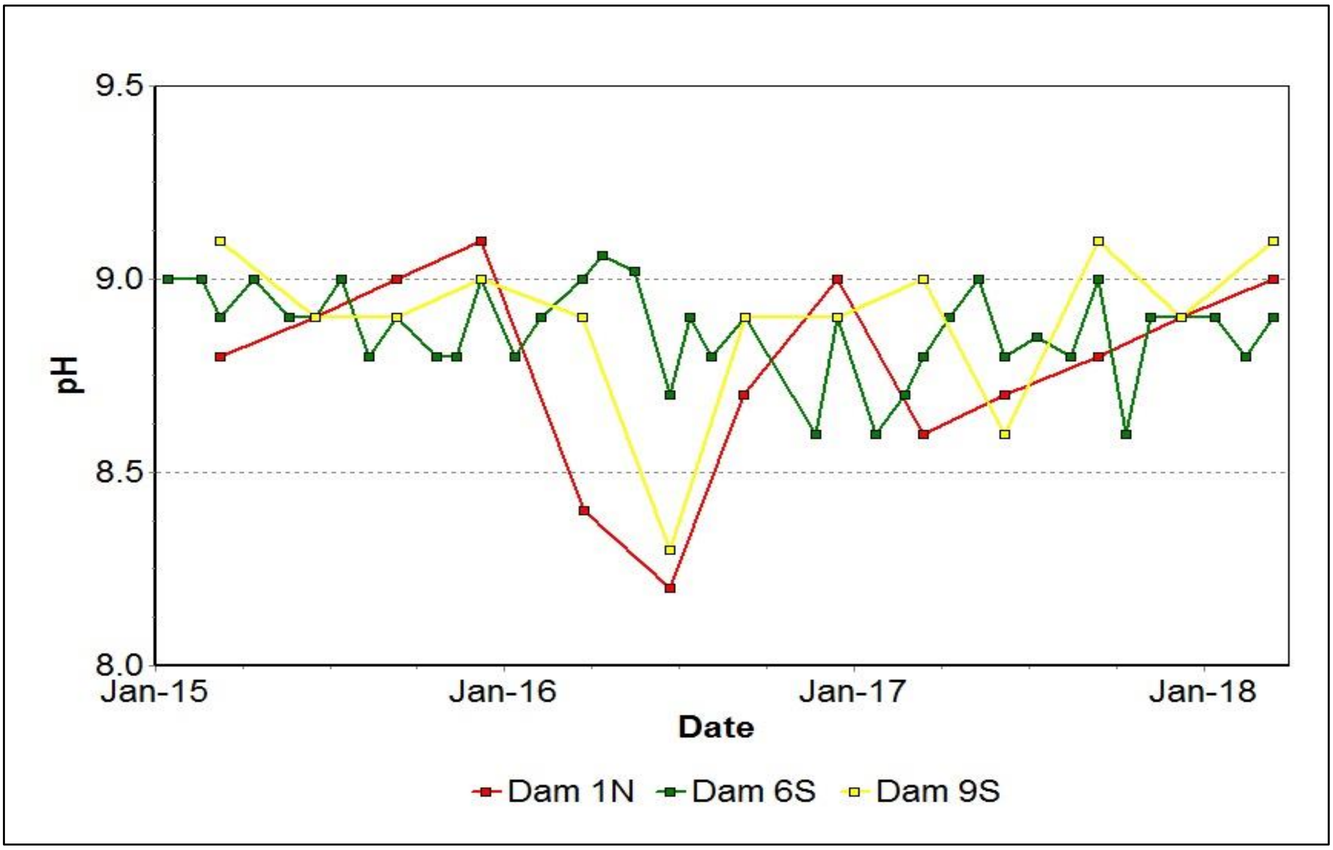


Figure 10: Site Dams pH Trend – March 2018

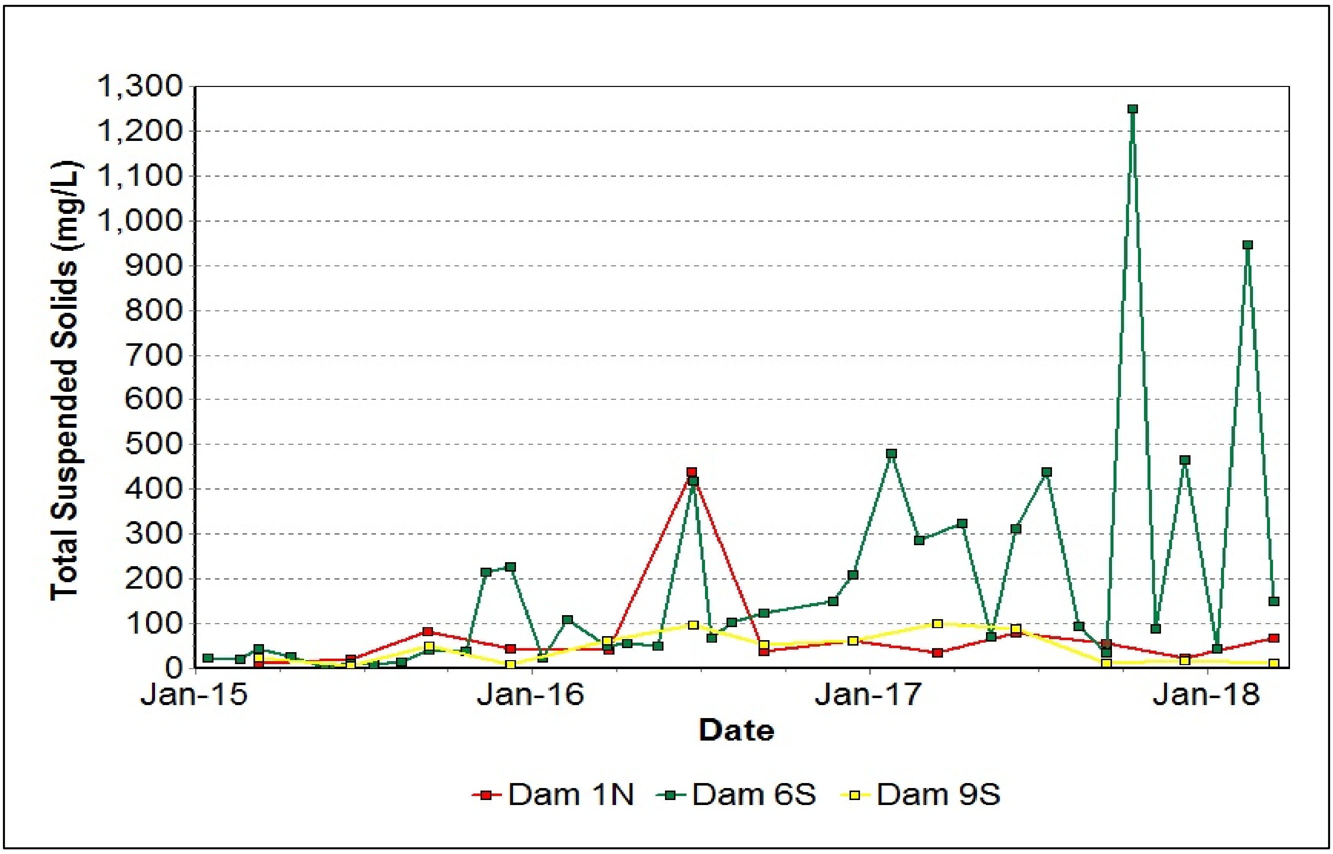


Figure 11: Site Dams Total Suspended Solids Trend – March 2018

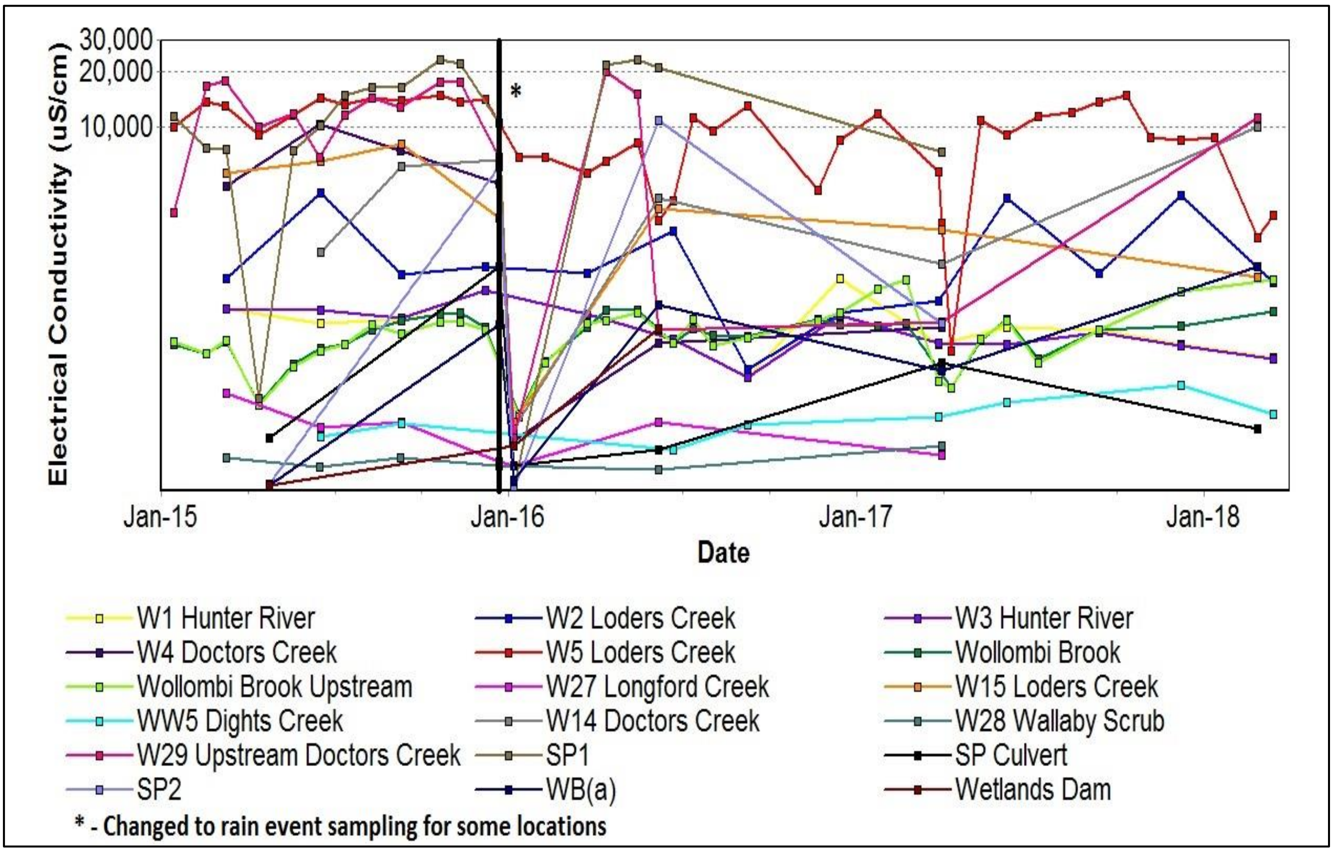


Figure 12: Watercourse Electrical Conductivity Trend – March 2018

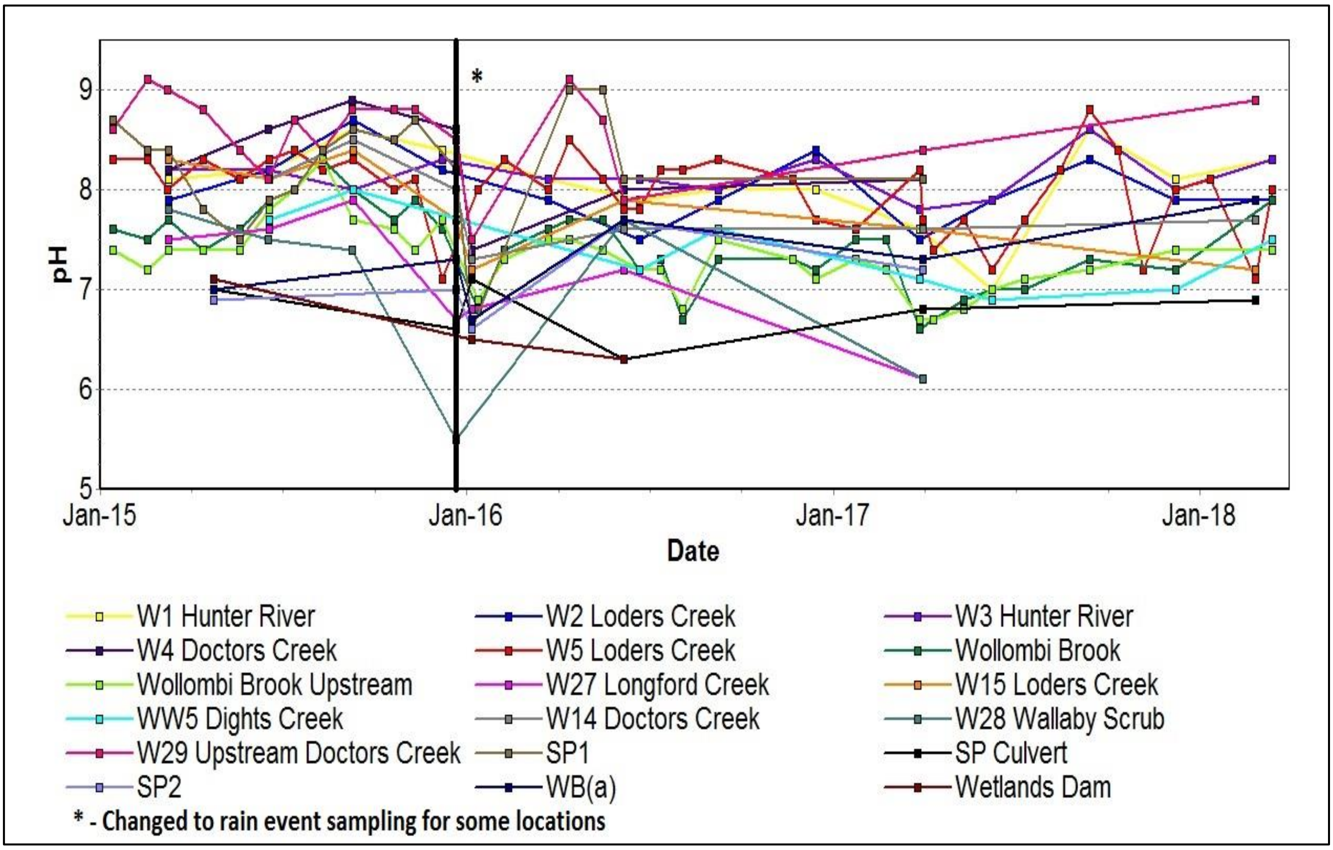


Figure 13: Watercourse pH Trend – March 2018

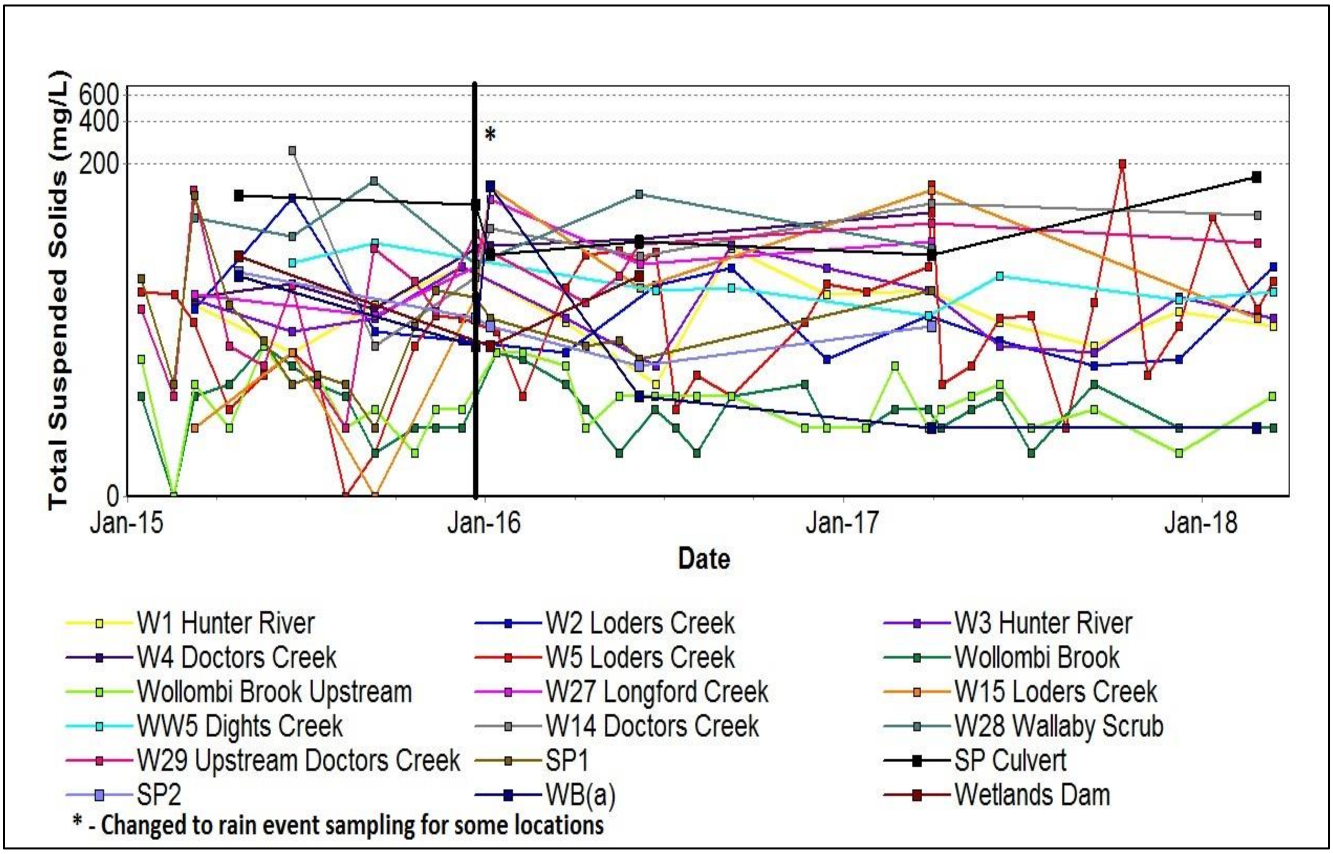


Figure 14: Watercourse Total Suspended Solids Trend – March 2018

3.1.2 Surface Water Trigger Tracking

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 MTW Water Management Plan.

Current internal surface water trigger limit breaches are summarised in Table 3.

Table 3: Surface Water Trigger Tracking – March YTD 2018

Site	Date	Trigger Limit Breached	Action Taken in Response
W14	26/02/2018	EC –95th Percentile	Watching Brief*
W5	14/02/2018	pH –5th Percentile	Watching Brief*
W15	26/02/2018	pH –5th Percentile	Watching Brief*
W5	12/01/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken
W14	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken
W29	26/02/2018	TSS – 50mg/L (ANZECC criteria)	Field investigation did not identify any mining related sources of sediment. Elevated TSS associated with high intensity rainfall event after prolonged dry period. No further action taken

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

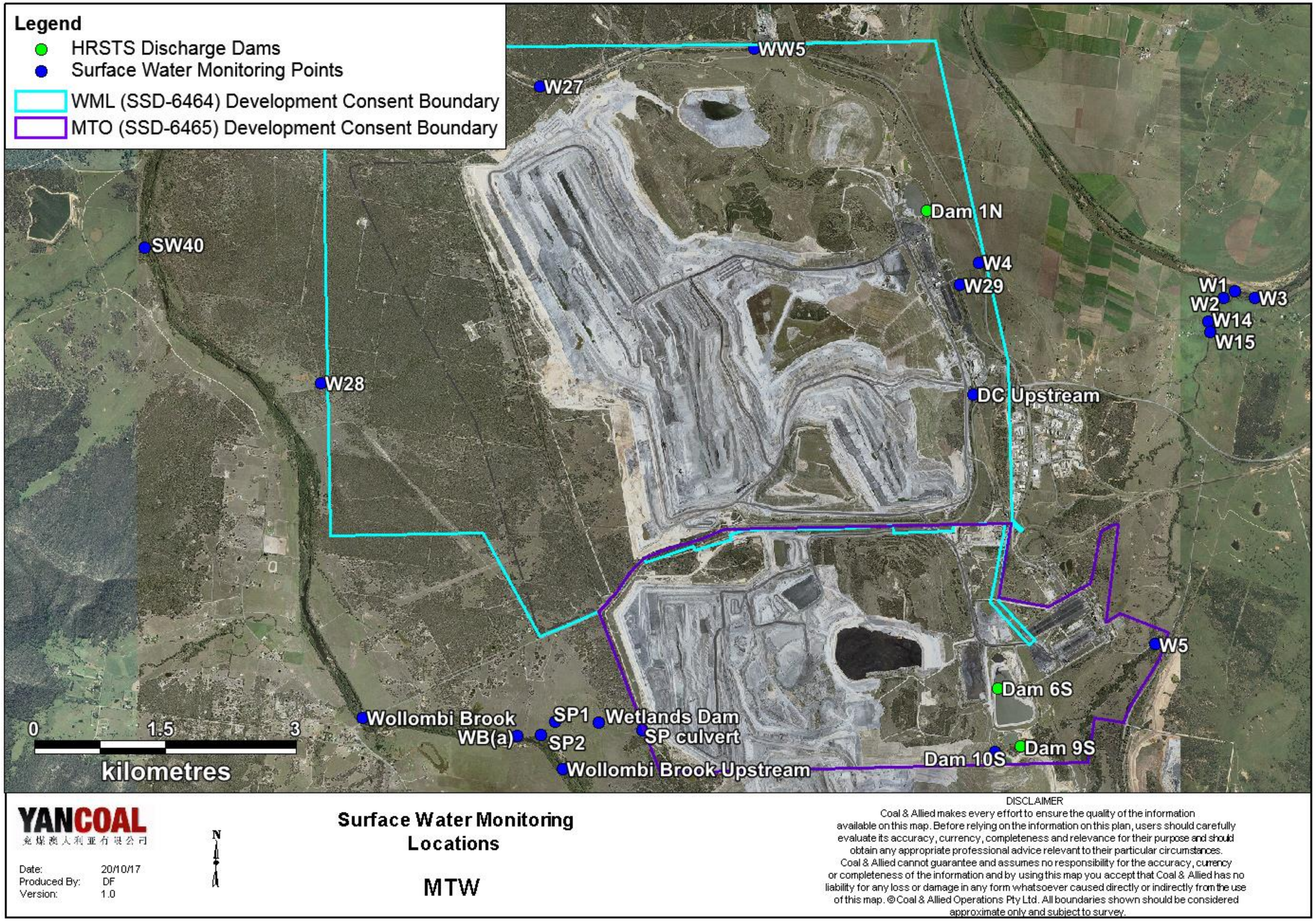


Figure 15: Surface Water Monitoring Location Plan

3.2 Groundwater Monitoring

Groundwater monitoring is undertaken on a quarterly basis in accordance with the MTW Groundwater Monitoring Programme.

Figure 16 to Figure 60 show the long term water quality trends (2015 – current) for groundwater bores monitored at MTW.

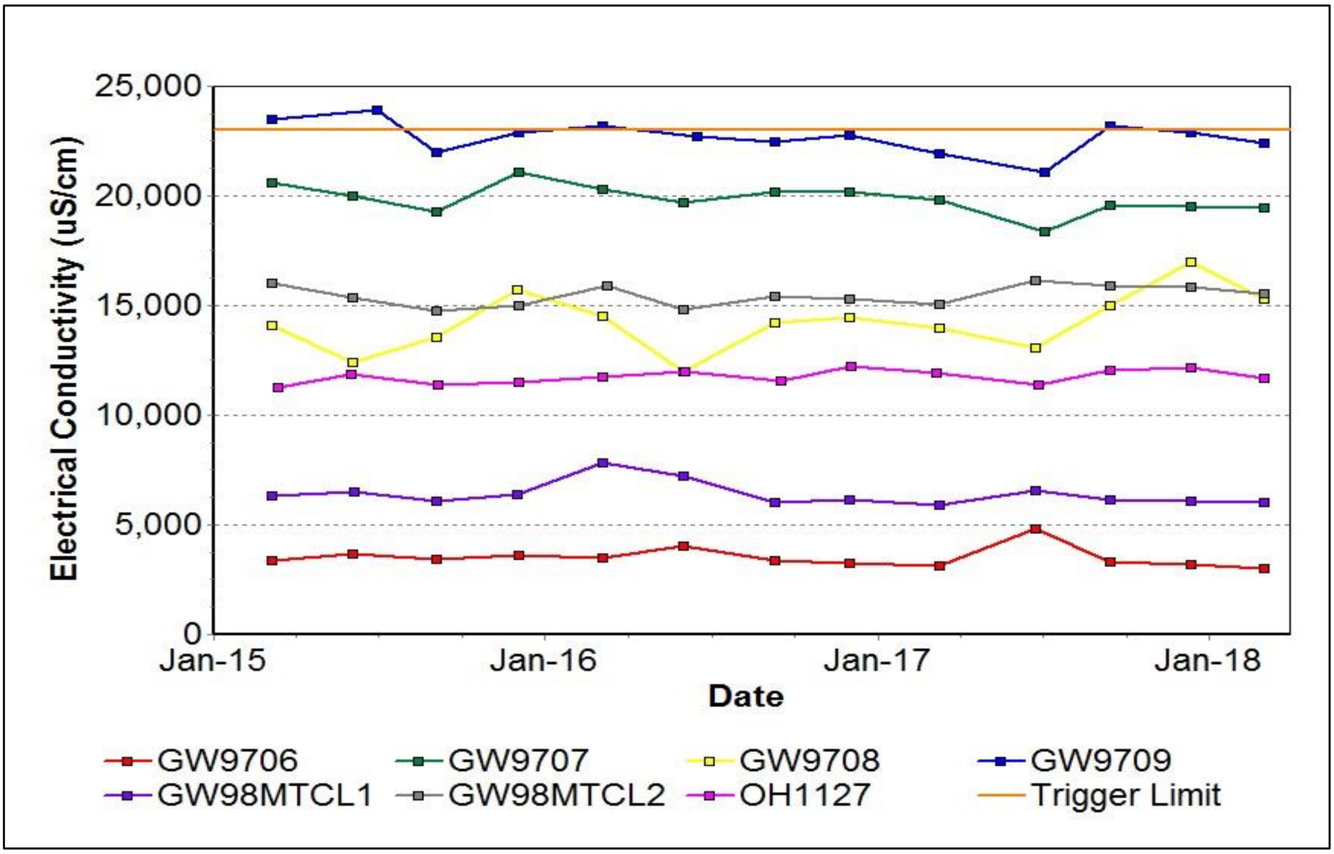


Figure 16: Bayswater Seam Electrical Conductivity Trend – March 2018

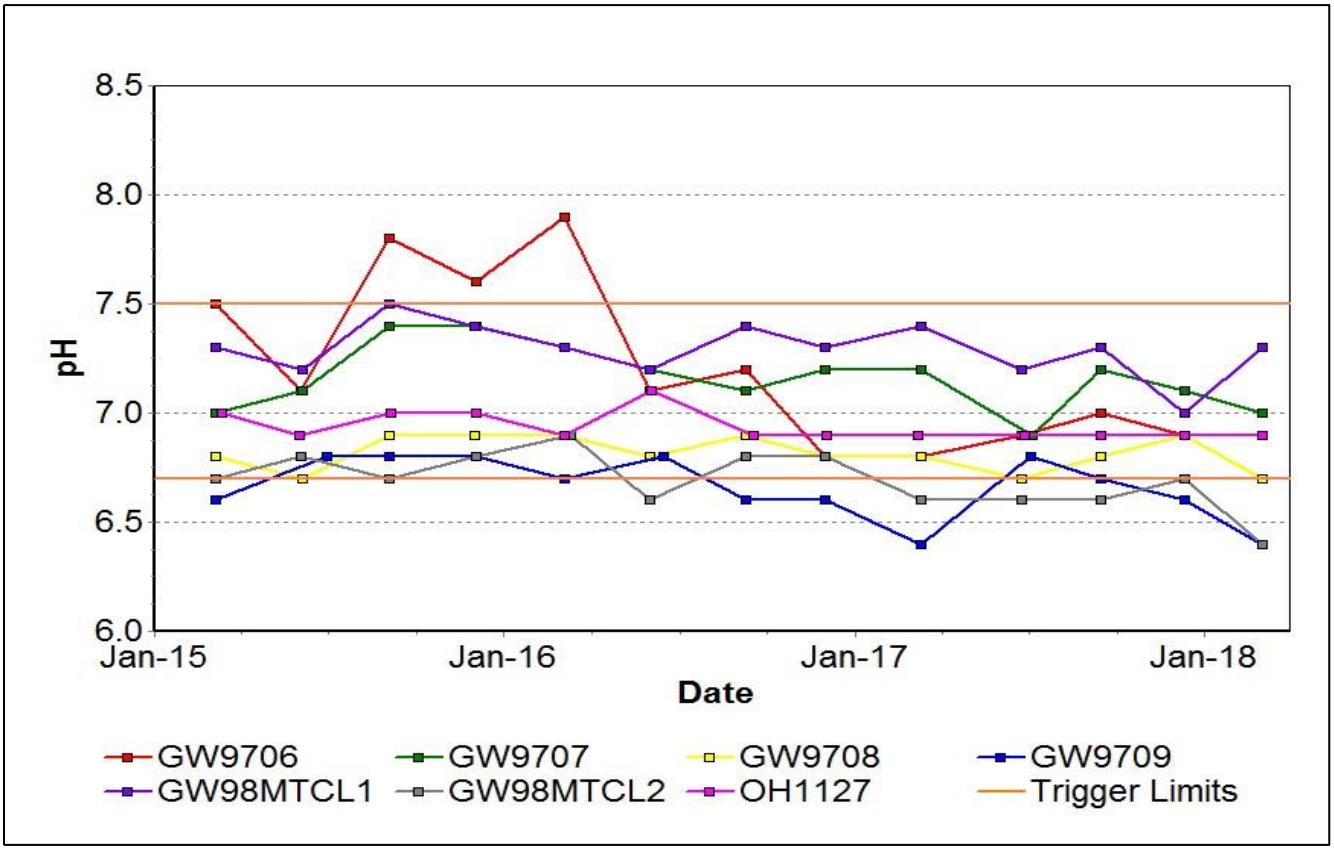


Figure 17: Bayswater Seam pH Trend – March 2018

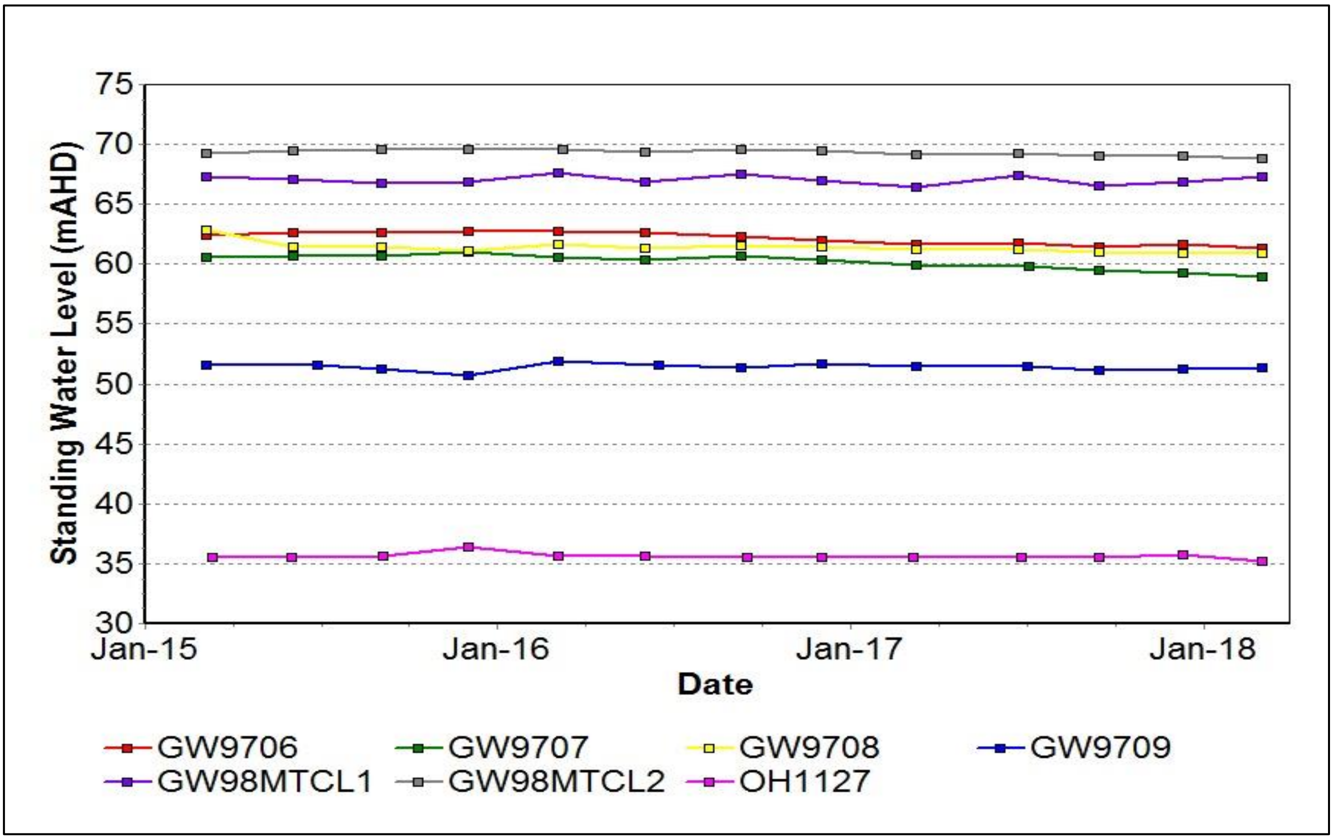


Figure 18: Bayswater Seam Standing Water Level Trend – March 2018

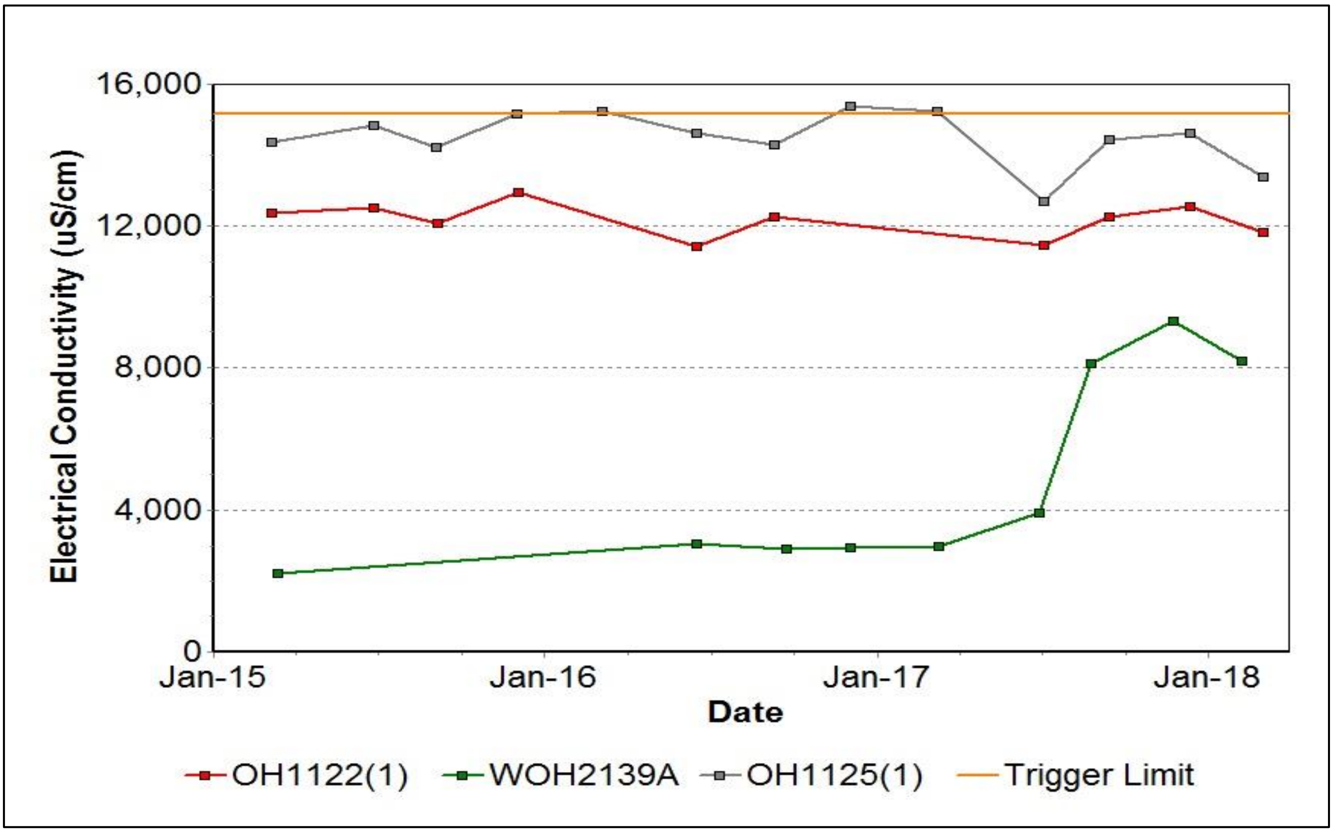


Figure 19: Blakefield Seam Electrical Conductivity Trend – March 2018

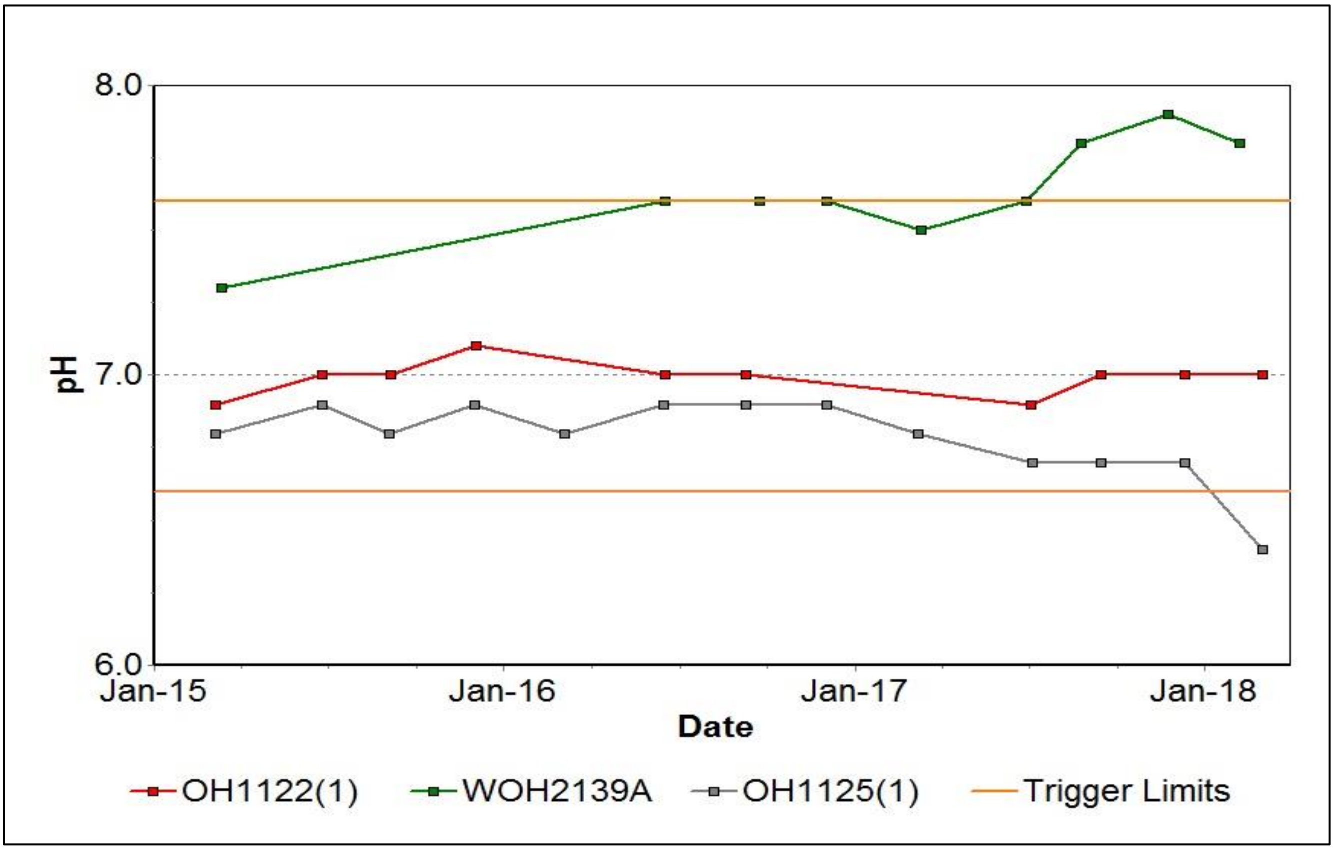


Figure 20: Blakefield Seam pH Trend – March 2018

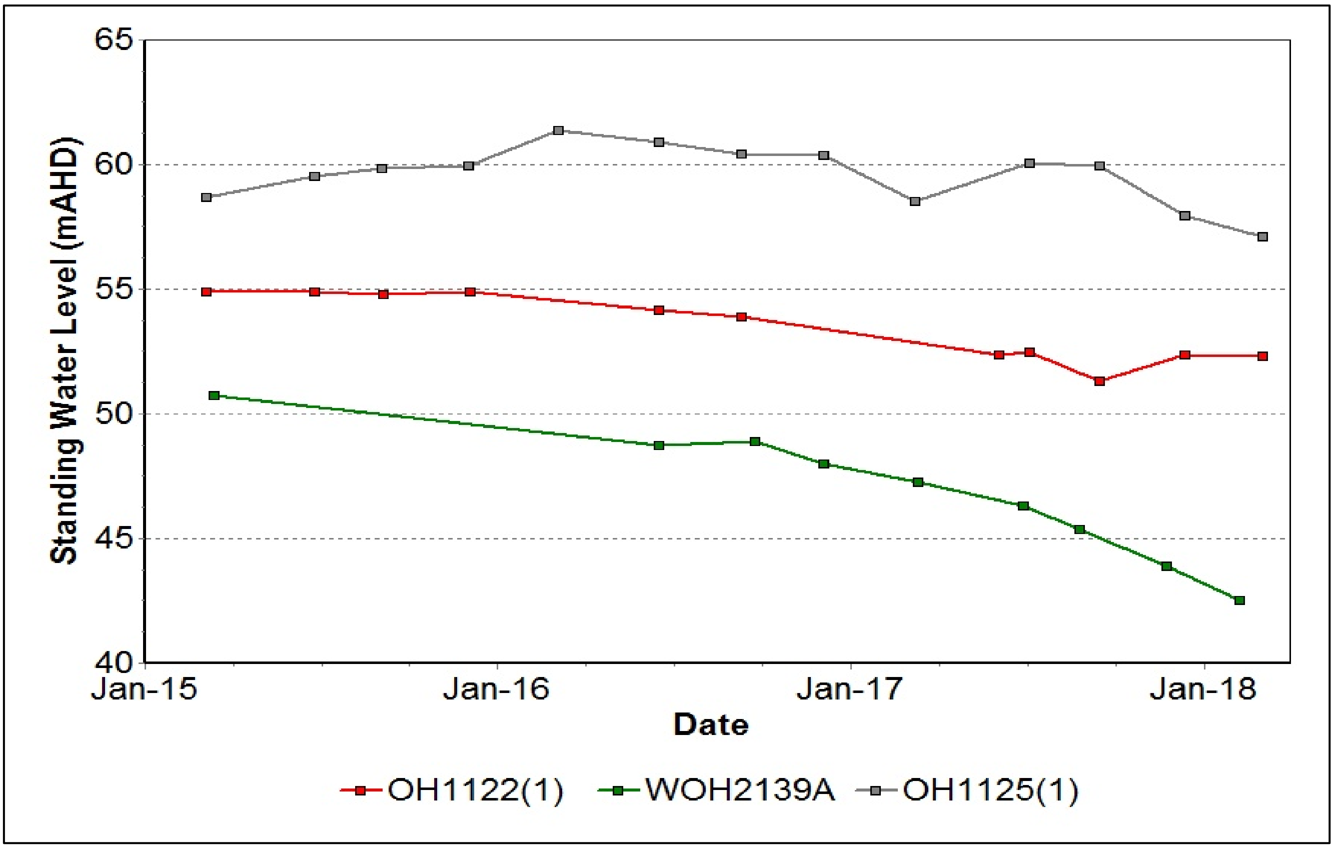


Figure 21: Blakefield Seam Standing Water Level Trend – March 2018

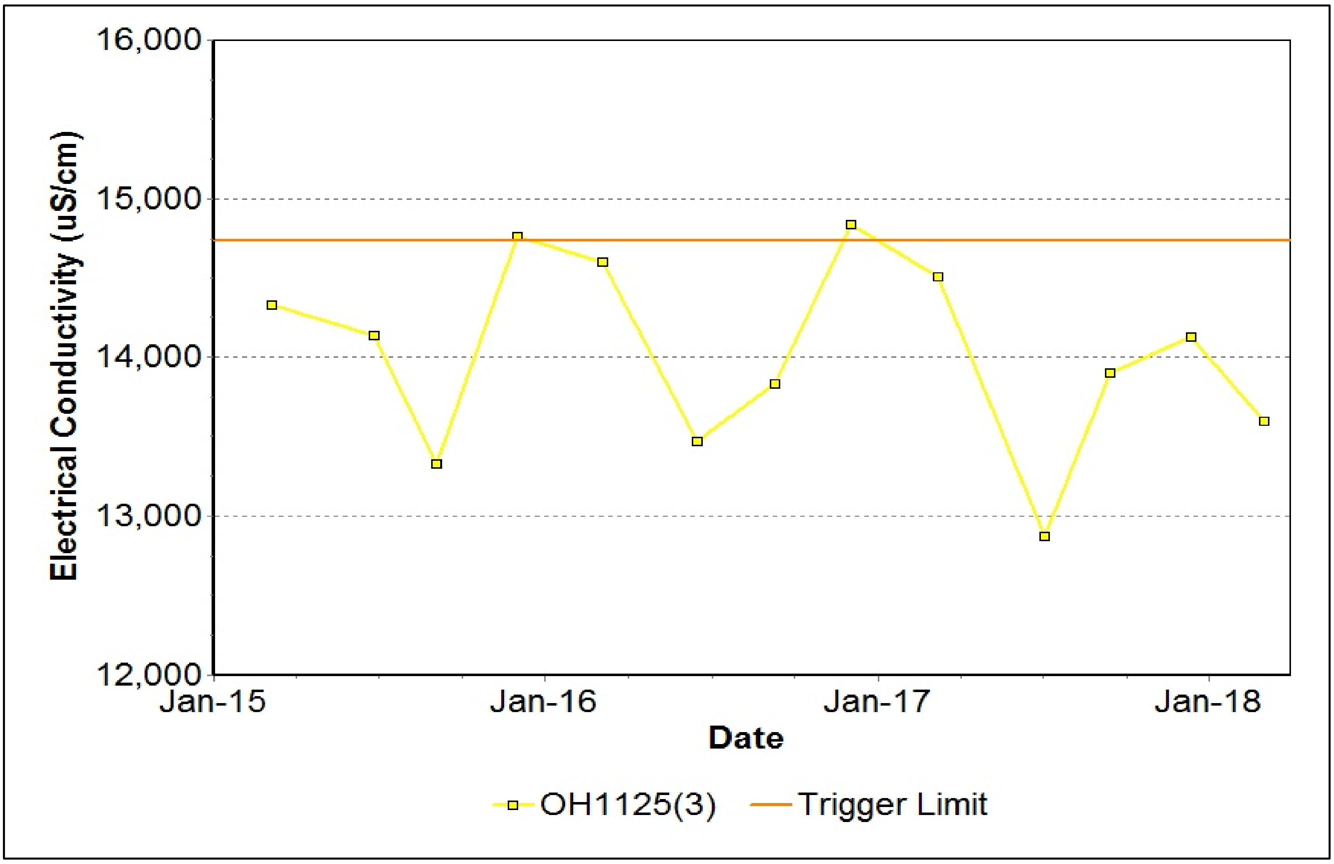


Figure 22: Bowfield Seam Electrical Conductivity Trend – March 2018

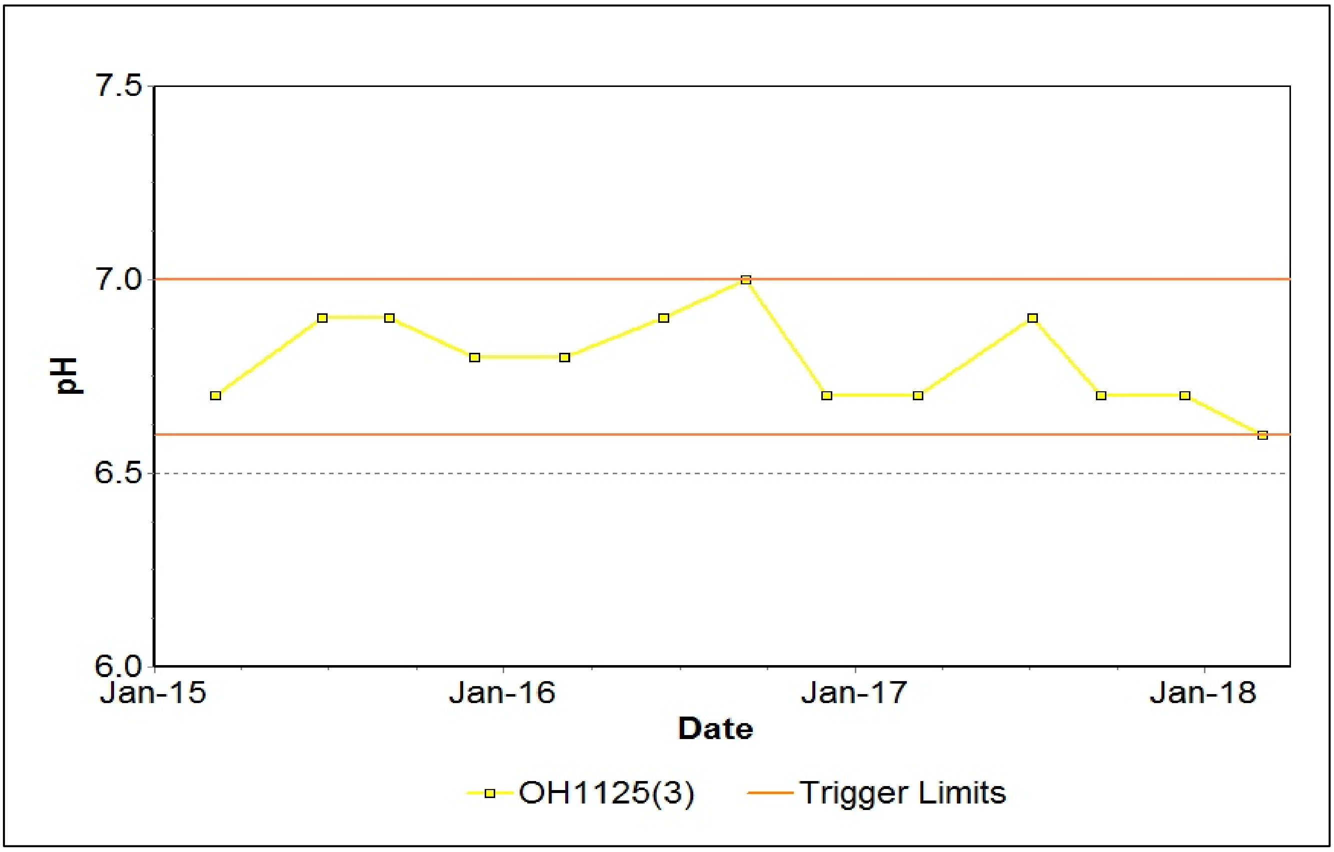


Figure 23: Bowfield Seam pH Trend – March 2018

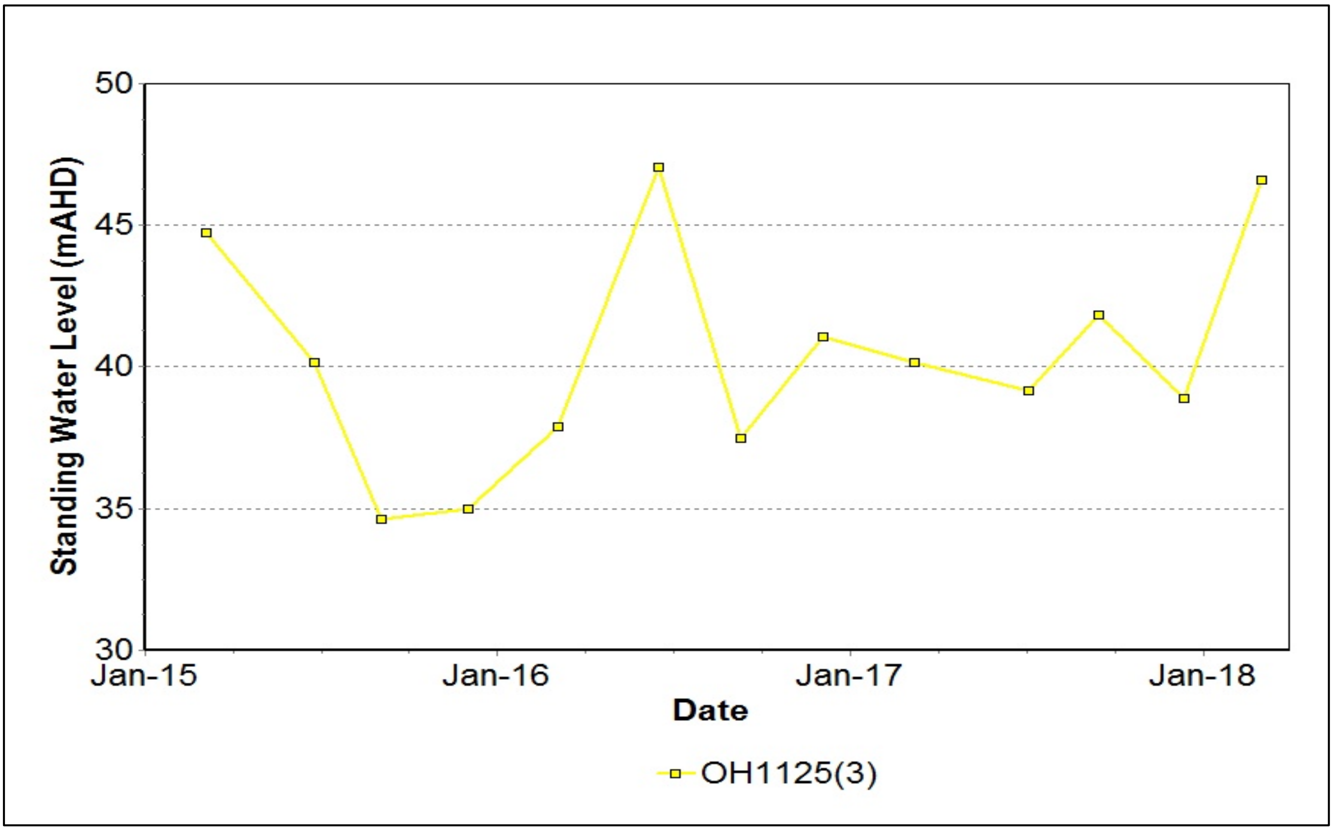


Figure 24: Bowfield Seam Standing Water Level Trend – March 2018

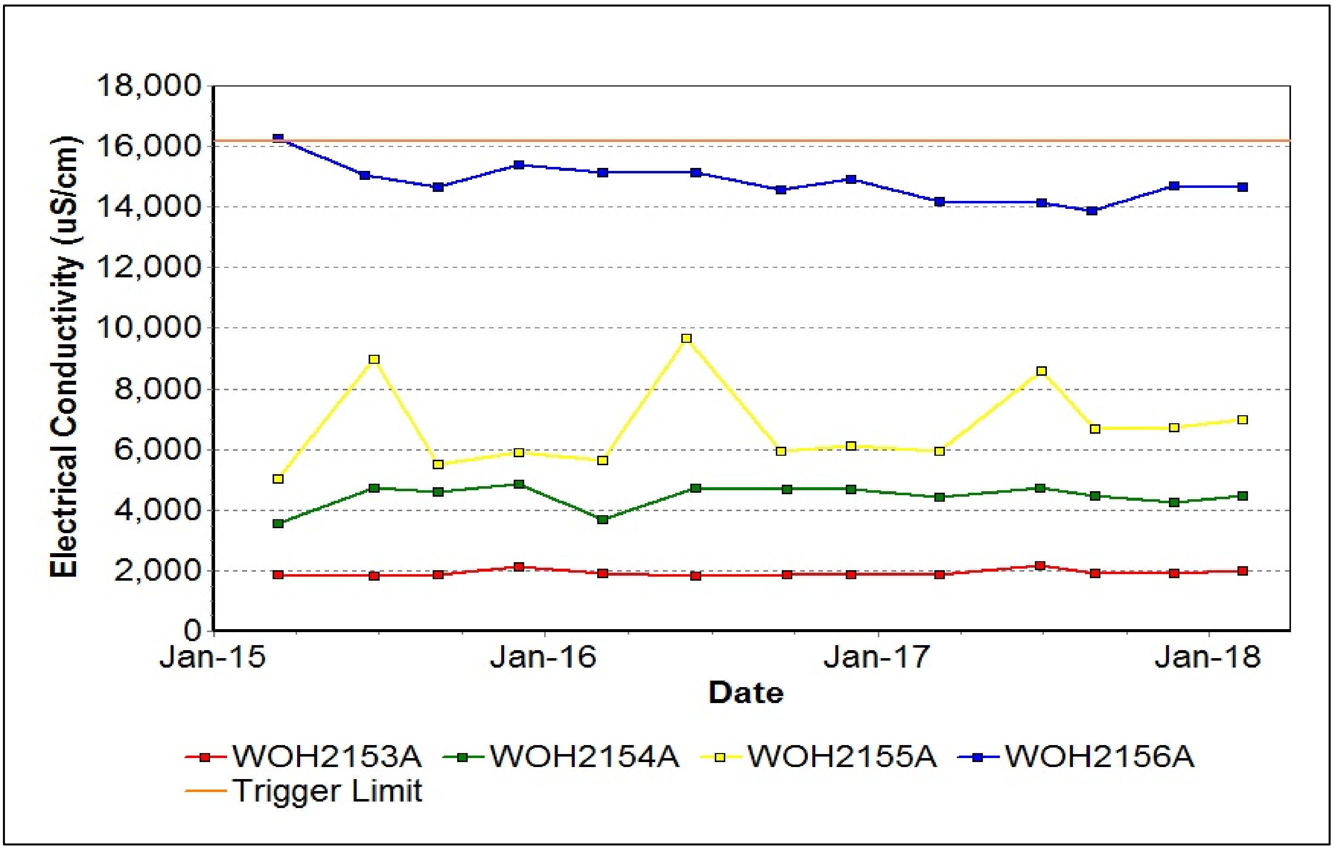


Figure 25: Redbank Seam Electrical Conductivity Trend – March 2018

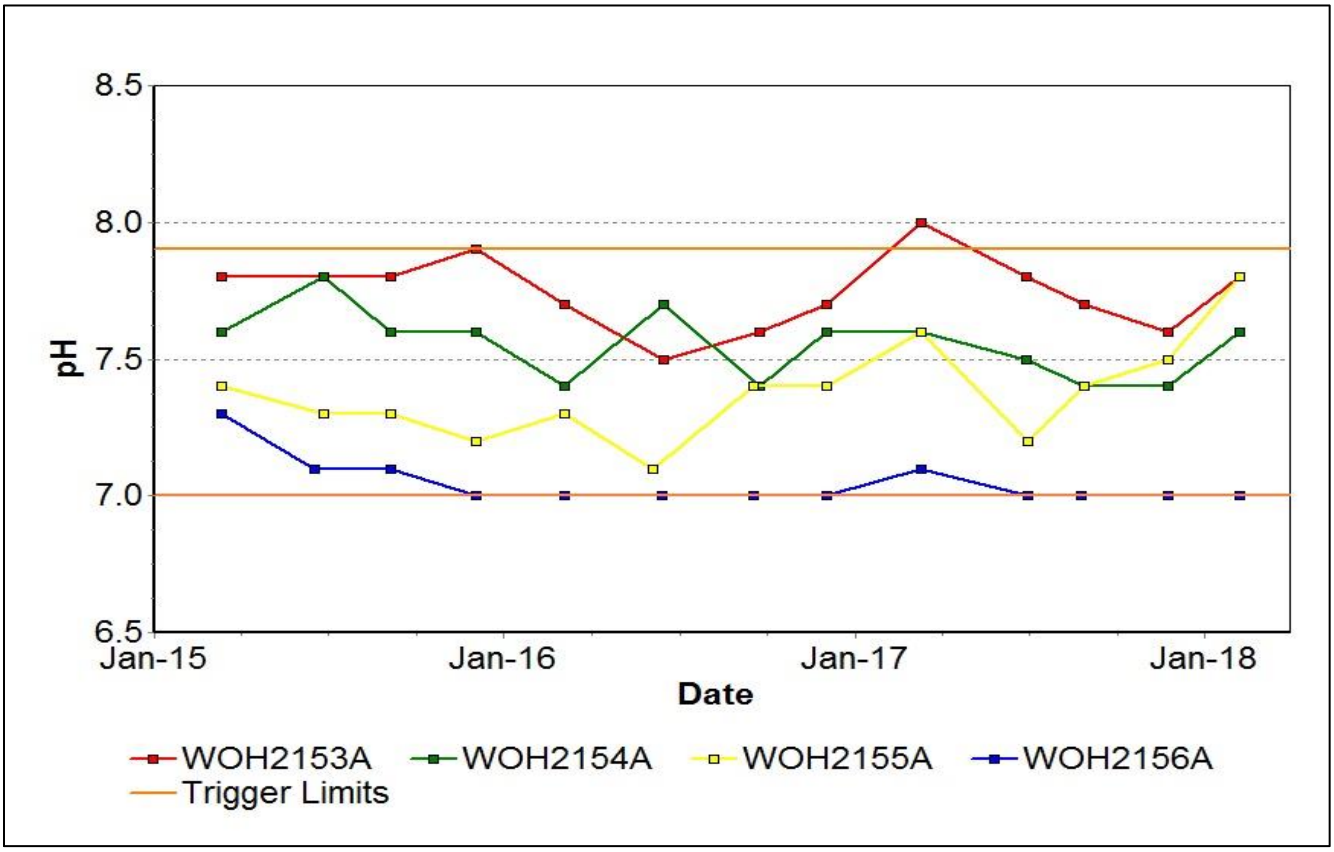


Figure 26: Redbank Seam pH Trend – March 2018

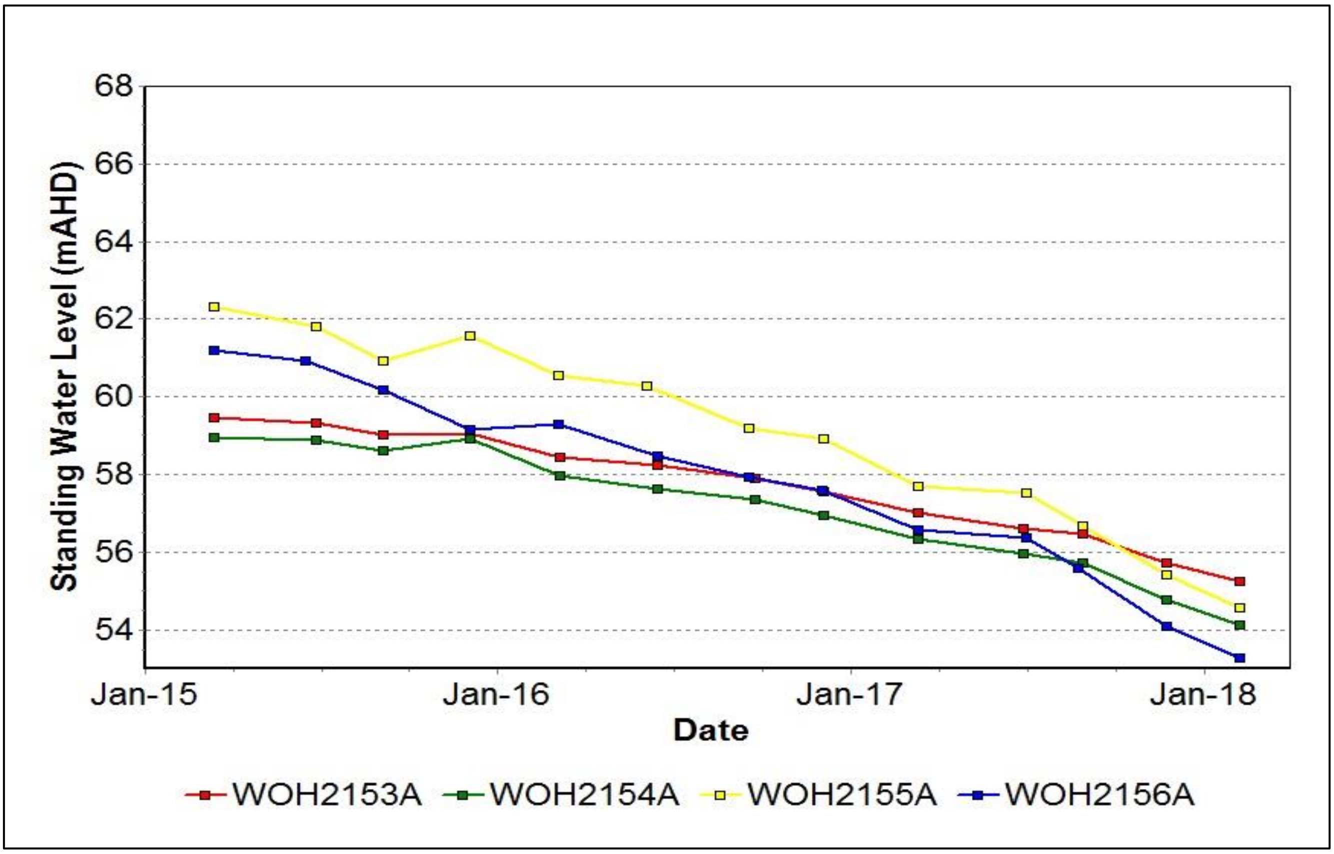


Figure 27: Redbank Seam Standing Water Level Trend – March 2018

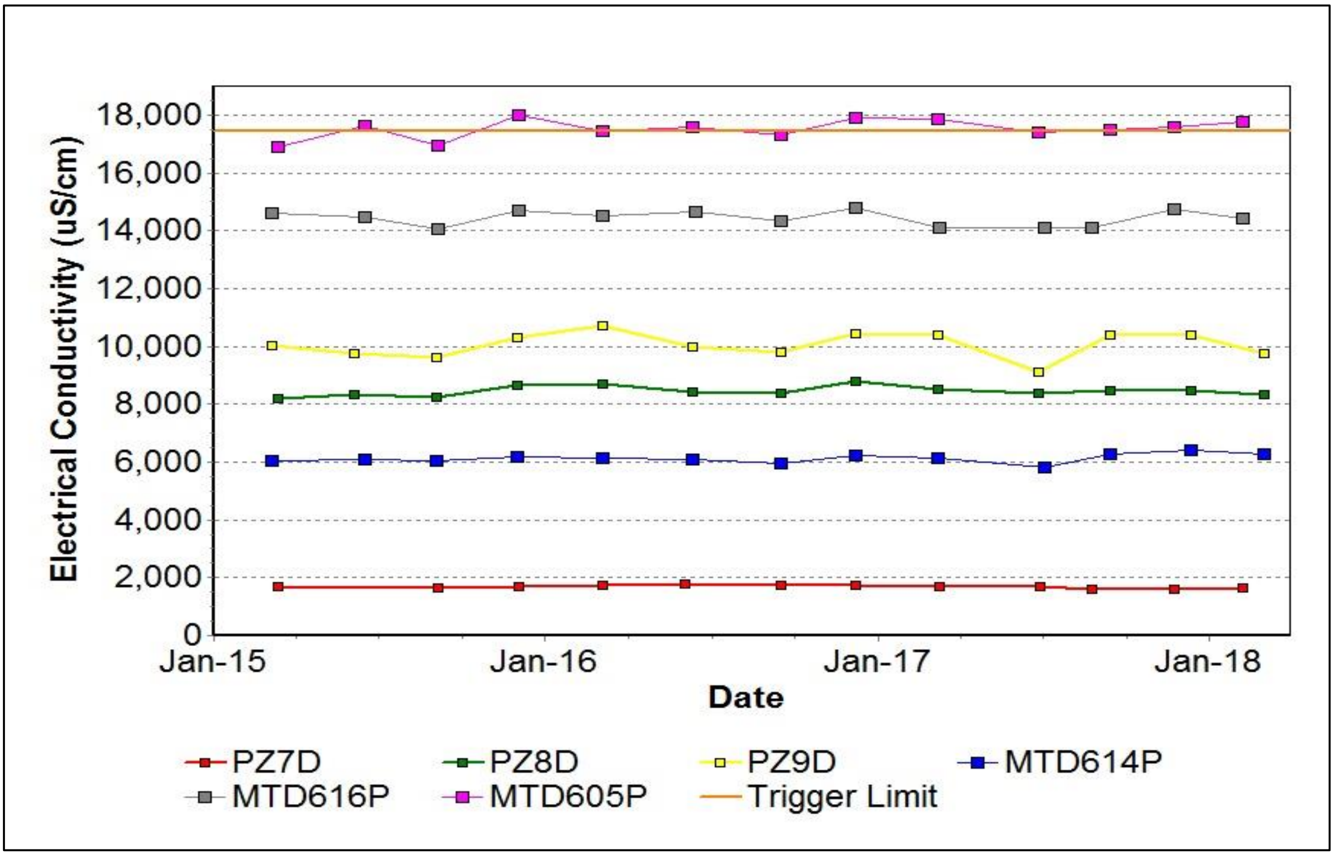


Figure 28: Shallow Overburden Seam Electrical Conductivity Trend – March 2018

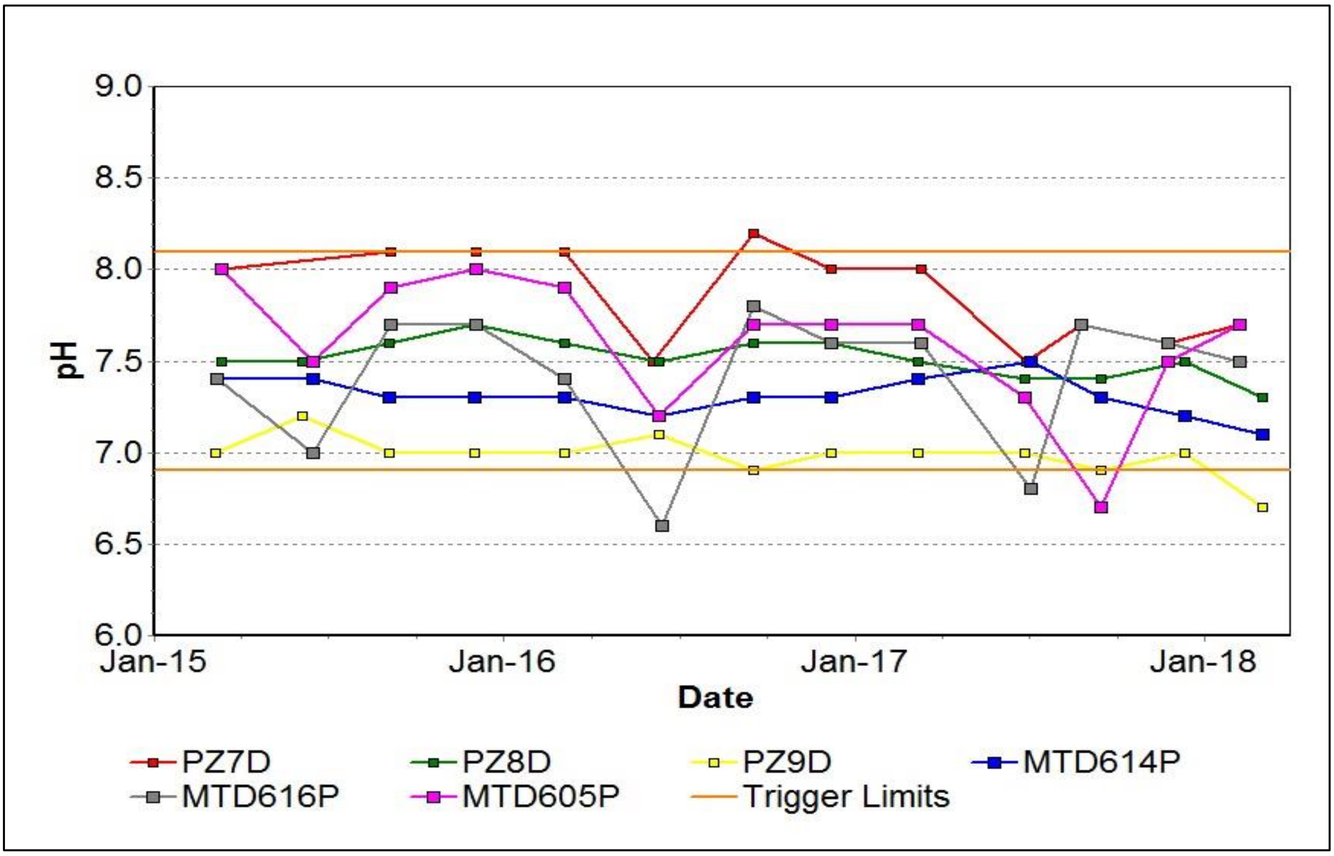


Figure 29: Shallow Overburden Seam pH Trend – March 2018

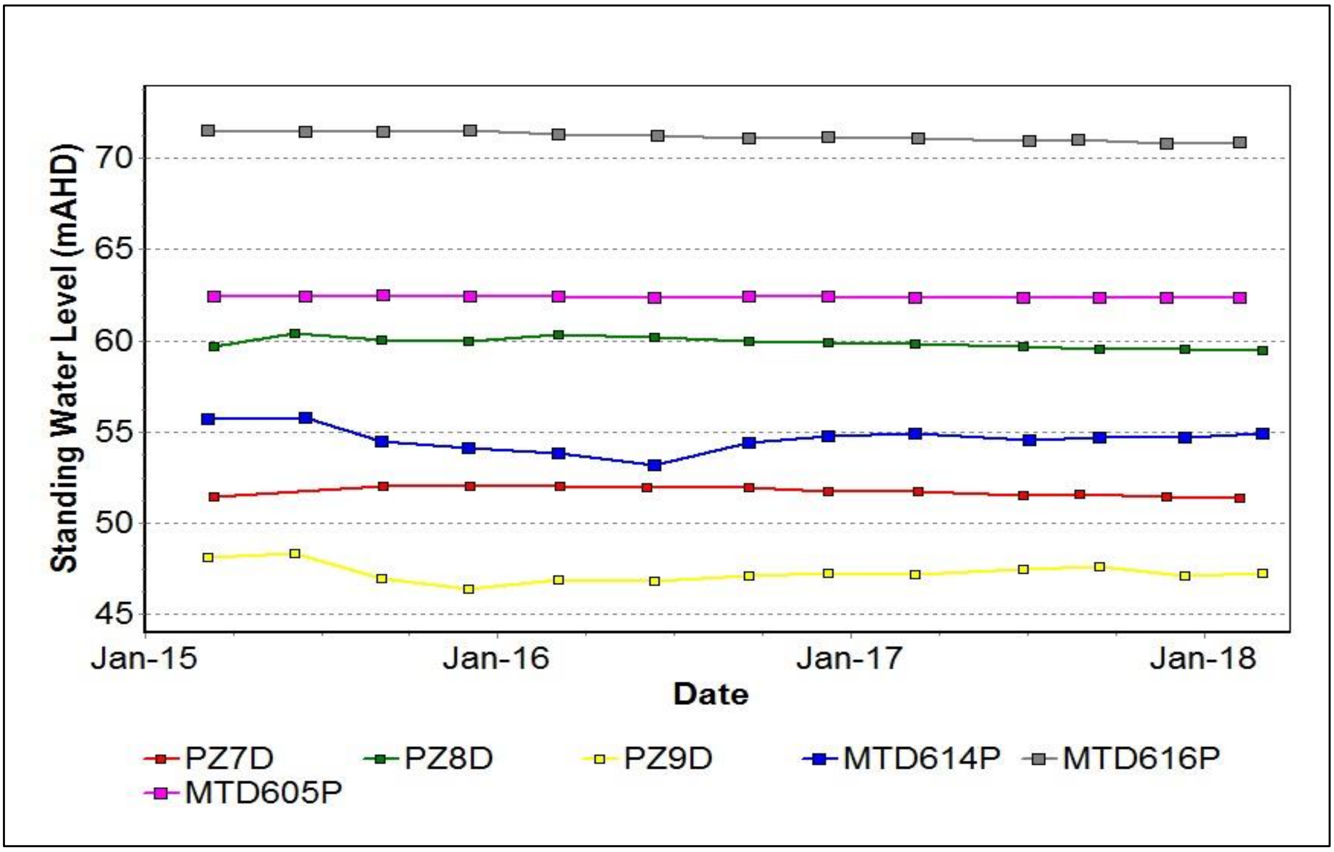


Figure 30: Shallow Overburden Seam Standing Water Level Trend – March 2018

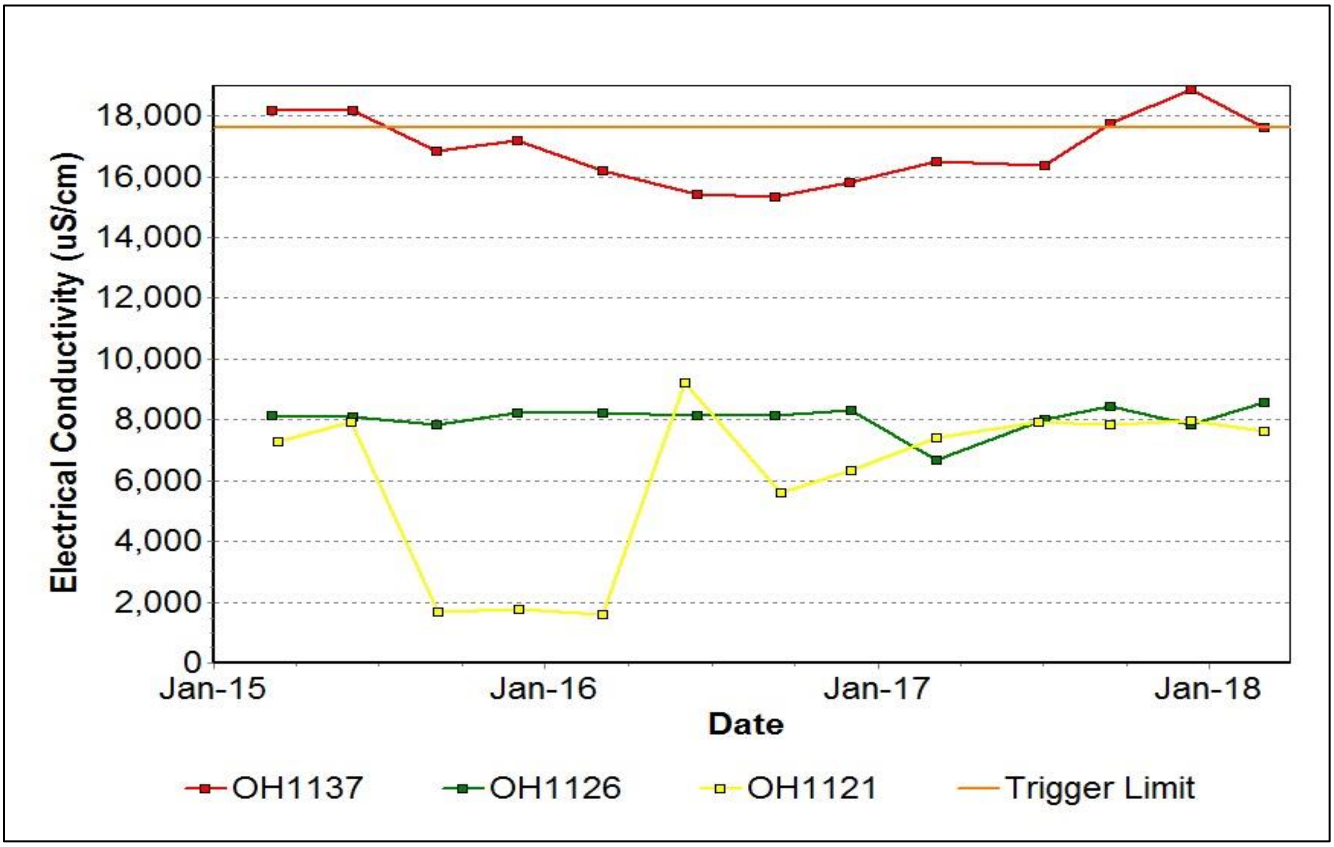


Figure 31: Vaux Seam Electrical Conductivity Trend – March 2018

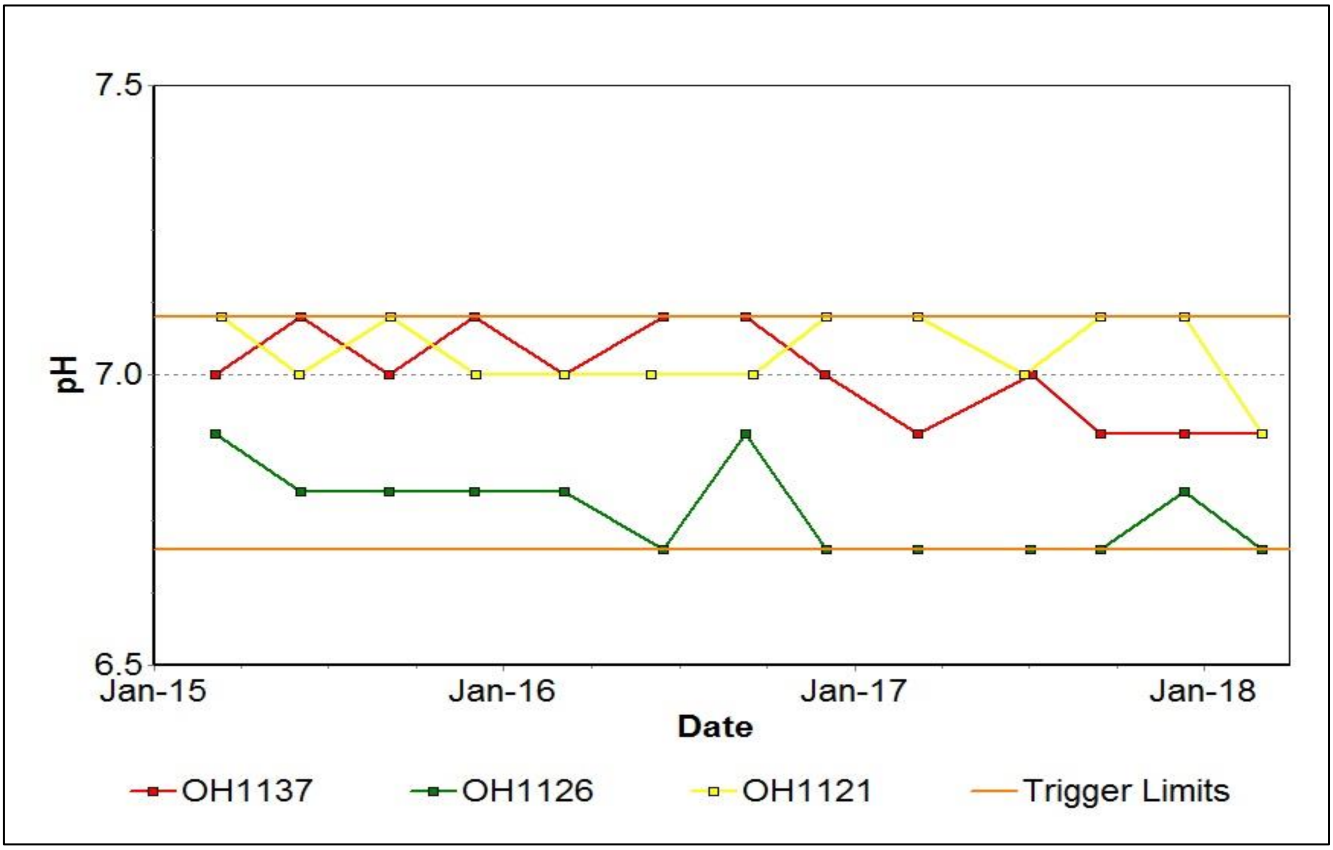


Figure 32: Vaux Seam pH Trend – March 2018

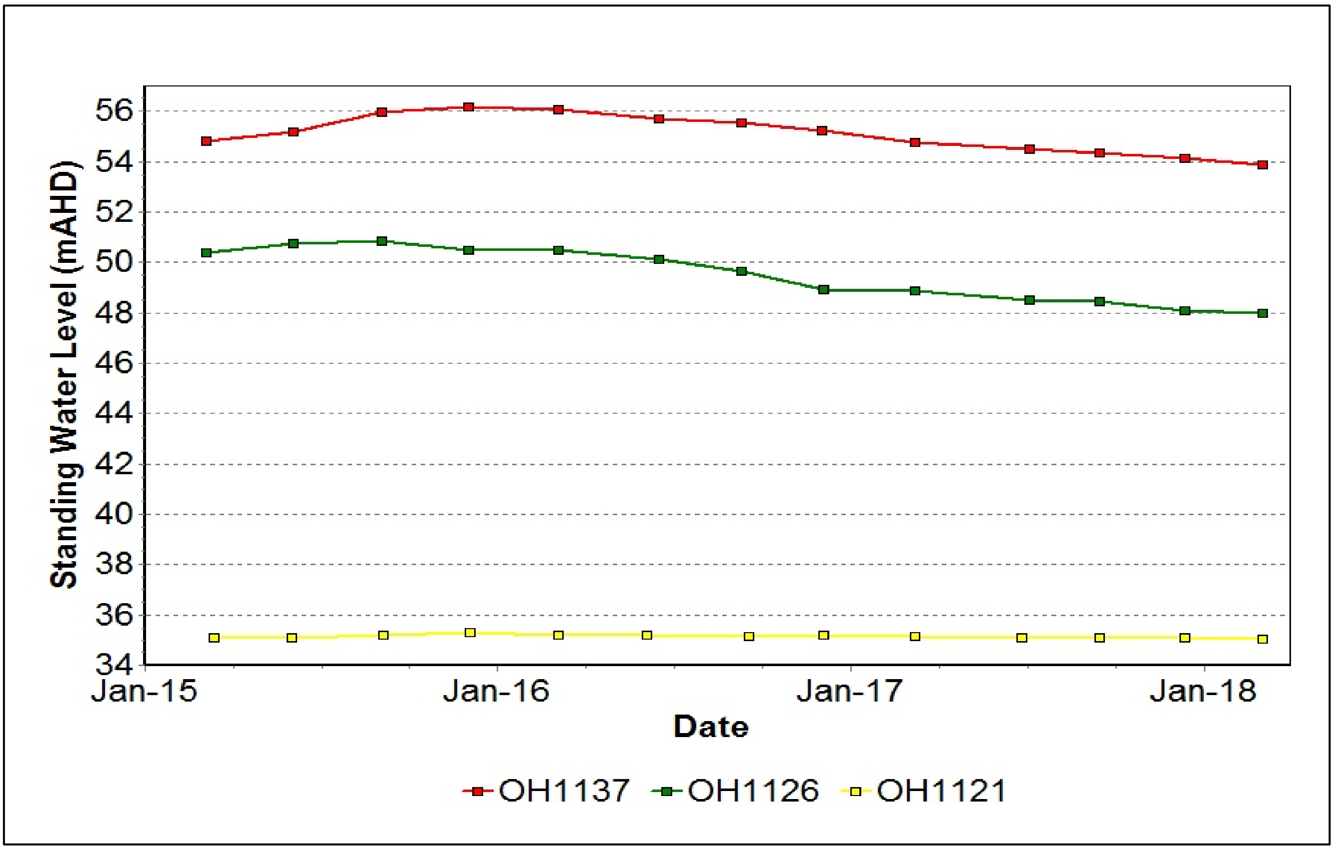


Figure 33: Vaux Seam Standing Water Level Trend – March 2018

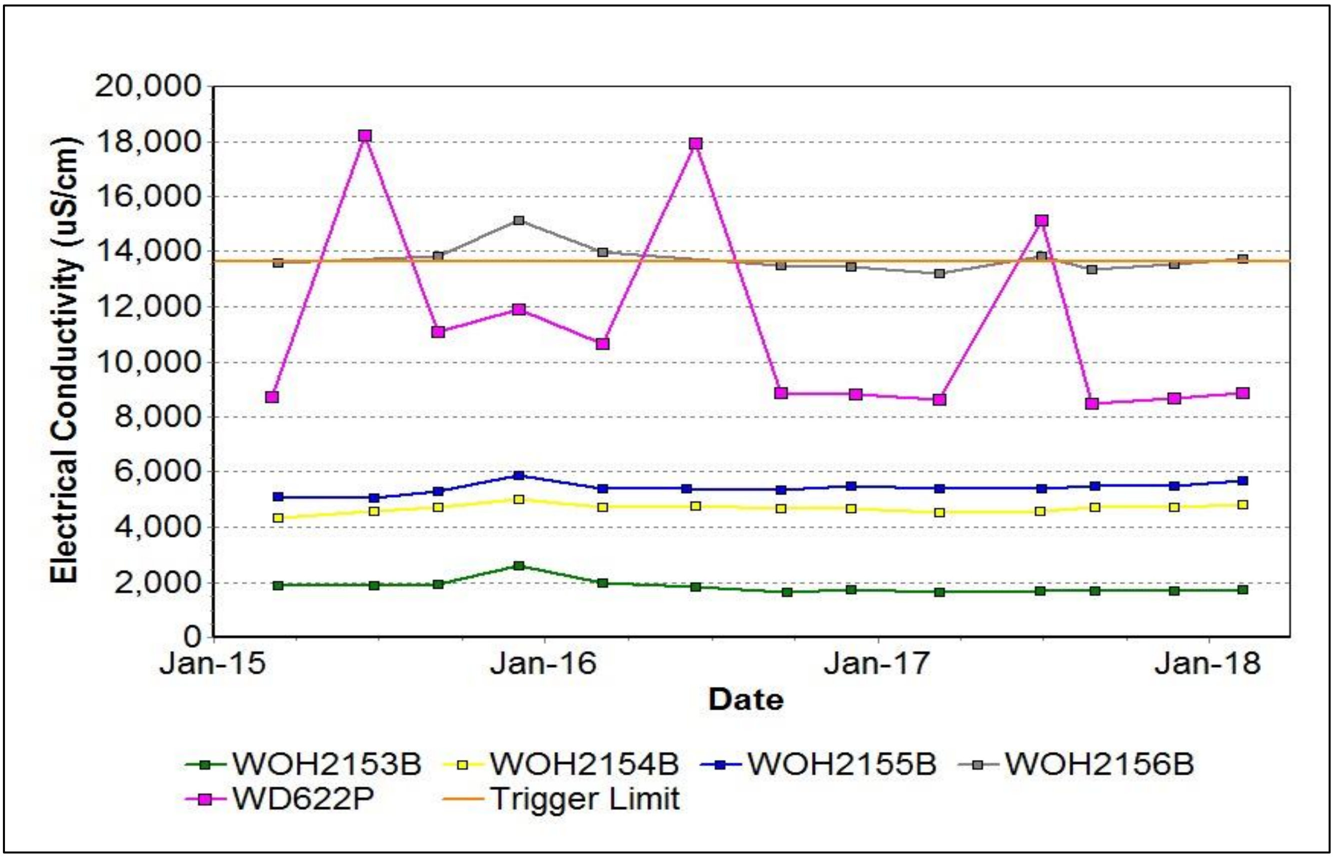


Figure 34: Wambo Seam Electrical Conductivity Trend – March 2018

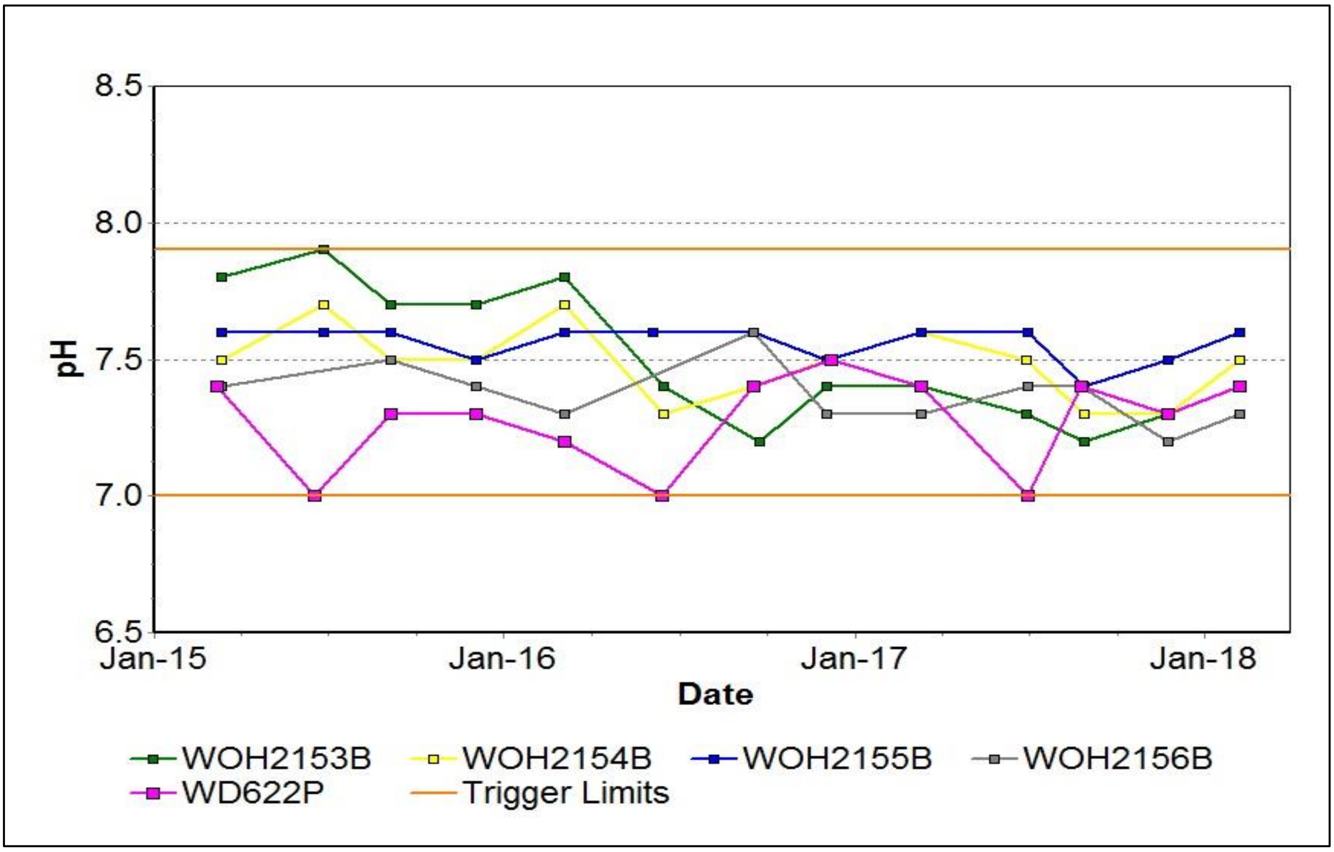


Figure 35: Wambo Seam pH Trend – March 2018

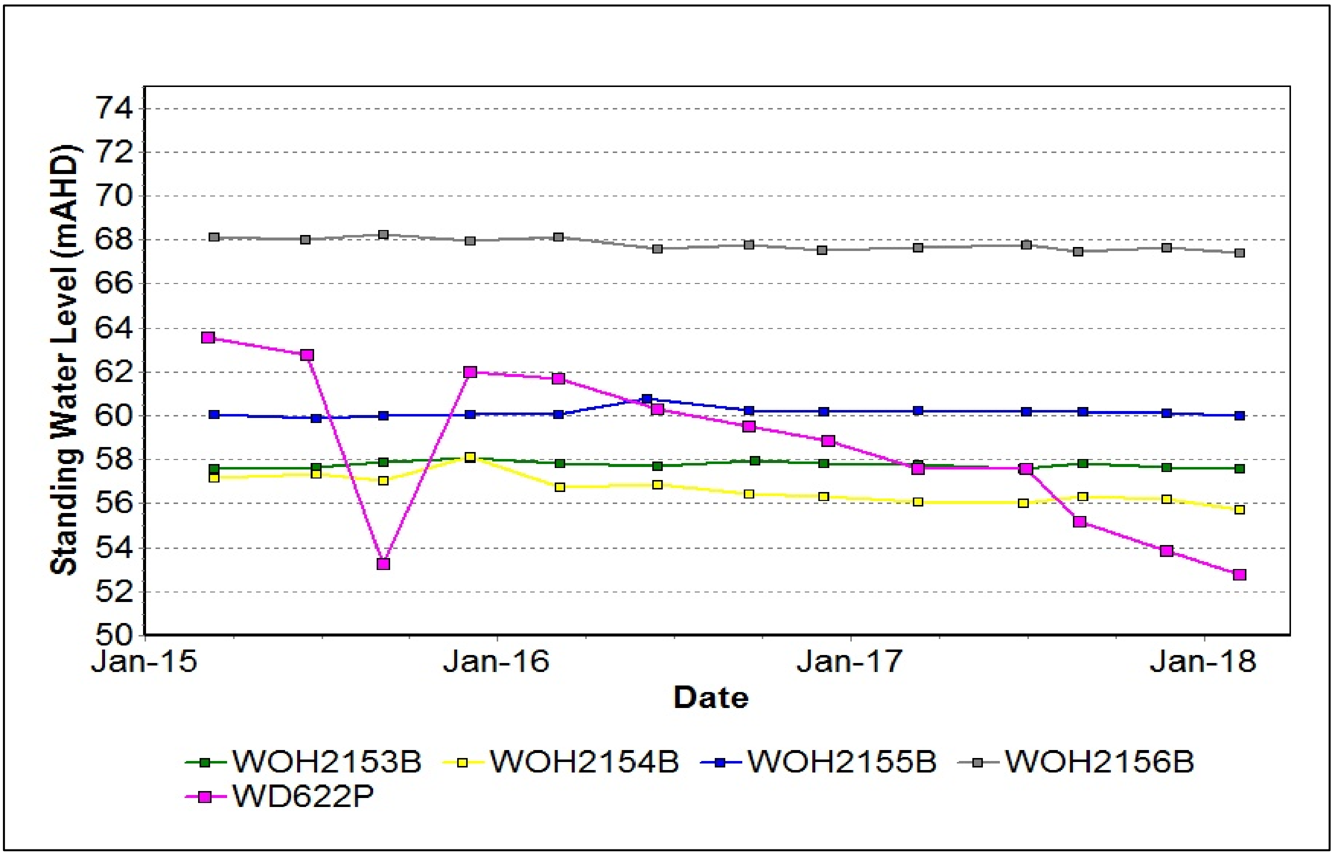


Figure 36: Wambo Seam Standing Water Level Trend – March 2018

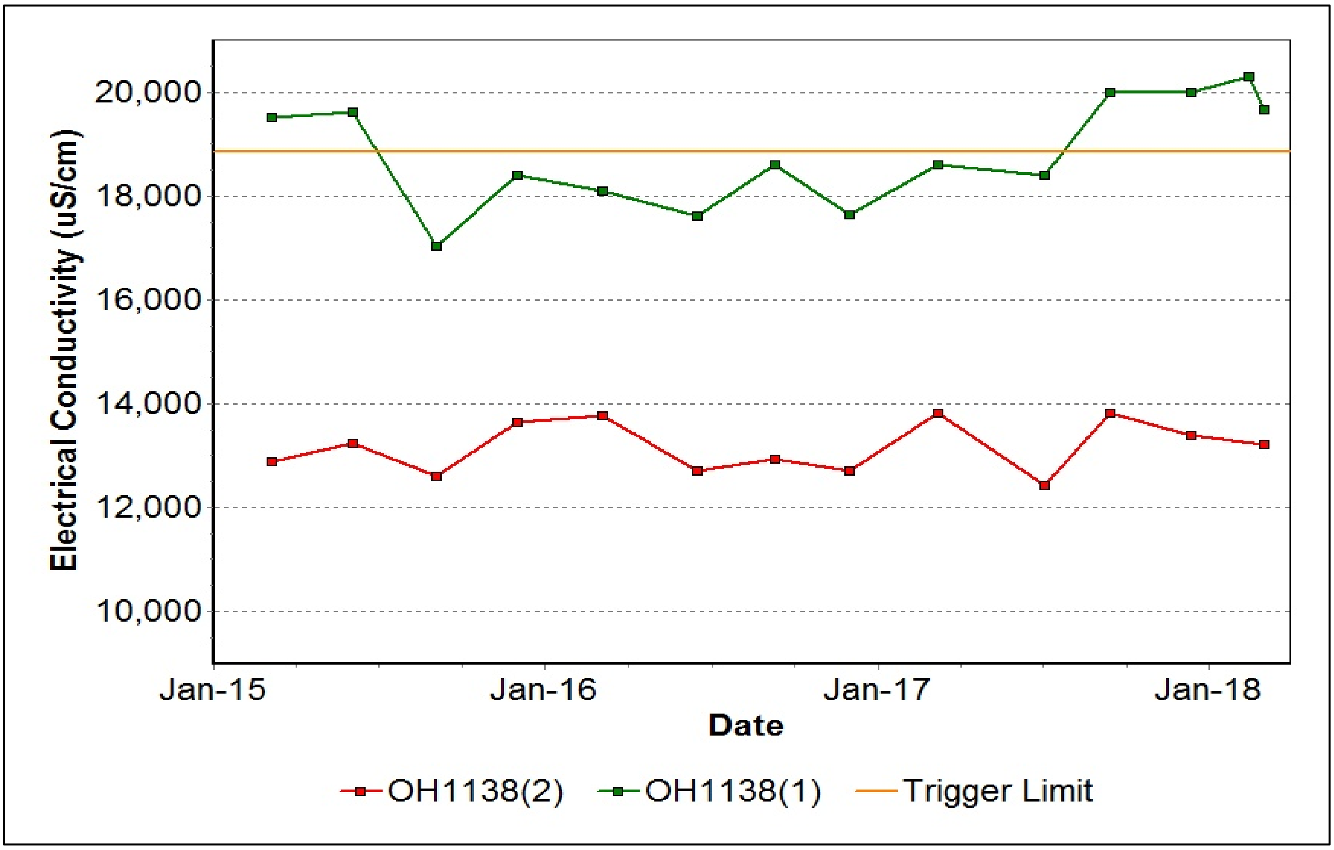


Figure 37: Warkworth Seam Electrical Conductivity Trend – March 2018

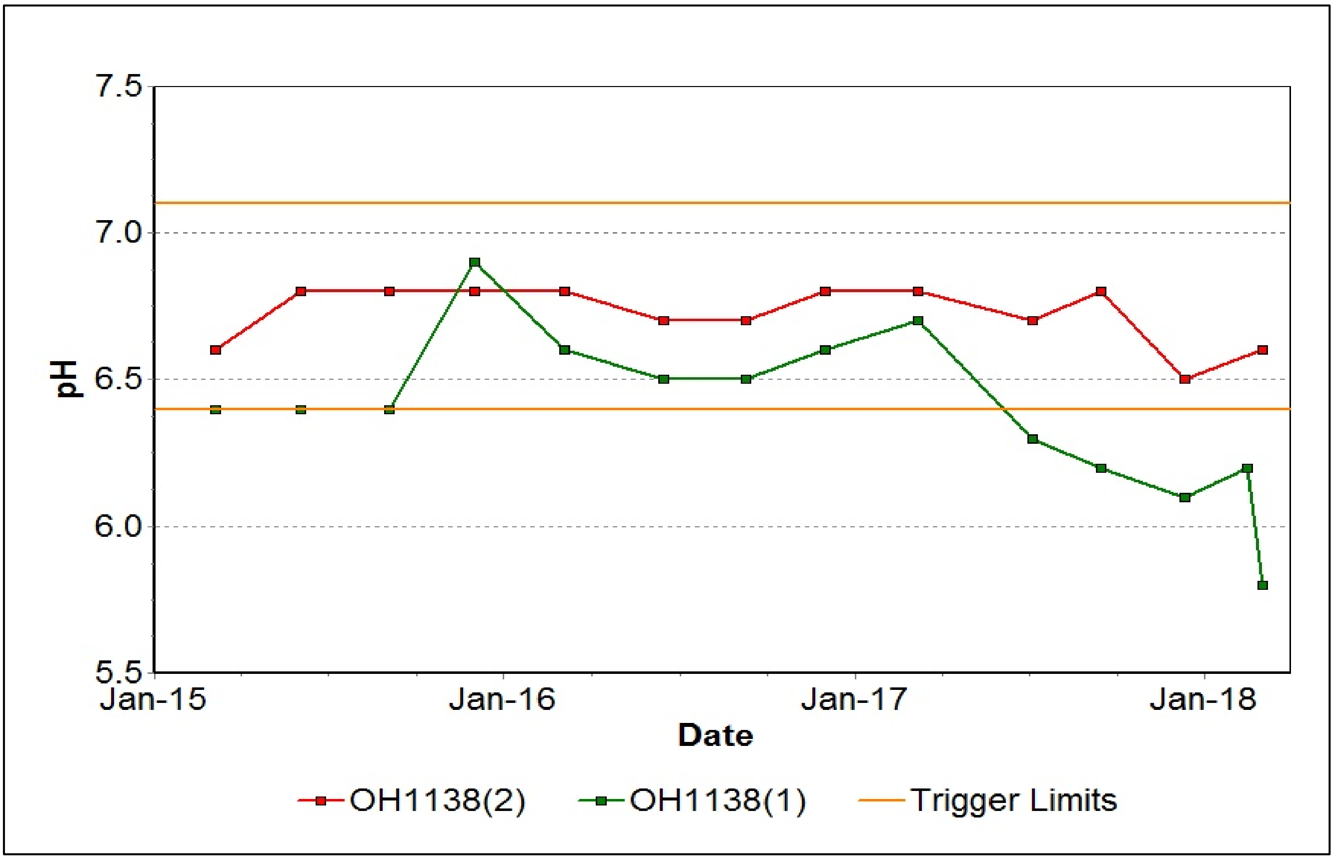


Figure 38: Warkworth Seam pH Trend –March 2018

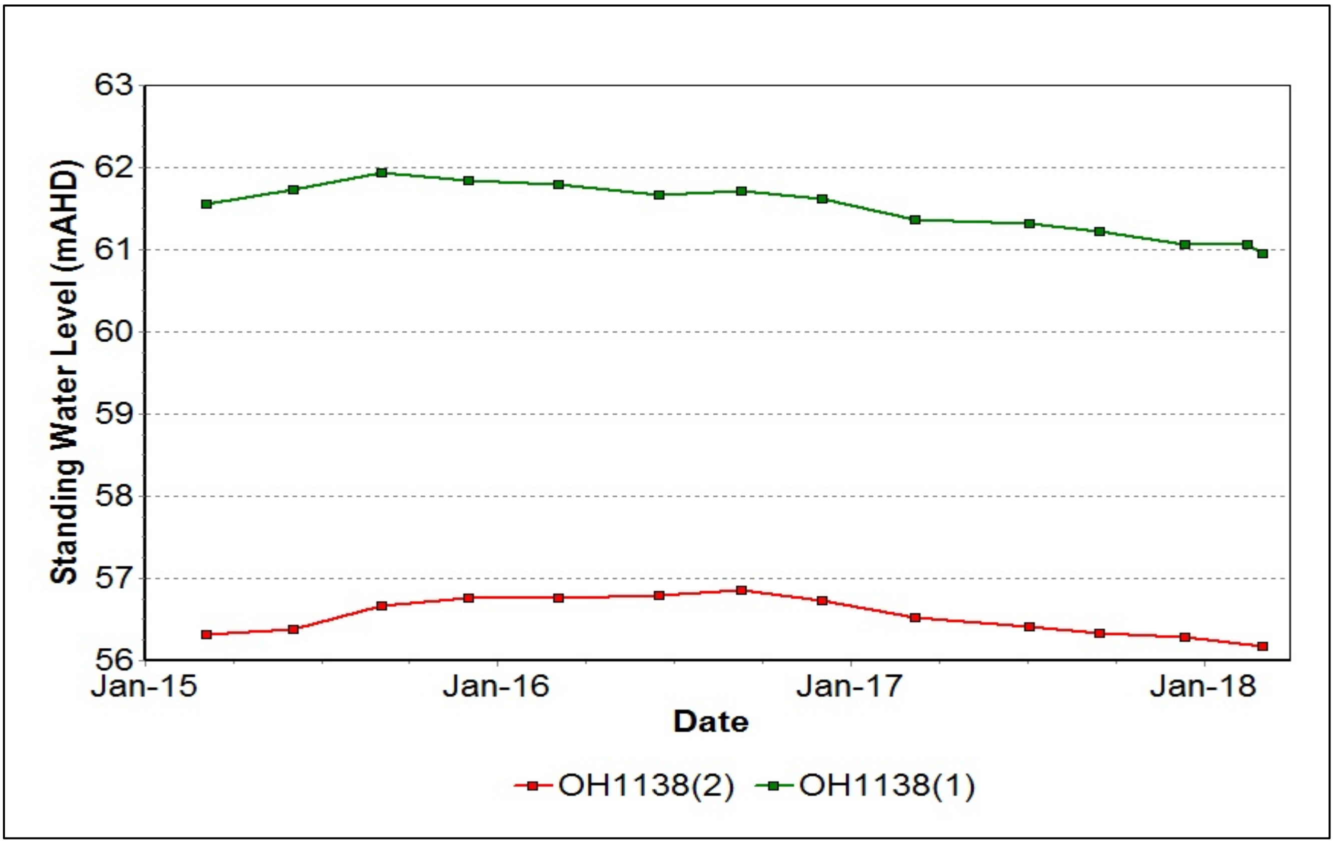


Figure 39: Warkworth Seam Standing Water Level Trend – March 2018

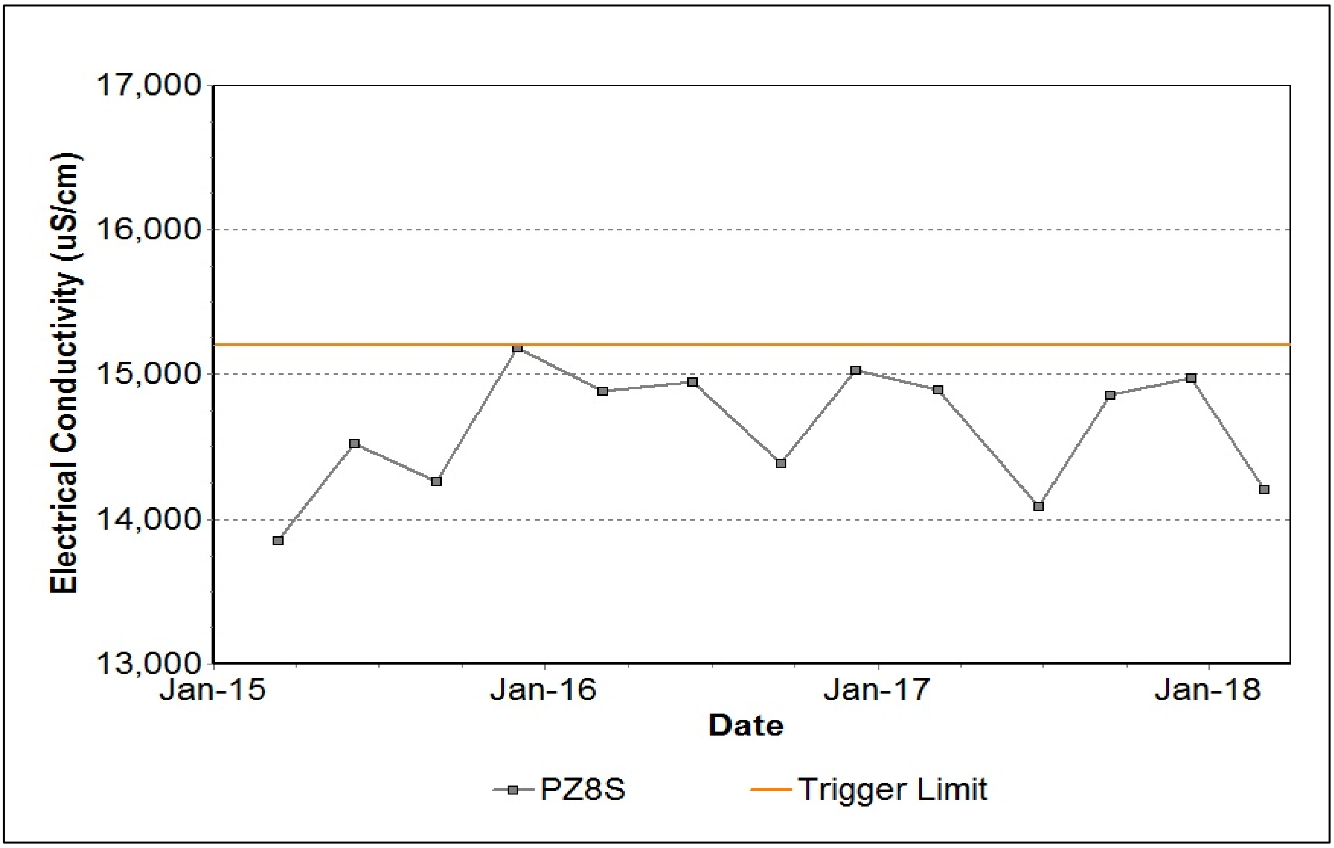


Figure 40: Wollombi Alluvium 1 Electrical Conductivity Trend – March 2018

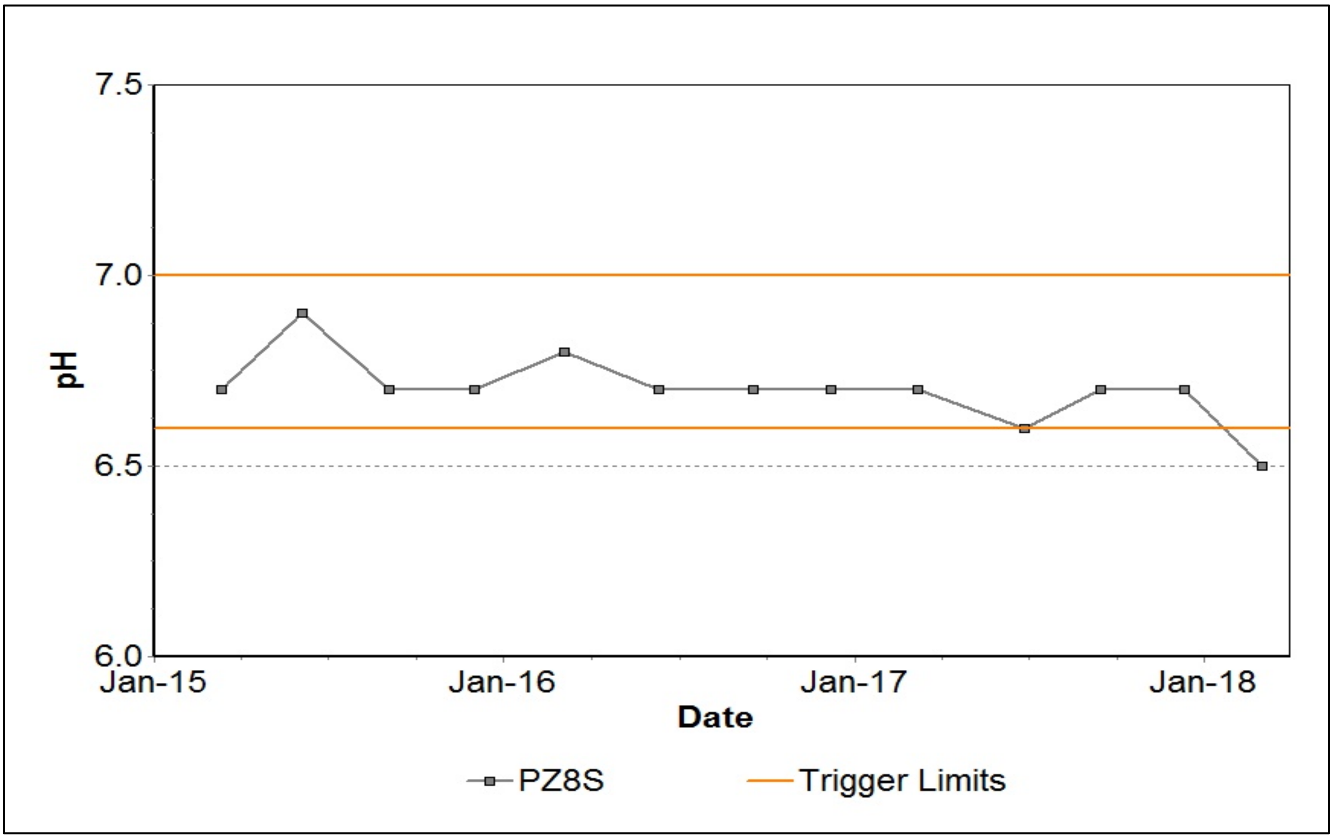


Figure 41: Wollombi Alluvium 1 pH Trend – March 2018

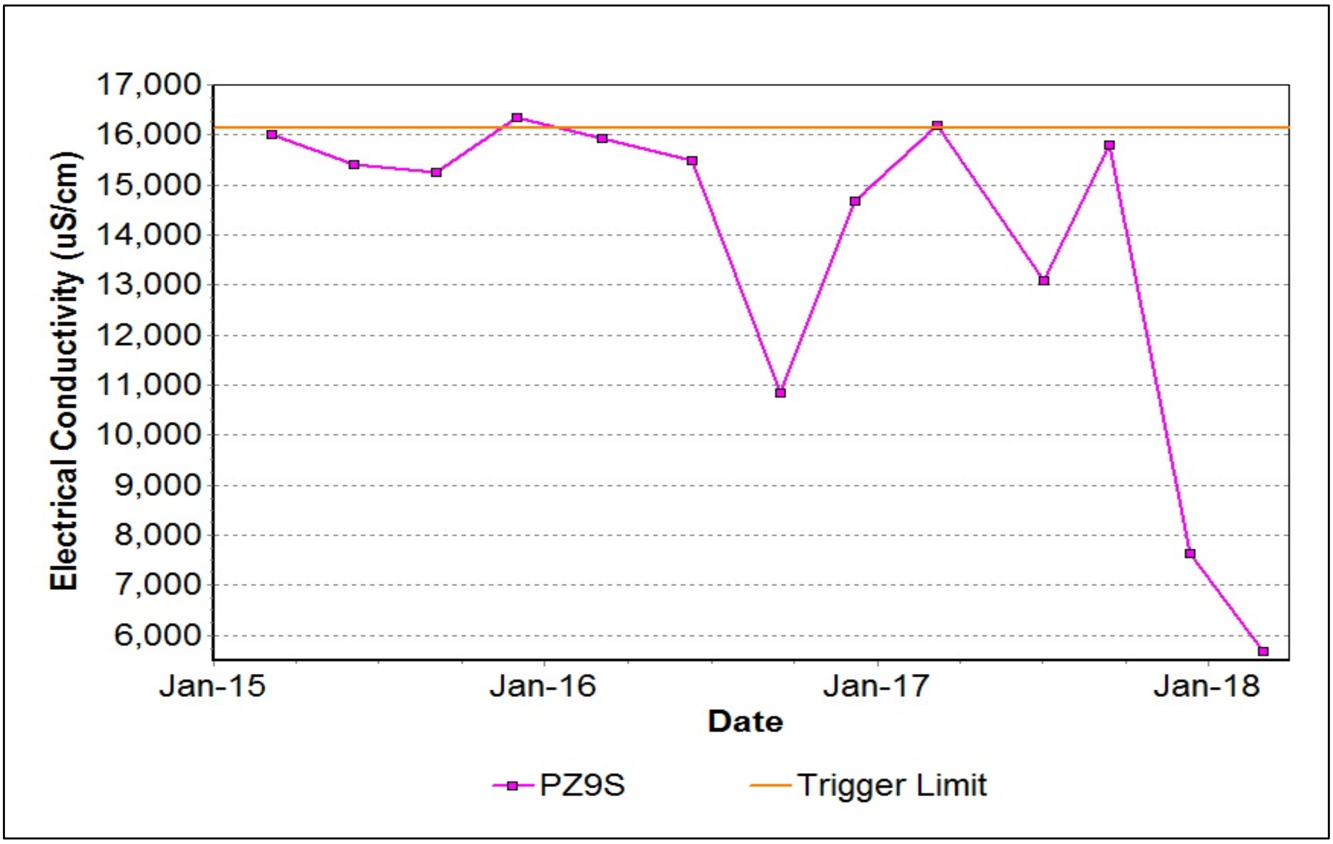


Figure 42: Wollombi Alluvium 2 Electrical Conductivity Trend – March 2018

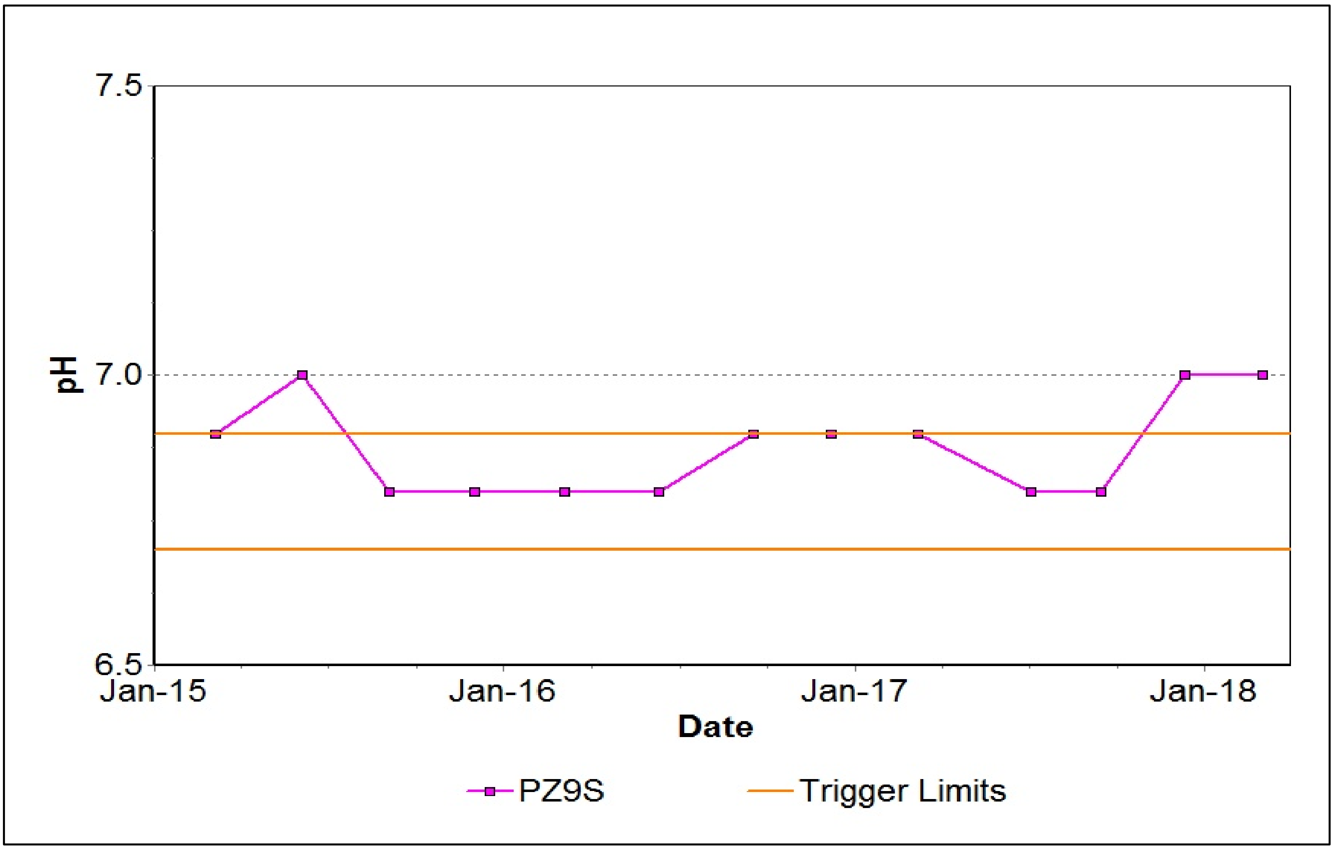


Figure 43: Wollombi Alluvium 2 pH Trend – March 2018

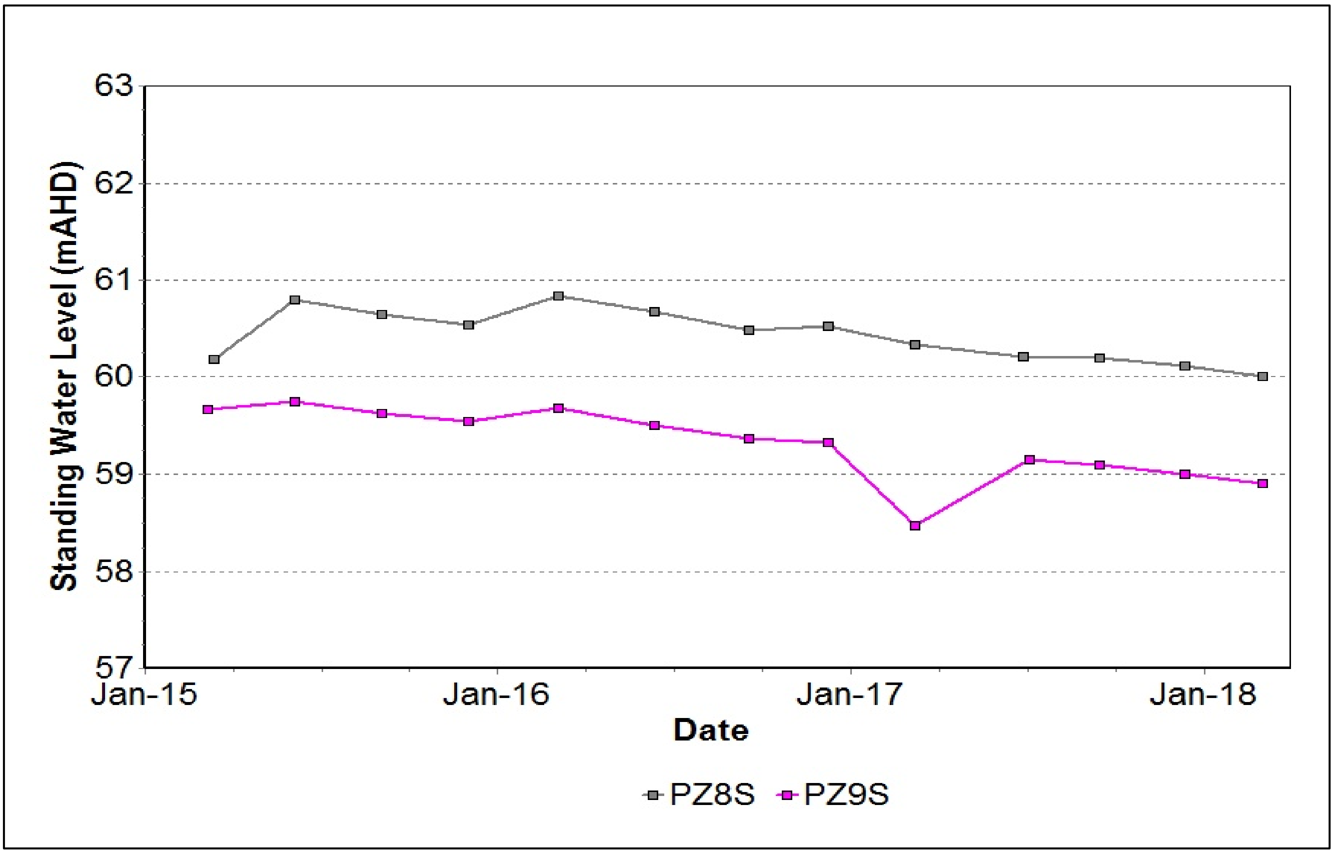


Figure 44: Wollombi Alluvium Standing Water Level Trend – March 2018

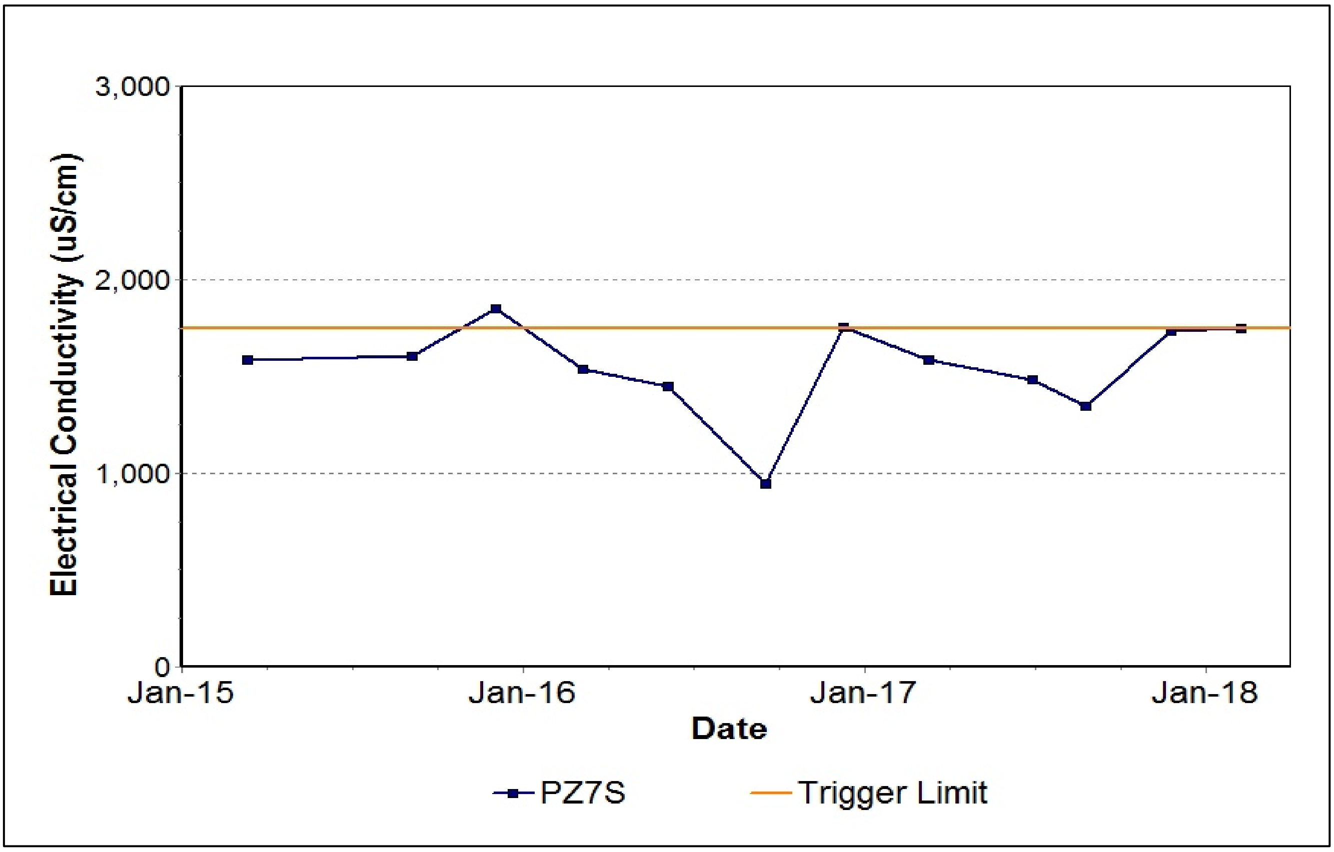


Figure 45: Aeolian Warkworth Sands Electrical Conductivity Trend – March 2018

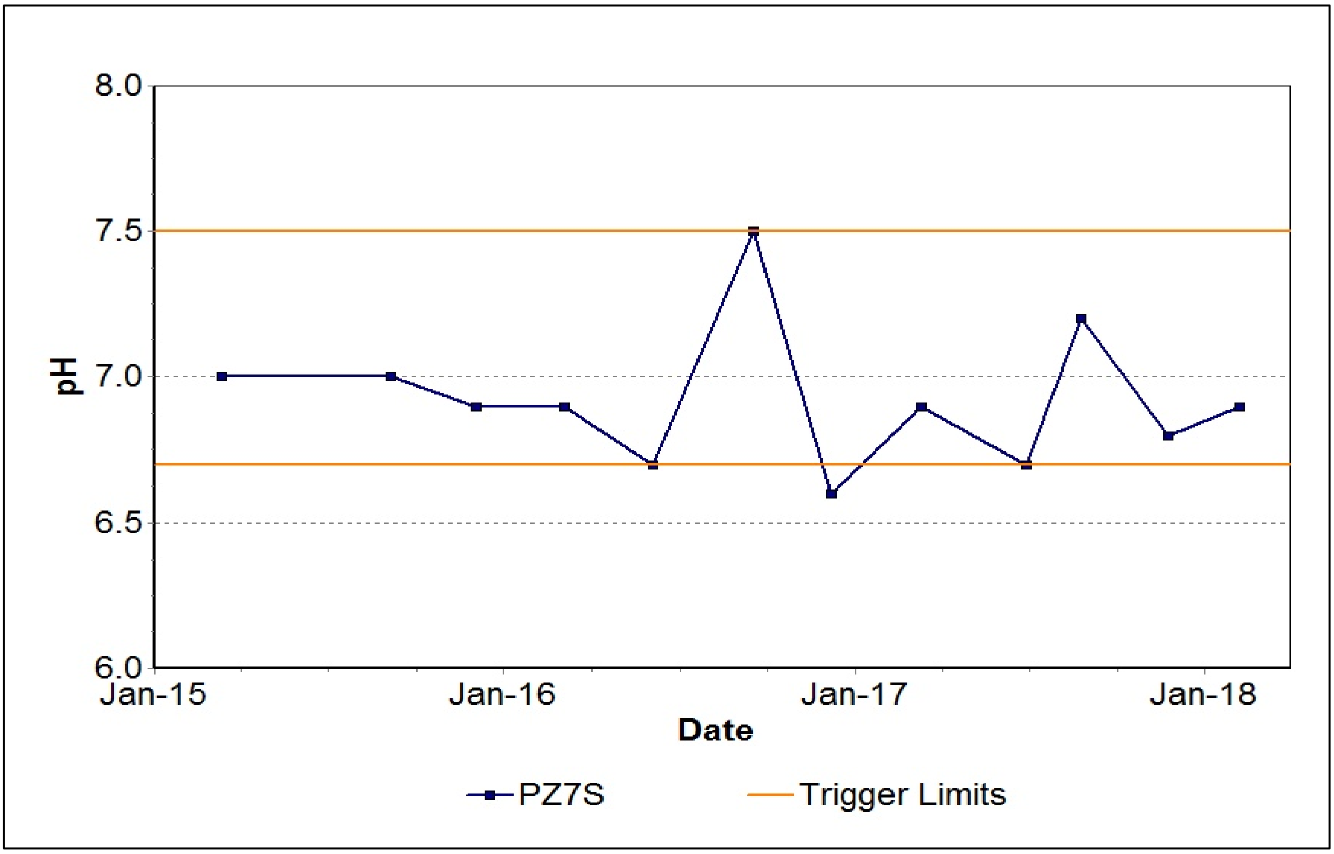


Figure 46: Aeolian Warkworth Sands pH Trend – March 2018

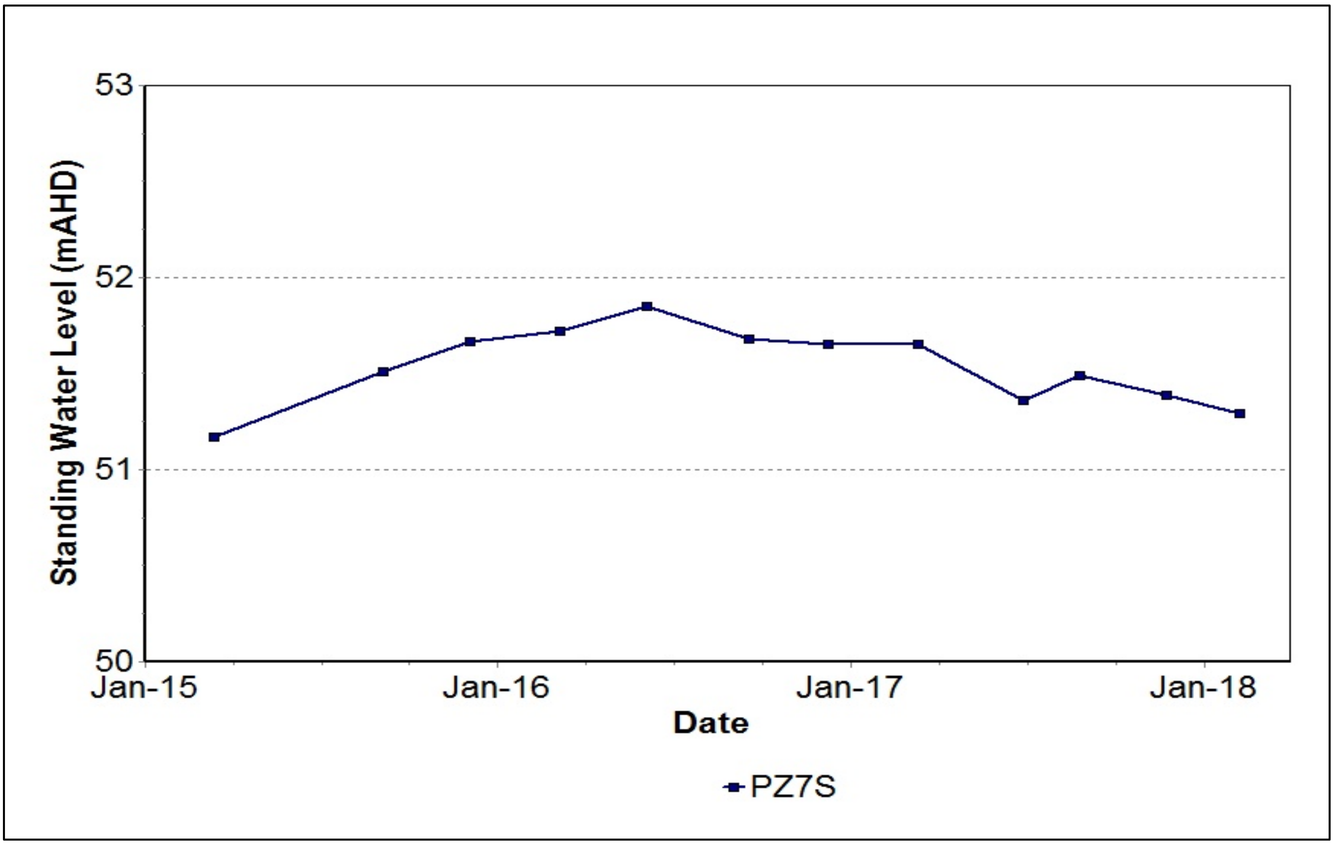


Figure 47: Aeolian Warkworth Sands Standing Water Level Trend – March 2018

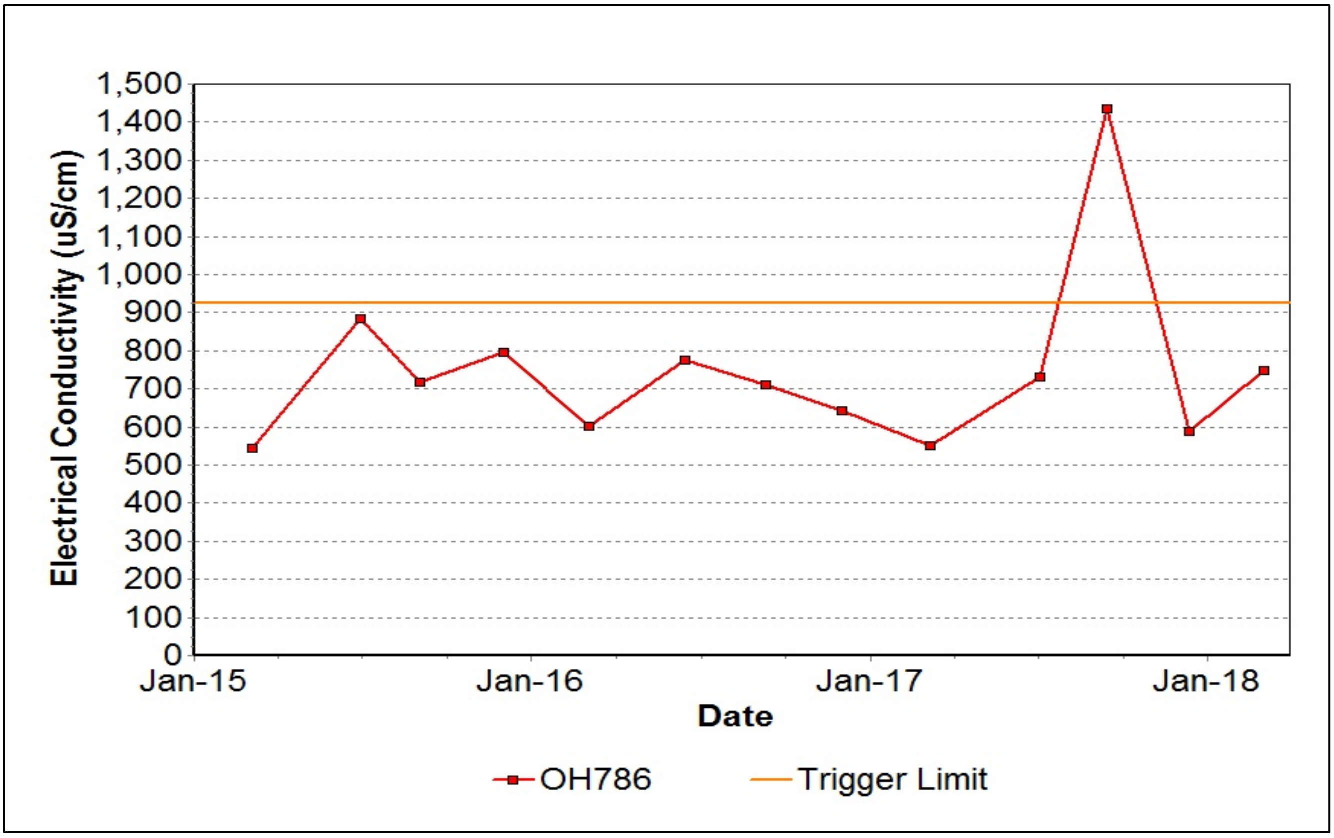


Figure 48: Hunter River Alluvium 1 Seam Electrical Conductivity Trend – March 2018

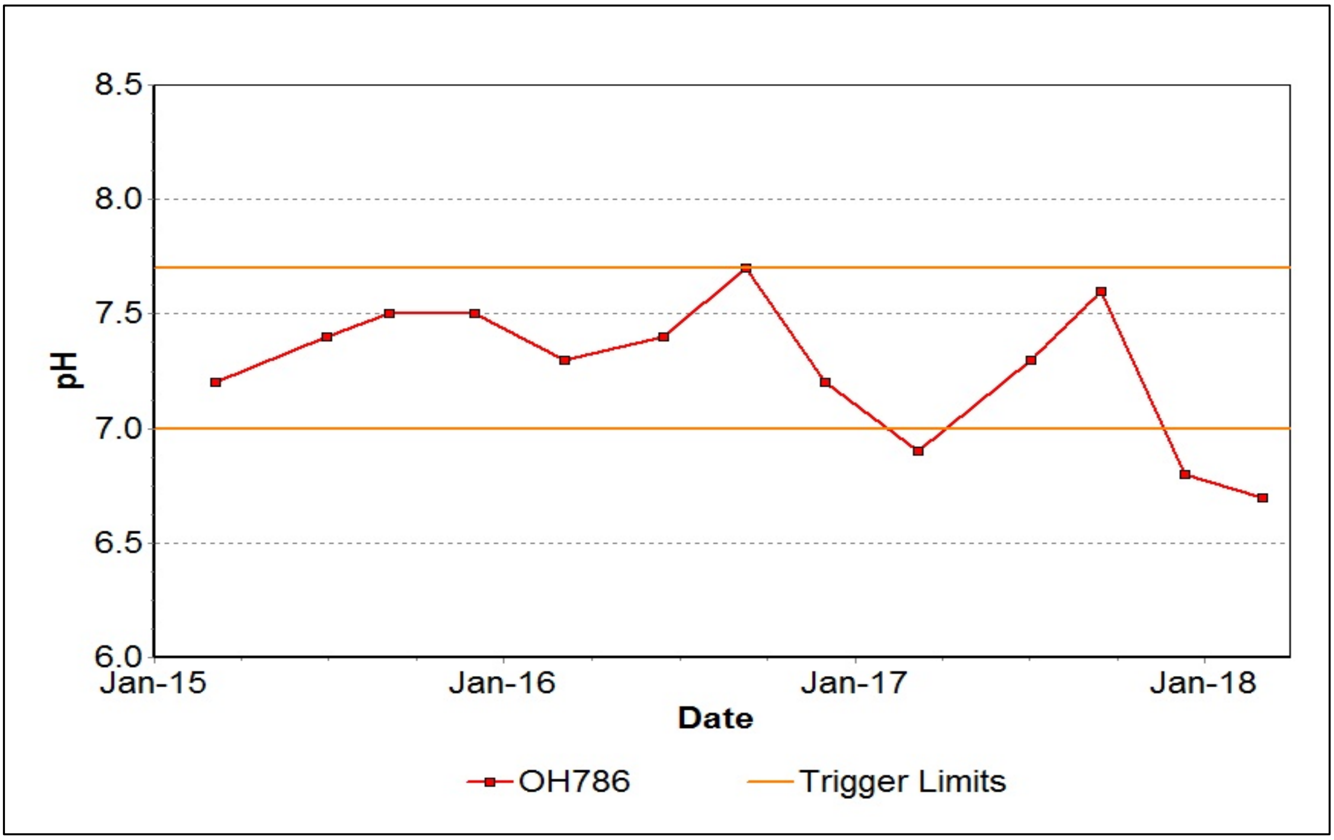


Figure 49: Hunter River Alluvium 1 Seam pH Trend – March 2018

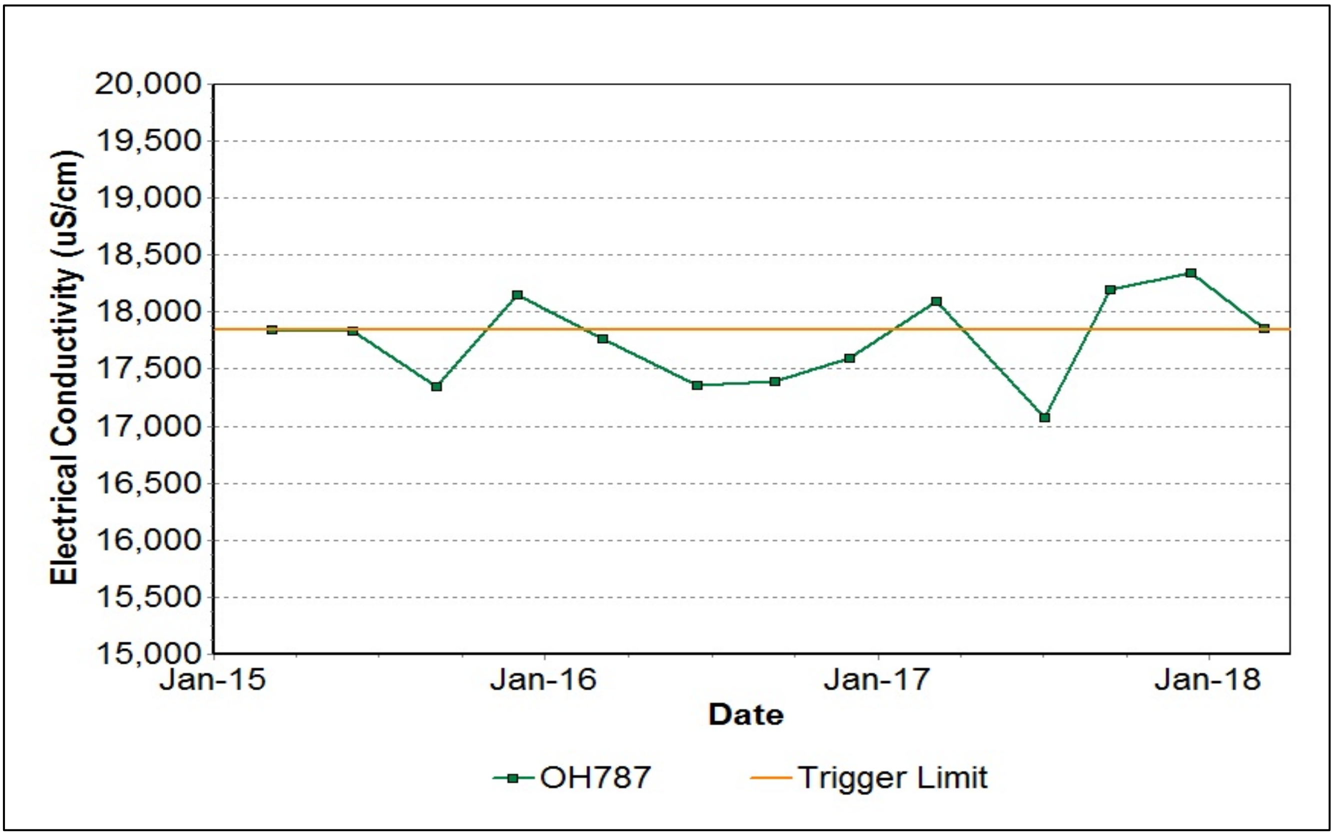


Figure 50: Hunter River Alluvium 2 Seam Electrical Conductivity Trend – March 2018

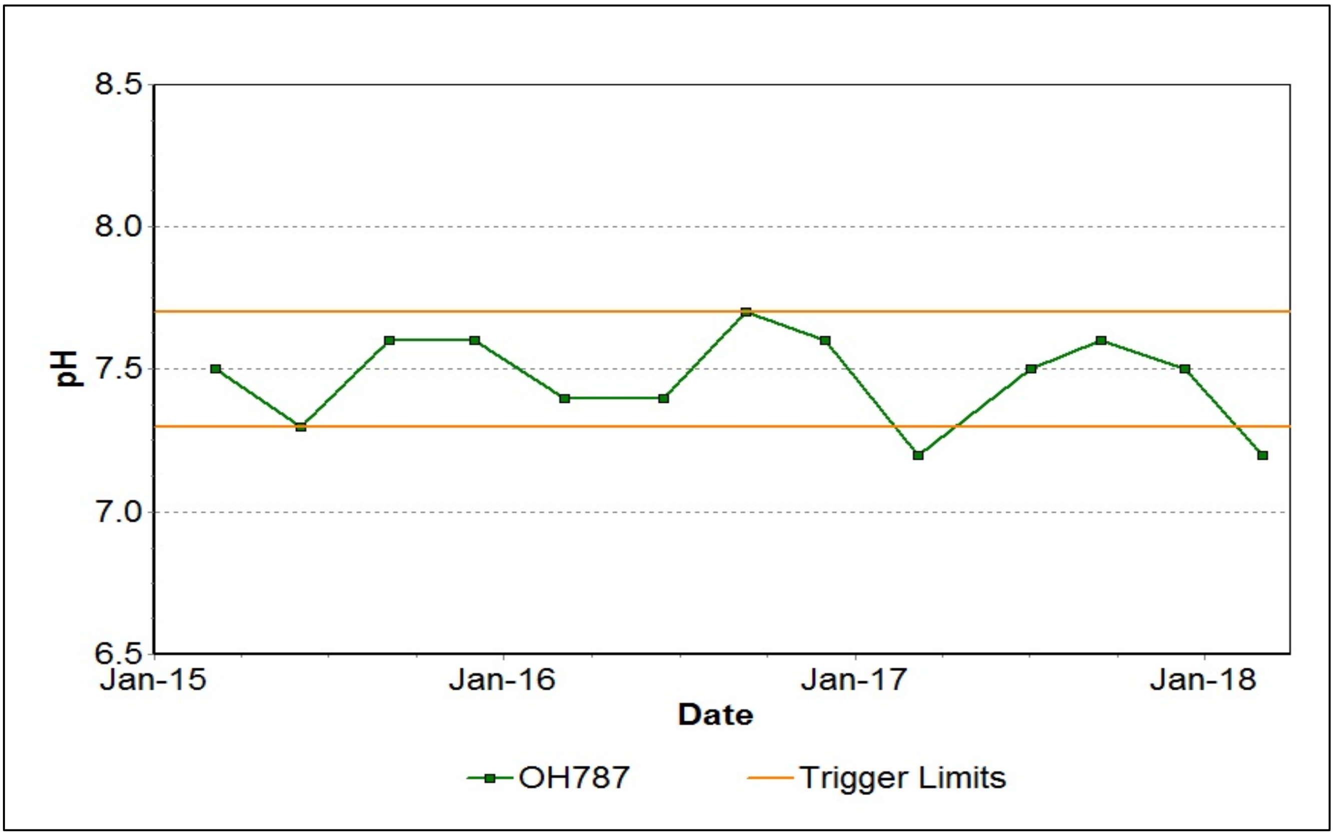


Figure 51: Hunter River Alluvium 2 Seam pH Trend – March 2018

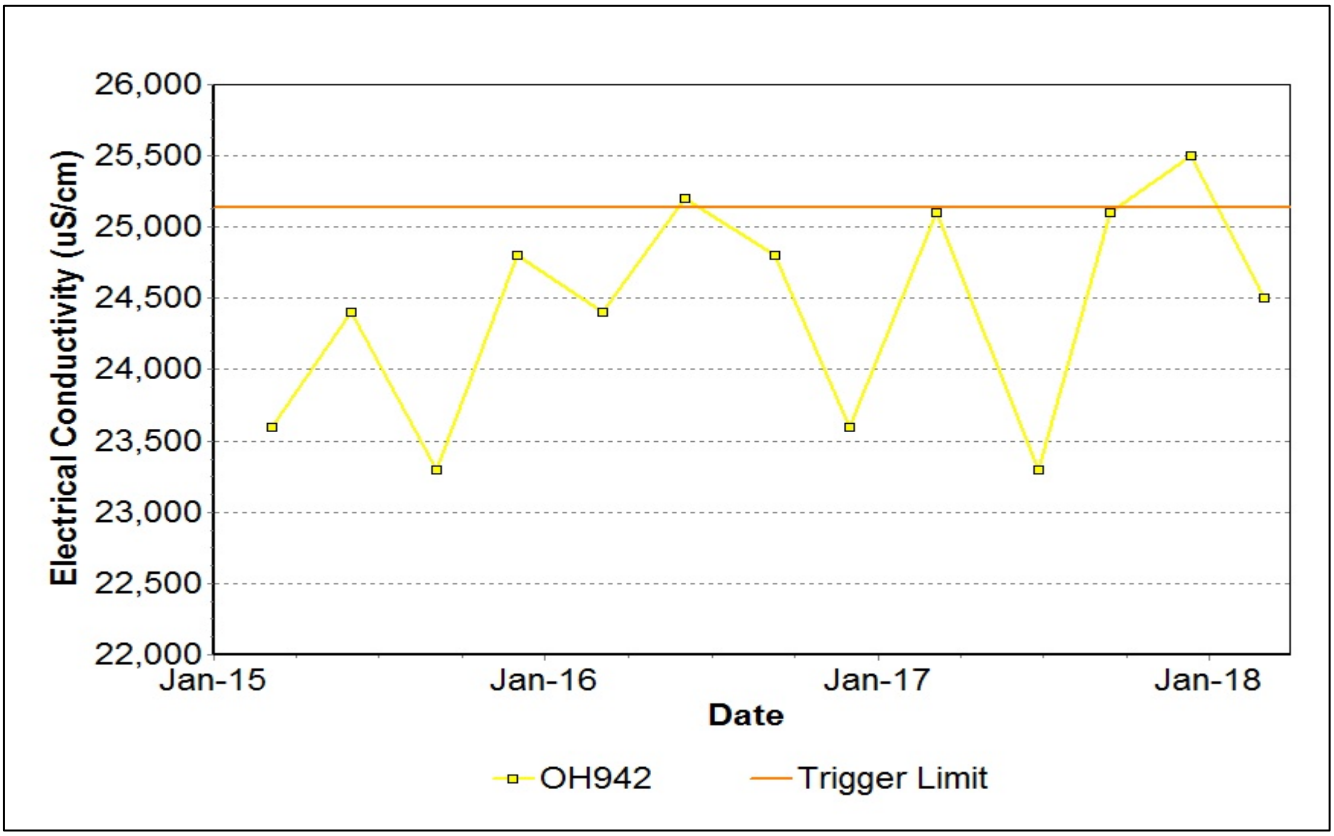


Figure 52: Hunter River Alluvium 3 Seam Electrical Conductivity Trend – March 2018

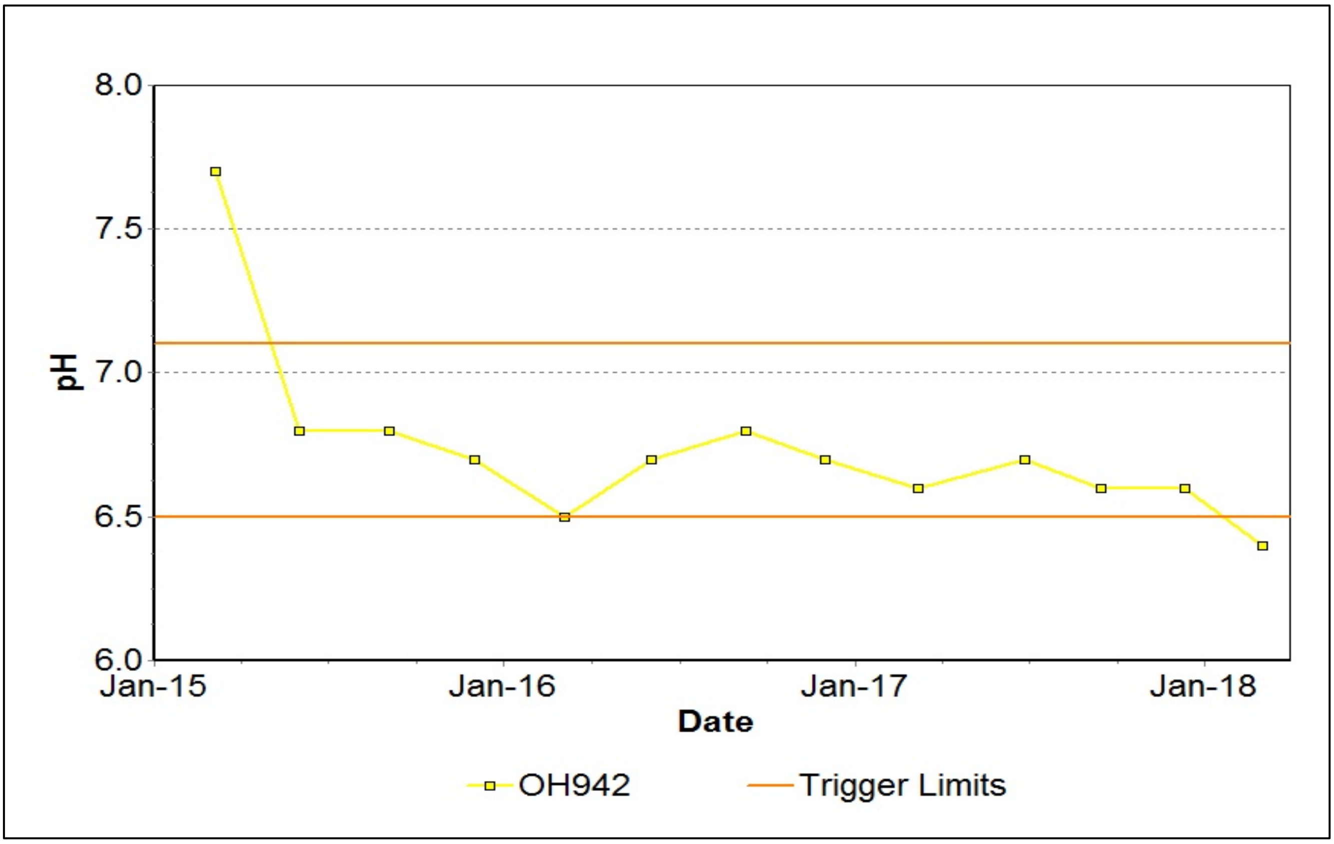


Figure 53: Hunter River Alluvium 3 Seam pH Trend – March 2018

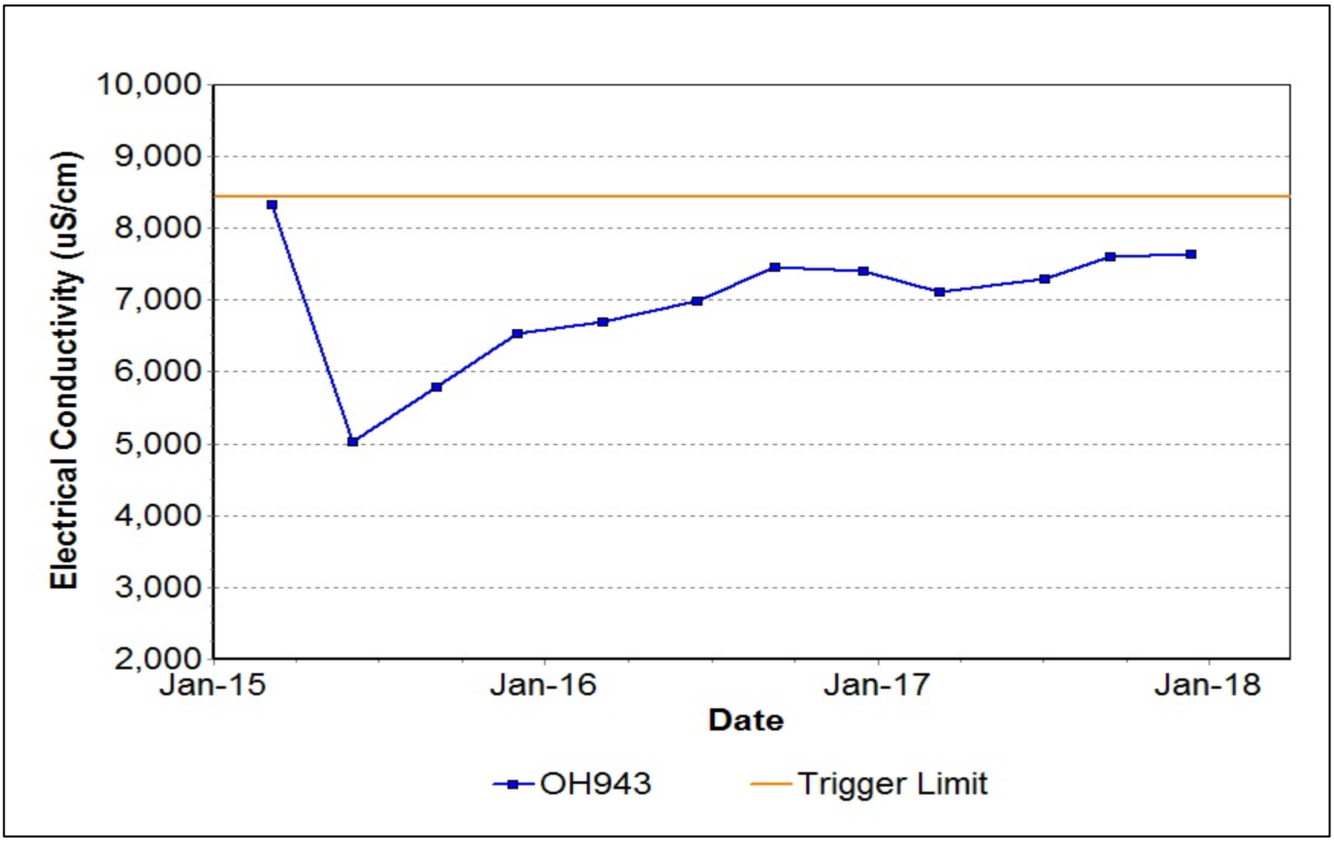


Figure 54: Hunter River Alluvium 4 Seam Electrical Conductivity Trend – March 2018

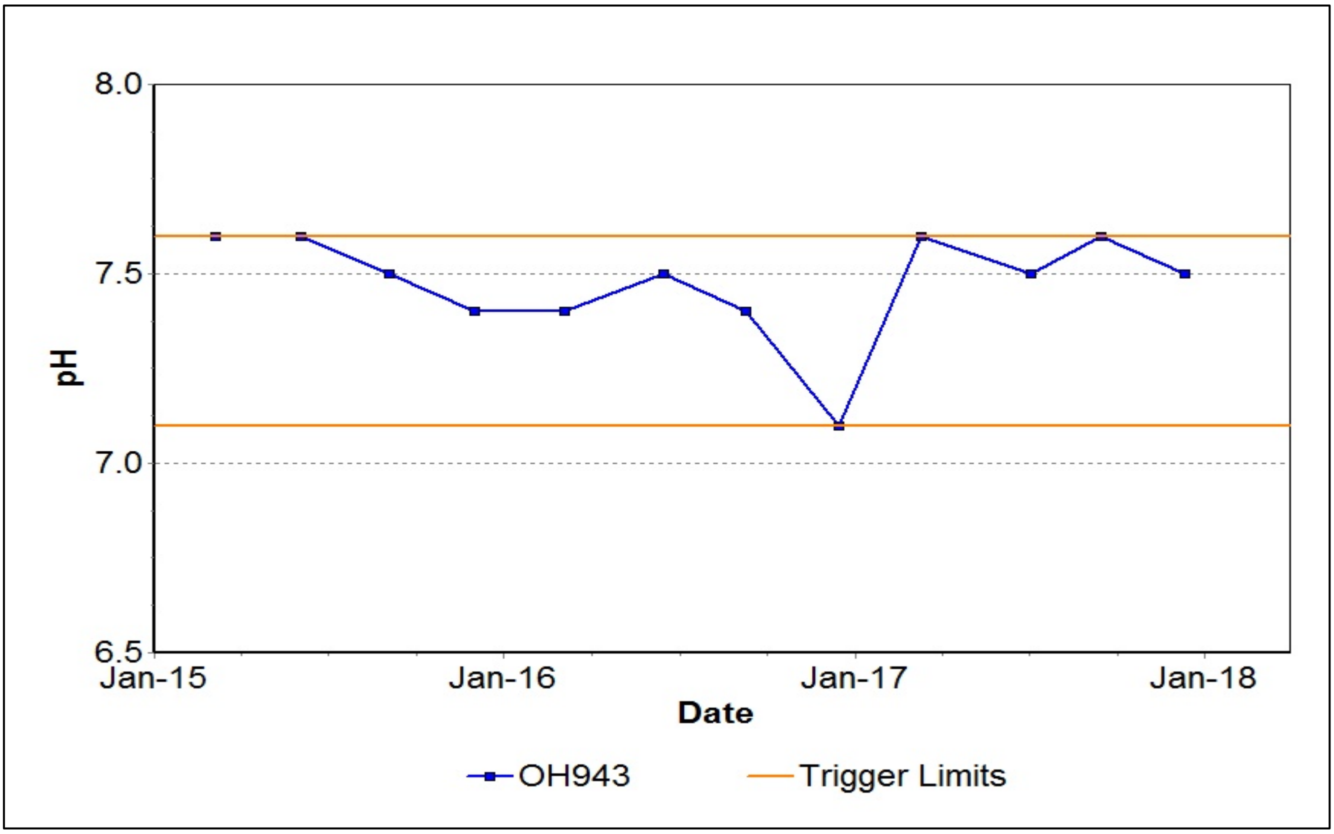
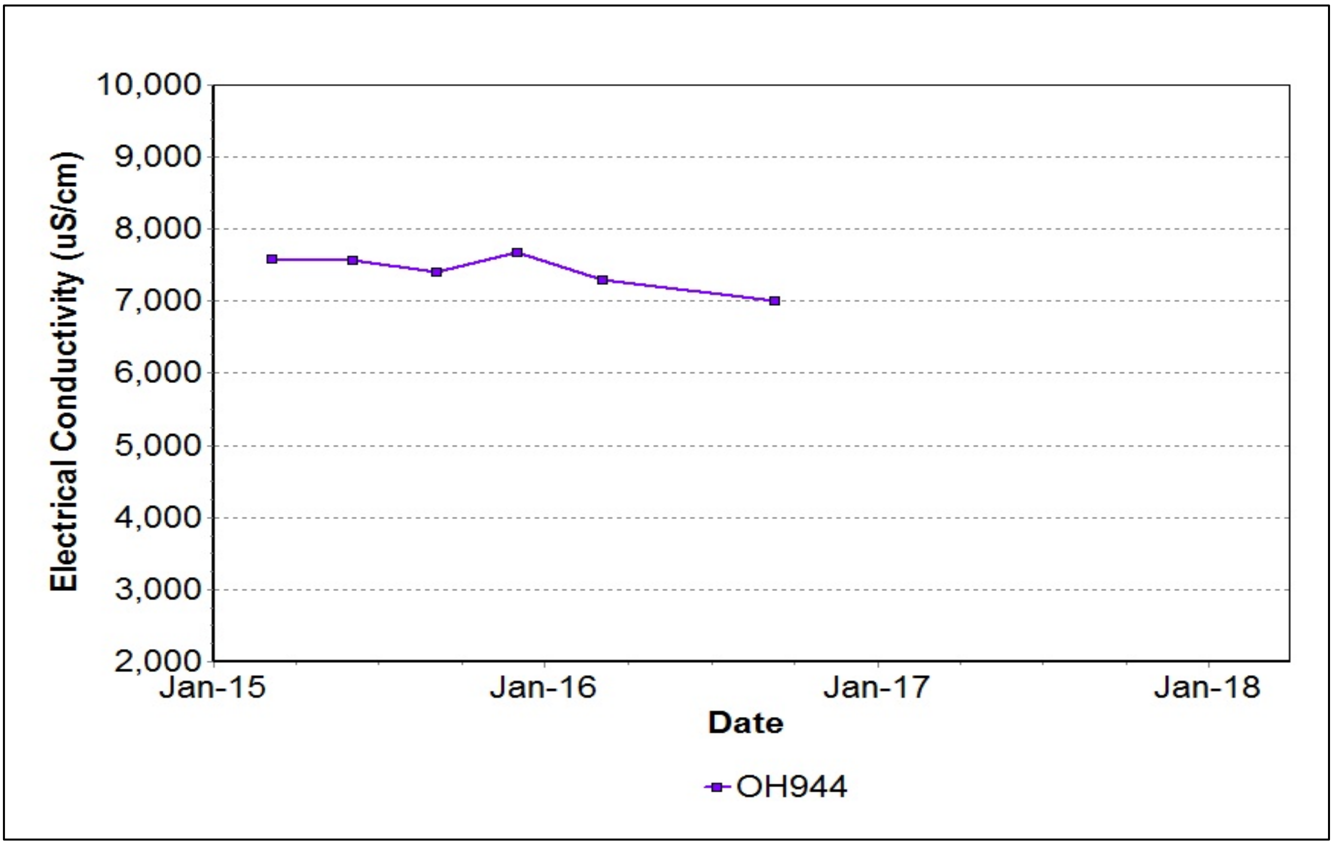
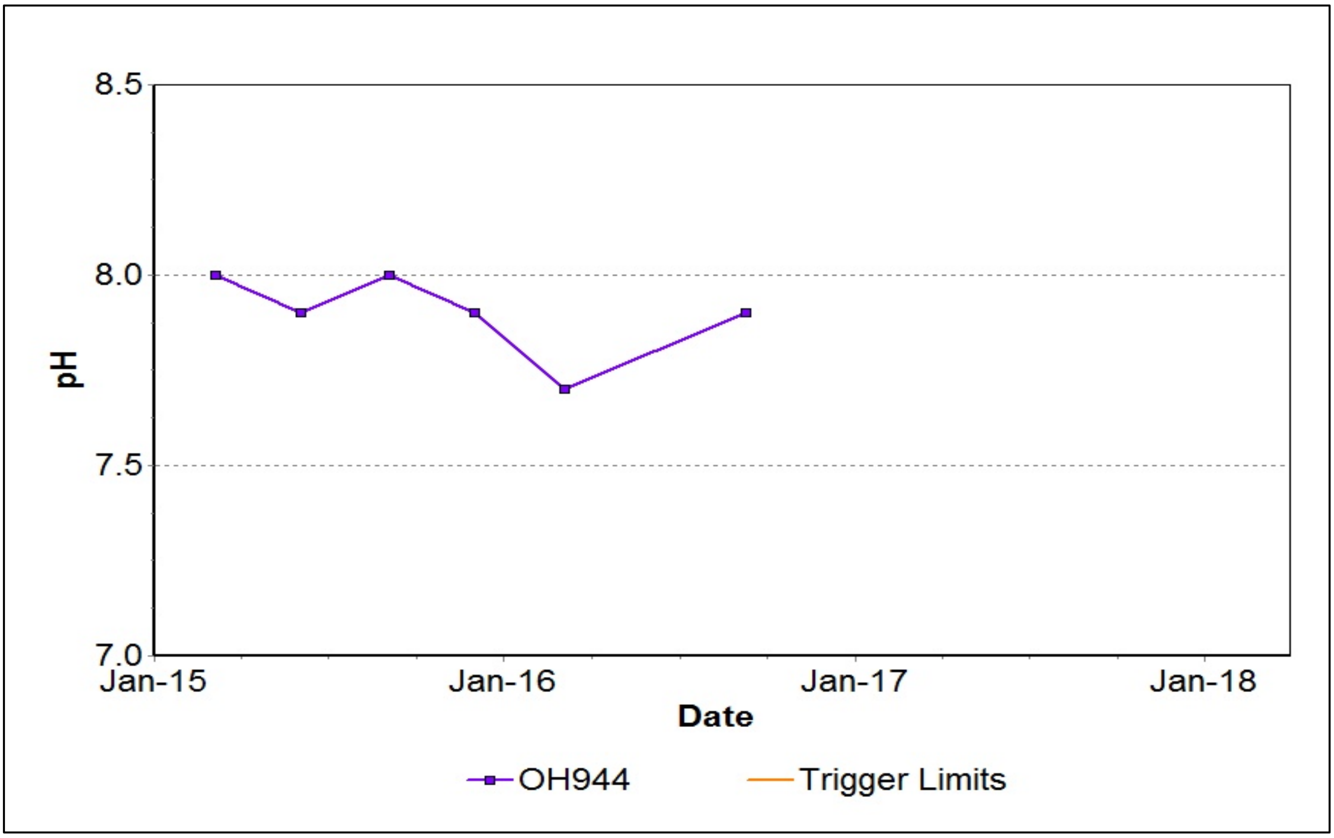


Figure 55: Hunter River Alluvium 4 Seam pH Trend – March 2018



Note: There has been insufficient water to sample since September 2016.

Figure 56: Hunter River Alluvium 5 Seam Electrical Conductivity Trend – March 2018



Note: There has been insufficient water to sample since September 2016.

Figure 57: Hunter River Alluvium 5 Seam pH Trend – March 2018

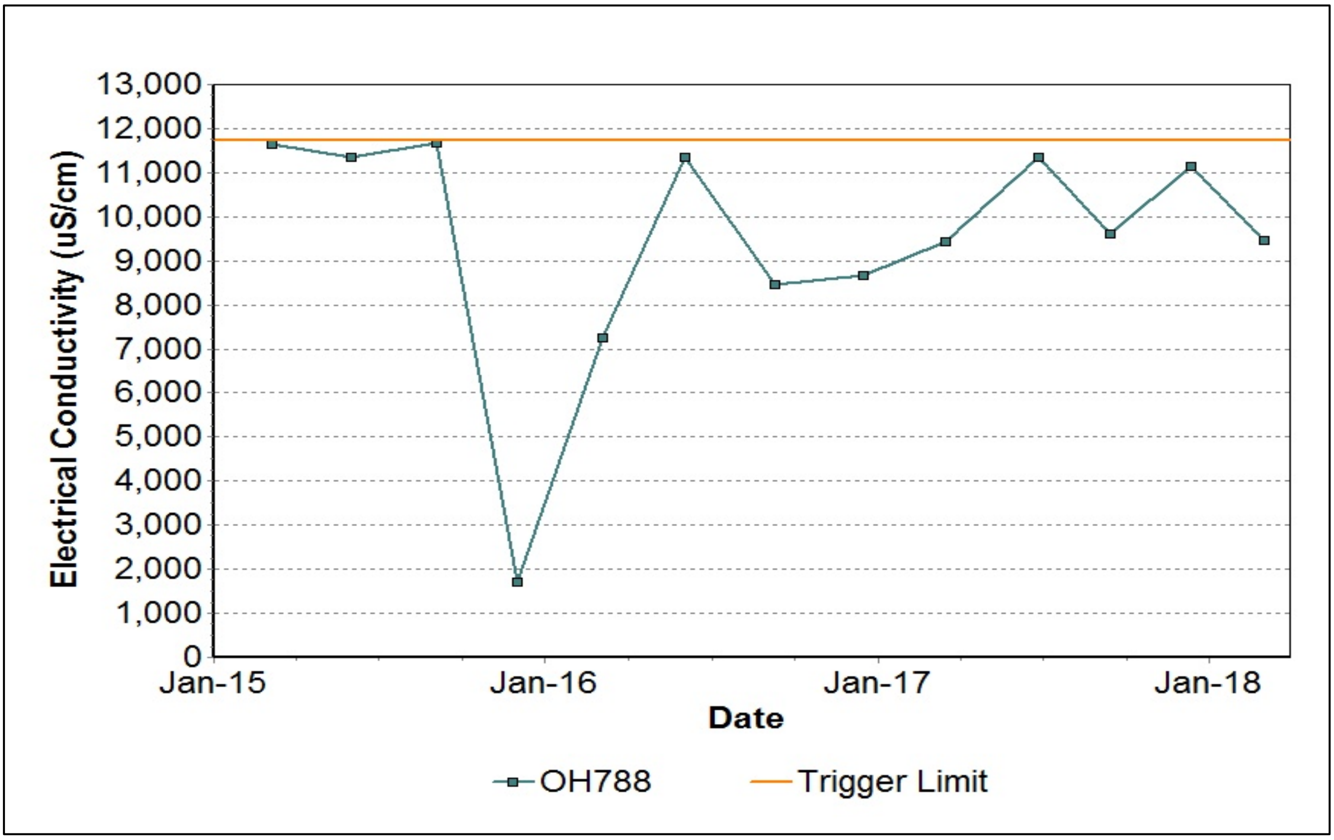


Figure 58: Hunter River Alluvium 6 Seam Electrical Conductivity – March 2018

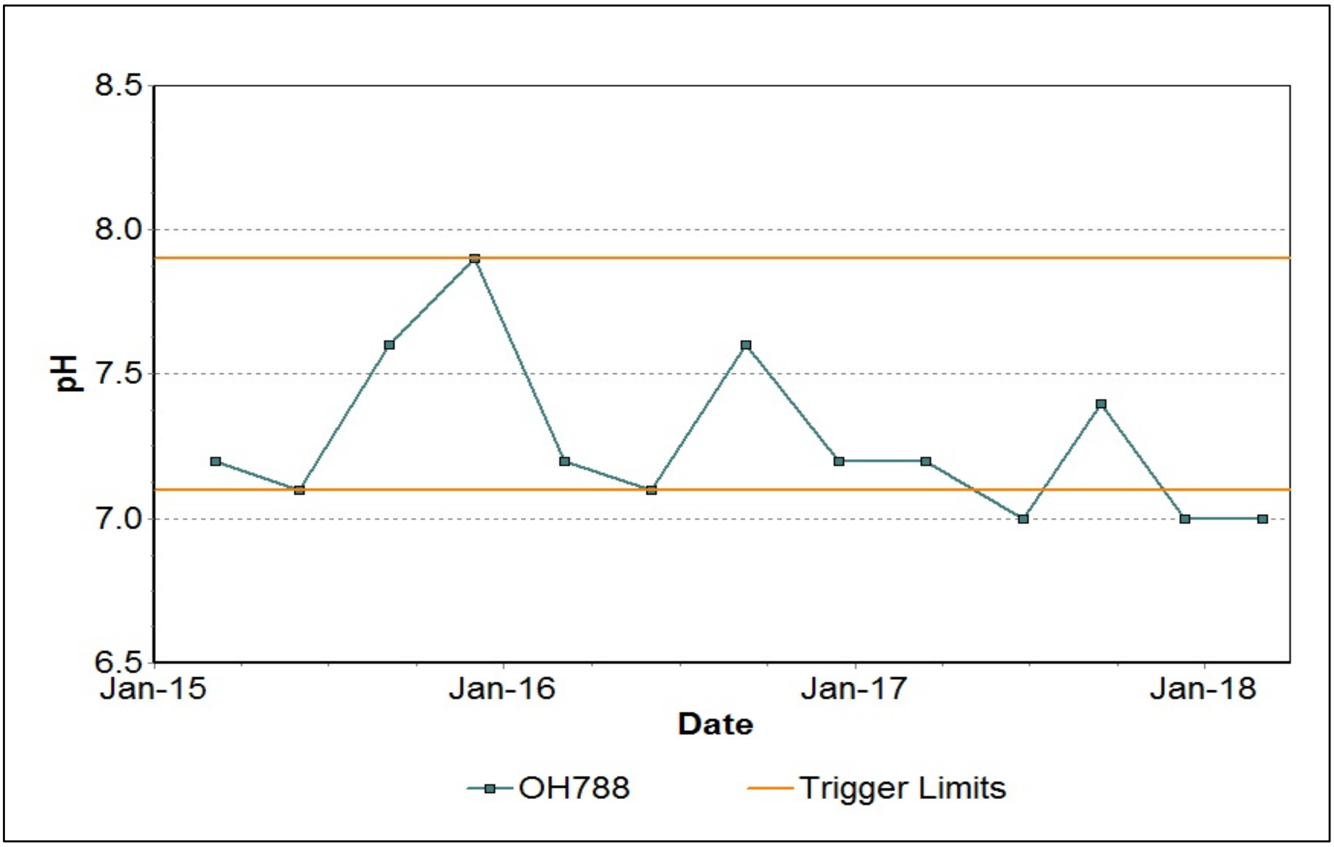


Figure 59: Hunter River Alluvium 6 Seam pH Trend – March 2018

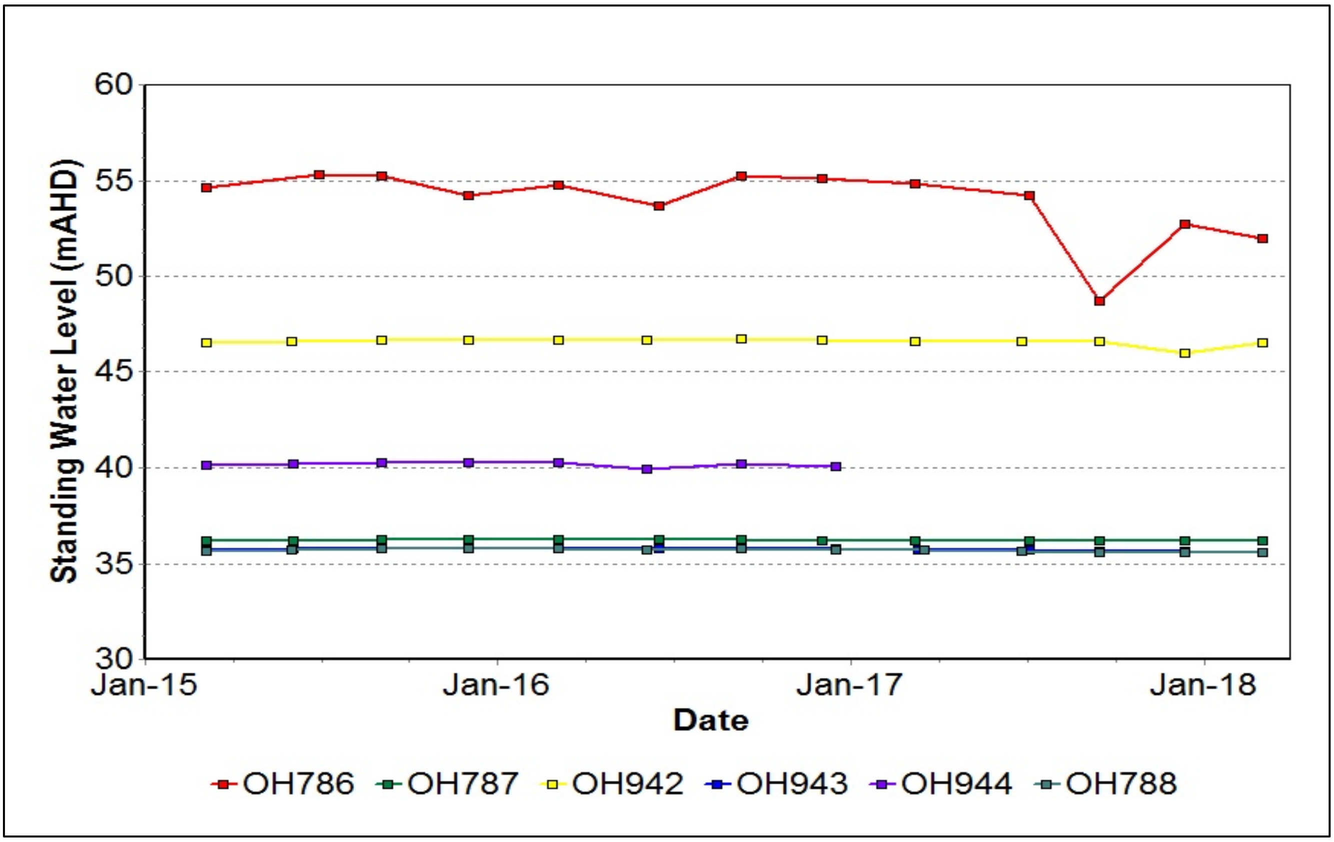


Figure 60: Hunter River Alluvium Standing Water Level Trend – March 2018

3.2.1 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 MTW Water Management Plan. Locations of groundwater bores are shown in Figure 61.

Current internal groundwater trigger limit breaches are summarised in Table 4.

Table 4: Groundwater Triggers - 2018

Site	Date	Trigger Limit Breached	Action Taken in Response
OH 787	02/03/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
MTD605P	06/02/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
WOH2156B	06/02/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 1138(1)	02/03/2018	EC – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 786	02/03/2018	pH –5th Percentile	Watching Brief*
OH 787	02/03/2018	pH –5th Percentile	Watching Brief*
OH 942	02/03/2018	pH –5th Percentile	Watching Brief*
OH 788	02/03/2018	pH –5th Percentile	Watching Brief*
PZ8S	02/03/2018	pH –5th Percentile	Watching Brief*
PZ9S	02/03/2018	pH – 95th Percentile	Watching Brief*
GW9709	02/03/2018	pH –5th Percentile	Watching Brief*
GW98MTCL2	02/03/2018	pH –5th Percentile	Watching Brief*
WOH2139A	06/02/2018	pH – 95th Percentile	Data is stable and consistent with historical trend; no further action
OH 1125(1)	02/03/2018	pH –5th Percentile	Watching Brief*
MB15MTW01D	06/02/2018	pH –5th Percentile	Watching Brief*
PZ9D	02/03/2018	pH –5th Percentile	Watching Brief*
OH 1138(1)	06/02/2018	pH –5th Percentile	Investigation commenced.

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

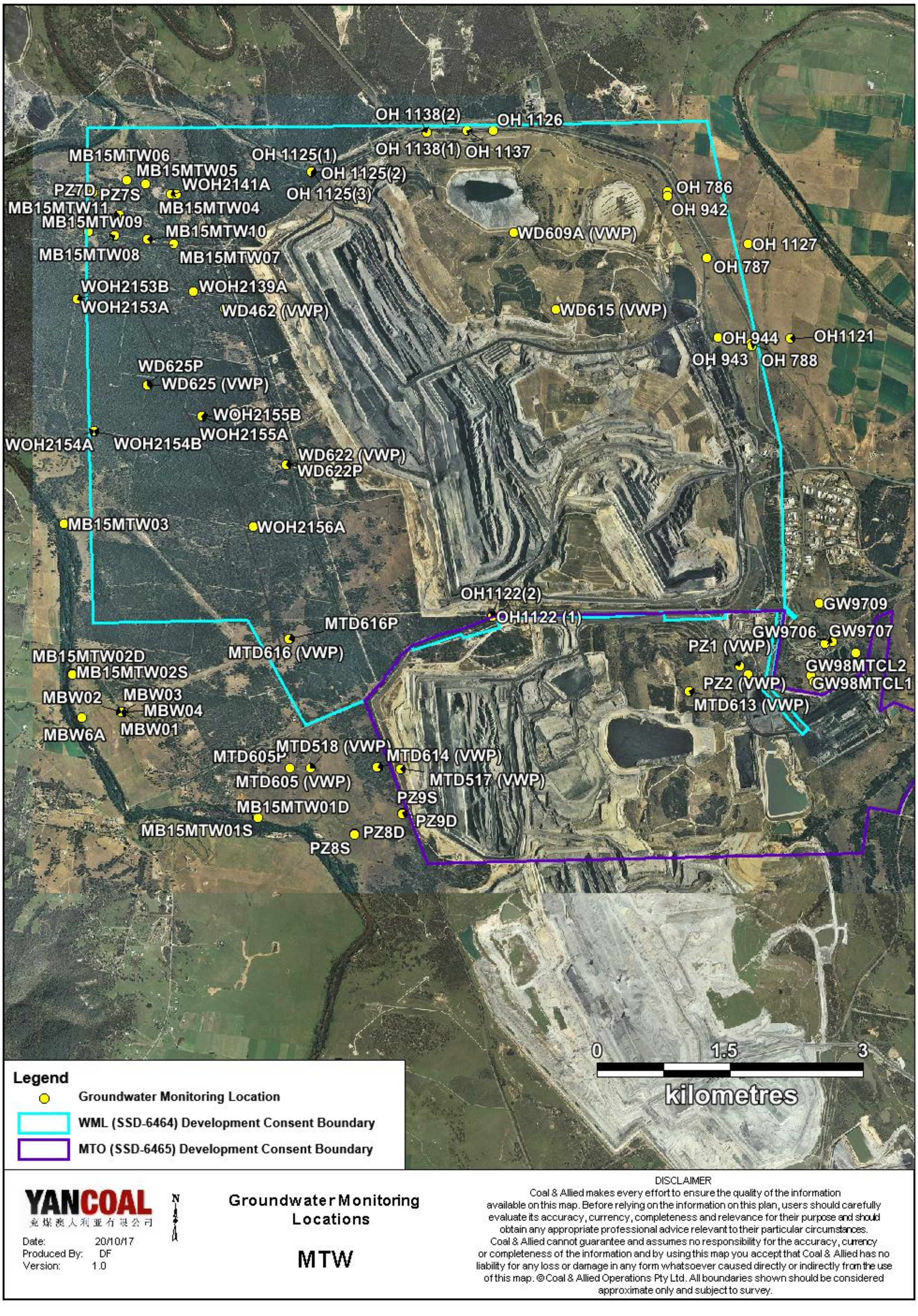


Figure 61: Groundwater Monitoring Location Plan

4.0 BLAST MONITORING

MTW have a network of six 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 68.

4.1 Blast Monitoring Results

During March 2018, 26 blasts were initiated at MTW. Figure 62 to Figure 67 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 no blasts exceeded the 115 dB(L) 5% threshold for airblast overpressure or 5mm/s-5% threshold for ground vibration

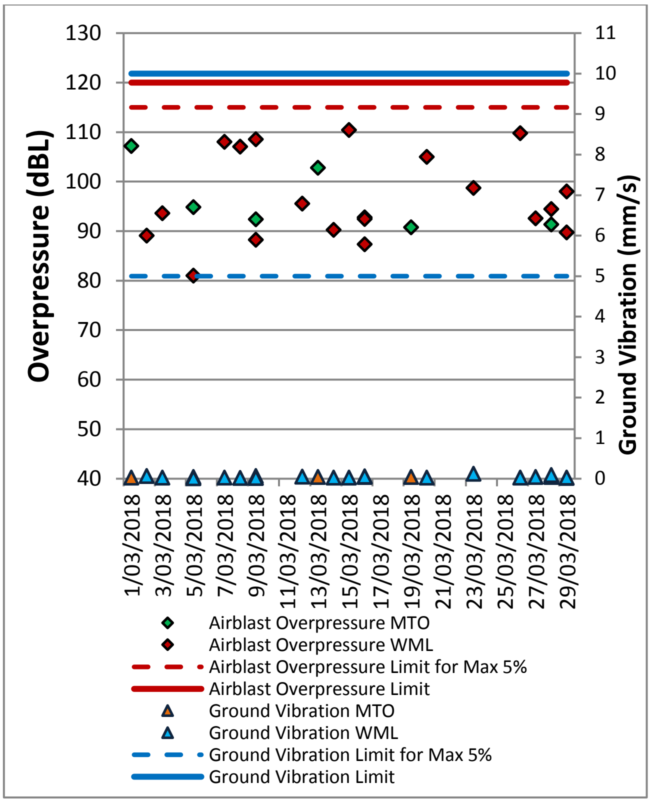


Figure 62: Abbey Green Blast Monitoring Results – March 2018

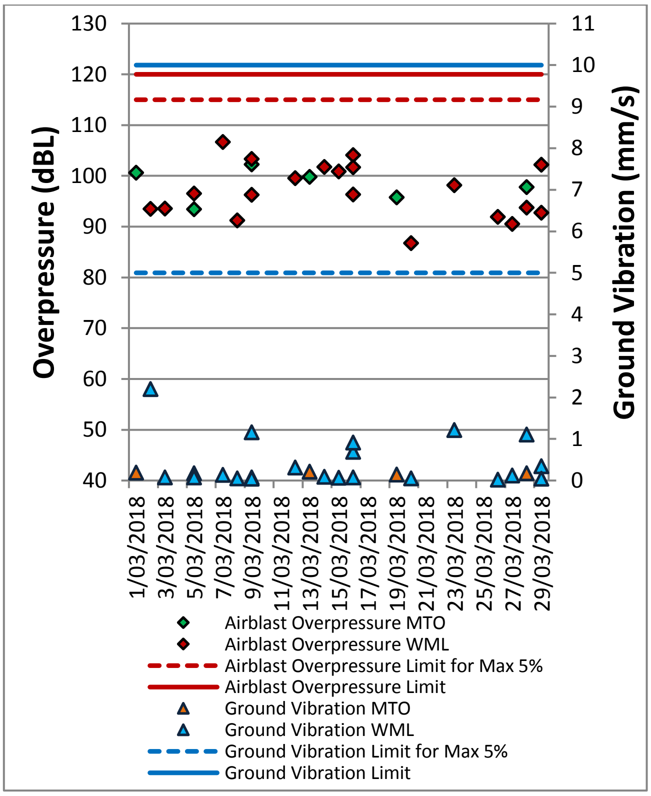


Figure 63: Bulga Village Blast Monitoring Results – March 2018

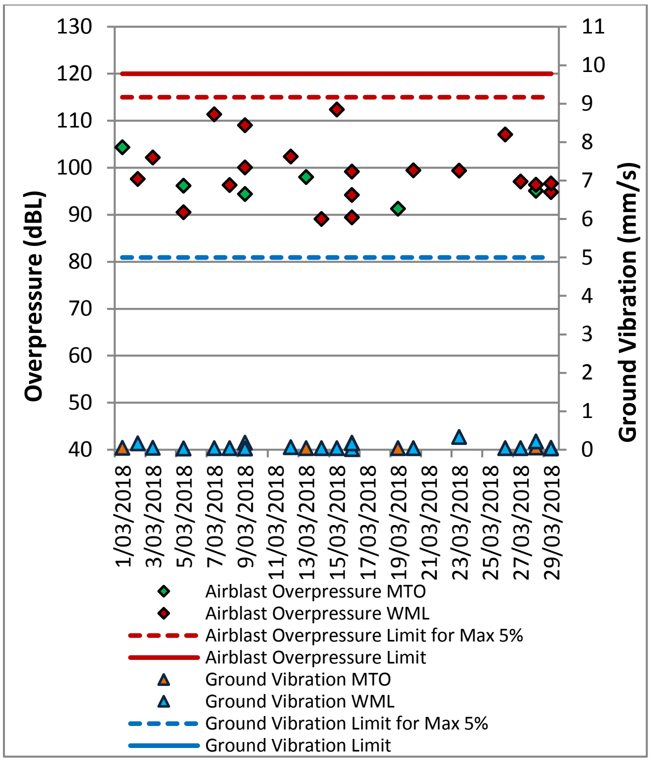


Figure 64: MTIE Blast Monitoring Results – March 2018

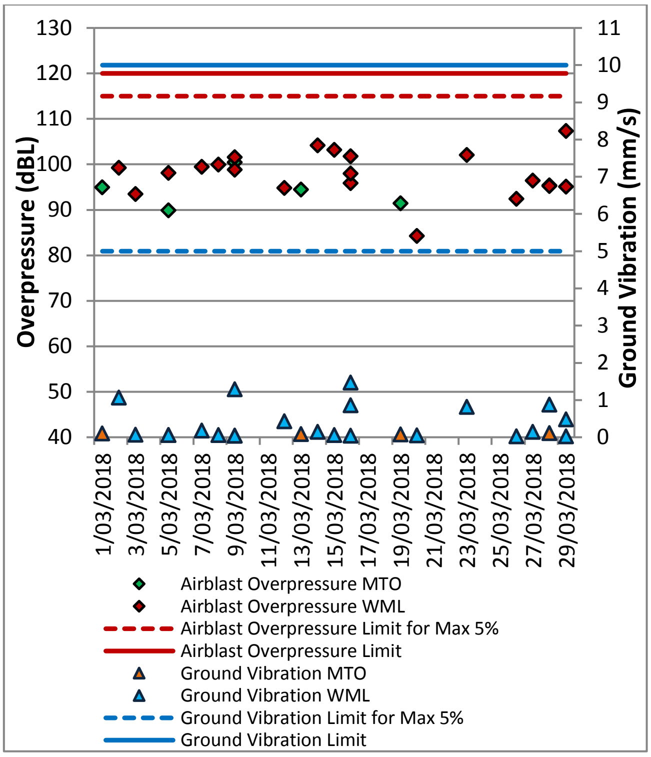


Figure 66: Wambo Road Blast Monitoring Results – March 2018

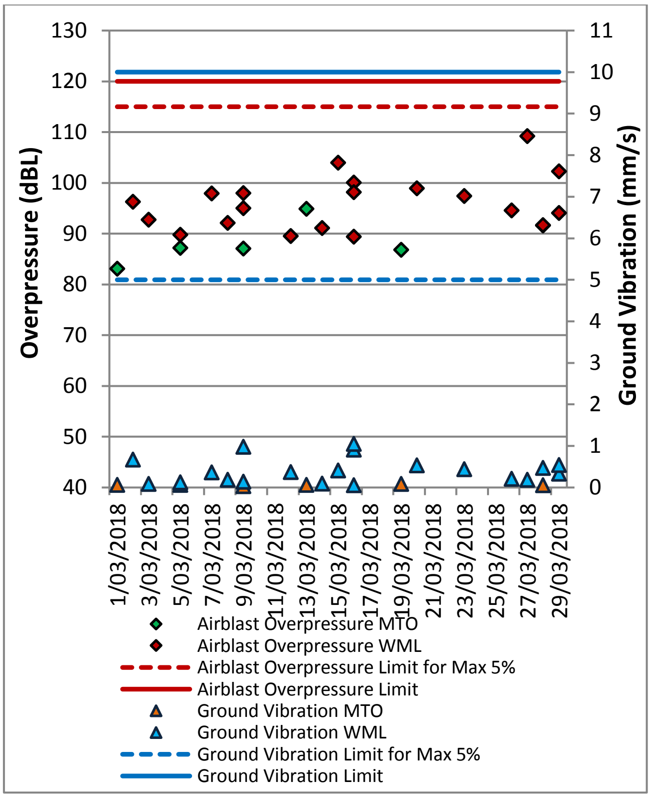


Figure 65: Warkworth Blast Monitoring Results - March 2018

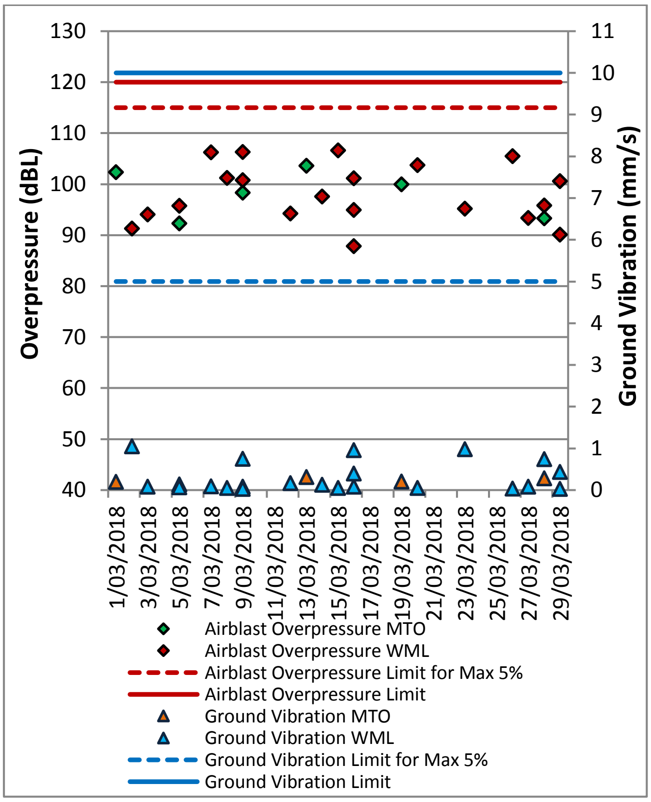


Figure 67: Wollemi Peak Road Blast Monitoring Results - March 2018

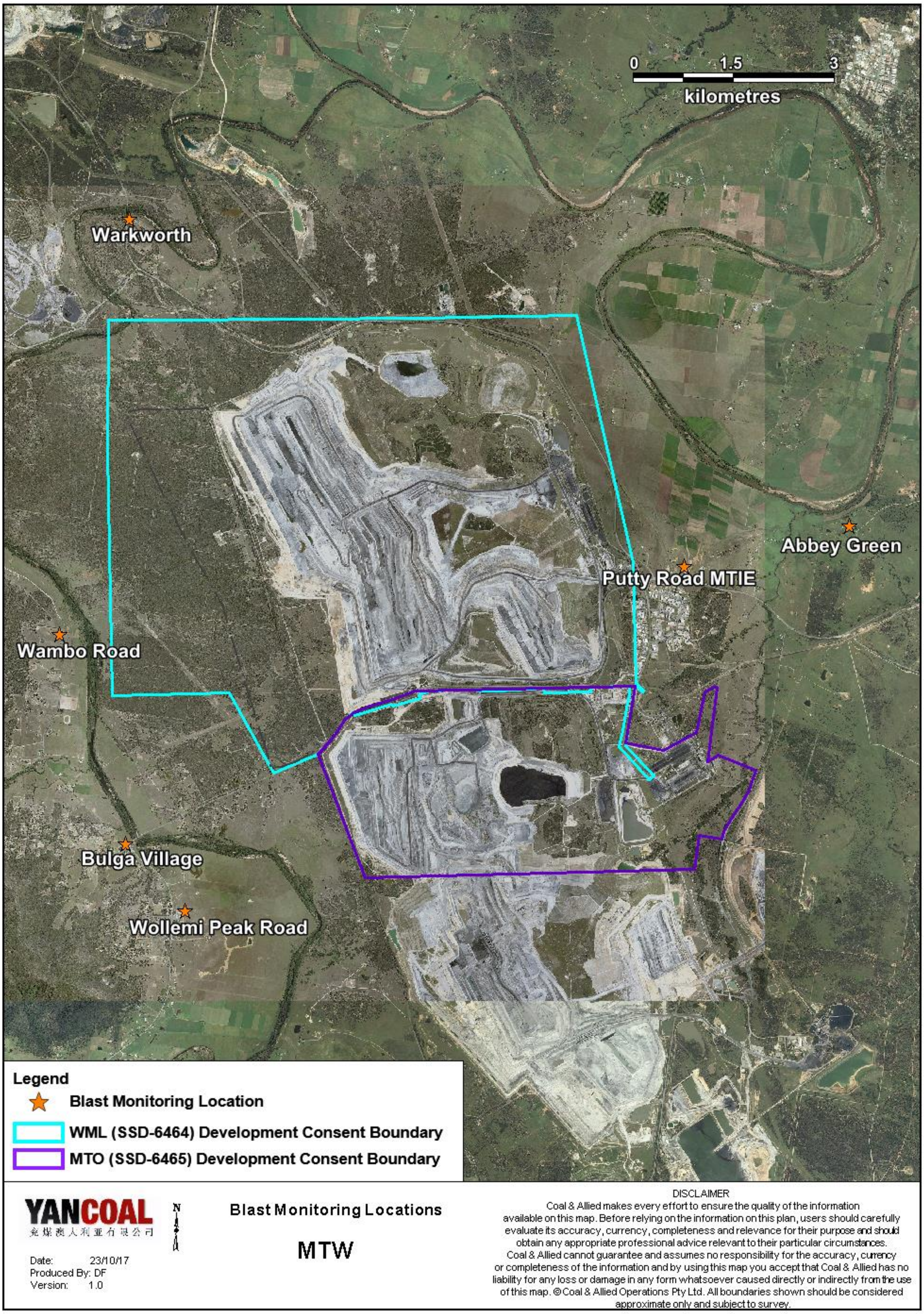


Figure 68: Blast and Vibration Monitoring Location Plan

5.0 NOISE

Routine attended noise monitoring is carried out in accordance with the MTW Noise Management Plan. A review against EIS predictions will be reported in the Annual Review. 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 MTW. The attended noise monitoring locations are displayed in Figure 69.

5.1 Attended Noise Monitoring Results

Attended monitoring was conducted at receiver locations surrounding MTW on the night of 8 March 2018. All measurements complied with the relevant criteria. Results are detailed in Table 6 to Table 9.

5.1.1 WML Noise Assessment

Compliance assessments undertaken against the WML noise criteria are presented in Table 6 and Table 7.

Table 6: $L_{Aeq, 15 minute}$ Warkworth Impact Assessment Criteria – March 2018

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,5]	WML L_{Aeq} dB[2,4]	Exceedance[3]
Bulga RFS	8/03/2018 21:02	2.8	D	37	Yes	IA	Nil
Bulga Village	8/03/2018 23:16	3.1	D	38	No	IA	NA
Gouldsville	9/03/2018 0:56	3.1	D	38	No	30	NA
Inlet Rd	8/03/2018 21:22	2.7	D	37	Yes	<25	Nil
Inlet Rd West	8/03/2018 21:00	2.8	D	35	Yes	IA	Nil
Long Point	9/03/2018 0:30	4.1	D	35	No	<25	NA
South Bulga	8/03/2018 21:37	2.6	D	35	Yes	IA	Nil
Wambo Road	8/03/2018 22:51	3.5	D	38	No	<25	NA

Notes:
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LAeq,15minute attributed to WML;
3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

Table 7: $L_{A1, 1 minute}$ Warkworth Impact Assessment Criteria – March 2018

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion (dB(A))	Criterion Applies?[1,5]	WML L_{Aeq} dB[2,4]	Exceedance[3]
Bulga RFS	8/03/2018 21:02	2.8	D	47	Yes	IA	Nil
Bulga Village	8/03/2018 23:16	3.1	D	48	No	IA	NA
Gouldsville	9/03/2018 0:56	3.1	D	48	No	33	NA
Inlet Rd	8/03/2018 21:22	2.7	D	47	Yes	<25	Nil
Inlet Rd West	8/03/2018 21:00	2.8	D	45	Yes	IA	Nil
Long Point	9/03/2018 0:30	4.1	D	45	No	28	NA
South Bulga	8/03/2018 21:37	2.6	D	45	Yes	IA	Nil
Wambo Road	8/03/2018 22:51	3.5	D	48	No	<25	NA

Notes:
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to Warkworth mine (WML);
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable.
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.2 MTO Noise Assessment

Compliance assessments undertaken against the MTO noise criteria are presented in Table 8 and Table 9.

Table 8: $L_{Aeq, 15minute}$ Mount Thorley Operations - Impact Assessment Criteria – March 2018

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion dB	Criterion Applies?[1,5]	MTO L_{Aeq} dB[2,4]	Exceedance[3]
Bulga RFS	8/03/2018 21:02	2.8	D	37	Yes	IA	Nil
Bulga Village	8/03/2018 23:16	3.1	D	38	No	NM	NA
Gouldsville	9/03/2018 0:56	3.1	D	35	No	IA	NA
Inlet Rd	8/03/2018 21:22	2.7	D	37	Yes	<25	Nil
Inlet Rd West	8/03/2018 21:00	2.8	D	35	Yes	IA	Nil
Long Point	9/03/2018 0:30	4.1	D	35	No	IA	NA
South Bulga	8/03/2018 21:37	2.6	D	36	Yes	IA	Nil
Wambo Road	8/03/2018 22:51	3.5	D	38	No	<25	NA

Notes:
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LAeq,15minute attributed to MTO;
3. NA means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

Table 9: $L_{A1, 1Minute}$ Mount Thorley Operations - Impact Assessment Criteria – March 2018

Location	Date and Time	Wind Speed (m/s)[5]	Stability Class	Criterion dB	Criterion Applies?[1,5]	MTO $L_{A1, 1min}$ dB[2,4]	Exceedance[3]
Bulga RFS	8/03/2018 21:02	2.8	D	47	Yes	IA	Nil
Bulga Village	8/03/2018 23:16	3.1	D	48	No	NM	NA
Gouldsville	9/03/2018 0:56	3.1	D	45	No	IA	NA
Inlet Rd	8/03/2018 21:22	2.7	D	47	Yes	<25	Nil
Inlet Rd West	8/03/2018 21:00	2.8	D	45	Yes	IA	Nil
Long Point	9/03/2018 0:30	4.1	D	45	No	IA	NA
South Bulga	8/03/2018 21:37	2.6	D	46	Yes	IA	Nil
Wambo Road	8/03/2018 22:51	3.5	D	48	No	<30	NA

Notes
1. Noise emission limits apply during all meteorological conditions except the following: during periods of rain or hail; average wind speed at microphone height exceeds 5 m/s; wind speeds greater than 3 m/s measured at 10 metres above ground level; stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or stability category G temperature inversion conditions;
2. Estimated or measured LA1,1minute attributed to MTO;
3. NA in exceedance column means atmospheric conditions outside conditions specified in project approval and so criterion is not applicable.
4. Bolded results in red are possible exceedances of relevant criteria; and
5. Criterion may or may not apply due to rounding of meteorological data values.

5.1.3 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 March 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 - March 2018

Location	Date and Time	Measured Site Only LA_{eq} dB (WML/MTO)	Site Only LC_{eq} dB[4] (WML/MTO)	Site Only LC_{eq}-LA_{eq} dB [1,4] (WML/MTO)	Result Max exceedance of ref spectrum dB[2,3,4] (WML/MTO)	Penalty dB(A) (WML/MTO)	Exceedance
Bulga RFS	8/03/2018 21:02	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Bulga Village	8/03/2018 23:16	IA/NM	NA/NA	NA/NA	NA/NA	NA/NA	NA
Gouldsville	9/03/2018 0:56	30/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd	8/03/2018 21:22	<25/<25	NA/NA	NA/NA	NA/NA	NA/NA	NA
Inlet Rd West	8/03/2018 21:00	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Long Point	9/03/2018 0:30	<25/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
South Bulga	8/03/2018 21:37	IA/IA	NA/NA	NA/NA	NA/NA	NA/NA	NA
Wambo Road	8/03/2018 22:51	<25/<25	NA/NA	NA/NA	NA/NA	NA/NA	NA

Notes:
1. As per NPfI, if LCeq – LAeq >= 15 dB further assessment of low frequency noise required.
2. 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;
3. Bold results and penalties in red are where the relevant modifying factor trigger was exceeded; and
4. Where it is not possible to determine the site only result due to the presence of other low frequency noise sources occurring during the measurement, or where criteria were not applicable due to meteorological conditions, this is noted as NA (not available) and no further assessment has been undertaken.

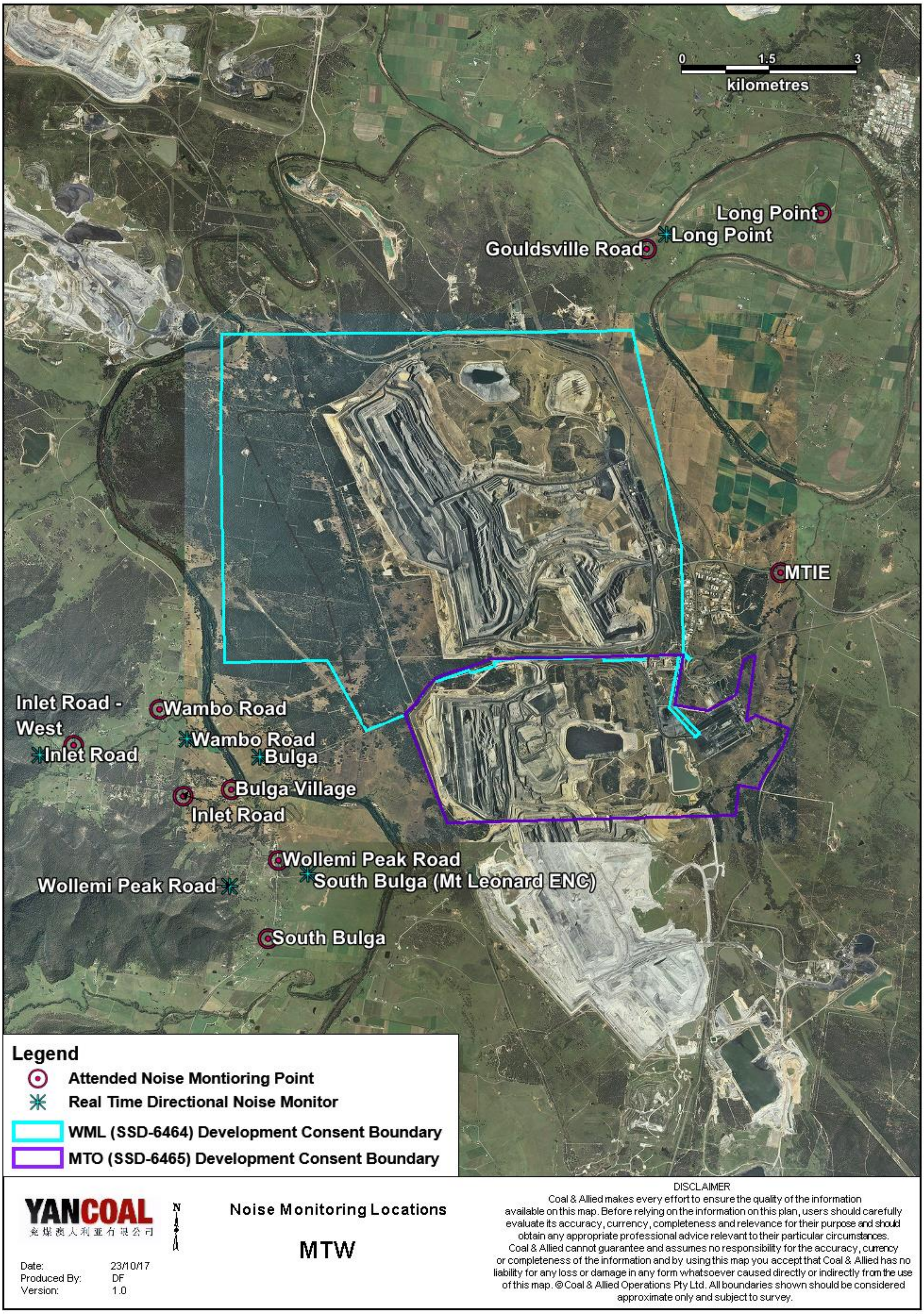


Figure 69: Noise Monitoring Location Plan

5.2 Noise Management Measures

A program of targeted supplementary attended noise monitoring is in place at MTW, supported by the real-time directional monitoring network and ensuring the highest level of noise management is maintained. The supplementary program is undertaken by MTW personnel and involves:

- Routine inspections from both inside and outside the mine boundary;
- Routine and as-required handheld noise assessments (undertaken in response to noise alarm and/or community complaint), comparing measured levels against consent noise limits; and
- Validation monitoring following operational modifications to assess the adequacy of the modifications.

Where a noise assessment identifies noise emissions which are exceeding the relevant noise limit(s) for any particular residence, modifications will be made so as to ensure that the noise event is resolved within 75 minutes of identification. The actions taken are commensurate with the nature and severity of the noise event, but can include:

- Changing the haul route to a less noise sensitive haul;
- Changing dump locations (in-pit or less exposed dump option)
- Reducing equipment numbers;
- Shut down of task; or
- Site shut down.

A summary of these assessments undertaken during March are provided in

Table 11.

Table 11: Supplementary Attended Noise Monitoring Data – March 2018

No. of assessments	No. of assessments > trigger	No. of nights where assessments > trigger	% greater than trigger
589	8	3	1.4

Note: Measurements are taken under all meteorological conditions, including conditions under which the consent noise criteria do not apply.

6.0 OPERATIONAL DOWNTIME

During March a total of 213 hours of equipment downtime was logged in response to environmental events such as dust, noise and elevated wind impacts. Operational downtime by equipment type is shown in

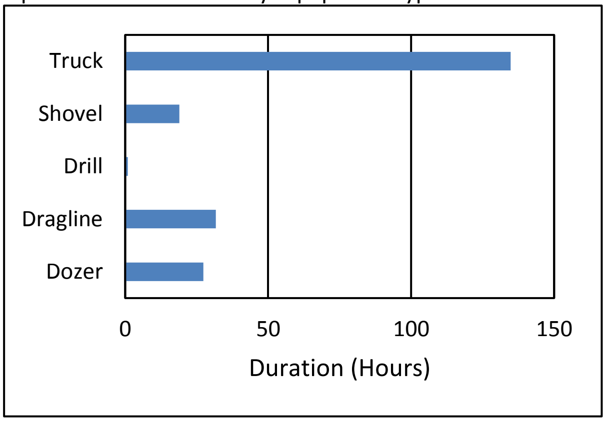


Figure 70.

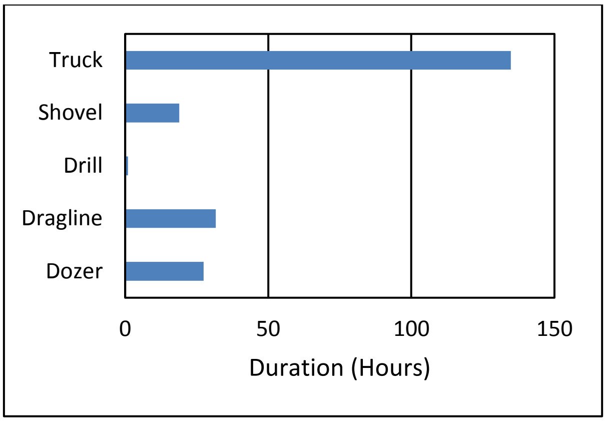


Figure 70: Operational Downtime by Equipment Type – March 2018

7.0 REHABILITATION

During March, 9.4Ha of land was released, 10.0Ha was bulk shaped and 1.9Ha was top soiled. Year-to-date progress can be viewed in Figure 71

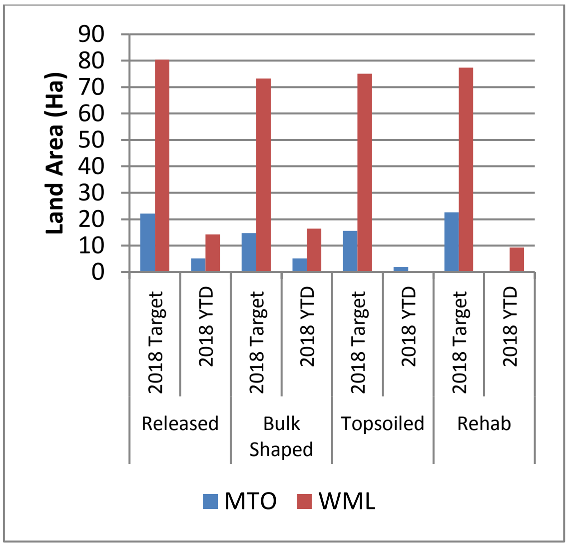


Figure 71: Rehabilitation YTD - March 2018

8.0 ENVIRONMENTAL INCIDENTS

There were no reportable environmental incidents during the reporting period.

9.0 COMPLAINTS

During the reporting period 27 complaints were received, details of these complaints are displayed in Figure 72 below.

	January	February	March	**Total**
Blasting	14	2	0	**16**
Air (Dust)	6	3	0	**9**
Air (Odour)	1	2	0	**3**

Lighting	1	3	3	**7**
Noise	9	7	24	**40**
Other	0	0	0	**0**
Grand Total	**31**	**17**	**27**	**75**

Figure 72: Complaints Summary - YTD March 2018

Appendix A: Meteorological Data

Table 12: Meteorological Data – Charlton Ridge Meteorological Station – March 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)
1/03/2018 0:00	28	19	71	41	1132	166	3.1	0.0
2/03/2018 0:00	28	16	84	40	1286	130	2.7	0.0
3/03/2018 0:00	33	16	84	28	982	148	2.0	0.0
4/03/2018 0:00	34	15	97	34	1314	190	2.8	22.6
5/03/2018 0:00	27	18	96	58	982	151	2.1	0.2
6/03/2018 0:00	23	16	95	53	1383	160	4.2	6.8
7/03/2018 0:00	26	16	90	36	1444	145	4.3	0.6
8/03/2018 0:00	25	14	86	43	1471	148	3.9	0.0
9/03/2018 0:00	26	15	83	44	1520	148	3.9	0.0
10/03/2018	28	16	83	34	1403	141	2.9	0.0
11/03/2018	28	14	85	35	1129	149	2.0	0.0
12/03/2018	29	12	92	35	1172	143	2.2	0.0
13/03/2018	28	15	85	43	1149	149	3.2	0.0
14/03/2018	31	18	86	35	1132	126	2.5	0.0
15/03/2018	35	16	90	25	1091	210	2.7	0.0
16/03/2018	30	20	77	42	1106	137	2.9	0.0
17/03/2018	36	20	82	14	933	213	2.8	0.0
18/03/2018	38	18	73	15	924	257	3.4	0.0
19/03/2018	38	20	75	13	911	179	2.7	0.0
20/03/2018	30	18	80	34	1034	170	3.7	0.0
21/03/2018	22	15	94	70	909	166	5.8	15.4
22/03/2018	21	14	97	67	1257	160	4.4	8.4
23/03/2018	22	15	94	67	796.6	142	3.1	5.2
24/03/2018	28	16	94	50	1083	140	1.6	0.0
25/03/2018	32	16	94	31	1056	273	3.3	0.0
26/03/2018	27	16	94	30	1057	259	3.8	14.0
27/03/2018	25	9	79	28	1321	150	3.0	0.0

28/03/2018	29	14	91	45	901	148	2.0	0.0
29/03/2018	29	15	95	43	942	135	1.9	0.0
30/03/2018	32	16	95	29	862	190	2.3	0.0
31/03/2018	28	18	87	46	1067	139	2.9	0.0

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