NARRABRI MINE
2025 ANNUAL REVIEW

Whitehaven

Name of Operation	Narrabri Mine
Name of Operator	Narrabri Coal Operations Pty Ltd
Development Consent / Project Approval #	Project Approval 08_0144, and Development Consent SSD-10269 (commencing 1 August 2025)
Name of holder of Development Consent/Project Approval	Narrabri Coal Operations Pty Ltd
Mining Lease #	ML 1609 and ML 1839
Name of holder of mining lease	Narrabri Coal Pty Ltd
Water Licence #	Refer to Water Licences in Table 5
Name of holder of water licence	Narrabri Coal Pty Ltd, Narrabri Coal Australia Pty Ltd, Posco International Australia Holdings Pty Ltd, J-Power Australia Pty Ltd, Kores Narrabri Pty Ltd, and Upper Horn Investments (Australia) Pty Ltd
Forward Program start date	1 January 2025
Forward Program end date	31 December 2027
Rehabilitation Management Plan	26 August 2025 (v3)
Annual Review Commencement Date	01 January 2025
Annual Review Completion Date	31 December 2025

I, Grant Case, certify that this audit report is a true and accurate record of the compliance status of the Narrabri Mine for the period 01 January 2025 to 31 December 2025, and that I am authorised to make this statement on behalf of Narrabri Coal Operations Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).

Name of Authorised Reporting Officer	**Grant Case**
Title of Authorised Reporting Officer	**General Manager**
Signature	GCase
Date	26/03/26

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ABBREVIATIONS

Abbreviation	Detailed Name
µg	Micrograms
ACHMP	Aboriginal Cultural Heritage Management Plan
AGE	Australasian Groundwater and Environmental Pty Ltd
AHIMS	Aboriginal Heritage Information Management System
AQMP	Air Quality Management Plan
ARRFP	Annual Rehabilitation Report and Forward Program
BC Act	Biodiversity Conservation Act 2016
BFMP	Bushfire Management Plan
Blue Book	Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004)
BMP	Biodiversity Management Plan
BOA	Biodiversity Offset Area
BOM	Bureau of Meteorology
BSA	Biodiversity Stewardship Agreement
CCC	Community Consultative Committee
CF	Cut and Flit
CH_4	Methane
CHPP	Coal Handling and Preparation Plant
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide Equivalent
CoC	Conditions of Consent
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DDG	Dust Deposition Gauges
DPHI	NSW Department of Planning, Housing and Infrastructure
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EL	Exploration Licence
EMP	Environmental Management Plans
EMS	Environmental Management Strategy
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPBC Approval	Environment Protection and Biodiversity Conservation (Approval 2009/5003 and 2019/8427)
EP-BMP	Extraction Plan - Biodiversity Plan
EPL 12789	Environment Protection Licence 12789
EP-LMP	Extraction Plan - Land Management Plan
EP-WMP	Extraction Plan - Water Management Plan
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
FBS	Floristic-Based Subsidence
FSV	Full Storage Volume
FWP	Forward Program
FY	Financial Year

GAB	Great Artesian Basin
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Minimisation Plan
GIS	Geographical Information System
GPS	Global Positioning System
GWMP	Groundwater Management Plan
ha	Hectares
HVAS	High Volume Air Sampler
IEA	Independent Environmental Audit
kL	Kilolitres (1kL = 1,000 L)
km	Kilometres
L	Litres
LGA	Local Government Area
LiDAR	Light Detection and Ranging
LW	Longwall
MDB	Murray Darling Basin
ML	Mining Lease (Followed by Number)
ML	Mega Litre (Preceded by Number)
mm	millimetres
MOD	Project Approval / Development Consent Modification
Mt	Million Tonnes
Mtpa	Million Tonnes Per Annum
MVAR	Mega Volt-Ampere Reactive
MWh	Megawatt Hour
NCOPL	Narrabri Coal Operations Pty Ltd
NDVI	Normalised Difference Vegetation Index
NGCG	Native Ground Cover Grass
NGERS	National Greenhouse and Energy Reporting Scheme
NMP	Noise Management Plan
NMS	Native Midstorey Cover
NOS	Native Overstorey Cover
NPI	National Pollutant Inventory
NPS	Native Plant Species
NPW Act	National Parks and Wildlife Act 1974
NPWS	National Parks and Wildlife Services
NSC	Narrabri Shire Council
NSW	New South Wales
OMP	Offset Management Plan
PA 08_0144	Project Approval 08_0144
PCT	Plant Community Type
PIRMP	Pollution Incident Response Management Plan
PM_{10}	Particulate Matter less than 10 Micrograms
$PM_{2.5}$	Particulate Matter less than 2.5 Micrograms
PTW	Permit to Work
RAPs	Registered Aboriginal Parties

RBOS	Revised Biodiversity Offset Strategy
Reporting Period	1 January 2025 - 31 December 2025 (Calendar Year)
RFS	Rural Fire Service
RMP	Rehabilitation Management Plan
ROM	Run of Mine
RR	NSW Resources Regulator
SCMP	Spontaneous Combustion Management Plan
SD	Sediment Dam
SoC	Statement of Commitments
SPMP	Subsidence Pond Management Plan
SPW	Sound Power Level
SSD-10269	State Significant Development (Narrabri Mine Stage 3 Extension Project)
STP	Sewerage Treatment Plan
SWB	Site Water Balance
SWMP	Surface Water Management Plan
t	Tonnes
TDS	Total Dissolved Solids
TEOM	Tapered Element Oscillating Microbalance
TfNSW	Transport for NSW
TMP	Traffic Management Plan
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
URN	Unique Reference Number
VWP	Vibrating Wire Piezometers
VZ	Vegetation Zones
WAL	Water Access Licence
WasteMP	Waste Management Plan
WHC	Whitehaven Coal Limited
WMP	Water Management Plan

1 STATEMENT OF COMPLIANCE

This Annual Review has been prepared to provide a summary of the environmental performance of the Narrabri Mine over the **Reporting Period**, 1 January 2025 to 31 December 2025. The compliance status of the Narrabri Mine against relevant approvals was assessed as at the end of the Reporting Period and is summarised in **Table 1**.

Non-compliances recorded during the Reporting Period (if applicable) were ranked according to the risk matrix included in **Table 2** and a brief description of each is provided in **Table 3** (if applicable). Further information about the non-compliances is provided in **Section 11** (if applicable). The compliance status described in this Annual Review (**Section 1** and **Section 11**) relates to the conditions of the relevant approvals listed in **Table 1** during the Reporting Period.

Table 1: Statement of Compliance

Were all the conditions of the relevant approvals complied with?	Yes/No
Development Consent – State Significant Development (**SSD**) 10269	Yes
Project Approval (**PA**) 08_0144	Yes
Environment Protection Licence (**EPL**) 12789 (applicable conditions as above)	Yes
Environment Protection Biodiversity Conservation (**EPBC**) Approval 2009/5003	Yes
EPBC Approval 2019/8427	Yes
Rehabilitation Management Plan (**RMP**) and Forward Program (**FWP**)	Yes
Mining Lease (**ML**) 1609	Yes
ML 1839	Yes
Water Access Licence (**WAL**): 29549 / 43017 / 15922 / 20131 / 12833 / 12822 / 6762 / 20152 / 2728 / 2671 / 44965	Yes
Water Supply Work Approval: 90WA812891 / 90CA802130	Yes

Table 2: Compliance Status Key

Risk Level	Colour Code	Description
High	High	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Medium	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Low	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur

Risk Level	Colour Code	Description
Administrative non-compliance	Administrative non-compliance	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

Table 3: Non-Compliances

Relevant Approval	Cond. #	Condition Description (Summary)	Compliance Status	Comment	Where addressed in Annual Review
Nil	N/A	N/A	Nil	Nil	Nil

2 INTRODUCTION

This Annual Review has been prepared for the Narrabri Mine (**Figure 1**) and has been prepared in accordance with the *'Annual Review Guideline, Post-Approval requirements for State significant mining developments'* (NSW Government, October 2015) (Guidelines). This document has been prepared to satisfy the following requirements:

- The Annual Review requirements per PA 08_0144, Schedule 6, Condition 6;
- The Annual Review requirements per SSD-10269, Part E, Condition E11; and
- The routine reporting expectations of relevant government authorities.

The Annual Review covers the period 1 January 2025 to the 31 December 2025. The Annual Review provides information on historical aspects of the Narrabri Mine, longer term trends in environmental monitoring results and relevant information on activities to be undertaken during the following Reporting Period.

2.1 PROJECT DESCRIPTION

The Narrabri Mine is operated by Narrabri Coal Operations Pty Ltd (**NCOPL**), on behalf of the Narrabri Mine Joint Venture, which consists of two Whitehaven Coal Limited (**WHC**) wholly owned subsidiaries, and other joint venture partners[1].

The Narrabri Mine is an underground coal mining operation situated in the Gunnedah Coalfield. It is located approximately 25 kilometres (**km**) south-southeast of Narrabri and approximately 60km north-west of Gunnedah, within the Narrabri Shire Council (**NSC**) Local Government Area (**LGA**) in New South Wales (**NSW**). The Narrabri Mine includes an underground coal mine, a Coal Handling Preparation Plant (**CHPP**) and associated rail siding and surface infrastructure.

The Narrabri Mine Stage 1 Operations was granted approval (PA 05_0102) on 13 November 2007 under Part 3A of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**). A modification to this approval was sought and granted approved in 2010 to allow for the construction of a CHPP, ventilation shaft and other long lead time items that would ultimately form part of an expanded longwall (**LW**) mining operation.

The Narrabri Mine Stage 2 Operations was granted approval (PA 08_0144) on 26 July 2010 under Part 3A of the EP&A Act. Since 2010, PA 08_0144 has undergone seven modifications. PA 08_0144 permits the mining of coal up to 11 million tonnes per annum (**Mtpa**) Run of Mine (**ROM**) until 26 July 2031. The Narrabri Mine is covered by ML1609 which encompasses an area of 5,298 hectares (**ha**) for the predominant purpose of mining for coal from the Hoskissons Coal Seam.

Stage 3 State Significant Development (SSD) 10269 was granted approval under section 4.38 of the EP&A Act on 1 April 2022, following the determination by the Independent Planning Commission. Approval for Stage 3 under the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) (EPBC Approval 2019/8427) was granted on 24 September 2024 by the Commonwealth Department of Climate Change, Energy, the Environment and Water (**DCCEEW**). In accordance with the SSD-10269 conditions of consent (**CoC**) A14, NCOPL notified the NSW Department of Planning,

[1] Narrabri Coal Pty Ltd, Narrabri Coal Australia Pty Ltd, Posco International Australia Holdings Pty Ltd, J-Power Australia Pty Ltd, Kores Narrabri Pty Ltd and Upper Horn Investments (Australia) Pty Ltd

Housing and Infrastructure (**DPHI**) that physical commencement of the development, mining operations, and the extraction of ROM coal phases would commence on 1 August 2025. The DCCEEW was notified of project commencement in accordance with Condition 31 of EPBC Approval 2019/8427. SSD-10269 permits the continuation of mining of coal up to 11 Mtpa ROM until 31 December 2044. Stage 3 Extension is covered by ML1839 which encompasses an area of 2,085ha for the predominant purpose of mining for coal from the Hoskissons Coal Seam.

2.2 MINE CONTACTS

The relent contacts for environmental management at the Narrabri Mine are outlined in **Table 4**.

Table 4: NCOPL Contacts

Contact	Contact Details
Grant Case General Manager	Phone: (02) 6794 4755
Brent Baker Environmental Manager	Phone: (02) 6794 4755
Narrabri Coal Website (Copies of public notices, environmental management documents, monitoring results and other information relating to Narrabri Mine's operations)	https://whitehavencoal.com.au/our-business/our-assets/narrabri-mine/
Phone	Narrabri Mine General Enquiries: 02 6794 4755 Community Complaints Hotline: 1800 942 836

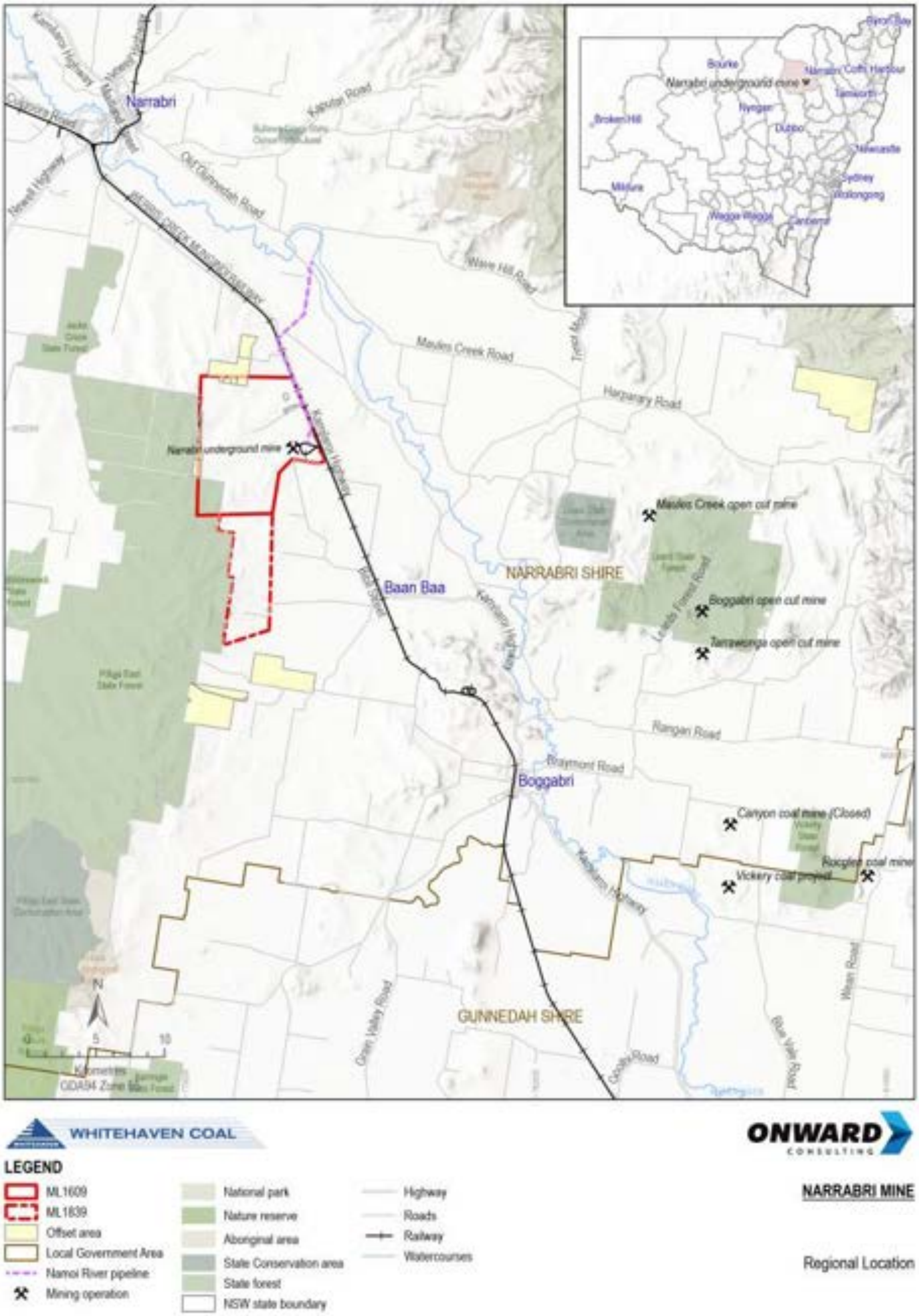


Figure 1: Regional Scale Locality Plan

Figure 2: Local Scale Locality Plan

3 APPROVALS

Table 5 provides a summary of the key licences, leases and approvals that have been obtained (and remain active) for the Narrabri Mine to enable the construction and operation of Narrabri Mine.

Table 5: Licences, Leases and Approvals

Approval	Approval Period(s)	Authority[1]
PA 08_0144 *(as modified)*	26/7/2010 – 26/7/2031*	DPHI
PA 08_0144 Modification (**MOD**) 1, approved 30 March 2011	26/7/2010 – 26/7/2031	DPHI
PA 08_0144 MOD2, approved 21 December 2011	26/7/2010 – 26/7/2031	DPHI
PA 08_0144 MOD4, approved 22 September 2015	26/7/2010 – 26/7/2031	DPHI
PA 08_0144 MOD5, approved 9 December 2015	26/7/2010 – 26/7/2031	DPHI
PA 08_0144 MOD6, approved 13 January 2017	26/7/2010 – 26/7/2031	DPHI
PA 08_0144 MOD7, approved 23 November 2021	26/7/2010 – 26/7/2031	DPHI
SSD-10269**	1/4/2022 – 31/12/2044	DPHI
SSD-10269 MOD1, approved 18 December 2025	1/4/2022 – 31/12/2044	DPHI
EPBC Approval 2009/5003	21/1/2011 – 31/12/2040	DCCEEW
EPBC Approval 2019/8427**	24/9/2024 – 31/12/2066	DCCEEW
EPL 12789	Anniversary date: 20 February	NSW Environment Protection Authority (**EPA**)
Radiation Management Licence 5063666	Expiry date: 3/1/2027	EPA
Construction Certificate DP816020	17/10/2008 – Perpetuity	NSC
Inspection Report/Permit to Occupy No 2413	6/8/2009 – 26/7/2031	NSC
RMP	26/08/2025 (latest revision)	NSW Resources Regulator (**RR**)
FWP	1/1/2025 – 31/12/2027	RR
ML1609	18/1/2008 – 18/1/2029	RR
ML1839**	13/9/2022 – 13/9/2043	RR
Exploration Licence (**EL**) 6243	21/5/2004 – 21/5/2029	RR
EL 9455	6/9/2022 – 6/9/2028	RR

Approval	Approval Period(s)	Authority[1]
EL 9456	6/9/2022 – 6/9/2028	RR
XSTR100215 (Licence to Store Explosives)	20/07/2010 – 20/07/2030	SafeWork NSW
NDG037955 (Notification of Hazardous Chemicals on Premises)	23/03/2021 - Perpetuity	SafeWork NSW
WAL 6762 (Lower Namoi Regulated River Water Source (high security)) – 20 units	Continuing	Water NSW
WAL 2728 (Lower Namoi Regulated River Water Source (general security)) – 10 units	Continuing	Water NSW
WAL 20152 (Lower Namoi Regulated River Water Source (general security)) – 600 units	Continuing	Water NSW
WAL 2671 (Lower Namoi Regulated River Water Source (general security)) – 48 units	Continuing	Water NSW
WAL 12833 (Upper Namoi Zone 5 Namoi Valley Groundwater Source) – 67 units	Continuing	Water NSW
WAL 20131 (Upper Namoi Zone 5 Namoi Valley Groundwater Source) – 150 units	Continuing	Water NSW
WAL 12822 (Upper Namoi Zone 5 Namoi Valley Groundwater Source) – 43 units	Continuing	Water NSW
WAL 29549 (Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source) – 1,468 units	Continuing	Water NSW
WAL 43017 (Gunnedah – Oxley Basin Murray Darling Basin Groundwater Source) – 403 units	Continuing	Water NSW
WAL 15922 (Southern Recharge Water Source) – 248 units	Continuing	Water NSW
WAL 44965 (Eulah Creek Water Source) – 40 units	Continuing	Water NSW

Notes:

* Schedule 2, Condition 5 of PA 08_0144 provides that mining operations may be carried out until 26 July 2031. The consent continues to apply in all other respects other than the right to conduct mining operations until rehabilitation and other relevant obligations have been carried out satisfactorily.

** Operations under *Approval* commenced 01 August 2025.

1 - Authority Name as at 31 December 2025 (i.e. End of Reporting Period)

3.1 PENDING APPLICATIONS AT END OF REPORTING PERIOD

There were no pending applications as at 31 December 2025.

3.2 VARIATIONS

The following new or varied approvals were issued during the Reporting Period:

1. EPL 12789 variation approved on 29 January 2025 to include a Special Condition to allow NCOPL to receive activated sludge for the purpose of activating new aeration tanks at the sewage treatment plant located at the premises.

2. EPL 12789 variation approved 7 August 2025 to amend conditions relating to the construction of the Eastern Ventilation Shaft and associated hardstand and sediment dam (**SD**) 10. The variation added a wet weather discharge point for SD10, groundwater monitoring amendments to correct administrative errors and update the land approved to reflect the SSD-10269 approved mine plan.
3. SSD-10269 was modified on 18 December 2025. The modification included amendments to the Project consent to revise the staging of surface disturbance over the life of the Project, provisions to allow a reduction in any species credit type where appropriate, inclusion of a condition enabling adjustment of biodiversity offset phases with the agreement of the Planning Secretary, and removal of an approved ventilation infrastructure area that is no longer required.
4. EPL 12789 was varied on 23 December 2025 to amend conditions relating to noise monitoring locations and to remove Condition E2 (Waste – Activated Sludge Receival), following confirmation that activated sludge is no longer required at the site.

3.3 STATUS OF MANAGEMENT PLANS

Prior to commencing operations under SSD-10269 on 1 August 2025, NCOPL operated in accordance with the Environmental Management Plans (**EMPs**) prepared and approved under PA 08_0144. Following commencement of SSD-10269, the applicable EMPs are those prepared and approved for SSD-10269.

In accordance with Condition E7 of SSD-10269, all approved EMPs were reviewed within three months of commencing operations. Where this review identified the need for revisions, the updated plans were submitted to DPHI for approval.

Table 6 provides a summary of the EMP's and their approval status as at the end of the Reporting Period.

NCOPL are required to revise the existing approved Exaction Plan/s (CF201-202 and LW203-206) to meet requirements of SSD-10269 and obtain approval prior to surrendering PA 08_0144 (scheduled for 1 August 2026).

Table 6: Status of NCOPL Management Plans

Management Strategy / Plan	Regulatory Approval
Aboriginal Cultural Heritage Management Plan (**ACHMP**)**	20/12/2022
Air Quality Management Plan (**AQMP**) **	23/12/2022
Biodiversity Management Plan (**BMP**)**	14/12/2022
Bushfire Management Plan (**BFMP**)	3/11/2025
Revised Biodiversity Offset Strategy (**RBOS**)	18/6/2025
Extraction Plan 201 – 202[1]	27/4/2022
Extraction Plan LW203 – LW206*[1]	7/5/2023
Environmental Management Strategy (**EMS**)**	23/12/2022
Erosion and Sediment Control Plan (**ESCP**)**	29/9/2023
Greenhouse Gas Minimisation Plan (**GHGMP**)	21/12/2023
Groundwater Management Plan (**GWMP**)**	5/10/2023
Noise Management Plan (**NMP**)**	23/12/2022
Pollution Incident Response Management Plan (**PIRMP**)	1/10/2025

Management Strategy / Plan	Regulatory Approval
Site Water Balance (**SWB**)**	14/9/2023
Spontaneous Combustion Management Plan (**SCMP**)**	20/12/2022
Surface Water Management Plan (**SWMP**)**	5/10/2023
Traffic Management Plan (**TMP**)**	22/9/2022
Water Management Plan (**WMP**)**	5/10/2023

*Conditional approval for extraction of LW204.
** Management Plan submitted to DPHI (and other relevant authorities). Approval pending.
1. Extraction Plan approved under PA 08_0144.
Note: Mining under Extraction Plan LW101-106 and Extraction Plan LW107-110 has been completed.

4 OPERATIONS SUMMARY

4.1 MINING OPERATIONS

Longwall

The secondary LW extraction of LW203 was completed in April 2025. Extraction of LW204 commenced in June 2025.

Cut and Flit (CF)

CF202 extraction was completed in May 2025. Extraction of CF203 commenced in June 2025.

Development

Underground development continued into MG205, MG206 and the 200/201 Mains.

Table 7 presents the production summary for the previous and current Reporting Periods and the forecast production schedule for the next Reporting Period.

Table 7: Production Summary

Material	Approved limit (Million Tonnes) (Mt)	Previous Reporting Period (actual) (Mt)	This Reporting Period (actual) (Mt)	Next Reporting Period (forecast) (Mt)
Waste Rock / Overburden	-	0	0	0
ROM Coal*	11	5.12	4.38	5.34
Reject Material	-	0.12	0.10	0.11
Saleable Product**	-	5.00	4.25	5.23

* ROM Coal is total production at the mine site. The difference between ROM Coal and final product is related to changes in stockpile volumes at the mine.
** Saleable Product is coal railed from site.

4.2 OTHER OPERATIONS

4.2.1 Exploration Activities

There were no exploration boreholes drilled during the Reporting Period.

4.2.2 Coal Transport

During the Reporting Period, 4.25 Mt of product coal were transported via rail to the Port of Newcastle. The total number of train movements during the Reporting Period was 968 with a maximum of 6 train movements per day.

4.2.3 Construction

The following construction activities were undertaken during the Reporting Period:

- Dilling of the western downcast shaft commenced March 2024 and was completed September 2025.
- Commenced civil works construction of the eastern shaft facilities located on the southern extent of ML 1609 in September 2025.
- Additional storage sheds constructed at pit-top area

4.2.4 Hours of Operation

The approved hours of operation are provided in **Table 8**.

Table 8: Hours of Operation

Activity	Hours / Days
Mining operations[1], including drilling at ventilation shaft sites	24 hours / 7 days
All other construction activities[2]	7:00am to 6:00pm / 7 days

1. The carrying out of mining, including the extraction, processing, stockpiling and transportation of coal on the site and the associated removal, storage and/or emplacement of vegetation, topsoil, overburden and reject material; and includes underground development necessary for mining operations to be carried out (such as installation and use of electricity, water, communications and other services and infrastructure).
2. Activities undertaken outside of the approved construction hours can include:
   - the delivery of materials of which delivery is required, by the NSW Police or NSW Roads and Maritime Services to be undertaken for safety reasons outside the normal construction hours; and
   - Emergency work to avoid the loss of life, damage to property or to prevent environmental harm.

4.2.5 Mining Fleet Upgrades

Underground mining equipment introduced during this Reporting Period included:

- 2 x Trunk Belts including substations.
- 2 x 66kV portable substations.
- 1 x 6 Mega Volt-Ampere Reactive (**MVAR**) Statcom unit.

4.3 NEXT REPORTING PERIOD

4.3.1 Mine Operations

The forecast mine production for 2026 will be 5.34 Mt of ROM coal, which is expected to contain approximately 0.11 Mt of coarse reject material. Longwall extraction of LW204 will continue with completion currently forecast late 20265. Development (first workings) will continue for MG205, MG206 and 200/201 Mains. Additionally, MG207, TG301 and MG301 are forecast to commence preliminary works in 2026. There will also be continuing production from the CF203 and CF204 panel area during 2026.

4.3.2 Exploration

There are no exploration boreholes planned for 2026.

4.3.3 Construction Activities

NCOPL propose to:

- Continue the construction of the eastern shaft and associated infrastructure located on the southern extent of ML 1609.
- Construct electricity transmission line from the main substation to the eastern shaft facilities.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The 2024 Annual Review identified the following actions, summarised in **Table 9**.

Correspondence was received from DPHI on 5 June 2025 stating that the 2024 Annual Review report generally satisfied the reporting requirements of the approval and the NSW Planning Annual Review Guideline.

Table 9: Actions Required by the 2024 Annual Review

Action Required from Previous Annual Review	Requested By	Action Taken by NCOPL	Where Discussed in Annual Review
Air Quality: Installation and commissioning of new real time Air Quality monitoring network.	NCOPL	Completed. NCOPL commissioned the second Tapered Element Oscillating Microbalance (**TEOM**) - Omeo in May 2025, prior to the commencement of SSD-10269.	**Section 6.3**
Mining Operations: Commence development under SSD-10269.	NCOPL	Completed. NCOPL notified DPHI and DCCEEW on 23 July 2025 that mining operations will commence 1 August 2025.	**Section 3.3**
Management Plans: Seek progressive approval of Extraction Plan LW203-206.	NCOPL	Ongoing. NCOPL obtained approval from the Planning Secretary on 7 March 2025 for Extraction Plan LW203-206 to allow secondary extraction for LW204. Further conditions are required to be met prior to a revised extraction plan being submitted 3 months prior to commencement of mining LW205.	**Section 3.3**
Independent Environmental Audit (IEA): Commission IEA per PA 08_0144, Schedule 6, Condition 7.	NCOPL	Complete. NCOPL commissioned an IEA to be undertaken, which was completed 5 November 2025.	**Section 10**

6 ENVIRONMENTAL PERFORMANCE

The following sub-sections report on the environmental performance achieved during the Reporting Period and provides a summary of the environmental monitoring data compared to data predictions, trends and management measures.

Environmental monitoring locations are illustrated on **Figure 3**.

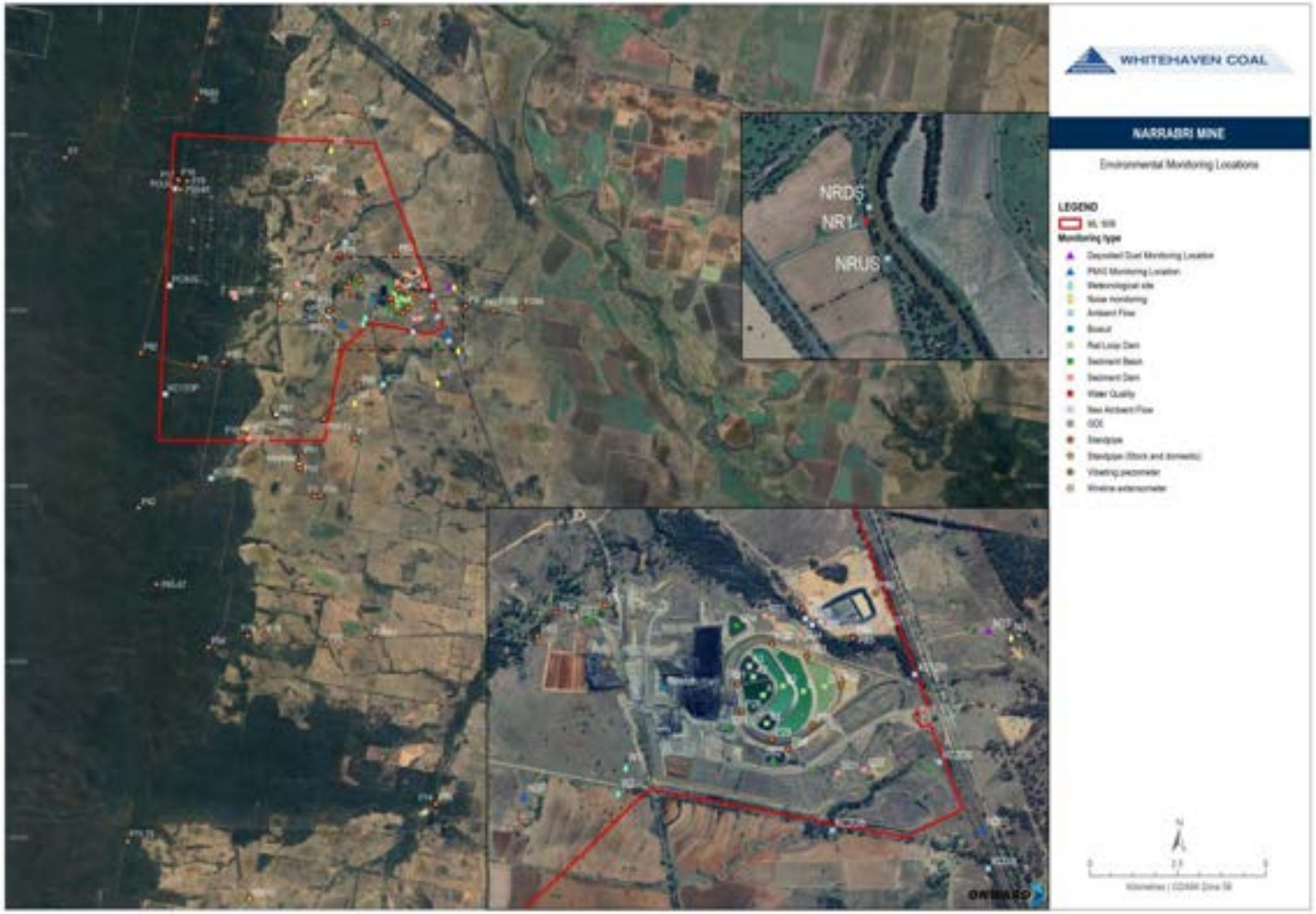


Figure 3: Environmental Monitoring Location

6.1 METEOROLOGY

6.1.1 Environmental Management

NCOPL operates a meteorological station and inversion tower in accordance with requirements of PA 08_0144, SSD-10269 (CoC B24) and EPL 12789 (see **Figure 3**).

Maintenance and calibration activities completed on the meteorological station and inversion tower were undertaken in July and October 2025.

6.1.2 Environmental Performance

Wind speed, wind direction, air temperature, relative humidity, solar radiation, rainfall and evapotranspiration are recorded at the meteorological station. **Appendix A** summaries the monthly meteorological conditions recorded at the Narrabri Mine weather stations for the Reporting Period.

The total rainfall for the Reporting Period was recorded at 723.6 millimetres (**mm**), which is above the historical average of 583mm recorded from the Narrabri Airport and above the 696.8mm recorded during 2024.

The minimum temperature during the Reporting Period was -1.7°C in August 2025 and the maximum temperature was 40.3°C in both January and December 2025. The minimum temperatures recorded were slightly below historical averages while the maximum temperatures recorded were slightly above historical averages.

The predominant wind direction in the Reporting Period was south-east, which is comparable to previous Reporting Periods.

6.1.3 Activities for the Next Reporting Period

There are no additional actions planned for 2026.

6.2 NOISE AND VIBRATION

6.2.1 Environmental Management

Potential noise impacts associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 4, Condition 1 to 5 - noise criteria and operating conditions;
- PA 08_0144 Statement of Commitments (**SoC**);
- SSD-10269, CoC B1 to B8 - noise;
- EPL 12789 - conditions L4, M7, R4 and E2; and
- the NMP.

The Narrabri Mine noise monitoring network is illustrated in **Figure 3** and includes:

- quarterly compliance attended monitoring at locations as described in the EPL and NMP; and
- continuous unattended monitoring at three locations (real-time, for management purposes).

6.2.2 Environmental Performance

Attended Monitoring (Compliance)

Attended noise monitoring is conducted on a quarterly basis by an independent consultant. There were no exceedances of the noise criteria during the Reporting Period. A summary of the noise monitoring results is outlined in **Table 10**.

Table 10: Noise Monitoring Summary 2025

Site ID	Site name	Criteria ($L_{Aeq(15\ minute)}$, dB(A))	Criteria ($L_{A(1\ minute-NIght)}$, dB(A))	Quarter 1		Quarter 2		Quarter 3*		Quarter 4*	
				24-26 March		23-25 June		08-10 September		01-03 December	
				(Mine Contribution, dB(A))[2]							
				L_{Aeq} 15 min	L_{A1}	L_{Aeq} 15 min	L_{A1}	L_{Aeq} 15 min	L_{A1}	L_{Aeq} 15 min	L_{A1}
N1	Bow Hills[1]	50	50	I/A	I/A	39	44	29	33	34	47
N5	Oakleigh[3]	-	-	32	36	I/A	42	32	35	27	32
N6	Newhaven	40 / 35[4]	45	30	39	35	38	23	20	26	34
N8	Haylin View[3]	-	-	30	32	30	35	35	44	31	33
N9	High Range[3]	-	-	32	34	33	33	I/A	I/A	31	33
N11	Uambi	40 / 35[4]	52	-	-	-	-	I/A	I/A	I/A	I/A

* Monitoring undertaken in accordance with Stage 3 NMP requirements.
I/A = Inaudible, N/M = Not Measurable
$L_{Aeq\ 15\ minute}$ = A-weighted equivalent sound pressure level, over a 15 minute period
L_{A1} = A-weighted sound pressure level exceeded for 1% of the 15 minute interval over the period from 10:00pm to 7:00am.
Note 1: A private agreement between NCOPL and the residents of N1 Bow Hills defines a compliance level of 50 dBA $L_{Aeq(15minute)}$.
Note 2: Noise levels presented are the highest measured noise level under compliant weather conditions over the monitoring period.
Note 3: Property is owned by NCOPL and are not a private residence, therefore the noise criteria does not apply.
Note 4: Includes criteria for evening and night periods, as defined in SSD-10269.

Sound Power Level (SPW) Testing

SPW testing was undertaken on key mobile plant and other fixed equipment during the Reporting Period and were generally consistent with the predictions in the PA 08_0144 MOD 5 EA.

Blasting

No surface blasting has occurred during the Reporting Period.

Comparison to Assessment Predictions

Noise monitoring results recorded during the Reporting Period were generally consistent with the predictions in the Environmental Impact Statement (**EIS**) for the Narrabri Coal Mine Stage 2 Longwall Project and the Narrabri Underground Mine Stage 3 Extension Project.

6.2.3 Activities for the Next Reporting Period

There are no proposed actions planned for 2025.

NCOPL will continue to review the NMP and if amendments are required, NCOPL will lodge the revised NMP with DPHI for approval.

6.3 AIR QUALITY

6.3.1 Environmental Management

Potential air quality impacts associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 4, Condition 6 – air quality criteria;
- PA 08_0144 SoC;
- SSD-10269, CoC B9 to B15 – air quality;
- EPL 12789 – conditions O3, P1 and M2; and
- the AQMP.

Narrabri Mine air quality monitoring network is illustrated in **Figure 3.**

The Stage 2 (PA 08_0144) monitoring network includes:

- 2 High Volume Air Samplers (**HVAS**) measuring Particulate Matter less than 10 micrograms (**µg**) (**PM$_{10}$**) for a 24-hour period, every 6 days; and
- 8 Deposited Dust Gauges (**DDGs**), measuring deposited dust collected monthly.

Note: Total Suspended Particulate (**TSP**) matter is inferred at a ratio of 1:2 from the measured PM$_{10}$ data.

The Stage 3 (SSD-10269) air quality monitoring network includes:

- 2 TEOM monitors measuring PM$_{10}$ and Particulate Matter less than 2.5 micrograms (**PM$_{2.5}$**) continuously; and
- 1 DDG, measuring deposited dust collected monthly.

Note: At the end of the Reporting Period, the revised AQMP was pending approval from DPHI under SSD-10269 for inclusion of TEOM monitoring locations, therefore HVAS monitoring PM$_{10}$ has continued during the Reporting Period.

6.3.2 Environmental Performance

Deposited Dust

Table 11 details the annual average DDG monitoring results for the Reporting Period, indicating all monitoring locations are below the annual average Total Insoluble Solids criteria of 4 g/m^2/month. Narrabri Mine measure compliance with the criteria with results of ND3, as all other monitoring locations are located on NCOPL owned land and are monitored for internal purposes only, therefore compliance measures do not apply.

The Reporting Period average for ND3 was 0.6 g/m^2/month and the long-term average is 1.6 g/m^2/month.

Table 11: Deposited Dust Monitoring Data Summary for the Reporting Period

Site	EPL ID No.	Property Name	PA 08_0144 Annual Average Criteria		Annual Mean Total Insoluble Solids (g/m^2/month)
			Max Increase (g/m^2/month)	Max Total (g/m^2/month)	
ND1	-	Turrabaa	-	-	1.8
ND2	-	Claremont	-	-	3.2

Site	EPL ID No.	Property Name	PA 08_0144 Annual Average Criteria		Annual Mean Total Insoluble Solids ($g/m^2/month$)
			Max Increase ($g/m^2/month$)	Max Total ($g/m^2/month$)	
ND3	3	Bow Hills	2	4	0.6
ND4A	-	Matoppo	-	-	3.1
ND5	-	Willarah	-	-	3.5
ND6	-	Willarah	-	-	0.9
ND7	-	Claremont	-	-	1.5
ND8	**-**	Claremont	-	-	1.5

DDG measurements recorded during the Reporting Period were consistent with previous Reporting Periods (**Figure 4**).

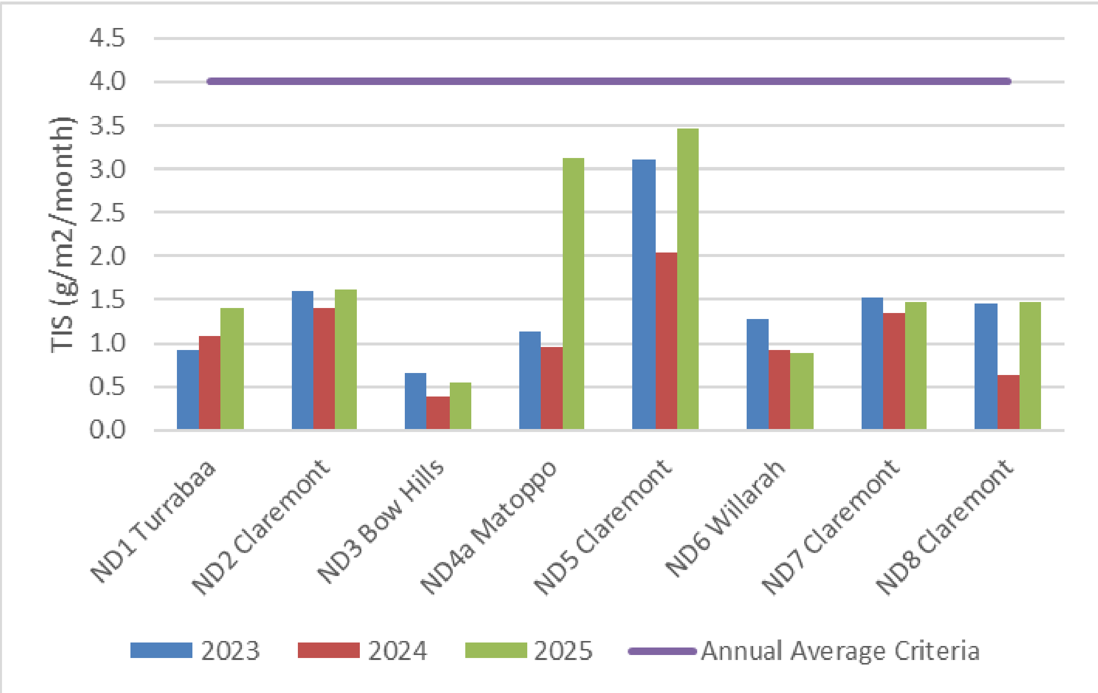


Figure 4: Deposited Dust Annual Mean 2023 - 2025

PM$_{10}$

During the Reporting Period, NCOPL recorded one elevated PM$_{10}$ 24-hour all source measurement (54.6µg/m^3) at ND10 'Turrabaa' on 12 April 2025, above the criterion (50 µg/m^3). The elevated reading was investigated and reported to DPHI, determining that the elevated reading was not a result of mining activities. All PM$_{10}$ monitoring is shown in **Figure 5** and **Figure 6**.

Table 12 presents PM$_{10}$ annual average monitoring results for the Reporting Period and the previous 2 years. The cumulative annual average PM$_{10}$ concentration for the Reporting Period was below the annual average criterion (30 µg/m^3 for PA 08_0144 and 25 µg/m^3 for SSD-10269) at both compliance monitoring sites.

Table 12: PM_{10} Annual Average (2023 – 2025)

Site		2023	2024	2025
ND9	µg/m³	8.67	9.5	9.16
ND10	µg/m³	9.37	8.49	9.03

The AQMP assumes an ambient background level for annual average PM_{10} at 11µg/m³, indicating that 2025 results are below the ambient background level.

Laboratory results were not recorded for ND9 for the sampling events dated 25 March 2025 and 17 July 2025 due to filter paper damage at ALS Laboratory and 3 September 2025 due to power outage.

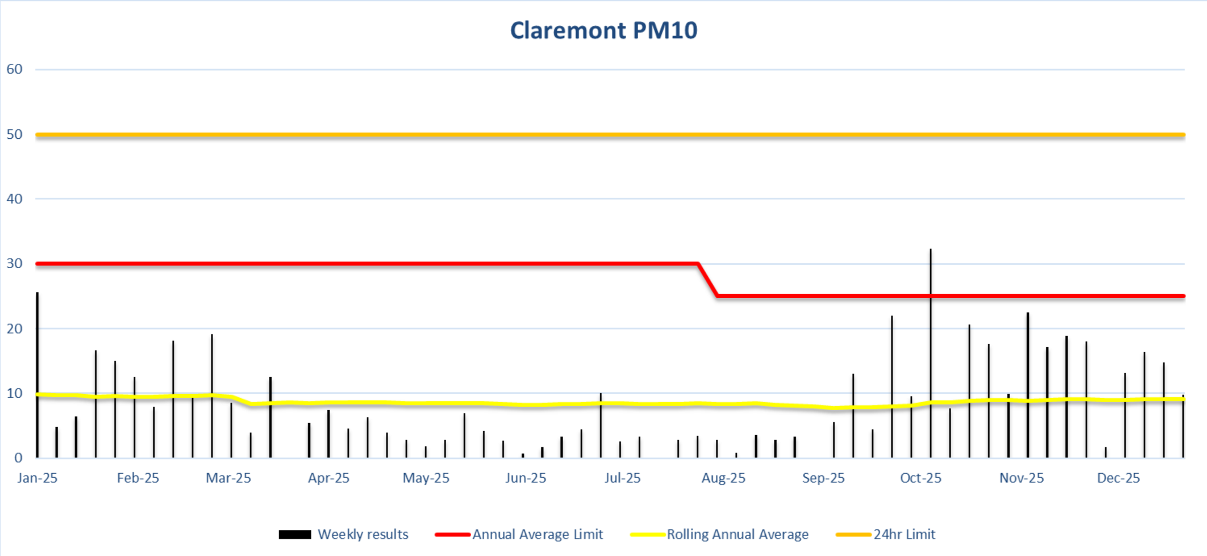


Figure 5: ND9 PM_{10} Results Including Extraordinary Weather Events

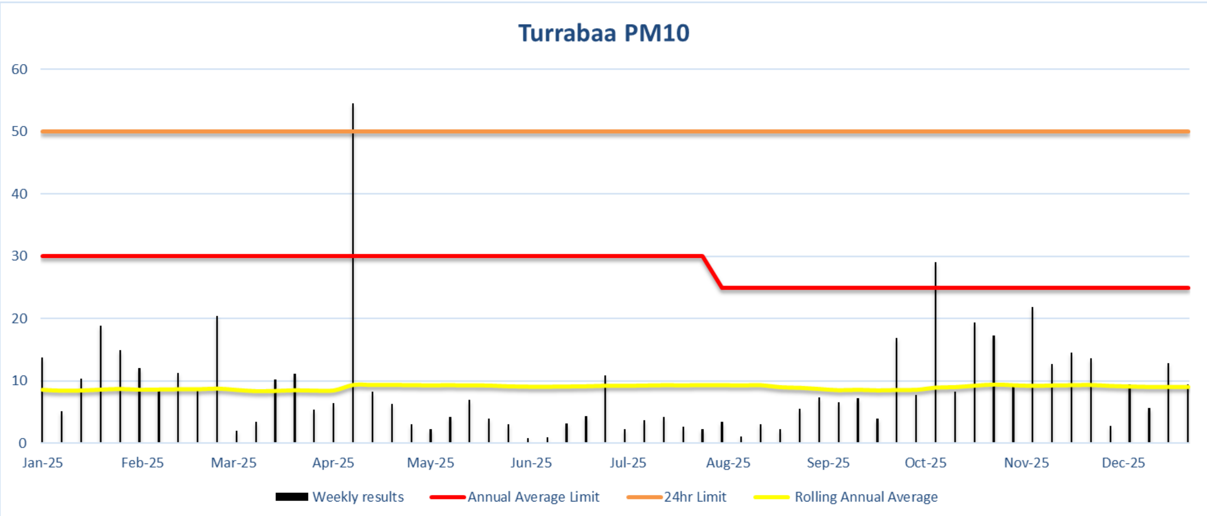


Figure 6: ND10 PM_{10} Results Including Extraordinary Weather Events

TSP

TSP is calculated at a ratio of 1:2 from the measured PM_{10} data. Therefore, based on the results in **Table 12** the calculated annual average TSP concentrations of 18.3 µg/m^3 at ND9 and 18.1 µg/m^3 at ND10 are both below the 19 µg/m^3 annual average impact assessment TSP criterion.

Real-time PM_{10} and $PM_{2.5}$

NCOPL commissioned two real-time air quality monitors prior to the commencement of SSD-10269. These monitors have been located along the primary wind-axis to determined Narrabri Mine incremental impact in accordance with SSD-10269 monitoring requirements. The 'Turrabaa property' TEOM was commissioned in November 2024 and the 'Omeo property' TEOM was commissioned in May 2025. The AQMP has been revised to include these monitoring points, pending approval from DPHI as at the end of the Reporting Period.

Since the commencement of SSD-10269 on 1 August 2025, NCOPL have monitored real-time air quality, as shown in **Figure 7** and **Figure 8** below. There were no exceedances of the 24-hour average criterion for air quality during the Reporting Period.

Table 12 presents the annual average PM_{10} and $PM_{2.5}$ monitoring results from the TEOM for the Reporting Period (from commencement of SSD-10269). Results from the Turrabaa and Omeo TEOMs were below the applicable annual criteria.

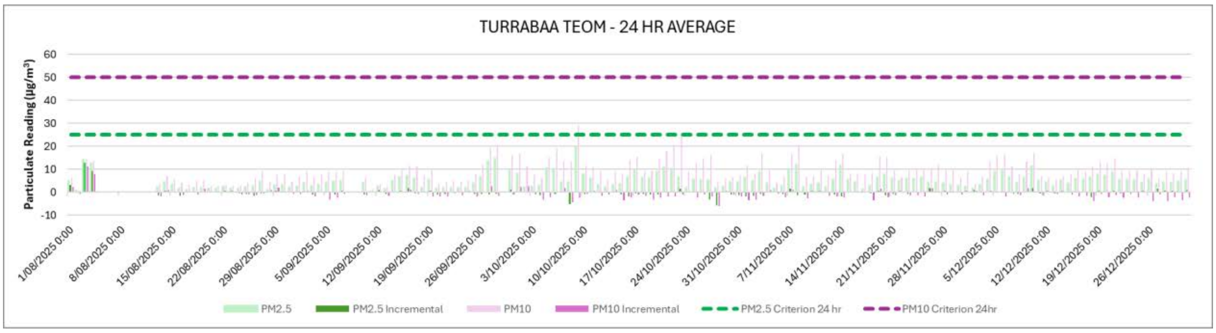


Figure 7: Turrabaa TEOM PM_{10} 24 Hour Average (1 August – 31 December)

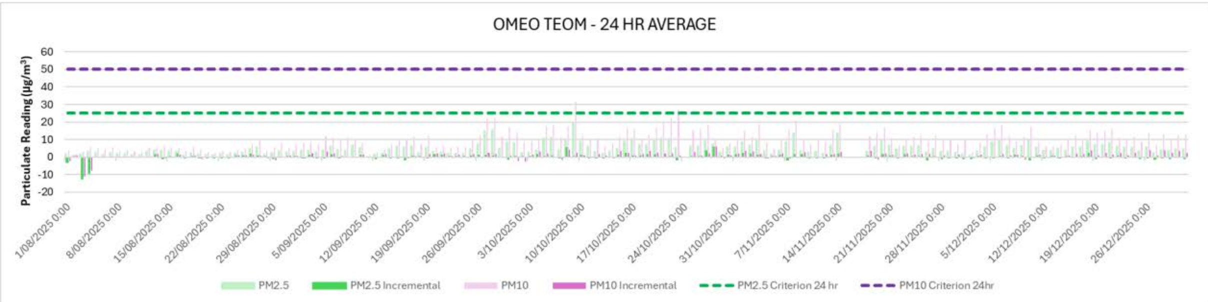


Figure 8: Omeo TEOM PM_{10} 24 Hour Average (1 August – 31 December)

Table 13: Annual Average (TEOM) from 1 August – 31 December

TEOM	PM_{10} Annual Average	$PM_{2.5}$ Annual Average
Turrabaa	9.57 µg/m³	5.10 µg/m³
Omeo	10.17 µg/m³	5.07 µg/m³

1. Annual measurements are total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

Comparison to Assessment Predictions

Air quality monitoring results recorded during the Reporting Period were generally consistent with the predictions in the EIS for the Narrabri Coal Mine Stage 2 Longwall Project the Narrabri Underground Mine Stage 3 Extension Project.

6.3.3 Activities for the Next Reporting Period

NCOPL will continue to review the AQMP and if amendments are required, NCOPL will lodge the revised AQMP with DPHI for approval.

6.4 GREENHOUSE GAS

6.4.1 Environmental Management

Greenhouse Gas (**GHG**) emissions at the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 4, Conditions 30 and 32;
- PA 08_0144 SoC;
- SSD-10269, CoC B16 and B17 – GHG emissions; and
- the GHGMP.

The main sources of GHG emissions considered in the GHGMP are:

- Consumption of diesel fuel – Scope 1;
- Consumption of electricity – Scope 2; and
- Fugitive emissions associated with gas drainage and ventilation – Scope 1.

6.4.2 Environmental Performance

GHG emissions are reported through participation in the National Pollutant Inventory (**NPI**) and as part of the WHC Group in the National Greenhouse and Energy Reporting Scheme (**NGERS**). The total of Scope 1 and Scope 2 GHG emissions reported for the NGERS FY2025 reporting year was 570,589 tonnes (**t**) Carbon Dioxide Equivalent (**CO_2-e**), a 7.6% reduction from FY2024 (617,863 CO_2-e). The decrease was due to the following factors:

- The low average methane (**CH_4**) concentration in the main ventilation system meant that NCOPL did not trigger the requirement to report gassy mine post mining emissions in FY2025.
- Fugitive emissions from underground mining ventilation decreased slightly in line with natural production variability.
- ROM production decreased by 10% compared to FY2024.

The EIS prediction for total of Scope 1 and Scope 2 GHG emissions for FY2025 Reporting Year was 1,118,000 t CO_2-e. The reported emissions for NGER FY2025 are lower than the GHGMP predictions and this can be attributed to the following factors:

- FY2025 ROM production of approximately 4.4Mt was lower than forecast production of approximately 5.5Mt, directly reducing fugitive emissions.
- FY2025 measured CH_4 content at the main fan was lower than forecasted, causing emissions to fall below the trigger for reporting of post mining emissions. Consequently, post-mining emissions were excluded from the reported NGER FY2025 data; these were previously included in the forecast.

The following sections detail the key contributors for the NGERS FY2025 Reporting Year.

Scope 1 Emissions

Scope 1 GHG emissions for the NGERS FY2025 Reporting Year totalled 511,474 t CO_2-e; including 343,843 t CO_2-e from CH_4, with an emissions intensity of 0.12048 t CO_2-e per ROM tonne. This is lower than the EIS total Scope 1 emission predictions of 926,000 t CO_2-e. The breakdown of contributors to the Scope 1 emissions total is as follows:

- Fuel combustion, emissions released from combustion of Diesel oil: Approximately 2,969 kilolitres (**kL**) was consumed, resulting in to 8,047t CO_2-e, including 11 t CO_2-e of CH_4, with an emissions intensity of 0.002. The diesel emissions are lower than the EIS prediction for FY2025 of 9,753 t CO_2-e.
- Fugitive emissions (including pre-drainage gas, goaf gas, ventilation exhaust gas and post-mining activities): Reported emissions were 503,150 t CO_2-e, representing a decrease from the previous

Reporting Period. This included 343,832 t CO_2-e per ROM tonne. The fugitive emissions are lower than the EIS prediction for FY2025 of 1,143,277 t CO_2-e.

Scope 2 Emissions

- Approximately 89,568 Megawatt Hour (**MWh**) electricity was purchased by NCOPL during the FY2025, equating to 59,115 t CO_2-e GHG emissions. This is lower than the EIS prediction for FY2025 of 156,000 t CO_2-e.

Benchmarking Emissions Intensity

The annual average Scope 1 emission intensity of the Narrabri Underground Mine has been benchmarked against the FY24 emission intensities of other comparable underground coal mines in NSW (**Table 14**). This comparison shows that NCOPL's emissions intensity is consistent with relevant industry benchmarks and sits at the lower end of the range.

Table 14: Scope 1 Emission Intensity Benchmarking Against Other Underground Coal Mine

Mining Operation	Emission Intensity (in FY24) (t CO_2-e/t ROM coal)
Moolarben Coal Mine[1]	0.01
Wambo Coal Mine[1]	0.05
Narrabri Underground Mine	**0.12**
Dendrobium Coal	0.16
Myuna Colliery	0.20
Ashton Coal Mine[1]	0.25
Integra Underground Mine	0.30
Metropolitan Colliery	0.35
Tahmoor Coal Mine	0.44
Mandalong Mine	0.44
Appin Colliery	0.54
Chain Valley Colliery	0.60
Russell Vale Colliery	0.67

- 1 Combined open cut and underground operation

Minimising GHG Emissions

WHC are currently investigating several decarbonisation project strategies to reduce GHG emissions at the Narrabri Mine.

- ***Fugitive emissions abatement opportunities:***
  - **Flaring of pre-drainage gas:** During the Reporting Period, detailed engineering design of an enclosed flare continued with initial payment made on long lead time items for the flare's construction. The system will be configured to integrate with NCOPL's existing pre-drainage infrastructure. The flare is designed to destroy CH_4 from the pre-drainage system when CH_4 concentrations exceed 30% and oxygen levels are below 6%, in line with regulatory requirements.

- ***Reducing Scope 2 emissions:***
  - During the Reporting Period, WHC submitted an EIS for a 26MWh solar photovoltaic electricity generation system (solar farm) located on WHC land adjacent to the Narrabri Mine. The project also includes an optional 10 MWh behind-the-meter battery energy storage system.
  - During the Reporting Period, NCOPL offset Scope 2 emissions by purchasing carbon neutral electricity.
- ***Concept Studies***
  - **Algae Growth**: Given the facility's high Carbon Dioxide (**CO_2**) production, NCO has been assessing opportunities to convert CO_2 from pre-drainage gas into a useful by-product. In FY2025, several options were reviewed, and the use of pre-drainage gas to support algae growth was selected for further investigation, with initial safety reviews and targeted feasibility assessments undertaken.

    Over the next phases of the program, the project will further assess whether pre-drainage gas and mine water are suitable for algae production. Successful outcomes would support a range of potential end uses for the algae product and provide an early demonstration of technical performance and environmental benefits.

Energy Audit

In November 2025, NCOPL engaged an independent auditor to undertake an Energy Audit in accordance with AS/NZS 3598:2014 Energy Audits as required by the GHGMP. The audit report is still awaiting to be finalised at the end of the Reporting Period.

6.4.3 Activities for the Next Reporting Period

NCOPL will continue to progress with further monitoring and review of the decarbonisation research projects outlined in the **Section 6.4.2**.

The following reports and reviews are planned for completion during the 2026 Reporting Period:

- Scope 1 Emissions Minimisation Plan: required to be prepared within 12 months of commencing development under SSD-10269 (CoC B18) being 1 August 2026. NCOPL have engaged a suitably qualified consultant approved by the Secretary, and the report is scheduled to be completed within the next Reporting Period.

6.5 BIODIVERSITY AND LAND MANAGEMENT

6.5.1 Environmental Management

Biodiversity and land impacts associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 3, Condition 4, and Schedule 5, Conditions 1 to 7;
- PA 08_0144 SoC;
- SSD-10269, CoC B39 to B46 – biodiversity;
- The Narrabri Mine Extraction Plan and relevant sub-plans, including the Biodiversity Management Plan (**EP-BMP**) and the Landscape Management Plan (**EP-LMP**);
- the Subsidence Pond Management Plan (**SPMP**);
- the BMP;
- the BFMP;
- the RBOS; and
- the RMP.

NCOPL Biodiversity Offset Area (**BOA**) properties are shown at a regional scale in **Figure 9** and further described in **Section 6.5.2.2**.

NCOPL implemented various programs during the Reporting Period to manage and mitigate impacts of the Narrabri Mine, including (but not limited to):

- Weed monitoring and inspections;
- Feral animal monitoring, inspections and control;
- Flora and Fauna monitoring; and
- Ground maintenance and land monitoring.

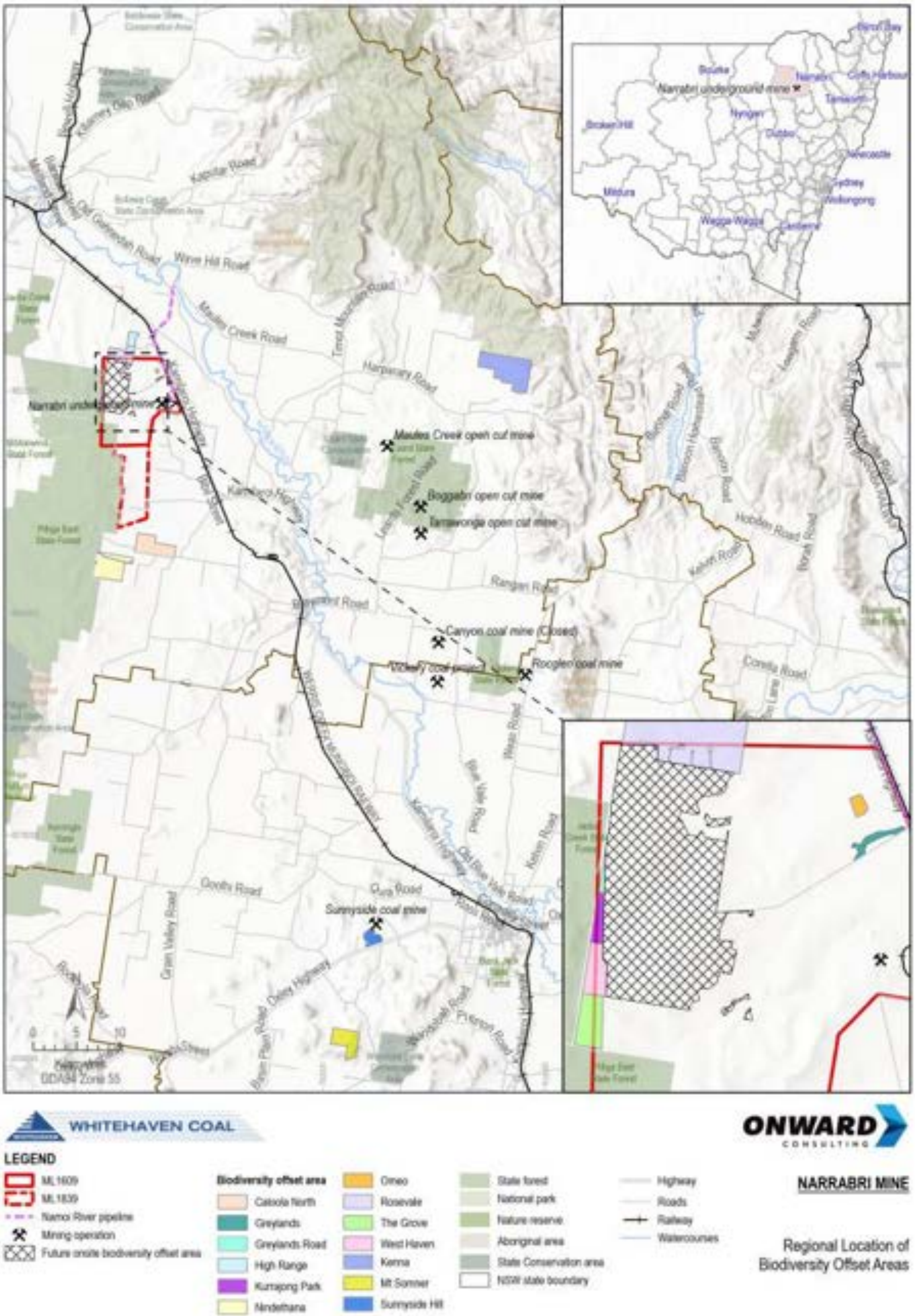


Figure 9: Regional Location of BOA's

6.5.2 Environmental Performance and BOMP Implementation

6.5.2.1 Mine Site Environmental Performance

Weed Management

Weed management programs were implemented at Narrabri Mine during 2025. Weed management consists of spot and boom spraying programs periodically throughout the year when conditions are favourable. Locations requiring management are identified through:

- Weed management mapping supported by the ArcGIS software application 'Field Maps'; and
- Ecological monitoring reports and locations of listed weed species.

Weed control in the pastoral areas is planned to be managed by landholder management and pasture improvement (or as recommended in subsequent monitoring reports). Weeds targeted in the Reporting Period include African Boxthorn, Common Pear, Saffron Thistle and Mother of Millions.

Feral Animals

NCOPL undertook three vertebrate animal control programs at Narrabri Mine during the Reporting Period, targeting feral pigs and foxes.

The Autumn/Winter program results are below;

- Feral pigs
  - 8 sites were setup across site;
  - A total of 18 pigs were successfully trapped and shot.

The Spring program results are below

- Feral pigs
  - 5 sites were setup across site;
  - A total of 23 pigs were successfully baited.

The Summer program results are below;

- Foxes
  - 72 baits were presented at 25 stations set up across site;
  - A total of 23 foxes were successfully baited.

Appropriately qualified and experienced feral animal contractors (appropriate feral animal management qualifications and pesticide accreditation where relevant) were engaged to undertake feral animal control works for NCOPL.

Bushfire Mitigation and Management

No hazard reduction burns were undertaken during the Reporting Period. In December 2025, an assessment of fuel loads and fuel characteristics was undertaken following extensive rainfall in recent years to inform bushfire risk mitigation under the BFMP. Based on the outcomes of this assessment, NCOPL will continue to implement mitigation measures during 2026, including the maintenance of firebreaks and other vegetation management activities where appropriate.

Annual Extraction Plan Monitoring

The results of annual biodiversity and land management monitoring was undertaken during the Reporting Period, as required by the Extraction Plan, are summarised in **Table 15** and **Table 16**.

Table 15: Biodiversity Management Plan 2025 Monitoring Results

Performance Measures	BMP Performance Criteria[1]	2025 Results[1]
CF201-CF02		
Threatened fauna populations and habitat are maintained	Threatened fauna and their habitat do not experience adverse impacts including reduction in habitat area, hollow-bearing trees and woody debris	**Compliant and Ongoing** Habitat features recorded in Floristic-Based Subsidence (**FBS**) monitoring were consistent between the 2024 and 2025 monitoring. Terrestrial fauna monitoring in 2025 recorded similar species richness, including threatened species compared to the 2024 monitoring period. Pest and species occurrence was similar however, presence of juveniles suggests healthy, stable populations are present.

Performance Measures	BMP Performance Criteria[1]	2025 Results[1]
To minimize the clearing and disturbance of vegetation above the mining area	Areas of Normalised Difference Vegetation Index (**NDVI**) change no greater than 1 standard deviation from the mean change and no greater than 0.1ha in area	**Not assessed** NDVI analysis not required after previous two years of consecutive monitoring.
	Canopy dieback is not substantially greater than that observed during baseline traverses and considered beyond natural seasonal dieback and natural variation due to weather.	**Achieved** All canopy dieback metrics were stable or decreasing between baseline traverses and 2025.
	Data does not indicate declining trend in vegetation and habitat conditions.	**Achieved** None of the monitoring sites have strong indications of declining canopy health, with average trendlines across all sites.
	Less than 10% increase in weed cover in impact quadrats in comparison to control quadrats.	**Achieved** 2025 FBS monitoring showed percentage cover either equal to or less than the control sites.
	Clearing does not exceed the estimated area of clearing assessed by the EIS and as updated in PA 08_0144 MOD 5 EA.	**Achieved** Clearing does not exceed the approved disturbance limits approved under PA 08_0144.
LW203-LW206		
No vegetation clearance outside of approved areas	No vegetation is cleared outside or approved area. No unauthorised ground disturbance (i.e. without a Permit to Work (**PTW**)).	**Achieved** All clearing activities were carried out under the approved PTW process. Clearing does not exceed the approved disturbance limits approved under the PA 08_0144.
No ongoing or significant (>50 mm) surface cracking, erosion, slumping, or ponding impacting native vegetation. Surface cracks >50 mm are remediated within 2 months of identification or when safe to do so.	Surface cracking, erosion, slumping and/or ponding determined during subsidence monitoring.	**Compliant and Ongoing** No significant surface cracks or erosion was detected during subsidence monitoring.
	Surface crack remediation and stabilisation works conducted.	**Compliant and Ongoing** Subsidence crack monitoring was undertaken and where cracks identified rehabilitation was completed.

Performance Measures	BMP Performance Criteria[1]	2025 Results[1]
	FBS monitoring determines no impact on native vegetation.	**Achieved** FBS monitoring presented all indicators of vegetation health were considered stable
	No decline in vegetation health within ponded areas.	**Achieved** No ponded areas identified within vegetated areas.
High Threat Weeds identified during monitoring have been controlled.	High Threat Weeds are controlled determined by biannual weed monitoring.	**Compliant and Ongoing** A very low coverage of high threat weeds *Opuntia stricta* (Prickly pear) and *Lycium ferocissimum* (African Boxthorn) at multiple FBS sites which are currently targeted by NCOPL weed management plan.
Pest animals identified during monitoring have been controlled.	Pest animals are controlled determined by biannual monitoring.	**Compliant and Ongoing** Refer to **Section 6.5.2.1**

1 – Performance Criteria that has been Previously Achieved (i.e. not assessed in 2025) has been excluded from Table.

Achieved: The performance criterion has been assessed and confirmed as achieved for the Reporting Period.

Compliant and Ongoing: The performance measure has been assessed and is currently compliant; however, ongoing actions or management measures are required to maintain compliance.

Not Assessed: The performance measure was not assessed during the Reporting Period, typically because the condition requires assessment at a frequency greater than annually.

Table 16: Land Management Plan 2025 Monitoring Results

Performance Measures	Performance Criteria[1]	2025 Results[1]
LW107-LW110		
Surface cracking		
Creek lines	Change to overall drainage pattern is not more than predicted.	**Compliant and Ongoing** Next Light Detection and Ranging (**LiDAR**) cycle scheduled for 2026. Three areas showing significant reductions in NDVI value have been recommended for targeted field surveys which could indicate issues with creekbank stability and overall drainage patterns. Targeted field surveys are planned to be conducted in early 2026 and reported on in 2026 monitoring.
Groundcover (multi-spectral images – erosion and pasture cover)	Identified areas of NDVI change (greater than 1 standard deviation from the mean change) investigated in the field to determine the source of the change.	**Compliant and Ongoing** Three areas showing significant reductions in NDVI value have been recommended for targeted field surveys which could indicate issues with cover and/or erosion. Targeted field surveys are planned to be conducted in early 2026 and reported on in 2026 monitoring.
Ponding	Monitoring of subsidence ponding must demonstrate that no adverse impacts to biodiversity have occurred.	**Compliant and Ongoing** Routine inspections and monitoring of subsidence ponds were carried out by NCOPL personnel during the Reporting Period
CF201-CF202		
Surface cracking	Permanent cracks (which do not self-close within 1 month of longwall face passing) are remediated as soon as practicably possible (and safe to do so). Surface cracking that does not self-correct will be remediated to prevent erosion and slope instability issues within 1 month after mining.	**Compliant and Ongoing** No subsidence cracks were recorded in the 2025 period.
Landscape morphology	Subsidence across the landscape does not exceed subsidence predictions for CF201 and CF202.	**Achieved** Subsidence measurements were below the maximum predicted (**Table 17**).

Performance Measures	Performance Criteria[1]	2025 Results[1]
Creek lines	Change to overall drainage pattern is not more than predicted.	**Achieved** Subsidence measurements were negligible (approximately 0.02m) (**Table 17**) and therefore no changes to the overall drainage pattern were detected.
Groundcover (multi-spectral images – erosion and pasture cover)	Identified areas of NDVI change (greater than 1 standard deviation from the mean change) investigated in the field to determine the source of the change. Site specific management report prepared, and recommendations implemented where necessary.	**Achieved** Three targeted field surveys within CF 201 and CF 202 have been recommended based on remote sensing analysis in 2025. Targeted field surveys to investigate possible weed outbreaks to be undertaken in early 2026 and reported on in 2026 monitoring.
LW203 - LW206		
Surface cracking	Surface cracks are remediated within 2 months of identification or when safe to do so.	**Achieved** Monitoring for subsidence cracks undertaken in accordance with Extraction Plan and cracks remediated when identified.
Landscape morphology	Detected alteration in topography/landscape morphology within normal range compared to baseline data.	**Not assessed** To be conducted after next LiDAR monitoring cycle (2026)
Creek lines	Change to overall drainage pattern is not more than predicted and detected alteration in channel dimensions or processes within normal range compared to baseline data.	**Compliant and Ongoing** Multi-spectral analysis showed no evidence of altered drainage patterns compared to baseline. Two targeted field surveys within LW203 have been recommended based on remote sensing creek line survey analysis in 2025. Targeted field surveys and initial subsidence inspections to be undertaken in 2026.
Ponding	Monitoring of subsidence ponding must demonstrate that no adverse impacts to biodiversity have occurred.	**Compliant and Ongoing** Routine inspections and monitoring of subsidence ponds were carried out by NCOPL personnel during the Reporting Period

1 – Performance Criteria that has been Previously Achieved (i.e. not assessed in 2025) has been excluded from Table.

Achieved: The performance criterion has been assessed and confirmed as achieved for the Reporting Period.

Compliant and Ongoing: The performance measure has been assessed and is currently compliant; however, ongoing actions or management measures are required to maintain compliance.

Not Assessed: The performance measure was not assessed during the Reporting Period, typically because the condition requires assessment at a frequency greater than annually.

Pre-Clearing and Clearing Surveys

During the Reporting Period, NCOPL has undertaken clearing to facilitate surface disturbance activities. The ecological works for the clearing consisted of the following activities;

- Fauna and flora Pre-clearing Surveys;
- Clearance Supervision; and
- Post-felling inspections.

A summary of clearing activities and associated ecological outcomes is provided in the **Appendix D**.

Prior to the commencement of any disturbance activities the limits of clearing are surveyed and physically marked with flagging tape. Targeted threatened flora surveys were conducted prior to clearing activities commencing with all threatened flora identified during these surveys recorded and their locations mapped using hand-held Global Positioning System (**GPS**) units.

Fauna pre-clearance surveys were also conducted and consisted of identifying, marking and documenting suitable fauna habitat features. These features generally include nests, large woody debris and trees bearing hollows, which have the potential to support species such as bats, gliders, possums, reptiles and birds. All trees with habitat features are felled following a clearing protocol and is done in the presence of a suitably qualified Ecologist. All trees identified as having habitat features were recorded using a hand-held GPS unit.

Fauna was occasionally encountered during clearing works undertaken during the Reporting Period, including species of birds, mammals and reptiles. No fauna or their habitats were significantly impacted during clearing works. None of the species recorded were listed as threatened under the *Biodiversity Conservation Act 2016* (**BC Act**) or the EPBC Act. No threatened flora was encountered or translocated during clearing works.

Poplar Box Woodland Monitoring

During the Reporting Period, NCOPL commenced monitoring of the Poplar Box Woodland areas in accordance with the BMP monitoring requirements. As this represents the initial monitoring event, no trend analysis could be undertaken at this stage.

The monitoring identified two key management actions to be implemented prior to the Spring 2026 monitoring program. These include a targeted program for the control of high-threat weed species and improvements to fencing within the monitoring areas to enhance protection and site integrity.

6.5.2.2 RBOS Environmental Performance

Offset Security Management

As of 16 July 2021; WHC have successfully registered seven Conservation Agreements on the land titles for the seven BOA as required per the RBOS. The Conservation Agreements were secured under Part 4 Division 12 of the NSW *National Parks and Wildlife Act 1974* (**NPW Act**) and Part 5 Division 3 of the BC Act in accordance with EPBC Approval 2009/5003 Conditions 2a and 2b and PA 08_0144, Schedule 5 Condition 7.

Across 2025, WHC has continued consultation with National Parks and Wildlife Services (**NPWS**) for those Offsets Areas previously shown interest in being transferred to National Park Estate. Further the Nindethana Biodiversity Stewardship Agreement (**BSA**) was registered on 16 July 2025. Ahead of commencement for the Narrabri Stage 3 Project Phase 1 and 3 on 1 August 2025; WHC submitted a Biodiversity Credit Retirement Report for Phase 1 & 3 to DPHI on 31 July 2025 to confirm the retirement of biodiversity credits required by SSD-10269 Condition B39 with a total of 1,792 ecosystem credits and 10,946 species credits retired on behalf of NCOPL.

Weather Summary of Narrabri Mine BOA's

Regionally central meteorological station to the BOA's is the Gunnedah Pool site (Bureau of Meteorology (**BOM**) 2024)) which has recorded highly variable rainfall over the last 5 years; from the driest on record of 233mm in 2019, followed by above average rainfall years in 2020, 2021 and 2022 of 844mm, 990mm and 860mm respectively (resulting in numerous major flooding events of the Namoi River). While in 2023 and 2024, the Gunnedah Airport site (BOM 2025) recorded 496mm and 572mm which are closer to the annual average rainfall of 572mm. Flooding of the Namoi River was experienced again in August 2025 with a return to above average annual rainfall for 2025 of 755mm.

WHC maintains three meteorological stations across the NCOPL BOA's, with a summary of weather conditions experienced during the Reporting Period:

- Kenna – Maximum monthly average temperature was 35°C in January 2025. Minimum monthly average temperature was 6°C in July 2025. Annual temperature ranges were 1°C to 41°C in 2025. The total annual rainfall in 2025 was 564mm with the maximum in March (91mm) and minimum in January (18mm).
- Rosevale - Maximum monthly average temperature was 34°C in January 2025. Minimum monthly average temperature was 3°C in July 2025. Annual temperature ranges were -2°C to 40°C in 2025. The total annual rainfall in 2025 was 749mm with the maximum in March (158mm) and minimum in June (27mm).
- Caloola North - Maximum monthly average temperature was 33°C in January 2025. Minimum monthly average temperature was 1°C in June 2025. Annual temperature ranges were -3°C to 39°C in 2025. The total annual rainfall in 2025 was 586mm with the maximum in March (123mm) and minimum in February (10mm).

Infrastructure Management

During the Reporting Period, a total of 6.1km of new or repaired fencing (fauna friendly) was constructed along the perimeter of the NCOPL BOA's including of Greylands, Caloola North and The Bulga as well as maintenance of signage and gates undertaken as required to continue to restrict unauthorised access and minimise livestock incursion. Additionally, 13.1km of redundant internal fences were deconstructed from NCOPL BOA's including The Bulga and Nindethana. Any remaining derelict assets/infrastructure items will continue to be assessed, removed and remediated as required prior to potential transfer of certain NCOPL BOA's to the National Park Estate.

Seed Management

The routine seed assessments on the NCOPL BOA's aims to identify on a seasonal basis the life cycle stage and development of native plants to identify what, where, when and how to target appropriate resources to collect seed for future revegetation programs. A total of seven species were collected resulting in 6.8kg of local provident seed from across the Kenna and Rosevale BOA's that was incorporated with other local and regionally provident seed sourced by reputable seed collectors as part of the WHC group wide revegetation planning. A local revegetation provider was engaged to propagate the seed to produce woodland overstorey species seedlings required for the planning for the 2026 revegetation program for the NCOPL BOA's.

Revegetation Management

The NCOPL BOA's revegetation strategy focuses on restoration and revegetation of previously cleared non-native grassland and derived native grasslands and assisting natural regeneration in better quality woodland areas. During the Reporting Period, no specific revegetation works were undertaken. Only ongoing maintenance revegetation is required for the original Offset Areas having materially completed primary revegetation in 2023 towards the target Woodland Plant Community Type (**PCT**) vegetation composition, structure and function.

Heritage Management

During the Reporting Period, annual heritage inspections were completed on the 41 known heritage sites (Aboriginal archaeological) within the NCOPL BOA's. Heritage sites were maintained with 3.4km of demarcation fencing around the perimeter and signage to mitigate access and inadvertent disturbance.

Habitat Management

During the Reporting Period, habitat augmentation was undertaken with 32 new nest boxes installed on the Kenna BOA. This brings the total habitat augmentation constructed since 2021 on NCOPL BOA's to 71 nest boxes and 168 coarse woody debris piles.

Weed Management

WHC coordinated weed monitoring/inspections across NCOPL BOA's in March, August, November and December 2025. The priority weeds identified included legacy weeds inherited from previous owners management regimes such as African Boxthorn, African Lovegrass, Bathurst Burr, Blue Heliotrope, Buffel Grass, Coolatai Grass, Guinea Grass, Mother of Millions, Noogoora Burr, Paterson's Curse, Prickly Pear, Silver-leaf Nightshade and Velvet Pear.

During the Reporting Period, WHC implemented a weed control program across 101ha being treated, targeting primarily broadleaf weeds within revegetation areas and along fire-break tracks as required within the Kenna, Greylands, Omeo, Rosevale, Caloola North, The Bulga and Nindethana BOA's.

Weed control works for WHC were conducted by qualified and experienced contractors with AQF3 accreditation or higher for herbicide use.

Pest Animals Management

WHC is implemented a comprehensive pest animal management program across NCOPL BOA's, using a grid-based motion detection camera monitoring program and observations. Monitoring data from grid-based motion cameras, pest observations, and previous control results guided the program. The program focused on high detection areas like Eastern Grey Kangaroos, Feral Pigs, Foxes and Goats, while other species have scarce detection levels. In 2025, WHC implemented a pest animal control program using 1080 canid pest ejectors, Hoggone baits, and trapping programs.

The program resulted in 69 canid pest ejectors triggered from 383 deployed and 650 Hoggone baits consumed from 1578 laid across the NCOPL BOA's. A further 59 Feral Pigs were trapped and removed from the NCOPL BOA's. Open range shooting programs resulted in 89 Feral Pigs, 1 feral goat, 16 Foxes and 392 Eastern Grey Kangaroos being controlled. Feral Goat mustering continued resulting in 589 Goats being captured and sold to an abattoir.

Soil & Erosion Management

Annual inspections of unsealed fire-break tracks and associated drainage structures across the NCOPL BOA's to review appropriate Erosion and Sediment Control (**ESC**) measures required in accordance with *Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004)* (the **Blue Book**). A total of 11 observations were recorded with no locations requiring targeted additional track maintenance to mitigate further erosion and sedimentation. The remaining tracks/drainage structures are maintained during routine WHC track maintenance program.

In addition, known erosion sites are subject to a separate annual inspection process and updates to the WHC erosion register. During the Reporting Period, monitoring or remediation actions and investigations commensurate to the risk were undertaken for the eight erosion sites identified within NCOPL BOA's.

Grazing Management

NCOPL BOA's continued to be destocked with no strategic grazing occurring during the Reporting Period. There was one instances of stock incursion during the Reporting Period; with stock jumping over the cattle grid on Kenna BOA with a gate temporarily installed to prevent recurrence until the nuisance stock were sold.

Bushfire Management

The NCOPL BOA's annual fuel load monitoring was undertaken between September and December 2025 as part of the planning and assessment of bushfire hazard and ecological burn program for 2026; with the results indicating an overall high fuel loads present.

During the reporting period, there were no bushfires or ecological burns undertaken on the NCOPL BOA's. WHC also undertook other fire management controls, including track maintenance of approximately 169km across the NCOPL BOA's.

WHC maintains regular communications with the Namoi-Gwydir Zone Rural Fire Service (**RFS**) teams around planning of WHC BOA ecological burn programs, as well as contact points in case of emergency. WHC engages a specialist firefighting contractor during the fire season to respond to any fires on WHC owned land, including BOA's.

Threatened Flora Management

During the Reporting Period, threatened flora inspections were completed of the 50 known threatened flora site for *Tylophora linearis, Lepidium monoplocoides, Bertya opponens* and *Pomaderris queenslandica* within the NCOPL BOA's maintained with demarcation fencing around the site perimeter and signage to mitigate access and inadvertent disturbance.

As approved in the BMP (and consistent with the revised Narrabri Stage 2 Offset Management Plan (**OMP**) 2025), the *Coolabah Bertya* Translocation and Propagation Management Plan 2024 outlines the methods for the germination, propagation and salvage translocation that have been implemented at the Rosevale BOA. At the end of 2025, a survival rate for plants in the propagation translocation program was 27.7% and the survival rate for the salvage translocation program was 60.1%. Transplant stress may be a factor in the low survival rate of plants within the first 12 months of their translocation, however likely to reduce overtime as the plants become established. This translocation program has helped inform and willguide the successful translocation of *Bertya opponens* to suitable habitat in future translocations.

At the end of 2025, a survival rate for the 268 *Pomaderris queenslandica* salvage translocated in June 2025 was 98.0%. Although preliminary, these results indicate that whole plant translocations for this species are a viable option when salvage translocations are required.

Monitoring Program

During the Reporting Period, the ecological monitoring program of the NCOPL BOA's included:

- Winter bird surveys that were undertaken in July and August 2025;

- Spring flora monitoring of 35 plots across six Vegetation Zones (**VZs**). Monitoring ceased at 4 plots in VZ 23 after achieving completion criteria (5-year average); and
- Annual fauna monitoring at 34 bird monitoring sites, 14 microbat echolocation sites, 42 pitfall sites, 52 active forage sites and 8 motion detection camera sites.

During flora monitoring, VZ 33 was recorded as meeting or exceeding completion criteria for all four biometrics. Native plant species (**NPS**) richness completion criteria (benchmark for relevant biometric vegetation communities) was met or exceeded at 4 out of 6 VZs. Native overstorey cover (**NOS**) completion criteria (minimum benchmark for relevant biometric vegetation communities) was met or exceeded at 1 out of 6 VZs. Native midstorey cover (**NMS**) completion criteria (minimum benchmark for relevant biometric vegetation communities) was met or exceeded at 2 out of 6 VZs. Native ground cover grass (**NGCG**) completion criteria (minimum benchmark for relevant biometric vegetation communities) was met or exceeded at all six VZs. Comparison of individual plot data shows that NPS decreased from 27 out of 35 plots meeting or exceeding completion criteria in 2024 to 21 out of 35 plots in 2025 likely due to a flush of annual exotics following above-average autumn and winter rainfall which supressed native species and reduced detectability. NOS decreased from 17 out of 35 plots meeting or exceeding the completion criteria in 2024 to 16 out of 35 plots in 2025. NMS increased from 12 out of 35 plots meeting or exceeding the completion criteria in 2024 to 13 out of 35 plots in 2025. NGCG decreased from 33 out of 35 plots meeting or exceeding the completion criteria in 2024 to 29 out of 35 plots in 2025.

During the winter bird surveys, three threatened species (Dusky Woodswallow, Speckled Warbler and Turquoise Parrot) were recorded. Monitoring results from diurnal bird surveys recorded an overall total of 71 and 83 bird species compared to 99 and 56 species at Kenna and Pilliga sites respectively in 2024. For remnant woodland sites; diurnal bird surveys recorded 51 bird species at 7 Kenna sites (average = 17.57; range 14 to 21) and 75 bird species at Pilliga sites (average = 22.16; range 15 to 32). For naturally regenerating sites; diurnal bird surveys recorded 50 species from 7 Kenna sites (average = 16.85; range 11 to 23) and 31 bird species at 2 Pilliga sites (average = 17.5; range 7 to 28). For revegetation/rehabilitation sites; diurnal bird surveys recorded 35 species from 8 Kenna sites (average = 10.5; range 8 to 15) and 14 bird species at 2 Pilliga sites (average = 7; range 3 - 11). Monitoring results from microbat surveys recorded an overall 17 species (positively identified from echolocation recordings) across 14 Kenna echolocation sites including 5 species listed as threatened under the BC Act. Species richness from microbat surveys recorded 17 species at remnant woodland sites (average 12.33, range 5 - 16), 14 species in naturally regenerating sites (average = 9.87, range 7 - 13) and 13 species in revegetated sites (average 6.8, range 0 - 10). Monitoring results from pitfall trap surveys recorded an overall 34 species of vertebrate fauna captured across 24 Kenna and 8 Pilliga pitfall trap sites plus 40 Kenna and 12 Pilliga active forage sites with species richness values ranged between 1 to 11 per Kenna site and 1 to 6 per Pilliga site respectively. Species richness from pitfall trap and active forage surveys recorded 26 species in Kenna remnant woodland sites (average 5.1, range 2 - 11) and 10 species in Pilliga remnant woodland sites (average 5.66, range 5 - 6), 14 species in Pilliga naturally regenerating sites (average = 5.25, range 4 – 6) and 3 species in Pilliga revegetated woodland sites (average 3.25, range 1 - 3). A total of 16 fauna species were detected on 10 Kenna motion detection cameras, including 8 introduced and 2 threatened fauna species and 11 species were detected on at the 3 Pilliga motion detection camera sites including seven introduced species.

A detailed flora species list and photographic monitoring point register are presented in **Appendix B** and **Appendix C**, respectively.

6.5.3 Activities for the Next Reporting Period

NCOPL will implement the management measures outlined in the Poplar Box Woodland monitoring recommendations. Ongoing review of monitoring requirements under the BMP, BFMP, EP-LMP, EP-BMP, SPMP, RBOS and RMP and implement actions, as required. If amendments to any of the above are required, NCOPL will lodge the revised Plans with the DPHI for approval.

6.6 ABORIGINAL CULTURAL HERITAGE

6.6.1 Environmental Management

Aboriginal Cultural Heritage is managed in accordance with:

- PA 08_0144, Schedule 4, Condition 23;
- PA 08_0144 SoC;
- SSD-10269, CoC B47 to B53 - heritage; and
- the ACHMP.

6.6.2 Environmental Performance

Archaeological Salvage Program

During the Reporting Period, NCOPL discovered a previously unidentified Aboriginal artefact scatter located on LW204 while undertaking a pre-disturbance survey. NCOPL engaged a suitably qualified Archaeologist and, with the assistance of two cultural heritage monitors representing the Registered Aboriginal Parties (**RAPs**), undertook a detailed assessment of the site. The site was recorded as Mayfield AS14 and registered on the Aboriginal Heritage Information Management System (**AHIMS**; site ID 19-6-0305). A due diligence assessment determined that salvage was required to protect the artefacts. A total of 13 Aboriginal artefacts were salvaged and recorded, with each artefact allocated a Unique Reference Number (**URN**) for archival purposes. The artefacts are currently stored at the approved safekeeping location.

An application to salvage Aboriginal cultural heritage sites Kurrajong AS2 (AHIMS 19-6-0316), Kurrajong AS3 (AHIMS 19-6-0317), Mayfield AS27 (AHIMS 19-6-0342), Merrilong AS3 (AHIMS 19-6-0314) and Merrilong AS9 (AHIMS 19-6-0343) was submitted to DPHI on 13 November 2025. At the end of the Reporting Period, a determination on the salvage application was pending.

Fencing Program

NCOPL has continued to upgrade and/or install new fencing to protect both known Aboriginal artefact sites and newly identified Aboriginal artefact sites during the Reporting Period.

Ongoing Consultation

NCOPL maintains regular contact with a representative of the RAPs in order to ensure appropriate cultural heritage supervision is available for planned surface disturbance activities. NCOPL conduct formal biannual consultation meetings with the RAPs.

Previously Unidentified Sites

During the Reporting Period, cultural heritage monitors identified several previously unrecorded cultural artefact sites during pre-disturbance surveys, annual Aboriginal cultural heritage site audits and opportunistic finds. Sites included artefact scatter(s), a scar tree and grinding grooves. NCOPL engaged a qualified Archaeologist and, with the assistance of RAP representatives conducted a detailed review of the identified sites, which have been registered as per the procedure outlined in the ACHMP:

- Kurrajong AS4 19-6-0318
- Kurrajong IA2 19-6-0319
- Kurrajong T1 AS1 19-6-0320
- Mayfield AS18 19-6-0324
- Mayfield AS19 19-6-0325
- Mayfield AS15 19-6-0321
- Mayfield AS16 19-6-0322
- Mayfield AS17 19-6-0323
- Mayfield AS20 19-6-0326
- Mayfield AS21 19-6-0327

- Mayfield AS22 19-6-0328
- Mayfield AS23 19-6-0329
- Mayfield AS24 19-6-0330
- Mayfield AS25 19-6-0331
- Mayfield AS26 19-6-0332
- Mayfield IA12 19-6-0333
- Mayfield IA13 19-6-0334
- Mayfield IA14 19-6-0335
- Merrilong AS4 19-6-0336
- Merrilong AS5 19-6-0337
- Merrilong AS6 19-6-0338
- Merrilong AS7 19-6-0339
- Merrilong AS8 19-6-0340
- Wakefield AS1 19-3-0305
- Wakefield AS2 19-3-0304
- Wakefield AS3 19-3-0303
- Wakefield IA1 19-3-0306
- Mayfield AS6 19-6-0199
- Mayfield AS7 19-6-0198
- Mayfield IA5 (AS) 19-6-0183
- Mayfield IA8(AS) 19-6-0180
- Mayfield IA9(AS) 19-6-0188
- Pine Creek T2/OS 28 19-3-0102
- Mayfield AS14 19-6-0305
- Kurrajong Creek GG1 19-6-0306
- NCM Stage 1 AS1 19-6-0311
- NCM Stage 1 IA1 19-6-0312
- NCM Kurrajong Creek ST1 19-6-0313
- Merrilong AS3 19-6-0314
- Kurrajong AS2 19-6-0316
- Kurrajong AS3 19-6-0317
- Kurrajong IA1 19-6-0315
- Kurrajong AS5 19-6-0344
- Mayfield AS27 19-6-0342
- Mayfield AS28 19-6-0341
- Merrilong AS9 19-6-0343
- Longsight AS1 19-6-0345

During the Reporting Period, several sites were extended or amended when additional artefacts or grinding grooves were found outside of the site footprint. NCOPL engaged a qualified Archaeologist and, with the assistance of RAP representatives conducted detailed reviews of the identified sites

- Pine Creek T2 AGG1 was extended when additional grinding groove were found outside of the site footprint. One additional grinding groove was identified in May 2025 and a further six new grinding groove clusters consisting of 20 new groves in total were identified in November 2025. The AHIMS record for Pine Creek T2/AGG 1 (AHIMS 19-6-0345) has been updated to include a separate, southern component.
- The location of Pine Creek T2/ OS7 (AHIMS 19-3-0093) was corrected in AHIMS to more accurately reflect the site location and fenced in the Pine Creek T2/AGG 1 footprint.
- An additional 50 artefacts were located during a pre-disturbance survey near Mayfield AS12 (19-6-0193). AHIMS was updated to include the northern boundary of the site to incorporate the newly identified artefacts
- NCM Stage 1(5) (AHIMS 19-6-0215) was extended when a further 15+ artefacts were located outside of the site footprint. The new artefacts were mapped, photographed and described, and the AHIMS site card was updated with the new, larger site information.
- An additional 17 additional artefacts were located outside of NCM Stage 1(5) (AHIMS 19-6-0215) site boundary. AHIMS was updated to extend to the western boundary of the sites and the site refenced.

During the Reporting Period, in accordance with the Extraction Plan LW203-206 Heritage Management Plan a slotting trial mitigation program was conducted above the underground mining area of LW204. The results of the slotting trial were provided in a technical report with recommendations for the protection of Mayfield GG1 Grinding Groove site during the proposed secondary extraction of LW205.

6.6.3 Activities for the Next Reporting Period

NCOPL will inspect and maintain fencing surrounding all registered sites in accordance with the ACHMP. NCOPL will continue to review the ACHMP and if amendments are required, NCOPL will lodge the revised ACHMP with DPHI for approval.

6.7 TRANSPORT

6.7.1 Environmental Management

Traffic impacts associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 4, Conditions 25 to 27;
- PA 08_0144 SoC;
- SSD-10269, CoC B66 to B75 - transport;
- Narrabri Mine Shuttle Bus Traffic Control Protocol (when triggered); and
- TMP.

6.7.2 Environmental Performance

The portion of Greylands Road that traverses Narrabri Mine has been purchased by NCOPL and is no longer accessible to the public.

Scratch Road, located in the western portion of ML1609 has not been utilised to construct mining related infrastructure and as such, no agreement has been developed with NSC.

Prior to commencement of PA 08_0144, NCOPL constructed the intersection to the Narrabri Mine along the Kamilaroi Highway in consultation with both NSC and Transport for NSW (**TfNSW**). TfNSW has advised NCOPL that the ongoing maintenance of the intersection is the responsibility of TfNSW.

The Narrabri Mine Shuttle Bus Traffic Control Protocol has been implemented, for the workforce engaged for the bord and pillar mining operations approved by the PA 08_0144 MOD7.

In accordance with Condition B67 of SSD-10269 NCOPL submitted a draft design to TfNSW for the upgrade of the intersection of the Mine Access Road with Kurrajong Creek Road and Kamilaroi Highway. The draft design is currently being reviewed by TfNSW.

No traffic incidents were reported during the Reporting period.

6.7.1 Activities for the Next Reporting Period

Continue negotiations with TfNSW on the design principles, final design and timing of construction of the Mine Access Road Intersection upgrade, in accordance with Condition B67 of SSD-10269.

6.8 WASTE MANAGEMENT

6.8.1 Environmental Management

NCOPL aims to implement all reasonable and feasible measures to minimise waste and ensure it is appropriately stored, handled and disposed. Waste materials at Narrabri Mine are generally managed in accordance with:

- SSD-10269, CoC B55 and B56 – waste;
- PA 08_0144, Schedule 4, Condition 33;
- PA 08_0144 SoC;
- the Waste Management Plan (**WasteMP**); and
- the PIRMP.

Narrabri Mine waste streams generally include general waste, underground waste, oil & greases, recyclables (steel and paper/cardboard), drill cuttings and effluent.

6.8.2 Environmental Performance

During the Reporting Period, NCOPL engaged a licensed contractor to transport waste from Narrabri Mine to a licensed facility. Approximately 880 t of general waste was generated. Recyclable materials included approximately 9.6 t of cardboard/paper, 152 t of timber and 315 t of steel, as well as approximately 62,820 L (**Litres**) of used oils. These quantities are generally consistent with previous years, although slightly lower overall (refer **Figure 10**).

Effluent from sewage and ablutions facilities is treated via an on-site Sewage Treatment Plant (**STP**) utilising a continuous extended aeration process. Waste sludge generated from the STP is collected weekly and transported off-site by a licensed contractor. A total of 537,000 L of sludge was removed during the Reporting Period, representing a slight decrease compared to 2024.

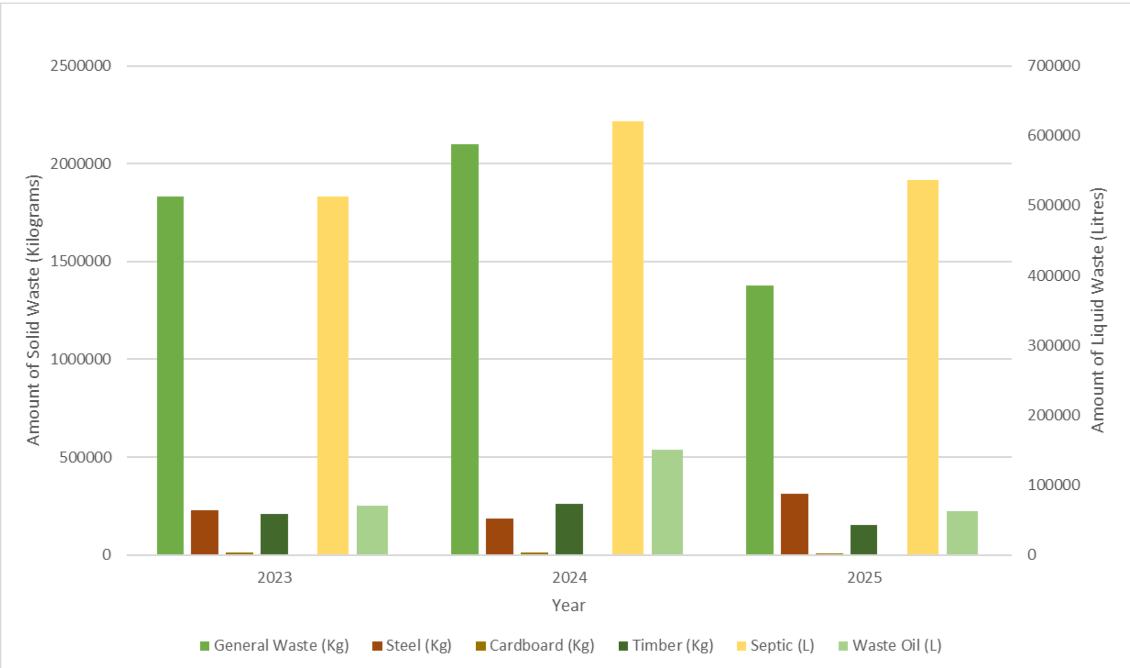


Figure 10: Comparison of Waste Streams Previous 3 Years

6.8.3 Activities for the Next Reporting Period

NCOPL will continue to monitor wastes on a regular basis to effectively manage waste generated by the operation and maximise re-use and recycling opportunities.

6.9 VISUAL & LIGHTING

6.9.1 Environmental Management

Visual amenity and lighting impacts associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144, Schedule 4, Conditions 28 and 29;
- PA 08_0144 SoC; and
- SSD-10269, CoC B54 – visual.

6.9.2 Environmental Performance

No community complaints were received during the Reporting Period relating to the visual amenity or lighting associated with Narrabri Mine.

6.9.3 Activities for the Next Reporting Period

NCOPL will continue to manage visual and lighting impacts from Narrabri Mine during 2026.

6.10 SPONTANEOUS COMBUSTION

6.10.1 Environmental Management

Spontaneous combustion risks at Narrabri Mine are managed in accordance with:

- SSD-10269, CoC B521-23 – spontaneous combustion, and
- SCMP.

6.10.2 Environmental Performance

No significant spontaneous combustion events were recorded during the Reporting Period.

6.10.3 Activities for the Next Reporting Period

NCOPL will continue to manage spontaneous combustion events as they occur during 2026.

6.11 MINE SUBSIDENCE

6.11.1 Environmental Management

Potential mine subsidence impacts associated with the Narrabri Mine are managed in accordance with the Subsidence Monitoring Programs outlined in:

- PA 08_0144 Schedule 3, Condition 4 (g):
- PA 08_0144 SoC;
- SSD-10269, CoC C1 to C2 and C8 g(i) – Extraction Plan and Subsidence Monitoring Program;
- Extraction Plan CF201-202; and
- Extraction Plan LW203-206.

6.11.2 Environmental Performance

Subsidence monitoring was conducted in accordance with the approved Extraction Plans. Subsidence remained within predicted ranges (**Table 17**).

Telecommunications Infrastructure

No telecommunications infrastructure exists within the approved Extraction Plan areas.

Public Roads

There are no public roads within the active mining area.

Land Surface

There have been rehabilitation activities of subsidence cracks across the active subsidence areas and previously subsided longwall panels. A Geographical Information System (**GIS**) based monitoring platform for subsidence crack monitoring is utilised to record the inspection areas, size and location of subsidence related cracking, and rehabilitation records.

Buildings and Other Structures

No privately owned buildings or sheds were undermined during the Reporting Period.

Water Storage Dams and Contour Banks

No subsidence related impacts were identified following monitoring.

Fences and Gates

NCOPL has excluded all stock from the active mining area.

Mine Infrastructure

No subsidence related impacts were identified following monitoring.

6.11.3 Comparison Against Predictions

NCOPL has monitored for subsidence movement in accordance with the approved Extraction Plans. **Table 17** outlines the maximum subsidence parameters recorded as part of the subsidence monitoring program and a comparison with the maximum predicted subsidence parameters as outlined in the Extraction Plan. Results were within acceptable limits. No mine emergency response procedures were activated as a result of subsidence during the Reporting Period.

6.11.4 Activities for the Next Reporting Period

NCOPL will continue subsidence monitoring and repair programs as required by the Extraction Plan.

Table 17: Subsidence Parameters – Predicted and Measured

Longwall Panels (LW)		
	Maximum Predicted Extraction Plan	**Maximum Measured**
Line J – Cross Panel Survey Line (over LW203 for a cover depth of 200 m & T = 4.0m)		
Subsidence (m)	2.75	2.275
Tilt (mm/m)	35 - 53	20 - 37
Tensile Strain (mm/m)	15 (31^)	3.1 - 7.6
Compressive Strain (mm/m)	18 (35^)	3.9 - 4.2
Line K –Survey Line (CF201 East at a cover depth of 180 m & h' = 4.2 m)		
Subsidence (m)	1.77	0.025
Tilt (mm/m)	15 - 22	< 1.5
Tensile Strain (mm/m)	8 (16^)	< 2
Compressive Strain (mm/m)	9 (17^)	< 2
Line L – Cross Panel Survey Line (CF201 East at a cover depth of 180 m & h' = 4.2 m)		
Subsidence (m)	1.77	0.024
Tilt (mm/m)	15 - 22	< 1.5
Tensile Strain (mm/m)	8 (16^)	< 2
Compressive Strain (mm/m)	9 (17^)	< 2
Line M – Cross Panel Survey Line (CF202 east at a cover depth of 180 m & h' = 4.2 m)		
Subsidence (m)	1.77	0.012
Tilt (mm/m)	16 - 24	< 1.5
Tensile Strain (mm/m)	9 (19^)	< 2
Compressive Strain (mm/m)	9 (17^)	< 2
Line N – Cross Panel Survey Line (CF203 east at a cover depth of 180 m & h' = 4.2 m)		
Subsidence (m)	1.77	0.010
Tilt (mm/m)	16 - 24	< 1.5
Tensile Strain (mm/m)	9 (19^)	< 2
Compressive Strain (mm/m)	9 (17^)	< 2

^ - strain measurements may exceed the predicted U95%CL values by up to 2 times due to discontinuous subsidence or cracking.
h' = effective mining height of 4.13 m based on mining height of 3.2 m + 1 m of floor brushing). *Note: NOCPL is no longer proposing to brush the floor in these workings, so the predicted values shown are conservative for an actual mining height of 3.2 m.*

7 WATER MANAGEMENT

7.1 WATER SUPPLY

Table 18 summarises the water licences held by NCOPL to account for direct (pumped) and indirect (mine inflow) take associated with mining, and water usage for operational purposes, during the Reporting Period. All water take for the Reporting Period is below current licence entitlements.

Table 18: Narrabri Mine Water Take

Water Sharing Plan	Water Source/ Licence category	Water Access Licence	Allocation (Unit Shares)	Annual Use Limit	Active (Pumped) Take	Indirect Take[2]	Total Take
Namoi Alluvial Groundwater Sources Order 2020	Upper Namoi Zone 5 Groundwater Source	WAL 12833	67	134	0.2	-	58
		WAL 20131	150	300	0	-	
		WAL 12822	43	86	n/a[1]	0	
NSW Great Artesian Basin (**GAB**) Groundwater Sources 2020	GAB Southern Recharge Groundwater Source	WAL15922	248	322.4	n/a[1]	9	9
NSW Murray Darling Basin (**MDB**) Porous Rock Groundwater Sources Order 2020	Gunnedah Oxley Basin MDB Groundwater Source	WAL 29549	1,468	2,338	n/a[1]	849	849
		WAL 43017	403				
Upper Namoi and Lower Namoi Regulated Water Sources 2016	Lower Namoi Regulated River Water Source Regulated River (High Security)	WAL 6762	20	20	0	-	0
	Lower Namoi Regulated River Water Source Regulated River (General Security)	WAL 2671	48	60	0	-	246
		WAL 2728	10	12.5	n/a[1]	0	
		WAL 20152	600	750	246	-	
Namoi and Peel Unregulated Rivers Water Sources 2012	Eulah Creek Water Source	WAL 44965	40	80	n/a[1]	0	0

[1] No active pumping for water usage purposes, WAL's have been assigned to miscellaneous work approvals to account for indirect take from the individual water sources as a result of mining impacts.

[2] Predicted maximum indirect take during 2025 from *Narrabri Coal Mine Groundwater Model- Re-calibration Stage 3, Australasian Groundwater and Environmental Pty Ltd (**AGE**) 2024*.

* All units in Mega Litres (**ML**)

7.2 SURFACE WATER MANAGEMENT

7.2.1 Environmental Management

The Narrabri Mine surface water management system is managed in accordance with:

- PA 08_0144, Schedule 4, Conditions 10 to 17;
- PA 08_0144 SoC;
- SSD-10269 CoC B26 to B35 and B36e(iii);
- EPL 12789 Conditions P1, L1, L2 and M2;
- the WMP; and
- the Extraction Plan – Water Management Plan (**EP–WMP**) prepared to satisfy the requirements of PA 08_0144, Schedule 3, Condition 4.

Surface water monitoring is conducted at locations within and surrounding Narrabri Mine as shown in **Figure 3**.

7.2.2 Environmental Performance

Surface Water Quality

NCOPL undertakes surface water monitoring of creeks and tributaries during flow events, as detailed in the WMP. Surface water and ambient flow monitoring results are presented in **Appendix E** and **Appendix G** respectively.

Wet Weather Discharge Monitoring

During the Reporting Period, NCOPL undertook two discharge events[2] from EPL 12789 licence point 13 (SD2), one discharge event from EPL 12789 licence point 11 (SD4) and five discharge events from EPL 12789 licence point 43 (SD9) following the rainfall trigger. In accordance with EPL12789, the discharge and ambient monitoring points were routinely sampled with results presented in **Table 19**.

[2] Discharge Event is defined as continuous release of water following a rainfall event greater than 38.4mm over 5-day period.

Table 19: Controlled Discharge Monitoring

Location	Date	Has Discharge been triggered by Rainfall > 38.4 mm, 5 Day Rainfall Event.	pH (field)	Oil and Grease[1] (mg/L)	Total Suspended Solids[2] (TSS) (mg/L)
EPL Criteria			***6.5 - 8.5***	***10***	***50***
SD2	29/03/2025	Yes	8.34	<5	98
SD2	03/04/2025	Yes	8.12	<5	51
SD4	30/03/2025	Yes	8.38	<5	156
SD9	29/03/2025	Yes	7.98	10	772
SD9	02/04/2025	Yes	7.26	<5	205
SD9	28/07/2025	Yes	7.68	<5	50
SD9	04/08/2025	Yes	7.29	<5	378
SD9	12/12/2025	Yes	8.40	<5	10300
KC2US[3]	29/03/2025	Yes	7.05	<5	130
KC2US[3]	03/04/2025	Yes	7.15	<5	10
KC2DS[3]	29/03/2025	Yes	8.05	<5	81
KC2DS[3]	03/04/2025	Yes	7.25	<5	17
KC1US[4]	30/03/2025	Yes	7.46	<5	52
KC1DS[4]	30/03/2025	Yes	8.34	<5	226
KCTOP[5]	29/03/2025	Yes	6.95	<5	154
KCTOP[5]	02/04/2025	Yes	Dry	Dry	Dry
KCTOP[5]	28/07/2025	Yes	Dry	Dry	Dry
KCTOP[5]	04/08/2025	Yes	6.77	<5	<5
KCTOP[5]	12/12/2025	Yes	Dry	Dry	Dry
KCUS[5]	29/03/2025	Yes	7.79	<4	456
KCUS[5]	02/04/2025	Yes	Dry	Dry	Dry
KCUS[5]	28/07/2025	Yes	7.71	<5	11
KCUS[5]	04/08/2025	Yes	7.59	<5	14
KCUS[5]	12/12/2025	Yes	Dry	Dry	Dry

[1] Oil and Grease and TSS are determined via lab analysis, while pH is measured in situ in the field. Lab analysis is undertaken at the frequency specified by EPL 12789, Condition M2.4

[2] EPL12789 Condition L2.5 (a), TSS concentration limits are permitted to be exceeded for water discharged following rainfall measured at the premises that exceeds 38.4mm over any consecutive 5-day period.

[3] Monitoring required during discharge of SD2.

[4] Monitoring required during discharge of SD4.

[5] Monitoring required during discharge of SD9.

Brine & Raffinate Management

No raffinate was discharged to the Namoi River during the Reporting Period.

7.2.3 Activities for the Next Reporting Period

NCOPL propose to construct a sediment dam (SD10) to manage surface water runoff and sediment generated during the preparation and use of the VS03 shaft construction area. This dam has subsequently been incorporated into EPL 12789 to authorise future discharges of water from the site during wet weather events.

NCOPL will continue to review the monitoring requirements in the WMP and implement actions, as required. If any new amendments are identified, NCOPL will lodge the revised Plan for approval.

7.3 GROUNDWATER MANAGEMENT

7.3.1 Environmental Management

The Narrabri Mine groundwater management system is managed in accordance with:

- PA 08_0144, Schedule 4, Condition 18;
- PA 08_0144 SoC;
- SSD-10269 CoC B26 to B35 and B36e(iv);
- EPL 12789 Conditions P1, L1, L2 and M2;
- the WMP (including the GWMP); and
- the EP–WMP prepared to satisfy the requirements of PA 08_0144, Schedule 3, Condition 4.

Activities in 2025

Groundwater monitoring is conducted at locations within and surrounding Narrabri Mine as shown in **Figure 3** and outlined in **Table 20**.

Table 20: Groundwater Monitoring Summary

Location	Parameters	Frequency
Standpipes (Pilliga Sandstone) P6B, P7, P60, P66, P82, P90	• Water level, • Field Electrical Conductivity (**EC**) and pH • Laboratory analysis: - Physical parameters (e.g. alkalinity, EC, Total Dissolved Solids (**TDS**), TSS and pH); - Cations (e.g. calcium, magnesium, sodium, and potassium); - Anions (e.g. carbonate, bicarbonate, sulphate, chloride, and fluoride); - Dissolved metals (e.g. aluminium, antimony, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, silver, selenium, and zinc); and - Nutrients (e.g. ammonia, nitrate, phosphorous and reactive phosphorous).	**Pilliga Sandstone** • Monthly for water level • Quarterly for water quality (EC and pH) • Annually for all other parameters
Standpipes (other formations) P1, P2, P3, P4, P5, P8, P9, P10, P11, P12, P13, P16, P17, P19, P39A, P39B, P43, P47, P51, P52, P53, P59, P62, P65, P68, P71, P74, P75, P91, P92, WB2		**Other Formations** • Quarterly for water level and water quality (EC and pH) • Annually for all other parameters
Pit top water storage standpipes (Seepage bores) P28, P29, P30, P31, P32, P33, P34, P58, P83, P84, P85, P88, and P89		Quarterly (in accordance with Condition M2.3, U2.1 and U3.1 of EPL 12789)
Vibrating Wire Piezometers (VWPs)	• Pressure data	
VWPs (Pilliga Sandstone sensors) P42, P54, P77		**VWPs (Pilliga Sandstone sensors)** Continuous with monthly download of data
VWPs (all formations) P42, P44, P45, P46, P54, P55, P56, P76(b), P77, P80		**VWPs (all formations)** Continuous with quarterly download of data
Mine water pumped into and out of the mine (Box Cut)	• Discharge rate	Weekly meter read
Water quality entering the underground mine workings (i.e. within longwall panels).	• EC • TDS	Monthly for an initial 6-month period and annually thereafter[2]
Water quality entering the underground mine workings (i.e. in the mine water collection system via the monitoring at the box cut sump).	• TDS • pH	Continuous

Private landholder bores WB10[1], WB11, WB12, WB13, WB14[1], WB15, WB16, WB17, and WB18.	• Water level • Field EC and pH • Laboratory analysis: - Physical parameters (e.g. alkalinity, EC, TDS, TSS and pH); - Cations (e.g. calcium, magnesium, sodium, and potassium); - Anions (e.g. carbonate, bicarbonate, sulphate, chloride, and fluoride); - Dissolved metals (e.g. aluminium, antimony, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, silver, selenium, and zinc); and - Nutrients (e.g. ammonia, nitrate, phosphorous and reactive phosphorous).	Annually
Subsidence calibration borehole P80 and geotechnical borehole P81 above LW 203 – deep borehole piezometers, shallow standpipe piezometers and deep wireline extensometers.	• Water level • Displacement.	Continuous
Groundwater Dependent Ecosystems (GDEs) VI sites 1-8 Hardy's, Mayfield, and Eather Dam 1 and 2, Blairmore Feature 1 and 2, and mapped high priority GDEs.	• Four site photographs (upstream, downstream, at the left bank and at the right bank) and observations of: • Flow rates (no, low, or high flow) • Surface water levels (water present, low, high); • Field water quality (EC and pH) in any standing pools; and • Vegetation health.	Quarterly
Surface water quality (Quaternary alluvial bores) P59/P60/P61 (PCUS in SWMP), P62/P63/P64 (PCa in SWMP), P65/P66/P67 (P65-P67 SW1), P68/P69/P70 (P68-P70 SW2), P71/P72/P73 (P71-P73 S3), P74/P75/P76 (P74-P76 SW4)	• Field water level (water present, low/high) and quality (EC and pH) in any standing pools.	Quarterly
Research sampling program • Selected monitoring bores in the Surat and Gunnedah Basin and mine inflow (Permian associated with the Gunnedah Basin): <u>Near surface strata</u>: P91 and P92 (at Mayfield Spring) <u>Surat Basin</u>: Pilliga Sandstone: P7 and P90 Purlawaugh Formation: P8, P9, P11, P72 Garrawilla Volcanics: P13 and P16. <u>Gunnedah Basin</u>: Napperby Formation: P10 and P12 Hoskissons Coal Seam: Mine water (4 samples)	• CH_4 • Radiocarbon dating (*14*C and *36*Cl).	Reviewed every 5 years

1. No longer a privately owned bore, as the Nindethana property was acquired by NCOPL prior to the Reporting Period.
2. Monthly sampling ceased in September 2024.

7.3.2 Environmental Performance

Annual Hydrogeological Review

An annual hydrogeological review was undertaken by AGE for the period 1 January 2025 to 31 December 2025. Groundwater monitoring results for the Reporting Period are provided in **Appendix F** as required by the WMP.

Groundwater Levels

Groundwater level data collected from the NCOPL monitoring bores are provided in **Appendix F**.

Groundwater Quality

Groundwater quality data collected from the NCOPL monitoring bores are provided in **Appendix F**.

Compensatory Water Supply

No compensatory water has been required as no privately-owned water supplies have been affected.

7.3.3 Activities for the Next Reporting Period

NCOPL will continue to review the monitoring requirements in the WMP and implement actions, as required. If any new amendments are identified, NCOPL will lodge the revised Plan for approval.

7.4 SITE WATER BALANCE

Surface water

Error! Reference source not found. presents an estimate of the volume of stored water at the beginning and end of the Reporting Period (i.e. calendar year). NCOPL pumped 274 ML into Dam D from Namoi Alluvium or the Namoi River water sources via approved WAL's during the Reporting Period (i.e. calendar year). NCOPL also utilised water from sediment basins for mine supply. The site water balance has been reviewed following the 2025 Reporting Period and includes forecast simulation of the key inflows and outflows for the next 5-year period. The water balance model results show that (for the period 2026-2031) there were no spills from A1, A2, A3, B2, C or BR1 into the receiving environment for any of the climatic conditions assessed. The SB dams would be sufficiently managed during operations as to prevent uncontrolled spills to the receiving environment.

Table 21: Stored Water

	Volumes Held (ML)		Capacity* at the end of the Reporting Period (ML)
	Start of Reporting Period	At End of Reporting Period	
Raw & Filtered Water (Dam D and B1 in Rail loop)	131	68	72
Dirty Water (in Sediment Dams SD1-SD9)	51	30	175
Mine reclaim water (A1-A3, SB1- SB4)	275	204	28
Brine storage (BR1, B2, C)	484	595	80

*Capacity determined as full storage volume (**FSV**)

Groundwater Inflows

Table 18 summarises the water licences held by NCOPL to account for indirect take associated with mining, and water usage for operational purposes, during the Reporting Period. All water take for the Reporting Period is below current licence entitlements. Information on actual groundwater inflows is inferred from monitoring of the volume of water pumped underground and the volume of water returned via the box-cut dewatering pump. The calculated water take utilising inputs and losses of water within the mine are represented by the waterfall chart (**Figure 11**).

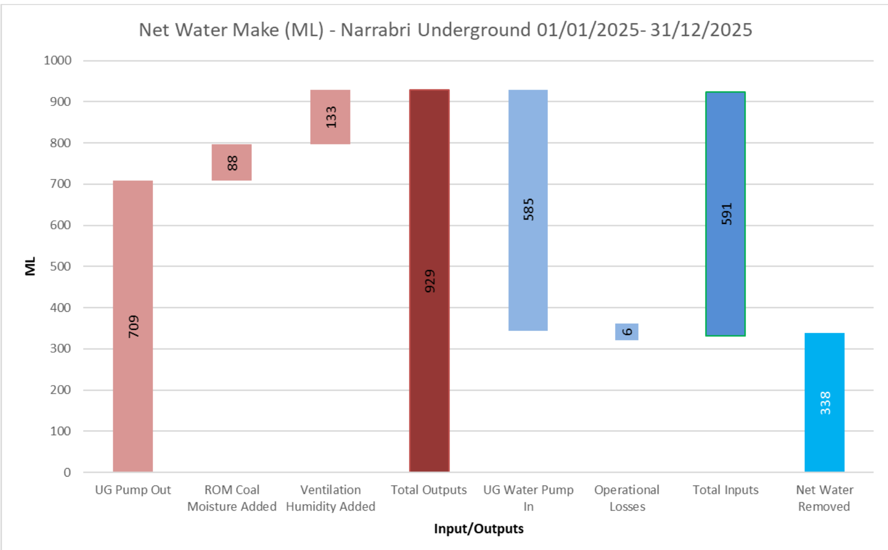


Figure 11: Waterfall Chart – Water Inputs/Outputs for Reporting Period

8 REHABILITATION

Narrabri Mine rehabilitation works are managed in accordance with:

- PA 08_0144, Schedule 5, Condition 4;
- PA 08_0144 SoC;
- SSD-10269 CoC B61 to B65 - rehabilitation;
- EPBC Approval 2009/5003, Condition 5;
- PA 08_0144 SoC;
- FWP;
- RMP; and
- Standard mining lease conditions, Division 1 (4-6), Division 2 (7), Division 3 (10 and 12).

The Rehabilitation Objectives for Narrabri Colliery were approved by the RR on October 18, 2023. The objectives and other updates were then added to the RMP. The Annual Rehabilitation Report and Forward Program (**ARRFP**), as required by the *NSW Mining Regulation 2016*, has been prepared and submitted to the RR.

Section 8.1 provides an overview of the rehabilitation practices that were conducted during the Reporting Period.

8.1 REHABILITATION PERFORMANCE DURING THE REPORTING PERIOD

8.1.1 Status of Mining and Rehabilitation

Rehabilitation activities were undertaken over the disturbed areas above LW203-204 during the Reporting Period, with approximately 4.05ha being rehabilitated. Rehabilitation activities undertaken during the Reporting Period included:

- Decommissioning drill holes;
- Grading landforms and re-spreading topsoil/subsoil; and
- Weed management.

8.1.2 Post Rehabilitation Land Uses

Narrabri Mine final land use requirements is outlined in Table 2-1 of the RMP.

8.1.3 Rehabilitation Performance Indicators

The rehabilitation completed for 2024 (previous Reporting Period), 2025 (this Reporting Period) and the predicted rehabilitation activities for 2026 is summarised in **Table 22**.

Figure 12 and **Figure 13** shows the status of rehabilitation at the Narrabri Mine.

Table 22: Rehabilitation Status

Mine Area Type*	Previous Reporting Period 2024 (Actual)	This Reporting Period 2025 (Actual) **	Next Reporting Period 2026 (Forecast) **
A. Total Mine Footprint	512.07[1]	546.44	582.39
B. Total Active Disturbance	327.78[2]	358.72	390.3[4]
C. Land Being Prepared for Rehabilitation	7.3	4.05	9.02
D. Land Under Active Rehabilitation	176.99[3]	180.59	184.64
E. Completed Rehabilitation	0	0	0

Notes: * Data reported to align with definitions in the Annual Review Guideline (DPE, 2015).

** Data sourced from ARRFP

1. 2024 Annual Review reported 521.85 ha, however, recalculated to align with Annual Rehabilitation Report 2024.
2. 2024 Annual Review reported 344.05 ha, however, recalculated to align with Annual Rehabilitation Report 2024.
3. 2024 Annual Review reported 170.50 ha, however, recalculated to align with Annual Rehabilitation Report 2024.
4. ARRFP, total cumulative active disturbance is 390.3 ha.

8.1.4 Rehabilitation Risks

The NSW *Mining Act 1992* requires the Leaseholder to conduct a rehabilitation risk assessment and implement measures to eliminate, minimise or mitigate the risks in accordance with the *Guideline: Rehabilitation Risk Assessment*.

A risk assessment workshop was conducted on 19 May 2025 to identify key issues presenting a risk to achieving the rehabilitation objectives and completion criteria.

The risk workshop assessed a total of 32 risks, which were ranked as follows:

- One risk was not applicable as it related to retained underground workings and habitation by native fauna;
- 27 risks were ranked as low;
- Four risks were ranked as moderate; and
- No risks were ranked as high or critical.

The risks assessed as moderate related to the decommissioning of brine dams and mine water storages, management of mineral waste, surface water impacts associated with rehabilitation areas, and potential impacts on areas of heritage and cultural significance.

8.1.5 Decommissioning and Demolition Activities

Decommissioning activities were undertaken during the Reporting Period included:

- Reclaiming of gas drainage infrastructure, e.g. poly pipe; and
- Cementing and rehabilitation of boreholes.

8.1.6 Departmental Sign-off of Rehabilitated Areas

Departmental sign-off was not requested during the Reporting Period.

8.1.7 Monitoring

Rehabilitation monitoring results are outlined in **Section 6.5**. Additionally, NCOPL undertake routine inspections of roads and creeks impacted by mine subsidence, water management structures, soil stockpiles and seeded areas for evidence of instability/erosion and/or poor germination and borehole sealing.

8.1.8 Trials, Research Projects and Initiatives

During the Reporting Period, NCOPL continued to expand and refine its electronic GIS-based monitoring platform, enhancing functionality, data capture and integration with rehabilitation workflows. During the Reporting Period, the system has improved the consistency, traceability and accessibility of monitoring records, providing a centralised database to support performance assessment, reporting and continuous improvement.

8.2 ACTIVITIES FOR THE NEXT REPORTING PERIOD

In accordance with CoC B63, a Rehabilitation Strategy was required to be prepared and submitted to DPHI by 1 February 2026. This action will be progressed during the next Reporting Period in line with correspondence and/or approval received from DPHI.

Rehabilitation activities for 2026 will be carried out generally in accordance with the FWP and RMP subject to operational progress.

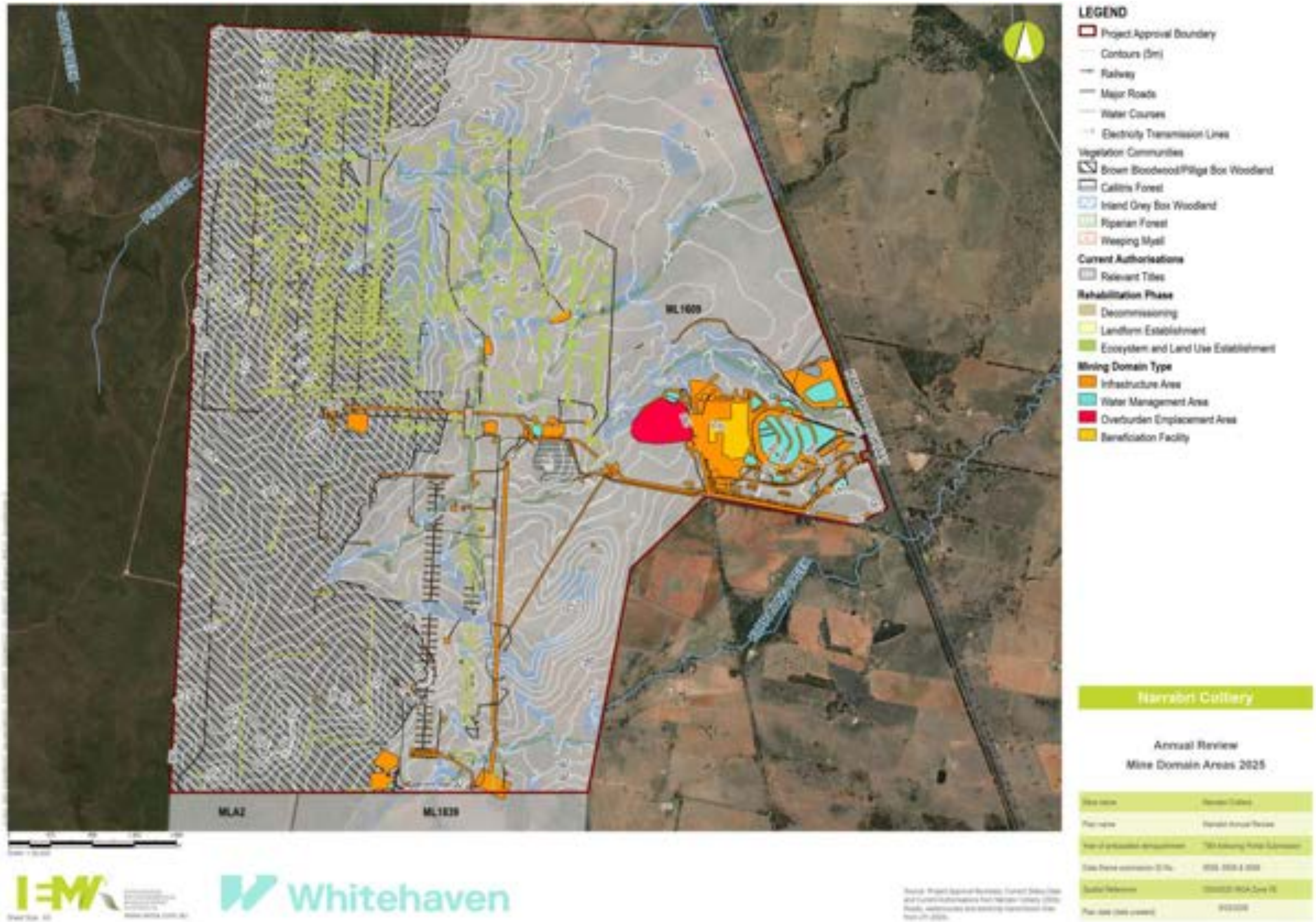


Figure 12: Mine Domains Reporting Period 2025

Figure 13: Rehabilitated Areas, Reporting Period 2025

9 COMMUNITY

Social impacts and opportunities associated with the Narrabri Mine are managed in accordance with:

- PA 08_0144;
- PA 08_0144 SoC; and
- SSD-10269.

9.1 COMMUNITY ENGAGEMENT

NCOPL undertook a range of engagement activities during 2025:

- Narrabri Mine Community Consultative Committee (**CCC**) meetings. The CCC comprises representatives of NCOPL, NSC and the local community. The meetings were held in March, June, September and December 2025. Minutes of each of these meetings are available at the WHC website.
- Near neighbour consultation regarding impacts, address any potential concerns and other interactions.

In addition, general information relating to Narrabri Mine is available:

- On the WHC website;
- The Annual Sustainability Report; and
- At other consultation meetings as required with neighbours and a range of stakeholders including government and non-government agencies. WHC meets regularly with the NSC and is a regular attendee at the Narrabri and Boggabri Business Chamber meetings.

9.2 COMMUNITY CONTRIBUTIONS & INITIATIVES

In addition to attending functions, WHC and NCOPL also contributed to the community by providing financial support to the Narrabri community and sponsorship to various community events and initiatives during the Reporting Period including:

- 2025 Tamworth Science & Engineering Challenge
- Australian Bushman's Campdraft and Rodeo Association
- Baan Baa Tennis Club
- Barraba Central School
- Barraba Junior touch Football Association Inc
- Barraba Public School
- Bellata Common Trust
- Black n Blue Boxing Gunnedah
- Boggabri & District Rugby League Football Club Inc
- Boggabri Anglican Church
- Boggabri Business Chamber
- Drovers Campfire
- Boggabri Gunnedah Gun Club
- Boggabri Joeys Playgroup
- Boggabri Junior Rugby League Club
- Boggabri Men's Shed
- Boggabri Pony Club
- Boggabri Public School
- Boggabri Showground And Public Recreation Land Manager
- Boomerangs Sports Club

- Business NSW
- CanAssist
- Carinya Christian School
- Challenge Community Services
- Children's Medical Research Institute
- Clontarf Academy
- Connecting with Bricks
- Cougars Baseball Club
- Country Education Foundation of the Namoi
- Cure Brain Cancer Foundation
- Curlewis Public School
- Deadly Dance Academy
- Awesome Opportunities Basketball
- Dorothea Mackellar Poetry Society
- Dymocks Children's Charities
- Eulah Creek Recreation Reserve Land Manager
- Fairfax Public School Parents & Citizens Association
- Foundation boxing
- G.S Kidd Memorial Public School
- Gomeroi Roos
- Group 4 Rugby League
- Gunnedah & District Chamber of Commerce
- Gunnedah & District Soccer Association
- Gunnedah and District Australian Football Club
- Gunnedah Athletics Centre
- Gunnedah Baptist Community Preschool
- Gunnedah Bulldogs Rugby League Football Club
- Gunnedah Cricket Club
- Gunnedah Family Support
- Gunnedah Gymnastics
- Gunnedah High School
- Gunnedah Kennel Club
- Gunnedah Meals on Wheels
- Gunnedah Ministers Fraternal
- Gunnedah Mountain Bikers
- Gunnedah MS Incorporated
- Gunnedah Show Society
- Gunnedah South Public School P & C Association
- Gunnedah Triathlon Club
- Huskies Baseball Club Inc
- Inverell Bear Eaters Elders Group
- Kamilaroi Lightning
- Kootingal Moonbi Rugby League Football Club
- Lake Keepit Family Fishing Club
- Little Wings
- Manilla Show Society
- Maules Creek Campdraft

- Movember Foundation
- Mullaley Cricket Club
- Namoi Valley Christian School
- Narrabri & District Junior Rugby League
- Narrabri & District Pony Club
- Narrabri Arts Eisteddfod
- Narrabri Clay Target Club
- Narrabri Dirt Bike Club
- Narrabri Dolphins Water Polo Club
- Narrabri High School
- Narrabri Hospital
- Narrabri Jockey Club
- Narrabri Junior Rugby Club
- Narrabri Local Aboriginal Land Council
- Narrabri Polocrosse Club
- Narrabri Racecourse Land Manager
- Narrabri RSL sub Branch
- Narrabri Rugby League Football Club
- Narrabri Show Society
- National Breast Cancer Foundation
- New England Quarter Horse Association
- Nexus Health and Wellbeing
- Ngaarr Thawun Rural Ag and Environmental Sustainability Indigenous Corporation
- Northern Inland Academy of Sport
- Nosh Narrabri
- NSW Aboriginal Golf Incorporated
- Nungaroo Local Aboriginal Land Council
- Parkinsons Support Group of Narrabri
- PCYC Gunnedah
- Pink Shenanigan's Crew
- Premer Public School
- Quirindi Branch of the Country Women's Association
- Quirindi Grasshoppers Rugby League Football Club
- Quirindi RSL Sub Branch
- Red Chief LALC
- Rotary Club of Gunnedah West
- Rotary Club of Narrabri
- Rotary Club of Tamworth West
- Royal Far West
- Sacred Heart School
- Spring Ridge Public School P & C Association
- Square and Round Dance Association of NSW
- St Francis Xaviers Narrabri
- St Mary's College Gunnedah
- Summit Community Services Inc
- Swimming Gunnedah Inc
- Tambar Springs Progress Association
- Tamworth and District Campdraft Club
- Tamworth Business Chamber

- Tamworth Crows
- The Tiny Foxes Pty Ltd
- VRL Memorial women's rugby league team
- Wean Jockey Club
- Wee Waa Aboriginal Local Land Council
- Wee Waa High School
- Wee Waa Lions Club
- Wee Waa Show Society Inc
- Weeks of Speed Gunnedah
- Werris Creek Golf Club Anglers Club
- Werris Creek Public School
- Werris Creek Rugby League Club
- Werris Creek Swimming Club
- Westpac Rescue Helicopter Service
- White Elephant Ball
- Yallambee Homes for the Aged

9.3 COMMUNITY COMPLAINTS

NCOPL maintains a designated complaints line (1800 942 836). In the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded on a complaint register. The complaints register is available on the WHC website.

During the Reporting Period, NCOPL received no community complaints.

9.3.1 Complaint Trends

NCOPL received no community complaints during the Reporting Period which is a decrease from one complaint received during 2024 (**Figure 14**).

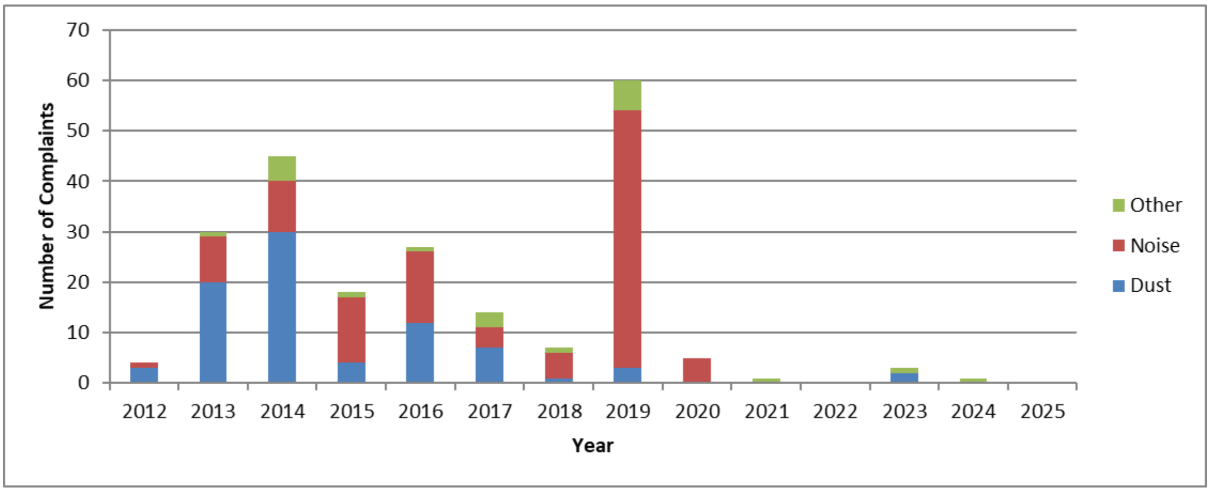


Figure 14: Complaints Trend Since Commencement of Operations

9.4 ACTIVITIES FOR THE NEXT REPORTING PERIOD

NCOPL will also continue to meet with NSC and the Narrabri Business Chamber regularly and support the Narrabri Shire Community through the Community Investment Committee.

10 INDEPENDENT AUDIT

10.1 INDEPENDENT ENVIRONMENTAL AUDIT

During the Reporting Period, a 3-yearly IEA was conducted in accordance with PA 08_0144, Schedule 6, Condition 7, covering the period from 9 December 2022 to 5 November 2025. One non-compliance was identified, originating from a self-reported air quality incident documented in the 2023 Annual Review. The 2025 IEA Report and NCOPL's Response Action Plan was provided to the DPHI and published to the Whitehaven website.

In accordance with SSD-10269, CoC E13, NCOPL is required to commission an IEA for the first 12-month period of operations under SSD-10269 by 1 August 2026.

11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

11.1 NON-COMPLIANCES

The compliance status of the Narrabri Mine against relevant approvals during the Reporting Period was assessed in **Section 1** as at the end of the Reporting Period (i.e. 31 December 2025). Further details of any non-compliance and actions undertaken or proposed for the following Reporting Period is summarised in **Table 23**.

Table 23: Non-Compliance Details and Proposed Action Plan

Non – Compliance Summary	Cause / Details	Action Taken to Ensure Compliance
Nil	Nil	Nil

11.2 REPORTABLE INCIDENTS OR EXCEEDANCES

There were no “incidents” (as that term is defined in PA 08_0144 or SSD-10269) during the Reporting Period.

Table 25 provides details of matters or exceedances during the Reporting Period that were reported by NCOPL to regulatory authorities. Matters addressed at **Section 1** or **Section 11.1** are not reproduced in **Table 24.**

11.3 REGULATORY ACTIONS

There were no formal regulatory actions issued during the Reporting Period.

Table 24: Reportable Matters or Exceedances 2025

No.	Date	Reported To	Nature	Details	Action Taken	Matter Status
1	12 February 2025	DPHI	Groundwater	Quarter 1 2025 groundwater monitoring results reported exceedances of groundwater trigger values, including: Water quality: P2, P3, P4, P7, P10, P11, P29, P39A, P38B, P43 and P47. Water level: P11.	Hydrogeological review completed. Event report submitted to DPHI in accordance with notification requirements. Hydrogeological investigation outcomes to be reported in Annual Review.	No further action required. Completed and closed. Further information provided in Annual Groundwater Report (**Appendix F**)
2	12 April 2025	DPHI	Air Quality	Potential exceedance of 24-hour air quality criteria at PM_{10} site ND10, all sources reading measured 54.6 µg/m^3.	Analysis report (concluding NCOPL did not exceed criteria) submitted to DPHI.	No further action required. Completed and closed.
3	5 June 2025	DPHI	Groundwater	Quarter 2 2025 groundwater monitoring results reported exceedances of groundwater trigger values, including: Water quality: P2, P4, P7, P10, P11, P29, P39A, P38B, P43, P47 and P53. Water level: P11.	Hydrogeological review completed. Event report submitted to DPHI in accordance with notification requirements. Hydrogeological investigation outcomes to be reported in Annual Review.	No further action required. Completed and closed. Further information provided in Annual Groundwater Report (**Appendix F**)
4	31 July 2025	DPHI	Surface Water	KCUS exceeded water quality EC trigger value, measuring 931 µS/cm over trigger value 798 µS/cm.	Hydrologist review completed. Event report submitted to DPHI in accordance with notification requirements. Investigation concluded that the recorded EC measurement was not caused by water stored within, or runoff from, subsidence ponds, however, was directly attributable to a controlled discharge of water from an (upstream) sediment dam (SD9) occurring at the time of KCUS sample collection.	No further action required. Completed and closed.

No.	Date	Reported To	Nature	Details	Action Taken	Matter Status
5	3 September 2025	DPHI, DCCEEW	Groundwater	Quarter 3 2025 groundwater monitoring results reported exceedances of groundwater trigger values, including: Water quality: P2, P3, P4, P7, P9, P10, P11, P29, P39A, P38B, P43, P47 and P53. Water level: P11.	Hydrogeological review completed. Event report submitted to DPHI in accordance with notification requirements. Hydrogeological investigation outcomes to be reported in Annual Review.	No further action required. Completed and closed. Further information provided in Annual Groundwater Report (**Appendix F**)
6	11 November 2025	DPHI, DCCEEW	Groundwater	Quarter 4 2025 groundwater monitoring results reported exceedances of groundwater trigger values, including: Water quality: P2, P4, P7, P9, P10, P11, P29, P39A, P38B, P47 and P53. Water level: P11.	Hydrogeological review completed. Event report submitted to DPHI in accordance with notification requirements. Hydrogeological investigation outcomes to be reported in Annual Review.	No further action required. Completed and closed. Further information provided in Annual Groundwater Report (**Appendix F**)
7	12 December 2025	DPHI, DCCEEW	Surface Water	KCUS exceeded water quality Total Organic Carbon (**TOC**) trigger value, measuring 18 mg/L over trigger value 17 mg/L.	Hydrologist review completed. Event report submitted to DPHI in accordance with notification requirements. Investigation concluded that the recorded TOC measurement at KCUS was not caused by water stored within, or runoff from, subsidence ponds, but rather was due to natural elevated levels upstream of monitoring location.	No further action required. Completed and closed.

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

A summary of key environmental management activities proposed for 2026 is presented in **Table 25**. Progress against these activities will be reported in the 2025 Annual Review.

Table 25: Environment Management Activities Proposed for 2026

Area / Issue	Actions Proposed	Timeline for Implementation
Audit	Commission IEA per SSD-10269 CoC E13.	1 August 2026
Audit	Undertake Independent Audit of EPBC Approval 2019/8427, condition 45.	1 August 2026
Approvals	Surrender PA 08_0144	1 August 2026 (or other timeframe agreed by the Planning Secretary)
Management Plans	Seek progressive approval of Extraction Plan LW203-206	3 months prior to commencement of secondary extraction in LW205
Rehabilitation	Submit Rehabilitation Strategy for approval	1 February 2026

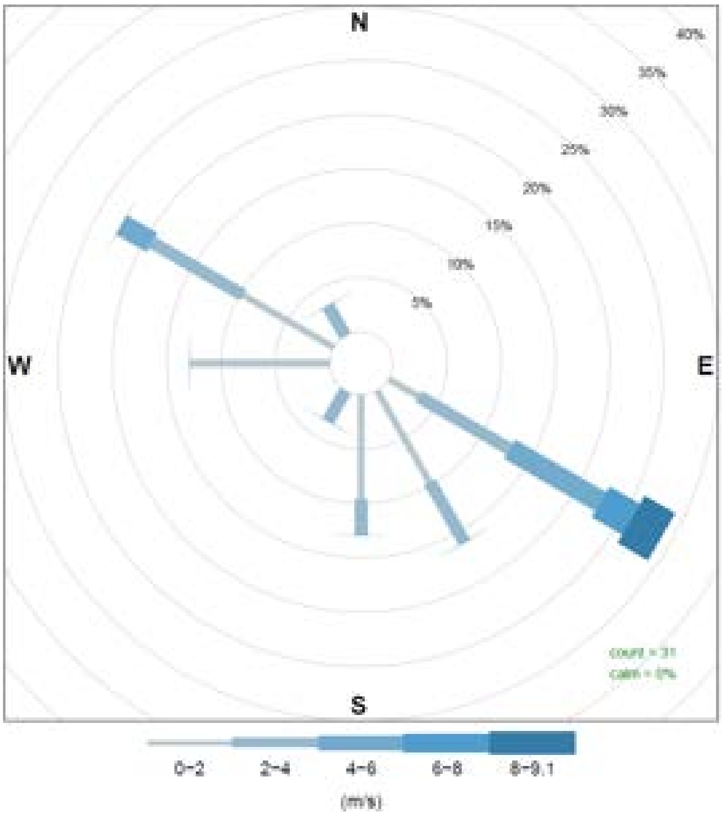
Appendix A – *Meteorological Monitoring*

Table A1: Summary of Meteorological Conditions 2025

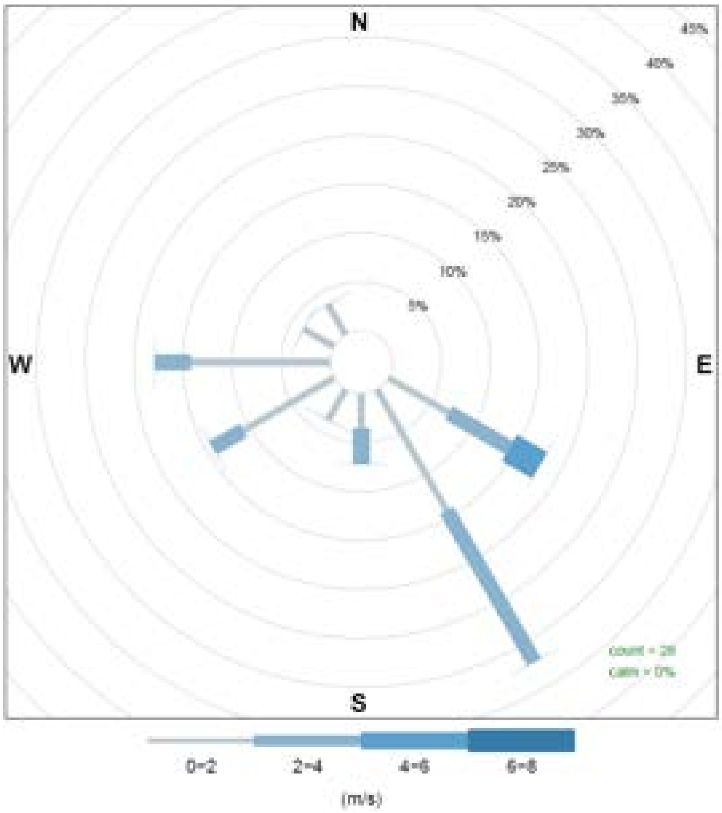
Month	Rain (mm)	Cumulative Rainfall (mm)	Rainfall Days (>1mm)	2m Temperature (˚C)			Wind		Inversion Conditions[1]
				Min	Mean	Max	Av. Speed (m/s)	Predominant Direction	% of Evening/Night Time Period[2] (%)
Jan-25	53.6	53.6	6	13.4	26.1	40.3	2.8	SE	53
Feb-25	36.6	90.2	5	10.4	25.8	38	1.74	SE	61
Mar-25	194.4	284.6	5	17.4	24.2	38.5	3.2	SE	47
Apr-25	76.2	360.8	4	6.7	18.2	30	2.5	SE	84
May-25	47	407.8	6	3.8	14.9	25	2.8	SE	84
Jun-25	19.6	427.4	2	-0.1	9.7	22	2.3	SE	94
Jul-25	69.6	497	7	-0.5	10.2	21.3	2.6	SE	88
Aug-25	55	552	5	-1.7	11.3	24.1	2.6	SE	91
Sep-25	41.8	593.8	4	1.6	15.9	30.9	2.3	NW	95
Oct-25	38.4	632.2	2	6.6	24.1	37.8	2.5	NW	79
Nov-25[3]	37.4	669.6	4	6.1	23.4	38.6	2.7	NW	82
Dec-25[3]	54.8	724.4	3	6.7	25.5	40.3	2.8	SE	69

1. Inversion conditions are calculated from measurements recorded by the site 60m Inversion Tower. Inversions occur during E, F and G stability categories (these categories represent weak, moderate and strong inversion conditions).
2. Evening and night period generally includes 6pm-7am.
3. Partial data loss due to site meteorological station power issues. Annual data recovery rate was 96%. Where data was lost,, supplementary data from the BOM Narrabri Airport AWS was analysed for reporting purposes.

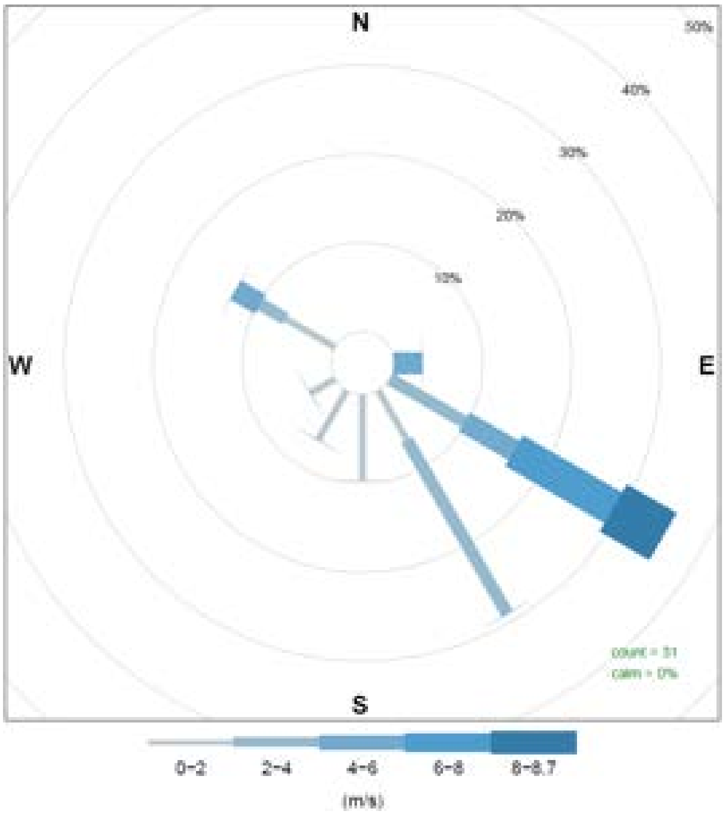
January 2025



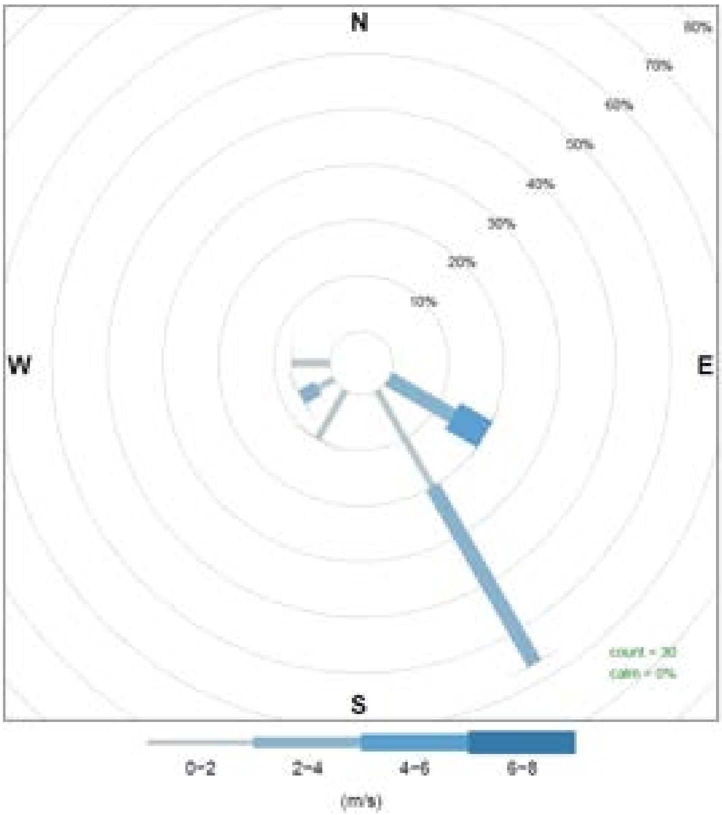
February 2025



March 2025

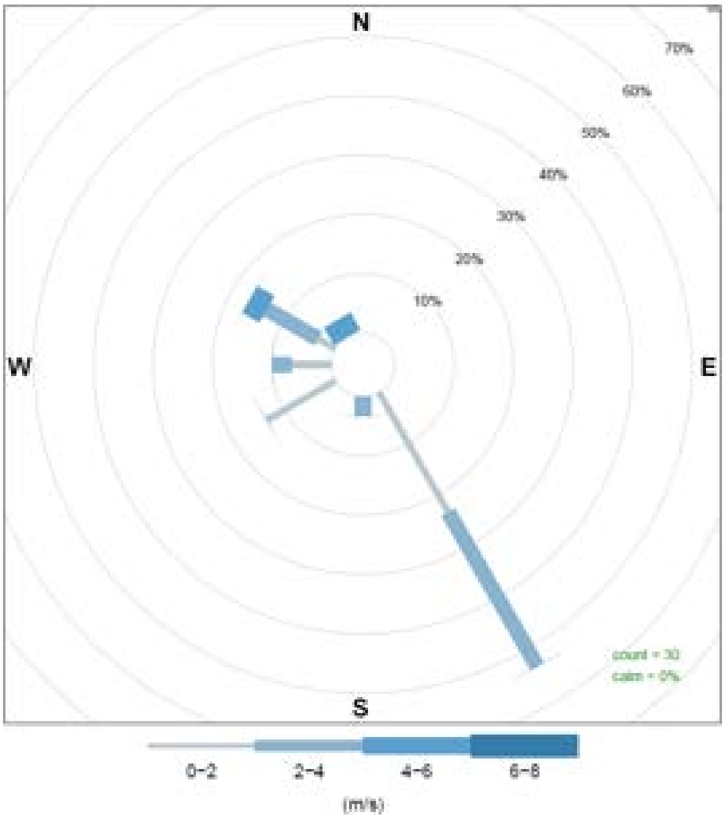


April 2025

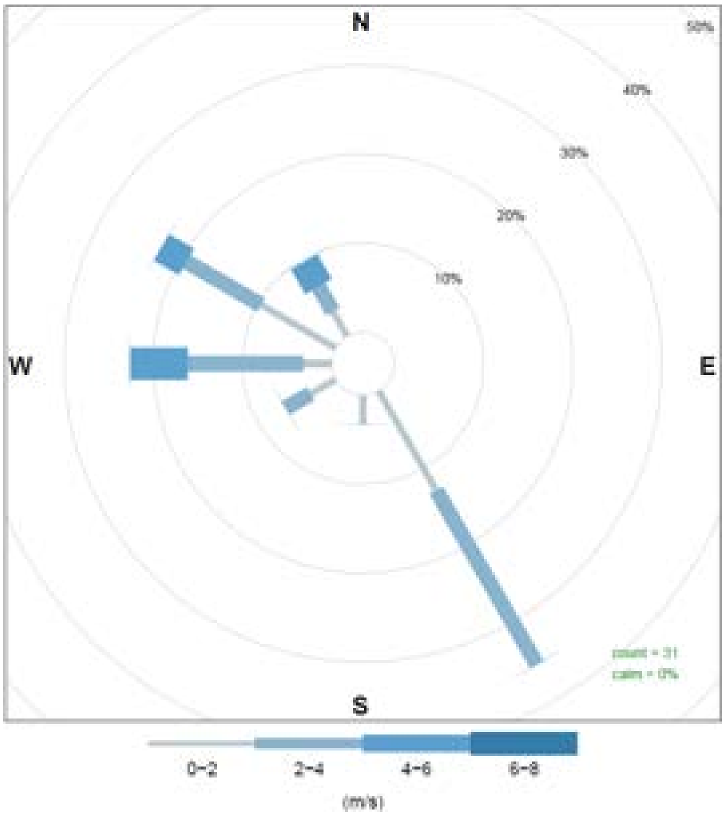


May 2025

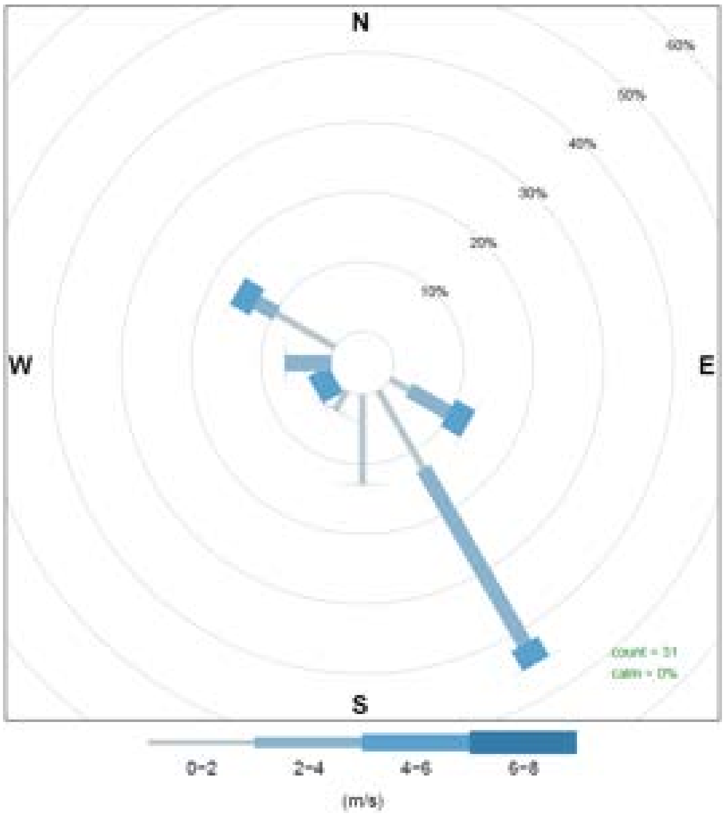
June 2025



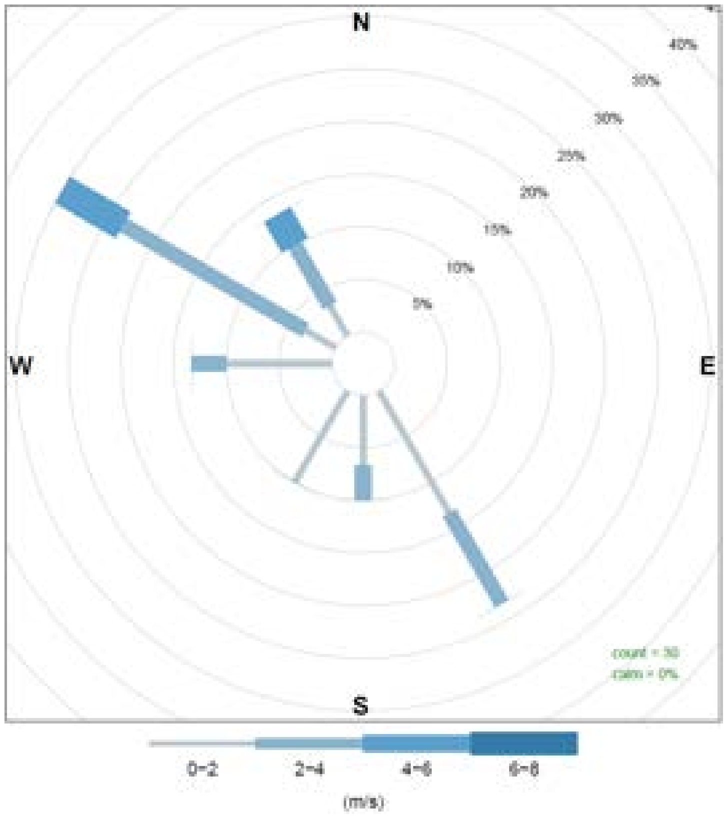
July 2025



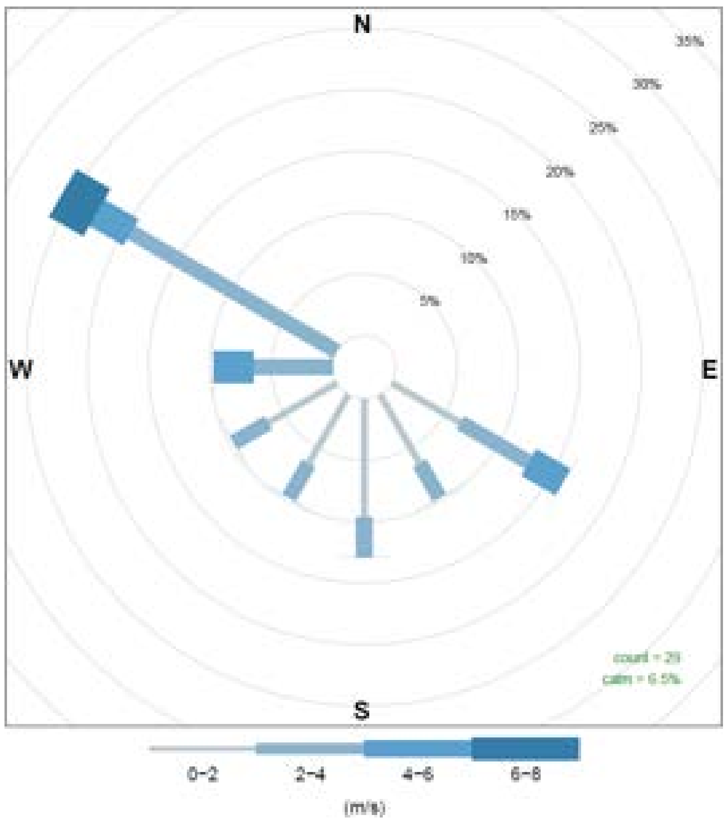
August 2025



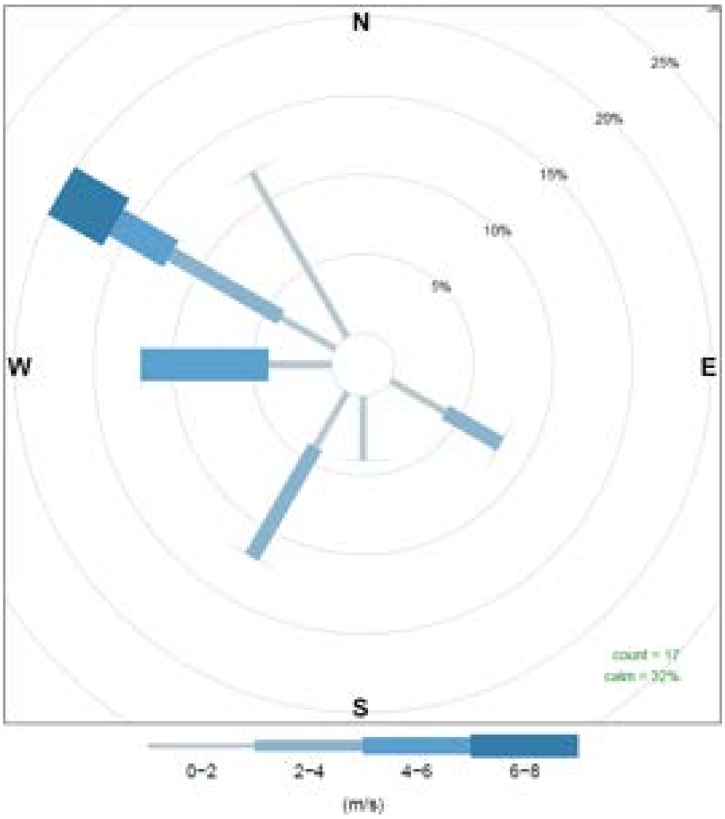
September 2025



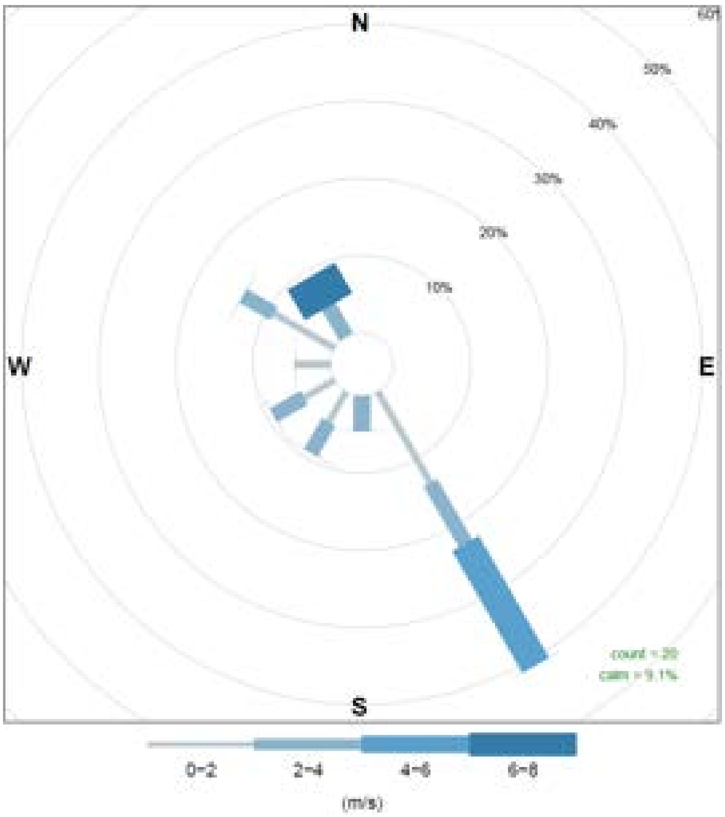
October 2025



November 2025



December 2025



Appendix B – *Flora Species List*

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Acacia burrowii	Burrow's Wattle	Native		X	X	X	X	X					X	6
Acacia deanei	Green Wattle	Native						X		X		X	X	4
Acacia ixiophylla		Native											X	1
Acacia leiocalyx subsp. leiocalyx	Curracabah	Native	X	X	X	X	X	X						6
Acacia neriifolia	Silver Wattle	Native											X	1
Acacia penninervis	Mountain Hickory	Native	X		X	X								3
Actinotus helianthi	Flannel Flower	Native	X											1
Actinotus gibbonsii		Native	X	X		X	X							4
Allocasuarina diminuta		Native											X	1
Allocasuarina luehmannii	Bulloak	Native						X		X				2
Alphitonia excelsa	Red Ash	Native		X	X									2
Alstonia constricta	Quinine Bush	Native			X					X				2
Amyema spp.	Mistletoe	Native								X				1
Aristida caput-medusae	Many-headed Wiregrass	Native		X	X			X						3
Aristida jerichoensis	Jericho Wiregrass	Native				X								1
Aristida personata		Native		X	X		X							3
Aristida spp.		Native								X		X	X	3
Asperula conferta	Common Woodruff	Native						X						1
Asteraceae indeterminate	Daisies	Exotic						X		X	X	X	X	5
Atalaya hemiglauca	Whitewood	Native										X		1
Austrostipa scabra	Speargrass	Native						X				X		2
Austrostipa verticillata	Slender Bamboo Grass	Native			X			X						2
Bertya gummifera		Native											X	1
Bertya opponens	Coolabah Bertya	Native		X	X									2

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Boronia glabra	Sandstone Boronia	Native	X		X									2
Boronia occidentalis		Native	X	X	X	X								4
Brachychiton populneus	Kurrajong	Native						X						1
Brachyscome spp.		Native		X	X					X				3
Brassicaceae indeterminate	Mustards	Exotic									X			1
Briza minor		Exotic								X				1
Brunoniella australis	Blue Trumpet	Native						X					X	2
Bulbine semibarbata	Wild Onion	Native						X						1
Bursaria spp.		Native											X	1
Callitris endlicheri	Black Cypress Pine	Native				X	X							2
Callitris glaucophylla	White Cypress Pine	Native								X	X	X	X	4
Calochilus robertsonii	Purplish Beard Orchid	Native					X							1
Calochilus spp.		Native											X	1
Calotis cuneifolia	Purple Burr-Daisy	Native		X	X	X		X		X				5
Calotis lappulacea	Yellow Burr-daisy	Native										X		1
Calytrix tetragona	Common Fringe-myrtle	Native	X			X	X							3
Carex inversa	Knob Sedge	Native							X					1
Carthamus lanatus	Saffron Thistle	High threat									X	X		2
Cassinia spp.		Native	X										X	2
Cassytha glabella		Native	X											1
Centaurium spp.		Exotic									X			1
Cerastium glomeratum	Mouse-ear Chickweed	Exotic							X	X				2
Cheilanthes sieberi	Rock Fern	Native		X	X	X		X	X	X	X	X	X	9
Chloanthes parviflora		Native	X			X	X							3

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Chloris spp.		Native									X			1
Chloris truncata	Windmill Grass	Native										X		1
Chrysocephalum apiculatum	Common Everlasting	Native								X	X	X		3
Cirsium vulgare	Spear Thistle	Exotic						X						1
Cleistochloa rigida		Native	X			X	X							3
Convolvulus spp.		Native									X			1
Conyza spp.		Exotic								X				1
Corymbia trachyphloia	White Bloodwood	Native	X	X	X	X	X							5
Crassula sieberiana		Native										X		1
Crassula spp.		Native								X	X			2
Cyclospermum leptophyllum		Exotic							X	X				2
Cymbopogon refractus	Barbed Wire Grass	Native		X	X			X	X	X	X	X	X	8
Cynodon dactylon	Common Couch	Native							X					1
Dampiera adpressa	Purple Beauty Bush	Native	X			X	X							3
Daucus glochidiatus	Native Carrot	Native		X				X		X	X	X		5
Denhamia cunninghamii		Native											X	1
Dianella revoluta	Blueberry Lily	Native						X					X	2
Dichanthium sericeum	Queensland Bluegrass	Native									X	X		2
Dichondra sp. Inglewood		Native						X		X			X	3
Digitaria breviglumis		Native		X										1
Dodonaea falcata		Native	X			X	X							3
Dodonaea viscosa	Sticky Hop-bush	Native			X								X	2
Echium plantagineum	Patterson's Curse	Exotic							X	X		X		3
Einadia nutans	Climbing Saltbush	Native								X				1

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Entolasia stricta	Wiry Panic	Native											X	1
Epacridaceae indeterminate	Austral heaths	Native											X	1
Eragrostis brownii	Brown's Lovegrass	Native			X									1
Eragrostis curvula	African Lovegrass	High threat							X	X	X	X		4
Eragrostis spp.		Native						X		X	X	X		4
Eucalyptus dwyeri	Dwyer's Red Gum	Native	X		X									2
Eucalyptus fibrosa	Red Ironbark	Native	X	X	X	X		X					X	6
Eucalyptus microcarpa	Western Grey Box	Native								X				1
Eucalyptus spp.		Native									X	X		2
Euchiton sphaericus	Star Cudweed	Native						X						1
Euchiton spp.		Native			X									1
Exocarpos spp.		Native											X	1
Fabaceae indeterminate	Legumes	Native								X				1
Gahnia aspera	Rough Saw-sedge	Native						X					X	2
Geijera parviflora	Wilga	Native						X						1
Geranium homeanum		Native						X						1
Glandularia aristigera	Mayne's Pest	Exotic							X	X	X	X		4
Glycine clandestina	Twining glycine	Native			X			X		X			X	4
Glycine tomentella		Native								X				1
Gonocarpus elatus		Native	X	X	X	X	X						X	6
Goodenia rotundifolia		Native	X	X		X	X						X	5
Harmogia densifolia		Native	X			X								2
Hibbertia circumdans		Native	X				X							2
Hibbertia covenyana		Native	X											1

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Hibbertia spp.		Native											X	1
Hibiscus sturtii	Hill Hibiscus	Native		X	X			X				X		4
Homoranthus flavescens		Native		X	X									2
Hyparrhenia hirta	Coolatai Grass	High threat								X				1
Hypericum gramineum	Small St John's Wort	Native								X				1
Hypochaeris glabra	Smooth Catsear	Exotic		X	X	X		X	X	X		X		7
Hypochaeris radicata	Catsear	Exotic							X		X		X	3
Indigofera adesmiifolia	Tick Indigo	Native											X	1
Juncus spp.		Native							X	X				2
Lactuca serriola	Prickly Lettuce	Exotic						X	X					2
Lamiaceae indeterminate	Mints and balms	Native											X	1
Leontodon rhagadioloides		Exotic							X	X	X	X		4
Lepidosperma laterale	Variable Sword-sedge	Native	X											1
Lolium rigidum		Exotic							X	X	X			3
Lomandra cylindrica		Native											X	1
Lomandra filiformis		Native	X		X			X						3
Lomandra multiflora subsp. multiflora	Many-flowered Mat-rush	Native			X			X					X	3
Lomandra spp.	Mat-rush	Native						X					X	2
Lysimachia arvensis	Scarlet Pimpernel	Exotic			X			X	X	X	X	X		6
Lythrum hyssopifolia		Native								X				1
Maireana microphylla	Small-leaf Bluebush	Native									X	X		2
Marsdenia viridiflora subsp. viridiflora	Native Pear	Native						X						1
Medicago truncatula	Barrel Medic	Exotic									X			1

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Melaleuca uncinata	Broombush	Native											X	1
Melichrus erubescens	Ruby Urn Heath	Native					X							1
Melichrus urceolatus	Urn Heath	Native	X	X										2
Microlaena stipoides	Weeping Grass	Native		X	X			X					X	4
Microtis spp.		Native							X		X	X		3
Microtis unifolia		Native								X				1
Notelaea microcarpa	Native Olive	Native						X						1
Nuttallanthus texanus		Exotic							X					1
Olearia decurrens	Clammy Daisy-bush	Native						X						1
Oplismenus imbecillis		Native						X						1
Opuntia stricta	Common Prickly Pear	Exotic			X			X		X	X			4
Oxalis spp.		Native		X	X			X	X	X			X	6
Panicum effusum	Hairy Panic	Native								X		X		2
Panicum spp.	Panicum	Native		X				X			X		X	4
Parsonsia eucalyptophylla	Gargaloo	Native		X				X					X	3
Paspalidium spp.		Native		X	X			X					X	4
Petrorhagia dubia		Exotic								X				1
Petrorhagia nanteuilii	Proliferous Pink	Exotic							X		X	X		3
Phebalium squamulosum		Native	X	X	X	X	X	X					X	7
Philotheca ciliata		Native	X	X	X	X	X	X					X	7
Phyllanthus virgatus	Wiry Spurge	Native										X		1
Pimelea spp.		Native			X									1
Platysace ericoides		Native					X							1
Poaceae indeterminate	Grasses, reeds and bamboos	Exotic						X	X	X	X	X		5

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Pomaderris spp.		Native											X	1
Pomax umbellata	Pomax	Native	X		X	X	X						X	5
Poranthera microphylla		Native		X	X			X						3
Poranthera spp.		Native											X	1
Prostanthera ringens	Gaping Mint-bush	Native											X	1
Pterostylis bicolor		Native											X	1
Pterostylis spp.		Native									X			1
Ranunculus sessiliflorus		Native						X						1
Ranunculus spp.		Native							X					1
Rumex brownii	Swamp Dock	Native							X					1
Schoenus spp.		Native				X								1
Senecio spp.	Groundsel, Fireweed	Native		X						X				2
Seringia collina		Native			X									1
Setaria parviflora		Exotic								X				1
Sida corrugata	Corrugated Sida	Native										X		1
Sida cunninghamii	Ridge Sida	Native											X	1
Sida spp.		Native		X	X			X						3
Solanum ferocissimum	Spiny Potato-bush	Native		X				X					X	3
Solanum jucundum		Native		X	X								X	3
Solanum parvifolium subsp. parvifolium	Nightshade	Native			X									1
Solanum spp.		Native						X				X		2
Sonchus oleraceus	Common Sowthistle	Exotic						X	X	X	X	X	X	6
Sporobolus creber	Slender Rat's Tail Grass	Native								X	X	X		3
Stuartina muelleri		Native		X	X	X								3

Scientific Name	Common Name	Native Exotic HTE	GRY-1	ROV-1	ROV-2	ROV-3	ROV-4	ROV-5	ROV-6	ROV-7	ROV-8	ROV-9	WEH-1	Grand Total
Thyridolepis mitchelliana	Mulga Mitchell Grass	Native		X	X									2
Trifolium arvense		Exotic							X	X	X	X		4
Trifolium campestre	Hop Clover	Exotic							X	X	X	X		4
Trifolium glomeratum		Exotic							X		X			2
Unknown A								X			X			2
Unknown B								X						1
Verbascum virgatum		Exotic							X					1
Vittadinia cuneata		Native									X			1
Vittadinia muelleri		Native									X			1
Vittadinia spp.	Fuzzweed	Native										X		1
Vulpia spp.	Rat's-tail Fescue	Exotic								X	X			2
Wahlenbergia communis	Tufted Bluebell	Native									X		X	2
Wahlenbergia spp.	Bluebell	Native		X	X	X				X		X		5
Xerochrysum bracteatum		Native		X				X				X		3
Xerochrysum spp.		Native			X									1

Appendix C – *Photo Monitoring Points*

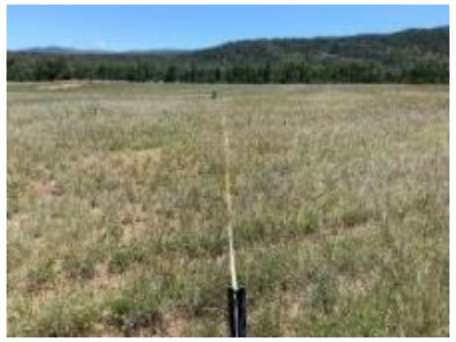
Greylands - 1

PLOT ID: FL-WSD-GRY-1-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 772042	NORTHING: 6622013		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 772002	NORTHING: 6621987		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

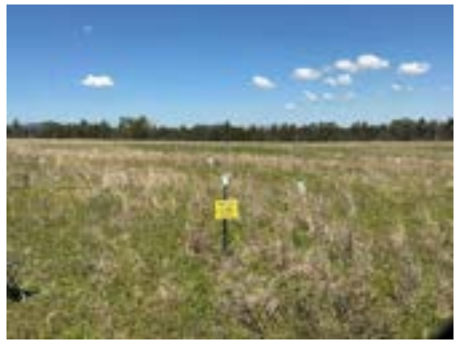
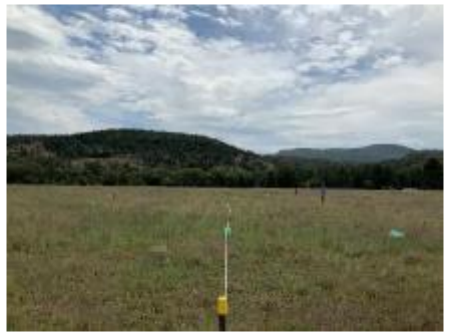
Kenna – 5

PLOT ID: FL-WSD-KEN-5-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2014**	*** PHOTOS AVAILABLE FROM 2019**	
START	**EASTING: 236891**	**NORTHING: 6623818**		
Year 3 – 2019*	**Year 4 – 2020**	**Year 5 – 2021**	**Year 6 – 2022**	**Year 7 - 2023**
				
Year 8 - 2024	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**	**Year 12 - 2028**
				
END	**EASTING: 236880**	**NORTHING: 6623769**		
Year 3 – 2019*	**Year 4 – 2020**	**Year 5 – 2021**	**Year 6 – 2022**	**Year 7 - 2023**
				
Year 8 - 2024	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**	**Year 12 - 2028**
				

Kenna – 6

PLOT ID: FL-WSD-KEN-6-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2014**	*** PHOTOS AVAILABLE FROM 2018**	
START	**EASTING: 236996**	**NORTHING: 6622393**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				
END	**EASTING: 236990**	**NORTHING: 6622350**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				

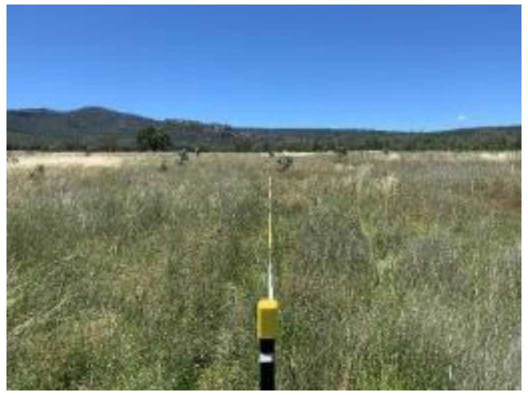
Kenna – 7

PLOT ID: FL-WSD-KEN-7-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2014**	*** PHOTOS AVAILABLE FROM 2018**	
START	**EASTING: 237522**	**NORTHING: 6622394**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				
END	**EASTING: 237512**	**NORTHING: 6622345**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				

Kenna – 8

PLOT ID: FL-WSD-KEN-8-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 237814	NORTHING: 6621782		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 237826	NORTHING: 6621827		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Kenna – 9

PLOT ID: FL-WSD-KEN-9-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING:**	**NORTHING:**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 236675**	**NORTHING: 6623721**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 10

PLOT ID: FL-WSD-KEN-10-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	**EASTING: 237960**	**NORTHING: 6624186**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				
END	**EASTING: 237965**	**NORTHING: 6624142**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				

Kenna – 11

PLOT ID: FL-WSD-KEN-11-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	EASTING: 237564	NORTHING: 6624008		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
				
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				
END	EASTING: 237573	NORTHING: 6624060		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
				
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				

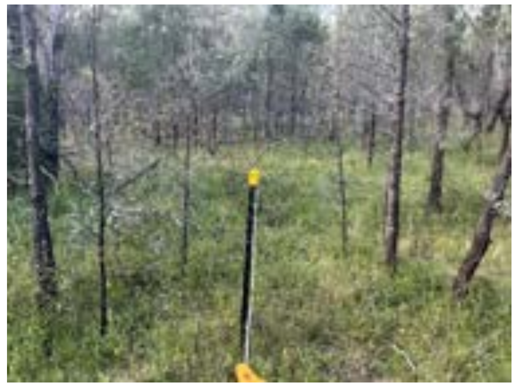
Kenna – 12

PLOT ID: FL-WSD-KEN-12-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	**EASTING: 237297**	**NORTHING: 6624220**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				
END	**EASTING: 237297**	**NORTHING: 6624165**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 - 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				

Kenna – 13

PLOT ID: FL-WSD-KEN-13-G	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 237097**	**NORTHING: 6622264**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 237080**	**NORTHING: 6622210**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

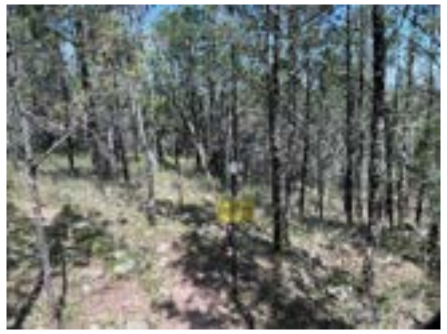
Kenna – 14

PLOT ID: FL-WSD-KEN-14-G	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 236970**	**NORTHING: 6623089**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 236963**	**NORTHING: 6623040**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 15

PLOT ID: FL-WSD-KEN-15-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	**EASTING: 237070**	**NORTHING: 6623580**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 237052**	**NORTHING: 6623529**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 16

PLOT ID: FL-WSD-KEN-16-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	EASTING: 234272	NORTHING: 6624557		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
NO PHOTO AVAILABLE	NO PHOTO AVAILABLE	NO PHOTO AVAILABLE		
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				
END	EASTING: 234266	NORTHING: 6624511		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
		NO PHOTO AVAILABLE		
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				

Kenna – 17

PLOT ID: FL-WSD-KEN-17-S	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2020	
START	EASTING: 236475	NORTHING: 6623523		
Year 4 – 2020*	Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024
				
Year 9 - 2025	Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029
				
END	EASTING: 236468	NORTHING: 6623472		
Year 4 – 2020*	Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024
				
Year 9 - 2025	Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029
				

Kenna – 18

PLOT ID: FL-WSD-KEN-18-S	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	EASTING: 236284	NORTHING: 6624183		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
				
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				
END	EASTING: 236291	NORTHING: 6624231		
Year 2 – 2018*	Year 3 - 2019	Year 4 - 2020	Year 5 - 2021	Year 6 - 2022
				
Year 7 - 2023	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				

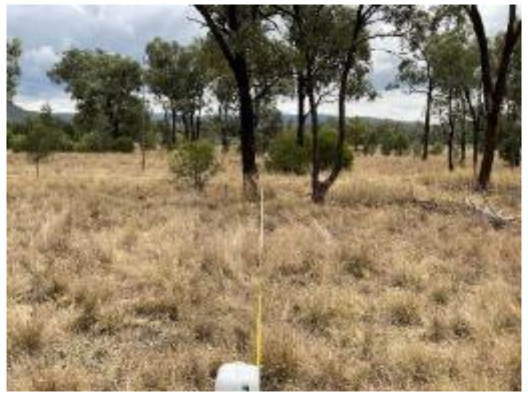
Kenna – 19

PLOT ID: FL-WSD-KEN-19-S	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	**EASTING: 234140**	**NORTHING: 6625283**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 234108**	**NORTHING: 6625321**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

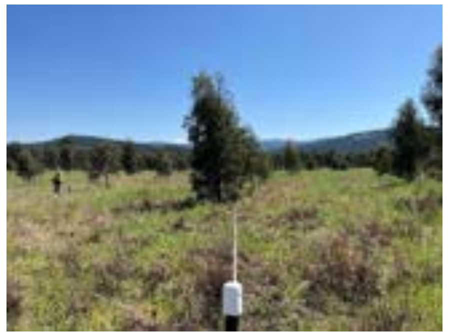
Kenna – 20

PLOT ID: FL-WSD-KEN-20-S	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 234293**	**NORTHING: 6624851**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 234308**	**NORTHING: 6624803**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 21

PLOT ID: FL-WSD-KEN-21-S	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 235300**	**NORTHING: 6623419**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 235304**	**NORTHING: 6623467**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 22

PLOT ID: FL-WSG-KEN-22-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	EASTING: 236383	NORTHING: 6624974		
Year 2 – 2018*	Year 3 - 2019	Year 4 – 2020 (start and end swapped)	Year 5 - 2021	Year 6 - 2022
				
Year 7 – 2023 (start and end moved)	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				
END	EASTING: 236375	NORTHING: 6625023		
Year 2 – 2018*	Year 3 - 2019	Year 4 – 2020 (start and end swapped)	Year 5 - 2021	Year 6 - 2022
				
Year 7 – 2023 (start and end moved)	Year 8 - 2024	Year 9 - 2025	Year 10 - 2026	Year 11 - 2027
				

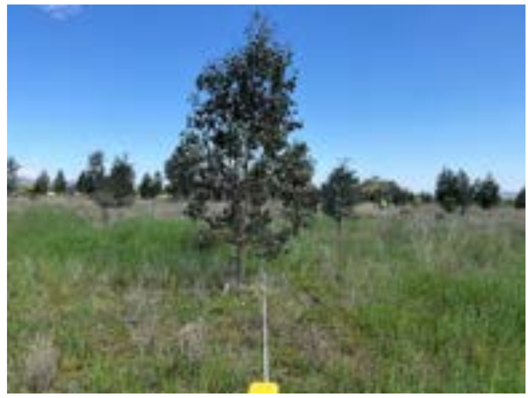
Kenna – 23

PLOT ID: FL-WSG-KEN-23-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2014	* PHOTOS AVAILABLE FROM 2018	
START	**EASTING: 234687**	**NORTHING: 6625266**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 – 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 - 2023	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				
END	**EASTING: 234715**	**NORTHING: 6625312**		
Year 2 – 2018*	**Year 3 - 2019**	**Year 4 – 2020**	**Year 5 - 2021**	**Year 6 - 2022**
				
Year 7 – 2023 (end point moved)	**Year 8 - 2024**	**Year 9 - 2025**	**Year 10 - 2026**	**Year 11 - 2027**
				

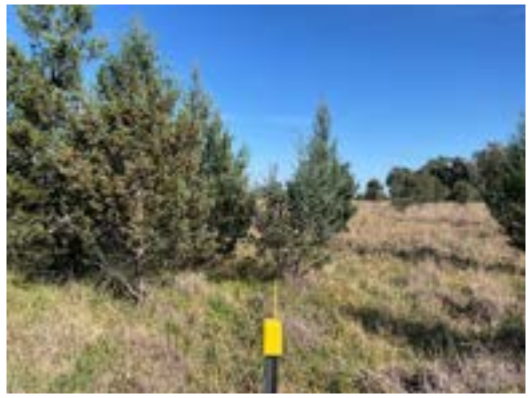
Kenna – 24

PLOT ID: FL-WSG-KEN-24-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 236557**	**NORTHING: 6623986**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 236547**	**NORTHING: 6624037**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 25

PLOT ID: FL-WSG-KEN-25-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 235968	NORTHING: 6624792		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 235975	NORTHING: 6624842		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Kenna – 26

PLOT ID: FL-WSG-KEN-26-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	**EASTING: 235876**	**NORTHING: 6623240**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 235925**	**NORTHING: 6623228**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Kenna – 27

PLOT ID: FL-WSG-KEN-27-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 236049	NORTHING: 6624460		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 236085	NORTHING: 6624434		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Kenna – 28

PLOT ID: FL-WSG-KEN-28-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	**EASTING: 235068**	**NORTHING: 6624719**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 235020**	**NORTHING: 6624697**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Rosevale – 1

PLOT ID: FL-WSD-ROV-1-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 774876	NORTHING: 6625271		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 774843	NORTHING: 6625302		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Rosevale – 2

PLOT ID: FL-WSD-ROV-2-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 774785	NORTHING: 6624729		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 774738	NORTHING: 6624717		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Rosevale – 3

PLOT ID: FL-WSD-ROV-3-G	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 773697**	**NORTHING: 6625385**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 773739**	**NORTHING: 6625364**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

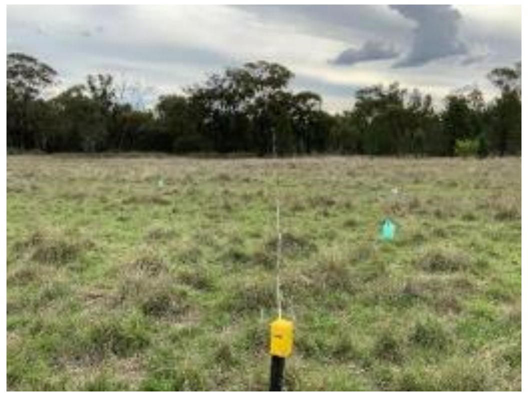
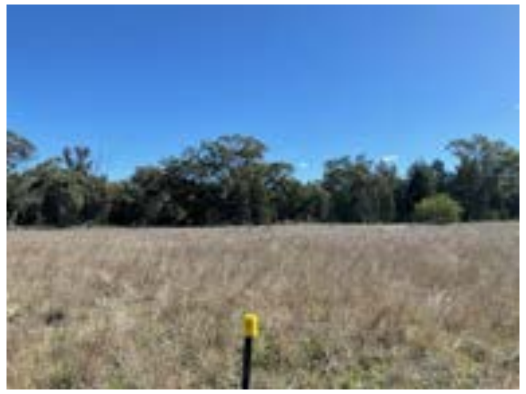
Rosevale – 4

PLOT ID: FL-WSD-ROV-4-G	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 773626**	**NORTHING: 6625135**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 773678**	**NORTHING: 6625141**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Rosevale – 5

PLOT ID: FL-WSD-ROV-5-G	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 774783**	**NORTHING: 6625874**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 774748**	**NORTHING: 6625907**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

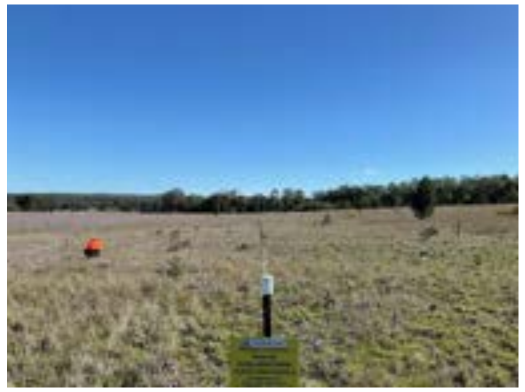
Rosevale – 6

PLOT ID: FL-WSD-ROV-6-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 774822	NORTHING: 6624361		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 774865	NORTHING: 6624384		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

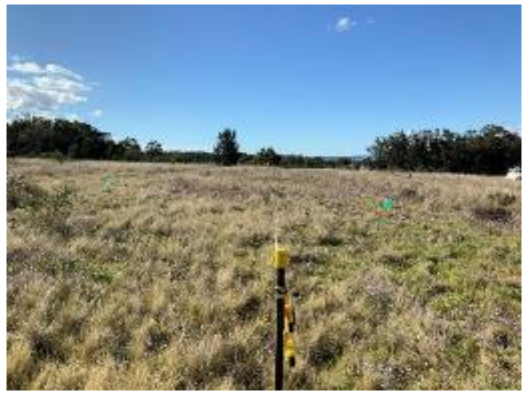
Rosevale – 7

PLOT ID: FL-WSG-ROV-7-D	**MANAGEMENT COMMENCED: 2016**	**MONITORING COMMENCED: 2021**		
START	**EASTING: 775169**	**NORTHING: 6625904**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**
END	**EASTING: 775209**	**NORTHING: 6625942**		
Year 5 - 2021	**Year 6 - 2022**	**Year 7 - 2023**	**Year 8 - 2024**	**Year 9 - 2025**
				
Year 10 - 2026	**Year 11 - 2027**	**Year 12 - 2028**	**Year 13 - 2029**	**Year 14 - 2030**

Rosevale – 8

PLOT ID: FL-WSD-ROV-8-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 774966	NORTHING: 6624662		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 774936	NORTHING: 6624620		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Rosevale – 9

PLOT ID: FL-WSD-ROV-9-D	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 775107	NORTHING: 6625276		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 775098	NORTHING: 6625228		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

West Haven – 1

PLOT ID: FL-WSD-WEH-1-G	MANAGEMENT COMMENCED: 2016	MONITORING COMMENCED: 2021		
START	EASTING: 772007	NORTHING: 6620721		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030
END	EASTING: 771956	NORTHING: 6620721		
Year 5 - 2021	Year 6 - 2022	Year 7 - 2023	Year 8 - 2024	Year 9 - 2025
				
Year 10 - 2026	Year 11 - 2027	Year 12 - 2028	Year 13 - 2029	Year 14 - 2030

Appendix D – *Annual Clearing Report*

Narrabri Coal Mine Annual Clearing Report 2025 (Stage 3)

10 Kurrajong Creek Rd. Baan Baa NSW 2390

2025-200-01

Prepared for: Narrabri Coal Operations Pty Ltd

25 February 2026 Version: 1.0 – Final

<table>
<tr><td>PROJECT NUMBER</td><td colspan="4">2025-200-01</td></tr>
<tr><td>PROJECT NAME</td><td colspan="4">Narrabri Coal Mine Annual Clearing Report 2025 (Stage 3)</td></tr>
<tr><td>PROJECT ADDRESS</td><td colspan="4">10 Kurrajong Creek Rd. Baan Baa NSW 2390</td></tr>
<tr><td>PREPARED FOR</td><td colspan="4">Narrabri Coal Operations Pty Ltd</td></tr>
<tr><td>AUTHOR/S</td><td colspan="4">Ross Fraser</td></tr>
<tr><td rowspan="2">REVIEW</td><td>Technical</td><td>QA</td><td>Version</td><td>Date to client</td></tr>
<tr><td colspan="2">Lucas McKinnon</td><td>1.0 – Final</td><td>25 February 2026</td></tr>
<tr><td>COVER PANEL</td><td colspan="4">Stage 3 disturbance area (blue polygon), NCO Data Hub</td></tr>
<tr><td rowspan="4">LICENCES</td><td colspan="2">Scientific Licence</td><td colspan="2">SL101557</td></tr>
<tr><td colspan="2">Bionet Sensitive Species Data Licence</td><td colspan="2">1115</td></tr>
<tr><td colspan="2">Animal Research Authority Ethics Licence</td><td colspan="2">Fauna Surveys and Monitoring (16/346)</td></tr>
<tr><td colspan="2">Scientific Collection - Aquatic</td><td colspan="2">P19/0009-1.0 & OUT19/2602</td></tr>
</table>

This report should be cited as: ‘Ecoplanning (2026). Narrabri Coal Mine Annual Clearing Report 2025 (Stage 3) – 10 Kurrajong Creek Rd. Baan Baa NSW 2390. Prepared for Narrabri Coal Operations Pty Ltd.’

ECOPLANNING PTY LTD | 428 PRINCES HIGHWAY WOONONA NSW 2517 | P: (02) 4244 2736

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Glossary and abbreviations

Acronym	Description
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Plan
EPBC Act	Environment Protection and Biodiversity Conservation Act
ha	hectares
HBT	Hollow Bearing Tree
m	metre
LGA	Local Government Area
LWD	Large Wooden Debris
MLA	Mining Lease Application
NCOPL	Narrabri Coal Operations Pty Ltd
NSW	New South Wales
PCS	Pre-clearance Survey
PCT	Plant Community Type
TARP	Trigger Action Response Plan
VCP	Vegetation Clearing Protocol

1 Introduction

Ecoplanning Pty Ltd (Ecoplanning) was engaged by Narrabri Coal Operations Pty Ltd (NCOPL) to undertake annual ecological monitoring at the Narrabri Mine in 2025, in accordance with the Narrabri Mine Biodiversity Management Plan (BMP) (2022). The BMP details the measures to assess, monitor and manage impacts from longwall mining to biodiversity, including provisions to manage and monitor the required clearing of native vegetation within the Stage 3 surface development footprint which is shown in **Figure 1.1**.

1.1 Background

The Narrabri Mine, operated by NCOPL, is an existing underground coal mining operation situated in the Gunnedah Coalfield. It is located approximately 25 kilometres (km) south-east of Narrabri and approximately 60 km north-west of Gunnedah, within the Narrabri Shire Council Local Government Area (LGA) in New South Wales (NSW).

As part of the mine's Stage 3 Extension Project (which involves an extension to the south of the approved underground mining area within Mining Lease Application (MLA) areas 1 and 2), progressive and selective clearance of approximately 421.6 hectares (ha) of woodland and approximately 125.1 ha of derived native grassland over a 23-year period is required (BMP 2022).

Native vegetation clearing is required for the installation of mine ventilation and gas management infrastructure, services corridors and access tracks, exploration and service boreholes, pre-conditioning of resistant strata for mine safety, and water management infrastructure (BMP 2022). The primary measure implemented by NCOPL to mitigate this impact on biodiversity is the Vegetation Clearing Protocol (VCP) (BMP 2022; Section 6.2 pp. 22-23) which allows for clearing activities to be undertaken throughout the year.

1.2 Objective and scope

The main objective of this report is to document the vegetation clearing activities undertaken by NCOPL under the Stage 3 Development Consent (SSD-10269), from the commencement date of 1 August through to 31 December 2025 (herein referred to as the 'clearing period'). The report only focuses on clearing activities that have required the supervision of a suitably qualified ecologist (herein referred to as 'supervised clearing').

The total Stage 3 development footprint (**Figure 1.1**) is partitioned into six (6) separate development phases (BMP 2022). Supervised clearing activities during the clearing period were undertaken within development phases 1 and 3 only and are presented in **Figure 1.2** below.

The scope of this report does not include analysis against the BMP performance measures and completion criteria (BMP 2022; Table 7.1), nor the biodiversity Trigger Action Response Plans (TARPs) (BMP 2022; Table 9.1).

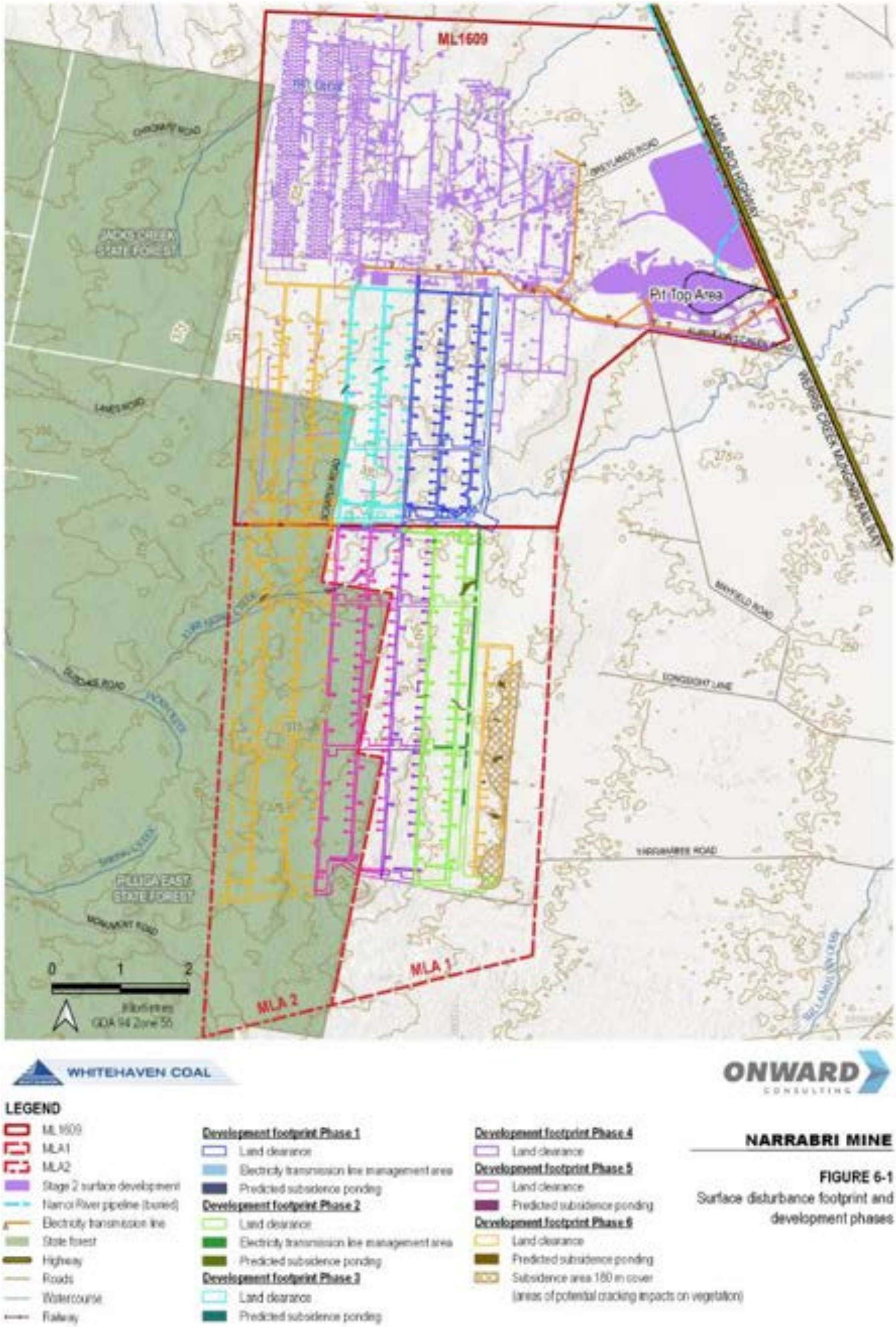

Figure 1.1: Stage 3 surface disturbance footprint and development phases (Source: BMP 2022).

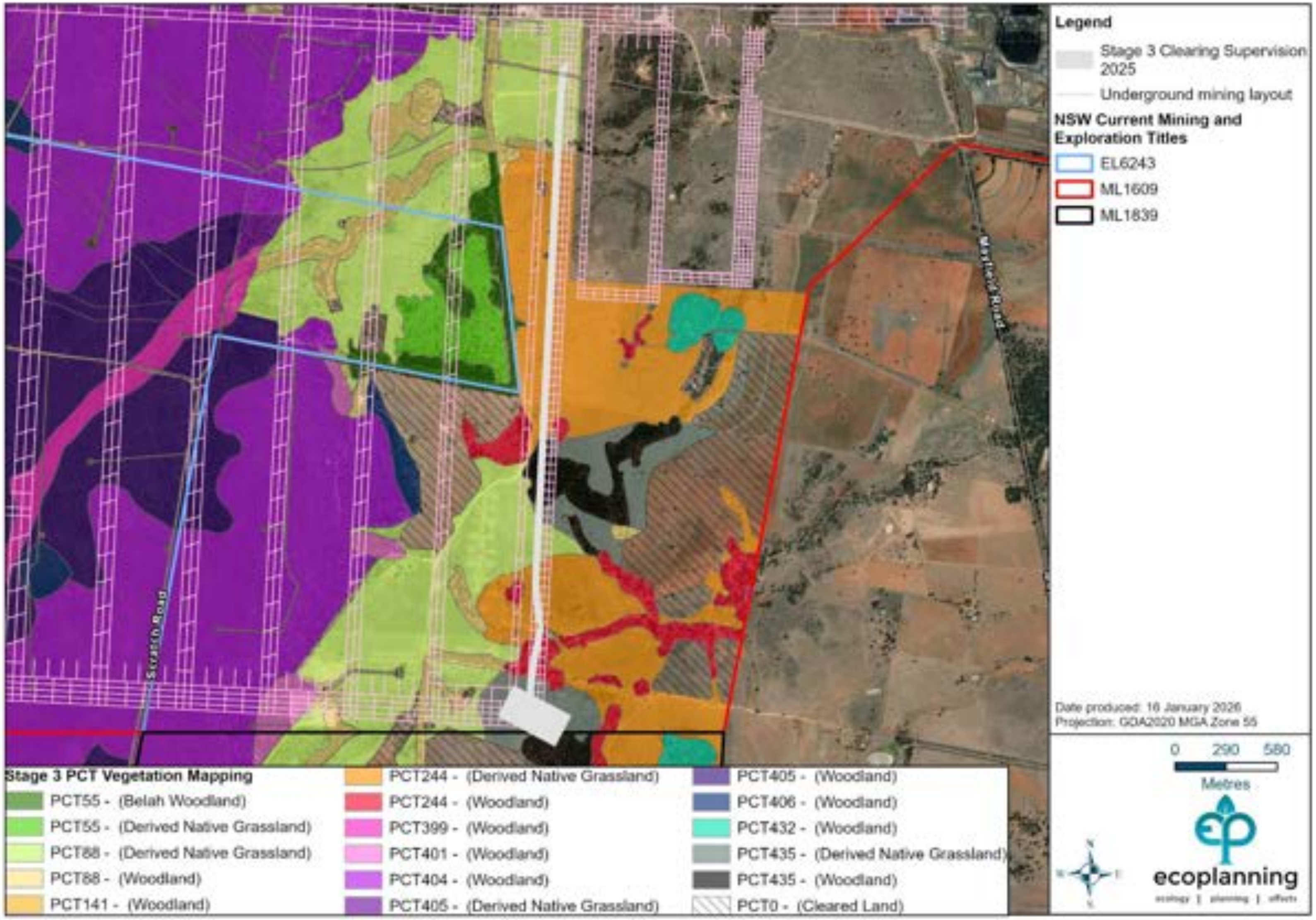

Figure 1.2: Stage 3 2025 clearing supervision areas with vegetation mapping and underground mining layout.

2 Methodology

2.1 Pre-clearance surveys

In accordance with the BMP (2022), a suitably qualified ecologist must conduct pre-clearance surveys (PCS) across the proposed clearing area prior to disturbance. The aim is to identify any potential habitat features or instances of threatened flora or fauna.

Habitat features may take the form of:

- hollow bearing tree (HBT) - alive or stag (dead standing);
- decorticating bark;
- nest;
- habitat rock; and
- large wooden debris (LWD) – log on ground greater than 100 mm in diameter

If present, they are recorded (**Section 2.3**), marked appropriately, and it is deemed necessary for a suitably qualified ecologist to supervise the removal of all identified habitat features in accordance with the VCP (BMP 2022).

2.2 Clearing supervision

During clearing supervision, the following clearing methods were employed in collaboration with the clearing contractor to mitigate risk to any fauna present:

- retaining trees with suspected active nests until the nest is disused;
- under-scrubbing around habitat trees prior to felling;
- tapping/nudging of habitat trees and HBTs using heavy machinery immediately prior to the proposed removal;
- if an animal emerges, then at least 30 minutes will be allowed for the animal to leave the tree;
- if the animal comes to the ground, or when it is on the lower trunk, attempts will be made to capture the animal;
- controlled lowering of trees with the hollow facing upwards to enable fauna to exit;
- once the tree has been felled, a search will be made of the branches around the tree for any fleeing fauna and hollows inspected;
- injured, shocked or immature captured animals will be brought to a wildlife carer;
- uninjured animals will be released in appropriate habitat identified during the pre-clearing surveys as soon as practicable (at night for nocturnal species);
- hollow branches or sections of trunk will be set aside for transfer to storage areas and placement into rehabilitation areas; and
- rocks or other habitat features will be inspected prior to and after removal for any fauna such as snakes or frogs potentially sheltering within or underneath them.

2.3 Mapping and recording

Pre-clearance survey mapping of potential habitat features, and threatened species identified within the clearing area was created using the NCO Environment and Rehabilitation Data Hub – ESRI ArcGIS Field Maps. This mapping ensured marked habitat features were easily located by the supervising ecologist and all attending clearing contractors.

Additionally, field maps contained associated data collection forms with the capacity to collect details (including photos) regarding cleared habitat features, captured / observed species, and pre-rehabilitation activities, such as seed collection, in accordance with the BMP (2022).

This workflow and monitoring data provided by NCOPL Data Hub is used in the **Results** section below to detail the extent and outcomes of supervised clearing in regard to impacts on fauna and flora as defined in the VCP and other relevant biodiversity measures detailed in the BMP (2022).

3 Results

3.1 Weather

On site weather data provided by NCOPL for the clearing dates is shown in **Table 3.1** below.

Table 3.1: Weather data (Narrabri AWS01)

Date	Clearing Area ID	Rainfall (mm)	Avg Temp°	Max Temp°	Min Temp°
18/08/2025	PTW1871	0	7.5	15.2	-1.1
20/08/2025	PTW1871	10.4	9.8	12	7.6
01/09/2025	PTW1871	0	11.8	21.9	3.4
02/09/2025	PTW1871	0	11.9	21.9	2.3
11/09/2025	PTW1874	0	11.1	15	7.6

3.2 Pre-clearance survey and supervised clearing outcomes

Pre-clearance surveys on proposed disturbance areas and any subsequent clearing supervision activities were undertaken throughout the clearing period by Ross Fraser (Field Ecologist, Ecoplanning).

All supervised clearing was undertaken in accordance with the VCP as detailed in the BMP (2022). There were no instances of threatened flora or fauna identified during PCS or clearing supervision.

Details of the supervised clearing activities are outlined in **Table 3.2** and the various habitat features identified in the clearing areas are detailed in **Figure 3.1** below.

Table 3.2: Outline of Stage 3 supervised clearing activities for the clearing period.

Clearance ID number	PCT	Clearing area (Ha)	Clearing date/s	Summary of habitat features present (from PCS)	Habitat features removed	Fauna species found	Number	Comments on fauna impacts
PTW1874	435 (Good)	1.11	11/09/2025	HBTs, LWDs, nests	34	*Pagona barbata* (Eastern bearded dragon)	1	Recovered from stag pre-felling, relocated nearby
PTW1871	244 (Good)	1.14	18/08 - 02/09/2025	HBTs, LWDs, decorticating bark, nests	35	*Pagona barbata* (Eastern bearded dragon)	1	Recovered from felled tree, relocated nearby
						Strophurus williamsi (Eastern spiny-tailed gecko)	2	2 recovered from LWD, relocated nearby
						Egernia striolata (Tree-crevice skink)	1	Recovered from LWD, relocated nearby
	244 (DNG)	7.99				*Eolophus roseicapilla* (Galah - hatchling)	3	3 delivered to wildlife carer in stable condition
						*Corvus unknown (*Australian raven or Torresian crow - fledgling)	3	3 deceased
						Molossidae sp. unknown (Freetail microbat)	2	1 deceased and 1 delivered to wildlife carer in stable condition
	435 (Good)	1.69				*Tyto* sp. unknown (Barn owl or Masked owl)	1	Exited HBT pre-felling and self-relocated. Hollow examined for nesting activity
						Chenonetta jubata (Australian Wood Duck - eggs)	6	All eggs were compromised during felling

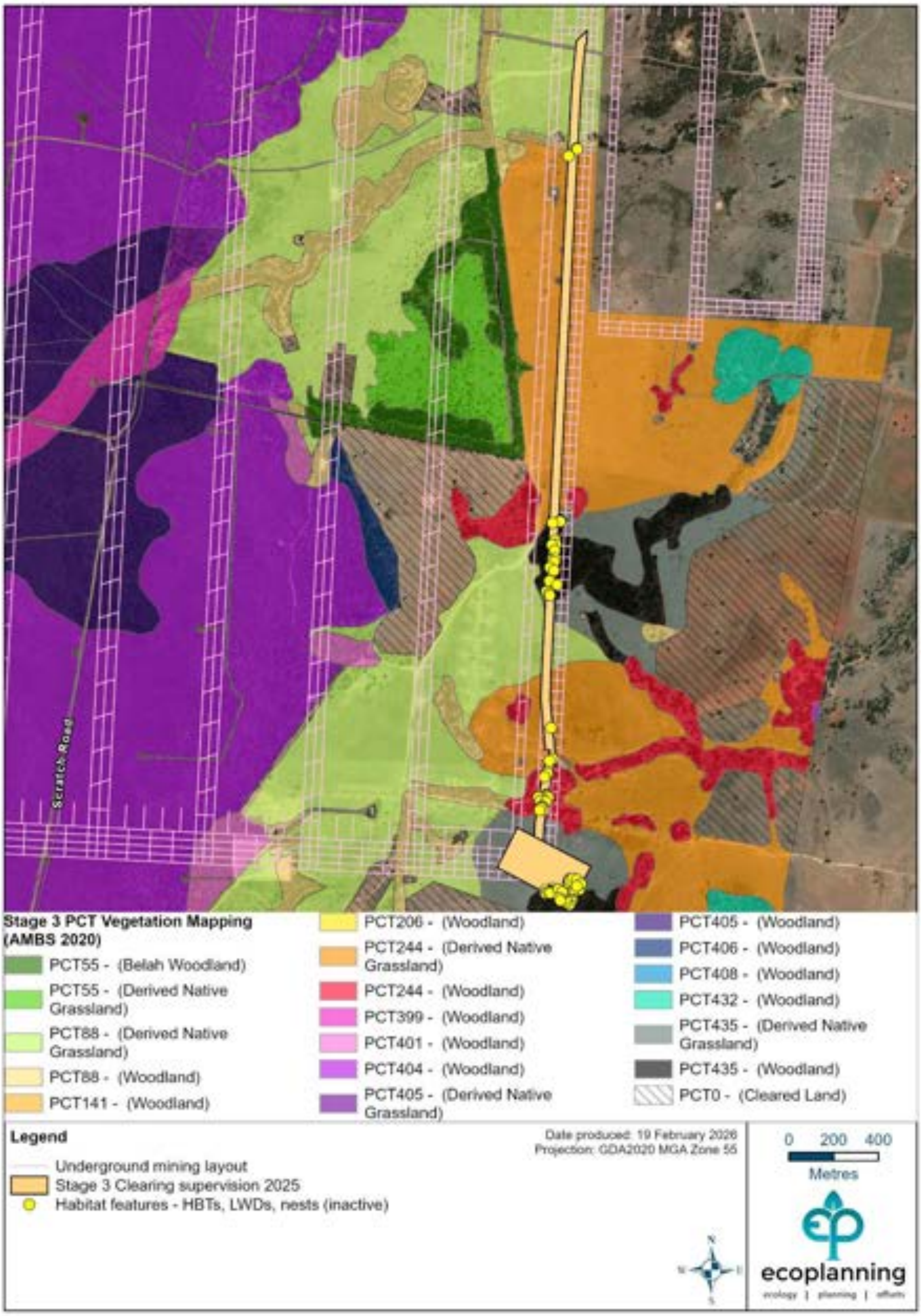

Figure 3.1: Locations of identified habitat features in Stage 3 clearing areas with vegetation mapping.

4 Conclusion

The Stage 3 supervised clearing activities undertaken at Narrabri coal mine between 1 August and 31 December 2025 corresponded with the VCP outlined in the BMP (2022) in accordance with the Stage 3 Development Consent (SSD-10269).

There were no instances of threatened flora or fauna identified during pre-clearance surveys nor supervised clearing activities. All captured animals were recorded and successfully relocated within suitable nearby habitat and any injured or deceased fauna was delivered to the local registered wildlife carer.

References

AMBS Ecology and Heritage. (AMBS). (2020). *Narrabri Underground Mine Stage 3 Extension Project – Flora Survey Report*. Prepared for Narrabri Coal Operations Pty Ltd.

Onward Consulting. (BMP). (2022). *Biodiversity Management Plan.* Prepared for Narrabri Coal Operations Pty Ltd. Revision 14 December 2022.
Retrieved from: https://whitehavencoal.com.au/our-business/documentation/

Appendix E – *Surface Water Monitoring*

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
A1	14/01/2025	5860	9.25	9	19	7	
	11/02/2025	6170	9.47	< 5	11	6	
	5/03/2025	6030	9.16	< 5	26	28	
	1/04/2025	6630	9.18	< 5	21	11	
	5/05/2025	6030	9.21	16	17	35	
	11/06/2025	5920	9.34	< 5	10	7	
	15/07/2025	6440	9.04	6	12	133	
	13/08/2025	5750	9.05	< 5	16	9	
	4/09/2025	5940	9.07	< 5	18	19	
	15/10/2025	6510	9.07	< 5	11	< 5	
	4/11/2025	7400	9.17	< 5	8	5	
	1/12/2025	6630	9.28	< 5	9	10	
A2	14/01/2025	5930	9.1	28	35	44	
	11/02/2025	5700	9.37	< 5	10	8	
	5/03/2025	5570	9.04	12	30	34	
	1/04/2025	6170	9.16	18	28	30	
	1/04/2025	6170	9.16	20	40	82	
	5/05/2025	5940	9.26	10	12	45	
	11/06/2025	6170	9.28	< 5	7	10	
	15/07/2025	6870	8.96	8	13	6	
	13/08/2025	5500	8.91	< 5	18	16	
	4/09/2025	5880	8.97	< 5	14	28	
	15/10/2025	6800	9.05	< 5	9	5	
	4/11/2025	7180	9.09	< 5	8	< 5	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	1/12/2025	6280	9.2	< 5	7	12	
A3	14/01/2025	5220	9.07	9	35	100	
	14/01/2025	5220	9.07	< 5	40	106	
	11/02/2025	5420	9.37	< 5	11	22	
	5/03/2025	5390	9.05	15	36	82	
	5/03/2025	5390	9.05	< 5	16	27	
	1/04/2025	6040	9.15	18	46	89	
	5/05/2025	6200	9.38	< 5	17	97	
	11/06/2025	6480	9.27	< 5	8	20	
	15/07/2025	7320	8.86	22	37	44	
	13/08/2025	5410	8.89	5	20	37	
	4/09/2025	5890	8.95	< 5	13	40	
	15/10/2025	6780	8.98	< 5	28	144	
	4/11/2025	6770	9.05	< 5	8	56	
	1/12/2025	6450	9.17	< 5	8	26	
B1	14/01/2025	648	7.77	< 5	8	< 5	
	11/02/2025	852	9.51	< 5	7	< 5	
	5/03/2025	867	9.11	< 5	9	< 5	
	1/04/2025	1029	7.99	< 5	6	12	
	5/05/2025	938	8.25	< 5	7	< 5	
	11/06/2025	576	7.67	98	6	< 5	
	15/07/2025	913	8.06	<5	6	8	
	13/08/2025	676	7.49	< 5	5	< 5	
	4/09/2025	1087	9.14	< 5	6	< 5	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	15/10/2025	944	8.02	< 5	7	< 5	
	4/11/2025	889	8.33	< 5	7	< 5	
	1/12/2025	892	8.25	< 5	6	< 5	
B2	5/05/2025	5490	9.55	< 5	22	52	
	5/05/2025	5490	9.55	< 5	22	50	
	11/06/2025	5890	9.56	5	31	34	
	15/07/2025	5770	9.48	<5	29	34	
	13/08/2025	5580	9.59	6	36	40	
	4/09/2025	5850	9.74	< 5	27	32	
Box Cut	14/01/2025	4460	8.92	11	168	6980	
	11/02/2025	3100	8.95	76	343	18200	
	5/03/2025	4400	9.17	< 5	10	1040	
	10/04/2025	7910	8.99	119	1440	3000	
	13/05/2025	5570	9.06	30	151	2260	
	4/06/2025	7630	9	21	12	1250	
	15/07/2025	6260	8.78	79	507	425	
	20/08/2025	3910	9.71	18	276	5060	
	15/09/2025	4230	8.77	12	571	2830	
	15/10/2025	5650	9.09	< 5	25	1170	
	4/11/2025	6170	8.91	8	32	416	
	3/12/2025	4970	8.7	26	2060	–	Sludge consistency
C	14/01/2025	27700	9.79	< 5	18	37	
	11/02/2025	28800	10.01	< 5	47	124	
	5/03/2025	28500	9.61	< 5	82	132	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	1/04/2025	–	9.8	< 5	69	139	EC over range of field meter
	5/05/2025	–	9.81	< 5	58	88	EC over range of field meter
	11/06/2025	19830	9.78	< 5	55	31	
	15/07/2025	19300	9.56	<5	69	26	
	13/08/2025	18670	9.59	< 5	202	10	
	4/09/2025	19250	9.55	< 5	40	10	
	15/10/2025	–	9.56	< 5	45	< 5	EC over range of field meter
	4/11/2025	17540	9.16	6	64	28	
	1/12/2025	19200	9.65	< 5	59	24	
	1/12/2025	19200	9.65	< 5	55	23	
D	14/01/2025	640	8.96	< 5	13	30	
	11/02/2025	608	9.03	< 5	9	28	
	5/03/2025	604	8.72	< 5	15	32	
	1/04/2025	601	8.7	< 5	6	30	
	5/05/2025	578	8.84	< 5	9	27	
	11/06/2025	622	9.16	< 5	5	6	
	11/06/2025	622	9.16	8	8	8	
	15/07/2025	765	9.28	<5	6	<5	
	13/08/2025	538	9.59	< 5	8	< 5	
	13/08/2025	538	9.59	< 5	7	< 5	
	4/09/2025	632	9.24	< 5	6	< 5	
	4/09/2025	632	9.24	< 5	6	< 5	
	15/10/2025	660	9.03	< 5	< 1	< 5	
	15/10/2025	660	9.03	< 5	11	< 5	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	4/11/2025	682	8.79	< 5	8	14	
	1/12/2025	794	9.48	< 5	5	20	
NRUS	7/01/2025	504	8.16	< 5	9	41	
	4/02/2025	496	8.51	< 5	8	26	
	12/03/2025	571	8.34	< 5	13	26	
	16/04/2025	567	8.3	< 5	10	46	
	27/05/2025	449	8.43	< 5	11	244	
	11/06/2025	705	9.69	< 5	6	48	
	15/07/2025	497	8.54	< 5	12	46	
	20/08/2025	381	7.96	< 5	8	52	
	15/09/2025	457	7.92	< 5	7	32	
	29/10/2025	781	8.49	< 5	1	13	
	17/11/2025	795	8.41	< 5	7	22	
	16/12/2025	440	8.28	< 5	10	58	
SB1	21/01/2025	5030	9.11	< 5	20	137	
	13/02/2025	5290	9.3	11	126	113	
	11/03/2025	5470	9.14	13	166	242	
	16/04/2025	7370	9.28	38	41	166	
	20/05/2025	6260	9.09	< 5	13	83	
	16/06/2025	7030	9.03	< 5	28	70	
	23/07/2025	4830	9	33	50	183	
	27/08/2025	5870	8.85	< 5	16	68	
	23/09/2025	6010	8.86	< 5	14	32	
	14/10/2025	6320	8.89	5	23	49	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	12/11/2025	6710	8.91	< 5	40	68	
	10/12/2025	5880	9	<5	11	47	
SB2	21/01/2025	4000	9.41	< 5	12	24	
	13/02/2025	4310	9.69	< 5	70	5	
	11/03/2025	4000	9.37	< 5	64	31	
	16/04/2025	3420	9.43	< 5	11	15	
	20/05/2025	2850	9.3	< 5	16	35	
	16/06/2025	2940	9.15	< 5	10	21	
	23/07/2025	2530	9.09	< 5	13	154	
	27/08/2025	2210	9.05	< 5	8	< 5	
	23/09/2025	2080	9.07	< 5	9	7	
SB3	21/01/2025	5950	9.66	< 5	35	76	
	13/02/2025	6620	9.71	< 5	17	78	
	11/03/2025	9930	9.55	< 5	51	102	
	16/04/2025	5040	9.8	< 5	69	69	
	20/05/2025	3980	9.57	< 5	32	44	
	16/06/2025	4860	9.54	< 5	44	159	
	23/07/2025	3690	9.32	8	13	184	
	27/08/2025	5640	9.48	< 5	30	38	
	23/09/2025	6140	9.6	< 5	32	39	
	23/09/2025	6140	9.6	< 5	43	38	
	14/10/2025	7160	9.64	< 5	48	38	
	12/11/2025	5600	9.73	< 5	136	79	
	10/12/2025	6420	9.44	<5	25	26	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
SB4	21/01/2025	3290	9.61	< 5	13	38	
	13/02/2025	3600	9.91	< 5	4	22	
	11/03/2025	4110	9.59	< 5	18	124	
	16/04/2025	2330	9.53	< 5	15	25	
	20/05/2025	2100	9.39	< 5	11	179	
	16/06/2025	1780	9.3	< 5	9	20	
	23/07/2025	1890	9.16	< 5	11	34	
	27/08/2025	1807	9.11	< 5	7	< 5	
	14/10/2025	2440	9.27	< 5	10	< 5	
	12/11/2025	2810	9.34	< 5	11	51	
	10/12/2025	3380	9.37	<5	14	23	
SD1	21/01/2025	1973	28.1	< 5	30	16	
	13/02/2025	2300	9.34	< 5	23	23	
	11/03/2025	2660	9.22	7	41	56	
	16/04/2025	1836	9.16	< 5	26	16	
	20/05/2025	1707	8.67	< 5	28	13	
	16/06/2025	1596	8.45	< 5	36	< 5	
	23/07/2025	1641	8.62	< 5	23	8	
	27/08/2025	801	8.11	< 5	22	< 5	
	23/09/2025	851	8.06	< 5	24	< 5	
	14/10/2025	1350	8.43	< 5	15	< 5	
	12/11/2025	1584	8.89	< 5	20	32	
	10/12/2025	1904	9.27	21	34	42	
SD2	21/01/2025	574	9.17	< 5	21	38	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	13/02/2025	700	9.02	< 5	13	7	
	11/03/2025	814	8.87	< 5	16	24	
	29/03/2025	416	8.34	< 5	12	98	EPL Discharge Sample [1]
	3/04/2025	314	8.12	< 5	13	51	EPL Discharge Sample [1]
	16/04/2025	459	8.69	< 5	18	11	
	20/05/2025	448	8.7	< 5	11	10	
	16/06/2025	385	8.21	< 5	10	< 5	
	23/07/2025	526	8.45	< 5	12	< 5	
	27/08/2025	597	8.37	< 5	18	< 5	
	23/09/2025	623	8.5	< 5	19	< 5	
	14/10/2025	931	8.75	< 5	13	< 5	
	12/11/2025	1018	8.22	< 5	13	30	
	10/12/2025	1132	8.99	5	17	22	
SD3	21/01/2025	523	9.25	< 5	18	55	
SD3	13/02/2025	607	9.19	< 5	14	10	
SD3	11/03/2025	762	8.88	< 5	15	31	
SD3	16/04/2025	445	8.04	< 5	18	34	
SD3	20/05/2025	436	8.36	< 5	11	20	
SD3	16/06/2025	508.9	8.37	< 5	9	20	
SD3	23/07/2025	526	8.45	< 5	12	12	
SD3	27/08/2025	571	8.5	< 5	17	12	
SD3	23/09/2025	789	9.01	< 5	16	40	
SD3	14/10/2025	712	8.73	< 5	11	38	
SD3	12/11/2025	847	9.25	< 5	13	81	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	10/12/2025	1159	9.15	7	26	98	
SD4	21/01/2025	1050	9.35	< 5	17	25	
	13/02/2025	1251	9.57	< 5	12	19	
	11/03/2025	1483	9.18	< 5	16	34	
	30/03/2025	361	8.38	< 5	14	156	EPL Discharge Sample [1]
	16/04/2025	770	8.82	< 5	11	60	
	20/05/2025	676	8.58	< 5	10	13	
	16/06/2025	773.9	8.21	< 5	9	6	
	23/07/2025	829	8.69	< 5	11	17	
	27/08/2025	888	8.73	< 5	11	< 5	
	23/09/2025	1036	8.88	< 5	12	< 5	
	14/10/2025	1057	8.79	< 5	10	7	
	12/11/2025	1404	9.43	< 5	11	53	
	10/12/2025	1942	9.3	<5	18	40	
SD6	21/01/2025	998	9.11	< 5	24	44	
	13/02/2025	1116	9.21	< 5	16	14	
	11/03/2025	1132	8.48	< 5	20	85	
	11/03/2025	1132	8.48	< 5	20	79	
	16/04/2025	862	8.2	< 5	17	14	
	20/05/2025	762	8.38	< 5	18	< 5	
	16/06/2025	815	8.2	< 5	15	< 5	
	23/07/2025	721	8.57	< 5	15	83	
	27/08/2025	774	8.94	< 5	17	9	
	27/08/2025	774	8.94	< 5	18	8	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	23/09/2025	826	9.13	< 5	17	7	
	14/10/2025	906	8.93	< 5	17	7	
	12/11/2025	1008	8.9	< 5	18	21	
	12/11/2025	1008	8.9	< 5	19	22	
	10/12/2025	1068	8.79	<5	20	14	
SD7	21/01/2025	181	7.96	< 5	8	195	
	13/02/2025	206	9.35	< 5	8	906	
	11/03/2025	246	8.14	< 5	7	49	
	16/04/2025	254	9.01	< 5	9	192	
	20/05/2025	235	8.42	< 5	7	41	
	16/06/2025	284.6	9.21	< 5	7	376	
	23/07/2025	216	8.37	< 5	7	146	
	27/08/2025	184	8.09	< 5	12	38	
	23/09/2025	225	8.71	< 5	7	202	
	14/10/2025	231	8.34	< 5	8	32	
	14/10/2025	231	8.34	< 5	8	36	
	12/11/2025	243	7.35	< 5	12	985	
	10/12/2025	322	8.94	5	10	1220	
SD8	21/01/2025	961	9.31	< 5	16	49	
	13/02/2025	1018	9.51	< 5	21	34	
	11/03/2025	1064	9.19	< 5	22	53	
	16/04/2025	603	9.08	< 5	12	28	
	20/05/2025	655	8.59	< 5	12	24	
	16/06/2025	701.6	8.3	< 5	10	16	

Data Point	Date	EC – Field (µS/cm)	pH - Field	Oil & Grease (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids [TSS] (mg/L)	Comments
	23/07/2025	650	8.93	< 5	18	26	
	23/07/2025	650	8.93	< 5	18	22	
	27/08/2025	606	8.55	< 5	12	8	
	23/09/2025	641	8.81	< 5	11	14	
	14/10/2025	704	8.85	< 5	11	6	
	12/11/2025	701	7.82	< 5	14	110	
	10/12/2025	736	8.82	7	9	26	
SD9	29/03/2025	154	7.98	< 5	4	772	EPL Discharge Sample [1]
	2/04/2025	432	7.26	< 5	27	205	EPL Discharge Sample [1]
	28/07/2025	1453	7.68	< 5	18	3060	EPL Discharge Sample [1]
	4/08/2025	395	7.29	< 5	15	378	EPL Discharge Sample [1]
	23/09/2025	1177	8.64	< 5	6	254	
	12/12/2025	209	8.4	< 5	5	10300	EPL Discharge Sample [1]

1. *In accordance with EPL 12789 Condition L 2.5 the Total Suspended Solids concentration limit specified may be exceeded from water discharged provided that the discharge occurs solely as a result of rainfall measured at the premises that exceeds 38.4 millimeters over any consecutive 5 day period immediately prior to the discharge occurring.*

Appendix F – *Groundwater Review (AGE)*

Australasian
Groundwater
& Environmental
Consultants

Report on

Narrabri Mine 2025Annual Groundwater Review

Prepared for
Narrabri Coal Operations Pty Ltd

Project No. 20250022.NAR5027.001
March 2026

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Narrabri Mine 2025 Annual Groundwater Review

1 Introduction

The Narrabri Mine is an underground coal mine located in the Gunnedah Coalfield, approximately 25 kilometres (km) southeast of Narrabri and 60 km northwest of Gunnedah. The operation is situated within the Narrabri Shire Council (NSC) Local Government Area, in New South Wales (NSW). It is operated by Narrabri Coal Operations Pty Ltd (NCOPL), on behalf of the Narrabri Mine Joint Venture, which consists of two Whitehaven Coal Limited's (WHC) wholly owned subsidiaries (77.5% ownership), and three other joint-venture partners (each with 7.5% share).

Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) were engaged by NCOPL to review the available groundwater monitoring data and provide an annual review of the performance of the groundwater monitoring network. This review is conducted under the framework of the approved Stage 2 groundwater monitoring program (GWMP) which forms Attachment 5 of the Narrabri Mine Water Management Plan (WMP) (Whitehaven, 2013) and the Stage 3 GWMP submitted to the regulator for approval in December 2025. This annual report describes the monitoring results for the period 1 January 2025 to 31 December 2025.

2 Background

2.1 Mining

Stage 1 of the Narrabri Mine was approved under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act, 1979) in 2007 and involved initial site establishment activities and continuous miner, mining operations. Project Approval (PA) 08_0144 for Stage 2 of the Narrabri Mine was issued under Part 3A of the EP&A Act in 2010 and allowed the Narrabri Mine to convert to a longwall mining operation. PA 08_0144 has subsequently been modified on seven occasions[1].

The Narrabri Mine, incorporating Stages 1 and 2, extracts coal from the Hoskissons Coal Seam. PA 08_0144 allows for the production and processing of up to 11 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until July 2031. The approved Narrabri Mine comprises 20 longwall panels, these include longwalls (LW) 101 to 111 and 201 to 209 (Figure 2.1). Longwall mining of LW101 commenced in 2012 and has progressed sequentially to LW110 (Table 2.1) followed by mining LW203. Board and Pillar mining commenced in August 2022 and is expected to continue until August 2027. This annual report reviews groundwater monitoring for the 2025 calendar year (reporting period) during which time LW203 and LW204 were mined.

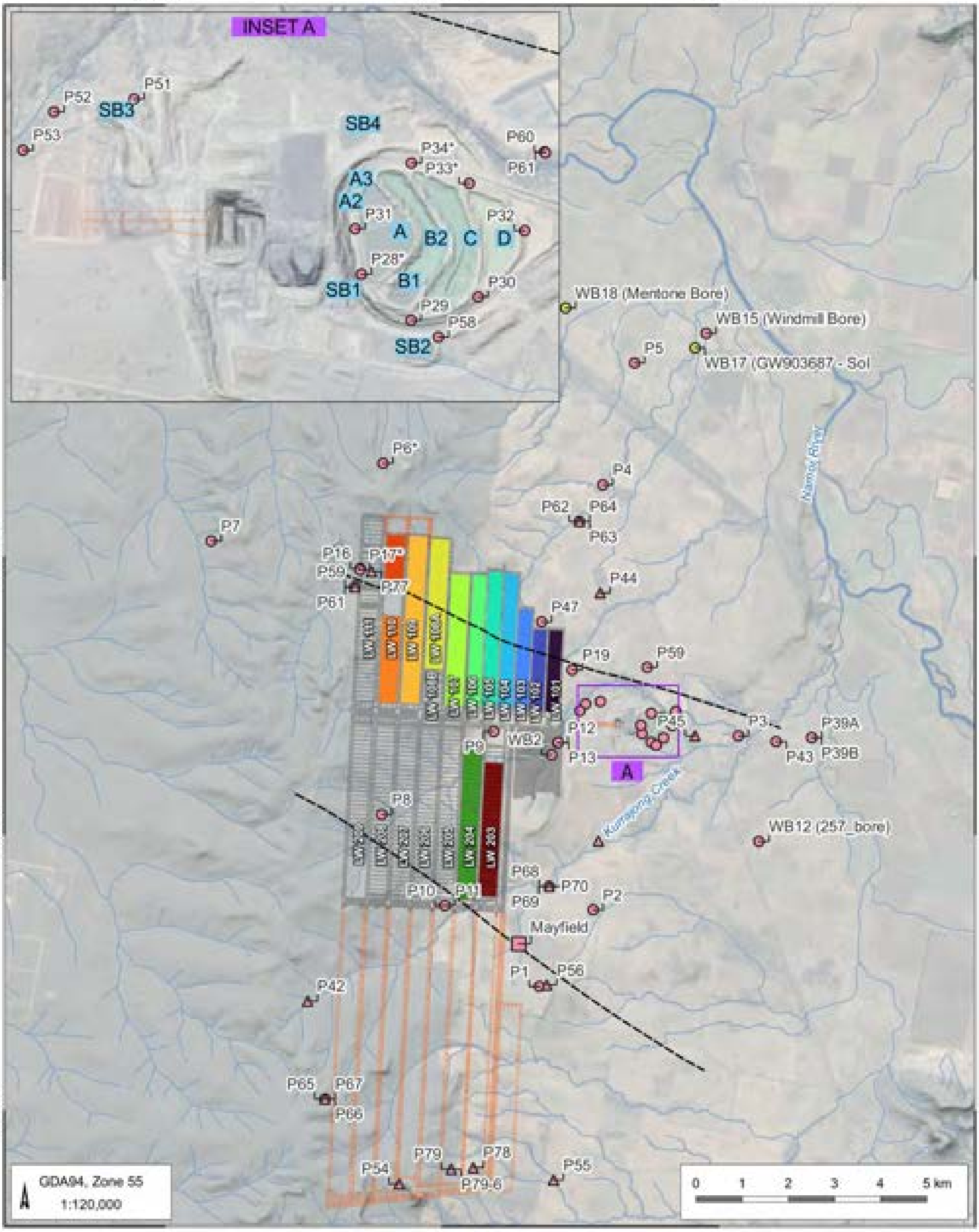
The Narrabri Underground Mine Stage 3 Extension Project (Stage 3) involves a southern extension of the Stage 2 mining area to gain access to additional areas of coal reserves within Mine Lease 1839, and Mining Lease Application (MLA) 2 (forming part of Exploration Licence (EL) 6243), an increase in the mine life up to 31 December 2044. Stage 3 was approved on the 1st of April 2022 under State Significant Development (SSD) 10269 under section 4.38 of the EP&A Act.

Table 2.1 Mining progression

Longwall	Start Date	Completion Date
Longwall 101	6 June 2012	1 June 2013
Longwall 102	22 July 2013	20 January 2014
Longwall 103	3 March 2014	20 October 2014
Longwall 104	1 December 2014	4 August 2015
Longwall 105	10 September 2015	16 May 2016
Longwall 106	20 June 2016	10 March 2017
Longwall 107	19 April 2017	22 July 2018
Longwall 108	16 September 2018	17 November 2019
Longwall 109	6 January 2020	7 November 2021
Longwall 110A	22 December 2020	15 June 2022
Longwall 110B	21 July 2022	17 April 2023
Longwall 203	05 June 2023	12 April 2025
Longwall 204	14 June 2025	28 July 2026*
Longwall 205	11 September 2026*	23 September 2027*
Longwall 206	8 November 2027*	22 October 2028*

Note: * Planned mining.

[1] Consolidated Consent, Narrabri Coal Project – Stage 2. March 2011 (MOD 1), December 2011 (MOD 2), September 2015 (MOD 4), December 2015 (MOD 5), December 2016 (MOD 6) and November 2021 (MOD 7).



LEGEND

- Drainages
- Fault
- UG mine workings - Stage 2
- UG mine workings - Stage 3

Monitoring bores

- GDE
- Standpipe
- Standpipe (Stock and domestic)
- VWP

Mining Progression 100

- LW101 - JUN 2012 to JUN 2013
- LW102 - JUL 2013 to JAN 2014
- LW103 - MAR 2014 to OCT 2014
- LW104 - DEC 2014 to AUG 2015
- LW105 - SEP 2015 to MAY 2016
- LW106 - JUN 2016 MAR 2017
- LW107 - APR 2017 to JUL 2018
- LW108 - SEP 2018 to NOV2019
- LW109 - JAN 2020 to NOV2021
- LW110A - DEC 2020 to JUN 2022
- LW110B - JUL 2022 to APR 2023

Mining Progression 200

- LW203 - JUN 2023 to JAN 2025
- LW204 - APR 2024 to JUL 2026

Narrabri Mine 2025 Annual Groundwater Review (NAR5027.001)

Mining progression and stages

AGE

DATE 27/01/2026

FIGURE No: **2.1**

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2.2 Regulatory framework

2.2.1 Regulatory requirements

Regulatory requirements relating to groundwater are listed in Appendix A, these include:

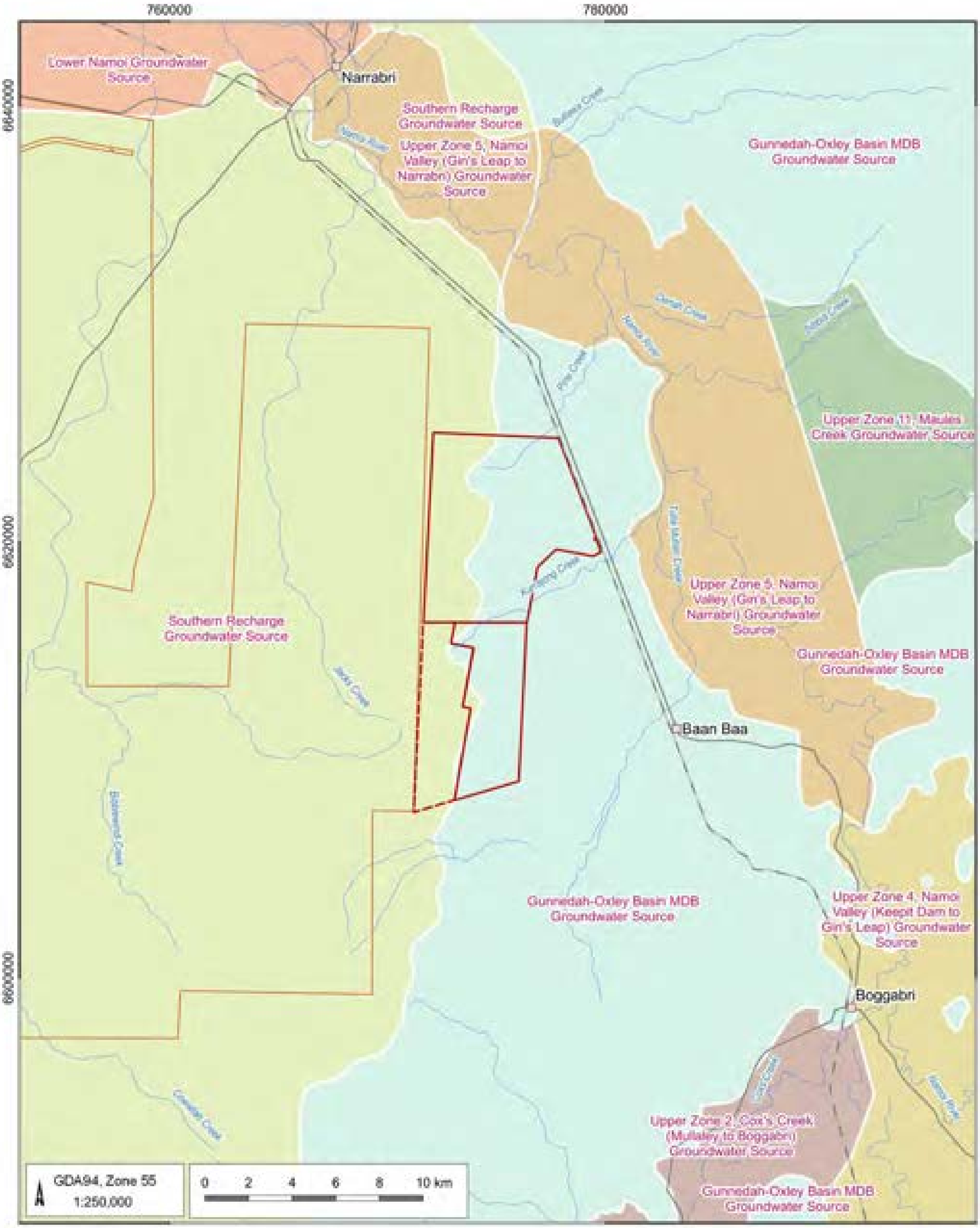
- Project Approval 08_0144 conditions (Appendix A, Table A 1);
- EPL 12789 compliance conditions (Appendix A, Table A 2); and
- Project Approval 08_0144 Statement of Commitments (Appendix A, Table A 3).
- Development Consent SSD-10269 conditions. (Appendix A, Table A 4)

A detailed overview of the statutory requirements relating to water management is described in Section 3 of the WMP.

2.2.2 Water sharing plans (WSPs)

NCOPL is located within the Namoi Water Management Area and comes under the jurisdiction of two specific WSPs under the Water Management Act 2000 (Figure 2.2).

1. Water Sharing Plan for the NSW Murry Darling Basin (MDB) Porous Rock Groundwater Sources Order 2020. Part of which includes Gunnedah-Oxley Basin MDB Groundwater Source, consisting of the Permian and Triassic rocks associated with the Gunnedah Basin and the overlying younger Jurassic and Cretaceous rocks associated with the Oxley Basin.
2. Water Sharing Plan for the NSW Great Artesian Basin (GAB) Groundwater Sources 2020 applies to the management of the upper hard rock aquifers of the GAB. Of specific relevance to the NCOPL area is the Southern Recharge Groundwater Source. This occupies most of the non-artesian portion of the GAB in New South Wales and is limited to the sandstone aquifers of Jurassic age.



LEGEND

- Populated place
- Drainage
- Road
- Rail
- Mining Lease
- Mining Lease Application
- Proposed Narrabri Gas Project (Santos)

Water sharing sources

- Gunnedah-Oxley Basin MDB Groundwater Source
- Lower Namoi Groundwater Source
- Southern Recharge Groundwater Source
- Upper Zone 11, Maules Creek Groundwater Source
- Upper Zone 2, Cox's Creek (Mullaley to Boggabri) Groundwater Source
- Upper Zone 4, Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source
- Upper Zone 5, Namoi Valley (Gin's Leap to Narrabri) Groundwater Source

Narrabri Mine 2025 Annual Groundwater Review (NAR5027.001)

Water Sharing Plan areas

AGE

DATE 05/02/2026

FIGURE No: **2.2**

Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011.; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006.
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2.2.3 Water allocation licences (WAL)

A summary of the WALs held by NCOPL can be found in Table 2.2. An aquifer interference licence was obtained to dewater the underground workings, and the remaining allocations are off-site licences from either the GAB or the Namoi River.

Table 2.2 Water allocation licences held by NCOPL

WSP	Water source	Licence	Water Access Licence &/or Groundwater Works	Nominal Allocation (ML/yr)
NSW Murray Darling Basin (MDB) Porus Rock Groundwater Sources Order 2020	Gunnedah Oxley Basin MDB Groundwater Source	90AL822538 (90MW833064)	WAL29549	1468
		90AL836233 (90MW833064)	WAL43017	403
NSW Great Artesian Basin (GAB) Groundwater Sources 2020	GAB Southern Recharge Groundwater Source	90AL811346 (90MW833068*)	WAL15922, GW062433	248
Namoi Alluvial Groundwater Sources Order 2020	Upper Namoi Zone 5 Groundwater Source	90AL807254 (90MW833065)	WAL12822	43
		90AL812858 (90WA812891)	WAL20131, GW969667	150
		90AL807276 (90WA812891)	WAL12833	67
Upper Namoi and Lower Namoi Regulated Water Sources 2016	Lower Namoi Regulated River Water Source Regulated River (General Security)	90AL812863 (90CA802130)	WAL20152	600
		90AL802212 (90MW833069)	WAL2728	10
		90AL801995 (90CA802130)	WAL2671	48
	Lower Namoi Regulated River Water Source Regulated River (High Security)	90AL802129 (90CA802130)	WAL6762	20
	Eulah Creek Water Source	90AL838378	WAL44965	40

Notes: ML/yr – megalitres per year.

*applications submitted to Water NSW to change assigned nominated works to new miscellaneous work numbers for the purposes of water accounting associated with passive take.

2.3 Water management plan (WMP)

A Stage 2 groundwater monitoring program (GWMP) has been developed in accordance with Schedule 4, Condition 13 and Condition 18 of the PA 08_0144, and applicable regulatory requirements. The GWMP forms Attachment 5 of the Narrabri Mine WMP (2013) and has been reviewed and resubmitted for approval in November 2024. Following Notification of Commencement of mining operations under condition A14 of Development Consent SSD-10269 on 01 August 2025, the Stage 2 GWMP has been superseded by the approved Stage GWMP (Rev0A 2022). A draft Stage 3 GWMP has been developed in accordance with Part E Section E5 and E11 of Development Consent SSD 10269 and submitted for approval.

The GWMP as part of the WMP was developed to ensure that both surface and subsurface mining operations are conducted in a manner which minimises the potential for adverse impacts on groundwater flow and quality, aquifer integrity, groundwater dependent ecosystems and other offsite groundwater related impacts. The key components of the GWMP are:

- measurement of water levels in seepage, standpipe, and production bores;
- water quality sampling of seepage, standpipe and production bores;
- continuous measurement of water levels at the Vibrating Wire Piezometers (VWPs);
- continuous monitoring of water quality entering the underground mine workings;
- manual reading of the volume of groundwater pumped to surface from the box cut;
- water level and quality analysis at affected bores (with a >2m predicted drawdown) in accordance with the 'make good' agreement; and
- photographs and site observations at identified springs and high priority Groundwater Dependent Ecosystem (GDE) sites.

The GWMP defines groundwater level and quality triggers to measure groundwater performance against as well as a trigger action response plan (TARP) which defines the actions and responses required when triggers are exceeded.

The Extraction Plan Water Management Plan (EP-WMP) for longwall panels LW203 to LW206 has been prepared in accordance with Schedule 3 Condition 4(h) of the Project Approval and the Department of Planning and Environment (DPE) Draft Extraction Plan Guideline (NSW Department of Planning and Environment, 2022). The groundwater level triggers presented for monitoring bore P7 was specifically calculated for the EP-WMP and adopted in this review (Section 6.2).

This annual review satisfies the requirements in the WMP as stated above.

3 Objectives

The primary objective of the annual groundwater review is to review and summarise the mine's environmental performance of the preceding year in relation to groundwater inflows, levels and quality and to compare the groundwater levels and quality to the triggers previously set. The annual groundwater review will:

- review the monitoring data against the WMP's relevant groundwater related performance measures this includes:
  - Analysing the groundwater level monitoring data including:
    - observing trends over the course of the year and the life of the project considering mining progression and climatic changes;
    - investigating trigger exceedances as per approved GWMP and anomalies; and
    - comparing the observed data with the predicted drawdown from the numerical groundwater model.
  - Analysing the groundwater quality data, including:
    - observing trends over the course of the year and the life of the project considering mining progression and climatic changes;
    - investigating trigger exceedances as per approved GWMP and anomalies; and
    - comparing water quality results against the National Environmental Protection Measures (NEPM) livestock guidelines where relevant.
- assess if available drawdown attributable to the mine for the existing groundwater users is reduced by over 15%;
- identify relationships between measured EC and TDS in mine water and groundwater in the Hoskissons Seam and adjoining aquifers from the collection of adequate samples over time and evaluating this data for comparison (i.e. trends);
- assess trends in water level and quality data at standing pools with comparison to associated shallow aquifer water level and quality data to determine possible connectivity;
- establishment and assessment of the ongoing suitability of appropriate factors for converting EC to TDS for each sampling site with consideration of the influence of major ionic composition.
- review of observed/estimated groundwater inflow rates for the year against the numerical groundwater model prediction.
- review trigger levels as additional monitoring information becomes available and, if required, advise on updating the GWMP; and
- report/present groundwater inflow data at a monthly timescale.

4 Site setting

4.1 Climate

Climate data was sourced from the Scientific Information for Landowners (SILO) dataset, for the coordinates 30.50° S, 149.85° E (Queensland Government Long Paddock, 2025). The SILO dataset is used to obtain location specific infilled and quality-controlled climate data and is calculated from surrounding weather stations and interpolated through splining and kriging techniques.

The total rainfall recorded for 2025 was 674.6 millimetres (mm), the average rainfall for the period 2008 to 2025 was 623.7 mm. Rainfall during 2025 was reflective of average conditions for the area; however, the range of yearly rainfall ranged from 216.1 mm (2019) to 864.4 mm (2021). Average monthly evaporation (based on the period 2008 to 2025) demonstrated that average monthly evaporation exceeds average monthly rainfall throughout the year, with the highest moisture deficits recorded in the summer months (Figure 4.1).

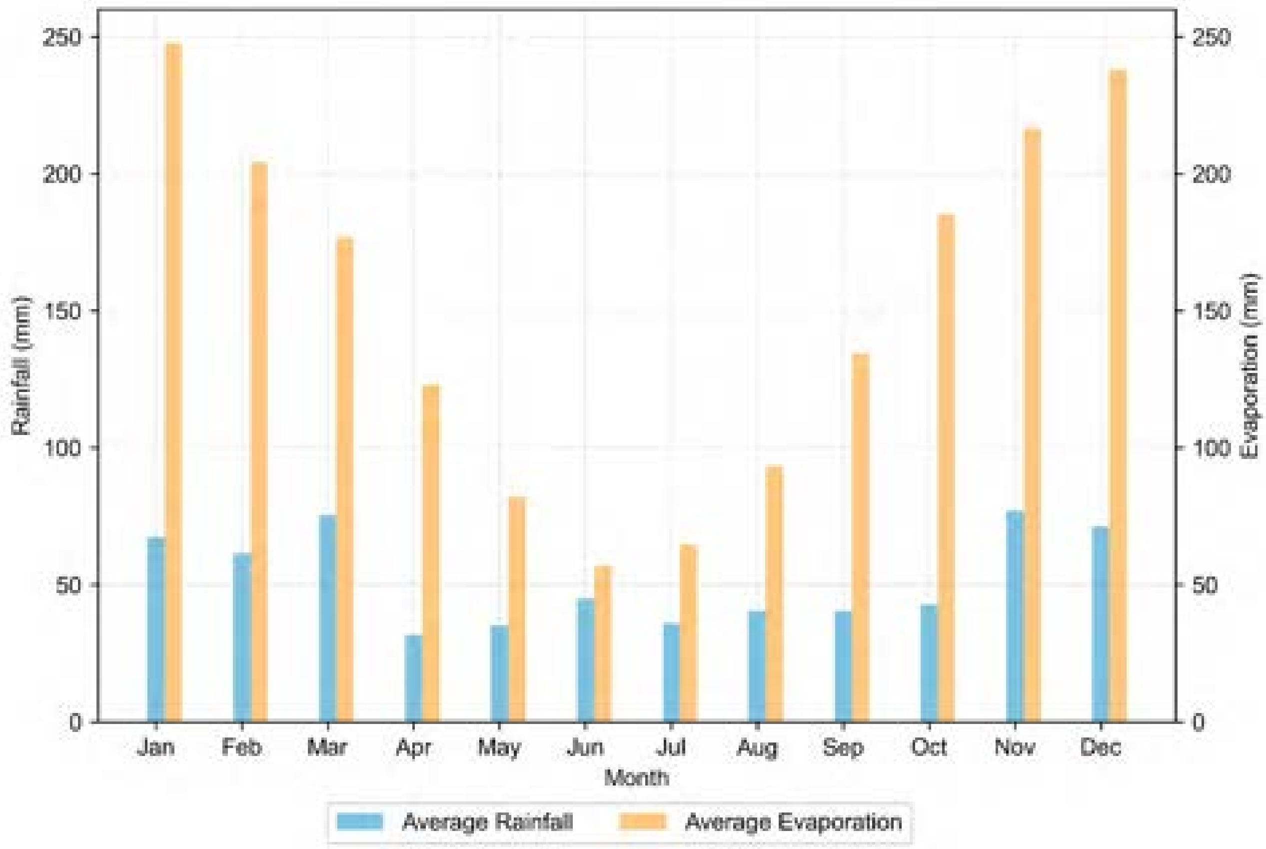

Figure 4.1 Average rainfall and evaporation for 2025 (SILO, 2025)

To place rainfall in the recent years into a historical context, the cumulative rainfall departure (CRD) (also referred to as the residual rainfall mass) was calculated (Figure 4.2). The CRD is calculated by subtracting the long-term average monthly rainfall from the actual monthly rainfall, providing a monthly departure from average conditions. A rising slope in the CRD plot indicates periods of above average rainfall, while a falling slope indicates below average rainfall.

Prior to mining commencing in 2012, the site experienced an increasing rainfall trend between 2003 and 2006 and again between 2007 and 2012 when a period of significantly higher rainfall occurred throughout most of Australia.

After the record 2012 rainfall event, there was a long-term decline and below average rainfall to 2020, most notably between 2017 and 2020 when NSW experienced the Tinderbox Drought, the driest three-year period recorded in the region (Devanand, et al., 2024). After the drought, rainfall increased significantly between 2020 and 2023, in 2022 Narrabri shire experienced flooding events due to ongoing heavy rainfall and overflowing of the Namoi River. Since 2023 rainfall has generally declined, with a small, isolated increase during the 2025 reporting period.

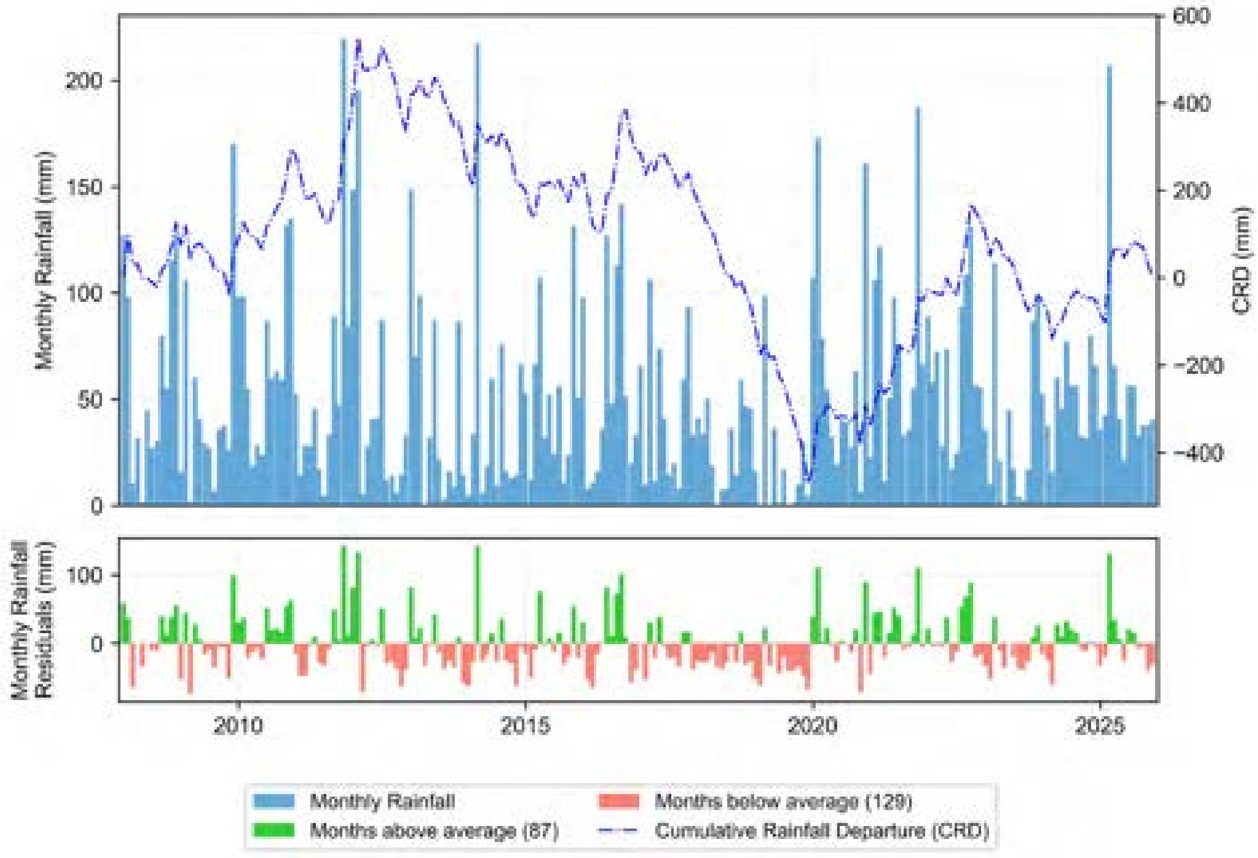

Figure 4.2 Cumulative rainfall departure

4.2 Hydrogeological regime

The topography of the Narrabri Mine slopes to the east and northeast from over 300 m AHD in the southwest of the site to 270 m AHD in the east. Surface contours reveal subtle undulations with surface drainage occurring across the site in a north-easterly direction.

The Narrabri Mine is located within the Mullaley Sub-basin, which forms part of the larger Gunnedah Basin. The western half of the mining lease is also located on the eastern margin of the Surat Basin. Generally, the Surat and Gunnedah Basin stratigraphic units are characterised by a dip to the west at an angle of less than 10 degrees and outcrops along the Namoi River valley.

The main stratigraphic units occurring in the vicinity of the Narrabri Mine are the:

- Quaternary alluvium consisting of unconsolidated clays, silts, sands, and gravels associated with the Namoi River and its tributaries.
- Surat Basin Units including:
  - Jurassic Pilliga Sandstone, Purlawaugh Formation and Garrawilla Volcanics.
- Gunnedah Basin Units including:
  - Triassic Napperby and Digby Formations; and
  - Permian Black Jack Group, including the Hoskissons Coal Seam, and Arkarula and Pamboola Formations (which are locally characterised by an east [shallowest] to the west [deepest] dip).

A conceptual cross section through the mine and key stratigraphic units is displayed in Figure 4.3.

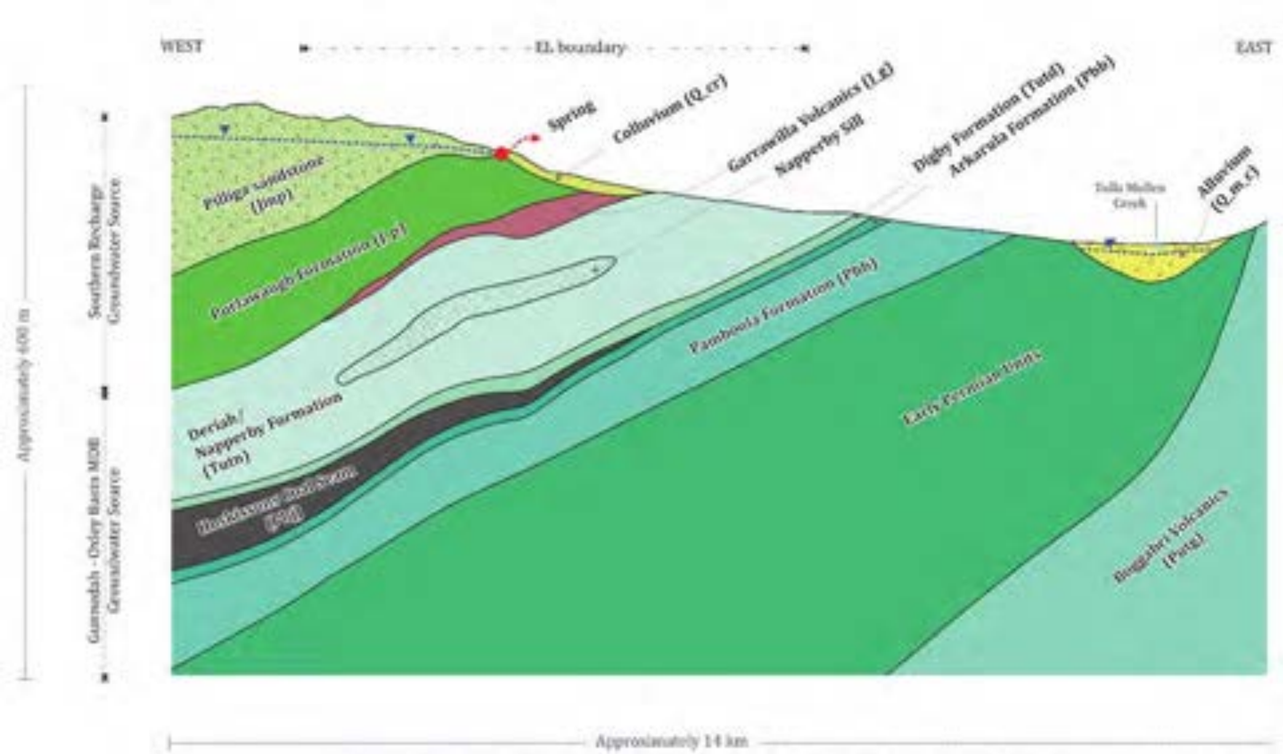

Figure 4.3 Conceptual geology cross-section (AGE, 2020)

Of the units listed above, only the Namoi River alluvium and Pilliga Sandstone are considered regionally significant aquifers (“highly productive” under the Aquifer Interference Policy [AIP][2]) (NSW Department of Primary Indsutries, 2012). The Namoi River alluvium is present and outcrops approximately 5.5 km east of the mine.

Whilst the remaining units may support minor extractions for stock and domestic purposes, they are relatively low-yielding aquifers (“less productive” unit under the AIP). Only the Pilliga Sandstone, Pulawaugh Formation and occasionally the Garrawilla Volcanics outcrop or subcrop in the area encapsulating the mine.

Other units present in the vicinity of the mine are considered ‘less productive’ aquifers, as they don’t meet the appropriate criteria for salinity and/or yield to be considered ‘highly productive’.

4.2.1 Baseline groundwater levels

NCOPL has historically undertaken monitoring of groundwater levels (pre-2012, before mining started) within the Namoi Alluvium, Pilliga Sandstone, Purlawaugh Formation, Garrawilla Volcanics, Napperby Formation, Digby Formation, Hoskissons Coal Seam, Arkarula Formation, Pamboola Formation and various older units.

Regional groundwater level contours for the Namoi Alluvium indicate that groundwater flows generally south to north along the Namoi River, consistent with topography and flow direction of the river (Hydrosimulations, 2015). Intensive groundwater use for irrigation results in seasonal water table drawdown up to 15 m in areas of the Namoi Alluvium (Figure 4.4).

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[2] A ‘highly productive’ source is defined by the Aquifer Interference Policy (AIP) as a groundwater source which has been declared in regulations and datasets, based on the following criteria:

- has a total dissolved solids (TDS) concentration less than 1,500 milligrams per litre (mg/L); and
- contains water supply works that can yield water at a rate greater than 5 litres per second (L/s).

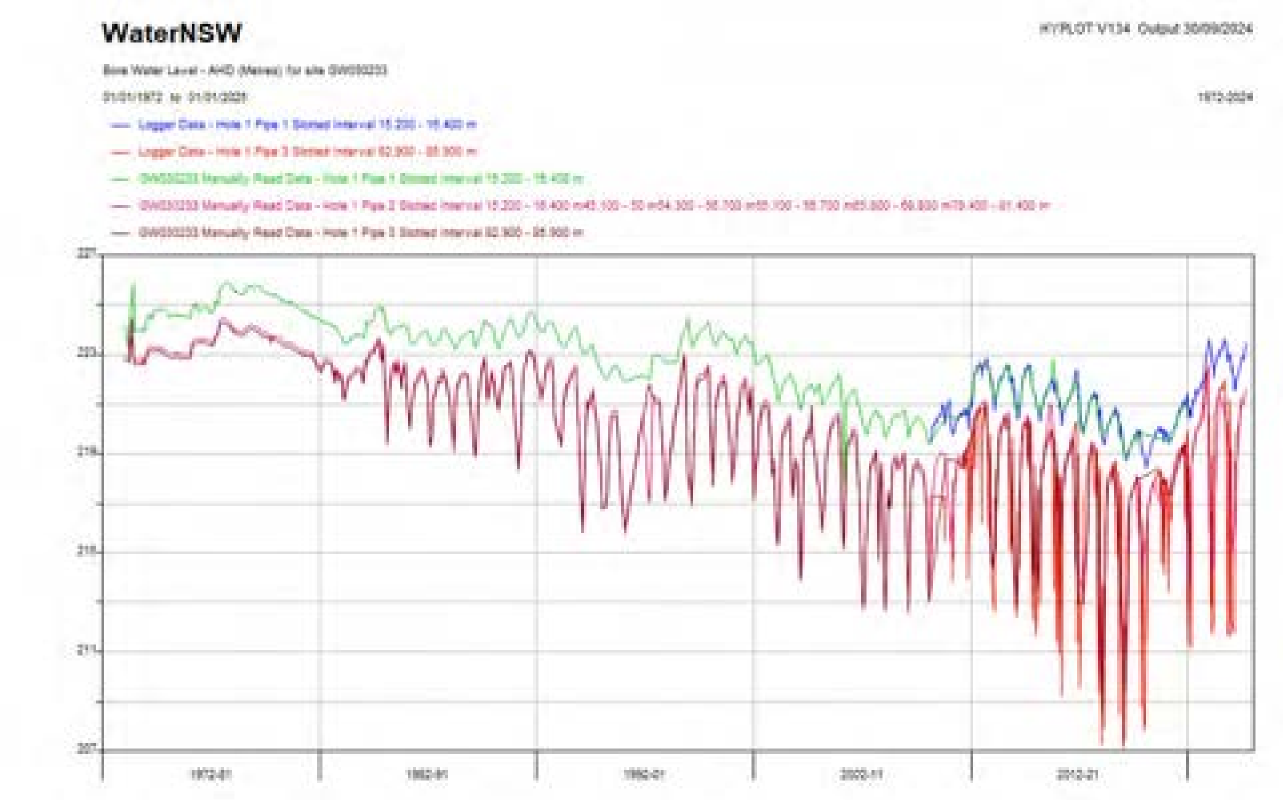


Figure 4.4 Groundwater bore installed northeast of mining near Namoi River

Within the deeper hard rock aquifers, groundwater levels are generally in the range 25 to 55 meters (m) below ground level (bgl). The shallower of the two hard rock groundwater systems occurs within the Jurassic sediments, which subcrops beneath the project area. The westerly dip on the strata exposes progressively younger units from east to west across the site. A deeper groundwater flow system occurs within the Permian-Triassic sediments which also dip in a westerly direction.

Regional groundwater flow directions in the Pilliga Sandstone are towards the northwest, show little or no temporal variation, and do not appear to be affected by climate, Narrabri Mine dewatering and other extraction. Groundwater levels in the Pilliga Sandstone are deeper near the Narrabri Mine (between 60 and 100 m bgl).

4.2.2 Baseline groundwater quality

Salinity has a significant influence on the beneficial use of groundwater. Generally, it correlates to EC, which can be used to categorise groundwater quality using the following ranges (Rhoades, Kandiah, & Mashali, The use of saline waters for crop production - FAO irrigation and drainage paper 48, 1992):

- Fresh water <700 µS/cm
- Brackish (slightly saline) 700 to 2,000 µS/cm
- Moderately saline 2,000 to 10,000 µS/cm
- Saline 10,000 to 25,000 µS/cm
- Highly saline 25,000 to 45,000 µS/cm
- Brine >45,000 µS/cm

Table 4.1 summarises the probability of exceedance levels of groundwater salinity using EC measurements.

Table 4.1 Summary statistics for field EC data organised by hydrostratigraphic units (AGE 2020)

Formation	No of bores	No of tests	Field EC (µS/cm)					
			Mean	Min	25%	50%	75%	Max
Alluvium	9	92	2,292	597	704	853	5,860	7,050
Pilliga Sandstone	4	93	1,410	129	256	393	2,900	5,440
Purlawaugh Formation	4	181	8,343	293	674	4,880	18,960	34,900
Garrawilla Volcanics	9	360	4,606	274	1,379	2,630	4,158	20,200
Napperby Formation	9	438	9,632	1,020	3,083	7,040	17,628	33,100
Hoskissons Coal Seam	1	5	5,580	1,410	4,070	6,180	7,490	8,750
Arkarula Formation	1	15	19,230	1,140	15,915	23,770	25,015	25,420
Pamboola Formation	3	174	14,785	1,050	3,468	17,175	25,025	27,340

4.2.3 Groundwater yield

The Narrabri Mine is mapped primarily as Jurassic sediments (Purlawaugh Formation), which are rarely considered as aquifers and have yields generally less than 0.5 L/s. There are small areas in the southeast portion of mining lease (ML) 1609 as part of the Gunnedah Basin sequence, with low yields similar to the Purlawaugh Formation. The geological unit in the Narrabri area with the highest potential yields is the Garrawilla Volcanics of the NSW GAB Groundwater Sources Southern Recharge Groundwater Source; however, this formation is not regionally extensive and not considered a highly productive groundwater source.

4.2.4 Groundwater use

There are more than 2,200 bores in the region surrounding Narrabri Mine, including approximately 1,500 water supply bores and 700 bores drilled for non-water supply purposes (e.g., monitoring, exploration, or dewatering). Registered water supply bores in the broader region are located predominantly within the Namoi Alluvium and include several bores used for irrigation purposes that tap into the ‘highly productive’ Namoi Alluvium aquifer.

Closer to the site, groundwater use is less prevalent and less intensive. Privately-owned registered water supply bores in the immediate vicinity of the mine are predominantly used for stock and domestic purposes. NCOPL extracts groundwater from an alluvial bore (GW969667) when water supply from underground mining areas is insufficient and allocation from Namoi River is unavailable. The alluvial bore water is extracted in accordance with the relevant WAL held by NCOPL and the rules prescribed in the WSP.

4.2.5 Groundwater dependent ecosystems (GDEs)

At the time of the MOD 5 Groundwater Impact Assessment (GIA) no high priority GDEs or culturally significant sites were listed in WSPs of relevance to the Narrabri Mine. The MOD 5 GIA (Hydrosimulations, 2015) therefore concludes that no impacts on either type of sensitive site are predicted. The WSPs were revised by Department of Planning, Industry and Environment (DPIE) -Water in June 2020 and now identify high priority GDEs within the predicted zone of influence of the Stage 2 operations (Figure 4.5). These GDEs are understood to be based on ‘high potential’ GDE areas identified in the National Groundwater Dependent Ecosystem Atlas (Bureau of Meteorology, 2018) of which several are identified using satellite image analysis with limited ground truthing. Modelling completed for the Narrabri Stage 3 Extension Project (Australian Groundwater and Environmental Consultants, 2020) suggests that the mapped GDE areas are unlikely to be actual GDE areas since regional groundwater levels are thought to be more than 10 m bgl.

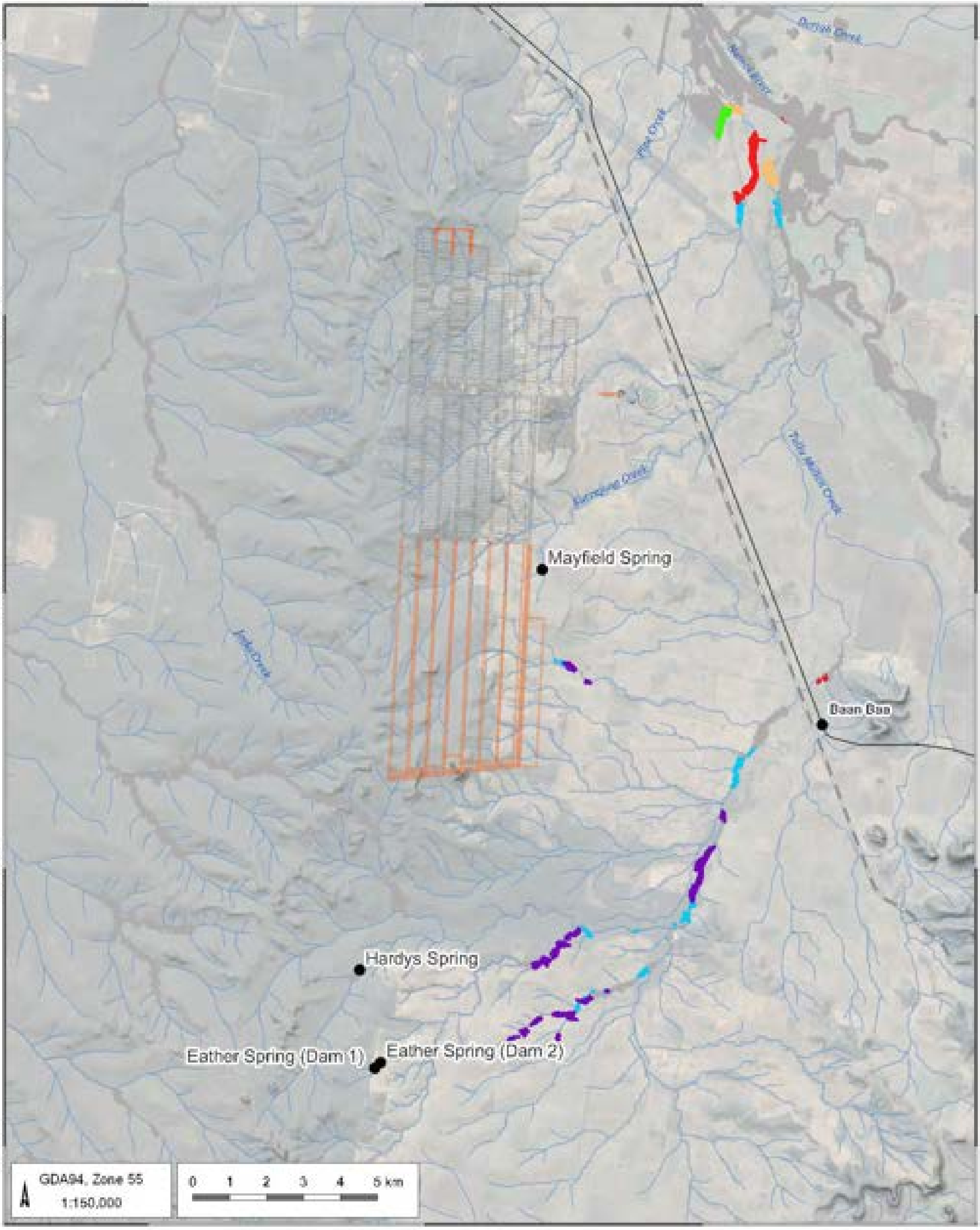
The Hardy's and Eather Springs, located approximately 8.5 km and 10.5 km south of the mining lease area respectively, are also listed as high priority spring GDE sites in the latest revision of the WSP for the GAB Southern Recharge Source. As shown in Figure 4.5, a third potential spring feature, the Mayfield Spring has also been identified close to the southern boundary of the mining lease. This spring is not mapped in the GDE Atlas (Bureau of Meteorology, 2018) or listed as a high priority GDE in the relevant WSPs.

All potential GDEs in the area, including the three springs, are thought to be sourced from shallow groundwater systems and/or perched surface water dominated systems. A summary of the status of GDEs at Narrabri Mine, including mapped features, monitoring, and regulatory context, is provided in Table 4.2 below.

The identification and management of GDEs at Narrabri Mine is guided by the latest Water Sharing Plan (2020), the Groundwater Management Plan, and the Extraction Plan Water Management Plan. While high priority GDEs have been mapped within the predicted zone of influence, most are classified as 'potential' due to reliance on remote sensing and limited field verification. Ongoing monitoring, regular reporting, and adaptive management are in place, with recommendations from the Independent Expert Scientific Committee (IESC) such as further field verification, tracer studies, and model updates being progressively implemented. The monitoring network and GIS mapping are regularly updated, and all findings are reported to regulators and made publicly available. Uncertainties remain, particularly regarding the actual status of mapped GDEs.

Table 4.2 Current Status of GDEs at Narrabri Mine

Feature	Status/Findings	Source(s)
High Priority GDEs	Identified in WSP (2020); mostly "potential" areas, limited ground truthing	WSP (2020); Annual review (2025)
Confirmed Springs	Hardy's, Eather (high priority); Mayfield (potential, not listed in Atlas)	WSP (2020); Annual review (2025)
Groundwater Levels	Typically, >10 m below ground; mapped GDEs may not be actual GDEs	Modelling & field data (AGE, 2020; 2024)
Monitoring & Response	GWMP and EP-WMP in place; trigger action response protocols enacted for exceedances	GWMP (2024); Annual Review (2025)
Regulatory Oversight	Stage 3 Extension approved; ongoing monitoring and reporting required	NSW Planning Portal (2024)
Scientific Review	IESC recommends further data collection and improved modelling	IESC Advice (2020–2024)



LEGEND

- Drainages
- Fault
- UG mine workings - Stage 2
- UG mine workings - Stage 3
- Rail
- Major road

Monitoring network

- GDE
- Standpipe
- Standpipe (Stock and domestic)
- VWP
- Seepage monitoring

- Potential Groundwater Features

GDEs areas max ddn exceeds AIP 2m

- Box grassy woodland
- Narrow-leaved Ironbark
- Other High priority GDE areas
- Red Gum
- River Red Gum
- Shallow freshwater wetland sedgeland

Narrabri Mine 2025 Annual Groundwater Review (NAR5027.001)

GDEs and groundwater features

AGE

DATE 05/02/2026

FIGURE No: **4.5**

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4.2.6 Recharge, discharge, and receptors

Recharge to the hydrostratigraphic units occurs through diffuse rainfall and occasional seepage from the non-perennial Kurrajong Creek and its tributaries when flowing. Recharge estimates from the Bioregional Assessment Program Namoi subregion (Bioregional Assessment Programme, 2016) estimate recharge ranges from up to 68.7 mm/year in the alluvium (Table 4.3) but generally from 0.1 to 6.6 mm/year in all other formations. There is no aquifer discharge from baseflow near the mining area, as groundwater levels are deep and below the ephemeral creeks. No alluvium is present along these creeks, which are either disconnected or only rarely connected to the Namoi Alluvium.

Table 4.3 Recharge estimates from the Bioregional Assessment Namoi subregion (Bioregional Assessment Programme, 2016)

Formation	Bioregional Assessment recharge range (mm/year) (Bioregional Assessment Programme, 2016)
Alluvium	< 1.0 – 68.7
Pilliga Sandstone	16.5
Purlawaugh Formation	0.1
Garrawilla Volcanics	0.3 – 6.6
Napperby Formation	0.1 – 4.3
Digby Formation	0.2 – 6.2
Hoskissons Coal Seam	-
Arkarula Formation	-
Pamboola Formation	0.2 – 0.4

5 Groundwater monitoring network

The groundwater monitoring network at Narrabri Mine includes open standpipe monitoring bores which are used to measure groundwater levels and quality each month or quarter and multi-level VWPs which record pore pressures multiple times per day. Springs are also monitored for water quality A summary of the monitoring requirements (as per the GWMP, 2024) is shown in Table 5.1. Table B 1 in Appendix C details all the monitoring locations at NCOPL and the groundwater monitoring network is shown in Figure 5.1.

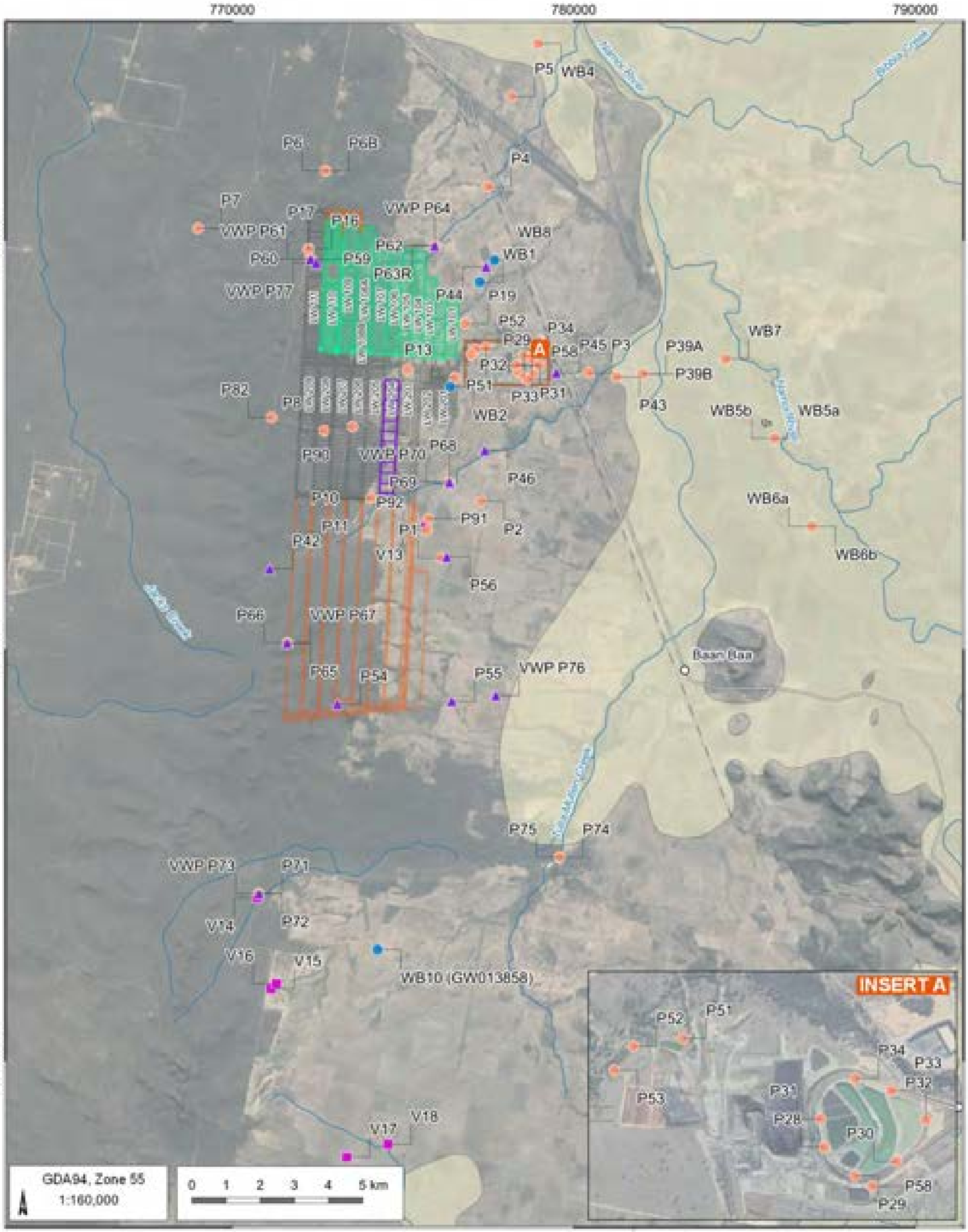
An additional 15 standpipes and 32 VWPs sensors at 7 locations were added to the existing monitoring network in late 2023 in preparation for the Stage 3 expansion, bores with sufficient data have been included in the updated Stage 3 GWMP.

Table 5.1 Groundwater monitoring program (Whitehaven Coal, 2024)

Location	Parameters	Frequency
VWPs **Pilliga Sandstone sensors** P42, P54, P77 **All other sensors** P42, P44, P45, P46, P54, P55, P56, P76, P77, P80	• Pressure data.	**Pilliga Sandstone sensors** Continuous with monthly download of data. **All other sensors** Continuous with quarterly download of data.
Standpipes **Pilliga Sandstone** P6B, P7, P60, P66, P82, P90 **All other formations** P1, P2, P3, P4, P5, P8, P9, P10, P11, P12, P13, P16, P17, P19, P39A, P39B, P43, P47, P51, P52, P53, P59, P62, P65, P68, P71, P74, P75, P91, P92, WB2	• Water level. • Field EC and pH. • Laboratory analysis: - physical parameters (e.g., alkalinity, EC, TDS, TSS and pH); - cations (e.g., calcium, magnesium, sodium and potassium); - anions (e.g., carbonate, bicarbonate, sulphate, and chloride); - dissolved metals (e.g., aluminium, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, selenium and zinc); and - nutrients (e.g., ammonia, nitrate, phosphorous and reactive phosphorous).	**Pilliga Sandstone** Monthly for water level Quarterly for water quality (EC and pH) Annually for all other parameters. **Other formations** Quarterly for water level and water quality (EC and pH) Annually for all other parameters.
Seepage bores P28, P29, P30, P31, P32, P33, P34, P58^, P83^*, P84^*, P85^*, P88^*, P89^*	• Water level. • Field EC and pH. • Laboratory analysis: - physical parameters (e.g., alkalinity, EC, TDS, TSS and pH); - cations (e.g., calcium, magnesium, sodium and potassium); - anions (e.g., carbonate, bicarbonate, sulphate, and chloride); - dissolved metals (e.g., aluminium, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, selenium and zinc); and - nutrients (e.g., ammonia, nitrate, phosphorous and reactive phosphorous).	Quarterly (in accordance with EPL 12789).

Location	Parameters	Frequency
Additional monitoring of water quality entering the underground mine workings (i.e. within longwall panels)	• EC. • TDS.	Monthly for an initial 6-month period and annually thereafter.
Mine water pumping inflow and outflow	• Discharge rate.	Weekly meter read.
Private landholder bores WB12 and WB18	• Water level. • Field EC and pH. • Laboratory analysis: - physical parameters (e.g. alkalinity, ED, TDS, TSS and pH); - cations (e.g. calcium, magnesium, sodium and potassium); - anions (e.g. carbonate, bicarbonate, sulphate, chloride and fluoride); - dissolved metals (e.g. aluminium, antimony, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, silver, selenium and zinc); and - nutrients (e.g. ammonia, nitrate, phosphorous and reactive phosphorous).	Annually.

Note: **^ - installed after EPL 12789 issued, not included in licence**
* - Brine dam standpipes to be sampled monthly for first 4 months after initial use of the dam



LEGEND

- Populated place
- Road
- Rail
- Drainage
- UG workings - stage 3
- UG workings - Stage 2
- Mined goaf
- Current mining - LW204
- Underground mine workings

Monitoring Locations

- GDE
- Standpipe
- Standpipe (Stock and domestic)
- VWP

Gunnedah rock units 100k

- Qx - Quaternary Sediments

Narrabri Mine 2025 Annual Groundwater Review (NAR5027.001)

Groundwater monitoring network

AGE

DATE 27/01/2026

FIGURE No: 5.1

Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011 ; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006 ;
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5.1 Groundwater level triggers

Tiered water level trigger values for monitoring bores have been developed based on the 5th percentile of baseline data and modelled predicted drawdown and are defined in section 4.3.2 of the Stage 2 GWMP (2024) and section 6.6.3 of the Stage 3 GWMP (2025). Methods for tiered triggers are listed in Table 5.2.

Table 5.2 Tiered trigger level description

Tier	Description	Trigger
Tier 1	Upper allowable limit (UAL): • Indicates trend is towards an unacceptable level but is still within reasonable expected levels.	5th percentile of baseline data.
Tier 2	Upper cut-off limit (UCL): • A detailed investigation is required for three consecutive exceedances. Model predicts yearly triggers to 2031.	Model prediction + 2 m (subtract predicted drawdown from selected baseline groundwater level and add 2 m to allow for model uncertainty).
Tier 3	Applies to Pilliga Sandstone monitoring bore P7 only.	Greater than 4 m drawdown.
Tier 4	Applies to Pilliga Sandstone monitoring bore P7 only.	Greater than 10 m drawdown.

A full list of triggers for monitoring bores is in Table 5.3. Reporting of trigger level exceedances and associated responses are outlined in the Trigger Action Response Plan (TARP) in the Stage 2 GWMP (2024), triggers were reviewed and updated as part of the Stage 3 GWMP; this has been submitted pending approval, all trigger exceedances reported for 2025 are based on the Stage 2 GWMP triggers.

Table 5.3 Groundwater level triggers (m AHD)

Bore	Formation	Tier 1	Tier 2							Tier 3	Tier 4
			2025	2026	2027	2028	2029	2030	2031		
P1	Garrawilla	291.6	291.5	291.5	291.5	291.5	291.4	291.4	291.3	n/a	n/a
P2	Napperby	242.4	236.8	235.4	234.2	233.1	232.1	231.2	230.3	n/a	n/a
P3	Pamboola	222.3	221.4	221.2	221.0	220.8	220.6	220.4	220.2	n/a	n/a
P4	Napperby	226.7	225.7	225.5	225.4	225.2	225.1	225.0	224.8	n/a	n/a
P5	Pamboola	207.7	206.6	206.4	206.2	206.0	205.8	205.6	205.4	n/a	n/a
P7	Pilliga	224.4	224.4	224.4	224.4	224.4	224.4	224.4	224.4	222.4	216.4
P8	Purlawaugh	269.6	269.6	269.6	269.6	269.5	268.4	267.2	266.6	n/a	n/a
P9	Purlawaugh	264.2	260.6	260.3	259.4	258.9	258.6	258.4	258.2	n/a	n/a
P10	Napperby	275.2	272.4	270.9	269.8	267.3	263.9	260.9	258.7	n/a	n/a
P11	Purlawaugh	270.4	269.8	267.8	267.4	262.5	262.8	262.8	263.4	n/a	n/a
P12	Napperby	199.0	208.8	207.7	206.3	205.0	203.9	203.1	202.5	n/a	n/a
P13	Garrawilla	264.7	262.5	262.4	262.3	262.3	262.2	262.1	262.0	n/a	n/a
P39b	Alluvium	220.3	219.6	219.6	219.6	219.6	219.6	219.6	219.6	n/a	n/a
P42_90	Pilliga	244.7	244.2	244.2	244.2	244.2	244.2	244.2	244.2	n/a	n/a
P47	Garrawilla	262.4	261.1	261.0	260.9	260.8	260.7	260.7	260.6	n/a	n/a
P53	Garrawilla	254.8	253.5	253.5	253.4	253.4	253.4	253.3	253.3	n/a	n/a
P54_30	Pilliga	332.4	332.3	332.3	332.2	332.1	332.0	332.0	332.0	n/a	n/a
WB12	Arakula/Pamboola	208.3	208.6	208.6	208.6	208.6	208.6	208.6	208.6	n/a	n/a
WB18	Napperby	214.2	213.0	212.9	212.7	212.6	212.5	212.3	212.2	n/a	n/a

5.2 Groundwater quality triggers

Where suitable, the guideline water quality objectives for stock drinking water (beef cattle) and long-term irrigation have been adopted (ANZG, 2018). These guideline values assume that groundwater is abstracted for the purpose associated with the identified environmental values and are based on guidance provided in OEH (2006) and ANZG (2018). However, because of the high variability in groundwater chemistry, groundwater quality may not meet the water quality objectives set in the ANZG (2018) at all locations and/or at all times.

Bore specific EC water quality triggers are used for bores identified to have high variability in groundwater chemistry or quality identified in historical data (AGE 2021). The monitoring locations have been selected based on the suitability of the water quality (e.g. irrigation or stock [beef cattle] drinking) and monitoring purpose. EC triggers for these bores are calculated as a rolling median calculated from the eight most recent data points and plotted against the 80th and 95th percentiles of the long-term dataset.

EC and pH water quality triggers for each bore is listed in Table 5.4. If pH is outside the range of 6.0 to 8.5 for three consecutive readings or the EC trigger value of 5,970 (µS/cm) is exceeded for three consecutive readings, the TARP (Level 2) will be initiated.

For those monitoring locations where water quality is unsuitable for use as irrigation/stock watering or where the intended purpose is seepage monitoring, two-tiered EC triggers will be utilised.

Two triggers are then identified as follows:

- Tier 1 – where the rolling median exceeds the 80th percentile of long-term data; and
- Tier 2 – where three consecutive exceedances of the 95th percentile of the long-term data occur. If this occurs, the TARP (Level 2) will be initiated.

The Tier 1 trigger provides a method for assessing a gradual change in groundwater quality over the medium term via use of the rolling median, whilst the Tier 2 trigger is intended to detect an event related change over the short term.

Groundwater quality triggers are listed in Table 5.4.

Table 5.4 Groundwater quality pH and EC triggers

Location ID	Coordinates (MGA55)		Bore depth (m)	Screen interval (m bgl)	Formation	Trigger criteria	EC		pH^	
	Easting	Northing					Tier 1 (80th)	Tier 2 (95th)	Min	Max
Seepage monitoring bores										
P51	777437	6620859	18	9-12	Garrawilla Volcanics	EC two tiered	19,500	19,860	6.0	8.5
P53	776994	6620655	24	18-21	Garrawilla Volcanics	EC two tiered	1,107	1,169	6.0	8.5
P29	778541	6619978	25	19-25	Napperby Formation (above sill)	EC two tiered	9,732	11,337	6.0	8.5
P31	778318	6620343	15	9-15	Napperby Formation (above sill)	EC two tiered	7,110	7,195	6.0	8.5
P32	778993	6620335	15	9-15	Napperby Formation (above sill)	EC two tiered	2,170	2,938	6.0	8.5
P52	777117	6620807	24	18-21	Napperby Formation	EC two tiered	2,300	2,533	6.0	8.5
Strata likely to experience drawdown impacts										
P8	772697	6618421	65	57-63	Purlawaugh Formation	ANZG (stock)	5,970		6.0	8.5
P9	775127	6620209	36	24-36	Purlawaugh Formation	EC two tiered	20,330	21,190	6.0	8.5
P11	774066	6616447	40	34-40	Purlawaugh Formation	EC two tiered	6,052	6,546	6.0	8.5
P1	776116	6614694	50	44-50	Garrawilla Volcanics	ANZG (stock)	5,970		6.0	8.5
P13	776526	6619972	30	24-30	Garrawilla Volcanics	ANZG (stock)	5,970		6.0	8.5
P16	772233	6623740	146	137-146	Garrawilla Volcanics	ANZG (stock)	5,970		6.0	8.5
P47	776166	6622586	30.5	8-30.5	Garrawilla Volcanics	ANZG (stock)	5,970		6.0	8.5
WB2	776382	6619701	26	22-26	Garrawilla Volcanics	ANZG (stock)	5,970		6.0	8.5
P2	777282	6616355	50	44-50	Napperby Formation	EC two tiered*	19,342	19,731	6.0	8.5
P4	777490	6625553	30	24-30	Napperby Formation	EC two tiered*	24,912	25,610	6.0	8.5
P10	774063	6616444	130	118-130	Napperby Formation (no sill)	EC two tiered*	8,894	9,426	6.0	8.5

Location ID	Coordinates (MGA55)		Bore depth (m)	Screen interval (m bgl)	Formation	Trigger criteria	EC		pH^	
	Easting	Northing					Tier 1 (80th)	Tier 2 (95th)	Min	Max
P12	776513	6619964	90	84-90	Napperby Formation (above sill)	ANZG (stock)	5,970		6.0	8.5
P3	780433	6620115	40	34-40	Pamboola Formation	EC two tiered*	18,016	18,564	6.0	8.5
P39a	782024	6620076	80	72-80	Watermark Formation	ANZG (stock)	5,970		6.0	8.5
P43	781248	6619992	65	59-65	Watermark Formation	EC two tiered*	11,162	11,412	6.0	8.5
Strata unlikely to experience drawdown impacts										
P39b	782018	6620077	32	15-30	Alluvium	ANZG (irrigation), bore specific	6,546	-	6.0	8.5
P7	768998	6624338	90	78-90	Pilliga Sandstone	ANZG (irrigation)	2,327		6.0	8.5
Private bores with predicted drawdown >2 m[2]										
WB12	780874	6617836	100	60-75	Arkarula and Pamboola Formations	ANZG (stock)	5,970		6.0	8.5
WB18	776686	6629386	16.69	-	Napperby Formation	ANZG (stock)	5,970		6.0	8.5

Notes: * Review of EC data suggests that salinity (EC) values for groundwater at these locations is unsuitable for use as livestock drinking water, these locations are recommended for exclusion from ongoing assessment against the livestock drinking water trigger values.

1 - Converted from TDS trigger using equation 4.6 (ANZECC, 2000). ANZG (2018) Irrigation.

2 – No historic data currently available, initial EC value based on ANZG (2018) beef cattle watering guidelines until sufficient baseline data is collected.

^ ANZG (2018) irrigation, long term application.

m bgl – metres below ground level.

5.2.1 TDS to EC conversion for stock watering applications

As indicated in the GWMP (2024), EC trigger values for stock watering applications are based on the TDS limit for livestock drinking water (beef cattle) after ANZG (2018) by a conversion factor of 0.67 (equation 4.6, ANZECC (2000)) The validity of the factor applied was cross-checked with all data (Nov 2007 to Nov 2025) and bore specific ratios were confirmed and presented in Figure 5.2. It is evident from the box-and-whisker-plot[3] (Figure 5.2) that the mean of the datasets plots below the 0.67 factor. The applied trigger value is therefore confirmed as still relevant.

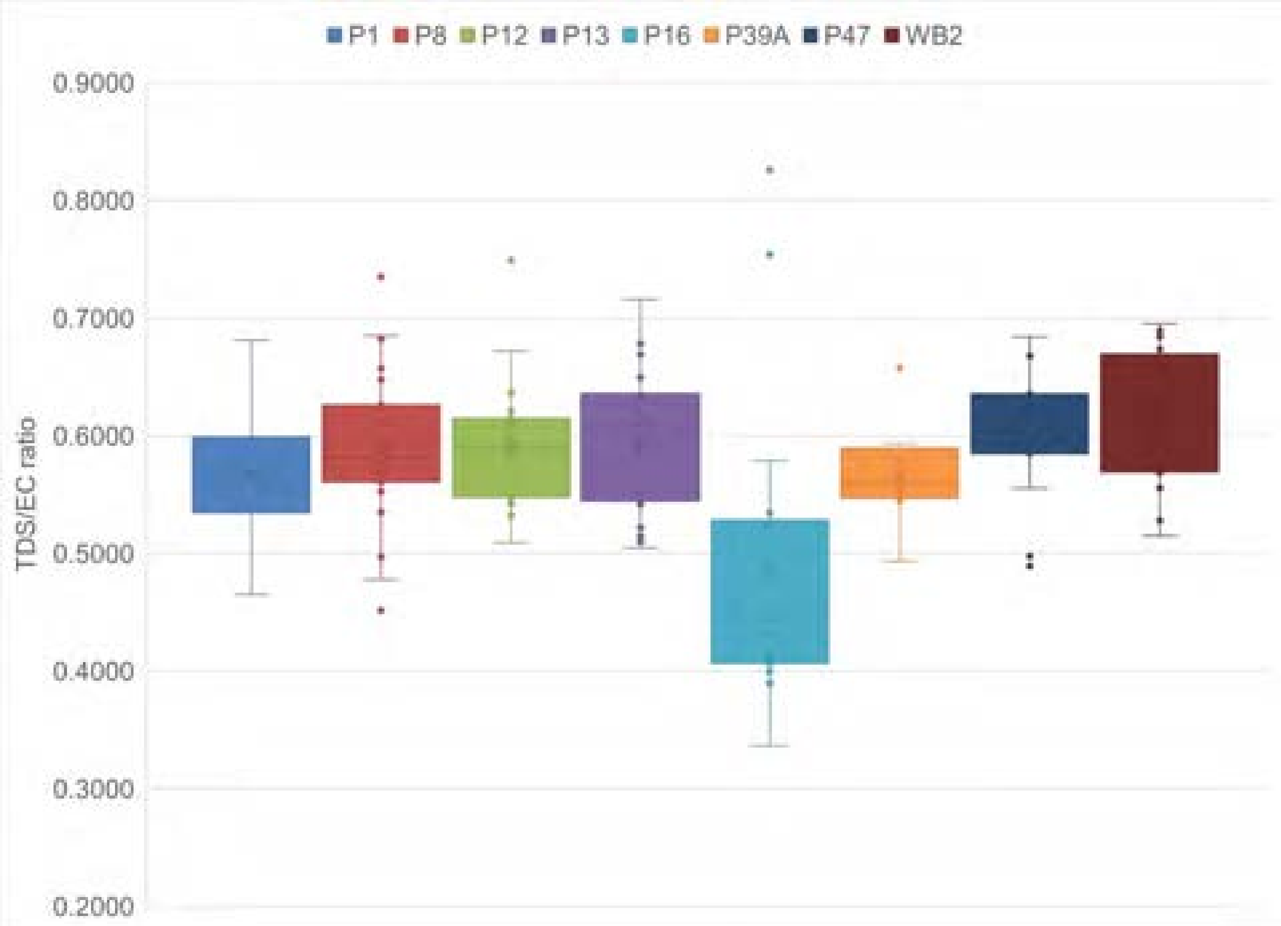


Figure 5.2 TDS/EC ratio for bores with stock water EC trigger

[3] The box-and-whisker-plots include min, max, median, interquartile range [25th percentile to 75th percentile] and any outliers.

6 Groundwater level analysis

Groundwater levels are monitored by a network of standpipe and VWP monitoring bores. Water levels for standpipe bores are grouped by formation and plotted with CRD in Sections 6.1 to 6.7. The CRD, when plotted with hydrographs, can be used to assess if changes in groundwater levels are correlated with climatic conditions. Individual bores are plotted with their respective trigger levels in Appendix C. A summary of water levels recorded by the VWP network is provided in Section 6.8 with VWP hydrographs plotted in Appendix D.

6.1 Alluvium

The alluvium is monitored by bore P39B which is located 5.3 km east of mining in the Tulla Mullen alluvium on the eastern side of the Namoi Alluvium. An additional network of “WB” series bores is installed along the Namoi River. These bores (WB3a, WB3b, WB4, WB5a, WB5b, WB6a, WB6b, and WB7) are managed by Water NSW, and a copy of historical hydrographs is included in Appendix C for reference only. Three bores, screened in deeper formations and located between mining and the Namoi Alluvium (P3, P4, and P5), have been designated as early-warning detection bores. These bores are discussed in their relevant sections and are plotted together with P39B in Figure 6.1.

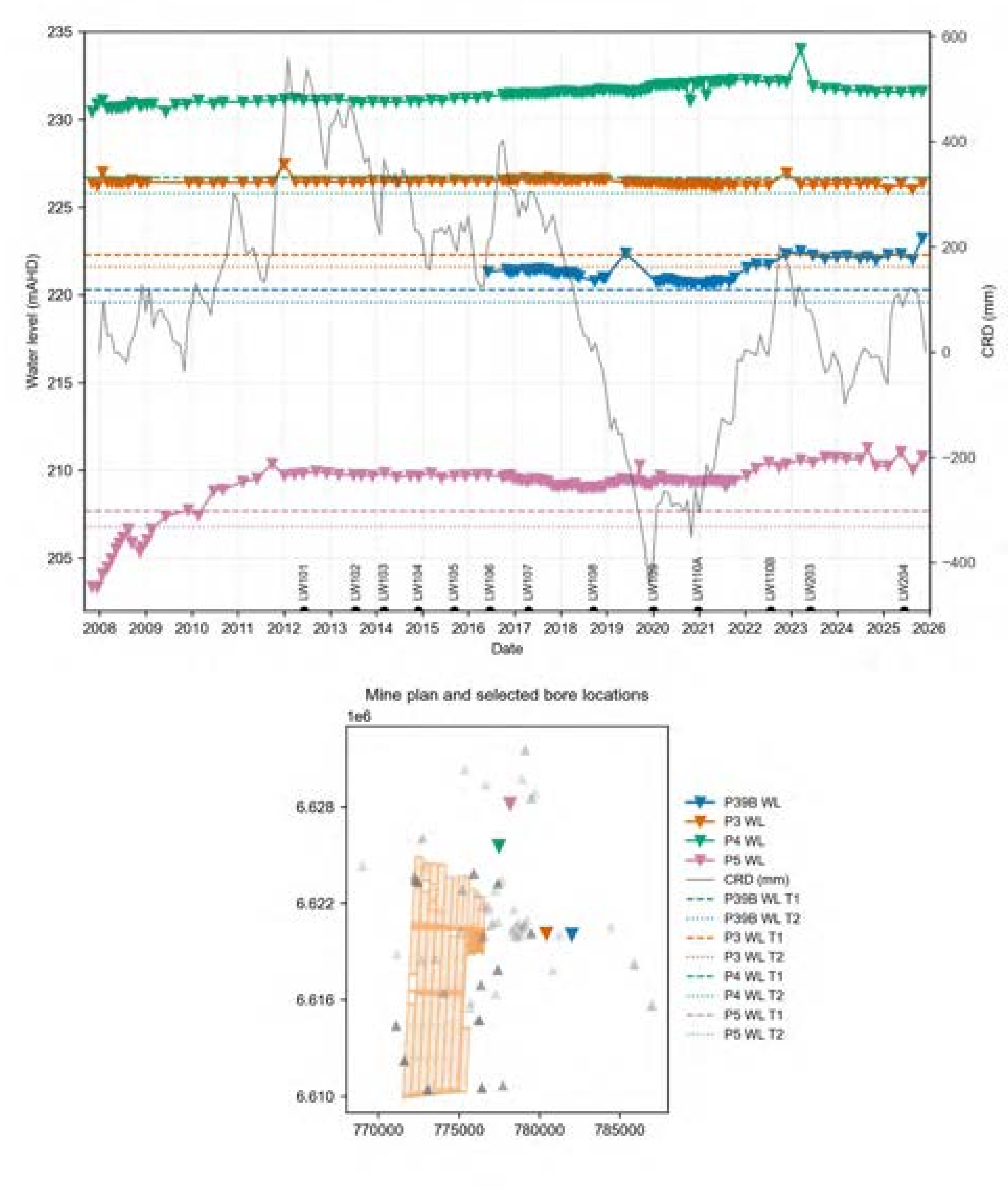
A summary of the recent data collected at the alluvial monitoring bore P39B is listed in Table 6.1. Time series groundwater elevation data is plotted with the CRD curve in Figure 6.1. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.1 Alluvium data summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P39B	5.3 km east of mining	Yes	220.3	219.6	222.29	222.32	221.99	223.23	-	D/F

Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.
* Visual approximation of trend of data relative to historical measurements.

The water levels recorded in bore P39B are influenced by natural rainfall patterns. The declining trend observed from 2023 to mid- 2024, was consistent with a decrease in rainfall for that period. The reporting period indicated a stable to slight increasing groundwater level with an increasing anomaly during the last monitoring event. early warning locations also indicated stable trends for the reporting period.



Notes: WL: Water level.
T1: Tier 1 trigger.
T2: Tier 2 trigger.

Figure 6.1 Alluvium early warning bores (P3, P4, P5) and alluvium monitoring bore (P39B)

6.2 Pilliga Sandstone

The Pilliga Sandstone is monitored by five standpipe bores, these include P6B, P7, P60, P66, and P82, VWP bores also monitor water levels in the Pilliga at P42, P54 and P77. Of these bores, only P7 is currently monitored as part of the Stage 2 GWMP (2024). Bore P6 has been historically recorded as dry and was recently replaced by P6B, which was installed at the base of the Pilliga Sandstone. A summary of Pilla bores and their results are included in Table 6.2.

Table 6.2 Pilliga Sandstone data summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P6B	1 km north of LW111	N/A[2]	-	-	-	-	-	-	-	
P7	5 km west and up dip of UG workings	Yes	224.4	224.4[1]	226.5	226.5	226.5	226.5*	Level 1	S
P60	above LW111	N/A[2]	-	-	-	-	-	-	-	-
P66	5.5 km south of LW209	N/A[2]	-	-	-	-	-	-	-	-
P82	2.3 km southwest of LW111	N/A[2]	-	-	-	-	-	-	-	-

Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.
[1] P7 has 4 Tier triggers, Tier 3 is 222.4 and Tier 4 is 216.4.
[2] bores dry since installation.
* The Q4 drawdown is attributed to the Research Sampling Program conducted on 29 October 2025.

Groundwater levels at P7 have remained steady at around 226.5 m AHD since 2012. Groundwater level at P7 is neither affected by mining nor influenced by climatic variations.

It is evident that, initially, the groundwater level in the newly installed P90 rose from about 260 m AHD to about 284 m AHD in 2023/2024, then remained stable but declined slightly in 2025. The anomaly recorded during the last monitoring event requires further investigation or confirmation.

The Pilliga Sandstone is also monitored by VWP bores P42, P54 and P77, a combined plot of all available Pilliga bores is included in Figure 6.2.

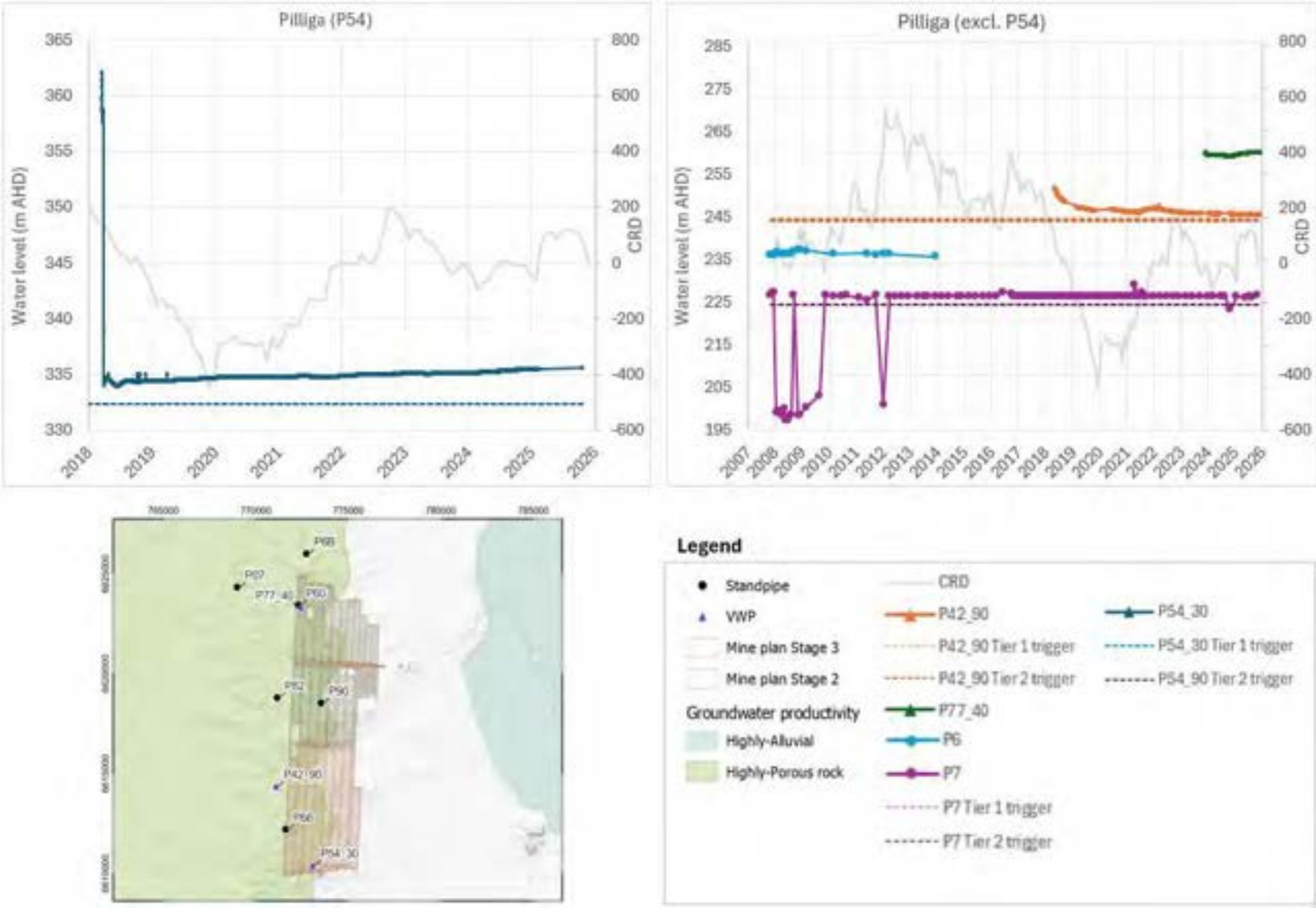


Figure 6.2 Pilliga Sandstone standpipe and VWP monitoring bore hydrographs

6.3 Purlawaugh Formation

Four active monitoring bores are installed in the Purlawaugh Formation. Additional monitoring is conducted with VWP sensors (P42_185, P54_60, P54_100, P61_92, P67_115, P67_170, P77_90) summaries are in Section 6.8. Table 6.3 outlines the location for each bore with associated triggers and recent water levels. Time series groundwater elevation data is plotted with the cumulative rainfall departure curve in Figure 6.3. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.3 Purlawaugh Formation summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P8	Middle of LW208	Yes	269.6	269.6	271.0	270.9	270.9	270.8	-	D
P9	Central mains on LW203	Yes	264.2	260.6	269.1	268.2	267.0	266.9	-	D
P11	Southern boundary of LW205	Yes	270.4	269.8	266.7	268.6	266.4	265.7	Level 2	D
P72	16 km south of the mine	Yes	-	-	270.2	270.6	270.8	270.1	-	I
P90	above LW206	N/A	-	-	283.8	283.4	283.2	270.2*	-	D[2]

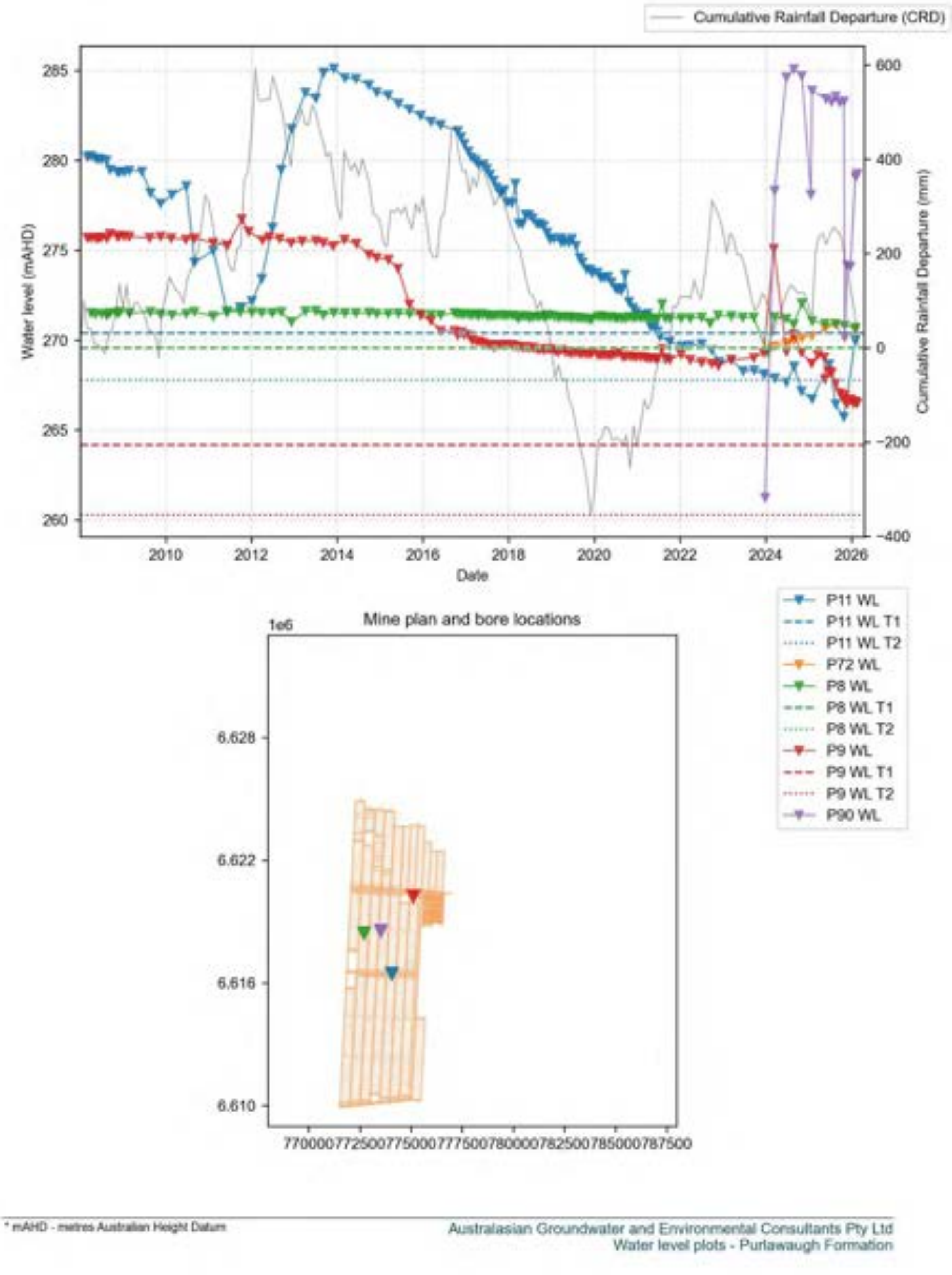
Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing over the 12 month period.

Bore P8 indicating a stable to very slight decreasing trend for the reporting period and remains above Tier 1 and 2 triggers.

Bore P9 declined rapidly from 2014 to 2016 after which the rate of decline slowed; this slower rate of decline coincides with a period of below average rainfall from late 2016 to 2023. From 2023 water levels have commenced recovering; however, a decreasing groundwater level started in mid-2024 and persist throughout the reporting period. The water levels remain above the Tier 1 trigger level. The recent decline may be attributed to board-and-pillar mining east of the bore location.

Bore P11 remains below the Tier 2 trigger level, and continues a steady rate of decline, investigations into water level decline have been conducted with an exceedance review included in Appendix F.

The newly installed P72 indicated a stable-to-increasing groundwater level trend, with a slight decrease during the last monitoring event of the reporting period. Because it is 16km to the south, the bore only indicated climatic trends.



Note: bore P72 is not plotted on the bore location map, this bore is located 16km south of LW111, off the map.

Figure 6.3 Purlawaugh Formation monitoring bore hydrographs and location

6.4 Garrawilla Volcanics

Four active monitoring bores are installed in the Garrawilla Volcanics, of these, bores P1, P13 and P47 have water level triggers defined in the GWMP (2024). Additional monitoring is conducted with VWP sensors (P61_138, P73_90 and P77_145) summaries are in Section 6.8. A summary of recent data is listed in Table 6.4. Time series groundwater elevation data is plotted with the cumulative rainfall departure curve in Figure 6.4. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.4 Garrawilla Volcanics summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P1	3.6 km south of Cut and Fill panel 201	Yes	291.6	291.5	295.2	295.6	295.4	295.3	-	S
P13	South of LW101	Yes	264.7	262.5	264.2	264.3	264.8	265.6	Level 1	S
P16	West of LW111	N/A	-	-	207.1	208.6	206.2	202.9	-	D
P47	north of LW101	Yes	262.4	261.1	265.3	265.3	265.7	265.8	-	S

Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.

Bore P13 indicates a clear correlation between rainfall and water levels (evident in the individual plot in Appendix C), with water levels ranging from approximately 262 m AHD to 271 m AHD. A significant decline in groundwater levels occurred in mid to late 2013, largely because of mining activities associated with the completion of LW101 and LW102, resulting in a drop of approximately 6 m. No further decline related to underground mining has been observed. Q1 and Q2 has recorded measurements below the Tier 1 trigger; however, this appears to be due to fluctuations associated with variations in rainfall.

The groundwater decline observed in P16 was investigated previously, it was found that groundwater decline was due to goaf fracturing caused by the collapse of LW107 and LW109. In 2023 additional VWP monitoring sensors were installed these are; P61, installed at 138 m bgl and located 413 m south of P16, and P77, installed at 145 m bgl and located 252 m east of P16 (Figure 6.5). Groundwater pressure readings from these VWP sensors have either remained relatively stable (P77_145) or have increased (P61_138) (Figure 6.5). No decline was recorded in these nearby locations throughout the reporting period which consistent with conclusions that water level decline is isolated around P16 and likely attributable to fracturing within the goaf. P16 indicated a continuous declining trend for the reporting period.

Both P1 and P47 indicated a stable groundwater level for the reporting period.

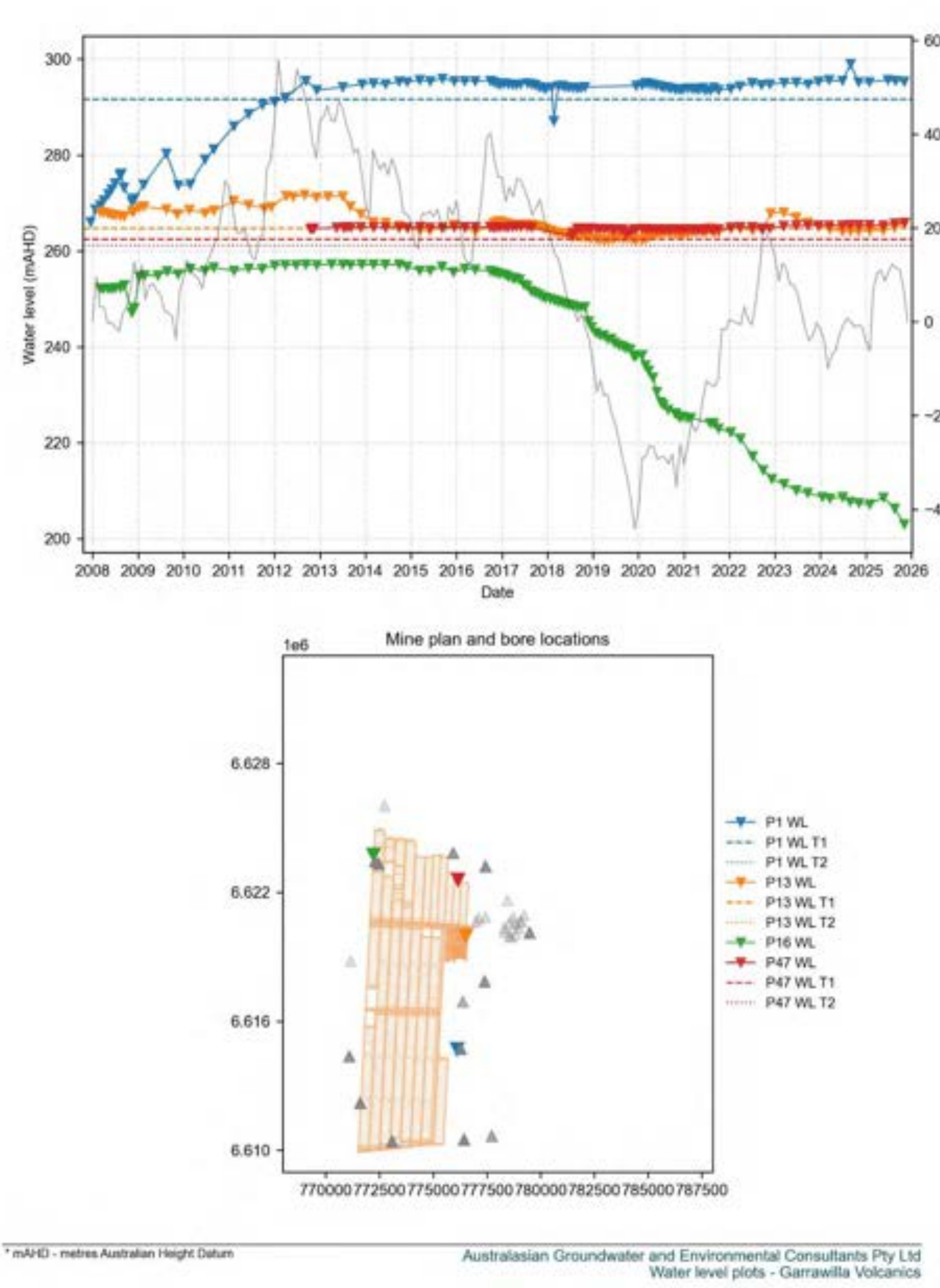


Figure 6.4 Garrawilla Formation monitoring bore hydrographs and location

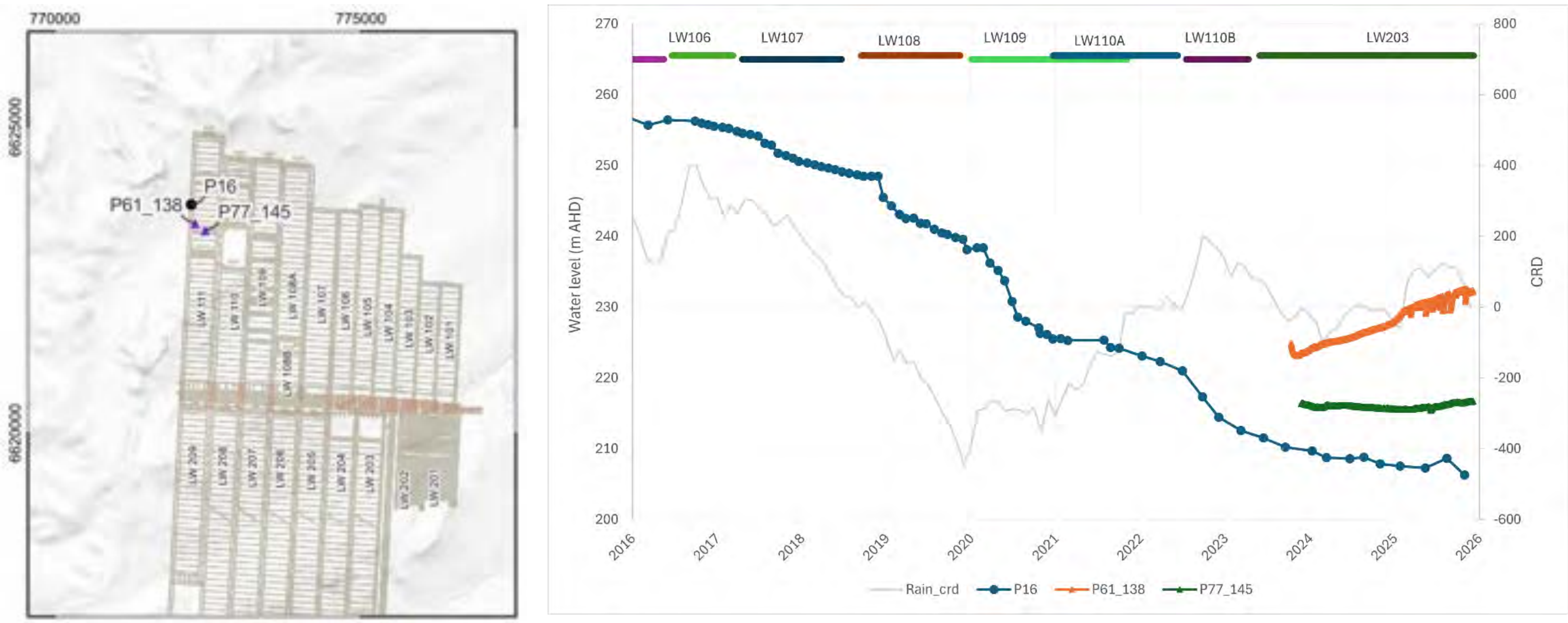


Figure 6.5 Garrawilla hydrographs for bores P16, P61 and P77

6.5 Napperby Formation

Seven active (P2, P4, P10, P12, P63R, P69 and P75) monitoring bores are installed in the Napperby Formation. A summary of the data collected during 2025 is listed in Table 6.5. Water levels are also monitored with a network of VWP sensors, which are summarised in Section 6.8. An additional five bores (P29, P30, P31, P32 and P58) are monitoring the Napperby Formation within the rail loop water storages area, data for these are presented in Section 8. One bore (P52) is installed in the Napperby Formation, monitoring the reject emplacement. Time series groundwater elevation data is plotted with the cumulative rainfall departure curve in Figure 6.6. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.5 Napperby Formation summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P2	2 km east of LW203	Yes	242.4	236.8	248.0	248.0	248.2	247.9	-	S
P4	3 km northeast of LW101	Yes	226.7	225.7	231.6	231.5	231.6	231.6	-	S
P10	southern edge of LW205	Yes	275.2	272.4	275.3	277.7	270.3	265.0	Level 1	D
P12	near CF201, 650 m south of LW101	Yes	199.0	208.8	230.6	230.1	233.3	228.4	-	S
P63R	1 km north of LW103	Yes[1]	-	-	227.6	227.8	228.0	-	-	I
P69	3.5 km south of LW101	Yes[1]	-	-	253.4	253.6	253.5	253.1	-	S
P75	16 km southeast of the active mining area	Yes[1]	-	-	244.2	244.4	244.4	244.4	-	S

Notes: All water levels reported in meters Australian Height Datum (m AHD).

[1] Bores installed late 2023 as part of the Stage 3 preparations, minimal data collection has occurred.

Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.

Bore P10 shows fluctuations in water levels that are generally consistent with variations in rainfall, since 2023 a declining trend in water levels has been observed; however, this is during a period of below average rainfall and is expected. From mid-2025 groundwater levels decreased from 277.7 m AHD to 265.1 m AHD. Mining commenced on LW204, the southern end of which is located 400 m east of P10, on 14 of June 2025. Drawdown recorded at P10 is likely due to mining at LW204.

The rest of the Napperby monitoring bores all indicated stable trends for the monitoring period.

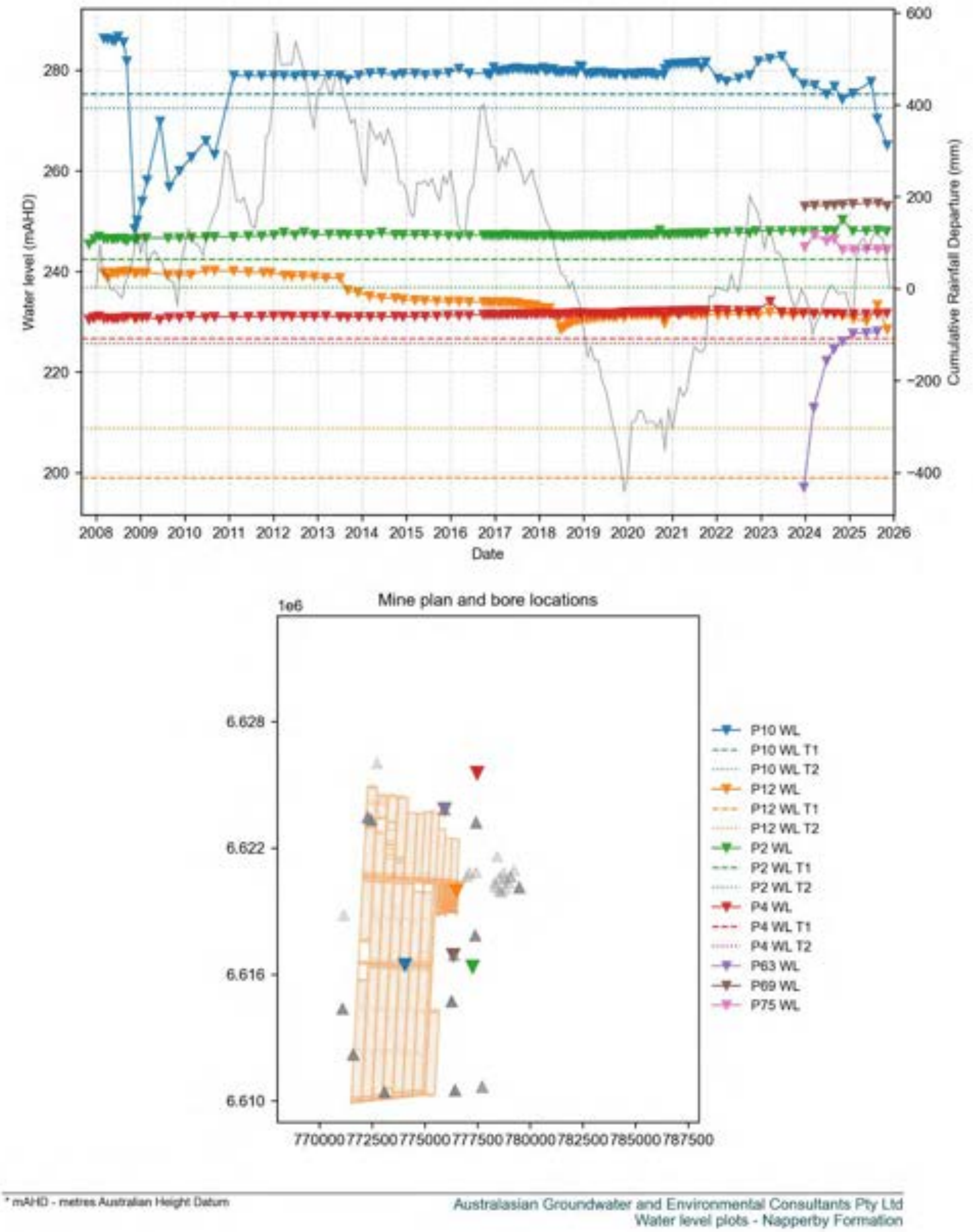


Figure 6.6 Napperby Formation monitoring bore hydrographs and location

6.6 Watermark Formation

Two active monitoring bores are installed in the Watermark Formation, a summary of the data collected during 2025 is listed in Table 6.6. Time series groundwater elevation data is plotted with the cumulative rainfall departure curve Figure 6.7. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.6 Watermark Formation summary, water levels in m AHD

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P39A	5.3 km east of the mine	Yes	-	-	222.0	222.3	222.6	222.2	-	S
P43	780 m west of P39A	Yes	-	-	226.8	224.6	224.1	225.1	-	S

Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.

Groundwater levels in the Watermark Formation monitoring bores P39A and P43 are stable, bore P39A shows fluctuations up to 0.5 m which are attributed to changing climatic conditions, this is evident in individual plots in Appendix C. Bore P39A and P43 do not have groundwater level triggers associated with them in the GWMP (2024).

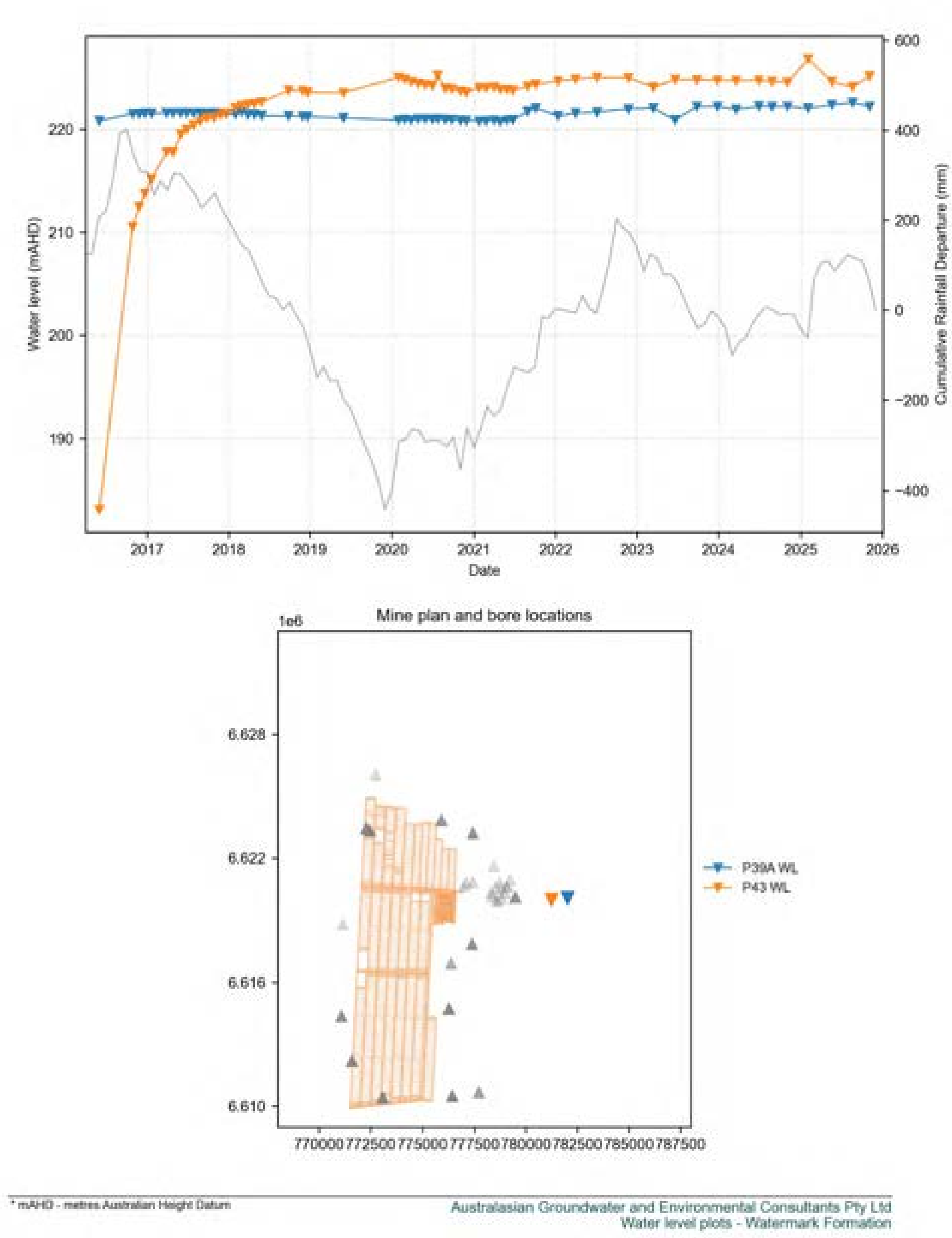


Figure 6.7 Watermark Formation monitoring bore hydrographs and location

6.7 Pamboola Formation

Three active monitoring bores are installed in the Pamboola Formation, a summary of the data collected during the reporting period is listed in Table 6.7. Time series groundwater elevation data is plotted with the cumulative rainfall departure curve in Figure 6.8. The groundwater data for each bore is also plotted individually in Appendix C.

Table 6.7 Pamboola Formation summary

Bore ID	Location	Monitoring guidelines met?	Trigger		Recent water levels				TARP	Trend*
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025		
P3	3.7 km east of LW101	Yes	222.3	221.4	226.0	226.3	226.0	226.4	-	S
P5	6 km north of the mine	Yes	207.7	206.6	210.2	211.0	210.0	210.8	-	S
P19	200 m east of LW101	Yes	-	-	-	139.8	139.6	138.4	-	S/D

Notes: All water levels reported in meters Australian Height Datum (m AHD).
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.

Bores P3 and P5 indicated stable groundwater levels during the 2025 reporting period. Bore P19 is located just east of LW101, prior to August 2020 the wrong bore was sampled at P19 therefore no data is used prior to this date. The impacts at this location are not directly evident in this bore as LW101 was mined from June 2012 to June 2013. From 2020 to 2024 groundwater levels have declined a total of 5 m from 144.3 m AHD in August 2020 to 139.3 m AHD in December 2024, maintaining a stable trend in 2025 with the last sample run indicating a slight decline.

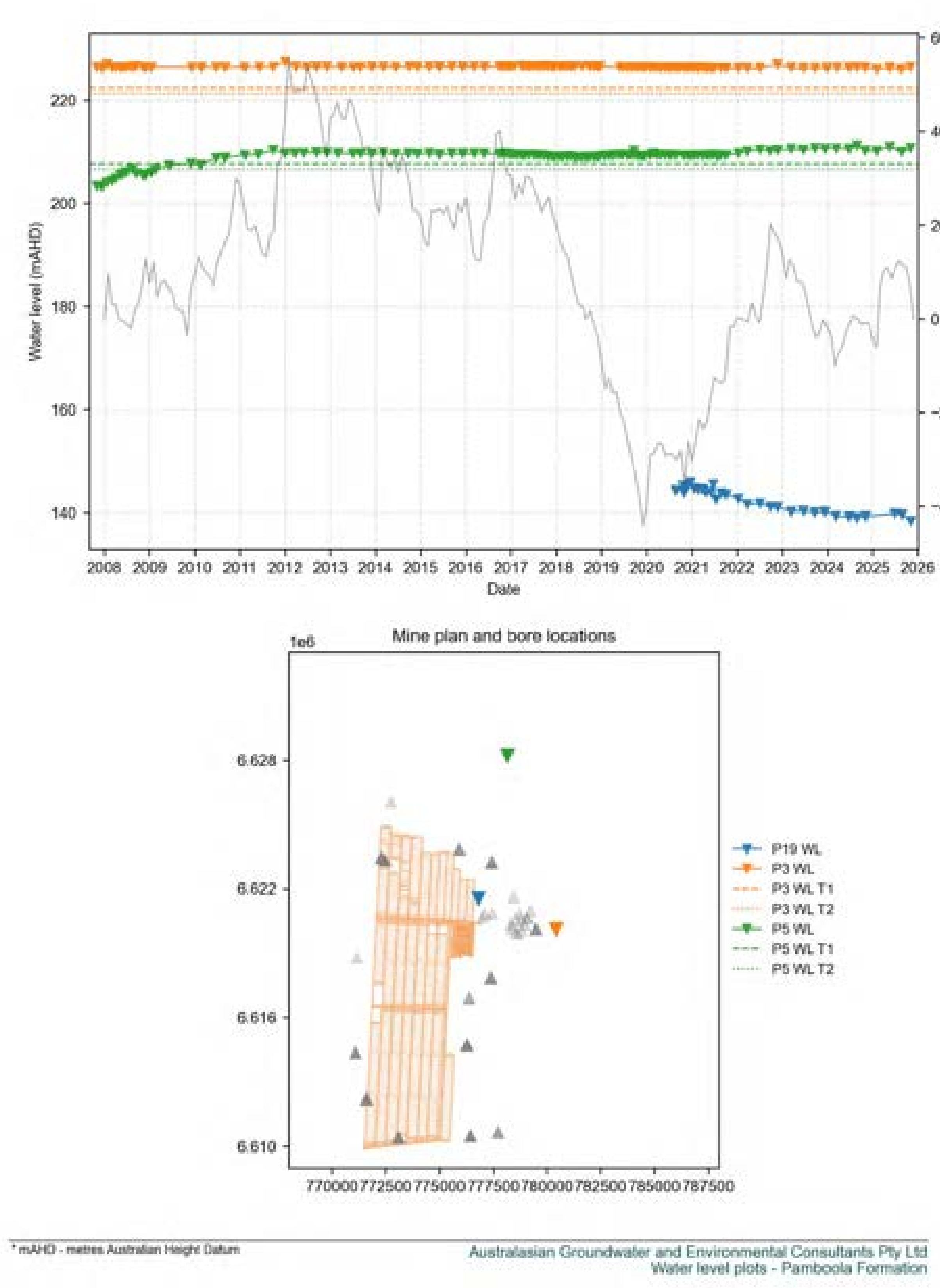


Figure 6.8 Pamboola Formation monitoring bore hydrographs and location

6.8 VWP monitoring network

Multi-level VWPs were first installed at Narrabri Mine in 2008. The network is constantly evolving with VWPs being mined out and replaced as monitoring requirements and locations change. A summary of the data collected at the operational VWPs at Narrabri is in Table 6.8. VWP hydrographs are available in Appendix D.

Table 6.8 VWP monitoring network

VWP ID	Sensor depth (m bgl)	Sensor depth (m AHD)	Formation	Average pressure head Q4 (m AHD)	Trigger (m AHD)	Comments*
P42	90	245.9	Pilliga	245.8	244.7	Stable
	185	150.9	Purlawaugh	275.3	-	Stable
	345	-9.1	Digby	163.9	-	Erratic data, invalid
	375	-39.1	Benelabri	167.1	-	Stable
	395	-59.1	Hoskissons	164.0	-	Slight decline
	415	-79.1	Arkarula	162.5	-	Stable
P44	95.5	172.7	Napperby	-	-	No data transmitted in 2025
	134	134.2	Digby	208.0	-	Small fluctuations
	245	23.2	Pamboola	240.3	-	Stable
	330	-61.9	Watermark	280.9	-	Watermark Formation is drifting, results unrealistic
	375	-106.9	Porcupine	203.7	-	Stable
	445	-176.9	Maules Creek	284.4	-	Stable with large data gap in 2025
P45	42.5	204.8	Digby	206.3	-	Stable
	80	167.3	Arkarula	224.7	-	Stable
	150	97.3	Watermark / Porcupine	227.5	-	Slight decline
	200	47.3	Maules Creek	219.7	-	Fluctuating with a slight increase
	240	7.3	Maules Creek	-	-	Historical results erratic. No data transmitted since Q1 2025
	276	-29.7	Maules Creek	-	-	Declining. No data transmitted since Q1 2025
P46	70	193	Napperby	238.4	-	Stable
	87	176	Digby	250.2	-	Slight increase
	151	112	Pamboola	220.7	-	Slight decline
	250	13	Watermark	222.9	-	Noise in data, unreliable
	308	-45	Porcupine	255.8	-	Slight decline
	343	-80	Maules Creek	276.8	-	Fluctuating possible sensor error

VWP ID	Sensor depth (m bgl)	Sensor depth (m AHD)	Formation	Average pressure head Q4 (m AHD)	Trigger (m AHD)	Comments*
P54*	28	335.1	Pilliga	335.6	332.4	Stable, data missing 2025
	58	305.1	Napperby	307.6	-	Stable, data missing 2025
	98	265.1	Napperby	292.7	-	Slight decline
	138	225.1	Napperby	269.6	-	Stable
	178	185.1	Pamboola	260.4	-	Stable
	218	145.1	Pamboola	252.6	-	Stable
	258	105.1	Pamboola	250.3	-	Stable/Fluctuating
	298	65.1	Porcupine	258.9	-	Small fluctuations
	336	27.1	Porcupine	-	-	Declining. No data transmitted since Q1 2025
P55	25	249.6	Purlawaugh	249.3	-	Sensor is unsaturated
	44	230.6	Purlawaugh	230.2	-	Sensor is unsaturated
	75	199.6	Napperby	228.2	-	Stable
	98	176.6	Digby	247.2	-	Stable with local fluctuations
	110	164.6	Hoskisson Coal	246.4	-	Gradual pressure decline
	135	139.6	Pamboola	246.8	-	Stable
	159	115.6	Pamboola	251.5	-	Gradual pressure decline
	195	79.6	Porcupine	208.9	-	Data unreliable, sensor drift
	228	46.6	Porcupine	243.5	-	Stable. Large data gap from Q2 2025
P56	55	260.4	Napperby	261.1	-	Sensor is unsaturated
	85	230.4	Napperby	254.4	-	Stable with local fluctuations
	115	200.4	Napperby	246.5	-	Fluctuating, possible sensor error
	145	170.4	Napperby	234.0	-	Gradual pressure decline
	175	140.4	Pamboola	-	-	Sensor failed 2021
	205	110.4	Pamboola	-	-	Sensor failed 2021
	235	80.4	Pamboola	-	-	Sensor failed 2021
	265	50.4	Porcupine	-	-	Sensor failed 2021
	300	15.4	Porcupine	263.2	-	Stable with local fluctuations
P61	92	207.6	Purlawaugh	234.3	-	Stable
	138	161.6	Garrawilla	232.2	-	Increasing
	205	94.6	Napperby	202.9	-	Stable
	260	39.6	Basalt Sill	-	-	Sensor failed in 2024
	300	-0.4	Digby	175.1	-	Stable

VWP ID	Sensor depth (m bgl)	Sensor depth (m AHD)	Formation	Average pressure head Q4 (m AHD)	Trigger (m AHD)	Comments*
P64	104	159.6	Basalt Sill	303.3	-	Stable
	120	143.6	Napperby	311.8	-	Increasing
	150	113.6	Digby	276.0	-	Stable
	159	104.6	Hoskissons Coal	192.9	-	Increasing
P67	115	262.3	Purlawaugh	283.4	-	Fluctuating
	170	207.3	Purlawaugh	281.9	-	Steady decline
	240	137.3	Napperby	271.0	-	Stable with local fluctuations
	300	77.3	Napperby	259.7	-	Stable
	371	6.3	Digby	256.3	-	Declining. Data recording errors, some data removed as anomalous
P70	85	188.0	Napperby	249.9	-	Declining
	118	155.0	Digby	244.3	-	Declining
	124	149	Hoskissons Coal	247.8	-	Stable
P73	90	227.0	Garrawilla	272.4	-	Declining
	175	142.0	Napperby	276.6	-	Stable, slight decline
	310	7.0	Digby	263.2	-	Stable, slight decline
	320	-3.0	Arkarula	263.9	-	Stable, slight decline
P76	11	252.6	Napperby	251.0	-	Unsaturated
	40	223.6	Napperby	222.9	-	Stable
	81	182.6	Digby	226.3	-	Stable
	105	158.6	Arkarula	224.1	-	Stable
P77	40	262.5	Pilliga	260.3	-	Unsaturated
	90	212.5	Purlawaugh	228.9	-	Stable
	145	157.5	Garrawilla	216.6	-	Stable
	205	97.5	Napperby	194.6	-	Stable
	245	57.5	Basalt Sill	165.1	-	Stable
	265	37.5	Napperby	155.3	-	Stable. Possible connection with Digby
	295	7.5	Digby	154.2	-	Stable. Possible connection with Napperby

Notes: All water levels reported in meters Australian Height Datum (m AHD)
*Data logger at P54 failed in early 2025, this was replaced in July 2025.

7 Groundwater quality

Groundwater quality samples are collected from the Narrabri Mine open standpipe monitoring bores monthly or quarterly in accordance with the WMP 2013, the GWMP 2024 and the draft Stage 3 GWMP. EC is used as a representative measure of salinity of groundwater which varies significantly between different formations, with some formations namely the Napperby formation, having a wide range of salinities (see Section 4.2.2). pH is monitored to better understand groundwater acidity or alkalinity.

A summary of EC triggers and measurements recorded for the year are included in Table 7.1, with further discussion of trends observed during the reporting period in Sections 7.1 to 7.7. An overall summary of salinity and chemical composition is included in Section 7.8.

Groundwater quality exceedances listed by their TARP trigger level are highlight in Table 7.1 these were investigated and are included in Appendix F.

Table 7.1 EC summary

Bore ID	Formation	Monitoring guidelines met?	Trigger		Recent EC measurements				Rolling median	TARP	Trend
			Tier 1	Tier 2	Q1 2025	Q2 2025	Q3 2025	Q4 2025			
P1	Garrawilla	Yes	5,970	-	4,370	4,510	4,320	4,140	4,565	-	I
P2	Napperby	Yes	19,342	19,731	19,990	20,190	20,150	19,460	19,595	Level 1	F
P3	Pamboola	Yes	18,016	18,564	18,300	17,860	17,190	17,510	18,135	Level 1	F
P4	Napperby	Yes	24,912	25,610	26,200	26,100	26,580	25,300	26,900	Level 2	F
P7	Pilliga	Yes	2,327	-	114	114.5	121	119.4	123.4	-	-
P8	Purlawaugh	Yes	5,970	-	989	1,032	973	830	965	-	-
P9	Purlawaugh	Yes	20,330	21,190	20,320	22,020	21,400	21,900	20,850	Level 1	-
P10	Napperby	Yes	8,894	9,426	14,960	15,120	13,820	14,680	15,930	Level 2	S
P11	Purlawaugh	Yes	6,052	6,546	6,590	6,890	7,470	9,316	7,000	Level 2	F
P12	Napperby	Yes	5,970	-	2,920	3,170	2,960	3,000	3,060	-	S
P13	Garrawilla	Yes	5,970	-	1,840	1,811	1,371	1,755	2,197	-	F
P16	Garrawilla	Yes	5,970	-	4,180	4,180	4,020	5,030	3,815	-	F
P39A	Watermark	Yes	5,970	-	7,700	7,680	7,580	7,020	7,620	Level 2	F
P39B	Alluvium	Yes	6,546	-	13,980	14,360	11,040	12,090	13,165	Level 2	F
P43	Watermark	Yes	11,162	11,412	11,630	11,790	11,120	11,740	11,820	Level 2	F
P47	Garrawilla	Yes	5,970	-	6,320	6,430	6,170	6,120	6,095	Level 2	F
WB2	Garrawilla	Yes	5,970	-	1,893	2,117	1,979	2,078	2,279	-	F
WB12	Arkarula	Yes		-	-	-	-	17,400*	-	-	-
WB18	Napperby	Yes	-	-	-	-	-	6,510*	-	-	-

Notes: All electrical conductivities were reported in µS/cm.
Trends: (S) stable, (D) declining, (F) fluctuating, (I) increasing.
* Lab EC.

7.1 Alluvium

Groundwater quality in the alluvium is represented by bore P39B, several other monitoring bores are installed; however, these are monitored by WaterNSW. EC steadily increased from 2016 to mid-2021 when EC began to increase at a higher rate (Figure 7.1). pH has remained within the acceptable range of 6 to 8.5; however, some trends are visible in the data (Figure 7.2), pH became more basic (increasing pH) during the Tinderbox Drought followed by a trend towards neutral(lower pH) during periods of above average rainfall post drought.

P39B has exceeded its EC trigger since the end of the Tinderbox Drought at the end of 2019, the changes in EC are attributed to changing climatic conditions and are discussed in Appendix F groundwater quality exceedances.

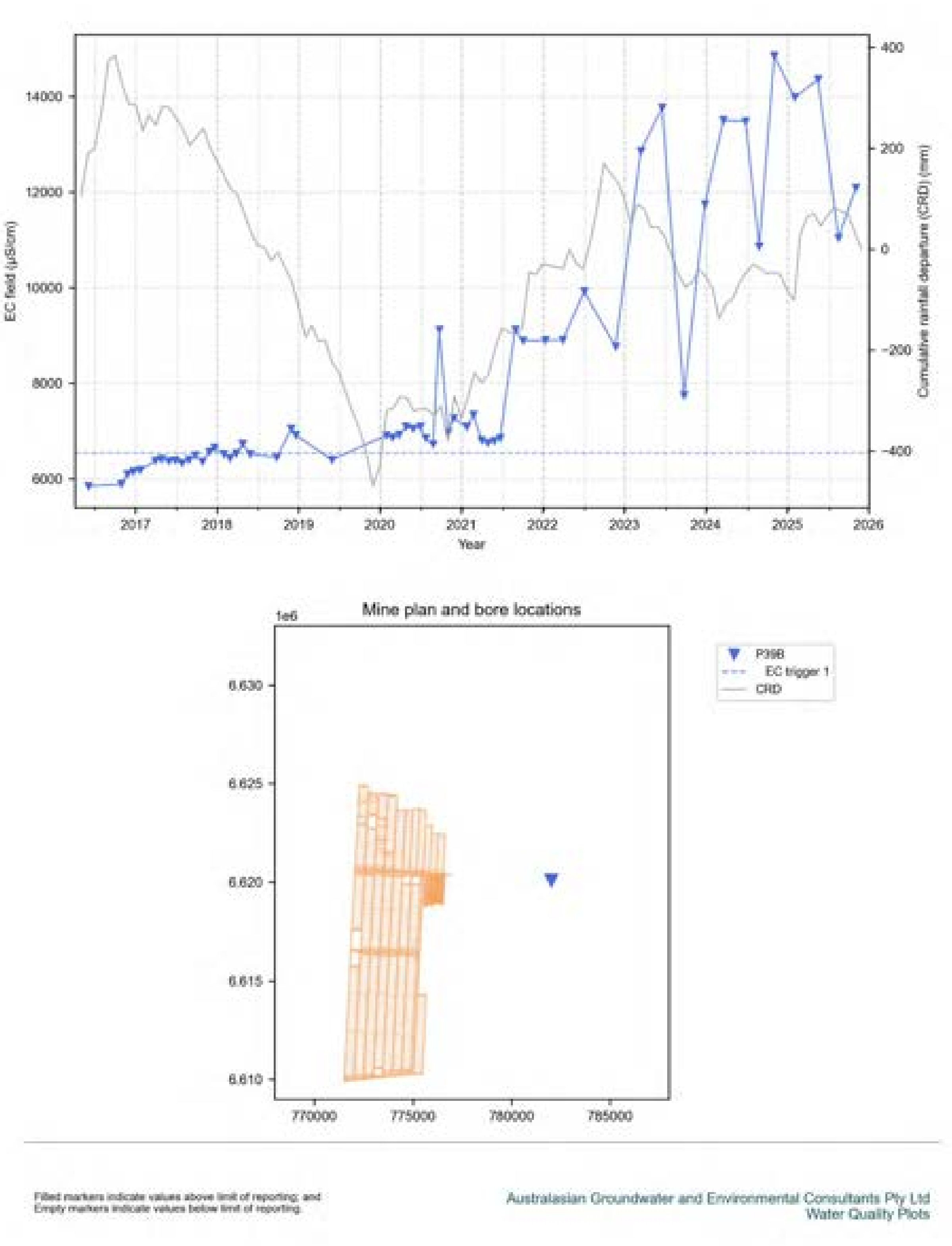


Figure 7.1 EC plot Namoi Alluvium

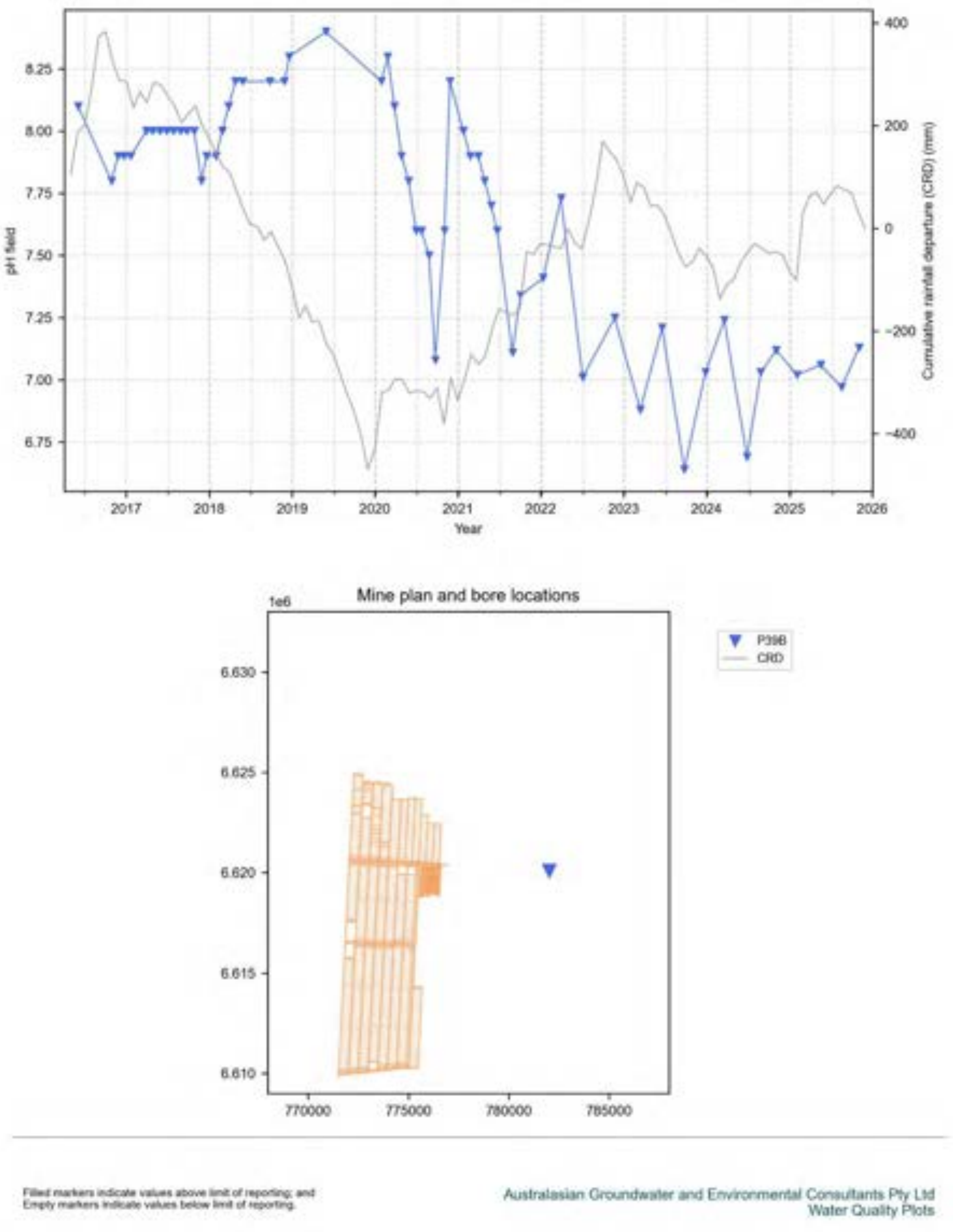


Figure 7.2 pH plot Namoi Alluvium

7.2 Pilliga Sandstone

The Pilliga Sandstone is monitored by five bores, four of which are currently dry or do not provide sufficient water for a water sample. Currently active bores with sufficient water to provide samples include:

- P7 – located 5 km west of the underground workings at the mine.

A stable EC measurement has been recorded at P7 since 2021 (Figure 7.3). From late 2020 until mid-2024 pH decreased from 6.5 to 5.5 (Figure 7.4) thereby exceeding the pH trigger level of 6. This decrease in pH coincides with the high rainfall events that followed the Tinderbox Drought and are discussed further Appendix F.

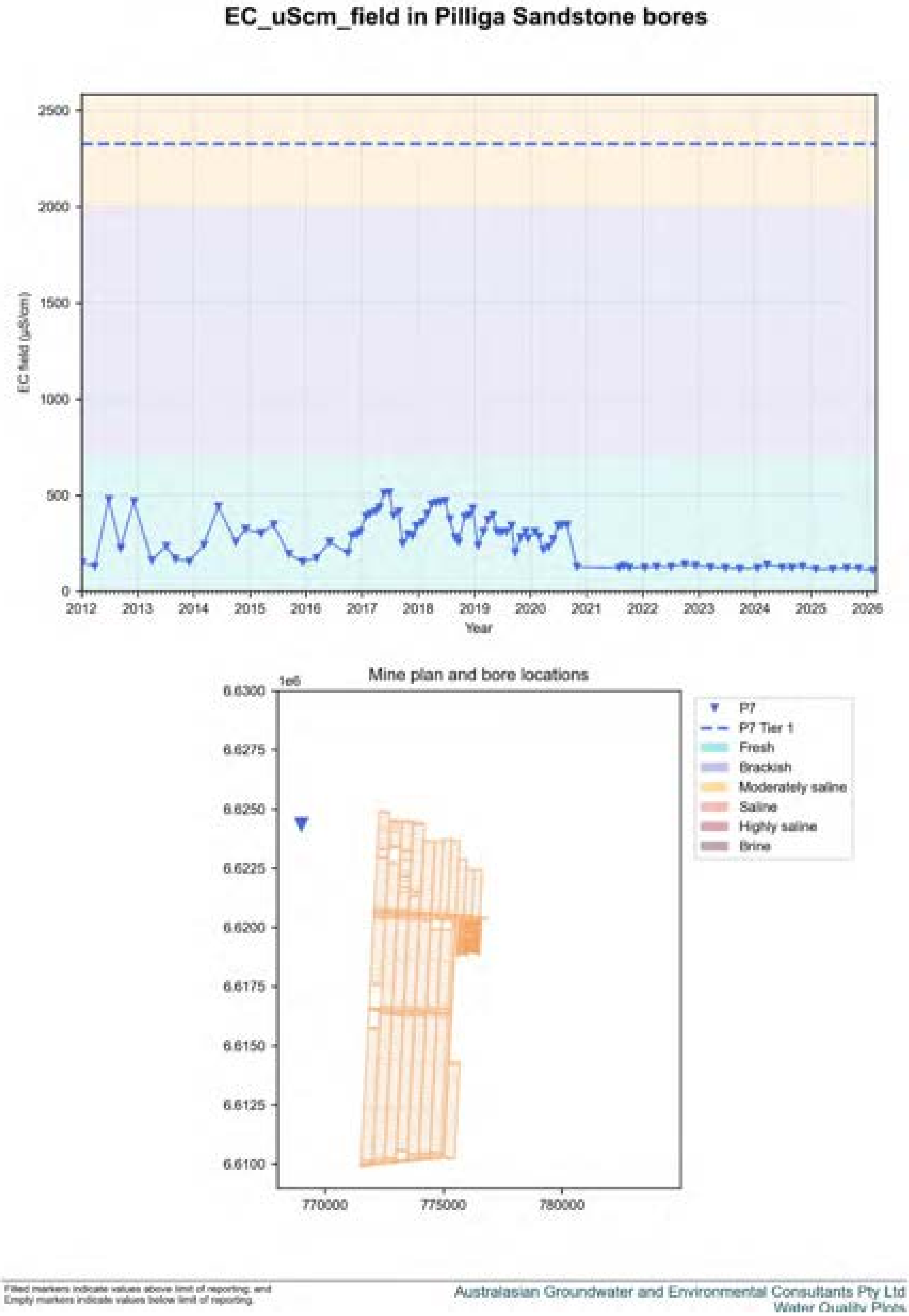


Figure 7.3 EC plot Pilliga Sandstone

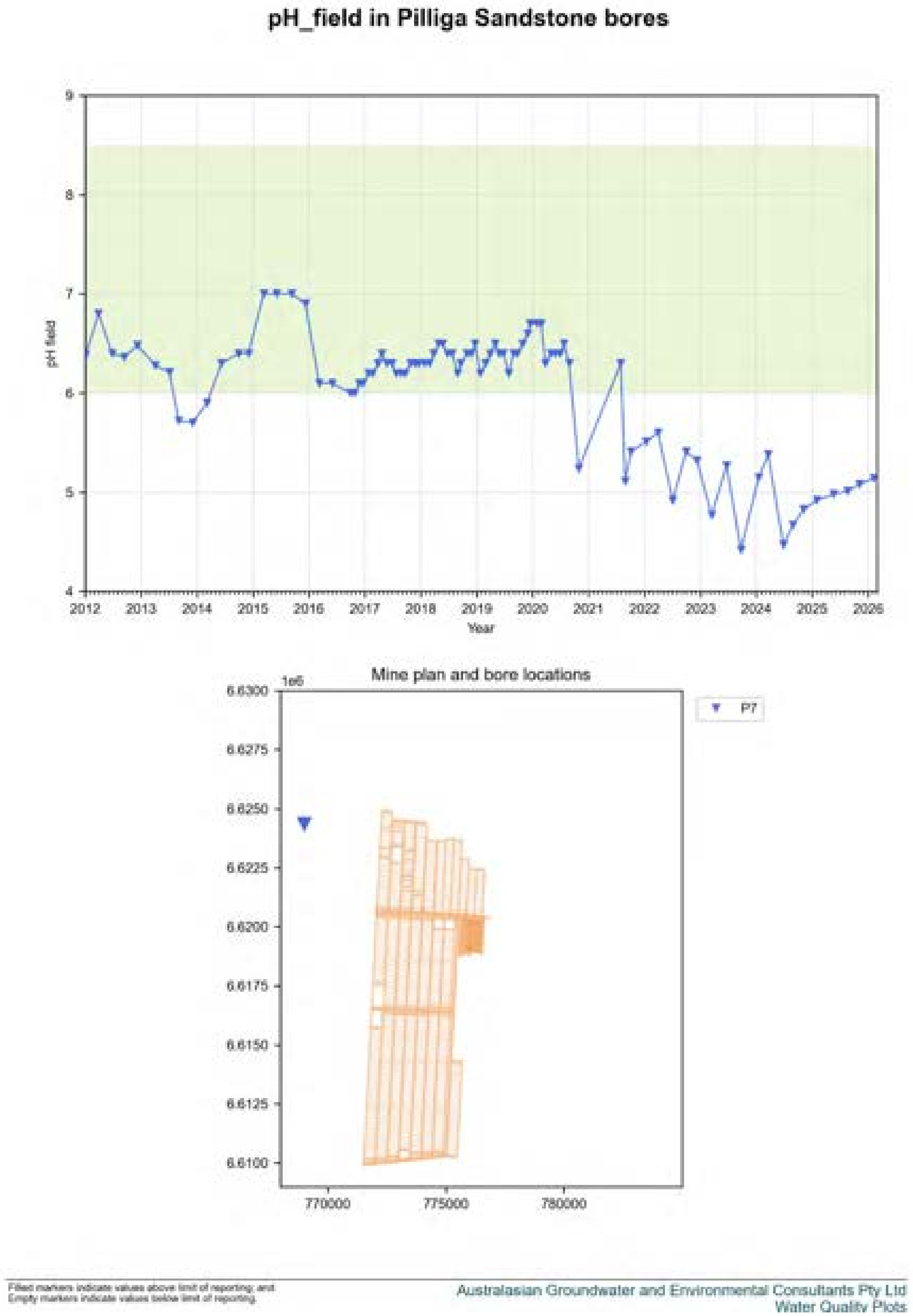


Figure 7.4 pH plot Pilliga Sandstone

7.3 Purlawaugh Formation

Four active monitoring bores are installed in the Purlawaugh formation these include:

- P8 – located in the middle of LW208;
- P9 – located near the central mains on LW203;
- P11 – located at the southern edge of LW205;
- P72 – located ~12km south of the LW204; and
- P90 – located above planned LW208.

Since installation in 2009, EC for bores P11 and P9 has generally increased (Figure 7.5), the highest rates of increase occurred during the two major climate events for the region, the Tinderbox Drought and the preceding period of above average rainfall. From 2022 onwards, EC values have stabilised with some small fluctuations recorded. EC at P9 fluctuates between 20,000 µS/cm and 25,000 µS/cm from 2020 until now, while at bore P11, EC has fluctuated between 5,500 µS/cm and 9,000 µS/cm.

Bore P8, installed above LW208 has a stable EC trend, while bore P72 was installed in 2023 and fluctuates between 5,000 µS/cm and 8,000 µS/cm.

During the same period pH values fluctuate with greater ranges in consecutive measurements than previously recorded (Figure 7.6). pH generally ranges between 6 and 7.75 within ANZECC guideline ranges with the exception of P72 which has pH recorded above 7.75 on one occasion recorded after installation.

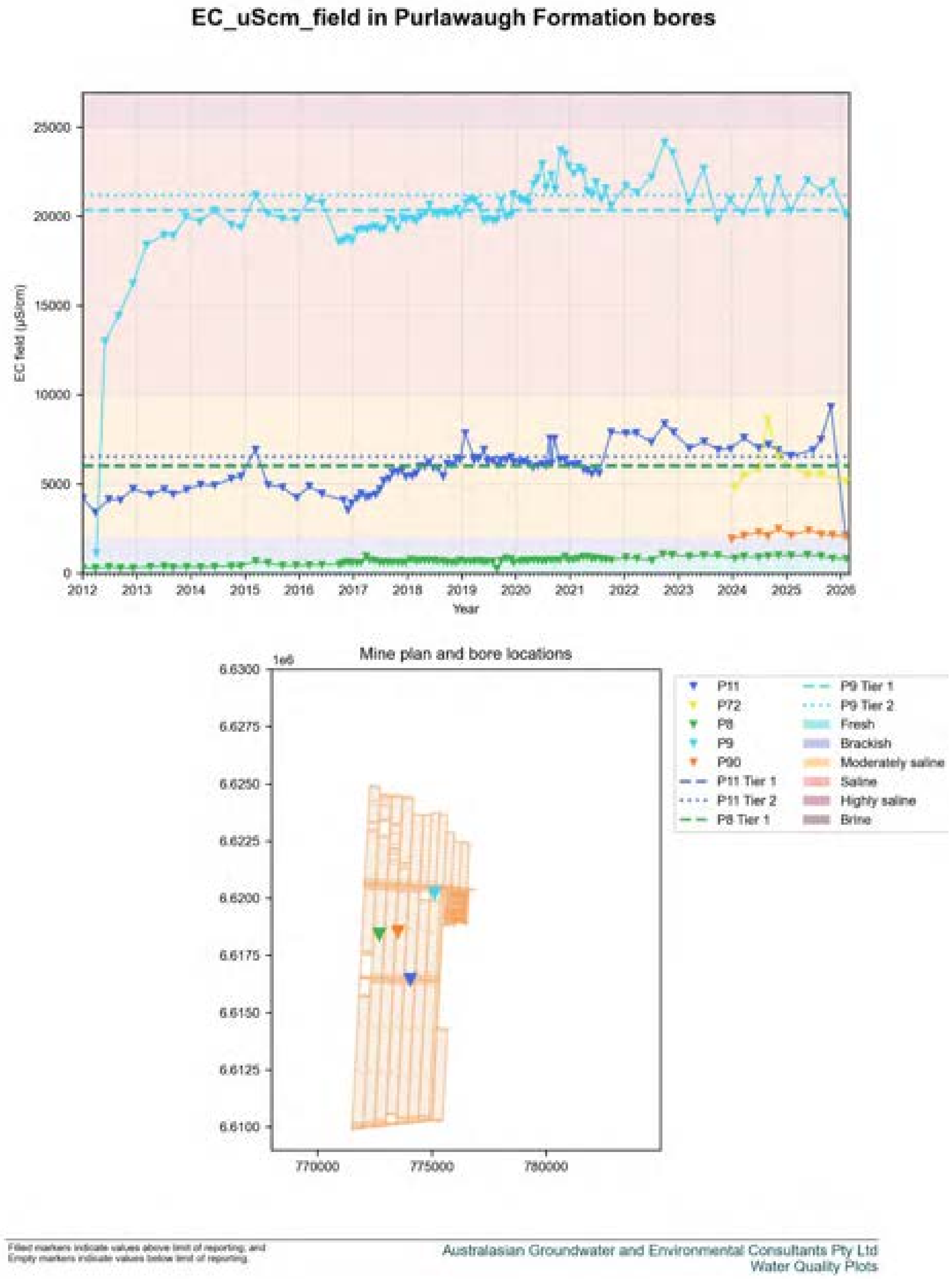


Figure 7.5 EC plot Purlawaugh Formation

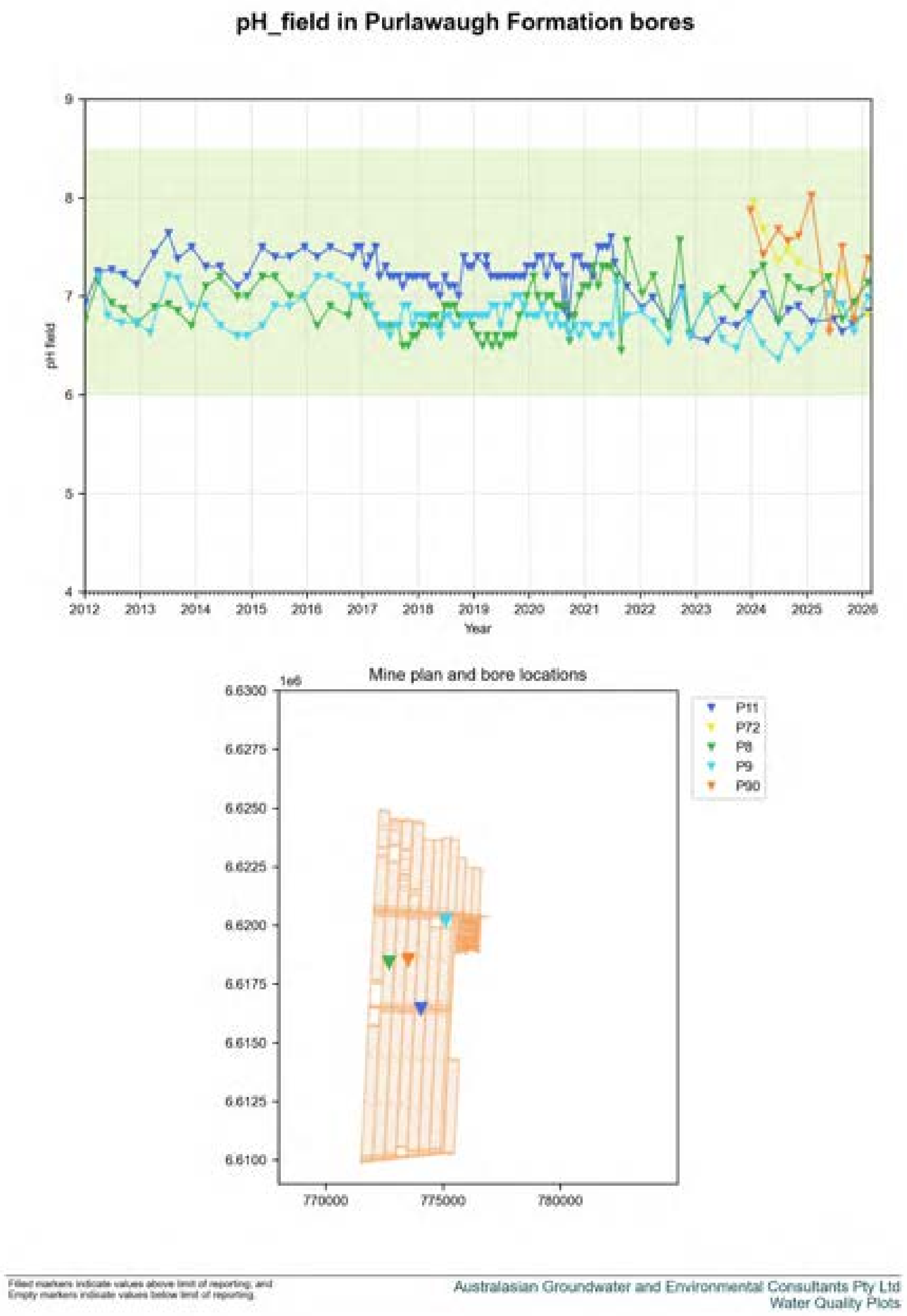


Figure 7.6 pH plot Purlawaugh Formation

7.4 Garrawilla Volcanics

There are six active monitoring bores in the Garrawilla Volcanics these include:

- P1 – located 3.6 km south of the Cut and Fit (CF) panel 201;
- P13 – located south of LW101;
- P16 – located at the western edge of LW111;
- P47 – located north of LW101;
- P51 – located north of the reject emplacement area (REA); and
- P53 – located north of the REA.

Bore P51 and P53 are both installed in the vicinity of the REA and are discussed in Section 8. Garrawilla bores (P1, P13, P16, and P47) have salinity ranging from fresh brackish (700 to 2,000 µS/cm) to moderately saline (2,000 to 10,000 µS.cm)[4] (Rhoades, Kandiah, & Mashali, 1992) (Figure 7.7).

Bore P47, located north of LW102, has experienced an increasing EC trend since records began in 2013. From mid-2021 recorded EC values have fluctuated significantly with values between consecutive measurements ranging anywhere up to approximately 7,000 µS/cm. P47 regularly exceeds its EC trigger of 5,970 µS.cm. This is further discussed in Appendix F.

pH recorded in Garrawilla bore generally fluctuates between 6.5 and 8 (Figure 7.8).

[4] Salinity classes based on FAO classification https://www.fao.org/4/t0667e/t0667e05.htm#quality%20characteristics%20of%20saline%20waters.

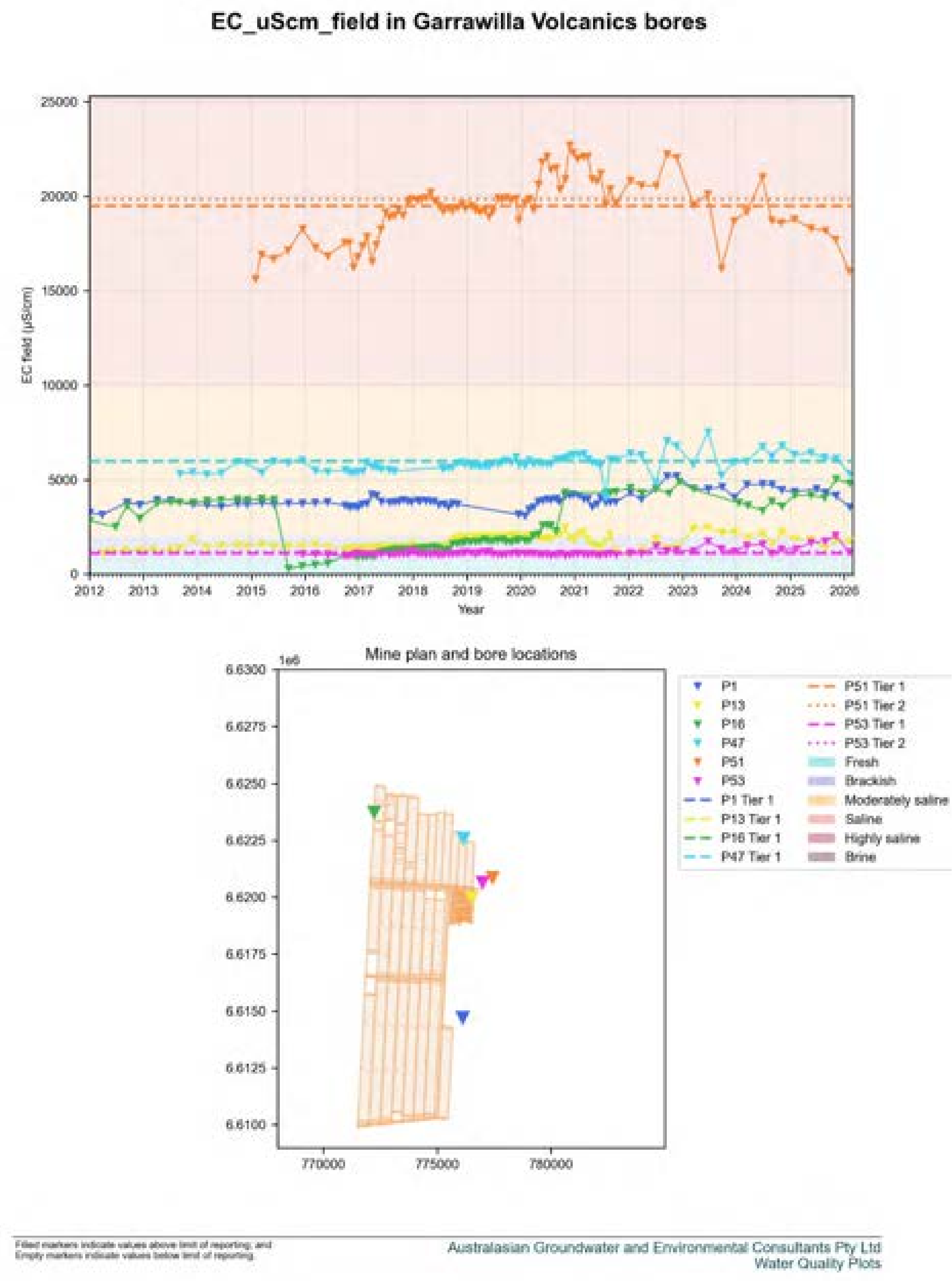


Figure 7.7 EC plot Garrawilla Volcanics

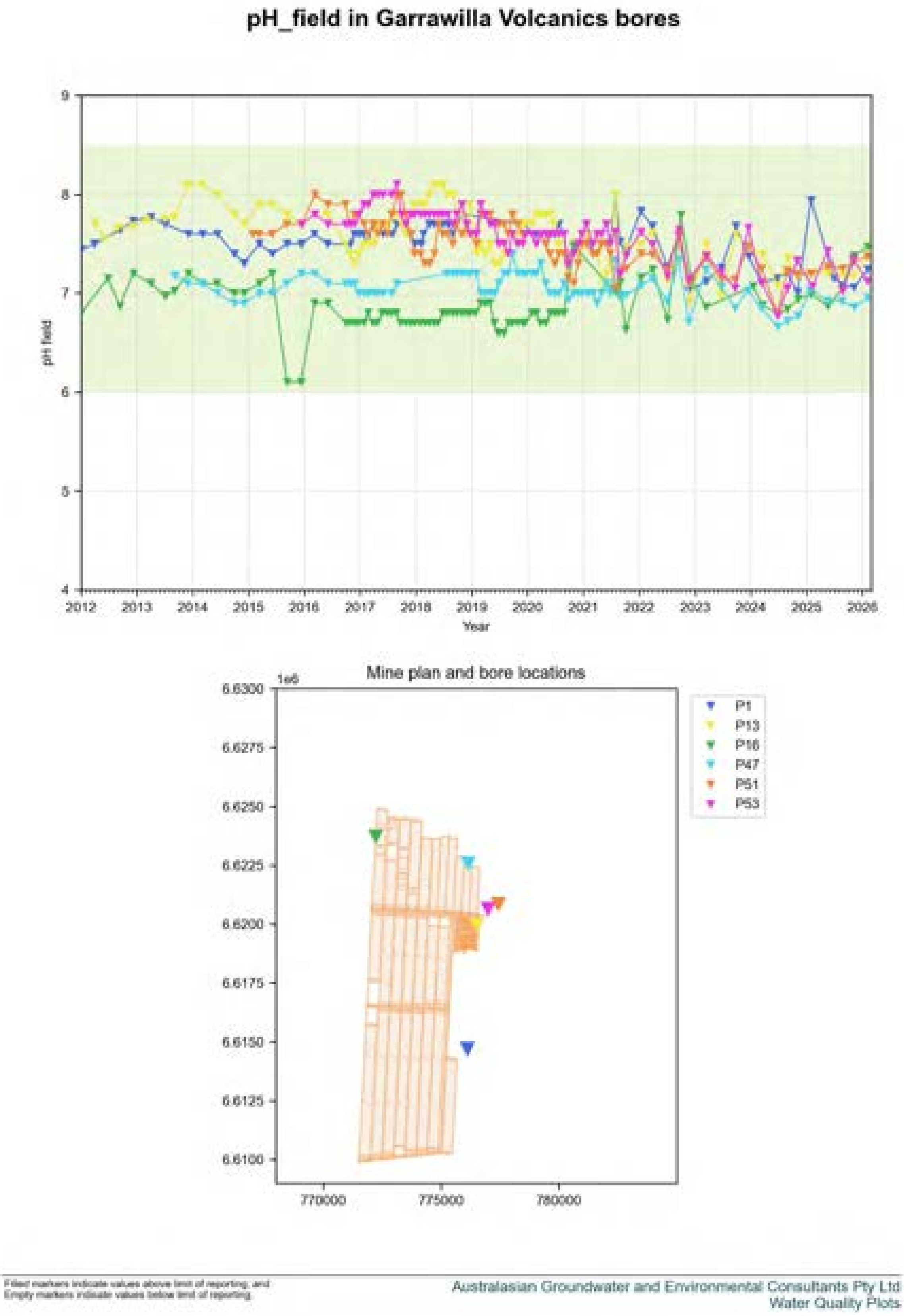


Figure 7.8 pH plot Garrawilla Volcanics

7.5 Napperby Formation

There are nine active monitoring bores in the Napperby Formation these include:

- P2 – located southeast of the mine ~2 km east of LW203;
- P4 – located northeast of the mine ~3 km northeast of LW101;
- P10 – located at the southern edge of LW205;
- P12 – located south of the central main heading near CF201, ~650 m south of LW101;
- P52 – located near the REA;
- P63 – located 1 km north of LW103;
- P69 – located 3.5 km south of LW101; and
- P75 – located 16 km southeast of the active mining area.

The Napperby Formation bores have variable natural salinities ranging from brackish to highly saline which is reflected in the large range of recorded EC values (1,500 to 29,000 µS/cm) (Figure 7.9).

Bores P12 and P52, located immediately east of mining have stable EC records with values consistently remaining below ANZEC guidelines of 4,950 µS/cm.

Bores P2 and P4, located northeast and southeast of mining, respectively, have historically recorded highly saline water quality with EC measurements generally around 20,000 to 25,000 µS/cm. In 2020 both bores incurred a notable increase in ECwhich has fluctuated since. Like P2 and P4, EC measurements of P10 also increased notably in 2020, and have remained relatively stable thereafter.

Bore P63, P69 and P75 were installed in late 2023 and although some minor fluctuations are recorded the EC levels remain relatively stable. Excluding one point which appears anomalous, EC recorded at P63 fluctuates between 9,860 to 12,060 µS/cm. Bores P69 and P75 range from 15,960 to 20,560 µS/cm and 9,530 to 14,180 µS/cm respectively.

The pH of most bores demonstrates greater fluctuations post 2020 with a slightly decreasing trend. No bores exceeded pH trigger values (Figure 7.10).

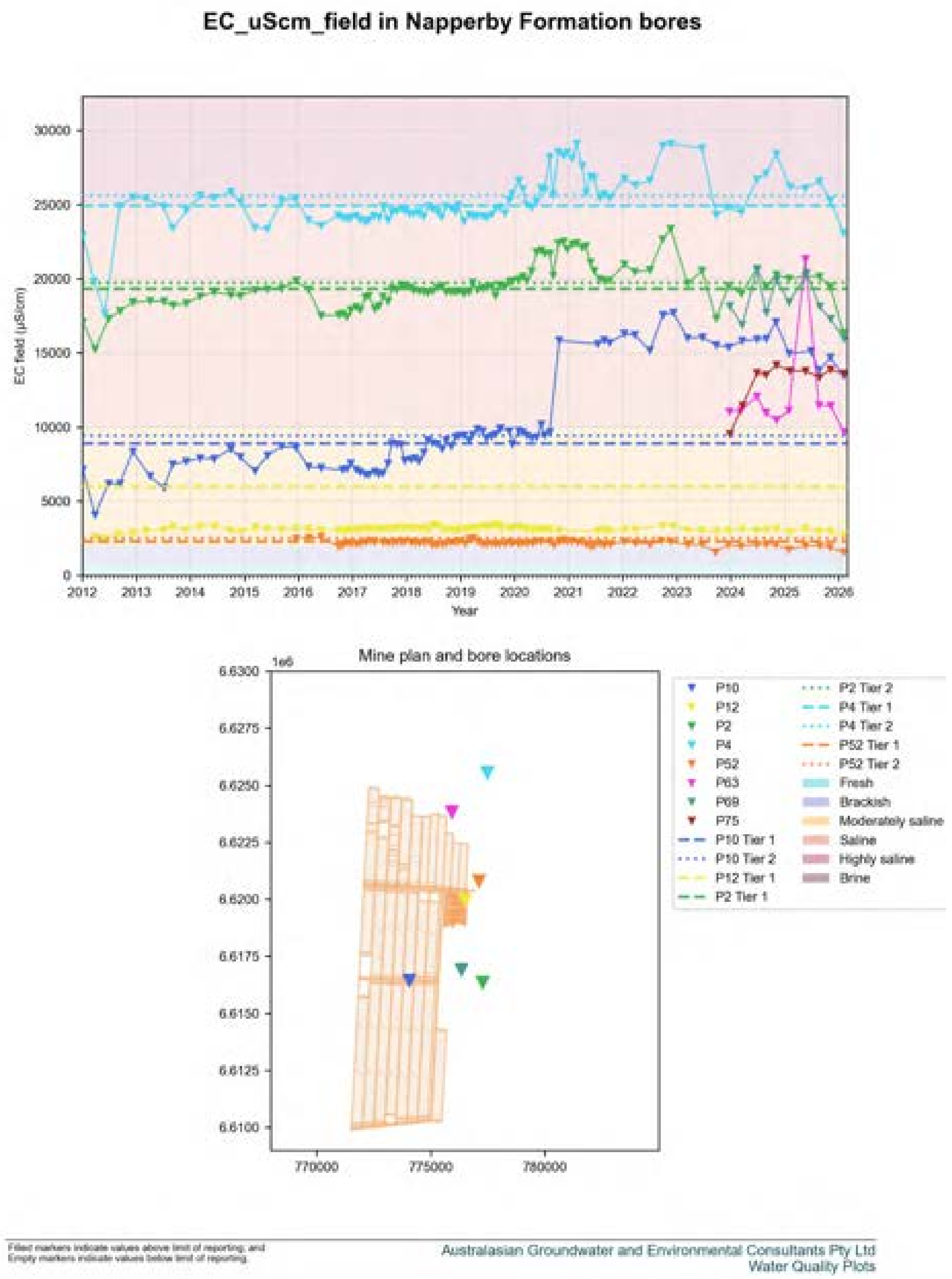


Figure 7.9 EC plot Napperby Formation

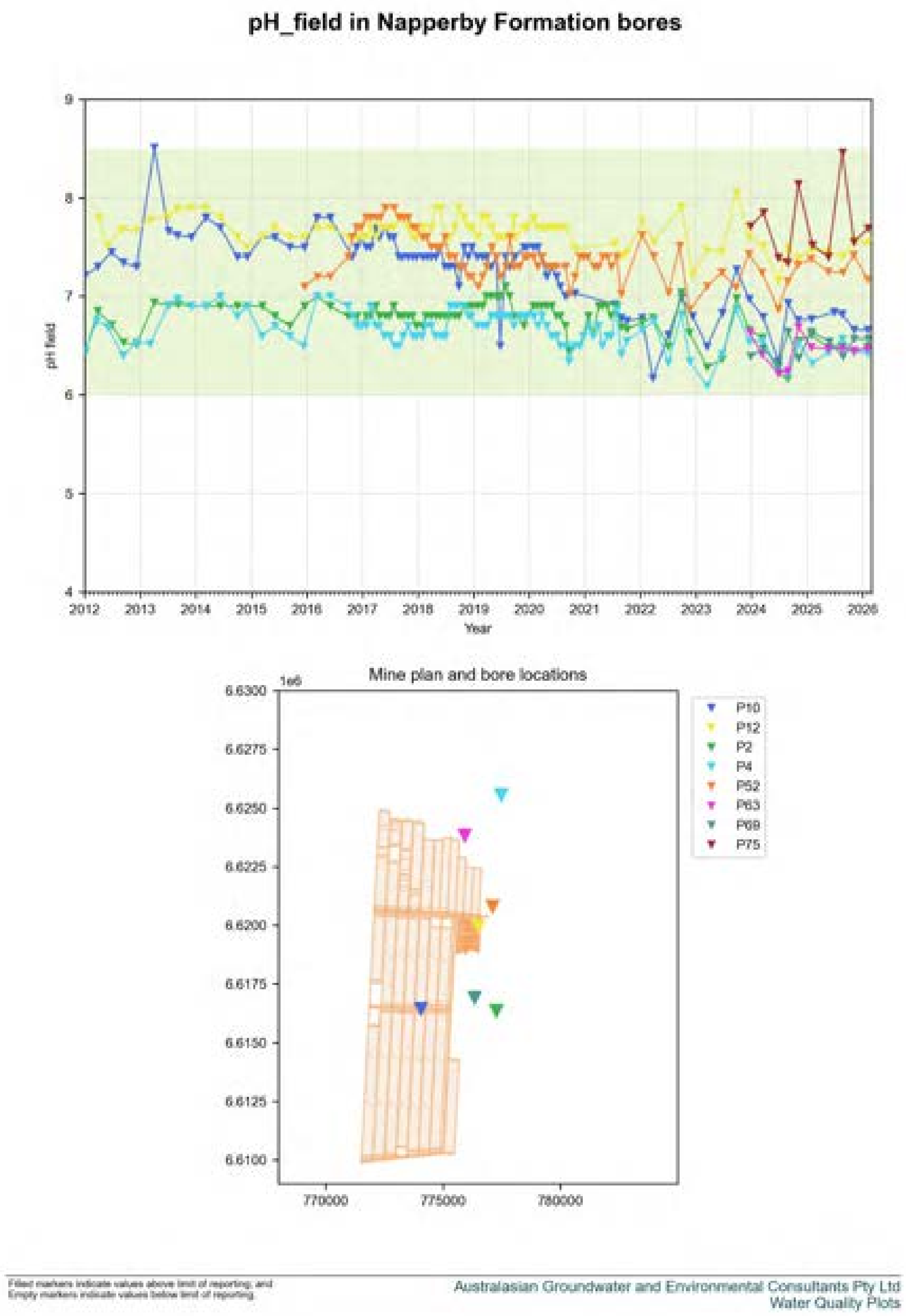


Figure 7.10 pH plot Napperby Formation

7.6 Watermark Formation

There are two standpipe monitoring bores screened in the Watermark Formation, both bores were installed in 2016:

- P39A – located 5.5 km east of LW201; and
- P43 – located approximately 5 km east of the mine.

From 2016 to mid-2020 both bores experience a steadily increasing trend in salinity (Figure 7.11), from mid-2020 salinity increased more significantly at the same time both bores saw a drop in pH. P39A decreased in pH from approximately 8 to 7, at the same time P43 dropped from approximately 7.5 to 7. Both bores have recorded similar pH since mid-2020 (Figure 7.12).

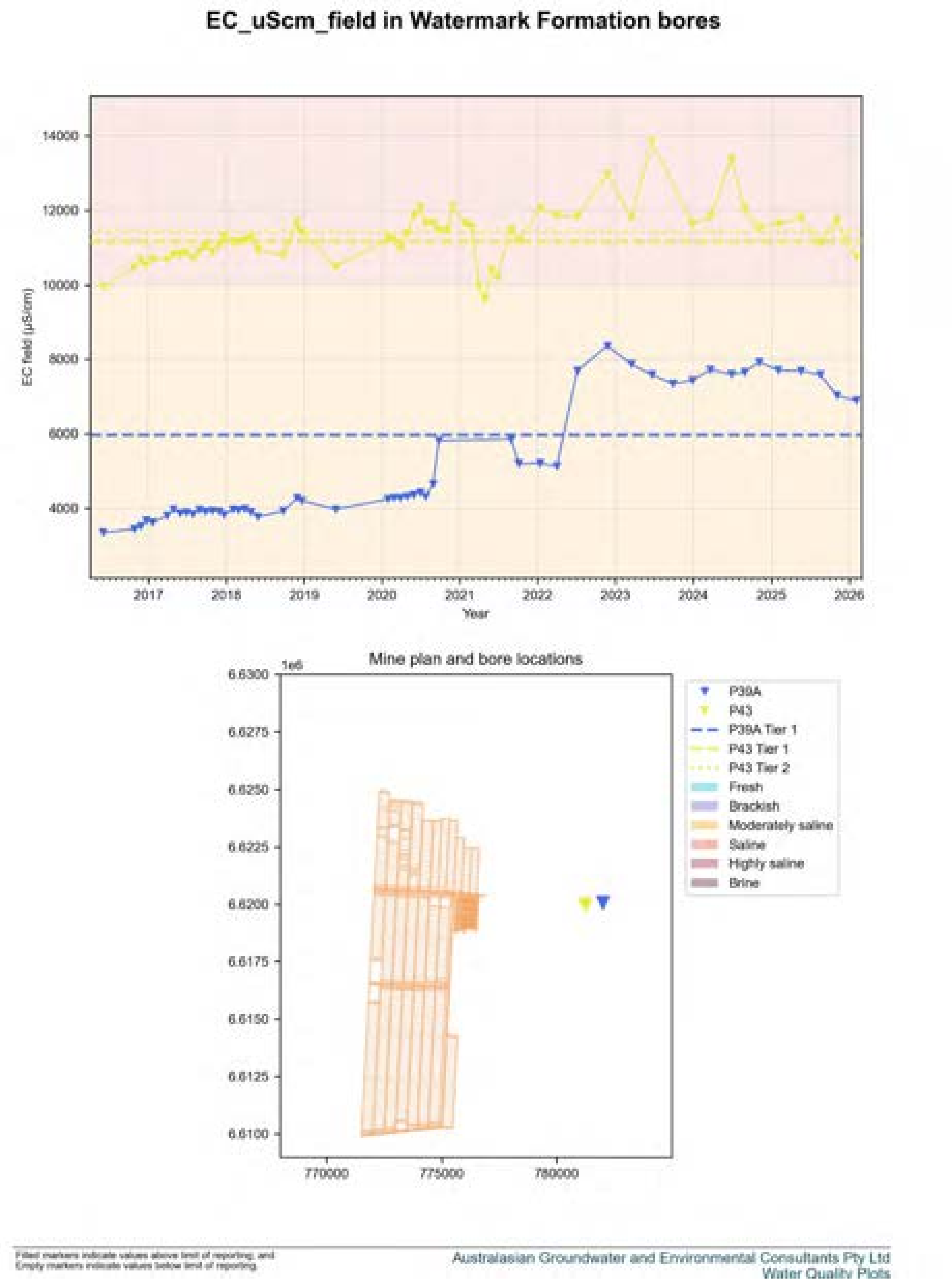


Figure 7.11 EC plot Watermark Formation

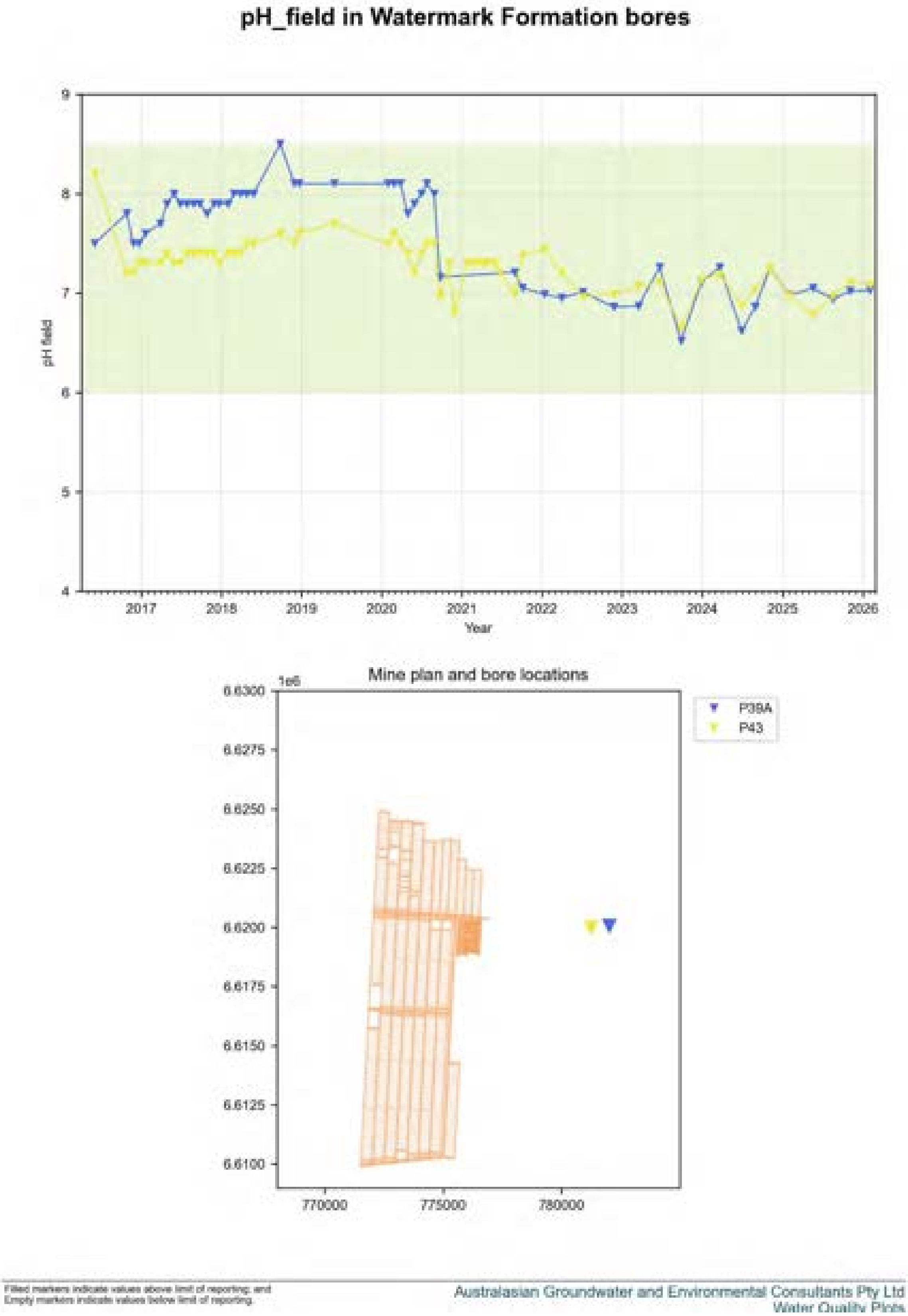


Figure 7.12 pH plot Watermark Formation

7.7 Pamboola Formation

There are three standpipe monitoring bores screened in the Pamboola Formation:

- P3 – located east of the project located to the east of the highway;
- P5 – located 6 km north of the Narrabri mine; and
- P19 – located near early mining activities located just east of LW101.

Due to an error in the wrong bore being monitored, all groundwater level data prior to August 2020 is unusable as it is not representative of the Pamboola Formation at P19. Recorded measurements from 2020 until now are moderately stable.

Bores P3 and P5 have recorded stable EC and pH from 2012 to 2021 (Figure 7.13). From 2021 pH measurements become increasingly erratic and with an overall decreasing trend (Figure 7.14), during the same period EC began to increase and fluctuate. A similar trend has been noted in other formations; the trend generally coincides with the end of the Tinderbox Drought.

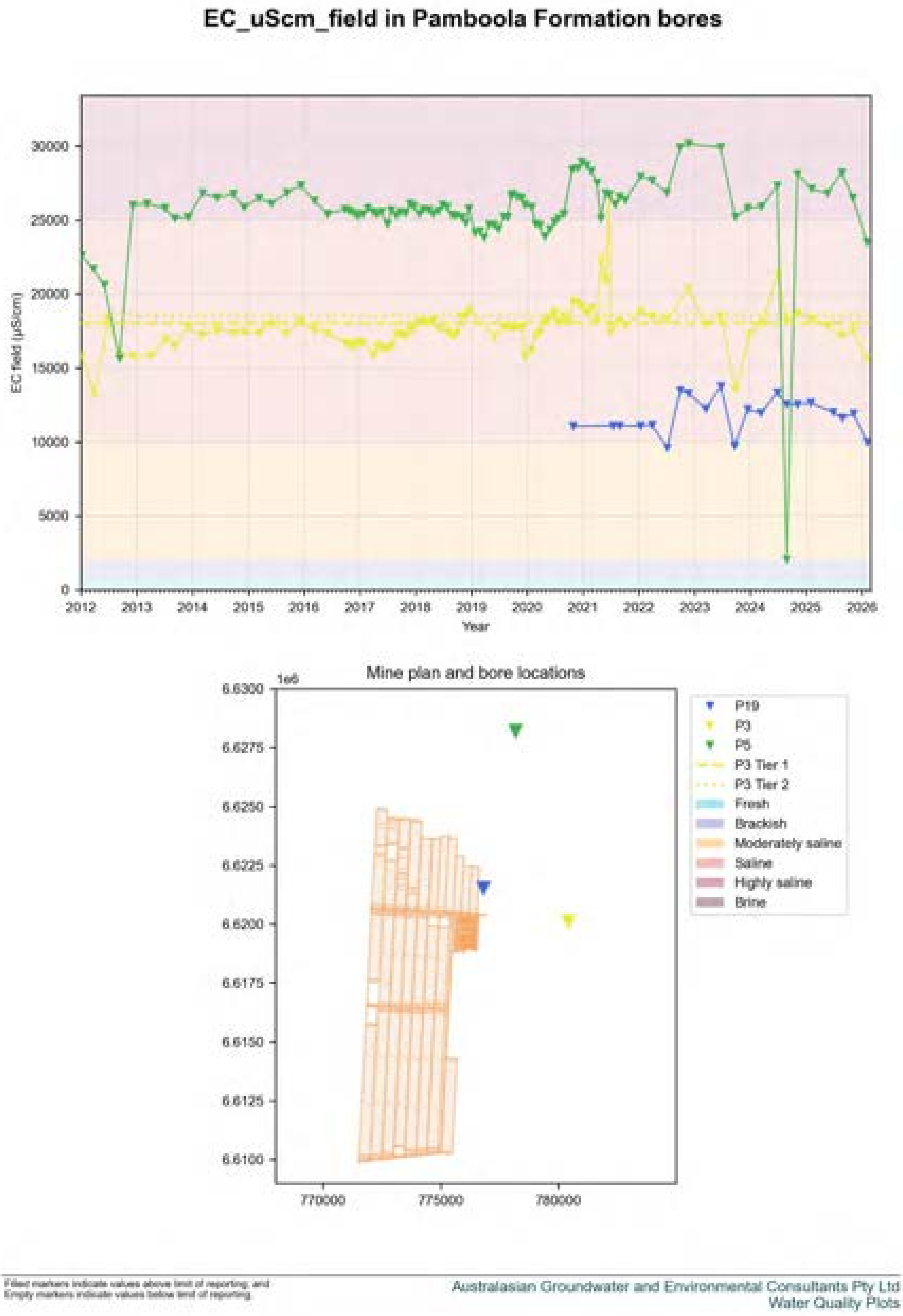


Figure 7.13 EC plot Pamboola Formation

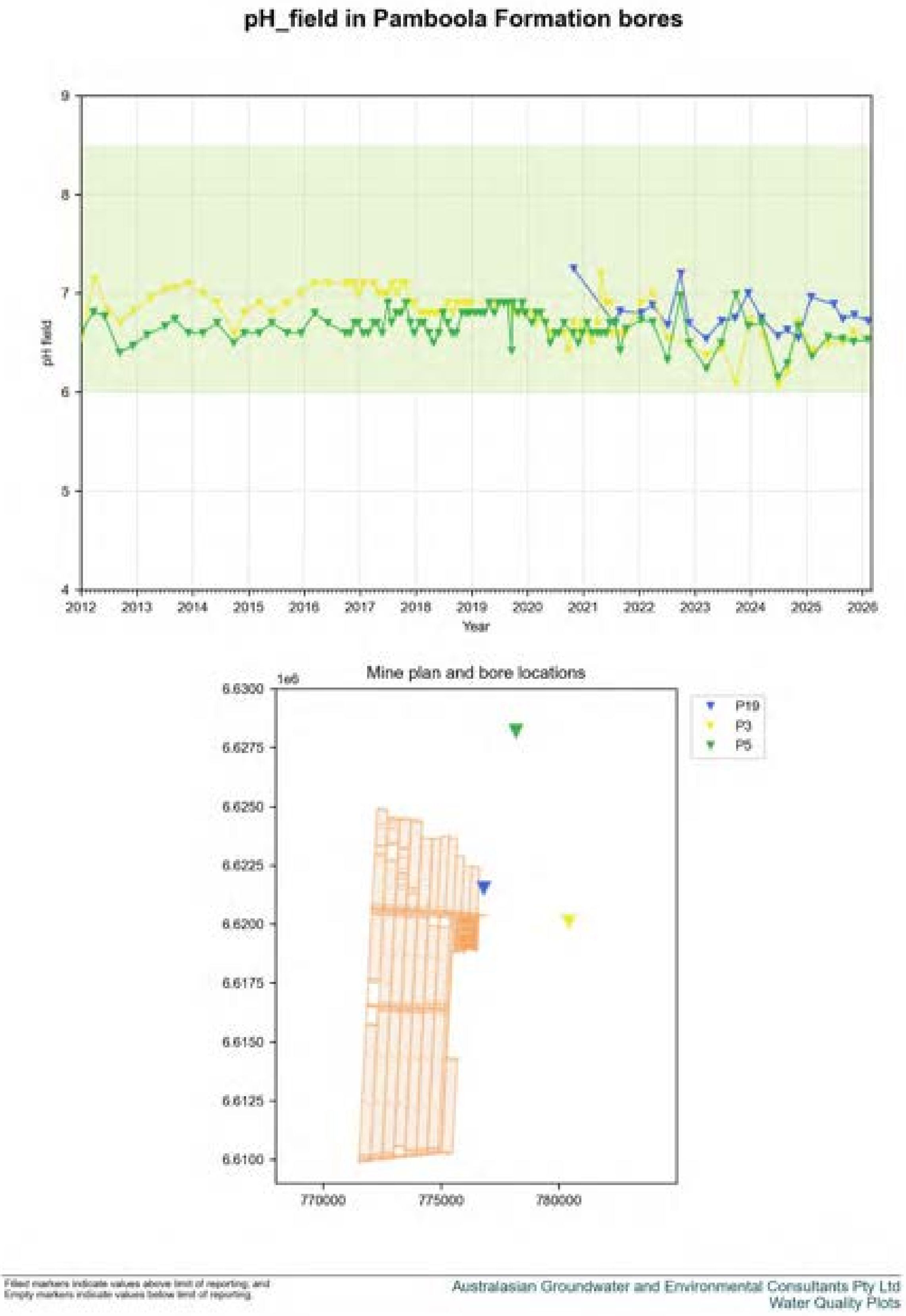


Figure 7.14 pH plot Pamboola Formation

7.8 Overall salinity and chemical composition

Figure 7.15 presents EC measurements in monitoring bores from hydrostratigraphic units as a box and whisker plot which shows the spread of the data and a range of statistics (including min, max, median, interquartile range [25th percentile to 75th percentile] and any outliers). The plot is used here to illustrate the distribution of salinity data within each of the hydrostratigraphic units. No EC data are currently available for Digby Formation. The salinity categories described previously are shown with equivalent EC measurements.

As indicated in AGE (2020), all sub-surface strata will show some degree of variability since salinity can be affected by a range of factors including sampling depth, aquifer residence time and evapo-concentration processes occurring in near surface areas. However, in general, higher permeability aquifer units (especially where they occur at shallow depths) are typically characterised by relatively low salinity, whilst relatively high salinity and variability would be expected in low permeability aquitard units. As expected, both the main aquifers in the area, that is the Namoi Alluvium and the Pilliga Sandstone aquifers, are characterised by relatively low salinities and variability (Figure 7.15). The median EC for both of these aquifers is less than 700 µS/cm suggesting fresh water predominates. Data for the Garrawilla Volcanics with a median EC of 2,630 µS/cm, presents as brackish to moderately saline.

Median EC values for the Purlawaugh and Napperby Formations present moderately saline conditions on average, but show a high degree of variability and relatively fresh waters in some cases, suggesting that potentially useful groundwater can be encountered within these formations.

Data for the Hoskissons Coal Seam suggest moderately saline conditions based on the median EC value of 6,180 µS/cm, whilst data for the two deepest units monitored in the Project Area, the Arkarula and Pamboola Formation, suggest median EC values of in excess of 15,000 µS/cm suggesting saline groundwater. The relatively high salinity values recorded in samples taken from the Arkarula Formation may reflect the depth of this unit and the lack of any known outcrop areas. Residence times with the strata may therefore be substantial resulting in relatively high salinity groundwater (AGE, 2020).

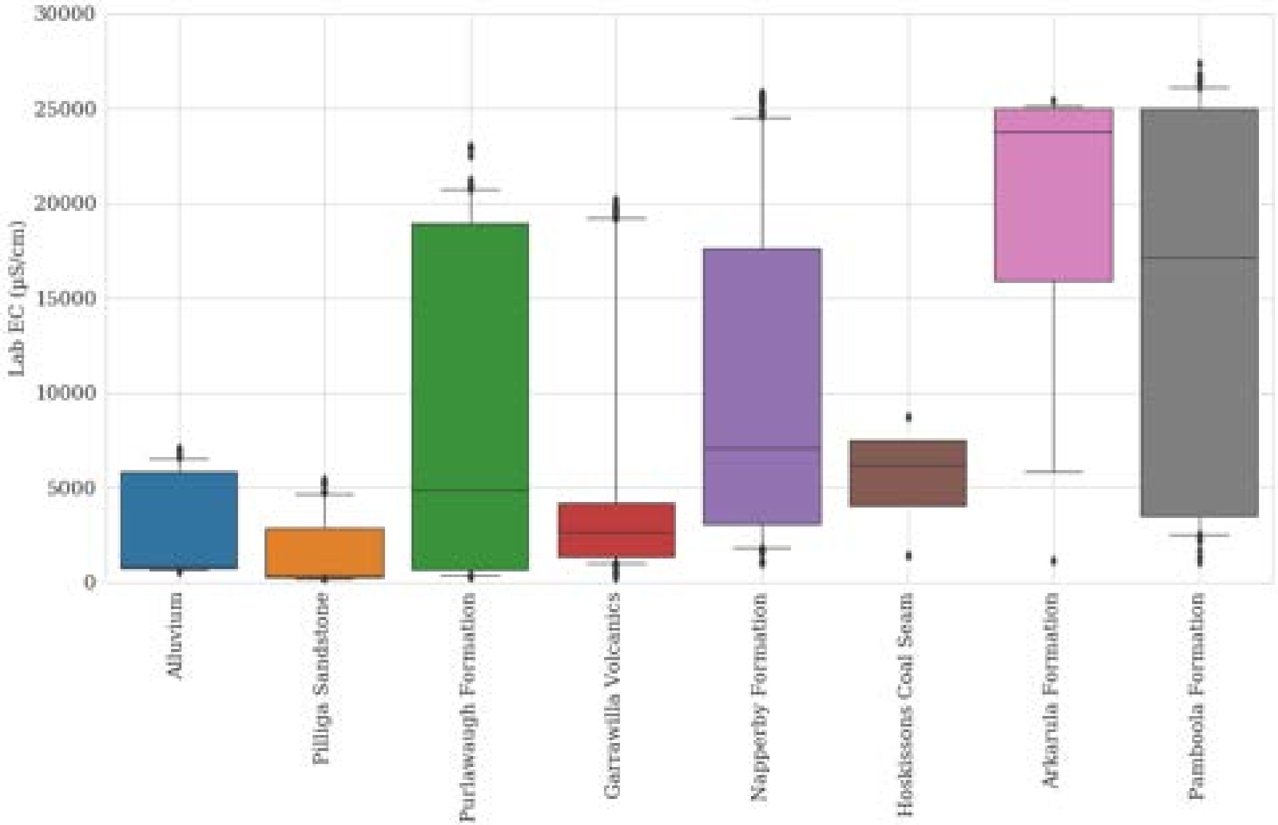


Figure 7.15 Distribution of groundwater lab EC data by hydrostratigraphic unit

Results for the majority of the samples tested suggest relatively low proportions of sulphate, but a broad distribution from bicarbonate to chloride dominance among the other anions. Chloride dominances tend to occur in higher salinity waters from deeper formations, with bicarbonate dominance more prevalent in fresher groundwater samples from shallower formations. However, as shown in Figure 7.16, some water samples from the Hoskissons Seam and Arkarula Formation suggest bicarbonate dominance, which may be indicative of mineralisation source in the Permian sequence (Aquaterra, 2009).

In 2024, fourteen water samples were obtained from the 203 LW underground area. The field measurements indicate variable salinity; TDS varies between 114 and 7,100 mg/l and EC between 247 and 14,200 uS/cm. pH varies between 5.29 and 7.67.

The relationship between EC and TDS in mine water and groundwater in the Hoskissons Seam and adjoining aquifers are not clear, and ongoing monitoring will provide more clarity in this regard.

Similarly, the cation and anion composition does not indicate clear patterns. As shown on the piper-plot in Figure 7.16, the mine water inflow samples mainly plot in the Ca-Mg-HC0₃ quadrant and the Na-K-HCO₃ quadrant. Evidently, there is a strong HCO_3 dominance, similar to historical coal seam data.

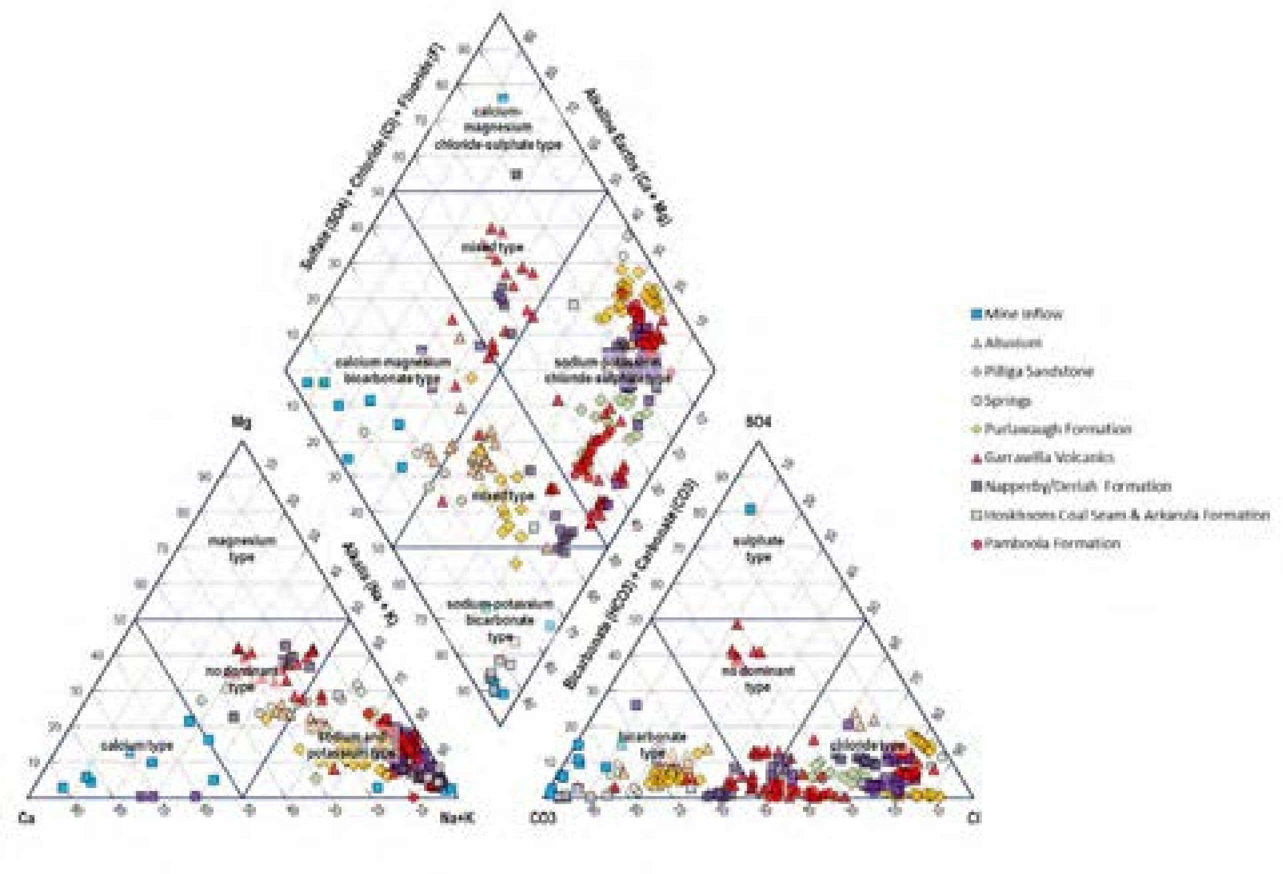


Figure 7.16 Piper plot Mine inflow and formations

8 Seepage monitoring

The rail loop and brine storage dam complexes consist of eight dams ranging in capacity from approximately 30 ML to 450 ML. Water stored in the RLDs includes saline/brackish water pumped from the underground workings, site runoff from disturbed areas (stockpile and laydown areas), and fresh water from licensed sources. Dam BR1 is a turkey's nest constructed as cut to fill along (and offset from) a tributary of Kurrajong Creek, with a capacity of 450 ML and is lined with a primary HDPE (High Density Polyethylene resin), a laminated geotextile drainage layer and a secondary HDPE layer.

The Reject Emplacement Area (REA) is located immediately west of the box cut. Three shallow standpipe monitoring bores (P51, P52 and P53) are installed north of the REA. It is expected that 8.2 million tonnes (or approximately 5.7 million m3) will be managed within the REA over the 30-year mine life. SB3 is located north of the REA to capture surface water runoff. EC and pH plots for REA bores are plotted in Figure 8.1 and Figure 8.2 respectively.

Surface water storage dams are monitored for seepage by a network of thirteen standpipe bores installed at depths ranging from 9 to 39 m bgl. A comprehensive review of the monitoring network is conducted quarterly and annually and is reported in the Annual and Quarterly Seepage Monitoring Reviews. EC and pH plots for REA bores are plotted in Figure 8.3 and Figure 8.4 respectively.

A summary of data collected for the RLD, BDA and REA network of bores is presented in Table 8.1, Table 8.2 and Table 8.3.

Table 8.1 Rail loop dam (RLD) seepage monitoring bores

Bore ID	Easting	Northing	Elevation	TD	Install depth (m BGL)	Formation	Water level (m AHD) November 2025
P28	778343	6620162	262.46	25	19-25	Napperby Formation	dry
P29	778541	6619978	256.84	25	19-25	Napperby Formation	253.64
P30	778808	6620071	254.95	15	9-15	Napperby Formation	244.93
P31	778318	6620343	264.39	15	9-15	Napperby Formation	249.38
P32	778993	6620335	252.49	15	9-15	Napperby Formation	246.97
P33	778772	6620523	253.56	15	9-15	Napperby Formation	239.67
P34	778542	6620604	255.96	15	9-15	Napperby Formation	dry
P58	778649	6619912	254.65	42	33-39	Napperby Formation	236.55

Note: TD = termination depth.

Table 8.2 Brine storage dam (BSD) seepage monitoring bores

Bore ID	Easting	Northing	Elevation	TD	Install depth (m BGL)	Formation	Water level (m AHD) November 2025
P83	778453	6621599	265.534	38	35-38	Napperby Formation	dry
P84	779072	6620649	247.812	24	21-24	Napperby Formation	234.8
P85	779075	6620645	247.725	11	7-10	Near surface strata	dry
P88	778744	6620835	250.9	11	7-10	Near surface strata	dry
P89	779221	6620940	247.43	11	7-10	Near surface strata	dry

Note: TD = termination depth.

Table 8.3 REA seepage monitoring bores

Bore ID	Easting	Northing	Elevation (m AHD)	TD (m)	Install depth (m BGL)	Formation	Water level (m AHD) November 2025
P51	777437	6620859	267.15	18	9-12	Garrawilla Formation	261.89
P52	777117	6620807	268.85	24	18-21	Napperby Formation	263.32
P53	776994	6620655	270.98	24	18-21	Garrawilla Volcanics	263.71

Note: TD = termination depth.

Bores P29 and P53 exceeded their EC triggers and both bores are included in the exceedance review in Appendix F. Additional review of the exceedance at P53 was recently conducted this review found that:

> *Ratios of major ions and EC measured at P53 and P52 indicate that the water types at the two bores) have become similar to each other since 2022. This could indicate that a source of water with a consistent composition is influencing the groundwater at both sites via mixing. The mechanism for this mixing is not clear; however, mixing trends identifiable in piper plots and Ca/Mg ratios indicate that water quality at P53 is becoming less similar to water types typical of mine inflow and coal seams. Mixing trends indicate that water is becoming more chloride rich relative to bicarbonate (or bicarbonate depleted), whereas water types of mine inflow, coal seams, or water affected by rejects would be expected to be more bicarbonate-dominant relative to chloride.*

No immediate remediation is recommended as changing water quality is likely due to mixing from other groundwater sources.

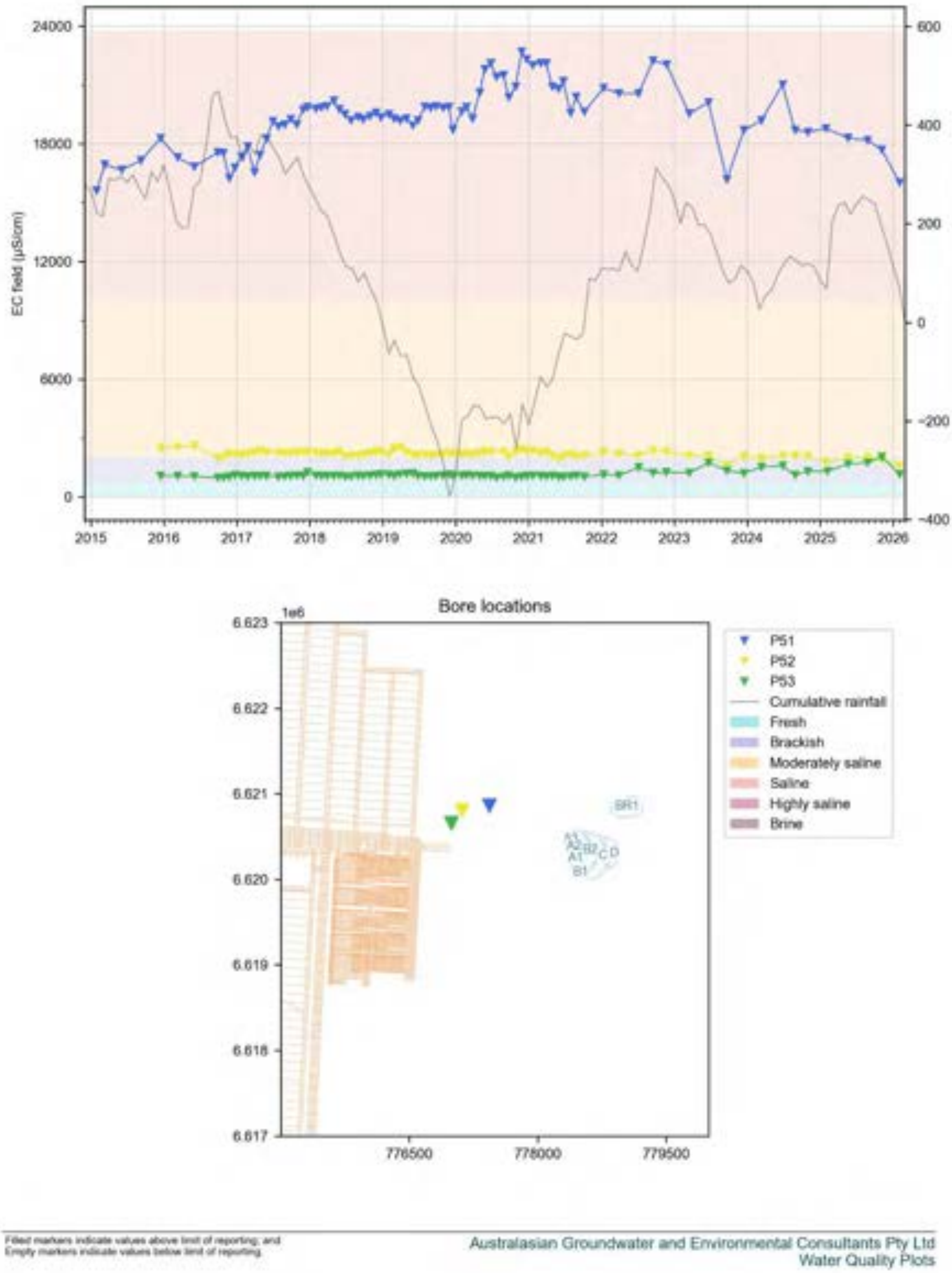


Figure 8.1 EC plot REA monitoring bores

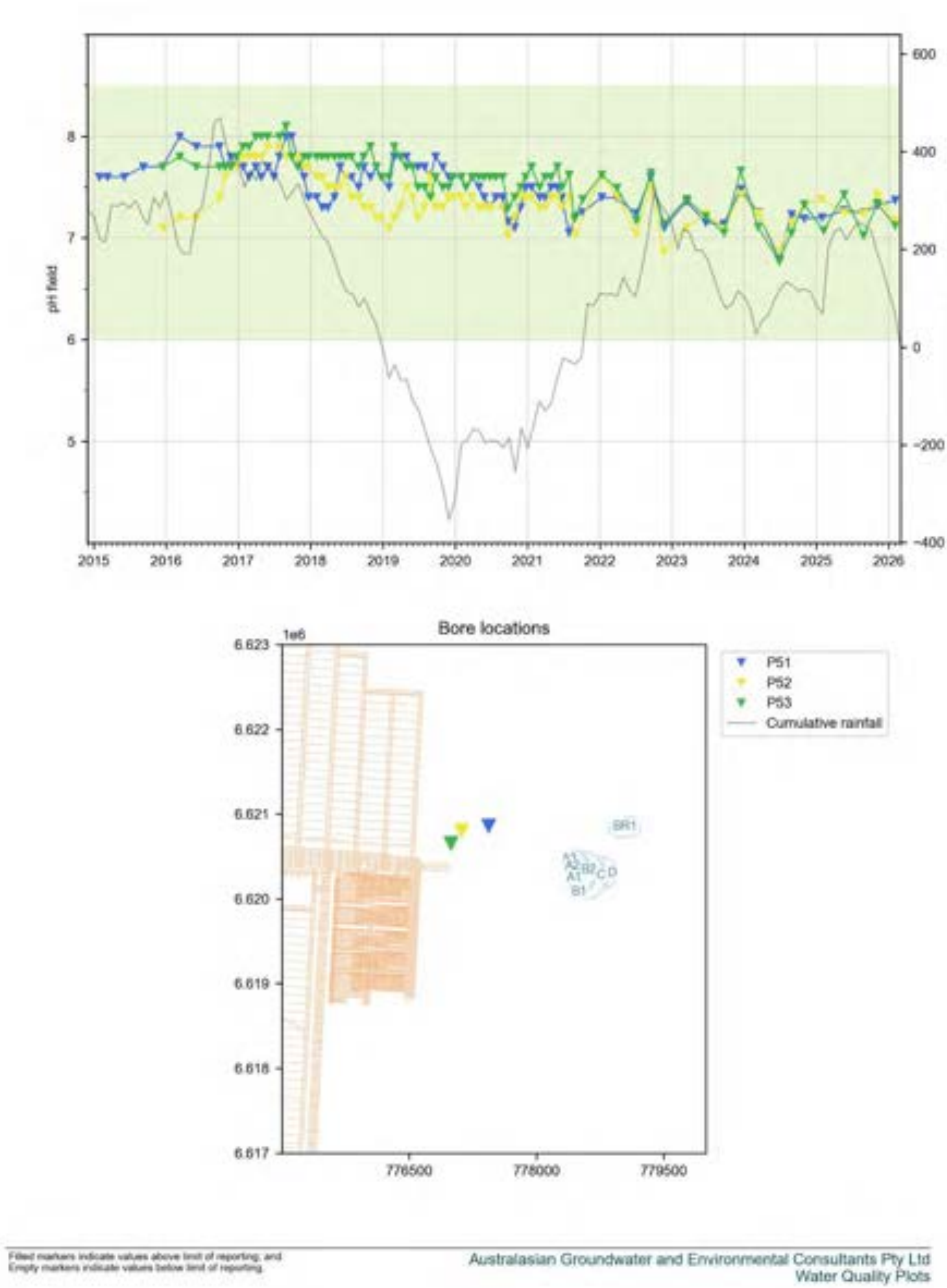


Figure 8.2 pH plot REA monitoring bores

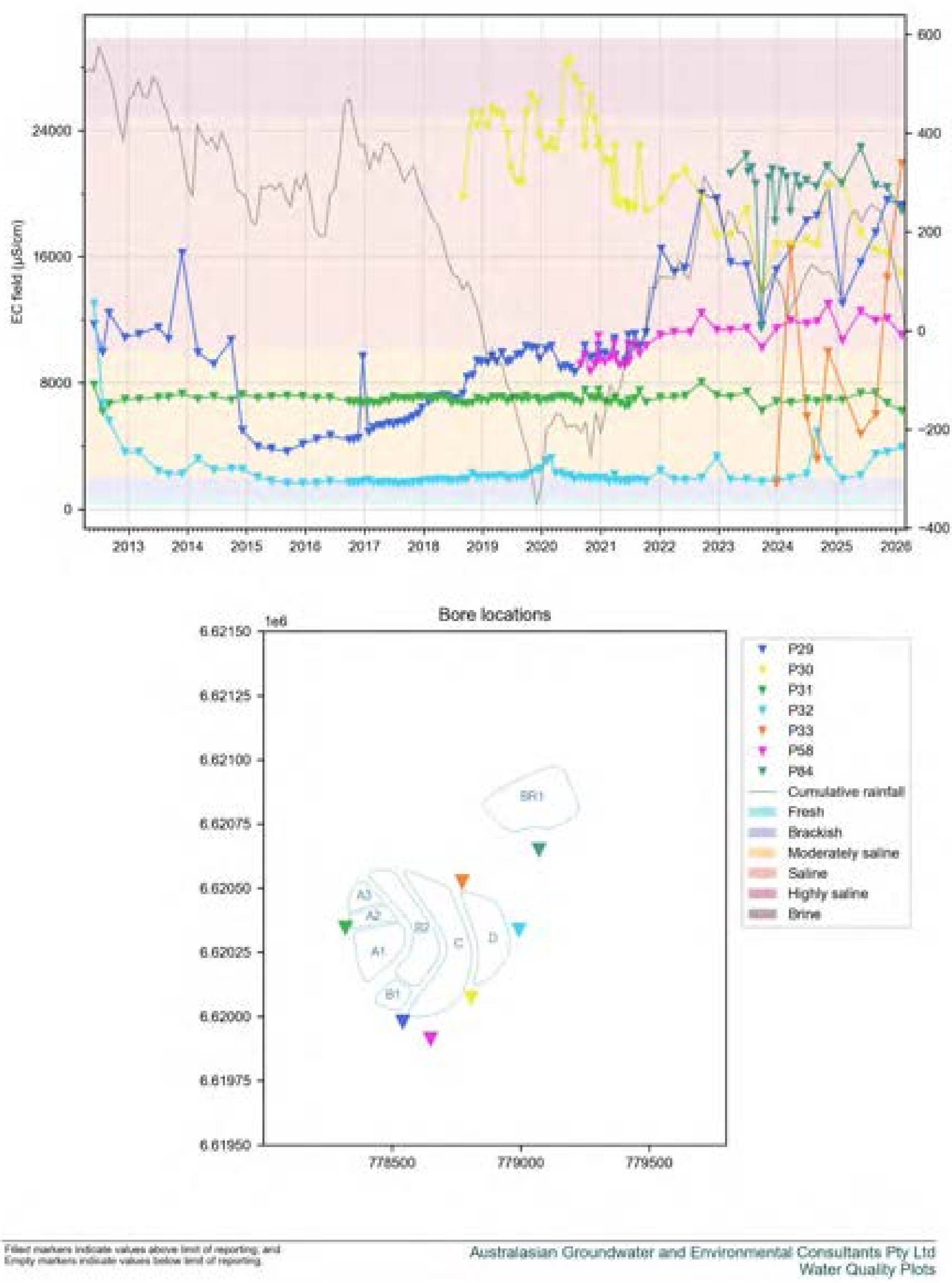


Figure 8.3 EC plot seepage monitoring bores

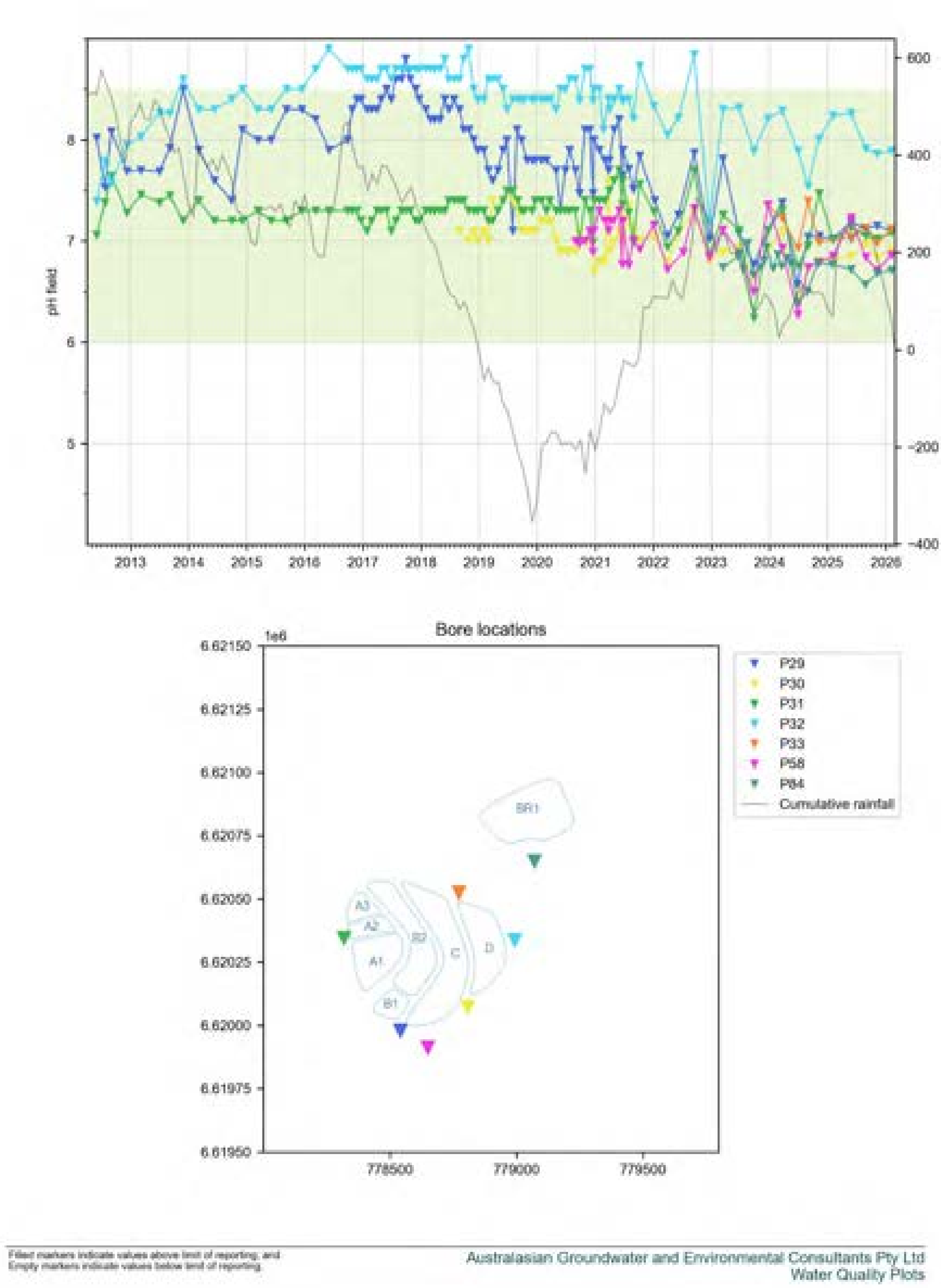


Figure 8.4 pH plot seepage monitoring bores

9 Mine inflows

The forward predictions from groundwater modelling predicted groundwater inflows of 1.7 ML/day (or 625 ML/year) for 2025 (AGE, 2024). Groundwater pumping from the Namoi Alluvial Groundwater Source Order 2020 only occurred for test pumping with total take for the year below 1ML.

Table 9.1 Active and indirect water take

Water Sharing Plan	Water Source/ Licence category	Water Access Licence	Allocation (Unit Shares)	Annual Use Limit	Active (Pumped) Take	Indirect Take[3]	Total Take
Namoi Alluvial Groundwater Sources Order 2020	Upper Namoi Zone 5 Groundwater Source	WAL 12833	67	134	0[1]	-	0
		WAL 20131	150	300	0	-	
		WAL 12822	43	86	n/a[1]	0	
NSW Great Artesian Basin (GAB) Groundwater Sources 2020	GAB Southern Recharge Groundwater Source	WAL15922	248	322.4	n/a[2]	9	9
NSW Murray Darling Basin (MDB) Porous Rock Groundwater Sources Order 2020	Gunnedah Oxley Basin MDB Groundwater Source	WAL 29549	818	1,526.3	n/a[2]	616	616
		WAL43017	403				
Upper Namoi and Lower Namoi Regulated Water Sources 2016	Lower Namoi Regulated River Water Source Regulated River (High Security)	WAL 6762	20	20	0	-	0
	Lower Namoi Regulated River Water Source Regulated River (General Security)	WAL 2671	48	60	0	-	246.5
		WAL 2728	10	12.5	n/a[1]	0	
		WAL 20152	600	750	246.5	-	

Notes: ML – Megalitres.

[1] metered usage 0.262 ML/year, pumping only occurred infrequently to test the pump

[2] No active pumping for water usage purposes, Water Access Licences have been assigned to miscellaneous work approvals to account for indirect take from the individual water sources as a result of mining impacts.

[3] Predicted maximum indirect take during 2024 from Narrabri Coal Mine Groundwater Model - Re-calibration Stage 2 MOD7, Australasian Groundwater and Environmental Pty Ltd (AGE) 2024.

10 Conclusion and recommendations

Several bores have exceeded their Tier 1 or Tier 2 EC triggers during the 2025 reporting period and prior reporting periods, one bore (P7) installed in the Pilliga Sandstone has exceeded its lower pH trigger level. A summary of exceedances and recommendations are included in Table 10.1.

Bores installed in 2023 include several bores further from active mining and closer to sensitive environmental receptors, as such, it is recommended to establish baseline data sets and calculate groundwater quality and level triggers for these bores and replace several bores proximal to mining with those closer to sensitive receptors. Monitoring of bores closer to mining are recommended to continue being used as an early warning of potential changes attributable to mining.

Table 10.1 Summary of exceedances

Bore ID	Formation	Exceedance	Likely cause	New baseline / triggers established
P2	Napperby	EC	Natural variations / major climate event	Tier 1 22,080 µS/cm Tier 2 22,533 µS/cm
P4	Napperby	EC	Natural variations / major climate event	Tier 1 28,300 µS/cm Tier 2 28,991 µS/cm
P7	Pilliga	pH	Natural variability of formation	N/A
P9	Purlawaugh	EC	Natural variations / major climate event	No
P10	Napperby	EC	Natural variations / major climate event	Replaced by P69 near Kurrajong creek
P11	Purlawaugh	EC and water levels	Lateral migration of water and mixing within the formation	Replaced by P71 near Hardy's spring
P29	Napperby	EC	Saturation of unsaturated zone	N/A
P39A	Watermark	EC	Natural variations / major climate event	Tier 1 7,710 µS/cm Tier 2 8,031 µS/cm
P39B	Alluvium	EC	Natural variations / major climate event	Tier 1 13,662 µS/cm Tier 2 14,198 µS/cm
P47	Garrawilla	EC	Natural variations / major climate event	No
P53	Garrawilla	EC	Mixing with other groundwater	N/A

The current groundwater monitoring program is considered sufficient to monitor changes in the groundwater system, while future quarterly reviews should include a short review of each bore with recorded exceedances to consider if conclusions remain consistent.

As indicated in this review, there are also groundwater level and quality exceedances that may be regarded as isolated with other potential causes. For example, the exceedances recorded at P11 indicated isolated drawdown which do not propagate away from P11. Although additional field work did indicate potential depressurisation of a newly drilled ventilation shaft in the area, continued monitoring is recommended.

Overall, the review indicated that the GWMP was followed and that none of the exceedances resulted in potential risk of environmental impacts to sensitive receptors. Trends observed in the groundwater level and quality data are generally consistent with natural climatic conditions.

11 References

AGE. (2020). Groundwater Assessment Narrarbi Mine Stage 3 Extension Project, project No. G1973. Narrabri Coal Operations Pty Ltd.

AGE. (2024). Narrabri Coal Mine Groundwater Model - Re-calibration Stage 2 Mod 7. Narrabri Coal Operations Pty Ltd.

ANZG. (2018). Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

Australian and New Zealand Environment and Conservation Council Agriculture and Reource Management Council of Australia and New Zeeland [ANZECC ARMCANZ}. (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Australian Groundwater and Environmental Consultants. (2020). Groundwater Assessment Narrarbi Mine Stage 3 Extension Project . Narrabri Coal Operations Pty Ltd.

Bioregional Assessment Programme. (2016). Namoi dryland diffuse groundwater recharge. Bioregional Assessment Derived Dataset.

Bioregional Assessment Programme. (2016). Namoi hydraulic conductivity measurements.

Bureau of Meteorology. (2018). GDE Atlas. Retrieved from http://www.bom.gov.au/water/groundwater/gde/

Devanand, A., Abram, N., Evans, J., Ukkola, A., Gallant, A., & Pitman, A. (2024). Australia's Tinderbox Drought (2017-2019) briefing notes. Climate extremes ARC centre of excellence.

Hydrosimulations. (2015). Narrabri Mine Modification Groundwater Assessment. Narrabri Coal Operations Pty Ltd.

NSW Department of Planning and Environment. (2022). Extraction Plan Guideline. NSW Department of Planning and Environment.

NSW Department of Primary Indsutries. (2012). NSW Aquifer Interference Policy.

OEH. (2006). Using the ANZECC Guidelines and Water Quality Objectives in NSW. Sydney: Department of Environment and Conservation NSW.

Queensland Government Long Paddock. (2025, February 19). SILO - Australian climate data from 1889 to yesterday. Retrieved from https://www.longpaddock.qld.gov.au/silo/

Raiber, M., Martinez, J., Suckow, A., Deslandes, A., & Gerber, C. (2022). Assessment of the influence of geological structures on aquifer connectivity in the Pilliga Forest area, NSW - an integreated hydrogeological, geophysical, hydrochemical and environmental tracer approach. Canberra: CSIRO for GISERA. doi:https://doi.org/10.25919/exee-za89

Rhoades, J. D., Kandiah, A., & Mashali, A. M. (1992). The use of saline waters for crop production - FAO irrigation and drainage paper 48. Rome: Food and Agriculture Organisation of the United Nations.

Rhoades, J. D., Kandiah, A., & Mashali, A. M. (1992). The use of saline waters for crop production (FAO Irrigation and Drainage Paper No. 48). Food and Agriculture Organization of the United Nations. Retrieved from www.fao.org

Whitehaven. (2013). WHC_PLN_NAR Water Management Plan. Narrabri Coal Operations Pty Ltd.

Whitehaven Coal. (2024). Narrabri Mine Groundwater Monitoring Program. Narrabri Coal Operations Pty Ltd.

Appendix A

Regulatory commitments

Table A 1 Project Approval 08_0144 conditions relevant to groundwater management

Project Approval 08_0144 conditions	
Condition	Requirement
Schedule 2, Condition 1	The Proponent shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.
Schedule 2, Condition 2	The Proponent shall carry out the project generally in accordance with the: (a) EA; and (b) conditions of this approval.
Schedule 2, Condition 4	The Proponent shall comply with any reasonable and feasible requirements of the Secretary arising from the Department's assessment of: (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with the conditions of this approval; and (b) the implementation of any actions or measures contained in these reports, plans, programs, strategies or correspondence.
Schedule 2 Condition 11	With the approval of the Secretary, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis. ***Note**: The conditions of this approval require certain strategies, plans, and programs to be prepared for the project. They also require these documents to be reviewed and audited on a regular basis to ensure they remain effective. However, in some instances, it will not be necessary or practicable to prepare these documents for the whole project at any one time, particularly as these documents are intended to be dynamic and improved over time. Consequently, the documents may be prepared and implemented on a progressive basis, subject to the conditions of this approval. In doing this however, the Proponent will need to demonstrate that it has suitable documents in place to manage the existing operations of the project.*
Schedule 4, Condition 9	Within 2 years of the commencement of longwall coal extraction, and every 5 years thereafter, the Proponent shall undertake a transient calibration of the groundwater model presented in the EA, in consultation with DPIE Water, and to the satisfaction of the Secretary. This re-calibration of the groundwater model must include forward impact predictions of brine re-injection to the mine's goaf at the conclusion of mining operations.
Schedule 4, Condition 9A	The Proponent shall ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations on site to match its available water supply. ***Note:** Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.*
Schedule 4, Condition 9B	The Proponent shall provide a compensatory water supply to any landowner of privately-owned land whose water supply is adversely and directly impacted as a result of the project (other than an impact that is minor or negligible), in consultation with DPIE Water, and to the satisfaction of the Secretary. The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributable to the project. Equivalent water supply should be provided (at least on an interim basis) as soon as practicable from the loss being identified, unless otherwise agreed with the landowner. If the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution. If the Proponent is unable to provide an alternative long-term supply of water, then the Proponent shall provide alternative compensation to the satisfaction of the Secretary.
Schedule 4, Condition 10	Except as may be expressly provided for by an EPL, the Proponent shall not discharge any waters from the disturbed areas of the site. However, raffinate from the water conditioning plant may be transferred to water users in accordance with an approved Water Management Plan (see below).

Project Approval 08_0144 conditions	
Schedule 4, Condition 11	Any raffinate from the water conditioning plant discharged to the Namoi River must be discharged in accordance with the conditions of an EPL and meet the following criteria: (a) 50 percentile of all samples (volume based) are below 250 mg/l of Total Dissolved Solids; (b) 100 percentile of all samples (volume based) are below 350 mg/l of Total Dissolved Solids; and (c) pH values of all sampled water to be between 6.5 and 8.5.
Schedule 4, Condition 12	Within 3 years of the date of this approval, or otherwise agreed by the Secretary, the Proponent must commission the water conditioning plant identified in the EA, to the satisfaction of the Secretary.
Schedule 4, Condition 13	Prior to 30 June 2011, the Proponent shall revise the Water Management Plan for the Stage 1 project to encompass all proposed mine activities and potential impacts associated with water management (Stages 1 and 2) and subsequently implement this revised version of the Water Management Plan to the satisfaction of the Secretary. This revised plan must be produced in consultation with EPA and DPIE Water by suitably qualified expert/s whose appointment/s have been approved by the Secretary and include a: (a) Site Water Balance; (b) Erosion and Sediment Control Plan; (c) Surface Water Monitoring Plan; (d) Raffinate Discharge and Transfer Control and Monitoring Plan; ***Note:*** *The Raffinate Discharge and Transfer Control and Monitoring Plan does not need to be produced and approved until 3 months prior to the planned discharge or transfer of raffinate from the site.* (e) Groundwater Monitoring Program; and (f) Surface and Groundwater Response Plan, setting out the procedures for: • investigating, and if necessary mitigating, any exceedances of the surface or groundwater assessment criteria (see conditions 16(b) and 18(c)); and • responding to any unforeseen impacts of the project.
Schedule 4, Condition 14	The **Site Water Balance** must: (a) include details of: • sources and security of water supply; • underground water make; • water use on site; • water management on site; • off-site water transfers; • reporting procedures; (b) describe measures to minimise water use by the project; and (c) be reviewed and recalculated each year in the light of the most recent water monitoring data.
Schedule 4, Condition 15	The Erosion and Sediment Control Plan must: (a) be consistent with the requirements of Managing Urban Stormwater: Soils and Construction manual (Landcom, 2004), or its latest version; (b) identify activities that could cause soil erosion and generate sediment; (c) describe measures to minimise soil erosion and the potential for transport of sediment to downstream waters; (d) describe the location, function, and capacity of erosion and sediment control structures; and (e) describe what measures would be implemented to monitor and maintain the structures over time.

Project Approval 08_0144 conditions	
Schedule 4, Condition 16	The **Surface Water Monitoring Plan** must include: (a) detailed baseline data on surface water flows and quality in creeks and other water bodies that could be affected by the project; (b) surface water impact assessment criteria; (c) a program to monitor the impact of the project on surface water flows and quality; (d) procedures for reporting the results of this monitoring.
Schedule 4, Condition 17	The **Raffinate Discharge Control and Monitoring Plan** must: (a) be approved by the Secretary prior to any raffinate discharge to the Namoi River; (b) include measures for the continuous monitoring and recording of volumes of water discharged to the Namoi River; (c) contain an ambient water quality monitoring program upstream and downstream of the discharge point; and (d) contain a water quality monitoring program for discharged waters.
Schedule 4, Condition 18	The **Groundwater Monitoring Program** must include: (a) further development of the regional and local groundwater model; (b) detailed baseline data to benchmark the natural variation in groundwater levels, yield and quality (including at any privately owned bores in the vicinity of the site); (c) groundwater impact assessment criteria; (d) a program to monitor the impact of the project on groundwater levels, yield and quality; (e) a program to monitor any impacts of the project on the Namoi River Alluvium; (f) a program to monitor (by the use of shallow piezometers/lysimeters), detect, and quantify any leakage/leachate from the site's evaporation/storage ponds, brine storage area or coal reject emplacement area; and (g) procedures for reporting the results of this monitoring.
Schedule 4, Condition 19	The Proponent shall ensure that the integrity of the low permeability layers lining the evaporation/storage ponds is maintained and achieves a permeability of less than 1×10^{-14} m/s whenever these ponds are in use for the storage of saline waters and less than 1×10^{-9} m/s when being used to store raffinate or captured surface waters.
Schedule 4, Condition 20	The Proponent shall ensure that the integrity of the low permeability layers lining the brine storage ponds is maintained and achieves a permeability of less than 1×10^{-14} m/s whenever these storage ponds are in use.
Schedule 4, Condition 21	Within 2 years of commissioning the water conditioning plant, and every 5 years thereafter, unless otherwise directed by the Secretary, the Proponent shall engage suitably qualified experts approved by the Secretary to review brine management and beneficial use options for raffinate, brine and minewater produced by the project. The Proponent shall implement all reasonable and feasible recommendations of these reviews, to the satisfaction of the Secretary.

Project Approval 08_0144 conditions	
Schedule 6, Condition 2	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data; (b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria: (d) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see (c) above); (e) a contingency plan to manage any unpredicted impacts and their consequences; (f) a program to investigate and implement ways to improve the environmental performance of the project over time; (g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and (h) a protocol for periodic review of the plan.
Schedule 6, Condition 3	Within 3 months of the submission of an: (a) audit under condition 7 of Schedule 6; (b) incident report under condition 4 of Schedule 6; and (c) annual review under condition 5 of Schedule 6; and (d) any modification to the conditions of this approval (unless the conditions require otherwise), the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.
Schedule 6, Condition 4	The Proponent shall notify the Secretary in writing via the Major Projects website and any other relevant agencies of any incident associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Secretary and any relevant agencies with a detailed report on the incident.
Schedule 6, Condition 5	The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval, and to the satisfaction of the Secretary.
Schedule 6, Condition 6	By the end of March each year, the Proponent must submit a review of the environmental performance of the project for the previous calendar year to the satisfaction of the Secretary.
Schedule 6, Condition 7	Prior to 13 September 2010, and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project (Stages 1 and 2).
Schedule 6, Condition 8	Within 6 weeks of the completing of this audit, or as otherwise agreed by the Secretary, the Proponent shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.
Schedule 6, Condition 9	-

Project Approval 08_0144 conditions	
Schedule 6, Condition 10	The Proponent shall: (a) make copies of the following publicly available on its website: • the documents referred to in Condition 2 of Schedule 2; • all current statutory approvals for the project; • all approved strategies, plans and programs required under the conditions of this approval; • a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs; • a complaints register, updated on a monthly basis; • minutes of CCC meetings; • the annual reviews of the project; • any independent environmental audit of the project, and the Proponent's response to the recommendations in any audit; • any other matter required by the Secretary; and **(b) keep this information up-to-date, to the satisfaction of the Secretary.**

Table A 2 EPL 12789 compliance conditions relevant to groundwater management

Condition	Requirement
P1	**Location of monitoring/discharge points and areas** P1.3 The following points referred to in the table are identified in this license for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

EPA ID No.	Type of monitoring point	Type of discharge point	Location description including NCOPL ID no.
28	Groundwater Monitoring Bore	-	P28
29	Groundwater Monitoring Bore	-	P29
30	Groundwater Monitoring Bore	-	P30
31	Groundwater Monitoring Bore	-	P31
32	Groundwater Monitoring Bore	-	P32
33	Groundwater Monitoring Bore	-	P33
34	Groundwater Monitoring Bore	-	P34
35	Groundwater Monitoring Bore	-	P58

Condition	Requirement
M2	**Requirement to monitor concentration of pollutants discharged** M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns: M2.3 Water and/or Land Monitoring Requirements

Point 28. 29, 30, 31, 32, 33, 34, 35			
Pollutant	**Units of measure**	**Frequency**	**Sampling Method**
Bicarbonate	mg/L	Quarterly	Representative sample
Calcium	mg/L	Quarterly	Representative sample
Carbonate	mg/L	Quarterly	Representative sample
Chloride	mg/L	Quarterly	Representative sample
Electrical Conductivity	µS/cm	Quarterly	In situ
Magnesium	mg/L	Quarterly	Representative sample
pH	pH	Quarterly	In situ
Potassium	mg/L	Quarterly	Representative sample
Sodium	mg/L	Quarterly	Representative sample
Standing Water Level	-	Quarterly	In situ
Sulfate	mg/L	Quarterly	Representative sample

M2.6 Note: Groundwater monitoring has not been formally included in the licence. However, the licensee is required to undertake groundwater monitoring in accordance with the Department of Planning and Environment approved "Stage 2 Water Management Plan" required under Schedule 4, condition 18 of the Project Approval (08_0144) for the Stage 2 project. The results of this monitoring are required to be reported in the Annual Review.

Table A 3 Project Approval 08_0144 Statement of Commitments relevant to groundwater management

SoC requirements	
SoC	**Summary of the requirement**
6.1	Seal the mine drifts and ventilation shaft using in-strata grouting or hydrophobic sealant.
6.2	Divert groundwater accumulating in the underground workings to designated sumps for pumping to surface.
6.3	Discharge groundwater pumped from the underground sumps into Dam A1 only.
6.4	Record extraction volumes including weekly totals from all pumping bores, and weekly totals from the underground mine and open cut sump.
6.5	Record volumes of water introduced to the mine for longwall operation and other requirements.
6.6	Record the groundwater quality (EC and pH) discharged from the underground workings and water supply bores.
6.7	Samples and analyse water from all pumping bores and underground pumping stations for the following parameters; • EC, TDS, TSS and pH. • Calcium, magnesium, sodium and potassium. • Carbonate, bicarbonate, sulphate and chloride. • Aluminium, arsenic, boron, cobalt, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, selenium, zinc. • Ammonia, nitrate, phosphorus, reactive phosphorus.
6.8	Record (by manual monitoring, or continuous automated monitoring) the standing water levels of piezometers P1 to P27 and WB1 to WB8 (and others as constructed).
6.9	Monitor the flow rate and water quality of the spring discharge from “Mayfield Spring”.
6.10	Install additional multi-level vibrating wire piezometers over LW1 to LW3 to obtain detailed data as to the impact of mine subsidence on the groundwater of the various strata above the underground workings.
6.11	Collect data from the vibrating wire piezometers and compare against initial groundwater and subsidence modelling predictions.
6.12	Commission an experienced hydrogeologist to collate and review the monitoring data collected annually in order to assess the impact of the project on the groundwater environment, and to compare any observed impacts with those predicted from groundwater modelling.
6.13	Develop the groundwater monitoring program in consultation with the Proponents consultant hydrogeologist, the Department of Environment, Climate Change and Water – Office of Water and those groundwater users potentially affected by the Longwall Project).
6.14	Complete an initial audit of the groundwater model predictions against monitoring data.
6.15	Recalibrate the groundwater model based on groundwater model audit and generate confirmatory forward impact predictions made.
6.16	Carry out regular audits of the groundwater model predictions against monitoring data.
6.17	Undertake remedial action if the available drawdown attributable to the mine for the existing groundwater users is reduced by over 15%. In the event that an existing water supply is deemed (by the hydrogeologist) to be adversely affected by the Longwall Project, the Proponent will mitigate, or compensate for this impact through the provision of a replacement water supply.
6.18	Undertake remedial action if the water quality of the dewatering discharge indicates an inflow salinity of more than 20% above that predicted by Aquaterra (2009).
6.19	Ensure the project is appropriately licenced for all groundwater make and use in accordance with required licensing arrangements through the NOW.

Table A 4 Development Consent SSD-10269 conditions

Condition	Requirement	Document reference
Obligation to minimise harm to the environment		
A1.	In addition to meeting the specific performance measures and criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Section 5 Section 6
Evidence of consultation		
A20.	Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document; and (b) provide details to the Department of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any matters not resolved between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	Attachment 2
Staging, combining and updating strategies, plans, or programs		
A21.	With the approval of the Planning Secretary, the Applicant may:	
	(a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);	No staging of the EP-WMP proposed
	(b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined);	No combining of the EP-WMP with another plan proposed
	(c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development); and	Section 9
	(d) combine any strategy, plan or program required by this consent with any similar strategy, plan or program required by an adjoining mining consent or approval, in common ownership or management.	No staging of the EP-WMP proposed
A22.	Requirements under Part B of this consent to prepare a Water Management Plan, Biodiversity Management Plan and Aboriginal Cultural Heritage Management Plan may be satisfied through an Extraction Plan prepared under condition C8, but only in respect of the land, values and features that may be affected by the second workings covered by that Extraction Plan.	This EP-WMP
A25.	The Applicant must continue to apply existing management strategies, plans or monitoring programs approved under development consent 08_0144, until the approval of a similar plan, strategy or program under this consent.	This EP-WMP
Compliance		
A30	The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Attachment B
Performance measures – Natural and Heritage Features etc		

<table>
<tr><th>Condition</th><th>Requirement</th><th>Document reference</th></tr>
<tr><td>C1.</td><td>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 9.
Table 9: Subsidence impact performance measures – natural and heritage features
<table>
<tr><th>Feature</th><th>Performance measures</th></tr>
<tr><td colspan="2">Watercourses</td></tr>
<tr><td>All 3rd order watercourses, including Kurrajong Creek, Kurrajong Creek Tributary 1 and Tulla Mullen Creek Tributary I</td><td>• No subsidence impact or environmental consequence greater than predicted in the EIS</td></tr>
<tr><td colspan="2">Landform features</td></tr>
<tr><td>Cliffs, rock face features and steep slopes</td><td>• No subsidence impact or environmental consequence greater than predicted in the EIS</td></tr>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Threatened species</td><td>• No environmental consequence greater than has been offset in accordance with Table 5</td></tr>
<tr><td colspan="2">Mine workings</td></tr>
<tr><td>First workings</td><td>• To remain long-term stable and non-subsiding, except insofar as they may be impacted by approved second workings</td></tr>
<tr><td>Second workings</td><td>• To be carried out only within the area of the Approved Mine Plan, in accordance with an approved Extraction Plan</td></tr>
</table>
Notes:
• Classification of streams in accordance with Strahler stream order system.
• The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in various management plans that are required under this consent (see condition C8)</td><td>Section 4
Section 5
Section 6
Section 7</td></tr>
<tr><td>C2.</td><td>Measurement and monitoring of compliance with performance measures and performance indicators in this consent is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans and monitoring programs. In the event of a dispute over the appropriateness of proposed methods, the Planning Secretary will be the final arbiter.</td><td>Section 5
Section 6</td></tr>
<tr><td>C6.</td><td>Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 10 is to be settled by the Planning Secretary, following consultation with SA NSW. Any decision by the Planning Secretary shall be final.</td><td>Section 5.8 of EP 203-206</td></tr>
<tr><td colspan="3">Additional offsets</td></tr>
<tr><td>C3.</td><td>If the applicant exceeds the performance measures in Table 9 and the Planning Secretary determines that:
(a) It is not reasonable or feasible to remediate the subsidence impact or environmental consequences; or
(b) Remediation measures implemented by the Applicant have failed to satisfactorily remediate the subsidence impact or environmental consequence
Then the Applicant must provide a suitable offset to compensate for the subsidence impact or environmental consequence, to the satisfaction of the Planning Secretary.</td><td>Section 1.4</td></tr>
<tr><td>C4.</td><td>The offset must give priority to like-for-like physical environmental offsets, but may also consider other offsets under the Biodiversity Offsets Scheme of the BC Act, such as the Biodiversity Conservation Fund, or funding or implementing supplementary measures, such as:
(a) actions outlined in threatened species recovery programs;
(b) actions that contribute to threat abatement programs;
(c) biodiversity research and survey programs; and/or
(d) rehabilitating degraded habitat.</td><td>Section 1.4</td></tr>
</table>

Condition	Requirement	Document reference
	Note: *any offset required under this condition must be proportionate with the significance of the impact or environmental consequence*	
Extraction Plan		
C8.	The Applicant must prepare an Extraction Plan (or Plans) for all second workings within the area of the Approved Mine Plan to the satisfaction of the Planning Secretary. Each Extraction Plan must:	
	(a) be prepared in consultation with the Resources Regulator, DPIE Water and the IAPUM (via the Department as Secretariat), by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	Section 1.6 Attachment B
	(b) be approved by the Planning Secretary before the Applicant carries out any second workings covered by the plan;	Section 1.4.1
	(c) include detailed plans of existing and proposed first and second workings and any associated surface development, including any applicable adaptive management measures;	Appendix H of EP 203-206
	(d) include detailed performance indicators for each of the performance measures in table 9 and Table 10;	Section 4
	(e) provide revised predictions of the potential subsidence effects, subsidence impacts and the environmental consequences of the proposed second workings, incorporating any relevant information obtained since this consent;	Section 3
	(f) describe the measures that would be implemented to ensure compliance with the performance measures in Table 9 and Table 10, and manage or remediate any impacts and/or environmental consequences to meet the rehabilitation objectives in Table 8;	Section 5 Section 6 Section 7
	(g) include a:	
	(i) Water Management Plan which has been prepared in consultation with DPIE – Water which provides for the management of potential impacts and/or environmental consequences of the proposed second workings on watercourses and aquifers, including:	This Plan
	• detailed baseline data on:	
	• surface water flows and quality in watercourses and other water bodies that could be affected by subsidence;	Section 2.1
	• groundwater levels, yield and quality in the region;	Section 2.2
	• surface and groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse impacts on water resources or water quality;	Section 3.2 Section 6
	• a surface water monitoring program to monitor and report on:	Section 6.1
	• surface water take associated with subsidence;	
	• stream flows and quality;	
	• stream and riparian vegetation health; and	
	• channel and bank stability;	
	• a groundwater monitoring program to monitor and report on	Section 6.2
	• groundwater inflows to the underground mining operations;	
	• the height of groundwater depressurisation;	
	• background changes in groundwater yield/quality against mine-induced changes, in particular, on groundwater bore users in the vicinity of the site;	
	• permeability, hydraulic gradient, flow direction and connectivity of the deep and shallow groundwater aquifers; and	
	• impacts of the development on groundwater dependent ecosystems;	

Condition	Requirement	Document reference
	• a description of any adaptive management practices implemented to guide future mining activities in the event of greater than predicted impacts on aquatic habitat; and	Section 7
	• a plan to respond to any exceedances of the surface water and groundwater assessment criteria;	Section 7
	(h) propose appropriate revisions to the Rehabilitation Strategy required under consent condition B63 and the Rehabilitation Management Plan required under condition B65; and	No revisions to the Rehabilitation Management Plan are proposed under this EP.
	(i) include a program to collect sufficient baseline data for future Extraction Plans.	Section 5 Section 6
C9.	The Applicant must not undertake second workings until the applicable Extraction Plan is approved by the Planning Secretary.	Section 1.4.1
C10.	The Applicant must implement Extraction Plans as approved by the Planning Secretary.	
End of Panel reporting		
C11.	Within 4 months of the completion of each longwall panel, or as otherwise agreed by the Planning Secretary, the Applicant must:	
	(a) prepare an end-of-panel report:	Section 5.7.2 of EP 203-206
	(i) reporting all subsidence effects (both individual and cumulative) for the panel and comparing subsidence effects with predictions;	
	(ii) describing in detail all subsidence impacts (both individual and cumulative) for the panel;	
	(iii) discussing the environmental consequences for watercourses, water yield, water quality, aquatic ecology, terrestrial ecology, groundwater, cliffs and steep slopes; and	
	(iv) comparing subsidence impacts and environmental consequences with predictions; and	
	(b) submit the report to the Department, Resources Regulator, BCS, DPIE Water and any other relevant agency, to the satisfaction of the Planning Secretary.	
	(c) The Applicant must include a comprehensive summary, analysis and discussion of the results of monitoring of subsidence effects, subsidence impacts and environmental consequences in each Annual Review.	
Adaptive management		
E4.	The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and performance measures in this consent. Any exceedance of these criteria or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. Where any exceedance of these criteria or performance measures has occurred, the Applicant must, at the earliest opportunity:	Section 5
	(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;	Section 7
	(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and	
	(c) implement reasonable remediation measures as directed by the Planning Secretary.	
	to the satisfaction of the Planning Secretary.	
Management plan requirements		

Condition	Requirement	Document reference
E5.	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	(a) a summary of relevant background or baseline data;	Section 3
	(b) details of:	
	(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 1.4
	(ii) any relevant limits or performance measures and criteria; and	Section 4 Section 7
	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	
	(c) any relevant commitments or recommendations identified in the document/s listed in condition A2(c);	Attachment 1
	(d) a description of the management measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 5 Section 6
	(e) a program to monitor and report on the:	
	(i) impacts and environmental performance of the development; and	Section 5 Section 6
	(ii) effectiveness of the management measures set out pursuant to paragraph (d);	
	(f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 5.5 of EP 203-206 Attachment E
	(g) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 5.7.5 of EP 203-206
	(h) a protocol for managing and reporting any:	
	(i) incident, non-compliance or exceedance of any impact assessment criterion or performance criterion;	Section 5.6 of EP 203-206
	(ii) complaint; or	Section 5.8 of EP 203-206
	(iii) failure to comply with other statutory requirements;	Section 5.6 of EP 203-206
	(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and	Section 1.5 and section 5.7 of EP 203-206
	(j) a protocol for periodic review of the plan.	Section 5.7.4 of EP 203-206
E6.	The Applicant must ensure that management plans prepared for the development are consistent with the conditions of this consent and any EPL issued for the site.	Attachment 1
Revision of strategies, plans, and programs		
E7.	Within three months of the:	Section 5.7.4 of EP 203-206
	(a) submission of an incident report under condition E9 or E10;	
	(b) submission of an Annual Review under condition E11;	
	(c) submission of an Independent Environmental Audit under condition E13;	
	(d) approval of any modification of the conditions of this consent (unless the conditions require otherwise); or	

Condition	Requirement	Document reference
	(e) notification of a change in development phase under condition A14, the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.	
E8.	If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review. ***Note****: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*	
Incident notification		
E9.	The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing via the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 5.6.1 of EP 203-206
Non-compliance notification		
E10.	Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the noncompliance. The Notification must be in writing via the Department's Major Projects Website And identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance ***Note****: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.*	Section 5.6.2 of EP 203-206
Annual review		

Condition	Requirement	Document reference
E11.	By the end of March in each year after the commencement of the development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must: (i) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year; (ii) include a comprehensive review of the monitoring results and complaints record of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) (requirements of any plan or program required under this consent; (iii) monitoring results of previous years; and (iv) relevant predictions in the document/s listed in condition A2(c); (iii) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence; (iv) evaluate and report on: (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions of this consent; (v) include an addendum report on Scope 1 and Scope 2 GHGE, which reports: (i) annual methane and annual total CO2-e emissions (both categorised by source) and emissions intensity (based on ROM coal production); (ii) overall annual emissions intensity, benchmarked against representative industry sectors and the predictions in the EIS, and performance measures in Table 3; and (iii) measures undertaken to minimise Scope 1 and Scope 2 GHGE, including actions under condition B19, and estimated reductions in CO2-e as a result of measures implemented; (vi) identify any trends in the monitoring data over the life of the development; (vii) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Section 5.7.1 of EP 203-206
E12.	Copies of the Annual Review must be submitted to the Mining Panel (via the Department as Secretariat), NSC and GSC and regulatory agencies and made available to the CCC and any interested person upon request.	Section 5.7.1 of EP 203-206
Independent environmental audit		
E13.	Within one year of commencement of development under this consent, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development.	Section 5.7.3 of EP 203-206
Access to information		
E17.	Before the commencement of construction until the completion of all rehabilitation required under this consent, the Applicant must:	

Condition	Requirement	Document reference
	(a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website: (i) the documents referred to in condition A2(c) of this consent; (ii) all current statutory approvals for the development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) the proposed staging plans for the development if construction, mining operations or decommissioning is to be staged; (v) minutes of CCC meetings; (vi) regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; (vii) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (viii) a summary of the current phase and progress of the development; (ix) contact details to enquire about the development or to make a complaint; (x) a complaints register, updated monthly; (xi) the Annual Reviews of the development; (xii) audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; (xiii) any other matter required by the Planning Secretary; and (b) keep such information up to date, to the satisfaction of the Planning Secretary.	Section 1.5 of EP 203-206

Appendix B

Groundwater monitoring network details

Table B 1   Groundwater monitoring locations

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
Springs									
Mayfield	GDE	NCOPL	775670	6615617	-	NA	NA	Pilliga Sandstone	Flow rate and surface conditions
Eather (Dam 1)	GDE	-	771133	6602103	-	NA	NA	NA	Flow rate and surface conditions
Eather (Dam 2)	GDE	-	771292	6602251	-	NA	NA	NA	Flow rate and surface conditions
Hardy's	GDE	-	770726	6604763	-	NA	NA	NA	Flow rate and surface conditions
Blairmore Feature 1	GDE	-	773353	6597177	-	NA	NA	NA	Flow rate and surface conditions
Blairmore Feature 2	GDE	-	774557	6597554	-	NA	NA	NA	Flow rate and surface conditions
Standpipe monitoring bores									
P1	Standpipe	NCOPL	776116	6614694	316.06	50	44-50	Garrawilla Volcanics	Level and quality
P2	Standpipe	NCOPL	777282	6616355	275.92	50	44-50	Napperby Formation	Level and quality
P3	Standpipe	Private	780433	6620115	236.31	40	34-40	Pamboola Formation	Level and quality
P4	Standpipe	Private	777490	6625553	248.96	30	24-30	Napperby Formation	Level and quality
P5	Standpipe	Stock Route	778180	6628195	233.41	30	24-30	Pamboola Formation	Level
P6	Standpipe	Private	772726	6626021	326.19	90	78-90	Pilliga Sandstone	Level and quality
P7	Standpipe	State Forest	768998	6624338	289.69	90	78-90	Pilliga Sandstone	Level and quality
P8	Standpipe	State Forest	772697	6618421	322.11	65	57-63	Purlawaugh Formation	Level and quality

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P9	Standpipe	State Forest	775127	6620209	295.51	36	24-36	Purlawaugh Formation	Level and quality
P10	Standpipe	State Forest	774063	6616444	301.78	130	118-130	Napperby Formation (no sill)	Level and quality
P11	Standpipe	NCOPL	774066	6616447	301.62	40	34-40	Purlawaugh Formation	Level and quality
P12	Standpipe	NCOPL	776513	6619964	276.48	90	84-90	Napperby Formation (above sill)	Level and quality
P13	Standpipe	NCOPL	776526	6619972	276.48	30	24-30	Garrawilla Volcanics/Napperby	Level and quality
P16	Standpipe	State Forest	772233	6623740	303.51	146	137-146	Garrawilla Volcanics	Level and quality
P17	Standpipe	State Forest	772222	6623712	303.24	56	47-56	Purlawaugh Formation	Level and quality
P19	Standpipe	NCOPL	776827	6621543	275.09	187	184-187	Pamboola Formation	Level and quality
P28	Standpipe	NCOPL	778343	6620162	262.46	25	19-25	Napperby Formation (above sill)	Seepage
P29	Standpipe	NCOPL	778541	6619978	256.84	25	19-25	Napperby Formation (above sill)	Seepage
P30	Standpipe	NCOPL	778808	6620071	254.95	15	9-15	Napperby Formation (above sill)	Seepage
P31	Standpipe	NCOPL	778318	6620343	264.39	15	9-15	Napperby Formation (above sill)	Seepage
P32	Standpipe	NCOPL	778993	6620335	252.49	15	9-15	Napperby Formation (above sill)	Seepage
P33	Standpipe	NCOPL	778772	6620523	253.56	15	9-15	Napperby Formation (above sill)	seepage
P34	Standpipe	NCOPL	778542	6620604	255.96	15	9-15	Napperby Formation (above sill)	Seepage

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P39A	Standpipe	NCOPL	782024	6620076	228.25	80	72-78	Watermark Formation	Levels and quality
P39B	Standpipe	NCOPL	782017	6620077	228.33	32	15-30	Alluvium	Levels and quality
P51	Standpipe	NCOPL	777437	6620859	267.15	17	9-12	Garrawilla Volcanics	-
P52	Standpipe	NCOPL	777118	6620808	268.85	24	18-21	Napperby Formation	-
P53	Standpipe	NCOPL	776995	6620655	270.98	24	18-21	Garrawilla Volcanics	-
P58	Standpipe	NCOPL	778649	6619912	254.65	40	32-38	Napperby Formation¶	-
P59*	Standpipe	NCOPL	772297	6623437	300.0	6	4-6	Alluvium	Level and quality
P60*	Standpipe	NCOPL	772292	6623441	300.0	37.2	29-35	Pilliga Sandstone	Level and quality
P62*	Standpipe	NCOPL	775947	6623827	263.0	6	4-6	Alluvium/Colluvium	Level and quality
P63R*	Standpipe	NCOPL	775937	6623827	263.0	78.4	72-78	Napperby Formation	Level and quality
P65*	Standpipe	NCOPL	771617	6612196	378.0	4.6	2.6-4.6	Alluvium/Colluvium	Level and quality
P66*	Standpipe	NCOPL	771612	6612210	377.0	63	57-63	Pilliga Sandstone	Level and quality
P68*	Standpipe	NCOPL	776364	6616888	273.0	6	2-6	Alluvium/Colluvium	Level and quality
P69*	Standpipe	NCOPL	776354	6616909	273.0	72.3	63.3-72.3	Napperby	Level and quality
P71*	Standpipe	NCOPL	770780	6604887	317.0	6	3-6	Alluvium/Colluvium	Level and quality
P72*	Standpipe	NCOPL	770777	6604888	317.0	48	42-48	Purlawaugh	Level and quality
P74*	Standpipe	NCOPL	779584	6605944	252.0	5.9	2.9-5.9	Alluvium/Colluvium	Level and quality
P75*	Standpipe	NCOPL	779591	6605950	252.0	18.4	12.4-18.4	Napperby Formation	Level and quality

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P82*	Standpipe	NCOPL	771156	6618806	368.0	110	104-110	Pilliga Sandstone	Level and quality
P6B*	Standpipe	NCOPL	772735	6626015	326.0	108	93-102	Pilliga Sandstone	Level and quality
P90*	Standpipe	NCOPL	773523	6618540	315.0	80	70-76	Purlawargh Formation	Level and quality
P91*	Standpipe	NCOPL	775736	6615843	289.0	15	9-15	Alluvium	-
P92*	Standpipe	NCOPL	775694	6615503	295.0	15	9-15	Alluvium	-
Private bores									
WB1	Standpipe (Stock and domestic)	-	777251	6622763	265.84	-	-	Garrawilla Volcanics	Level and quality
WB2	Standpipe (Stock and domestic)	NCOPL	776382	6619701	281.0	26	22-26	Garrawilla Volcanics	Level and quality
WB3a	Standpipe	-	779133	6631524	226.0	-	8.2-8.5	Alluvium	Level and quality
WB3b	Standpipe	-	779133	6631524	226.0	-	35.1-36.3	Alluvium	Level and quality
WB4	Standpipe	-	778957	6629746	224.0	-	11.3-15.9	Alluvium	Level and quality
WB5a	Standpipe	-	785892	6618196	233.0	-	11-14.5	Alluvium	Level and quality
WB5b	Standpipe	-	785892	6618196	233.0	-	26.5-28	Alluvium	Level and quality
WB6a	Standpipe	-	786976	6615621	234.0	-	11.5-13	Alluvium	Level and quality
WB6b	Standpipe	-	786976	6615621	234.0	-	76.7-78	Alluvium	Level and quality
WB7	Standpipe	-	784440	6620521	230.0	-	-	Alluvium	Level and quality
WB8	Standpipe (Stock and domestic)	-	777682	6623409	-	-	27.4-29.8	Alluvium	Level and quality

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
WB10 (GW013858)	Standpipe (Stock and domestic)	Private	774254	6603250	-	33.5	24.3-30.3	Napperby Formation	Level
WB11 (House bore)	Standpipe (Stock and domestic)	Private	772678	6601496	-	58	unknown	Garrawilla Volcanics	Level
WB12 (257_bore)	Standpipe	Private	780874	6617836	240.0	100	60-75	Arkarula Formation and Pamboola Formation	level
WB13 (GW008634)	Standpipe (Stock and domestic)	Private	772930	6597095	-	78.3	25.9-30.4 and 70.7-78.2	Garrawilla Volcanics/Napperby Formation	Level
WB14 (GW026121)	Standpipe	Private	773126	6603421	-	20.1	unknown	Garrawilla Volcanics	Level
WB15 (Windmill Bore)	Standpipe	Private	779733	6628836	-	20	Unknown	Napperby Formation	Level
WB16 (South Caloola)	Standpipe	Private	775254	6602244	-	41	Unknown	Napperby Formation	Level
WB17 (GW903687 - Solar Bore)	Standpipe (Stock and domestic)	Private	779491	6628525	-	23.88	Unknown	Napperby Formation	Level
WB18 (Mentone Bore)	Standpipe (Stock and domestic)	Private	776686	6629386	-	16.69	Unknown	Napperby Formation	Level
Vibrating wire piezometers									
P42_185	VWP	NCOPL	771092	6614376	335.92	427	185	Purlawaugh Formation	Level
P42_345	VWP	NCOPL	771092	6614376	335.92	427	345	Digby Formation	Level
P42_375	VWP	NCOPL	771092	6614376	335.92	427	375	Benelabri Formation	Level

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P42_395	VWP	NCOPL	771092	6614376	335.92	427	395	Hoskissons Coal Seam	Level
P42_415	VWP	NCOPL	771092	6614376	335.92	427	415	Arkarula Formation	Level
P42_90	VWP	NCOPL	771092	6614376	335.84	121	90	Pilliga Sandstone	Level
P44_134	VWP	NCOPL	777434	6623212	268.15	471	134	Digby Formation	Level
P44_245	VWP	NCOPL	777434	6623212	268.15	471	245	Arkarula Formation	Level
P44_330	VWP	NCOPL	777434	6623212	268.15	471	330	Arkarula Formation	Level
P44_375	VWP	NCOPL	777434	6623212	268.15	471	375	Arkarula Formation	Level
P44_445	VWP	NCOPL	777434	6623212	268.15	471	445	Arkarula Formation	Level
P44_95	VWP	NCOPL	777434	6623212	268.09	98	95	Napperby Formation	Level
P45_42	VWP	NCOPL	779491	6620117	247.27	291	42.5	Digby Formation	Level
P45_80	VWP	NCOPL	779491	6620117	247.27	291	80	Arkarula Formation	Level
P45_150	VWP	NCOPL	779491	6620117	247.27	291	150	Watermark Formation	Level
P45_200	VWP	NCOPL	779491	6620117	247.27	291	200	Watermark Formation	Level
P45_240	VWP	NCOPL	779491	6620117	247.27	291	240	Watermark Formation	Level
P45_276	VWP	NCOPL	779491	6620117	247.27	291	276	Watermark Formation	Level
P46_70	VWP	NCOPL	777395	6617847	262.33	396	70	Napperby Formation	Level
P46_87	VWP	NCOPL	777395	6617847	262.33	396	87	Digby Formation	Level

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P46_151	VWP	NCOPL	777395	6617847	262.33	396	151	Pamboola Formation	Level
P46_250	VWP	NCOPL	777395	6617847	262.33	396	250	Watermark Formation	Level
P46_308	VWP	NCOPL	777395	6617847	262.33	396	308	Porcupine Formation	Level
P46_343	VWP	NCOPL	777395	6617847	262.33	396	343	Leard Formation	Level
P54_30	VWP	State Forest	773079	6610419	363.07	348	30	Pilliga Sandstone	Level
P54_60	VWP	State Forest	773079	6610419	363.07	348	60	Purlawaugh Formation	Level
P54_100	VWP	State Forest	773079	6610419	363.07	348	100	Purlawaugh Formation	Level
P54_140	VWP	State Forest	773079	6610419	363.07	348	140	Napperby Formation	Level
P54_180	VWP	State Forest	773079	6610419	363.07	348	180	Napperby Formation	Level
P54_220	VWP	State Forest	773079	6610419	363.07	348	220	Napperby Formation	Level
P54_260	VWP	State Forest	773079	6610419	363.07	348	260	Napperby Formation	Level
P54_300	VWP	State Forest	773079	6610419	363.07	348	300	Benelabri Formation	Level
P54_338	VWP	State Forest	773079	6610419	363.07	348	338	Arkarula Formation	Level
P55_68	VWP	NCOPL	776425	6610503	274.56	230	68	Napperby Formation	Level
P55_91	VWP	NCOPL	776425	6610503	274.56	230	91	Napperby Formation	Level
P55_103	VWP	NCOPL	776425	6610503	274.56	230	103	Digby Formation	Level
P55_128	VWP	NCOPL	776425	6610503	274.56	230	128	Arkarula Formation	Level
P55_152	VWP	NCOPL	776425	6610503	274.56	230	152	Pamboola Formation	Level

Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P55_188	VWP	NCOPL	776425	6610503	274.56	230	188	Pamboola Formation	Level
P55_221	VWP	NCOPL	776425	6610503	274.56	230	221	Pamboola Formation	Level
P56_55	VWP	NCOPL	776277	6614725	315.38	368	55	Napperby Formation	Level
P56_85	VWP	NCOPL	776277	6614725	315.38	368	85	Napperby Formation	Level
P56_115	VWP	NCOPL	776277	6614725	315.38	368	115	Napperby Formation	Level
P56_145	VWP	NCOPL	776277	6614725	315.38	368	145	Napperby Formation	Level
P56_175	VWP	NCOPL	776277	6614725	315.38	368	175	Arkarula Formation	Level
P56_205	VWP	NCOPL	776277	6614725	315.38	368	205	Pamboola Formation	Level
P56_235	VWP	NCOPL	776277	6614725	315.38	368	235	Pamboola Formation	Level
P56_265	VWP	NCOPL	776277	6614725	315.38	368	265	Watermark Formation	Level
P56_300	VWP	NCOPL	776277	6614725	315.38	368	300	Porcupine Formation	Level
P61_92	VWP	NCOPL	772294.83	6623437.5	299.56	303	92	Purlawaugh Formation	Level
P61_138	VWP	NCOPL	772294.83	6623437.5	299.56	303	138	Garrawilla Volcanics	Level
P61_205	VWP	NCOPL	772294.83	6623437.5	299.56	303	205	Napperby Formation	Level
P61_260	VWP	NCOPL	772294.83	6623437.5	299.56	303	260	Basalt Sill	Level
P61_300	VWP	NCOPL	772294.83	6623437.5	299.56	303	300	Digby Formation	Level
P64_104	VWP	NCOPL	775929.23	6623827.5	263.59	162	104	Napperby Formation (upper)	Level

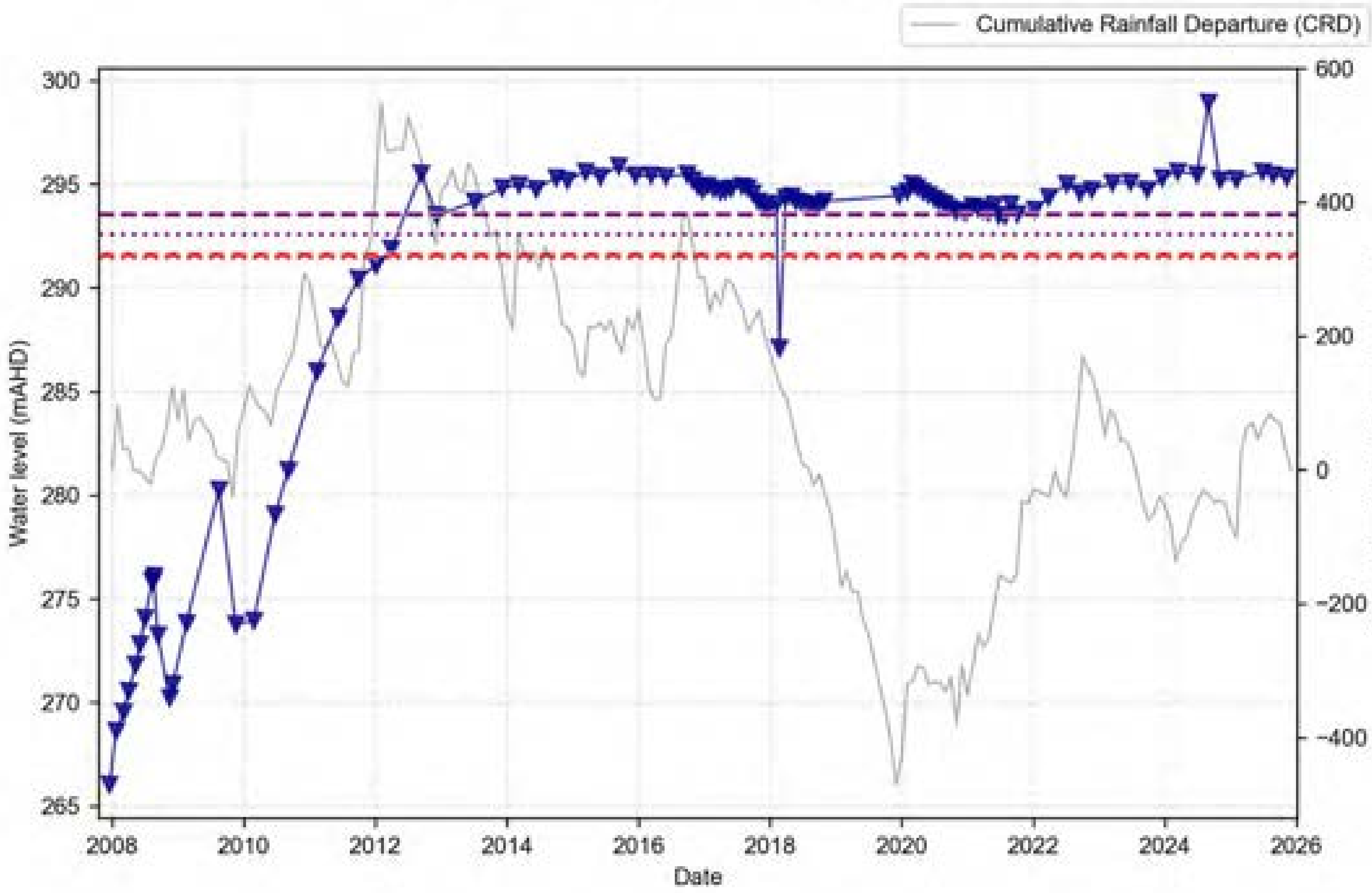
Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P64_120	VWP	NCOPL	775929.23	6623827.5	263.59	162	120	Napperby Formation (lower)	Level
P64_150	VWP	NCOPL	775929.23	6623827.5	263.59	162	150	Digby Formation	Level
P64_159	VWP	NCOPL	775929.23	6623827.5	263.59	162	159	Hoskissons coal seam	Level
P67_115	VWP	NCOPL	771606.69	6612207	377.29	374	115	Purlawaugh Formation (upper)	Level
P67_170	VWP	NCOPL	771606.69	6612207	377.29	374	170	Purlawaugh Formation (lower)	Level
P67_240	VWP	NCOPL	771606.69	6612207	377.29	374	240	Napperby Formation (upper)	Level
P67_300	VWP	NCOPL	771606.69	6612207	377.29	374	300	Napperby Formation (lower)	Level
P67_371	VWP	NCOPL	771606.69	6612207	377.29	374	371	Digby Formation	Level
P70_85	VWP	NCOPL	776364.49	6616908.8	272.98	127	85	Napperby Formation	Level
P70_118	VWP	NCOPL	776364.49	6616908.8	272.98	127	118	Digby Formation	Level
P70_124	VWP	NCOPL	776364.49	6616908.8	272.98	127	124	Hoskissons coal seam	Level
P73_90	VWP	NCOPL	770782.24	6604886.2	316.95	323	90	Garrawilla Volcanics	Level
P73_175	VWP	NCOPL	770782.24	6604886.2	316.95	323	175	Napperby Formation	Level
P73_310	VWP	NCOPL	770782.24	6604886.2	316.95	323	310	Digby Formation	Level
P73_320	VWP	NCOPL	770782.24	6604886.2	316.95	323	320	Arkarula Formation	Level
P76_11	VWP	NCOPL	777720.05	6610667.5	263.01	108	11	Napperby Formation (upper)	Level

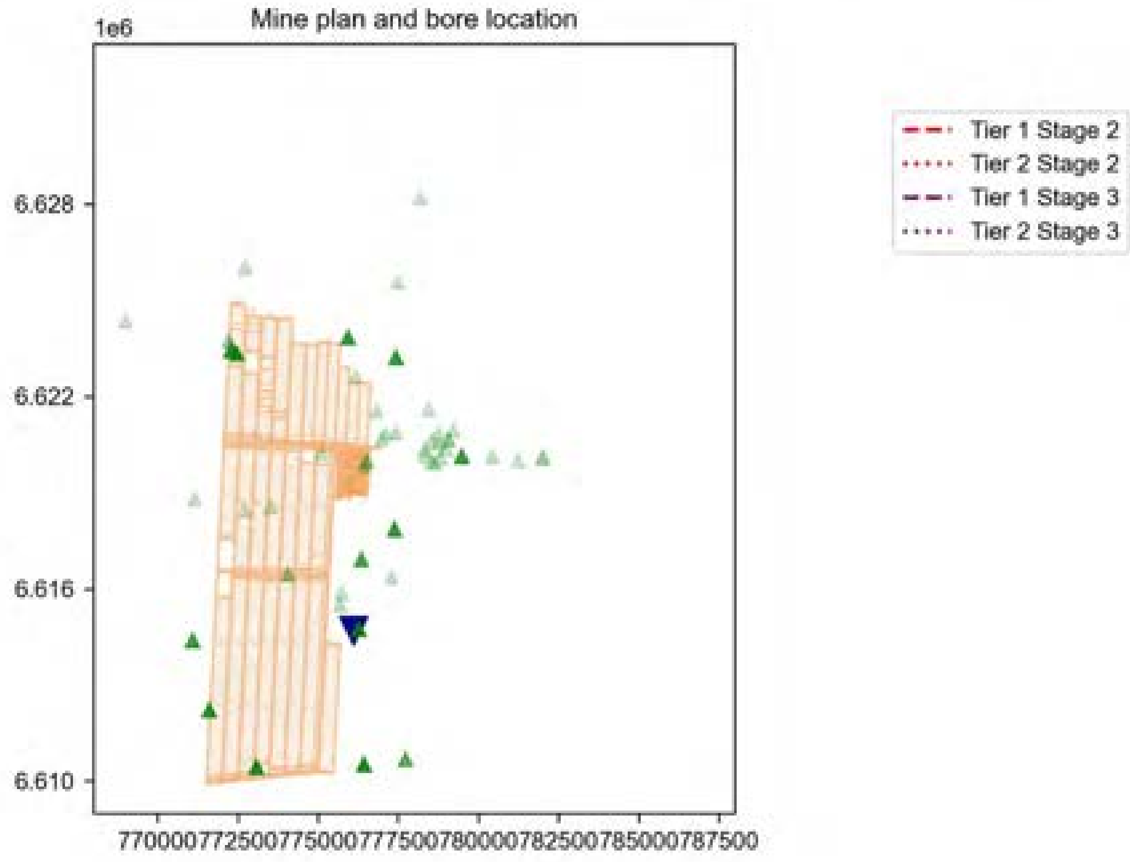
Location ID	Monitoring type	Owner	Eastings (MGA55)	Northings (MGA55)	Ground elevation (m AHD)	Bore depth (m)	Screen interval (m bgl)	Formation	Monitoring purpose
P76_40	VWP	NCOPL	777720.05	6610667.5	263.01	108	40	Napperby Formation (lower)	Level
P76_81	VWP	NCOPL	777720.05	6610667.5	263.01	108	81	Digby Formation	Level
P76_105	VWP	NCOPL	777720.05	6610667.5	263.01	108	105	-	Level
P77_40	VWP	NCOPL	772459.43	6623324.8	302.54	298	40	Pilliga Sandstone	Level
P77_90	VWP	NCOPL	772459.43	6623324.8	302.54	298	90	Purlawaugh Formation	Level
P77_145	VWP	NCOPL	772459.43	6623324.8	302.54	298	145	Garrawilla Volcanics	Level
P77_205	VWP	NCOPL	772459.43	6623324.8	302.54	298	205	Napperby Formation (upper)	Level
P77_245	VWP	NCOPL	772459.43	6623324.8	302.54	298	245	Napperby Formation (middle)	Level
P77_265	VWP	NCOPL	772459.43	6623324.8	302.54	298	265	Napperby Formation (lower)	Level
P77_295	VWP	NCOPL	772459.43	6623324.8	302.54	298	295	Digby Formation	Level

Appendix C

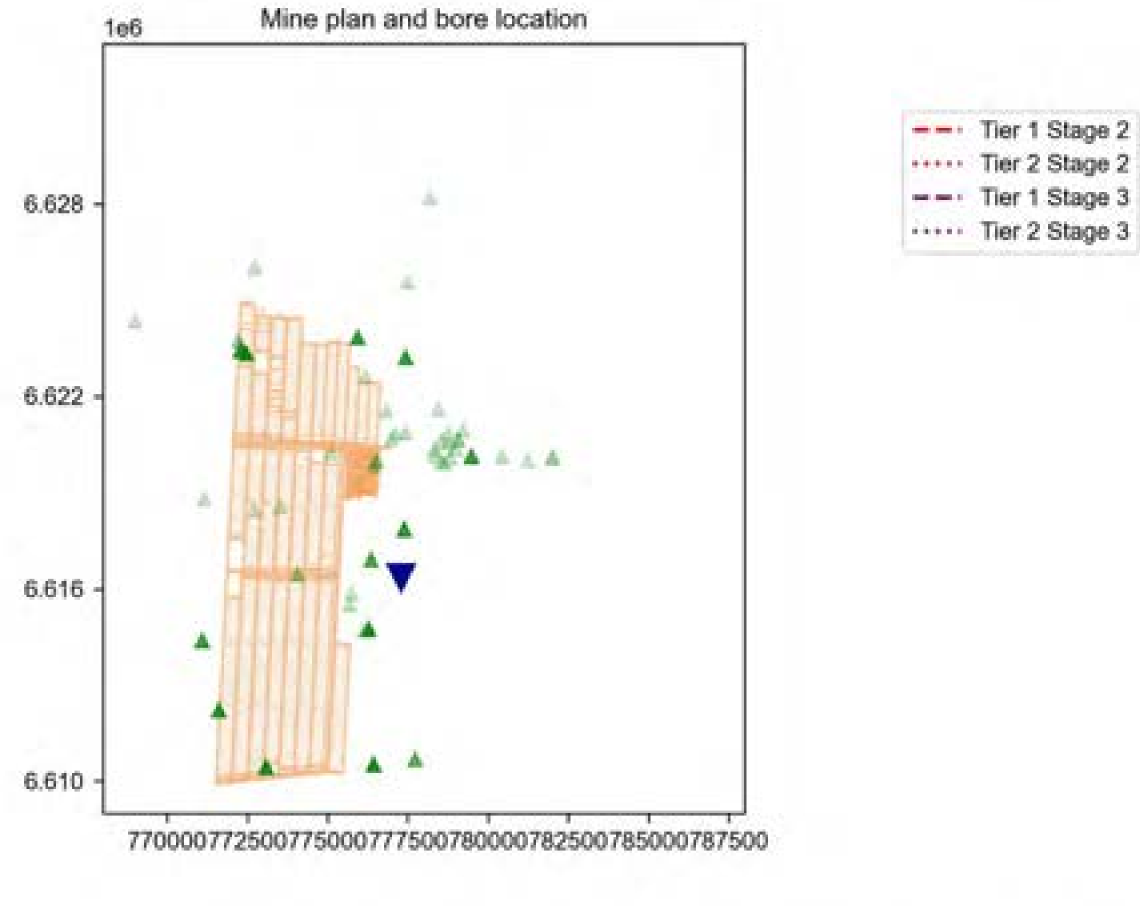
Hydrographs

P1 (Garrawilla Volcanics; Subcrop)

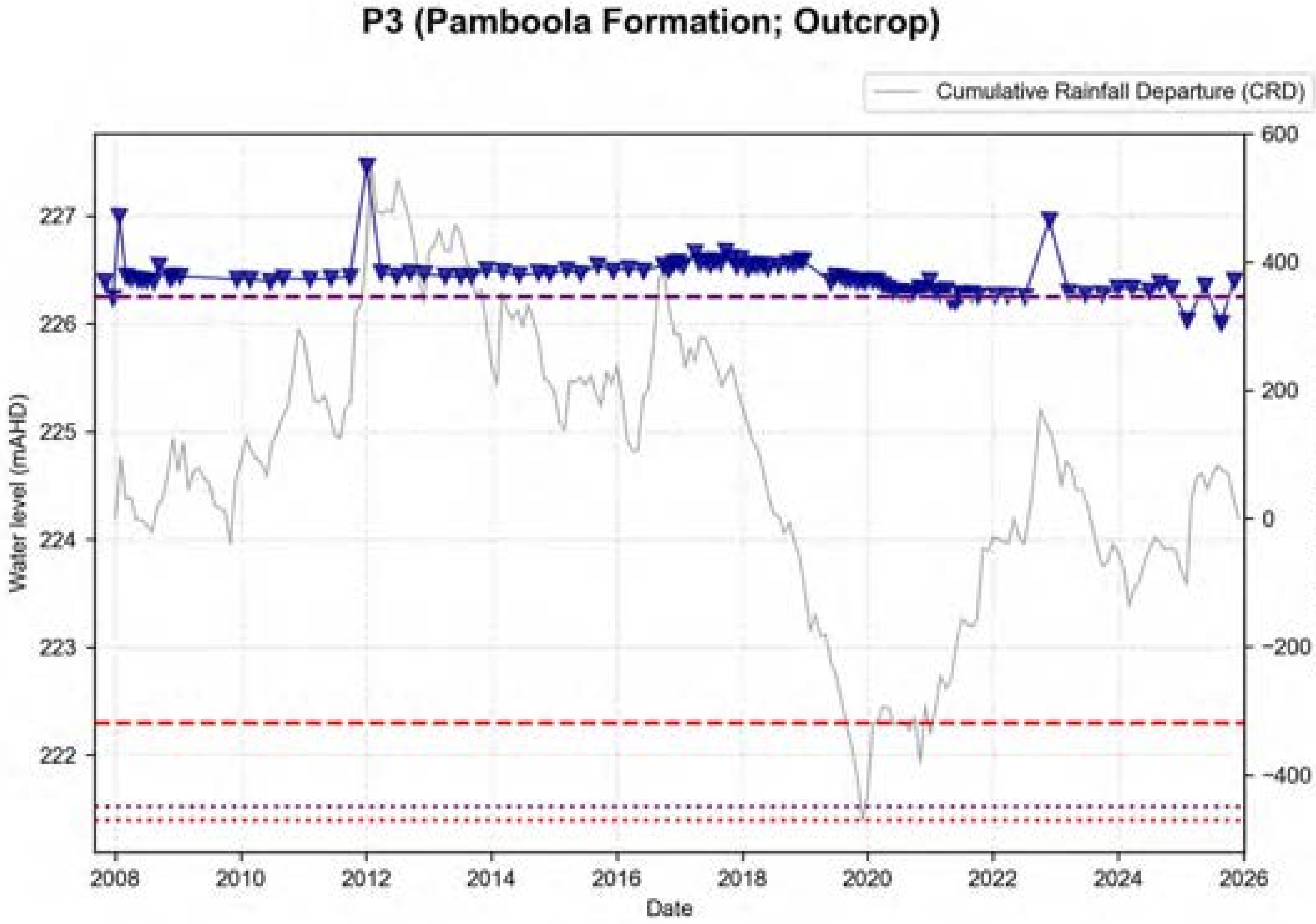




P2 (Napperby Formation; Subcrop)

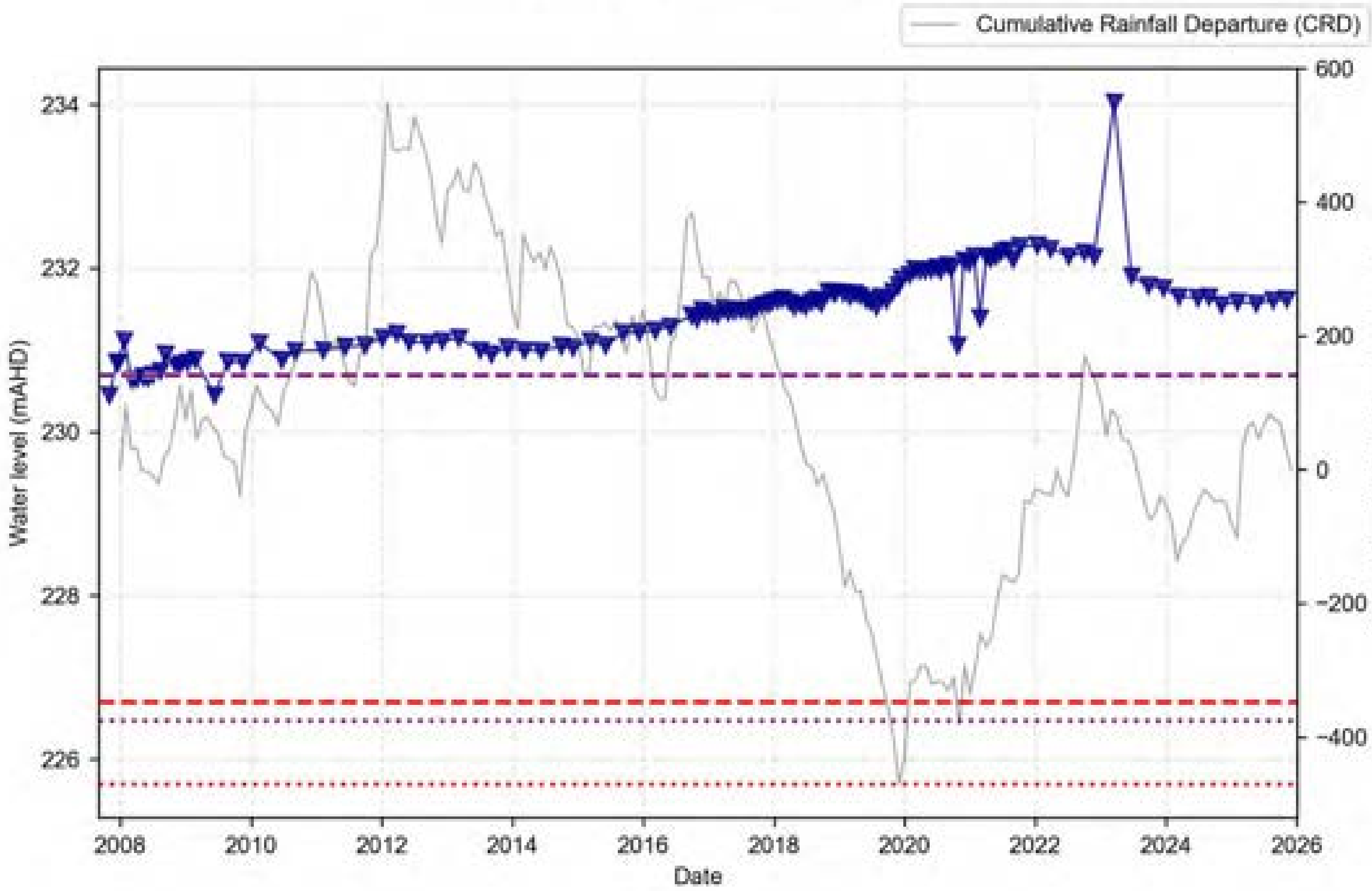


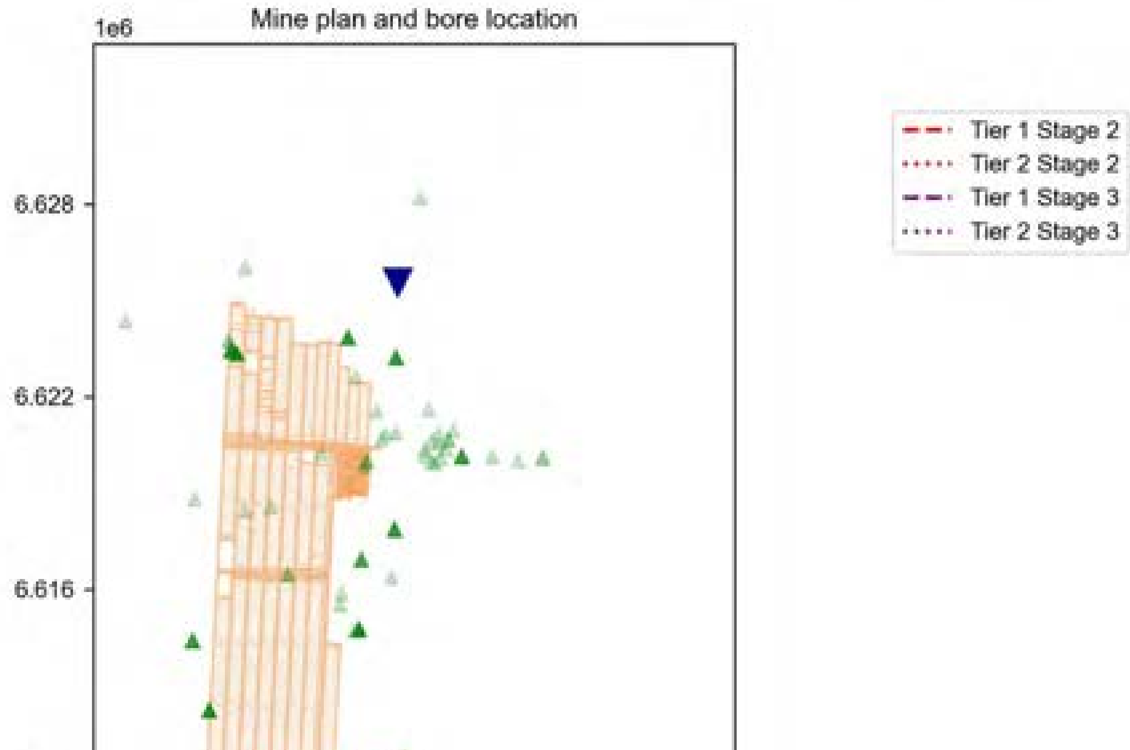
* mAHD - metres Australian Height Datum



* mAHD - metres Australian Height Datum

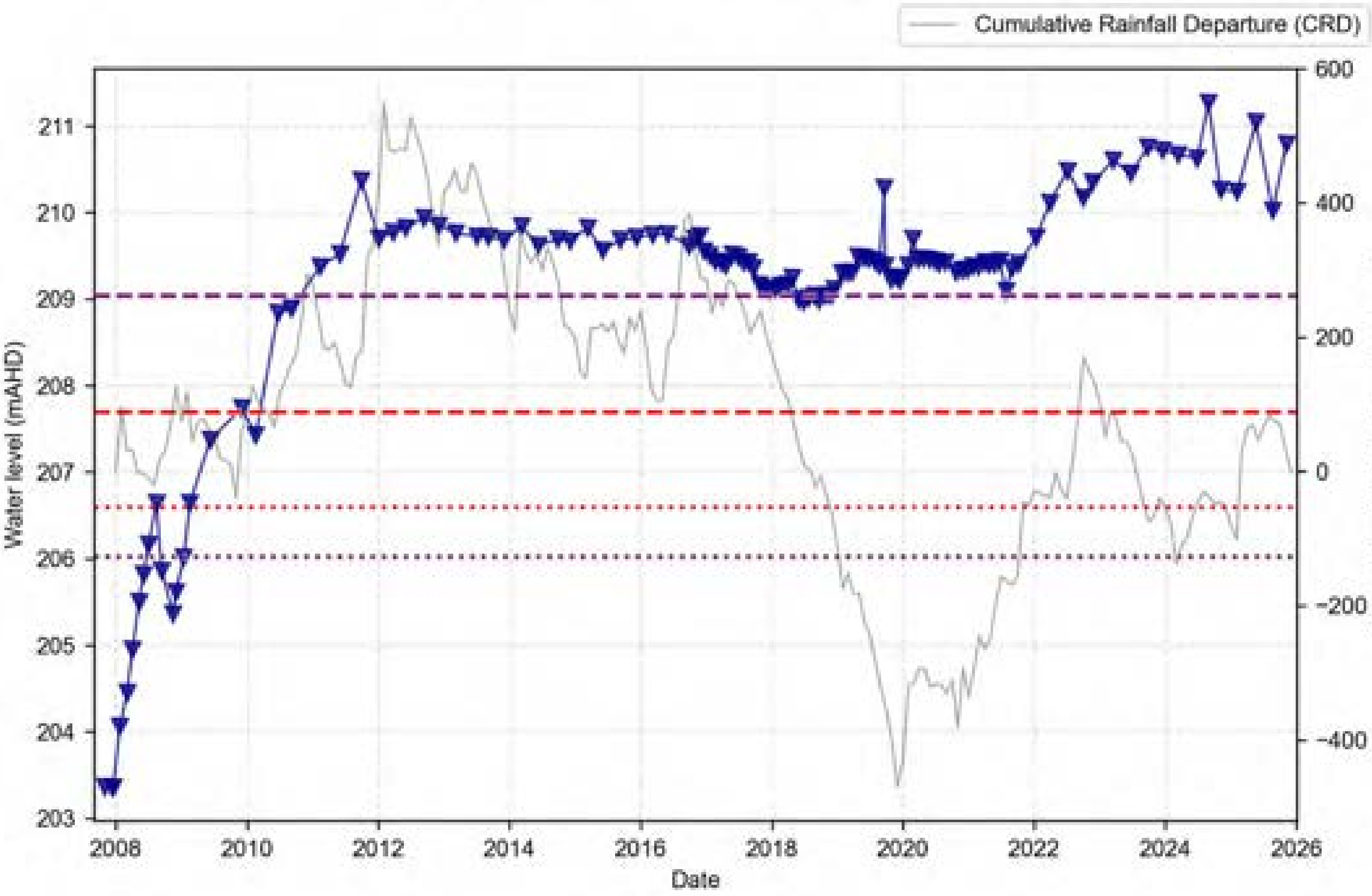
P4 (Napperby Formation; Outcrop)

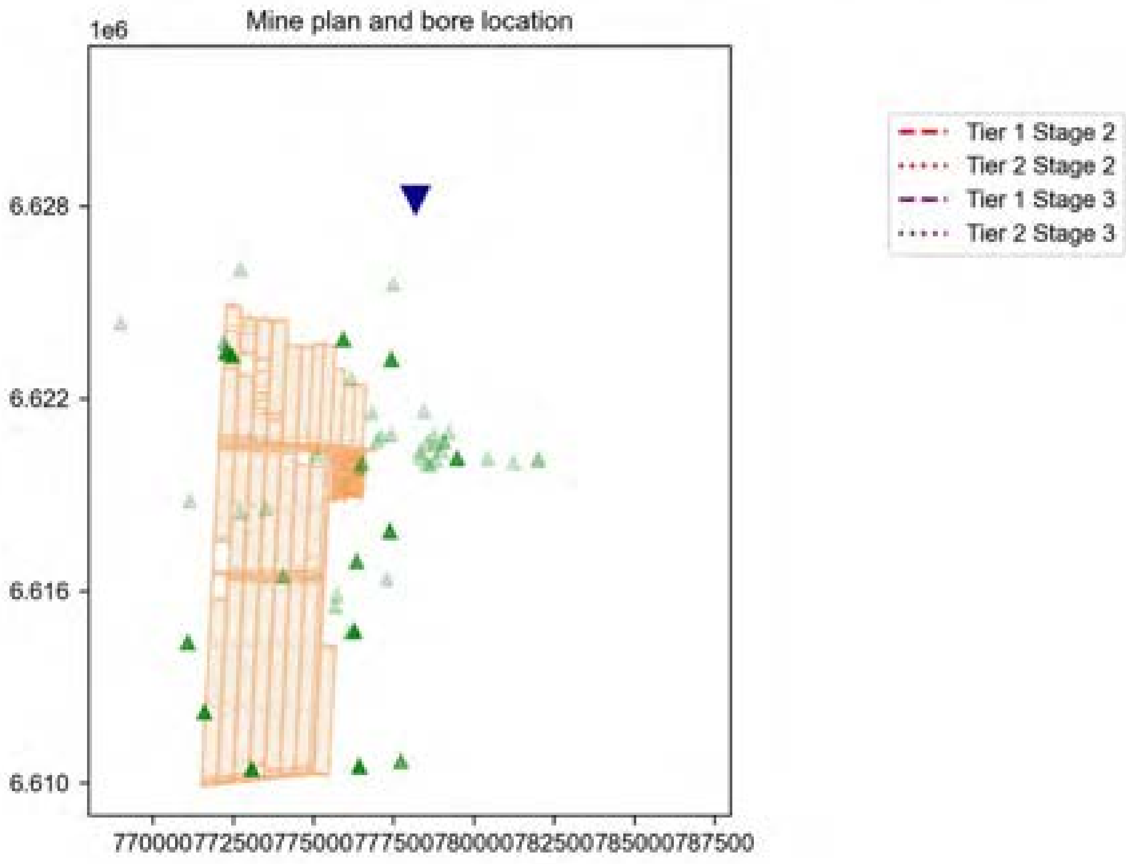




* mAHD - metres Australian Height Datum

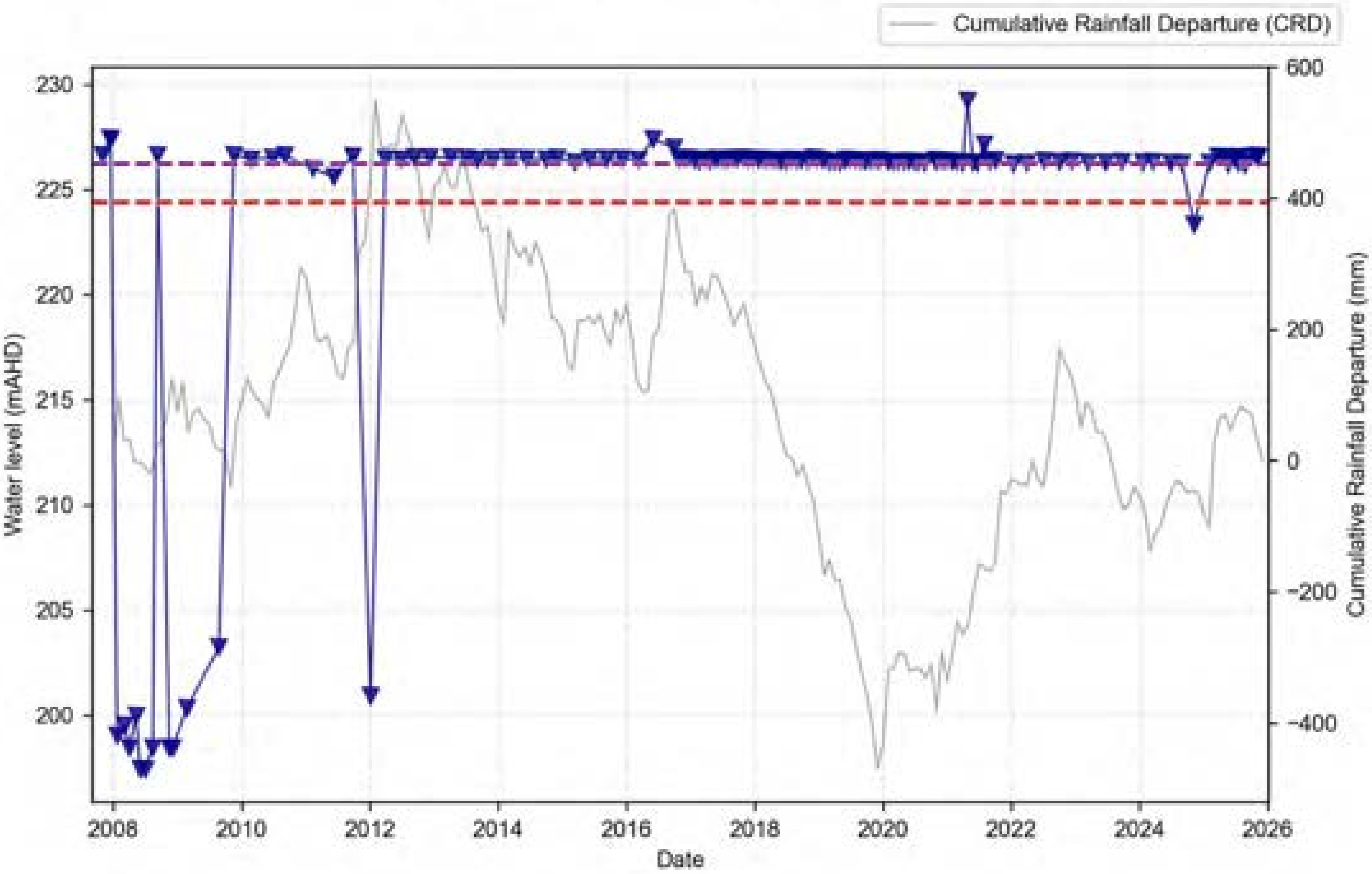
P5 (Pamboola Formation; Outcrop)

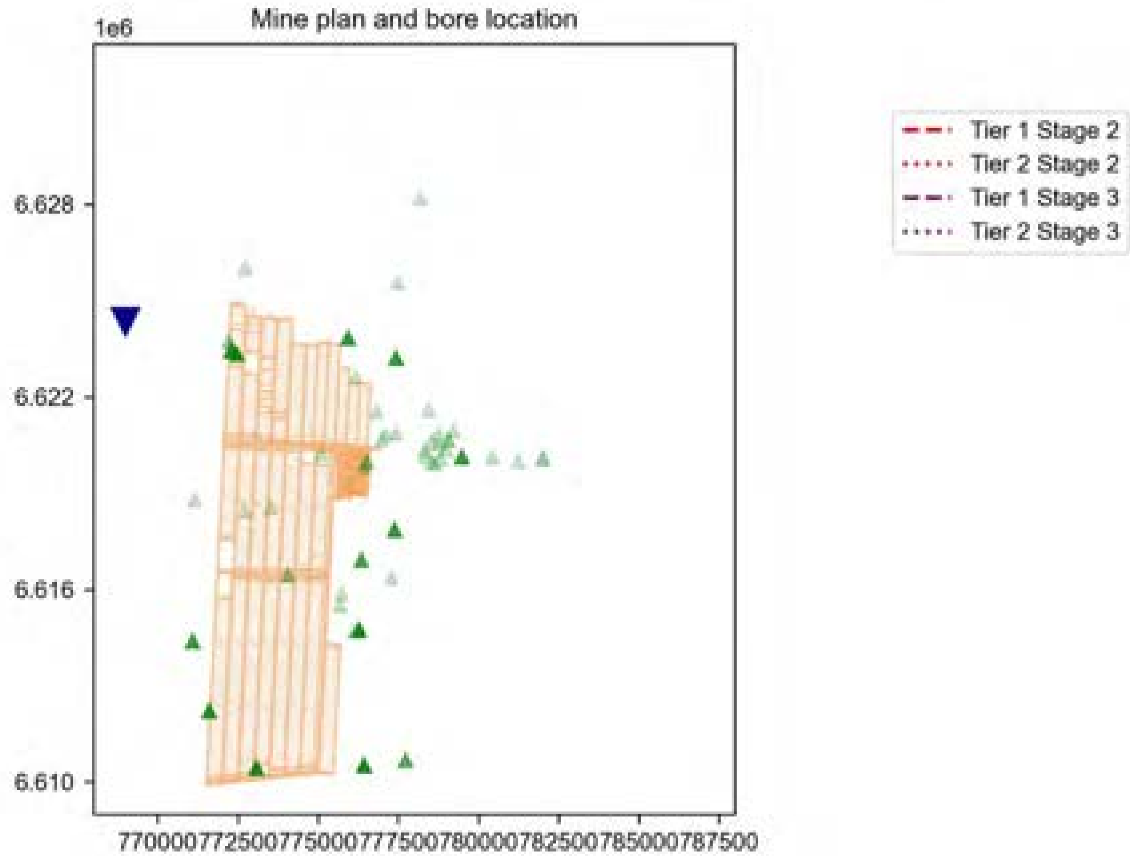




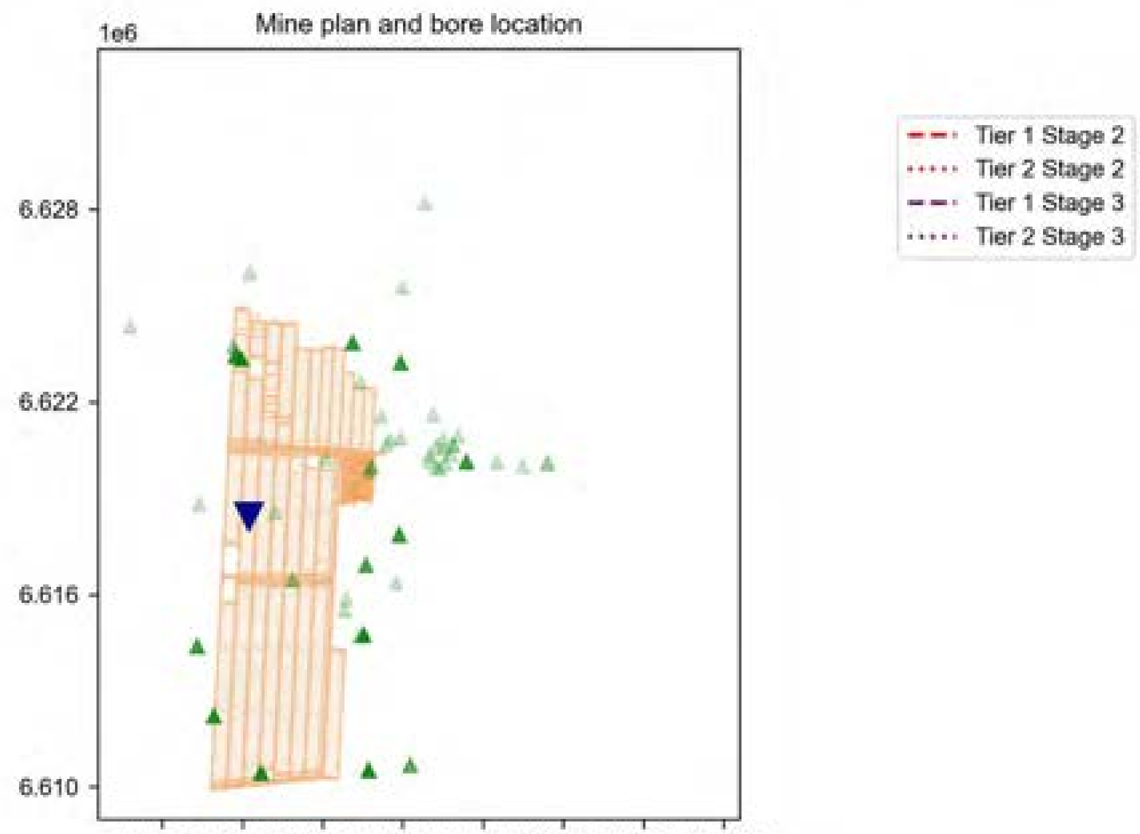
* mAHD - metres Australian Height Datum

P7 (Pilliga Sandstone; Outcrop)



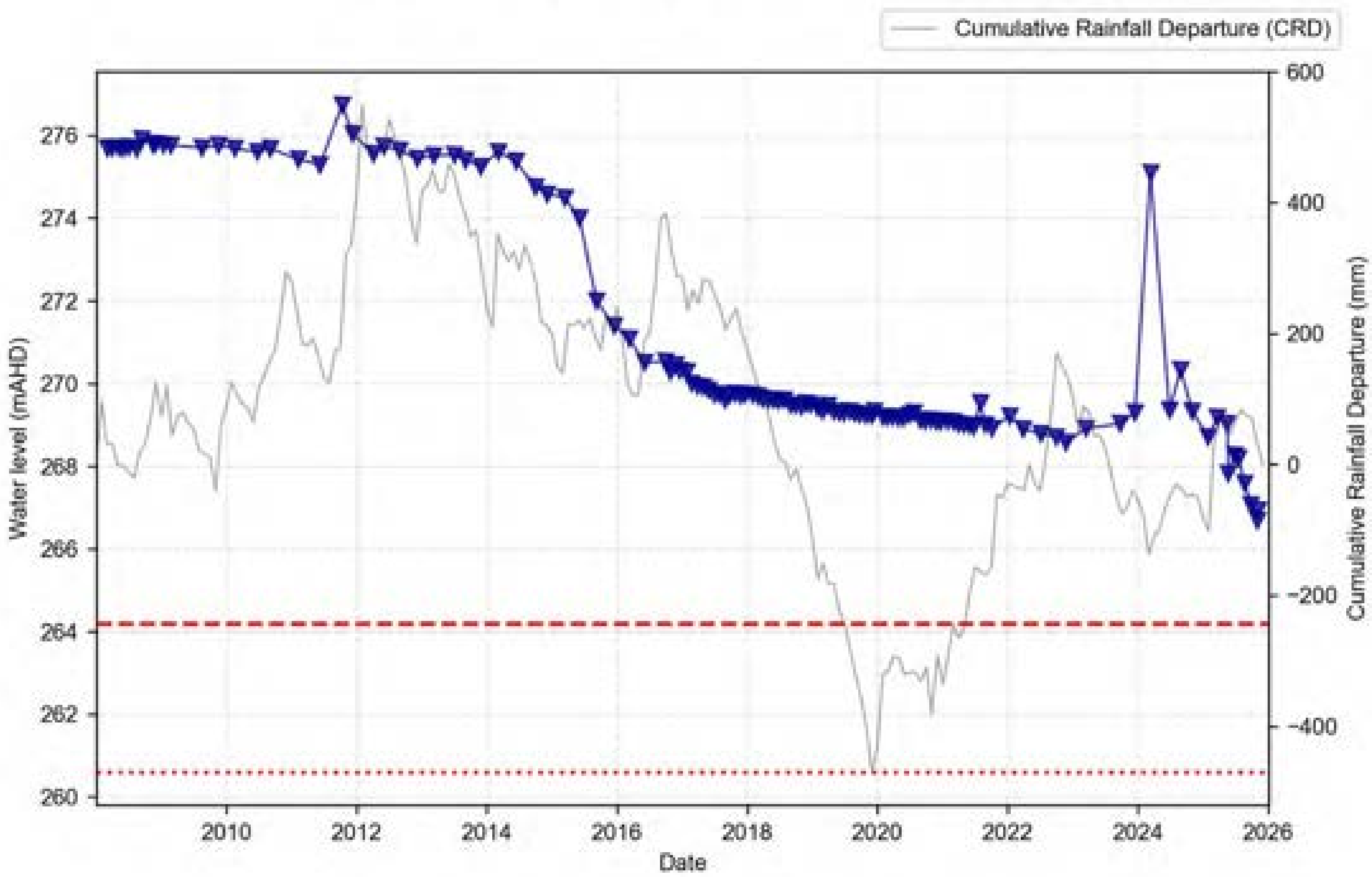


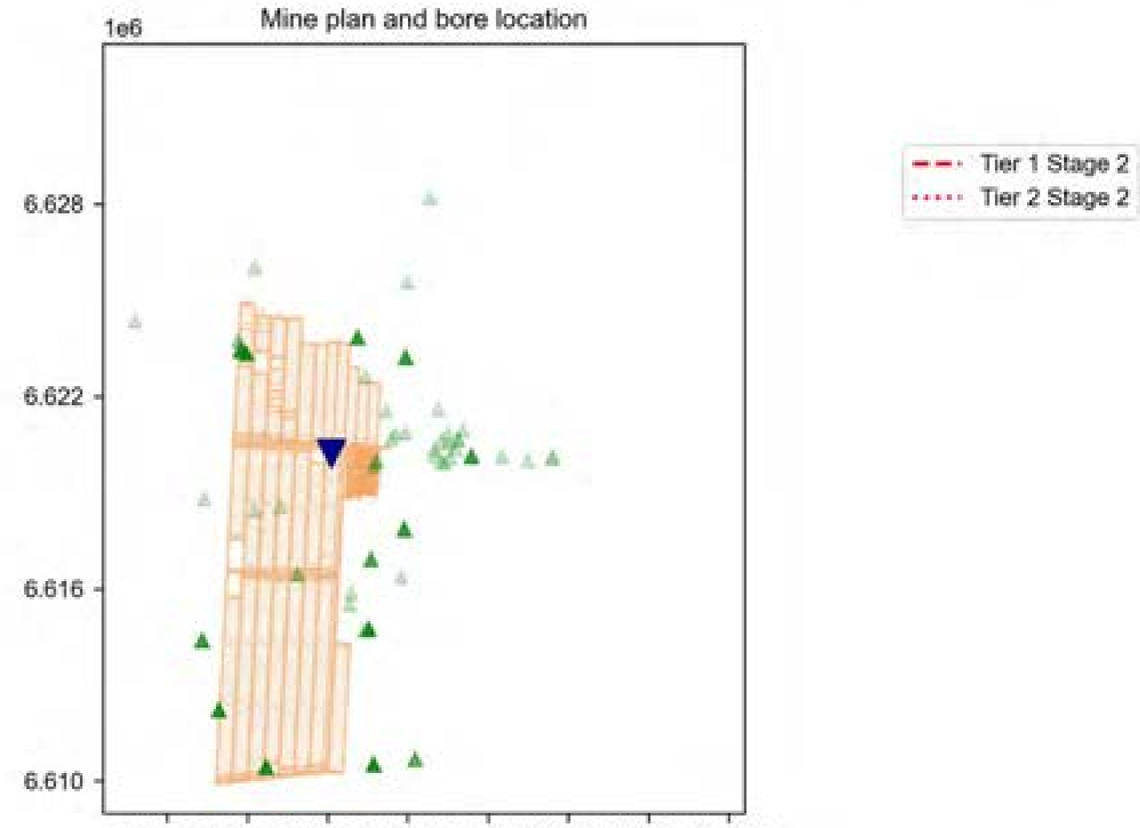
P8 (Purlawaugh Formation; Outcrop)



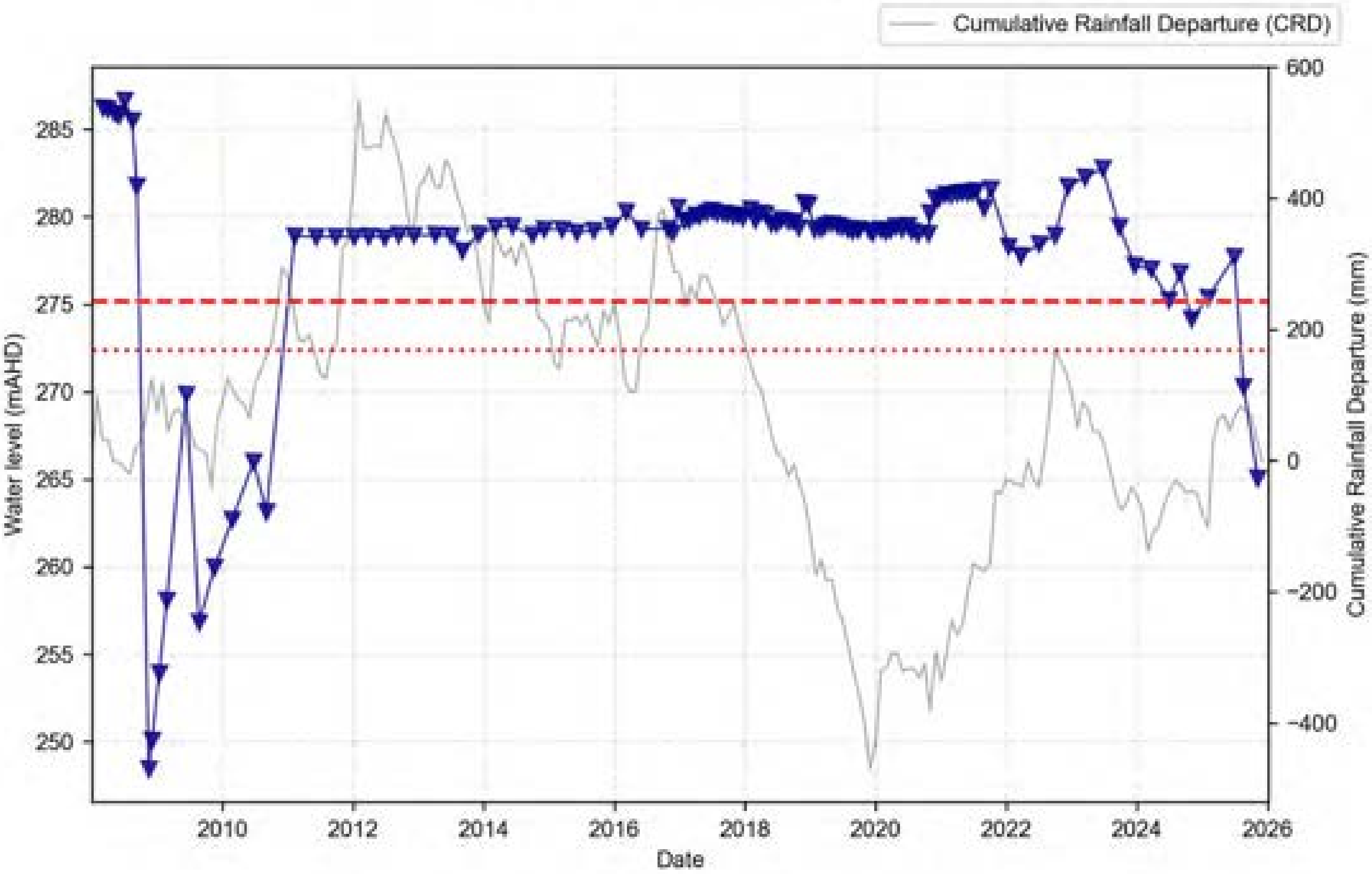
* mAHD - metres Australian Height Datum

P9 (Purlawaugh Formation; Outcrop)

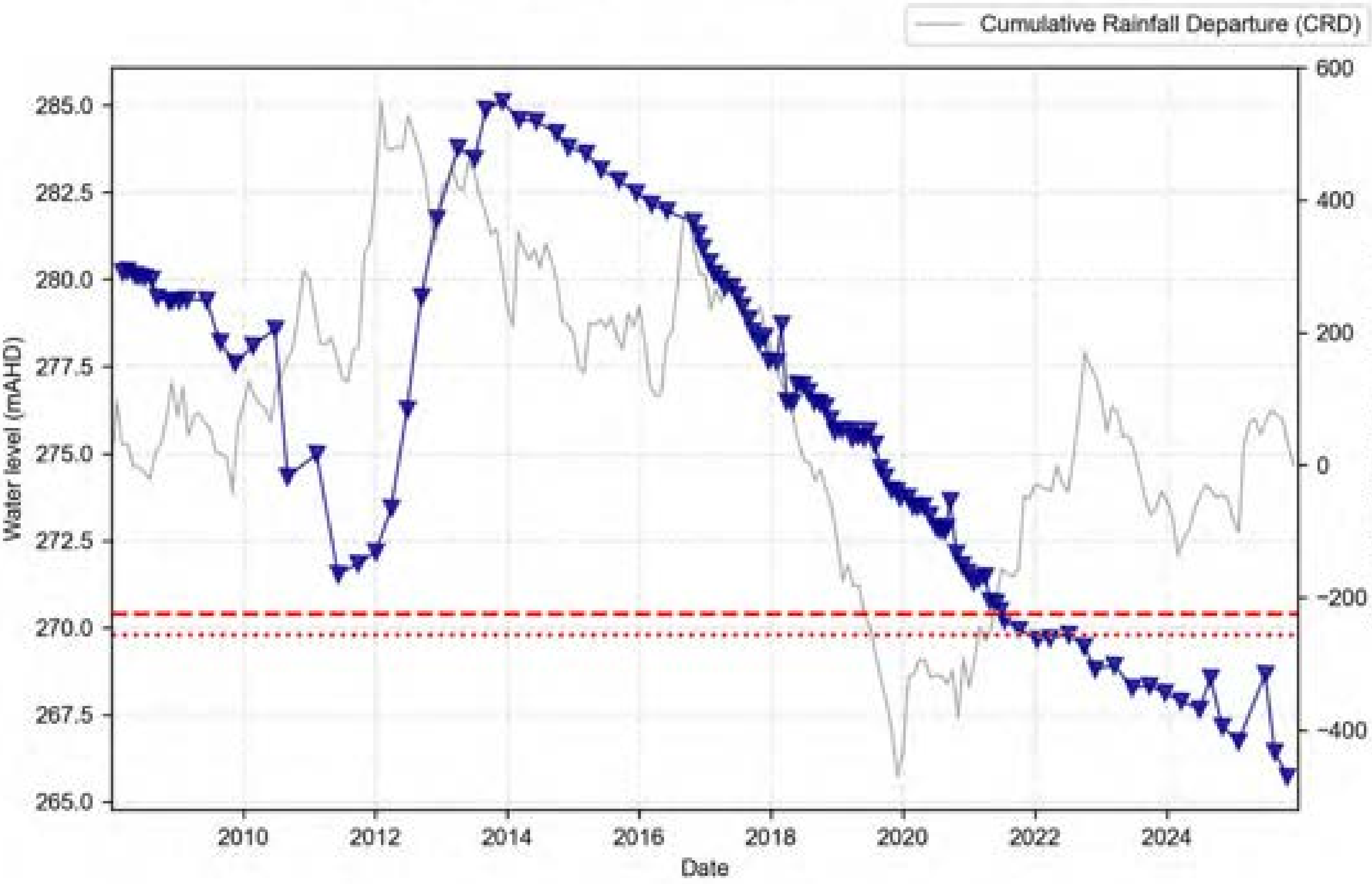


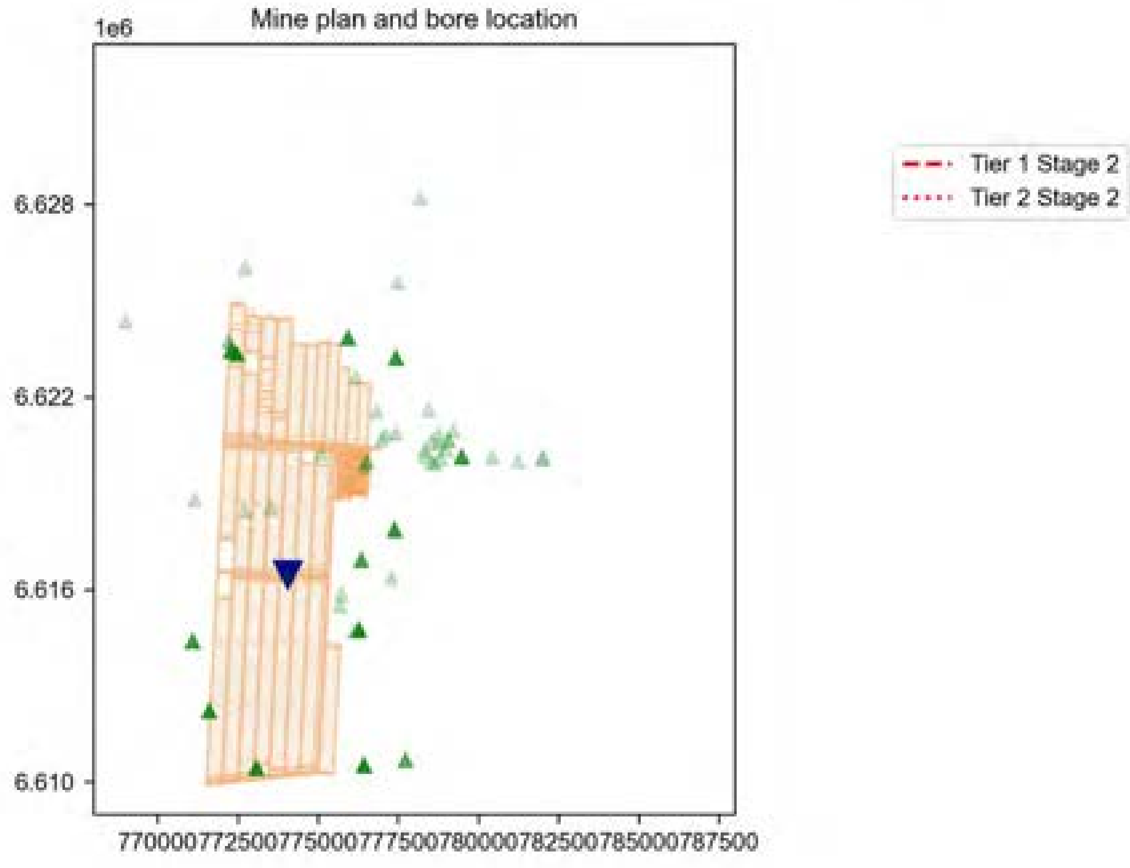


P10 (Napperby Formation; Subcrop)

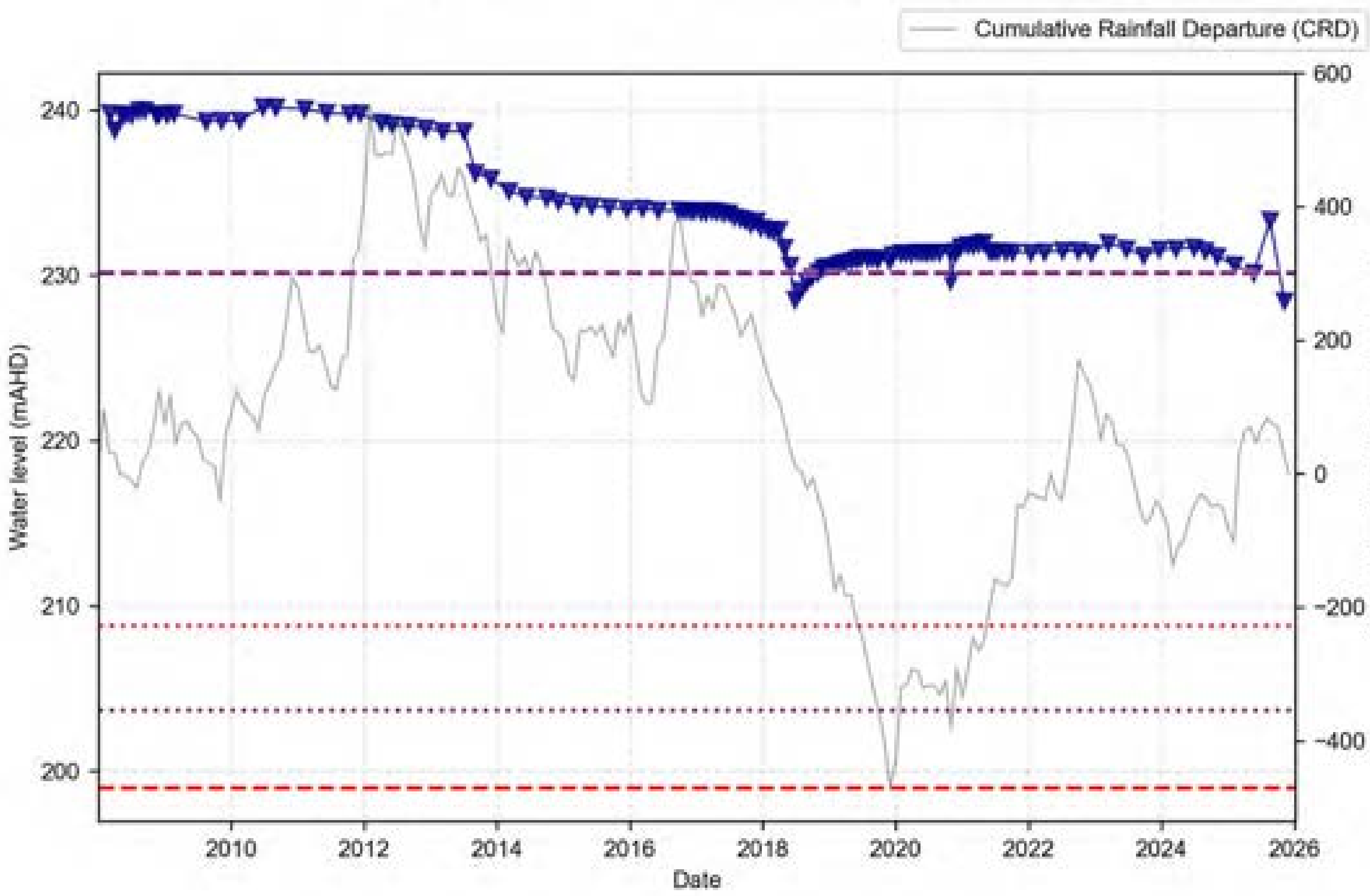


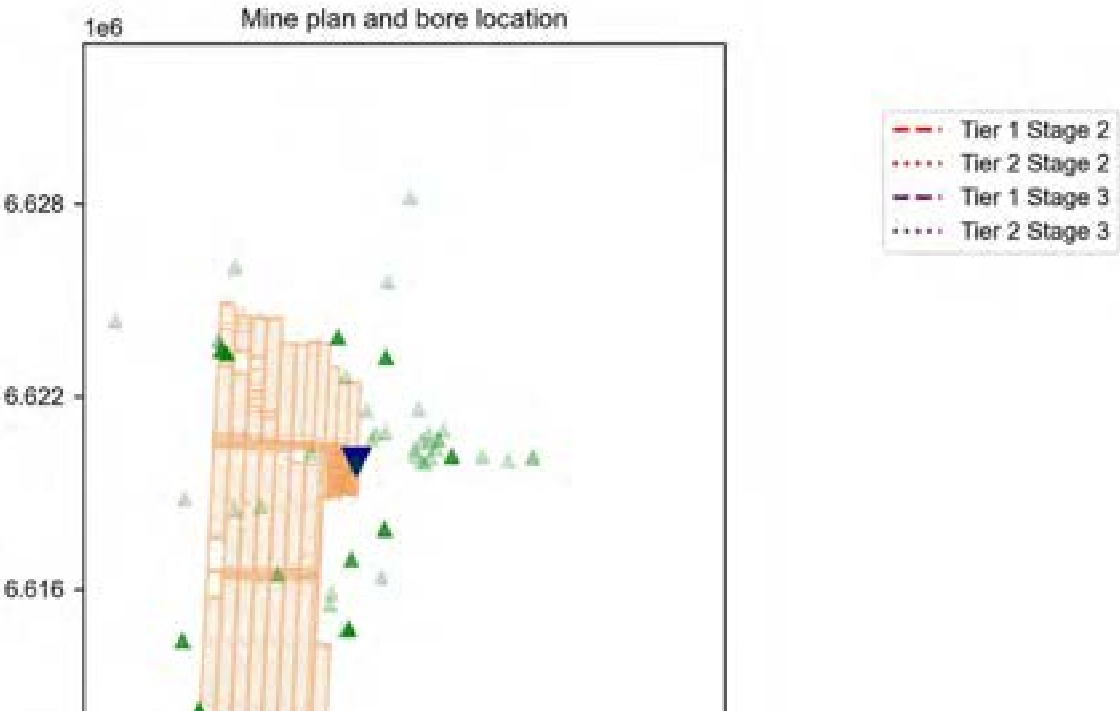
P11 (Purlawaugh Formation; Subcrop)



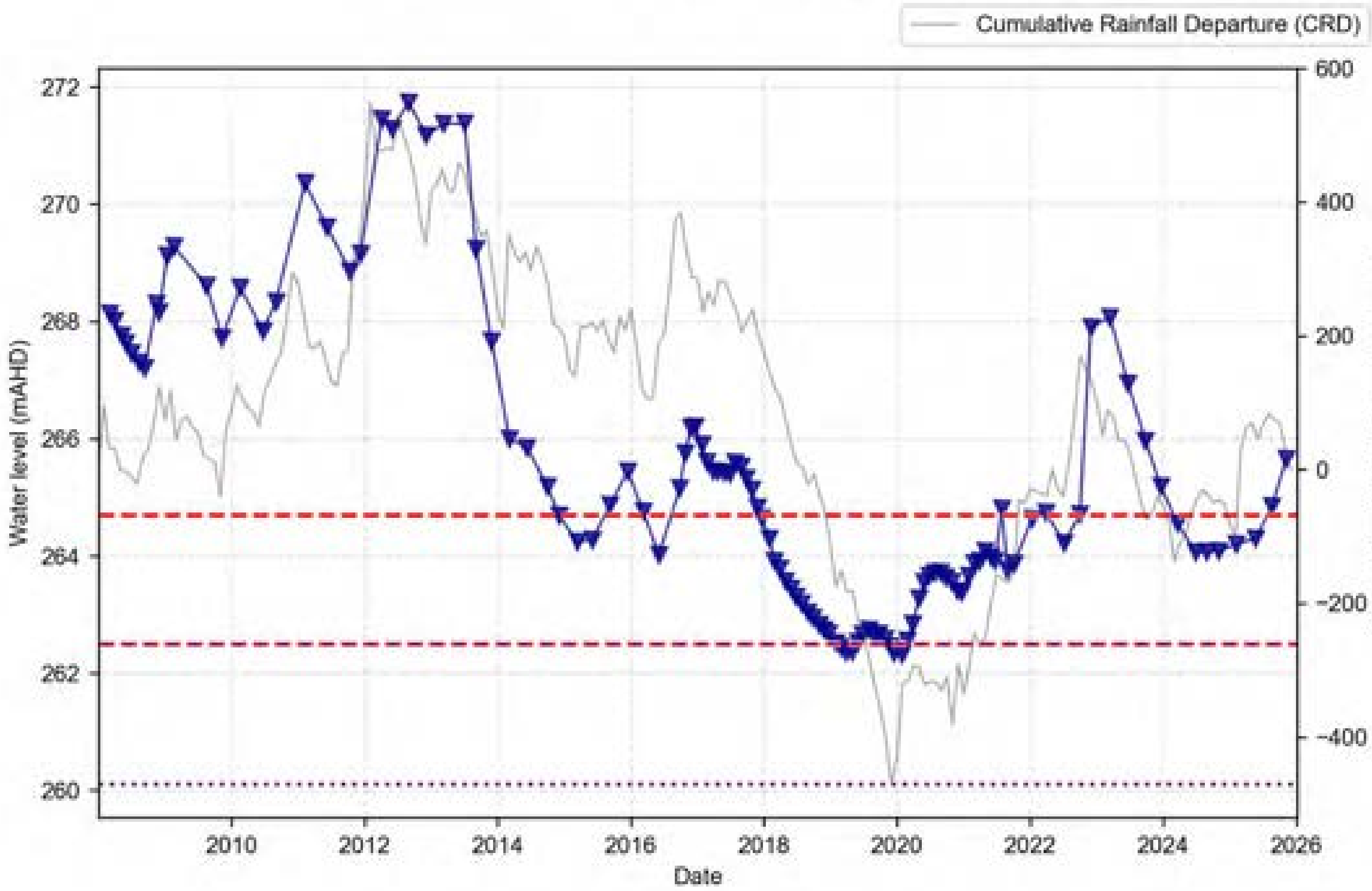


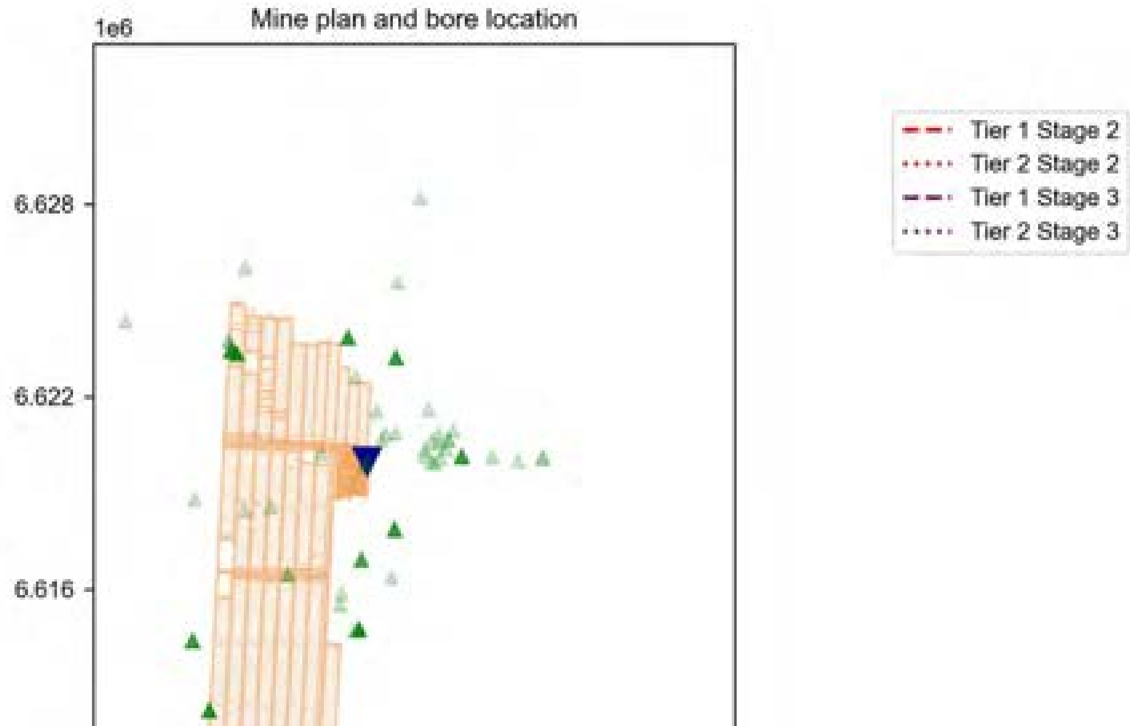
P12 (Napperby Formation; Subcrop)



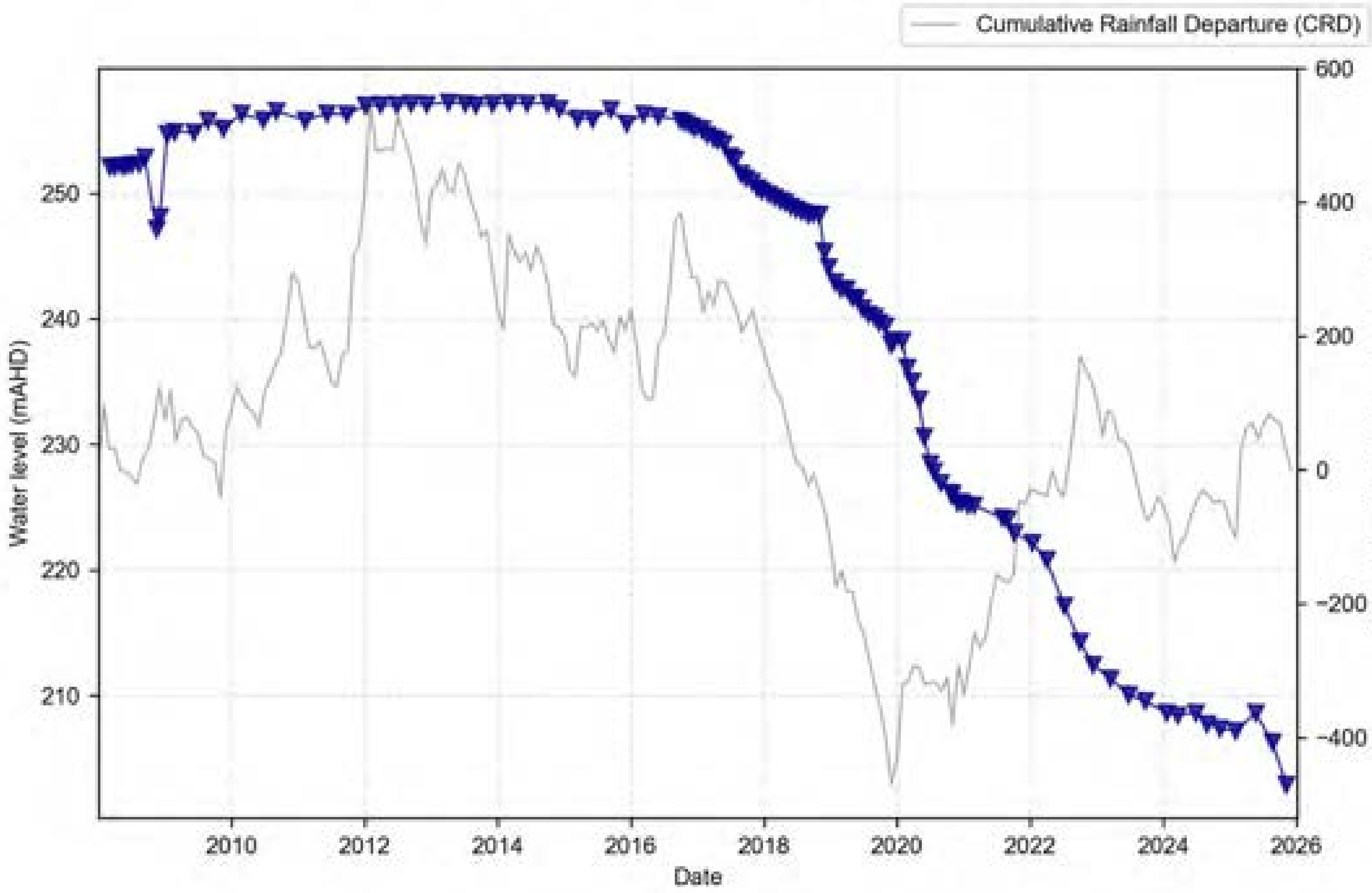


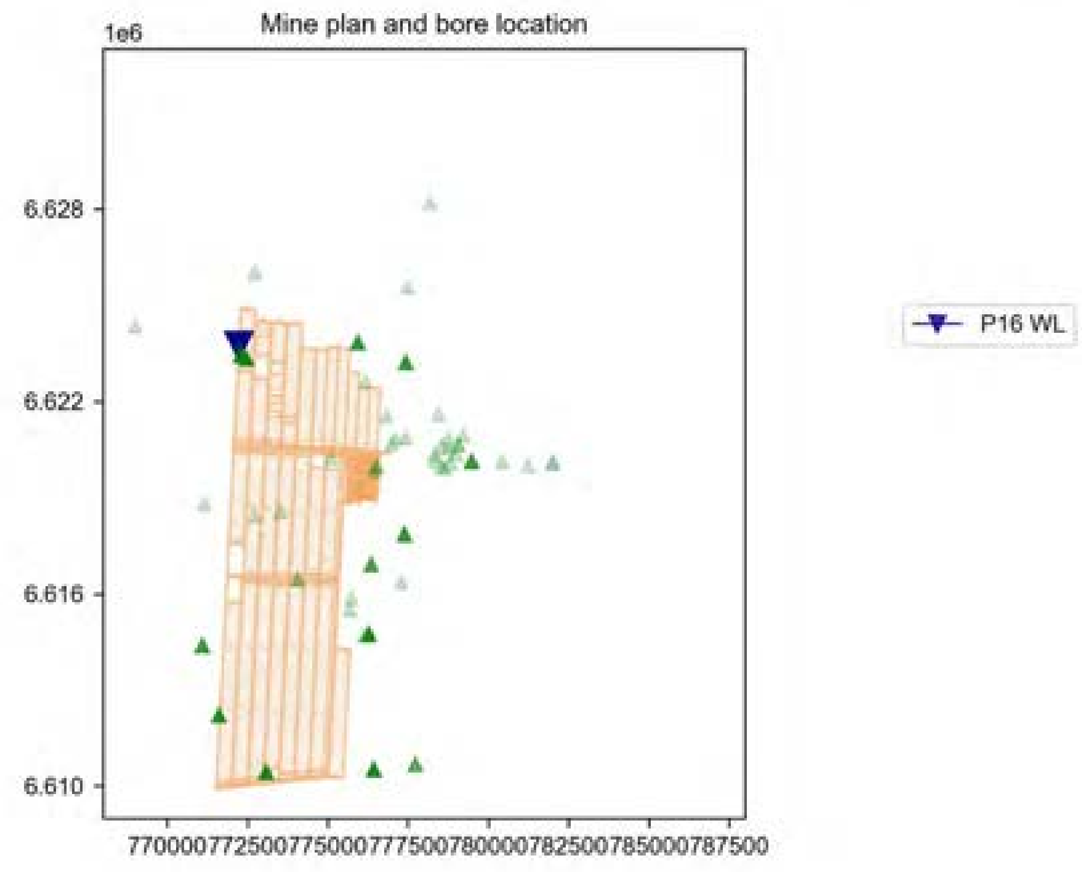
P13 (Garrawilla Volcanics; Subcrop)



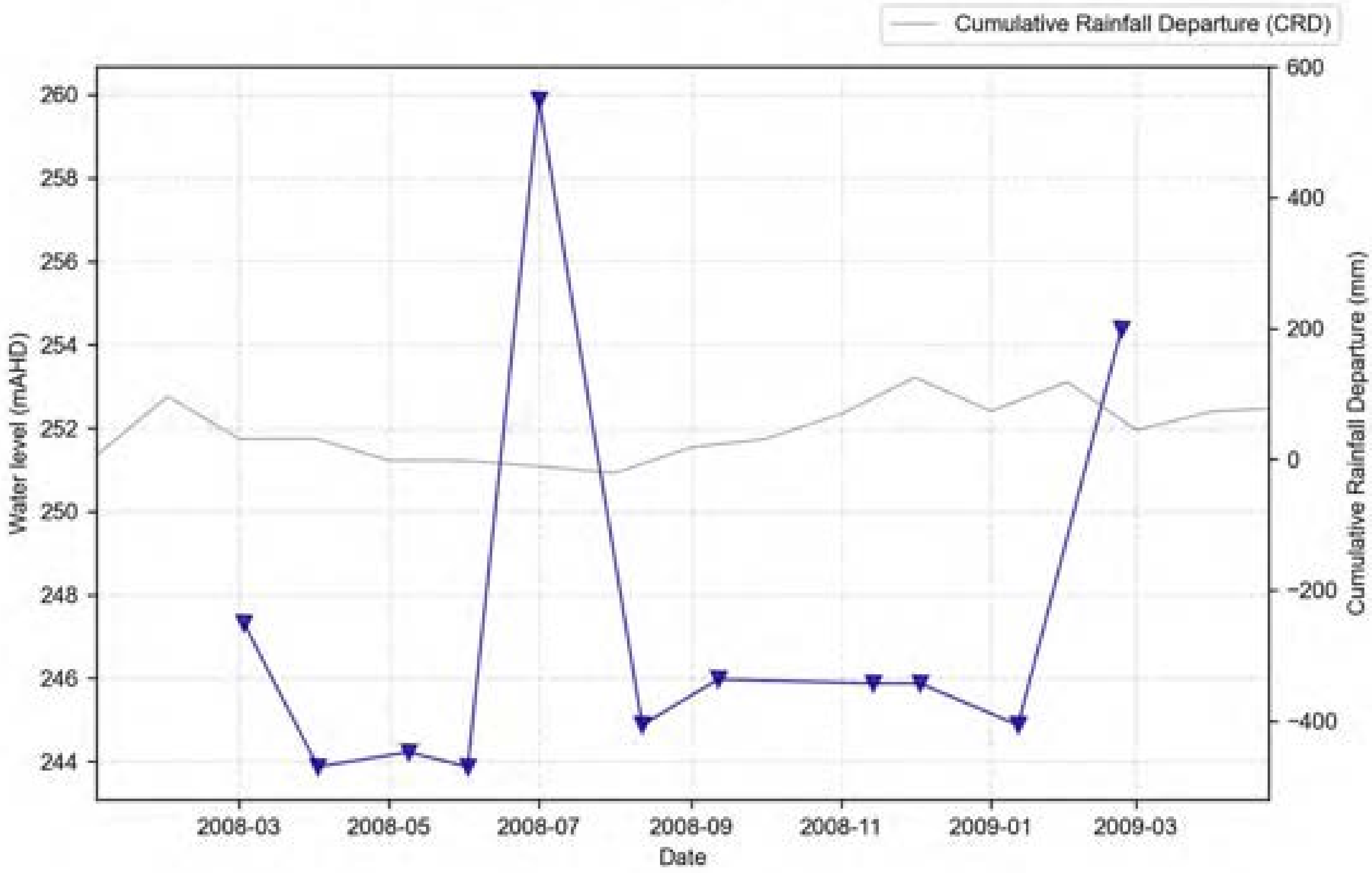


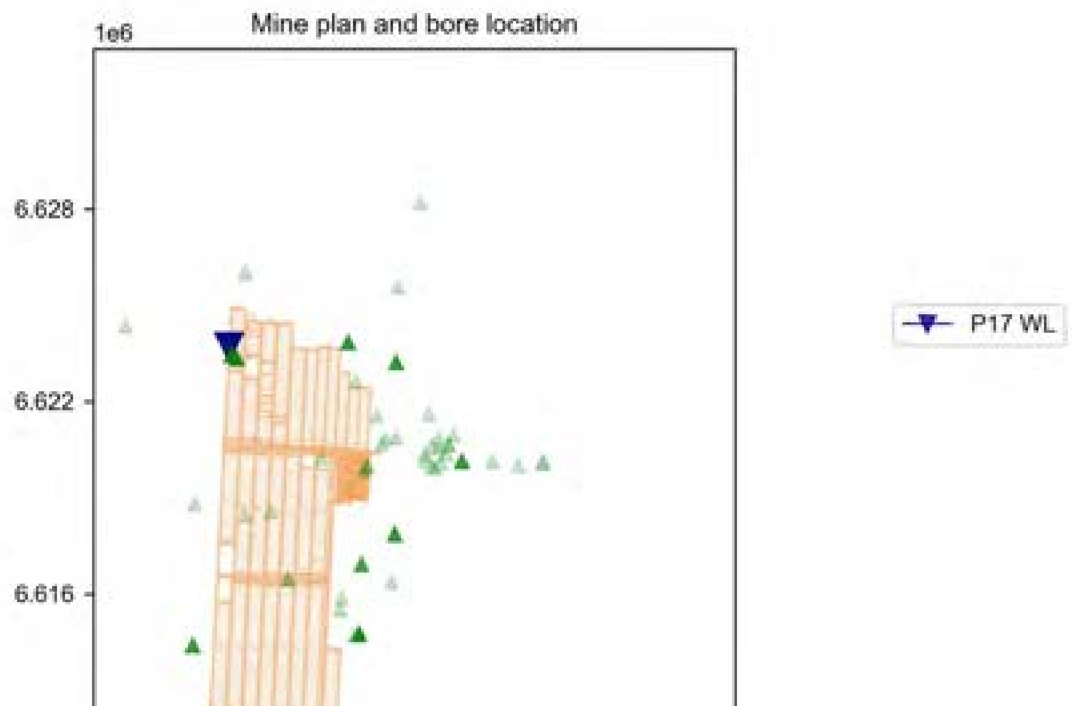
P16 (Garrawilla Volcanics; Subcrop)



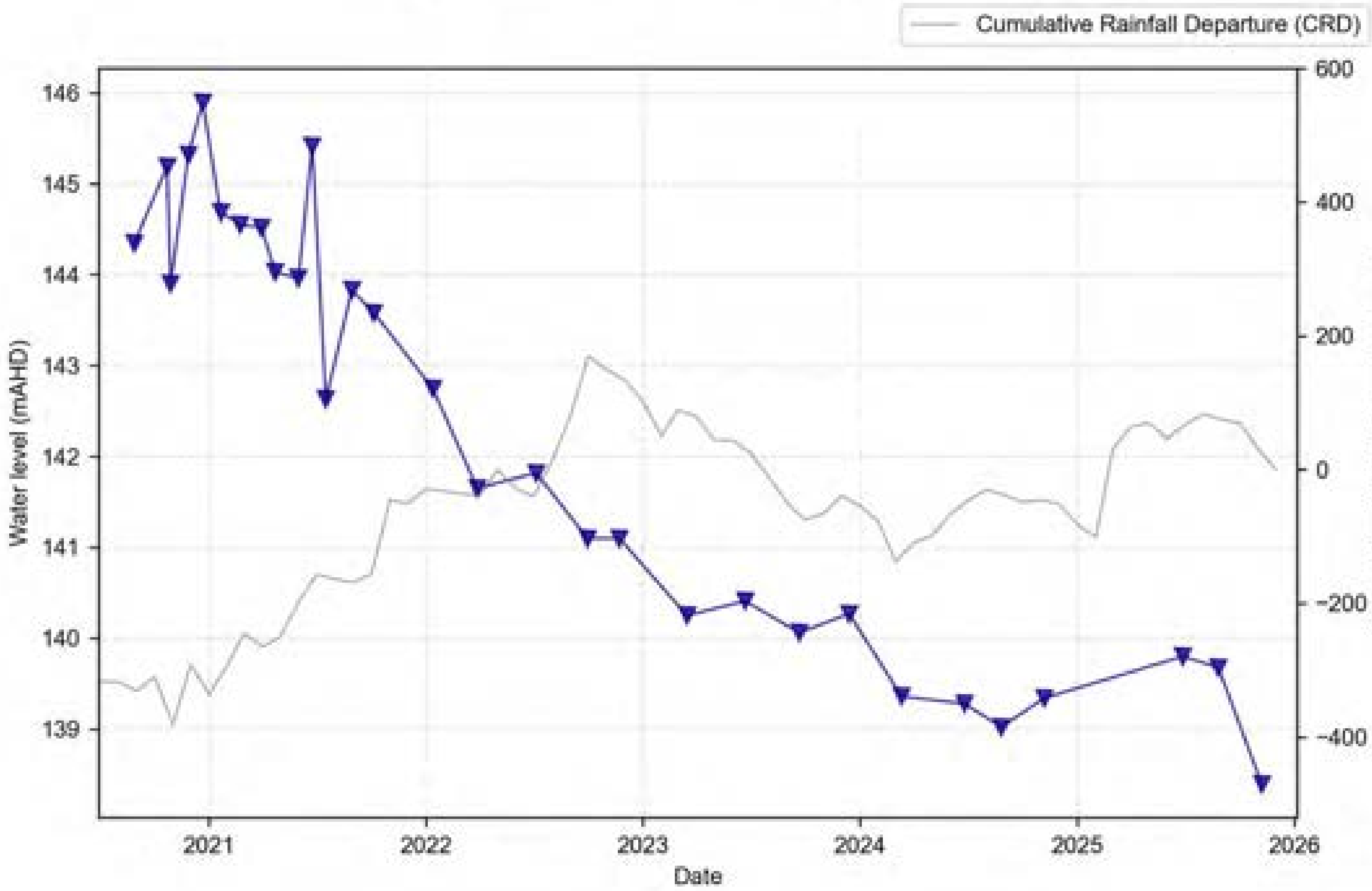


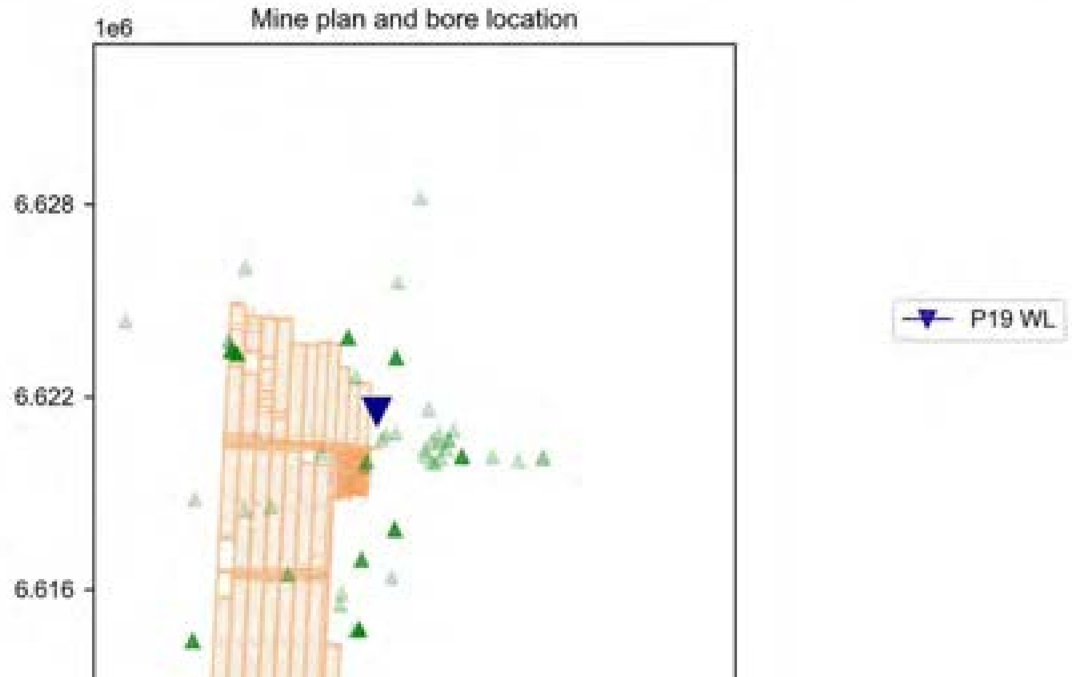
P17 (Purlawaugh Formation - old; Subcrop)



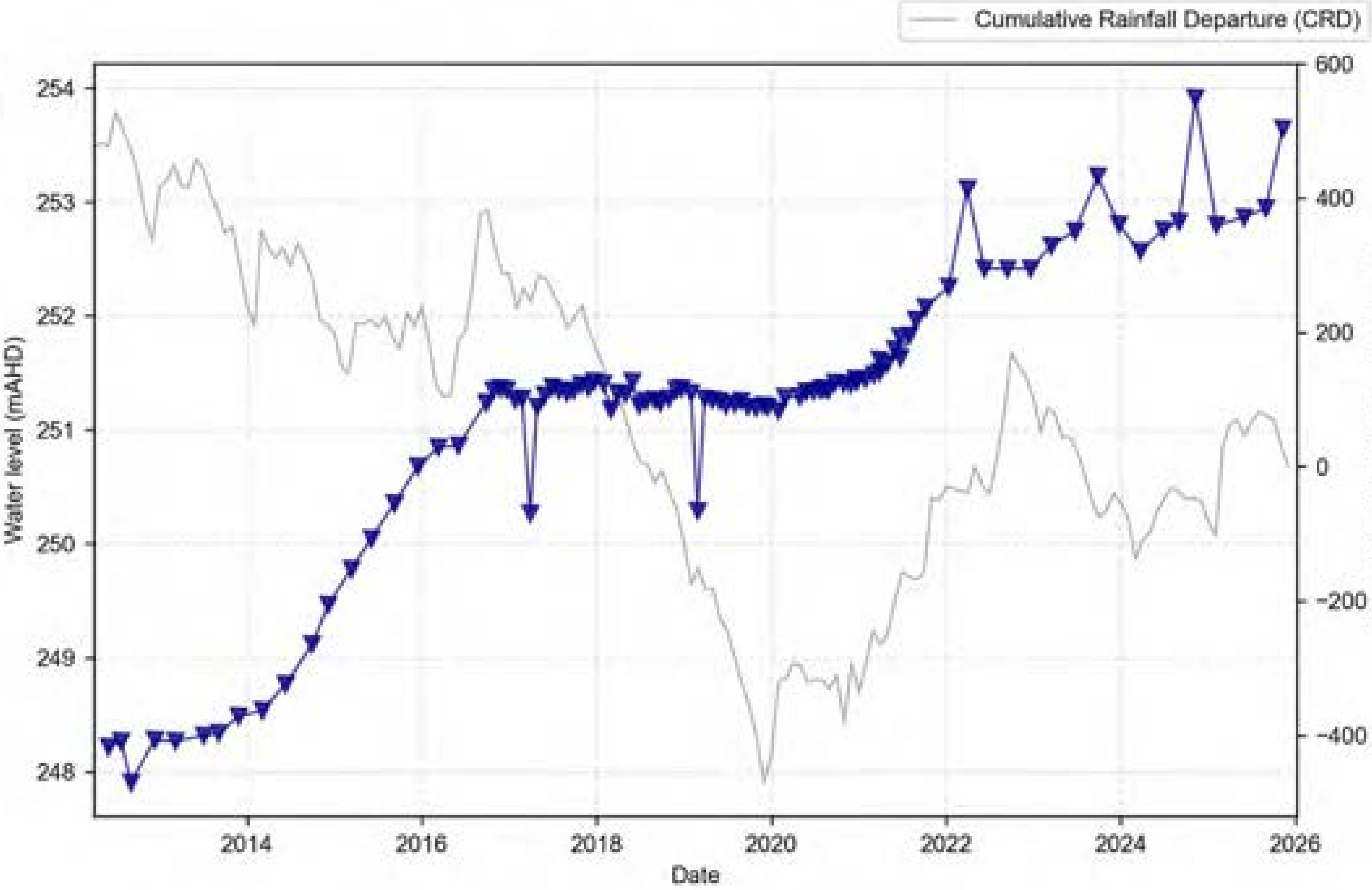


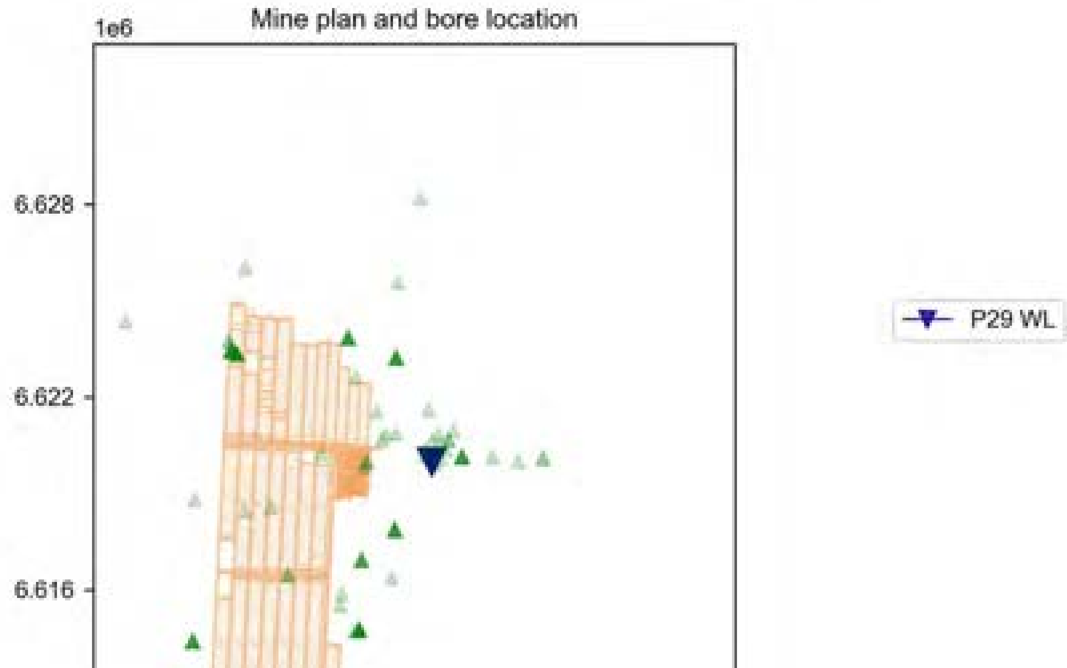
P19 (Pamboola Formation; Subcrop)





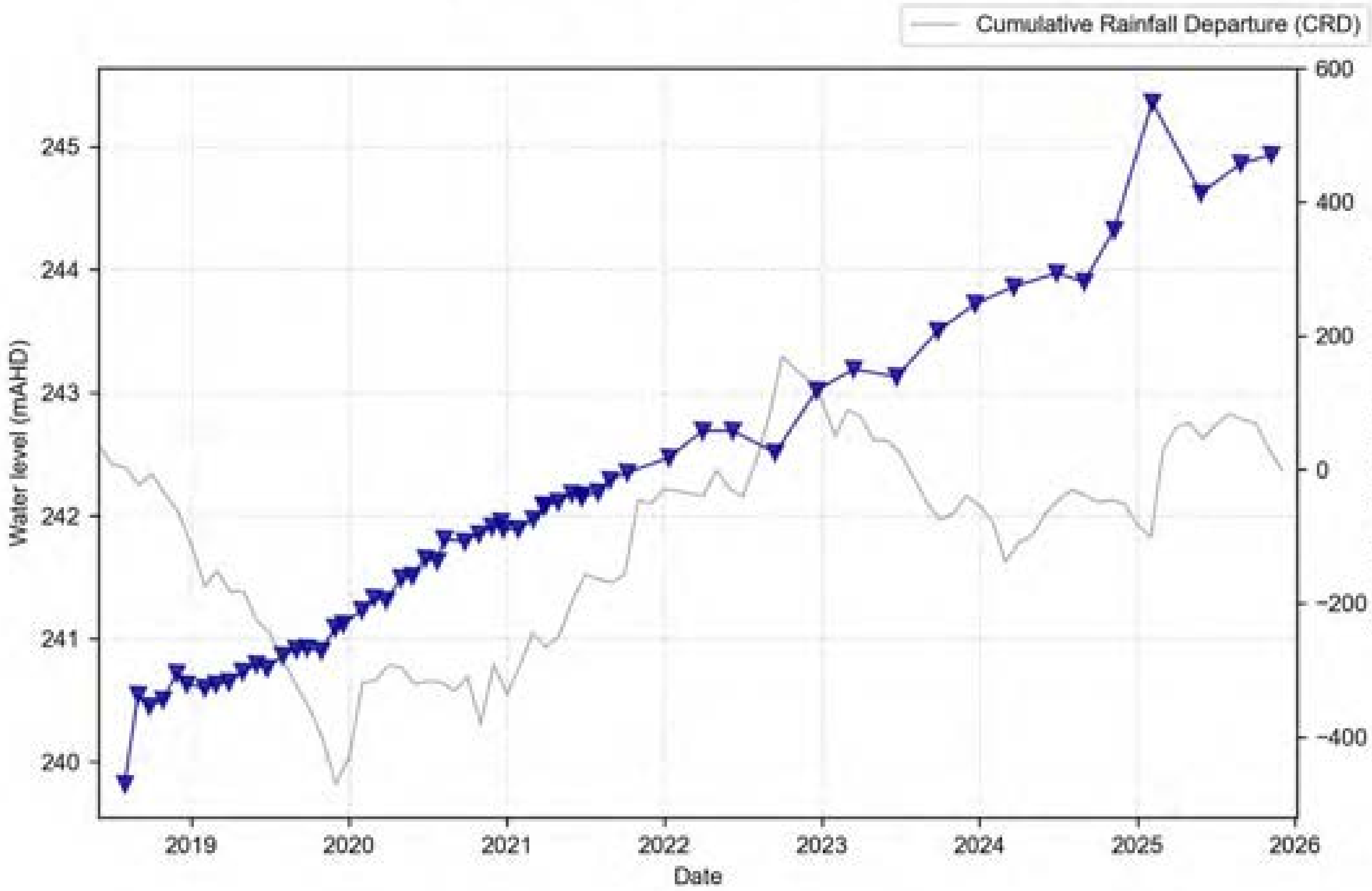
P29 (Rail Loop Dams; Outcrop)

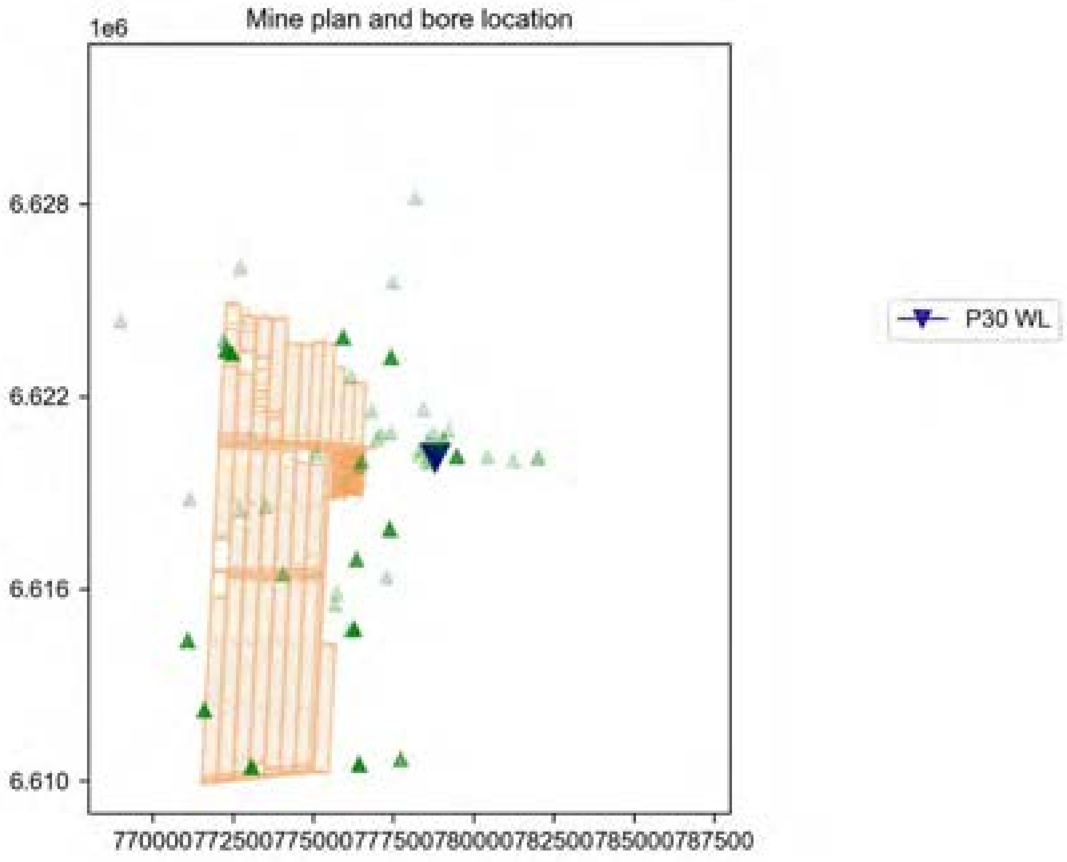




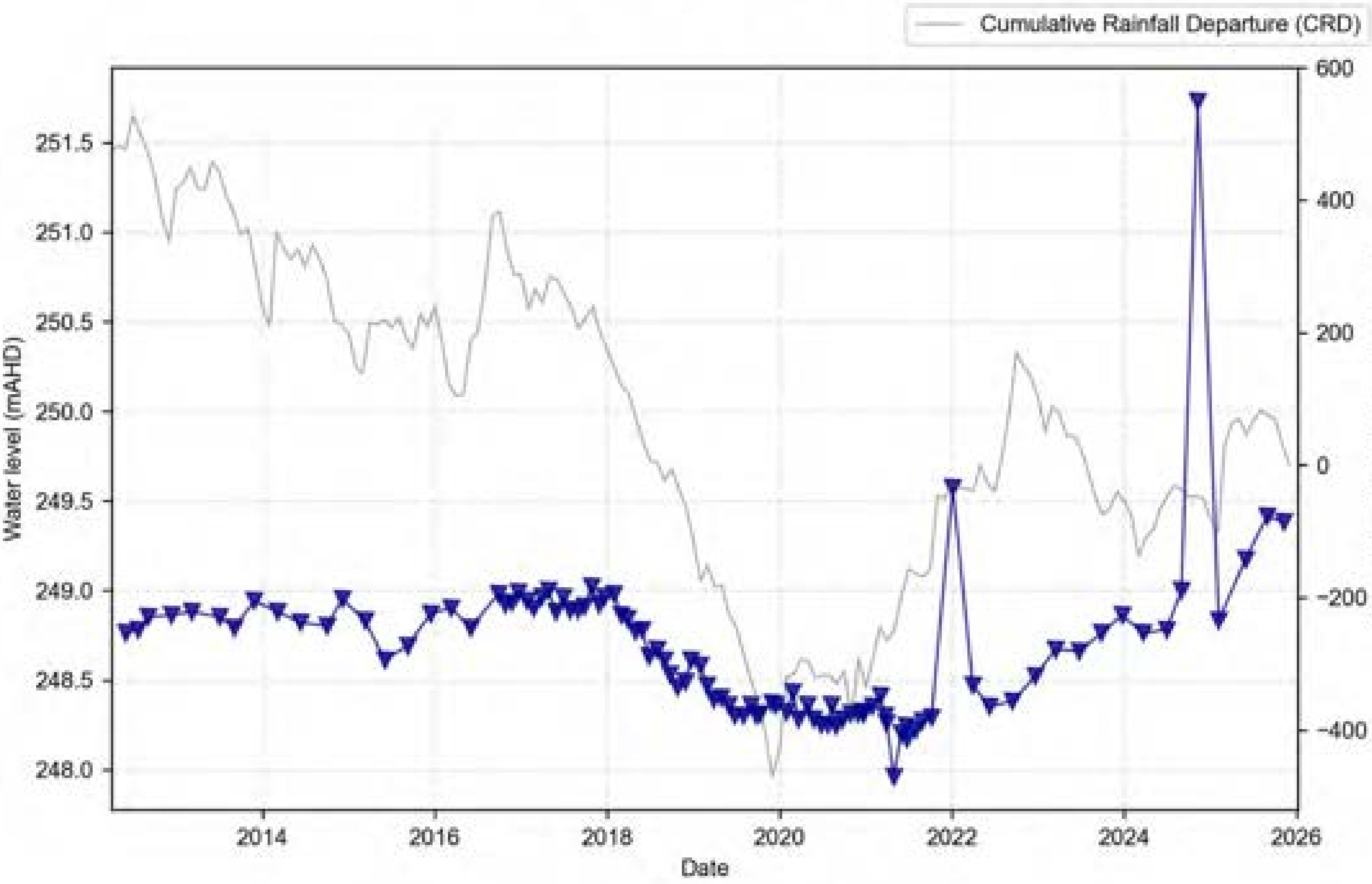
* mAHD - metres Australian Height Datum

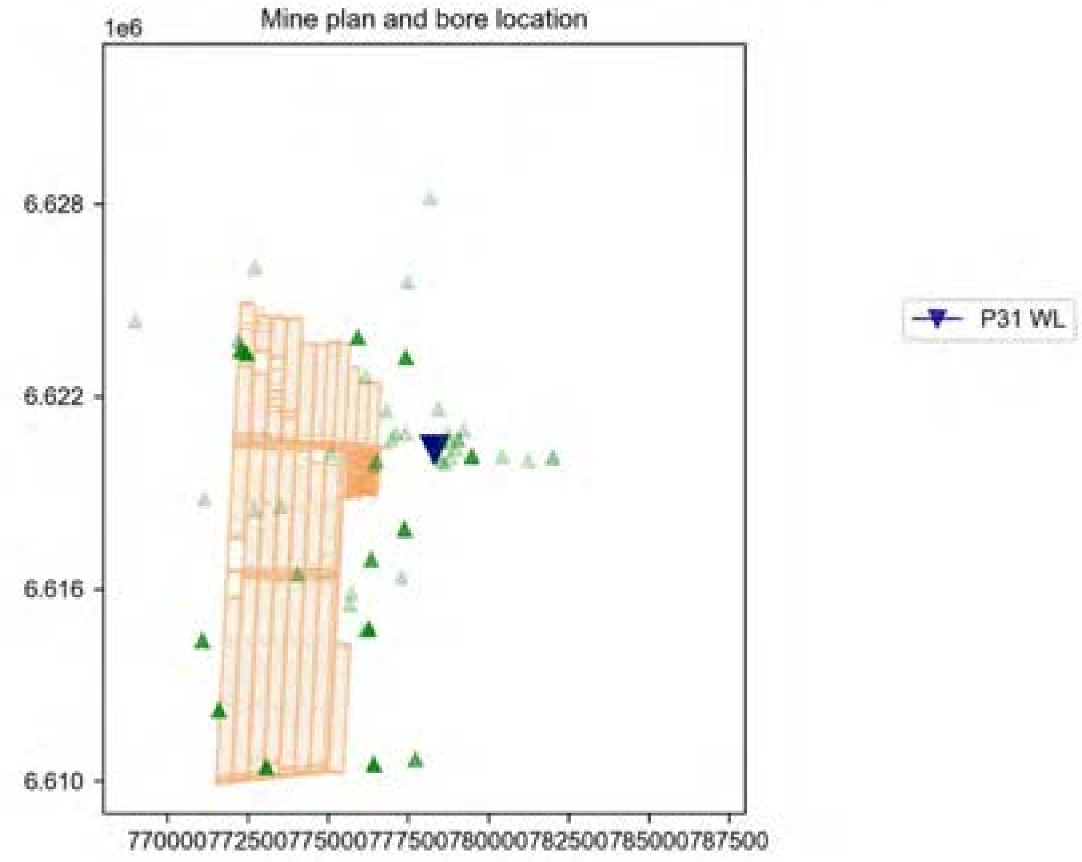
P30 (Rail Loop Dams; Outcrop)





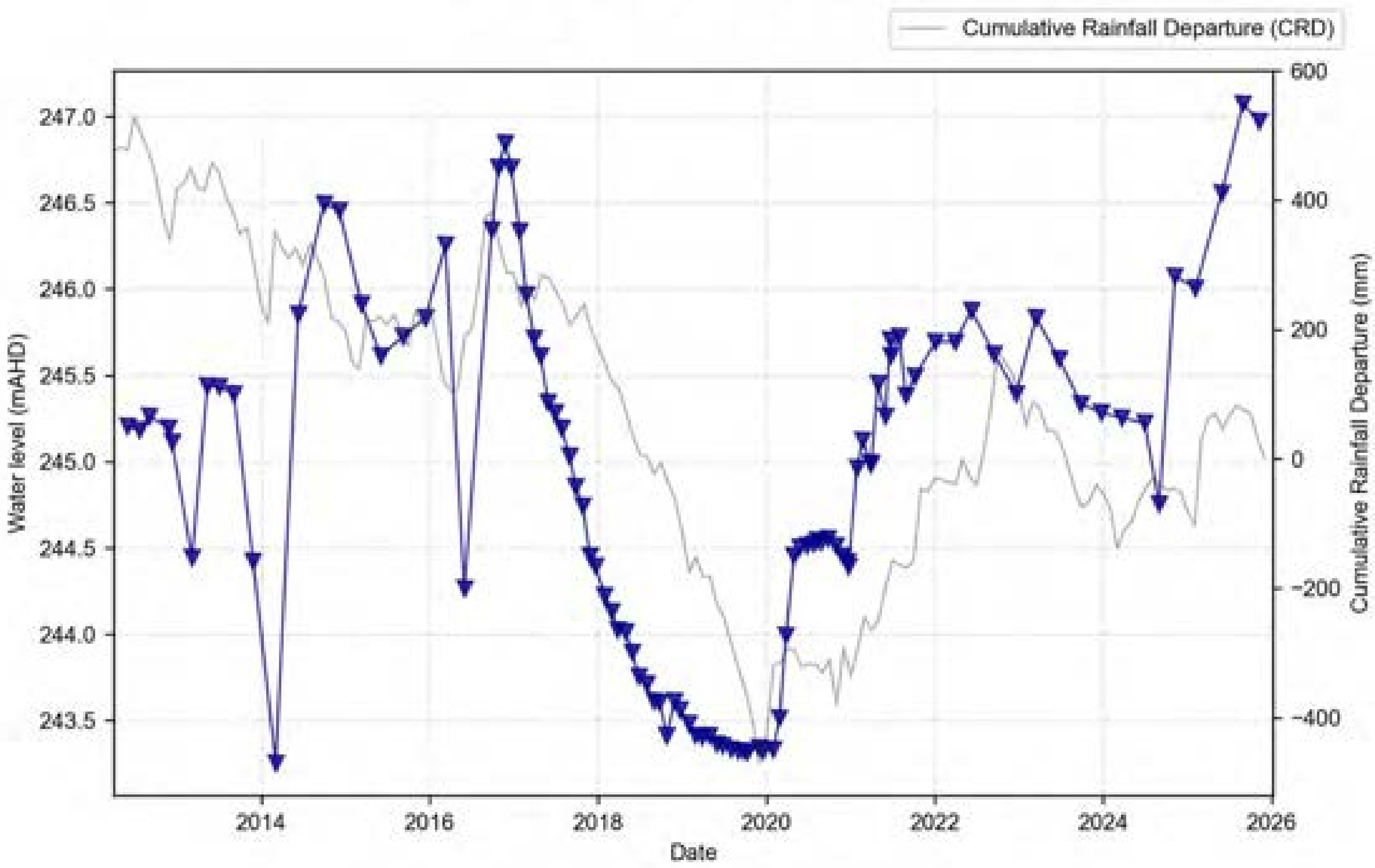
P31 (Rail Loop Dams; Outcrop)

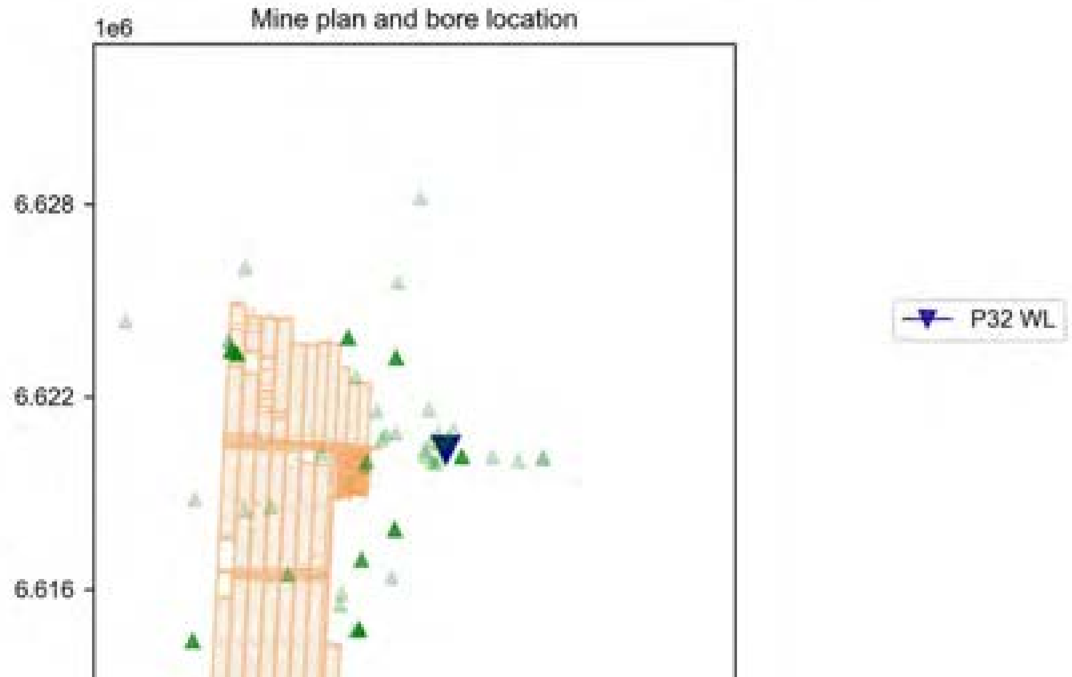




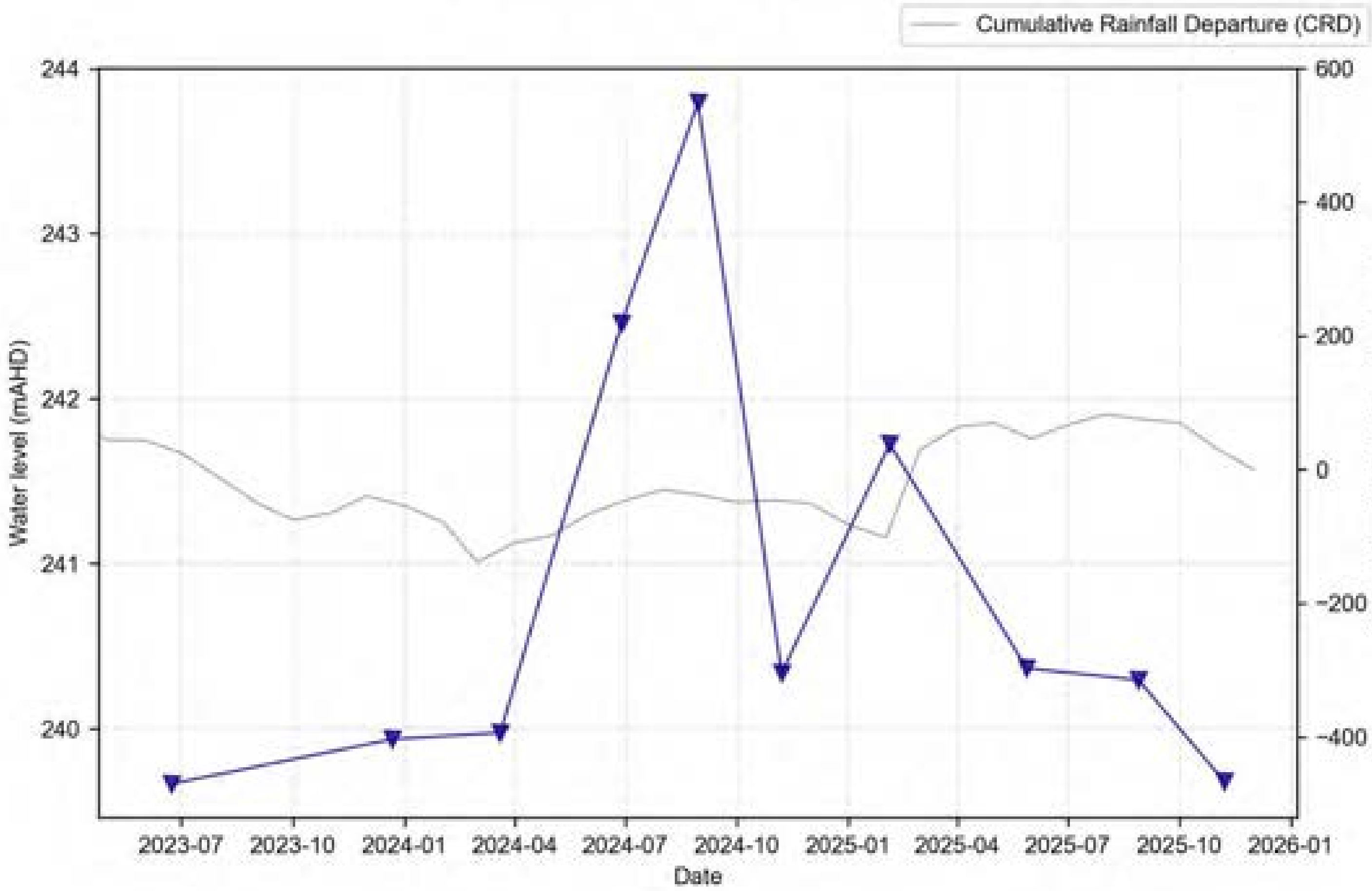
* mAHD - metres Australian Height Datum

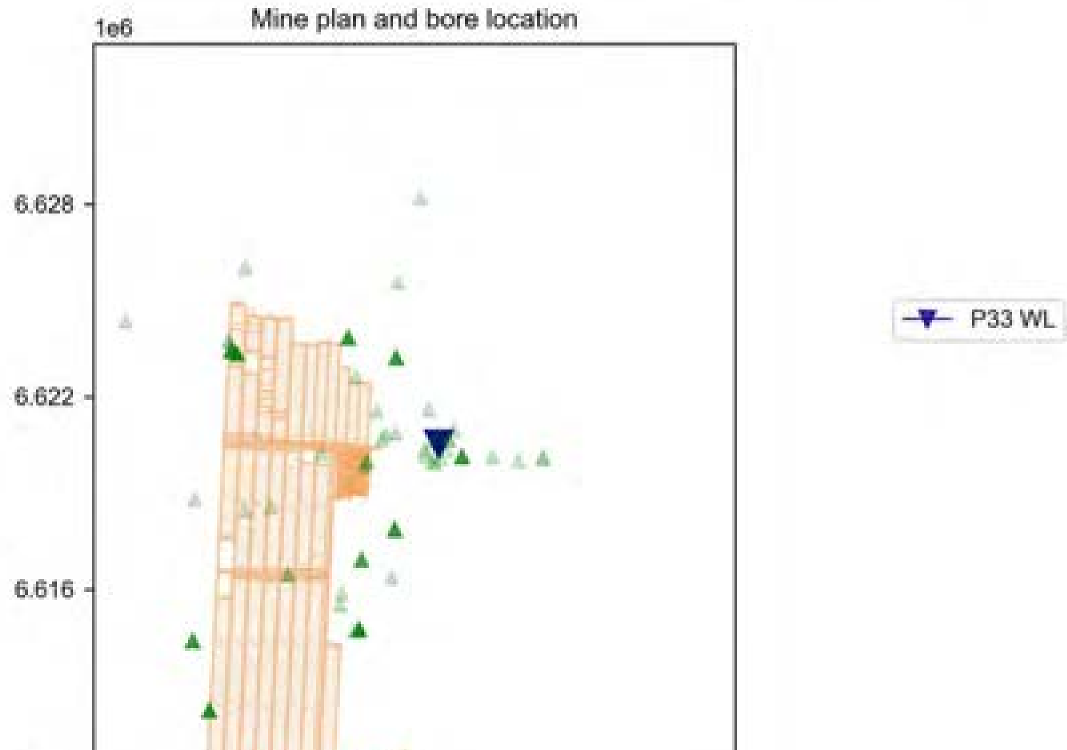
P32 (Rail Loop Dams; Outcrop)



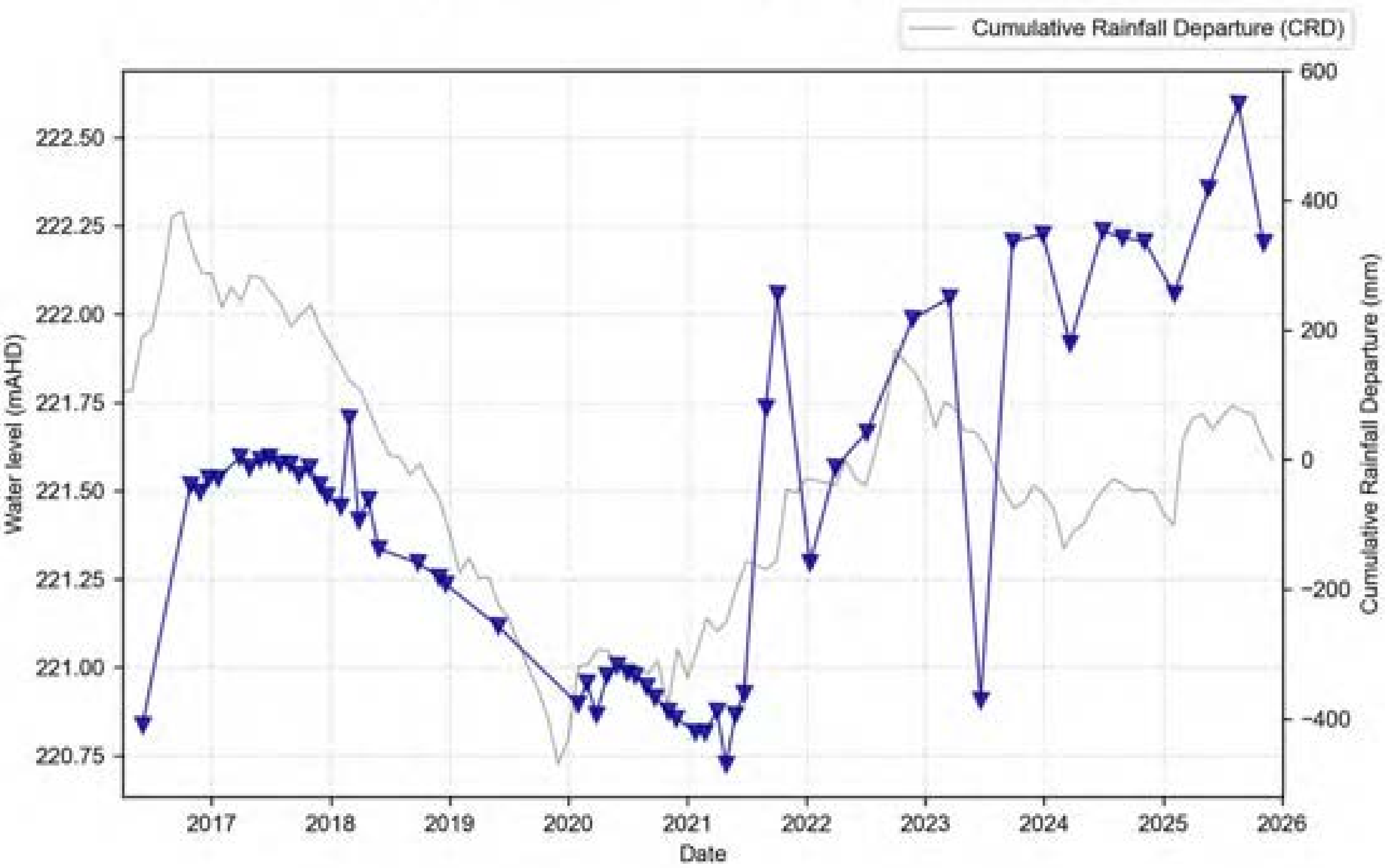


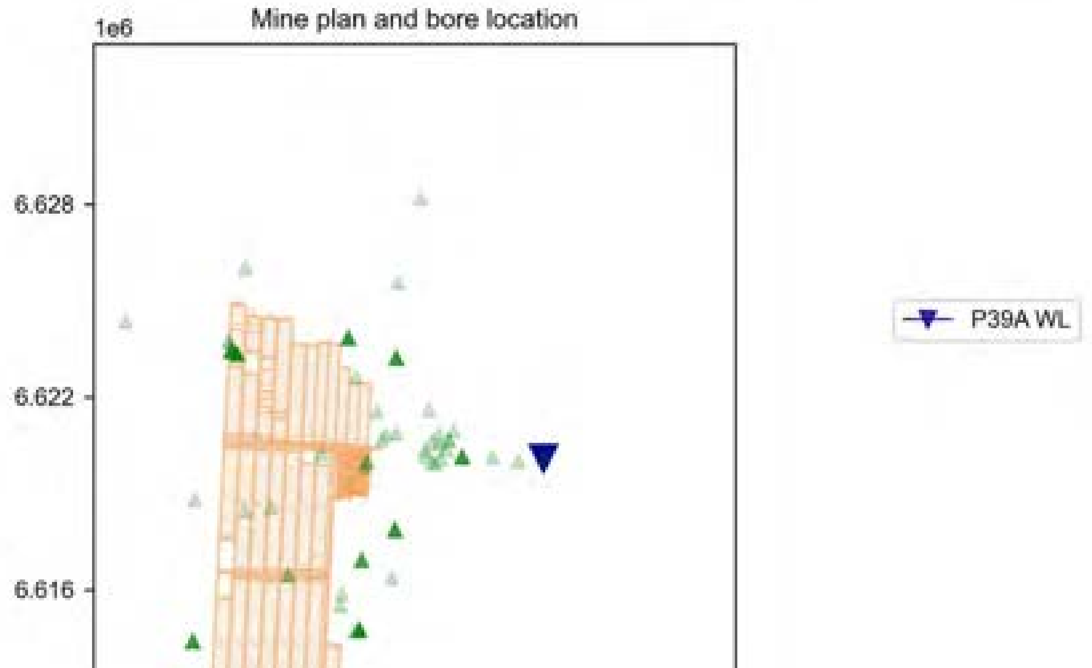
P33 (Rail Loop Dams; Outcrop)



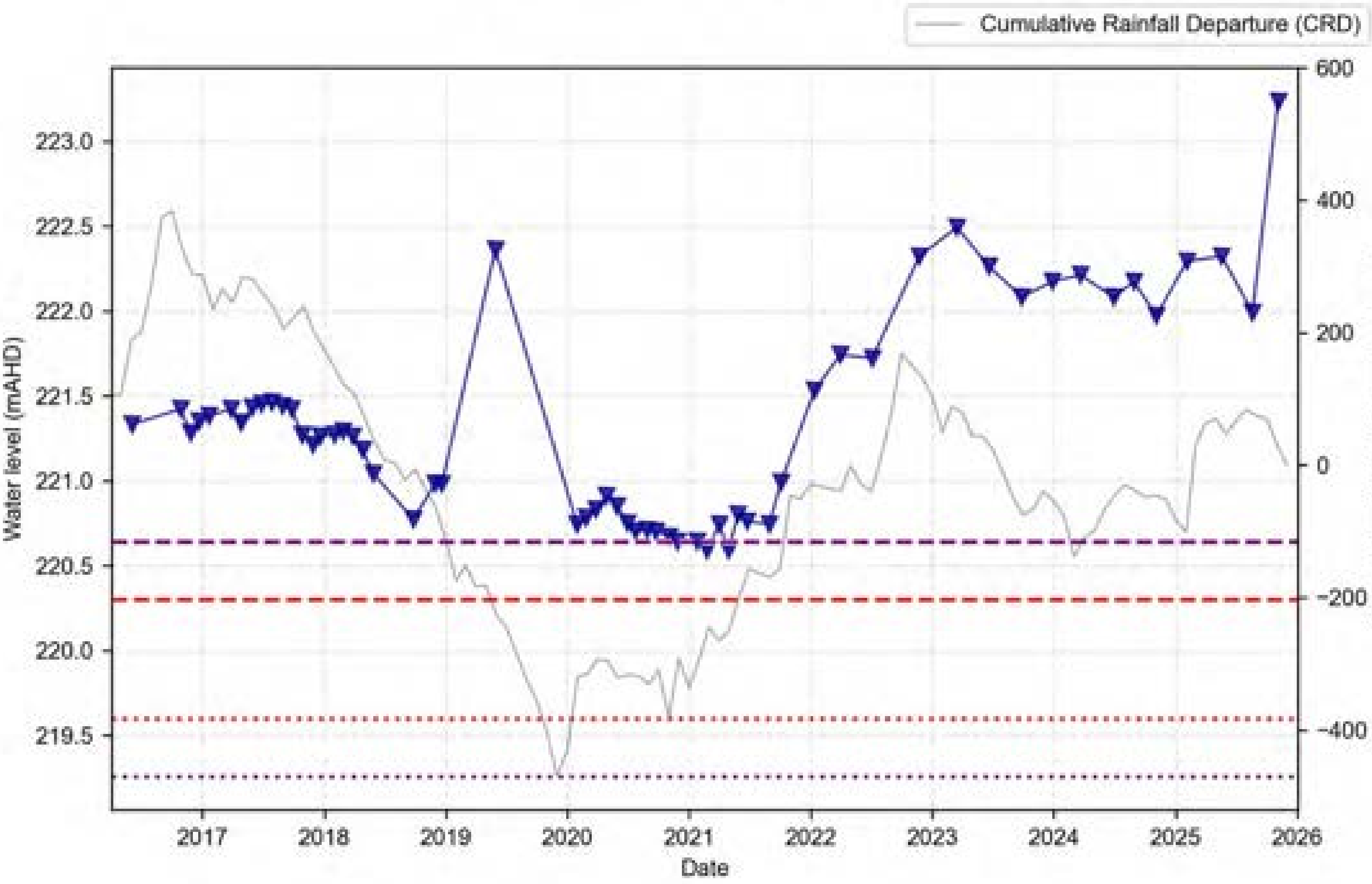


P39A (Watermark Formation; Outcrop)

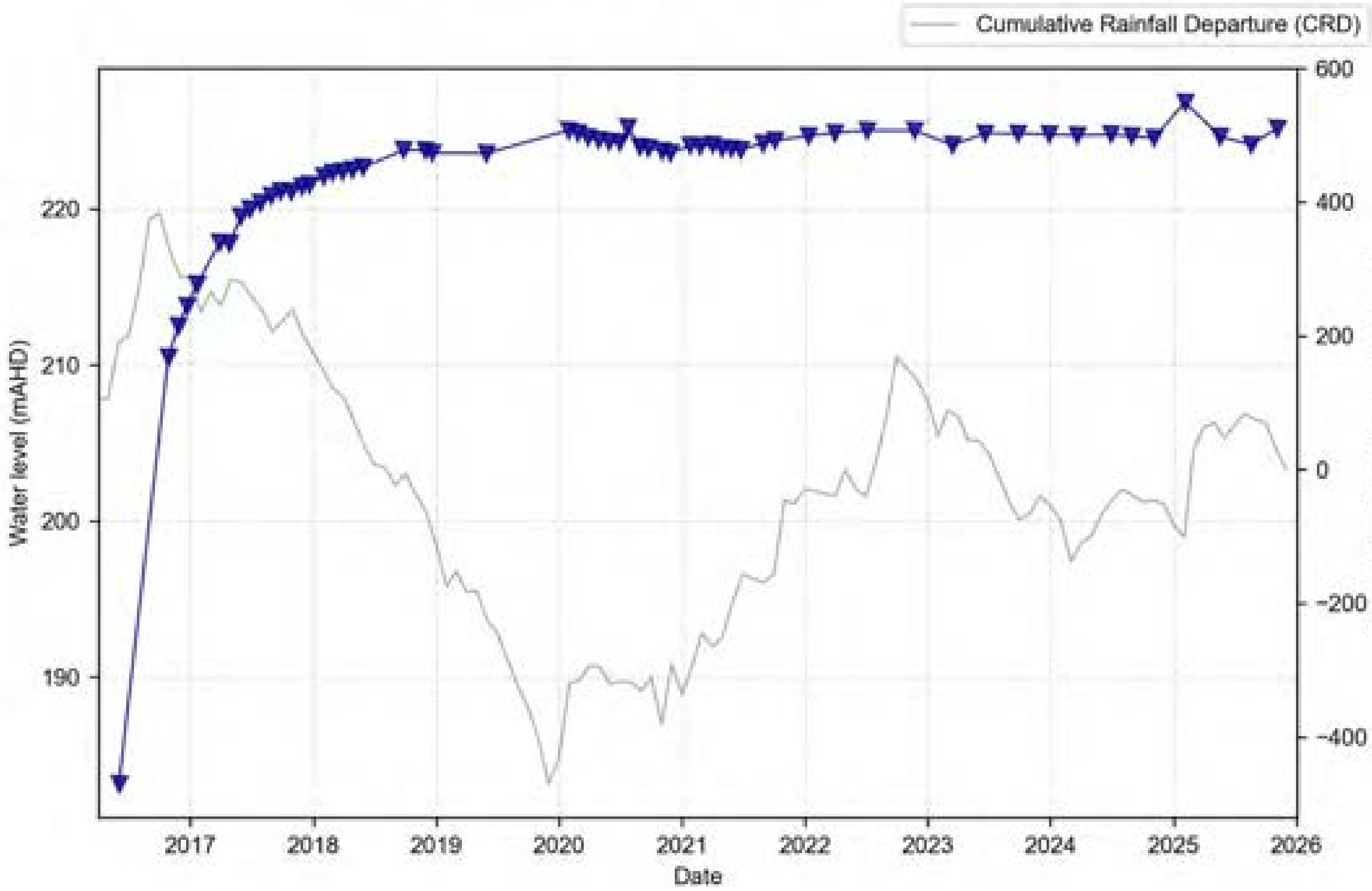


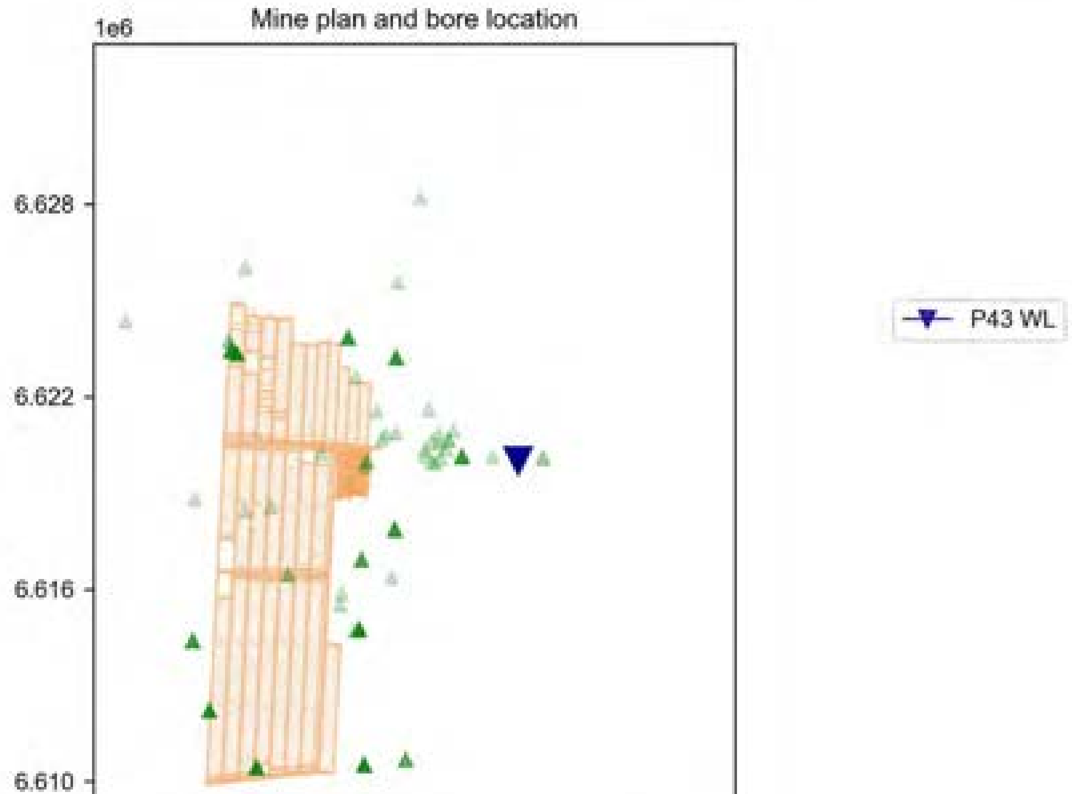


P39B (Alluvium; Outcrop)

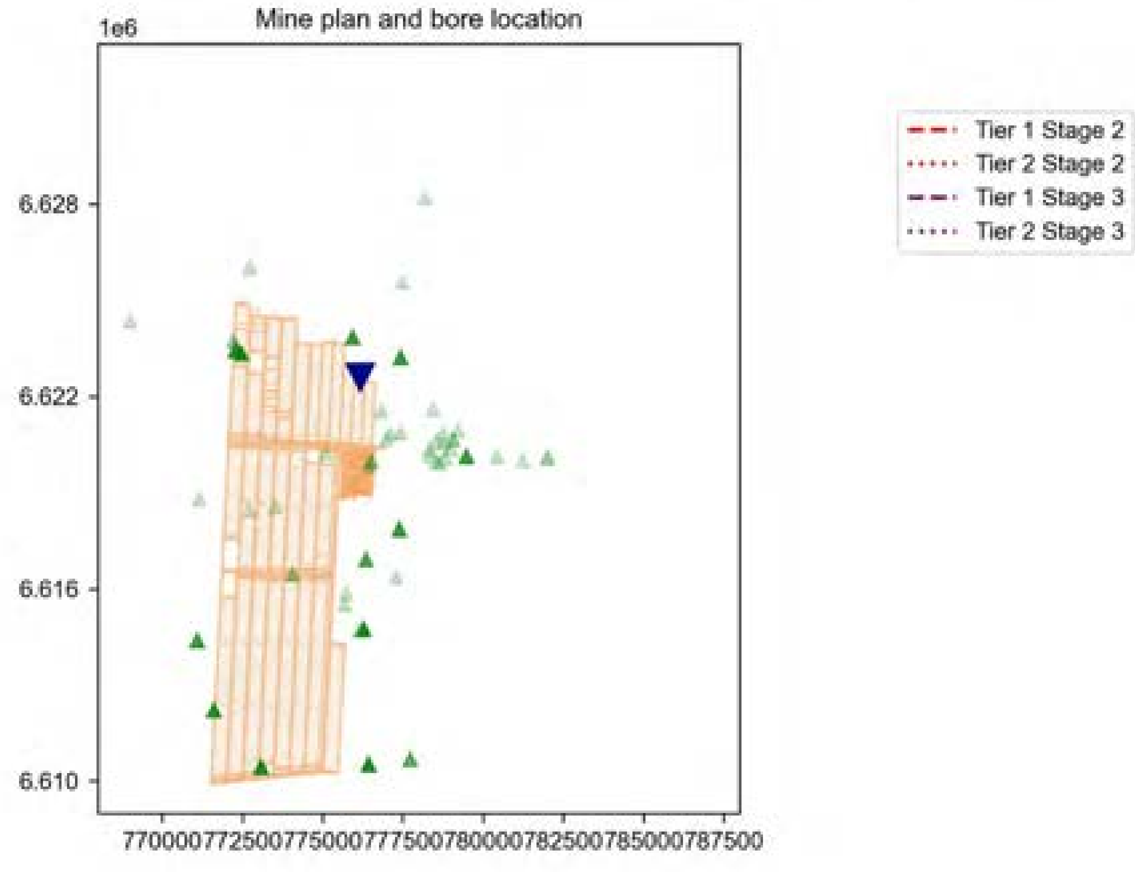


P43 (Watermark Formation; Outcrop)



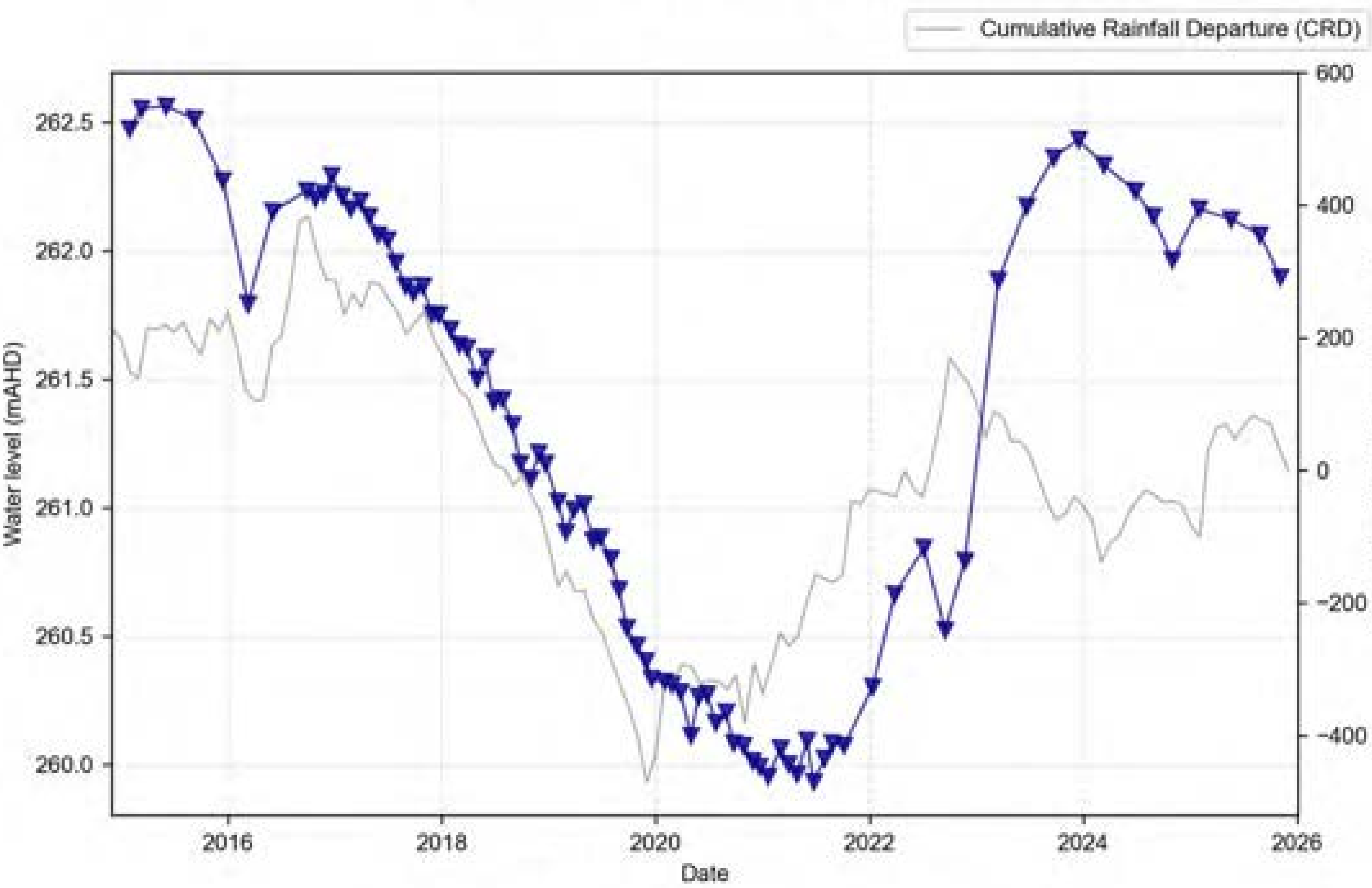


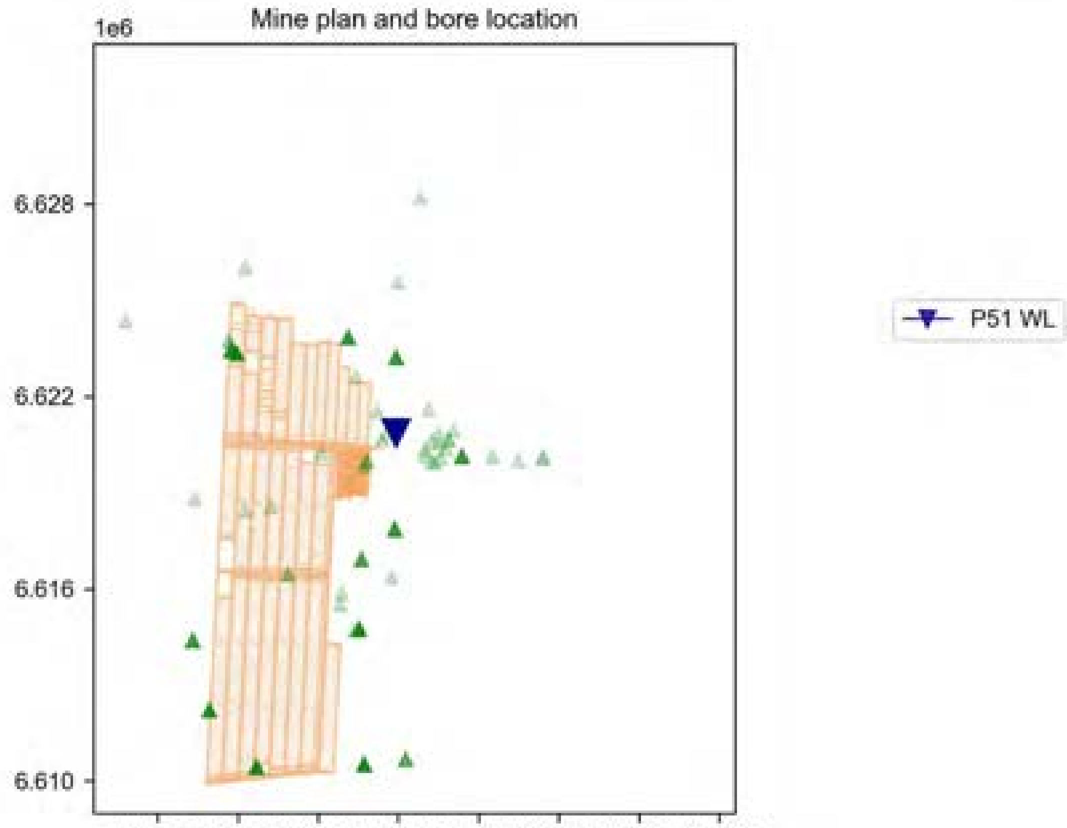
P47 (Garrawilla Volcanics; Outcrop)



* mAHD - metres Australian Height Datum

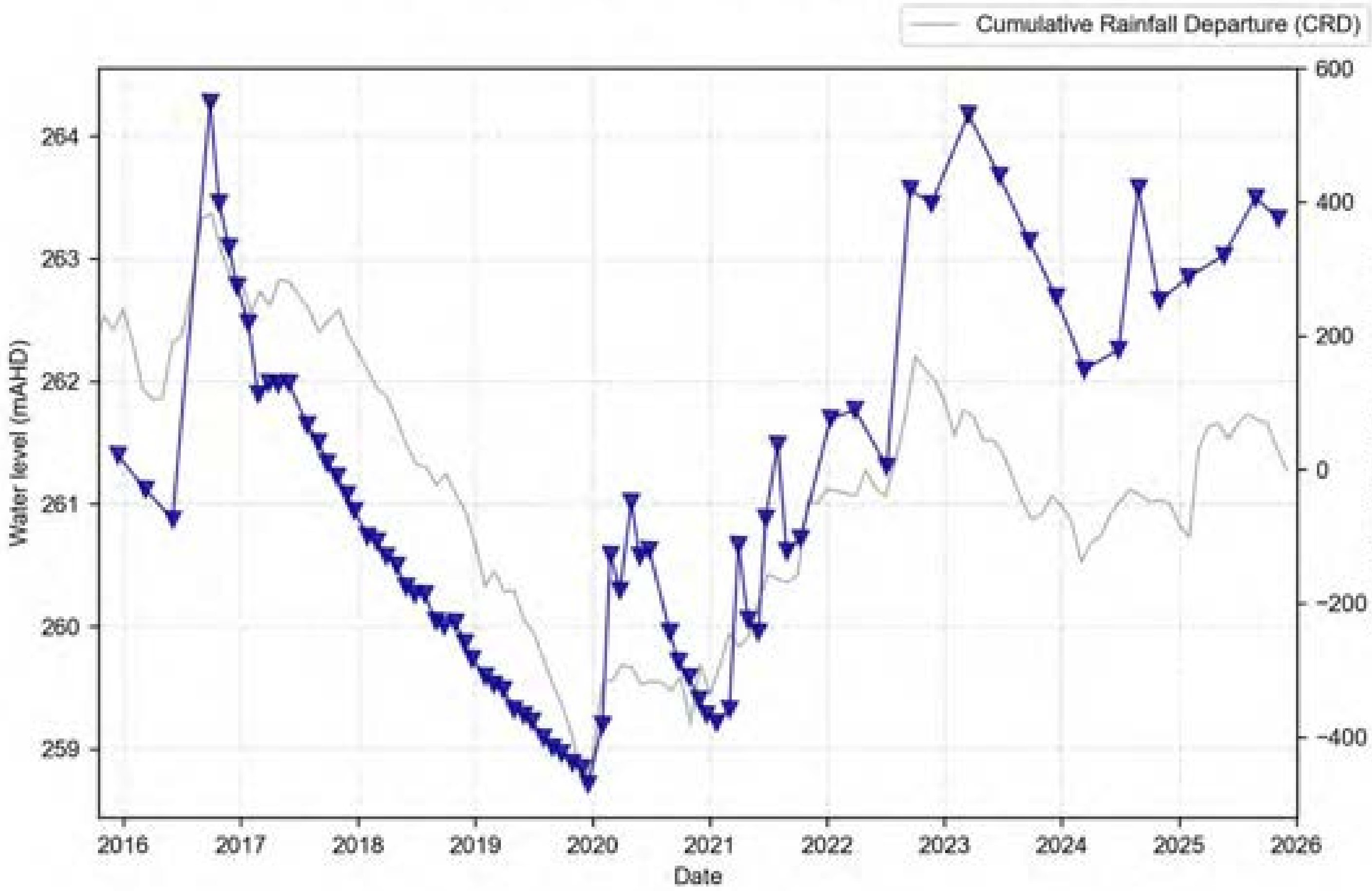
P51 (Garrawilla Volcanics; Outcrop)

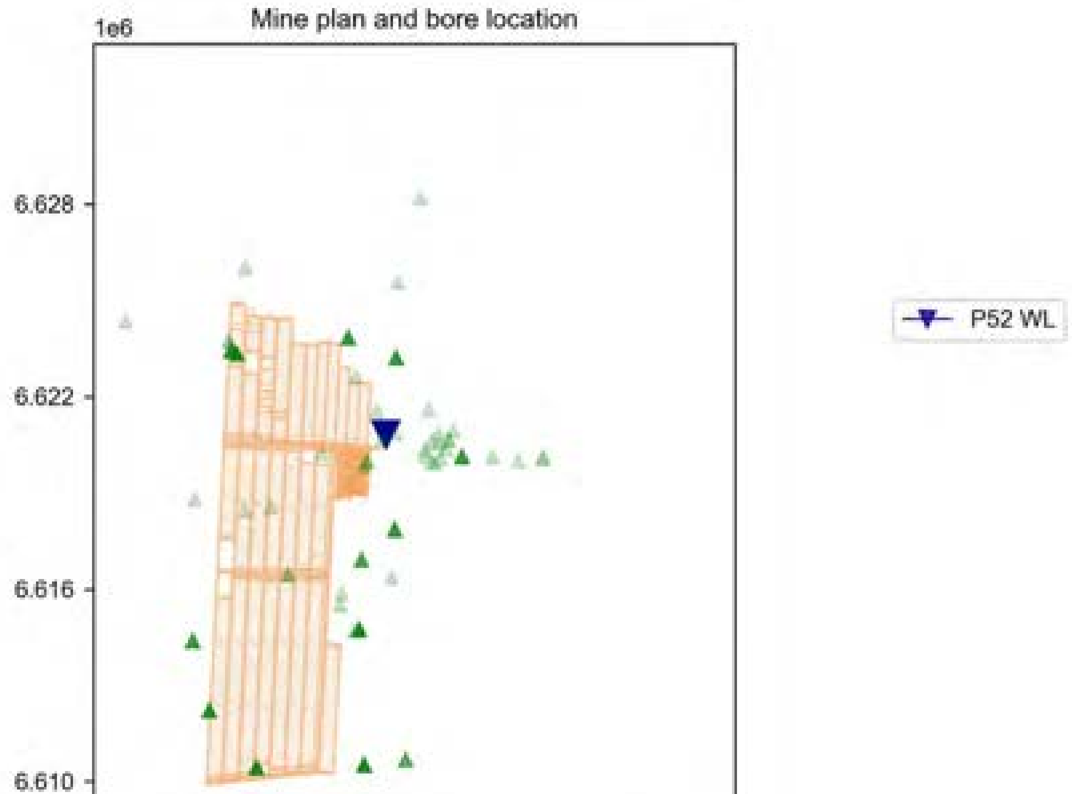




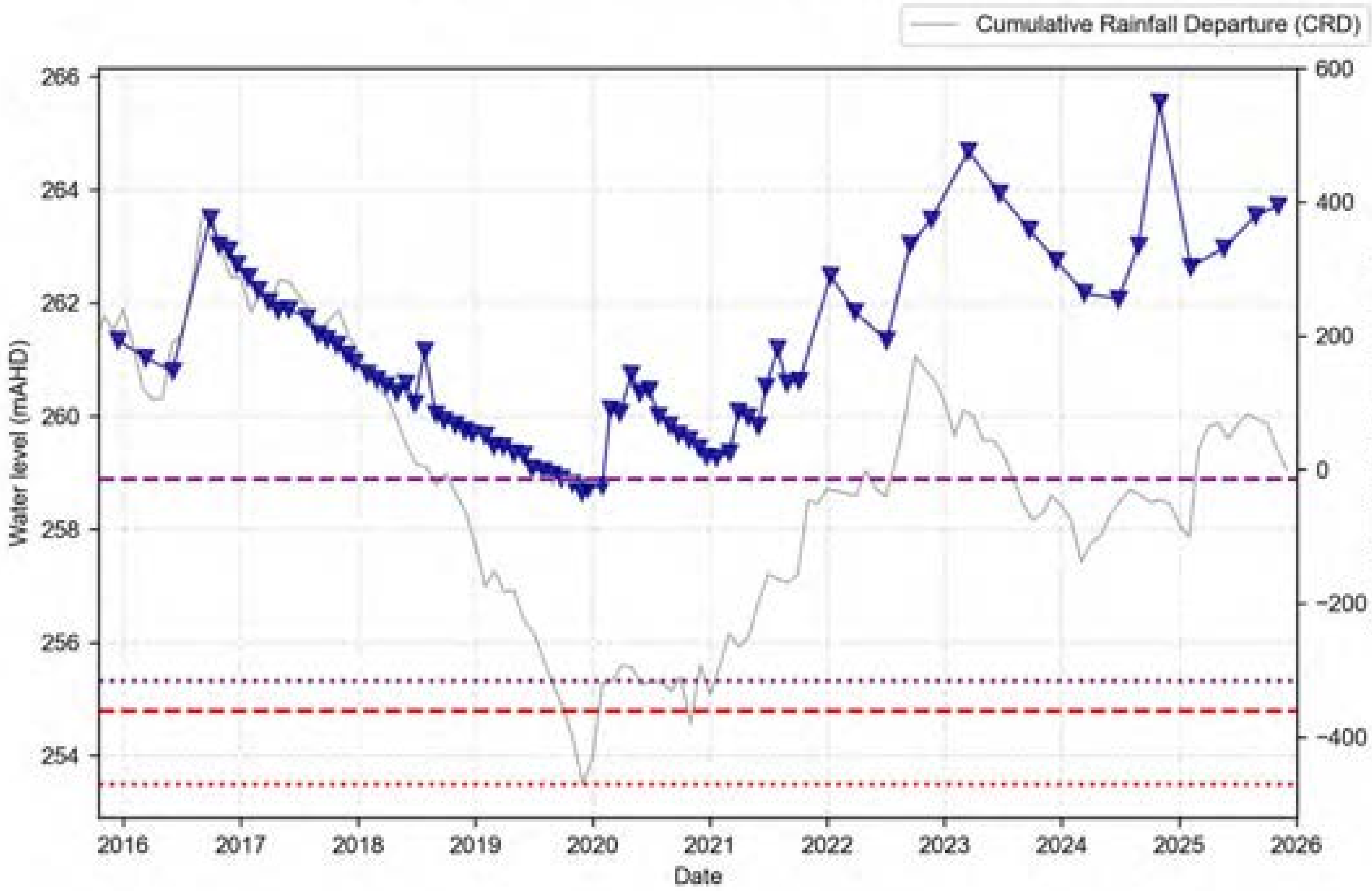
* mAHD - metres Australian Height Datum

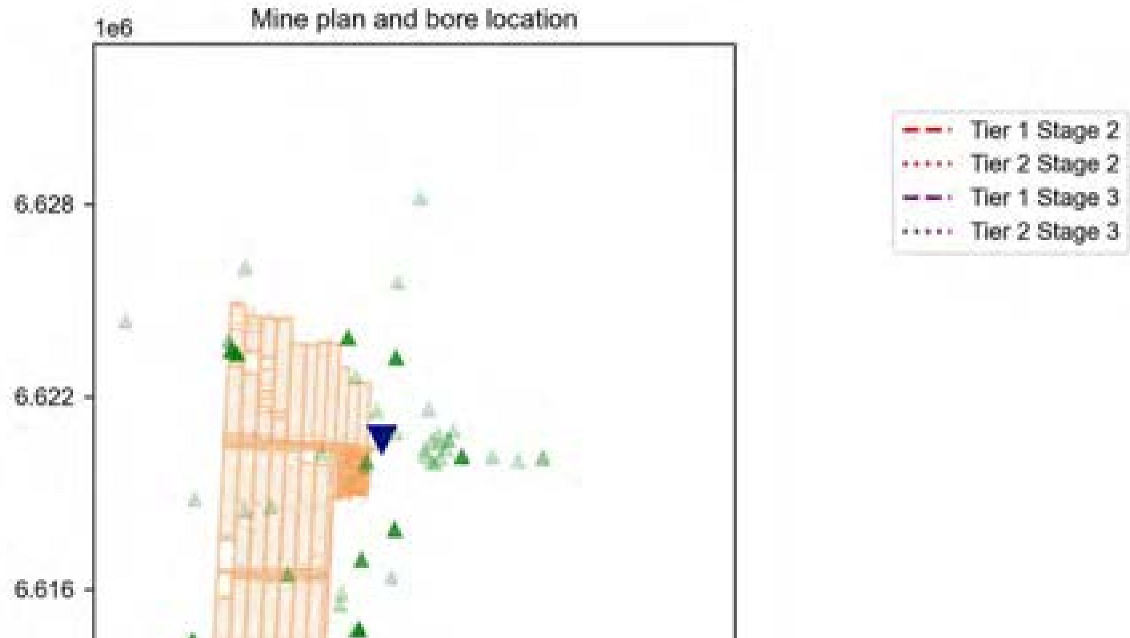
P52 (Napperby Formation; Outcrop)



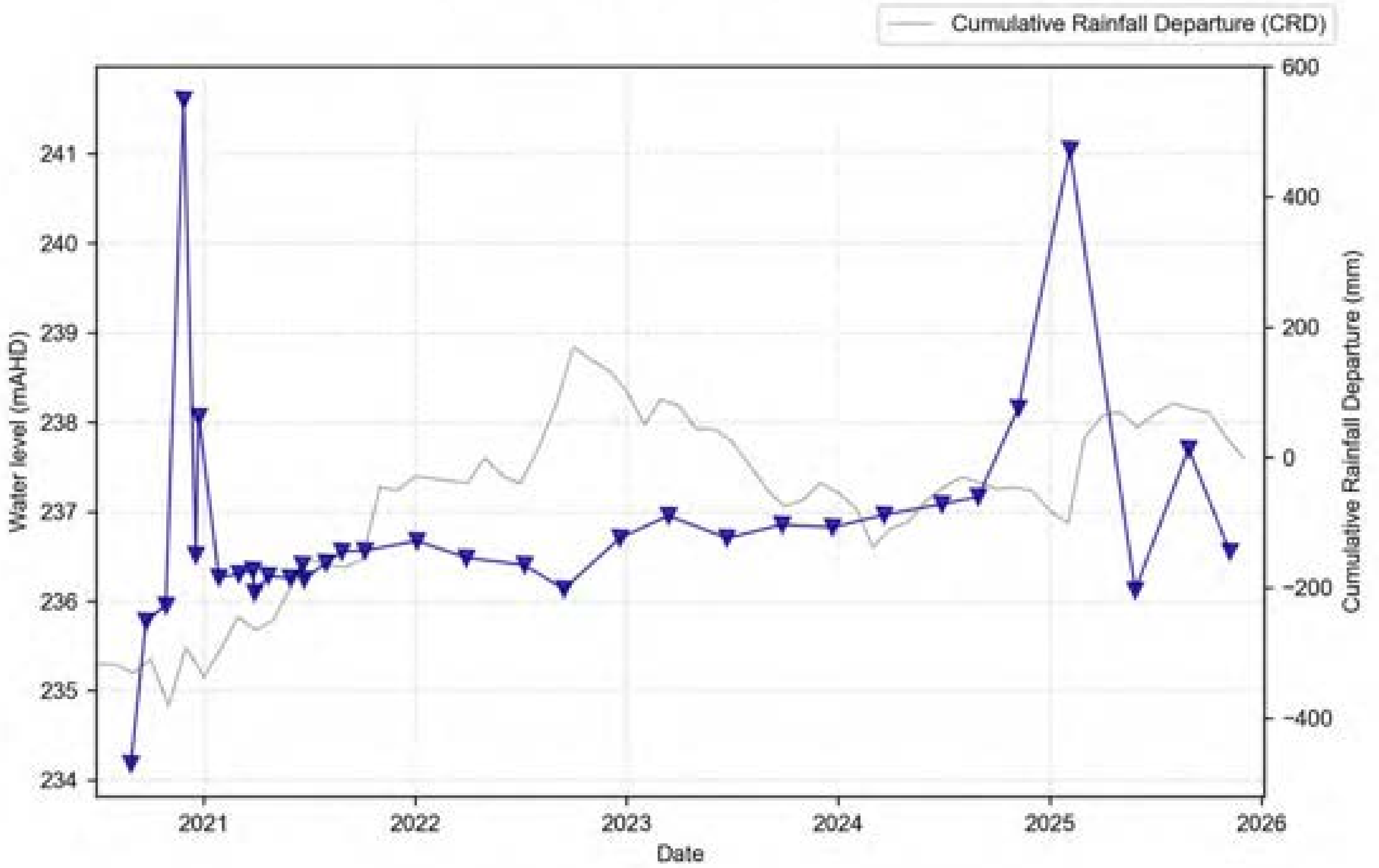


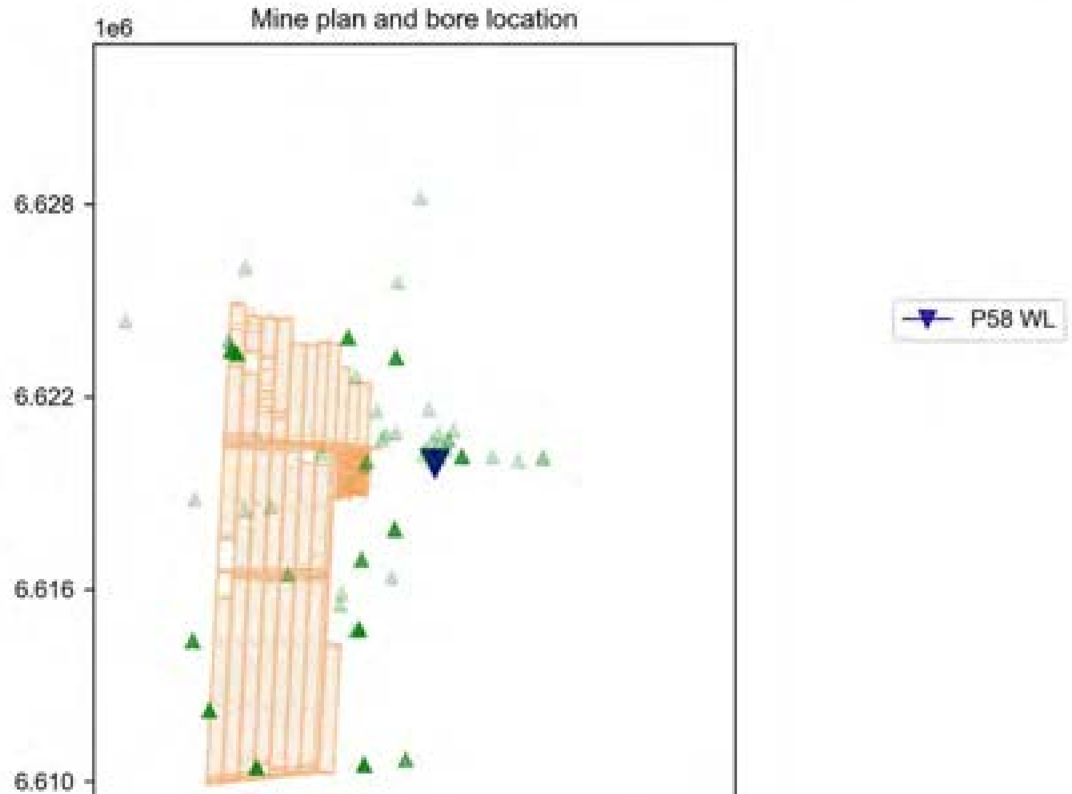
P53 (Garrawilla Volcanics; Outcrop)

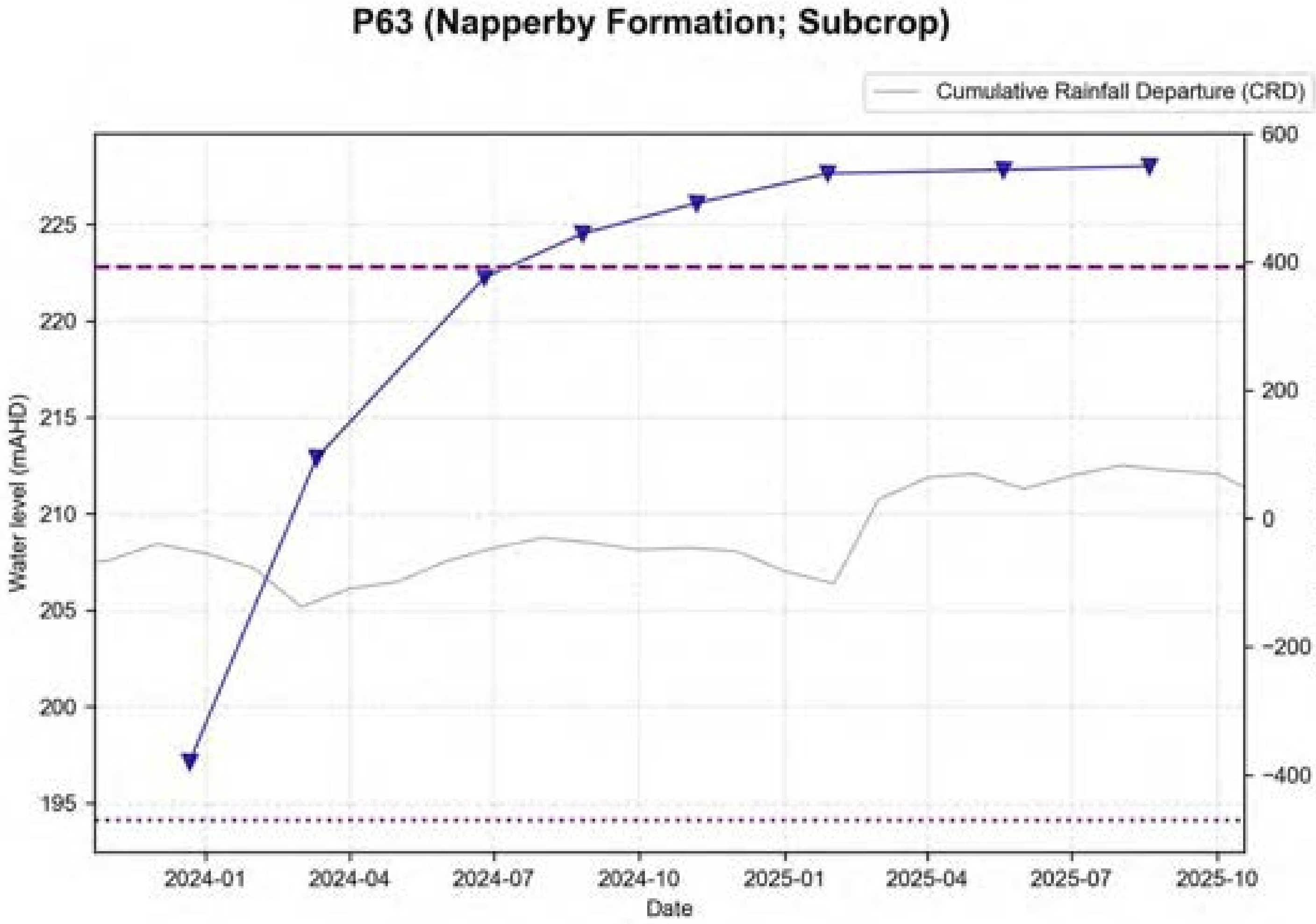


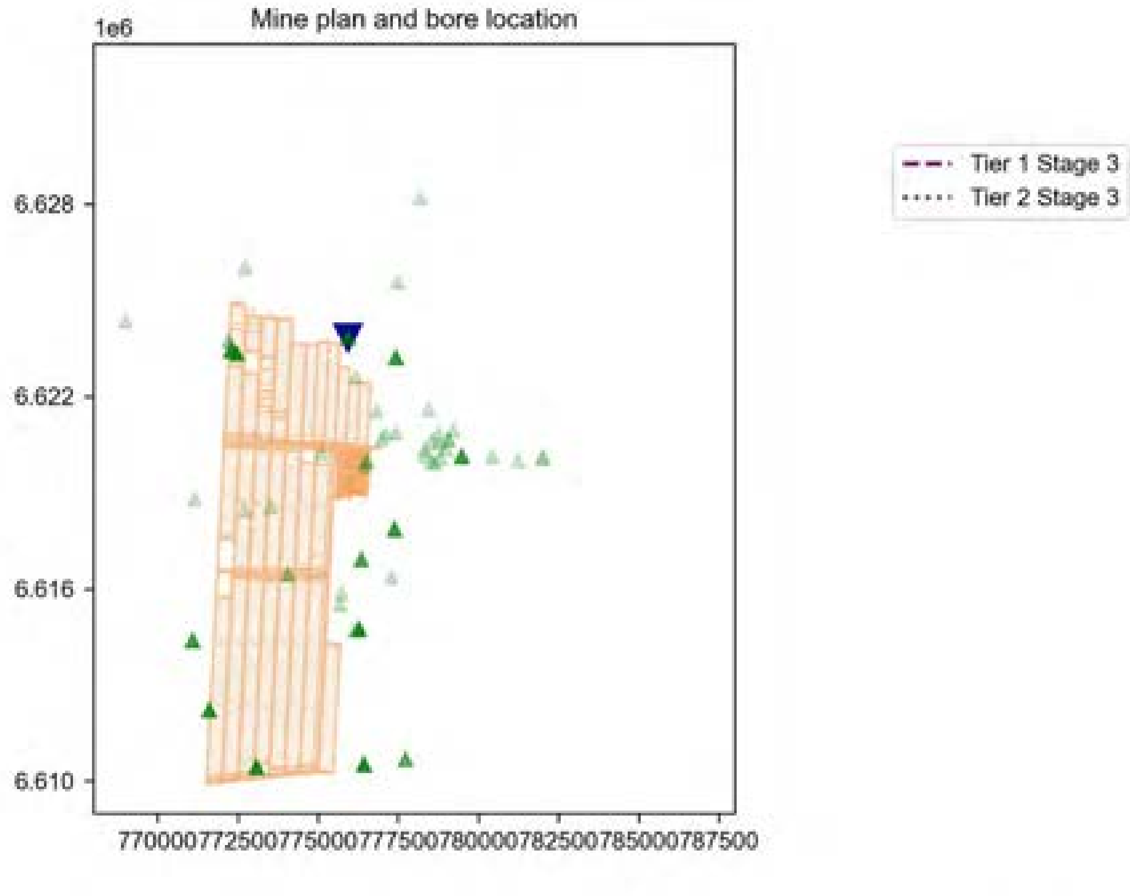


P58 (Rail Loop Dams; Outcrop)



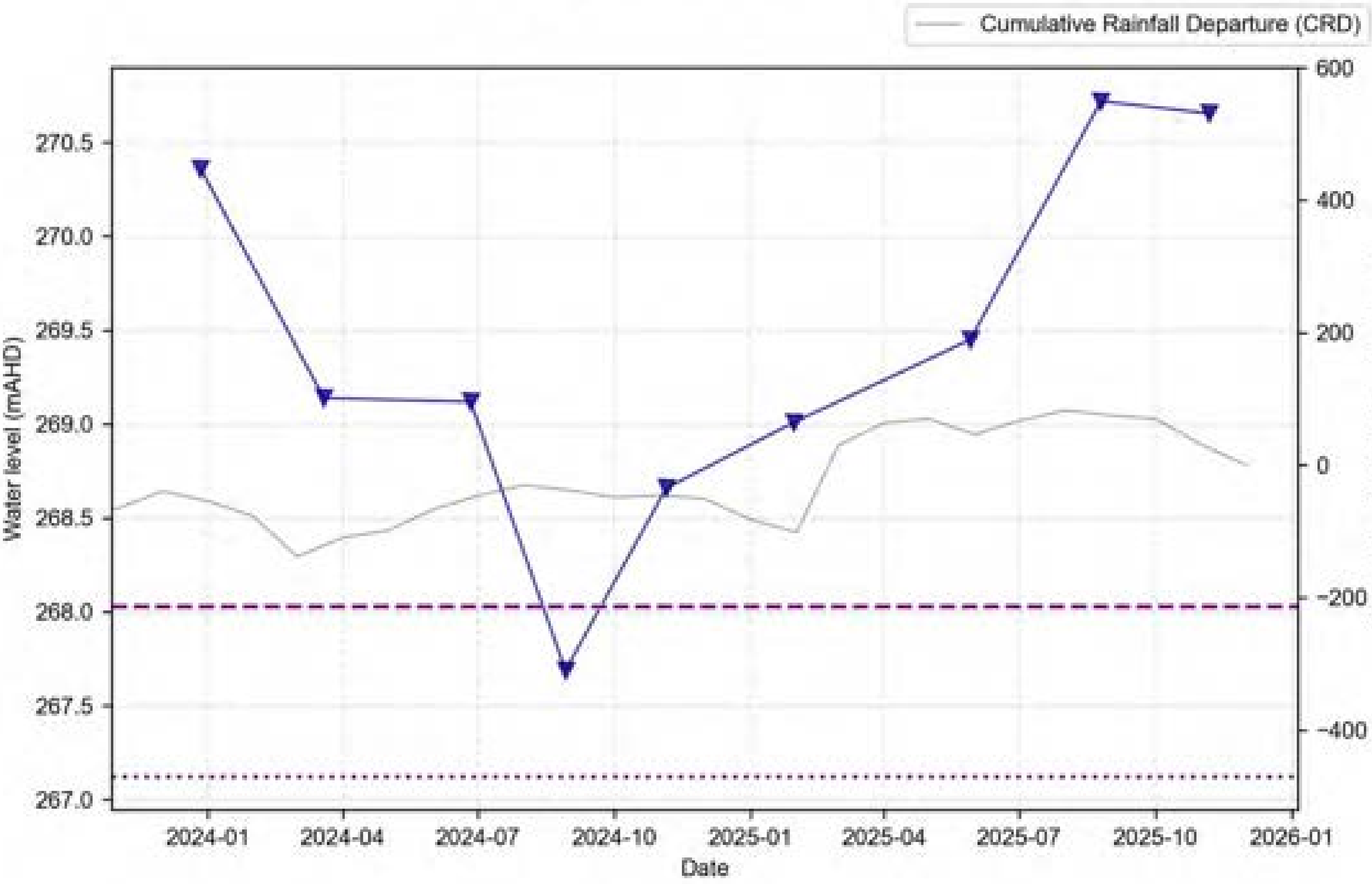


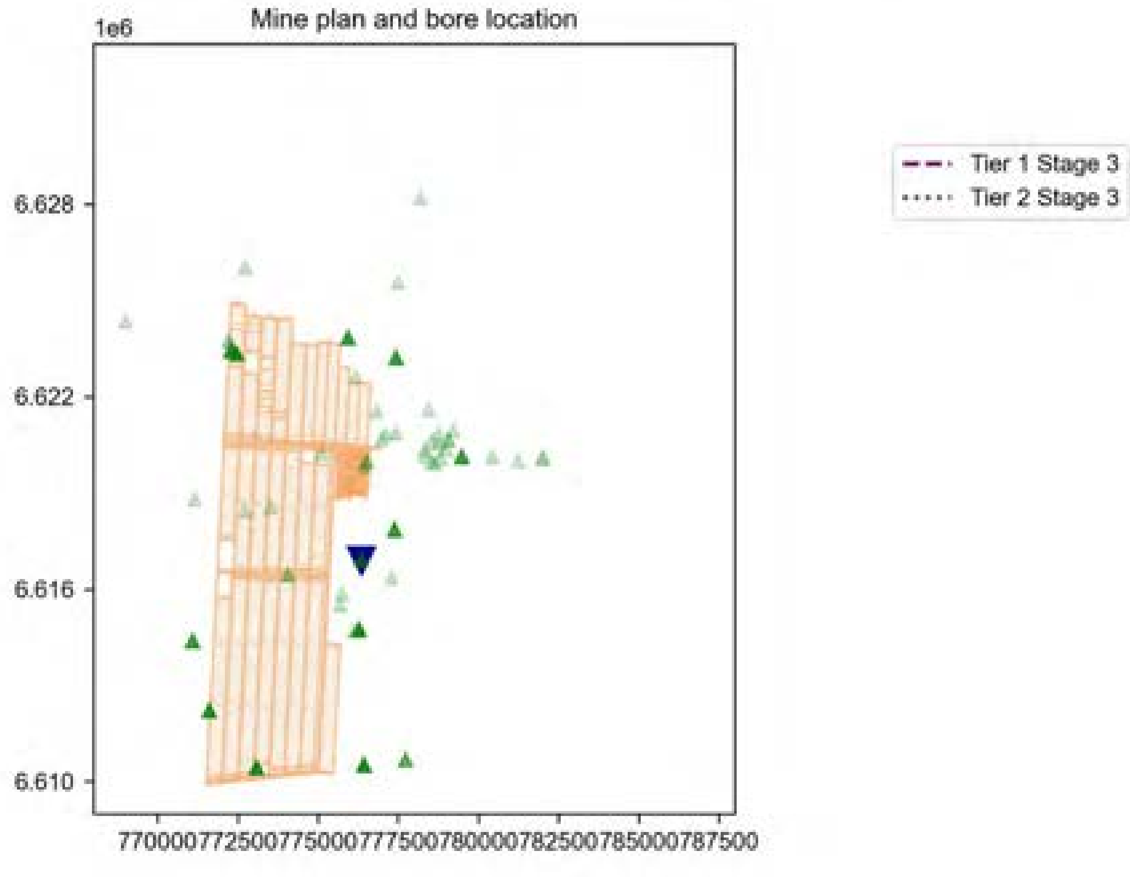




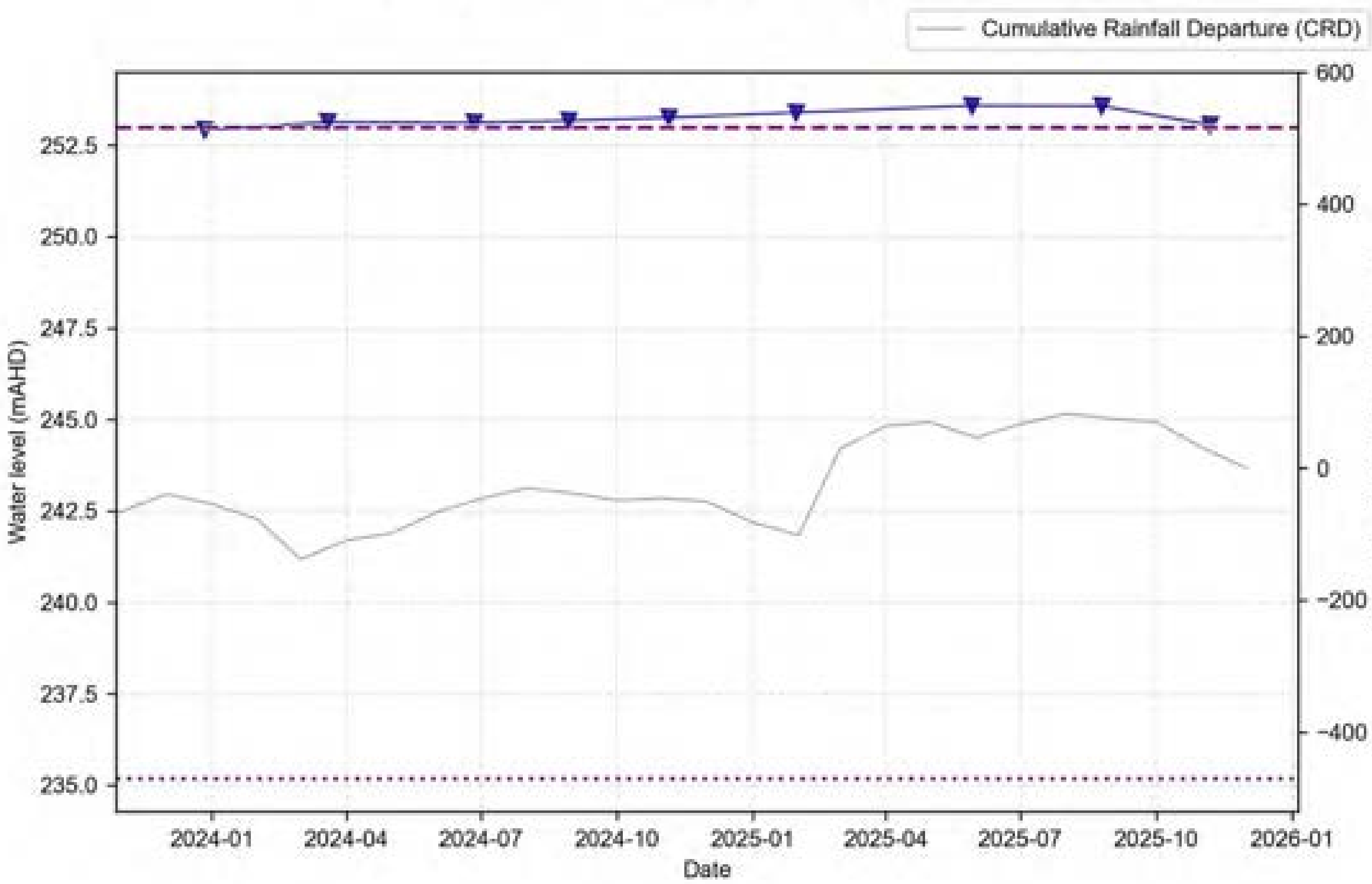
* mAHD - metres Australian Height Datum

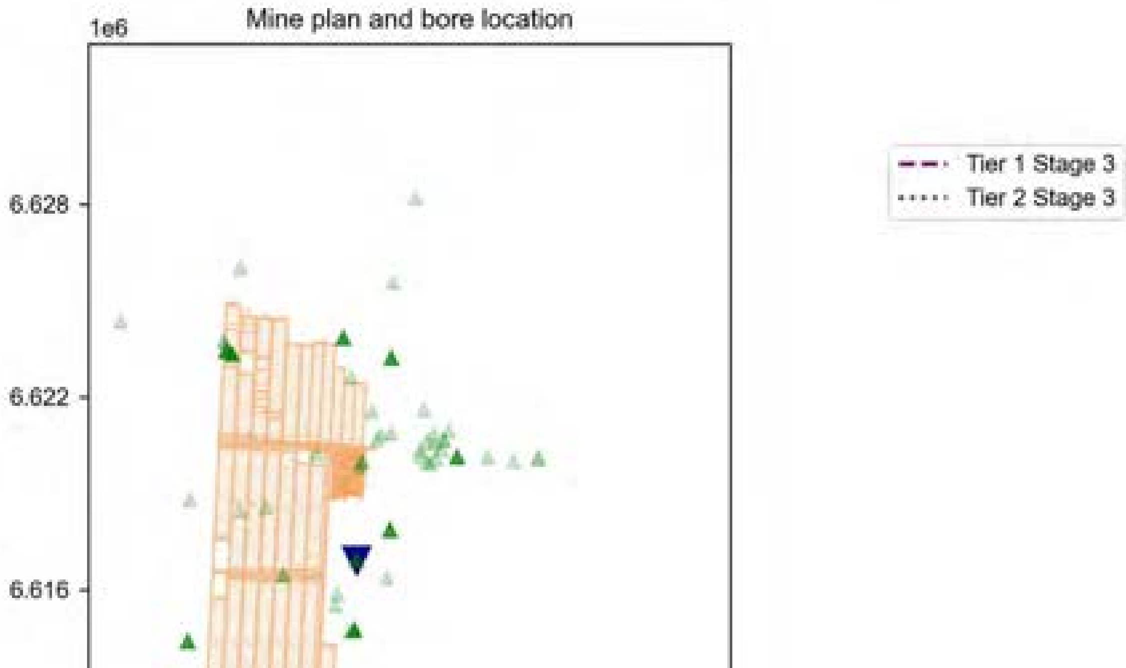
P68 (Colluvium; Outcrop)



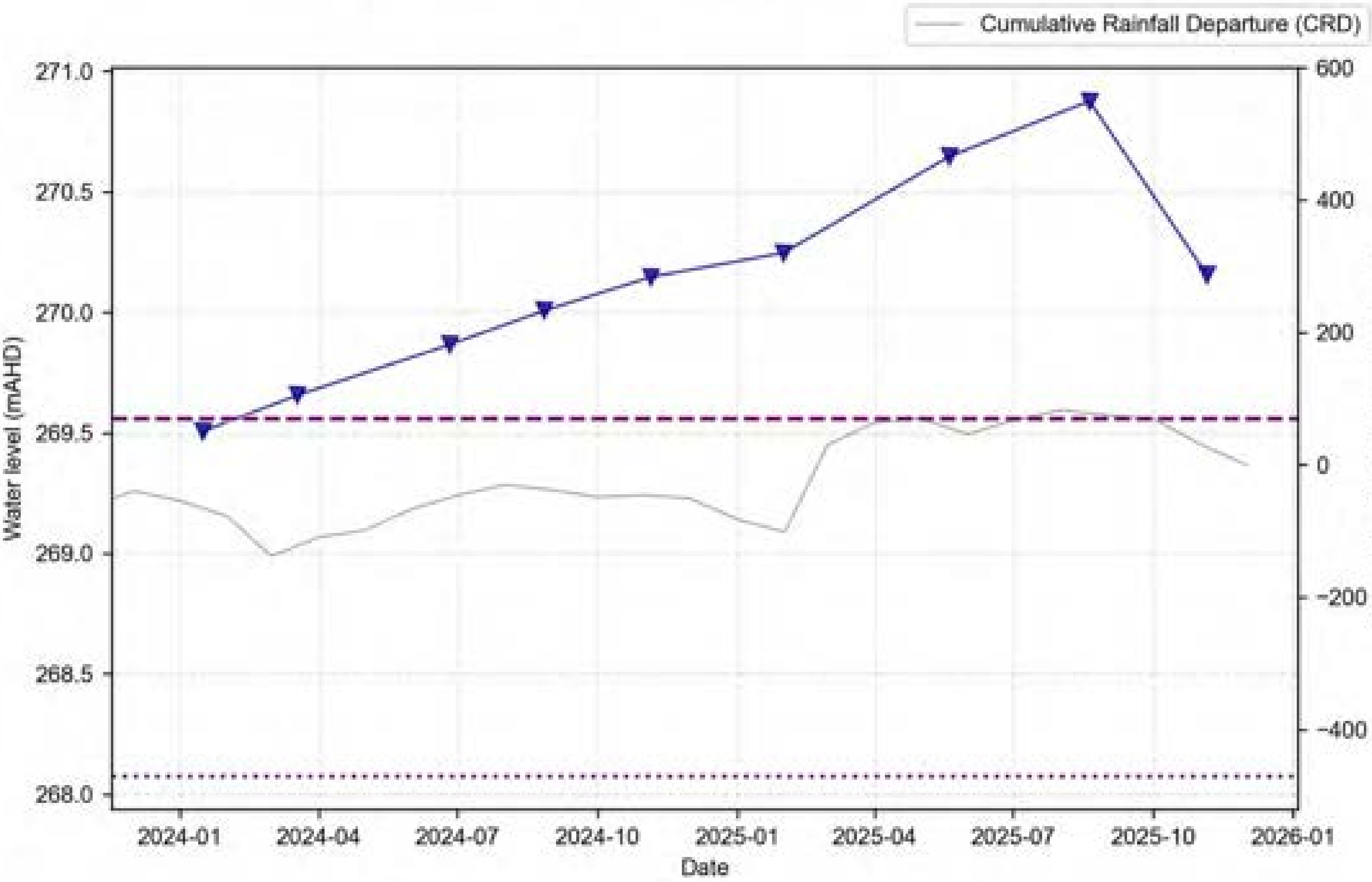


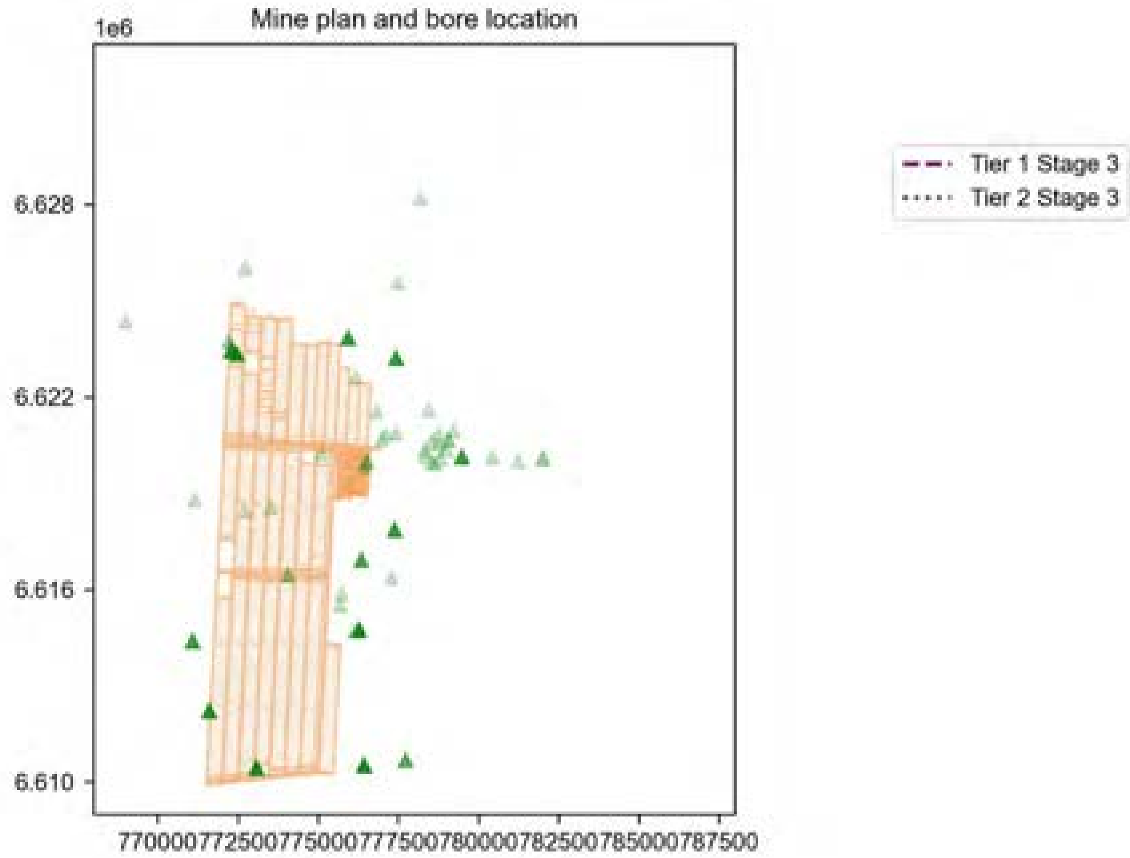
P69 (Napperby Formation; No outcrop info)



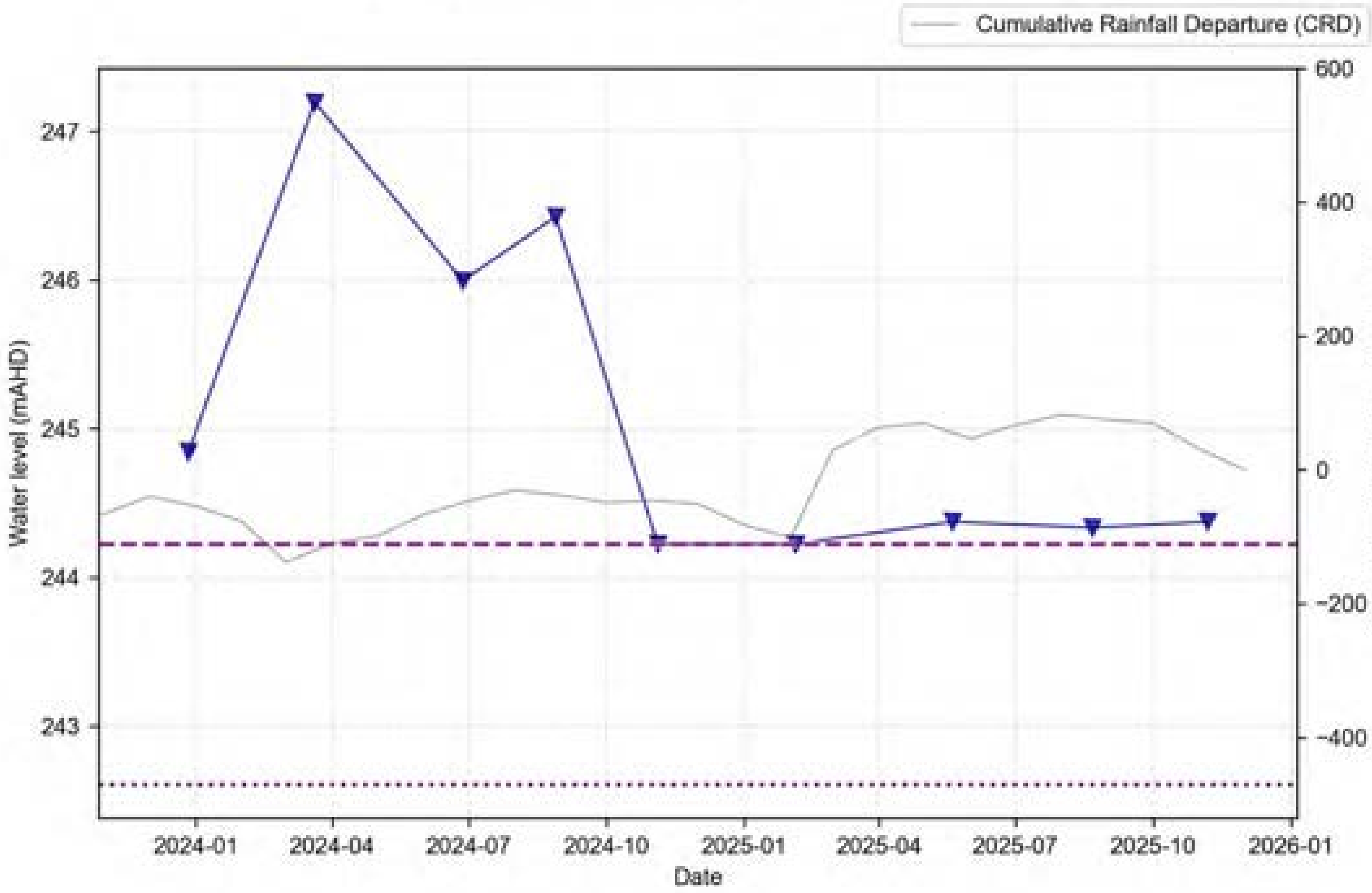


P72 (Purlawaugh Formation; No outcrop info)



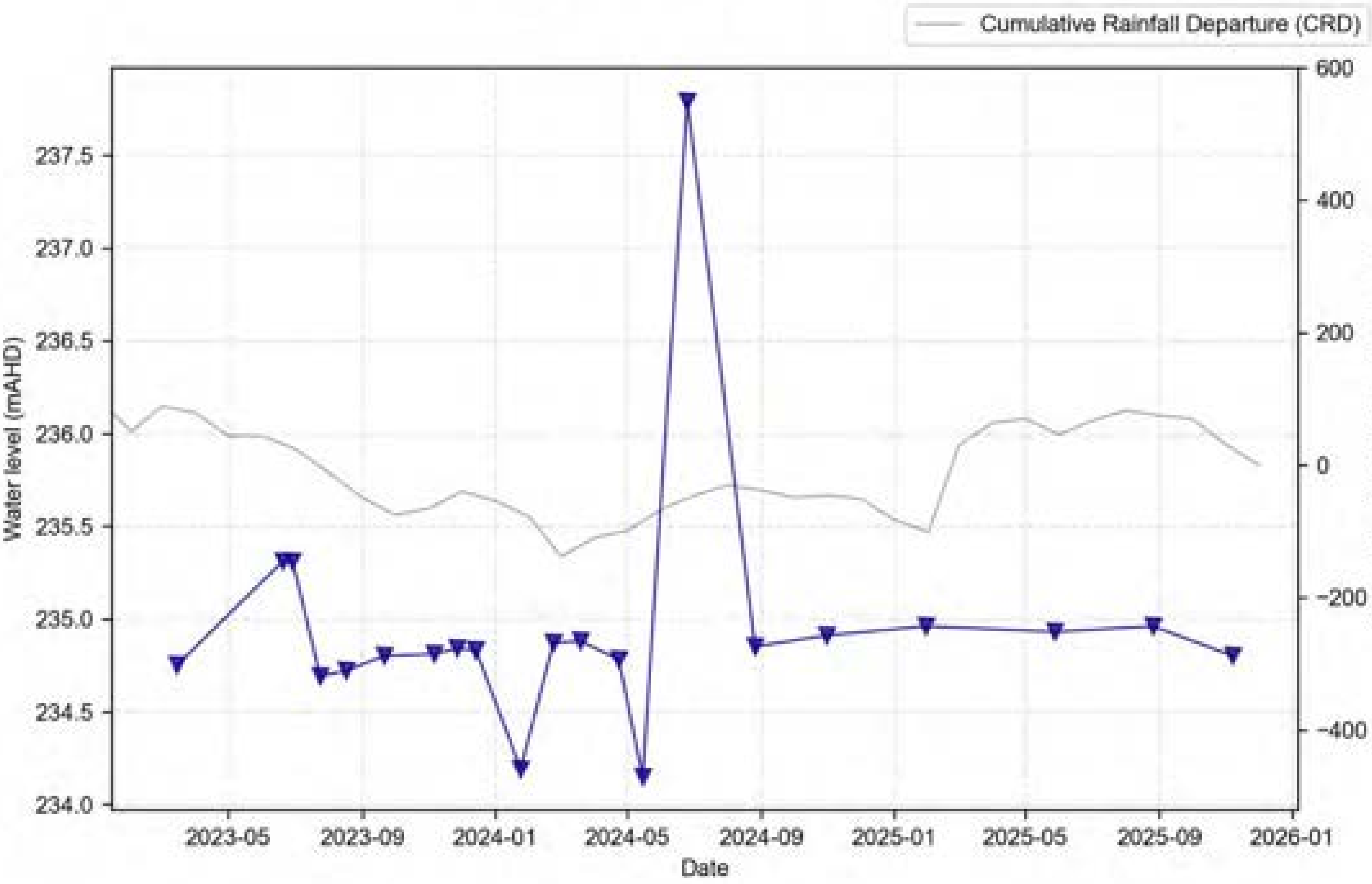


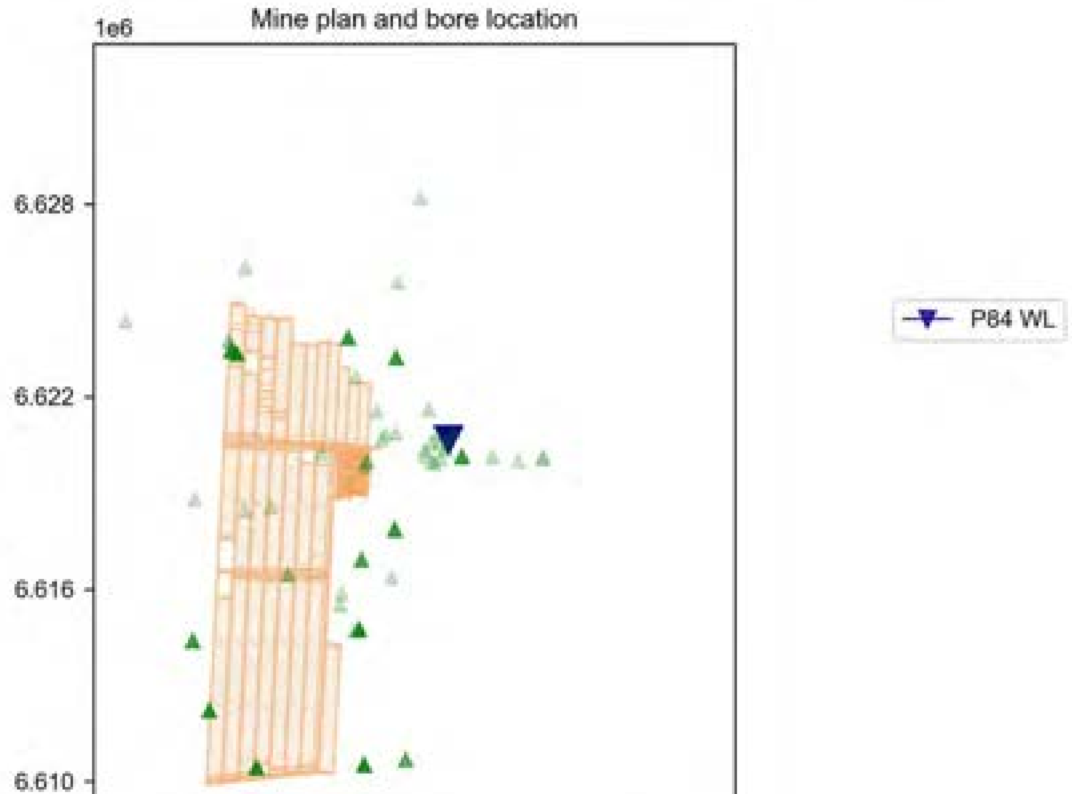
P75 (Napperby Formation; No outcrop info)



* mAHD - metres Australian Height Datum

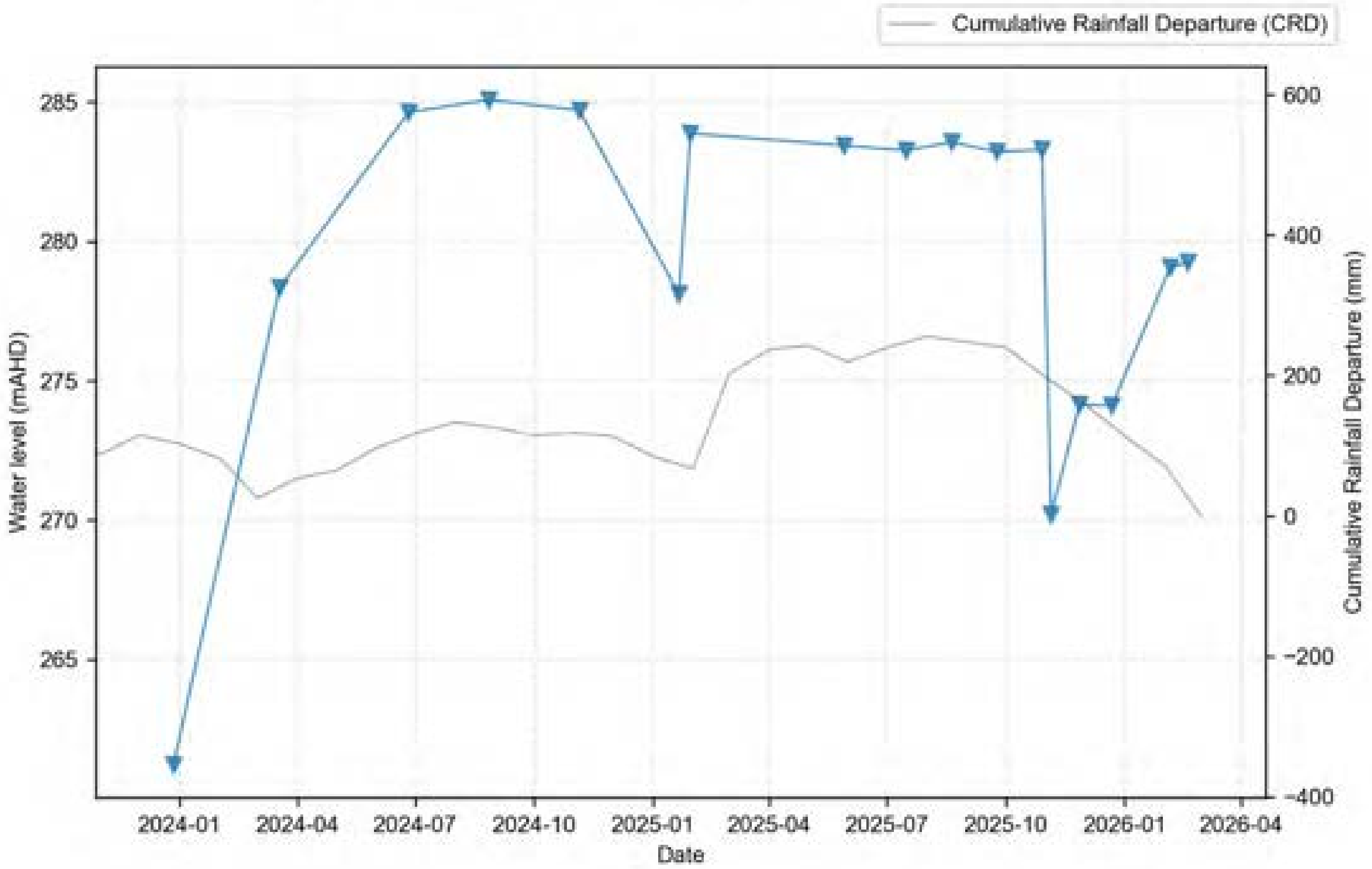
P84 (Siltstone; Outcrop)

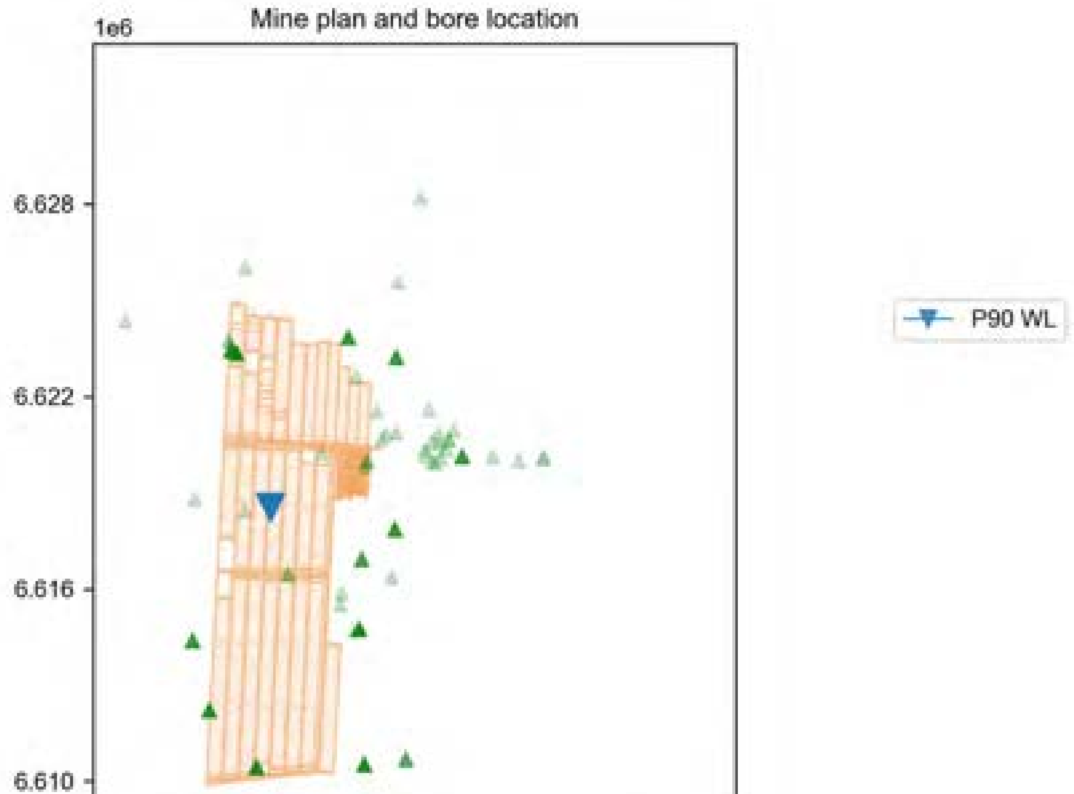




* mAHD - metres Australian Height Datum

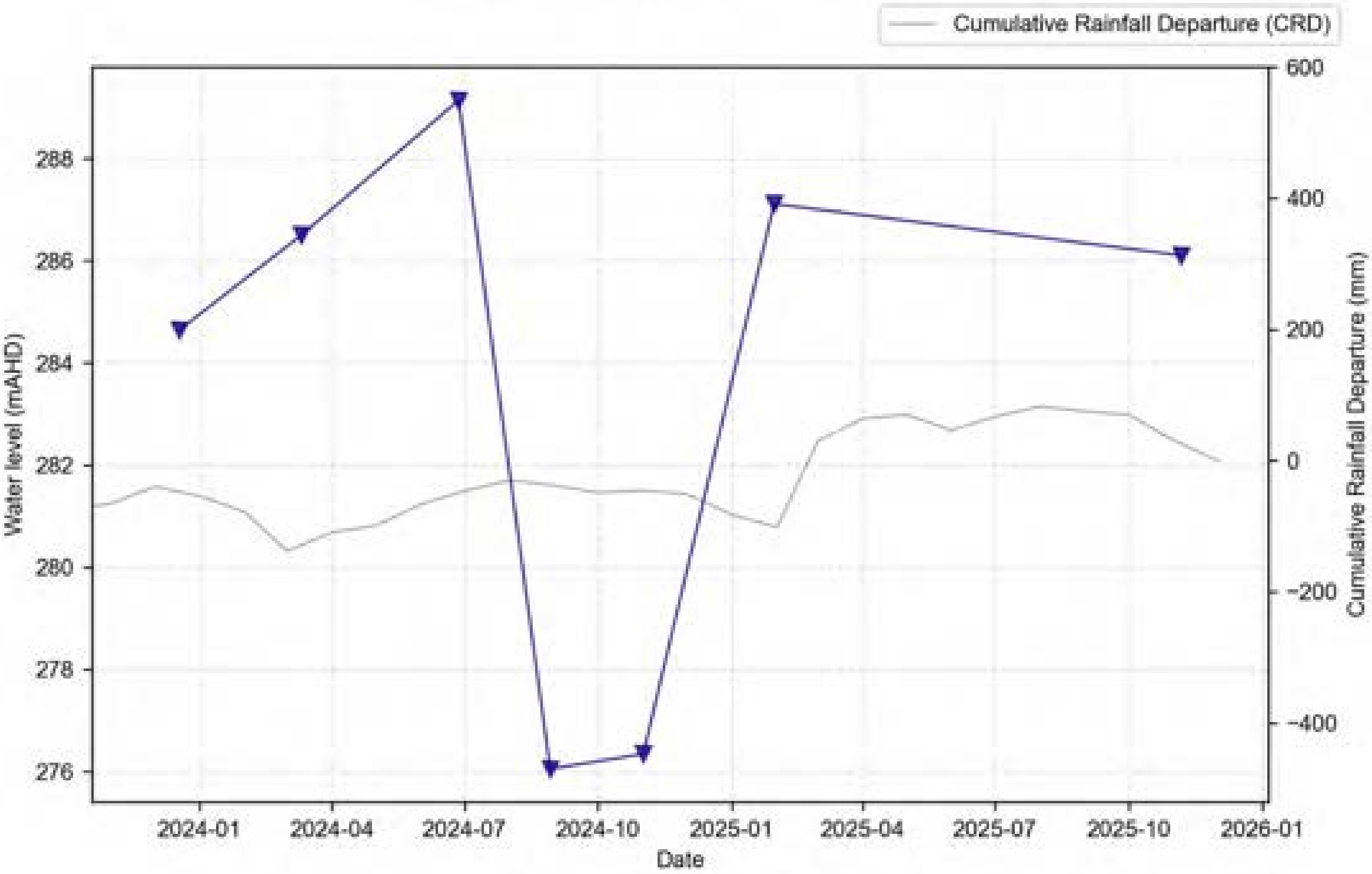
P90 (Purlawaugh Formation; No outcrop info)

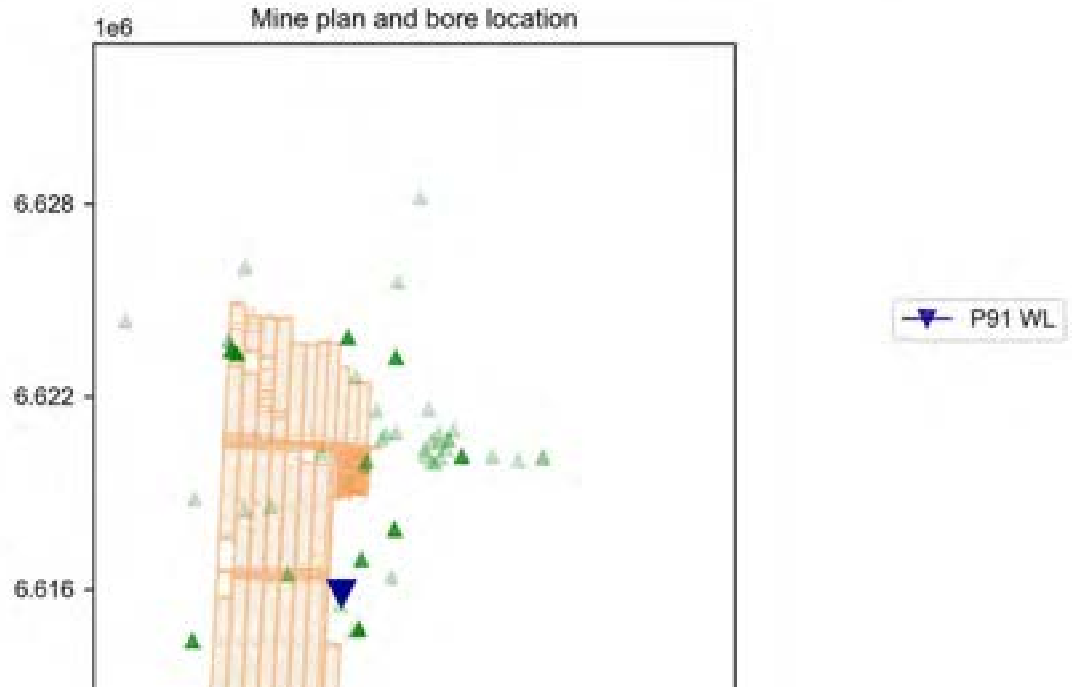




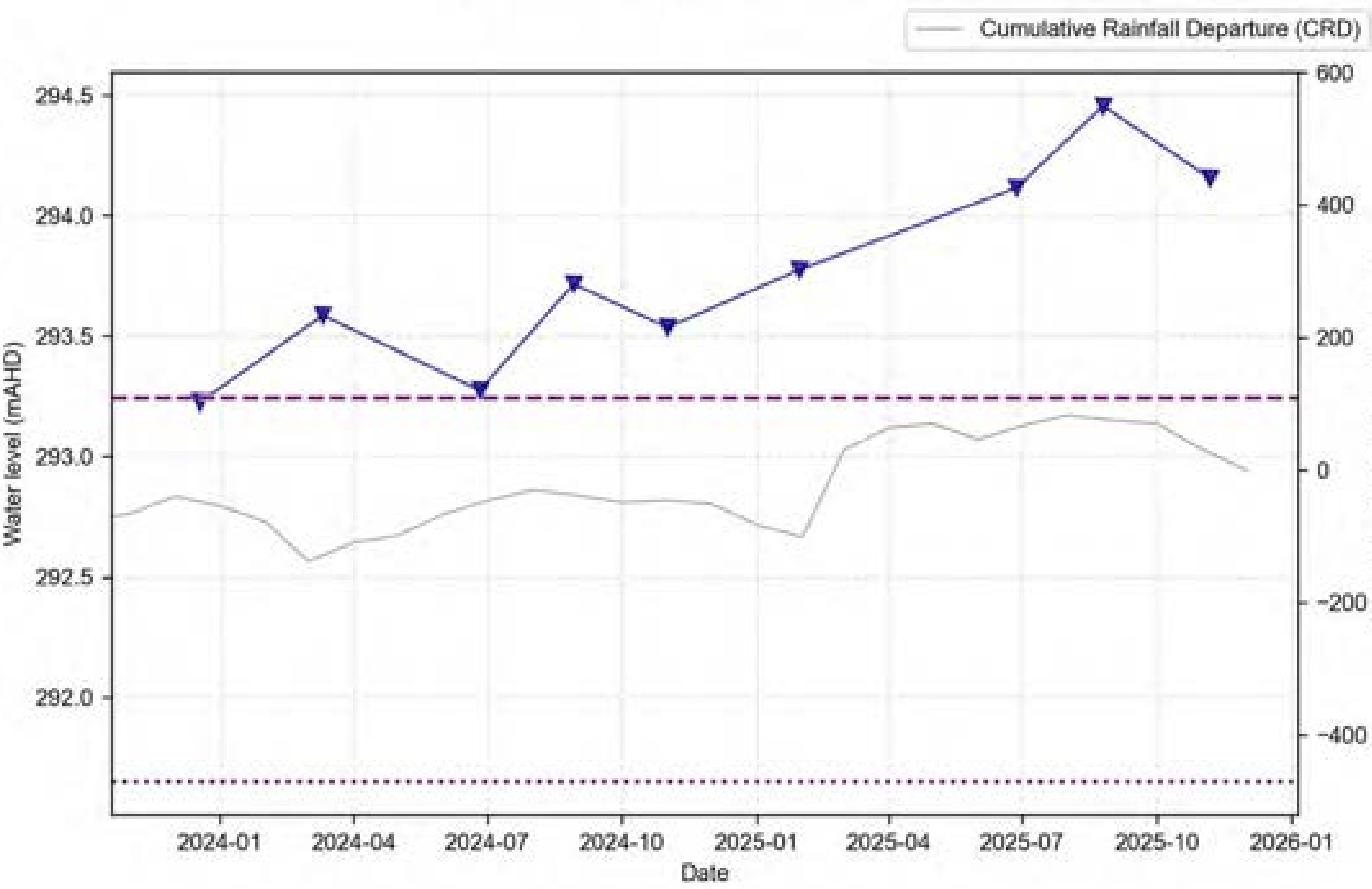
* mAHD - metres Australian Height Datum

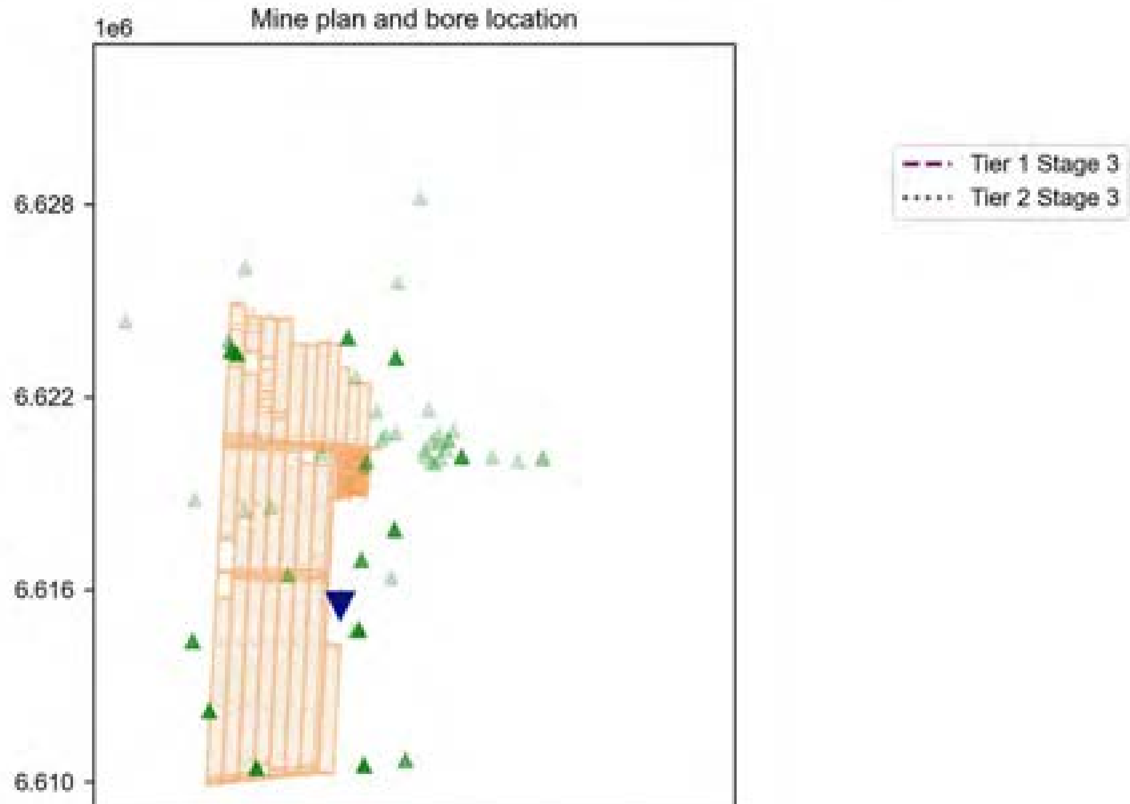
P91 (Mayfield Spring; Outcrop)



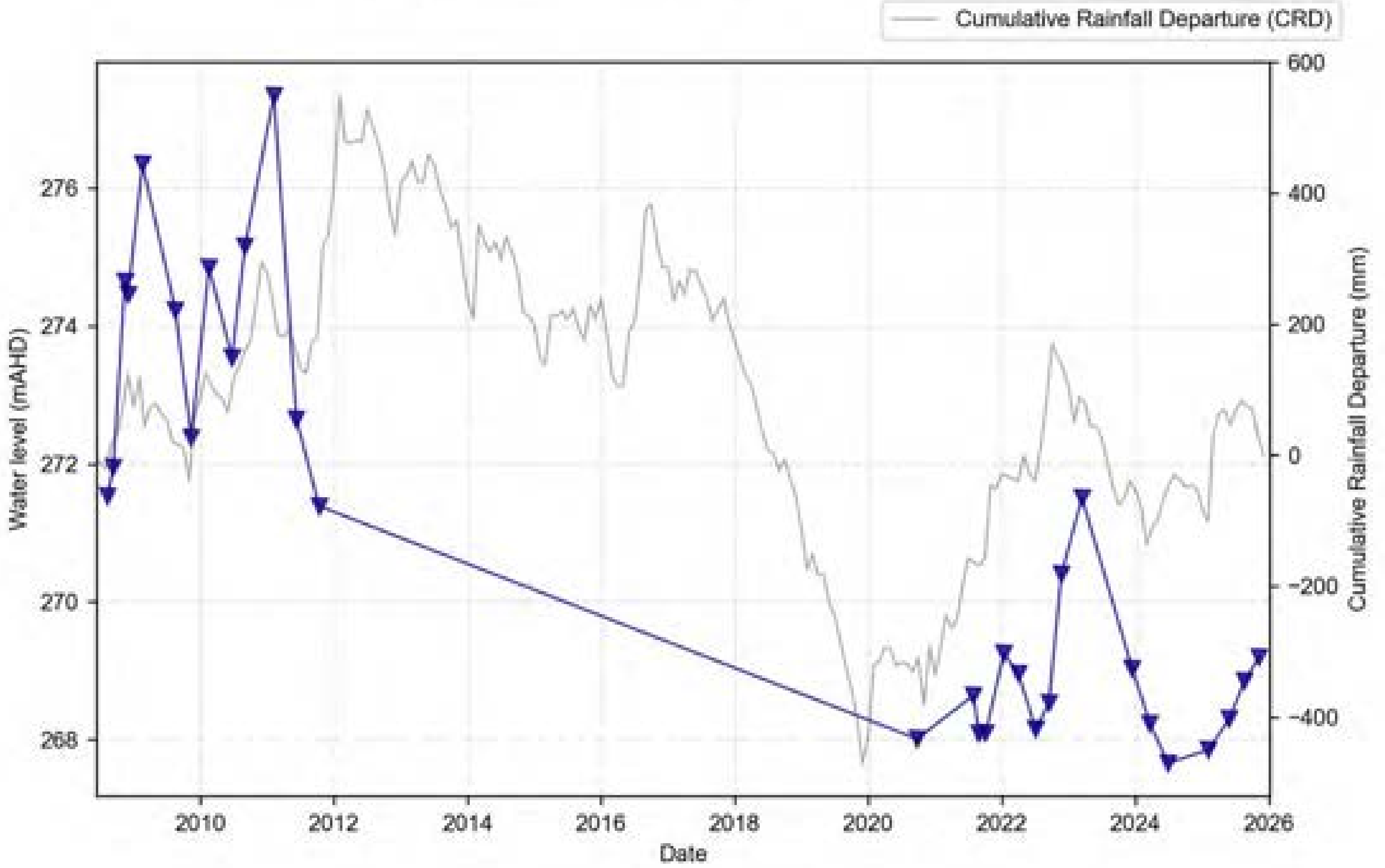


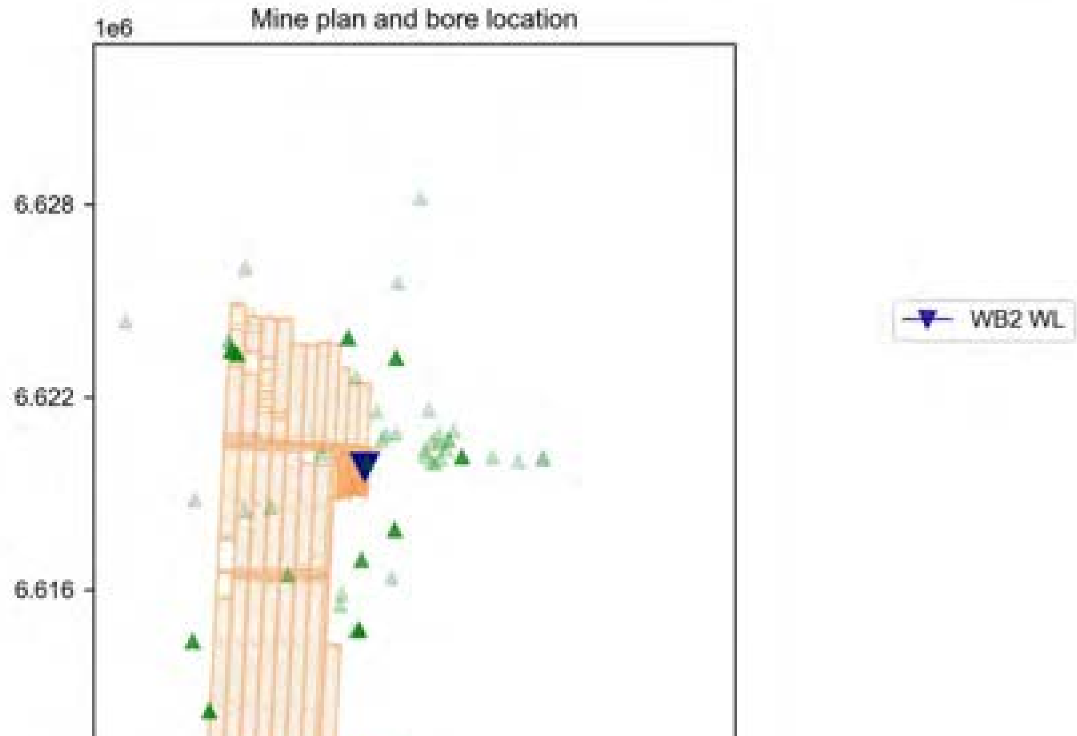
P92 (Mayfield Spring; Outcrop)





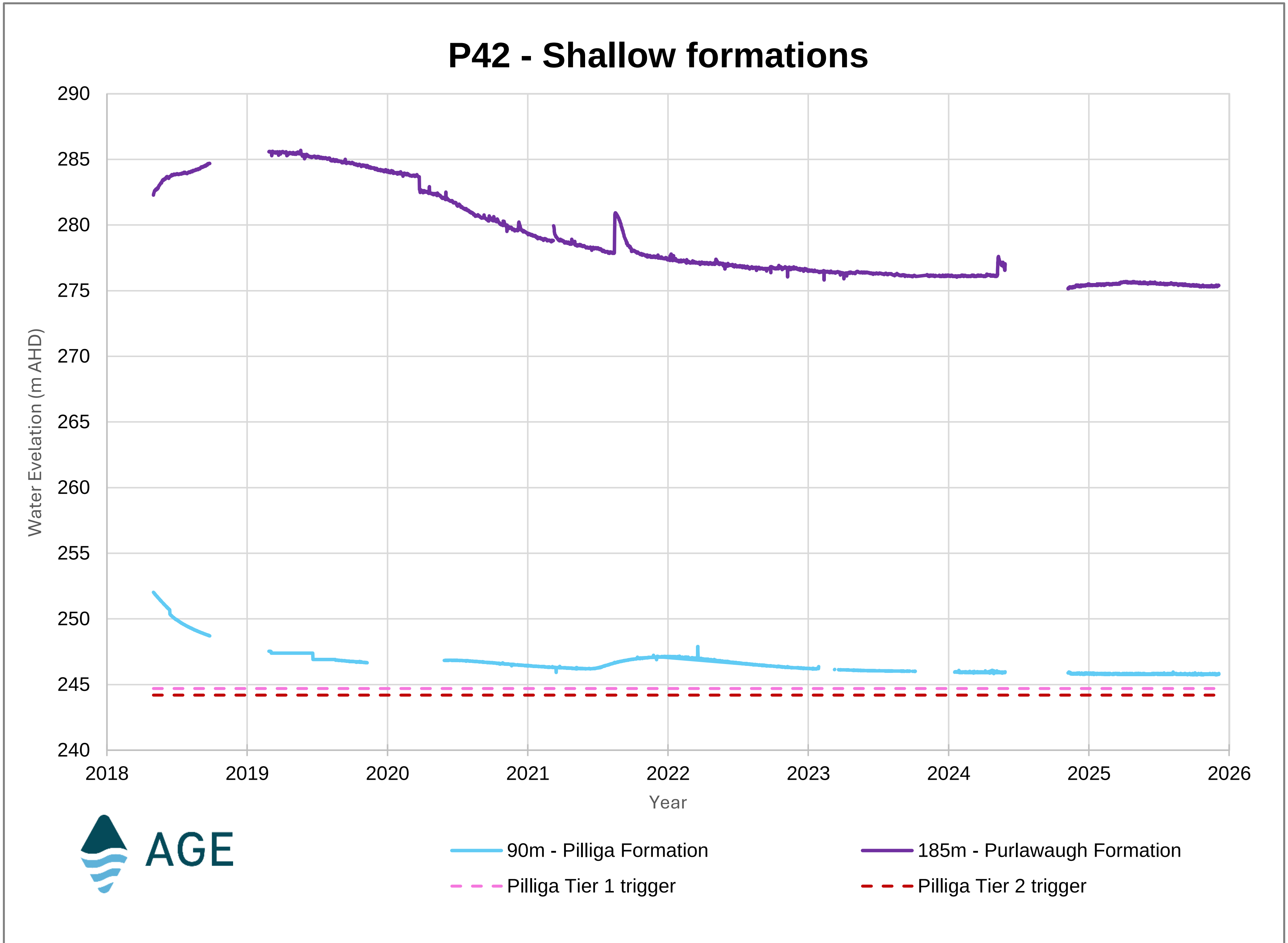
WB2 (Garrawilla Volcanics - old; Outcrop)



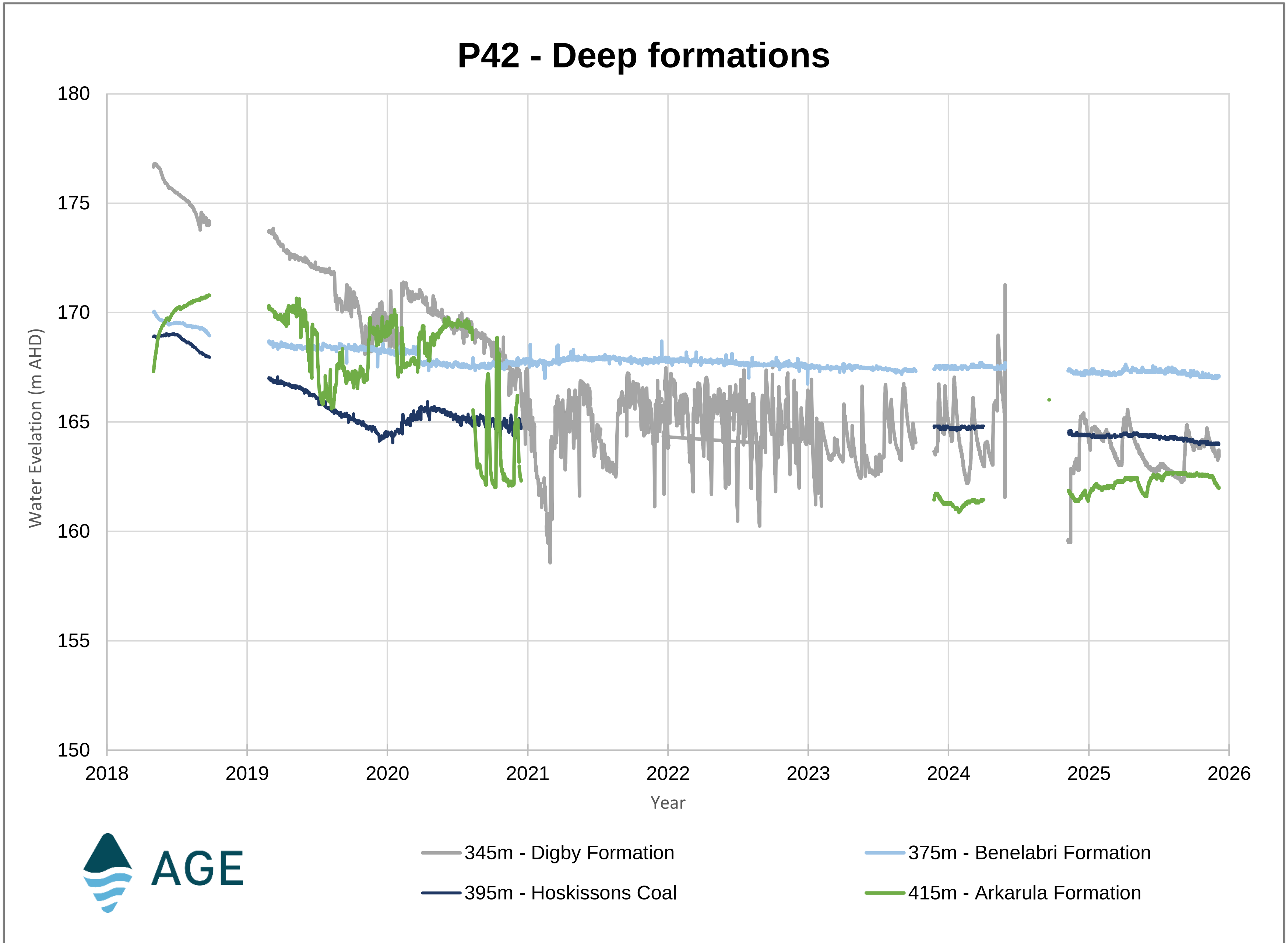


Appendix D

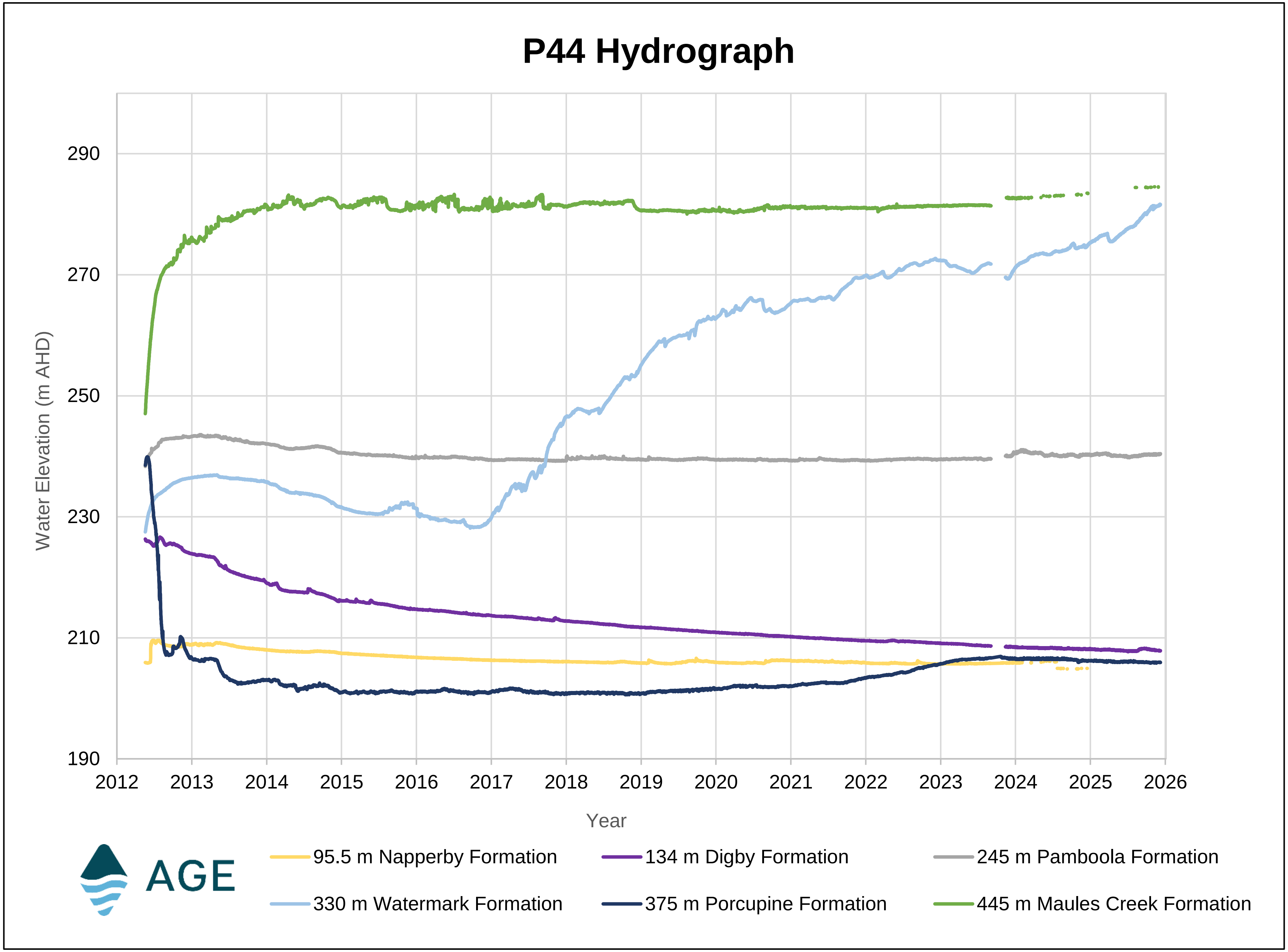
VWP hydrographs



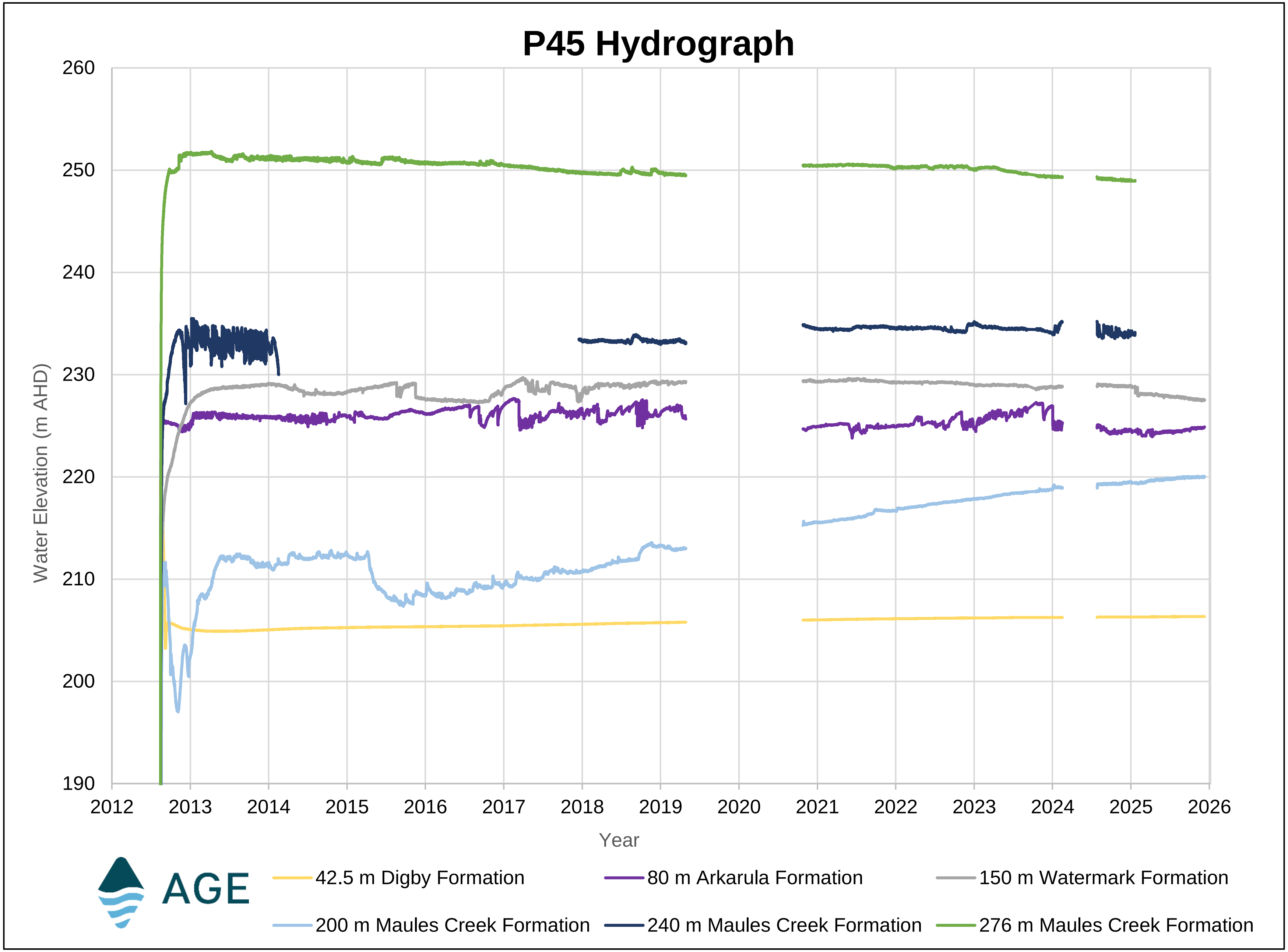
P42 - Shallow formations
290
285
280
275
270
265
260
255
250
245
240
Water Evelation (m AHD)
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
90m - Pilliga Formation
185m - Purlawaugh Formation
Pilliga Tier 1 trigger
Pilliga Tier 2 trigger



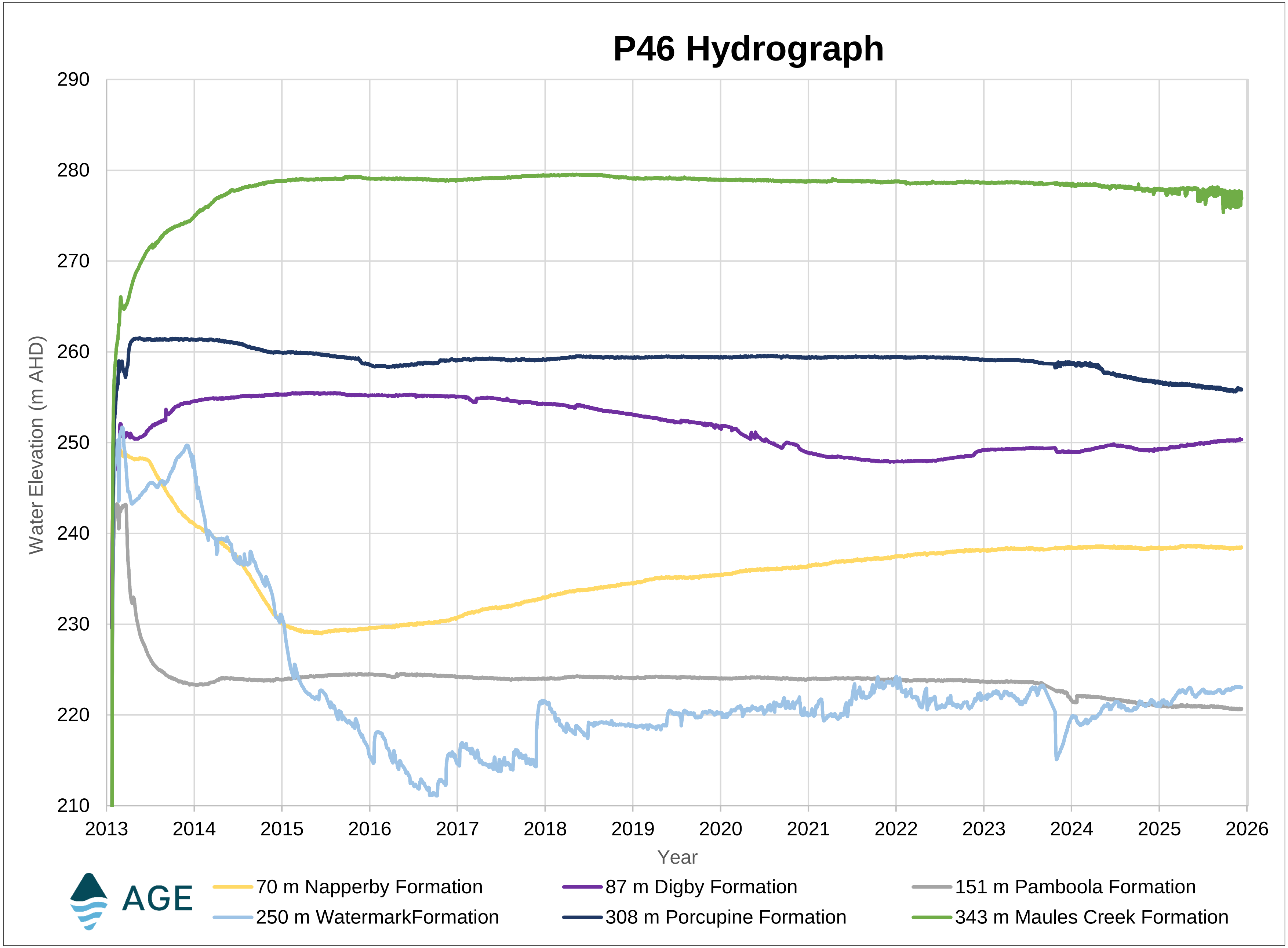
P42 - Deep formations
Water Evelation (m AHD)
180
175
170
165
160
155
150
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
345m - Digby Formation
375m - Benelabri Formation
395m - Hoskissons Coal
415m - Arkarula Formation



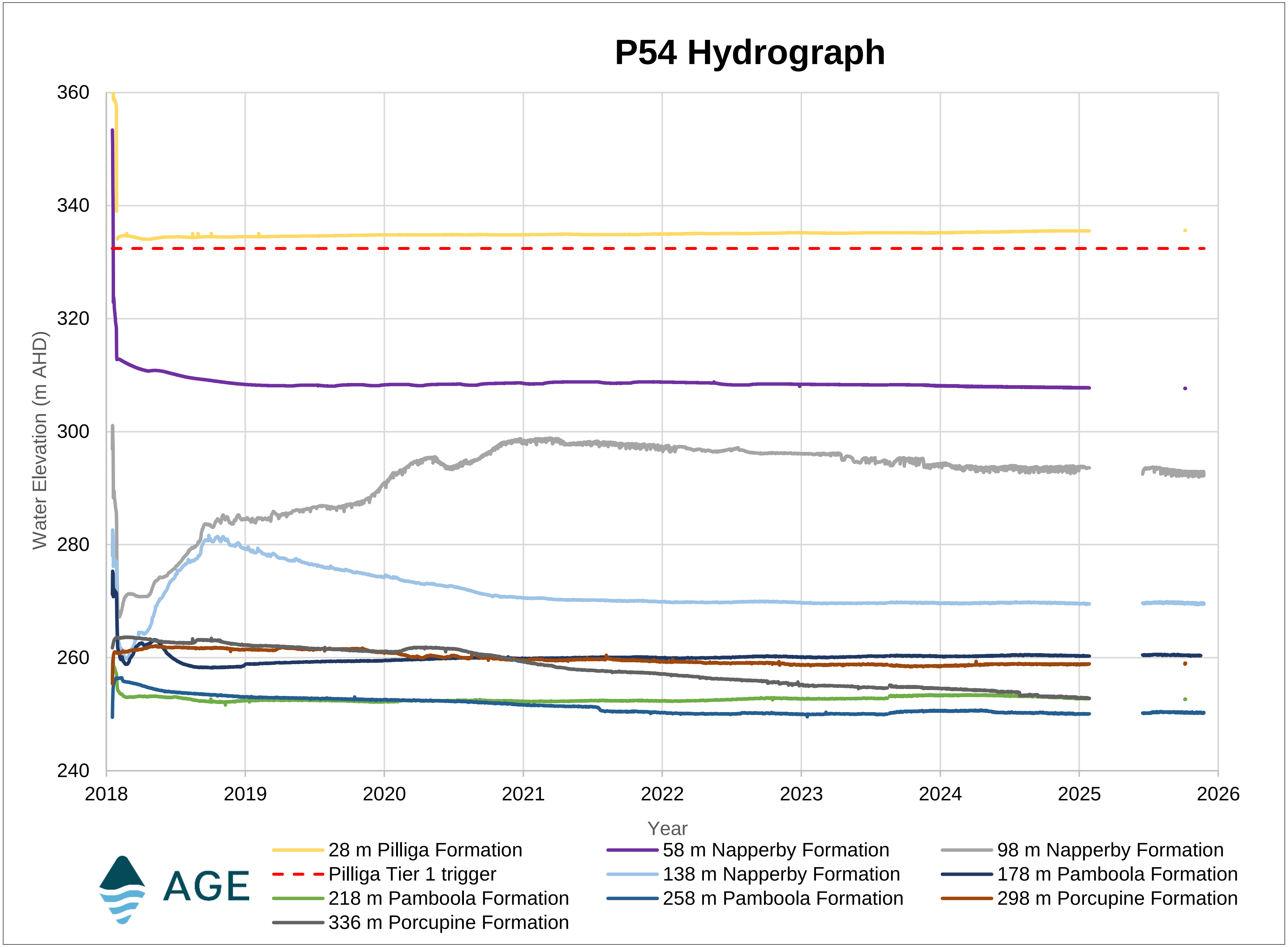
P44 Hydrograph
Water Elevation (m AHD)
290
270
250
230
210
190
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
95.5 m Napperby Formation
134 m Digby Formation
245 m Pamboola Formation
330 m Watermark Formation
375 m Porcupine Formation
445 m Maules Creek Formation

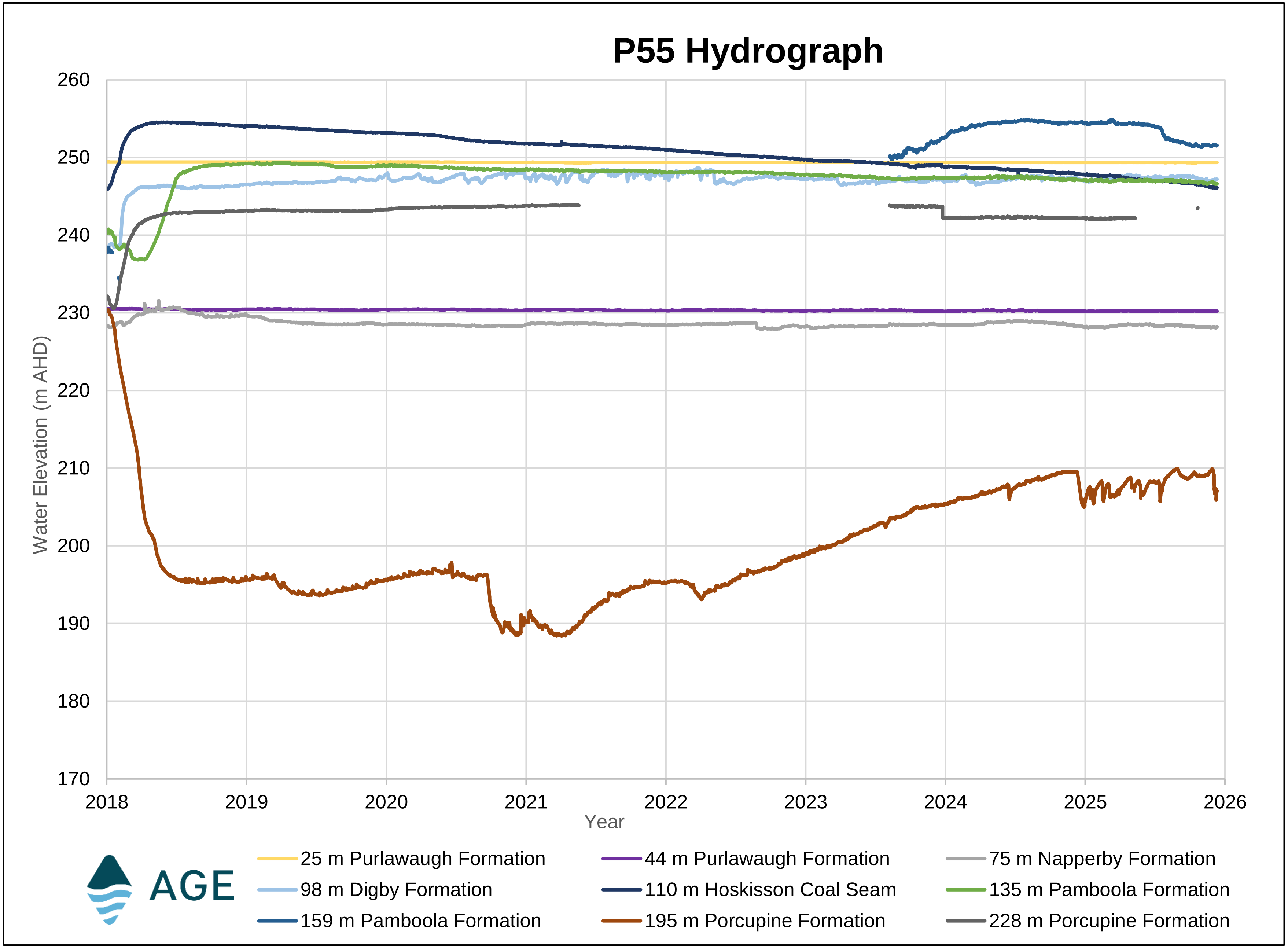


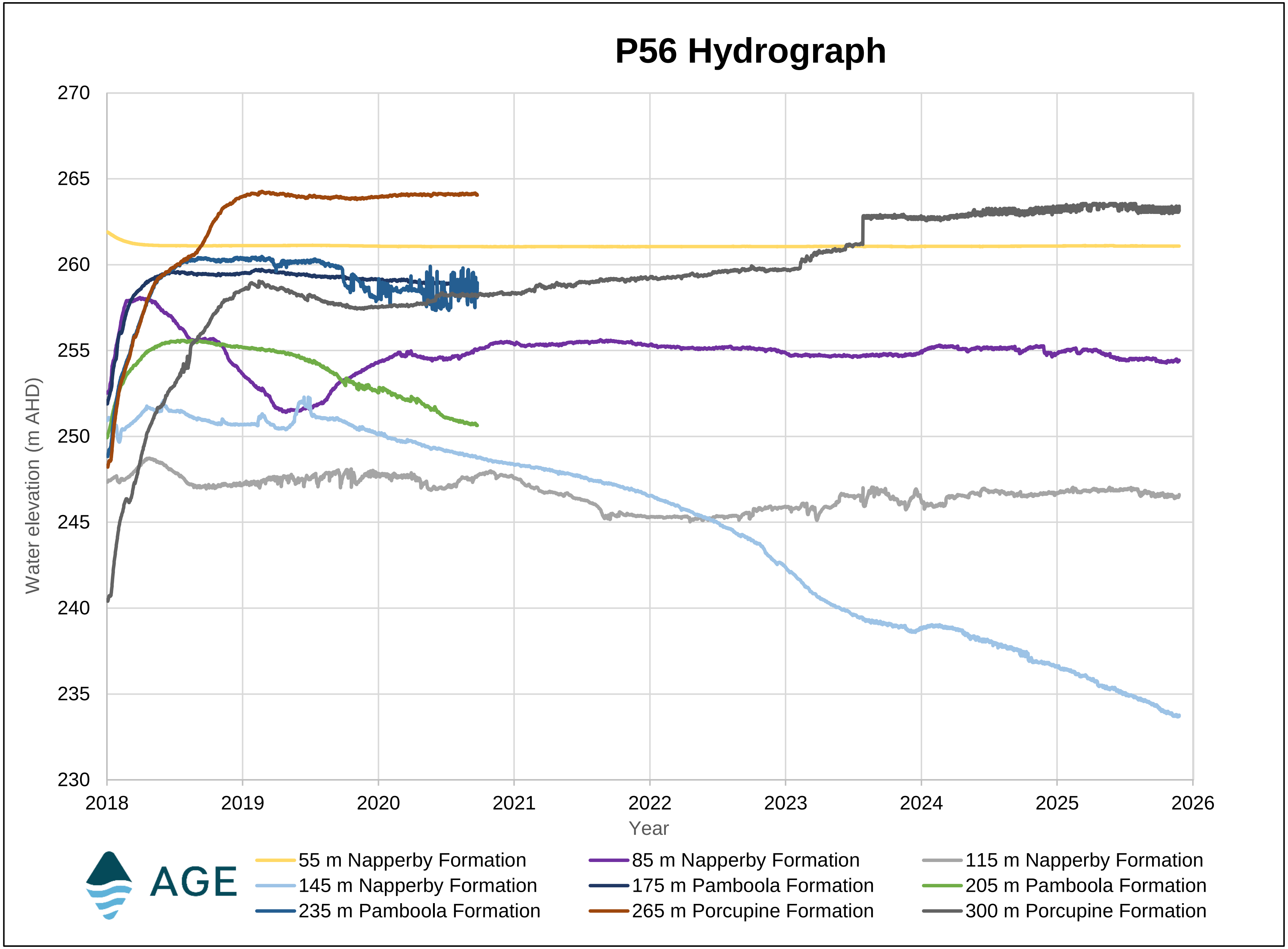
P45 Hydrograph
Water Elevation (m AHD)
260
250
240
230
220
210
200
190
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
42.5 m Digby Formation
80 m Arkarula Formation
150 m Watermark Formation
200 m Maules Creek Formation
240 m Maules Creek Formation
276 m Maules Creek Formation

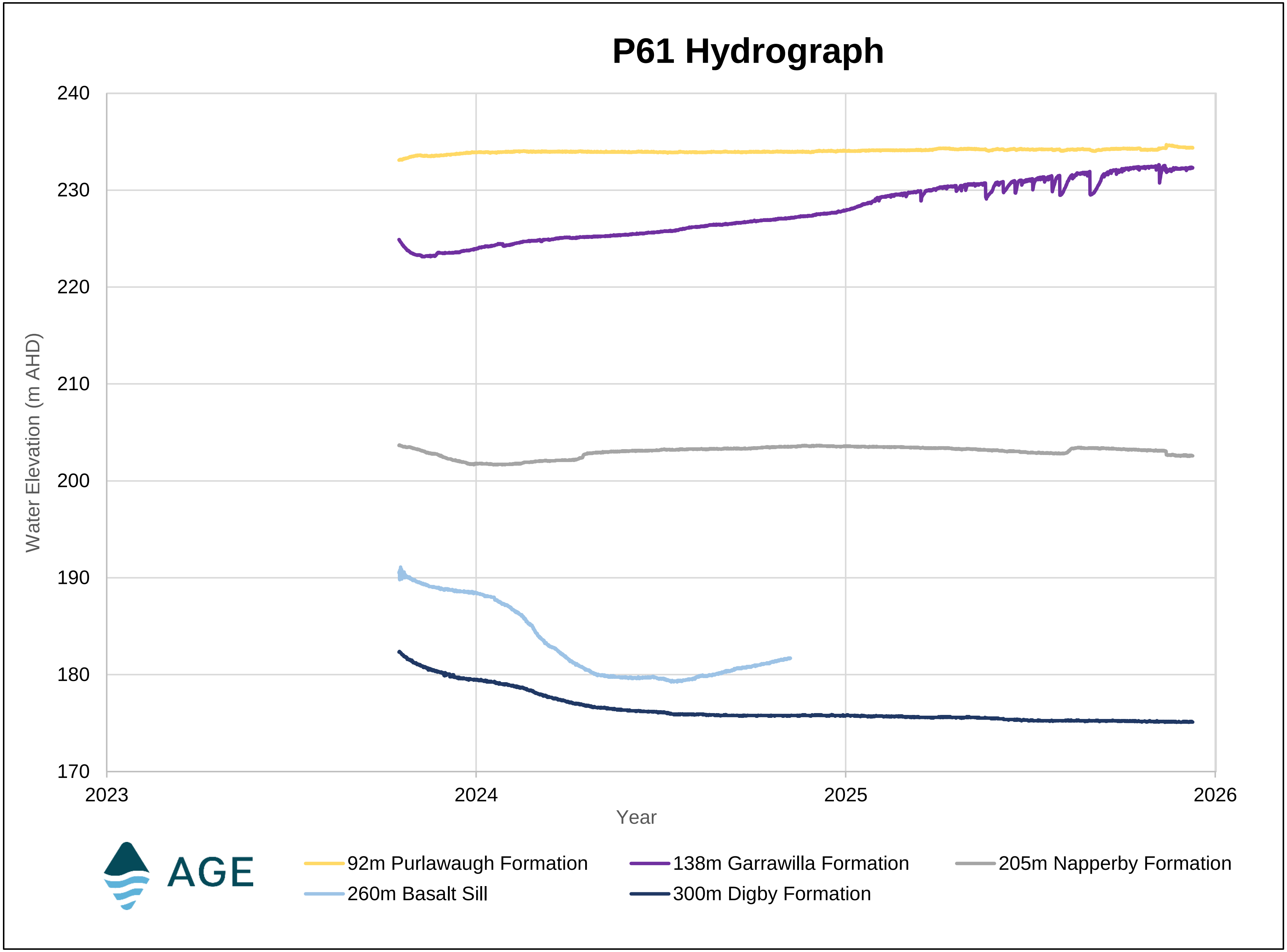


P46 Hydrograph
290
280
270
260
250
240
230
220
210
Water Elevation (m AHD)
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
70 m Napperby Formation
87 m Digby Formation
151 m Pamboola Formation
250 m WatermarkFormation
308 m Porcupine Formation
343 m Maules Creek Formation

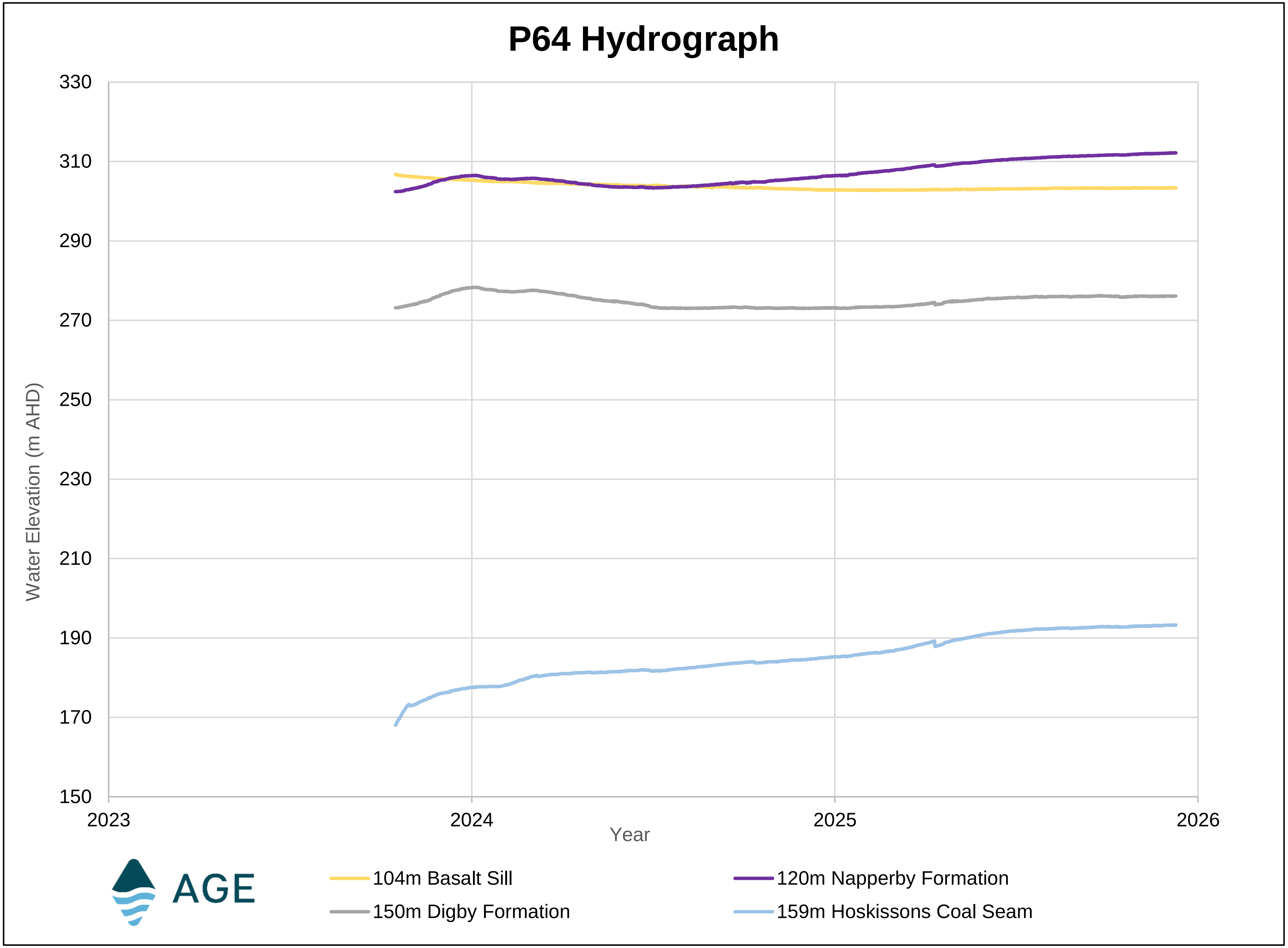

P54 Hydrograph
Water Elevation (m AHD)
360
340
320
300
280
260
240
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
28 m Pilliga Formation
Pilliga Tier 1 trigger
218 m Pamboola Formation
336 m Porcupine Formation
58 m Napperby Formation
138 m Napperby Formation
258 m Pamboola Formation
98 m Napperby Formation
178 m Pamboola Formation
298 m Porcupine Formation
AGE


P55 Hydrograph
260
250
240
230
220
210
200
190
180
170
Water Elevation (m AHD)
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
25 m Purlawaugh Formation
44 m Purlawaugh Formation
75 m Napperby Formation
98 m Digby Formation
110 m Hoskisson Coal Seam
135 m Pamboola Formation
159 m Pamboola Formation
195 m Porcupine Formation
228 m Porcupine Formation

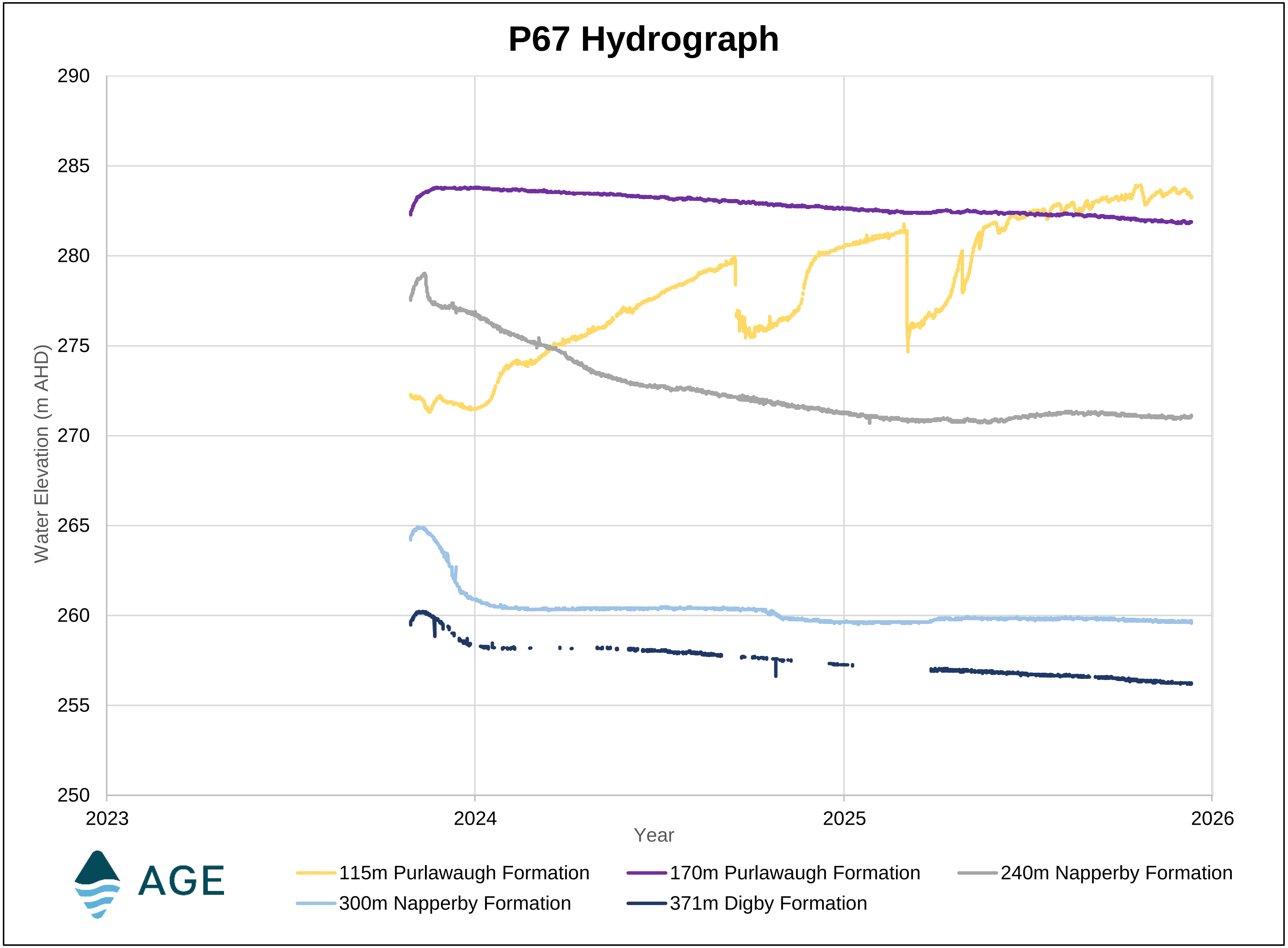

P56 Hydrograph
Water elevation (m AHD)
270
265
260
255
250
245
240
235
230
2018
2019
2020
2021
2022
2023
2024
2025
2026
Year
AGE
55 m Napperby Formation
85 m Napperby Formation
115 m Napperby Formation
145 m Napperby Formation
175 m Pamboola Formation
205 m Pamboola Formation
235 m Pamboola Formation
265 m Porcupine Formation
300 m Porcupine Formation

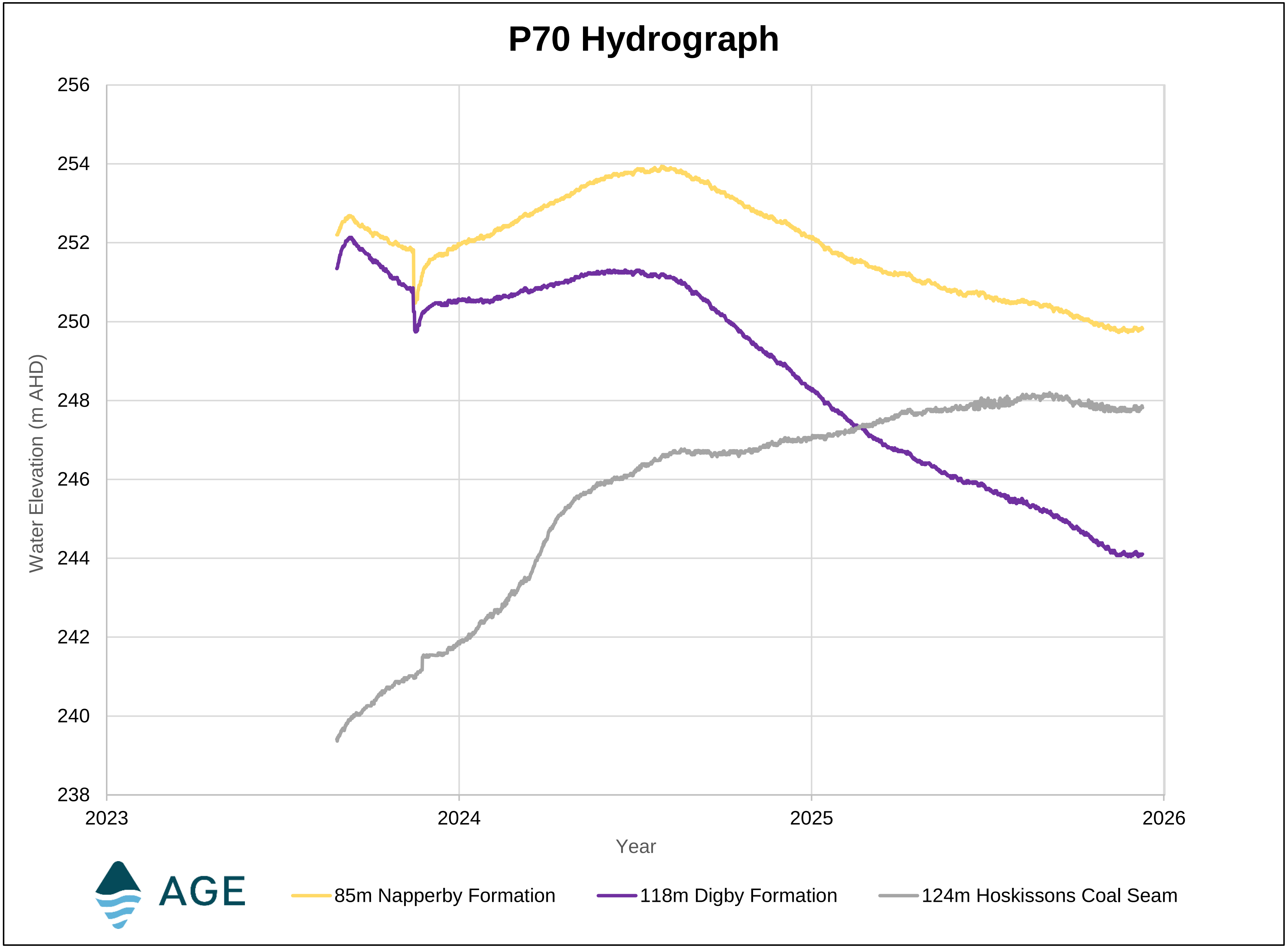


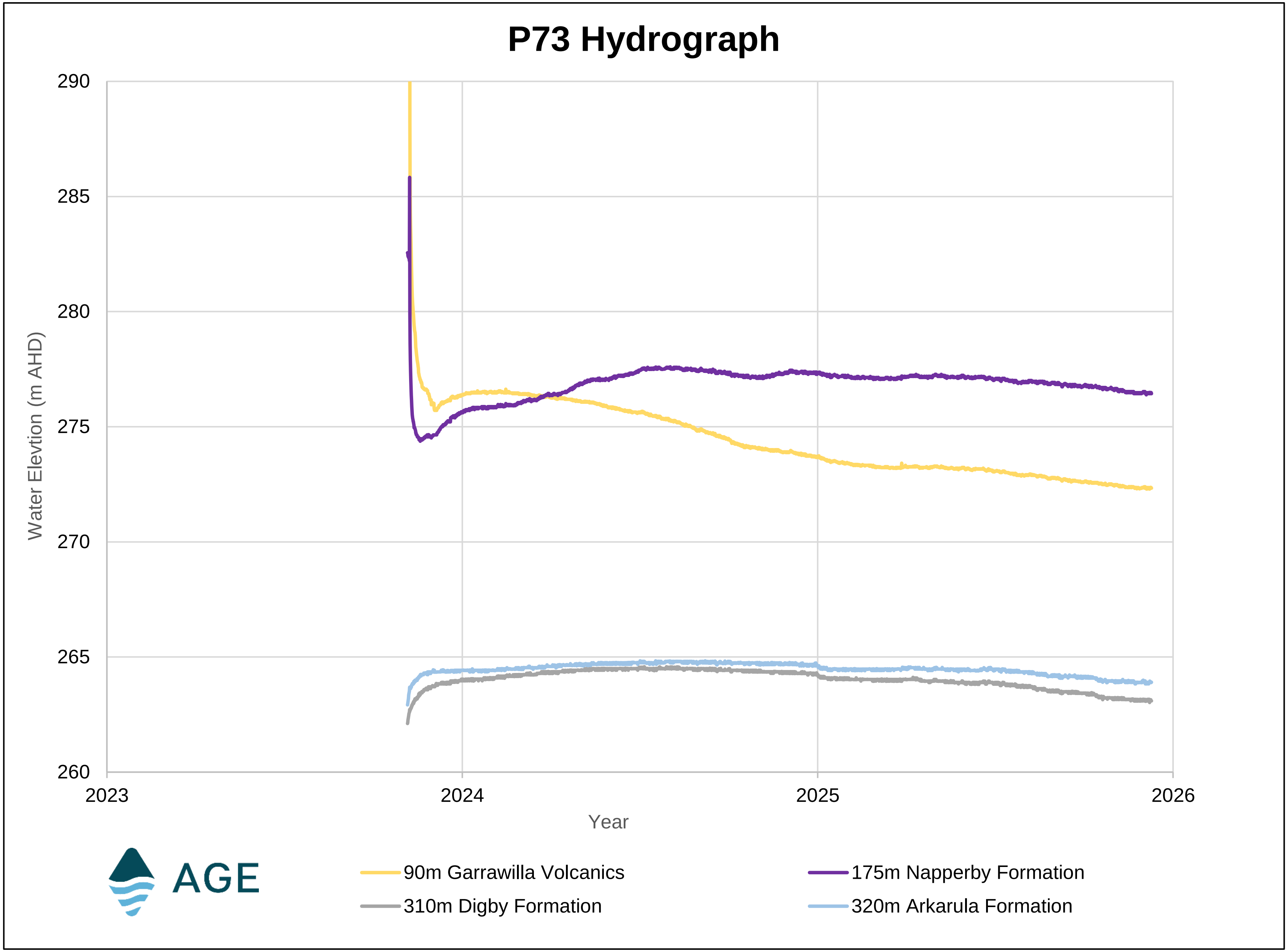
P61 Hydrograph
Water Elevation (m AHD)
240
230
220
210
200
190
180
170
2023
2024
2025
2026
Year
AGE
92m Purlawaugh Formation
138m Garrawilla Formation
205m Napperby Formation
260m Basalt Sill
300m Digby Formation

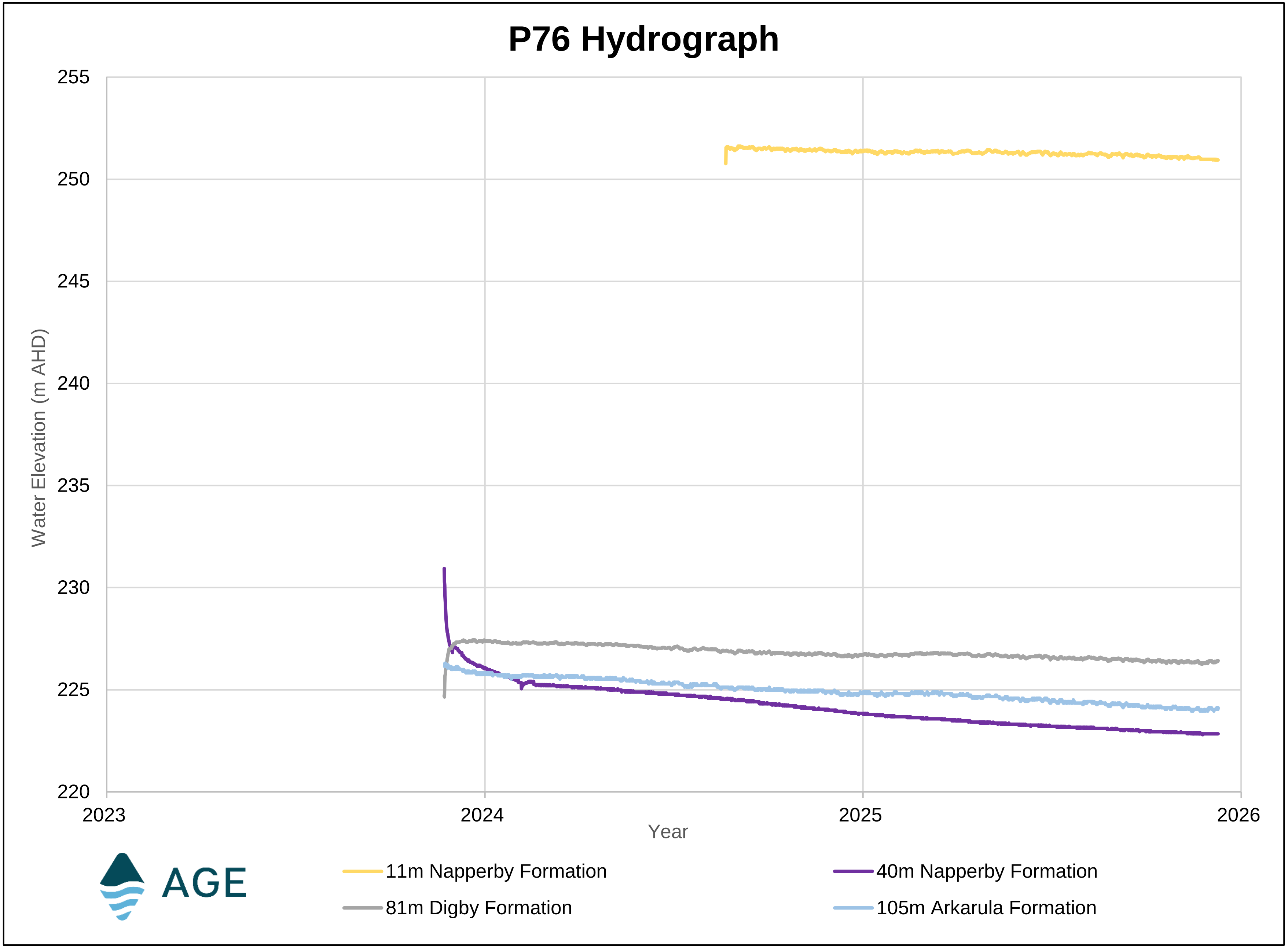


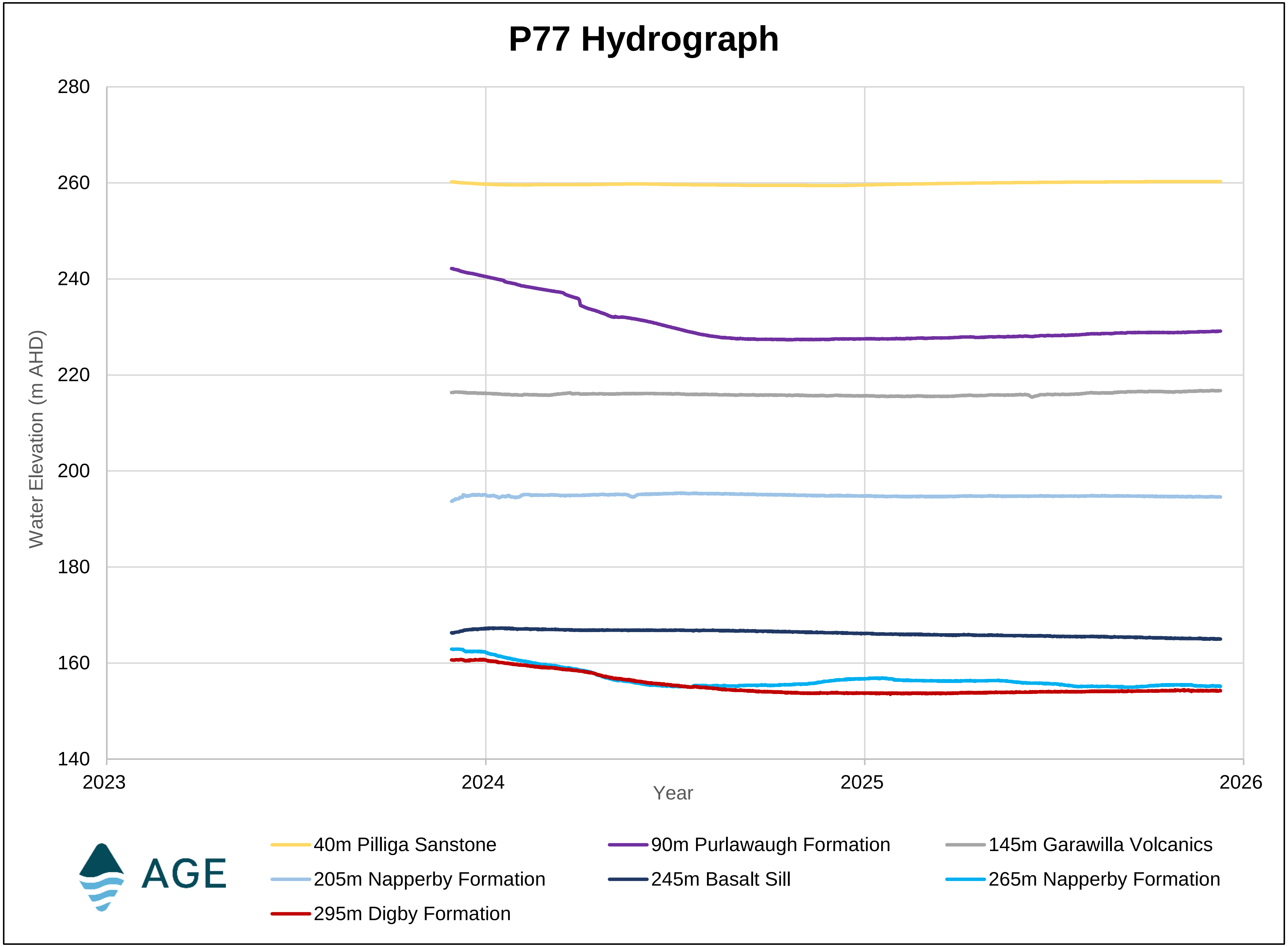
P64 Hydrograph
330
310
290
270
250
230
210
190
170
150
Water Elevation (m AHD)
2023
2024
2025
2026
Year
AGE
104m Basalt Sill
120m Napperby Formation
150m Digby Formation
159m Hoskissons Coal Seam


P67 Hydrograph
Water Elevation (m AHD)
290
285
280
275
270
265
260
255
250
2023
2024
2025
2026
Year
AGE
115m Purlawaugh Formation
170m Purlawaugh Formation
240m Napperby Formation
300m Napperby Formation
371m Digby Formation


P70 Hydrograph
Water Elevation (m AHD)
256
254
252
250
248
246
244
242
240
238
2023
2024
2025
2026
Year
AGE
85m Napperby Formation
118m Digby Formation
124m Hoskissons Coal Seam


P73 Hydrograph
Water Elevtion (m AHD)
290
285
280
275
270
265
260
2023
2024
2025
2026
Year
AGE
90m Garrawilla Volcanics
175m Napperby Formation
310m Digby Formation
320m Arkarula Formation


P76 Hydrograph
255
250
245
240
235
230
225
220
Water Elevation (m AHD)
2023
2024
2025
2026
Year
AGE
11m Napperby Formation
40m Napperby Formation
81m Digby Formation
105m Arkarula Formation

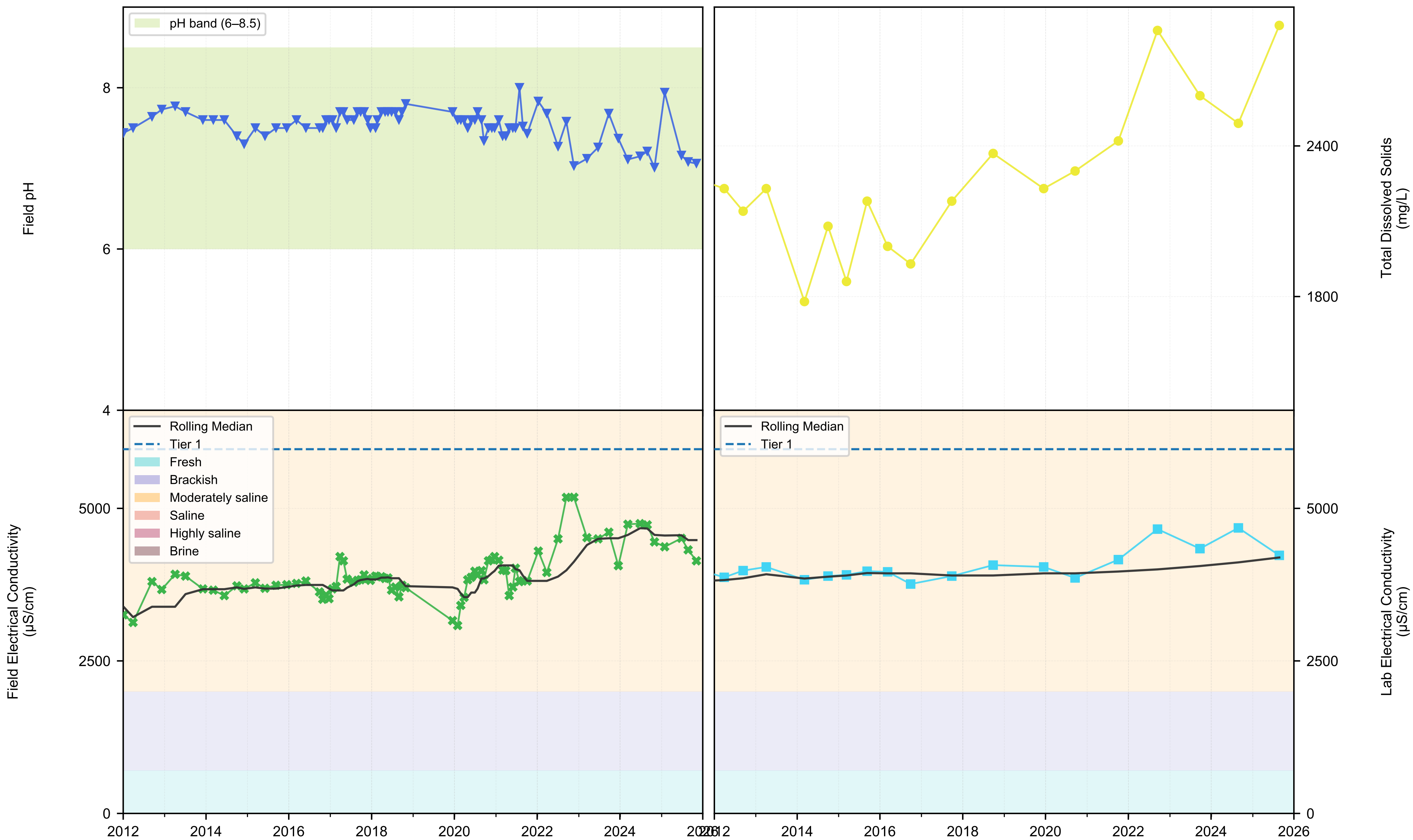


P77 Hydrograph
280
260
240
220
200
180
160
140
Water Elevation (m AHD)
2023
2024
2025
2026
Year
AGE
40m Pilliga Sanstone
90m Purlawaugh Formation
145m Garawilla Volcanics
205m Napperby Formation
245m Basalt Sill
265m Napperby Formation
295m Digby Formation

Appendix E

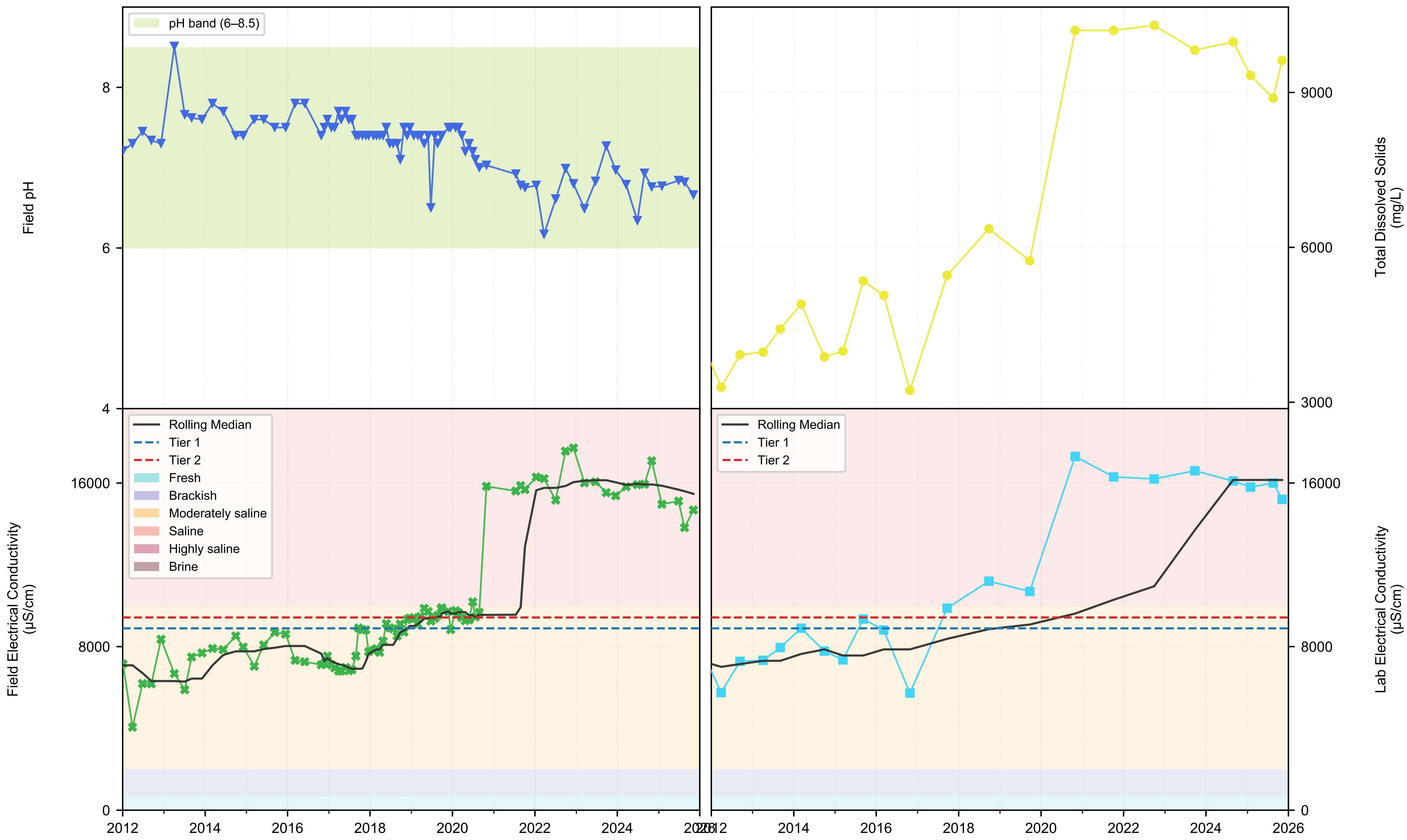
Water quality plots

P1 (Garrawilla Volcanics; Subcrop)



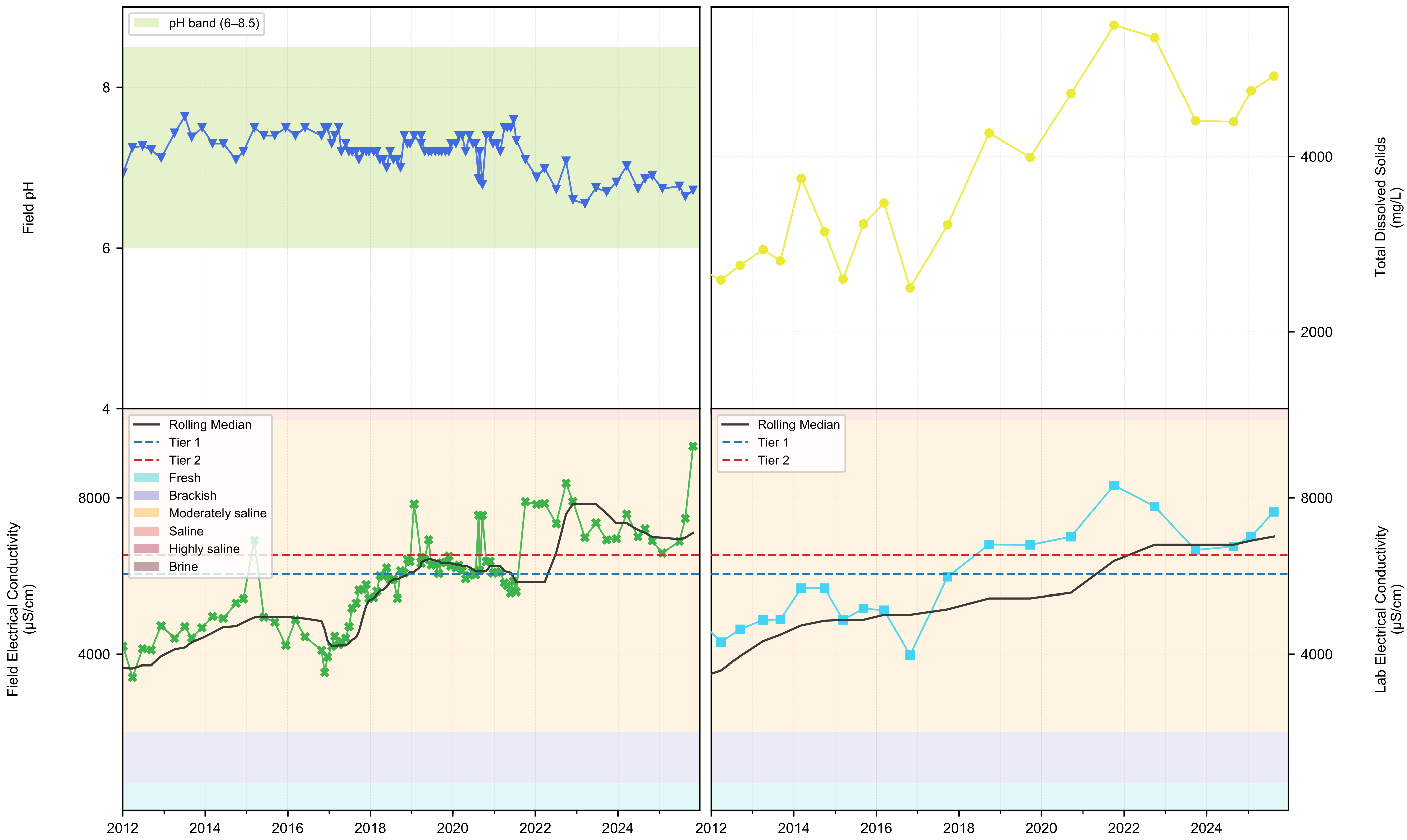
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
ANZG (stock) used for triggers

P10 (Napperby Formation; Subcrop)



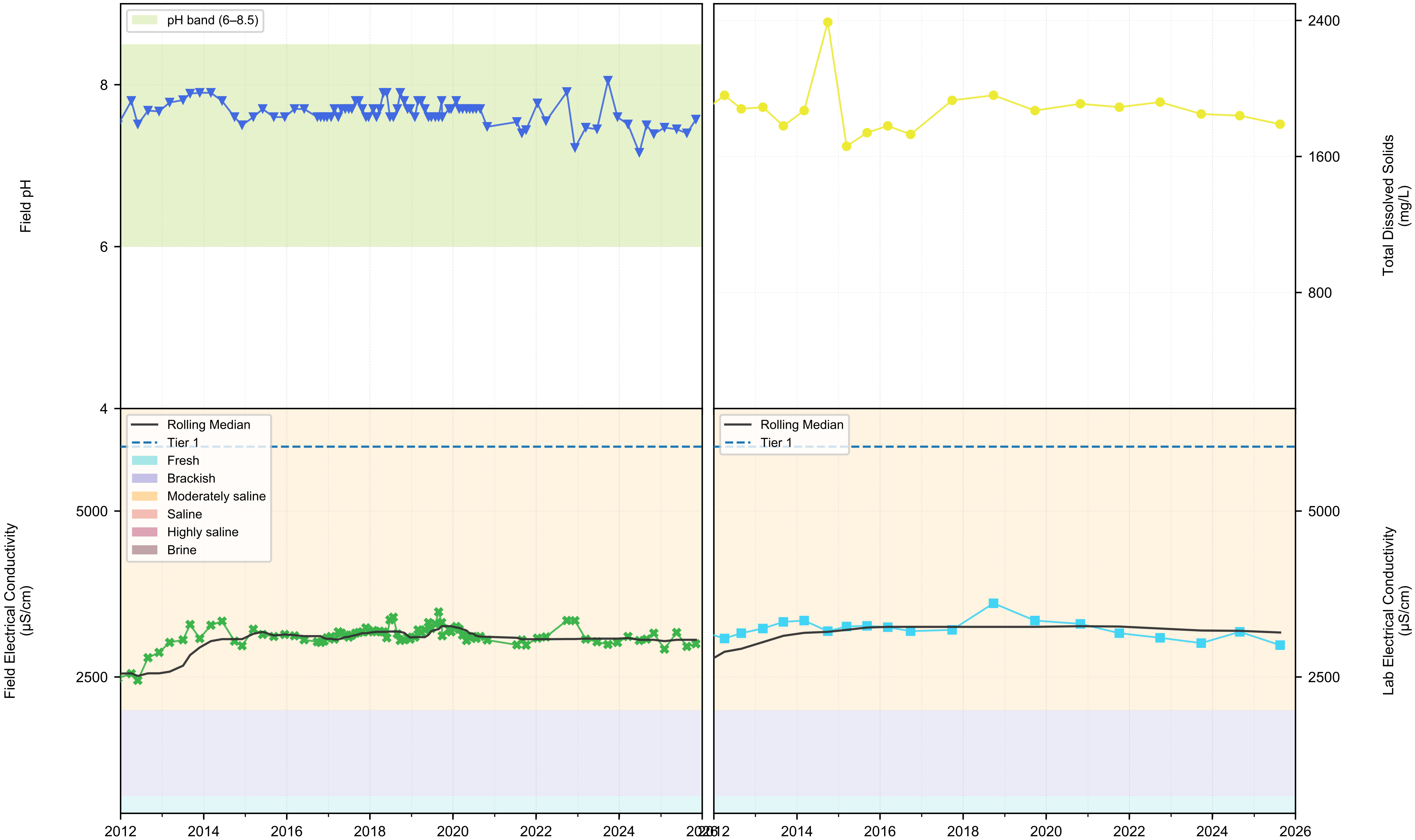
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P11 (Purlawaugh Formation; Subcrop)



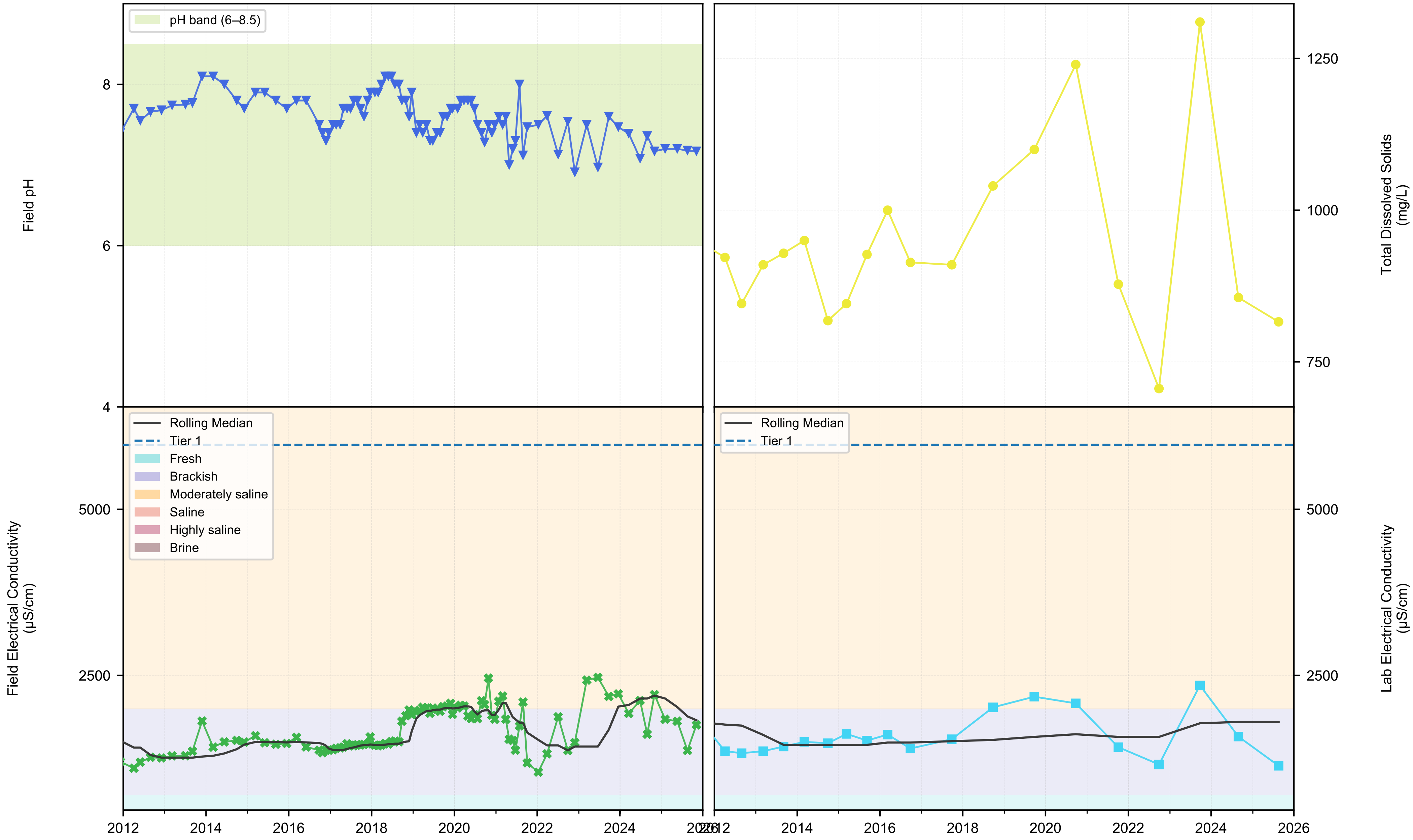
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P12 (Napperby Formation; Subcrop)



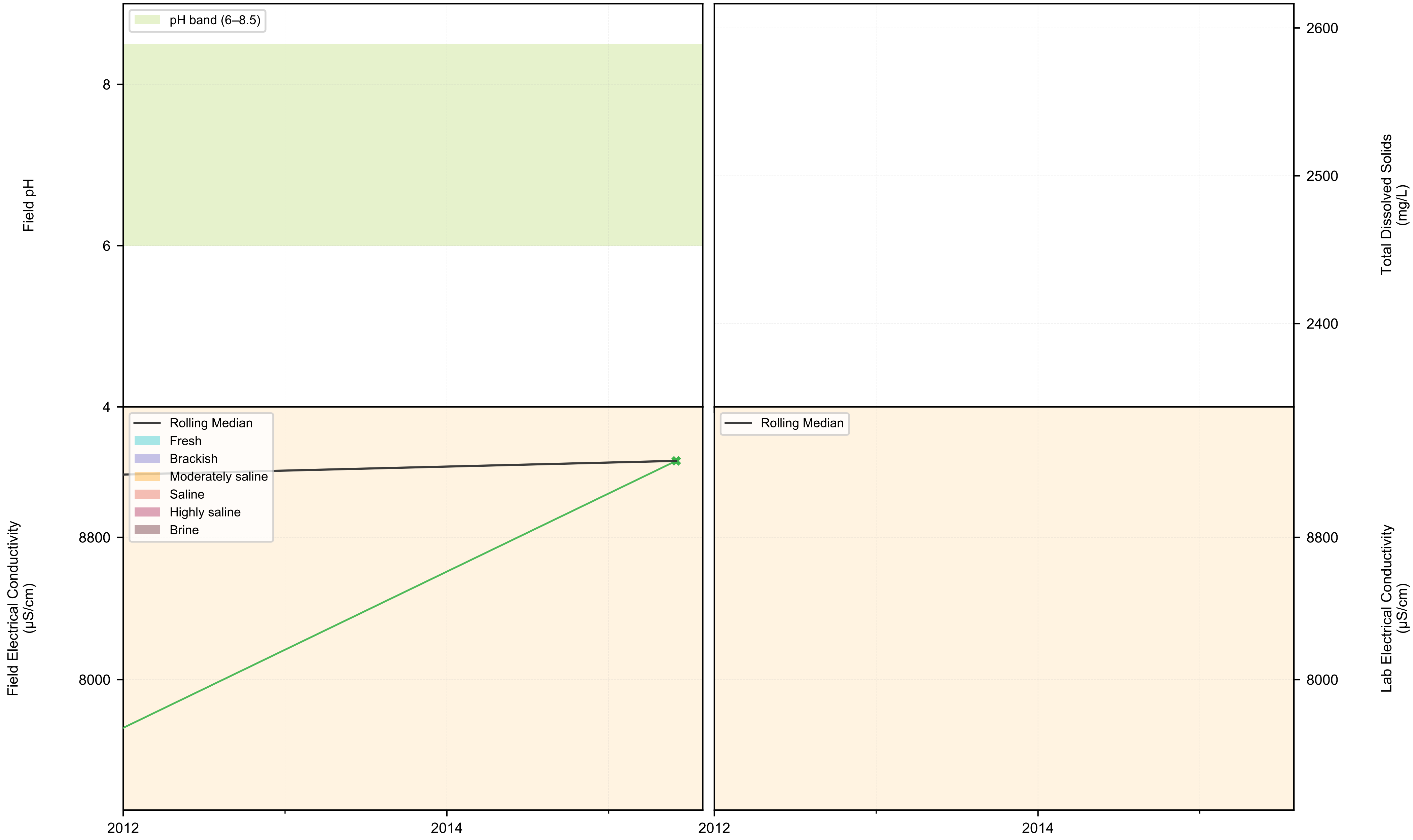
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
ANZG (stock) used for triggers

P13 (Garrawilla Volcanics; Subcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
ANZG (stock) used for triggers

P14 (Napperby Formation; No structure info)



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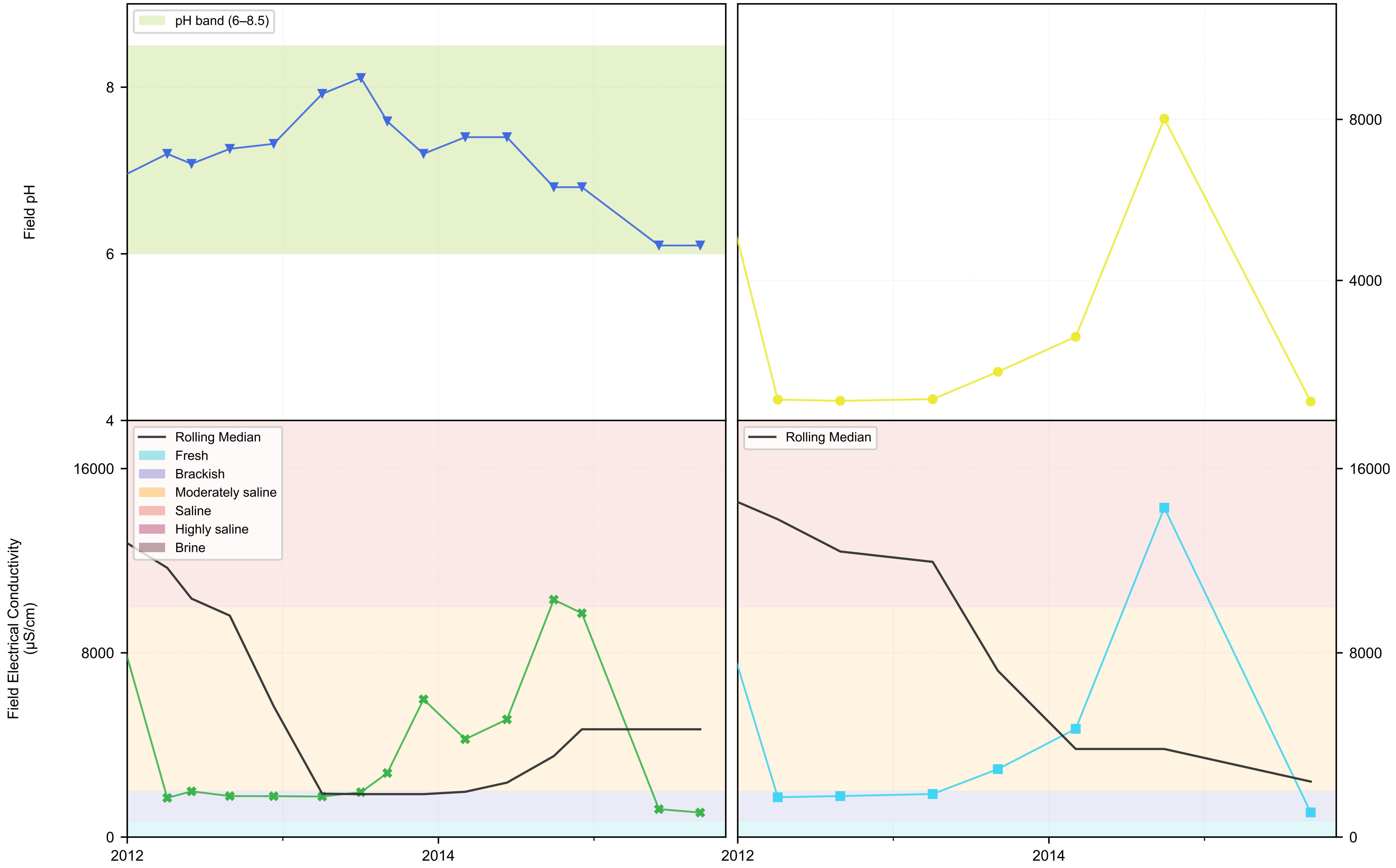
P15 (Garrawilla Volcanics; No structure info)



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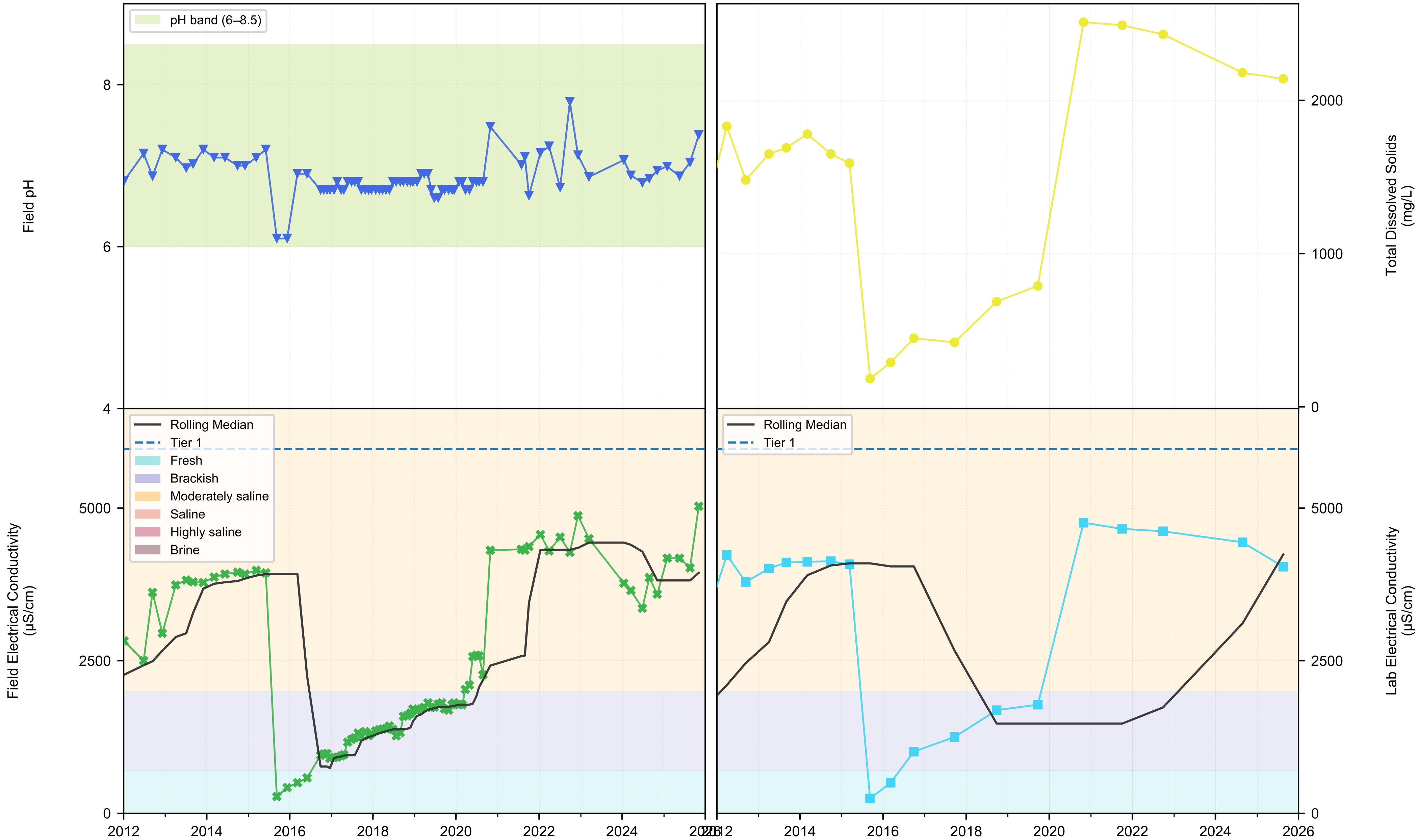
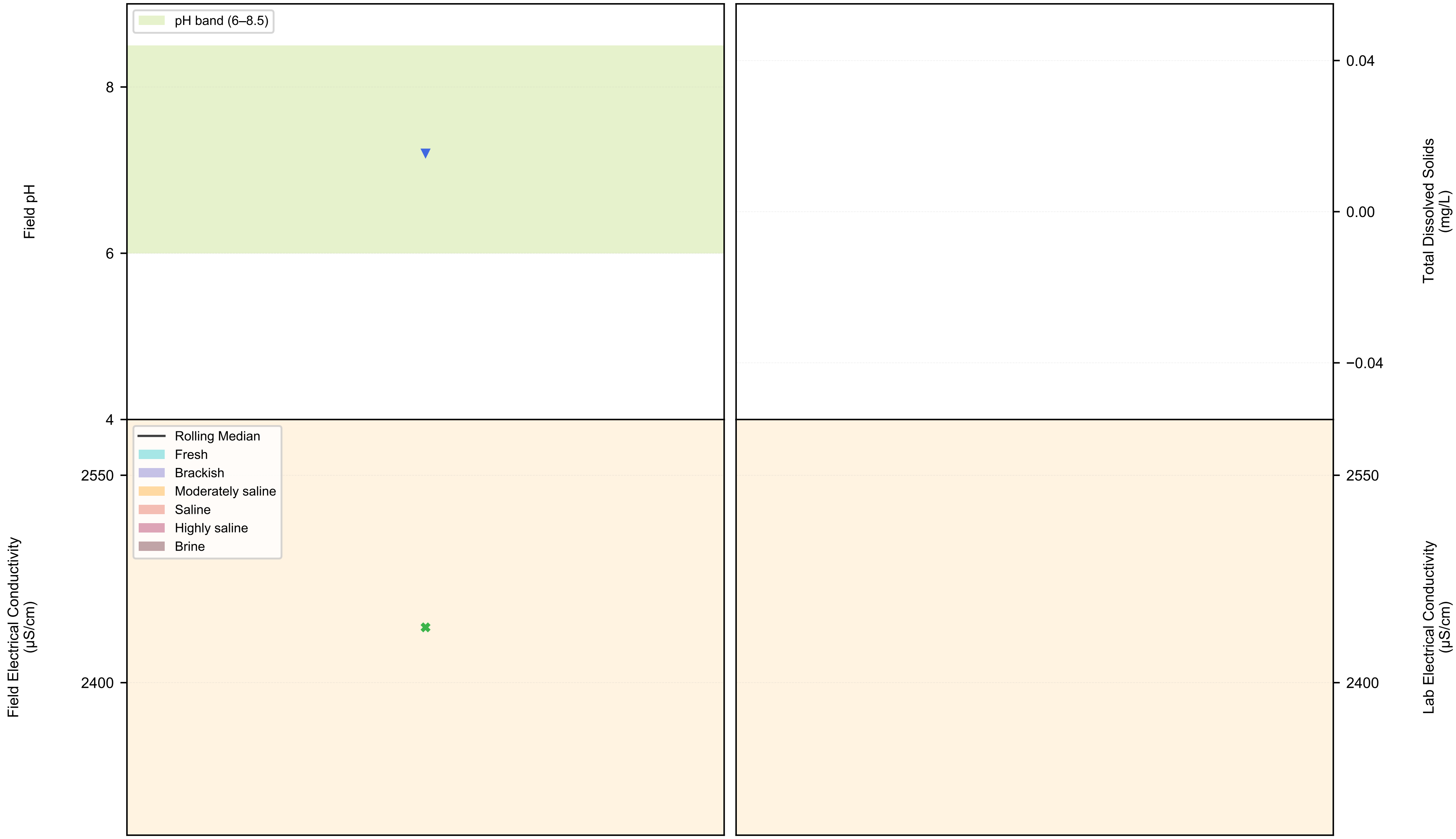
P16 (Garrawilla Volcanics; Subcrop)



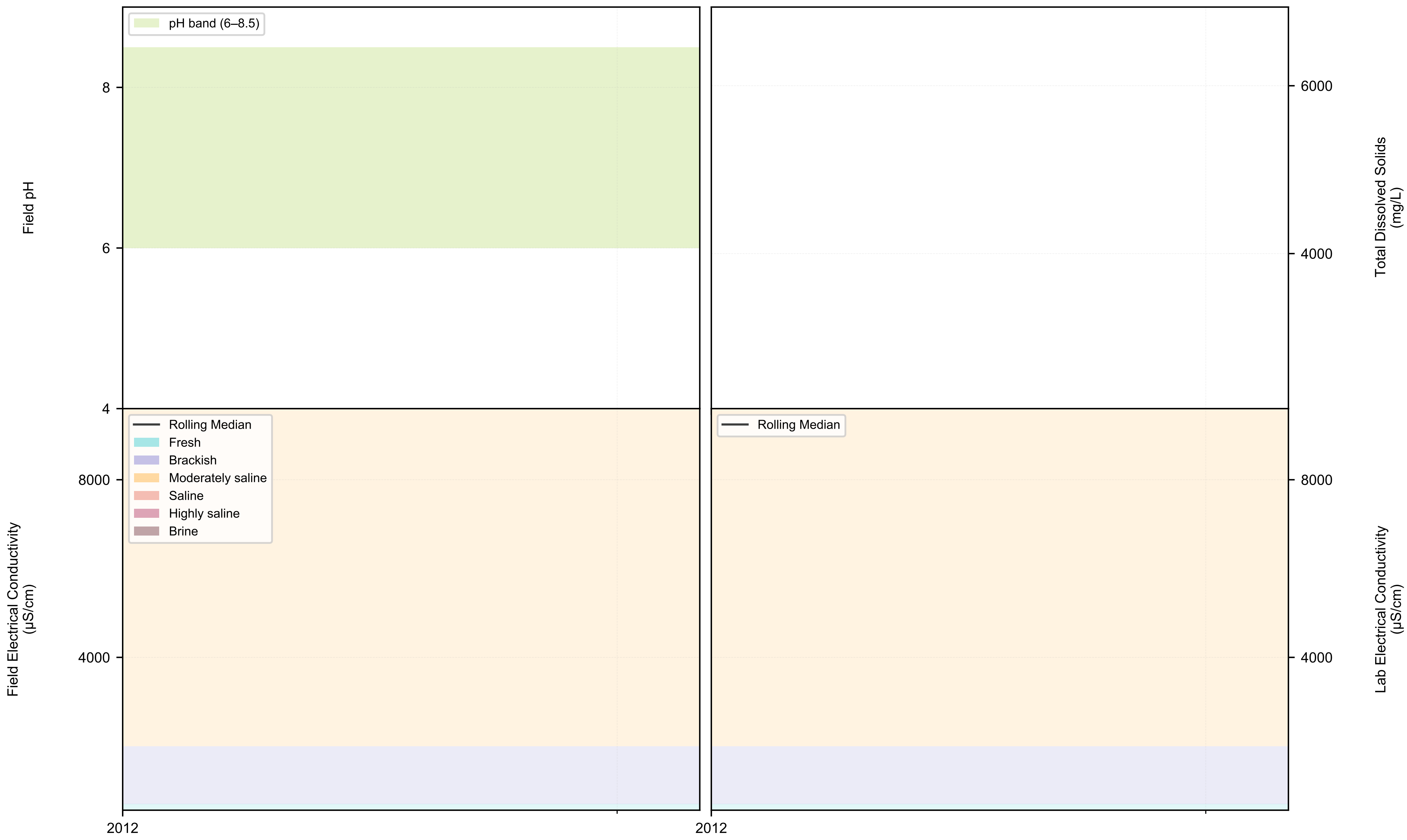
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
ANZG (stock) used for triggers

P17 (Purlawaugh Formation; Subcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P18 (Hoskissons Coal Seam; No structure info)

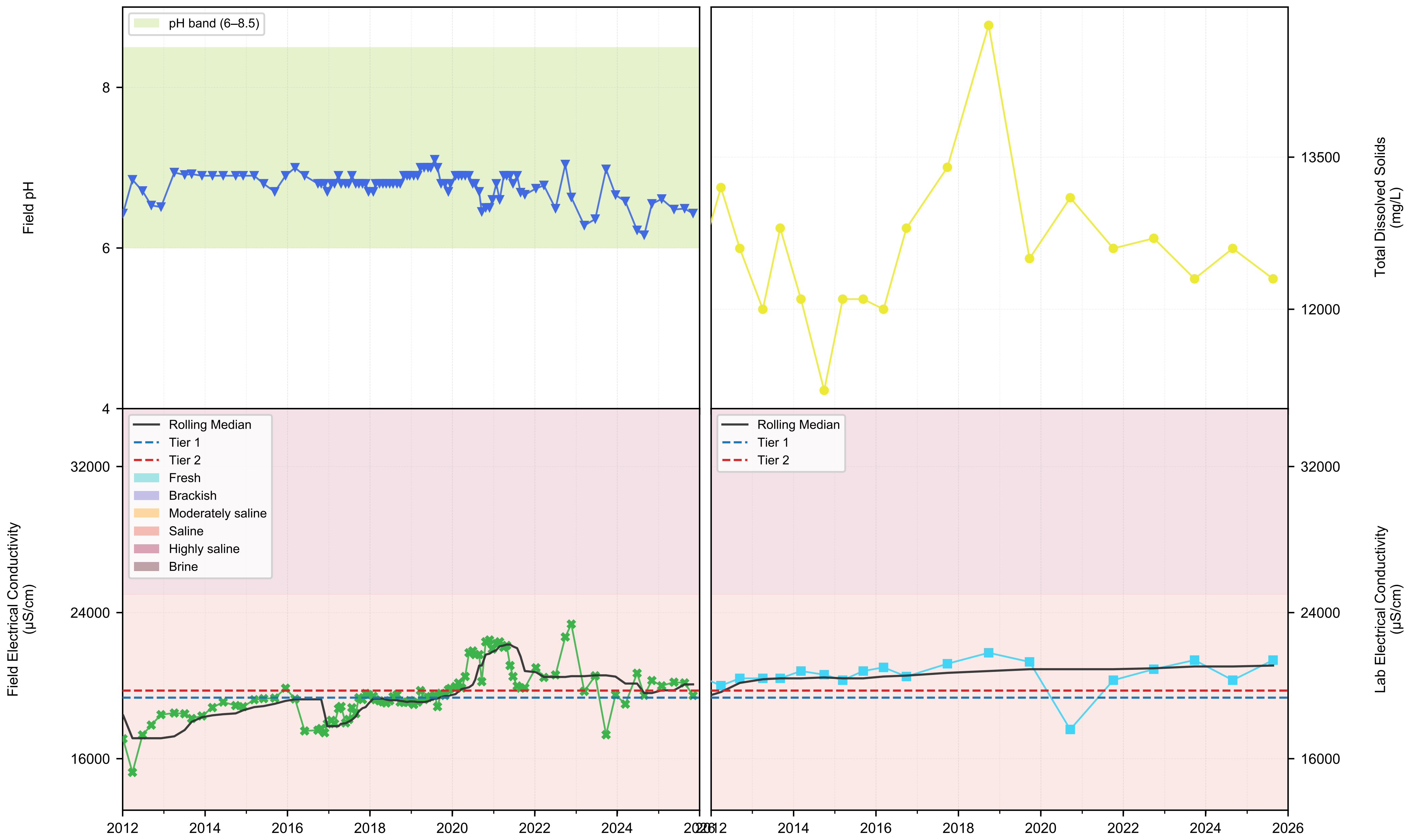


Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P19 (Pamboola Formation; Subcrop)

Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P2 (Napperby Formation; Subcrop)

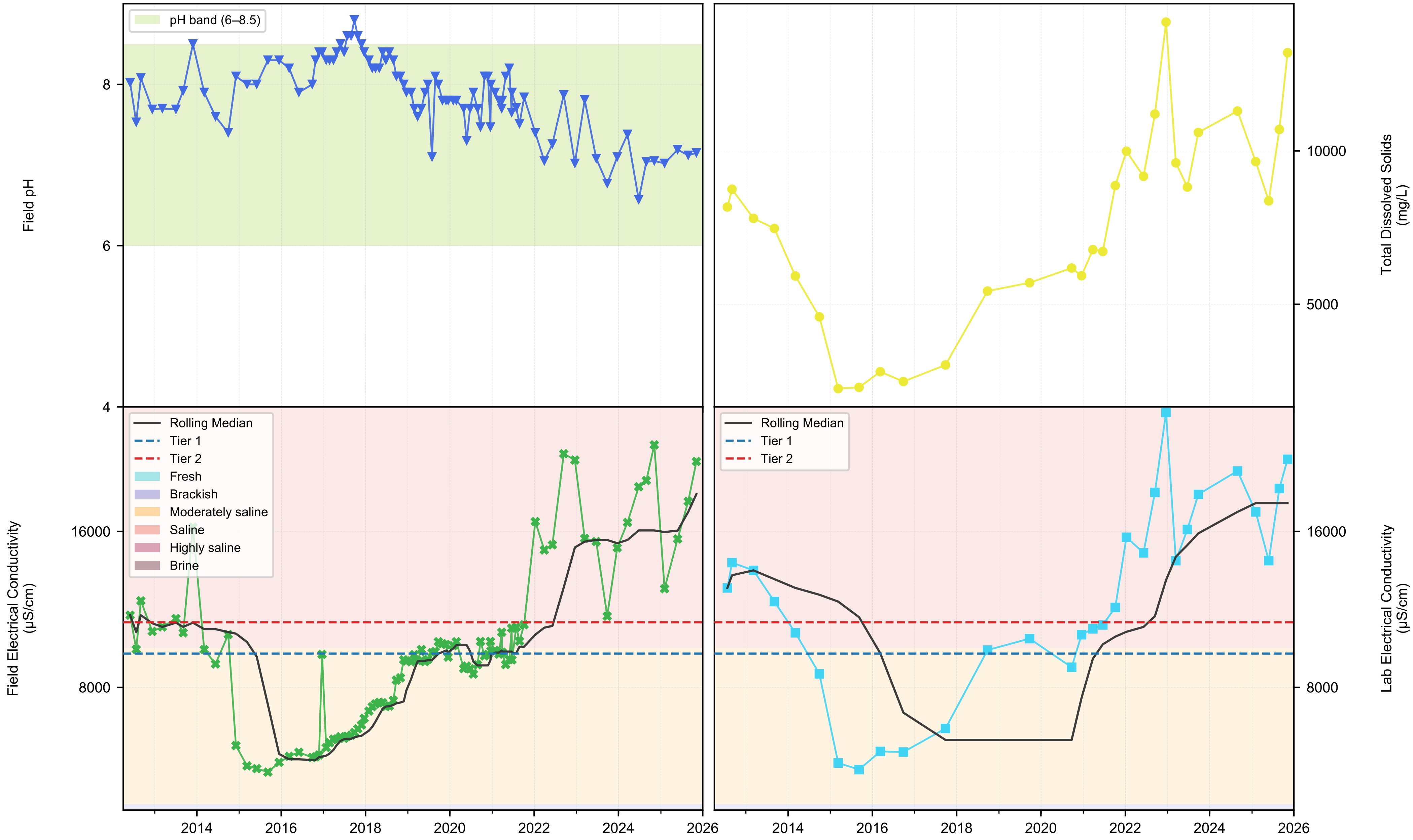


Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P20 (Arkarula Formation; No structure info)

Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P29 (Rail Loop Dams; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P3 (Pamboola Formation; Outcrop)

Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P30 (Rail Loop Dams; Outcrop)

Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

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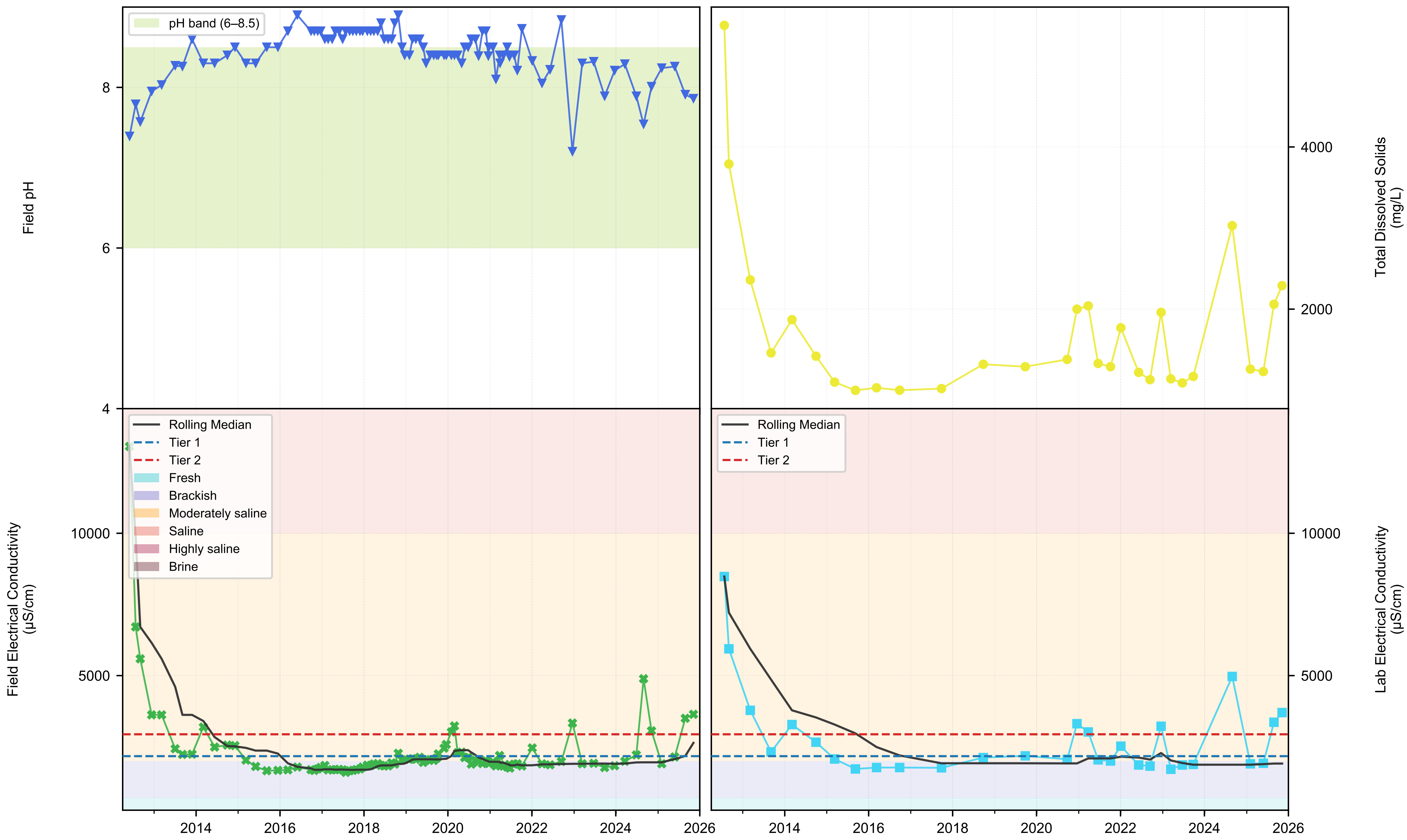
P31 (Rail Loop Dams; Outcrop)

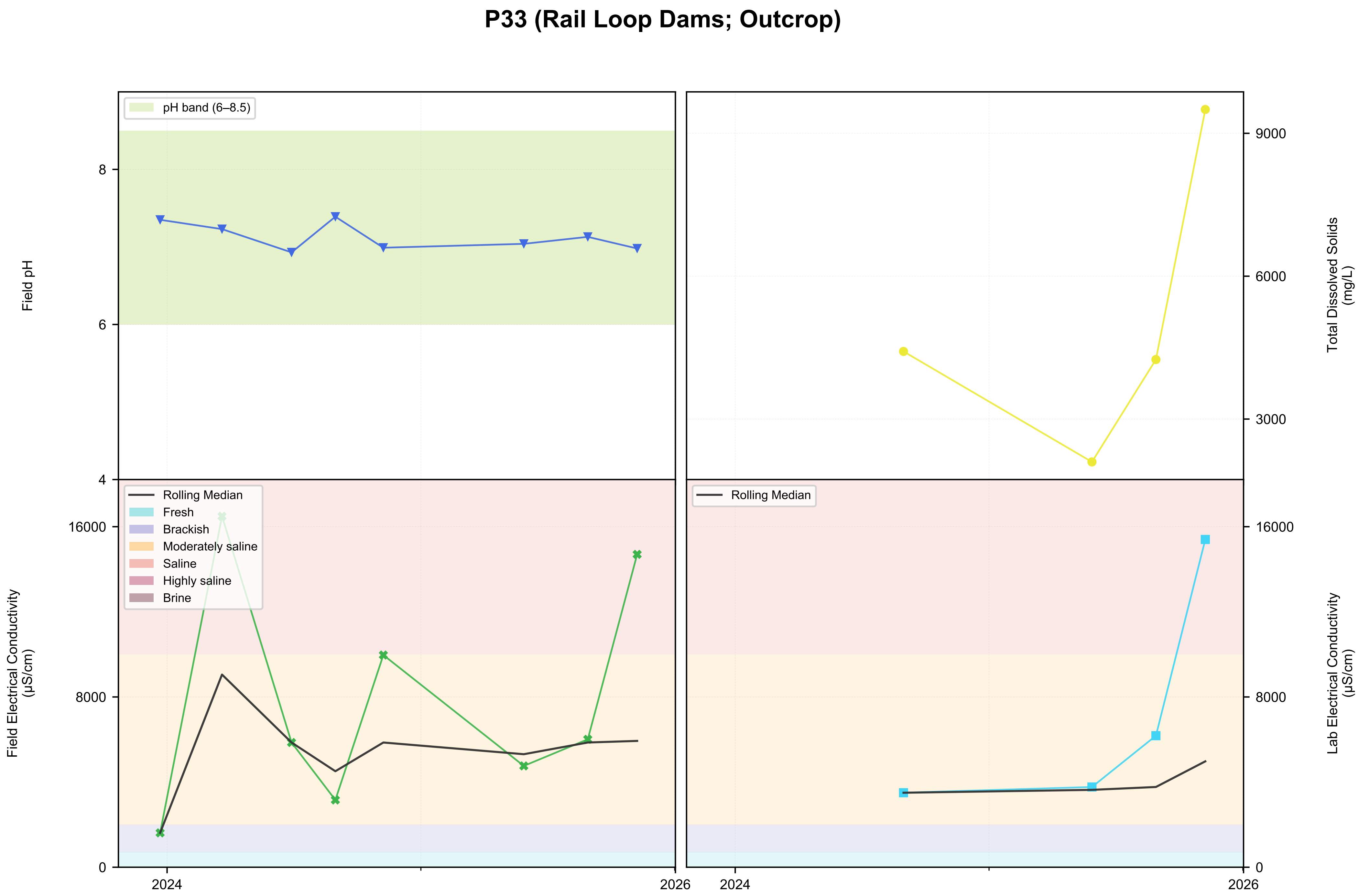
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P32 (Rail Loop Dams; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

Australasian Groundwater and Environmental Consultants Pty Ltd
Water Quality Plots - General Parameters



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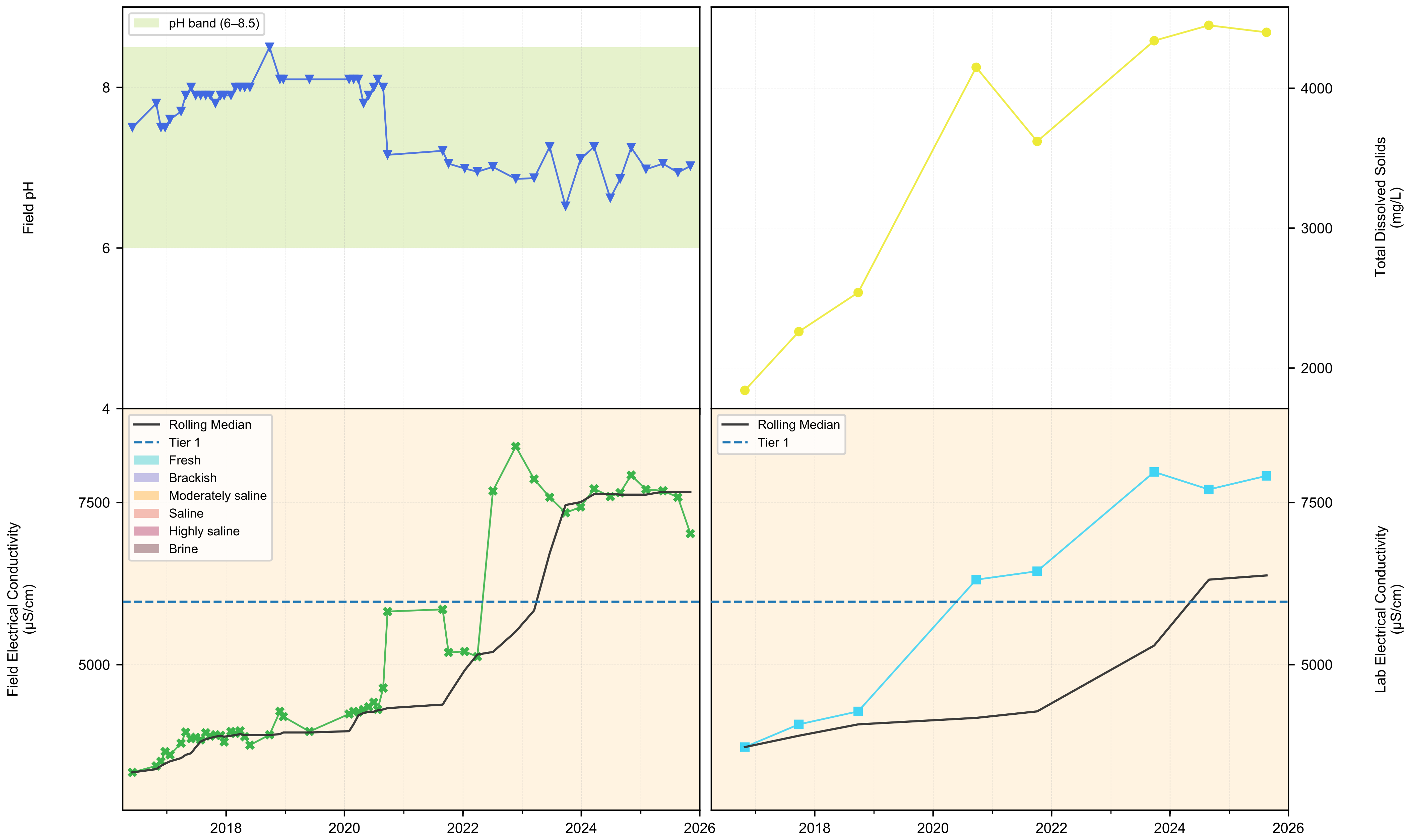
P39A (Watermark Formation; Outcrop)



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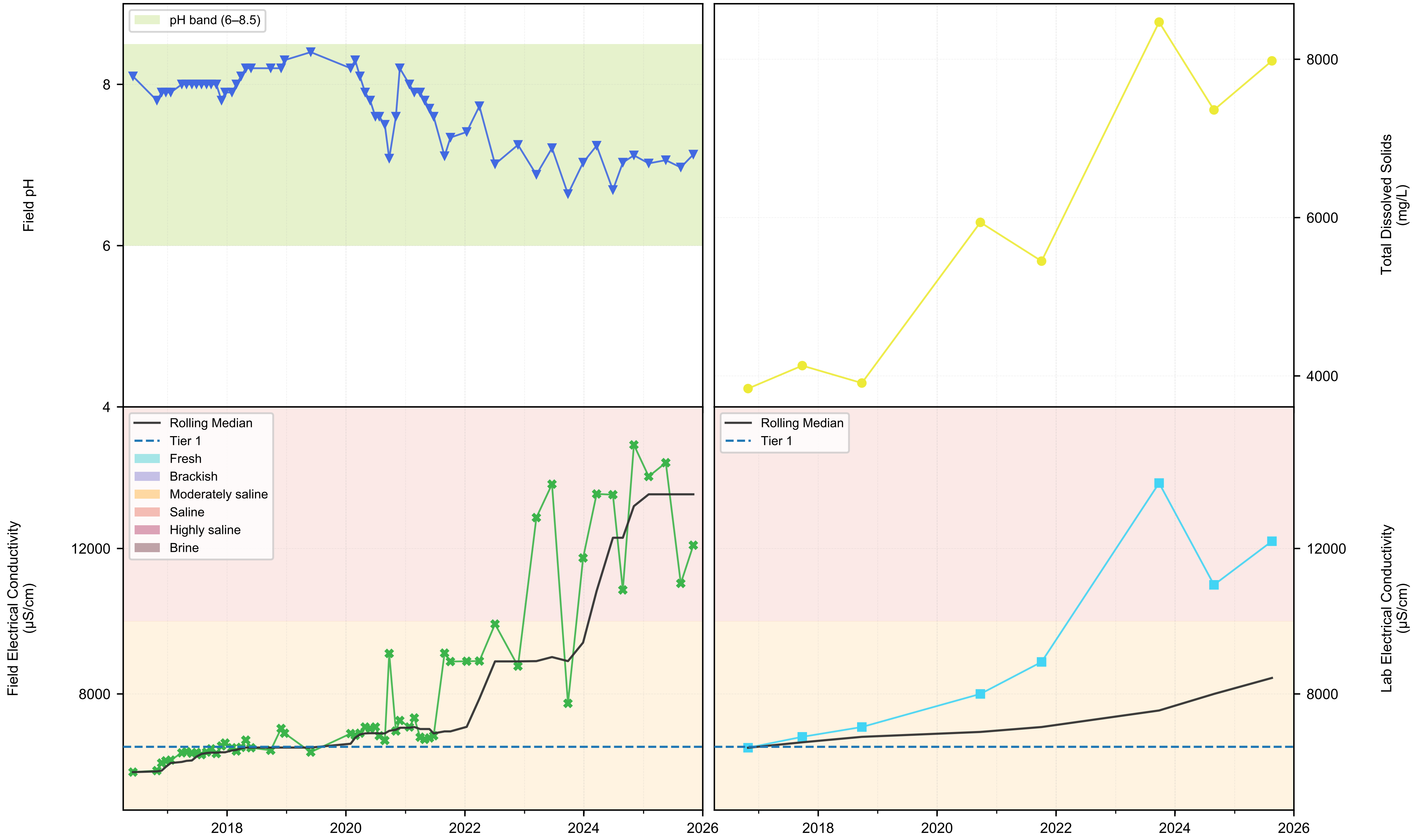
ANZG (stock) used for triggers

P39B (Alluvium; Outcrop)



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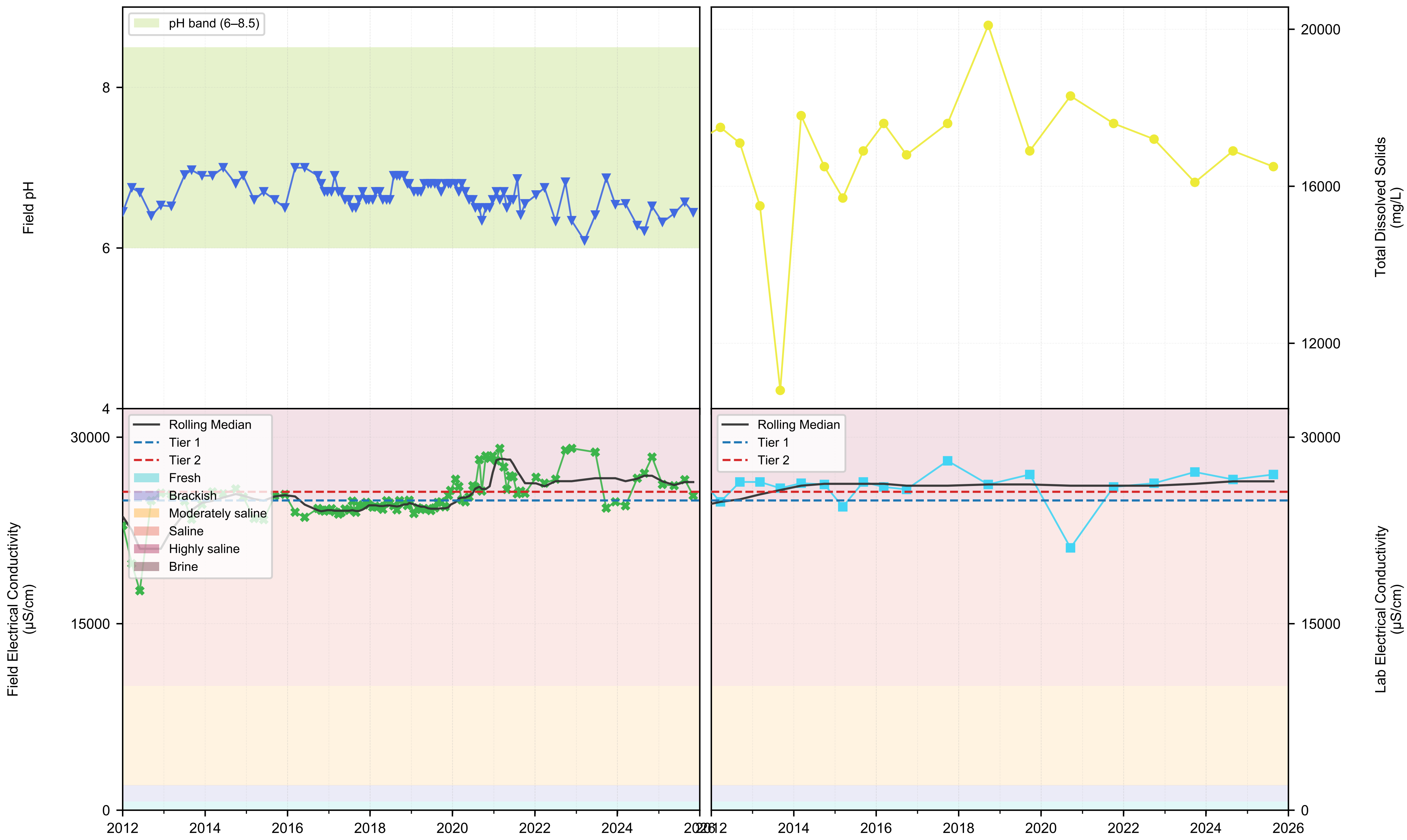
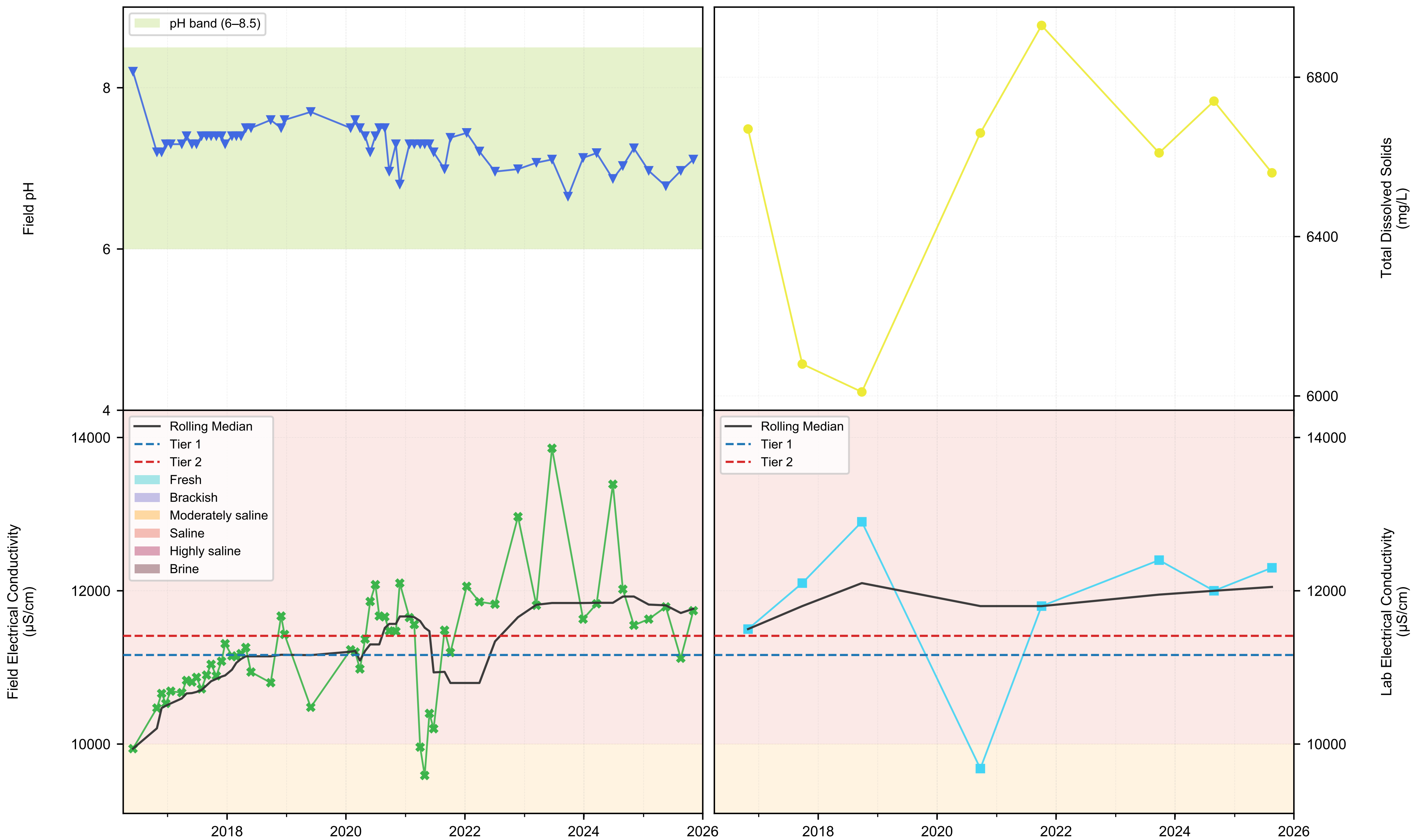
ANZG (irrigation) used for triggers

P4 (Napperby Formation; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

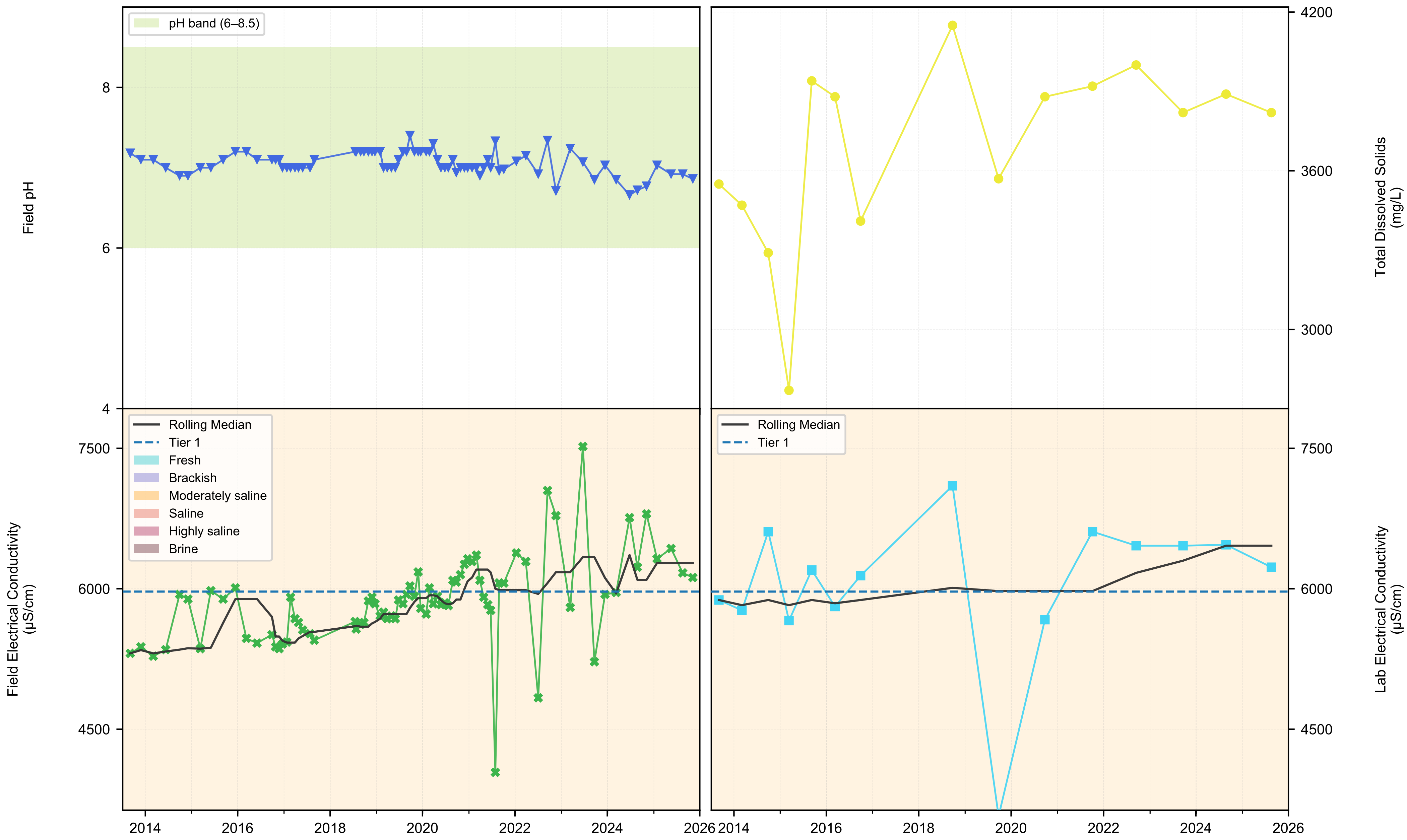
P43 (Watermark Formation; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

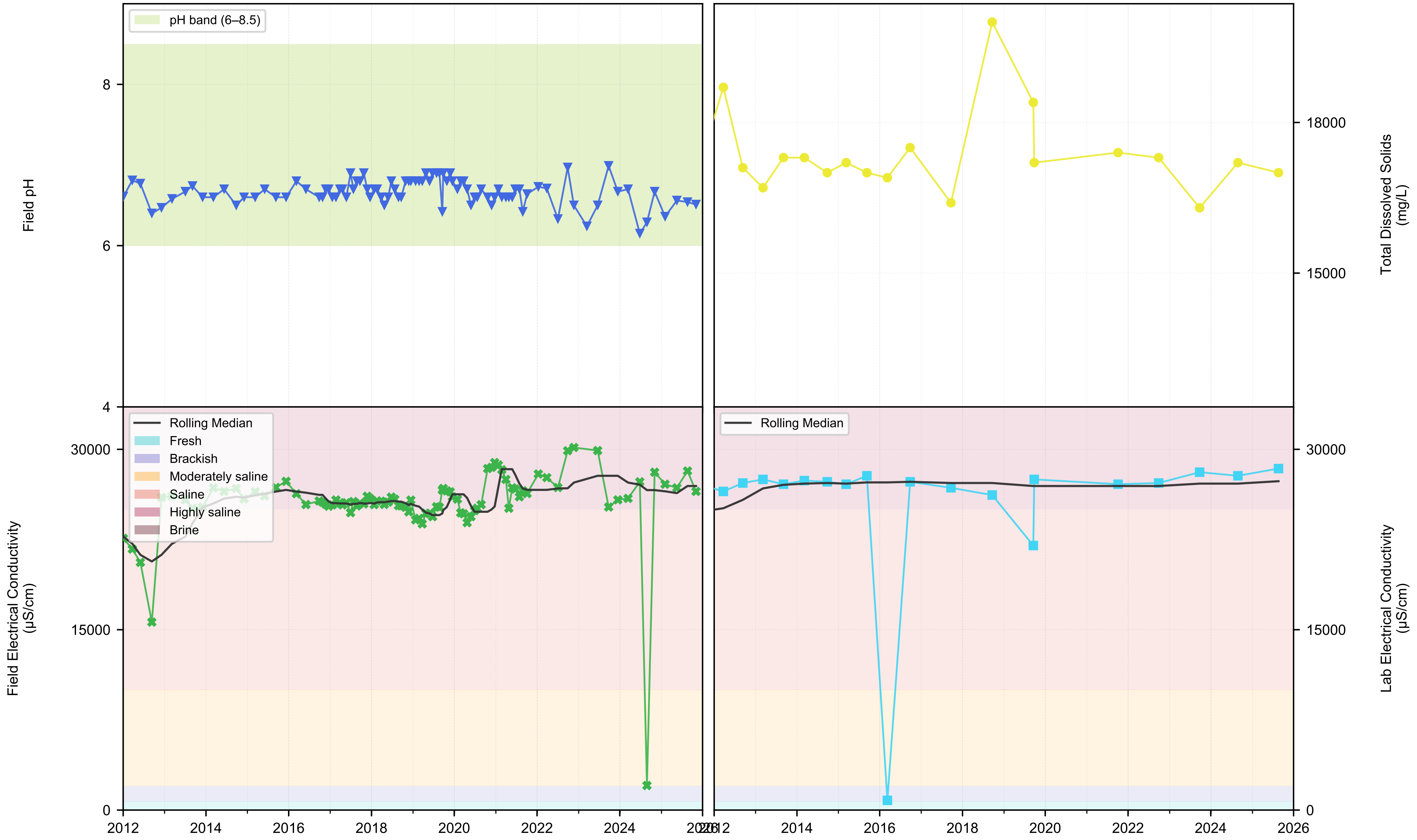
Australasian Groundwater and Environmental Consultants Pty Ltd
Water Quality Plots - General Parameters

P47 (Garrawilla Volcanics; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
ANZG (stock) used for triggers

P5 (Pamboola Formation; Outcrop)



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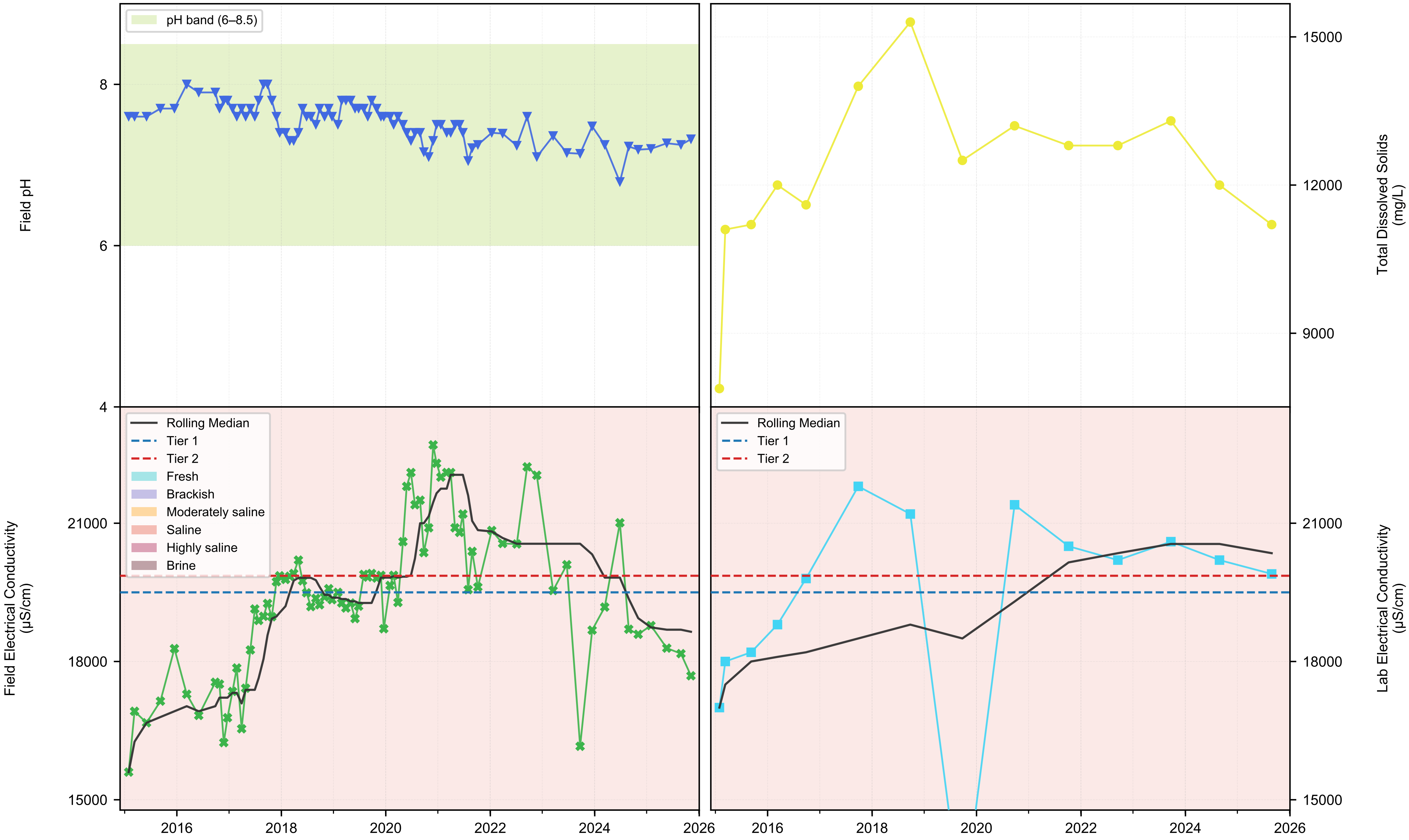
P51 (Garrawilla Volcanics; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

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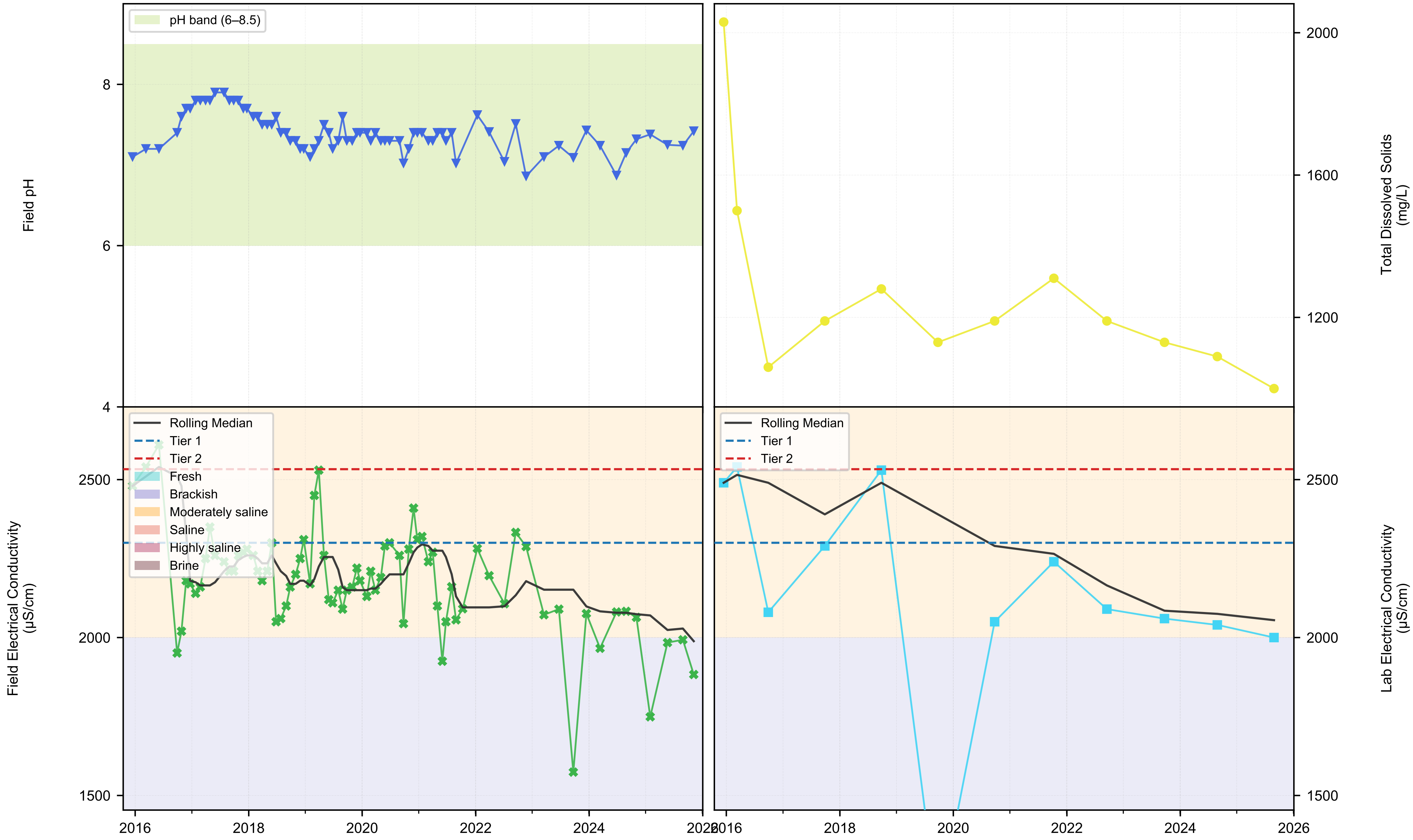
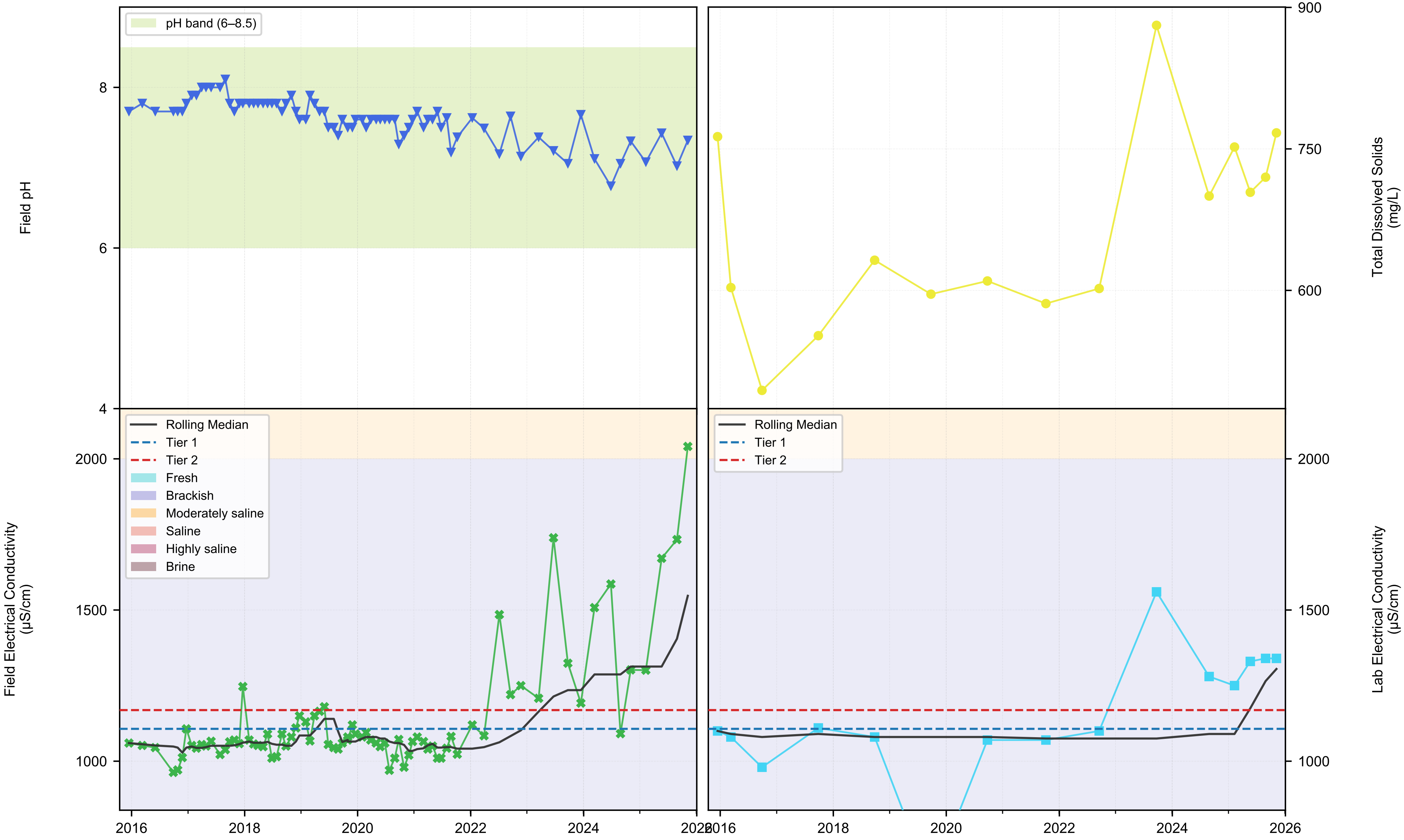
Water Quality Plots - General Parameters

P52 (Napperby Formation; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P53 (Garrawilla Volcanics; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting
EC two tiered used for triggers

P58 (Rail Loop Dams; Outcrop)

Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

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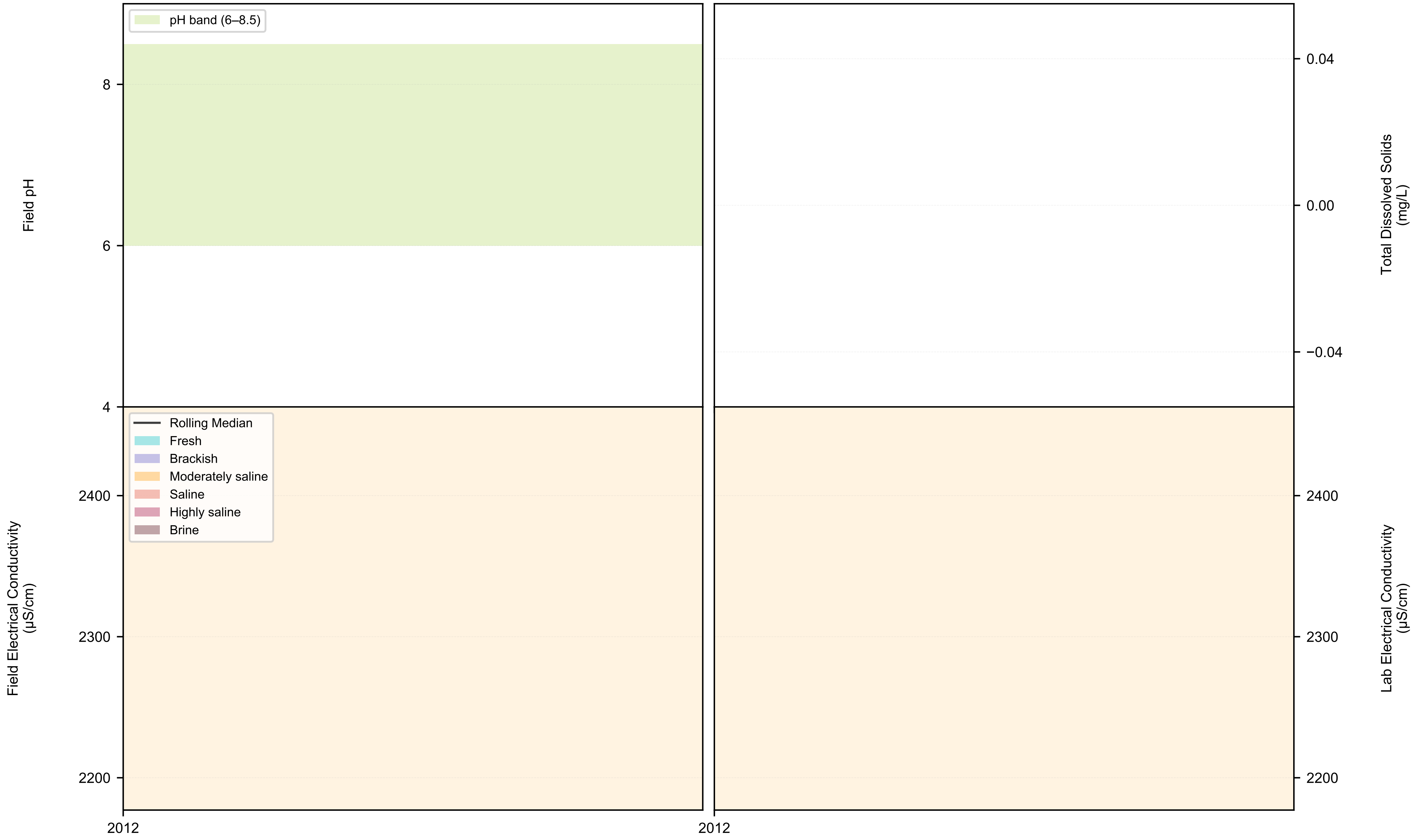
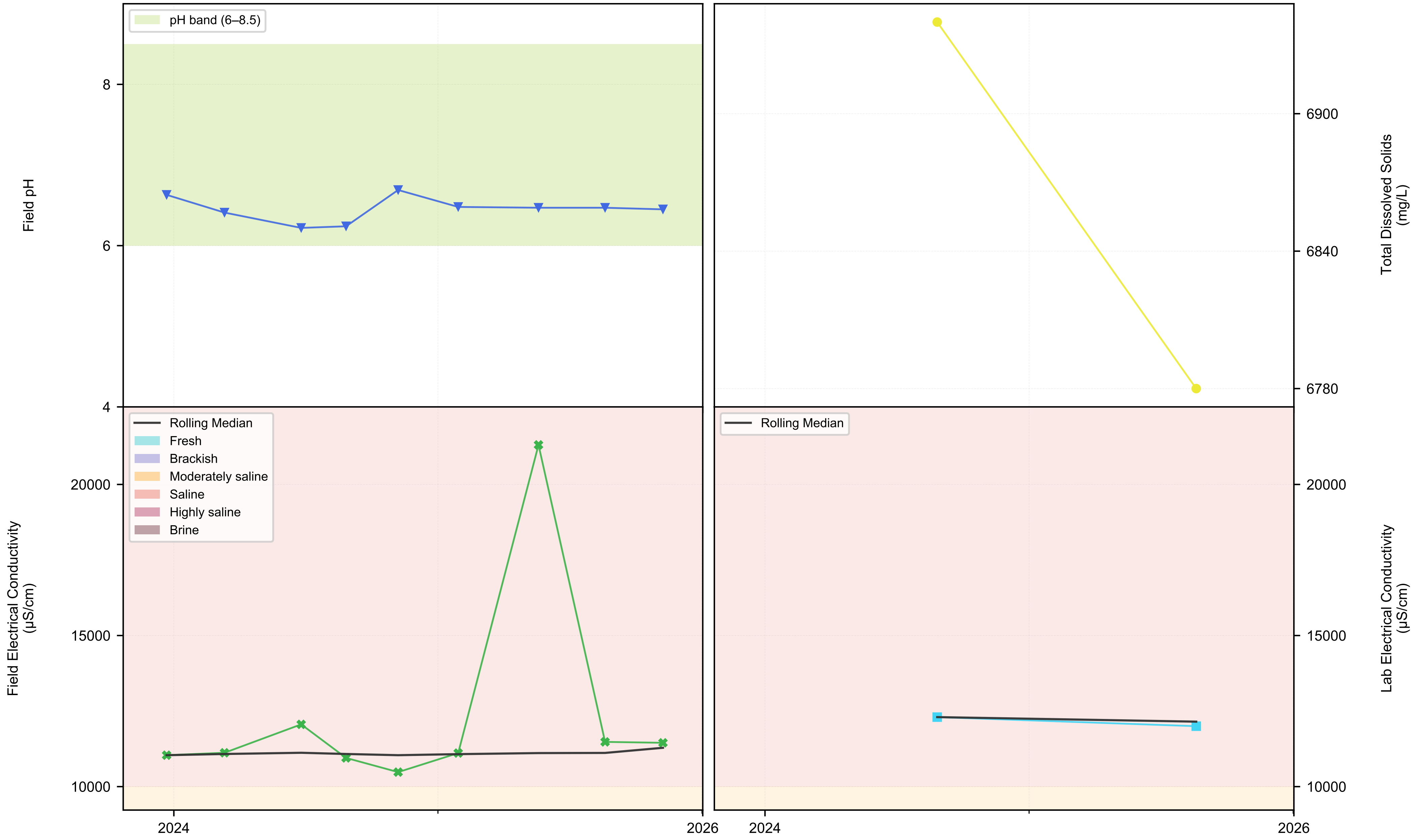
P6 (Pilliga Sandstone; Subcrop)



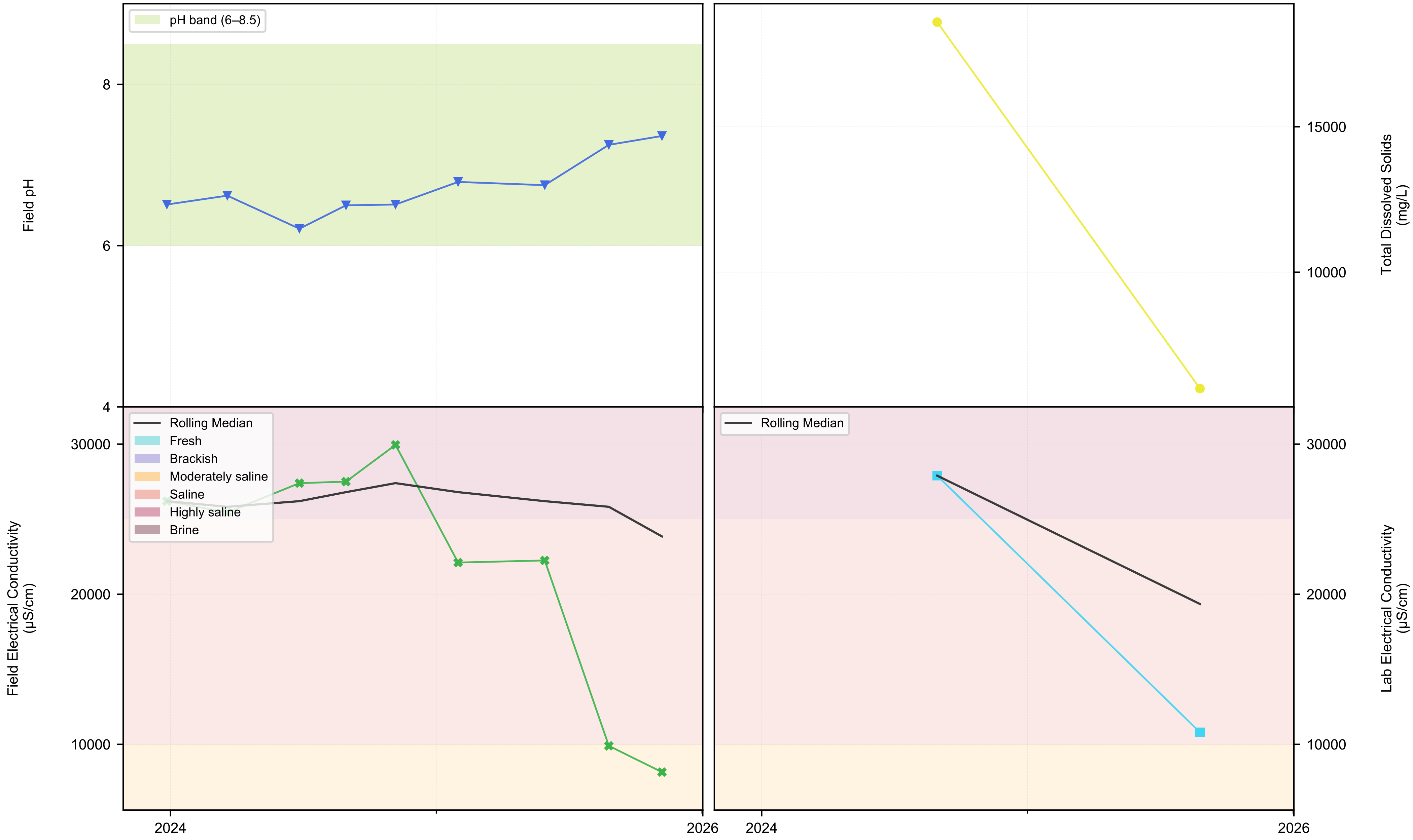
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P63 (Napperby Formation; Subcrop)



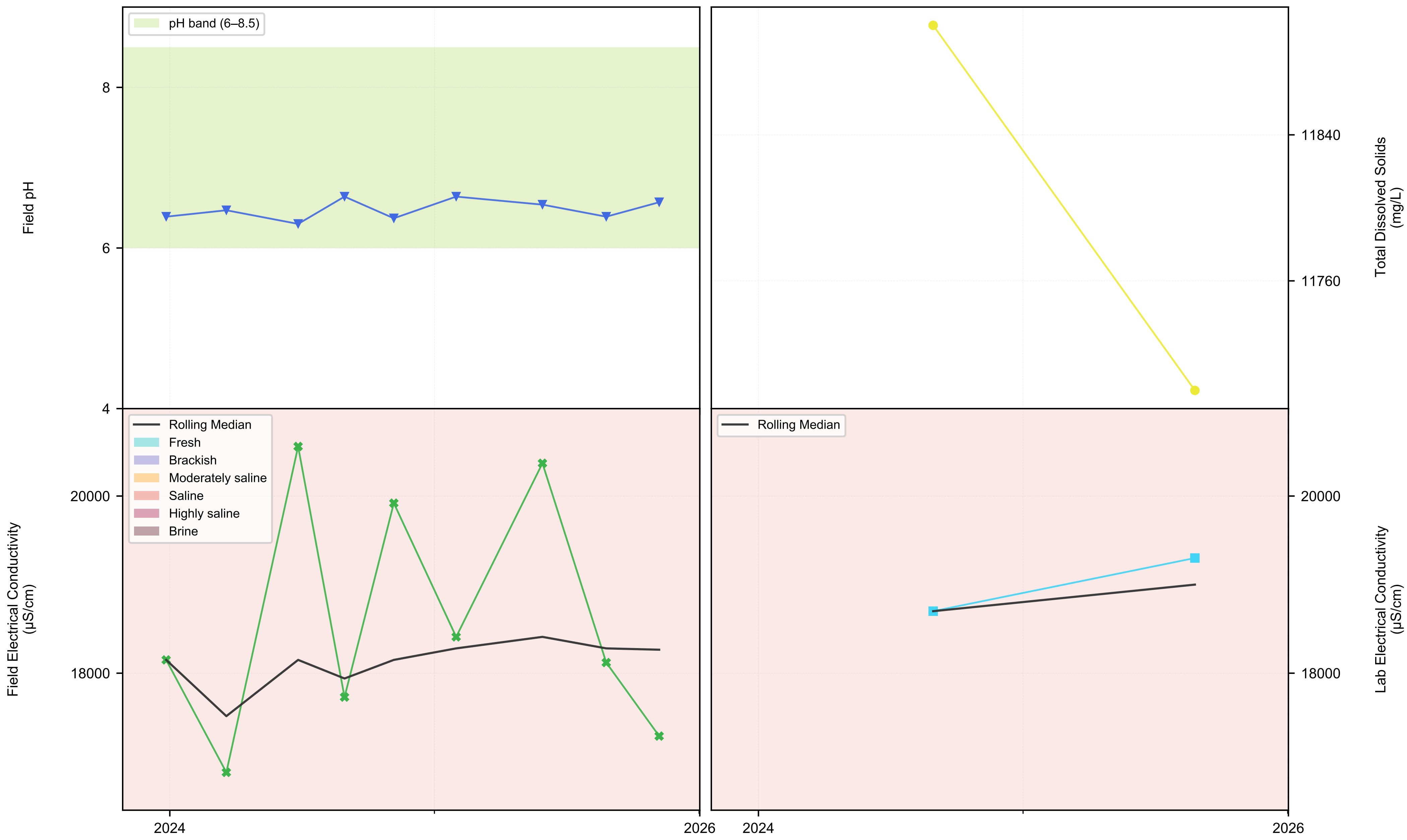
Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P68 (Colluvium; Outcrop)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

P69 (Napperby Formation; No structure info)



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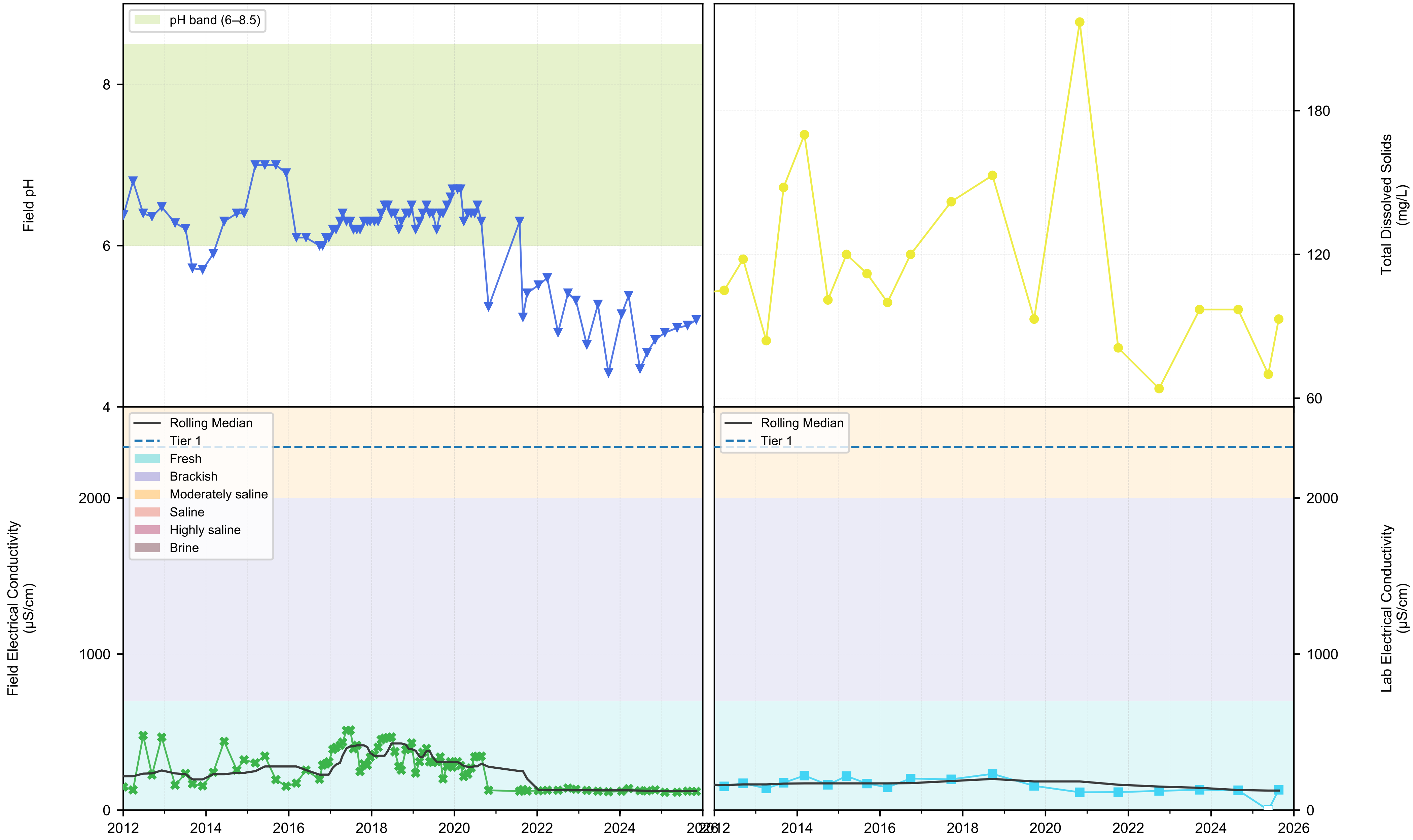
P7 (Pilliga Sandstone; Outcrop)



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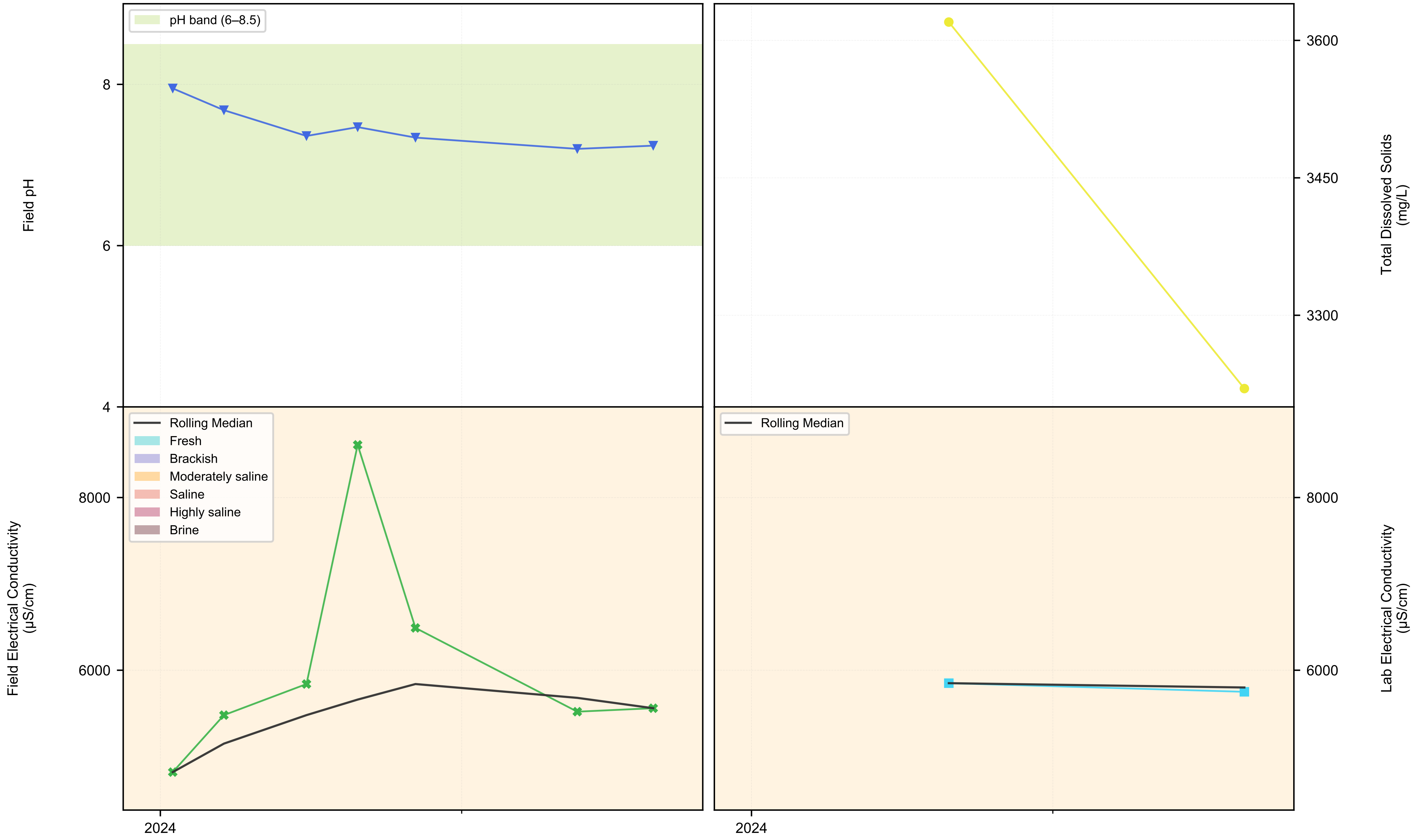
ANZG (irrigation) used for triggers

P72 (Purlawaugh Formation; No structure info)



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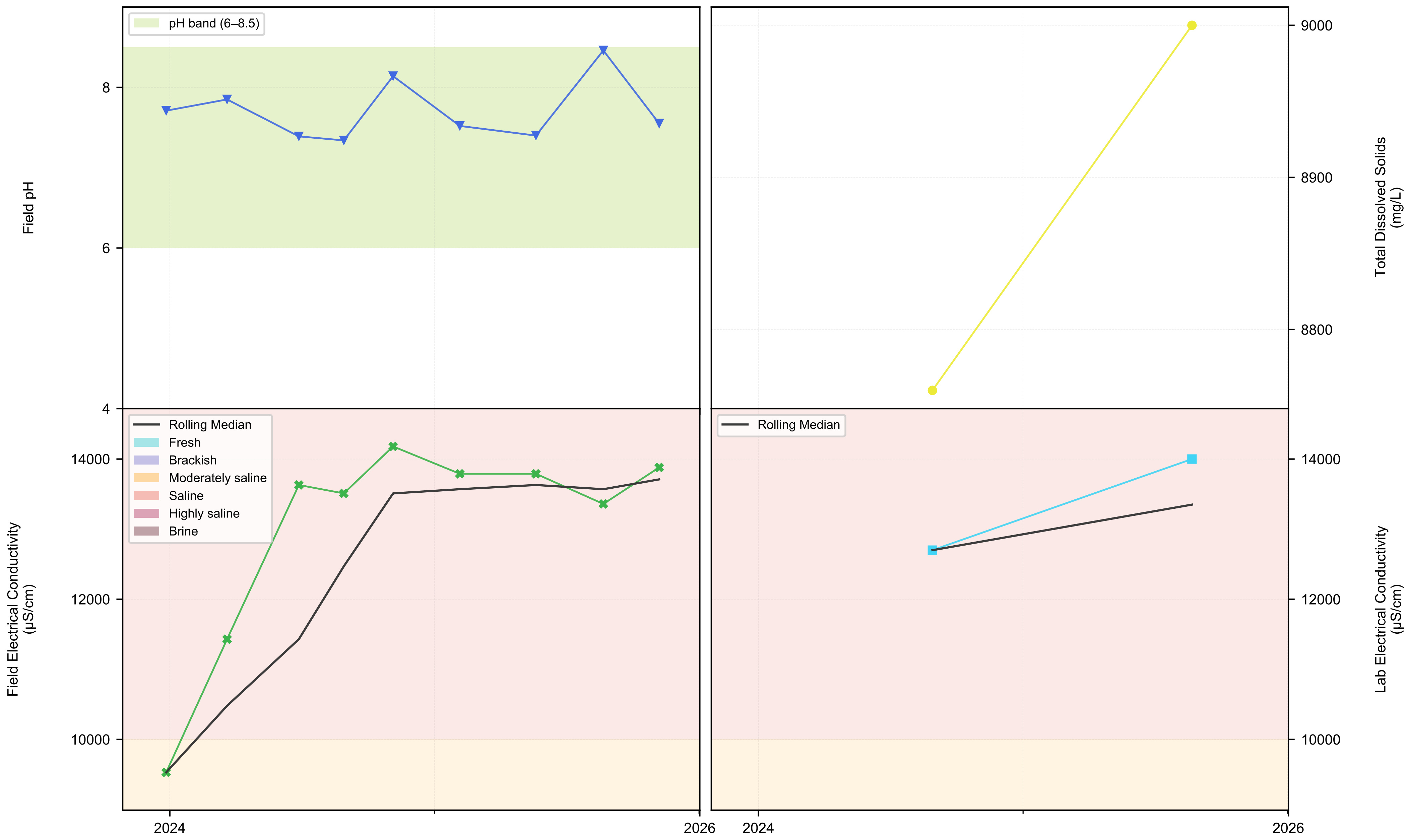
P75 (Napperby Formation; No structure info)



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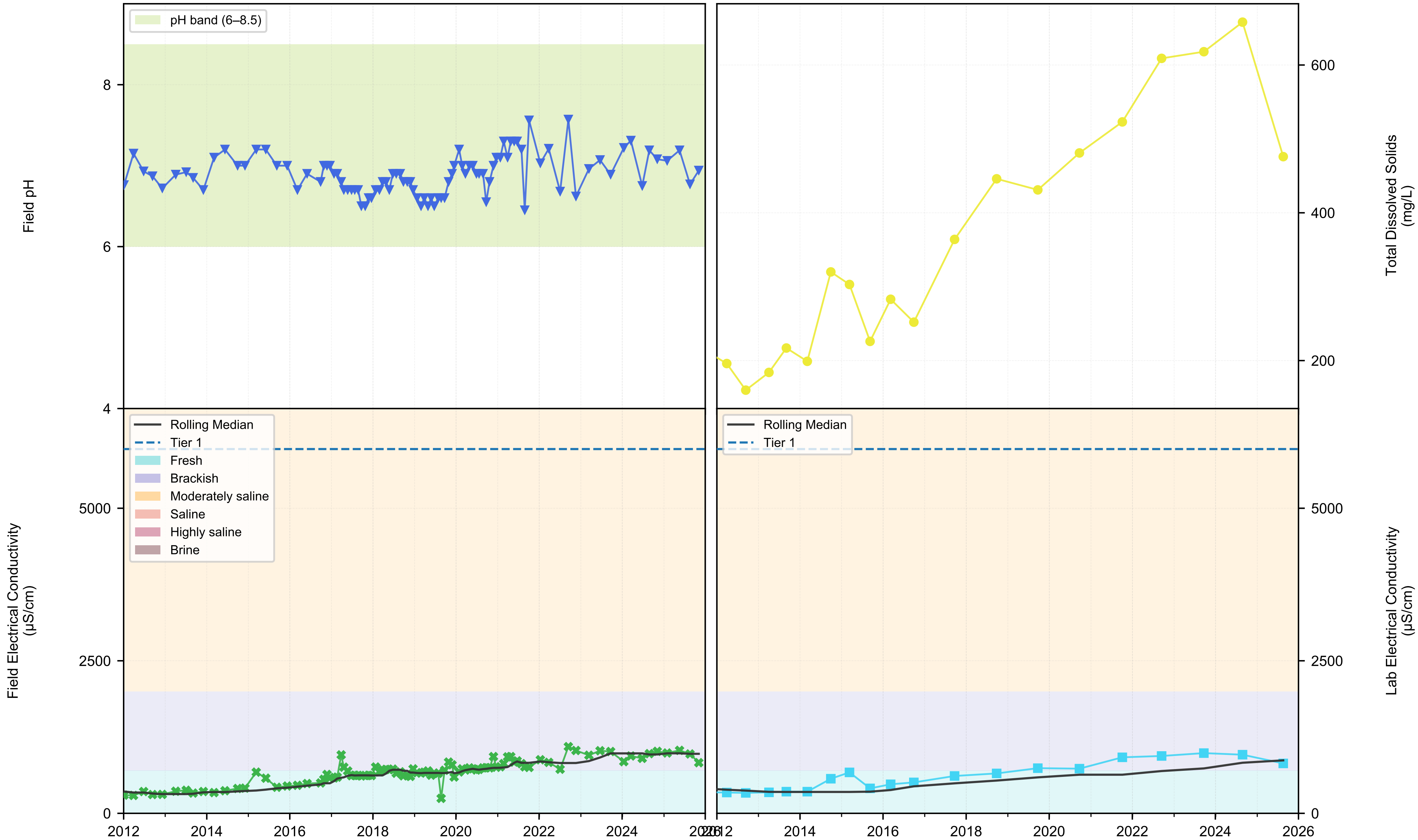
Australasian Groundwater and Environmental Consultants Pty Ltd
Water Quality Plots - General Parameters

P8 (Purlawaugh Formation; Outcrop)



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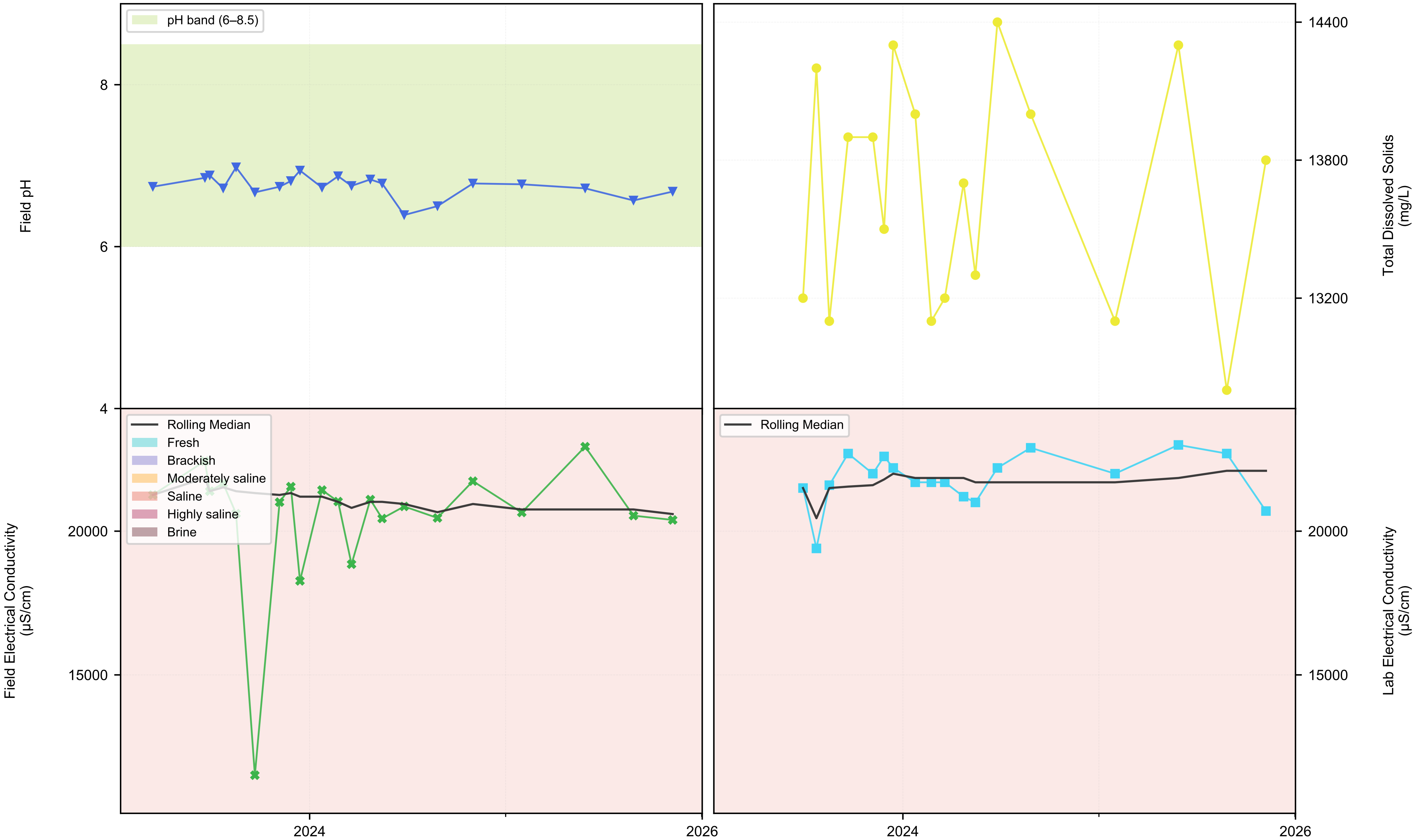
ANZG (stock) used for triggers

P84 (Siltstone; Outcrop)



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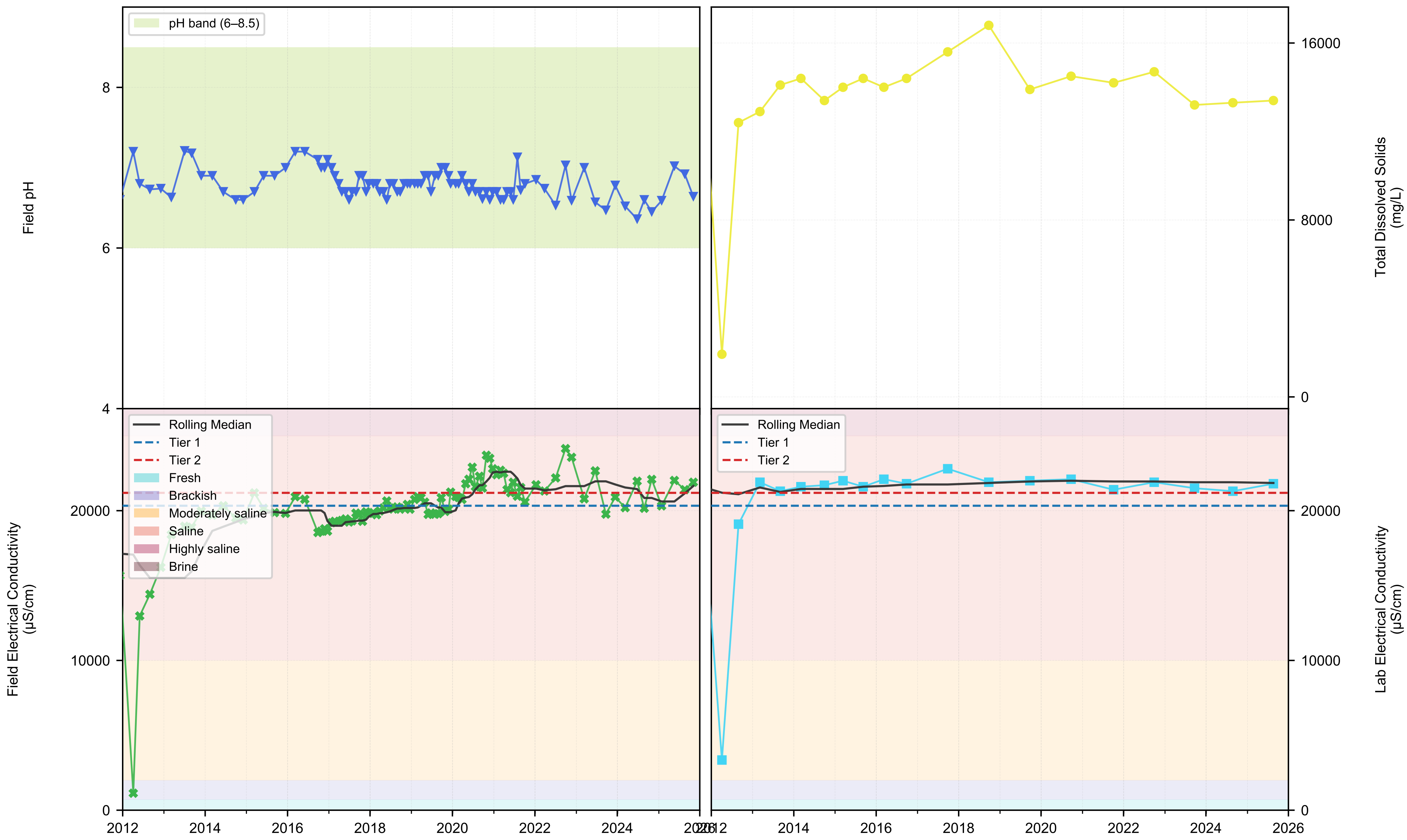
P9 (Purlawaugh Formation; Outcrop)



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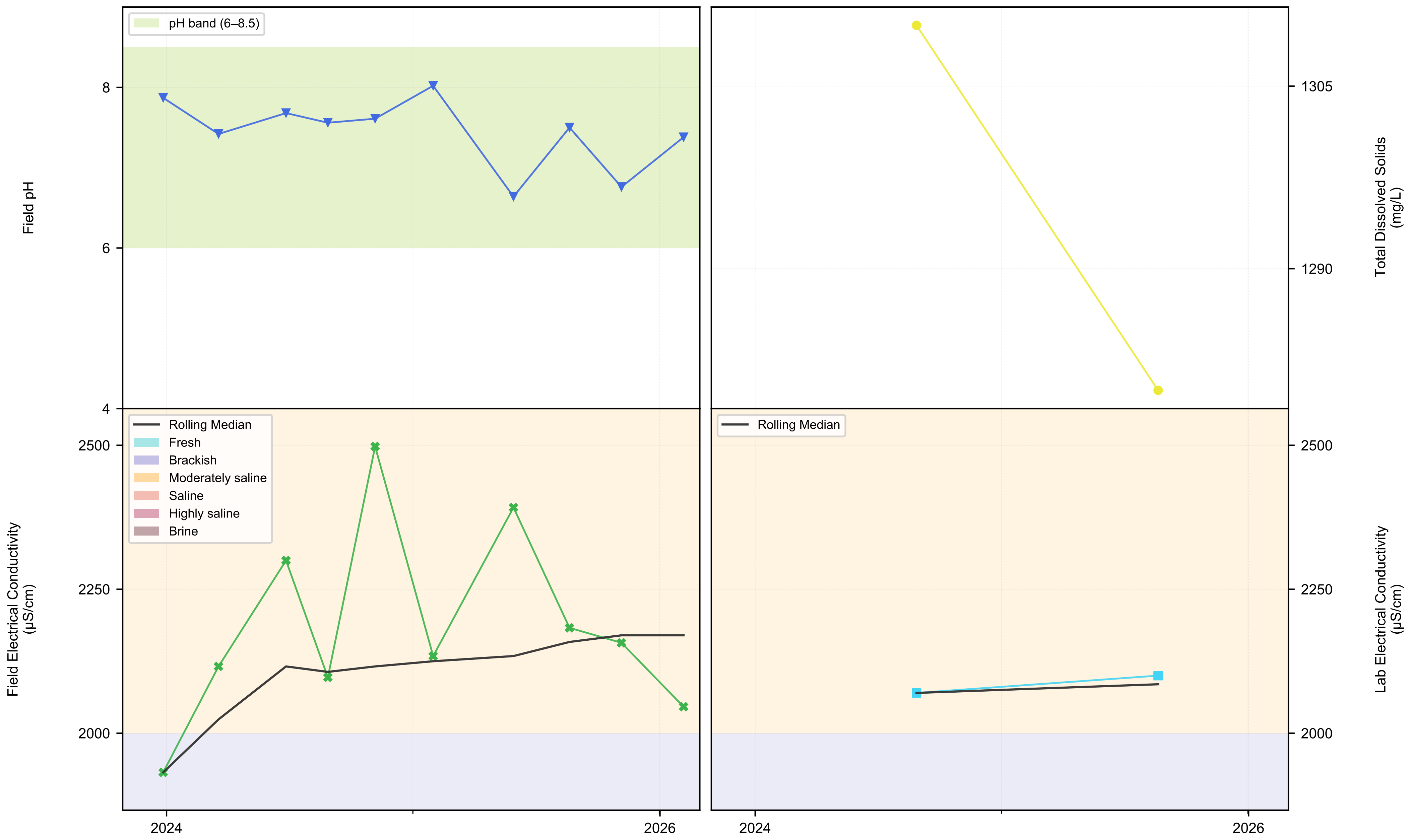
EC two tiered used for triggers

P90 (Pilliga Sandstone; No structure info)



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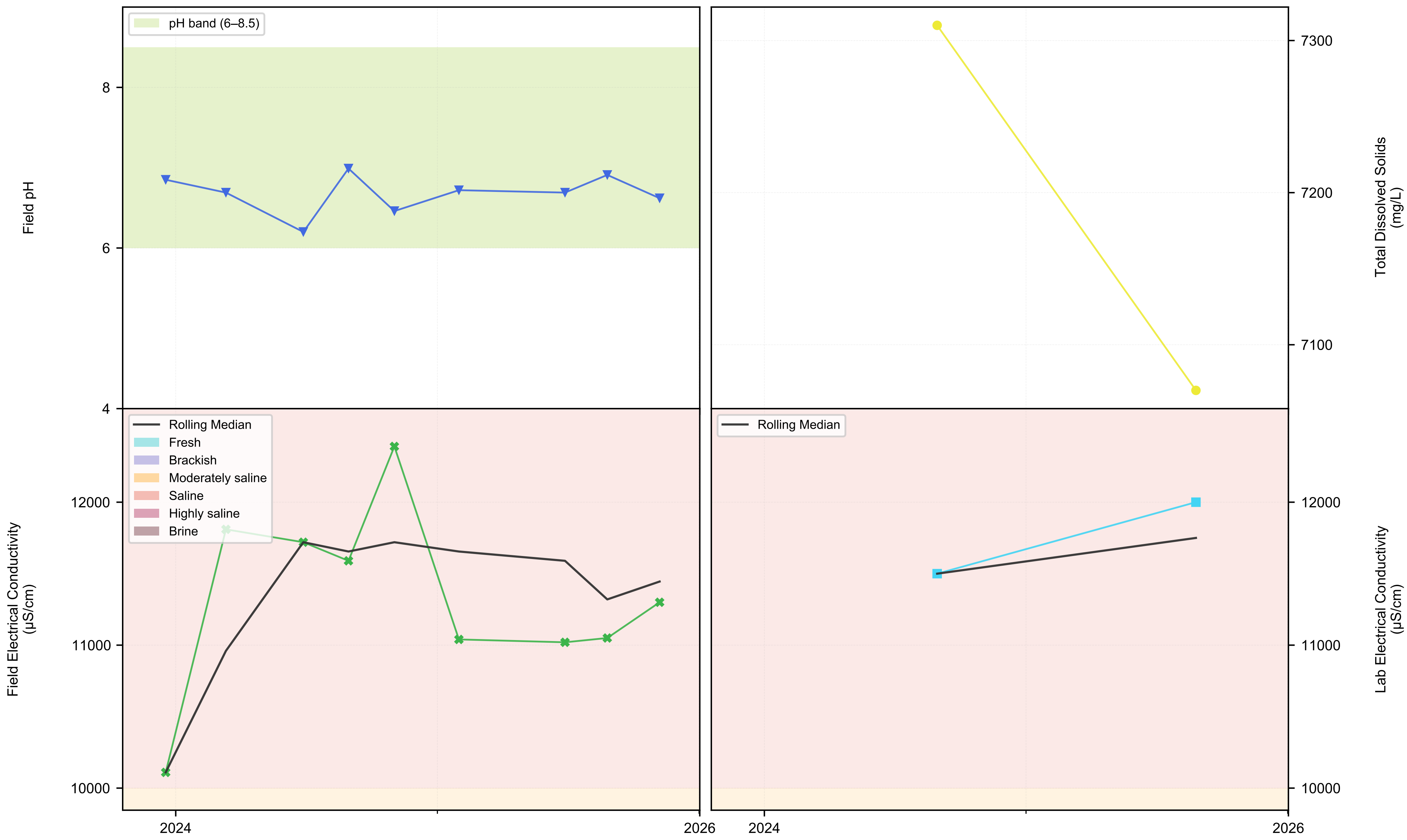
ANZG (stock) used for triggers

P91 (Mayfield Spring; Outcrop)



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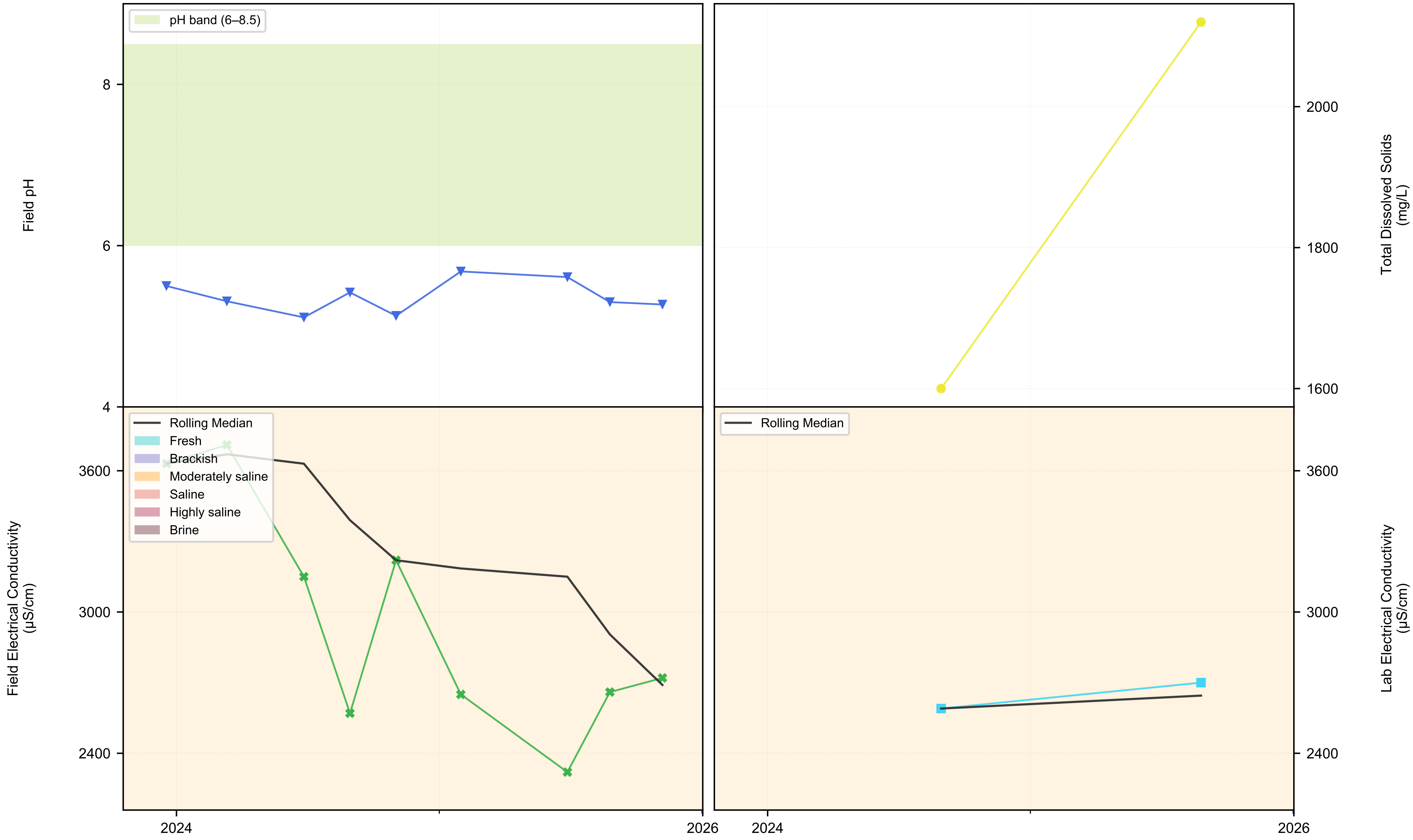
P92 (Mayfield Spring; Outcrop)



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WB1 (Garrawilla Volcanics; No structure info)

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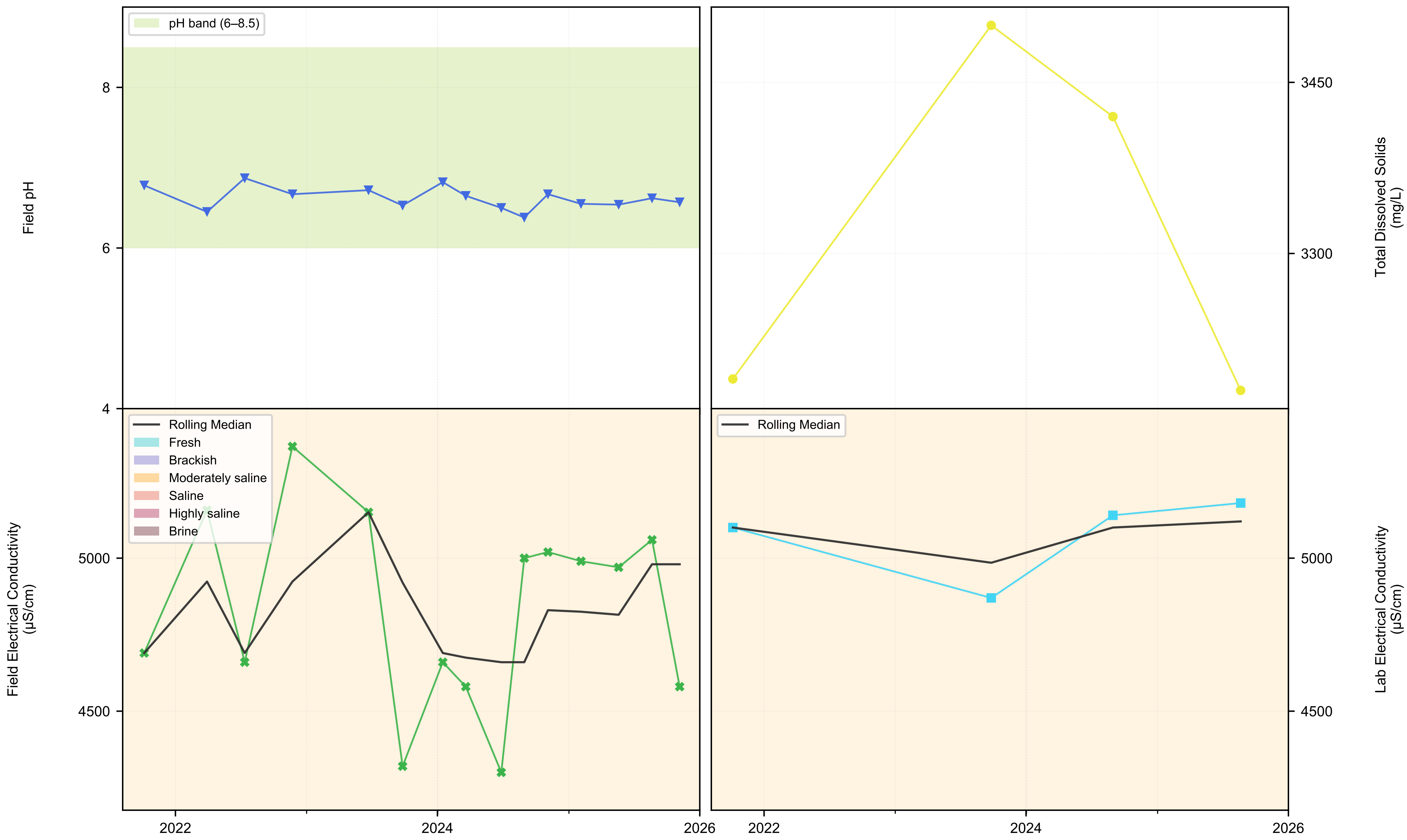
WB10 (Napperby Formation ; No structure info)



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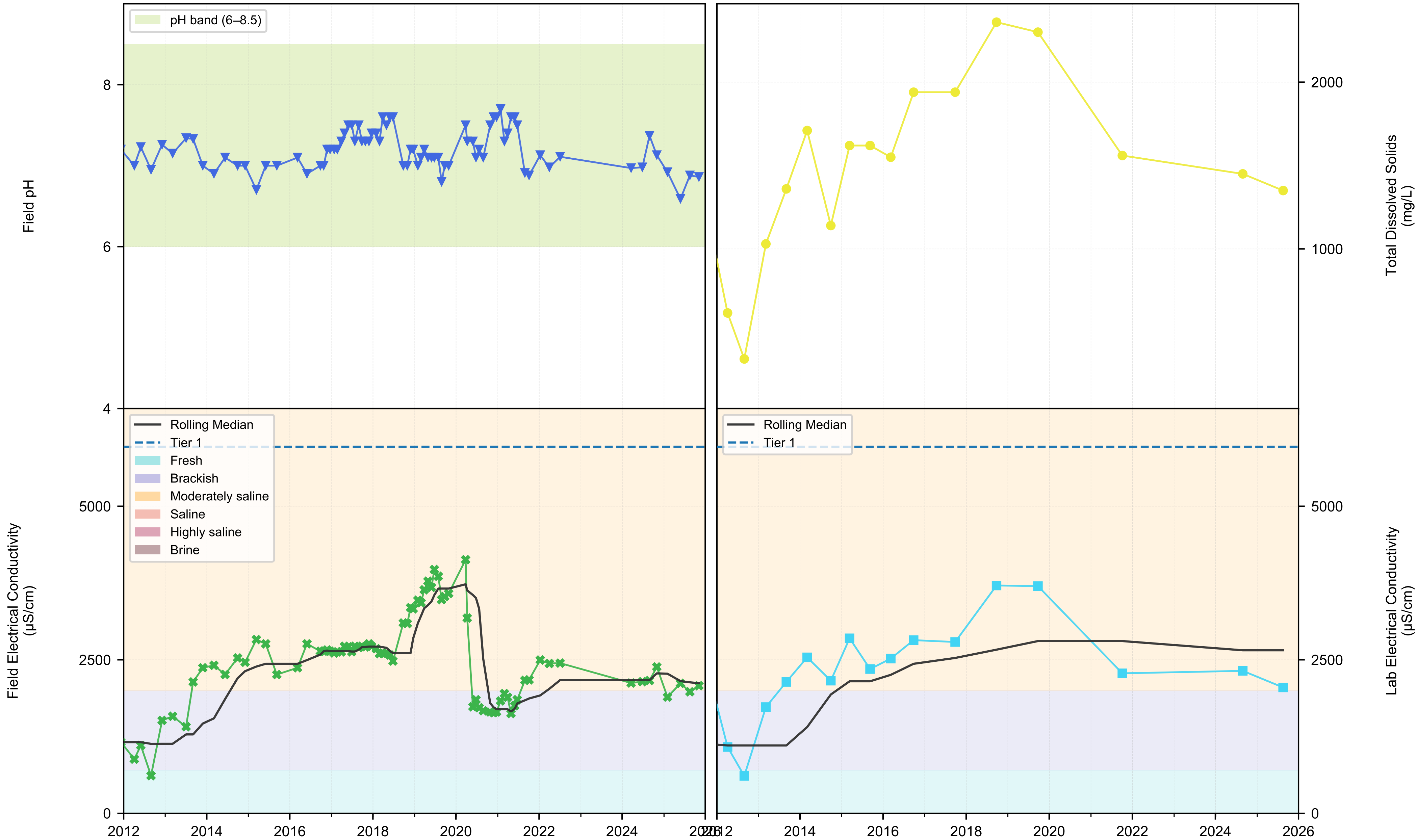
WB2 (Garrawilla Volcanics; Outcrop)



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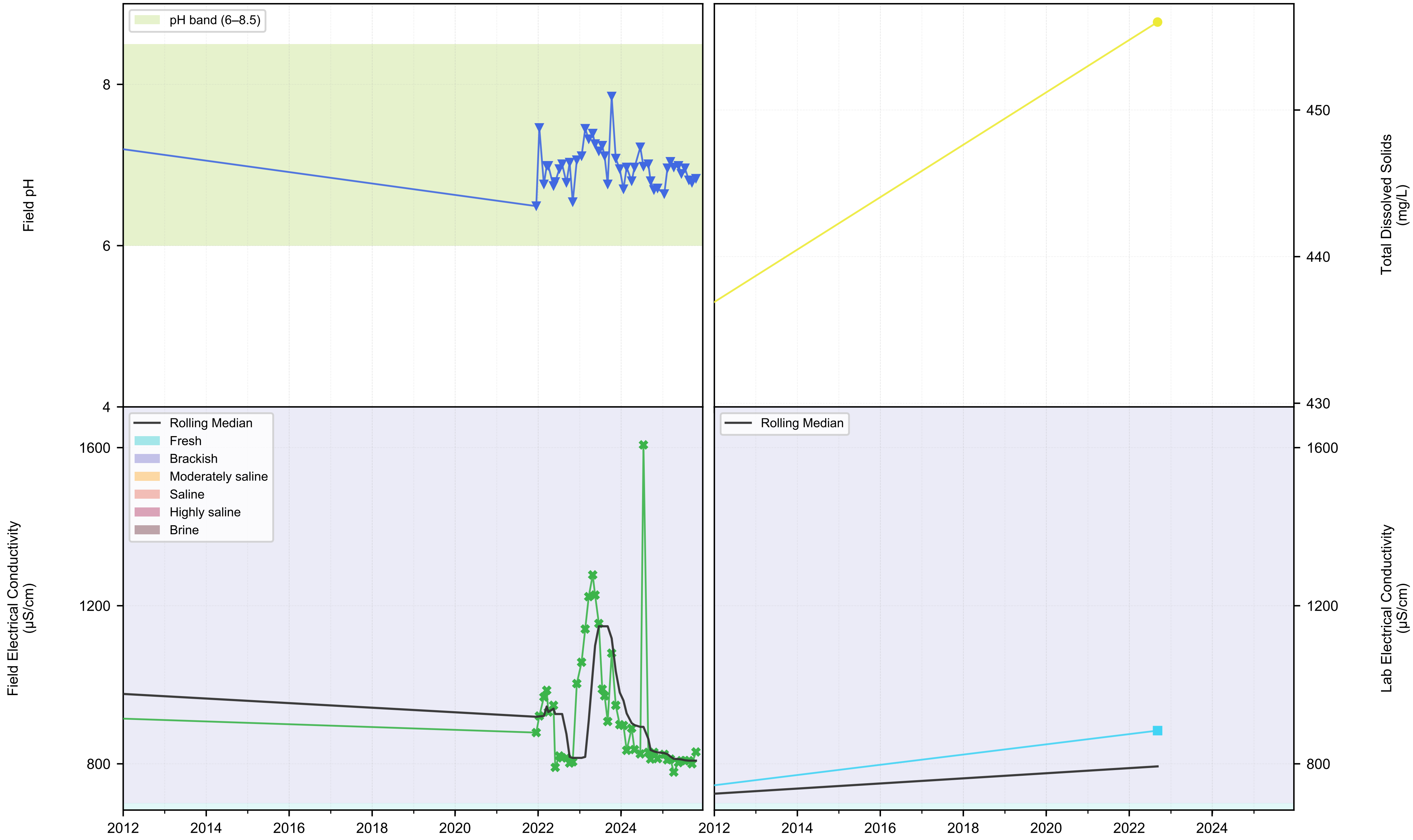
ANZG (stock) used for triggers

WB3a (Alluvium; No structure info)



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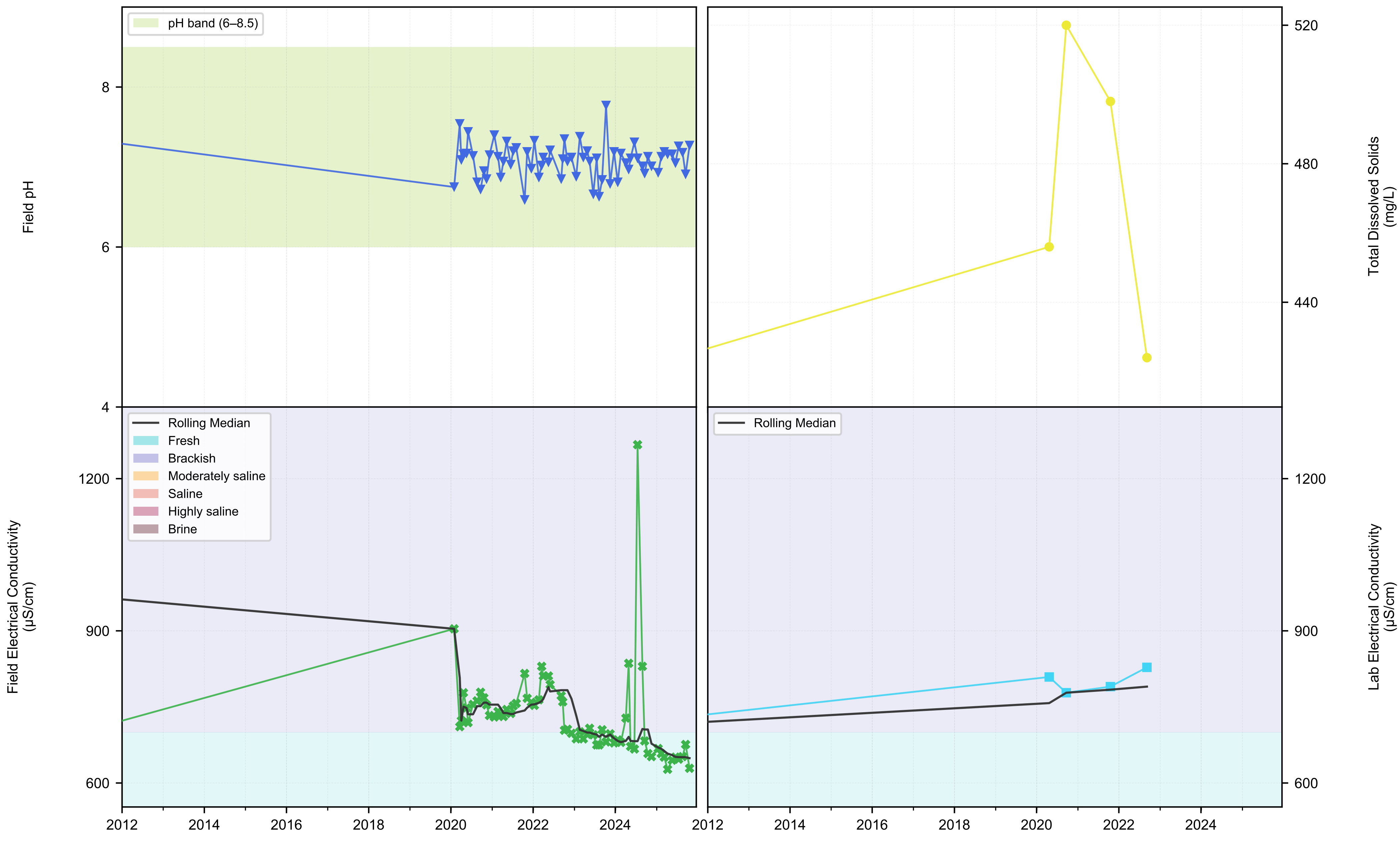
WB3b (Alluvium; No structure info)



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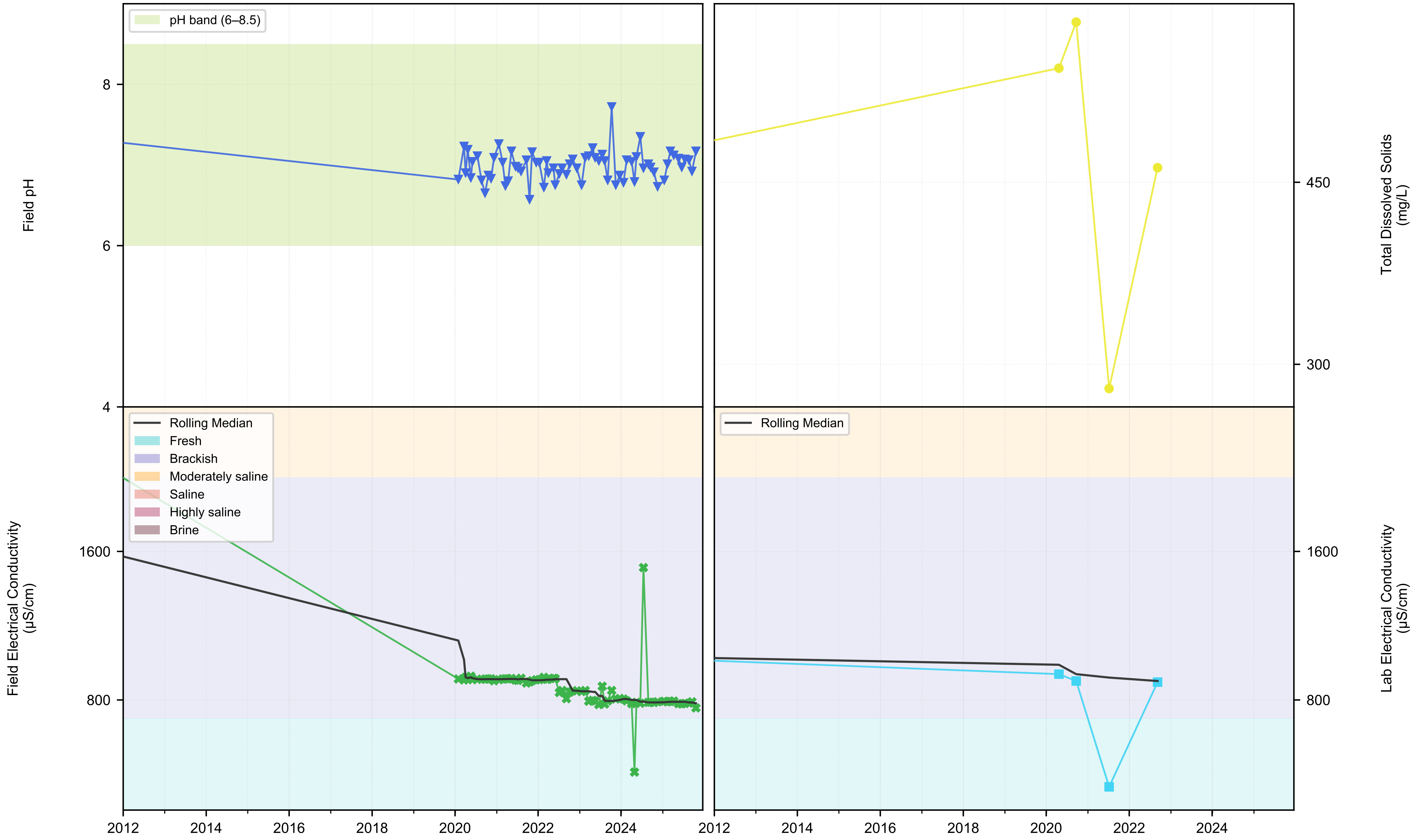
WB4 (Alluvium; No structure info)



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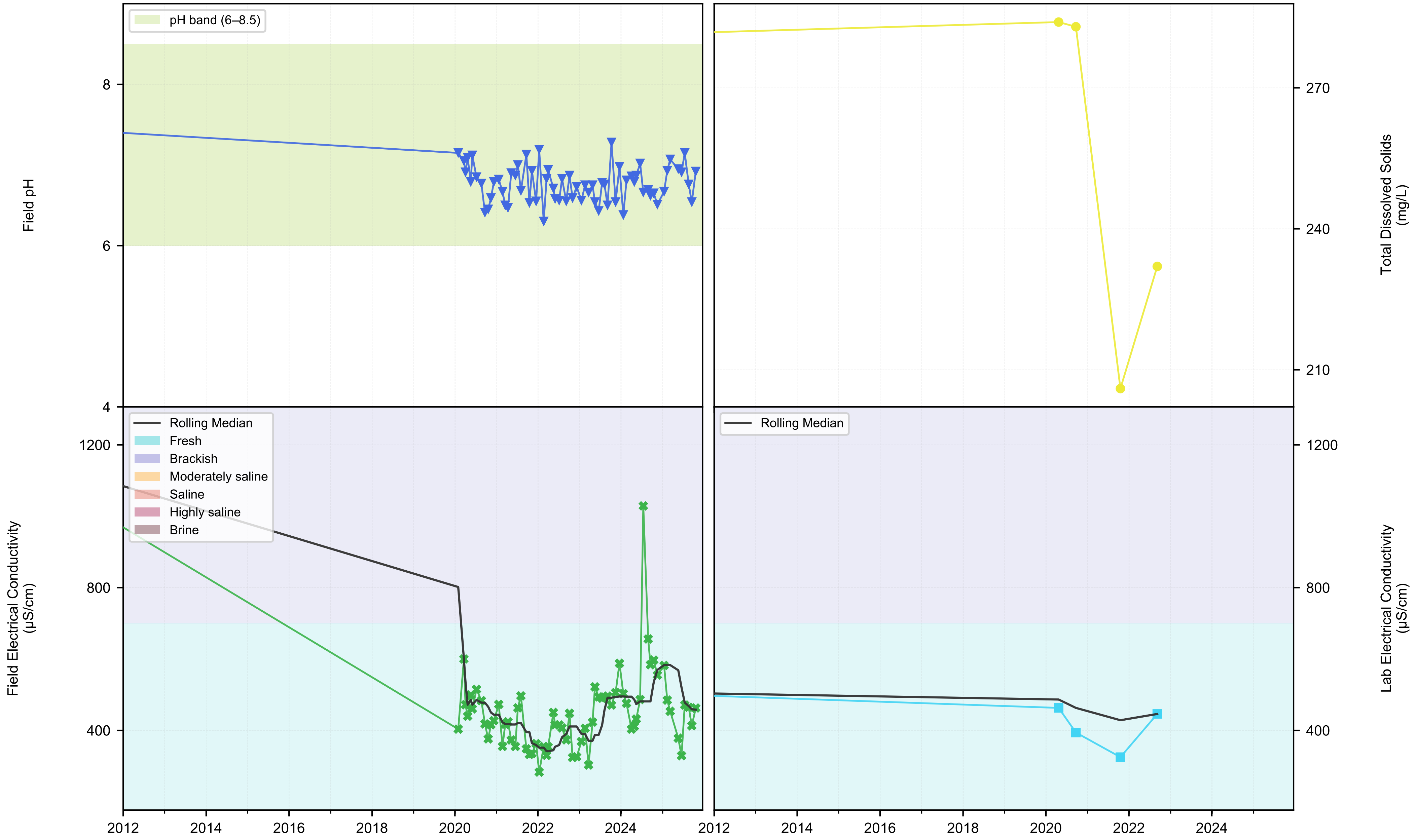
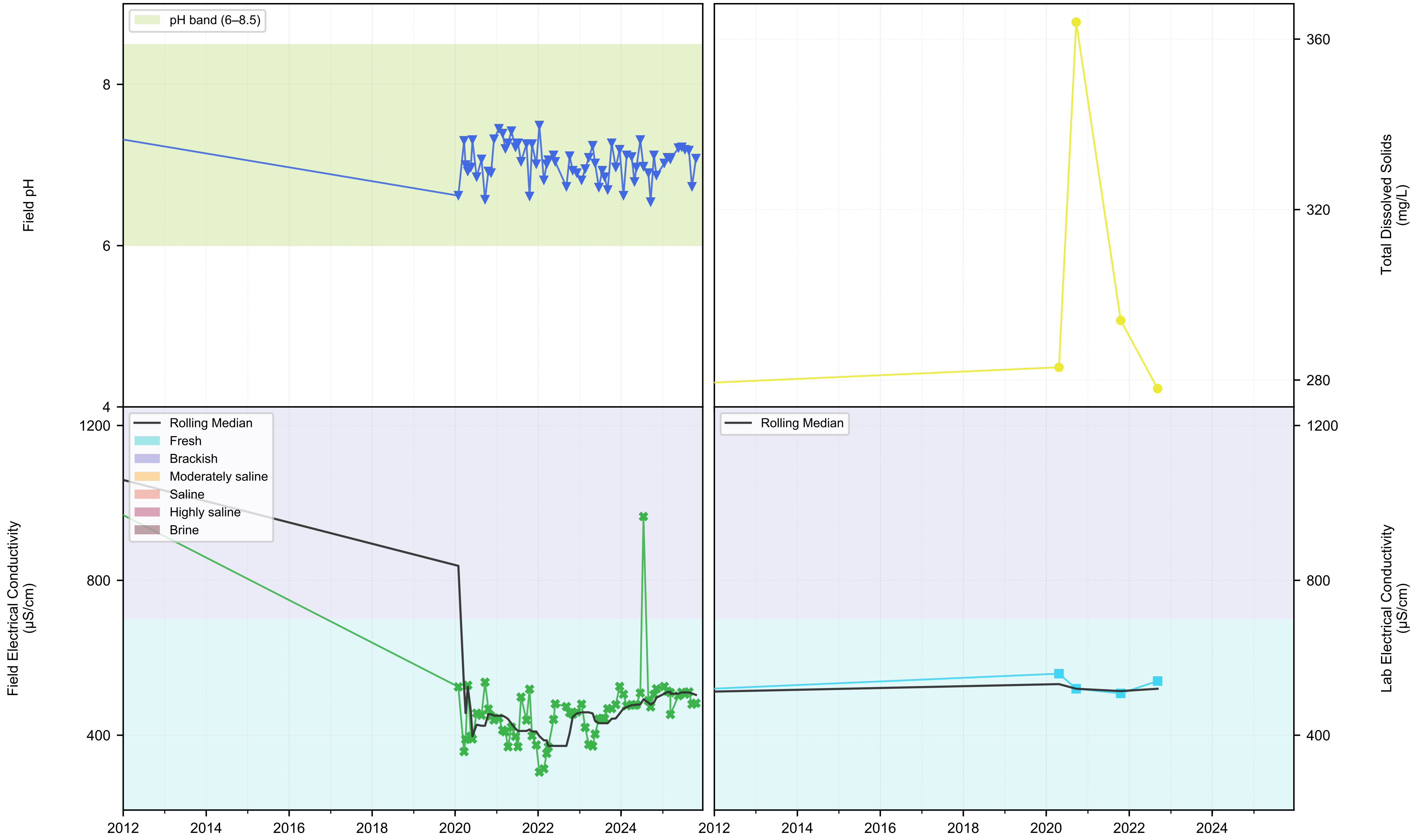
WB5a (Alluvium; No structure info)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

WB5b (Alluvium; No structure info)



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WB6a (Alluvium; No structure info)

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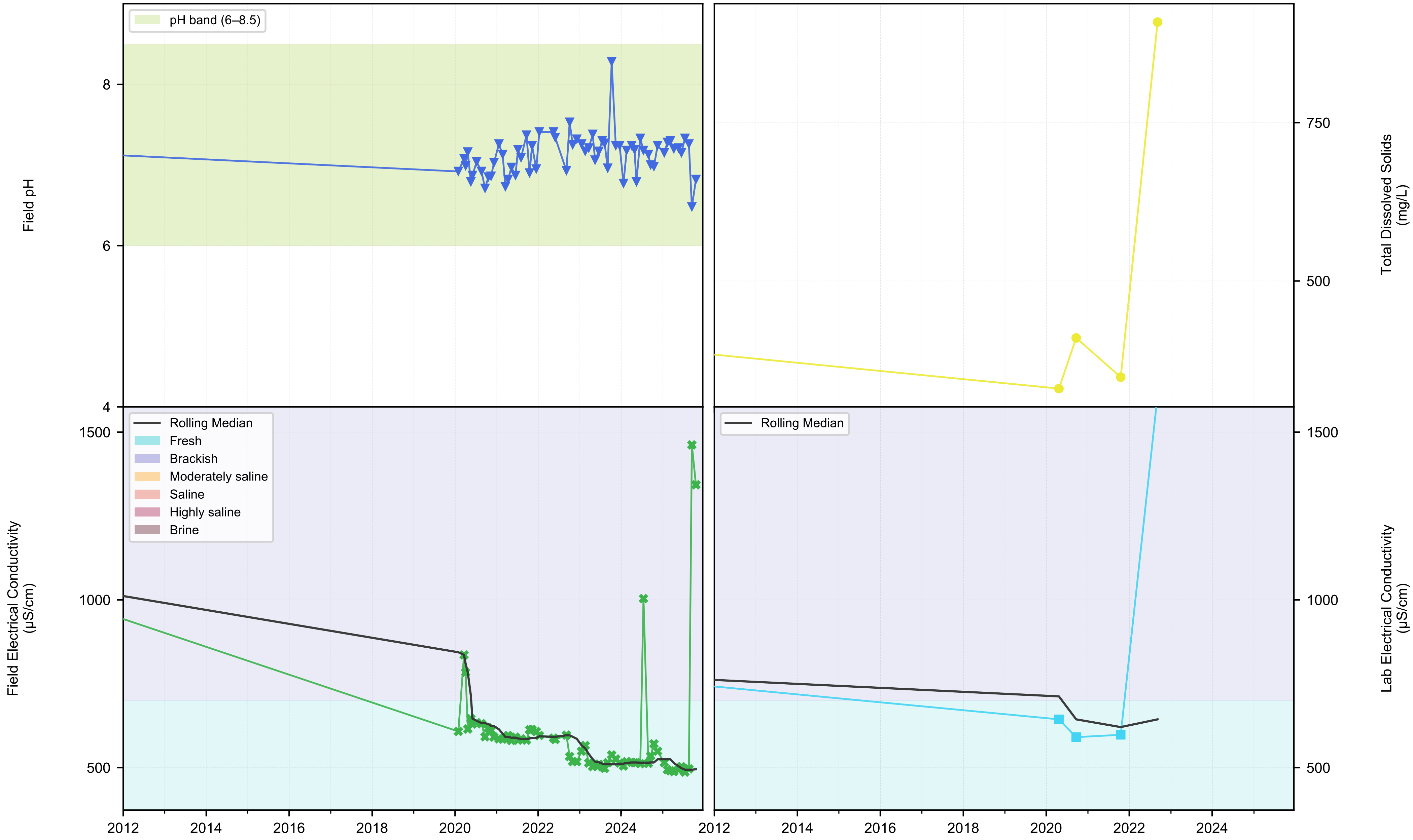
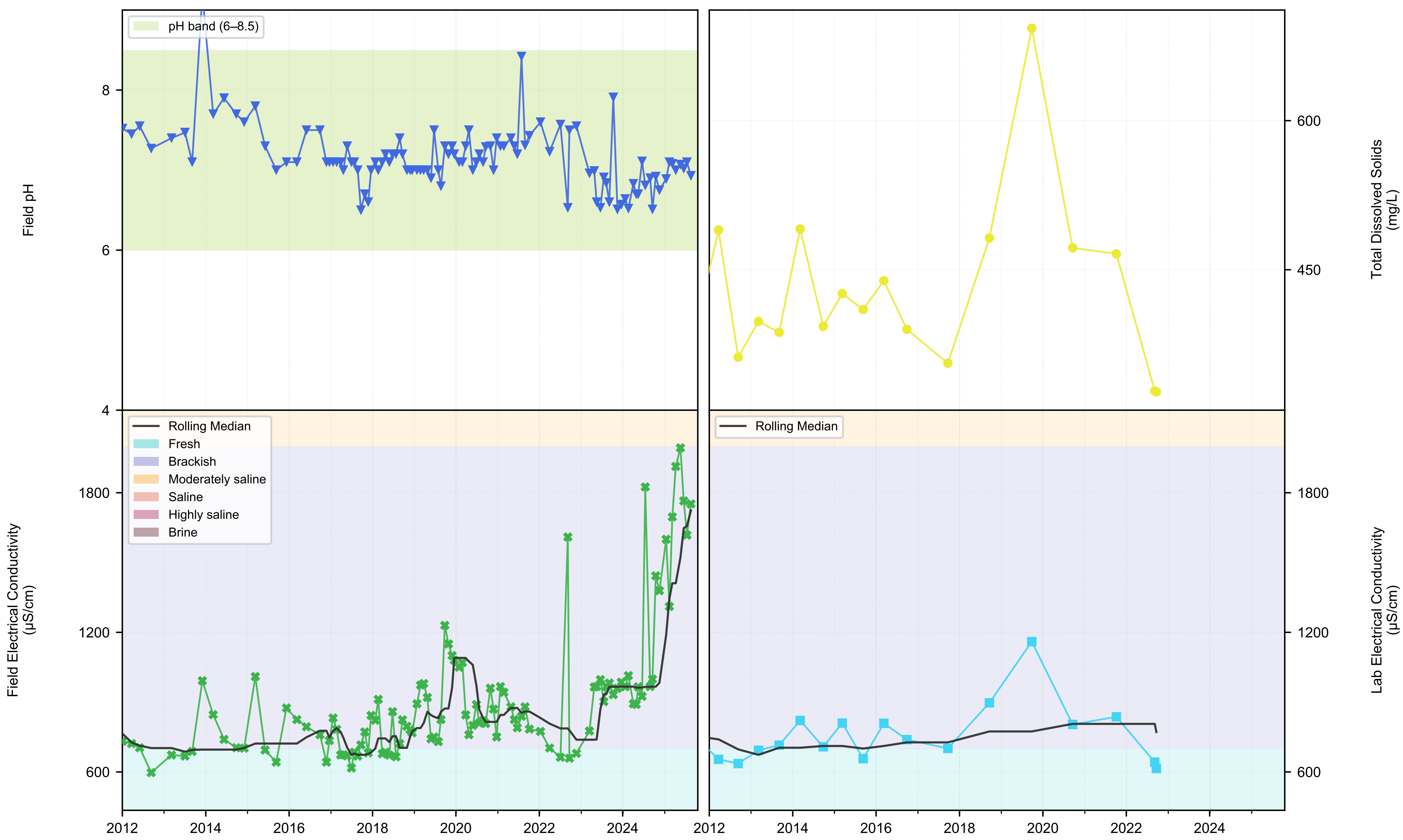
WB6b (Alluvium; No structure info)



Filled markers indicate above limit of reporting, empty markers indicate below limit of reporting

WB7 (Alluvium; No structure info)



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Appendix F

Bore exceedance reports

Australasian Groundwater & Environmental Consultants

11 December 2025

Narrabri Coal Mine
Kamilaroi Highway
Narrabri NSW 2390

Attention: Brent Baker
via email: BrentBaker@whitehavencoal.com.au

Dear Brent,

Narrabri Coal Mine – Hydrogeological Review of Monitoring Bore Exceedances Q4 2025

1 Introduction

Narrabri Coal Operations Pty Ltd (NCOPL) routinely monitor groundwater levels and quality above and surrounding the Narrabri Coal Mine. Groundwater monitoring campaigns are conducted in accordance with the site Water Management Plan (WMP) [1]. Monitoring results have been reviewed against the 2024 revision of the WMP which has been updated with water level and quality trigger criteria that align with the approved Extraction Plan LW203-206 WMP[2]. Groundwater drawdown trigger levels are based on the latest revision of the site groundwater model[3]. As shown in Figure 2.1 water levels and quality are monitored by a network of standpipe monitoring bores and vibrating wire piezometers (VWPs). Data collected at these monitoring locations is reviewed quarterly by Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) on behalf of NCOPL.

The Narrabri WMP includes Trigger Action Response Plans (TARP) for managing changes in groundwater levels and quality and defines groundwater level and quality triggers. For water levels and bores where water is unsuitable for stock and irrigation a two-tiered trigger system is used;

- Tier 1 trigger provides a method for assessing a gradual change in groundwater quality over the medium term; and
- Tier 2 trigger is intended to detect an event related change over the short term.

Bores P2, P4, P9, P10, P11, P29, P39A, P39B, P47, and P53 were identified as exceeding their Tier 2 water quality electrical conductivity (EC) trigger for three consecutive recordings, P7 exceeded pH trigger lower level and P11 exceeded water level trigger. As per the trigger action response plan (TARP), further review was required. AGE was commissioned by NCOPL to undertake this review of exceedances for Q4 2025.

[1] Narrabri Coal Operations (2022) Stage 3 Groundwater Management Plan, revision date 01 December 2022.

[2] Narrabri Coal Operations (2025) Narrabri Mine Extraction plan water management plan LW203 – LW206, revision date 24 January 2025.

[3] AGE Consultants (2024) Narrabri Coal Mine Groundwater Model – Re-calibration Stage 2 MOD 7 v 01.01.

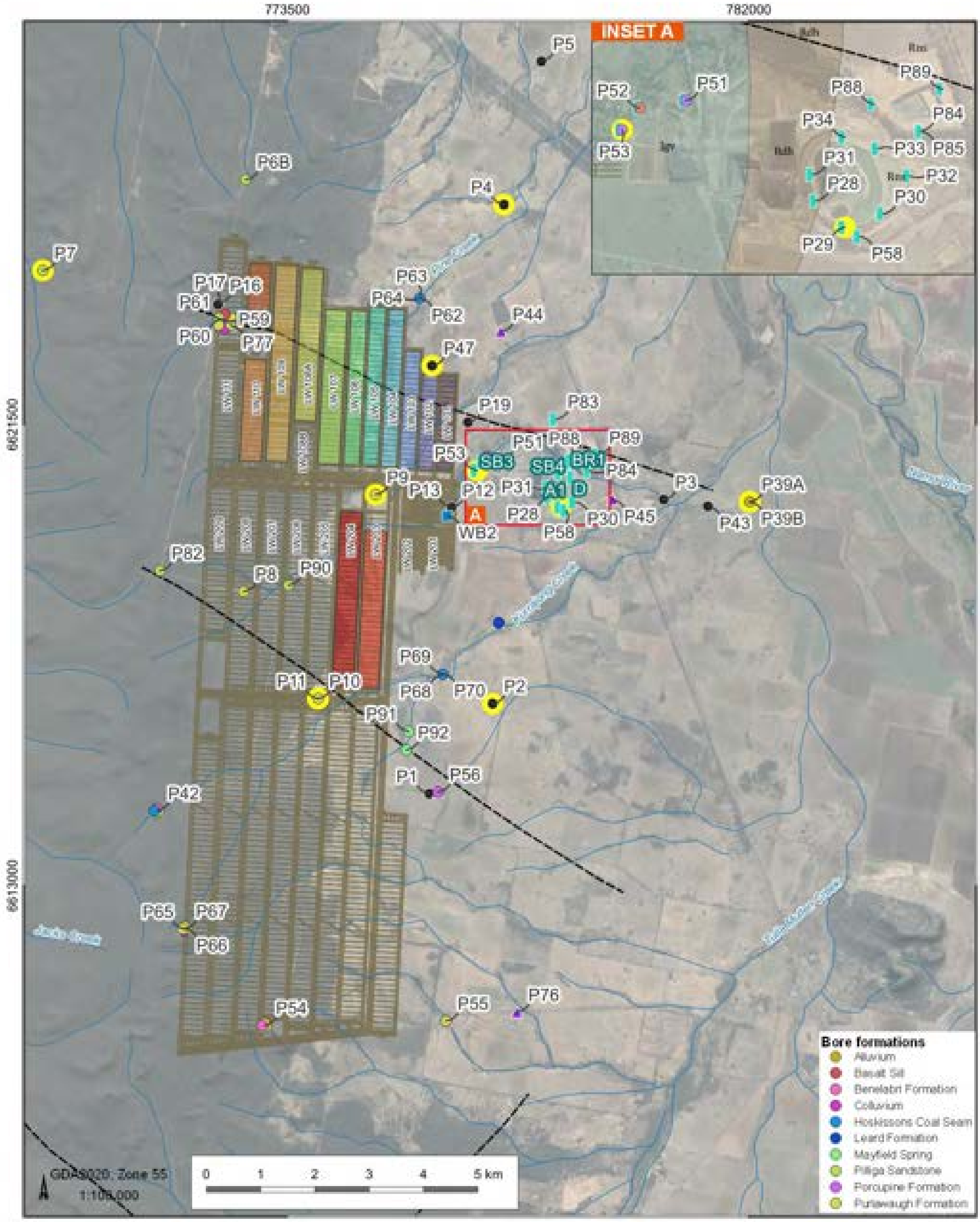
2 Bore locations and construction

Details of bores with recorded exceedances including locations, installation depths, screened intervals and formations are listed in Table 2.1. Further information on the trigger levels and exceedances is listed in Table 3.1, Table 3.2 and Table 3.3.

Table 2.1 Bore construction details of bore with exceedances and nearby bores

Bore ID	Easting	Northing	Total depth (m bgl)	Screen interval (m bgl)	Target formation	Exceedance
P2	777282	6616356	50	44-50	Napperby Formation	Water quality - EC
P4	777491	6625554	30	24-30	Napperby Formation	Water quality - EC
P7	768998	6624340	90	78-90	Pilliga Sandstone	Water quality - pH
P9	775127	6620209	36	24-36	Purlawaugh Formation	Water quality - EC
P10	774064	6616445	130	118-130	Napperby Formation	Water quality - EC
P11	774067	6616449	40	34-40	Purlawaugh Formation	Water quality – EC Water level
P29*	778542	6619979	25	19-25	Napperby Formation	Water quality - EC
P39A	782024	6620078	80	72-80	Watermark Formation	Water quality - EC
P39B	782019	6620079	32	15-30	Tullamullen Alluvium	Water quality - EC
P47	776167	6622587	30.5	8-30.5	Garrawilla Volcanics	Water quality - EC
P53*	776995	6620657	24	18-21	Garrawilla Volcanics	Water quality - EC

Notes: Coordinates are in GDA2020.
m bgl - metres below ground level.
*seepage monitoring bores.



LEGEND

- Drainage
- Minor
- Planned underground mine workings

Monitoring Bores

- Standpipe
- Standpipe - seepage detection
- Production - stock and domestic
- VWP
- Faults

LW101
LW102
LW103
LW104
LW105
LW106
LW107
LW108
LW109
LW110
LW110A
LW111
LW203
LW204

Narrabri Mine Quarterly and Annual Reporting 2025 - 2026 (NAR5027.001)

Groundwater Monitoring Network

AGE

DATE: 11/12/2025

FIGURE No: 2.1

Source: 1 second SRTM Derived DEM-S - © Commonwealth of Australia (Geoscience Australia) 2011 ; GEODATA TOPO 250K Series 3 - © Commonwealth of Australia (Geoscience Australia) 2006 ;
G:\Projects\NAR5027.001 NAR 2025-26 Annual and Quarterly Review\3_GIS\Workspaces\009_Q4_exceedances\04.01_NAR5027_Groundwater Monitoring Network.qgz

Narrabri Mine Quarterly and Annual Reporting 2025-2026 (NAR5027.001)

Reject emplacement area

AGE

DATE
11/12/2025

FIGURE No.
2.2

G:\Projects\NAR5027.001 NAR 2025-26 Annual and Quarterly Reviews\3_GIS\Workspaces\009_Q4_exceedances\04.01_NAR5027_Groundwater Monitoring Network.qgz

3 Trigger Exceedances

Water quality (EC) triggers are defined in the WMP and extraction plans. For datasets with non-normal distribution, a rolling median is calculated from the eight most recent data points and plotted on a time series chart (control chart) and a two-tiered trigger approach is used. Two triggers are then identified as follows:

- Tier 1 – where the rolling EC median[4] exceeds the 80th percentile of long-term data; and
- Tier 2 – where three consecutive EC exceedances of the 95th percentile of the long-term data occur. If this occurs, the TARP (Level 2) will be initiated.

Bores with three consecutive exceedances of their listed EC trigger level are outlined in Table 3.1, pH exceedances in Table 3.2 and water level exceedances in Table 3.3.

Table 3.1 Bores with reportable EC exceedances

Bore ID	Formation	EC trigger (µS/cm)		Three consecutive exceedances (µS/cm)	EC Trend (previous 12 months – between Q1 2025 and Q4 2025)
		Tier 1	Tier 2		
P2	Napperby	19,342	19,731	20,190 (May 2025), 20,150 (Aug 2025), 19,460 (Nov 2025)	Fluctuating between 19,490 and 20,190 µS/cm
P4[1]	Napperby	24,912	25,610	26,100 (May 2025), 26,580 (Aug 2025), 25,300 (Nov 2025)	Overall decreasing trend, rolling median exceeds Tier 1 trigger.
P9	Purlawaugh	20,330	21,190	22,020 (May 2025), 21,400 (Aug 2025), 21,900 (Nov 2025)	Fluctuating between 20,320 and 21,900 µS/cm
P10	Napperby	8,894	9,426	15,120 (May 2025), 13,820 (Aug 2025), 14,680 (Nov 2025)	Overall decreasing trend with short term fluctuations from 15,120 to 13,820 µS/cm
P11	Purlawaugh	6,052	6,546	6,890 (May 2025), 7,470 (Aug 2025), 9,316[2] (Oct 2025)	Increasing trend from 6,590 to 9,316 µS/cm
P29*	Napperby	9,732	11,337	15,610 (May 2025), 17,540 (Aug 2025), 19,590 (Nov 2025)	Increasing from 13,060 to 19,590 µS/cm
P39A	Watermark	5,970		7,680 (May 2025), 7,580 (Aug 2025), 7,020 (Nov 2025)	Decreasing from 7,700 to 7,020 µS/cm
P39B	Alluvium	6,546		1,436 (May 2025), 11,040 (Aug 2025), 12,090 (Nov 2025)	Overall decreasing trend with short term fluctuations 14,360 and 11,040 µS/cm
P47	Garrawilla	5,970		6,430 (May 2025), 6,170 (Aug 2025), 6,120 (Nov 2025)	Overall decreasing trend with minor fluctuations decreasing from 6.430 to 6,120 µS/cm
P53*	Garrawilla	1,107	1,169	1,671 (May 2025), 1,733 (Aug 2025), 2,041 (Nov 2025)	Increasing from 1,301 and 2,041 µS/cm

Notes: *Seepage monitoring bores.

[1] Quarterly monitoring result below Tier 1 trigger; however, rolling median based on last 8 results remains above Tier 1 trigger.

[2] sampled via low flow pump (not routine sampling), no sample available November 2025 due to bore water levels too low from pumped sampling in October.

[4] For datasets with non-normal distribution, a rolling median is calculated from the eight most recent data points and plotted on a time series chart.

Table 3.2 Bores with reportable pH exceedances

Bore ID	Formation	pH (lower) (pH units)	pH (upper) (pH units)	Three consecutive exceedances (µS/cm)	EC Trend (previous 12 months)
P7	Pilliga	6.0	8.5	4.98 (May 2025), 5.01 (Aug 2025), 5.08 (Nov 2025)	Increasing from 4.92 and 5.08

Table 3.3 Bores with reportable water level exceedances

Bore ID	Formation	Tier 1 (m AHD)	Tier 2 (m AHD)	Three consecutive exceedances (m AHD)	Water level trend (previous 12 months)
P11	Purlawaugh	270.4	269.8	268.66 (June 2025), 266.43 (Aug 2025), 265.729 (Oct 2025)	Declining

4 Climate

Monthly rainfall and evaporation totals obtained from Scientific Information for Landowners (SILO) (DES, 2025)[5] are plotted in Figure 4.1. Rainfall and evaporation trends show seasonal fluctuations with rainfall generally highest from November to March. A period of reduced rainfall was recorded from 2017 to the end of 2019 during which evaporation increased. A period of decreased evaporation and increased rainfall followed during the period 2020 to 2023.

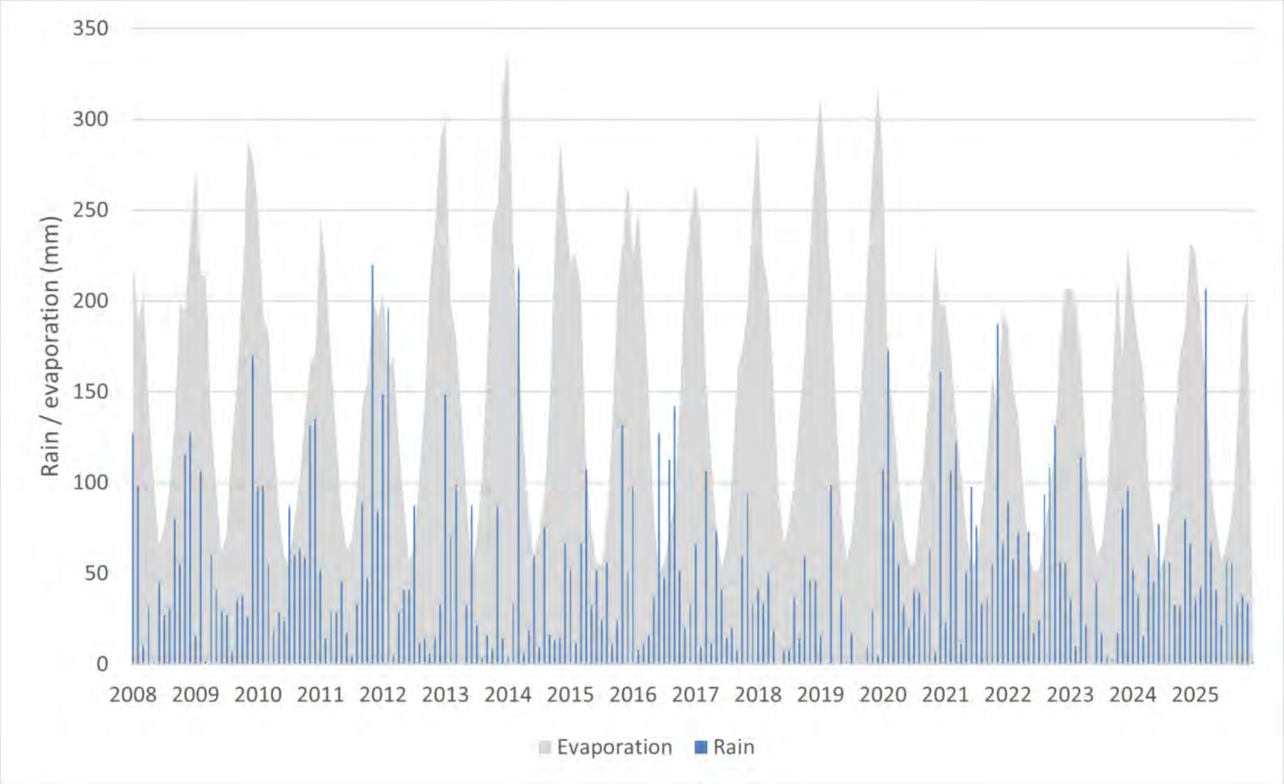


Figure 4.1 Monthly rainfall and evaporation 2018 to 2025

Cumulative rainfall departure (CRD) is calculated to place recent rainfall years into a historical context. The CRD is calculated by subtracting the long-term average monthly rainfall from the actual monthly rainfall, providing a monthly departure from the average. A rising slope in the CRD indicates periods of above-average rainfall, and a falling slope indicates below-average rainfall. CRD for the site is shown in Figure 4.2 using historical rainfall data obtained from the SILO website.

From 2017 to the end of 2019 a falling slope is recorded which coincides with the Tinderbox Drought, the direst three-year period on record for the region. Following this drought the region experienced a period of above average rainfall from early 2020 to 2023. Since then, rainfall fluctuations show similar trends to those experienced before the tinderbox drought (2008 to 2017).

[5] Department of Environment and Science. 2025. SILO Australian climate data from 1889 to yesterday, Downloaded from https://www.longpaddock.qld.gov.au/silo/ on 09 September 2025.

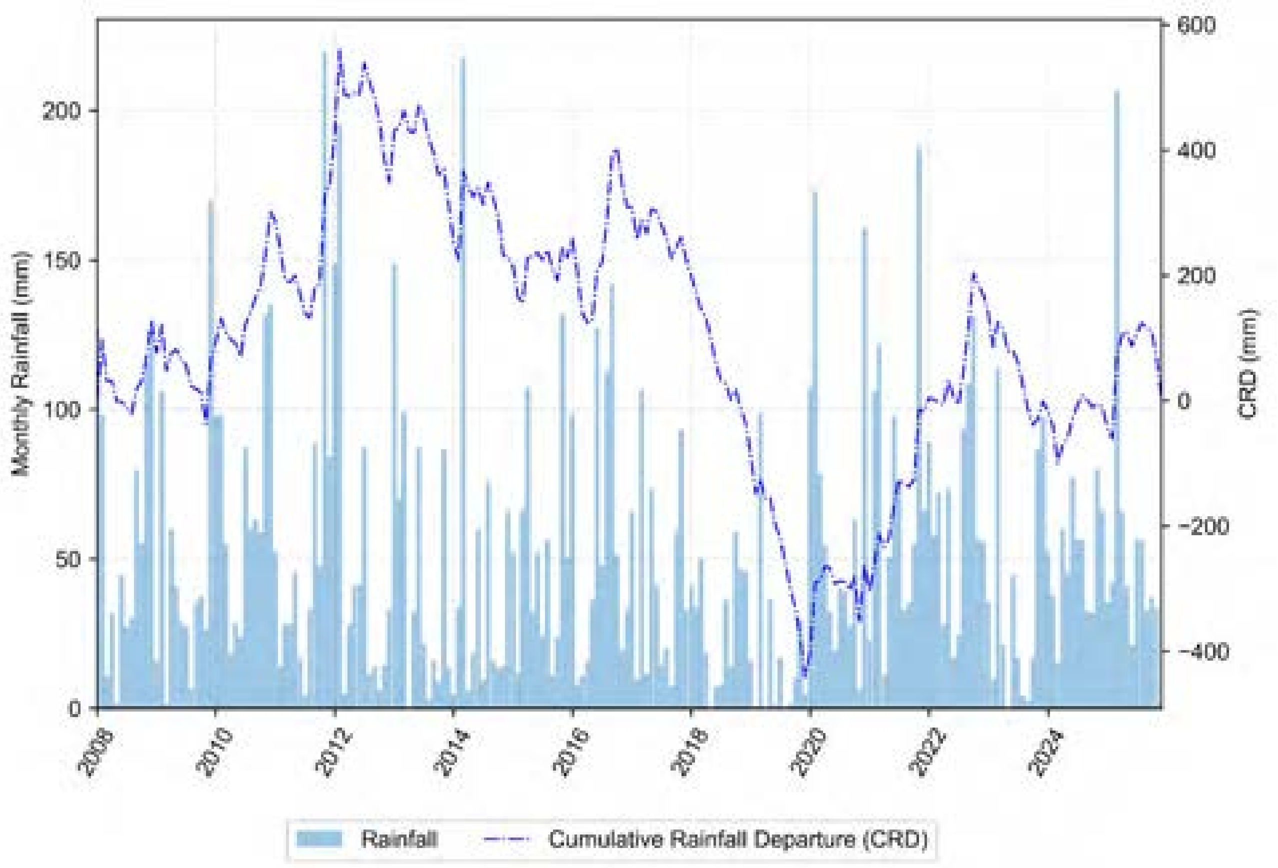


Figure 4.2 Cumulative rainfall departure and monthly rainfall from January 2008 to December 2025

5 Hydrogeological conceptual model

The Narrabri Mine is located within the Mullaley Sub-basin, which forms part of the larger Gunnedah Basin. The western half of the mining lease is also located on the eastern margin of the Surat Basin. Generally, the Surat and Gunnedah Basin stratigraphic units are characterised by a dip to the west at an angle of less than 10 degrees and outcrops along the Namoi River valley. The main stratigraphic units occurring in the vicinity of the Narrabri Mine are illustrated in Figure 5.1 and include the following:

- Quaternary alluvium consisting of unconsolidated clays, silts, sands, and gravels associated with the Namoi River and its tributaries;
- Surat Basin units including;
  - Jurassic Pilliga Sandstone, Purlawaugh Formation and Garrawilla Volcanics.
- Gunnedah Basin Units including;
  - Triassic Napperby Formation and Digby Formation; and
  - Permian Hoskissons Coal Seam, Arkarula Formation, Watermark Formation and Pamboola Formation.

Bores with recorded exceedances reviewed in this report are located within the Tulla Mullen alluvium (tributary of the Namoi River), Pilliga Sandstone, Purlawaugh Formation Garrawilla Volcanics, Watermark Formation, and Napperby Formation.

The Pilliga Sandstone is the youngest consolidated formation in the project area, and ranges in thickness from 0 to 120 m at the far western reach of the project area. The sandstone is predominantly a well sorted, fine to coarse grained quartz sandstone in medium cross beds (AGE, 2020).

The Purlawaugh Formation underlies the Pilliga Sandstone, which is a productive aquifer; and the former is typically comprised of fine grain lithic to labile sandstone and siltstone. The formation is reported to have a lower hydraulic conductivity than the Pilliga Sandstone and acts as an aquitard. The Purlawaugh Formation unconformably overlies the Garrawilla Volcanics, which was eroded by the deposition of the overlying sediments.

The Purlawaugh Formation unconformably overlies the Garrawilla Volcanics, a layer of alkali basalt rocks, trachytes and interbedded pyroclastis. The volcanics form the basal unit of the Surat Basin in the area and unconformably overlie the Triassic formations of the Gunnedah Basin.

The Napperby Formation is comprised of an upwards coarsening sequence of siltstone and sandstone laminate, interbedded with quartzose sandstone beds. The upper part of the Napperby Formation, above the Napperby Sill, has a higher proportion of sandstone. The Napperby Formation is generally unweathered rock with low permeability and is not a productive aquifer.

The Watermark formation consists of a fining-up sequence of intensely bioturbated silty sandstone to siltstone/claystone laminite with marine fossils, overlain by finely laminated siltstone/claystone, then a coarsening-up sequence (Australian Stratigraphic Units Database, 2023).

Recharge to the hydrostratigraphic units occurs through diffuse rainfall recharge as well as limited seepage through the non-perennial Kurrajong Creek and its tributaries when flowing. No aquifer discharge related to baseflow occurs near the mining area as groundwater levels are generally deep and well below the channels of the highly ephemeral creeks. Accordingly, no alluvium is present along these creeks, and they are either entirely disconnected (or possibly only very occasionally connected) to the Namoi Alluvium.

Two water sources dominate the mine area, the Gunnedah-Oxley Basin (GOB) Murray Darling Basin (MDB) Groundwater Source and the Great Artesian Basin (GAB) Southern Recharge Groundwater Source. The GOB MDB groundwater source covers an outcrop area of 1,128,000 hectares and comprises the Permian and Triassic rocks associated with the Gunnedah Basin and the younger Jurassic and Cretaceous rocks associated with the Oxley Basin. The GAB Southern Recharge Groundwater Source includes Cretaceous, Jurassic and Tertiary aged rocks including alluvial sediments and the outcropping Pilliga Sandstone.

Two high-productivity aquifers are located within the region: the Namoi River alluvium to the east and the Pilliga Sandstone to the west (Figure 5.1), all other formations are either considered aquitards or non-productive aquifers.

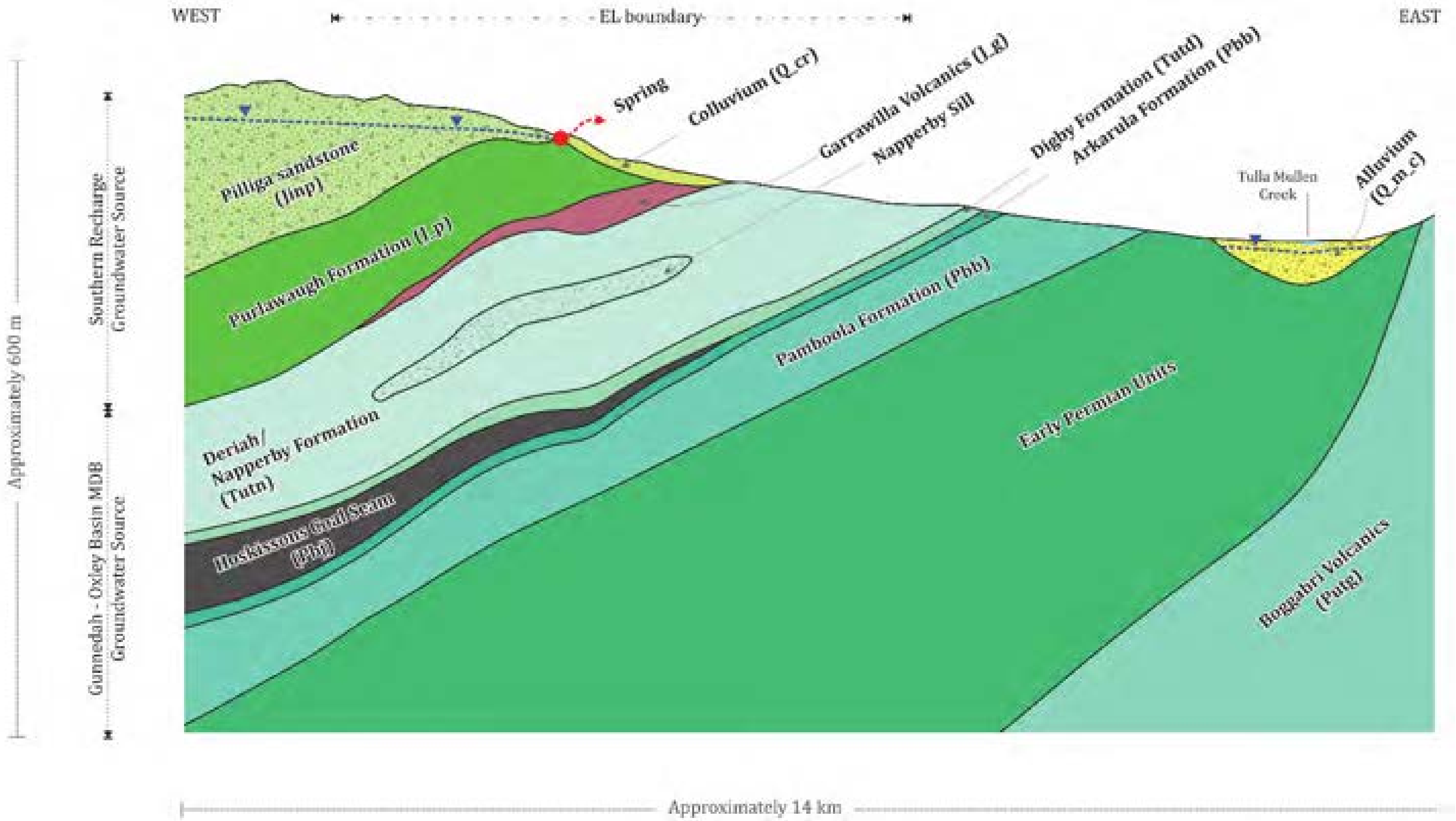


Figure 5.1 Conceptual geological cross section (AGE, 2020)[6]

[6] Australasian Groundwater & Environmental Consultants (AGE) (October 2020). Groundwater Assessment Narrabri Mine Stage 3 Extension Project. Prepared for Narrabri Coal Operations Pty Ltd.

6 Mining progression and infrastructure

Mining at NCO commenced in June 2012 with longwall (LW) 101 (Figure 2.1) and progressed west, in April 2023 the 100 series longwalls were completed. The 200 series commenced in June 2023 with LW 203. Mining progression is outlined in Table 6.1.

A set of water storage dams, the Rail Loop dams (RLDs) are located next to the Coal Handling and Processing Plant (CHPP) (inset Figure 2.1 and Figure 2.2). Typically, water stored in dams D and B1 is fresh (low salinity), water in dams A1, A2, A3, SB1, SB2, SB3 and SB4 are brackish while water quality in dams B2, C and BR1 are saline. Dam D receives water from the Namoi River pump station and the water supply bore.

Table 6.1 Progression of longwall mining

Longwall	Start Date	Completion Date
Longwall 101	6 June 2012	1 June 2013
Longwall 102	22 July 2013	20 January 2014
Longwall 103	3 March 2014	20 October 2014
Longwall 104	1 December 2014	4 August 2015
Longwall 105	10 September 2015	16 May 2016
Longwall 106	20 June 2016	10 March 2017
Longwall 107	19 April 2017	22 July 2018
Longwall 108	16 September 2018	17 November 2019
Longwall 109	6 January 2020	7 November 2021
Longwall 110A	22 December 2020	15 June 2022
Longwall 110B	21 July 2022	17 April 2023
Longwall 203	05 June 2023	12 April 2025
Longwall 204	14 June 2025	28 July 2026*
Longwall 205	11 September 2026*	23 September 2027*
Longwall 206	8 November 2027*	22 October 2028*

Note: *planned extraction.

7 Review of monitoring data

Potential causes of changes in groundwater quality at and around coal mines are both natural and anthropogenic, and typically include:

1. natural: a reduction in recharge (causing less dilution) or an increase in evaporation (causing more concentration) or increase in recharge (causing mobilisation of salts) due to climate factors; and/or
2. anthropogenic/natural: seepage from surface sources of water that have salinity elevated above groundwater levels and likely connected to aquifer systems directly or indirectly through lagged recharge; and/or
3. anthropogenic: groundwater mixing with groundwater from adjacent areas of hydrostratigraphic units due to permitted mine dewatering and/or third-party groundwater users (e.g. irrigation) that may cause changes or reversals in hydraulic gradient; and/or
4. anthropogenic: geochemical solute release due to oxidation and acid-rock drainage.

To determine the possible causes of water quality and level exceedances, this review encompasses the following tasks:

- undertake a first-order data review to identify any unexpected outliers or data errors;
- review results against baseline monitoring for the bore and against historical trends (if available);
- compare with trends in nearby bores within the same aquifer;
- investigate links to operational activities and external influences (e.g. climatic data) including:
  - natural climate factors;
  - seepage from surface sources;
  - mining induced mixing; and
  - solute release.
- assess potential risk of environmental impacts to sensitive receptors; and
- review the current monitoring regime and asses if further work or monitoring is required.

7.1 Alluvial Bores

7.1.1 P39B - water quality - EC exceedance

Bore P39B is installed approximately 6 km east of mining between Tulla Mullen and Kurrajong Creeks from 15 to 30 m bgl. The bore is co-located with bore P39A installed in the Watermark formation from 72 to 78 m bgl. P39B was installed in mid-2016, just prior to the onset of the Tinderbox Drought. From installation to 2021 water levels decreased (about 0.5 to 1 m) while EC increased with some minor fluctuations (Figure 7.1). From 2021 until 2025 water levels have increased (about 1.5 m), during the same time EC values have increased with significant fluctuations. The latest value, recorded in November 2025 of 12,090 µS/cm, supports the fluctuating EC trend.

Groundwater levels recorded at P39A (Watermark) and P39B (Alluvium) (Figure 7.2) have historically remained at similar levels with a slight upwards gradient from the Watermark Formation to the alluvium being recorded prior to 2022. From 2022 onwards, during which groundwater levels were recovering, the hydraulic gradient changed to a downwards gradient from the alluvial bore to the Watermark Formation bore.

Groundwater type based on major and minor ions indicates that the water sampled at P39B plots on the Piper Plot (Figure 7.3) as a Sodium-Chloride (Na-Cl) similar to groundwater samples from the Watermark Formation (bores P43 and P39A) and Pamboola Formation (bore P3). Other alluvial groundwater monitoring bores in the area are located further east (WB7) and southeast (WB5a/b) of P39B these bores are installed in the Namoi Alluvium with major anion and cations indicating a greater relative concentration of Calcium (Ca) compared with Sodium-Potassium (Na-K). Water samples for Namoi alluvium samples indicate a Calcium-Bicarbonate (Ca-HCO_3) or mixed type composition.

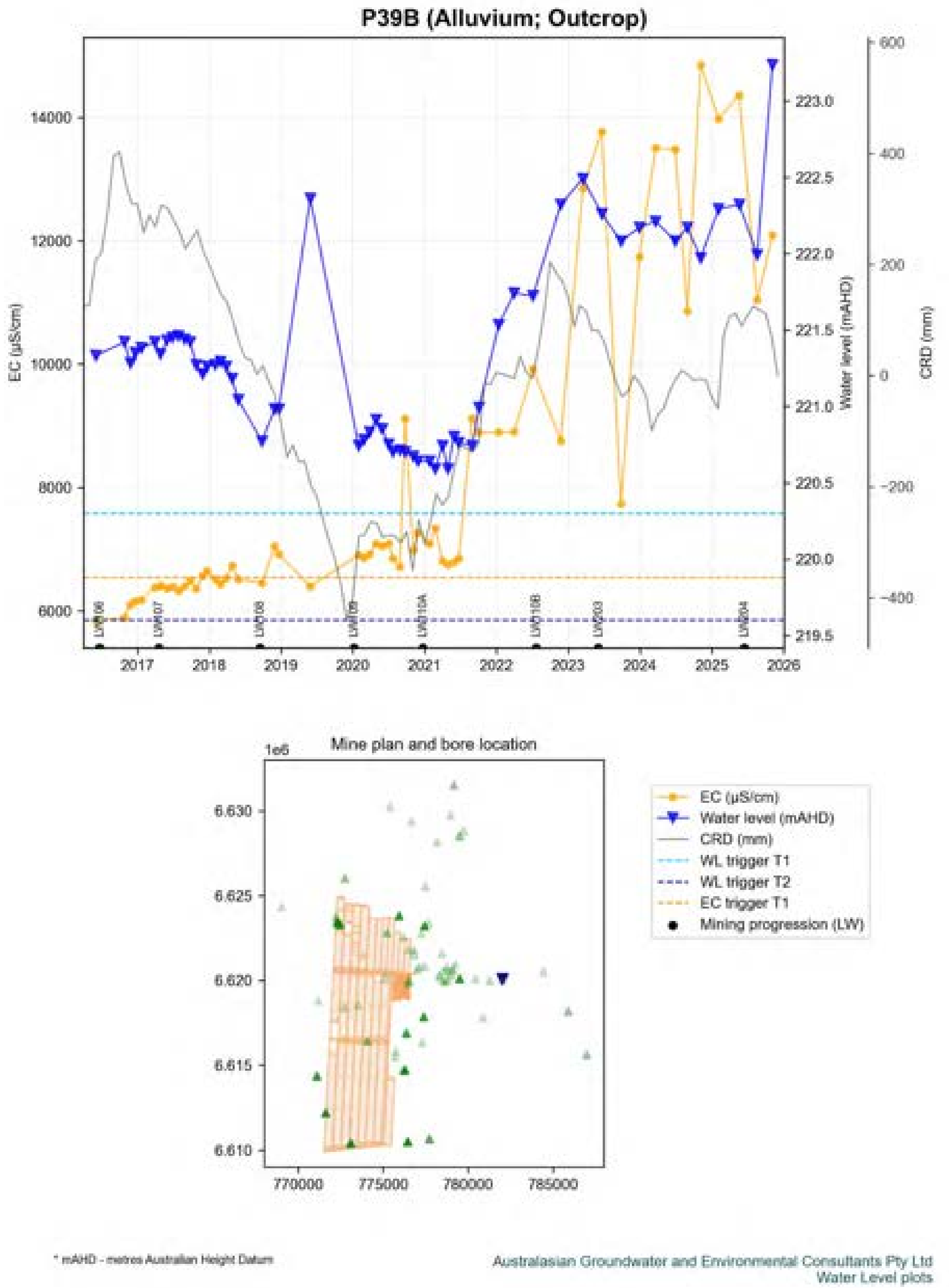


Figure 7.1 P39B EC field and laboratory measurements plotted with water levels

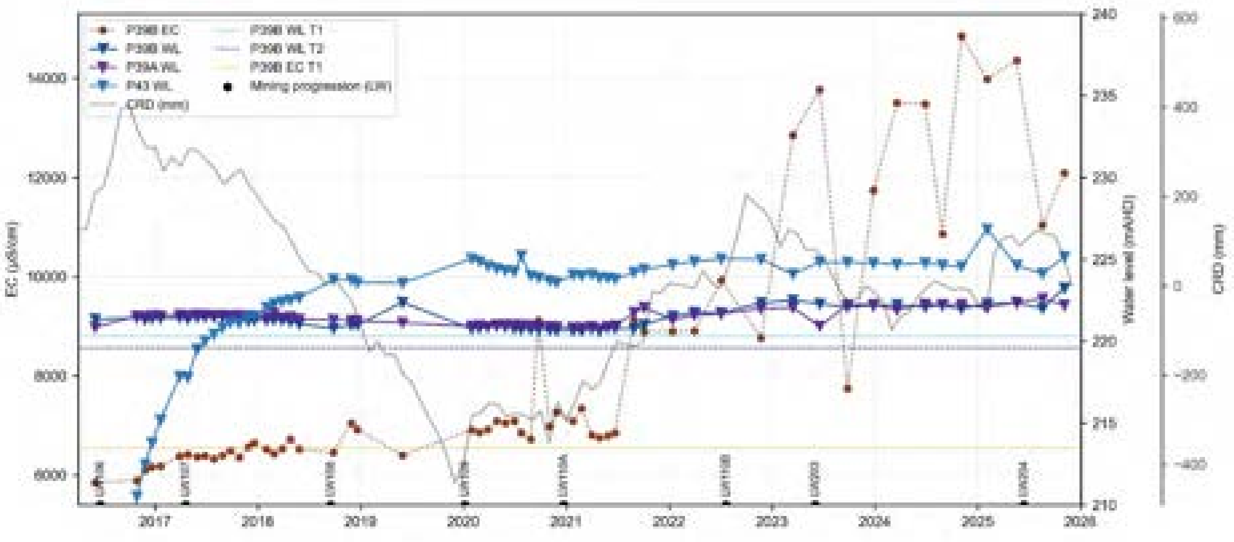


Figure 7.2 P39A and B and P43 groundwater elevations with P39A EC

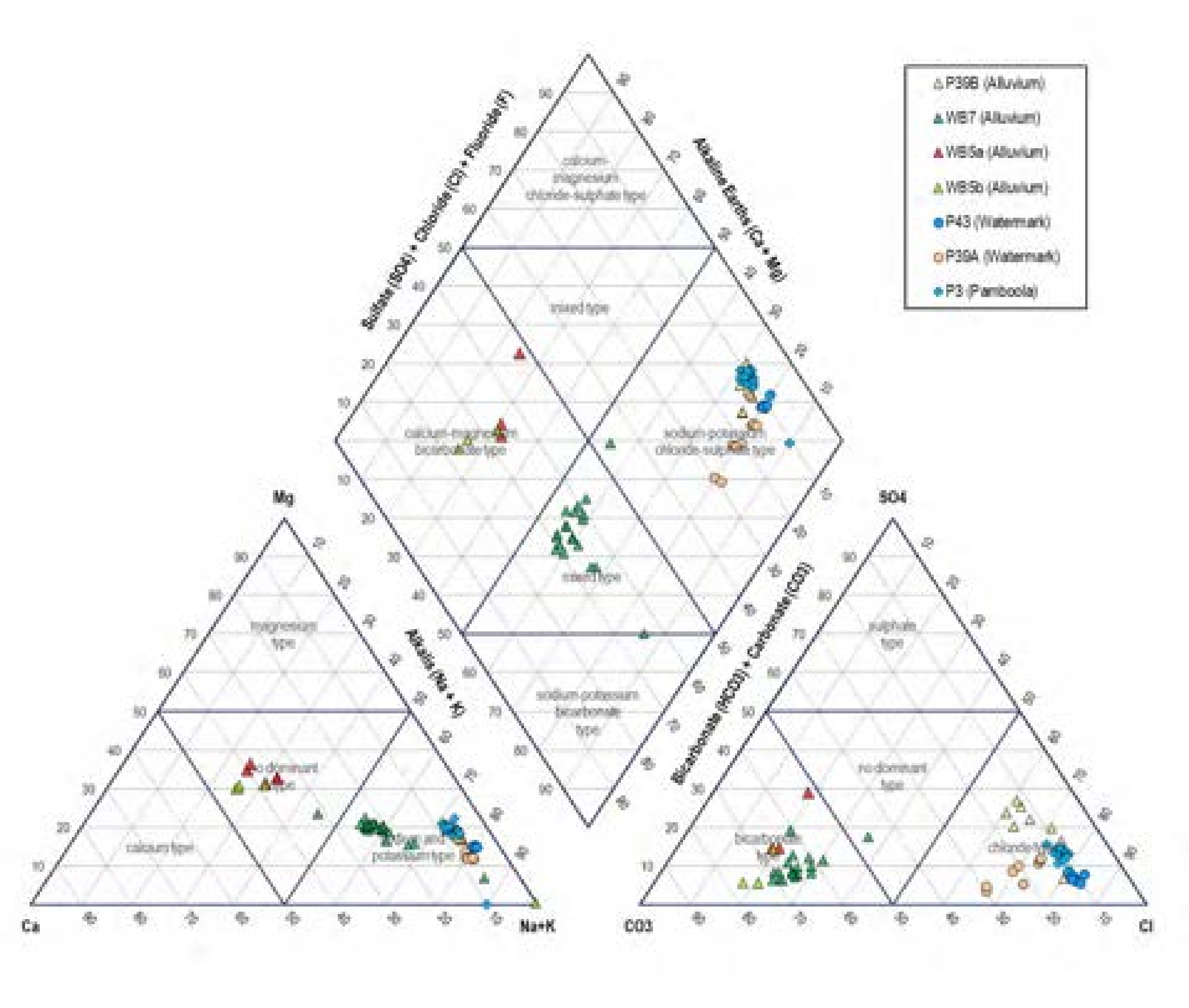


Figure 7.3 P39B and surrounds Piper Plot

7.1.1.1 Natural climate factors

The bore is installed in the alluvium associated with Tulla Mullen Creek which is a laterally unconfined, continuous channel, with low sinuosity (relatively straight) and a fine-grained bed. Rainfall remained above average from the end of the Tinderbox Drought until mid-2022; however, as can be seen by the hydrograph in Figure 7.1, the groundwater level did not commence recovering until the start of 2021. The two-year lag from the end of the Tinderbox Drought to the commencement of groundwater recovery is attributed to slow infiltration due to the fine-grained sediment of the Tulla Mullen Creek beds. Two periods of EC increases are observed, one whereby EC increases steadily during a period of decreasing water levels, these decreasing water levels are likely associated with the Tinderbox drought with a lag attributed to the slow infiltration and recovery. The second period of EC increases is more rapid and is associated with recovering water levels. The initial increase in salinity during the groundwater decline is likely caused by a reduction in recharge and dilution leaving remaining water to be more concentrated. During the drought, hot and dry conditions cause accumulation of salts in the soils and subsurface when groundwater levels increase salts are mobilised and groundwater salinity increases.

7.1.1.2 Seepage from surface sources

A comparison of Digital Earth Australia's (DEA) Landsat landcover classification[7] for the year 2019 (drought conditions) and 2022 (post drought conditions) is shown in Figure 7.4. During the Tinderbox Drought much of the surrounding landcover was classified as bare surface while after the drought was classified as herbaceous to woody natural vegetation. Persistent water, represented by varying shades of blue in the images shows an increase in persistent surface water post-drought with several surface water bodies present that were not present during the drought.

No surface water quality data is available for Tulla Mullen Creek or nearby dams therefore seepage from other surface water storage or Tulla Mullen Creek is a possible cause, but no conclusion can be made.

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[7] DEA Landsat Landcover provides annual land cover classifications for Australia using the Food and Agriculture Organisation's (FAO) Land Cover Classification System (LCCS) taxonomy Version 2 (Di Gregorio and Jansen, 1998; 2005) https://knowledge.dea.ga.gov.au/data/product/dea-land-cover-landsat/.

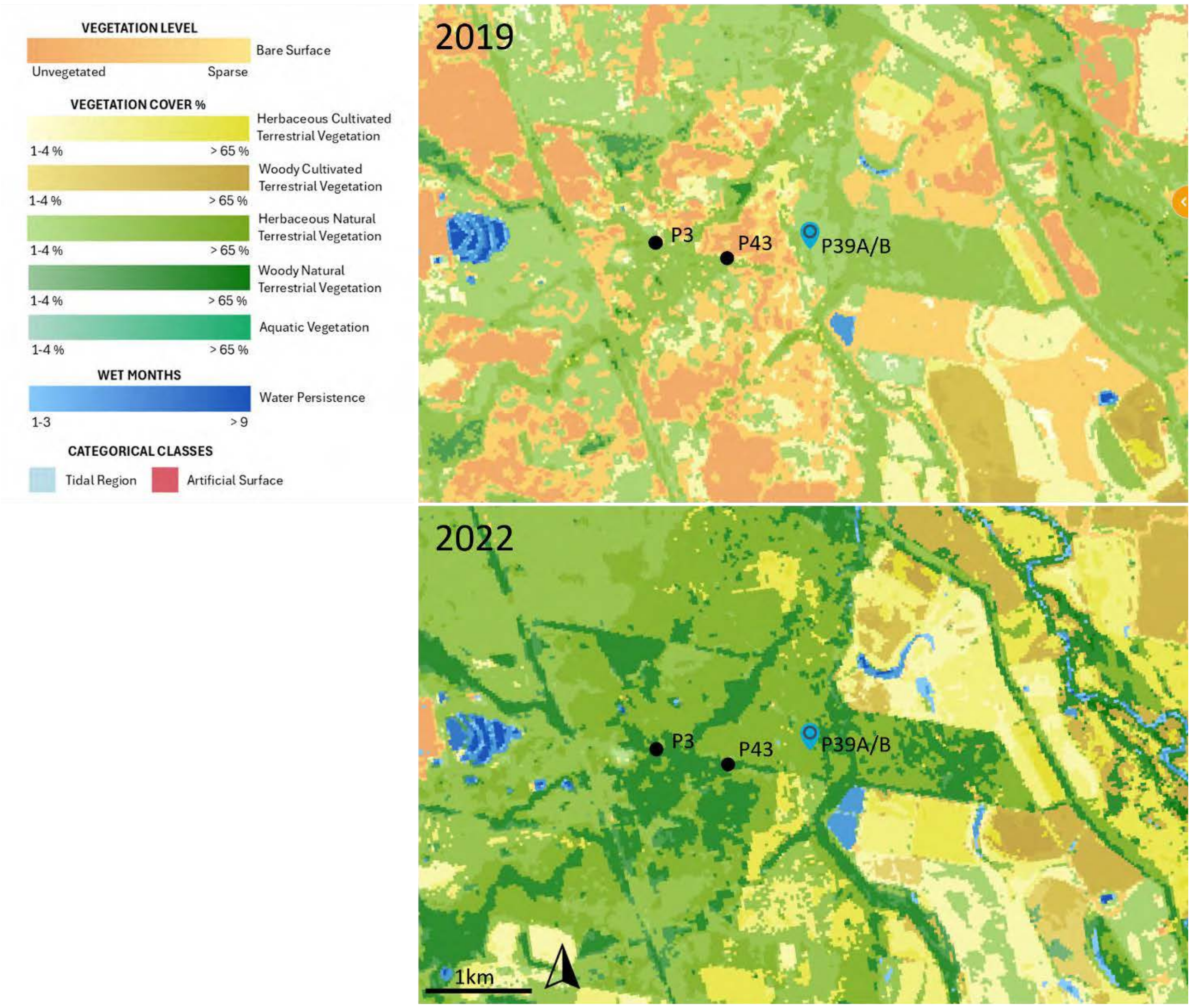

Figure 7.4 DEA Landsat Landcover 2019 and 2022 comparison

7.1.1.3 Mining-induced mixing

Groundwater levels recorded at bores P3 (Pamboola), P43 (Watermark), P39A (Watermark) and P39B (Alluvium) either remain stable (P3 and P43) or fluctuate with changes in rainfall (P39A and B). The lack of mining-induced depressurisation indicates that there is likely limited interconnectivity between the alluvium and the deeper coal seams and that mining-induced mixing is not a likely cause of elevated EC.

7.1.1.4 Solute release

The bores are located approximately 3 km to the west of the rail loop dams and 7 km from active underground mining, lateral migration of solutes from the dam complex is considered unlikely. Bores located between the dam complex and bore P39B do not show a similar increasing EC trend.

7.1.2 Conclusion and recommendations

The steady increase in EC observed during the Tinderbox Drought is likely due to reduced recharge from rainfall and diminished contributions from the Kurrajong and Tulla Mullen Creeks. Following the drought, as groundwater levels began to recover, EC values rise more sharply and exhibited greater fluctuations. This post-drought increase is potentially attributed to the mobilisation of salts that had accumulated in the unsaturated zone during the dry period, which were subsequently flushed into the aquifer as recharge resumed.

Trends observed in the EC and groundwater level data indicate that the likely cause of EC increases is due to two significant climate events, the Tinderbox Drought from 2017 to 2020 followed by a period of increased rainfall from 2020 to late 2022. During prolonged above-average rainfall, accumulated and concentrated salts (as a result of preceding dry spells) seep from near-surface strata to deeper strata within the unsaturated zone into saturated hydrostratigraphic units due to increased recharge or seepage from surface runoff drainage lines.

Given the natural causes of these mechanisms, no immediate action is required.

7.1.3 Potential impacts

Increases in EC are a likely result of long-term natural conditions with no mining-induced impacts likely. Before the increase in EC in 2021 background EC measurements ranged from 6,000 to 7,000 µS/cm with values now ranging from 8,000 to 14,000 µS/cm. Background salinity indicates saline water; however, within the acceptable ranges for most livestock eg TDS of 4,000 to 5,000 mg/L (2,680 to 3,350 µS/cm) for cattle and 4,000 to 10,000 mg/L (2,680 to 6,700 µS/cm) for sheep[8]. The increase in salinity may result in loss of production and a decline in livestock condition and heath.

7.2 Pilliga Sandstone Bores

7.2.1 P7 - water quality - pH exceedance

Bore P7, installed from 78 to 90 m bgl in the Pilliga Sandstone, has recorded stable water levels and EC measurements for the past 5 years. From mid-2020 pH levels have decreased and have dropped below the minimum pH threshold of 6 (Figure 7.5). Laboratory (lab) pH measurements decreased from 2022 to 2025; however, are more consistent with historical ranges. A report prepared by CSIRO for the gas industry social and environmental research alliance (GISERA) discuss distinct spatial zonation within the Pilliga Sandstone Raiber et al (2022). Characteristics of the Pilliga sandstone within this zone include low EC (less than 150 µS/cm), low pH (less than 6) and generally low major ion concentrations.

[8] ANZG. 2023. Livestock drinking water guidelines. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra.

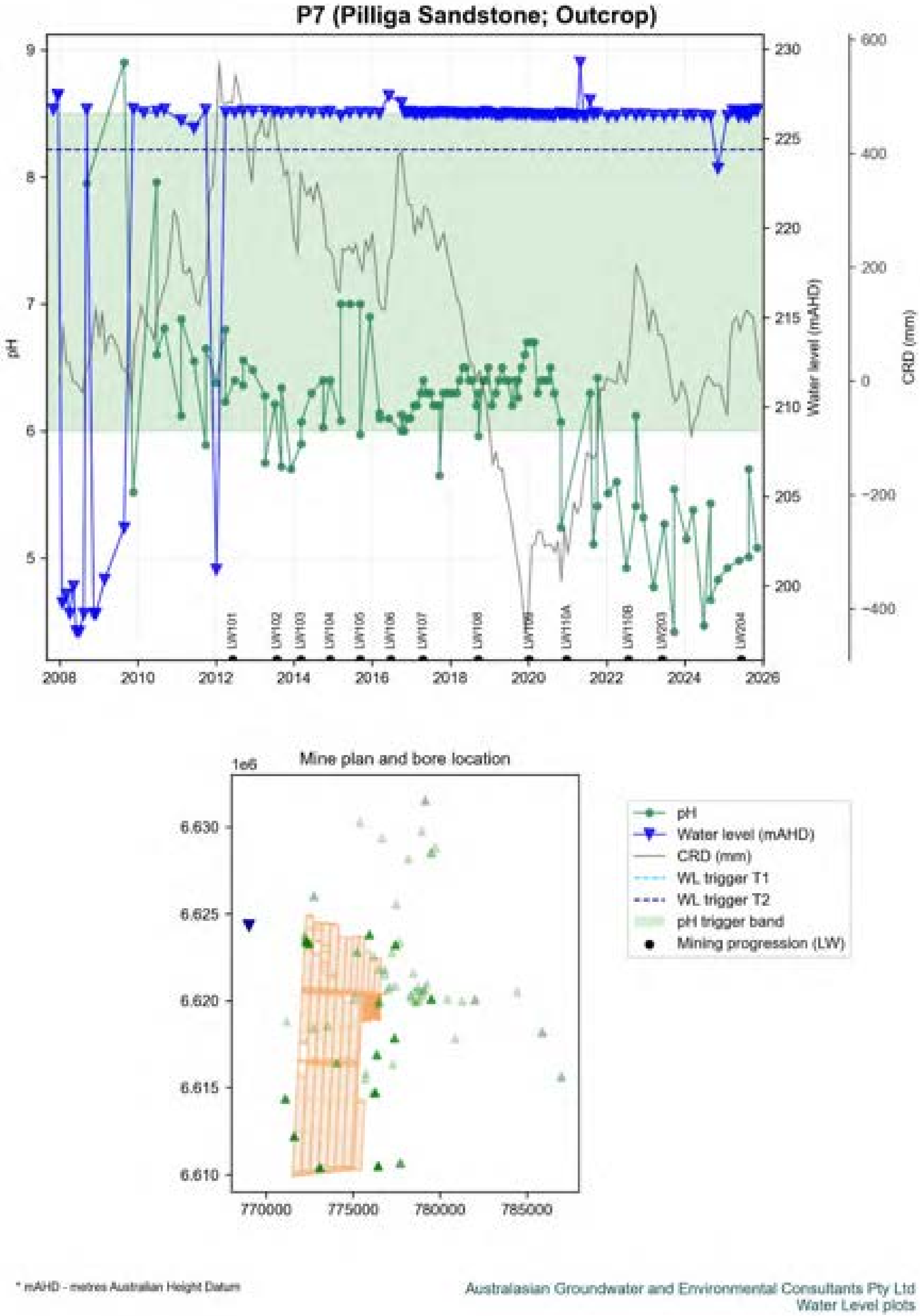

Figure 7.5 P7 pH field and laboratory measurements plotted with water levels

7.2.1.1 Natural climate factors

The decrease in pH coincides with the end of the Tinderbox Drought; however, no changes in water levels or EC are recorded at the same time. The increase in precipitation provides a possible source of acidity from soils during recharge. This is unlikely as soil types mapped in the area are Sodosols which are not strongly acidic and water levels are unaffected by climate variations.

Changes in pH are likely due to natural fluctuations; however, further monitoring is required to confirm this. There appears to be drift/error in the field measurements, laboratory measurements do not record similar drift and fluctuations.

7.2.1.2 Seepage from surface sources

No surface water is located near this bore therefore seepage from surface sources is unlikely.

7.2.1.3 Mining-induced mixing

Groundwater chemistry recorded at bore P7 plots as a sodium-chloride (Na-Cl) type water (Figure 7.6), a linear mixing trend in the anions is visible with a relative increase in bicarbonate. The linear mixing trend does not coincide with the decreasing field pH trend.

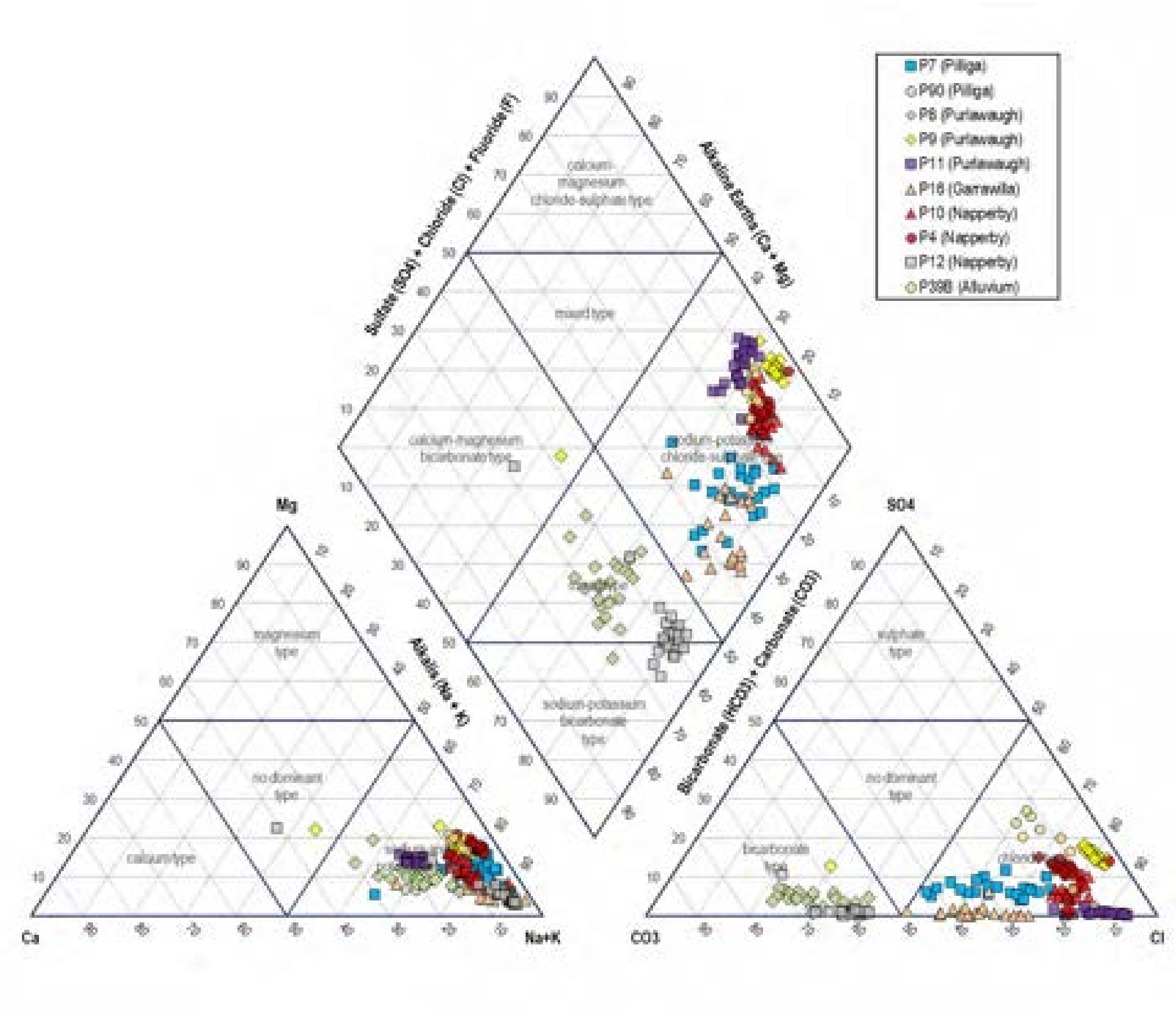

Figure 7.6 P7 and surrounding bores Piper Plot

7.2.1.4 Solute release

Pilliga Sandstone is not predicted to have significant impacts from mining in part due to the presence of multiple formations between the Hoskissons Coal and the Pilliga Sandstone including the Digby, Napperby, Garrawilla Volcanics and Purlawaugh formation (AGE, 2020). Groundwater samples collected underground from LW203 (located approximately 7.6 km southeast of P7) records pH from 5.3 to 7.7. Although pH measurements are similar to those recorded at P7, bore P90, also installed in the Pilliga Sandstone, and located closer to LW203 (approximately 1.4 km west) records pH measurements from 6.6 to 8.0 indicating that solute release from active mining is unlikely.

7.2.2 Conclusion and recommendations

Groundwater within the Pilliga at P7 has low baseline pH, decreases in pH subsequently trigger the lower trigger level (pH 6.0) with small decreases in pH. Multiple monitoring bores within the mining area have also recorded a decreasing pH trend with associated variable fluctuations. Sensor drift for field equipment is a possible means for the decreasing field trend; however, in most cases have an associated decreasing pH recorded in laboratory measurements, indicating that the decreasing trend is real. The timing of the decreasing pH across the site with the end of the Tinderbox drought indicates causes are likely attributable to changes in recharge. Additionally, reported pH in this zone of the Pilliga Sandstone is generally lower than 6 and as such recorded pH are within expected ranges for this zone.

7.2.3 Potential impacts

Hydrochemical studies conducted by Raiber et al[9]found that water of the Pilliga Sandstone often records pH lower than 6. Hierarchical cluster analysis (HCA) identified a cluster predominantly comprising bores sampled within the Pilliga region, exhibiting an average pH of 5.9. Considering the naturally low pH and baseline conditions, further reductions in pH are not anticipated to exert a significant impact on the groundwater system.

7.3 Purlawaugh Formation Bores

7.3.1 P11 - water quality and levels - EC and water level exceedance

Bore P11 is located next to P10 south of LW 205, the bore is installed in the Purlawaugh Formation at 44 to 50 m bgl. Prior to mining commencing in 2012 groundwater EC at P11 fluctuated between 1,000 to 4,000 µS/cm (Figure 7.7). EC values have fluctuated since installation with broad fluctuating trends spanning ~6-year periods. A steep increase is recorded during the Tinderbox Drought from 2017 to 2019, before decreasing. In late 2021, EC value jumped from 5,601 to 7,902 µS/cm then commenced trending down. The water levels at P11 have shown decreasing trends since 2014 and are now lower than those in the nested bore, P10.

P11 has exceeded its Tier 2 water level trigger since 2022, this trigger is based on the latest groundwater model predictions and is adjusted each year there is predicted drawdown. Figure 7.7 shows only the Tier 1 trigger (fixed) and Tier 2 trigger for 2025.

Other bores installed in the Purlawaugh formation include P8 which is installed from 57 to 63 m bgl above the planned LW 206 and P9 which is installed from 24 to 36 m bgl immediately south of LW 105. Bores P8 and P9 show stable trends prior to mining. A mining-related depressurisation is observed in bore P9 in which groundwater levels decline in 2015 when mining of LW105 commenced (Figure 7.8). Contrary to the behaviour observed in bores P8 and P9, the water levels prior to mining at P11 appear to respond to changes in rainfall with an approximate two-year lag.

[9] Raiber, M., Martinez, J., Suckow, A., Deslandes, A., & Gerber, C. 2022. Assessment of the influence of geological structures on aquifer connectivity in the Pilliga Forest, NSW – an integrated hydrogeological, geophysical, hydrochemical and environmental tracer approach. A technical report from GSIRO to GISERA.

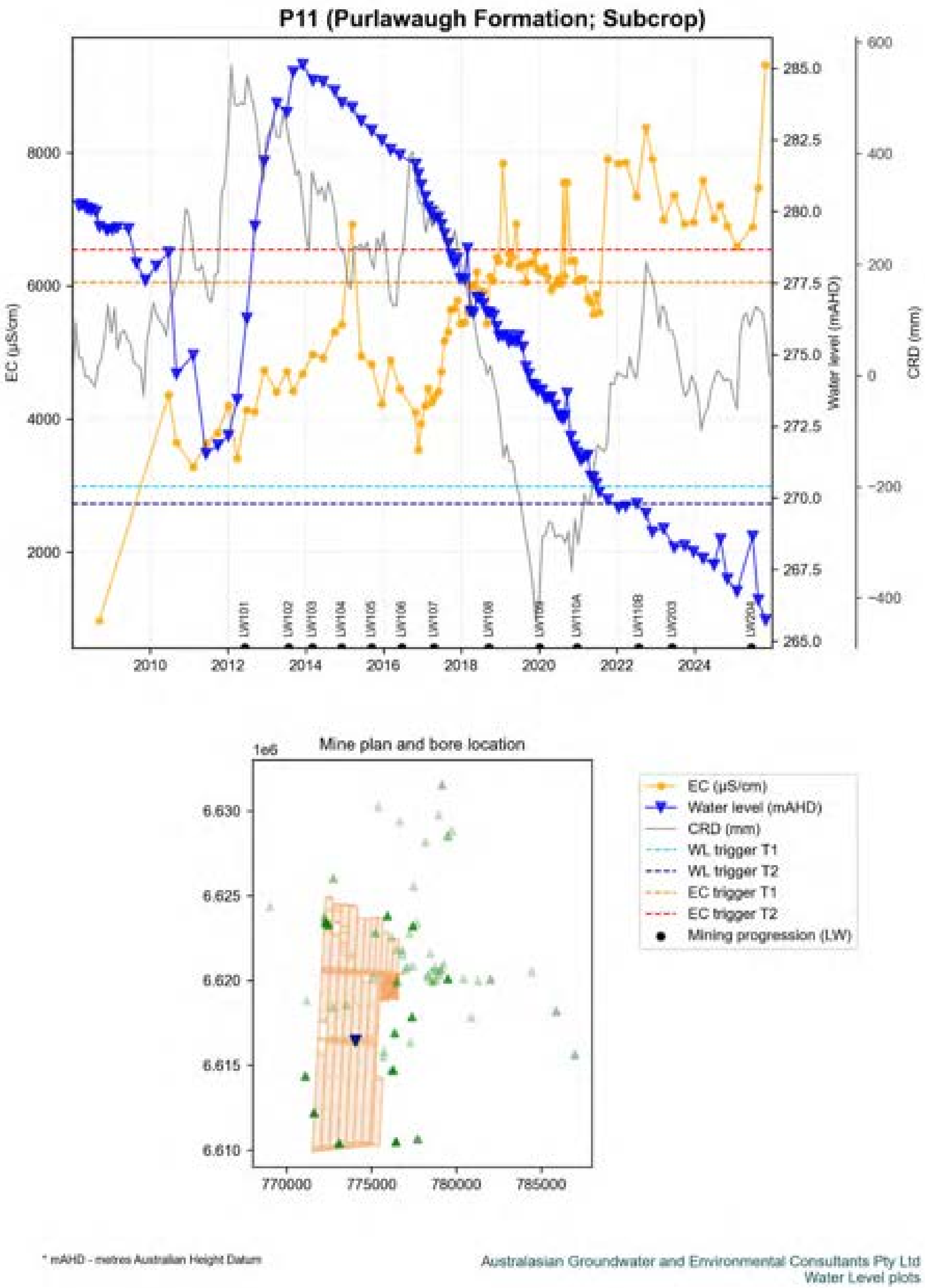

Figure 7.7 P11 EC field measurements plotted with water levels

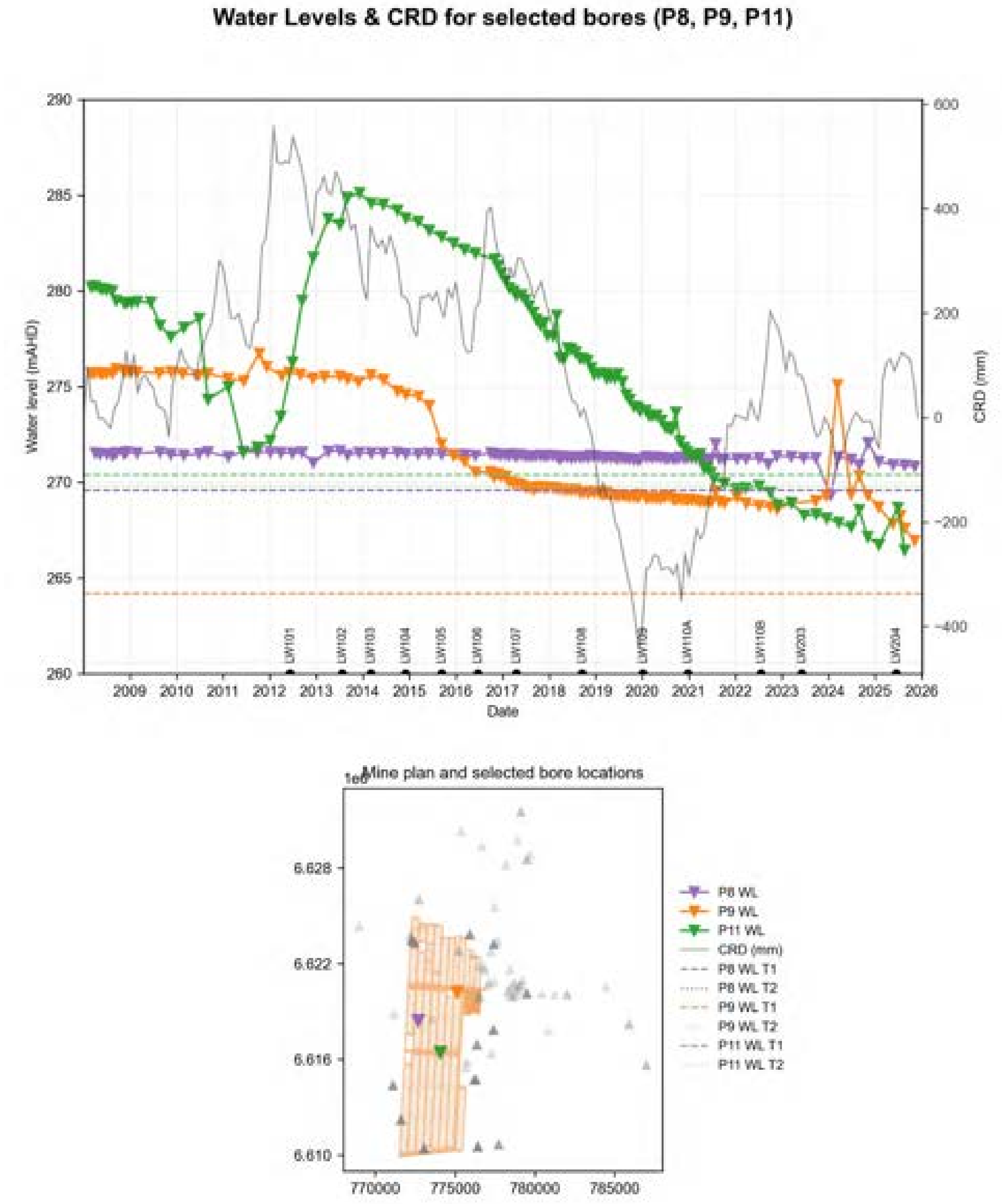

Figure 7.8 Groundwater levels for Purlawaugh Formation bores P8, P9, and P11

7.3.1.1 Natural climate factors

The gradual EC increase recorded between 2017 and 2020 is possibly associated with a reduction in recharge from precipitation and freshwater recharge from Kurrajong Creek during the Tinderbox Drought. P11 is a relatively shallow bore, and groundwater levels since 2021 indicate an ongoing decline. Ongoing depressurisation observed below previous 2011 low point has occurred since mid-2013. This is unlikely to be a result of the longwall mining as the northern 100 panels are approximately 4 to 5 km away.

7.3.1.2 Seepage from surface sources

The nearest surface water features are the Longsight dams; these dams are for stock watering and are located 2.6 km south of the bore, given the distance and purpose they are unlikely a cause of elevated EC.

7.3.1.3 Mining-induced mixing

In January 2017 the vertical hydraulic gradient between P11 (shallow) and P10 (deep) switched from downward to upward due to the decline in water level at P11 (Figure 7.8). The changes or reversals in hydraulic gradient could be causing groundwater mixing that has resulted in EC changes at P11.

Chemical composition of solutes at P11 indicates a sodium-chloride (Na-Cl) type water (Figure 7.10), which is similar to bores P9 (Purlawaugh), P2 (Napperby), and P10 (Napperby). The HCO_3/Cl mass ratio at P11 (Figure 7.9) decreases over time, indicating a change in overall chemistry and likely mixing with water more strongly dominated by chloride. Therefore, lateral migration of groundwater from adjacent areas of the Purlawaugh Formation is a possible cause of the EC change.

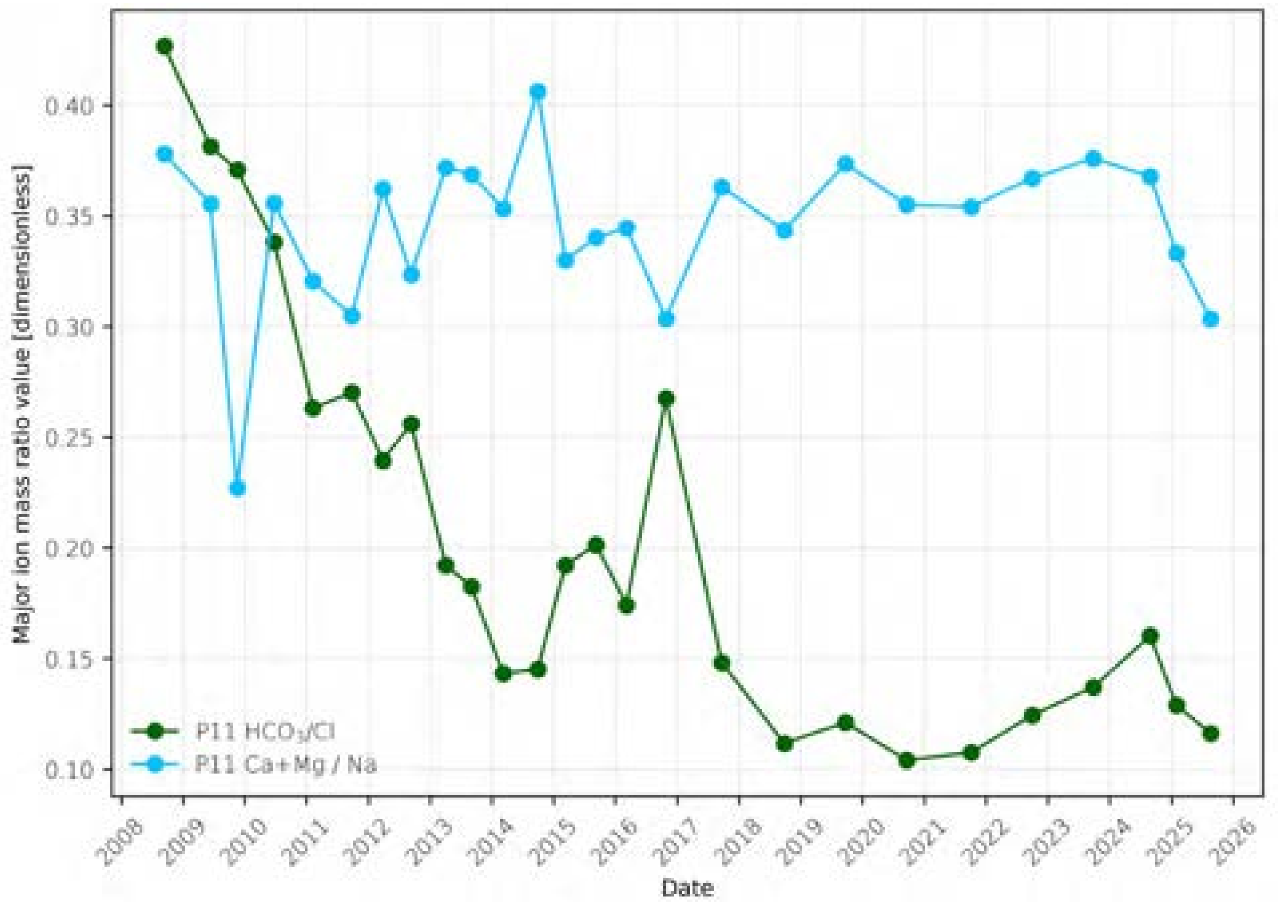

Figure 7.9 Ratios of bicarbonate to chloride and calcium + magnesium to sodium bore P11

Although the lower Napperby Formation has higher salinity and could be migrating upwards since 2017 due to the vertical hydraulic gradient, it is not likely to be the source of change at P11. This is because the calcium + magnesium to sodium (Ca+Mg/Na) mass ratio at P11 shows minimal correlation with time, and is a higher value (at about 0.35; Figure 7.9) than that at P10 (0.24; Figure 7.23).

7.3.1.4 Solute release

Nearby Purlawaugh Formation bores P9 and P8 are located immediately south of LW 105, and above the planned LW 206, respectively. Bore P8 (Purlawaugh), located further to the west of P11, has groundwater that plots between mixed type and Na-HCO_3 type (Figure 7.10). Given the proximity of P9 bore to active mining and water level decline at the onset of mining of LW 105 it is interesting to note the relatively minimal increase in salinity with levels having risen from 20,000 to 22,660 µS/cm from late 2015 until now, and minimal change in sulfate-chloride mass ratio from 0.21 in 2010 to 0.32 in 2023. By contrast, the sulfate-chloride mass ratio at P11 has not significantly changed over time and remains low. If water mixing is occurring from longwall mining in the north, a more significant change in water quality at P11 would be expected. In addition, the hydraulic gradient at P11 indicates flow toward the mining zone, indicating that there is no viable pathway for solutes to reach P11, if they were being produced.

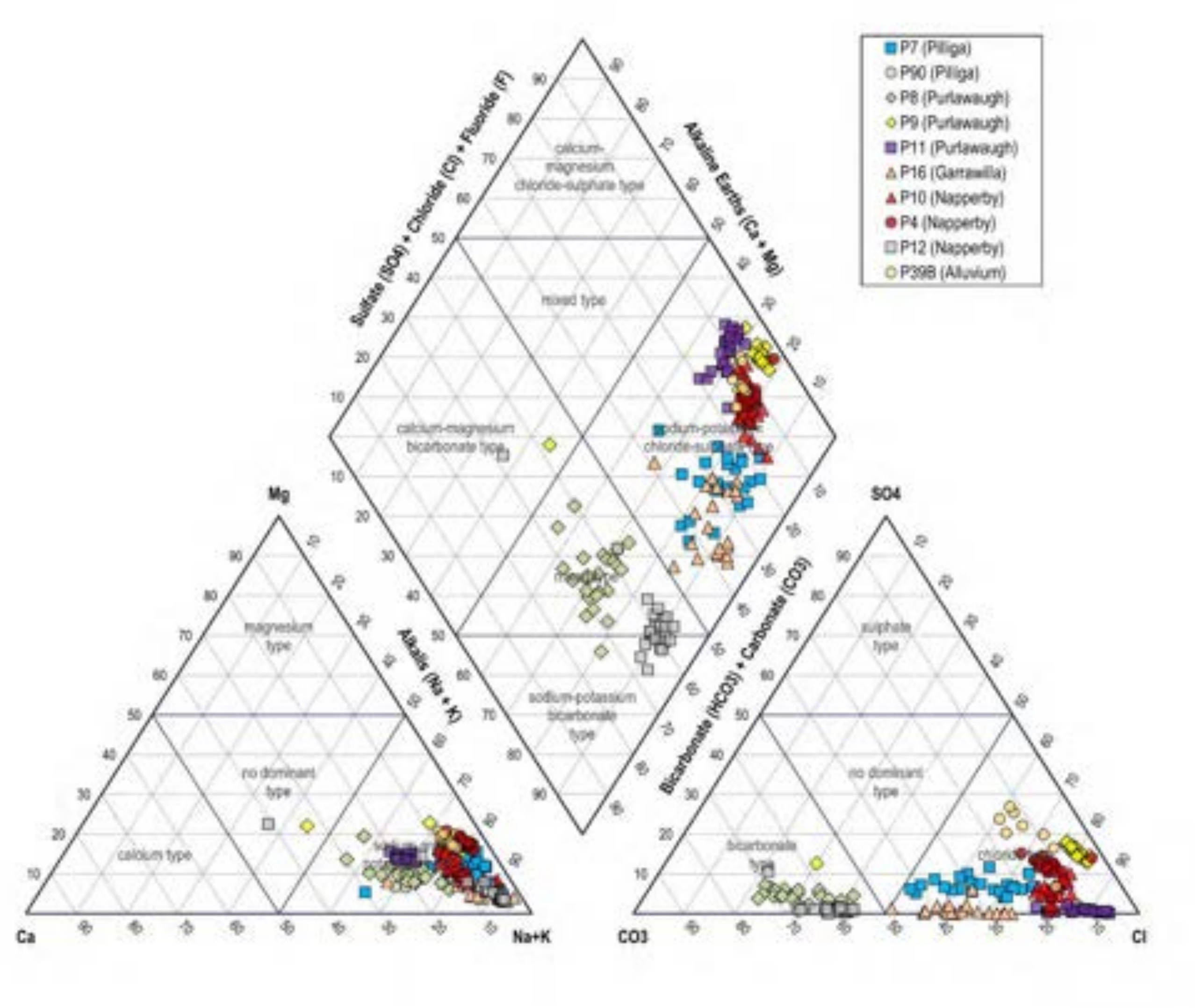

Figure 7.10 Purlawaugh bore Piper Plot with surrounding bores

7.3.2 P9 – water quality – EC exceedance

Bore P9 is located between LW203 and LW105, the bore is installed in the Purlawaugh Formation at 24 to 36 m bgl. Prior to mining commencing in 2012 groundwater EC at P11 fluctuated between 15,360 to 23,010 µS/cm (Figure 7.11). EC values have fluctuated since installation with a steep rising EC trend recorded during the tinderbox drought from 2017 to 2019. Since the end of the drought EC values have fluctuated between approximately 20,000 and 24,000 µS/cm. Depressurisation associated with mining was recorded in 2015 (Figure 7.8) no significant changes in EC were recorded at this time.

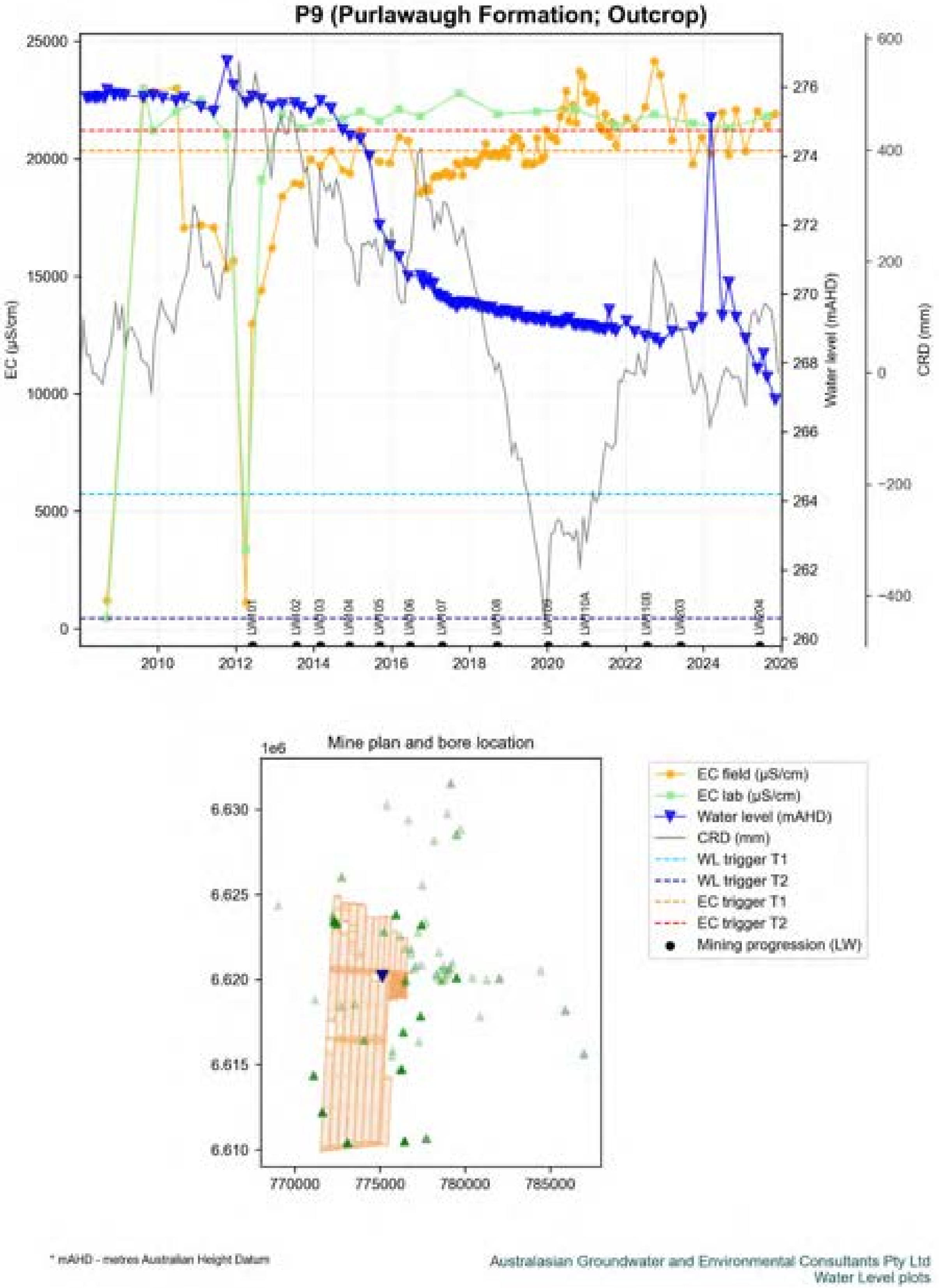

Figure 7.11 P9 EC field and laboratory measurements plotted with water levels

7.3.2.1 Natural climate factors

Significant fluctuations in EC observed at site P9 prior to the commencement of mining in 2012 suggest naturally variable salinity within the Purlawargh Formation. These variations are likely driven by environmental factors such as precipitation and temperature. In contrast, laboratory measurements consistently report EC values around 22,000 µS/cm, indicating a high baseline salinity under controlled conditions. The absence of any upward trend in lab EC over time supports the interpretation that the variability seen in field measurements reflects natural environmental fluctuations rather than anthropogenic influence.

7.3.2.2 Seepage from surface sources

Bore P9 is located 3.2 km west and hydraulically downgradient of the RLD complex as such the surface water provides a potential source for elevated EC. Bore P12 and P13 (installed in the Napperby Formation and Garrawilla Volcanics, respectively) are located between P9 and the potential source. Neither of these bores indicated elevated EC. Water from P9 plots as a Na-Cl type (Figure 7.10) with no mixing lines evident in the Piper plot. Seepage from surface storage is not a likely cause of an increase in salinity.

7.3.2.3 Mining-induced mixing

Stable laboratory EC measurements and lack of any mixing trend in the Piper plot indicates that no mixing with other water is occurring.

7.3.2.4 Solute release

In coal mine environments, acid-rock drainage is commonly linked to elevated sulfate levels resulting from the oxidation of reduced sulfides during dewatering. However, sulfate concentrations may also rise due to natural processes such as evaporation. To differentiate between these mechanisms, the sulfate-to-chloride mass ratio serves as a useful indicator. Ratios of sulfate to chloride show a generally stable trend (Figure 7.12), in 2015 when depressurisation was recorded a small increase in the ratio of SO_4 to Cl; however, remains stable over time.

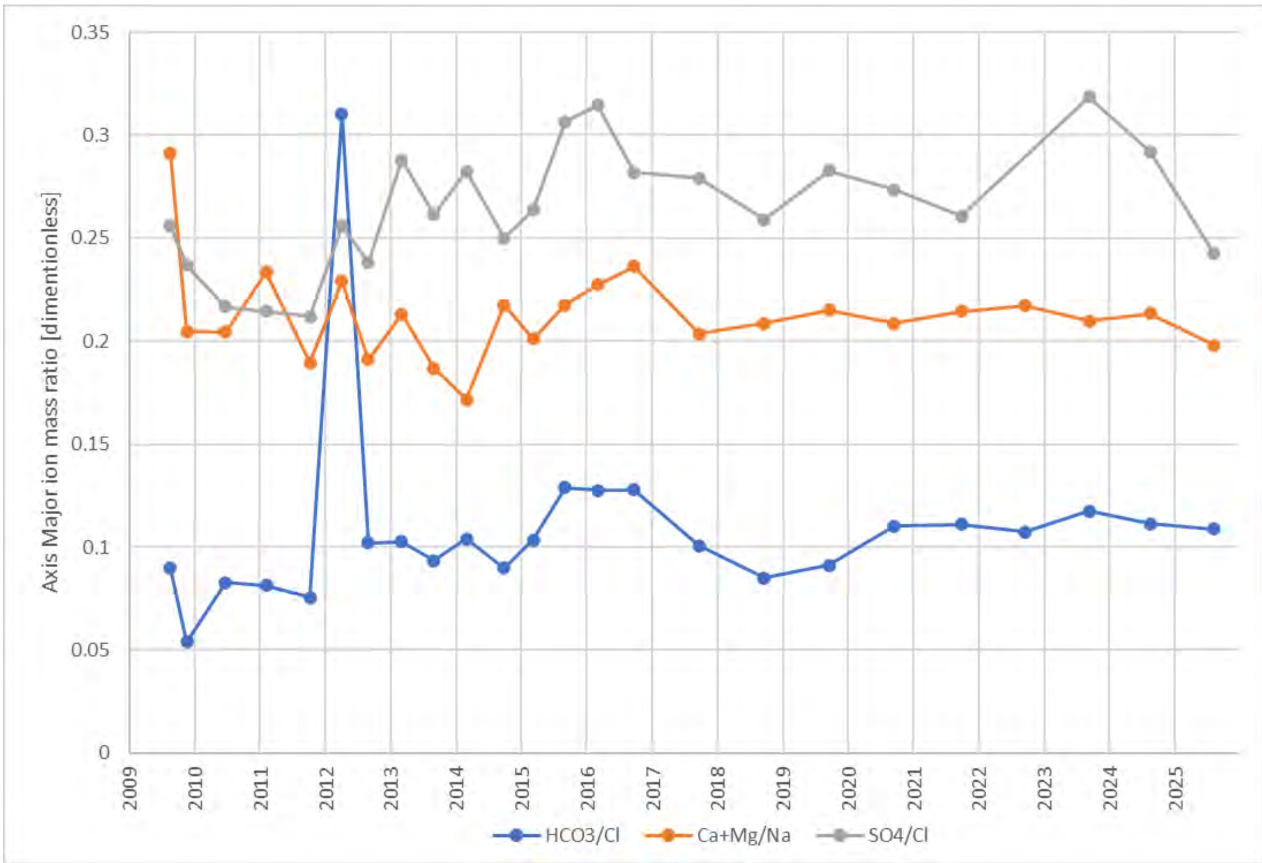

Figure 7.12 Ratios of bicarbonate to chloride, calcium + magnesium to sodium and Sulfate to Chloride bore P9

7.3.3 Conclusion and recommendations

Given the decreasing HCO_3/Cl mass ratio over time and overall changing chemistry (increasing relative concentration of Cl), the most likely cause of groundwater quality changes at P11 is due to lateral migration within the Purlawaugh Formation. Depressurisation observed from 2013 to 2022 are likely due to an overall decreasing rainfall and subsequently recharge. This observed decline is unlikely related to mining due to the timing of the decline and proximity of the bore to active mining at the time of the observed decline. Other bores in the same formation (P9) located near to LW105 shows a distinctive decline that is associated with mining.

A bore census was conducted in early 2025 to determine if any pumping was occurring in the area surrounding P11, no significant groundwater pumping was observed. During the bore census a down hole camera survey was conducted of the bore to determine if the bore was compromised. The survey indicated that that bore is intact and not damaged.

The EC measured in the lab for P9 indicates a stable baseline EC at approximately 22,000 µS/cm, given the natural fluctuations a review of the trigger value is recommended.

7.3.4 Potential impacts

The decreasing water levels recorded at P11 are not consistent with other bores installed in the Purlawaugh formation indicating that drawdown is localised around P11 and not associated with mining.

The naturally elevated EC observed at site P9, combined with the absence of nearby sensitive environmental receptors, suggests that the elevated field EC levels are unlikely to result in significant environmental impacts.

7.4 Garrawilla Volcanics Bores

7.4.1 P47 - water quality - EC exceedance

Bore P47 has exceeded its ANZG (stock) trigger level of 5,790 µS/cm (Figure 7.13), this bore has also seen a correlating increase in water levels. EC values recorded since 2021 have fluctuated with up to 2,000 µS/cm differences recorded between consecutive measurements. The reasons for the water level increase and fluctuating EC measurements are not yet well understood, historically the bore has a subdued response to variations in climate.

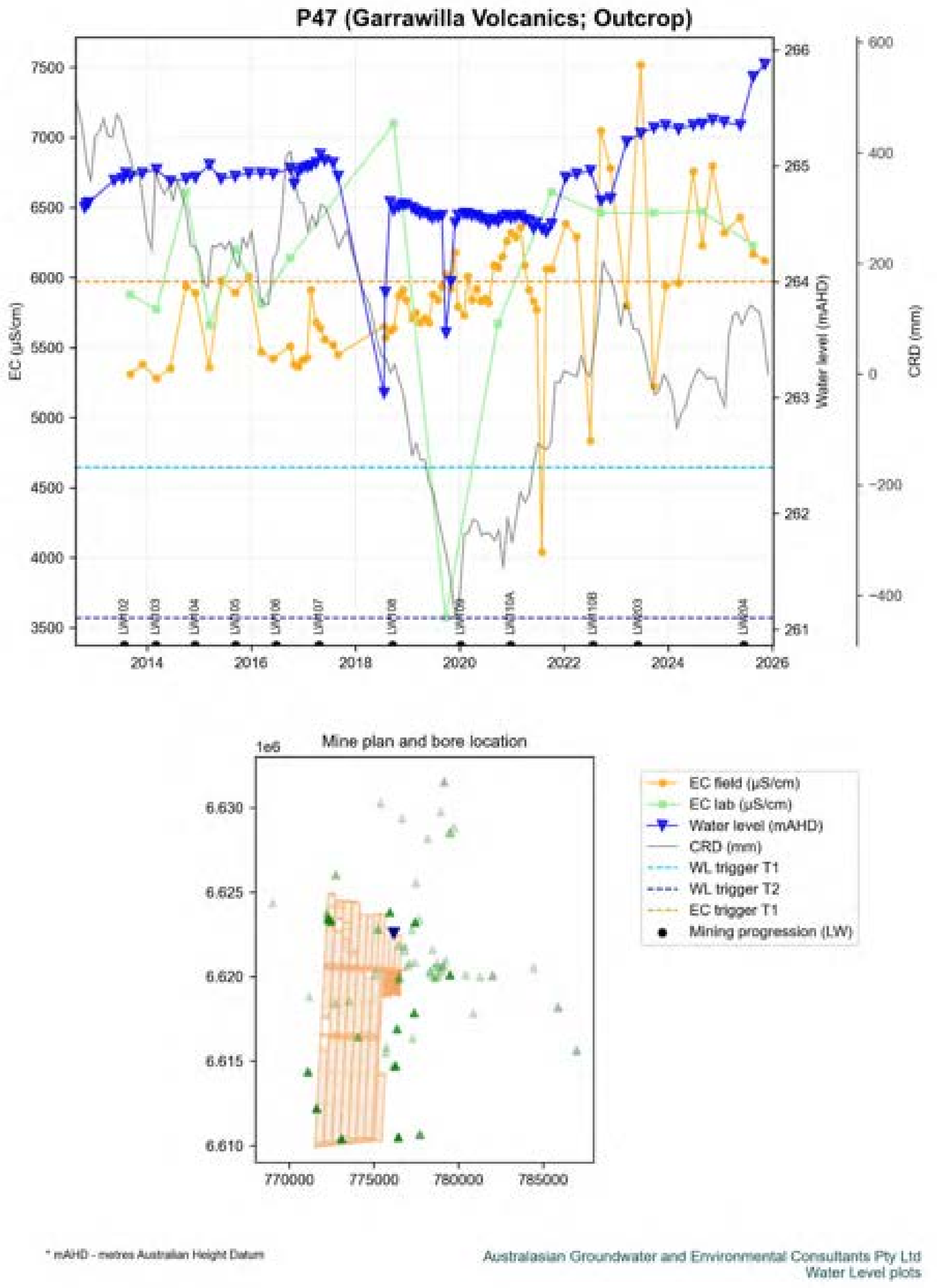

Figure 7.13 P47 EC field and laboratory measurements plotted with water levels

7.4.1.1 Natural climate factors

EC measurements have increased since records began in 2013; however, the first significant increase in EC occurred from 2018 to 2022 when water levels declined. The declining water level trend is likely due to the Tinderbox Drought with a delayed recharge response. From 2022 water levels commenced recovering, during this time EC lab measurements stabilised; however, field measurements, along with temperature fluctuated from 4,000 to 7,500 µS/cm. The fluctuating EC and temperature measurements observed from 2022 (Figure 7.14) indicate natural fluctuations are causing the EC variability.

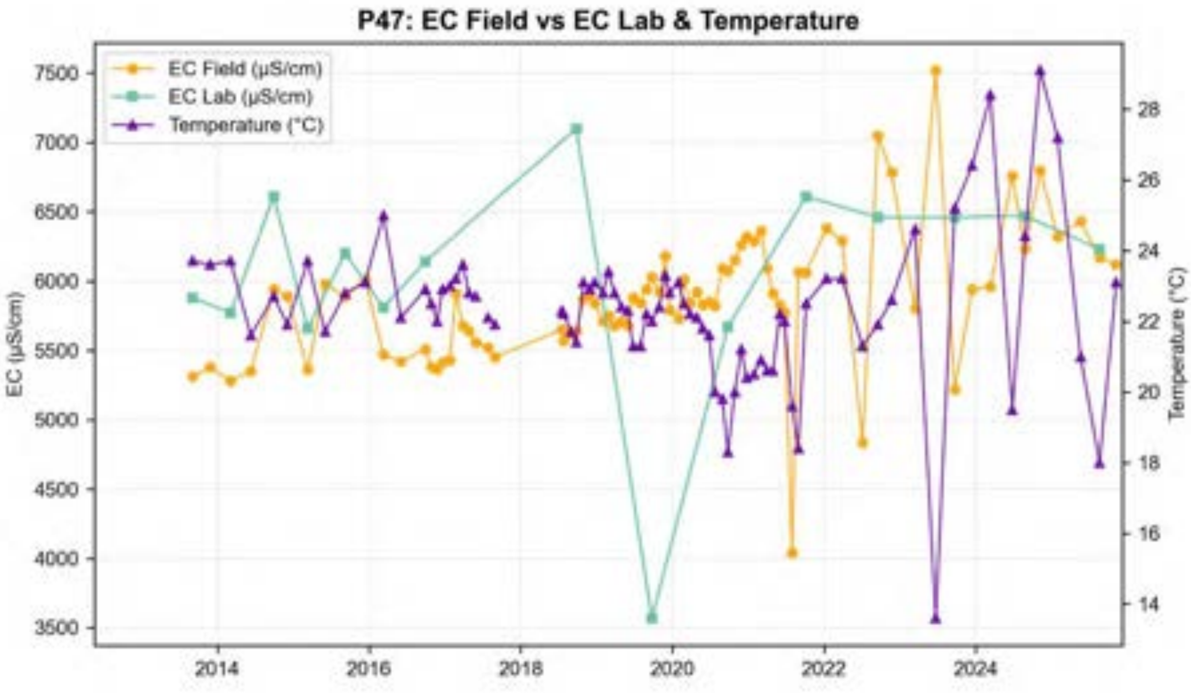

Figure 7.14 P47 EC and temperature measurements

7.4.1.2 Seepage from surface sources

Bore P47 is located 1 km south of Pine Creek and 2.1 km north of surface water storage, seepage from surface water is unlikely to cause the increasing EC recorded.

7.4.1.3 Mining-induced mixing

Groundwater chemistry indicates water sampled at P47 is a Na-Cl type, no mixing trends are identified in the data therefore mixing with other groundwater sources nearby is unlikely.

7.4.1.4 Solute release

Bore P47 is located immediately north of LW102 which was mined from July 2013 to January 2014, monitoring commenced around the same time therefore no pre-mining data is available for this bore.

7.4.2 Conclusion and recommendations

P47 shows no signs of mining-related depressurisation while some response to changing rainfall is observed with an approximate one-year lag in response to increasing recharge. During the Tinderbox Drought EC measurements increased steadily, when groundwater levels commenced recovering larger increases with greater fluctuations in EC and temperature were recorded. The larger increases in EC are likely due to the mobilisation of salts in the subsurface that accumulated during the drought and mobilised during periods of increased recharge. As such, the observed EC is considered due to natural climate variations.

Continued monitoring is recommended with a review of baseline groundwater quality parameters once EC and pH measurements stabilise.

7.4.3 Potential impacts

Increases in salinity are not considered significant and field measured EC fluctuates around the trigger level for this bore.

7.5 Watermark Formation Bores

7.5.1 P39A - water quality - EC exceedance

Bore P39A is installed approximately 6 km east of mining between Tulla Mullen and Kurrajong Creeks from 72 to 78 m bgl. The bore was installed just prior to the Tinderbox Drought and as with bore P39B demonstrates a lag from the end of the Tinderbox Drought to groundwater level recovery, as groundwater levels commenced recovering the EC values show a sharp increase with large (~3,000 µS/cm) fluctuations (Figure 7.15).

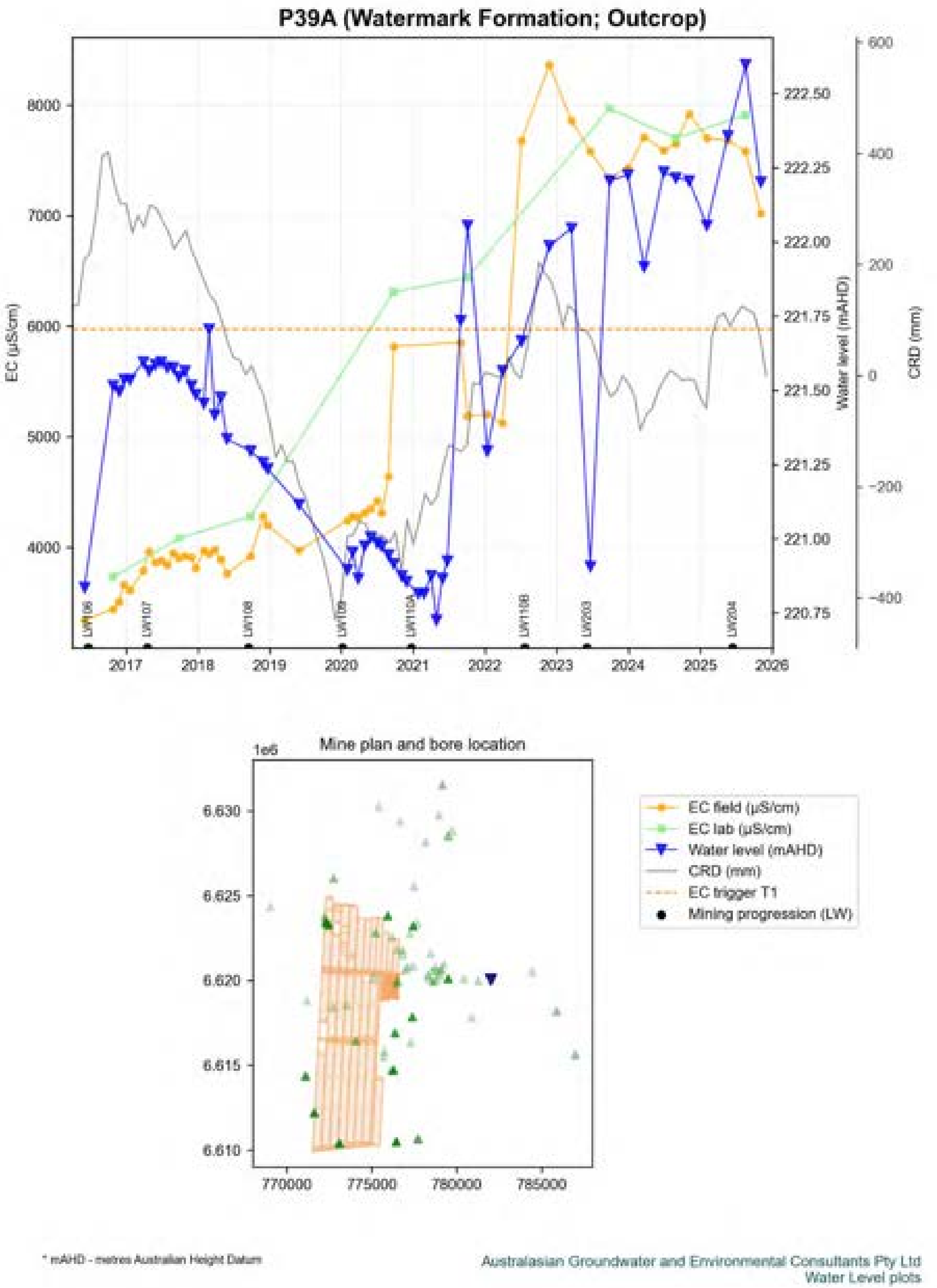

Figure 7.15 P39A EC field and laboratory measurements plotted with water levels

7.5.1.1 Natural climate factors

The steady increase in EC observed during the Tinderbox Drought is likely due to reduced recharge from rainfall and diminished contributions from the Kurrajong and Tulla Mullen Creeks. As with P39B, following the drought, as groundwater levels began to recover, EC values rise more sharply and exhibited greater fluctuations. This post-drought increase is attributed to the mobilisation of salts that had accumulated in the unsaturated zone during the dry period.

Water levels recorded at P39B (alluvium) and P39A (Watermark Formation) are similar, have similar fluctuations to changes in climate and EC trends, the natural climate factors influencing P39B appears to be also influencing water recorded at P39A.

7.5.1.2 Seepage from surface sources

Nearby surface water storage located northeast and southeast of the bore may contribute to elevated salinity; however, no surface water quality is available to cross reference.

7.5.1.3 Mining-induced mixing

No mixing trends are identified with other nearby formations, water type plots as Na-Cl type (Figure 7.3).

7.5.1.4 Solute release

The bore is located approximately 7 km east of active mining and 3 km east of rail loop dams, as such, solute release from these sources are unlikely without observable trends in bores located nearby.

7.5.2 Conclusion and recommendations

Mechanisms for change with the Watermark bores appear to be the same as with other formations experiencing EC exceedances. Groundwater EC trends are similar to those recorded in the Napperby formation, as such, recommendations are the same as for Napperby which include continued monitoring followed by a review of EC baseline once bores have reached a new equilibrium.

7.5.3 Potential impacts

EC measurements at bores P43 and P39A indicate the presence of naturally saline groundwater. As such, further increases in salinity are unlikely to result in significant impacts to the system.

7.6 Napperby Formation Bores

Three Napperby Formation bores have exceeded water quality (EC) triggers, these are shown together in Figure 7.16 and are further discussed in sections below.

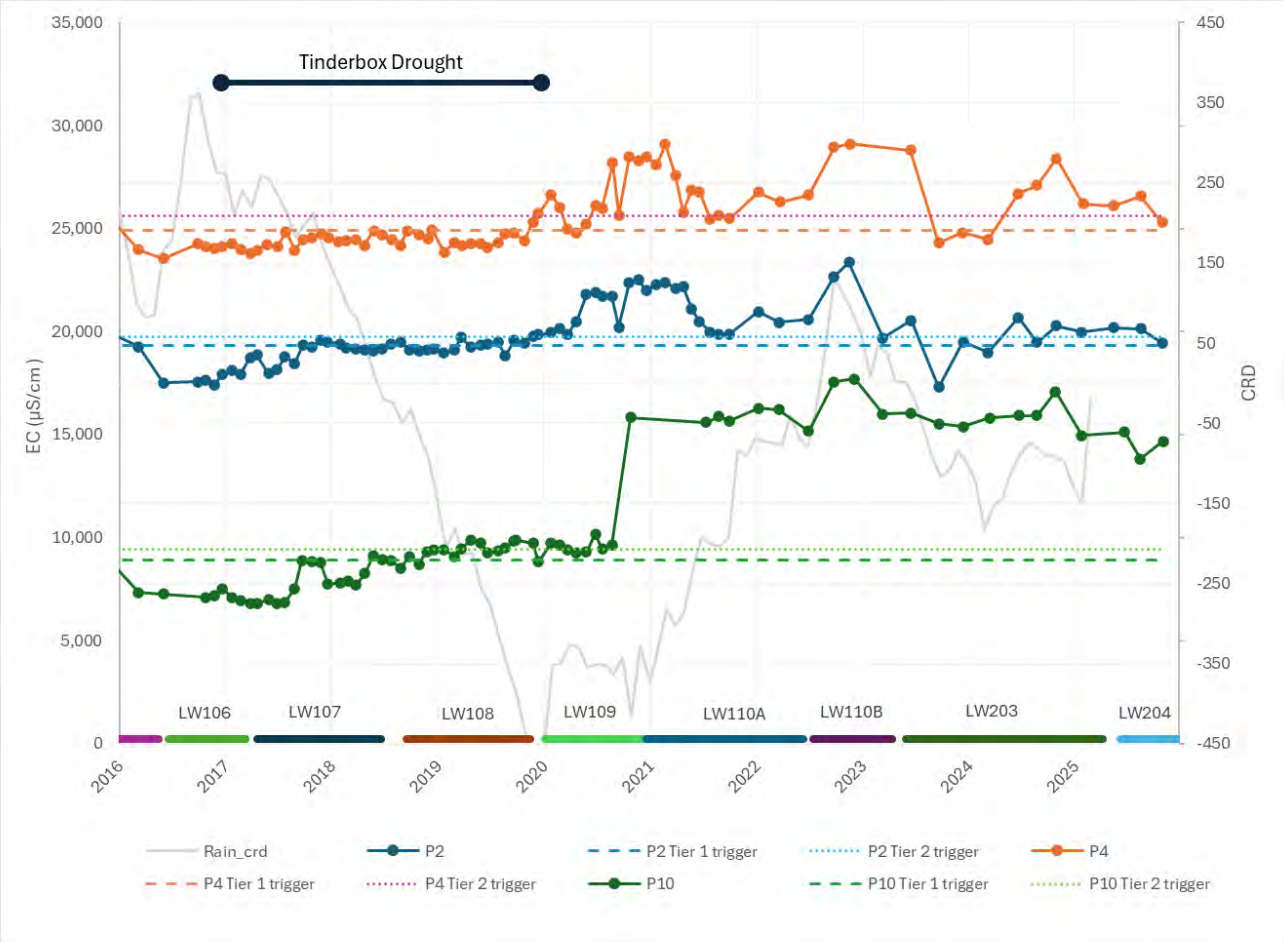

Figure 7.16 Napperby Formation bores EC comparison

7.6.1 P2 - water quality - EC exceedance

Bore P2, installed from 44 to 50 m bgl in the Napperby Formation and located southeast of the mine. The bore has historically high recorded EC values which is typical of this formation. Since recording commenced in 2010 (pre-mining) to the commencement of the Tinderbox drought in 2017 the EC measurements have fluctuated between 15,000 µS/cm and 20,000 µS/cm (Figure 7.17). In Q4 2025 EC values were below the Tier 2 trigger; however, the rolling median remains above the Tier 1 trigger.

In 2017, EC values at P2 began to steadily increase, rising from 17,000 µS/cm to 22,000 µS/cm. In late 2021, EC values saw a rapid increase, reaching 23,370 µS/cm by November 2022. After this peak, most of the Napperby Formation monitoring bores experienced a decrease in EC during 2023. This decreasing coincided with lower-than-average rainfall during that period. At P2, the decline in EC was followed by a slight increase in 2024 with values now appearing to stabilise.

Groundwater levels have increased by approximately 1 m since late 2019 and appeared to stabilise at approximately 27.9 m bgl with minimal fluctuations after 2023, indicating no depressurisation. Water level increases show moderate correlation but are generally stable prior to the drought.

The nearby bore P69 has recorded similar trends since it was constructed in 2023, the water level has increased by 0.30 m, while the EC fluctuates between 16,880 µS/cm and 20,560 µS/cm, the latest result being 17,290 µS/cm recorded in November 2025. In contrast, the bore P10 has had erratic groundwater levels since 2020 and significant variations in EC which have been attributed to a mixing process within the Napperby Formation.

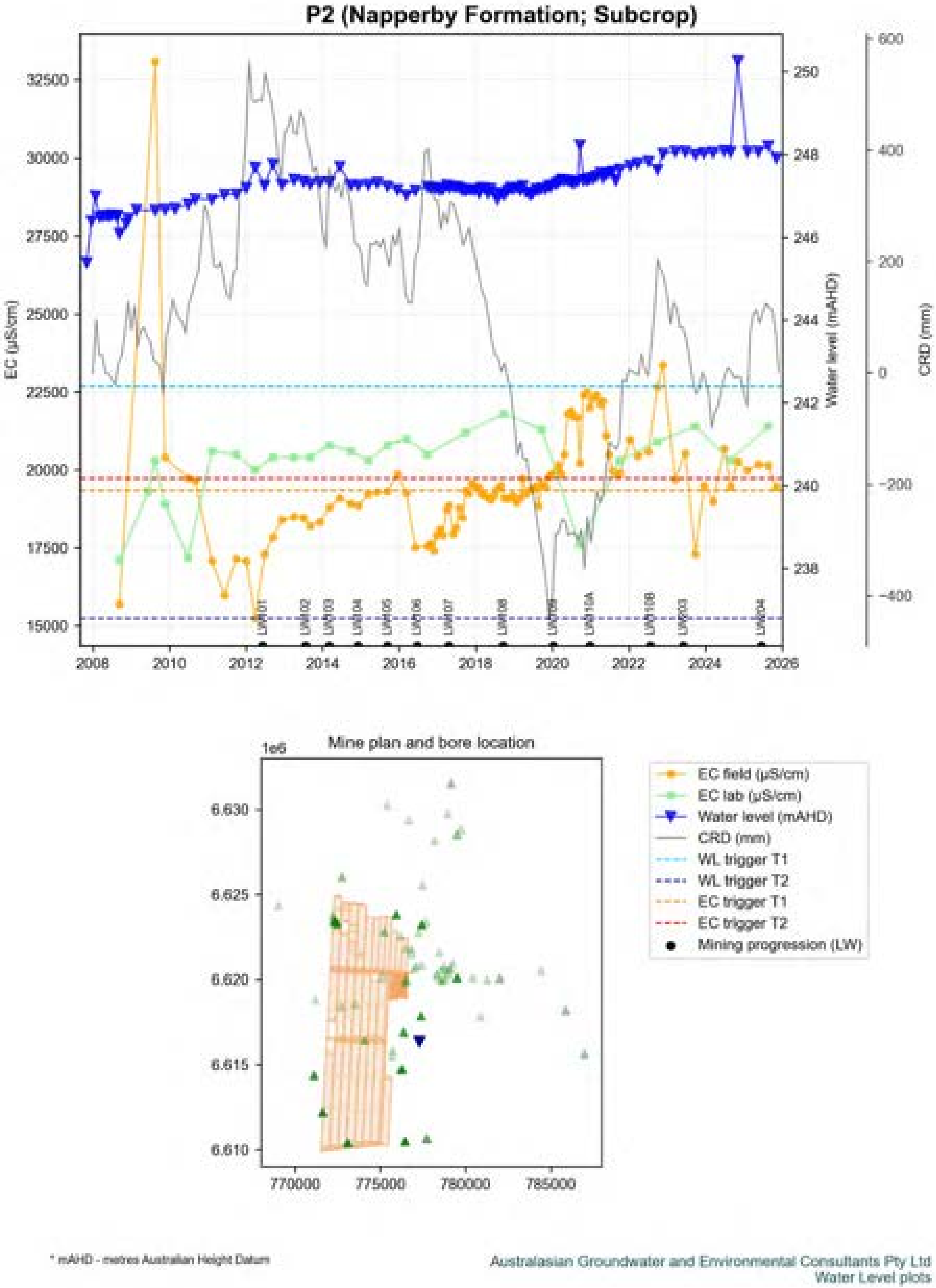

Figure 7.17 P2 EC field and laboratory measurements plotted with water levels

7.6.1.1 Natural climate factors

Groundwater levels recorded at P2 show a subdued response to changes in rainfall indicating a reduced effect of recharge on the system. Chloride mass balance (CMB) methods for calculating recharge support this with an average recharge for the Napperby Formation of 2.0 mm/year[10], the Bioregional Assessment estimated 0.1 to 4.3 mm/year[11].

During periods of relatively stable groundwater levels and rainfall (2008 to 2017) EC shows minimal short term fluctuations; however, from 2020, when rainfall increases post drought and groundwater levels commence recovery there is a shift in temperature and EC (Figure 7.18). Initially temperature decreases and a spike in field EC is observed, the temperature adjust lab measurement shows a decrease in EC, this could be due to sample storage and transport; however, a similar trend is also recorded at bore P4 (Figure 7.21).

From 2020 until the latest sampling in November 2025 field temperature and EC show erratic fluctuations. The fluctuations in EC are attributed to the variable temperatures; lab measurements show stable EC around 21,000 µS/cm.

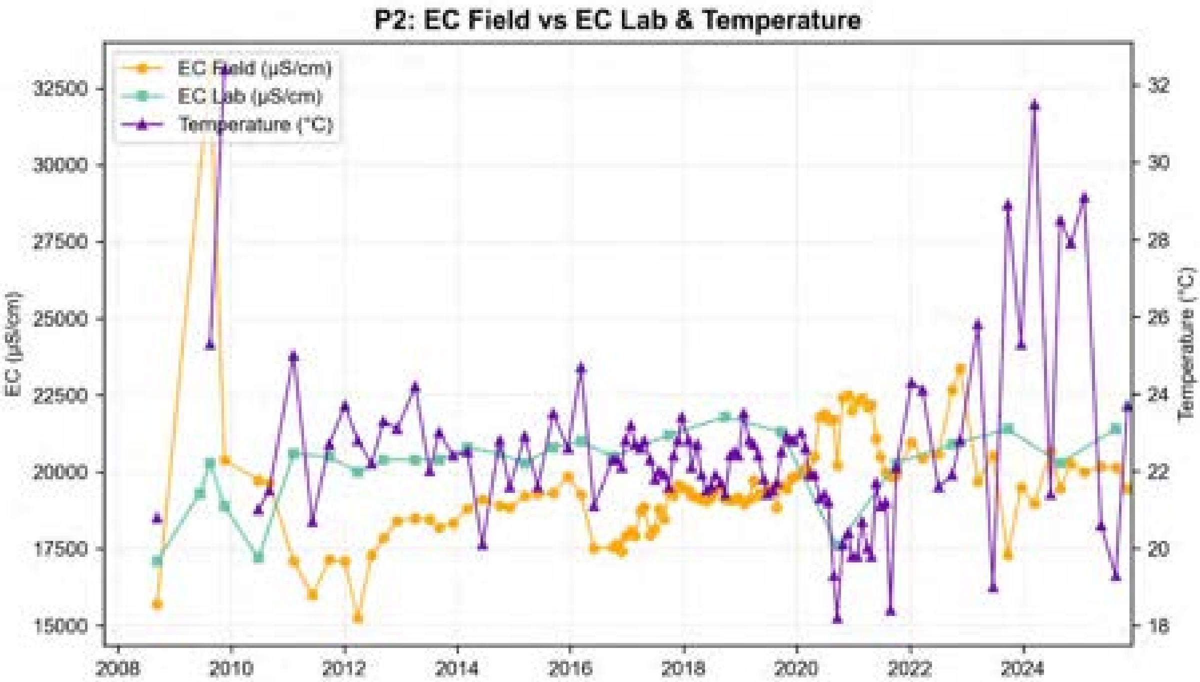

Figure 7.18 P2 EC and temperature measurements

7.6.1.2 Seepage from surface sources

Bore P2 is located between two dams, no hydrochemistry data is available for these dams; however, as the purpose is for stock and irrigation the salinity is expected to be low. As can be seen in Figure 7.19 no water was present in the southern dam during the Tinderbox drought, whereas water is present post drought. Seepage from the dams is unlikely given that P2 is installed at 44 m bgl within the very tight Napperby Formation.

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[10] AGE (2020) Groundwater Assessment - Narrabri Underground Mine Stage 3 Extension Project – v06.02.

[11] Bioregional Assessment Programme, 2016a. Namoi hydraulic conductivity measurements. Bioregional Assessment Source Dataset in AGE (2020).

Figure 7.19 Comparison of the area surrounding P2 between 2018 and 2023

7.6.1.3 Mining-induced mixing

Numerical modelling[12] indicates maximum drawdown in the Napperby to be above longwall panels thereby creating a groundwater gradient towards mining. EC exceedances are therefore not directly related to mining progression.

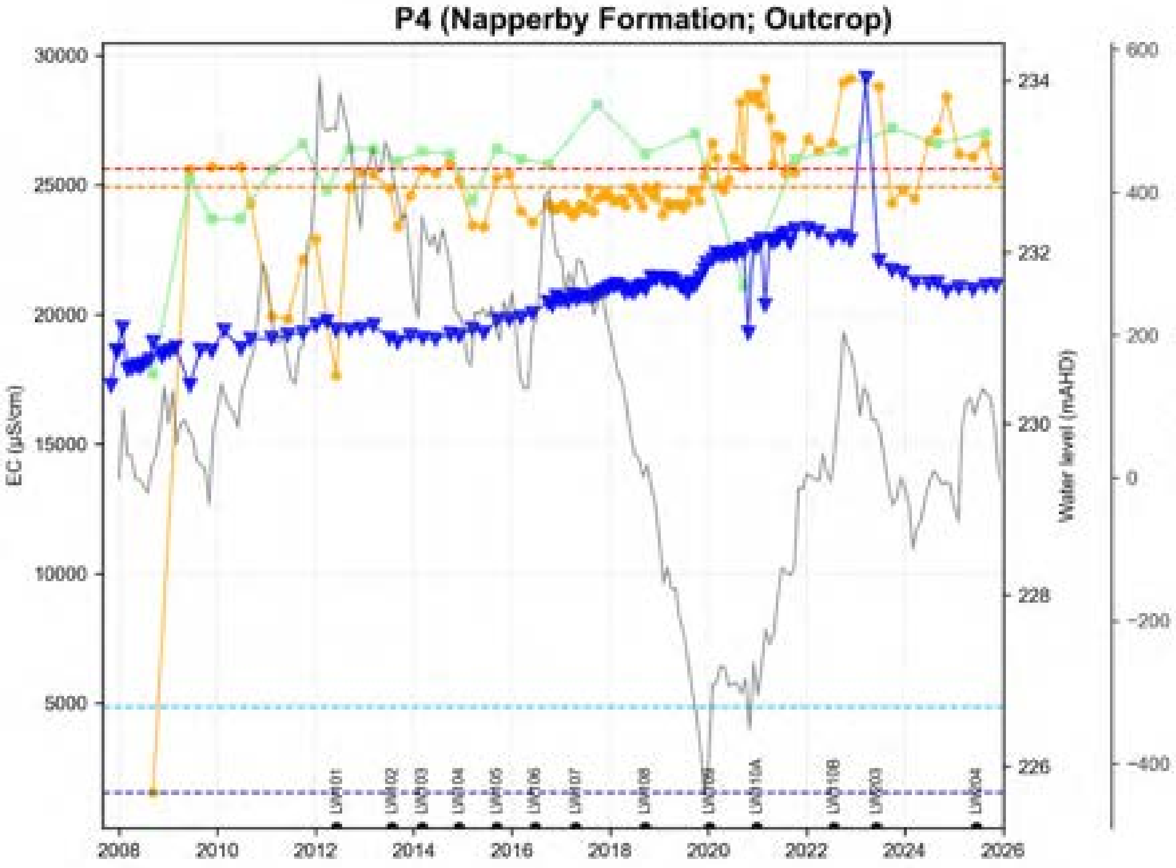
7.6.1.4 Solute release

Bore P2 is located west and hydraulically upgradient of mining, solute release from mining is considered unlikely.

7.6.2 P4 - water quality - EC exceedance

Bore P4 is installed from 24 to 30 m bgl in the Napperby Formation and is located approximately 3 km north of the mine near Pine Creek. EC measurements show a gradual increase during the Tinderbox Drought from 2017 to 2020 after which EC measurements fluctuated up to ~3,000 µS/cm with an overall increasing trend (Figure 7.20). Trends observed in bores P2, P4 and P10 have similar behaviour with the timing of changes, different depending on the depth at which bores are installed (Figure 7.16).

[12] AGE (2020) Groundwater Assessment - Narrabri Underground Mine Stage 3 Extension Project – v06.02.



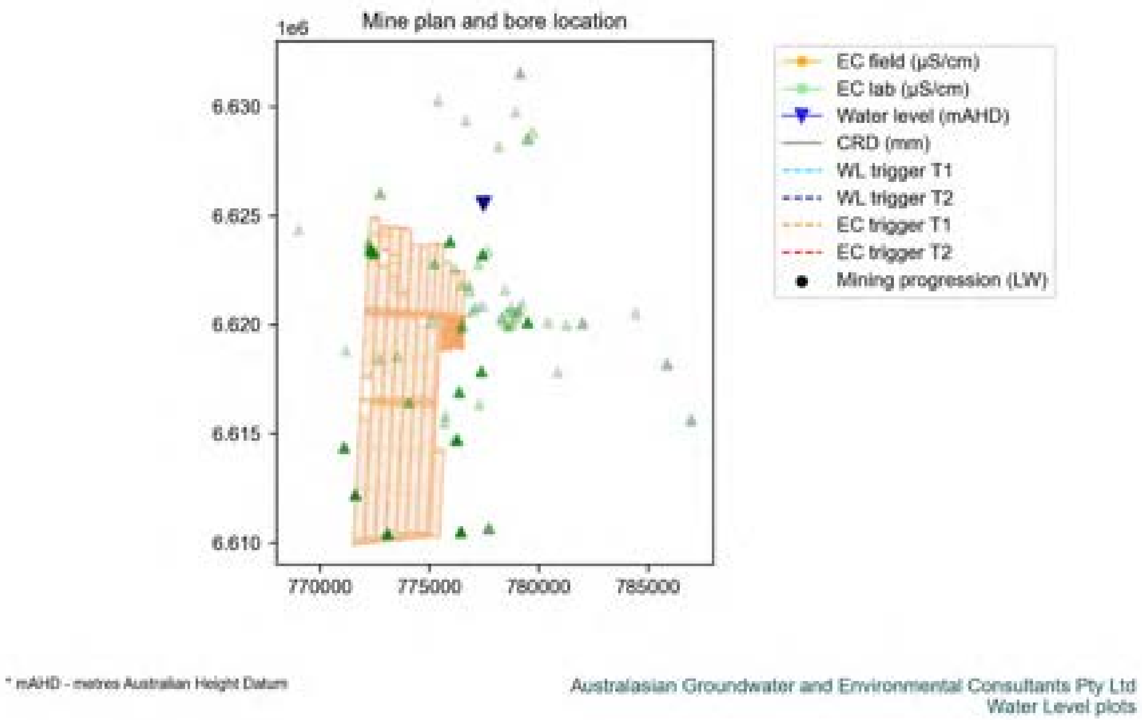


Figure 7.20 P4 EC field and laboratory measurements plotted with water levels

7.6.2.1 Natural climate factors

As with bores P2 (Section 7.6.1) and P10 (Section 7.6.3), changes in trends coincide with the Tinderbox Drought and subsequent period of above average rainfall. A similar EC trend to P2 is observed whereby a drop in temperature coincides with a decrease in lab EC and an increase in field EC. Following this initial trend EC fluctuates consistent with fluctuations in temperature, while lab EC remains consistent at approximately 21,000 µS/cm.

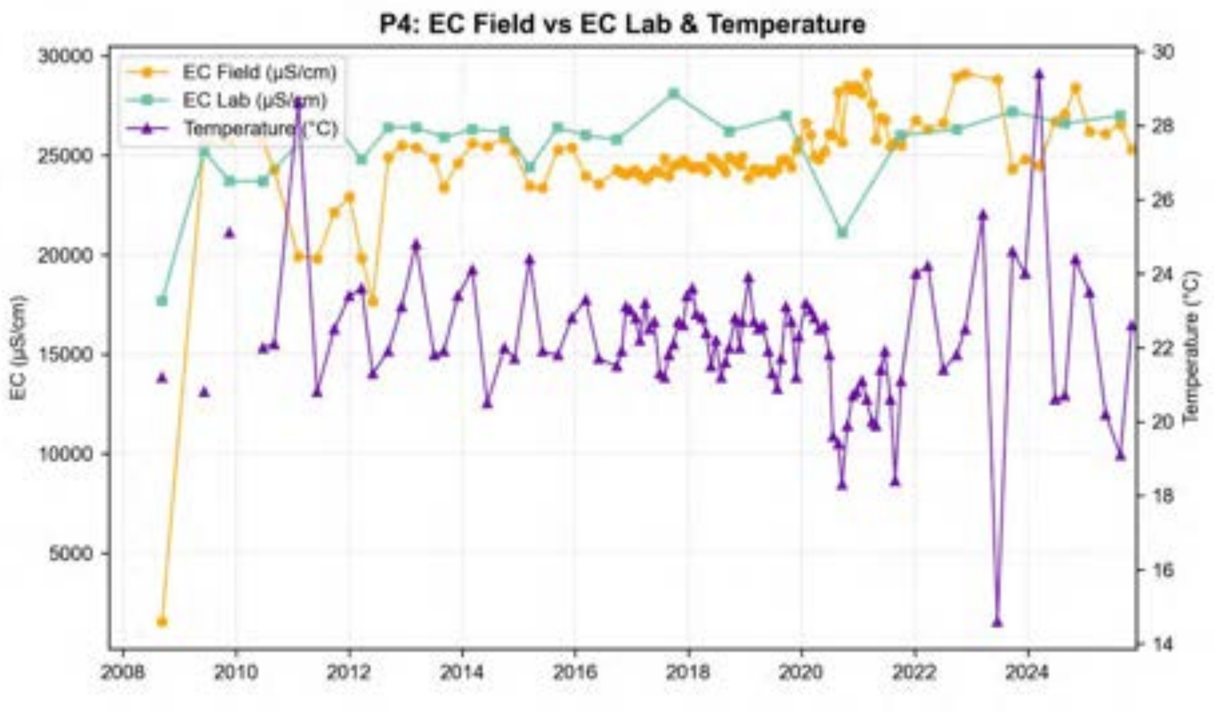


Figure 7.21 P4 EC and temperature measurements

7.6.2.2 Seepage from surface sources

Bore P4 is located approximately 300 m west of Pine Creek, the creek is an unlikely source of elevated salinity given the elevated natural salinity of water within the Napperby Formation.

7.6.2.3 Mining-induced mixing

Numerical modelling[13] indicates maximum drawdown in the Napperby to be above longwall panels thereby creating a groundwater gradient towards mining. No depressurisation is currently at P4 evident rather an overall increasing trend is observed from 2008 to 2022 despite drought conditions. EC exceedances are therefore not directly related to mining progression.

7.6.2.4 Solute release

As with P2, no regional or localised seepage from creek flow is expected.

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[13] AGE (2020) Groundwater Assessment - Narrabri Underground Mine Stage 3 Extension Project – v06.02.

7.6.3 P10 - water quality - EC exceedance

Bore P10 is located south of planned LW 205 and north of Kurrajong Creek; the bore is installed in the Napperby Formation from 118 to 130 m bgl and is immediately adjacent to bore P11, which is installed in the shallower Purlawaugh Formation at 44 to 50 m bgl. Groundwater EC values are naturally high in the Napperby Formation at P10 (Figure 7.22), having fluctuated between 4,000 and 8,000 µS/cm from 2010 (installation pre-mining) to 2017. In 2017, P10 groundwater EC values began to steadily increase from 7,000 to 10,000 µS/cm, and in late 2021 values increased rapidly and have remained at elevated levels since.

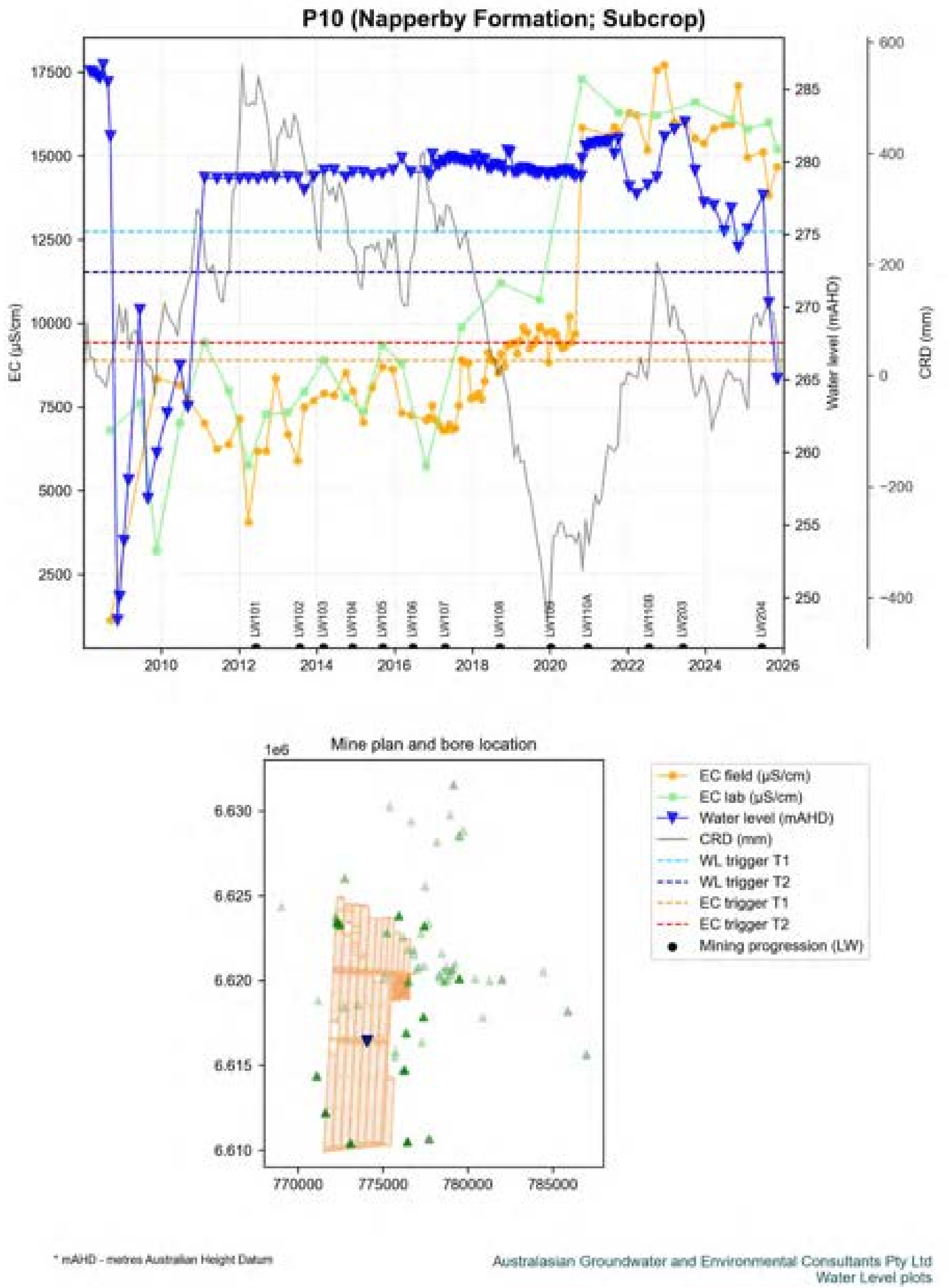

Figure 7.22 P10 EC field and laboratory measurements plotted with water levels

7.6.3.1 Natural climate factors

The gradual EC increase recorded between 2017 and 2020 is possibly associated with a reduction in recharge from precipitation and freshwater recharge from Kurrajong Creek during the Tinderbox Drought. However, with P10 being a deep bore, and the groundwater being naturally saline, immediate responses to a reduction in current recharge are only one possibility for the change in EC. In October 2020, just prior to the commencement of mining LW110A (December 2020) the groundwater levels recorded at P10 increased by 1.2 m from 279.0 to 280.2 m AHD at the same time EC increased from 9,670 to 15,841 µS/cm.

7.6.3.2 Seepage from surface sources

Nearby surface water testing at Kurrajong Creek shows no increases in groundwater salinity or possible contribution to changes in the underlying groundwater. In addition, there are no other surface sources adjacent to P10; therefore, this potential cause is dismissed.

7.6.3.3 Mining-induced mixing

Groundwater levels have been erratic at P10 since 2020, when EC changed significantly (Figure 7.22). In addition, in January 2017 the vertical hydraulic gradient between P10 (deep) and P11 (shallow) switched from downward to upward. Therefore, changes or reversals in hydraulic gradient could be causing groundwater mixing that has resulted in EC changes.

Chemical analysis of water from P10 indicates a Na-Cl type water chemistry throughout its record. Changes in chemistry over time could provide insight to the source of the higher EC water at P10. Ion-ion ratio plots indicate a decrease in the bicarbonate to chloride mass ratio, with a concurrent increase in the calcium + magnesium to sodium mass ratio (Figure 7.10). This indicates that the water at P10 is becoming more sodium-chloride dominated with time (Figure 7.23).

Bore P2, located 3.2 km to the east of P10, also plots as a Na-Cl type, indicating that this is a typical water composition for that formation. In addition, the EC at P2 is 20,190 µS/cm, which means there is naturally saline water in the formation that is greater than the Tier 2 value at P10. Therefore, the exceedance at P10 could be the result of groundwater mixing within the Napperby Formation.

7.6.3.4 Solute release

Acid-rock drainage in coal mine settings is typically associated with an increase in sulfate concentration, as reduced sulfides become oxidised because of dewatering. However, sulfate concentration can increase due to evaporation or other natural causes. One metric of sulfate release that distinguishes oxidation from evaporative concentration is the sulfate-chloride mass ratio. If this ratio does not increase above background concentrations, it indicates that sulfide oxidation is less likely to be the cause of groundwater quality changes. This is the case at P10, where the sulfate-chloride mass ratio has increased from about 0.10 in 2010 to about 0.18 in 2023 (Figure 7.23), but has remained well below the baseline value, which is approximately 0.23 to 0.43 in bore P8, and approximately 0.21 to 0.32 in bore P9. In addition, the hydraulic gradient at P10 indicates flow toward the mining zone, indicating that there is no viable pathway for solutes to reach P10, if they were being produced.

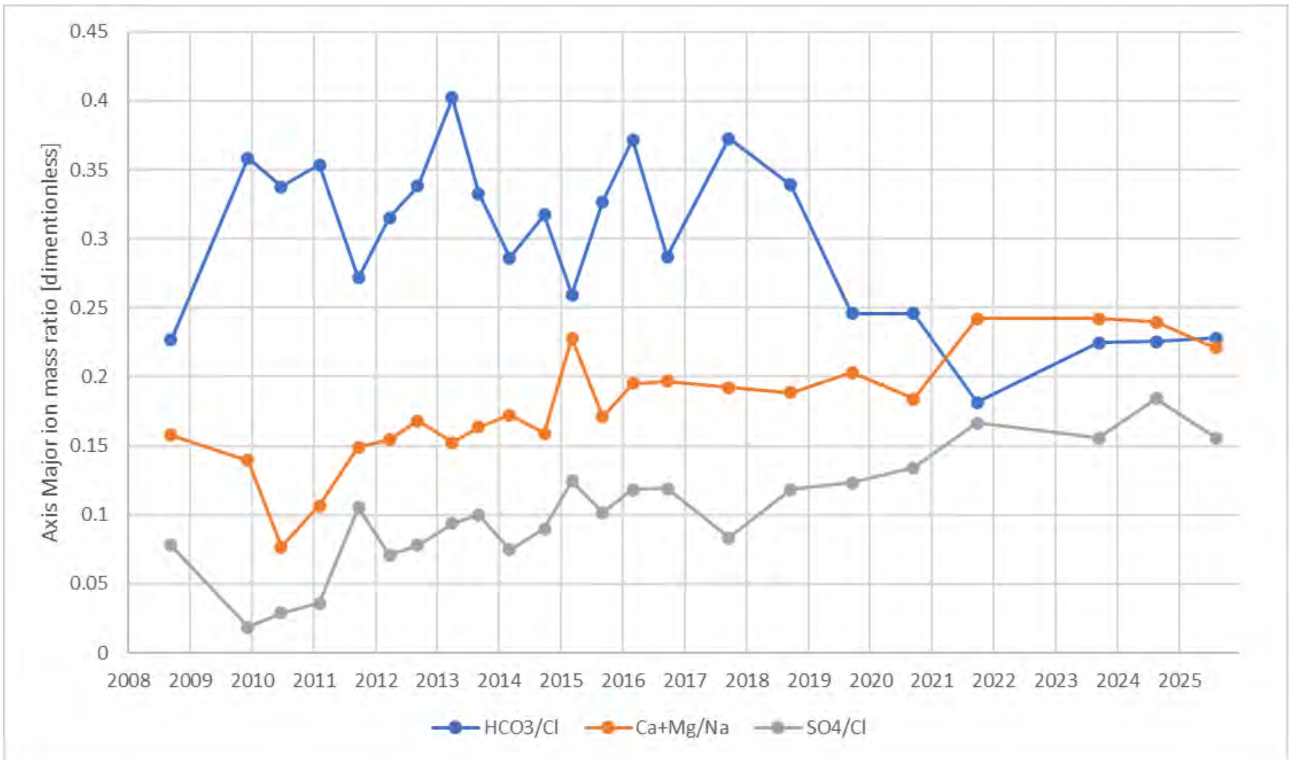

Figure 7.23 P10 HCO3/Cl, Ca+Mg/Na and SO4/Cl ratios

7.6.4 Conclusion and recommendations

Groundwater EC observed values within Napperby Formation bores P2, P4 and P10 have been historically high. EC increases appear to show a staggered response to the Tinderbox Drought with shallow bore P4 (24-30 m bgl) demonstrating changes in EC sooner after the end of the Tinderbox drought compared with the deeper bores of P2 (44-50 m bgl) and P10 (118-130 m bgl) thereby indicating that changes in salinity are a natural response to the mobilisation of salts after the end of the drought. The delayed response is associated with the tight Napperby Formation and depths for recharge to reach the bore depths. Given the distance the bores are located from active mining at the time of EC increases and the lack of depressurisation, impact from mining is an unlikely cause of EC exceedances.

It is recommended to continue monitoring and reevaluate baseline trigger levels once bores each a new equilibrium post drought.

7.6.5 Potential impacts

Salinity in groundwater within the Napperby Formation is naturally high therefore values resulting in EC elevations are unlikely to cause impacts to any sensitive environmental receptors or groundwater users.

7.7 Seepage Monitoring

7.7.1 P29 - water quality - EC exceedance

Bore P29 is a seepage monitoring bore located south of the rail loop dams (Figure 2.2), the bore is installed in Napperby Formation from 19 to 25 m bgl. The monitoring bore was installed in 2012 when the dams were installed. EC values initially declined after installation to mid-2015. Since 2015 values have fluctuated with an overall increase concurrent with an increase in water levels (Figure 7.24).

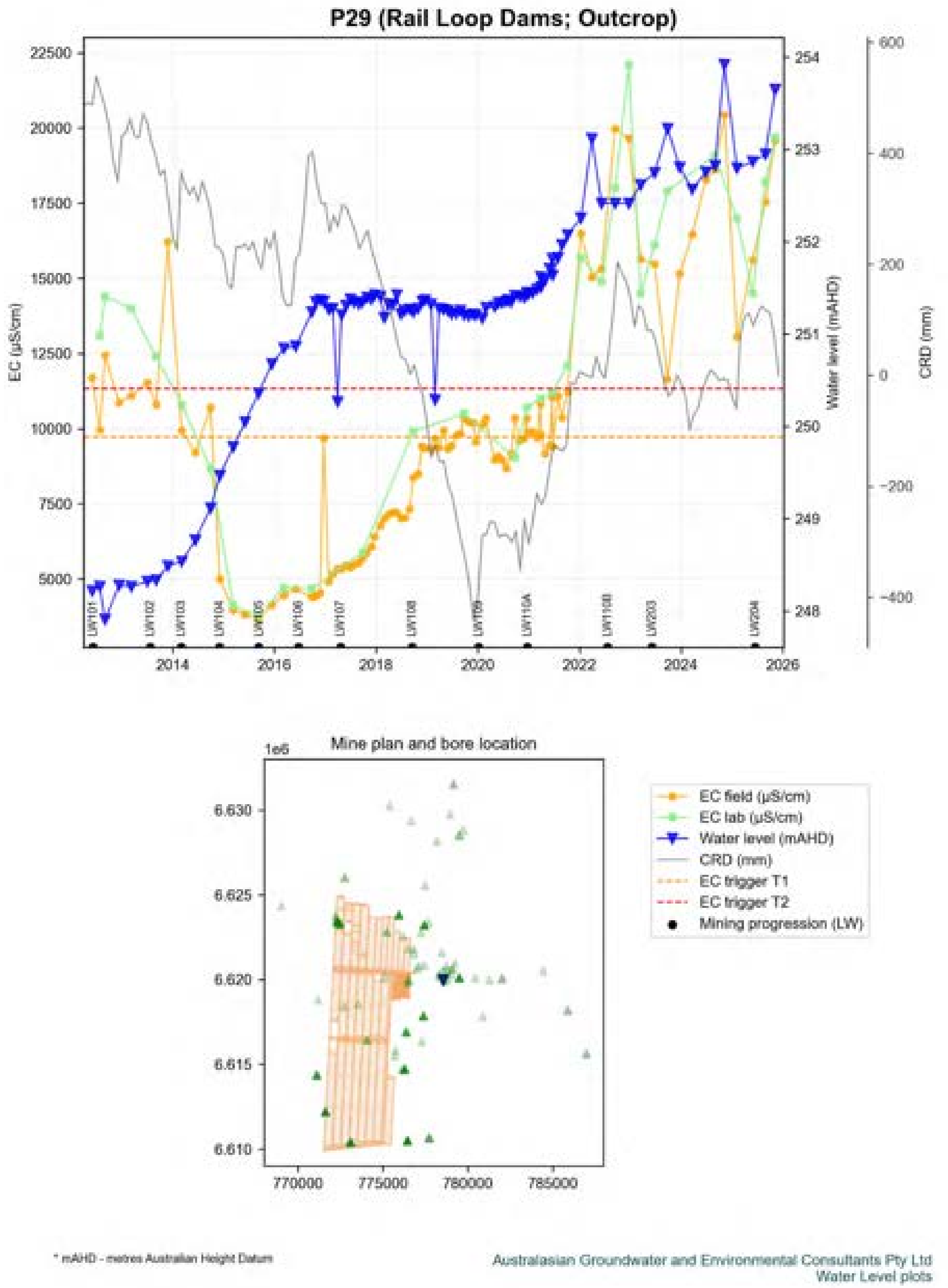

Figure 7.24 P29 EC field and laboratory measurements plotted with water levels

7.7.1.1 Natural climate factors

Surrounding seepage monitoring bores installed in the Napperby Formation (Figure 7.25) do not follow similar EC trends of P29. P30, located about 280 m to the east of P29 and adjacent to storage dams D and C shows a declining EC trend (Figure 7.25), although the two bores now currently have similar EC of about 17,000 µS/cm. The minimal correlation between bores and rainfall trends indicates natural climate variations are unlikely causing increasing trends in EC.

Bores P31 and P32 have a stable and low EC trend with minor fluctuations consistent with variations in average rainfall.

Further soil samples were collected in January 2025 to determine if saturation of previously unsaturated soils is a possible cause for increased salinity. Sample S1 was collected from the top 1 m of soil next to bore P29, sample S2 was collected south of BR1. Sodium Absorption Ratio (SAR) is a measure of the relative concentration of sodium compared to calcium and magnesium in soil solution. When the SAR is high, the water can increase the exchangeable sodium percentage (ESP) of the soil. Sample S1 has a SAR ranged from 4.94 to 7.47 while SAR for sample S2 ranged from 0.54 to 1.99. SAR of 6 to 8 is considered medium sodium hazard while less than 3 is considered ideal. Given the high SAR in soils near P29 the elevated EC could be attributed to mobilisation of salts and minerals present in the previously unsaturated soils.

7.7.1.2 Seepage from surface sources

As stated above, the high EC values at P29 and the changes over time indicate seepage from the rail loop dams as a possible cause of changes. Dams B2 and C have average EC values exceeding 20,000 µS/cm and are a viable source of the increased EC at P29.

The major ion water quality data from bore P29 and other seepage monitoring bores are plotted in Figure 7.26. Chemistry of recent P29 plots as a Na-Cl type water; whereas water from the dams B1, A1 and C plot as a Na-HCO_3 type. A linear mixing trend towards Na-HCO_3 types has been identified in historical data, the reasons for this is unknown.

The dam water is alkaline (Figure 7.26), having a pH consistently over 8, and often over 9. From 2012 until late 2021 pH measured at P29 ranged from 7.1 to 8.8, since EC began increasing over its trigger in November 2021 pH has commenced declining from approximately 8 to 6.5. Although this could indicate that the influences acting on water at P29 is not seepage from nearby dams this does not consider any buffering properties of the soil.

7.7.1.3 Mining-induced mixing

Mixing with water from adjacent areas of hydrostratigraphic units due to changes in hydraulic gradient are not likely to be the cause of EC increase at P29, due to the recorded increases in water levels, no depressurisation is recorded due to nearby mining.

7.7.1.4 Solute release

The hydraulic gradient at P29 indicates flow toward the mining zone, indicating that there is no viable pathway for solutes to reach P29, if they were being produced.

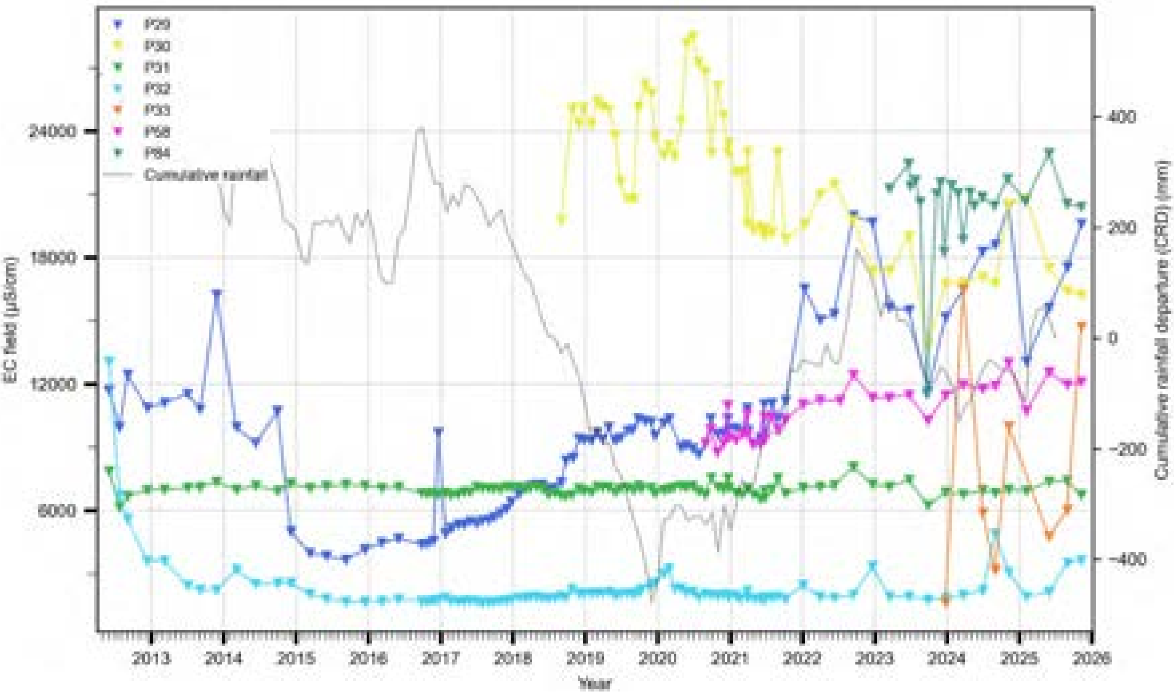

Figure 7.25 Seepage monitoring bore EC (anomalous data removed) and locations

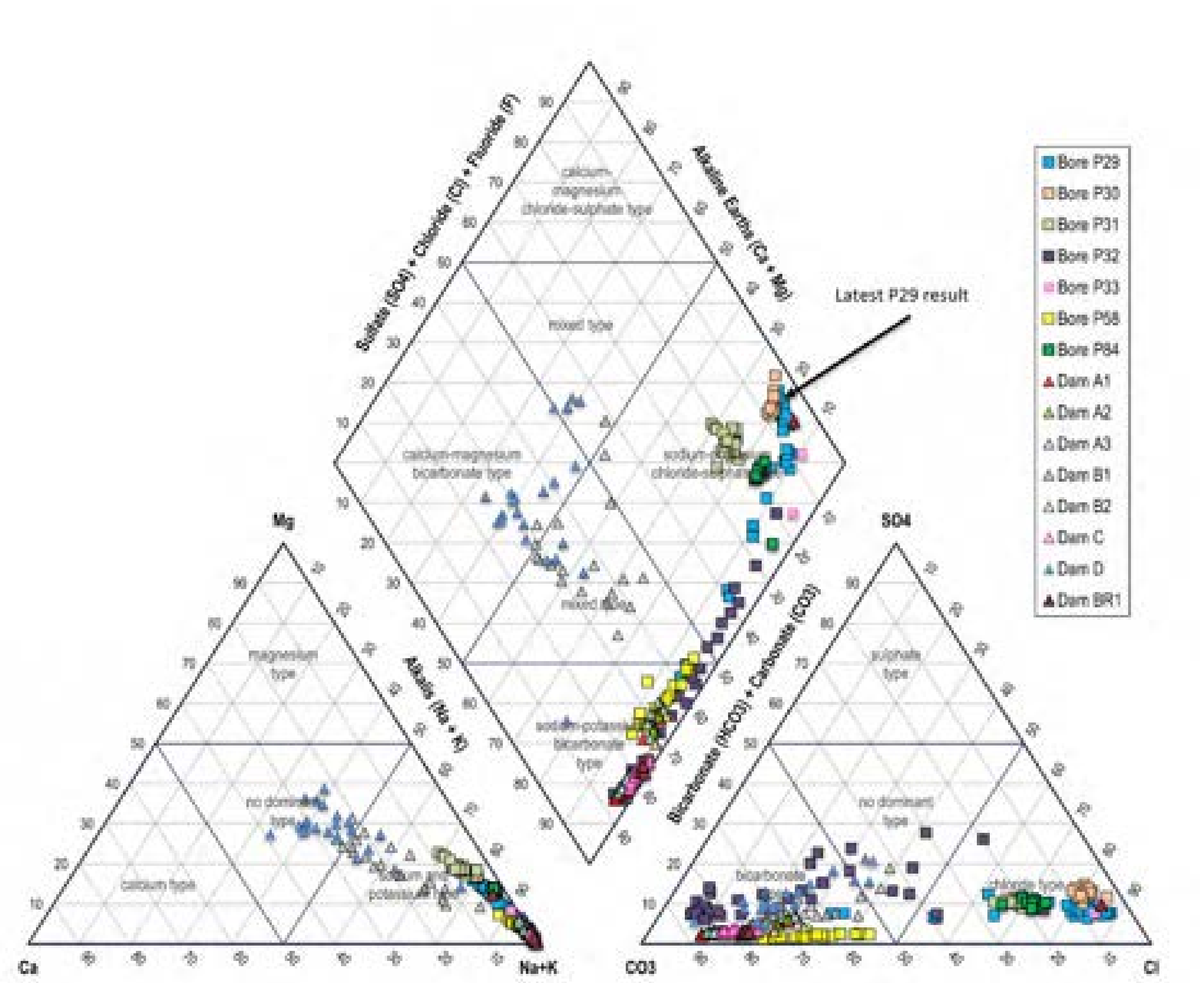

Figure 7.26 Piper diagram for monitoring bores P29 and surrounding sites, including rail loop dams B1, A1 and C

7.7.2 P53 - water quality - EC exceedance

Bore P53 is one of three Reject Emplacement Area (REA) monitoring bores and is located adjacent to a tributary to Kurrajong Creek (Figure 2.2). In late 2021 EC values began to increase, with fluctuation up to ~700 µS/m (Figure 7.27). Concurrently, water levels in P53 increased up to mid-2022, and have since declined.

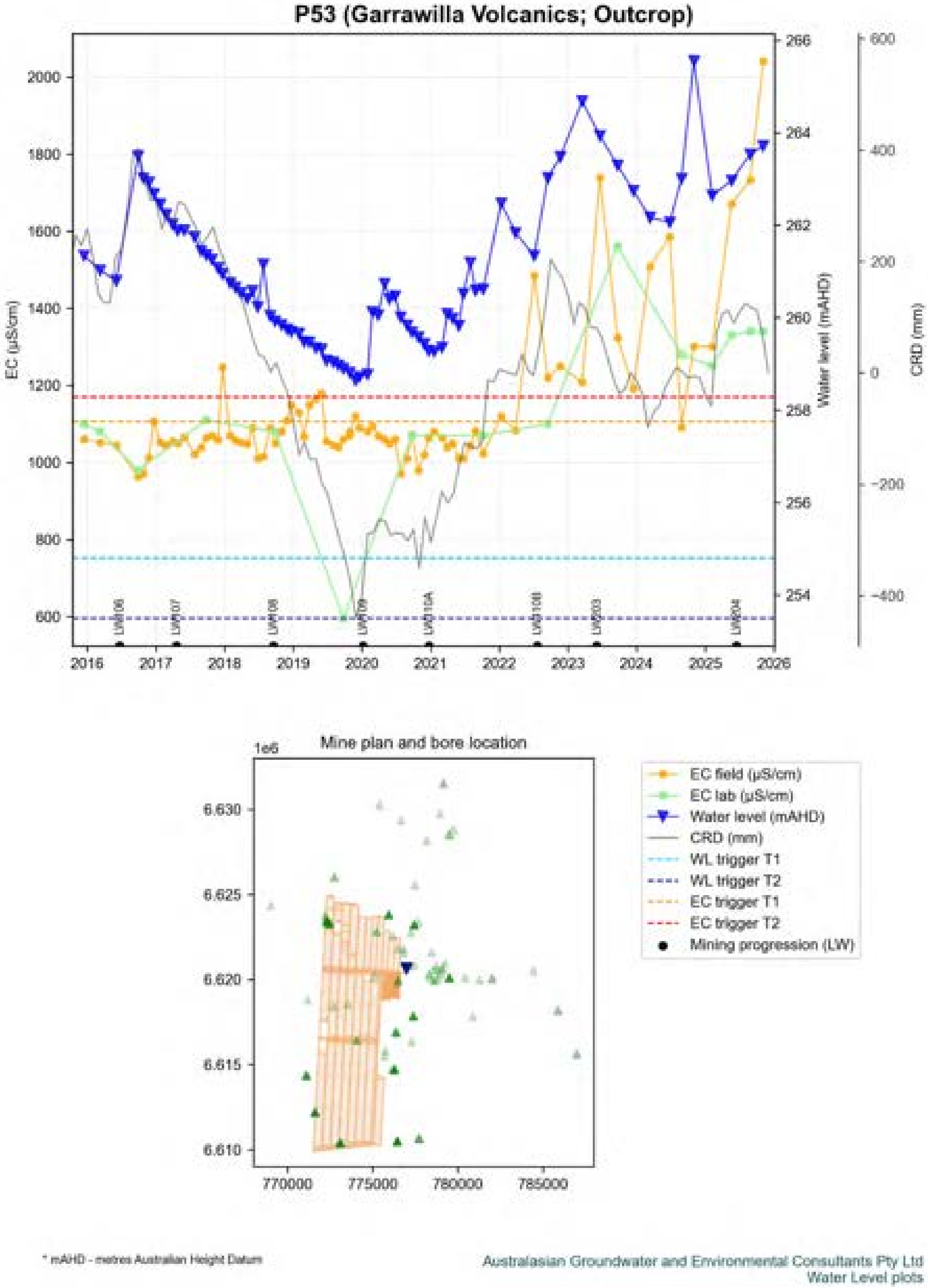

Figure 7.27 P53 EC field and laboratory measurements plotted with water levels

7.7.2.1 Natural climate factors

Both P53 and adjacent bore P52 had increased water levels consistent with changes in rainfall from 2020 to 2023, and during this time P53 groundwater increased in salinity, while that of P52 decreased. This may indicate that natural climate factors are not likely to be the cause of EC change at P53, as a consistent EC compared to past values (e.g. 1,100 µS/cm) would be expected due to the water level increase. Alternatively, the increase in EC at P53 may be a very delayed response to decreased recharge as a result of the Tinderbox Drought. However, given the shallow depth of P53, and the decrease in salinity at P52, this scenario is also considered unlikely.

7.7.2.2 Seepage from surface sources

No surface water data for major ions is available for the nearby creek or reject emplacements. The EC records for the creek monitoring location on the adjacent drainage line (KC1US) range from: 54 to 148 µS/cm. Therefore, it is not possible that mixing with naturally present groundwater below the creek is the cause of the exceedance.

Sediment dam SB3 is located immediately south of P51 and 400 m northeast of P53. Sampling throughout 2025 record a field EC ranging from 4,860 to 9,930 µS/cm. Recent groundwater levels recorded at P51 and P53 indicate a groundwater flow direction from P53 to P51 therefore seepage from SB3 is an unlikely cause of elevated salinity at P53.

It is not possible to determine with certainty if mixing with leachate from the REA interstitial water is occurring. It is a plausible process given the observations at P53 and further data collection is needed for better understanding. HCO_3/Cl ratios for P53 (Figure 7.28) shows the ratio of HCO_3 to Cl decreases from 2022 indicating more relative chloride present during the period of higher EC. This indicates that the water is becoming a more chloride type water, water from mine inflows and Hoskissons coal is more bicarbonate type (Figure 7.29), if changes in water quality was due to water contamination from the REA it would be expected to see the water becoming more Bicarbonate dominate with time and increasing EC, ratios of HCO3/Cl (Figure 7.28) show bore P53 becoming more Cl with time.

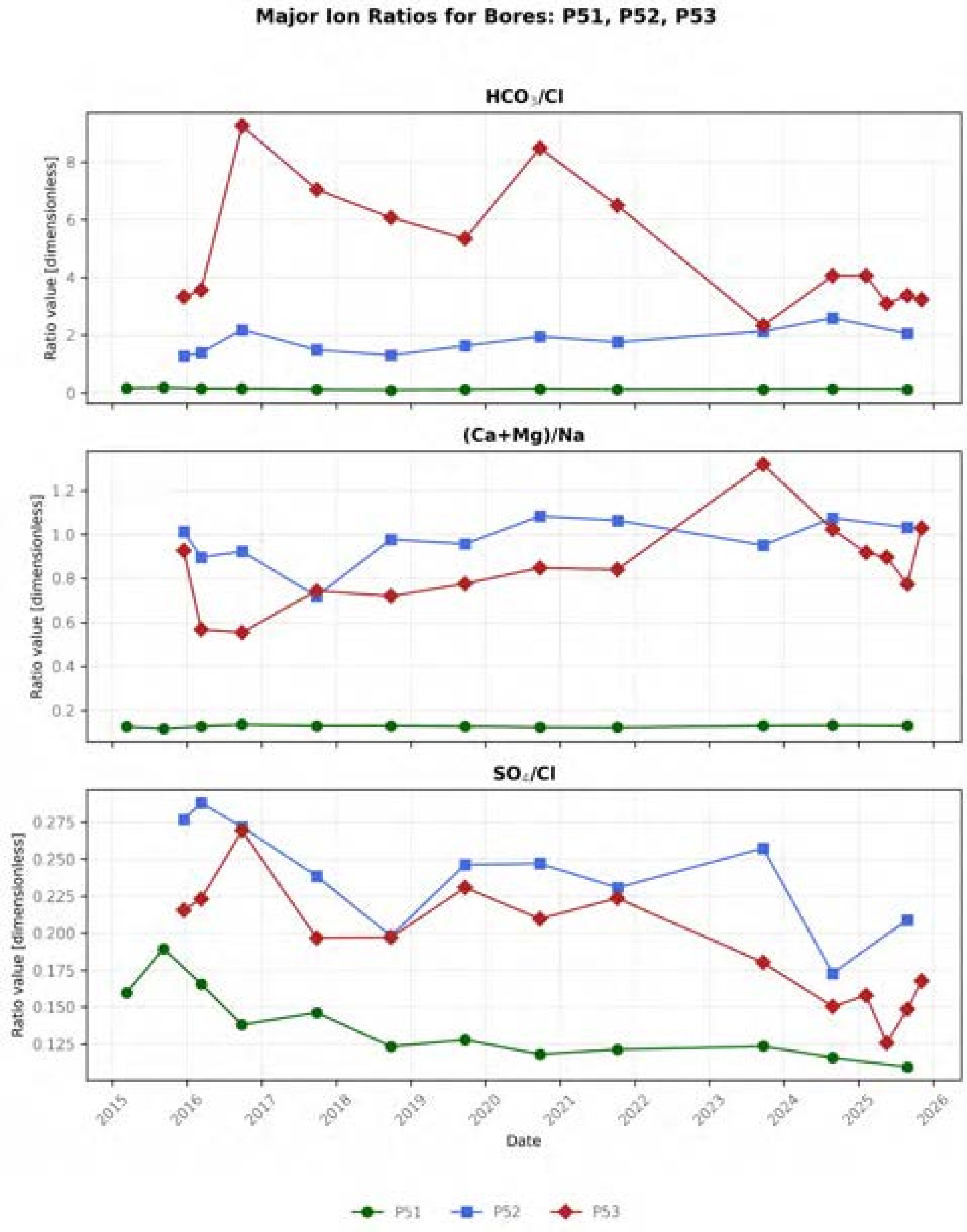

Figure 7.28 Major ion ratios for bores P51, P52 and P53

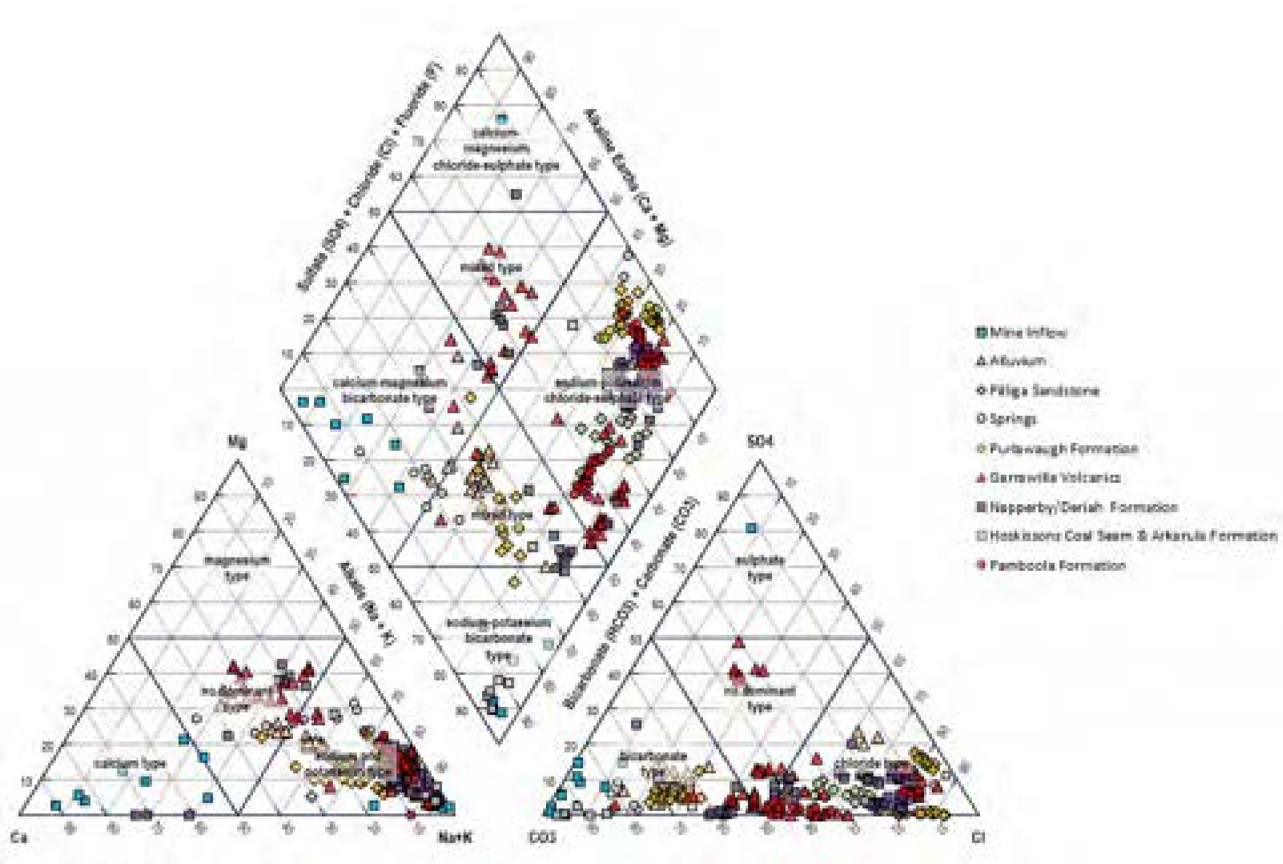

Figure 7.29 Piper plot grouped by formation

7.7.2.3 Mining-induced mixing

Water chemistry recorded at P53 is mixed type for cations, and bicarbonate-dominated for anions (Figure 7.30) P53 plots similar to P52 although P52 has higher relative portions of chloride. A linear mixing trend in the anions is visible with an increase in relative chloride. This trend, coupled with the higher EC recorded in P52 (2,000-2,400 µS/cm) indicates possible mixing with P52, possibly caused by changing water flow paths.

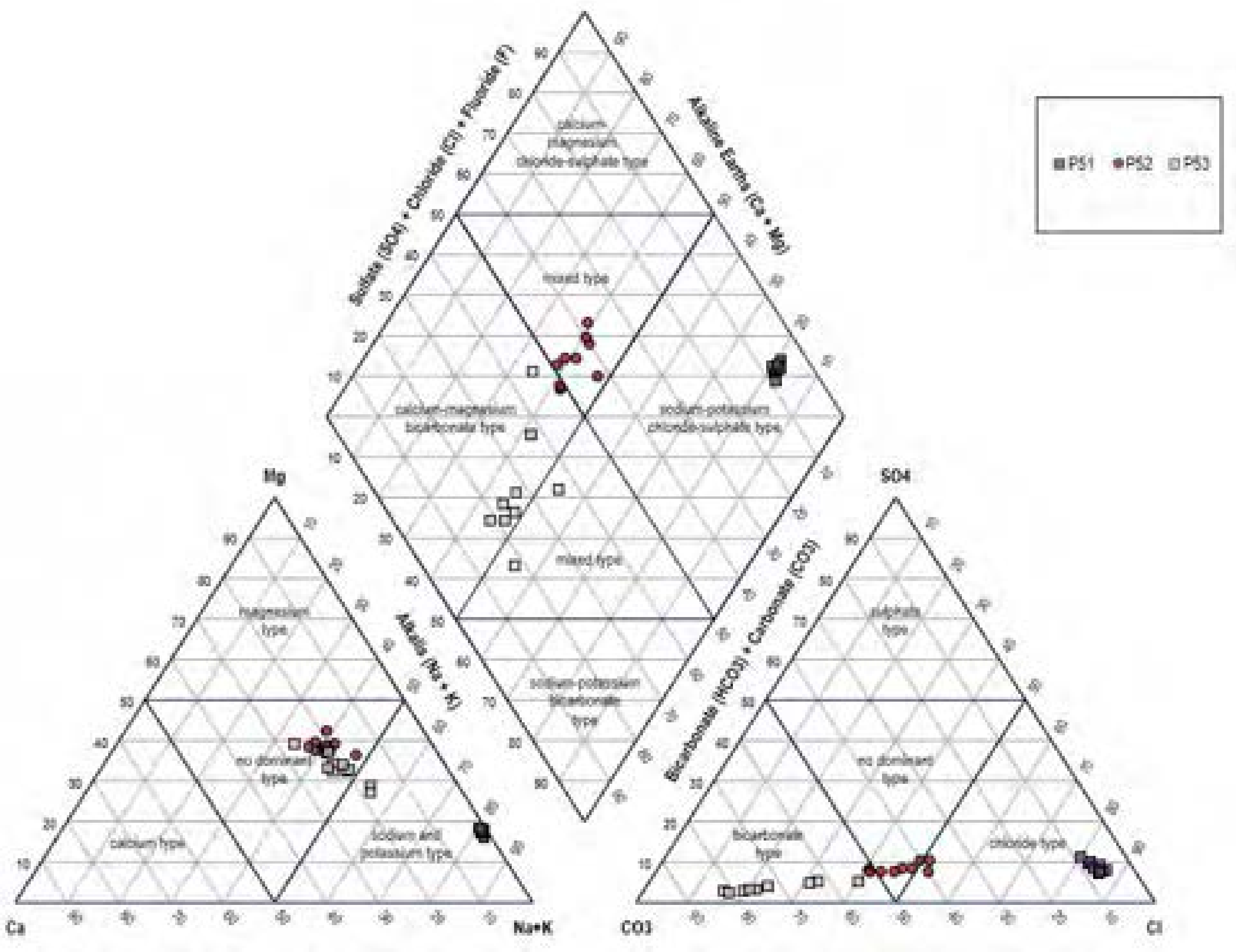

Figure 7.30 Piper plot REA bores P51, P52 and P53

7.7.2.4 Solute release

The hydraulic gradient at P53 indicates flow toward the mining zone, indicating that there is no viable pathway for solutes to reach P53, if they were being produced.

7.7.3 Conclusion and recommendations

Saturation of previously unsaturated soils is considered the most likely cause of elevated EC at P29, the lack of mixing trend indicates the source of water leading to elevated groundwater levels is not sourced from nearby highly saline Na-HCO_3 water as is characterised by water stored in nearby surface water dams.

The sources of increases in EC recorded at P53 and linear mixing trends apparent in the Piper Plots are unclear, continued monitoring is recommended.

7.7.4 Potential impacts

No sensitive environmental receptors are located nearby and other bores surrounding the RLD show no signs of seepage. Therefore, no significant environmental impacts are expected from the elevated EC measurements.

8 Conclusions

Conclusions and recommendations for individual exceedances are included in each section. A summary of findings, comparison with previous findings and recommendations for further work are included in Table 8.1. This includes recommendations from annual reporting that states that bores with recorded exceedances should consider the following:

- does the conclusion that changes are associated with these climatic events remain true; and
- has a new adjusted baseline been established, if so, a review of the baseline data and trigger levels is recommended.

For bores with no current recommendation for further work monitoring should continue with data reviewed quarterly to determine if bore has reached equilibrium or any other changes are noticeable.

Table 8.1 Summary of exceedances and further work

Bore ID	Formation	Exceedance	Likely cause	New baseline / triggers established	Further work required
P2	Napperby	EC	Natural variations / major climate event	Tier 1 22,080 µS/cm Tier 2 22,533 µS/cm	Update triggers
P4	Napperby	EC	Natural variations / major climate event	Tier 1 28,300 µS/cm Tier 2 28,991 µS/cm	Update triggers
P7	Pilliga	pH	Natural variability of formation	N/A	No, continue monitoring
P9	Purlawaugh	EC	Natural variations / major climate event	No	Examine if new baseline can be established
P10	Napperby	EC	Natural variations / major climate event	No	Examine if new baseline can be established
P11	Purlawaugh	EC and water levels	Lateral migration of water and mixing within the formation	No	No
P29	Napperby	EC	Saturation of unsaturated zone	N/A	No
P39A	Watermark	EC	Natural variations / major climate event	Tier 1 7,710 µS/cm Tier 2 8,031 µS/cm	Update triggers
P39B	Alluvium	EC	Natural variations / major climate event	Tier 1 13,662 µS/cm Tier 2 14,198 µS/cm	Update triggers
P47	Garrawilla	EC	Natural variations / major climate event	No	No
P53	Garrawilla	EC	Mixing with other groundwater and/or infiltration of water from REA	N/A	Review against geochemistry

Yours faithfully,

Kathryn Job
Team Lead and Senior Project Hydrogeologist
Australasian Groundwater and
Environmental Consultants Pty Ltd

Appendix G – *Ambient Flow Monitoring*

Data Point	Date	EC – Field (µS/cm)	Oil & Grease (mg/L)	pH - Field	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Comments
KC1DS	30/03/2025	237	< 5	8.3	16	226	Rain event
	31/03/2025	678	< 5	7.5	18	30	Flowing - rain event
	24/06/2025	-	-	-	-	-	No sample - dry, rain event
	28/07/2025	-	-	-	-	-	No sample - dry, rain event
KC1US	30/03/2025	26	< 5	7.5	18[2]	52	Rain related discharge event
	31/03/2025	165	< 5	7.9	19[2]	24	Flowing
	26/04/2025	-	-	-	-	-	No sample - dry, rain event
	28/07/2025	-	-	-	-	-	No sample - dry, rain event
	12/12/2025	-	-	-	-	-	No flow - rain event.
KC2DS	29/03/2025	447	< 5	8.1	9	81	Rain event
	31/03/2025	328	< 5	7.7	13	44	Flowing - rain event
	3/04/2025	104	< 5	7.3	14	17	Rain related discharge event
	24/06/2025	-	-	-	-	-	Puddle of water on road but no flow, rain event
	28/07/2025	-	-	-	-	-	No sample -do flow/ stagnant water, rain event
KC2US	29/03/2025	26	< 5	7.1	10	130	Rain related discharge event
	31/03/2025	-	-	-	-	-	No sample - no flow rain event
	3/04/2025	75	< 5	7.2	14	10	Rain related discharge event
	24/06/2025	-	-	-	-	-	Puddle of water on road but no flow, rain event
	28/07/2025	109	14	7.4	20	22	Flowing, rain event
	12/12/2025	-	-	-	-	-	No flow - rain event.
KCDS	31/03/2025	359	< 5	7.5	25	12	Flowing - rain event
	24/06/2025	-	-	-	-	-	Small puddles but no flow, rain event
	28/07/2025	453	< 5	7.8	20	64	Flowing, rain event
	12/12/2025	-	-	-	-	-	No flow - rain event.

Data Point	Date	EC – Field (µS/cm)	Oil & Grease (mg/L)	pH - Field	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)	Comments
KCTOP	29/03/2025	28[1]	< 5	7	9	154	Discharge event (SD9)
	31/03/2025	304	< 5	6	37	15	Slow trickle - rain event
	24/06/2025	-	-	-	-	-	No sample - no flow, rain event
	28/07/2025	-	-	-	-	-	No sample - stagnant puddle, rain event
	4/08/2025	256	< 5	6.8	34	< 5	Rain related discharge event (SD9)
	12/12/2025	-	-	-	-	-	No flow - rain event.
KCUS	29/03/2025	79[1]	< 5	7.8	10	456	Discharge event (SD9)
	31/03/2025	522	< 5	7.8	14	24	Rain event
	24/06/2025	-	-	-	-	-	Puddle of water but no flow, rain event
	29/07/2025	931	< 5	7.7	17[2]	11	Rain related discharge event (SD9)
	4/08/2025	453	< 5	7.6	17[2]	14	Rain related discharge event (SD9)
	12/12/2025	95	< 5	7.8	18[2]	120	Slow flow. Rain event
PCa	1/04/2025	122	< 5	7.5	17	63	Rain event
	24/06/2025	-	-	-	-	-	Stagnant puddle - no flow, rain event
	28/07/2025	149	8	7.3	13	112	Flowing, rain event
	12/12/2025	-	-	-	-	-	No flow - rain event.
PC1	31/03/2025	100.1	< 5	7.1	14	49	Flowing - rain event
	24/06/2025	-	-	-	-	-	Stagnant puddle - no flow, rain event
	28/07/2025	169	< 5	7.6	15	12	Flowing, rain event
	12/12/2025	-	-	-	-	-	No flow - rain event.

[1] Field measurement error, thus lab result shown.
[2] For KCUS and KC1US the exceedance for Total Organic Carbon according to the Stage 2 Water Management plan is 17 mg/L and as such was reported to the relevant departments (NSW DPHI and Commonwealth DCCEEW).