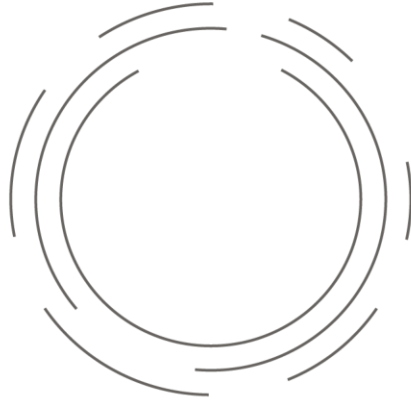


**BULGA  
COAL**

---

GLENCORE



**Quarter 3 - 2025**

Surface & Groundwater Monitoring Report



# Table of Contents

---

<b>1.</b>	<b>Executive Summary .....</b>	<b>2</b>
<b>2.</b>	<b>Introduction .....</b>	<b>2</b>
2.1	Scope .....	2
2.2	Background .....	2
2.3	Environmental Monitoring.....	2
<b>3.</b>	<b>Groundwater Monitoring .....</b>	<b>3</b>
3.1	Requirements.....	3
3.2	Method.....	3
3.3	Alluvial and Historical Trends.....	3
3.4	Groundwater results .....	5
<b>4.</b>	<b>Surface Water .....</b>	<b>25</b>
4.1	Requirements.....	25
4.2	Method.....	25
4.3	Surface Water Results .....	26
<b>5.</b>	<b>Mine Water Quality .....</b>	<b>29</b>
5.1	Requirements.....	29
5.2	Mine Water Results.....	29
<b>6.</b>	<b>Rainfall.....</b>	<b>32</b>

# 1. Executive Summary

---

There were no issues identified from the Quarter 3 2025 groundwater, surface water and meteorological monitoring results:

- Groundwater Quality:
  - Depth to water values of samples collected during the bi-monthly groundwater monitoring were generally consistent with historical ranges and variances observed to date. The observed rainfall was less than that recorded for Q2 2025.
  - The pH and EC values of laboratory samples were generally consistent with historical ranges observed to date.
- Surface Water:
  - Surface water quality results for pH, Electrical Conductivity (EC) and Total Suspended Solids (TSS) were within historical ranges for all monitoring locations downstream of Bulga Coal Complex operations. Several monitoring locations remained dry during Q3 2025 and were unable to be sampled throughout the quarter.
- Meteorological Monitoring:
  - The data parameters were captured during the reporting period in accordance with the requirements of the Development Consents.

## 2. Introduction

---

### 2.1 Scope

This report presents groundwater, surface water, mine water and meteorological monitoring results during Quarter 3 2025 (July to September).

### 2.2 Background

Bulga Coal operates under two Development Consents, **DA 376-8-2003** for the Bulga Underground Operations and **SSD-4960** for Bulga Open Cut. This report satisfies the surface water, mine water, groundwater and meteorological environmental monitoring and reporting requirements under these approvals.

### 2.3 Environmental Monitoring

The type, frequency and location of all required monitoring is summarised within the Bulga Coal Complex Environmental Management Strategy (EMS). The analysis of 2025 monitoring results is included in the Annual Review.

Environmental monitoring information is made publicly available on the Bulga Coal website: <https://www.glencore.com.au/operations-and-projects/coal/current-operations/bulga-coal>.

## 3. Groundwater Monitoring

---

### 3.1 Requirements

Water quality is monitored in accordance with the:

- BULCX-2103827161-4402 - Bulga Coal Water Management Plan; and
- Australian Standard AS5667.11 (1998) "Water Quality Sampling—Guidance on sampling of ground waters".

The approved groundwater monitoring network locations are shown on **Figure 3-1**.

### 3.2 Method

Groundwater samples are collected from various bores and wells on and surrounding the mine site to monitor:

- Depth to water - measured using a water level meter, which consists of a moisture sensor on the end of a 200m measuring tape.
- Water Quality - Water is purged from the bore or well using a PVC bailer. Samples are collected for field measurements (pH, EC and temperature) and laboratory analysis. Field measurements are duplicated from separate bailed samples to ensure the technique and results are consistent.

Some piezometers are not able to have the water column in the pipe 'purged' prior to sampling. Samples are then drawn by bailer from within or near the screened section of the piezometer for a reasonably representative sample. Water quality in those cases is primarily indicative only as a result of diffusion and mixing processes. Accordingly, abrupt changes in water quality parameters may be indicative of changed conditions in the standing water column (the pipe) rather than the groundwater in the aquifer itself. Ongoing observations are required in such cases.

### 3.3 Alluvial and Historical Trends

There are three broad groups of hydrostratigraphic units (HSUs):

- **Shallow groundwater system:** Alluvium (and underlying regolith) associated with Wollombi Brook and Monkey Place Creek and regolith
- **Interburden and shallow coal measures:** Weathered and fractured shallow sandstone and coal measures
- **Coal seams:** Wollombi Coal Measures and the Wittingham Coal Measures, which may be regarded as a fractured rock aquifer.

The alluvium and regolith has low to moderate hydraulic conductivity and supports local water supplies with around 20 private bores within a 3 km radius of BFS. This aquifer is used for a variety of purposes including stock and domestic, water supply and irrigation. Water quality is generally fresh.

The intermediate depth shallow coal measures exhibit relatively low hydraulic conductivity. The coal measures fractured rock aquifer comprises sandstone, siltstone and coal seams with varying degree of fracturing and hydraulic conductivity. This hydrostratigraphic unit is characterised by generally poor-quality groundwater and low hydraulic conductivity. There are no private bores extracting from the shallow coal measures within the vicinity of BFS.

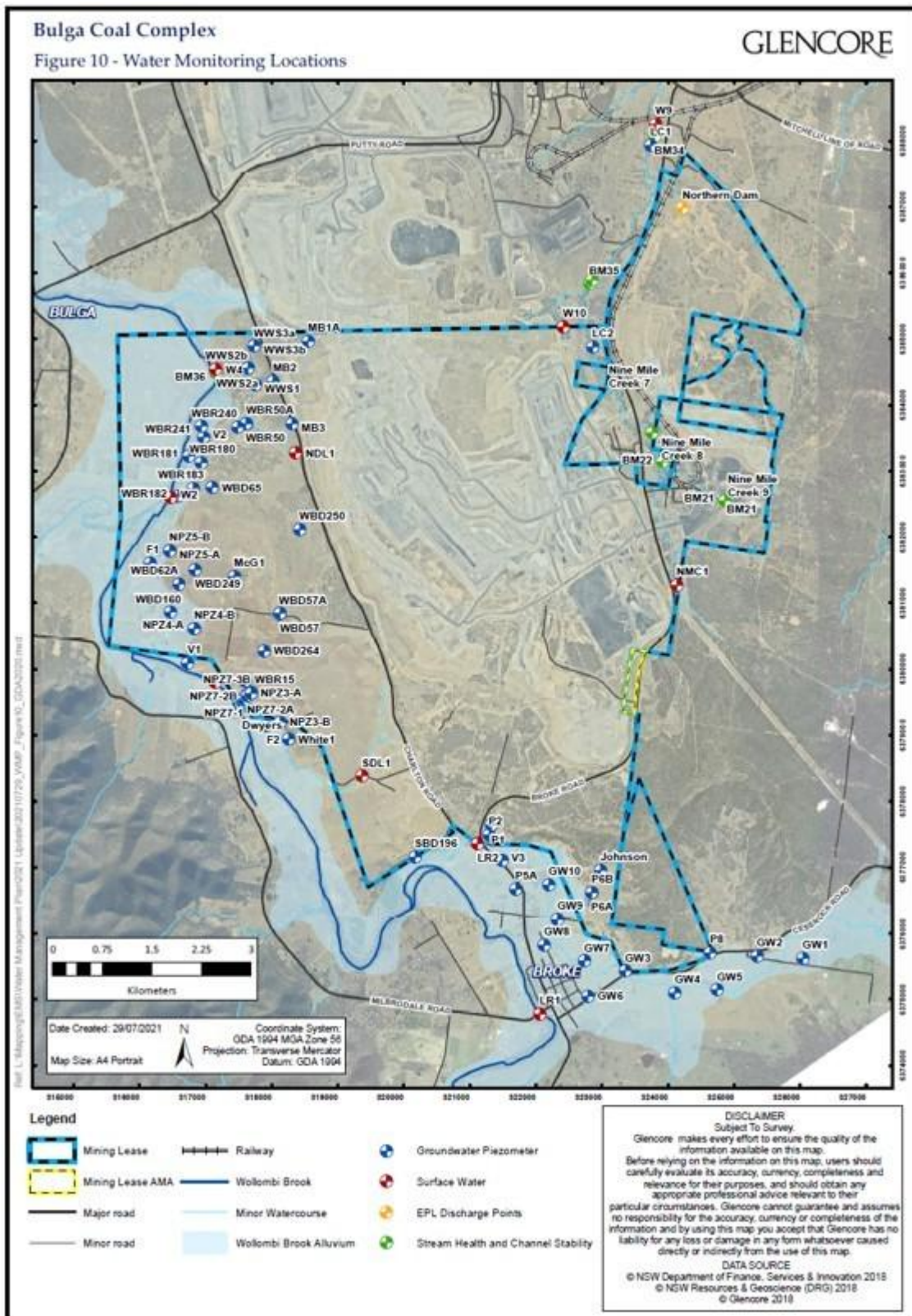


Figure 3-1 – Bulga Coal Water Quality Monitoring Sites

### 3.4 Groundwater results

The bi-monthly groundwater was undertaken in August 2025. Groundwater monitoring results are shown in **Table 3-1**. Long term trends of groundwater monitoring results are illustrated on **Figure 3-2** to **Figure 3-34**.

The pH and EC laboratory results were generally consistent with historical ranges observed to date except for pH at NPZ7-1 with no observed exceedances attributable to Bulga Coal. There were no samples collected for the Warkworth Sands groundwater monitoring points WWS2B and WWS3B for the Q3 2025 monitoring event. Long term trend analysis for all parameters measured throughout the year is assessed and discussed in detail in the Annual Review.

*Table 3-1 Bi-monthly Groundwater Monitoring*

Site	Date	Water elevation (mAHD)	Temp.(°C)	pH (lab)	EC (lab) (µS/cm)
<b>Broke Area Alluvials</b>					
GW1	20/08/2025	89.82	15.9	7.64	1240
GW2	20/08/2025	85.83	14.2	7.67	3320
GW4	20/08/2025	80.17	14	8.05	1480
GW5	20/08/2025	81.57	13.7	7.1	245
GW6	20/08/2025	75.71	15	8.22	7660
GW7	20/08/2025	74.96	14.2	7.34	2950
GW8	20/08/2025	72.95	16.4	7.65	3580
GW9	20/08/2025	73.26	15	7.47	663
GW10	20/08/2025	73.09	14.3	8.02	4300
V3	19/08/2025	69.56	18.7	7.49	2320
<b>Broke Area Wollombi Seam</b>					
P2	19/08/2025	69.09	15.7	8.12	11400
P5A	19/08/2025	69.36	17.9	8.38	7170
P6A	20/08/2025	68.84	17	7.5	1270
<b>Northern Area Shallow Alluvials</b>					
F1	21/08/2025	65.47	17.4	7.75	1120
F2	20/08/2025	66.19	17.2	7.75	1640
V1	20/08/2025	65.8	15	8.17	1240
V2	21/08/2025	61.57	17.7	6.77	125
WBR50A	21/08/2025	60.38	17.2	8.04	898
<b>SBC/Broke Area Lower Whybrow Seam</b>					
P1	20/08/2025	Bore blocked			
P6B	20/08/2025	-25.67	21.3	8.7	2840

<b>P8</b>	19/08/2025	ND	ND	ND	ND
<b>Northern Area Lower Whybrow Seam</b>					
<b>WBR50</b>	21/08/2025	30.28	18.3	7.33	1280
<b>Northern Alcheringa Seam</b>					
<b>WBD62A</b>	21/08/2025	66.89	17.5	7.46	567
<b>Beltana Area Miscellaneous Bores &amp; Wells</b>					
<b>Dwyers</b>	20/08/2025	64.43	16	8.03	1670
<b>Fernance</b>	20/08/2025	65.89	15.8	8.34	1410
<b>McG1</b>	21/08/2025	93.19	18.3	8.04	295
<b>WBR15</b>	20/08/2025	66.1	18.5	7.94	667
<b>White 1</b>	20/08/2025	66.55	17.6	8.02	2220
<b>Beltana Area NPZ</b>					
<b>NPZ3-B</b>	20/08/2025	66.39	17.6	8.07	777
<b>NPZ4-A</b>	21/08/2025	66.22	17.7	7.66	625
<b>NPZ4-B</b>	21/08/2025	51.6	17.9	7.7	1370
<b>NPZ5-A</b>	21/08/2025	65.27	17.4	7.21	763
<b>NPZ5-B</b>	21/08/2025	49.95	18.3	7.9	2560
<b>NPZ7-1</b>	20/08/2025	65.79	15.3	8.4	1150
<b>NPZ7-2A</b>	20/08/2025	65.77	18.3	7.91	1640
<b>NPZ7-2B</b>	20/08/2025	63.71	18.5	8.25	1260
<b>NPZ7-3A</b>	20/08/2025	65.82	18.1	7.83	1470
<b>NPZ7-3B</b>	20/08/2025	66.44	18.3	8.22	1170
<b>Wollombi Alluvials and Shallow Coal Measures</b>					
<b>SBD196</b>	21/08/2025	69.43	17.4	7.66	2920
<b>WBD160</b>	21/08/2025	66.52	18.5	7	102
<b>WBR180</b>	21/08/2025	36.13	19.1	7.81	20400
<b>WBR181</b>	19/08/2025	61.86	17.2	7.64	3170
<b>WBR182</b>	19/08/2025	63.75	17	7.86	1540
<b>WBR183</b>	21/08/2025	62.5	18.3	7.78	2850
<b>WBR240</b>	21/08/2025	61.34	17	7.87	614
<b>WBR241</b>	21/08/2025	61.86	17.7	7.1	371
<b>Loders Creek Alluvials</b>					
<b>LC1</b>	19/08/2025	Dry – unable to retrieve sample			
<b>LC2</b>	19/08/2025	43.31	14.7	7.82	3230

<b>Warkworth Sands</b>					
<b>WWS2B</b>	19/08/2025	94.15	<i>ND</i>	<i>ND</i>	<i>ND</i>
<b>WWS3B</b>	19/08/2025	83.42	<i>ND</i>	<i>ND</i>	<i>ND</i>

*ND – No data available*

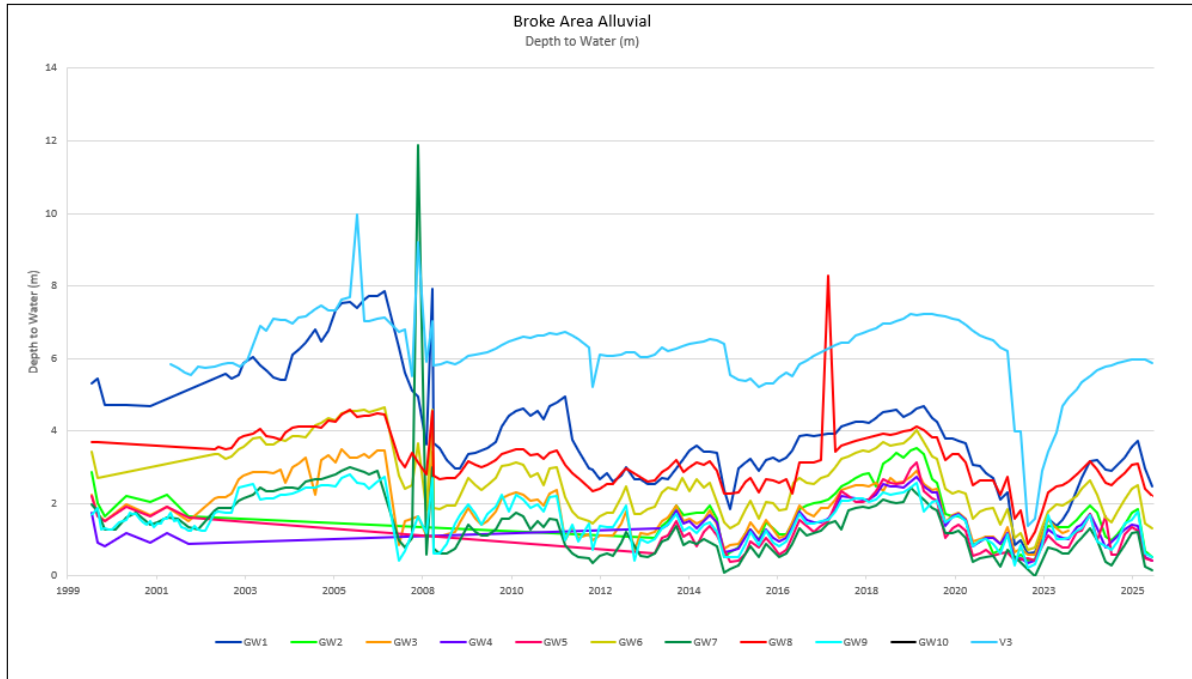


Figure 3-2 Broke Area Alluvial - Depth to water.

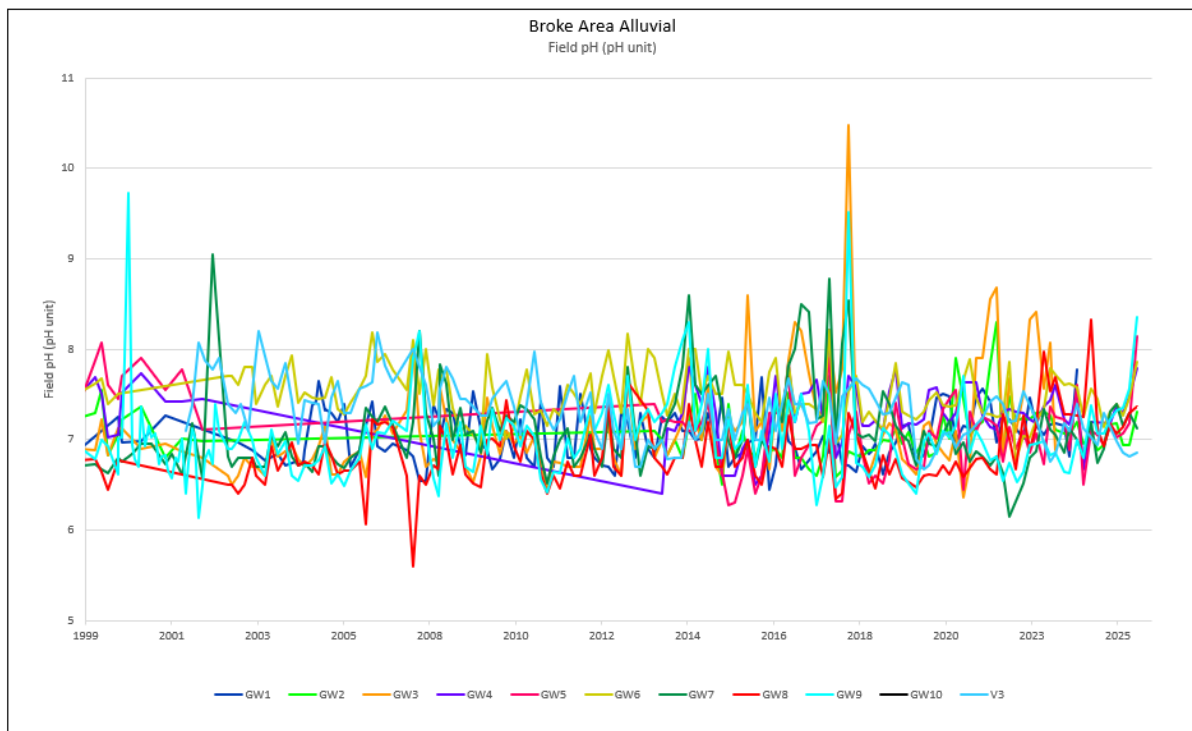


Figure 3-3 Broke Area Alluvial – Field pH

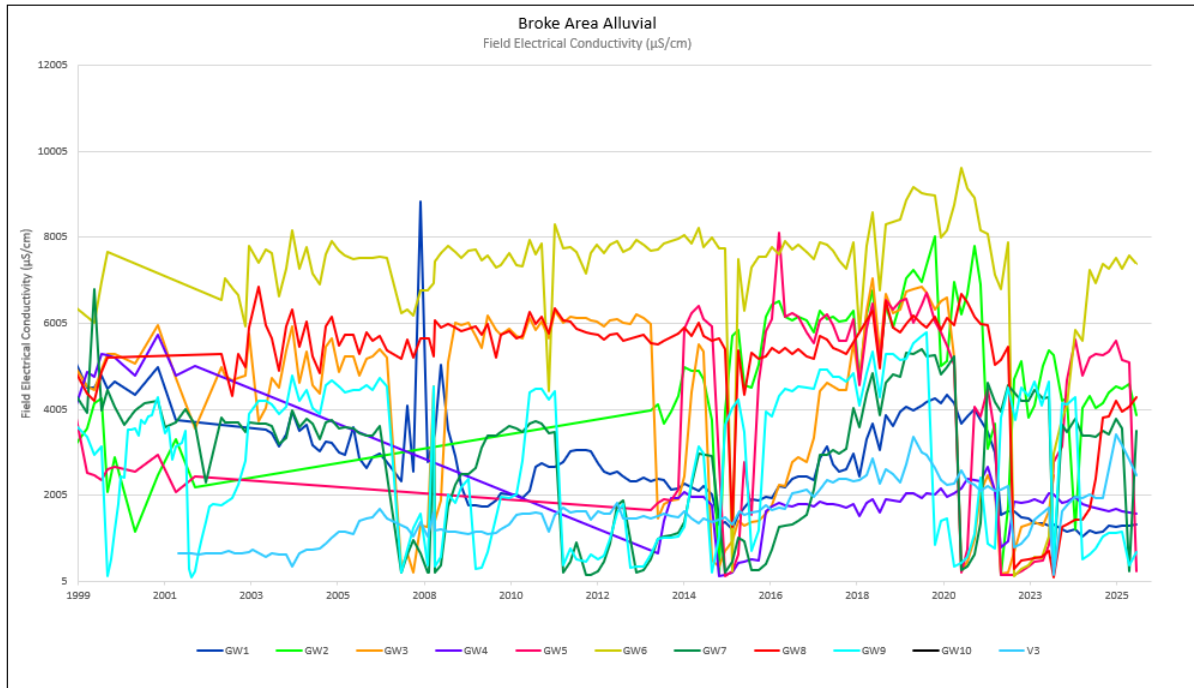


Figure 3-4 Broke Area Alluvial – Field EC

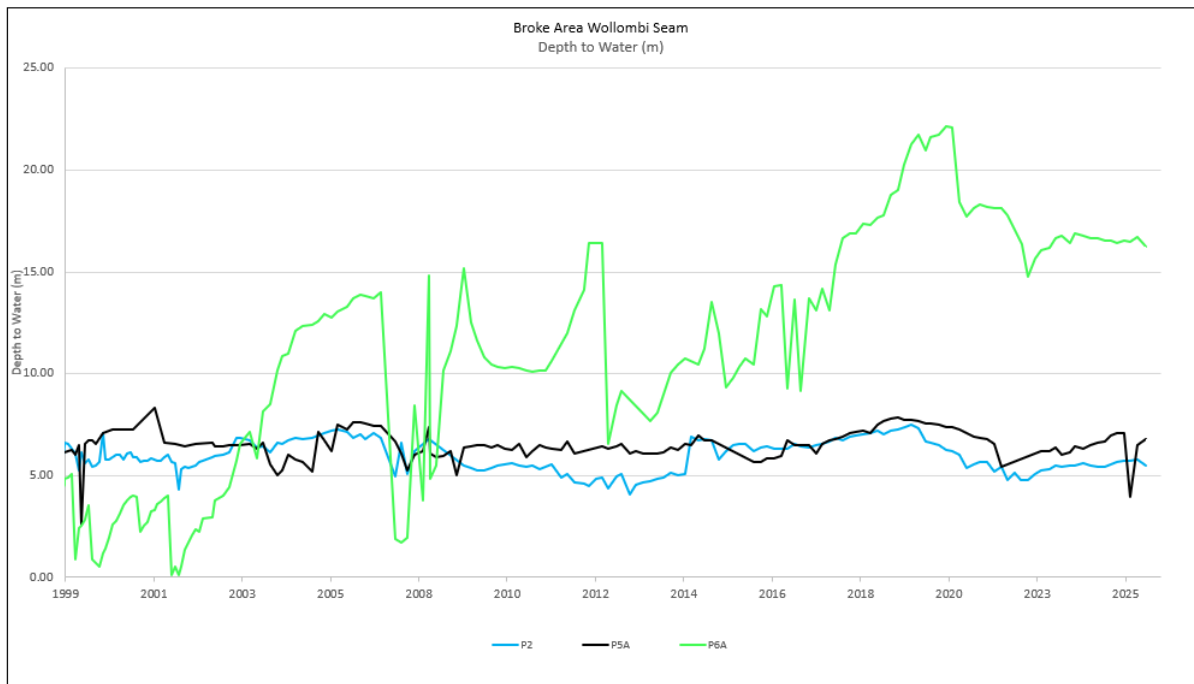


Figure 3-5 Broke Area Wollombi Seam - Depth to water

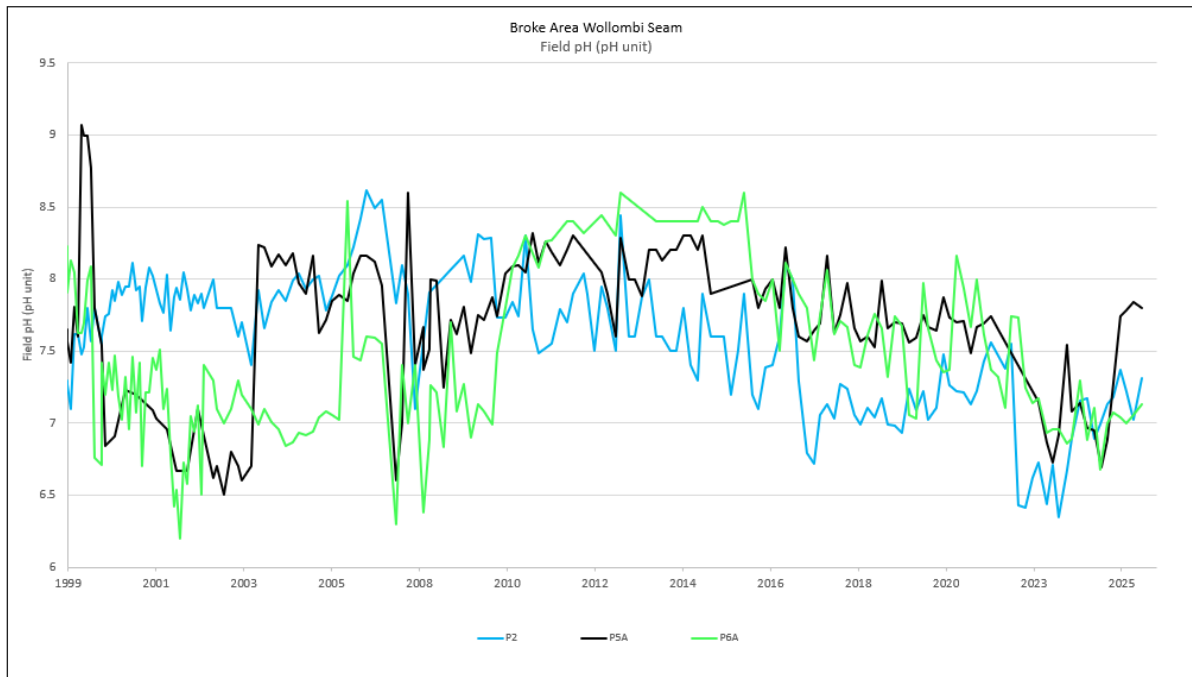


Figure 3-6 Broke Area Wollombi Seam – Field pH

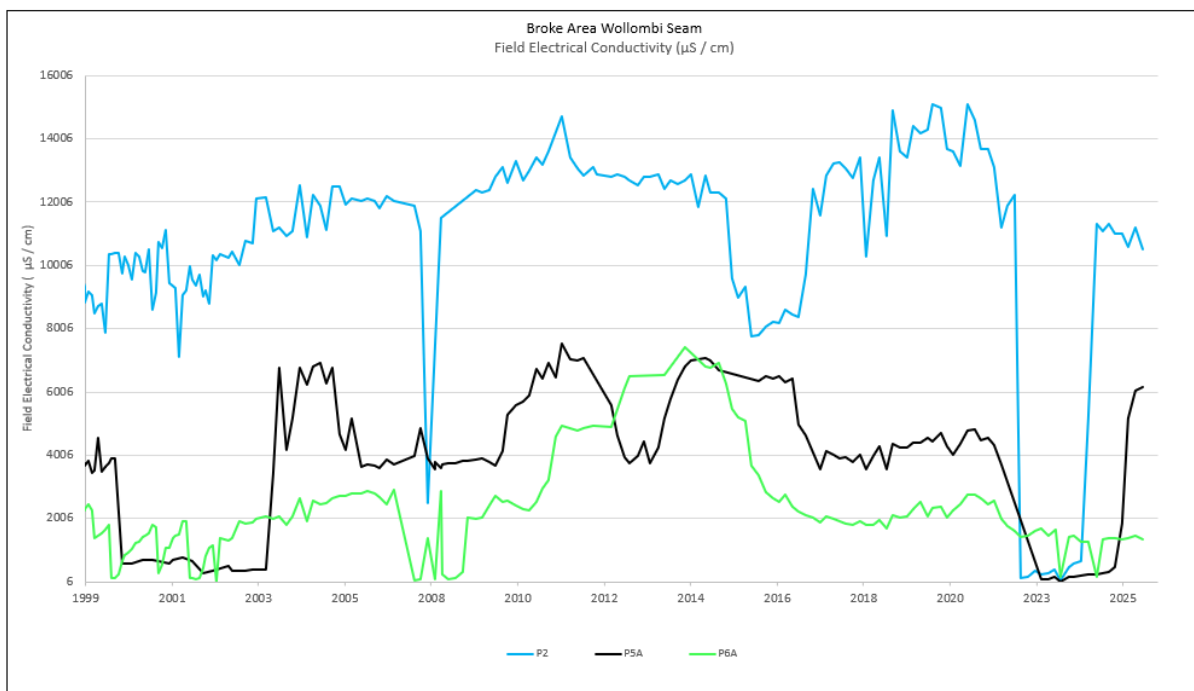


Figure 3-7 Broke Area Wollombi Seam – Field EC

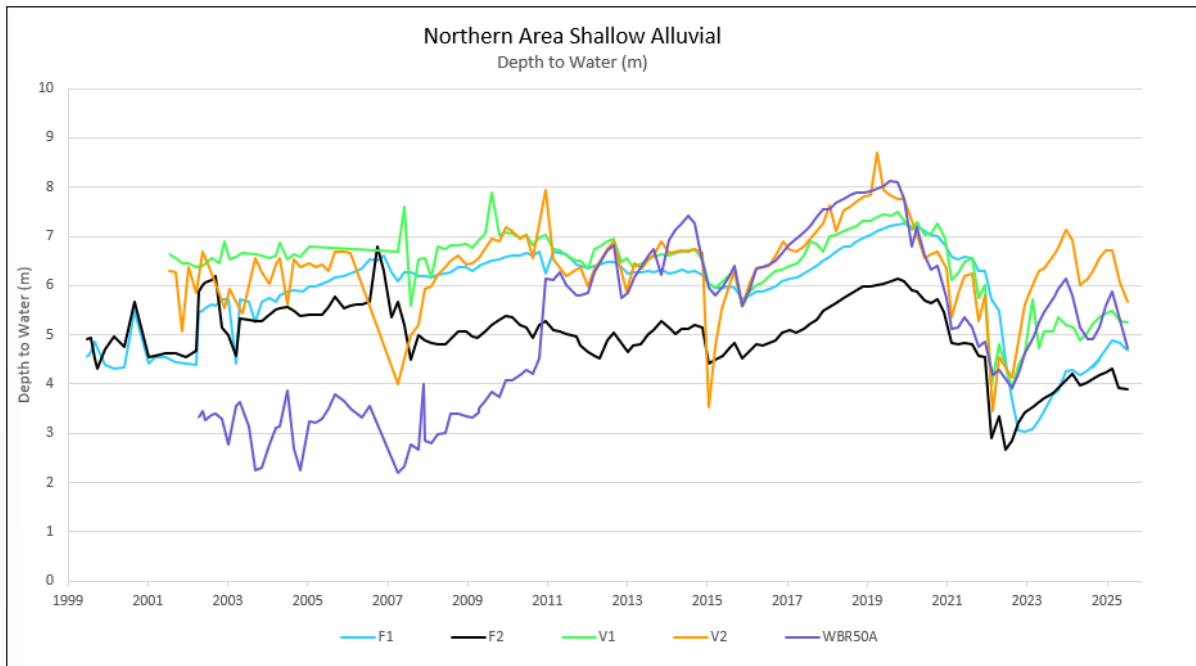


Figure 3-8 Northern Area Shallow Alluvial - Depth to water

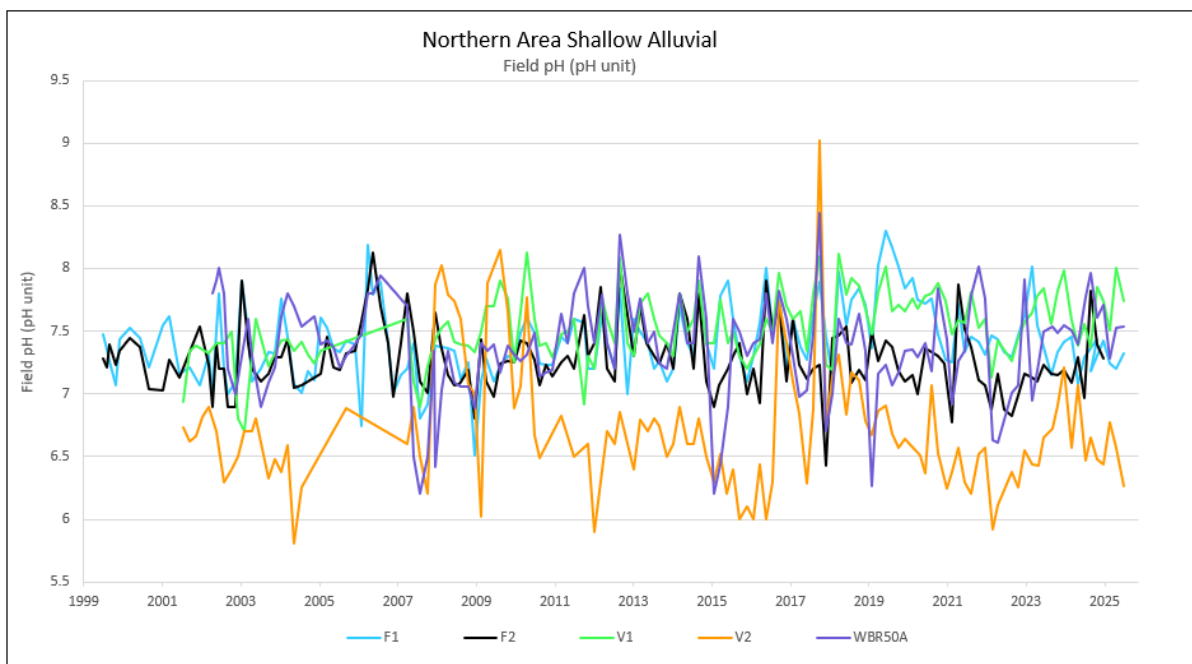


Figure 3-9 Northern Area Shallow Alluvial - Field pH

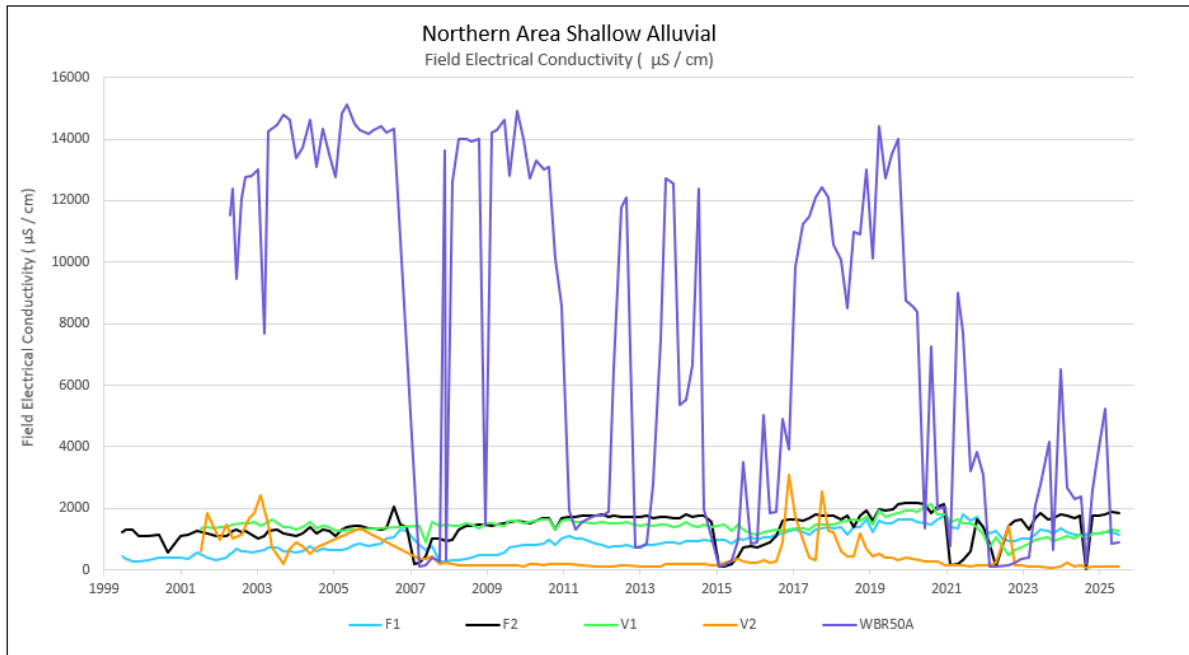


Figure 3-10 Northern Area Shallow Alluvial – Field EC

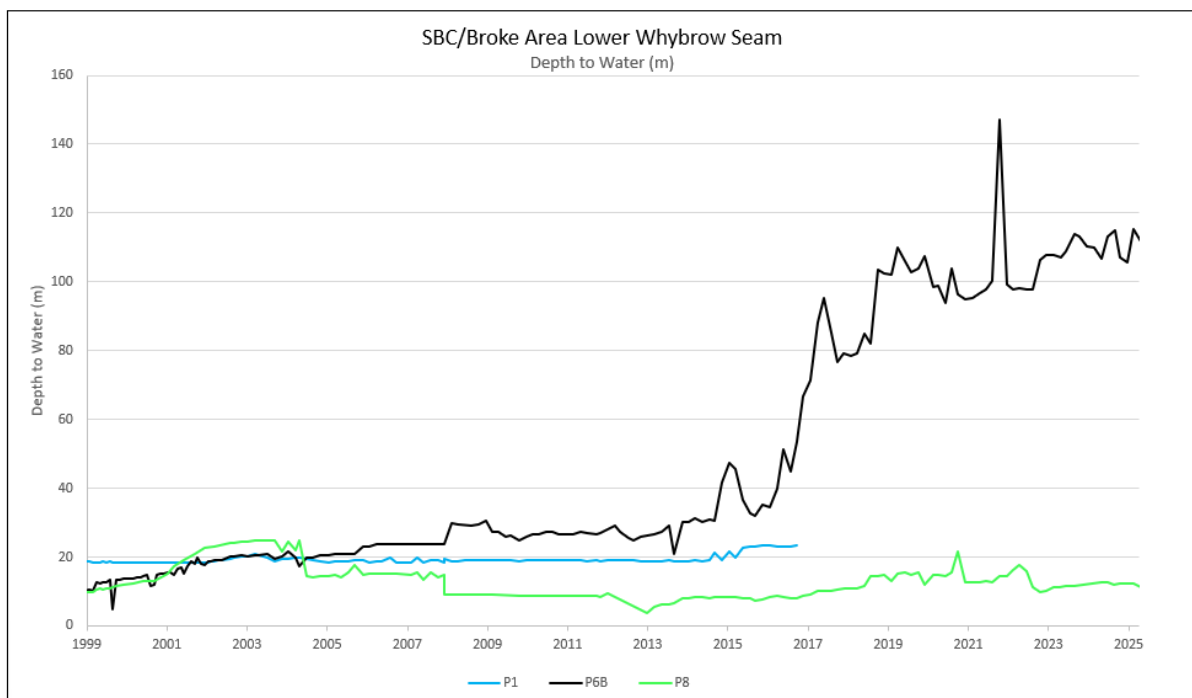


Figure 3-11 SBC/Broke Area Lower Whybrow Seam - Depth to water

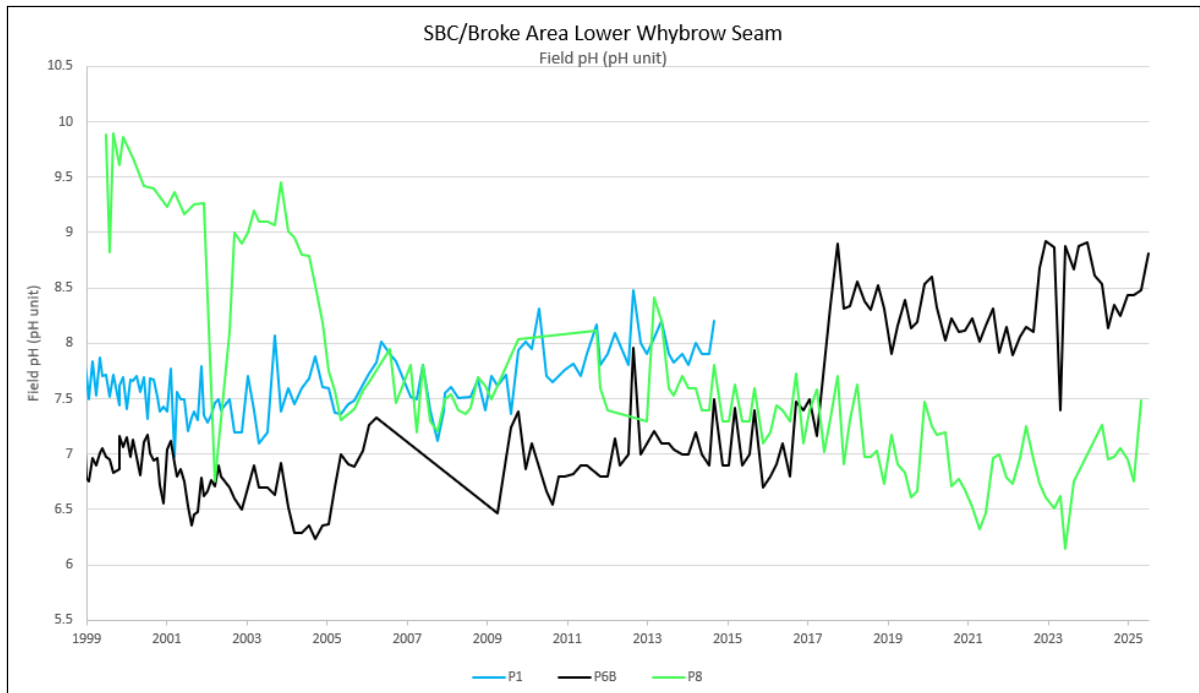


Figure 3-12 SBC/Broke Area Lower Whybrow Seam – Field pH

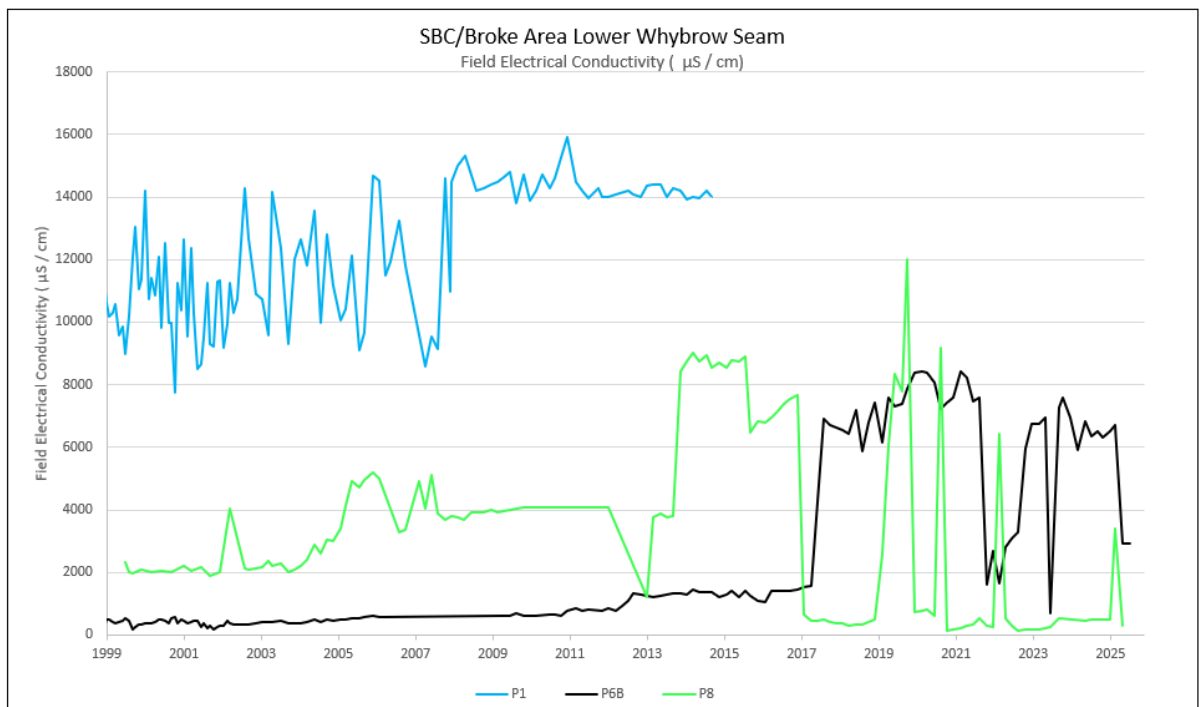


Figure 3-13 SBC/Broke Area Lower Whybrow Seam – Field EC

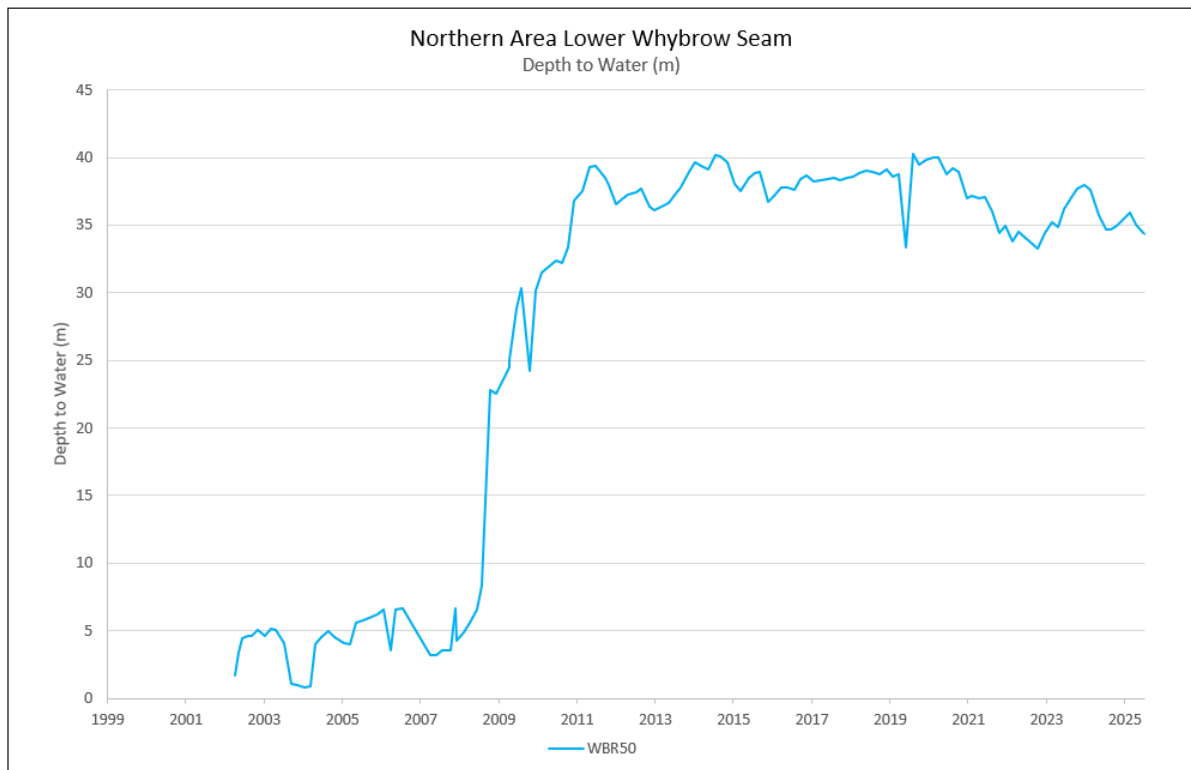


Figure 3-14 Northern Area Lower Whybrow Seam - Depth to water

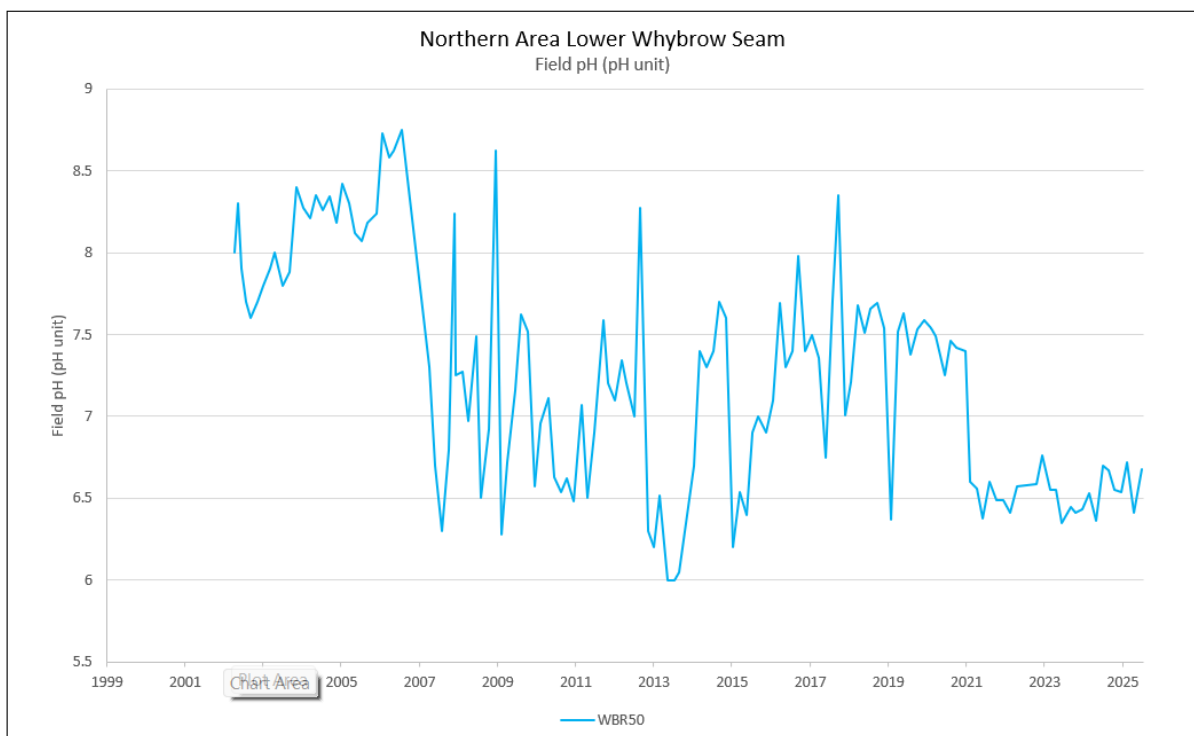


Figure 3-15 Northern Area Lower Whybrow Seam – Field pH

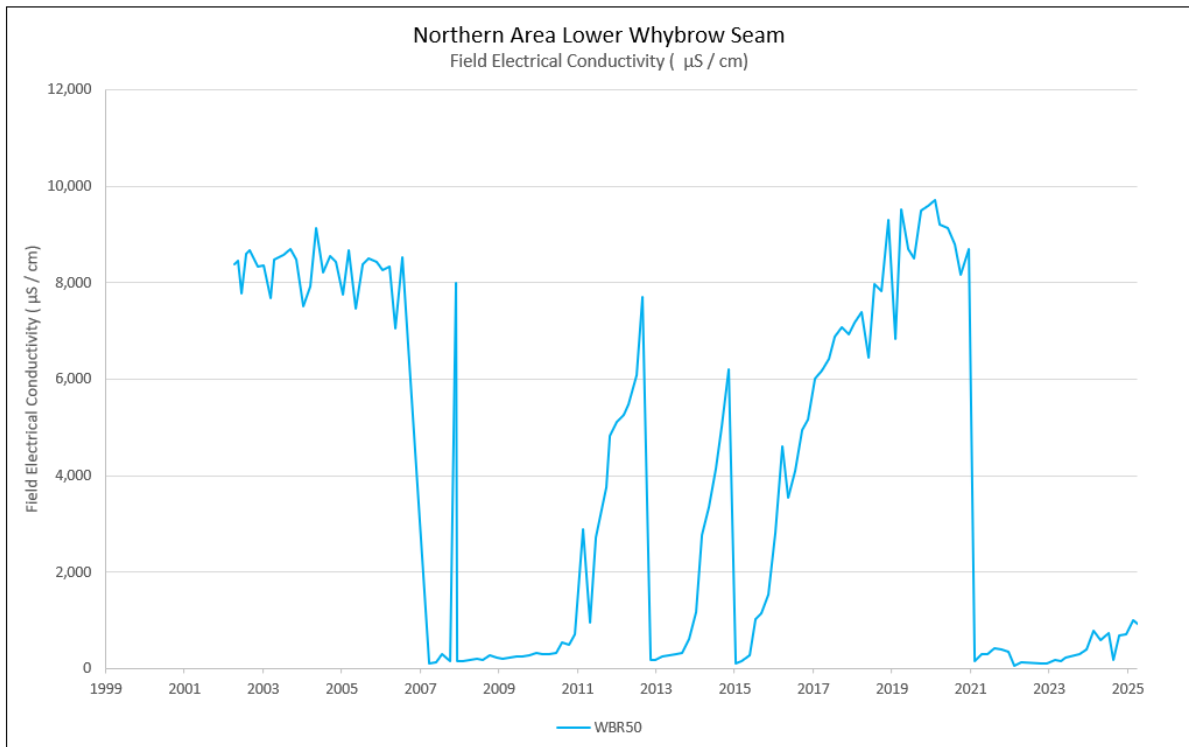


Figure 3-16 Northern Area Lower Whybrow Seam – Field EC

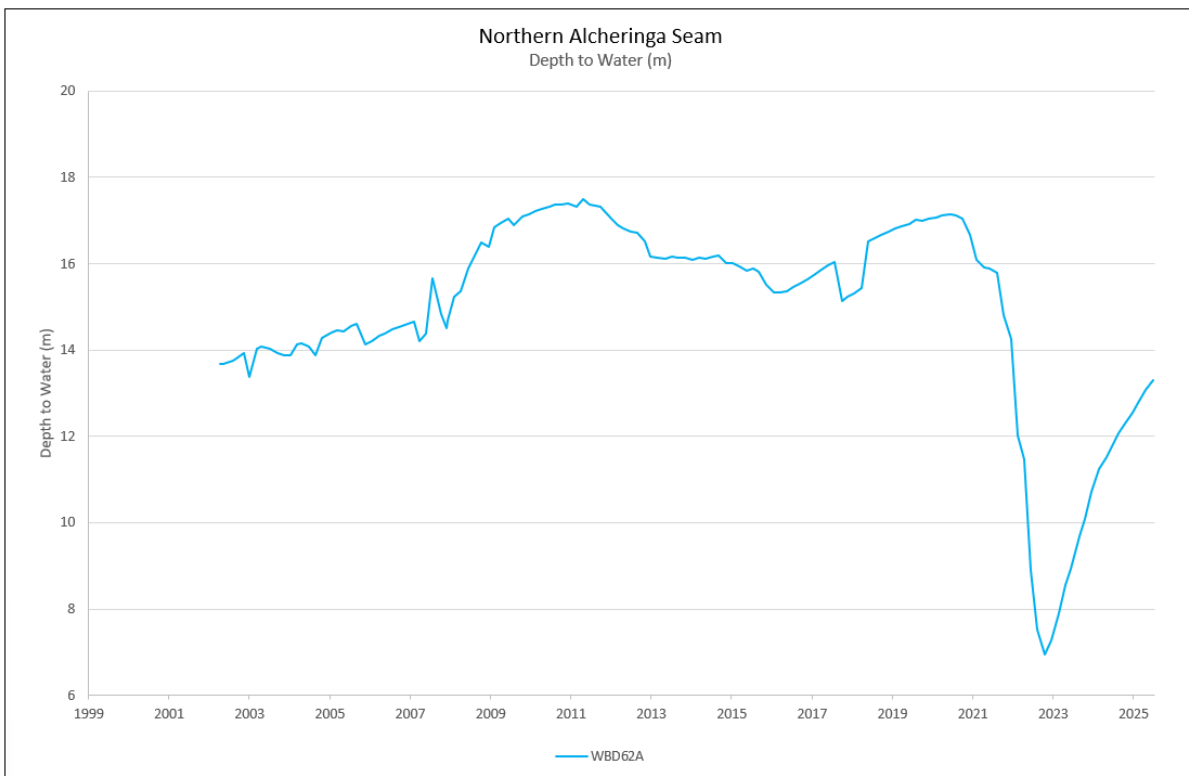


Figure 3-17 Northern Alcheringa Seam - Depth to water

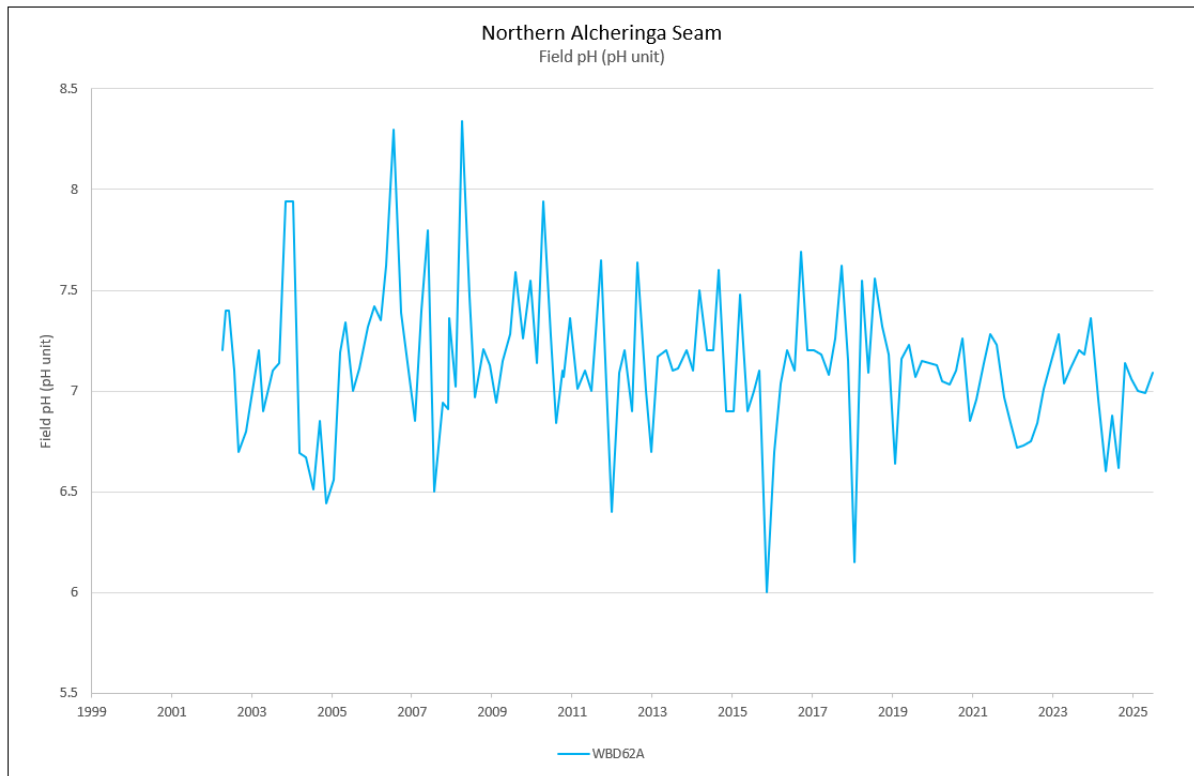


Figure 3-18 Northern Alcheringa Seam – Field pH

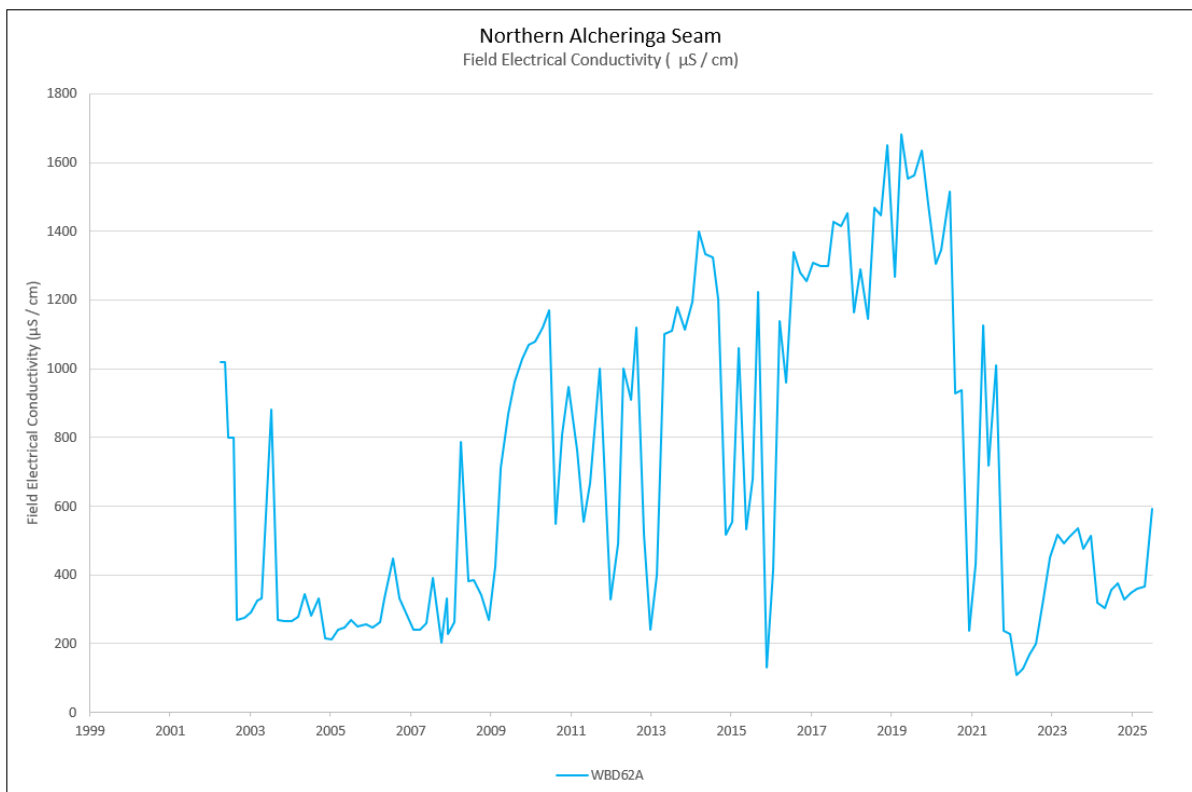


Figure 3-19 Northern Alcheringa Seam – Field EC

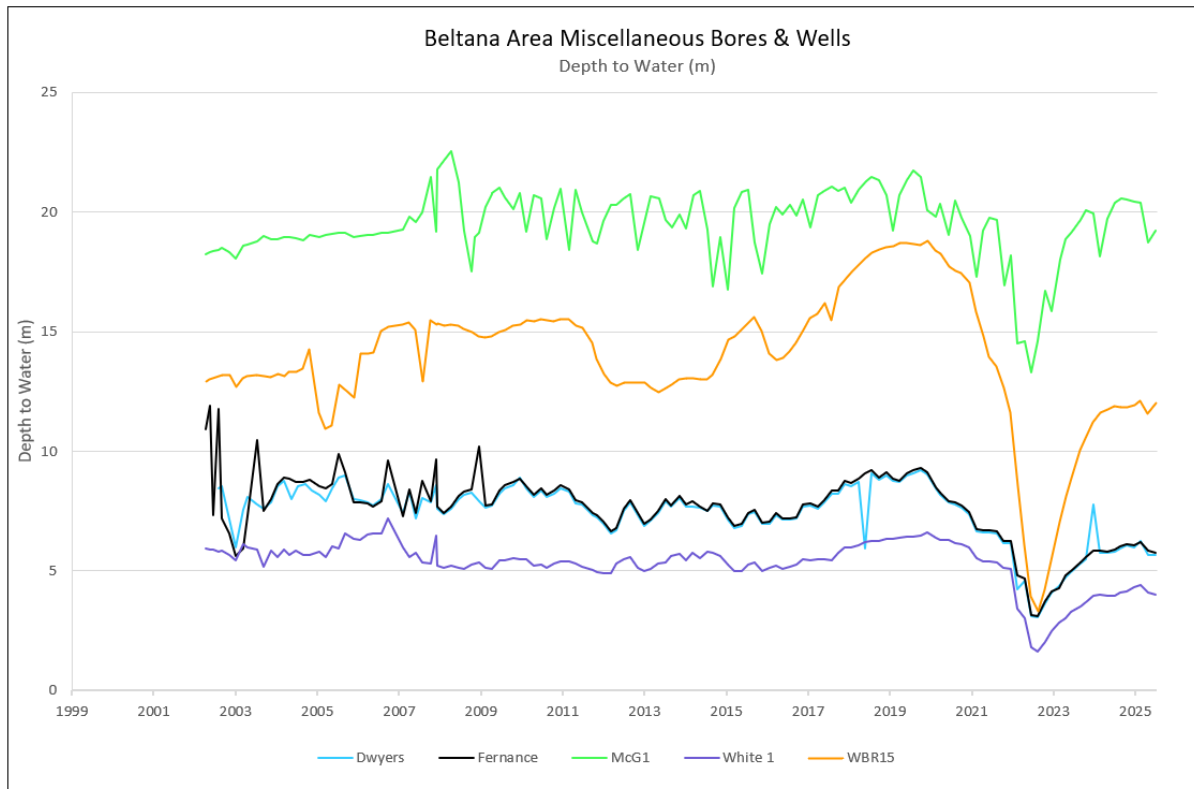


Figure 3-20 Beltana Area Miscellaneous Bores & Wells - Depth to water

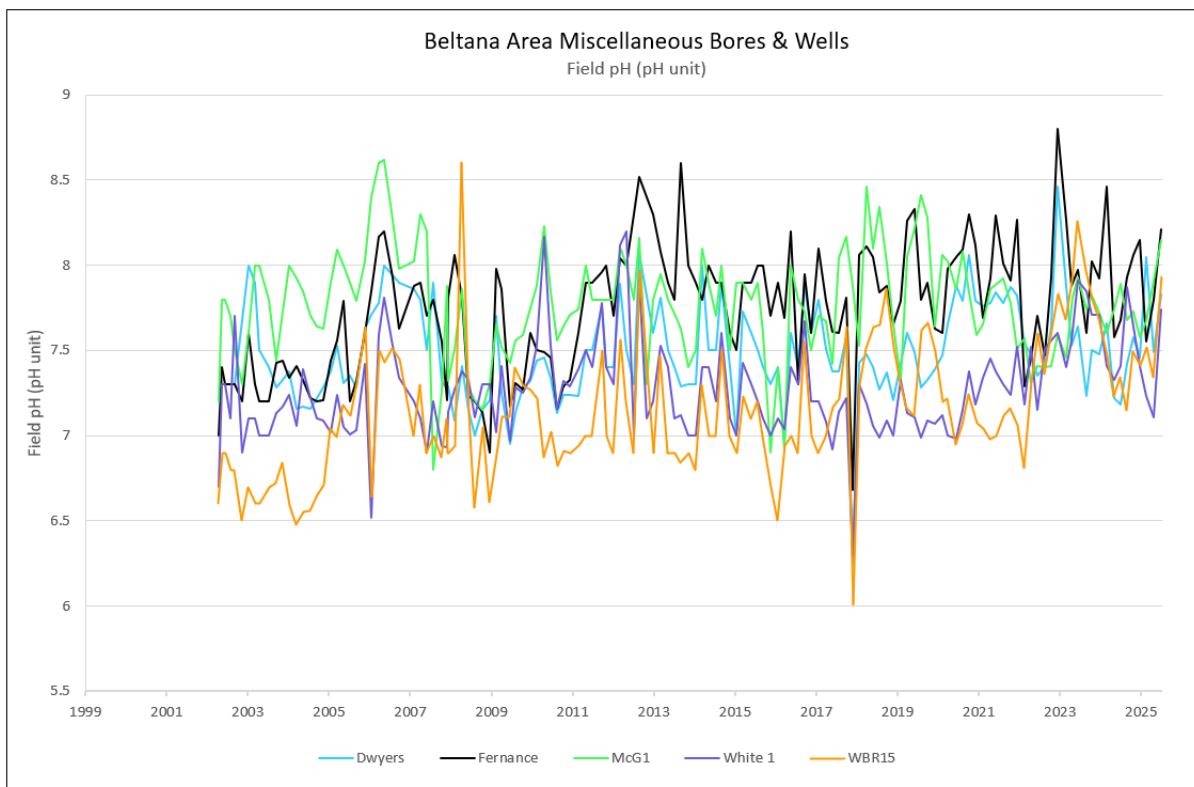


Figure 3-21 Beltana Area Miscellaneous Bores & Wells – Field pH

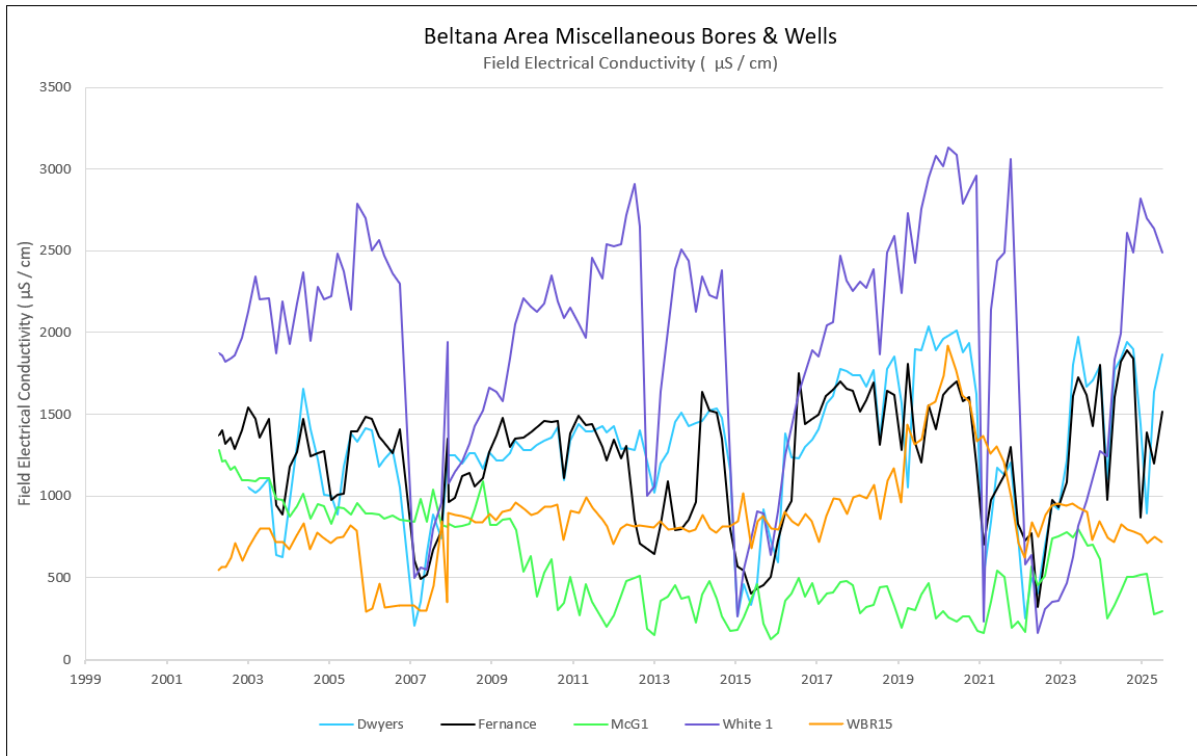


Figure 3-22 Beltana Area Miscellaneous Bores & Wells – Field EC

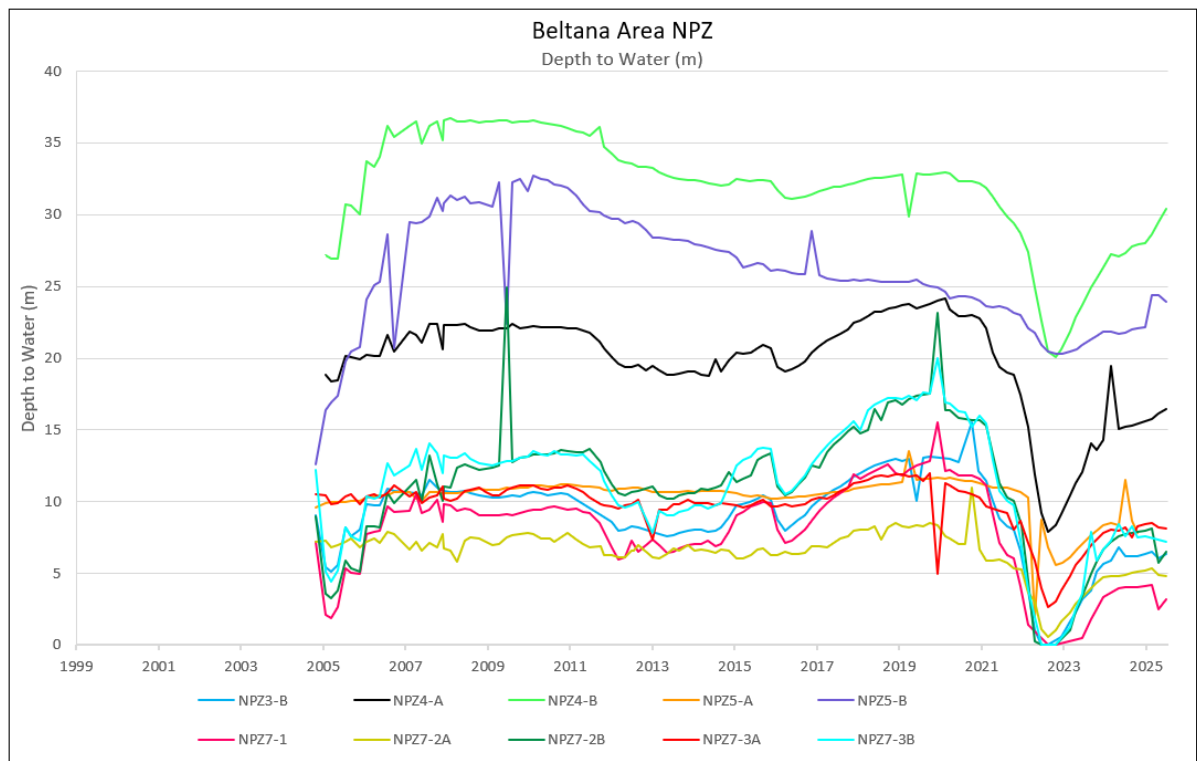


Figure 3-23 Beltana Area NPZ - Depth to water

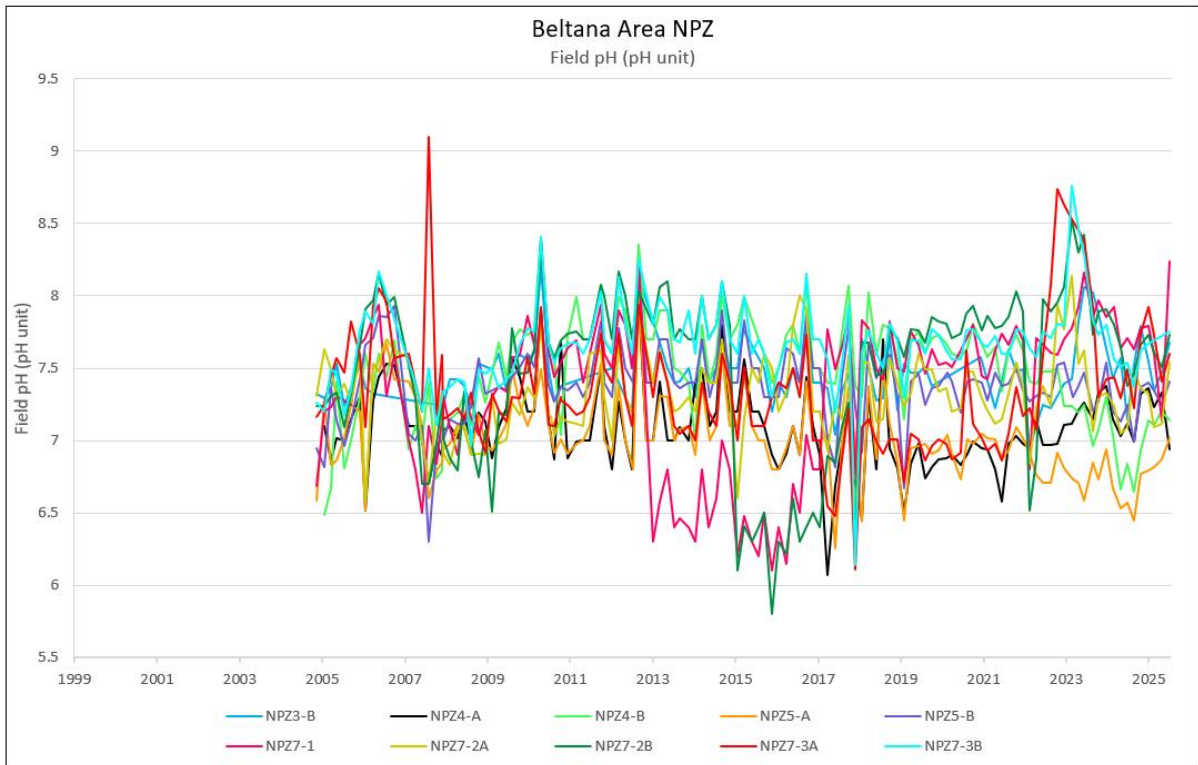


Figure 3-24 Beltana Area NPZ – Field pH

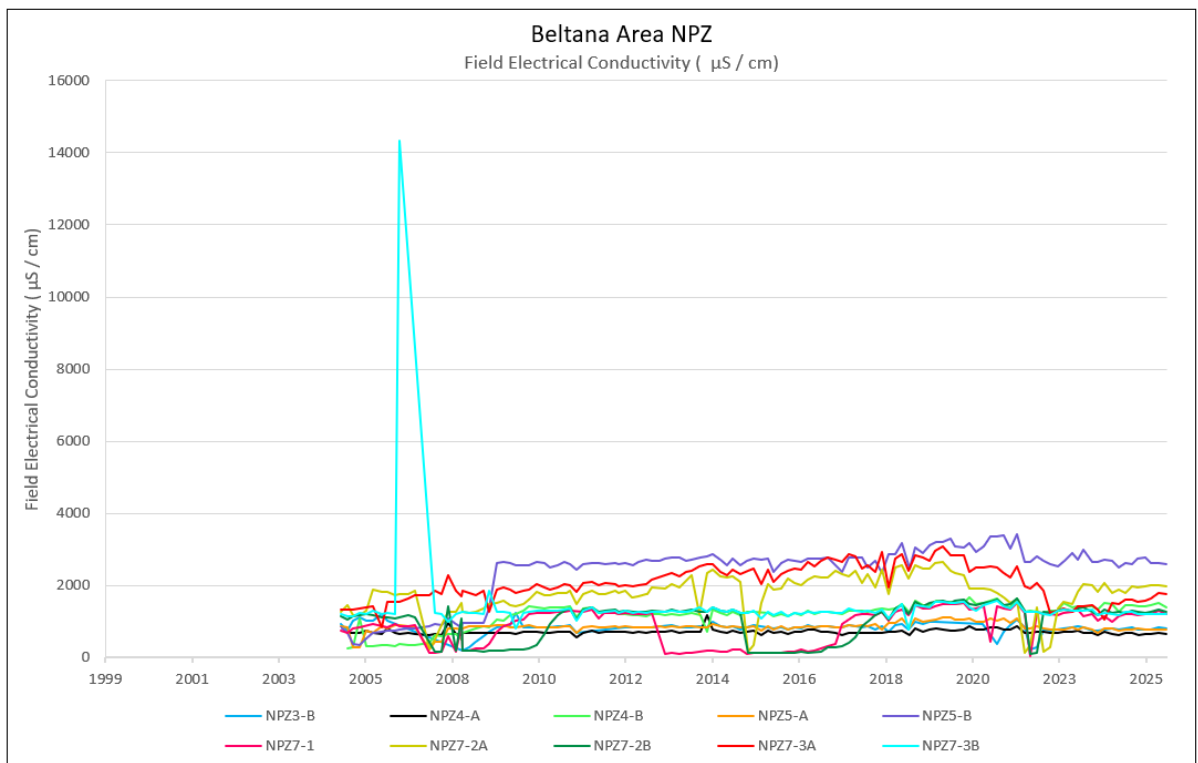


Figure 3-25 Beltana Area NPZ – Field EC

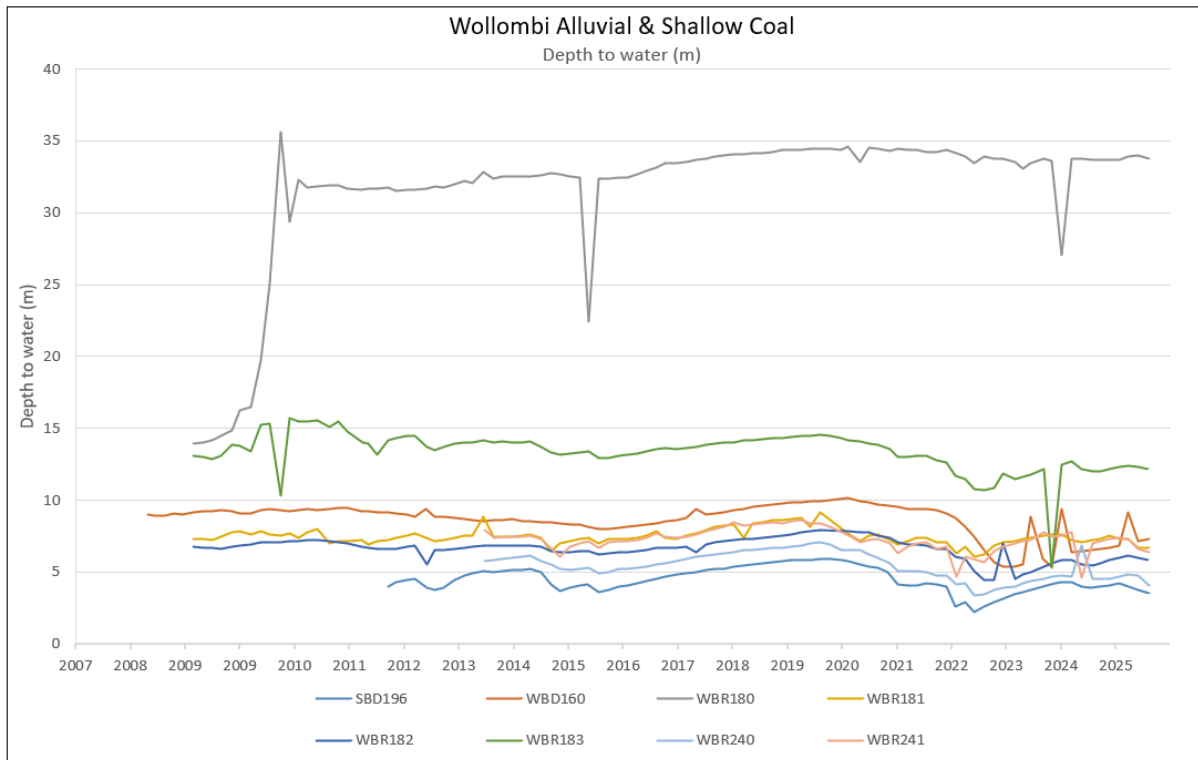


Figure 3-26 Wollombi Alluvial & Shallow Coal Measures - Depth to water

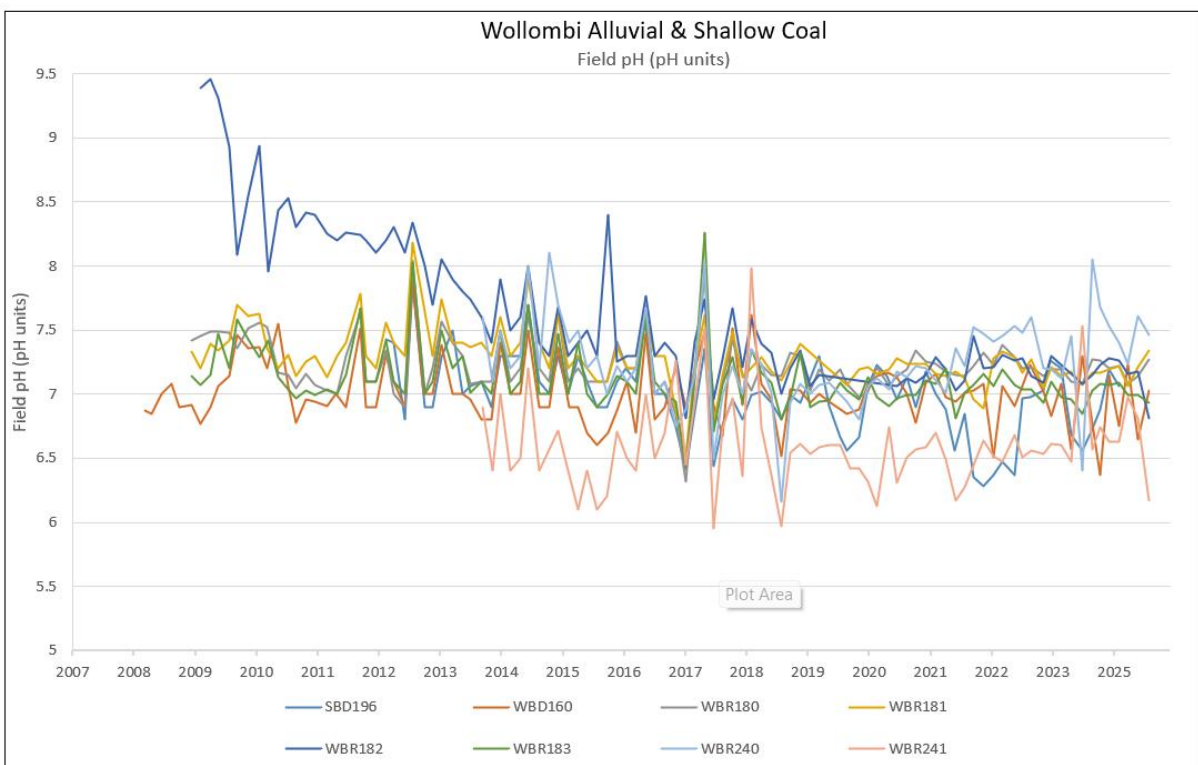


Figure 3-27 Wollombi Alluvial & Shallow Coal Measures – Field pH

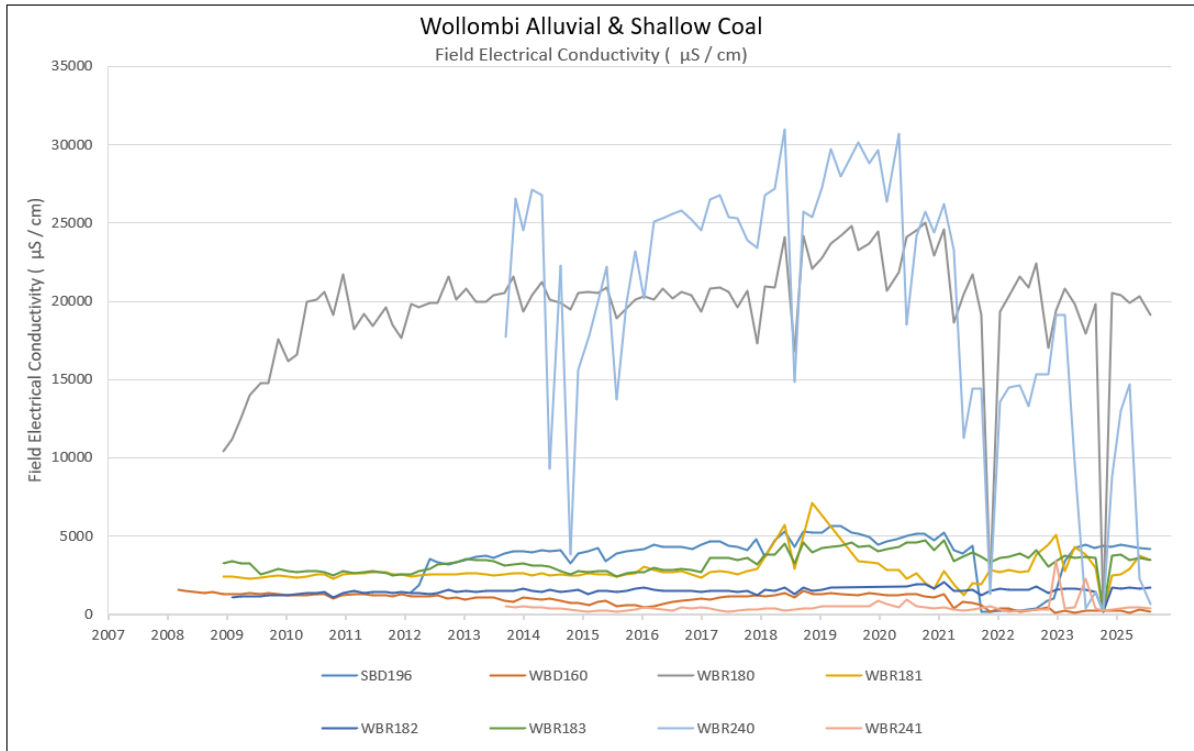


Figure 3-28 Wollombi Alluvial & Shallow Coal Measures – Field EC

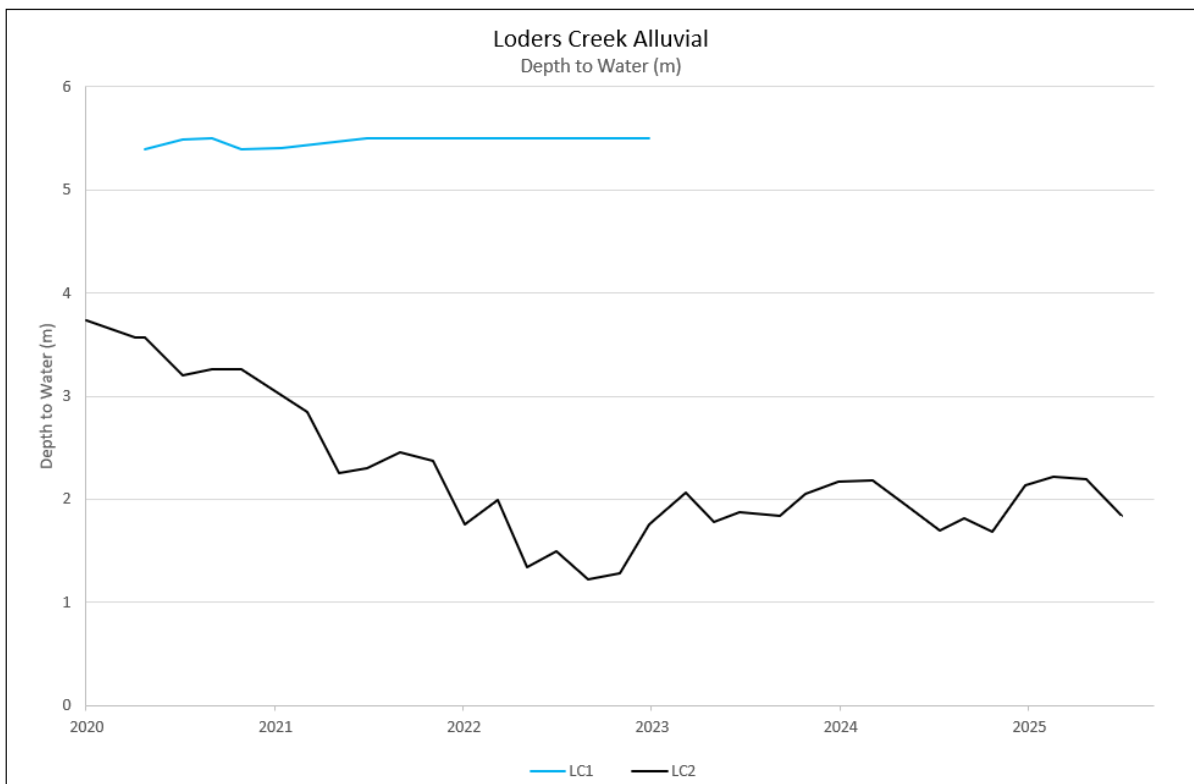


Figure 3-29 Loders Creek Alluvial - Depth to water

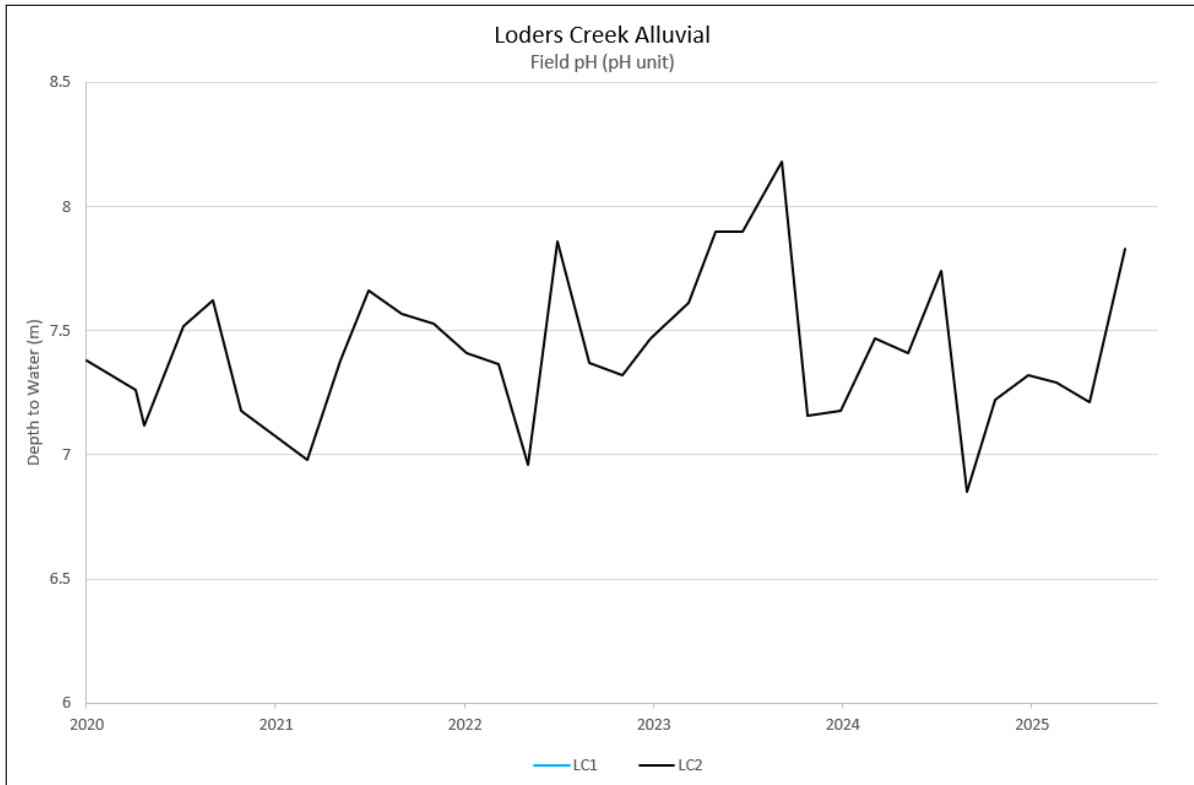


Figure 3-30 Loders Creek Alluvial – Field pH

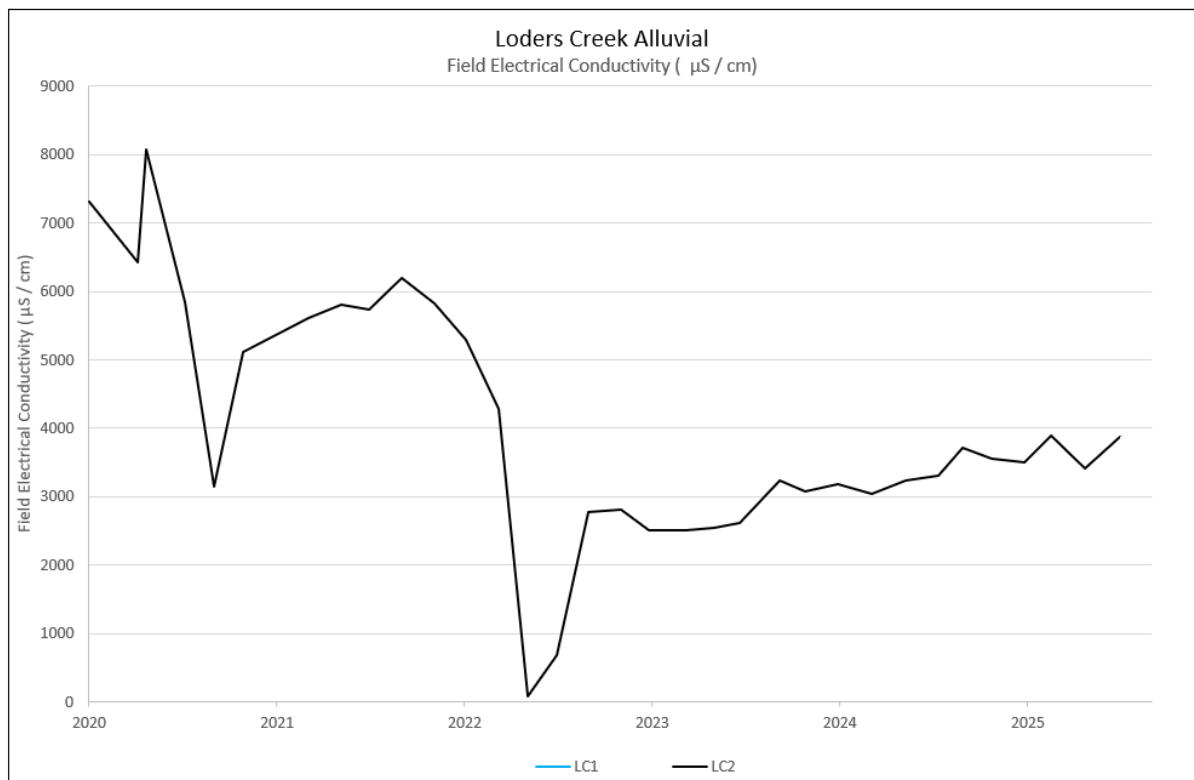


Figure 3-31 Creek Alluvial – Field EC

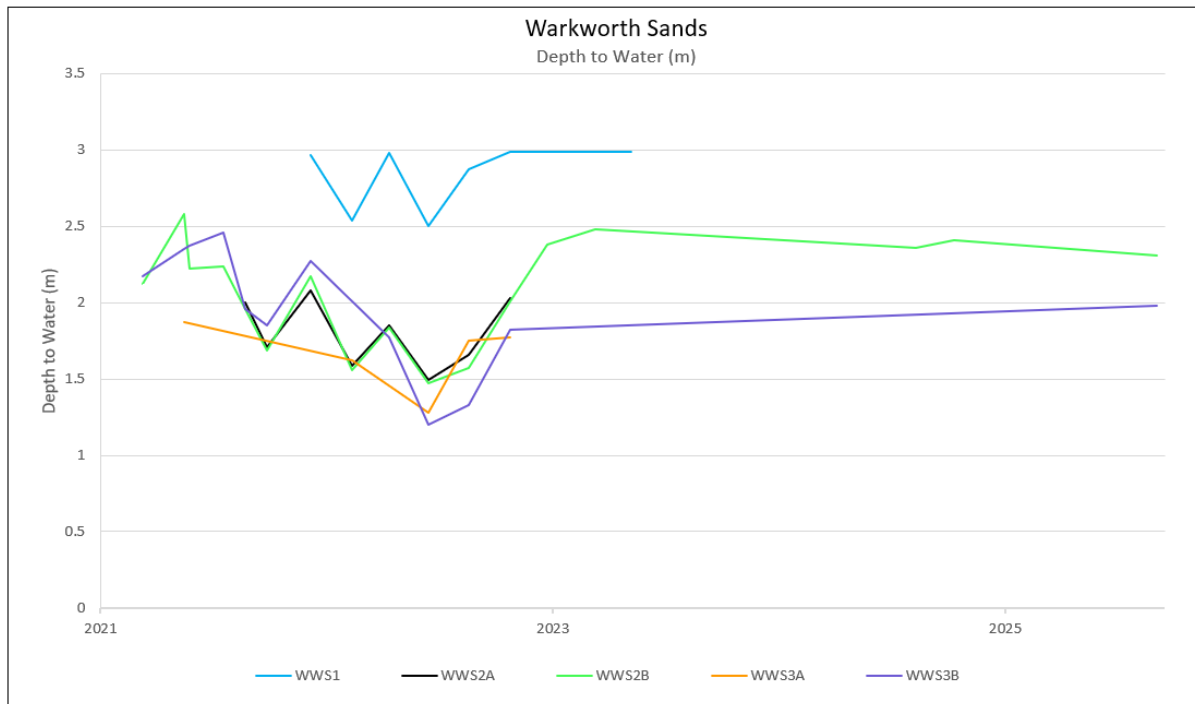


Figure 3-32 Warkworth Sands - Depth to water

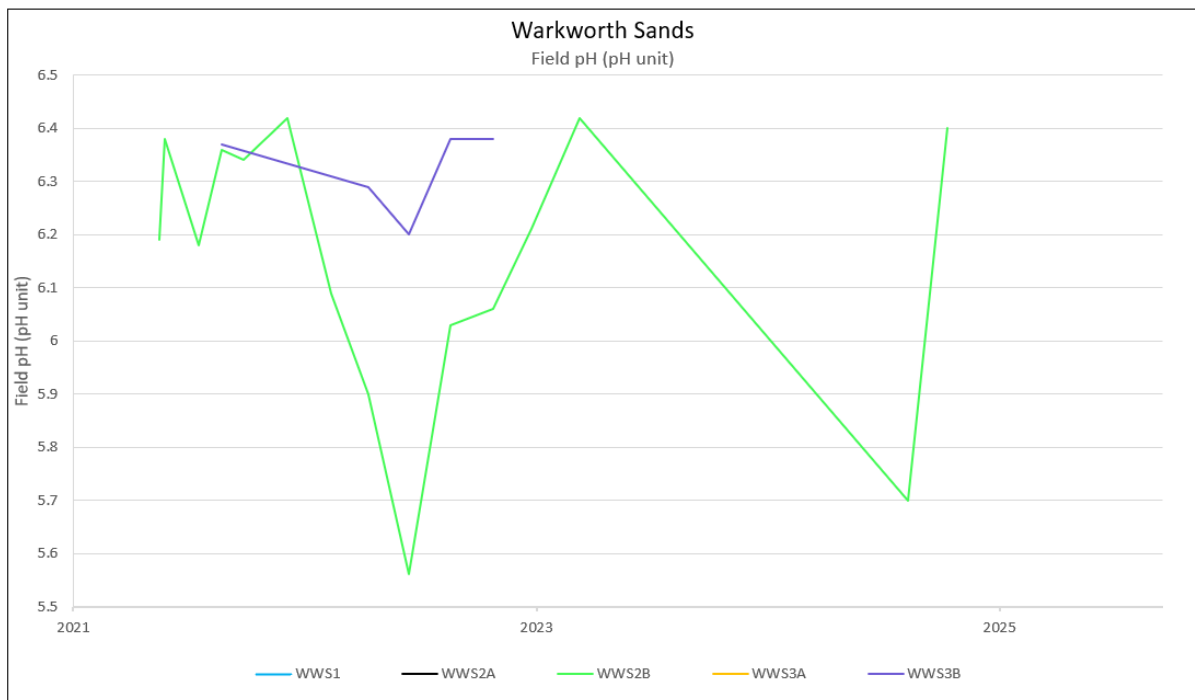


Figure 3-33 Warkworth Sands – Field pH

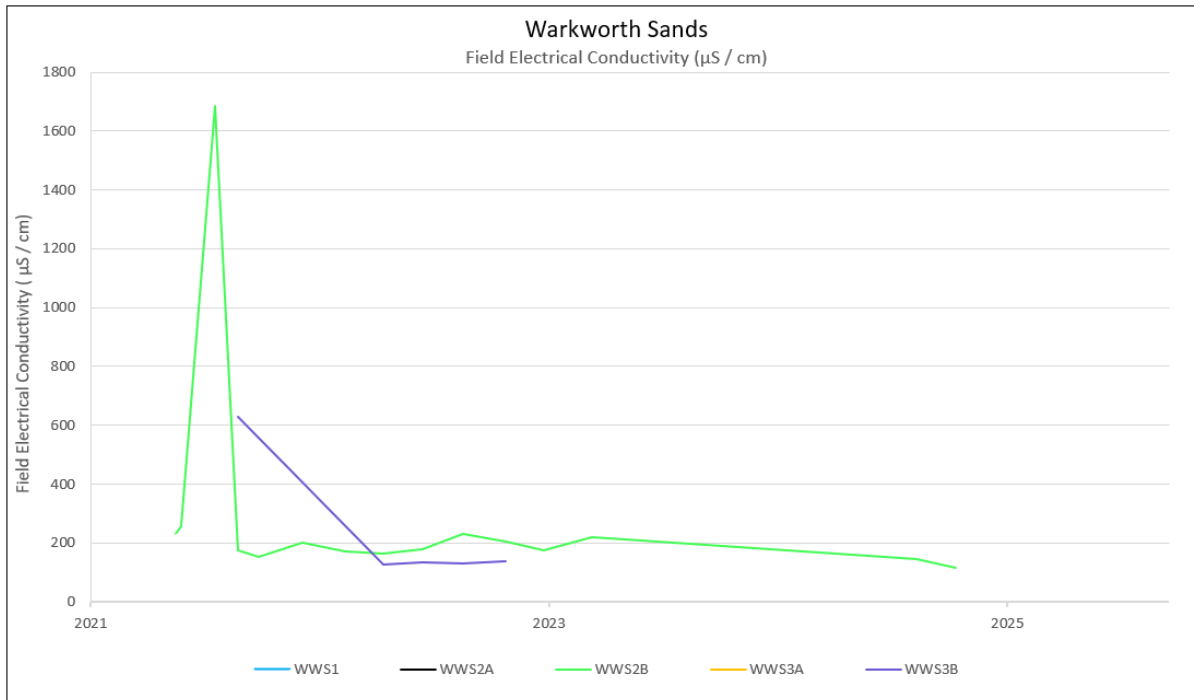


Figure 3-34 Warkworth Sands – Field EC

## 4. Surface Water

---

### 4.1 Requirements

Surface water quality monitoring is conducted at the Bulga Coal Complex in accordance with the site's approved Water Management Plan. The approved monitoring locations are located:

- Wollombi Brook (W2, W4, LR1, and LR5),
- Loders Creek (W9 and W10),
- Monkey Place Creek (LR2);
- Southern Drainage Line (SDL1);
- Northern Drainage Line (NDL1); and
- Nine Mile Creek (NMC1).

Monitoring locations LR1 and LR5 are considered representative of water quality upstream of the Bulga Coal Complex mining operations, while W4 is downstream. NDL1 represents the Northern drainage line and SDL1 represents the Southern drainage line.

Water quality in Wollombi Brook is generally good with low salinity and neutral pH. Monkey Place Creek, Loders Creek, Nine Mile Creek and the minor ephemeral drainage lines within the mining lease typically have poor quality water, which is alkaline and highly saline, except during high rainfall events (Mackie, 2003). The salinity was attributed in the 1980 EIS to seepage from the Saltwater Creek coal measures which subcrop in areas of Loders Creek (MER 2013).

### 4.2 Method

Surface water quality is monitored monthly. Electrical conductivity, pH and total suspended solids are monitored. Water is collected using an extendible water sampler and transferred into bottles for analysis. Some water quality parameters are measured on site (such as water depth and temperature), while others are performed by a NATA accredited laboratory (pH, electrical conductivity (EC) and total suspended solids (TSS)).

Surface waters are sampled in accordance with Australian Standards [AS5667.4 \(1998\)](#) "Water Quality Sampling—Guidance on sampling from lakes, natural and man-made" and [AS5667.6 \(1998\)](#) "Water Quality Sampling—Guidance on sampling of rivers and streams".

### 4.3 Surface Water Results

Surface water monitoring locations are shown in **Figure 3-1**. **Table 4-1** provides the surface water monitoring results. Year to date and long term water quality charts are shown in **Figure 4-1** to **Figure 4-3**.

*Table 4-1 – Summary of Surface Water Monitoring Results*

Sample Site	Date/Time Sampled	Lab pH (pH unit)	Lab Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
<b>July 2025</b>				
LR1	22/07/2025	7.19	364	6
LR2	22/07/2025	7.64	2070	23
LR5	22/07/2025	7.27	440	6
W2	22/07/2025	7.28	453	<5.0
W4	22/07/2025	7.26	454	<5.0
W9*	22/07/2025	8.09	10300	13
W10	21/07/2025	*	*	*
NDL1	22/07/2025	*	*	*
NMC1	21/07/2025	*	*	*
SDL1	22/07/2025	*	*	*
<b>August 2025</b>				
LR1	19/08/2025	7.22	290	5
LR2	19/08/2025	7.57	1080	12
LR5	19/08/2025	7.15	316	<5.0
W2	19/08/2025	7.06	319	<5.0
W4	19/08/2025	7.02	317	<5.0
W9*	19/08/2025	8.63	6220	5
W10	18/08/2025	*	19300	<5.0
NDL1	19/08/2025	*	*	*
NMC1	18/08/2025	8.42	973	<5.0
SDL1	19/08/2025	*	*	*

Sample Site	Date/Time Sampled	Lab pH (pH unit)	Lab Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
<b>September 2025</b>				
LR1	16/09/2025	7.09	269	16
LR2	16/09/2025	7.44	1060	28
LR5	16/09/2025	7.11	285	10
W2	16/09/2025	7.13	285	11
W4	16/09/2025	7.20	271	10
W9*	16/09/2025	8.11	3620	20
W10	16/09/2025	*	*	*
NDL1	16/09/2025	*	*	*
NMC1	16/09/2025	8.24	654	22
SDL1	16/09/2025	7.42	203	19

\*No result as monitoring location was dry or with no flow at the time of sampling.

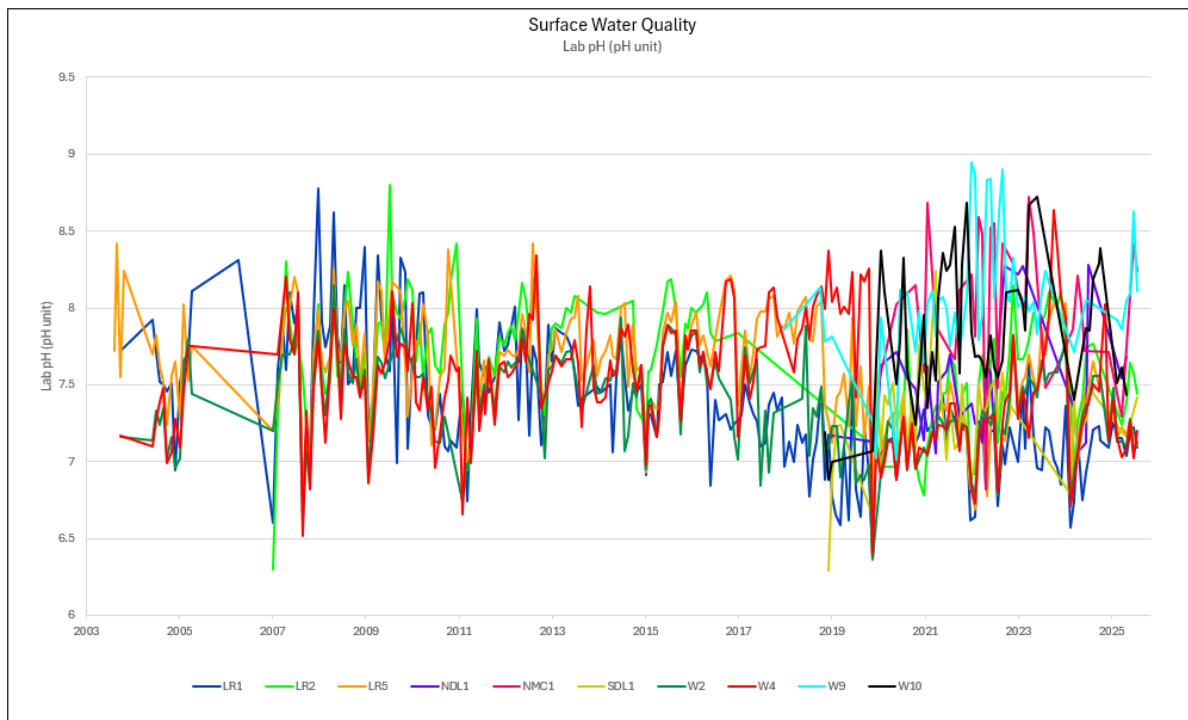


Figure 4-1 – Long Term surface water Lab pH results

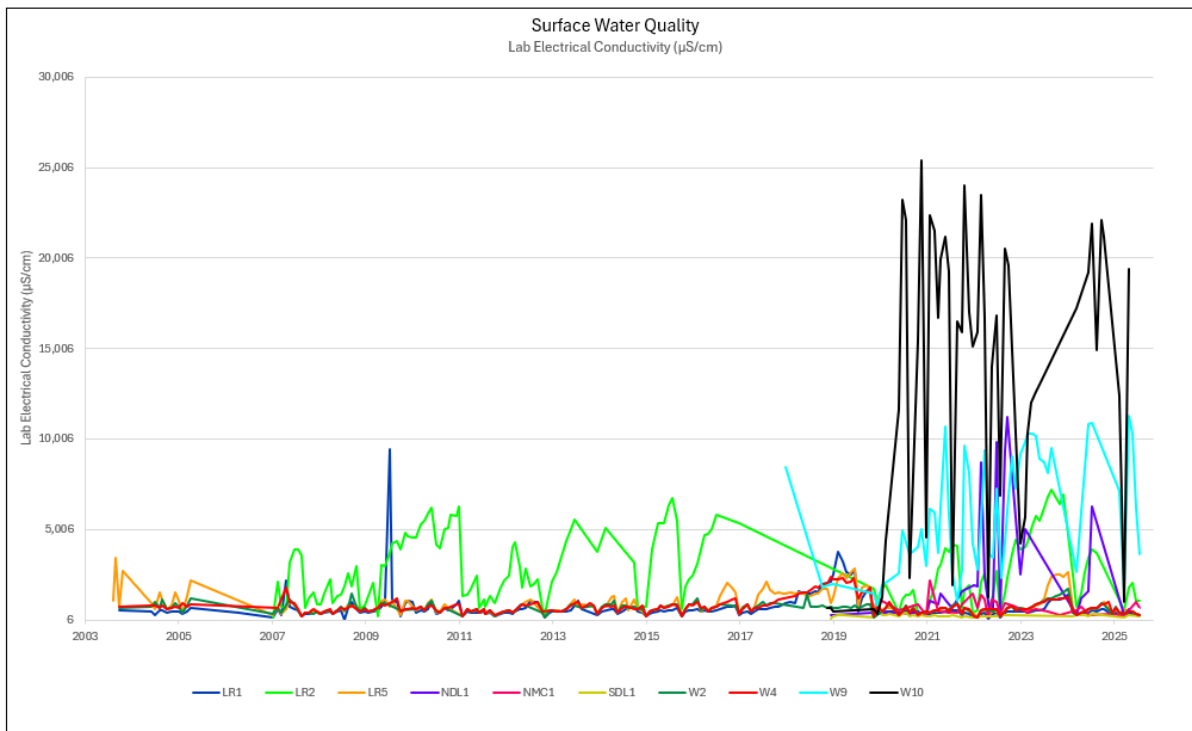


Figure 4-2 – Long Term surface water Lab Electrical Conductivity

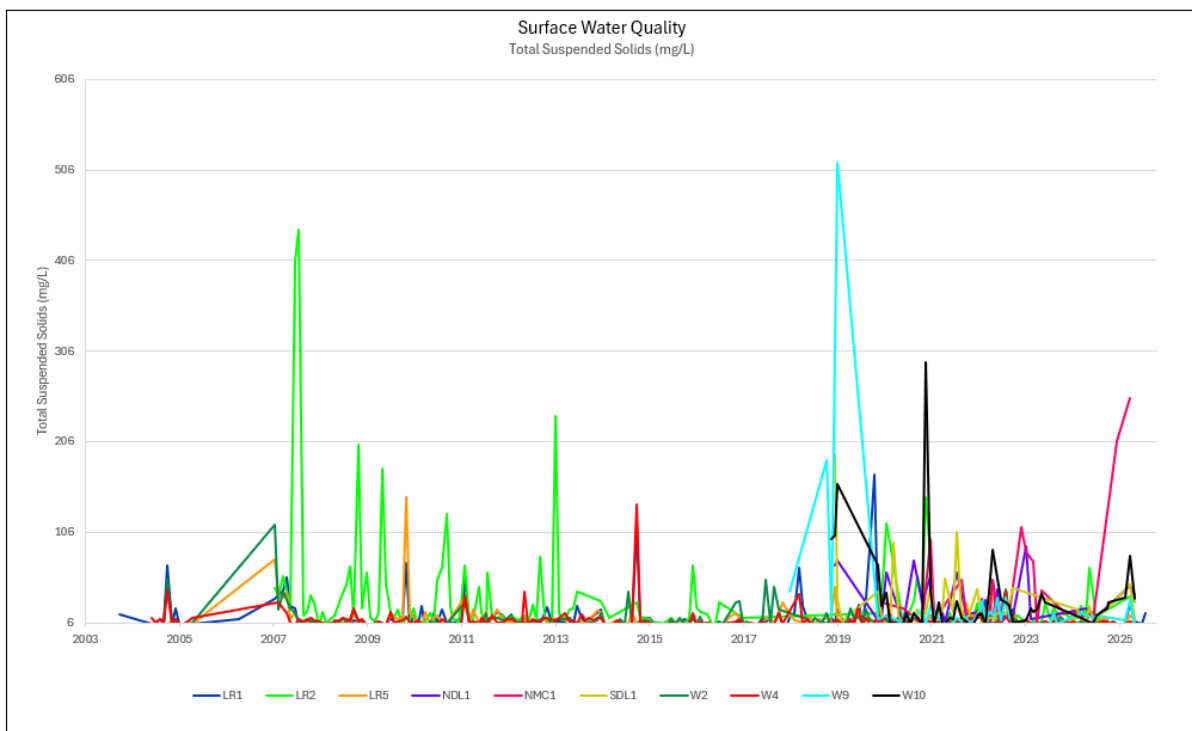


Figure 4-3 – Long Term surface water Total Suspended Solids

## 5. Mine Water Quality

### 5.1 Requirements

Mine water quality monitoring is conducted at the Bulga Coal Complex in accordance with the site's approved Water Management Plan. On-site mine water quality monitoring is currently undertaken at various locations within the BCC for internal water management purposes, and to maintain compliance with EPL 563 which prescribes the conditions in terms of water quality for releases as part of the HRSTS. The sediment dams and drains that capture the water that runs off the rehabilitation and overburden areas pump water to either Dam S7, the CHPP Surge Dam or the Northern Dam. The location of the current existing mine water quality monitoring points are shown in on **Figure 3-1**.

Dam s7 was decommissioned in December 2023 and will be replaced by dam s53, water monitoring results from the new dam will be included once it is commissioned.

### 5.2 Mine Water Results

**Table 5-1** provides the surface water monitoring results. Year to date and long-term water quality charts are shown in **Figure 5-1** to **Figure 5-3**. All results were within historical ranges except for Northern Dam (ND1) which exceeded the pH historical low in August and September 2025 and EC historical low in September 2025.

*Table 5-1 – Summary of Surface Water Monitoring Results*

Location	Date	pH	EC (µS/cm)	TSS (mg/L)
<b>July 2025</b>				
CHPP Surge Dam	22/07/2025	8.75	4310.00	20.00
Dam S7	N/A	*	*	*
Northern Dam (ND1)	22/07/2025	8.35	1510	22
<b>August 2025</b>				
CHPP Surge Dam	18/08/2025	8.84	4210.00	18.00
Dam S7	N/A	*	*	*
Northern Dam (ND1)	19/08/2025	8.23	1350	14
<b>September 2025</b>				
CHPP Surge Dam	15/09/2025	8.82	4170.00	22.00
Dam S7	N/A	*	*	*
Northern Dam (ND1)	16/09/2025	8.26	1260	62

\* S7 dam decommissioned. Will be replaced by new dam S53.

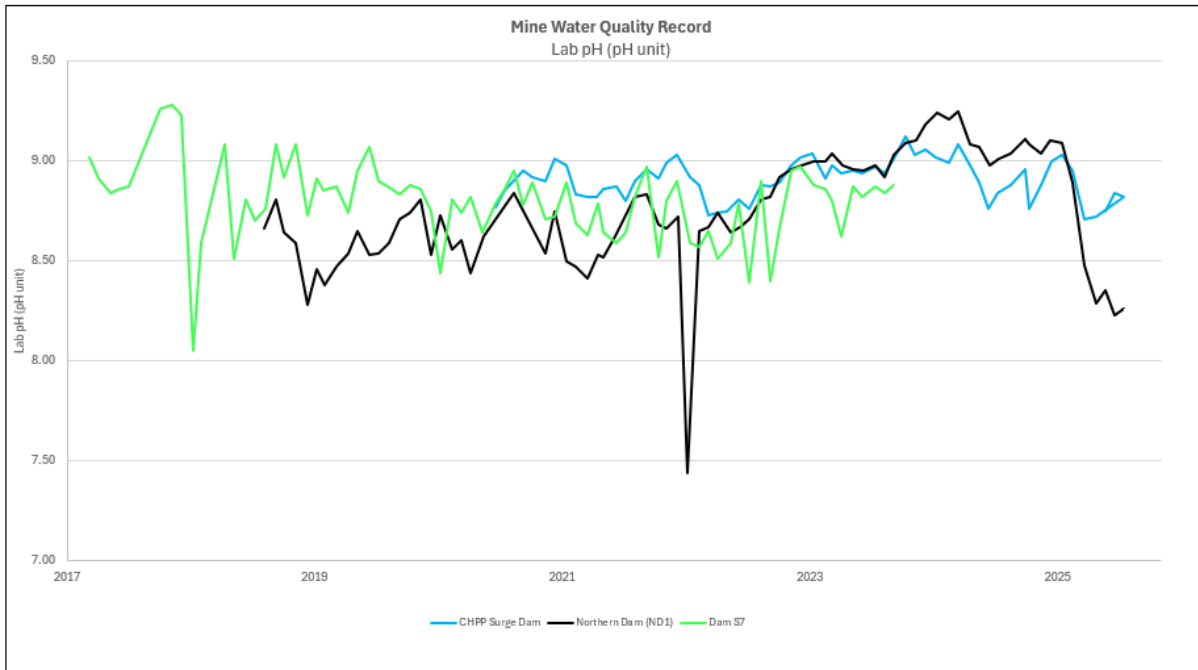


Figure 5-1 – Long Term mine water Lab pH

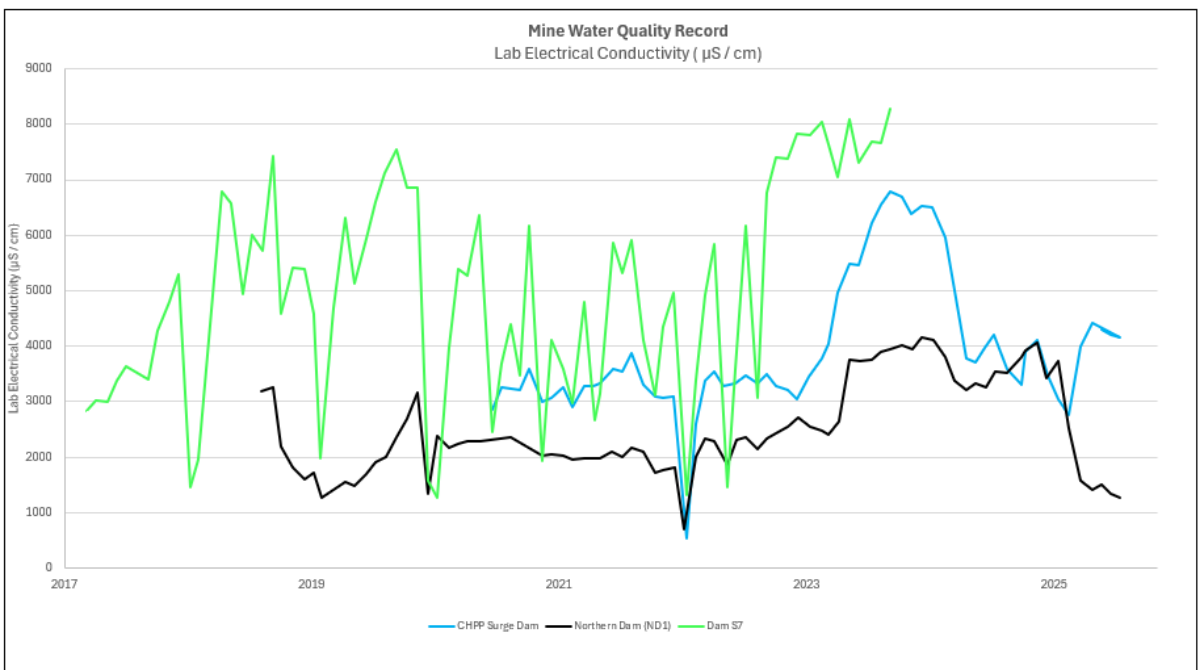


Figure 5-2 – Long Term mine water Lab Electrical Conductivity

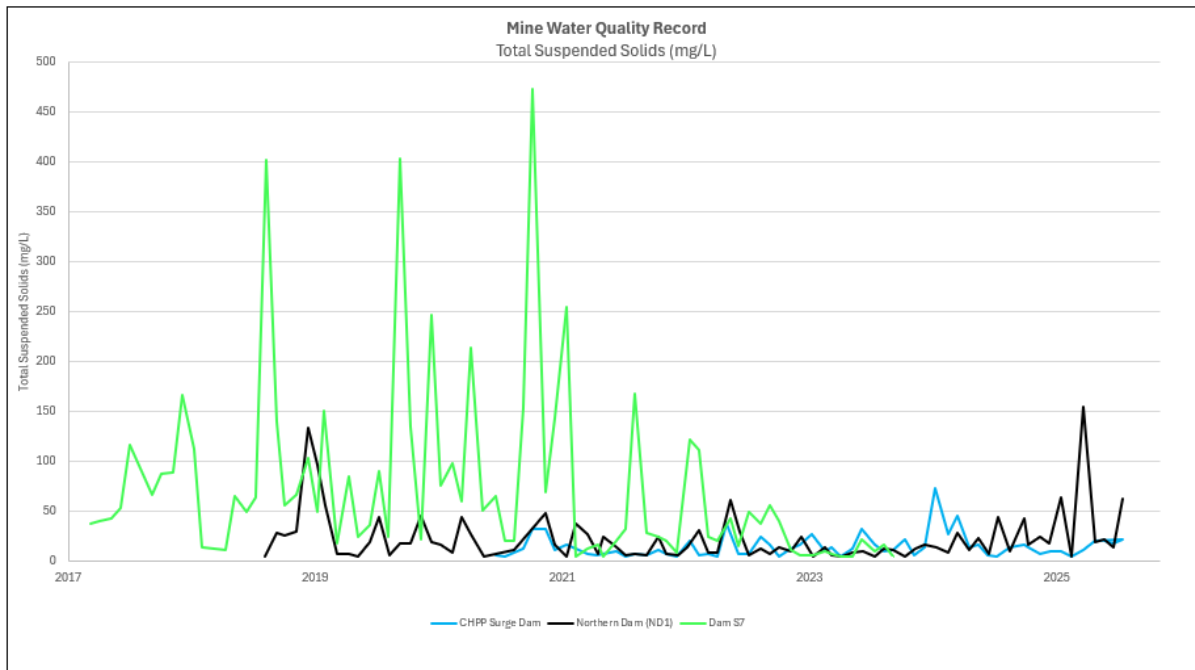


Figure 5-3 – Long Term mine water Total Suspended Solids

## 6. Rainfall

Meteorological monitoring is undertaken at the Bulga Coal Complex Weather Station. A summary of rainfall results is shown in **Table 6-1**. **Figure 6-1** to **Figure 6-3** show monthly rainfall for the quarter.

Table 6-1 - Total Monthly Rainfall

Month	Total Monthly Rainfall (mm)
July 2025	25
August 2025	120
September 2025	63

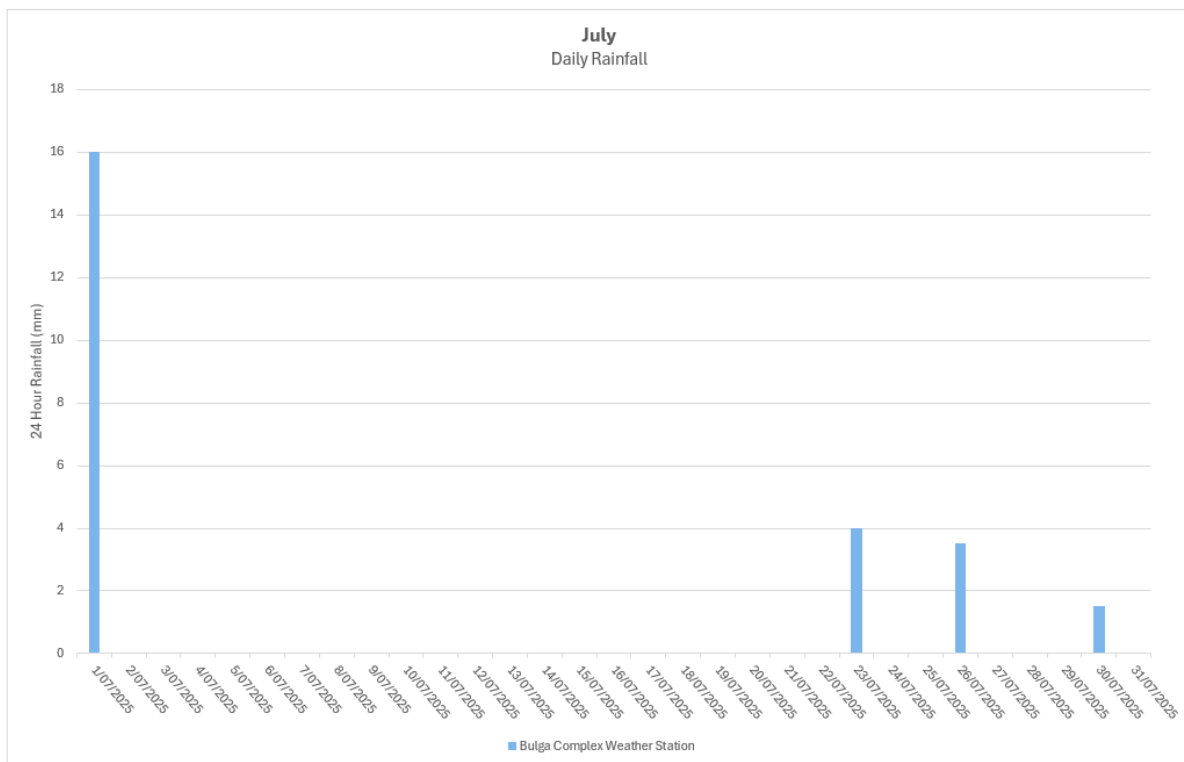


Figure 6-1 – Daily Rainfall during July 2025

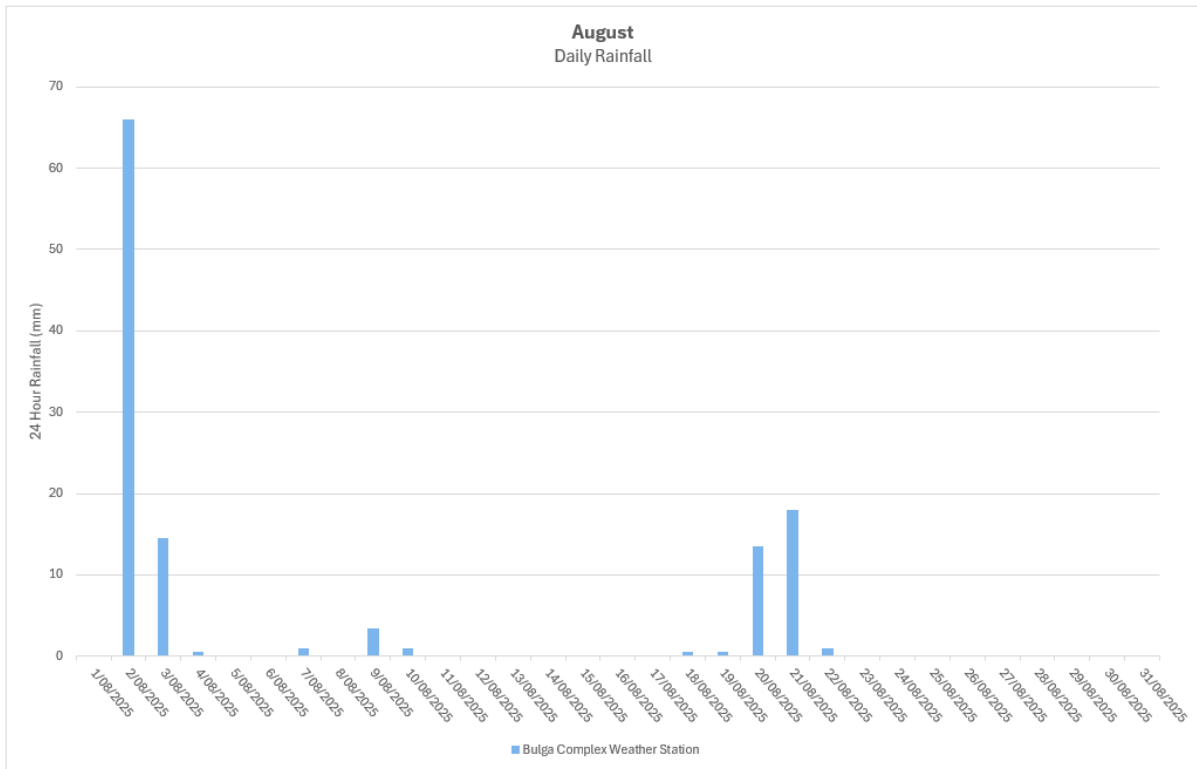


Figure 6-2 – Daily Rainfall during August 2025

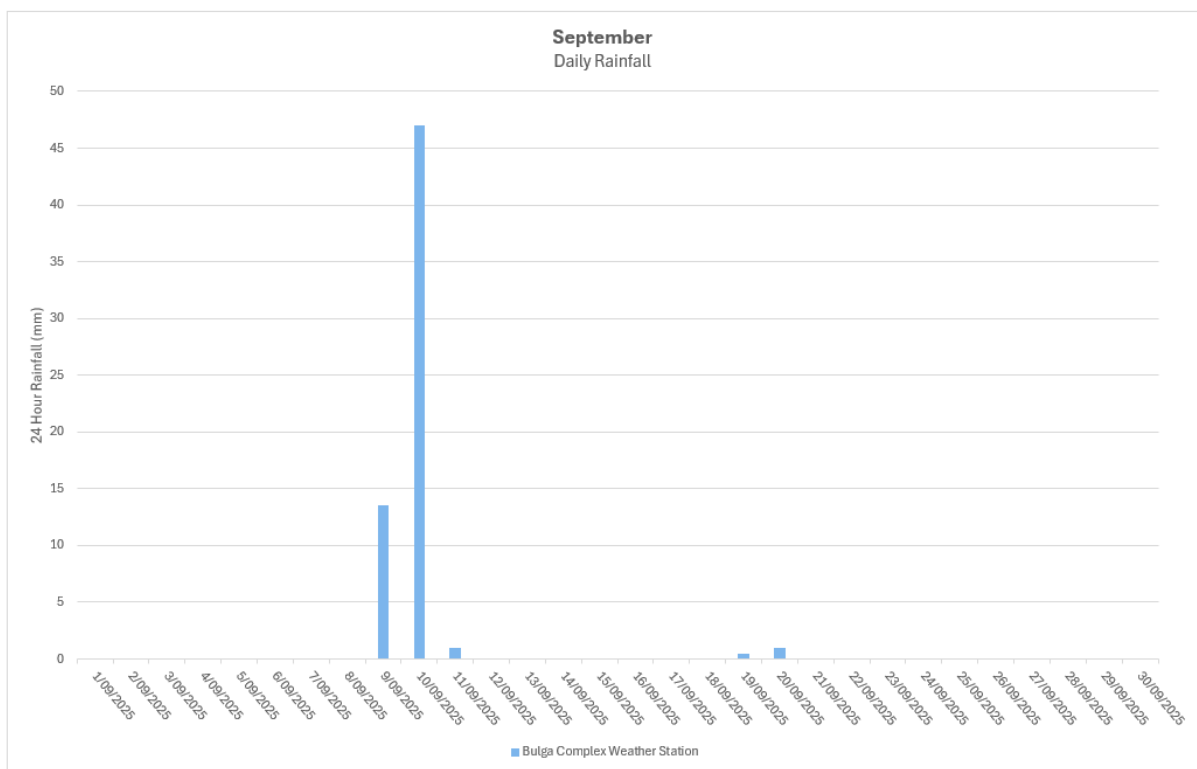


Figure 6-3 – Daily Rainfall during September 2025