

EnergyAustralia

Water Management Plan

Mt Piper Power Station, DA80/10060,
Mt Piper Ash Repository
July 2026

Revision 05

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Abbreviations

Abbreviations used throughout this document are described in the below table.

Abbreviation	Description
ALS	ALS Global Pty Ltd
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
BC	Brine Concentrator
BCA	Brine Conditioned Ash
BOM	Bureau of Meteorology
BRWMP	Brine and Residuals Management
CCC	Community Consultative Committee
CSM	Conceptual Site Model
DA	Development Approval
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure
EC	Electrical conductivity
Ecolab	Ecolab Pty Ltd
EMR	Environmental Management Report
EnergyAustralia	EnergyAustralia NSW Pty Ltd
EMP	Ecological Monitoring Program (Wangcol Creek)
ENM	Excavated Natural Material
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ER	Environmental Representative
ERM	Environmental Resources Management Australia Pty Ltd
ESCP	Erosion and Sediment Control Plan
HDPE	High-Density Polyethylene
HELP	Hydrologic Evaluation of Landfill Performance
km	kilometres
LBMS	Leachate Barrier Management System
LCC	Lithgow City Council
LGA	Local Government Area
LNAR	Lambers North Ash Repository
m AHD	metres Australian Height Datum

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Mod 9	Modification 9 to the Mt Piper Consent
Mod 10	Modification 10 to the Mt Piper Consent
MPAR	Mt Piper Ash Repository
MPPS	Mt Piper Power Station
MW	Megawatts
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEM	National Electricity Market
NGM	Numerical Groundwater Model
NRAR	Natural Resources Access Regulator
NSW	New South Wales
OEMP	Operational Environmental Management Plan
OH&S	Operational Health and Safety
PA	Project Approval
PIRMP	Pollution Incident Response Management Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
ROP	Repository Operations Plan
SPR	Source-Pathway-Receptor
SRTF	Salt Receival Transfer Facility
SSD	State Significant Development
SWTP	Springvale Water Treatment Project
TARP	Trigger Action Response Plan
TDS	Total Dissolved Solids
VENM	Virgin Excavated Natural Material
WCA	Water Conditioned Ash
WCS	Western Coal Services
WIA	Water Impact Assessment
WMP	Water Management Plan

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Key Terminology	Definition/Description
Mt Piper Consent	Development approval DA80/10060 granted under the EP&A Act on 1 April 1982.
Mod 9	Modification 9 to the Mt Piper Consent, as approved on 24 June 2025.
Mod 10	Modification 10 to the Mt Piper Consent, as approved on 11 June 2026.
WMP	This Water Management Plan (WMP), prepared to satisfy Condition 43 of Mt Piper Consent as modified.
2020 Water Management Plan	The Water Management and Monitoring Plan – Update for 60 ML Dam dated February 2020 (ERM, 2020) previously approved under the Mt Piper Consent. The 2020 Water Management Plan is replaced by this WMP.
2008 Water Management Plan	The Mt Piper Power Station Brine Conditioned Flyash Co-placement Extension Water Management and Monitoring Plan (Connell Wagner, 2008) previously approved under the Mt Piper Consent. The 2008 Water Management Plan was subsequently replaced by the 2020 Water Management Plan.
MPAR Phase 1 Capping	An engineered capping layer that will be installed over a targetted portion of the Stage 1 and Stage 2 BCA placement areas at the completion of ash placement operations.
MPAR Phase 1 Drainage	Engineered structures and upgraded surface water drainage systems that will be installed to direct clean water flows from the MPAR Phase 1 Capping and existing MPAR batters and benches to Wangcol Creek.
MPAR Phase 1 Capping and Drainage	The combination of the MPAR Phase 1 Capping and MPAR Phase 1 Drainage which are intended primarily as legacy BCA management measures to mitigate infiltration of water (recharge) and subsequent seepage of leachate from BCA into underlying groundwater.
MPAR Zone 2 LBMS	An engineered liner and leachate collection system that will be installed on the eastern end of the MPAR (MPAR Zone 2) to capture, store and transfer leachate and runoff from the MPAR Zone 2 LBMS to the LNAR leachate management system and to mitigate seepage of leachate from BCA into underlying groundwater.
MPAR Zone 2 Capping	An engineered capping layer that will be installed over the MPAR Zone 2 LBMS at the completion of ash placement operations in MPAR Zone 2 to mitigate infiltration of water (recharge) to BCA.
MPAR Zone 2 LBMS and Capping	The combination of the MPAR Zone 2 LBMS and MPAR Zone 2 Capping which are intended as ongoing BCA management measures to mitigate infiltration of water (recharge) to and subsequent seepage of leachate from BCA into underlying groundwater.
MPAR Capping Strategy	As required by Condition 59 of the Mt Piper Consent, the MPAR Capping Strategy must provide details of: *(a) short, medium and long-term solutions for control of migration of the solutes from the entire MPAR and into the receiving environment, including consideration of post-closure measures; and* *(b) additional works required and assessment of measures to reduce water infiltration on the batter slopes of the MPAR.* The MPAR Capping Strategy was developed separately to address Condition 59 following which this WMP was updated to address Condition 60 of the Mt Piper Consent.

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Document History and Status

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Final 03	29.05.2026	Gavin Powell	Tamie Weaver	29.05.2026	Revised following the MPAR Capping Strategy
Final 04	07.07.2026	Gavin Powell	Tamie Weaver	07.07.2026	Revised following the MPAR Capping Strategy
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1. Introduction

EnergyAustralia NSW Pty Ltd (EnergyAustralia) engaged Environmental Resources Management Australia Pty Ltd (ERM) to prepare an updated Water Management Plan (this WMP) for the Mt Piper Ash Repository (MPAR), located at the Mt Piper Power Station (MPPS), Boulder Road, Portland NSW (the Site).

The MPPS is located within the Lithgow Local Government Area (LGA), approximately 110 kilometres (km) west of Sydney and five km east of Portland NSW. The location of the MPPS in a regional context is presented in Figure 1 (all figures are presented in Appendix A.

This WMP should be read in conjunction with the Statement of Limitations (Appendix B).

1.1 Project Background

EnergyAustralia owns and operates the MPPS. The MPPS was originally authorised by development consent DA80/10060 (Mt Piper Consent) granted under the Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act) on 1 April 1982. The Mt Piper Consent has been modified on ten occasions, including Modification 9 as approved on 24 June 2025 (Mod 9) and Modification 10 as approved on 11 June 2026 (Mod 10). The Mt Piper Consent as modified authorises the MPPS and ancillary activities, including the MPAR.

The MPPS was built between 1984 and 1993 and comprises two coal-fired steam turbine generating units. Each unit was originally constructed to generate up to 660 megawatts (MW), and they have since been upgraded to utilise improvements in turbine technology. The generating units now produce up to 700 MW and 730 MW respectively. The ash produced from coal combustion to generate electricity is beneficially reused where market opportunities permit or placed in purpose-built ash placement repositories. The MPPS has two approved and operating ash placement repositories:

- The MPAR, which was originally approved under development consent 230/89 granted by Lithgow City Council on 21 March 1980. DA 230/89 was subsequently incorporated, via subsequent modifications, into the Mt Piper Consent. Most of the ash produced at MPPS to date has been placed within the MPAR; and
- The adjoining Lamberts North Ash Repository (LNAR), which was separately approved in February 2012 under Project Approval (PA) 09_0186 (LNAR Project Approval) as modified, is located immediately adjacent to the MPAR.

The MPAR and the LNAR are collectively referred to as the 'Ash Repositories'. Figure 2 presents the location of the Ash Repositories, along with other relevant features of the MPPS. Further details associated with the MPPS and Ash Repositories regulatory requirements and environmental setting are presented in Section 2 and Section 3 respectively.

1.1.1 MPPS and Ash Repositories Operations

The MPPS provides critical electricity supply into the National Electricity Market (NEM) and will continue to operate until it is retired by 2040 in line with the commitments contained in EnergyAustralia's Climate Transition Action Plan 2024. It is likely that MPPS will operate more flexibly, in a reserve role, in the early to mid-2030s to support system stability in the NEM.

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Further details of the MPPS and Ash Repositories regulatory requirements and environmental setting are presented in Section 2 and Section 3 respectively.

The operational changes at the MPAR associated with Mod 9 include installation of a low-permeability cap and associated water management features on the MPAR (MPAR Phase 1 Capping and Drainage) and installation of a leachate barrier management system (LBMS) and capping in MPAR Zone 2 (MPAR Zone 2 LBMS and Capping), as detailed below and described further in Section 6.

The MPAR Phase 1 Capping and Drainage encompasses:

- Installation of an engineered capping layer on the top section of the MPAR (MPAR Phase 1 Capping); and
- Construction of engineered structures and upgraded surface water drainage systems to direct clean water flows from the MPAR Phase 1 Capping, and existing MPAR batters and benches to Wangcol Creek (MPAR Phase 1 Drainage).

The MPAR Zone 2 LBMS and Capping encompasses:

- Installation of an engineered liner and leachate collection system on the eastern end of the MPAR (MPAR Zone 2 LBMS); and
- Installation of an engineered capping layer at the completion of ash placement in MPAR Zone 2 (MPAR Zone 2 Capping).

Following the completion of ash placement operations at the MPAR, the MPAR Zone 2 Capping will be tied in with the MPAR Phase 1 Capping to form a capped surface across the upper portion of the MPAR.

1.1.2 Status of Mod 9 Works

At the time this WMP was prepared (in July 2026) the status of Mod 9 works is as follows:

- Installation of the MPAR Phase 1 Capping is largely complete, including the seal bearing layer (consisting of placed ash material), the linear low-density polyethylene (LLDPE) geomembrane liner and the sub-soil layer (refer to Section 6.1.2). Topsoil placement and revegetation have not commenced, with completion anticipated in 2026;
- MPAR Phase 1 Drainage construction is progressing, with completion anticipated in 2026; and
- MPAR Zone 2 LBMS and Capping is subject to detailed design, with installation of the LBMS anticipated to commence in approximately 2027 or 2028.

1.2 Purpose of the WMP

This WMP updates the Water Management and Monitoring Plan – Update for 60 ML Dam dated February 2020 (ERM, 2020) previously approved under the Mt Piper Consent (2020 Water Management Plan) to address each of the matters required by Condition 43 of the Mt Piper Consent and to reflect the improvements to the MPAR authorised by Mod 9. Table 2-1 (Section 2) outlines where this WMP addresses the matters required by Condition 43.

This WMP includes a summary of information pertaining to the MPAR environmental setting, and summarises previous assessments that have informed the water management strategies for the MPAR. A detailed Water Impact

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Assessment (WIA)[1] was prepared for Mod 9 and forms the source of the majority of the information contained in this WMP and, as such, is not specifically referenced. Where information has been sourced from documents other than the WIA, those documents are referenced.

This WMP outlines a monitoring program for surface water and groundwater, including reporting requirements, TARPs, mitigation measures and commitments as outlined in the WIA.

This WMP does not address any new water management requirements that are specific to the works authorised by Mod 10. As required by the Mt Piper Consent, a revised WMP will be prepared to facilitate commencement of the works authorised by Mod 10.

An overview of the prior water management plans is provided in Table 1-1

Table 1-1 Overview of The Prior Water Management Plans

Title	Comment
Water Management and Monitoring Plan – Update for 60 ML Dam dated February 2020 (ERM, 2020) (the 2020 Water Management Plan)	The 2020 Water Management Plan is currently approved under the Mt Piper Consent following approval of a modification to develop an additional 60 ML storage pond at the MPPS (Mod 8). The 2020 Water Management Plan will be replaced by this WMP once it is approved (see Section 1.3 below).
Mt Piper Power Station Brine Conditioned Flyash Co-placement Extension Water Management and Monitoring Plan (Connell Wagner, 2008) (the 2008 Water Management Plan)	The 2008 Water Management Plan was previously approved under the Mt Piper Consent following approval of a modification to extend the existing brine and ash co-placement area on site (Mod 7). The 2008 Water Management Plan was subsequently replaced by the 2020 Water Management Plan.

[1] ERM, 2024a. Mt Piper Power Station: Water Impact Assessment – DA 90/10060 – Modification 9. For EnergyAustralia NSW Pty Ltd, dated 13 December 2024 (the WIA).

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1.3 Consultation

EnergyAustralia has maintained engagement with regulatory and community stakeholders throughout the MPPS operations. The key community and regulatory stakeholders consulted during implementation of the Mt Piper Consent and development of this WMP include:

Community

- Community Consultative Committee (CCC); and
- Springvale Coal Pty Ltd (Springvale).

Regulatory

- NSW Department of Planning, Housing and Infrastructure (DPHI);
- NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW);
- NSW Environment Protection Authority (EPA);
- WaterNSW;
- Natural Resources Access Regulator (NRAR); and
- Lithgow City Council (LCC).

The drafting of this WMP was communicated to the CCC during the meeting with EnergyAustralia on 05 August 2025.

A draft version of this WMP (dated 02 October 2025) was issued to DCCEEW Water, WaterNSW, and EPA for consultation as required by Condition 43 and was updated as required to reflect consultation outcomes prior to submission to the DPHI. The DPHI were provided with an updated version of this WMP (dated 27 November 2025) and provided further comments, which have been addressed in this WMP. In accordance with Condition 60 of the Mt Piper Consent, this WMP was updated following development of the MPAR Capping Strategy (ERM, 2026c) to the satisfaction of the EPA. As required by Condition 43B, a copy of the WMP will, once approved by DPHI, be provided to EPA, WaterNSW, DCCEEW Water, and LCC.

Appendix C provides the record of stakeholder consultation and comments provided to date, as relevant to this WMP

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2. Regulatory Requirements and Environmental Management Framework

2.1 Development Consent

The conditions imposed on the Mt Piper Consent were amended as part of the Mod 9 and relevantly require:

- The preparation and approval of an updated water management plan for the MPAR prior to commencement of the Mod 9 works (Condition 43). This plan has been prepared to satisfy this condition;
- EnergyAustralia to continue to implement the 2020 Water Management Plan for the MPAR which was previously prepared and approved under the Mt Piper Consent until such time as this WMP has been approved (Condition 43C);
- EnergyAustralia to provide an annual Environmental Monitoring Report for the MPAR on a yearly basis, to the satisfaction of the Secretary (Conditions 44 and 45);
- The EPA to be satisfied that the design of the leachate management system is generally consistent with the relevant requirements of the Environmental Guidelines, Solid Waste Landfills (EPA, 2016) prior to commencing the Mod 9 works (Condition 58). This will be addressed separately to this WMP;
- The development of an updated capping strategy for the entire MPAR to the satisfaction of the EPA, within 6 months of the approval of Mod 9 (Condition 59); and
- In accordance with Condition 60, this WMP has been further updated to reflect the MPAR Capping Strategy (ERM, 2023c) prepared and approved under Condition 59.

The Water Management Plan has been prepared to satisfy Condition 43 (a) to (f) under Development Approval DA80/10060 for the Mt Piper Power Station.

Further details of these conditions are set out in Table 2-1 below. EnergyAustralia confirms that it is committed to fully complying with the conditions of the Mt Piper Consent, including the specific conditions set out in Table 2-1 below.

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Table 2-1 Relevant Conditions of The Mt. Piper Consent

Condition	Consent requirements	Section in this WMP where conditions are addressed
Condition 43	*43. Prior to commencing the works as described in Modification 9, or as otherwise agreed by the Secretary, the Applicant must prepare a Water Management Plan for the MPAR to the satisfaction of the Secretary. The Water Management Plan must be prepared by a suitably qualified and experienced person/s, and in consultation with DCCEEW Water, WaterNSW and the EPA. The Water Management Plan must include, and not be limited to:*	This WMP has been prepared in accordance with this condition. The ERM signatories for this WMP are suitably qualified and experienced person/s. Details of stakeholder consultation are presented in Section 1.3 and Appendix C
	a) details of the monitoring programs for surface water and groundwater: *•detailed baseline data and monitoring programs presented in the Statement of Environmental Effects of Modification 5 (as updated by subsequent modifications), including baseline data on surface water flows and quality in creeks and waterbodies that could be affected by the MPAR (including Wangcol Creek);* *•monitoring of surface water flows and quality, stream health and channel stability in Wangcol Creek, and downstream of the energy dissipater as described in Modification 9; and* *•water quality testing at a minimum frequency of every three months, including details of water quality management criteria and measures to manage surface water and groundwater impacts, including trigger action response plans (TARPs).*	(a) Details of the monitoring programs for surface water and groundwater: • Detailed contemporary data for the period 2014 to 2024 (i.e. pre-capping baseline data) is described in Section 3.7 and Section 3.8 and presented in Appendix D. The pre-BCA placement baseline data is presented in the Statement of Environmental Effects (PPI, 1999) prepared in relation to Modification 5 of Mt Piper Consent. • The water characterisation and monitoring program is presented in Section 10. This includes stream health, stream flow and channel stability monitoring, along with groundwater and surface water quality monitoring, associated frequencies, testing requirements and management criteria for defined monitoring locations. Section 11 presents incident response, TARPs and contingency plans.
	(b) a site water balance, including details of: *•water management on site, including measures to be employed to control and/or capture surface water run-off from the site; and* *•off-site water discharges.*	(b) A site water balance was prepared as part of the WIA and provided as part of the Mod 9 application. Key outcomes from the site water balance and the WIA, including internal catchment management and off-site surface water flows, are described in Section 6 of this WMP (MPAR Water Management Systems) and Section 7 (MPAR Soil and Water Management Plan).
	(c) contingency plans for the mitigation of environmental impacts should run-off or leachate from the site be found to be negatively impacting on natural surface water or groundwater.	(c) Section 11
	(d) brine management objectives and strategies, with specific reference to measures aimed at reducing the volume of brine produced at the Mount Piper Power Station.	(d) Section 8
	(e) a program for the ongoing verification and refinement of the groundwater model for the MPAR.	(e) Section 10
	(f) identification of activities that could cause soil erosion and generate sediment and describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters.	(f) Section 7
The following conditions are included in this WMP in response to the DPHI's request for EnergyAustralia's commitments to water related conditions of the Mt Piper Consent.		
Condition 43A	*The Applicant must implement the approved Water Management Plan.*	EnergyAustralia is implementing this Water Management Plan.
Condition 43B	*The Applicant must provide a copy of the approved Water Management Plan to the EPA, WaterNSW, DCCEEW Water and Council.*	EnergyAustralia will provide a copy of the approved WMP to all regulators as required by this condition.
Condition 43C	*Prior to the approval of the revised Water Management Plan as detailed in condition 43, the project's Water Management Plan, as approved following Modification 8, must continue to be implemented, to the satisfaction of the Secretary.*	Prior to the approval of this WMP, EnergyAustralia continued to manage and operate the MPAR as authorised prior to Mod 9, including in accordance with the 2020 WMP. Following the approval of Mod 9 on 24 June 2025 and this WMP on 22 January 2026, EnergyAustralia has been managing and operating the MPAR in accordance with Mod 9 and this WMP. This includes, but is not limited to, implementation of sediment and erosion controls, water balance management, stormwater management, dust suppression, ash management, compaction and grading activities, as well as inspections, monitoring, and measurement programs.

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Condition	Consent requirements	Section in this WMP where conditions are addressed
Condition 44	*The Applicant must provide to the Secretary, EPA, DCCEEW Water, WaterNSW and Council, an Environmental Monitoring Report* (EMR) *for the MPAR on a yearly basis, to the satisfaction of the Secretary. The Environmental Monitoring Report must be prepared by a suitably qualified and experienced person/s approved by the Secretary.*	Condition 44 is not addressed by this WMP. An EMR will be prepared by suitably qualified and experienced person/s in accordance with the requirements of Condition 45, as detailed by the water characterisation and monitoring requirements in Section 10
Condition 45	*The Environmental Monitoring Report must include, but not be limited to:* *(a) a comprehensive review of the monitoring results from the Water Management Plan over the previous calendar year and identify any trends in the water monitoring data over the life of the project;* *(b) a discussion of the aims of the Water Management Plan and to what degree these aims have been attained in the context of results and analyses of the Water Monitoring Program, as part of the Water Management Plan;* *(c) actions taken, or intended to be taken, if any, to mitigate any adverse environmental impacts and to meet the reasonable requirements of the Secretary, EPA, DCCEEW Water, WaterNSW or Council;* *(d) a revised groundwater modelling report to include any potential and/ or the progressive improvements to the existing batters and benches that may contribute towards reducing the impacts from MPAR to the surrounding environment;* *(e) identification of 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; and* *(f) a complaints record of the project's water related impacts (quality and quantity) over the previous calendar year.*	Section 10 outlines the annual EMR reporting requirements, which EnergyAustralia will ensure are addressed.
Condition 58	*58.Prior to the commencement of construction of the leachate barrier management system in Zone 2 of the MPAR, as detailed in Modification 9, the Applicant must demonstrate to the satisfaction of the EPA that the design of the leachate management system is generally consistent with the relevant requirements of the Environmental Guidelines, Solid Waste Landfills (EPA, 2016), including:* *(a) the leachate barrier system, including liner and leachate collection system; and* *(b)the leachate storage dam/s including freeboard, appropriate sizing based on site water balance modelling and liner.*	EnergyAustralia will prepare separate documentation to demonstrate that the design of MPAR Zone 2 LBMS is generally consistent with the relevant requirements of the Environmental Guidelines, Solid Waste Landfills (EPA, 2016).
Condition 59	*59. Within six months of approval of Modification 9, or other timeframe agreed by the Secretary, the Applicant must develop a capping strategy for the entire MPAR to the satisfaction of the EPA. The design for the MPAR capping strategy must provide details of:* *(a) short, medium and long-term solutions for control of migration of the solutes from the entire MPAR and into the receiving environment, including consideration of post-closure measures; and* *(b) additional works required and assessment of measures to reduce water infiltration on the batter slopes of the MPAR.*	The MPAR Capping Strategy was completed separately to the satisfaction of the EPA (approved 05 March 2026) to address Condition 59 of the Mt Piper Consent Evidence of this is provided in Appendix C The Secretary granted an extension of time for delivery of the MPAR Capping Strategy until 24 March 2026. Evidence of this is provided in Appendix C
Condition 60	*60. Within three months of approval of the capping strategy in condition 59, the Applicant must review and revise the Water Management Plan in condition 43 and condition 43A, incorporating any outcomes.*	This WMP has been updated following completion of the MPAR Capping Strategy to address Condition 60.
Condition 64	*64. Within three months, unless the Secretary agrees otherwise of:* *(a) the submission of the Environmental Monitoring Report under condition 44 above;* *(b) the submission of an incident report under condition 66 or 67 below;* *(c) any modification of this consent; or* *(e) a direction of the Secretary under condition 61 above;* *the Applicant must review and, if necessary, revise the studies, strategies or plans required under the conditions of consent to the satisfaction of the Secretary.* *Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted to the Secretary for approval, unless otherwise agreed with the Secretary.*	Condition 64 is not addressed by this WMP, which is separately required to be prepared under Condition 43. EnergyAustralia will review and, if necessary, revise the studies, strategies or plans required under the conditions of consent to the satisfaction of the Secretary, as required by Condition 64.

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Condition	Consent requirements	Section in this WMP where conditions are addressed
Condition 66	*66. The Applicant must notify the Department within 24 hours of becoming aware of an incident. The notification must be made via the NSW planning portal (Major Projects) and address details of the incident including:* *(a) date, time and location;* *(b) a brief description of what occurred and why it has been classified as an incident;* *(c) a description of what immediate steps were taken in relation to the incident; and* *(d) identifying a contact person for further communication regarding the incident.*	Section 11.1
Condition 67	*67. The Applicant must provide the Department with a subsequent incident report in accordance with Appendix 1*	Section 11.1
Condition 68	*68. Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing and must be submitted via the NSW planning portal (Major Projects). The notification must identify the development (including the development application number and name), set out the condition of this consent that the development is noncompliant with, why it does not comply, the reasons for the non-compliance (if known), and what actions have been undertaken, or will be undertaken, and when, to address the non-compliance.*	Section 11.1.
Condition 69	*69. Within three months of approval of Modification 9 and until the completion of all rehabilitation required under this consent, the applicant must:* *(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:* *the Environmental Impact Statement;* *all current statutory approvals for the project;* *all approved strategies, plans and programs required under the conditions of this consent;* *contact details to enquire about the project or to make a complaint;* *a complaints register, updated monthly;* *the Environmental Monitoring Reports of the project and the Applicant's response to the recommendations in any Environmental Monitoring Report;* *any other matter required by the Secretary; and* *(b) keep such information up to date.*	Section 10.9

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2.2 Environment Protection Licence 13007

The MPPS (including the MPAR and the LNAR) is also regulated under the Environment Protection Licence 13007 (EPL) granted under the Protection of the Environment Operations Act 1997 (NSW) (the POEO Act).

The EPL regulates the materials authorised for placement in the MPAR, along with monitoring and reporting requirements that are conducted in parallel to those outlined in this WMP.

This WMP reflects the surface water and groundwater quality monitoring requirements related to the Ash Repositories arising under the current conditions of EPL 13007 (as they apply as of the date of this WMP).

The EPL, as varied on 10 December 2025, included Condition U1: Wangcol Creek Remediation Feasibility Study "to address any potential ongoing impacts by seepage" from the MPAR to parts of Wangcol Creek. The Wangcol Creek Remediation Feasibility Study required by this condition was finalised and submitted to the EPA (ERM, 2026b).

The assessment of options is ongoing. The implementation of any options assessed as feasible in line with the Wangcol Creek Remediation Feasibility Study is not currently authorised by the Mt Piper Consent and will, if planned to be implemented, require further separate approvals.

2.3 Springvale Water Treatment Project

The Springvale Water Treatment Project (SWTP) was separately approved under State Significant Development (SSD) 7592 (the SWTP Consent) and operates adjacent to the MPPS. It treats mine water received from local mines (Springvale and Angus Place) for beneficial re-use at MPPS. The SWTP produces both liquid and solid waste brine streams which are placed in the Ash Repositories, as approved. See Section 3.6for more detail.

Condition 5 of Schedule 3 of the SWTP Consent requires implementation of an approved Brine and Residuals Management Plan which outlines how these waste streams will be managed at the MPAR and LNAR. A Brine and Residuals Management Plan (GHD, 2019) was approved under the conditions of the SWTP Consent (referred to as the BRWMP in this WMP).

As related to the Mt Piper Consent and operation of the MPAR, the BRWMP includes as an attachment the 2008 Water Management Plan that was subsequently updated and superseded by the 2020 Water Management Plan (see Table 1-1). It is intended that the BRWMP will be updated to include this WMP, when approved.

2.4 MPAR Environmental Management Framework

Noting that the MPAR and the LNAR are adjoining landforms, the 'Ash Repositories' are generally managed as a single operational facility; however, water, leachate, and other environmental aspects at each are managed through the LNAR Operational Environmental Management Plan (OEMP) (EnergyAustralia) (the LNAR OEMP) (for the LNAR) and this WMP (for the MPAR).

A Contractor is engaged to operate and maintain the MPAR on behalf of EnergyAustralia. The Contractor will be required to implement this WMP. EnergyAustralia works under an ISO 14001 Environmental Management System

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(EMS). To ensure EnergyAustralia systems are reflected in on-site practices implemented by the Contractor (see Appendix E), the Contractor engaged to operate MPAR shall also manage its process responsibilities under the framework of a Repository Operation Plan (ROP) prepared regularly by the Contractor to address forward operational work. Contractual arrangements will be put in place to meet the overarching requirements set out by this WMP. The ROP is the key document prepared to support the implementation of this WMP. The ROP references specific work procedures covering (amongst others) site planning, quality, sprinklers and pumps, ash placement testing, survey and mobile plant. The ROP will contain an operating protocol for the ash placement irrigation system, including activation rates, application rates and the area of coverage and means of dealing with water shortages. Separate technical specifications and installation requirements for the MPAR Phase 1 Capping and Drainage works and the MPAR Zone 2 LBMS and Capping will be provided to the Contractor by the approved designer/engineer via EnergyAustralia.

As operations progress, the ROP shall be reviewed and, if necessary, updated to meet the criteria set out by this WMP, while at the same time improving the design and environmental mitigation measures through a process of continuous improvement. This provides the contractor a guiding document for its operational plans to ensure the MPAR continues to run sustainability.

The roles and responsibilities for implementation of this WMP are detailed Appendix E

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3. Site Setting

3.1 Mining History

The MPAR and surrounding area have been subject to extensive open cut and underground mining activity since at least 1940 including beneath parts of the MPPS, the Ash Repositories and along the alignment of Wangcol Creek.

3.2 Climate

The MPAR is located midway between two long-term Bureau of Meteorology (BOM) rainfall gauging stations:

- Portland (Jamieson St, Station Number 63071), approximately 4 km west of the LNAR, elevation 925 metres Australian Height Datum (m AHD). The rainfall record spans 1923 to current (some gaps in late 1990/2000/2010s); and
- Lidsdale (Maddox Lane, Station Number 63132), approximately 4 km south-east of the LNAR, elevation 890 m AHD. The rainfall record spans 1959 to present.

In addition to these, temperature and rainfall data is available from:

- The Lithgow BOM weather station (Cooerwull, Station Number 63226) which is located approximately 15 km south-east of the MPAR, elevation 900 m AHD. The weather record spans 1878 to current; and
- The MPPS weather station which is located at approximately 956 m AHD, has available rainfall and temperature data for the period 2006 to current.

Based on the long-term records for these four rainfall gauge locations, the highest rainfall in the vicinity of the MPAR occurs in Spring and Summer (particularly November to March), while the lowest rainfall occurs in Autumn (particularly April and May).

Based on the long-term records for the two available temperature records (Lithgow and MPPS), the highest temperatures are in summer (December to February), while the lowest temperatures are typically in winter (June to August).

3.3 Topography and Hydrology

The MPAR is situated within a broad landscape of rolling plains, surrounded by mountain ridges. Elevation in the locality generally falls toward the east and south, along the alignment of Wangcol Creek, which flows to the east and south-east, and towards the Coxs River.

The MPAR is located within the former Huons Gully catchment. The former Huons Gully is a part of the Wangcol Creek catchment, which is part of the upper Coxs River Catchment. The downstream portion of Huons Gully formerly flowed directly to Wangcol Creek, beneath the LNAR footprint. However, surface water flow in the former Huons Gully was altered due to historical mining and ash placement activities. Operational water management arrangements for the MPAR are described in Section 6.

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3.4 Hydrogeology

Groundwater beneath the MPAR is present within the Illawarra Coal Measures, and the regional groundwater flow direction is generally to the east. The natural stratigraphy of the Illawarra Coal Measures in the vicinity of the MPAR is generally as follows:

- Bunnyong Sandstone (Long Swamp Formation) – massive sandstone;
- Lidsdale Coal Seam – interbedded high ash coal and shale;
- Blackmans Flat Conglomerate – coarse sandstone and conglomerate;
- Lithgow Coal Seam; and
- Marrangaroo Conglomerate – massive sandstone and conglomerate.

Considering the former mining in the area, and the current ash placement activities described below, anthropogenic lithologies in the vicinity of the MPAR include ash, fill and placed overburden, and underground mine workings.

Long-term groundwater monitoring near the Ash Repositories indicates that the water table occurs variably in the former underground mining and open cut areas and, away from the Ash Repositories, predominantly in the overlying Bunnyong Sandstone. The water table elevation range is approximately 910 m AHD to 919 m AHD in the vicinity of the MPAR.

3.5 Ash Placement History

Ash is produced at the MPPS includes bottom ash (~10%) and fly ash (~90%). Bottom ash is placed directly onto the Ash Repositories, either temporarily (i.e. recovered and reused) or permanently. Prior to the placement of fly ash within the Ash Repositories, it is conditioned to increase its moisture content in order to achieve required compaction and to maintain geotechnical stability of the Ash Repositories; it also assists in dust suppression. Fly ash is conditioned by the addition of either:

- Water, sourced in accordance with existing MPPS water licences and allocations including recycled process water and fresh (non-potable) water. Fly ash treated with water is referred to as Water Conditioned Ash (WCA). WCA is permitted to be placed within all areas of the MPAR and has been placed into the MPAR since 1993; or
- Brine, a by-product from:
    - Treatment of evaporative cooling water from the cooling towers of MPPS to remove salts and impurities. Treatment at the MPPS Brine Concentrators is approved under the Mt Piper Consent; and
    - The SWTP.

Fly ash treated with brine is referred to as brine conditioned ash (BCA). BCA was authorised to be placed into the MPAR within the MPAR Stage 1 (from 2000) and Stage 2 (from 2008) BCA placement areas at elevations above 946 m AHD (Figure 2). Placement of BCA in unlined areas of the MPAR has stopped. Following the approval of Mod 9, BCA is authorised to be placed above the purpose built MPAR Zone 2 LBMS. BCA is also placed in the lined cells of the LNAR as approved by Modification 1 to LNAR Project Approval.

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Within the MPAR, ash is placed in layers and stepped to produce an overall maximum batter slope of approximately 1(V):4(H), with benches added up to every 10 m in vertical height change.

The approved final surface elevation has been achieved in some portions of the MPAR, including elevations up to 980 m AHD in the Stage 1 and Stage 2 BCA placement areas.

As authorised by Mod 9, BCA is approved to be placed up to 980 m AHD in the MPAR with the engineered capping solution, topsoil and vegetation above this. Placement of BCA in unlined areas of the MPAR has stopped. Future BCA placement in the MPAR will be limited to Zone 2, following installation of the LBMS.

The elevation of WCA placement within MPAR Zone 2 is approximately 950 to 965 m AHD, but will be further altered following implementation of the MPAR Zone 2 works and associated ash placement operations. As required by Condition 58 of the Mt Piper Consent the MPAR Zone 2 LBMS and Capping design will be submitted to the Secretary prior to construction, with the approved design to dictate the liner elevation.

3.6 Site Interaction

This WMP applies only to the MPAR but it is relevant to understand the broader site context in which the MPAR operates.

The liquid brine waste from the MPPS brine concentrators and the SWTP is stored in Brine Waste Pond A and Brine Waste Pond B, located to the west of the MPAR and to the south of the MPPS power generating footprint (Figure 2).

The conditioning of fly ash as WCA or BCA occurs at the Ash Conditioning Plant within the power block of the MPPS, to the west and away from the Ash Repositories. The BCA or the WCA is then separately transported via conveyor to the repository silos located at the MPAR. The conditioned fly ash is subject to further wetting in the silos with water so that the ash contains the correct moisture content. From the silos, the conditioned ash is loaded into trucks and transported to approved placement areas. Figure 2 presents the location of the ash conditioning and transfer infrastructure.

As outlined above, the SWTP produces both liquid and solid waste brine streams which have been placed in the Ash Repositories. A proportion of the SWTP liquid brine stream is disposed of through the conditioning of fly ash as BCA, while the remainder is further refined to solid crystal form; this is referred to as Mixed Salts. The other solid brine by-product from the desalination process is Lime Salts. Together, the Mixed Salts and Lime Salts are referred to as Solid Mixed Salts. The Solid Mixed Salts are co-placed with BCA in the Ash Repositories and are restricted to areas that are approved to receive BCA.

Solid Mixed Salts are trucked to the Salt Receival Transfer Facility (SRTF). The SRTF receives the Solid Mixed Salts which are transferred in controlled quantities to an overland conveyor (at Transfer Point 2) which also carries BCA. As above for BCA, the BCA and Solid Mixed Salts are then conveyed to silos at the MPAR prior to being transported to approved placement areas within the Ash Repositories (Figure 2). Solid Mixed Salts may also be trucked directly to lined cells and manually placed with BCA.

Historically for the MPAR, brine waste streams were placed in the Stage 1 and Stage 2 BCA placement areas. BCA has stopped being placed in unlined areas of

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the MPAR. Future BCA and Solid Mixed Salts placement operations in the MPAR will be limited to Zone 2, following installation of the LBMS.

The Western Coal Services coal washery facility currently operates in the area immediately east of the Ash Repositories, including at the Reject Emplacement Areas (waste coal fines and water from the washery), waste residuals from the SWTP mine water treatment process (filtered solids and water from the SWTP), DML Dam and Cooks Dam

3.7 Groundwater Conditions

As a result of historical mining, ash placement and regional background conditions, groundwater in the vicinity of the MPAR is typically elevated in salts and metals, including sulfate, arsenic, copper, chromium, iron, nickel, and manganese as well as some trace elements such as boron (ERM, 2024b). Groundwater flow directions are inferred to be generally from west of the MPAR towards the east and south-east.

Routine groundwater monitoring data has indicated that BCA placement activities at the MPAR are influencing groundwater and surface water conditions in the vicinity of the Ash Repositories. The changing groundwater conditions were initially identified in relation to groundwater monitoring bore D10 (adjacent to the south-east of MPAR), where concentrations of chloride in groundwater increased from ~2010 to January 2016. Since that time, the concentrations of chloride at this location have stabilised.

Annual water quality monitoring completed from 2018 to 2024 (ERM, 2024b) which assessed results from an expanded groundwater monitoring network, further identified concentrations of chloride, sulfate, boron, manganese, nickel and total dissolved solids (TDS) at elevated concentrations in groundwater to the north-east, east and south of the MPAR. BCA historically placed within the MPAR is considered to be the main source of elevated solute concentrations in groundwater in the vicinity of the Ash Repositories.

Appendix D presents detailed contemporary data for the period 2014 to 2024 (i.e. pre-capping baseline data) as reported annually (ERM, 2024b) in accordance with the Mt Piper Consent. These monitoring locations are shown in Figure 3. The pre-BCA placement baseline data is presented in the Statement of Environmental Effects (PPI, 1999) prepared in relation to Modification 5 of Mt Piper Consent.

3.8 Surface Water Conditions

Surface water in Wangcol Creek is characterised by elevated concentrations of sulfate, iron and manganese, reflecting the nature of the local geology, which includes out cropping coal seams, many of which were previously mined. Concentrations of other constituents, including chloride, boron and nickel, have been recorded in surface water at Wangcol Creek and have been reported as elevated relative to background since ~2010 (ERM, 2024b).

Surface water monitoring in Wangcol Creek identified that concentrations of key indicator analytes (e.g. TDS and chloride) of leaching and seepage associated with BCA in MPAR, were typically higher at the midstream (SW_E) and downstream (WX22 and SW_G) monitoring locations which are associated with historical mining disturbance, compared to upstream (LMP01 to SW_C) monitoring locations.

Annual environmental monitoring reporting (ERM, 2024b) for MPPS has reported that the concentrations of key indicator analytes at midstream and downstream

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monitoring locations within Wangcol Creek are typically most elevated in October through March, during which time sporadic more elevated concentrations of key indicators have been reported. These higher concentrations coincide with late spring to early autumn, a period which is characterised by lower rainfall and higher evaporation, resulting in a greater relative contribution of groundwater inputs to the surface water system when compared to conditions during winter.

Appendix D presents detailed contemporary data for the period 2014 to 2024 (i.e. pre-capping baseline data) as reported annually (ERM, 2024b) in accordance with the Mt Piper Consent. These monitoring locations are shown in Figure 3. The pre-BCA placement baseline data is presented in the Statement of Environmental Effects (PPI, 1999) prepared in relation to Modification 5 of Mt Piper Consent.

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4. Independent Groundwater Investigation

EnergyAustralia has routinely monitored electrical conductivity (EC), major ions and trace metal concentrations in groundwater and surface water to assess potential effects from ash placement activities at the MPAR and the adjoining and separately approved LNAR. The monitoring results indicated elevated concentrations of TDS and other ions in surface water and groundwater in the vicinity of the MPAR. In this area, TDS is used as a marker for solutes that enter the local groundwater via leaching from BCA at the MPAR, and includes elevated chloride, sulfate and related dissolved metals.

Due to these monitoring results, in 2016, ERM was engaged to complete an investigation associated with the elevated concentrations of key indicator analytes in groundwater and surface water that have since been attributed to leaching and seepage associated with BCA placement within the MPAR. This investigation was implemented in accordance with the 2008 Water Management Plan, then approved under the Mt Piper Consent.

The following subsections outline the approach to and outcomes from the Independent Groundwater Investigation, which concluded that the elevated concentrations of TDS in groundwater in the vicinity of the Ash Repositories are predominately associated with the placement of BCA in the MPAR.

4.1 Summary of Approach

As part of the investigations, ERM established an approach for development of a numerical groundwater model (NGM) (ERM, 2019) which included the collection and assessment of field data, and development of a conceptual site model (CSM), groundwater flow model, and a solute transport model. The key outcomes from the modelling are outlined in the following subsections. The approach, outcomes and next steps for the groundwater flow and solute transport modelling have been presented to stakeholders at regular meetings.

4.2 Conceptual Site Model

A 3D hydrogeological CSM was developed as a transition to the development of the NGM. The data used to develop the model included groundwater monitoring well and level data, mining history and ash repository construction history, topographic data, and creek / surface water bathymetry data (where available). The CSM focused on Sources, Pathways, and Receptors (SPR), consistent with the NEPC (1999), National Environment Protection (Assessment of Site Contamination) Measure (the ASC NEPM) framework. The primary source of impacts to groundwater was identified to be the placement of BCA in the MPAR.

As part of the CSM, a 3D geological model was created using Leapfrog Works Version 3.0 visualisation software. This was then used to import features into the groundwater flow model.

4.3 Groundwater Flow Model

The NGM was used to investigate both sub-regional groundwater movement and to quantify groundwater migrating through the Site. The data consolidated as part of CSM development, along with the outcomes of groundwater flow modelling, is presented in the Groundwater Flow Model Report (ERM, 2023a).

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As reported by ERM (2023a), the conclusions of the NGM are as follows:

- The NGM results indicated that the predominant groundwater flow paths are eastward from the Ash Repositories towards the DML Dam and Cooks Dam, with some discrete flow pathways to the north-east and east, toward Wangcol Creek. These flow paths have developed as a result of the mined out geology east of the MPAR and the undisturbed geology beneath the Castlereagh Highway, north of the MPAR. The water from DML Dam is recirculated within the Western Coal Services (WCS) facility or migrates as seepage toward the historical Wallerawang Underground Mine and Eastern Main Underground Mine;
- The majority of groundwater flow at the Site is hosted in deeper flow paths or is intercepted by DML Dam. The majority of groundwater that is not intercepted by DML Dam is considered likely to remain within the groundwater environment, continuing as underflow towards the historical Wallerawang Underground and Eastern Main Underground mine workings to the east and north-east;
- The NGM results indicated that groundwater flow paths are controlled to a large degree by the high permeability mine voids and filled mined out areas that underlie the MPAR and much of the surrounding area; and
- The former open cut mine pits within the Wangcol Creek channel alignment extend to the coal seams and intersect groundwater, resulting in a direct connection of the groundwater and surface water systems at these mined out features. This represents a complete SPR linkage from the BCA placement to Wangcol Creek via solute transport within groundwater.

4.4 Solute Transport Model

An unsaturated vertical leaching model and solute transport model formed part of the NGM in order to investigate the migration of chloride and sulfate from BCA placed in the MPAR, to and within the underlying regional groundwater flow system. The NGM enabled assessment of solute transport outcomes based on potential mitigation scenarios for MPAR.

The mitigation scenarios modelled were primarily focussed on assessing the effects of managing recharge over the MPAR, thus affecting volume and timing of infiltration and the resulting solute concentrations that migrate beyond the base of the MPAR into the underlying groundwater system for each scenario.

The unsaturated vertical leaching model and solute transport model outcomes are presented in the Solute Transport Model Report (ERM, 2023b). As reported by ERM (2023b), the main conclusions from the solute transport modelling are:

- Simulated chloride and sulfate concentrations indicate peak concentrations in groundwater would occur in approximately 2035 – 2050 depending on location and modelled mitigation scenario;
- Except for those scenarios that included the capping of all of the BCA placement areas in the MPAR with a low permeability cap, simulated concentrations in most areas of the active model domain were above the Environmental Goals for different physical extents and at different time periods; and
- The simulation of the currently approved decommissioning scenario (cover with WCA then mine spoil overburden material) indicated that, although there was a slight decline in initial solute concentrations, source term inputs persist

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resulting in modelled chloride and sulfate concentrations that remained above the Environmental Goals over a relatively extensive area and period following decommissioning of the MPAR.

The results of the unsaturated zone modelling within the MPAR and the solute transport modelling indicated that a targeted capping scenario would be an effective mitigation measure that would limit the concentrations of chloride and sulfate leaching from the MPAR.

In particular, the modelling indicated that capping a targeted area under the "targeted capping scenario" (described as Scenario 3a in ERM, 2023b) with a low permeability ($1x10^{-9}$ m/s) cap would result in significant reductions in modelled concentrations compared to those predicted if operational conditions continued, or the previously approved decommissioning scenario was to be implemented. While the modelled concentrations from the targeted capping scenario were not always below all relevant Environmental Goals, the modelled outcomes represent a significant improvement in surface and groundwater quality and would deliver better environmental outcomes than the previously approved decommissioning scenario.

The Solute Transport Model Report (ERM, 2023b) shows the modelled outcomes for the targeted low permeability cap and for the previously approved decommissioning strategy. Concentrations that remained above the Environmental Goals (predominantly sulfate) under the targeted capping scenario were due to the ongoing contribution from rehabilitated areas of MPAR outside of the proposed footprint of the low permeability cap (i.e. older BCA placement areas that had previously been rehabilitated in accordance with the Mt Piper Consent prior to Mod 9).

4.5 Upper Cap Assessment

Following further consideration of capping of the existing MPAR landform (including the existing batters, benches and access roads), a capping extent that was considered feasible for implementation (the feasible option; Scenario 3 in the addendum modelling letter, ERM, 2023c) was selected for further assessment using the unsaturated zone model.

The revised MPAR Phase 1 Capping footprint was selected due to the potential risks identified in relation to placing a very low permeability cap over the existing batter slopes, including potential future geotechnical instability, erosion, and slope failures for fill materials placed over the very low permeability layer, which made implementation of capping over the existing rehabilitated batters, benches and access roads not feasible.

The revised MPAR Phase 1 Capping footprint was modelled, as described in ERM (2023c), with the modelling indicating that reducing the extent of low permeability capping increases the modelled solute mass loading estimates to groundwater but that the modelled solute mass loading to groundwater remains lower than would result from rehabilitation in accordance with the arrangements previously approved for the MPAR under the Mt Piper Consent prior to Mod 9.

Accordingly, Mod 9 was submitted and approved which authorises a low permeability cap over the currently or recently active BCA placement areas, as described in Section 1.

In addition to the MPAR Phase 1 Capping, ERM (2023c) introduces the concept of augmented recharge controls and continued rehabilitation for BCA areas within the MPAR that extend beyond the proposed the MPAR Phase 1 Capping footprint.

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The concept of recharge control over BCA placement areas through MPAR Phase 1 Capping and Drainage, and additional rehabilitation, revegetation or other controls for the existing batters, to be described in the MPAR Capping Strategy, remains a key component of the overall mitigation options assessment, as discussed in Section 5.

4.6 Summary of Modelled SPR Linkages

As described in the Groundwater Flow Model Report (ERM, 2023a), the primary pathway for migration of solutes derived from BCA in the MPAR is considered to be by the vertical migration of leachate (water sourced from rainfall and irrigation across the MPAR) down through the BCA placed within the MPAR. Once the leachate reaches the base of the ash at MPAR, the vertical migration of leachate is assumed to continue until it reaches and mixes with the regional water table that underlies the Site.

Groundwater that flows to the east from the MPAR is primarily received by DML Dam and Cooks Dam due to the higher hydraulic conductivity of mined out areas. A portion of the groundwater that flows to the north-east and east from the MPAR is received by Wangcol Creek at Areas D, E and G, as indicated by relative groundwater and creek elevations where former open cuts are present in the creek. The groundwater flow model indicates that groundwater is also likely to continue as underflow beyond Wangcol Creek, towards the historical Wallerawang Underground Mine and Eastern Main Underground Mine. There are no registered users of groundwater in proximity to the Site, and one registered domestic household bore located east of the historical Eastern Main Underground Mine, approximately 3 km south-east of the MPAR (ERM, 2023a).

Portions of Wangcol Creek in the vicinity of the MPAR receive groundwater that is impacted by seepage of BCA leachate from the MPAR. Consequently, these sections of Wangcol Creek and their associated ecosystems and downstream waterways are receptors of groundwater that have the potential to be impacted as a result of previous BCA placement in the MPAR.

4.7 Implemented and Proposed Leachate Management Strategies

4.7.1 LNAR Mod 1

In parallel to the Independent Groundwater Investigation, in September 2021, the LNAR Project Approval was modified to authorise amendments to the design and operations of the LNAR (LNAR Mod 1), principally, the installation of a LBMS, along with the collection and treatment of leachate moving through the ash placed above the liner. The LNAR Mod 1 was implemented based on the findings from the Independent Groundwater Investigation to mitigate leaching and seepage associated with BCA that was planned to be placed in LNAR. No BCA was placed in the LNAR prior to installation of the LBMS approved by LNAR Mod 1. Similarly, Mod 9 authorises the MPAR Zone 2 LBMS and Capping works.

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4.7.2 Overview of BCA Leachate Management Strategies

Consistent with Mod 9 (and where relevant, LNAR Mod 1) BCA leachate management strategies for the Ash Repositories that have been implemented or are planned as a result of the Independent Groundwater Investigation, include:

Strategies being implemented in the short term

- Placement of BCA in lined cells with LBMS, i.e. LNAR Mod 1 and MPAR Zone 2;
- Water/leachate operational management, including:
    - Covering and rehabilitating ash placement areas quickly following completion;
    - Separation of clean and ash contact water streams; and
    - Recirculation of BCA leachate within lined BCA placement areas.
- MPAR Phase 1 Capping, MPAR Zone 2 LBMS and Capping with low permeability materials;
- Improved drainage from the MPAR batters and benches;
- Increased clean water flows to Wangcol Creek, resulting from the MPAR Phase 1 Capping and Drainage, and the MPAR Zone 2 Capping; and
- Increased clean water flows from completed and capped LNAR Stage 1 areas to the east and primarily towards DML Dam.

Each of the management strategies listed above will mitigate the continued leaching of solutes from BCA to groundwater in the longer-term, or in the case of increased clean water flows to Wangcol Creek and/or diversion of Wangcol Creek, provide for receptor controls to mitigate the discharge of groundwater to surface water in the longer-term.

Strategies being assessed for implementation in the medium term

- Soil amelioration (if and where warranted) and improved revegetation; and
- Alternate cover systems and/or recharge controls for the MPAR batters and benches.

These water and leachate management strategies are appropriate to be implemented for the MPAR as it transitions from active ash placement to a stable managed and decommissioned landform. Further details are presented in the following sections.

Each of the above strategies is being further assessed and will be confirmed and refined as part of this WMP and the updated Capping Strategy as required by the Mt Piper Consent.

Strategies for further planning and consideration

- Continued rehabilitation and revegetation improvements;
- Increased clean water flows to Wangcol Creek, as above and including water from the SWTP and/or Fish River Supply Scheme or other approved water supply;
- Diversion of Wangcol Creek flows around former mined open cuts in the creek; and
- Long-term management to preserve the opportunity for beneficial re-use of ash.

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Each of the strategies for further planning and consideration will continue to be assessed and reviewed as potential options leachate and water management at the MPAR as it transitions from active ash placement to a stable, managed, and decommissioned landform.

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5. MPAR BCA Leachate Management Strategies

The BCA leachate management strategies that are being implemented in the short and medium term at MPAR are considered to be reasonable and feasible as the facility transitions from active ash placement to a stable managed and decommissioned landform. The following subsections provide a summary of the decommissioning objectives for the MPAR and more detail regarding the BCA leachate management strategies currently being implemented, including those implemented as part of the MPAR Capping Strategy prepared in response to Condition 59 of the Mt Piper Consent.

5.1 Environmental Performance Objectives

The high-level objectives for the decommissioning of the MPAR are:

- The MPAR should be safe, stable and non-polluting;
- The MPAR should be a free draining landform;
- The MPAR will remain a managed landform and ancillary facility for ongoing operations at LNAR and MPPS; and
- The MPAR landform should be consistent with the surrounding environment, including vegetation groups.

The management approach needs to be flexible to allow for the consideration of new information and the potential for re-use of ash in the future if deemed feasible. The key water management measures are presented in the Capping Strategy (ERM, 2026c) as outlined in the following subsections.

5.2 Recharge Control Strategies

Recharge control at the MPAR (i.e. source control) was identified as the preferred mitigation option to control groundwater impact related to the MPAR in the longer term. The source control option (through capping, enhanced surface water runoff and augmented recharge controls) provides a means of reducing the volume, and increasing the timeframe, of infiltration through the MPAR, thus reducing the resulting solute concentrations that migrate beyond the base of the MPAR into the underlying groundwater system and ultimately receiving surface water. Source control through recharge reduction is considered to be the most reasonable and feasible mitigation option for implementation once the MPAR reaches its final approved ash placement extent. Implementing strategies that do not limit the beneficial re-use of MPAR has been a key consideration during assessment of potential recharge control strategies.

The recharge control strategies for the MPAR are captured in three main work streams for decommissioning the MPAR, as described below.

5.2.1 MPAR Phase 1 Capping and Drainage

As approved in Mod 9, and described further in Section 6.1.2, the MPAR Phase 1 Capping involves installation of a low-permeability engineered capping layer on the top section of the MPAR to mitigate infiltration of water (recharge) and subsequent leachate generation from BCA into underlying groundwater. The MPAR Phase 1 Capping will provide ongoing leachate management for the upper section of the MPAR that contains the most recently placed BCA and Solid Mixed

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Salts. The capping of the upper section of the MPAR will also provide a better opportunity for potential beneficial reuse of ash placed in the MPAR in the future, subject to further assessment of reuse options and their feasibility, when compared to a more extensive capping scenario.

The detailed designs for the MPAR Phase 1 Capping and Drainage works and the MPAR Zone 2 LBMS and Capping have improved the design of surface water drainage from the MPAR. The improved drainage design further supports recharge control and legacy leachate management at MPAR by reducing the residence time of clean runoff and therefore the potential for its infiltration. Reduced infiltration will reduce recharge to the underlying BCA, thereby reducing the rate of leachate production and seepage from previously placed BCA in the MPAR to the underlying groundwater system. The improved drainage arrangements will also increase the volume of clean water flows from the MPAR to Wangcol Creek.

5.2.2 MPAR Zone 2 LBMS and Capping

A LBMS, as required by Mod 9 to the Mt Piper Consent, will be installed on the eastern end of the MPAR (Zone 2) prior to the placement of BCA and Solid Mixed Salts above the liner in that area. The MPAR Zone 2 LBMS will include a leachate collection system that will be integrated with the existing LNAR leachate management system, which is managed under the LNAR OEMP. It will include suitable pipes and pumps to transfer leachate captured from MPAR Zone 2 prior to its transfer to the LNAR and MPPS water management system for storage and treatment. Following the completion of ash placement activities, a low-permeability engineered capping layer will be installed to achieve the maximum approved height of MPAR as required by Mod 9. The MPAR Zone 2 LBMS will provide ongoing leachate management for the upper section of the MPAR that will contain BCA and solid mixed salts that are yet to be placed.

5.2.3 MPAR Batters and Benches

As the MPAR Phase 1 Capping and Drainage has been designed over a portion of the historical MPAR BCA placement footprint, additional recharge control options for the uncapped historical BCA placement areas at the MPAR (i.e. to cover the entire Stage 1 and Stage 2 BCA placement footprint) are warranted. Therefore, in addition to the MPAR Phase 1 Capping and Drainage improvements, EnergyAustralia has assessed the potential need for soil amelioration (where warranted), improved revegetation approaches and alternate cover systems for the MPAR batters.

The approach and findings are presented in the Assessment of Additional Recharge Control Options ERM (2026a) which included field investigation, laboratory analysis and additional modelling of specific recharge control scenarios. The outcomes of the assessment are presented in the MPAR Capping Strategy (ERM, 2026c), and are summarised as follows:

- The ERM (2026a) assessment of additional recharge control options predicted similar performance improvements for each of the grass and/or shrub cover arrangements for assessed for batter slopes outside of the MPAR Phase 1 Capping footprint, both in terms of reduction in net percolation and reduction in cumulative solute mass discharged from the BCA to underlying groundwater;
- The ERM (2026a) assessment identified that application of ground cover vegetation on all MPAR batters >946 m AHD is the most reasonable and feasible additional recharge control option given that a mixture of grasses and shrubs is unlikely to have a material benefit over ground cover vegetation.

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Further, ground cover vegetation is likely to be more practical to implement as it is easier to establish and maintain when compared to a mixture of grasses and shrubs, and it will also require less bushfire risk management; and

- Laboratory testing indicated that some level of soil improvement will be required to assist with revegetation efforts on MPAR batters. The degree of soil improvement will depend on the groundcover vegetation species/mix selected for planting. Therefore, an assessment of suitable ground cover species and associated amelioration requirements will be conducted to inform the implementation of rehabilitation efforts on the batters as an additional means of recharge control at the MPAR.

The assessment of suitable groundcover species and associated amelioration requirements is ongoing. The ongoing assessments will include an interim ground cover strategy that includes species that do not present limitations for potential future ash reclamation and beneficial reuse. The interim ground cover strategy will also consider vegetation that is resilient to local climatic conditions and will consider bushfire risk management.

5.2.4 Summary

Implementation of the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS works will improve surface water drainage from the MPAR. The improved drainage, combined with the implementation of additional recharge controls for the MPAR batters and benches further supports legacy leachate management at MPAR by limiting the potential for clean runoff to infiltrate into MPAR. Reduced infiltration will reduce recharge to the underlying BCA, thereby reducing the rate of leachate production and seepage from previously placed BCA in the MPAR to the underlying groundwater system. The improved recharge control and drainage arrangements will also increase the volume of clean water flows from the MPAR to Wangcol Creek, ultimately resulting in improved water quality outcomes in Wangcol Creek in the long-term.

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6. MPAR Water Management Systems

A site water balance was prepared as part of the WIA and provided as part of the Mod 9 application. Key outcomes from the site water balance and the WIA, including internal catchment management and off-site surface water flows, are described in this section.

This section also describes the water management and mitigation measures for the MPAR that are applicable to the implementation of the MPAR Phase 1 Capping and Drainage works and the MPAR Zone 2 LBMS and Capping works, and for the entire MPAR as it approaches decommissioning, following the cessation of MPAR ash placement operations.

6.1 Ash Repositories Water Management System

The Ash Repositories' water management system is interconnected with the MPPS water management system, which can provide additional water/brine supply or water/brine storage to the Ash Repositories as needed.

6.1.1 Catchment Areas

The MPAR includes five surface water catchment areas. The operational changes authorised by Mod 9 will result in changes to the surface water reporting relative to the prior arrangements, as described in Table 6-1. While these catchments are intended to result from the works authorised by Mod 9, detailed design may result in minor deviations from these catchment arrangements. However, any deviations will maintain the intent, such that clean water is directed from the final MPAR surfaces to Wangcol Creek throughout MPAR operations, as the MPAR Phase 1 Capping and Drainage and MPAR Zone 2 Capping, and the additional recharge controls are completed progressively.

Table 6-1 MPAR Surface Water Catchments

Catchment	Prior reports to	Mod 9 reports to	Description
MPAR Surface	LNAR 5 pond	Wangcol Creek	Top surface of the MPAR. Water currently reports as runoff to LNAR 5 Pond. Following installation of the MPAR Phase 1 Capping and Drainage. In this area this runoff will report to Wangcol Creek via a drop structure and energy dissipator, and these flows will be managed in accordance with the surface water drainage and discharge designs presented in Section 6.1.2, and water management measures presented in Section 7.
MPAR Western External Batter	SW1	Wangcol Creek	Rehabilitated western batter of the MPAR. Currently reports to stormwater runoff pond SW1. Following installation of the MPAR Phase 1 Capping and Drainage in this area this runoff will report to Wangcol Creek via a drop structure and energy dissipator, and these flows will be managed in accordance with the surface water drainage and discharge designs presented in Section 6.1.2 and water management measures presented in Section 7.

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Catchment	Prior reports to	Mod 9 reports to	Description
MPAR Northern External Batter	SW1	Wangcol Creek	Rehabilitated northern batter of the MPAR. Currently reports to stormwater runoff pond SW1. Following installation of the MPAR Phase 1 Capping and Drainage in this catchment, and as per GHD (2025), this runoff will report to Wangcol Creek via a drop structure and energy dissipator, and these flows will be managed in accordance with the surface water drainage and discharge designs presented in Section 6.1.2, and water management measures presented in Section 7.
MPAR Southern External Batter	SW2	SW2	Rehabilitated southern batter of the MPAR. Currently reports to stormwater runoff pond SW2 and will continue to do so in the future.
MPAR Zone 2	LNAR 4 pond	LNAR 3 Pond and LNAR 5 Pond	MPAR Zone 2 area currently reports to LNAR 4. Following installation of the MPAR Zone 2 LBMS this will report to LNAR 3 Pond and LNAR 5 Pond.

6.1.2 MPAR Phase 1 Capping and Drainage

6.1.2.1 MPAR Phase 1 Capping

The MPAR Phase 1 Capping design (GHD, 2025) comprises (from top to bottom):

- 1 m thick layer of vegetation growth medium and associated revegetation;
- Sub-surface drainage (within or immediately below the growth medium);
- Linear low-density polyethylene (LLDPE) geomembrane liner; and
- Seal bearing layer (consisting of placed ash material).

The MPAR Phase 1 Capping over a targeted portion of the Stage 1 and Stage 2 BCA placement areas is intended to provide a low permeability cap over the currently or recently active BCA placement areas, beneath which a high mass of salts is stored. The design intent is to possess sufficient strength, flexibility and durability to ensure performance throughout the MPAR decommissioning process and post-closure.

Runoff from exposed areas of ash (BCA and/or WCA) in the MPAR Stage 1 and Stage 2 BCA placement areas will be interconnected and managed via the LNAR leachate management system until the MPAR Phase 1 Capping and the Zone 2 Capping works are completed.

The MPAR Phase 1 Capping area will be progressively rehabilitated and revegetated. The Technical Specification for the MPAR Phase 1 Capping outlines that the Contractor shall develop a revegetation strategy for the Works to facilitate the long-term stabilisation of the capped surface in line with the LNAR Operational Environmental Management Plan. This revegetation strategy shall outline the proposed materials to be used and any amelioration to be undertaken to support vegetation growth, vegetation selection (including use of an initial nurse/cover crop if deemed appropriate) and ongoing maintenance requirements both prior to and following Practical Completion. The plan shall include description

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of any field trials to be undertaken to inform the strategy. The plan shall be reviewed and approved by the Contractor Manager prior to installation.

Further details pertaining to additional rehabilitation, revegetation or other controls for the existing batters were prepared as part of the MPAR Capping Strategy, as detailed in Section 5.2.3.

6.1.2.2 MPAR Phase 1 Drainage

As detailed by GHD (2025), the surface water drainage and discharge designs that form the MPAR Phase 1 Drainage include:

- Chute and bench toe design, including:
    - Chute Drains, with a 300 mm compacted subgrade topped with 300 mm rock mattresses (D50: 100 - 150 mm), underlined with geotextile (for erosion control) and a geomembrane (for seepage control).
    - Bench Toe Drains, as either:
        - Type 1: Topsoiled and grassed, for a maximum velocity of 1.5 m/s. This type varies in depth at MPAR between 500 mm where the geomembrane is located to 700 mm where no geomembrane will be constructed; and
        - Type 2: 400 mm thick rock layer (D50: 200 mm) or a 170 mm thick rock mattress (D50: 70 - 100 mm) for a maximum flow velocity of 2.5 m/s.
    - Outlet Channels, as either:
        - Type 1: Either a 400 mm thick rock layer (D50: 200 mm) or a 170 mm thick rock mattress (D50: 70 - 100 mm), giving the Contractor the option, for a maximum velocity of 3 m/s; and
        - Type 2: 300 mm thick rock mattress (D50: 100 - 150 mm) for a maximum velocity greater than 3 m/s but less than approximately 5 m/s.
- Stilling Basins / Energy Dissipators which have been designed to include the interface with the outlet channels, designed levels and fall, rock mattress and gabion baskets.

As outlined by GHD (2025), no low permeability liners are proposed for the MPAR Phase 1 Drainage as the system is intended to formalise the surface water drainage across the existing batters and benches to reduce the potential for surface water infiltration. GHD (2025) provides the following additional justification for this:

- Channels and chutes shall be formed at minimum grades to mitigate build-up and ponding of surface water within these drainage features, and due to flow velocities within the chutes, negligible infiltration is expected; and
- Liners may present potential for stability issues through introduction of lining materials, in particular when considering peak flows and potential erosion/scour.

The surface water general arrangement plan from the detailed design package for the MPAR Phase 1 Drainage (GHD, 2025) is presented as Figure 6-1 below. GHD (2025) also provides typical section drawings and the design technical specifications and should be referred to in review of this WMP.

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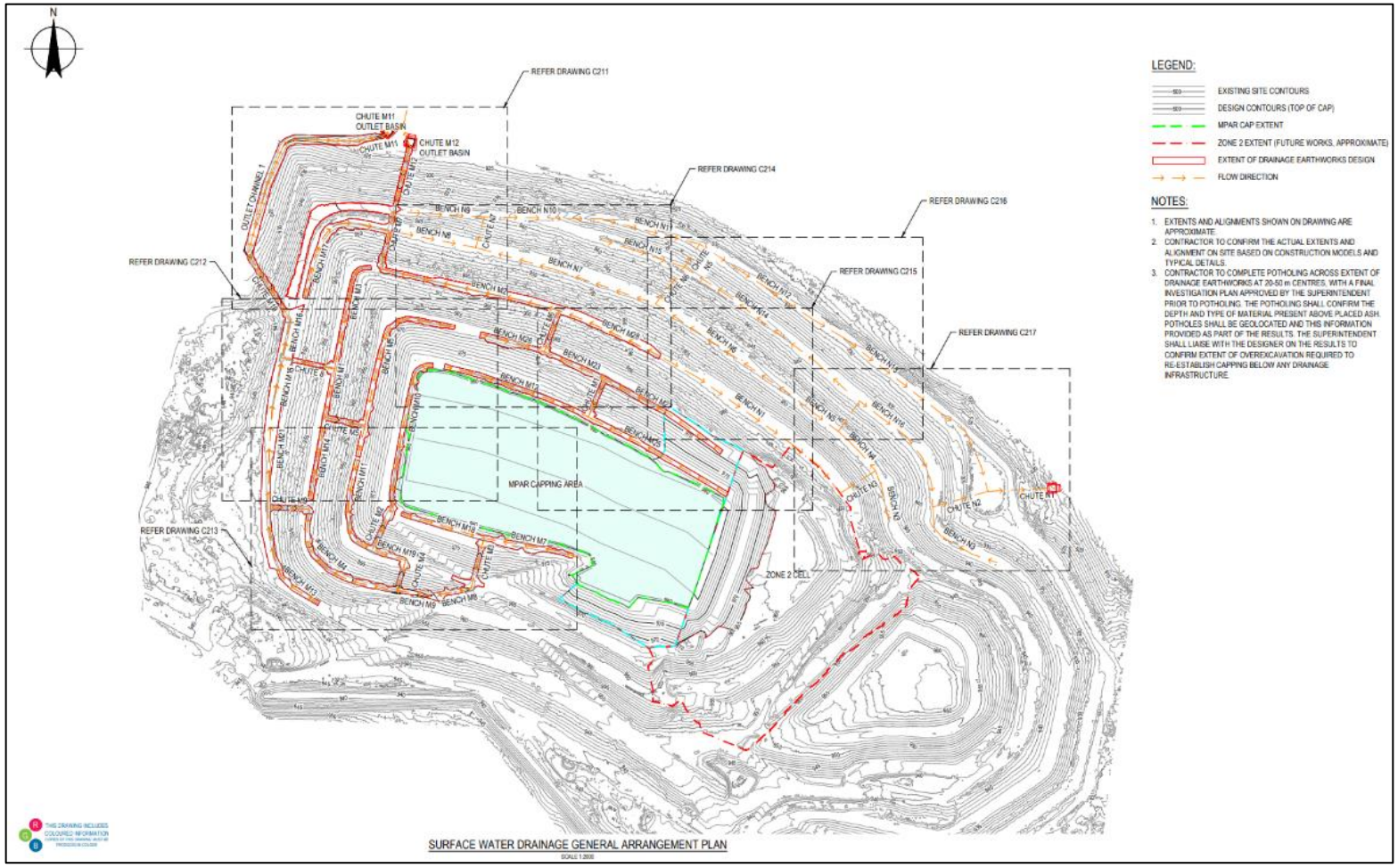


Figure 6-1 MPAR Surface Water Drainage General Arrangement Plan (GHD,2025)

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6.1.3 MPAR Zone 2 LBMS and Capping

6.1.3.1 Leachate Barrier System

A leachate barrier system will be installed as part of the MPAR Zone 2 LBMS through staged installation of a single high-density polyethylene (HDPE) or linear low-density polyethylene (LLDPE) liner, geocomposite or equivalent (liner) to suitable design specifications based on EPA (2016) Solid Waste Landfill Guidelines. The leachate barrier system will include:

- Placement of a geotechnical base layer using WCA (and/or other materials as per the detailed design technical specifications) with subsequent drainage/grading preparation (as required) and installation of the liner;
- Staged installation of the liner, including sidewall liner and capping liner, to suitable design specifications based on EPA (2016) Solid Waste Landfill Guidelines; and
- Leachate collection system, including placement of drainage aggregate, drainage pipework (as required) followed by geotextile or other equivalent material(s) for leachate management, and leachate sump and riser and connecting pipework.

6.1.3.2 Leachate Management System

As part of the MPAR Zone 2 LBMS, the leachate barrier system will be supported by a leachate management system to capture, store and transfer leachate and runoff from the MPAR Zone 2 LBMS to the LNAR leachate management system, to which the LNAR OEMP applies.

The LNAR Zone 2 LBMS includes internal leachate drainage lines which follow the general gradient of the prepared subgrade. This gradient will be designed to direct leachate to leachate collection sumps, where the leachate is extracted from risers and into transfer pipelines for collection in the existing double HDPE lined multipurpose storage ponds at the LNAR, and other ponds may be constructed as required by the detailed design specifications for the Ash Repositories. The leachate management system will be designed to operate effectively until the MPAR Zone 2 Capping is completed and the MPAR Zone 2 ash placement areas are considered stable.

The existing double HDPE lined multipurpose storage ponds storages, which are located within the LNAR footprint and managed under the LNAR OEMP, have the ability to pump water from in between the two liners, along with a sump for leak detection using a dip meter, and the ability to pump out water leaks. The leak detection sump will be checked monthly by the Contractor.

As part of both MPAR Zone 2 LBMS and LNAR operations, the volume of stored leachate will be managed via recycling for dust suppression within the lined BCA placement areas of the Ash Repositories, use of vaporisers, or leachate may be transferred to the MPPS for treatment for use as an alternate source of water for inclusion in the MPPS water management system for electricity generation as needed.

6.1.3.3 MPAR Zone 2 Capping

An engineered capping layer will be installed following the completion of ash placement in MPAR Zone 2 LBMS. The MPAR Zone 2 LBMS Capping will be designed and implemented in general accordance with the MPAR Phase 1 Capping, subject to the detailed design that will be in general accordance with EPA (2016) Solid Waste Landfill Guidelines. Following the completion of ash

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placement operations at the MPAR, the MPAR Zone 2 LBMS Capping will be tied in with the MPAR Phase 1 Capping, to form a capped surface across the upper portion of the MPAR. The MPAR Phase 1 Capping will be progressively rehabilitated and revegetated in line with the approach outlined for the MPAR Phase 1 Capping.

6.1.4 LNAR Leachate Management System

The LNAR leachate management system will also be designed and implemented in general accordance with the EPA (2016) Solid Waste Landfill Guidelines, as well as in accordance with requirements of LNAR Project Approval as modified, as outlined in the LNAR OEMP. The LNAR leachate management system includes double HDPE lined storage ponds (LNAR 3 and LNAR 5) to manage leachate and runoff from BCA placement as well as surface water runoff from active WCA placement surfaces prior to completion of MPAR Phase 1 Capping MPAR and from the Zone 2 LBMS and Capping area. The storage ponds are adequately sized to provide suitable storage volume for leachate and surface runoff derived from the lined areas. Where possible, leachate and runoff from active ash placement surfaces will be recycled for dust suppression within the lined areas or transferred to MPPS for treatment (if of a suitable quality) and used in electricity generation. Further details pertaining to available storage ponds is presented in the following subsection.

6.1.5 Storage Ponds

The Ash Repositories water management system includes multiple storage ponds as indicated in Table 6-1 above. In addition, Settling Pond A to Settling Pond D are double-lined storage ponds at the MPPS that provide additional storage capacity to receive water transferred from the Ash Repositories if LNAR 2 to LNAR 5 ponds approach full operating levels. Further, Brine Waste Pond A and Brine Waste Pond B are double-lined storage ponds at the MPPS that provide temporary storage of brine prior to its use in ash conditioning.

Table 6-2 presents an overview of the storage ponds at the MPPS and the Ash Repositories, including the relationships between each. The storage ponds and their intended uses should be reviewed in the context of the MPAR Zone 2 LBMS leachate monitoring management plan (Section 9).

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Table 6-2 Water Storage Ponds at The MPPS and The Ash Repositories

Location	Storage Feature	Size	Liner	Input and output arrangements
MPAR (managed via this WMP)	SW1	5 ML	Unlined	**Inputs:** Catchment for runoff from external batters of the MPAR. **Outputs:** Source of water for irrigation as needed or may be transferred to LNAR 2 and LNAR 4 Ponds as needed to maintain freeboard. To be infilled following installation of the MPAR Phase 1 Capping and Drainage in the MPAR Northern External Batter area
	SW2	1 ML	Unlined	**Inputs:** Catchment for runoff from external batters of the MPAR. **Outputs**: Source of water for irrigation as needed or may be transferred to LNAR 2 and LNAR 4 Ponds as needed to maintain freeboard.
LNAR (managed via the LNAR OEMP)	LNAR 2 Pond	13.8 ML	HDPE, double	**Inputs:** Catchment for runoff from external batters of the LNAR. Works in tandem with LNAR 4 to receive water from SW1 and SW2 to maintain freeboard. **Outputs:** Source of water for irrigation of MPAR and LNAR as needed. May be transferred to the additional storages in the MPPS area as needed.
	LNAR 3 Pond	20.5 ML	HDPE, double	**Inputs:** Runoff or leachate from the active ash placement areas. **Outputs:** Source of water for irrigation of the BCA placement areas. May be transferred to the additional storages in in the MPPS area as needed.
	LNAR 4 Pond	17.6 ML	HDPE, double	**Inputs:** Works in tandem with LNAR 2 to receive water from SW1 and SW2 to maintain freeboard. **Outputs:** Source of water for irrigation of MPAR and LNAR as needed. May be transferred to the additional storages in the in the MPPS area as needed.
	LNAR 5 Pond	19.1 ML	HDPE, double	**Inputs:** Runoff or leachate from the active ash placement areas. **Outputs:** Source of water for irrigation of the BCA placement areas. May be transferred to the additional storages in the in the MPPS area as needed.
Ash Repositories	Internal detention basins	Various, unlined		**Note:** These internal detention basins may be installed as part of future BCA placement within the Zone 2 LBMS footprint (i.e. above lined areas). These are temporary surface water management controls

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Location	Storage Feature	Size	Liner	Input and output arrangements
				used to minimise the potential for erosion and scouring of the ash placement areas. BCA runoff detention basins outside the Zone 2 LBMS footprint would be lined (e.g. similar to LNAR 2-5 Ponds). **Inputs:** Surface water runoff from the future BCA placement within the Zone 2. **Outputs:** Source of water for irrigation of the BCA placement areas, with transfer to LNAR 3 and LNAR 5 Ponds as needed.
Power Station Area	Mine Water Buffer Pond	100 ML	HDPE, double	**Inputs:** From the SWTP, or excess from Settling Pond D. **Outputs:** To MPPS Cooling Water System or transferred to the Thompsons Creek Reservoir.
	Settling Pond A	8 ML	HDPE, double	**Inputs:** Wash down water from within the power generation units. **Outputs:** Source of water for irrigation of the WCA/BCA placement areas, Ash Plant.
	Settling Pond B	8 ML	HDPE, double	
	Settling Pond C	8 ML	HDPE, double	
	Settling Pond D	60 ML	HDPE, double	**Inputs:** Multi-use storage pond to provide storage redundancy for a number of process streams at MPPS. Settling Pond D will receive flows from Settling Pond A – Settling Pond C, the Coal Settling Pond, and from areas of the Ash Repositories and the SWTP as required. **Outputs:** Mine Water Buffer Pond.
	Brine Waste Pond A	22 ML	HDPE, double	**Inputs:** Brine Concentrators / SWTP. **Outputs:** Ash conditioning for BCA placement in the MPAR and LNAR.
	Brine Waste Pond B	26 ML	HDPE, double	
	Coal Settling Pond	32 ML	unlined	**Inputs:** Runoff from the coal stockpile area. **Outputs:** Evaporation, discharge to the Final Holding Pond, transfer to Settling Pond D.
HDPE = High-Density Polyethylene				

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7. MPAR Soil and Water Management Plan

7.1 Potential Sources of Soil Erosion and Sediment Generation

The following potential sources of soil erosion and sediment generation have been identified for the ongoing ash placement and decommissioning activities at the MPAR;

- Civil and construction works required to install the operational improvements approved under Mod 9, including MPAR Phase 1 Capping and Drainage (including the energy dissipators), and the MPAR Zone 2 LBMS and Capping; and
- Ash repository operations and water management, including;
    - Ash placement activities;
    - Use of roads that can cause soil movement if not maintained regularly;
    - Heavy rainfall events that can collect sediments as they flow through drainage lines if not maintained regularly;
    - Use of plant and machinery on site that can cause soil movement and erosion if not operated correctly;
    - Overwatering of the ash if application rates are not adjusted to current metrological conditions;
    - Leaving exposed surfaces uncapped for prolonged periods which has the potential to increase erosion and sedimentation; and
    - Irrigation and storm water management, including improved drainage from the existing batters and benches.
- Power station water management (i.e. the network of pipes, pumps and storage associated with the MPPS) in the event of leaks or infrastructure failure.

As outlined in previous sections, in addition to MPAR, there are current and former activities in the vicinity of the Site that have the potential to act as sources of impact to groundwater and surface water (e.g. historical mining activities, the neighbouring Western Coal Services coal washery facility, and mine water management via the SWTP). These will also be considered, along with potential sources of soil erosion and sediment generation, in the context of monitoring data and reporting as described in Section 10.

Water management measures intended to mitigate these potential sources of soil erosion and sediment generation are outlined in the following subsections.

7.2 Soil and Water Management Measures

The MPAR operations will adhere to the water management principles described in the following subsections.

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7.2.1 General Measures

The following general soil and water management measures shall be implemented when carrying out the works approved under the Mt Piper Consent:

- Erosion and sediment controls (ESC) will be developed and implemented progressively to align with the progress of MPAR activities. These controls have been and will continue to be developed in general accordance with the minimum standards presented by DCCEEW (2008; the Blue Book). The controls soil and water management approaches and sequencing intended to protect the downstream receiving environment during routine operations and during the installation of features as planned as part of the MPAR Phase 1 Capping and Drainage and during MPAR Zone 2 improvements;
- All final batters and drainage features will be consistent with the approved final landform design for the MPAR. The ROP will confirm the batter length and width and any additional water control measures that may be required;
- Appropriate erosion/sediment controls and stormwater diversions shall be implemented for stormwater flows along drainage lines and through disturbed areas and soil stockpiles to mitigate the potential for erosion and sediment transport to downstream waterways;
- The area of active and exposed ash placement shall be limited at any one time, and the capping and rehabilitation of completed ash placement areas shall be undertaken as soon as practicable;
- Management and mitigation measures for water have been developed for the MPAR to address the potential for runoff from exposed ash surfaces entering Wangcol Creek. These measures include:
    - Separation of clean and dirty water as outlined in Section 7.2.2;
    - Stormwater runoff and leachate (as applicable) from the internal ash placement areas shall be directed to LNAR 3 Pond and LNAR 5 Pond for recycling;
    - Stormwater runoff from the completely covered external batters and benches shall be directed to SW1 or SW2 for recycling, or to Wangcol Creek via the MPAR Phase 1 Drainage arrangements; and
    - Sediment will be removed from storage ponds, when necessary, as a part of standard maintenance practice to maintain sufficient stormwater storage capacity.
- Significant ground disturbance activities to be rescheduled based on weather conditions or other circumstances that may enhance the potential for uncontrolled erosion or release of sediment;
- Appropriate storage, handling and transport of general wastes (e.g. plastics) and hazardous chemicals (e.g. fuels, oils, weed control, etc.) associated with operation of the MPAR shall be implemented to mitigate potential risks to soil and water quality that may result from accidental leaks or spills;
- All hazardous chemicals (e.g. fuels, oils, weed control, etc.) shall be stored in designated covered storage areas away from the MPAR, and loading of chemicals and refuelling shall be undertaken in a designated area away from concentrated stormwater flow and outside drainage paths; and
- Inspections will be conducted to record that appropriate and effective erosion/sediment management measures and controls are being implemented

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and to identify whether additional management measures and controls may be required. The inspections will be conducted in accordance with the minimum requirements outlined in Section 10.6. Inspections may prompt an investigation and/or response, and this will be conducted in accordance with the process outlined in Section 11.

7.2.2 Soil and Surface Water Management Measures

The MPAR water management involves the separation of clean and dirty water generated in distinct areas of the Site. These can be defined as:

- Clean water – water that has not come into contact with ash, such as runoff from permanent capped or revegetated areas or stormwater from surrounding areas that is diverted away; and
- Dirty water – water collected from disturbed areas within the MPAR. This includes runoff from the exposed ash face, work areas and haul roads that is contained on site within sediment ponds for reuse.

Implementation of the MPAR Phase 1 Capping and Drainage and the continued rehabilitation of MPAR batters and benches will continue to involve separation and discharge of clean stormwater flow from the MPAR to Wangcol Creek. Water from other catchments at MPAR, including at the MPAR Zone 2 LBMS, will be stored for reuse at the Ash Repositories or MPPS.

The increased catchment area associated with the MPAR Phase 1 Capping and Drainage will increase clean stormwater flow from the MPAR to the receiving environment (consistent with a reduction in recharge and infiltration at MPAR). As detailed in the WIA, this increase is not considered likely to significantly affect the hydrology of Wangcol Creek, the receiving stream, and will contribute to re-establishing the historical surface water catchment extent and hydrology prior to development of the Ash Repositories. Following completion of the ash placement operations, the MPAR Zone 2 Capping will be tied in with the MPAR Phase 1 Capping and Drainage, forming a capped surface across the upper portion of the MPAR, and directing clean water from the decommissioned MPAR to Wangcol Creek.

Surface water monitoring and reporting will be undertaken in accordance with Section 10, while incident response, TARPs, and contingency plans are presented in Section 11.

Additional surface water management measures are outlined in the following subsections.

7.2.2.1 Ash Placement Areas

Measures to minimise the opportunity for surface water infiltration and potential for erosion and sedimentation within the ash placement area shall include:

- Compaction of ash when it is placed. Where ash is compacted, the likelihood of infiltration during a rainfall event is reduced;
- The ash repository design will include a series of batters and laybacks. This will be further defined in the ROP;
- Standard construction practices consist of face normally 80 m wide with a placement bench length of 200 m x 200 m, however the ROP can define another more effective method;
- The MPAR will be designed accordingly, to mitigate any long or short -term effects of stormwater;

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- Design of pond sizes based on catchment areas and where possible are sized to a target of minimum 50-year ARI event;
- Leachate storage ponds will be designed, sized and installed with a double low permeability liner designed and implemented in general accordance with the EPA (2016) guidance; and
- Erosion on permanent batters to be mitigated by progressive rehabilitation and revegetation, which may include applying suitable species of shrubs, grasses and/or applying mulch.

7.2.2.2 Surface Water Management

Surface water is diverted from the active ash placement areas of MPAR by surface gradients toward diversion bunds and a pipe inlet. A pipeline is used to transfer surface runoff from active ash placement areas to double HDPE lined holding ponds. This is termed dirty water. The dirty water storages can pump water from between the two liners, along with a sump for leak detection using a dip meter, and the ability to repair leaks if detected. The space between the liners and the leak detection sump is checked monthly by the Contractor.

7.2.2.3 MPAR Phase 1 Capping and Drainage

SW1 and SW2

Stormwater runoff from the external batters of the MPAR that is not directed to Wangcol Creek will be managed by the existing unlined stormwater holding pond SW2, and LNAR 2 and LNAR 4 (double lined). The clean water in these ponds will be managed as part of ongoing operations at the LNAR, in accordance with the requirements of the LNAR OEMP.

Following installation of the MPAR Phase 1 Capping and Drainage in the MPAR Northern External Batter area, runoff will report to Wangcol Creek via a drop structure and energy dissipators, as described in the following subsection.

Runoff to Wangcol Creek

Following completion of the MPAR Phase 1 Capping and Drainage, surface runoff will be directed to Wangcol Creek via energy dissipators.

As outlined in Section 6.1.2, the design and installation of the proposed water drop structures and energy dissipators in accordance applicable hydraulic engineering guidelines will control flow velocities and water quality such as not to adversely impact the environmental values of Wangcol Creek.

Surface water quality and flow beyond the energy dissipators will be inspected monthly, and samples collected during periods of sustained flow, for 1 year after construction to assess performance relative to the design objectives. Pending the review of monitoring results, after this period, performance will be reported in the Mt Piper Power Station Environmental Monitoring Report through visual inspection of the drop structures and energy dissipators.

Timely progression of rehabilitation, including revegetation (MPAR Phase 1 Capping), in completed ash placement areas, along with installation of the surface water drainage and discharge designs outlined in Section 6.1.2 (MPAR Phase 1 Drainage) will reduce the potential for recharge of stormwater runoff into the MPAR and will mitigate the potential for soil erosion and sedimentation.

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7.2.2.4 Management During the Energy Dissipator Excavation

7.2.2.5 General Measures

The design and construction of the MPAR Phase 1 Capping and Drainage will adhere to the minimum standards presented by the DCCEEW (2008) (the Blue Book) to prevent erosion from the water drop structures and energy dissipators construction footprints impacting upon the surface water quality in downstream environments.

The energy dissipator excavation activities should be planned around a forecast suitable period of dry weather, and there shall be sufficient flexibility in the construction schedule to allow for rescheduling to avoid weather conditions or other circumstances that may enhance the potential for uncontrolled erosion or release of sediment.

7.2.2.6 Dewatering

As outlined in the WIA, while some limited groundwater seepage could be expected during construction of the energy dissipators, the construction activity will be short-term and temporary and the volumes are likely to be small (i.e. estimated to be less than 3 ML), and unlikely to result in impacts to the environment, existing infrastructure and other water users. Therefore, the interaction with groundwater seepage during construction is exempt from a Water Access Licence in accordance with the Water Management Act 2000 and the Water Management (General) Regulation 2018.

As the excavations are occurring immediately adjacent to the toe of the MPAR, the groundwater may have elevated salinity. Therefore, water that may require management during construction of the energy dissipators should be managed appropriately, including through in-situ testing of EC and storage, if required, in intermediate bulk containers or existing lined storages, until appropriate handling requirements within the MPPS and Ash Repositories water management system are evaluated.

EnergyAustralia will record the estimated volume of groundwater managed during the construction activity, and this will be reported within 28 days from 28 July each year.

7.2.2.7 Potentially Impacted Soils

In the event that unexpected finds such as stained and / or odorous soils are encountered during construction of the energy dissipators, the planned works in the area should cease, and the appropriate EnergyAustralia staff members should be notified. The area should be isolated, and a specialist Environmental Consultant should be engaged to provide advice regarding the nature and management of such materials.

If potentially contaminated soils are encountered during excavation activities, the suspect materials should be tested and assessed for on-site reuse in accordance with guidelines approved by the EPA under the Contaminated Land Management Act 1997 (the CLM Act) including:

- The National Environment Protection Council (1999). *National Environment Protection (Assessment of Site Contamination) Measure 1999* (as amended April 2013), Canberra (the ASC NEPM); and
- NSW EPA (2022a), *Contaminated Land Guidelines: Sampling design part 1 - application*, August 2022.

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Should off-site disposal of soil material be required, the material will need to be sampled with respect to the aforementioned documents and appropriately classified in accordance with the *Waste Classification Guidelines: Part 1 Classifying waste* (NSW EPA, 2014).

If soil material is required to be imported to the Site, the material should be classed as Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM), as defined by the POEO Act and associated guidelines.

7.2.3 Groundwater Management Measures

The MPAR Phase 1 Capping and Drainage as authorised by Mod 9 is key to mitigating risks identified from previously placed BCA at MPAR to groundwater. By directing runoff from the capped area via the drop structures to the energy dissipators and Wangcol Creek as authorised by Mod 9, recharge to the underlying BCA in MPAR will be reduced, thereby reducing seepage from the MPAR. The MPAR Phase 1 Capping will substantially reduce recharge to more recently placed BCA. Recharge to BCA that will be placed in the MPAR Zone 2 LBMS and Capping area will also be substantially reduced.

The concept of recharge control over previously and recently placed BCA through MPAR Phase 1 Capping and Drainage, and additional rehabilitation, revegetation or other controls for the existing batters (MPAR Capping Strategy) is a key component of the overall groundwater mitigation strategy for impacts derived from previously placed BCA at MPAR. The improvement of surface water drainage and continued rehabilitation and revegetation of the batters and benches above BCA that was placed earlier will further reduce recharge to the MPAR by reducing ponding, infiltration and recharge to groundwater and by increasing runoff and promoting evapo-transpiration. As outlined in Section 5.2.3, ERM (2026a) reported that the application of ground cover vegetation on all MPAR batters >946 m AHD is the most reasonable and feasible additional recharge control option given that a mixture of grasses and shrubs is unlikely to have a material benefit over ground cover vegetation. The assessment of suitable ground cover species and associated amelioration requirements is ongoing at the time of preparing this WMP.

In the future, BCA at the MPAR will be placed in the lined and capped MPAR Zone 2 LBMS and Capping area, which will substantially reduce the potential for recharge to BCA and the therefore substantially reduce the potential for seepage of leachate from BCA to the underlying groundwater system.

Groundwater quality will be further managed by the management of surface water in accordance with measures outlined in the preceding sections, installation and operation of the leachate management system (Section 6.1.4) and controls described in the leachate management plan (Section 9).

Groundwater quality and levels will continue to be monitored, and the results compared to Environmental Values, previous concentrations and previous groundwater model outputs to assess performance of the MPAR Phase 1 Capping and Drainage, the MPAR Zone 2 LBMS and Capping and additional augmented recharge controls that may be included in the MPAR Capping Strategy. If eventual reductions in groundwater solute concentrations are not observed, and/or consistently increasing temporal trends in concentrations are observed in the receiving surface water environment, the mitigation options assessment and numerical groundwater model may need to be revisited to inform the assessment of causes and potential interventions as required.

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Groundwater monitoring and reporting will be undertaken in accordance with Section 10, while incident response, TARPs, and contingency plans are presented in Section 11.

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8. Brine Production and Management Plan

Brine is produced at the MPPS and the SWTP, which also produces Solid Mixed Salts. The production of brine and Solid Mixed Salts is planned to continue in line with existing approved practices.

Furthermore, EnergyAustralia has ceased to place BCA and Solid Mixed Salts in unlined portions of the MPAR. Moving forward, any BCA and Solid Mixed Salts will only be placed above the MPAR Zone 2 LBMS, as approved under the Mt Piper Consent Mod 9.

Placement of the BCA and Solid Mixed Salts will also continue within the LNAR in line with the LNAR Project approval, as modified. This co-placement with ash is the only approved disposal method for the brine and Solid Mixed Salts. Following the completion of ash placement operations at the MPAR, the MPAR Zone 2 Capping and the MPAR Phase 1 Capping will be tied into the LNAR Stage 1 Capping.

8.1 Brine Management

Brine conditioning of the ash occurs within the paved MPPS area, away from the MPAR, to limit the likelihood that brine may enter natural waterways. The BCA is transported to the MPAR by conveyor before being loaded onto trucks for placement in designated and approved BCA disposal areas which, at the MPAR, will be limited to the MPAR Zone 2 LBMS footprint when constructed.

The pump to transport the brine to the ash conditioning plant is located adjacent to the brine holding ponds, and drainage from the pump area is directed back to the brine ponds. The pipeline is fully welded HDPE and acrylonitrile butadiene styrene (ABS) pipe, located above ground to minimise the possibility of an undetected leak.

The system layout is designed such that a spill of brine may be intercepted at the earliest point. The drainage system is backed up by the Final Holding Pond so that, in the unlikely event of leaked brine, it can be collected and pumped back for treatment via the Brine Concentrators. The brine storage ponds are double lined to minimise the risk of leaks and local groundwater contamination. Monitoring of groundwater in the vicinity of the brine waste ponds is conducted in accordance with the overview presented in Section 10.

Some solids settle out in the brine waste ponds and the settled material cannot be slurried with the brine for mixing with the ash. The settled material (brine sludge) is periodically excavated as required and transported to the Ash Repositories in trucks, where it is deposited in the BCA placement areas. The brine sludge is spread in thin layers and covered by a layer of BCA, and this practice will continue as necessary.

8.2 Brine Reduction Strategy

The MPAR receives brine from both the operations of the MPPS and from the adjoining SWTP, which treats mine water received from the local Springvale and Angus Place mines and produces a higher volume of brine than the MPPS. The brine produced at the MPPS and from the adjoining SWTP are both directed to double lined ponds before being further treated in the existing Brine Concentrators at MPPS which further treat and concentrate the brine, ultimately

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reducing the total quantity requiring disposal at the Ash Repositories. EnergyAustralia has undertaken process changes on the existing Brine Concentrators, to allow for "non-seeded" operation, via the segregation of the OPUS® brine waste stream produced by the SWTP from other waste streams. This non-seeded operation allows for the volume of liquid brine waste streams generated at both the MPPS and the adjoining SWTP to be more efficiently reduced by the existing Brine Concentrators, and has been shown to reduce the total volume of liquid brine by a factor of five.

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9. MPAR Zone 2 Leachate Management Plan

The Ash Repositories share essential infrastructure that enables the transfer of ash, and other approved materials from the MPPS as well as sharing various water management infrastructure. Consequently, the leachate management system for the LNAR will also be required to manage surface water runoff and leachate from the active ash placement areas of the MPAR until the MPAR ash surface is suitably capped and/or rehabilitated.

The MPAR Zone 2 leachate barrier system will be supported by a leachate management system (i.e. the MPAR Zone 2 LBMS) to capture, store and transfer leachate and runoff from the MPAR Zone 2 LBMS to the LNAR leachate management system.

This MPAR Zone 2 Leachate Management Plan addresses the mitigation and management measures outlined in the WIA. It provides a framework and protocols for EnergyAustralia and Contractors to manage leachate and to minimise the potential for adverse impacts to the environment during the operation of the MPAR.

9.1 General Leachate Management Measures

The MPAR Zone 2 leachate management system will capture, store and transfer leachate generated from the co-placement of BCA and Solid Mixed Salts within the MPAR Zone 2 LBMS to the existing approved leachate and runoff management infrastructure at the adjacent LNAR. The MPAR Zone 2 LBMS will be designed and implemented in general accordance with Part B: Section 1 and Section 2 of NSW EPA (2016), Solid Waste Landfill Guidelines, and will include:

- A leachate extraction and level control system installed in all lined areas that is suitable to maintain leachate in the base of lined areas no more than 300 mm above the upper surface of the base liner;
- A leachate collection system, including placement of drainage aggregate (sourced from mine spoil if available within the Ash Repositories or imported from a local supplier or bottom furnace ash, where suitable), drainage pipework (as required) followed by geotextile or other equivalent material(s) for leachate management, and leachate sump and riser; and
- Implementation of the proposed leachate management system including installation of suitable pumps and pipelines to transfer the leachate from MPAR Zone 2 LBMS to the existing LNAR leachate management system.

In addition to the design and installation of the MPAR Zone 2 LBMS, the following general management measures shall be implemented in relation to the MPAR Zone 2 LBMS:

- Visual inspections of the leachate management infrastructure (pumps, pipe work, ponds) shall be conducted to ensure infrastructure is in working order (e.g. no leaks). Maintenance of leachate management infrastructure will be conducted as required;
- The leachate management system and leachate barrier system shall be designed for each stage of the MPAR Zone 2 to be designed and implemented in general accordance with the relevant portions of the NSW EPA (2016) Solid Waste Landfill Guidelines;

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- The MPAR Zone 2 LBMS installation shall be supported by quality assurance and quality control protocols and record keeping;
- The leachate collection system shall be appropriately sized based on site water balance modelling, and leachate levels shall be maintained in the lined storages to provide for sufficient volume of leachate required to be extracted from the base of lined areas; and
- Maintenance of leachate management system infrastructure will be conducted as required.

9.2 Leachate Volume Management Controls

The volume of leachate collected via the MPAR Zone 2 LBMS shall be managed via the following controls:

- Limiting the area of exposed ash above lined areas;
- Controlling rainfall runoff away from lined ash placement areas, via upslope diversions;
- Directing internal runoff to internal holding basins, as deemed necessary;
- Ensuring adequate compaction of placed materials to limit the rate of infiltration; and
- Progressively capping of completed BCA placement areas as soon as practicable.

9.3 Leachate Monitoring Plan

The leachate monitoring plan for the MPAR Zone 2 LBMS is outlined in Table 9-1 and is consistent with the LNAR leachate monitoring plan recognising there is some common infrastructure.

Table 9-1 Leachate Monitoring Plan

Description of location	Monitoring parameters	Frequency	Target
Leachate storage	Storage volume / capacity, available freeboard, leachate quality as measured from leachate storages	As required for operational water / leachate management purposes	Suitable freeboard / pumping capacity available with account for seasonal weather and forecasting. To be defined by the Contractor in the ROP.
Leachate storage	Monitoring for leachate within the space between storage liners and within underlying sumps	Monthly as part of routine inspections	No leaks.
Lined ash placement areas	Leachate level monitoring as measured from leachate collection sumps and leak detection system	Monthly as part of routine inspections	Level to be maintained no more than 300 mm* above the upper surface of the base liner. No leaks.

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Description of location	Monitoring parameters	Frequency	Target
Leachate transfer pipelines	Monitoring volume and operational integrity	Weekly as part of routine inspections	Visual inspection and documentation to assess integrity of the transfer system. Record of volumes via flow totaliser meter.
Groundwater	In accordance with the requirements of Section 9 and Section 10.		
Note: *or as required by the technical specifications associated with the detailed design.			

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10. Water Characterisation and Monitoring Program

Groundwater monitoring has been conducted at the MPPS in the vicinity of the MPAR and the LNAR at least quarterly since 1993. Groundwater monitoring bores have been progressively installed and monitored at the Ash Repositories and nearby surrounding areas, with new and replacement bore locations installed based on results of earlier monitoring and planned future activities at the Ash Repositories.

The long history of investigation, groundwater and surface water monitoring, and data assessment has resulted in a high degree of confidence regarding the suitability of the monitoring network to provide data to identify potential changes in environmental conditions that may be attributed to operations at the Ash Repositories.

The results of the monitoring carried out under this WMP are reported annually in an EMR for the MPAR. The recent surface water and groundwater conditions within the vicinity of the MPAR are summarised in the MPAR 2023/24 EMR (ERM 2024b), as described in Section 3.7 and Section 3.8

The water monitoring program for the MPAR, including monitoring locations, monitoring frequency, sampling methods, and analytical suite has been developed in conjunction with, and following on from, the Independent Groundwater Investigation and with consideration of discussions with EPA in relation to the '*coal ash repository water characterisation assessment*' as required by EPL 13007. There is general consistency between the groundwater and surface water monitoring requirements of this WMP and those required under EPL 13007 and the LNAR OEMP.

10.1 Stream Health, Stream Flow and Channel Stability Monitoring

Stream health will continue to be monitored as part of the existing annual Wangcol Creek Ecological Monitoring Program (EMP). The EMP has been implemented to satisfy Condition 43 of the Mt Piper Consent (Mod 9).

The monitoring is undertaken on an annual basis, in spring, by suitably qualified independent consultants. The Wangcol Creek EMP consists of four AUSRIVAS sample sites NCR1, NCR2, NCR3, and A16. Two additional sites (NCR4 and NCR5) will be added upstream of the MPAR to augment the existing Wangcol Creek EMP. These six stream health monitoring locations are presented on Figure 4.

The following specific aspects will be generally recorded as part of the stream health monitoring:

- Total number of taxa;
- Number of pollution sensitive Ephemeroptera, Plecoptera and Trichoptera (EPT) taxa;
- OE50 taxa score (a biotic index of aquatic habitat and water quality); and
- SIGNAL2 score (a biotic index of water pollution).

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Stream stability will continue to be monitored on a bi-annual basis by suitably qualified independent consultants as part of the existing Wangcol Creek Stream Stability Survey. The Wangcol Creek Stream Stability Survey is conducted at six sites SH1, SH2, SH3, SH3a, SH4, SH5. Five additional sites (SH6- SH10) will be added to the existing stream stability survey to augment the existing monitoring program and satisfy Condition 43 of the Mt Piper Consent (Mod 9). These 11 channel stability monitoring locations are presented on Figure 4.

The following specific aspects will be generally recorded as part of the stream stability monitoring:

- Channel profile survey;
- Ephemeral stream assessment (channel floor and wall vegetation, longitudinal morphology);
- Visual observations, regarding stream flow and stream stability; and
- Stream flow records, as monitored by EnergyAustralia at LMP01 and at NSW stream monitoring location 212055 (see Figure 4).

Results of the Wangcol Creek EMP and the Wangcol Creek Stream Stability Survey will be summarised in the annual report.

10.2 Water Quality Monitoring Locations, Frequency and Duration

Table F-1 and Table F-2, Appendix F present the groundwater and surface water monitoring locations that will be monitored in accordance with this WMP, along with the monitoring frequency and rationale for each location. The analytical schedule for this WMP is presented in Table F-3, Appendix F. Figure 3 presents the monitoring locations.

Some existing monitoring infrastructure (e.g. groundwater monitoring wells D17 and D18) is likely to be decommissioned as part of the planned stages of LNAR operations. The existing groundwater monitoring network accounts for the decommissioning and potential for damage of monitoring infrastructure over time. A loss of monitoring infrastructure will not necessarily trigger a requirement for replacement groundwater monitoring infrastructure to be installed as the groundwater monitoring network around the MPAR is intended to maintain a suitable long-term monitoring network up to the extent of the EnergyAustralia landholding.

The LNAR OEMP and EPL 13007 include water monitoring and reporting requirements that are required in parallel to the monitoring and reporting outlined in this WMP.

10.3 Monitoring Method

Groundwater sampling from the monitoring bore network is undertaken using a submersible pump or via bailing. At locations with poor recharge, bores are purged dry 24 hours before sampling to allow sufficient recharge prior to sampling. Bores with good recharge are purged to remove a minimum of three times the bore volume prior to sampling. Surface water samples are collected via a grab sampling methodology. Field water quality parameters for both groundwater and surface water are collected at the time of sampling and, where required for analysis, samples are filtered in the field prior to collection in laboratory-supplied bottles.

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Field sampling and laboratory analysis will be conducted by trained personnel in general accordance with the NSW EPA (2022b), *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* guidance by Nalco / Ecolab Pty Ltd (Ecolab), with some laboratory analytical services subcontracted to ALS Global Pty Ltd (ALS). These analytical services are National Association of Testing Authorities (NATA) accredited for the services provided.

10.4 Monitored Parameters

Table F-3, Appendix F presents a summary of groundwater and surface water analytical suite and field parameters that will be monitored in accordance with this WMP. The analytical suite is based on the existing monitoring data with respect to potential pollutants that may be present.

10.5 Environmental Goals

The Environmental Goals provide water quality assessment guidelines applicable to the Ash Repositories, in accordance with the Mt Piper Consent as modified by Mod 9.

The Environmental Goals utilise the 95% ecosystem protection values, stock watering, irrigation water or drinking water values, in combination with 90th percentile pre-brine placement local environmental (groundwater/surface water) data (whichever is greater). The local guideline values incorporated into the Environmental Goals are based upon the 90th percentile pre-ash placement water quality results, as measured at surface water quality point WX22 (for surface water) or at the former groundwater collection basin (for groundwater).

The Environmental Goals have been used to assess groundwater conditions in relation to the MPAR for approximately 25 years, in accordance with the Mt Piper Consent. The Environmental Goals are considered suitable to monitor for changes in water quality that consider the sources of water pollutants, history of investigation and monitoring, and the existing groundwater and surface water conditions.

Where Environmental Goals have not been developed for a specific analyte, relevant Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) default guideline values have been adopted. Appendix G presents the Environmental Goals and ANZG (2018) values for monitored parameters (where applicable).

10.6 Site Inspections

Regular monthly inspections of the MPAR and inspection of the nearby surrounds will be conducted to monitor and assess the stability, integrity and overall progress of MPAR rehabilitation. The inspections will focus upon the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS and Capping at a minimum, and will include:

- Inspection of the engineered capping layers and drains for indications of erosion, integrity of capping, vegetation status and condition, ponding or pooling of water, other observations (e.g. salt efflorescence, etc.) and whether any activities have been undertaken, or issues have arisen within the capped area that require maintenance;
- Inspection of the batters and benches to for indications of erosion, integrity of cover, vegetation status and condition, ponding or pooling of water, other

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observations (e.g. salt efflorescence, etc.) and whether any activities have been undertaken, or issues have arisen within the capped area that required maintenance;

- Inspection for the presence of unsuitable vegetation (such as trees) that may be establishing on the capped area and to document progressive revegetation;
- Inspection of the vegetation growth at the MPAR site and assessment of whether management works such as weed management and/or slashing are required; and
- Inspection to assess whether there is suitable control of surface water runoff with minimal sediment transport outside of the designed flow paths, as well as inspection and monitoring of surface water flows from the drop structures and energy dissipators.

The observations and outcomes from the monthly inspections will be recorded, and maintenance and/or rectification works will be resolved, tracked and reported as part of the annual EMR. An example inspection checklist is provided as Appendix H

Visual inspections of the MPAR and MPAR infrastructure (pumps, pipe work, ponds) will be conducted by the Contractor to ensure infrastructure is in working order (e.g. no leaks). Maintenance of MPAR infrastructure will be conducted by the Contractor as required.

10.7 Other Data Requirements

In addition to the routine monitoring and inspection requirements outlined in the preceding subsections, the following data will be collated for inclusion in the annual EMR:

- Actions taken, or intended to be taken, if any, to mitigate any adverse environmental impacts and to meet the reasonable requirements of the Secretary, EPA, DCCEEW Water, WaterNSW or Council;
- Identification of any non-compliance or incident which occurred in the previous calendar year, and description of the actions that were (or are being) taken to rectify the non-compliance and avoid reoccurrence; and
- A complaints record of water related impacts (quality and quantity) from the MPAR over the previous calendar year.

10.8 Data Assessment and Reporting

As required by Condition 44 of the Mt Piper Consent, an EMR will be prepared in relation to the monitoring and management requirements specified in this WMP. As required by Condition 45 of the Mt Piper Consent, the completion of the EMR will involve the following scope of works:

(a) A comprehensive review of the monitoring results from the Water Management Plan over the previous calendar year and identify any trends in the water monitoring data over the life of the project;

(b) A discussion of the aims of the Water Management Plan and to what degree these aims have been attained in the context of results and analyses of the Water Monitoring Program, as part of the Water Management Plan;

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(c) Actions taken, or intended to be taken, if any, to mitigate any adverse environmental impacts and to meet the reasonable requirements of the Secretary, EPA, DCCEEW Water, WaterNSW or Council;

(d) A revised groundwater modelling report to include any potential and/ or the progressive improvements to the existing batters and benches that may contribute towards reducing the impacts from MPAR to the surrounding environment;

(e) Identification of 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; and

(f) A complaints record of the project's water related impacts (quality and quantity) over the previous calendar year.

The approach to preparation of the annual EMR to address Condition 45 (a) shall include:

- Review of surface water and groundwater quality data, including the spatial distribution of water quality parameters;
- Review of long-term water quality concentration trends, with reference to statistical assessment of concentration trends and triggers (Section 11);
- Assessment of the data to evaluate potential interactions with Wangcol Creek and potential changes to water quality;
- Reporting when the Environmental Goals have not been achieved;
- Interpretation and discussion of results;
- A summary of the Wangcol Creek EMP and Wangcol Creek Stream Stability Survey results;
- Update on the TARPs and contingency measures currently being implemented in accordance with this WMP; and
- Provision of the final report to the Planning Secretary, EPA, DCCEEW Water, WaterNSW and Council.

Commentary regarding any exceedances of the Environmental Goals will form a part of the EMR. The data assessment and reporting will also consider where changes in water quality are attributable to seepage from the MPAR, and particularly where changes in water quality may differ to those anticipated based on the current understanding of the CSM.

Noting the management and mitigation measures (Sections 5 to 6) and the TARPs (Section 11), the EMR will also include a review of the water quality monitoring program every 3 years to confirm whether, based on the data review, any updates are required to monitoring locations (added or removed), frequency, and/or analytes so that the monitoring program continues to meet the overall purpose of this WMP.

It is noted that there are other reporting requirements, including provision of water quality data, included as part of the annual EPL 13007 and as required under the LNAR Project Approval. These other reporting requirements will be completed separately to the reporting requirements outlined in this WMP.

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10.8.1 Groundwater Model Validation

A groundwater flow and solute transport model (the NGM) was developed as part of the Independent Groundwater Investigation. The conceptual basis of the NGM, i.e. the conceptual groundwater model, will be reviewed annually to assess whether the underpinning assumptions to the model remain valid, and to identify areas where the CSM merits update. Results will be reviewed in the context of likely concentration trends, as indicated by the current NGM and CSM.

The outcomes of this groundwater model validation will be included in the annual EMR required under this WMP, with a focus on chloride data. Chloride will be used as a primary indicator of potential impacts associated with brine because the local area is highly mineralised and it is difficult to distinguish the origin of other solutes. Additionally, chloride is unlikely to undergo chemical alteration in groundwater or surface water at the site.

This groundwater model validation process is intended to satisfy Condition 45 (d) of the Mt Piper Consent.

10.9 Access to Information

As required by Condition 69 of the Mt Piper Consent, within three months of approval of Modification 9 and until the completion of all rehabilitation required under this consent, EnergyAustralia will:

1. *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:*
    - *the Environmental Impact Statement;*
    - *all current statutory approvals for the project;*
    - *all approved strategies, plans and programs required under the conditions of this consent;*
    - *contact details to enquire about the project or to make a complaint;*
    - *a complaints register, updated monthly;*
    - *the Environmental Monitoring Reports of the project and the Applicant's response to the recommendations in any Environmental Monitoring Report;*
    - *any other matter required by the Secretary; and*
2. *keep such information up to date.*

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11. Incident Response, TARP and Contingency Plans

11.1 Environmental Incident Management

The following types of environmental incidents may require management in relation to MPAR operations:

- Discharge of sediment or polluted water in a manner that adversely impacts the quality of groundwater or surface water of Wangcol Creek;
- Spills of hazardous substances such as chemicals, oil or fuel;
- Failure of an embankment causing ash spillage from the site;
- A non-compliance of the Mt Piper Consent; and
- An exceedance of or non-compliance with the management systems, management plans, mitigations measure and/or Environmental Goals established by this WMP.

11.1.1 Incident Response Procedure

The Contractor must communicate any environmental incident that occurs during MPAR operations (including near misses) to the Contract Administrator immediately. The Contract Administrator, in conjunction with the Environmental Representative, will endeavour to resolve the issue as soon as practicably possible.

A list of the incident categories and required actions is provided in Table 11-1.

Table 11-1 Incident Categories and Required Actions

Incident Type	Incident Characteristics	Action Required
Near-miss	• Potential for, but no actual, pollution; • General environmental hazards (such as hazardous substances not stored in secured locations); • Handling mishaps with fuel, oil, lubricants and/or hazardous substances not resulting in spillage; • Loss of control of equipment not resulting in damage to vegetation or property; and • Inefficient or lacking traffic and access controls that almost resulted in an incident.	Contractor staff must report incident to the Site Manager immediately, who will notify the Contract Administrator. EnergyAustralia must then be notified within 24 hours and be provided with an incident notification record. Contractor must advise suitable controls to be implemented in future situations to prevent recurrence.
Minor	A minor environmental incident has occurred when material has been spilled or released to the environment (land, air, water, people affected), causing no actual or potential: • Harm to the health or safety of human beings or to ecosystems that is not trivial; or	Contractor staff must report incident to the Site Manager immediately, who will notify the Contract Administrator. The Shift Leader shall assess the incident facts using the Pollution

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Incident Type	Incident Characteristics	Action Required
	• Loss or property damage of an amount, or amounts in aggregate, exceeding $10,000. Its consequence/impact is measured as minor or not important and includes some of the following aspects: • Material easily contained and recovered; • Is confined to work site boundaries; • Involves minimal or minor interruption to work activities; • Complaints easily handled at the work site; or • Has no external or regulatory involvement (community, Council, emergency services, media, other relevant authorities).	Incident Response Management Plan (PIRMP). Contractor must advise suitable controls to be implemented in future situations to prevent recurrence.
Major	Material spilt or released to the environment where its consequences/impacts result in actual or potential harm to the environment. *Harm to the environment is material if:* *i. it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or* *ii. it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations). For this purpose, "loss" includes the reasonable costs and expenses that would be incurred in taking reasonable and practicable measures to prevent, mitigate or make good harm to the environment.*	Contractor staff must report incident to the Site Manager immediately. The Site Manager will report immediately to the Contract Administrator. The Shift Leader shall assess the incident facts using the PIRMP and if required, initiate the notification process and incident response as outlined in the PIRMP and/or EPL. EnergyAustralia shall notify the Secretary (via the Major Projects website) of any environmental incident within 24 hours of becoming aware of the incident. EnergyAustralia shall provide full written details (via the Major Projects website) of the incident to the Secretary within seven days of the date on which the incident occurred. The incident notification and incident reporting will be completed in line with the requirements of the Mt Piper Consent, per Section 11.1.2 below.
Non-compliance	A non-compliance with the conditions of the Mt Piper Consent.	The DPHI will be notified in accordance with the requirements of the Mt Piper Consent, per Section 11.1.2 below.

EnergyAustralia may engage and coordinate external service providers, such as the State Emergency Services or Fire and Rescue NSW, to assist in the response

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in the event of a release of contaminant, spill or leak of hazardous material. The Environmental Representative must be notified as soon as possible in order to address the cause or impact of the environmental incident and to ensure procedures are undertaken in accordance with this WMP, the EnergyAustralia emergency response system and the PIRMP.

Notification of an incident to the EPA must be made initially to the EPA Environment Line, and then in writing, in accordance with the EPL requirements.

11.1.2 Event Investigation

11.1.2.1 Incident Notification

In accordance with Section 66 of the Mt Piper Consent, EnergyAustralia will notify the Department within 24 hours of becoming aware of an incident. The notification will be made via the NSW planning portal (Major Projects) and address details of the incident including:

- date, time and location;
- a brief description of what occurred and why it has been classified as an incident;
- a description of what immediate steps were taken in relation to the incident; and
- identifying a contact person for further communication regarding the incident.

The Applicant must provide the Department with a subsequent incident report in accordance with Appendix 1 of the Mt Piper Consent (Incident Notification and Reporting Requirements).

11.1.2.2 Incident Reporting

Incidents will be documented, investigations conducted, and action plans established to prevent reoccurrence. As per Appendix 1 of the Mt Piper Consent, the following incident notification and reporting requirements will be adhered to:

1. *All incident notifications and reports must be submitted via the NSW planning portal (Major Projects).*
2. *The Applicant must provide notification as required under these requirements, even if the Applicant fails to give the notification required under Condition 66 or, having given such notification, subsequently forms the view that an incident has not occurred.*
3. *Within 7 days (or as otherwise agreed by the Secretary) of the Applicant making the immediate incident notification (in accordance with Condition 66), the Applicant is required to submit a subsequent incident report that:*
    a. *identifies how the incident was detected;*
    b. *identifies when the Applicant became aware of the incident;*
    c. *identifies any actual or potential non-compliance with conditions of consent;*
    d. *identifies further action(s) that will be taken in relation to the incident;*
    e. *a summary of the incident;*

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f. outcomes of an incident investigation, including identification of the cause of the incident;

g. details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence, including the period for implementing any corrective and/or preventative actions; and

h. details of any communication with other stakeholders regarding the incident.

4. The Applicant must submit any further reports as directed by the Secretary.

11.1.2.3 Non-Compliance Investigation

In accordance with Condition 68 of the Mt Piper Consent, EnergyAustralia will notify the Department within seven days of becoming aware of a non-compliance. The notification will be in writing and submitted via the NSW planning portal (Major Projects).

The notification will identify the development (including the development application number and name), set out the condition of the Mt Piper Consent that the development is non-compliant with, why it does not comply, the reasons for the non-compliance (if known), and what actions have been undertaken, or will be undertaken, and when, to address the non-compliance.

A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

11.2 TARPs

TARPs have been prepared in relation to monitoring results, including water quality monitoring and the Site inspections (Section 10). The data and information collected will be evaluated by EnergyAustralia to assess whether a trigger value/parameter has occurred. If there is a trend identified in the data over time that demonstrates water quality is deteriorating, then appropriate action and investigation will be undertaken.

The following "triggers" (Table 11-2) have been developed to provide a means of detecting potential changes in risk profile relating to conditions at the MPAR. Where these conditions are observed, response actions are to be employed to clarify the data and assess whether additional assessment, management actions, rectification or further remediation are required.

Table 11-2 Action Triggers and Responses

Area	Trigger	Response
Leachate management system / Brine Waste Storage Ponds	A leak is identified in the leachate barrier system, leachate storage ponds or pipelines, or Brine Waste Storage Ponds.	• Any leaks that are detected will be repaired. During the repair period, the leachate/brine may be transferred to another double lined pond at the MPPS while the defective liner is repaired. Construction of an additional temporary storage feature could also be considered if the adjacent ponds were not suitable for brine storage; and • If changes are considered to be associated with the BCA liner barrier system or the

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Area	Trigger	Response
		Brine Waste Storage Ponds, an investigation will be carried out to assess short-term and, if required, long-term mitigation measures and the relevant regulatory stakeholders will be notified and consulted regarding assessment requirements and mitigation options.
Cover and cap integrity	Erosion of the cover layers, or erosion of other areas at MPAR. Exposure of the very low permeability capping layer. Gaps or holes identified within the very low permeability capping layer or cover layers.	• Erosion and sediment control measures to be implemented as needed relative to the nature of the observation. Periodic weekly monitoring to be considered in the localised areas where erosion has been identified and control measures have been implemented; • Cover layers to be reinstated ◦ Cover materials to be reinstated to their original survey levels; ◦ If necessary, updated reference levels to be provided to ensure thickness requirements have been met; and ◦ Provide photographic evidence as a record of cover reinstatement following works. • Very low permeability cap to be repaired: ◦ Capping materials to be reinstated to their original survey levels; ◦ If necessary, updated reference levels to be provided to ensure thickness requirements have been met; ◦ Any damage to geotextile layers to be repaired prior to reinstatement of capping layers; ◦ Any vegetation removed to be replaced to ensure stabilisation of capping materials; and ◦ Provide photographic evidence as a record of capping reinstatement following works.
Unsuitable or insufficient vegetation	Unsuitable or insufficient vegetation is identified growing on the capped area or anywhere else within the Site.	*MPAR Phase 1 Capping and MPAR Zone 2 Capping* • Unsuitable vegetation (i.e. trees and large shrubs) is to be carefully removed from the capping area and the capping layers assessed for damage; • If capping layers have been damaged and require reinstatement, adhere to trigger response above; • If vegetation is not sufficient, additional planting or support of target species should occur; and • Unsuitable vegetation (i.e. weeds and invasive species) identified are to be removed and/or treated to mitigate growth and spread. *Batters and benches and MPAR Phase 1 Drainage*

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Area	Trigger	Response
		• Unsuitable vegetation (i.e. trees) is to be carefully removed from the batters and benches, including drains, and the cover layers assessed for damage; • If cover layers have been damaged and require reinstatement, adhere to trigger response above; • If vegetation is not sufficient, additional planting or support of target species should occur; and • Unsuitable vegetation (i.e. weeds and invasive species) identified are to be removed and/or treated to mitigate growth and spread.

Analyte concentrations in surface water or groundwater	Concentrations of a monitored parameter at a given location are reported above the Environmental Goal or adopted ANZG value for the first time.
	
	Concentrations at a given location reported an order of magnitude above the historical maximum.
	
	Concentrations at a given location indicate a statistically significant increasing trend.
		• Confirm the data with analytical laboratory;
		• Resample the monitoring location(s). If the concentrations are consistent;
		  ° Review the concentration trends in light of other data (e.g. groundwater elevations and recent MPPS / surrounding land use activities); and
		  ° Assess the potential for changes to the risk profile, including review of the NGM and CSM in the context of expected concentrations.
		• If potential for changes to the risk profile is possible, review the frequency/coverage of the monitoring plan and update/revise the WMP as appropriate, in consultation with relevant regulatory stakeholders (as appropriate).

11.2.1 Emergency Preparedness

EnergyAustralia has an established Emergency Response Plan and PIRMP for the MPPS. The PIRMP sets out the requirements for the notification, response and management of pollution incidents as defined in the Protection of the Environment Operations Act 1997.

The Emergency Response Plan and the PIRMP will be followed in case of an emergency at the Ash Repositories. Any personnel identifying an emergency should dial 555 (from a landline) or 6354 8316 (from a mobile phone) to alert the EnergyAustralia Emergency Response team.

11.3 Contingency and Mitigation Measures

Contingency mitigation measures to maintain surface water and groundwater water quality that may be considered, include:

- The ability to change placement area or leachate storage infrastructure as needed, within the approved limits of the MPAR;
- The installation of an alarm or data flagging system that is activated when the leachate level within the lined placement areas in the MPAR Zone 2 LBMS reaches >300 mm;

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- The ability to install additional monitoring infrastructure as part of contingency investigations;
- The multipurpose double lined storage infrastructure at the MPPS (see Section 6) may also provide storage in the event that leachate generation for MPAR Zone 2 LBMS exceeds the storage capacity at LNAR, or the MPPS is unable to recycle leachate for a period;
- Should timely recycling or treatment of leachate not be available at the MPAR, LNAR or MPPS then excess leachate would require treatment and disposal off site to a facility, which can lawfully accept it, with appropriate documentation and approval; and
- Should monitoring identify the potential for a leak in the MPAR Zone 2 LBMS, leachate storage ponds or pipelines, all relevant groundwater bores and surface water locations may be re-sampled to re-confirm the changing conditions and to evaluate the cause:
    - If changes are considered to be associated with leachate storage ponds or pipelines, the pond liners or pipeline will be checked for leaks. Any leaks that are detected will be repaired. During the repair period, the leachate may be transferred to another double lined pond at the MPPS while the defective liner is repaired. Construction of an additional temporary storage feature could also be considered if the adjacent ponds were not suitable for brine storage; and
    - If changes are considered to be associated with the MPAR Zone 2 LBMS, an investigation will be carried out to assess short-term and, if required, long-term mitigation measures and the relevant regulatory stakeholders will be notified and consulted regarding assessment requirements and mitigation options.

The above listed items may be considered in addition to:

- Maintenance and potential repair of capping layers and covers layers;
- Enhanced drainage off the batters and benches; and
- Maintenance of suitable vegetation as part of MPAR rehabilitation.

Should routine monitoring data suggest that there are material discrepancies between expected performance, analytical data, and modelled outcomes, a contingency investigation would be triggered to evaluate the potential risks associated with the discrepancy and, if necessary, assess the potential causes of the discrepancy. Based on the outcomes of the contingency investigation, and consultation with relevant regulatory authorities, EnergyAustralia will further review and update this WMP to include any additional site management and maintenance actions identified, in consultation with key stakeholders

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12. References

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Appendices

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Appendix A Figures

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Coordinate System:
GDA 1994 MGA Zone 56

Date: 30/09/2025
Created By: CB
Drawing Size: A4

0 5 10 15km

1:450,000

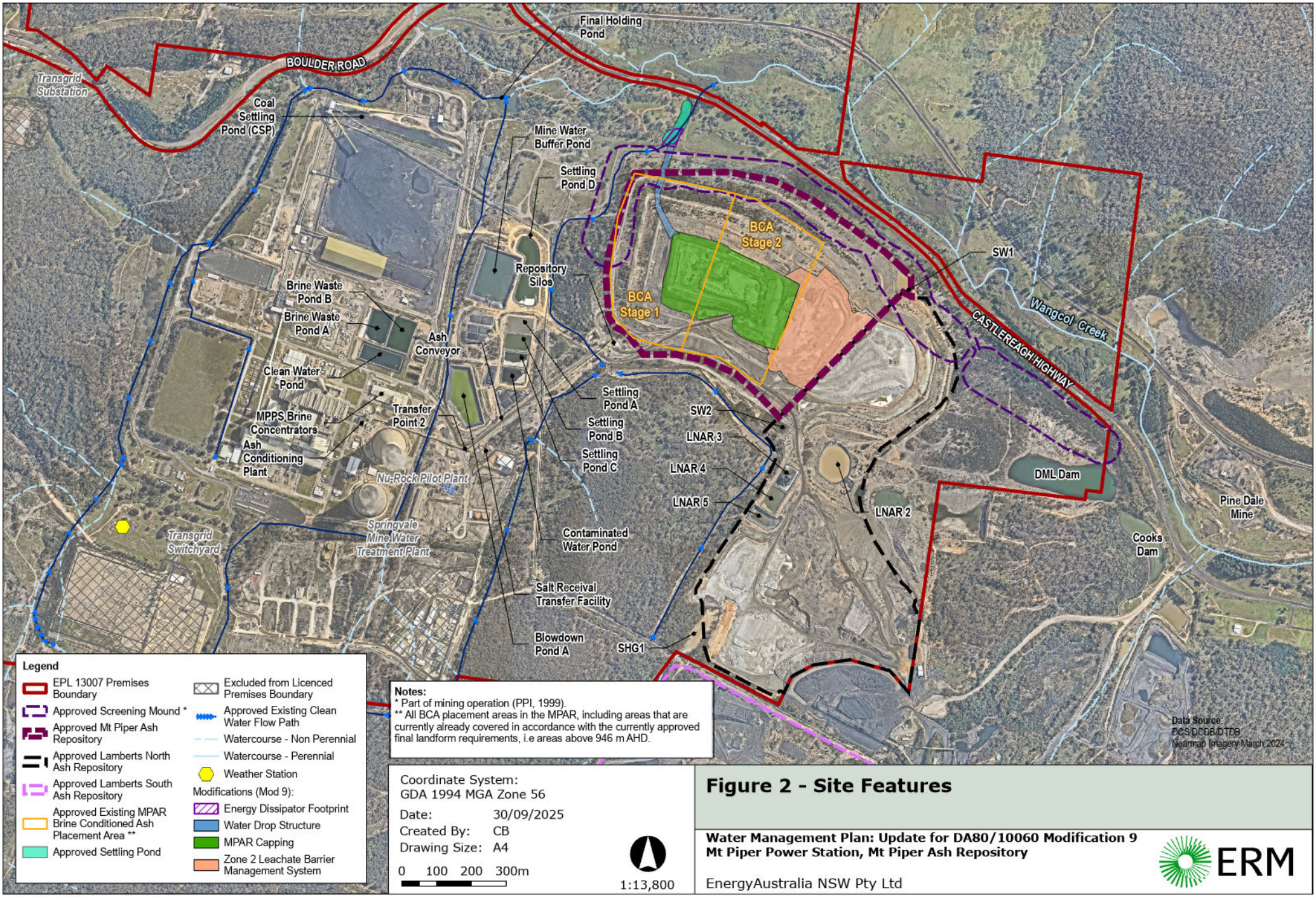
Figure 1 – MPPS Regional Context

Water Management Plan: Update for DA80/10060 Modification 9
Mt Piper Power Station, Mt Piper Ash Repository

EnergyAustralia NSW Pty Ltd

ERM

0751844 WMP_Update Mod 9.aprx



Coordinate System:
GDA 1994 MGA Zone 56

Date: 30/09/2025
Created By: CB
Drawing Size: A4

0 100 200 300m

1:13,800

Figure 2 - Site Features

Water Management Plan: Update for DA80/10060 Modification 9
Mt Piper Power Station, Mt Piper Ash Repository

EnergyAustralia NSW Pty Ltd

ERM

0751844 WMP_Update Mod 9.aprx

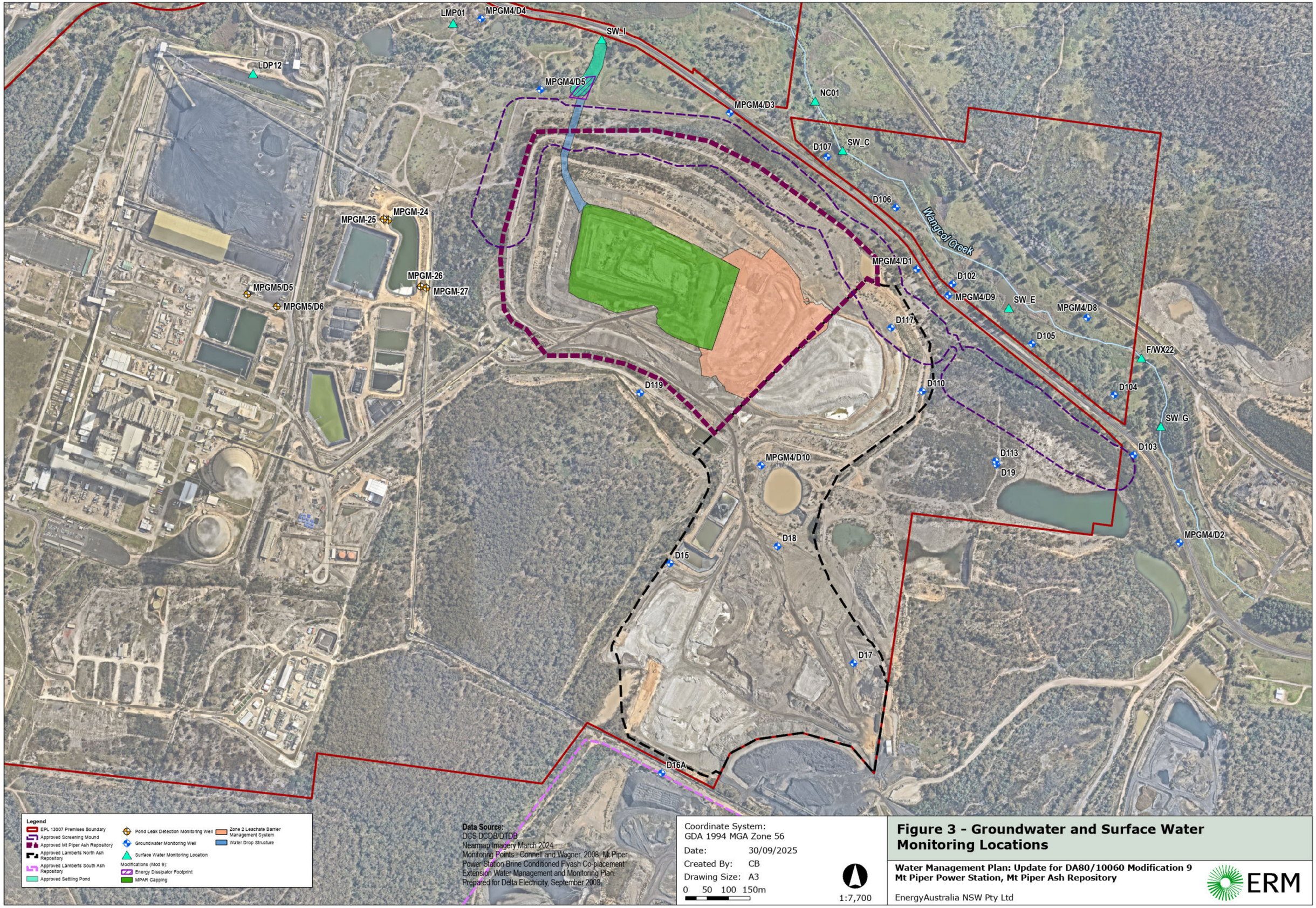


Figure 3 - Groundwater and Surface Water Monitoring Locations

Water Management Plan: Update for DA80/10060 Modification 9
Mt Piper Power Station, Mt Piper Ash Repository

EnergyAustralia NSW Pty Ltd

ERM

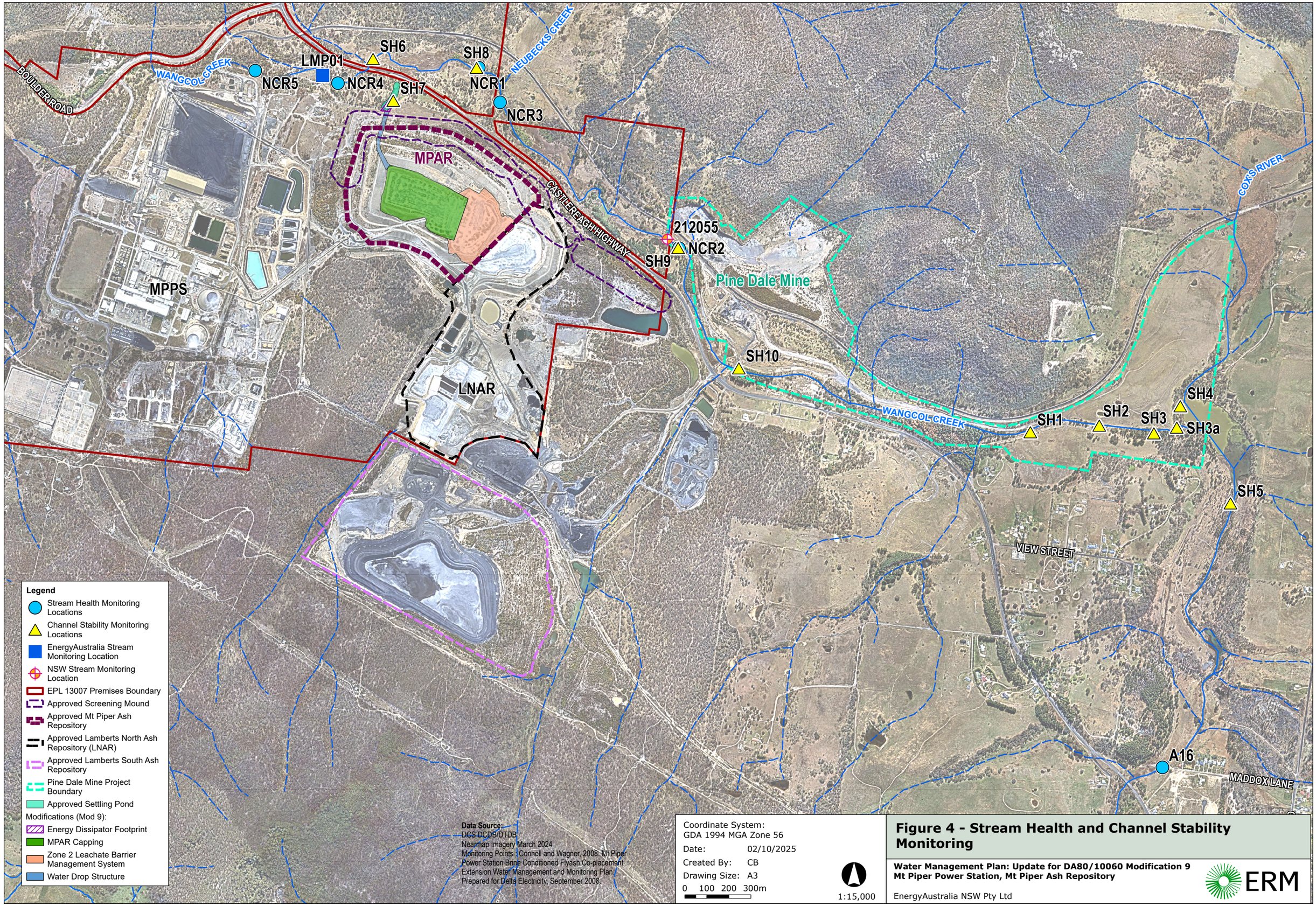


Figure 4 - Stream Health and Channel Stability Monitoring

Water Management Plan: Update for DA80/10060 Modification 9
Mt Piper Power Station, Mt Piper Ash Repository

EnergyAustralia NSW Pty Ltd

ERM

Appendix B Statement of Limitations

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1. This report is based solely on the scope of work described in our proposal P0744565 dated 29/8/24 (Scope of Work) and performed by Environmental Resources Management Australia Pty Ltd (ERM) for EnergyAustralia NSW Pty Ltd (the Client).The Scope of Work was governed by a contract between ERM and the Client (Contract).
2. No limitation, qualification or caveat set out below is intended to derogate from the rights and obligations of ERM and the Client under the Contract.
3. The findings of this report are solely based on, and the information provided in this report is strictly limited to that required by, the Scope of Work. Except to the extent stated otherwise, in preparing this report ERM has not considered any question, nor provides any information, beyond that required by the Scope of Work.
4. This report was prepared between October 2024 and 07 July 2026 and is based on conditions encountered and information reviewed at the time of preparation. This report does not, and cannot, take into account changes in law, factual circumstances, applicable regulatory instruments or any other future matter. ERM does not, and will not, provide any on-going advice on the impact of any future matters unless it has agreed with the Client to amend the Scope of Work or has entered into a new engagement to provide a further report.
5. Unless this report expressly states to the contrary, ERM's Scope of Work was limited strictly to identifying typical environmental conditions associated with the subject site(s) and does not evaluate the condition of any structure on the subject site nor any other issues. Although normal standard for professional practice have been applied, the absence of any identified hazardous or toxic materials, or any identified impacted soil or groundwater on the Site(s) should not be interpreted as a guarantee that such materials or impacts do not exist.
6. This report is based on one or more site inspections conducted by ERM personnel, the sampling and analyses described in the report, and information provided by the Client or third parties (including regulatory agencies). All conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved. Whilst normal checking of data accuracy was undertaken, except to the extent expressly set out in this report, ERM;
    a. Did not, nor was able to, make further enquiries to assess the reliability of the information or independently verify information provided by;
    b. Assumes no responsibility or liability for errors in data obtained from, the Client, any third parties or external sources (including regulatory agencies).
7. Although the data has been used in compiling this report is generally based on actual circumstances, if the report refers to hypothetical examples those examples may, or may not, represent actual existing circumstances.
8. Only the environmental conditions and or potential contaminants specifically referred to in this report have been considered. To the extent permitted by law and except as is specifically stated in this report, ERM makes no warranty or representation about:
    a. The suitability of the Site(s) for any purpose or the permissibility of any use;
    b. The presence, absence or otherwise of any environmental conditions or contaminants at the Site(s) or elsewhere; or
    c. The presence, absence or otherwise of asbestos, asbestos containing materials or any hazardous material on the Site(s).

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9. Use of the Site for any purpose may require planning and other approvals and, in some cases, environmental regulator and accredited site auditor approvals. ERM offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environmental works.
10. The ongoing use of the Site or use of the Site for a different purpose may require the management of or remediation of site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.
11. This report should be read in full and no excerpts are to be taken as representative of the whole report. To ensure its contextual integrity, the report is not to be copied, distributed or referred to in part only. No responsibility or liability is accepted by ERM for use of any part of this report in any other context.
12. Except to the extent that ERM has agreed otherwise with the Client in the Scope of Work or the Contract, this report:
    a. Has been prepared and is intended only of the exclusive use of the Client;
    b. Must not to be relied upon or used by any other party;
    c. Has not been prepared nor is intended for the purpose of advertising, sales, promoting or endorsing and Client interests including raising investment capital, recommending investment decisions, or other publicity purposes;
    d. Does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise in or in relation to the Site(s); and
    e. Does not purport to provide, nor should be constructed as, legal advice

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Appendix C Stakeholder Communications

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Project #	0751844
Report	Mt Piper Water Management Plan
Version	DRAFT
Dated	2/10/2025

#	Section	Comment By	Comment (17/10/2025)	EnergyAustralia Response (4/11/2025)
1	-	WaterNSW	the consent Condition 43(d) states to outline "*specific reference to measures aimed at reducing the volume of brine produced at the Mount Piper Power Station* " – this was not specifically addressed in this version of the WMP, and we request to provide further details in the final version of the plan.	This is now addressed in Section 8.2 of the WMP: "The MPAR receives brine from both the operations of the MPPS and from the adjoining SWTP, which treats mine water received from the local Springvale and Angus Place mines and produces a higher volume of brine than the MPPS. The brine produced at the MPPS and from the adjoining SWTP are both directed to double lined ponds before being further treated in the Brine Concentrators at MPPS which further treat and concentrate the brine, ultimately reducing the total quantity requiring disposal at the Ash Repositories. EnergyAustralia has commenced the construction of a new Brine Concentrator "non-seeded" pipeline and associated process infrastructure, which is intended to be commissioned in 2026. This non-seeded operation will allow for the volume of liquid brine waste streams generated at both the MPPS and the adjoining SWTP to be more efficiently reduced by the Brine Concentrators, and is expected to reduce the total volume of liquid brine by a factor of five."
2	-	WaterNSW	Water NSW also notes that Consent Condition 44 requires "The applicant must provide to the Secretary, EPA, DCCEEW Water, WaterNSW and Council, an Environmental Monitoring Report (EMR) for the MPAR on a yearly basis". Water NSW, however, requests to be notified as soon as possible should there be any significant exceedance of any analyte impacting water quality of the Wangcol Creek.	EnergyAustralia notes that conditions 66 and 67 from the Mt Piper Consent (see below) already require notification of incidents which is also separately regulated by the POEO Act and the MPPS Pollution Incident Response Management Plan (PIRMP). EA NSW confirms that WaterNSW will be notified of any incidents that are identified as impacting water quality in Wangcol Creek. COMPLIANCE 66. The Applicant must notify the Department within 24 hours of becoming aware of an incident. The notification must be made via the NSW planning portal (Major Projects) and address details of the incident including: (a) date, time and location; (b) a brief description of what occurred and why it has been classified as an incident; (c) a description of what immediate steps were taken in relation to the incident; and (d) identifying a contact person for further communication regarding the incident. 67. The Applicant must provide the Department with a subsequent incident report in accordance with Appendix 1 (Incident Notification and Reporting Requirements).

NSW Department of Climate Change, Energy, the Environment and Water

[redacted]

[redacted]
Energy Australia

Email [redacted]

22 October 2025

Subject: **Mount Piper Power Station (Ash Repository) (DA80/10060) – Water Management Plan**

Dear [redacted]

I refer to your request for advice sent on 8 October 2025 to the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Water Group about the above matter.

NSW DCCEEW Water Group has reviewed the Water Management Plan, and no aspects were identified which required comment.

Should you have any further queries in relation to this submission please do not hesitate to contact the DCCEEW Water Assessments team at [redacted]

Yours sincerely

[redacted]

[redacted]
Senior Project Officer, Water Assessments, Knowledge Division
NSW Department of Climate Change, Energy, the Environment and Water

EPA reference: [redacted]

Energy Australia NSW Pty Ltd
NSW Environment Leader
[redacted]

Via e-mail: [redacted]
CC: [redacted]

20 October 2025

Dear [redacted],

MOUNT PIPER POWER STATION (EPL 13007)
DA. 80/10060 – Water Management Plan

I refer to your email and letter to the Environment Protection Authority (EPA) on 2 September 2025, seeking comments on the draft Water Management Plan (WMP) for the Mount Piper Power Station (MPPS).

The EPA understands that the WMP is being updated in accordance with the requirements of Condition 43 of Mod 9 to DA 80-10060 for MMPS; this condition includes a requirement that the WMP to be prepared in consultation with the EPA. As you are aware, the EPA provided advice to the Department of Planning, Housing and Environment (DPHI) on the Mod 9 project, including specific comments on the capping and leachate management strategy for MPAR.

The EPA has reviewed the draft WMP and provides the following responses with reference to Table 2-1 within the WMP – Relevant Conditions of the Mt Piper Consent (conditions 58, 59, & 60 – Capping and Leachate Management). The Capping and Leachate Management strategy consists of three (3) components within the consent conditions, summarised as follows:

- **Condition 58 –** Prior to commencement of the construction of the leachate barrier management system in Zone 2 of the Mount Piper Ash Repository (MPAR), the applicant (EnergyAustralia) must demonstrate to the satisfaction of the EPA that the design is generally consistent with the relevant requirements of the *Environmental Guidelines, Solid Waste Landfills* (EPA 2016).

- **Condition 59 –** Within six months of Mod 9 being approved, EnergyAustralia must develop a capping strategy for the entire MPAR to the satisfaction of the EPA. The capping strategy must provide details of short, medium and long-term solutions for control of migration of the solutes from the entire MPAR, and this should include additional works to reduce infiltration on the batter slopes of MPAR.

- **Condition 60** – Within three months of approval of the capping strategy, the applicant must further revise the WMP.

The EPA notes that each of the above tasks have a logical flow and do not overlap each other, with each component activating the following. The EPA also notes that Table 2-1 of the draft WMP advises that each of these requirements (58, 59 & 60) are either being currently addressed or will be addressed with separate reports / plans for approval and / or review. The EPA will continue to respond to and review all subsequent reports and / or management plans regarding the capping strategy as they are provided.

If you have any specific questions regarding this matter, please contact [redacted] on [redacted] or via e-mail at [redacted]

Yours sincerely

[redacted]

Unit Head - Regulatory Operations
Environment Protection Authority

[redacted] [redacted]

Outlook

RE: Mt Piper Power Station Water Management Plan

From [redacted]
Date Fri 10/17/2025 11:15 AM
To [redacted]
Cc [redacted]

[redacted]

[redacted]

Hi [redacted],

Thank you very much for the opportunity provided to review the draft Water Management Plan (WMP) for Mt Piper Power Station.

Please find the comments below based on the review of the plan:

- the consent Condition 43(d) states to outline "*specific reference to measures aimed at reducing the volume of brine produced at the Mount Piper Power Station*" – this was not specifically addressed in this version of the WMP, and we request to provide further details in the final version of the plan.
- Water NSW also notes that Consent Condition 44 requires "The applicant must provide to the Secretary, EPA, DCCEEW Water, WaterNSW and Council, an Environmental Monitoring Report (EMR) for the MPAR on a yearly basis". Water NSW, however, requests to be notified as soon as possible should there be any significant exceedance of any analyte impacting water quality of the Wangcol Creek.

Kind regards,

[redacted]
Catchment Assessment Officer

WaterNSW
We're at the source

Level 14, 169 Macquarie St (1PSQ)
Parramatta NSW 2150
Work location: remote, please reach via email
E: [redacted]

Follow us on socials:

My work day may look different than your work day. Feel free to read, act on or respond during your working hours.

WaterNSW acknowledges the Traditional Custodians of the land and water on which we work and recognises the continuing cultural and spiritual connections that Aboriginal and Torres Strait Islander People have to Country. We pay our respects to Elders past and present.

Outlook

FW: EPL13007: MPAR Capping Strategy

From [redacted]
Date Thu 4/16/2026 1:03 PM
To [redacted]
Cc [redacted]>

7 attachments (53 KB)
image001.png; image002.png; image003.png; image004.png; image005.png; image006.png; ~WRD0002.jpg;

EXTERNAL MESSAGE

fyi

[redacted]

NSW Environment Leader

m +61 [redacted]

From: [redacted]>
Sent: Thursday, 5 March 2026 8:05 AM
To: [redacted]>
Cc: [redacted]
Subject: RE: EPL13007: MPAR Capping Strategy

Hello [redacted],

Thank you for providing the opportunity to provide comment on the draft Mt Piper Ash Repository Capping Strategy (draft capping strategy). The EPA has reviewed the draft capping strategy and has no further comments at this stage, however notes that further information by way of an 'Additional Recharge Control Options Assessment' will be provided to the EPA. In addition, the EPA notes that the Wangcol Creek Remediation Feasibility Study is being finalised and will be incorporated into the revised Capping Strategy. The EPA will review the updated Capping Strategy when these components have been incorporated. If necessary, the EPA will consider incorporating any outcomes of the above mitigation measures into conditions within the Mt Piper EPL.

Kind regards,

[redacted]

---------- Forwarded Message ----------
From: [redacted]
Sent: 4/03/2026 9:17 AM
To: info@epa.nsw.gov.au
Cc: [redacted]
Subject: EPL13007: MPAR Capping Strategy

Dear [redacted],

Further to:

1. The draft Mt Piper Ash Repository Capping Strategy (**Draft Capping Strategy**) provided to the EPA on 16 February 2026 for review and approval in accordance with condition 59 of Development Consent 80/10060, as modified by Modification 9 (**Mt Piper Consent**); and

2. Our pending request to vary condition U1 of EPL 13007 to extend the date for submission of the Wangcol Creek Remediation Feasibility Study until 24 March 2026 (which we understand the EPA does not object to and is currently processing),

I confirm that:

1. The draft Wangcol Creek Remediation Feasibility Study is currently being reviewed by NSW Treasury and will be provided to the EPA by 24 March 2026 as contemplated by the variation request.

2. ERM have now also prepared a draft Assessment of Additional Recharge Control Options (**Draft Additional Recharge Control Options Assessment**) which, as contemplated by section 3.3.3 of the Draft Capping Strategy, assesses and models additional recharge control options for those parts of the Mt Piper Ash Repository (**MPAR**) Stage 1 and Stage 2 brine conditioned ash placement footprint which are outside the new MPAR phase 1 cap approved by Modification 9, including the benches and batters of the MPAR. The Draft Additional Recharge Control Options Assessment identifies that, based on the modelling outcomes, scenario 2a (being grass cover over all MPAR batters > 946 mAHD with a suitable groundcover grass species and associated soil improvements) is likely to be the most feasible and appropriate option and does have merit in reducing water infiltration at the MPAR. The Draft Additional Recharge Control Options Assessment is also currently being reviewed by NSW Treasury and will be provided to the EPA once this review is finalised and any further clarifications requested by NSW Treasury have been addressed. However, it will also be necessary for EA NSW to carry out further assessments to confirm the extent of soil improvement works required and whether there are any material safety, site access and logistical considerations which will need to be further addressed before EA NSW can confirm that this is option is the most feasible and appropriate.

In light of this, and noting that the Draft Capping Strategy is required to be finalised and approved under condition 59 of the Mt Piper Consent by 24 March 2026 (in line with the proposed revised deadline for submission of the Wangcol Creek Remediation Feasibility Study), EA NSW respectfully asks the EPA to provide any comments on the Draft Capping Strategy as soon as practicable (ideally this week), so that we can finalise the Capping Strategy and have it approved by the EPA under condition 59 of the Mt Piper Consent prior to 24 March 2026 deadline.

EA NSW confirms that it will, within 6 months of the date on which the draft Capping Strategy is approved by the EPA:

3. review and update the approved Capping Strategy to incorporate the findings of both:

    1. 1. the final Additional Recharge Control Options Assessment and the outcome of EA NSW's ongoing feasibility assessments; and
    2. 2. the Wangcol Creek Remediation Feasibility Study (noting that Wangcol Creek is outside the approved boundaries of the Mt Piper Consent and that further approvals are likely to be separately required to authorise any works relating to Wangcol Creek),

4. submit the revised Capping Strategy to the EPA for further approval under condition 59 of the Mt Piper Consent.

Please let me know if you have any questions relating to the above.

Kind regards,

[redacted]

[redacted]

NSW Environment Leader

e[redacted]

m [redacted]

EnergyAustralia

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energyaustralia.com.au

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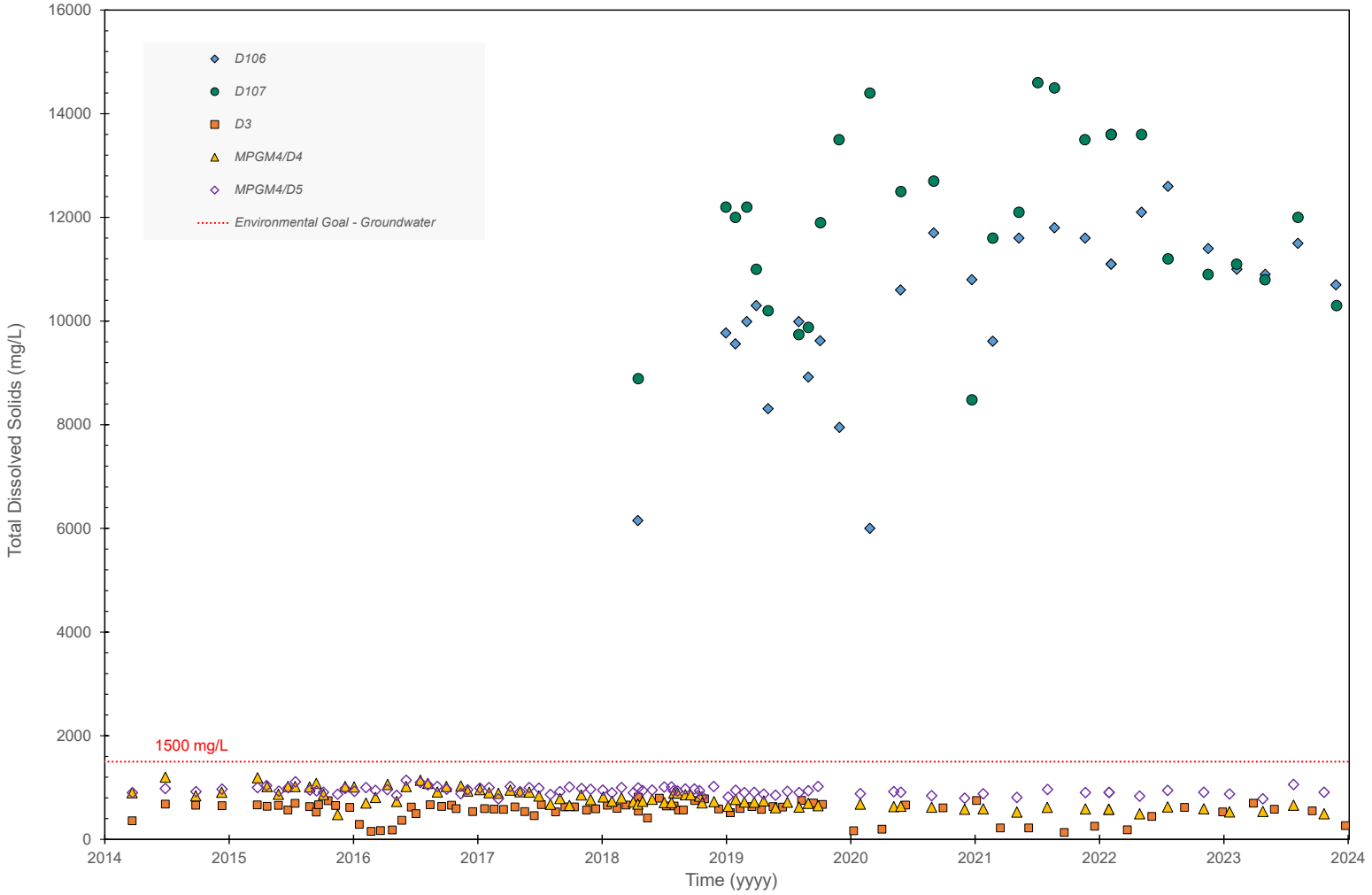


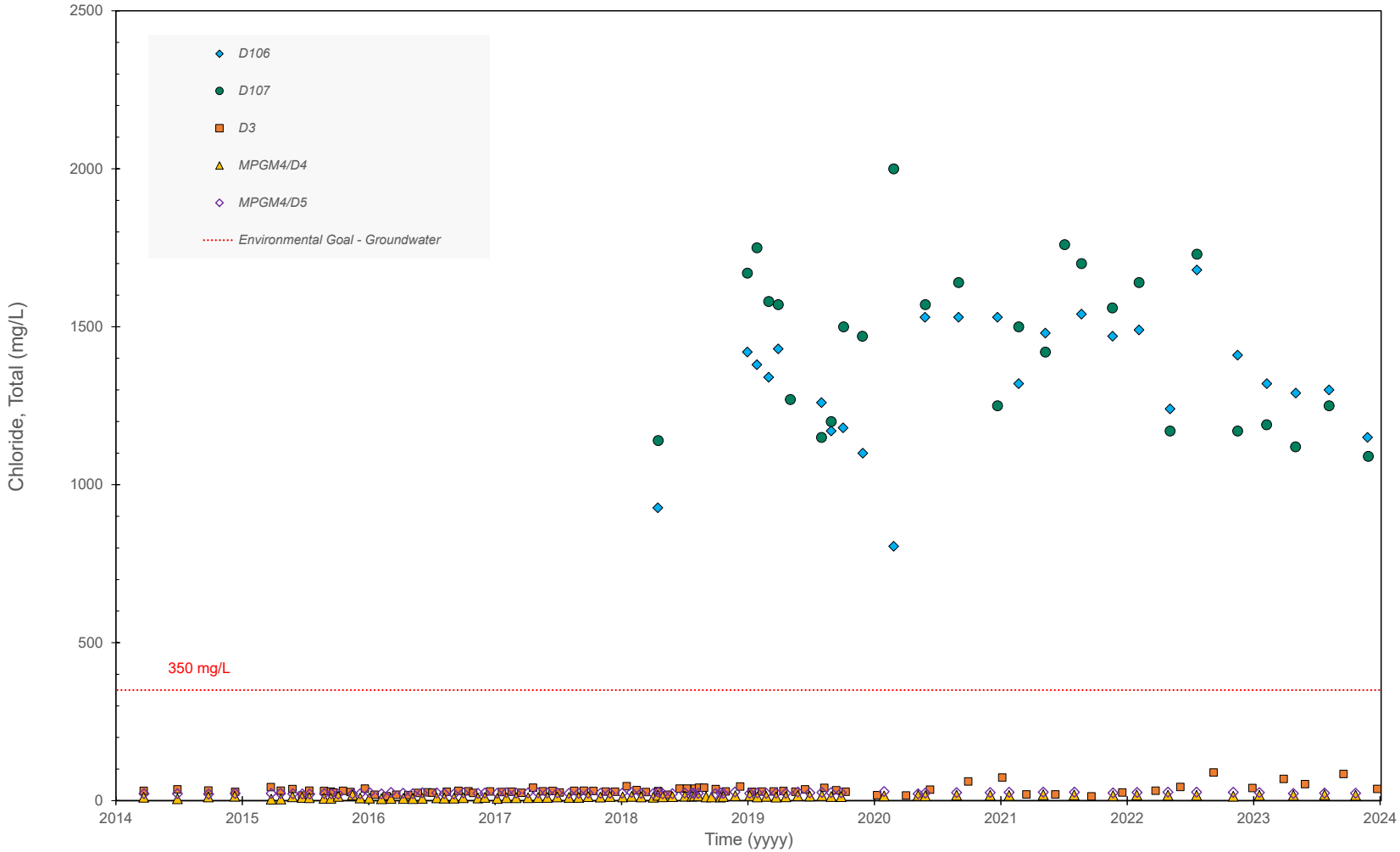
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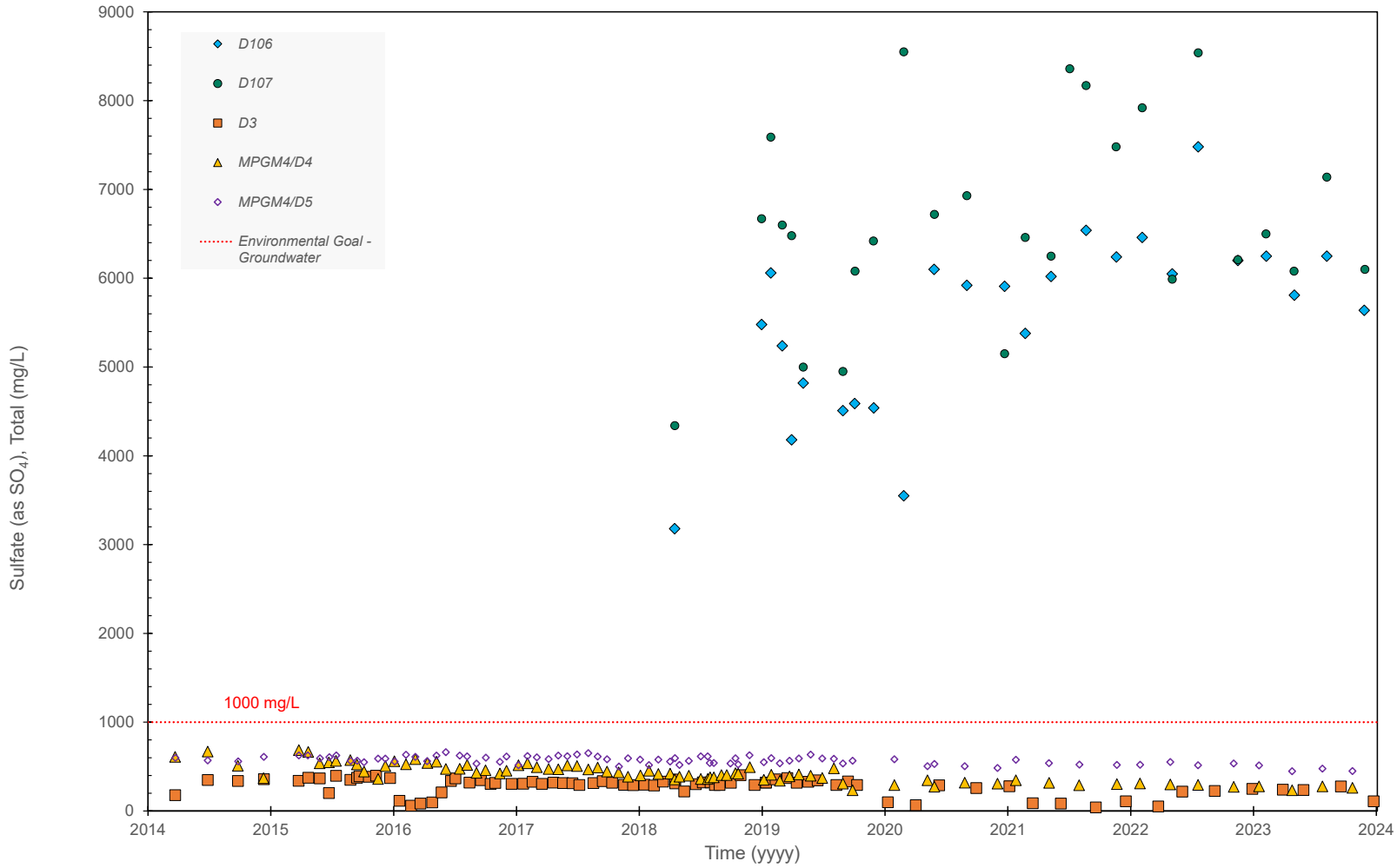
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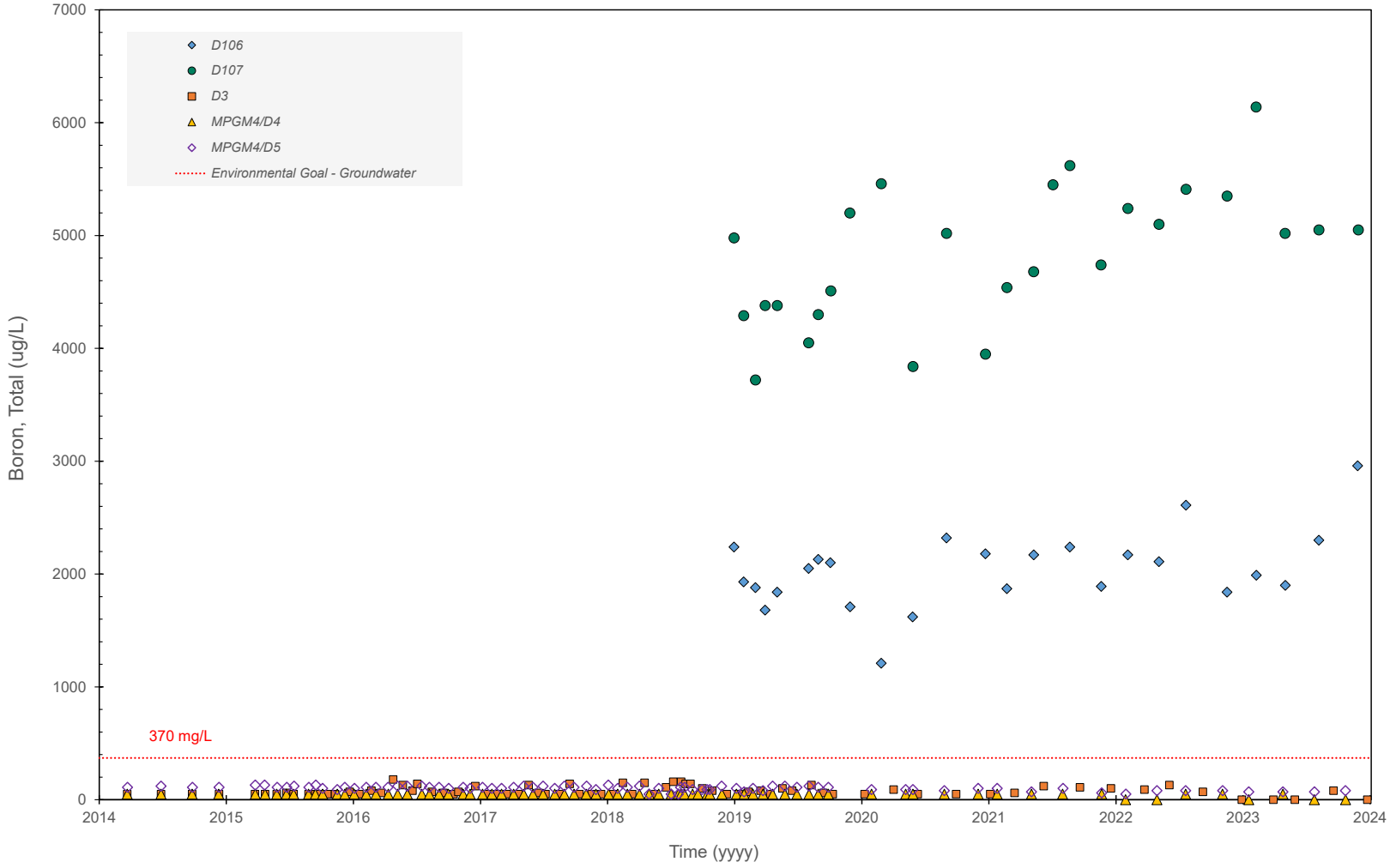
Appendix D Baseline Water Quality Data (2014-2024)

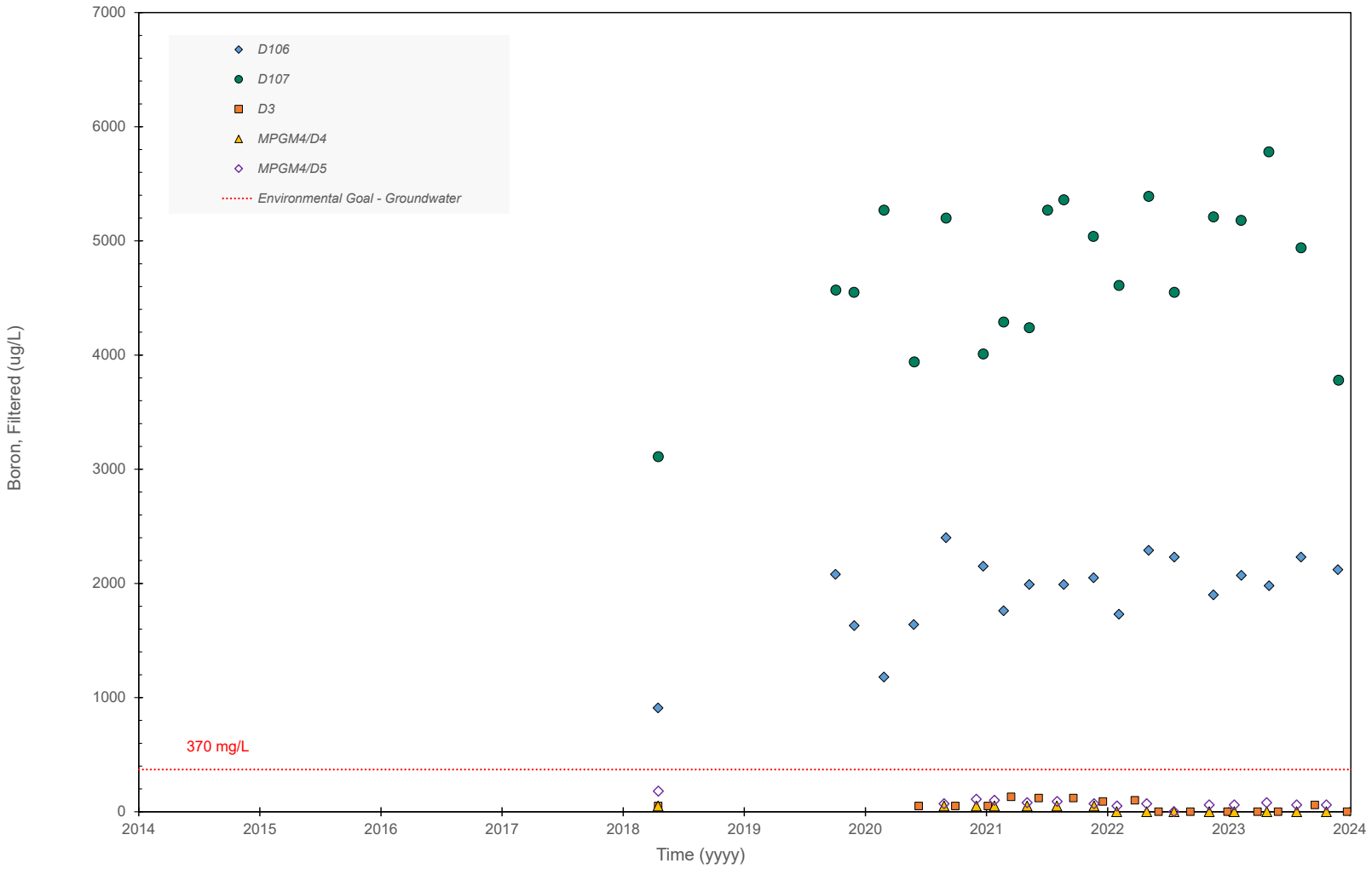
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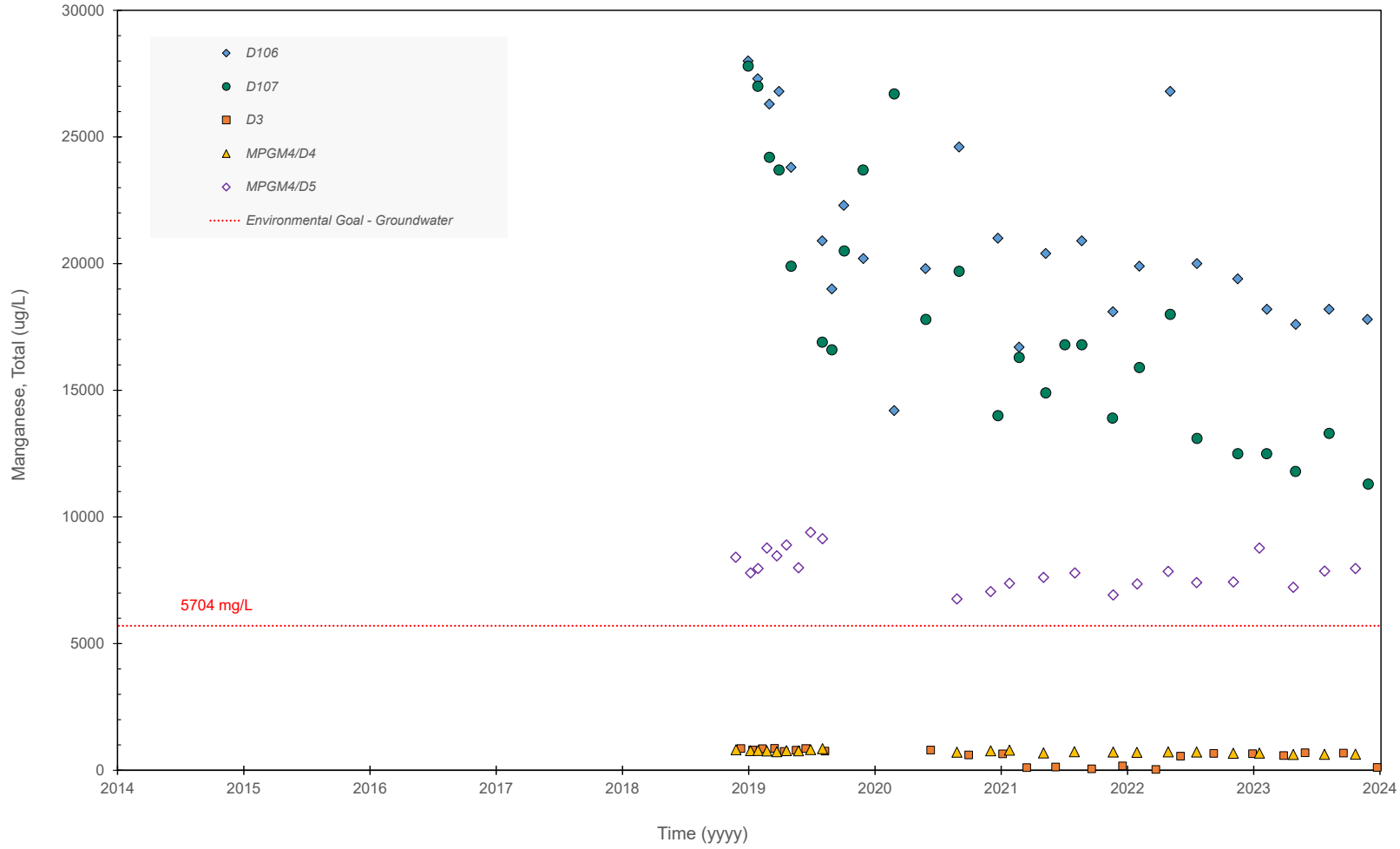

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
1500 mg/L
Total Dissolved Solids (mg/L)
Time (yyyy)
0
2000
4000
6000
8000
10000
12000
14000
16000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

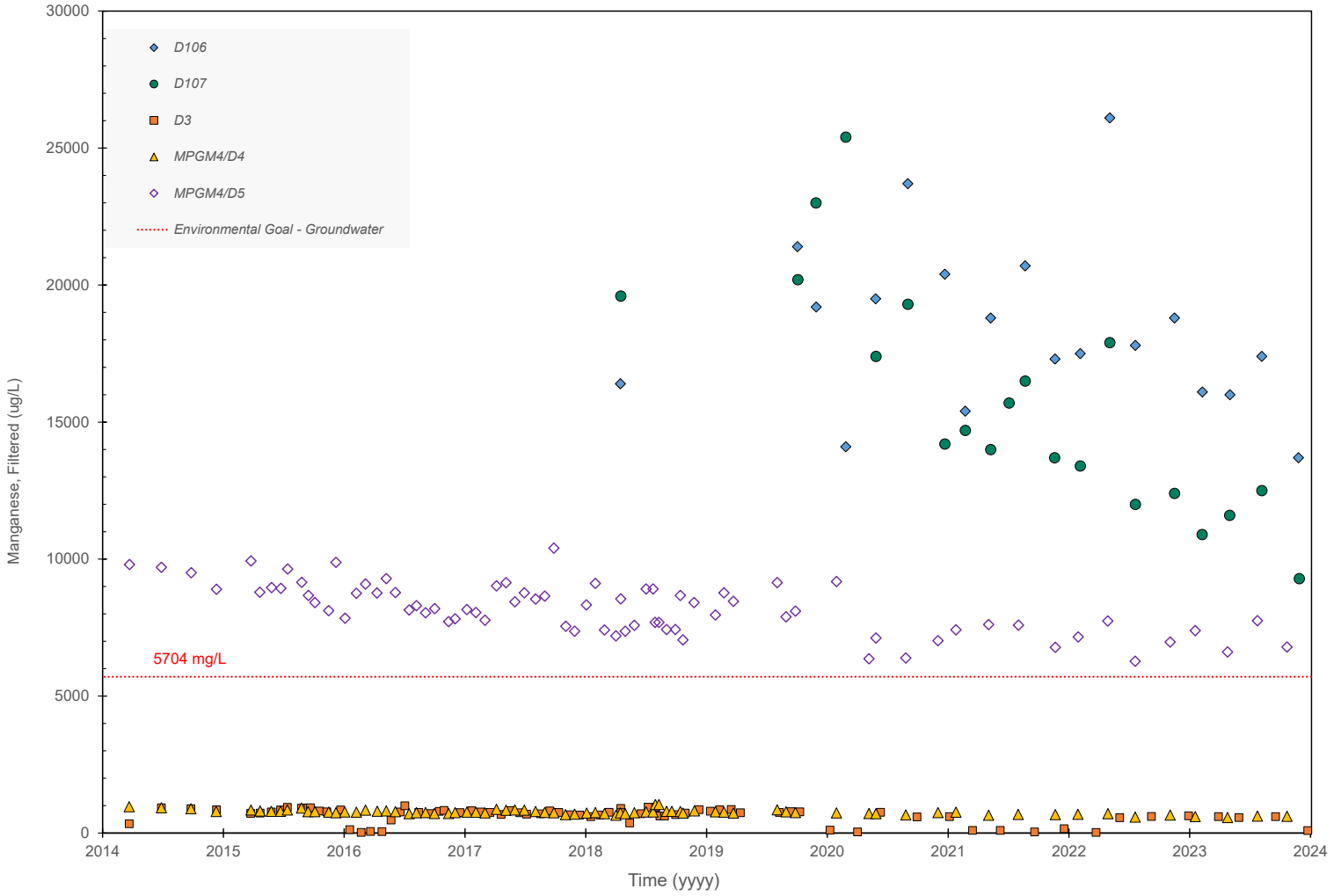

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
350 mg/L
Chloride, Total (mg/L)
Time (yyyy)
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

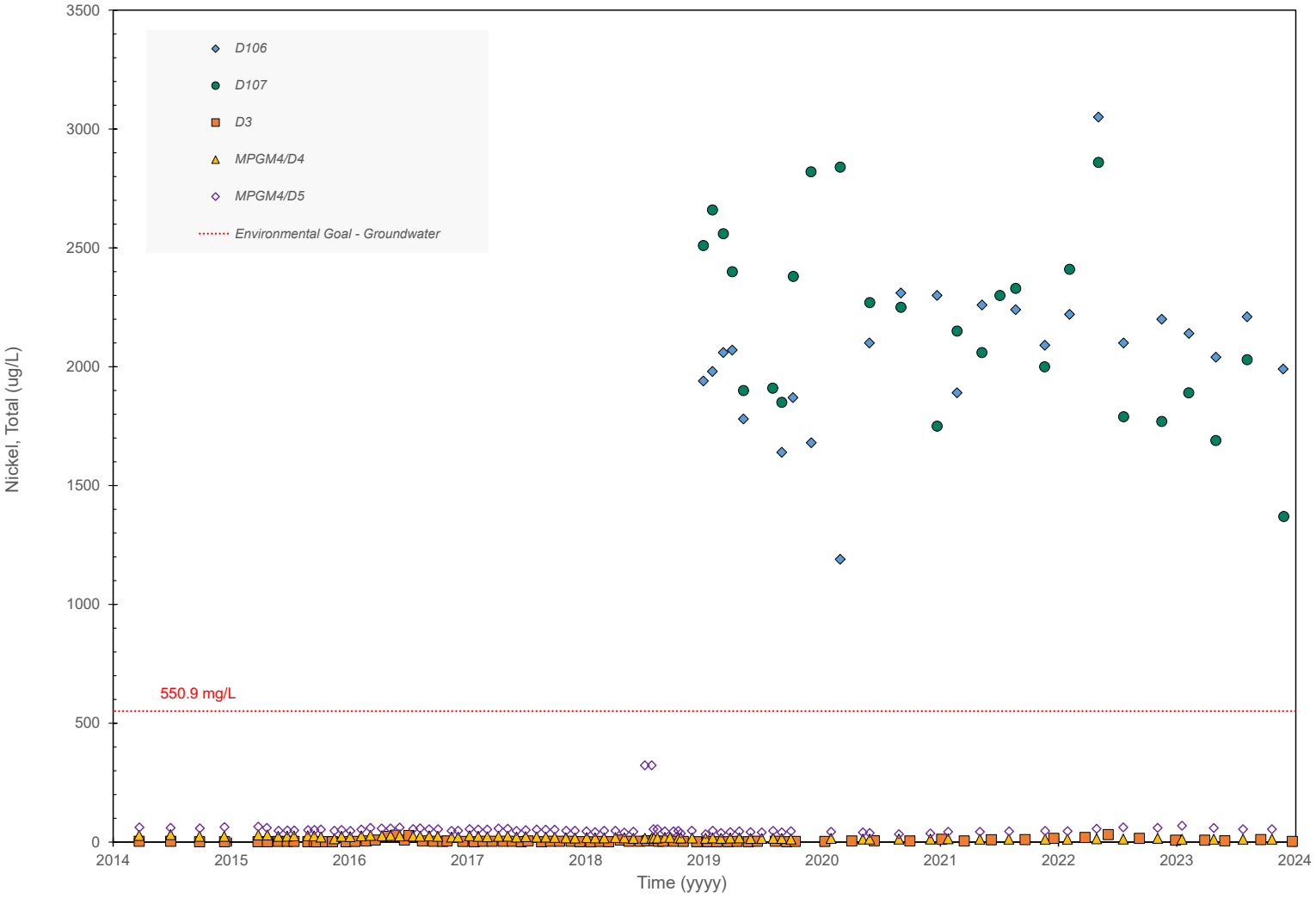

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
1000 mg/L
Sulfate (as SO_4), Total (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

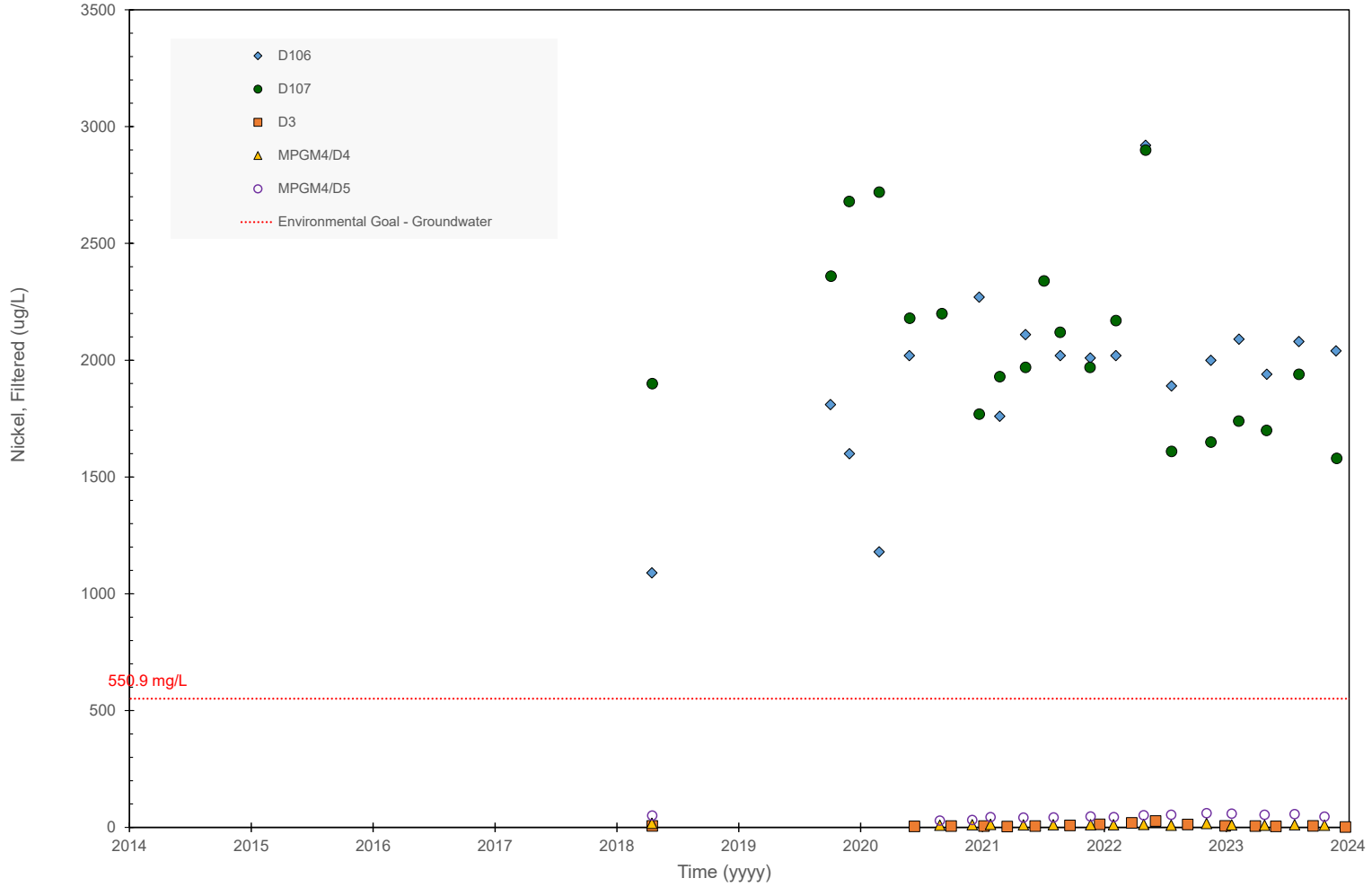

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
370 mg/L
Boron, Total (ug/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

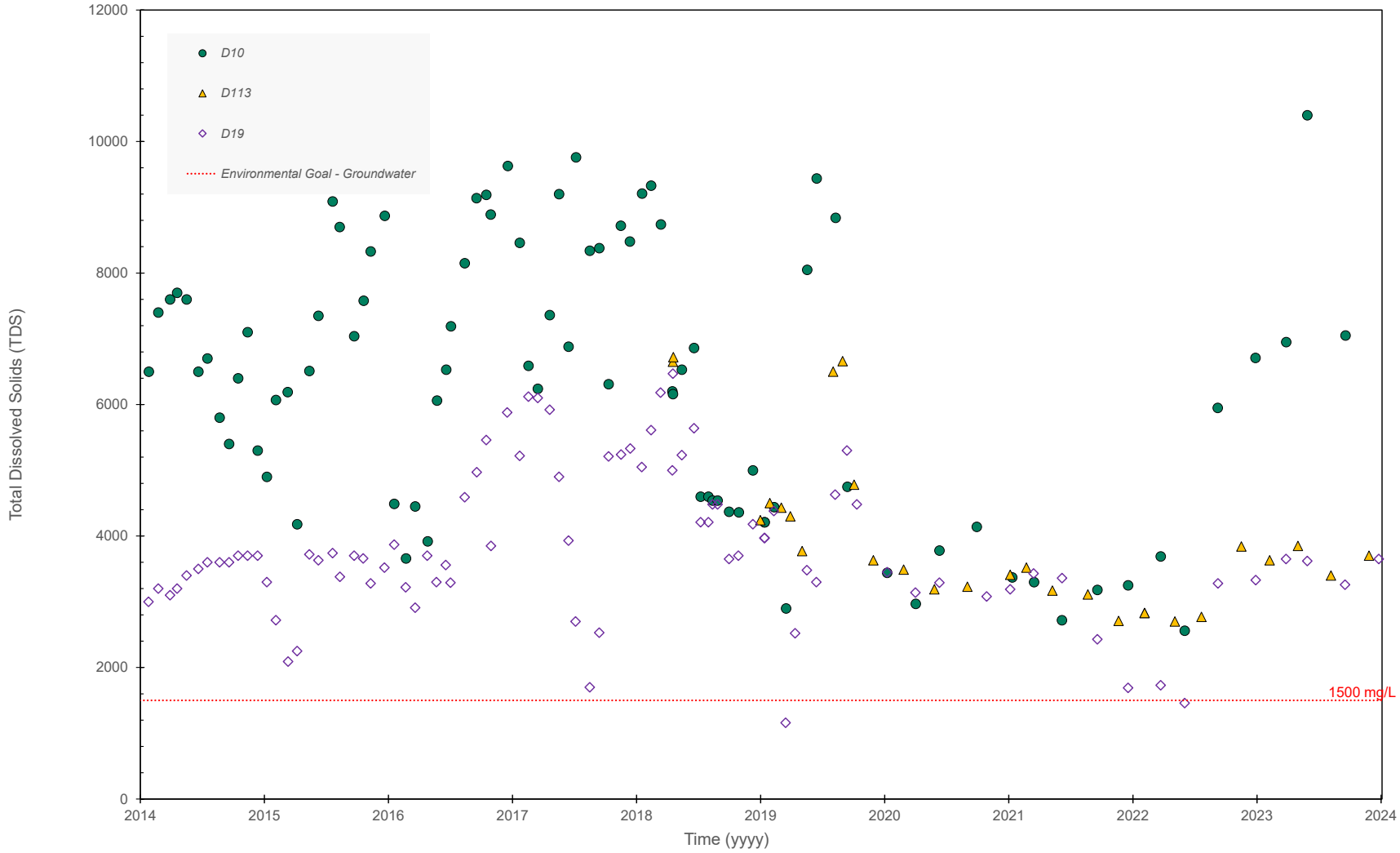

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
370 mg/L
Boron, Filtered (ug/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
5704 mg/L
Manganese, Total (ug/L)
Time (yyyy)
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

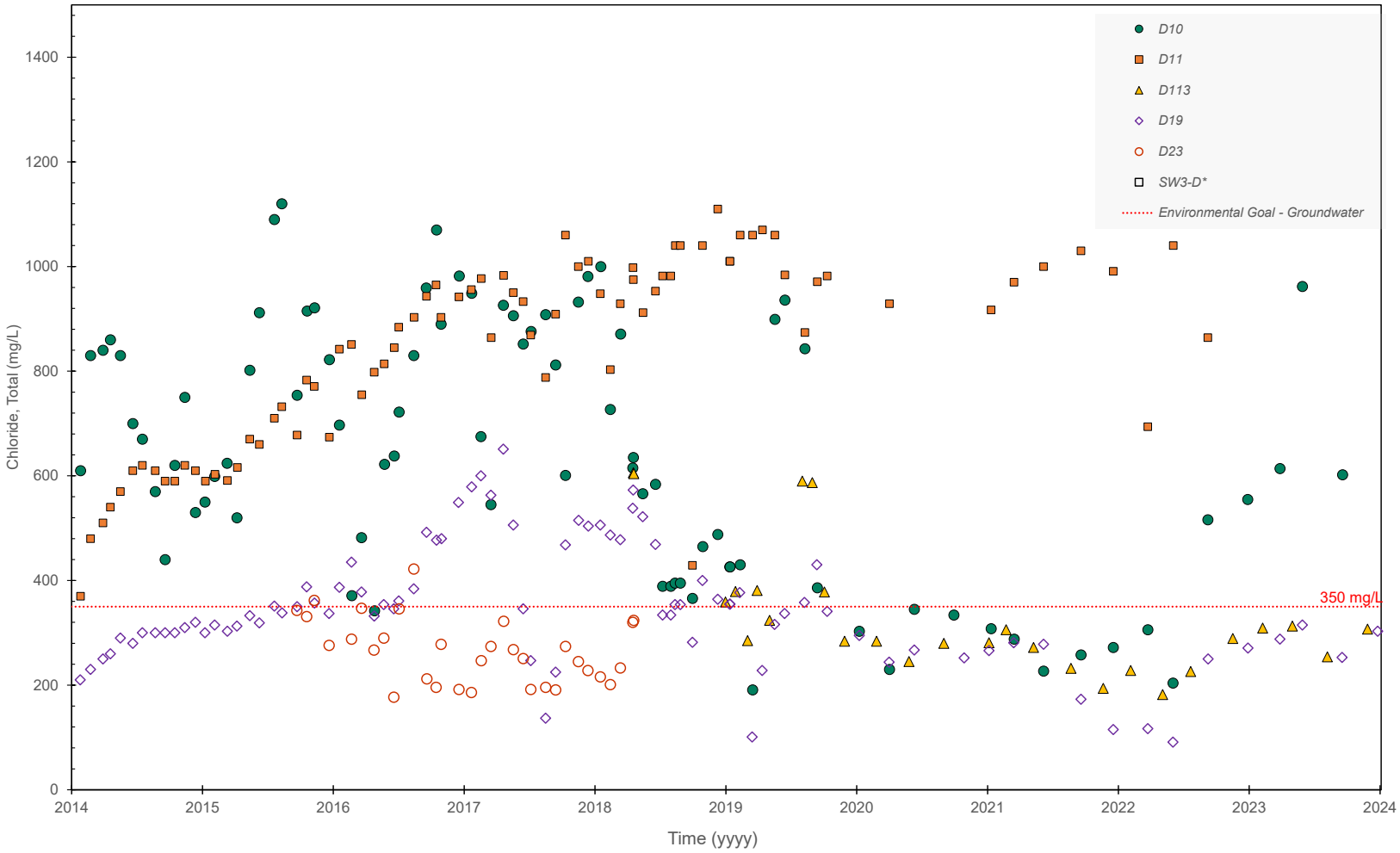

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
5704 mg/L
Manganese, Filtered (ug/L)
Time (yyyy)
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Total (ug/L)
Time (yyyy)
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

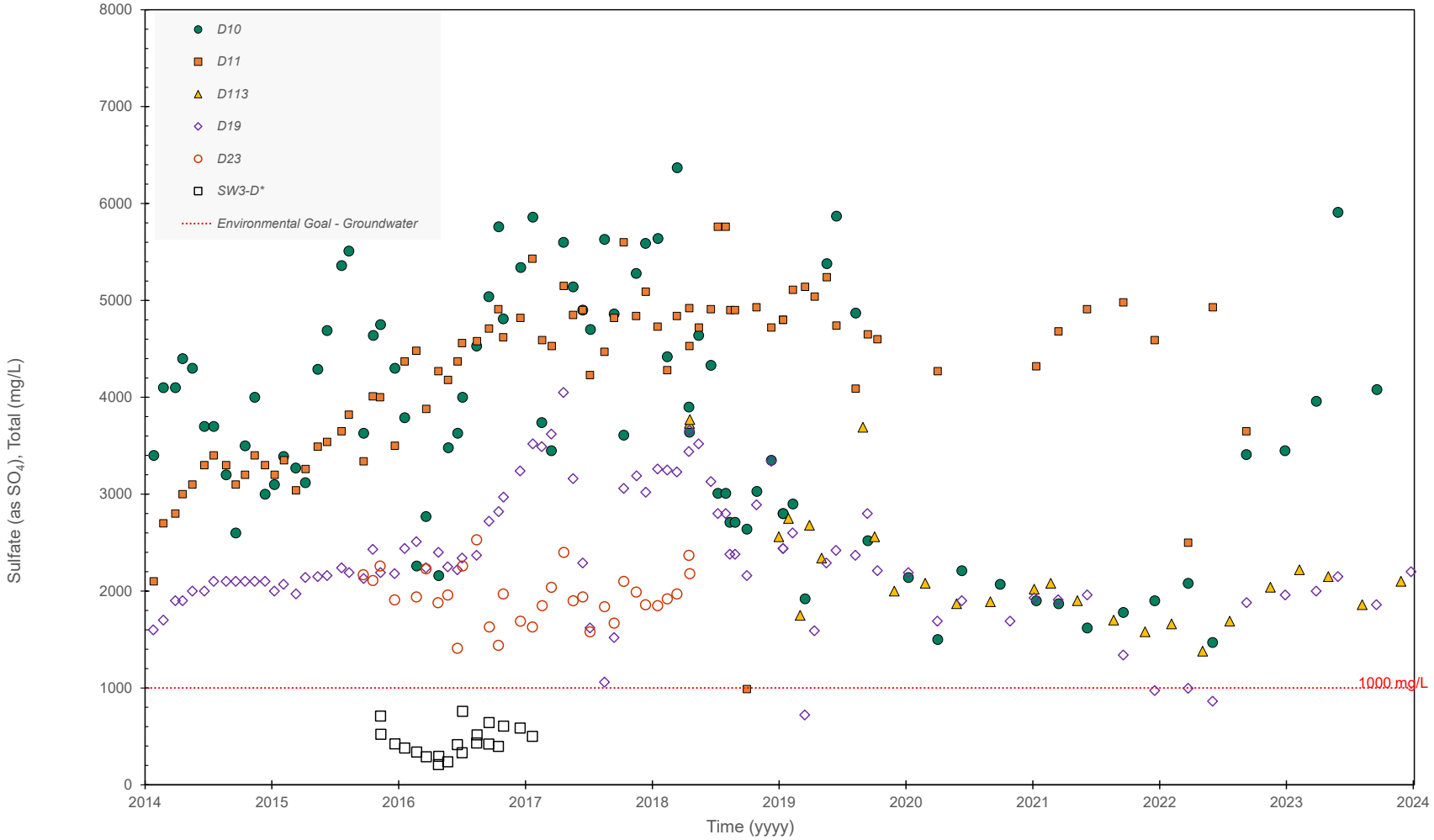

D106
D107
D3
MPGM4/D4
MPGM4/D5
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Filtered (ug/L)
Time (yyyy)
0
500
1000
1500
2000
2500
3000
3500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024



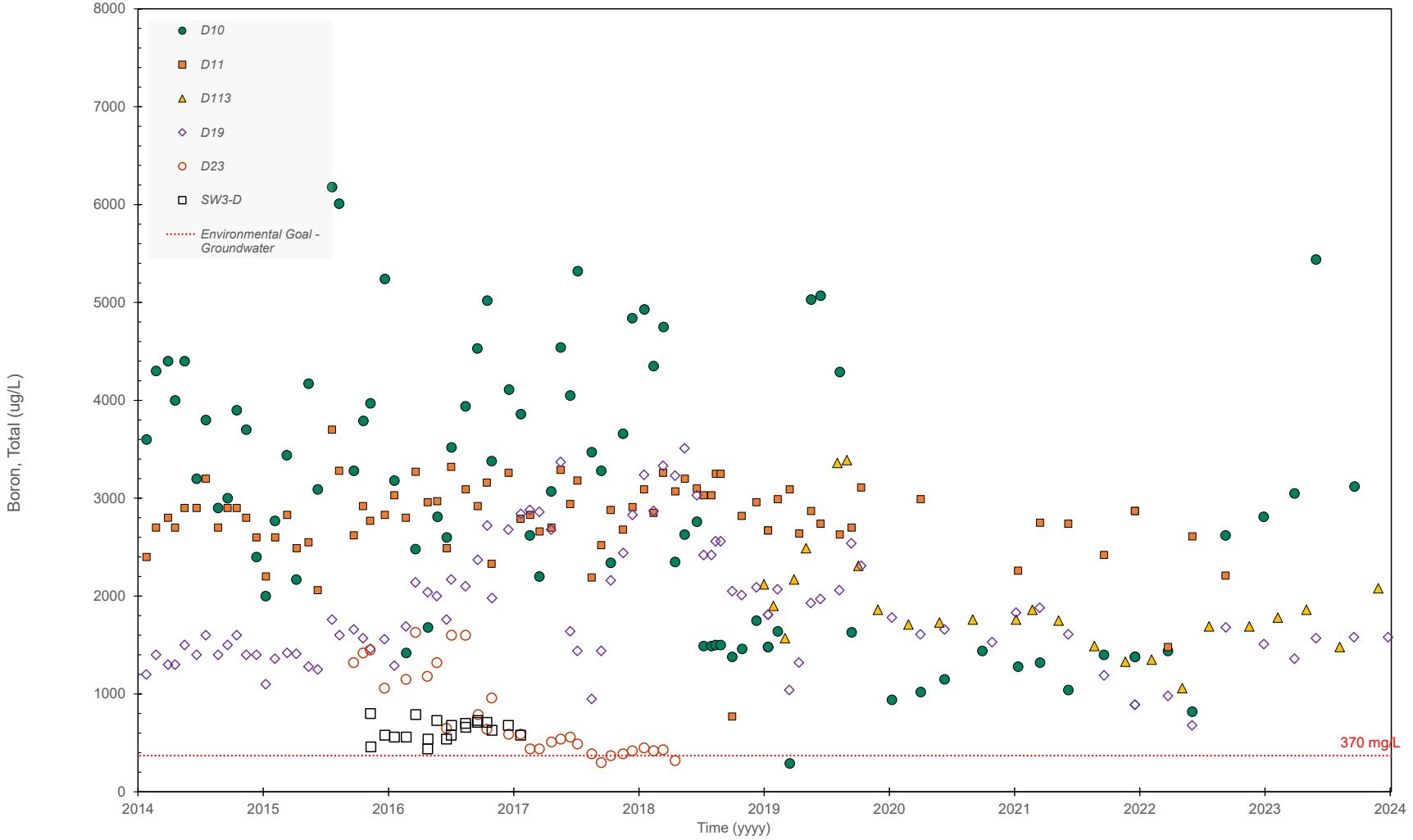
*Data for B5 and SWD-3 has not been supplied by EnergyAustralia since 2017 due to wells reported as either blocked or dry.



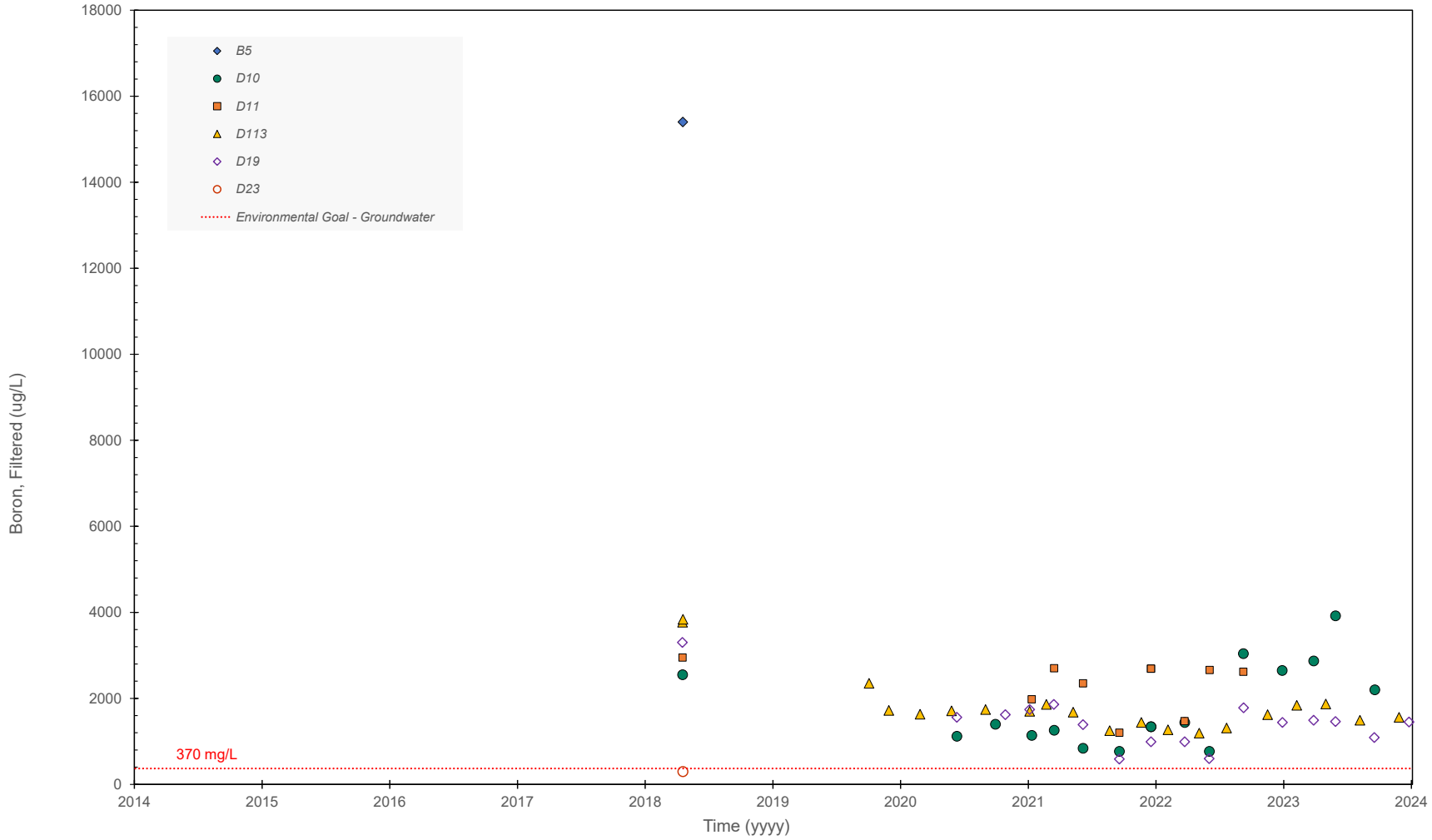
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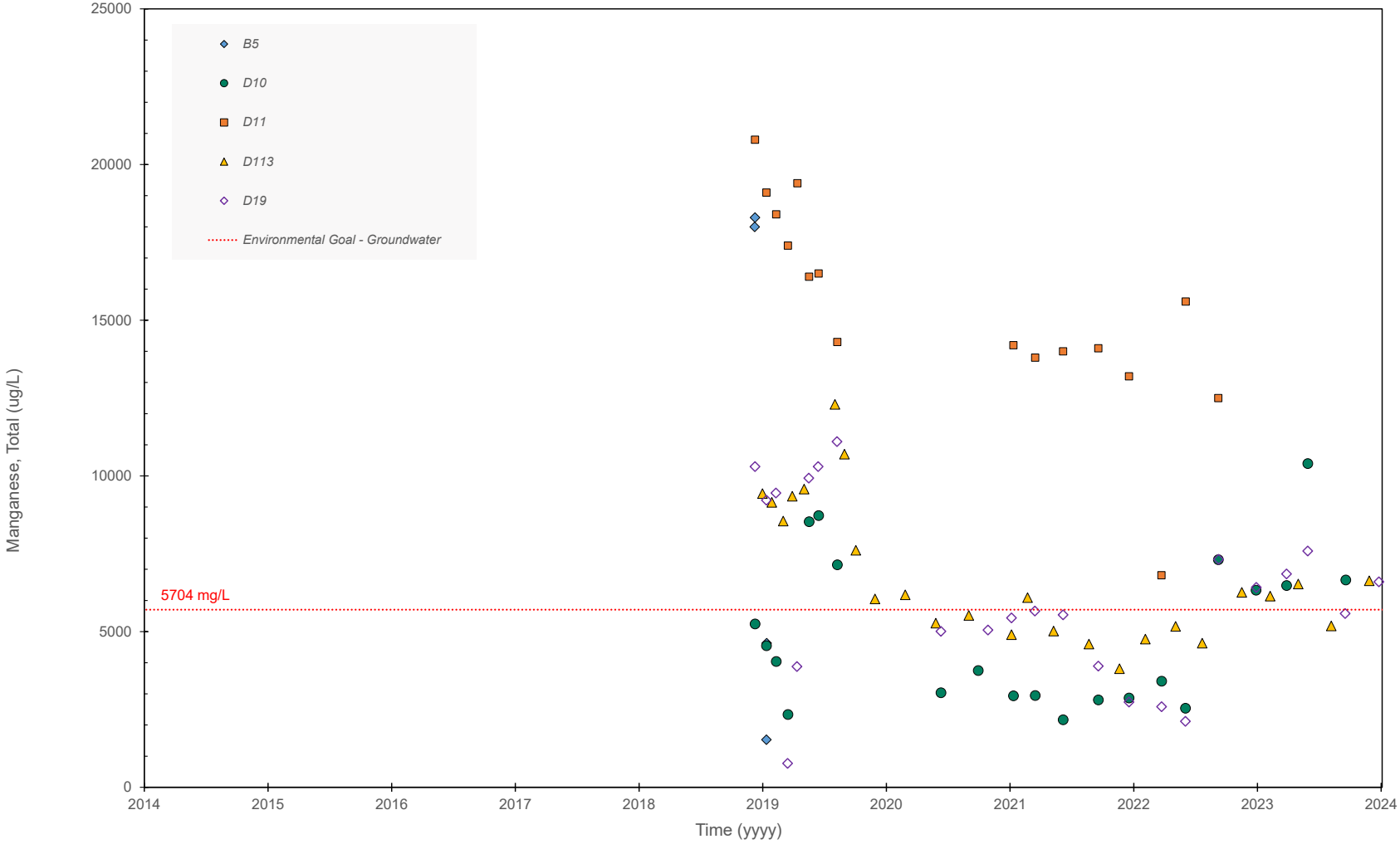
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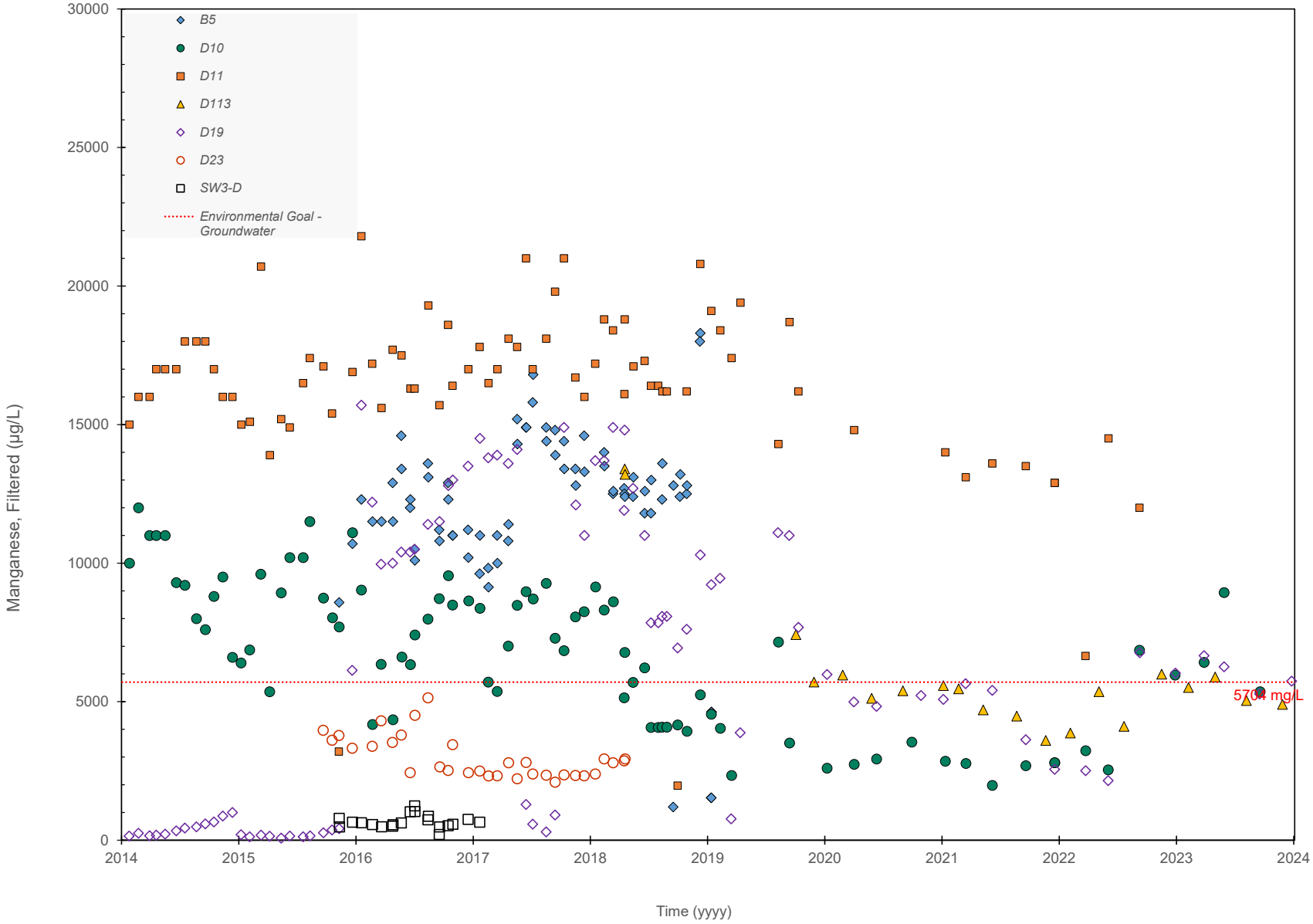


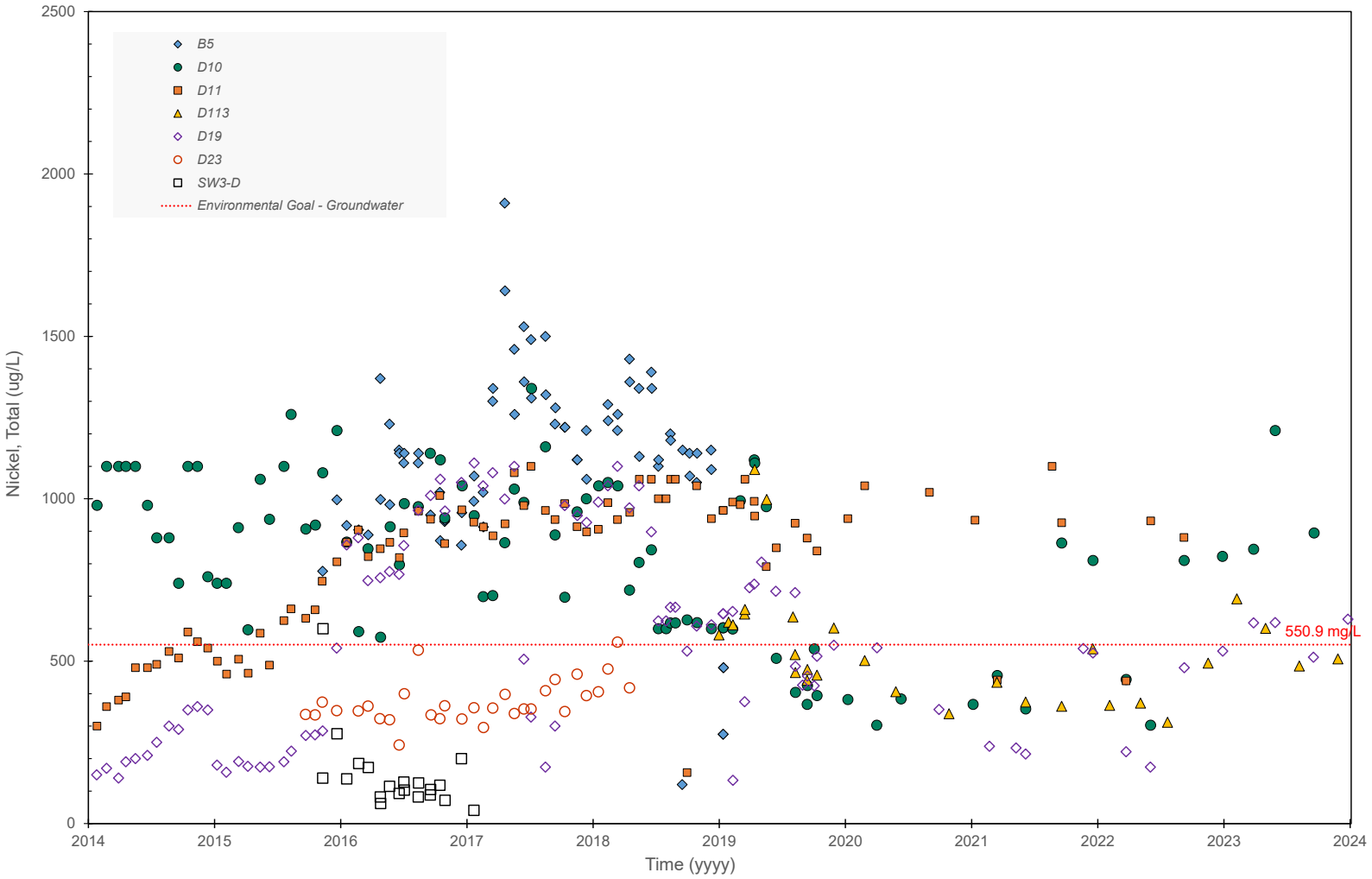
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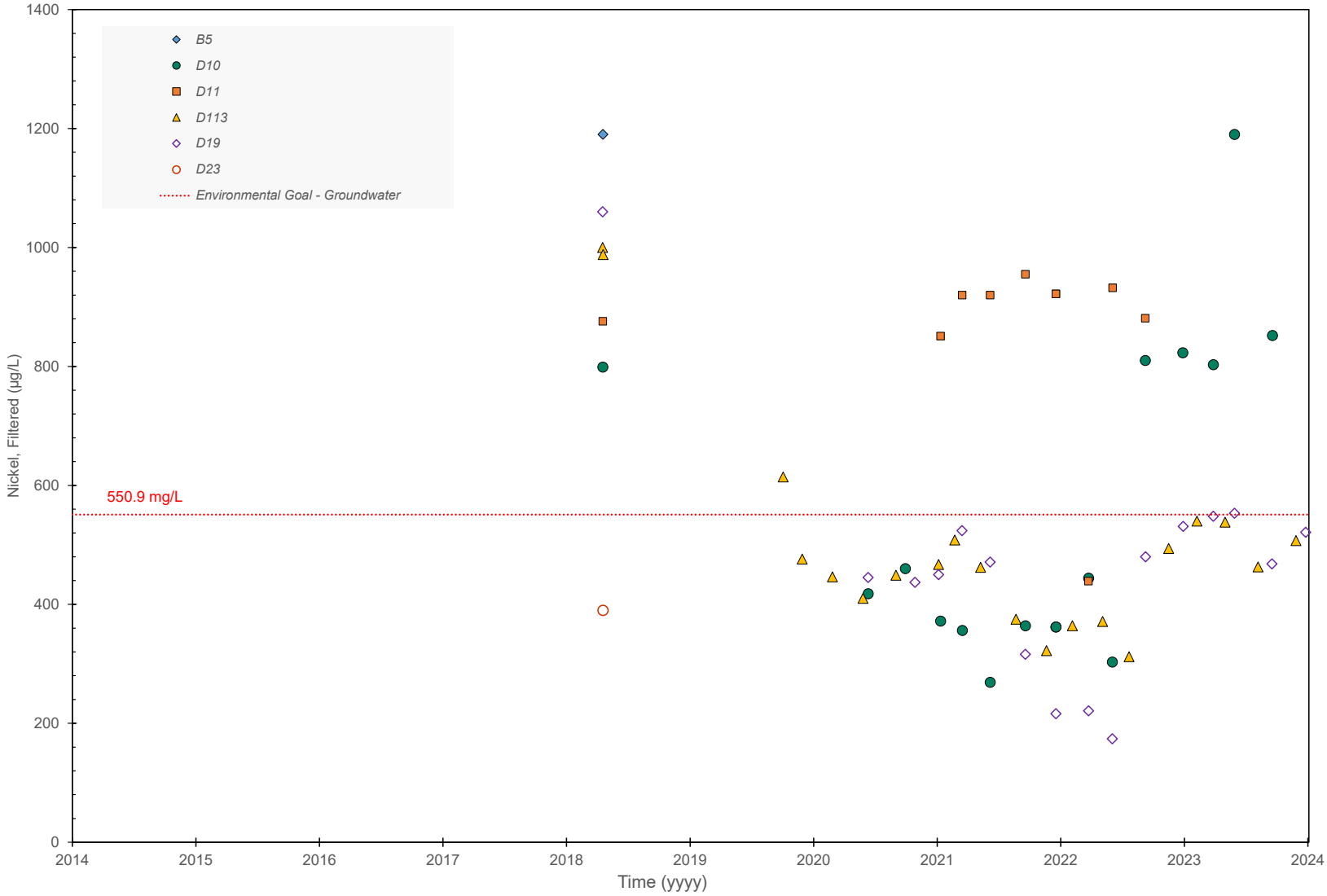


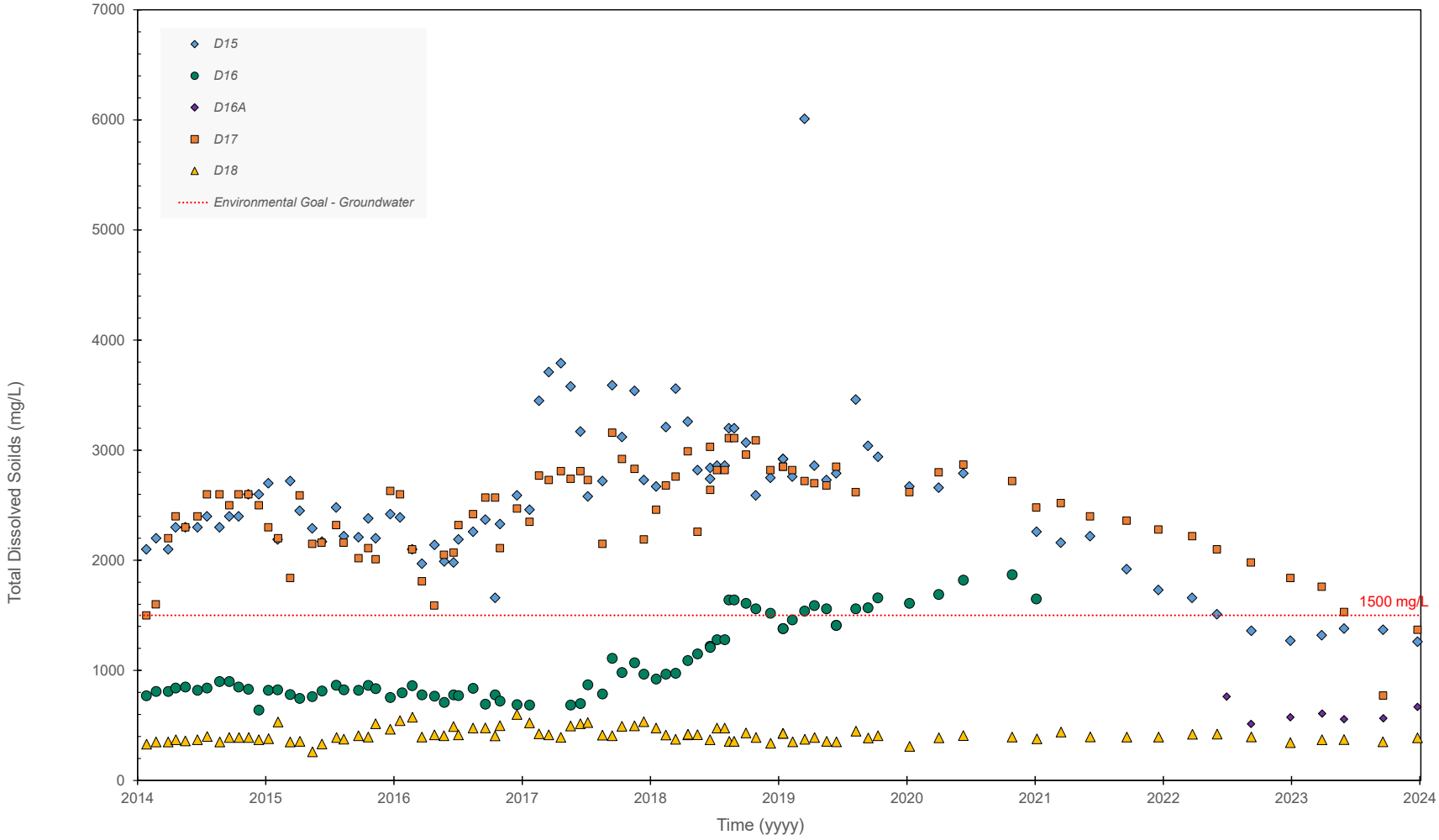
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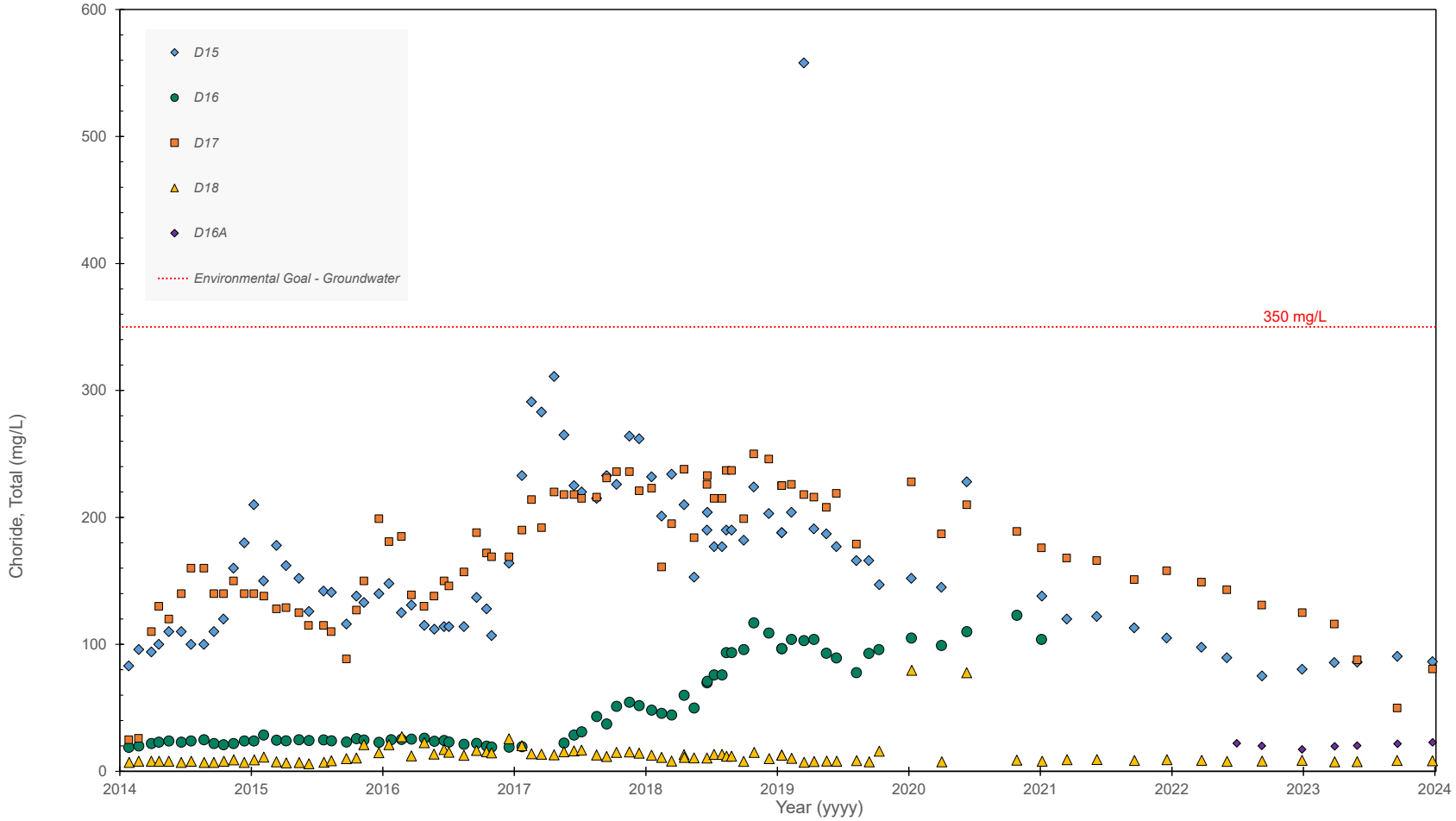

B5
D10
D11
D113
D19
Environmental Goal - Groundwater
5704 mg/L
Manganese, Total (ug/L)
Time (yyyy)
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

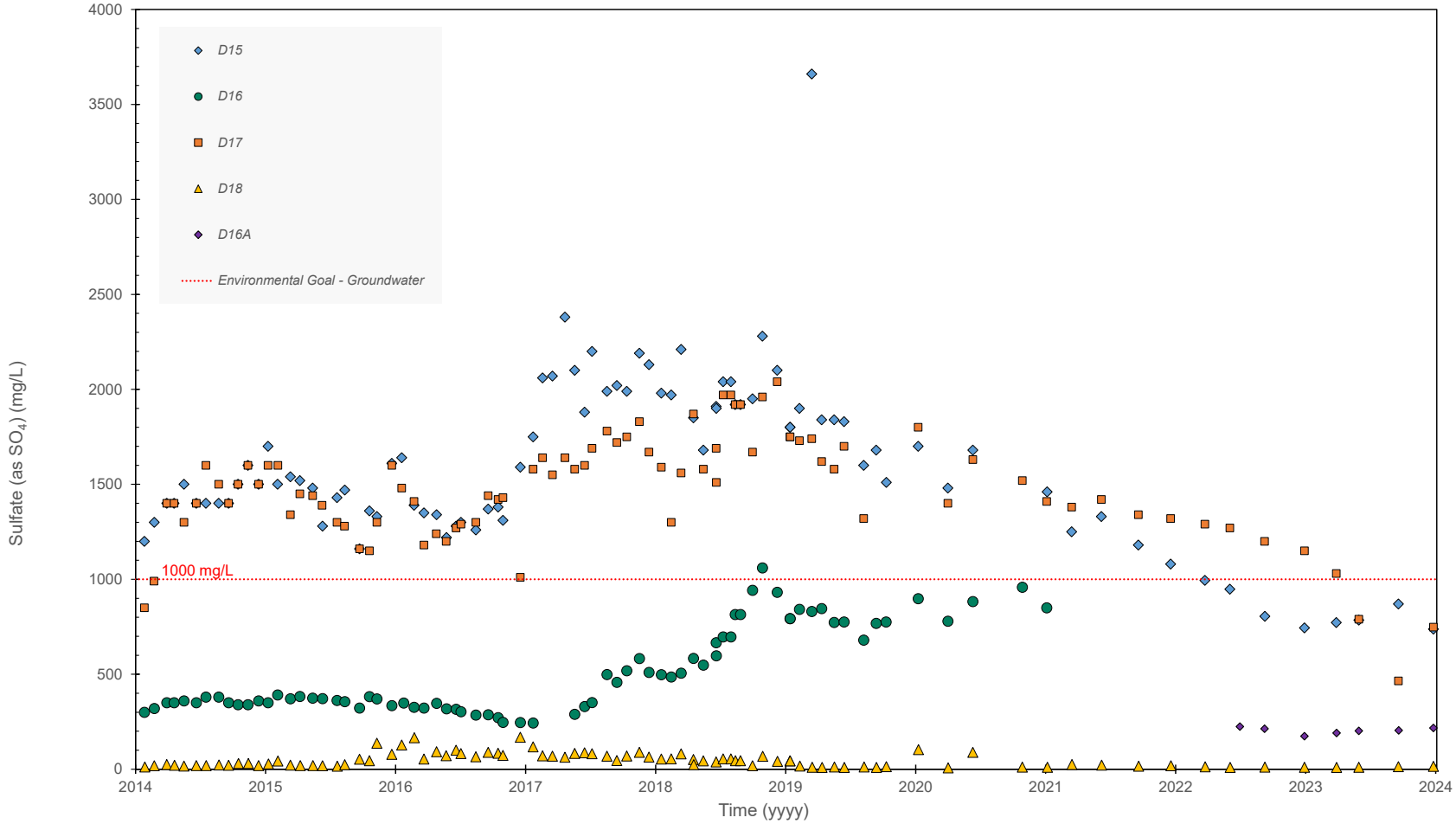

B5
D10
D11
D113
D19
D23
SW3-D
Environmental Goal - Groundwater
Manganese, Filtered (µg/L)
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Time (yyyy)
5704 mg/L

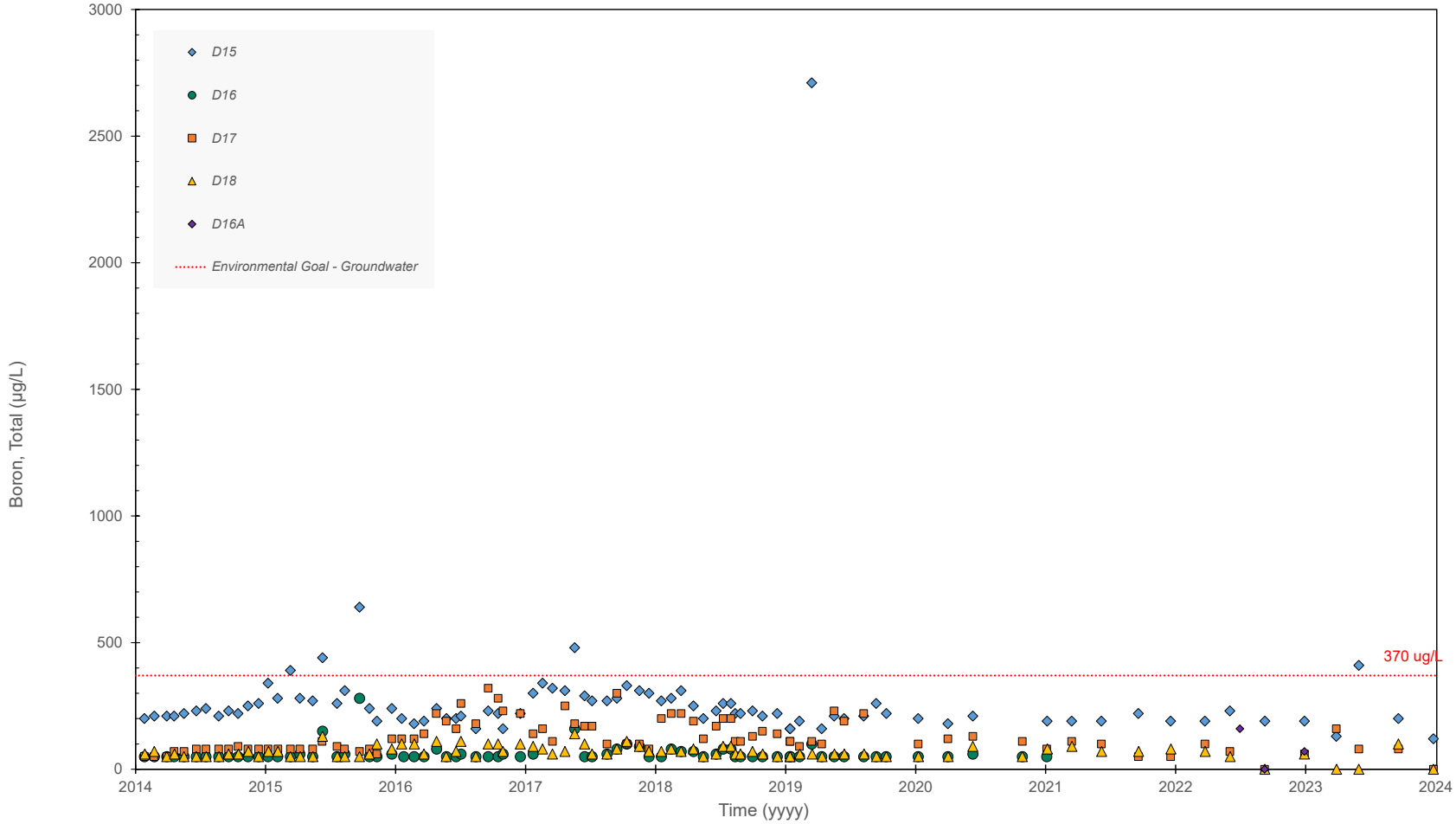

B5
D10
D11
D113
D19
D23
SW3-D
Environmental Goal - Groundwater
Nickel, Total (ug/L)
Time (yyyy)
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
550.9 mg/L

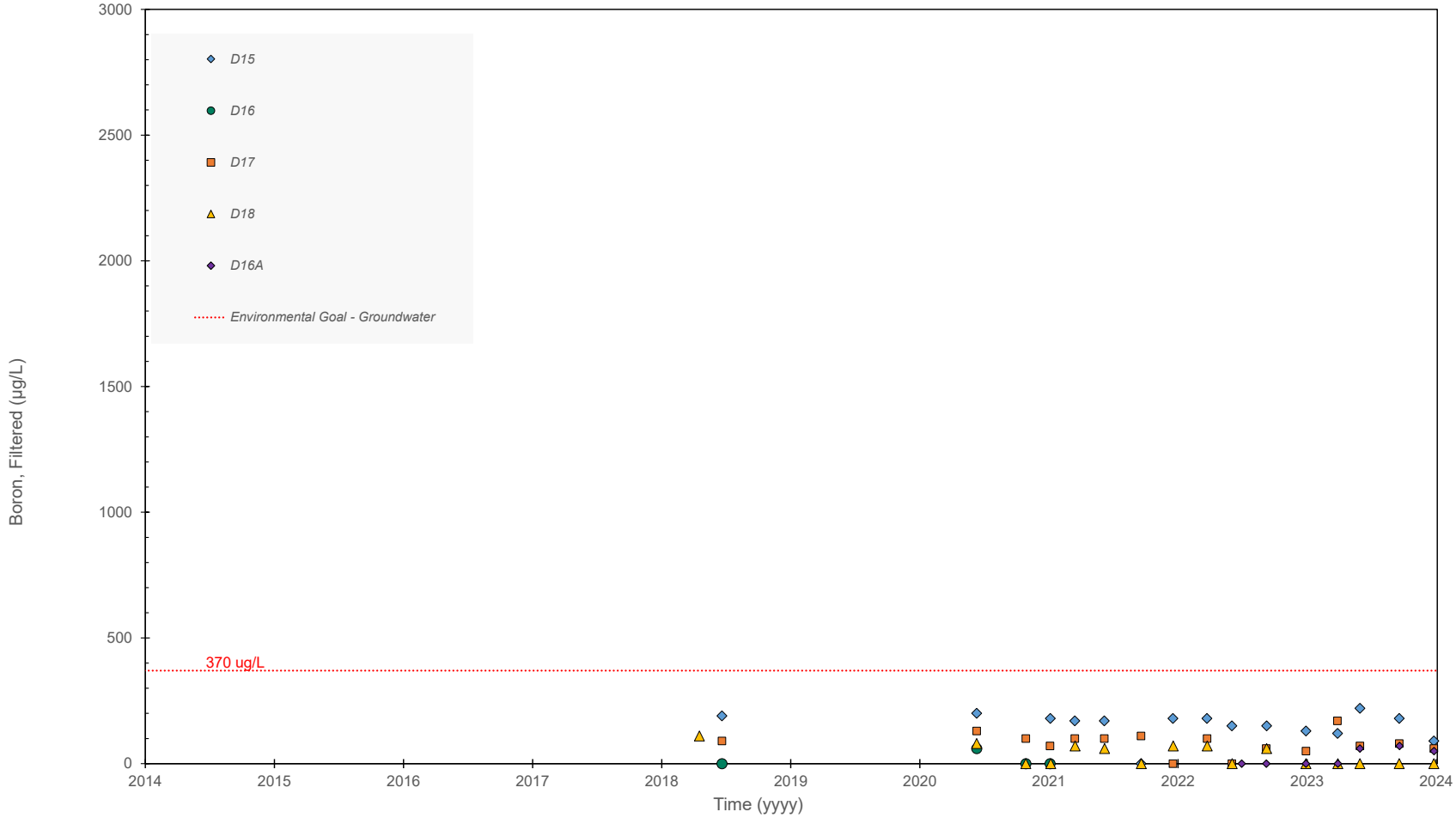

B5
D10
D11
D113
D19
D23
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Filtered (µg/L)
Time (yyyy)
0
200
400
600
800
1000
1200
1400
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

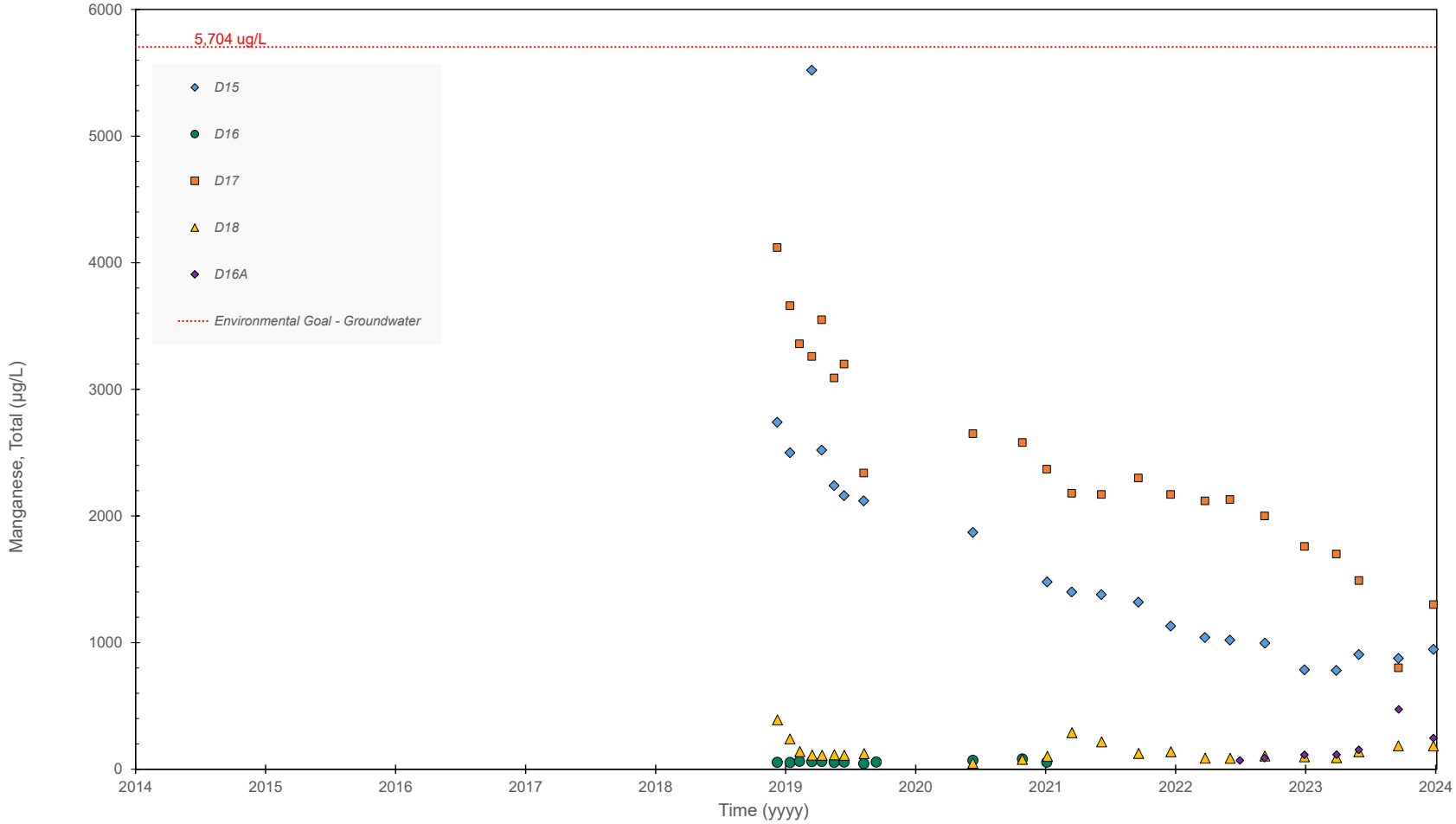

D15
D16
D16A
D17
D18
Environmental Goal - Groundwater
1500 mg/L
Total Dissolved Soilds (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

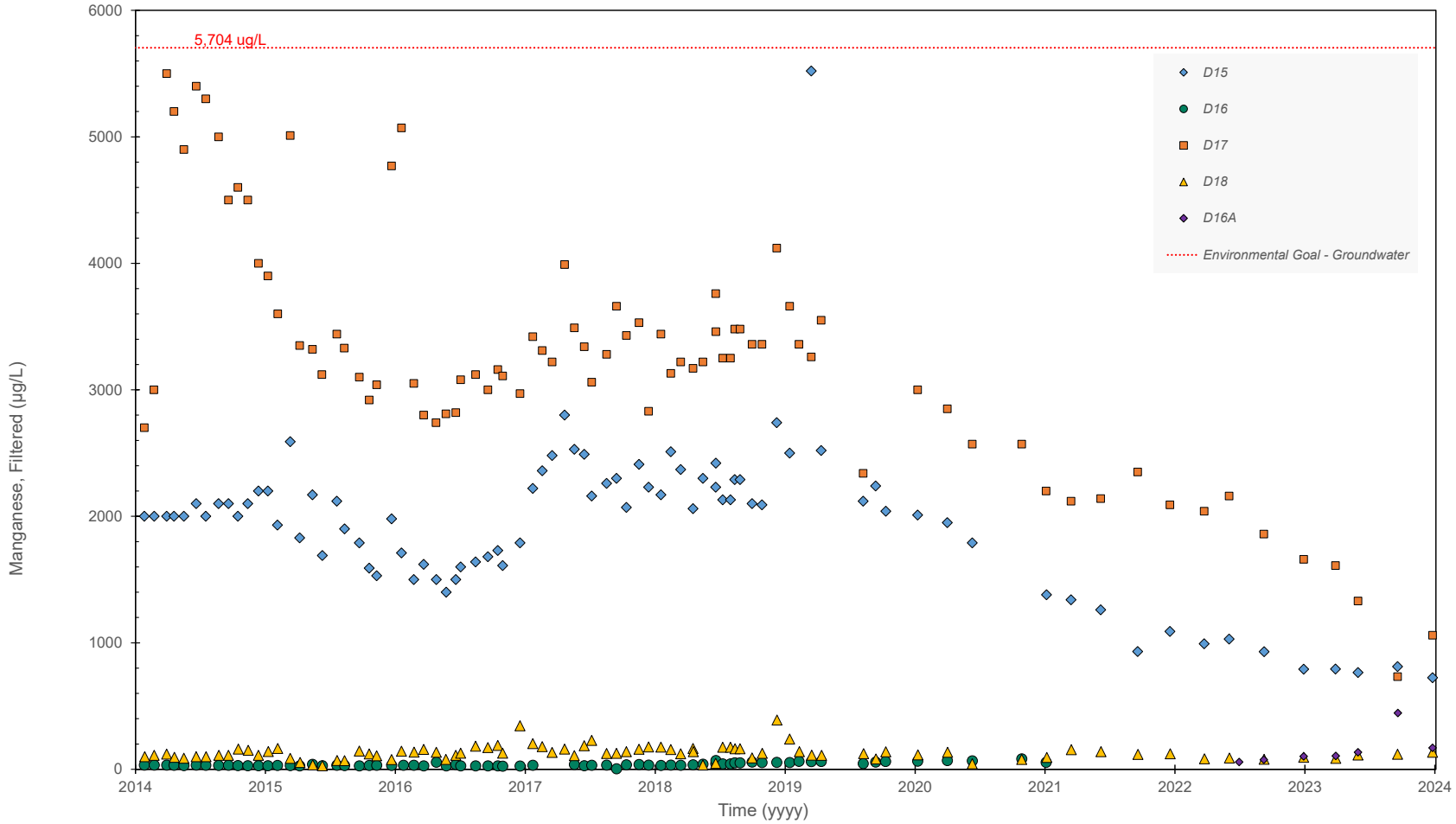

D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
350 mg/L
Choride, Total (mg/L)
Year (yyyy)
600
500
400
300
200
100
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

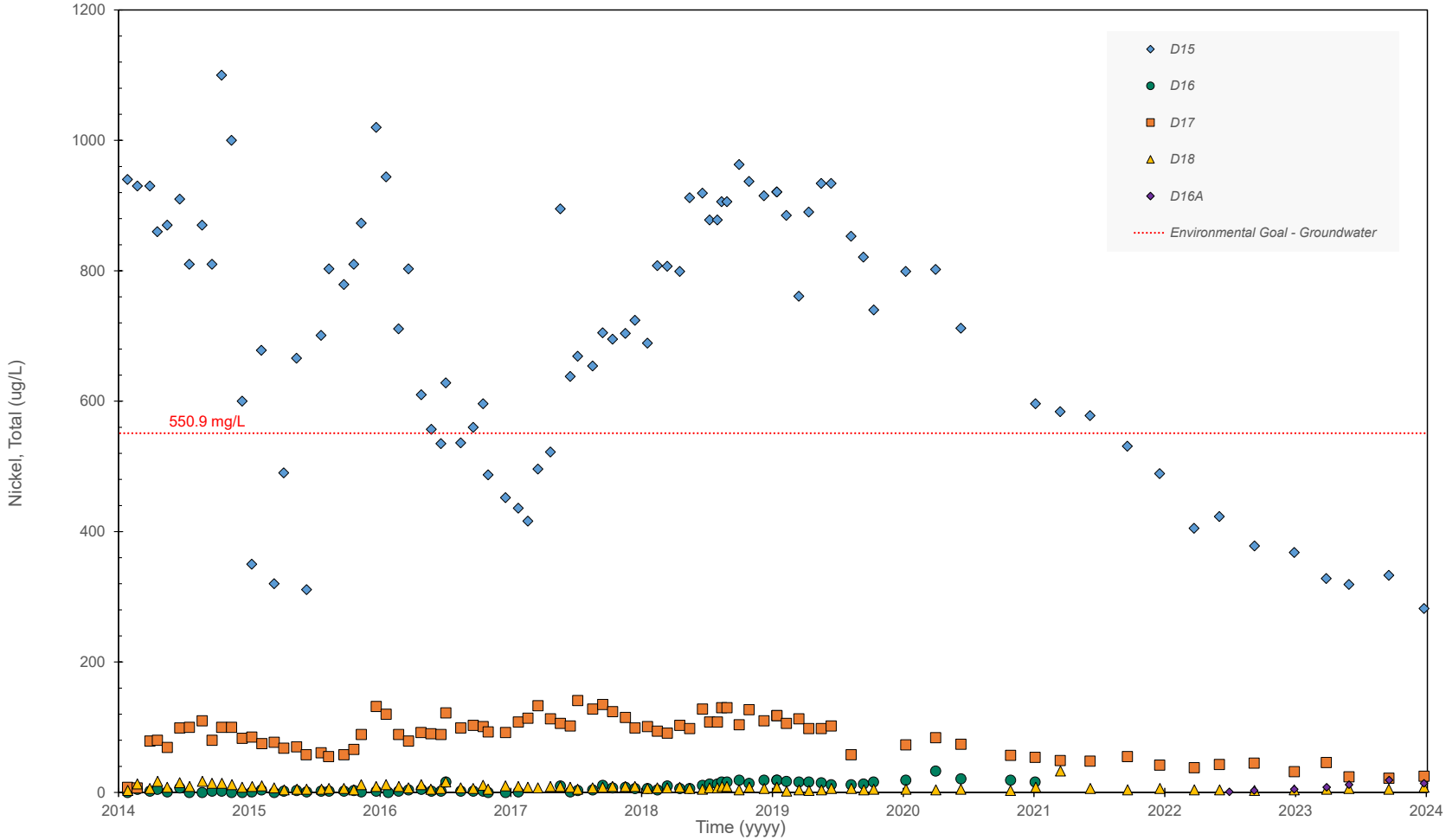

D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
1000 mg/L
Sulfate (as SO_4) (mg/L)
Time (yyyy)
4000
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

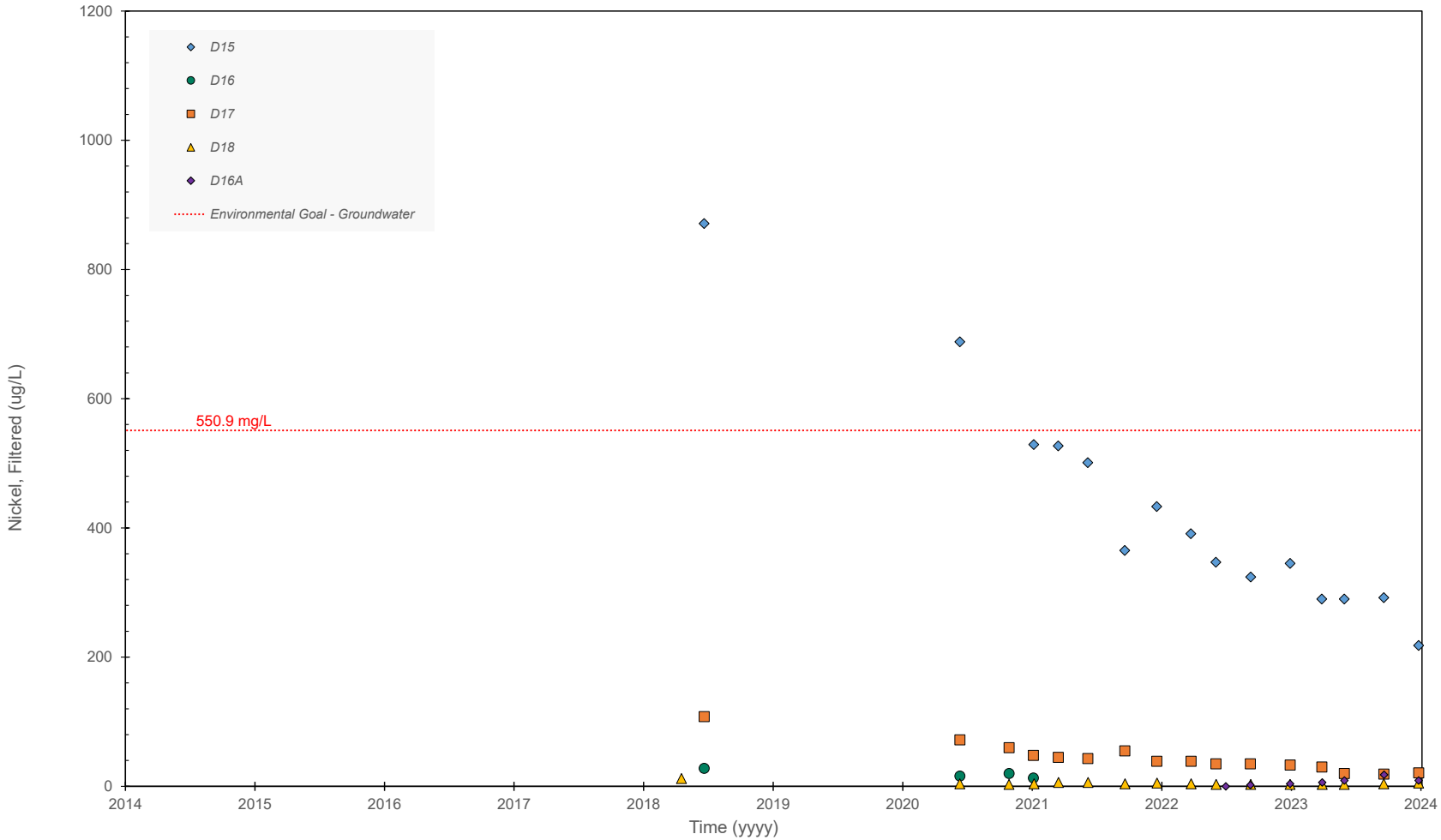

D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
370 ug/L
Boron, Total (µg/L)
Time (yyyy)
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

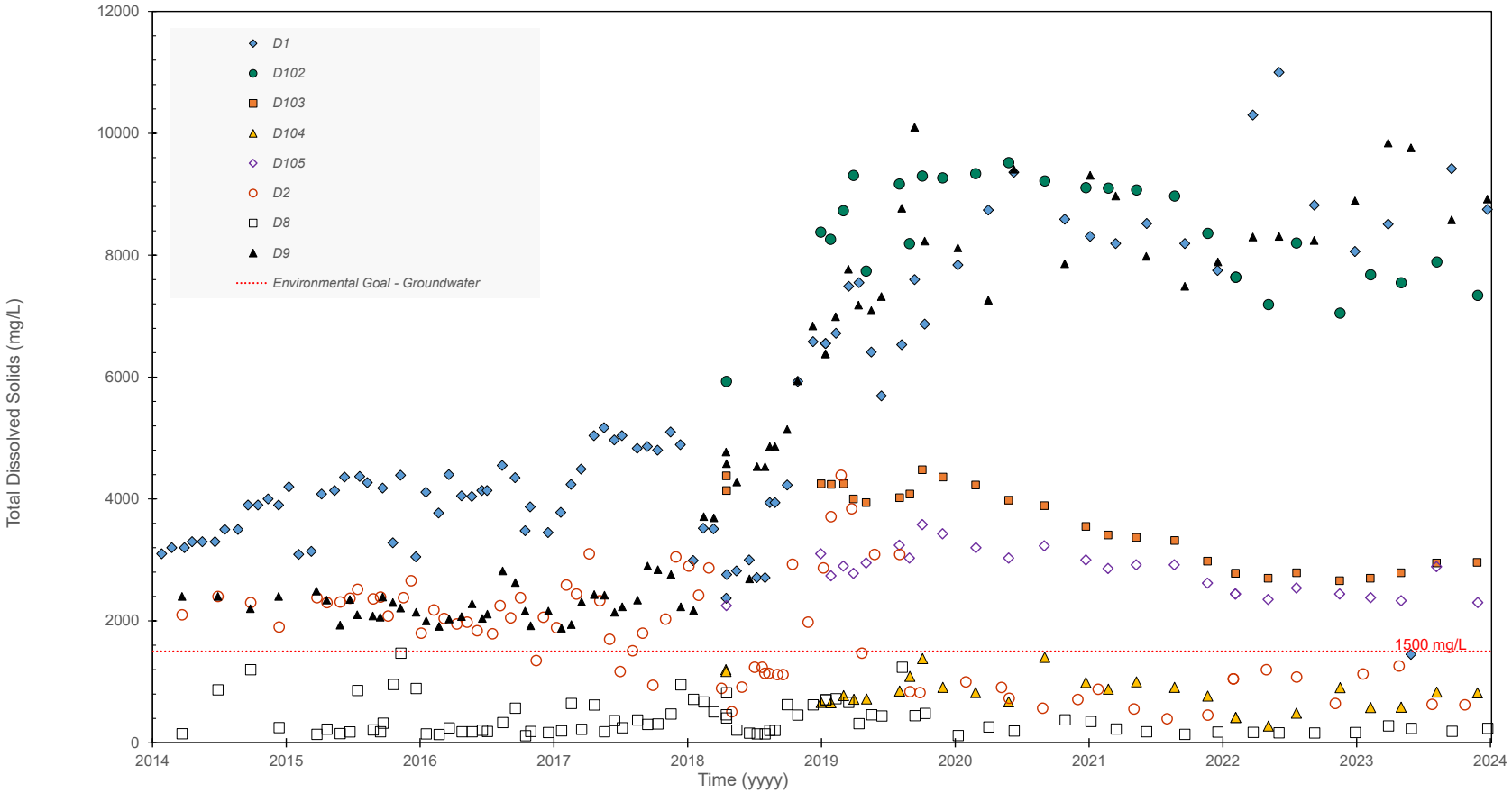

D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
370 ug/L
Boron, Filtered (µg/L)
Time (yyyy)
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

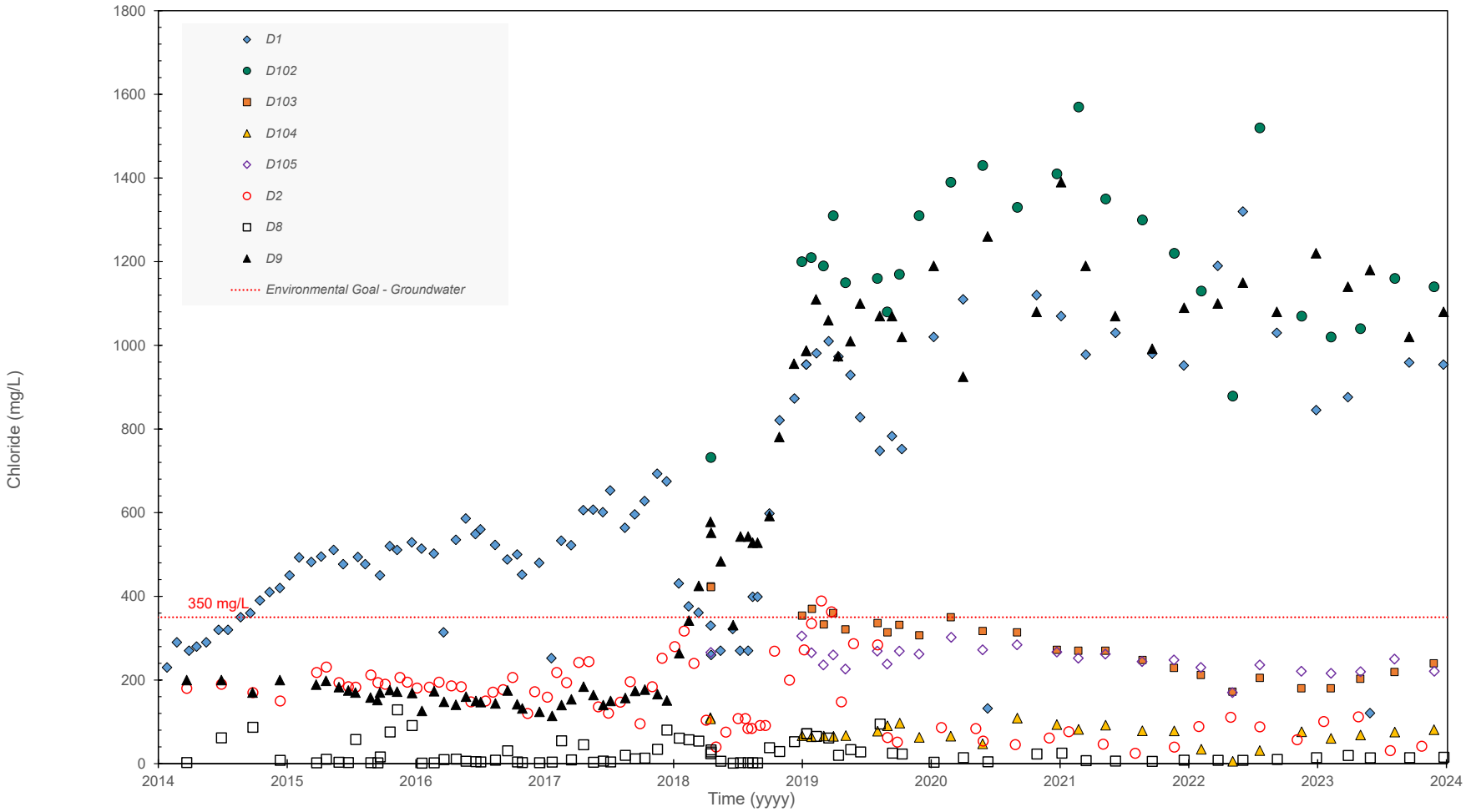

5,704 ug/L
D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
Manganese, Total (µg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

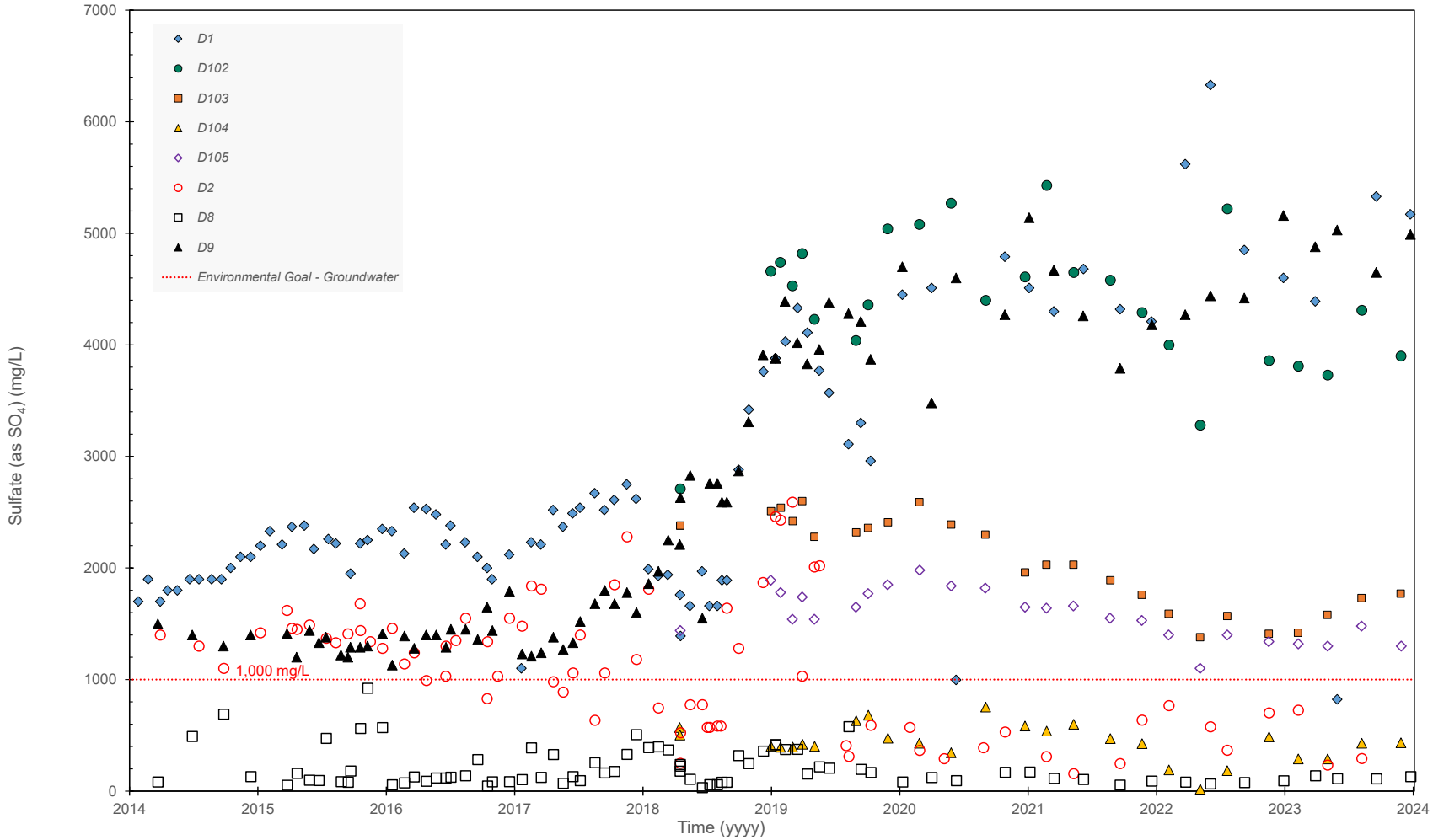

6000
5000
4000
3000
2000
1000
0
5,704 ug/L
Manganese, Filtered (µg/L)
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Time (yyyy)
D15
D16
D17
D18
D16A
Environmental Goal - Groundwater

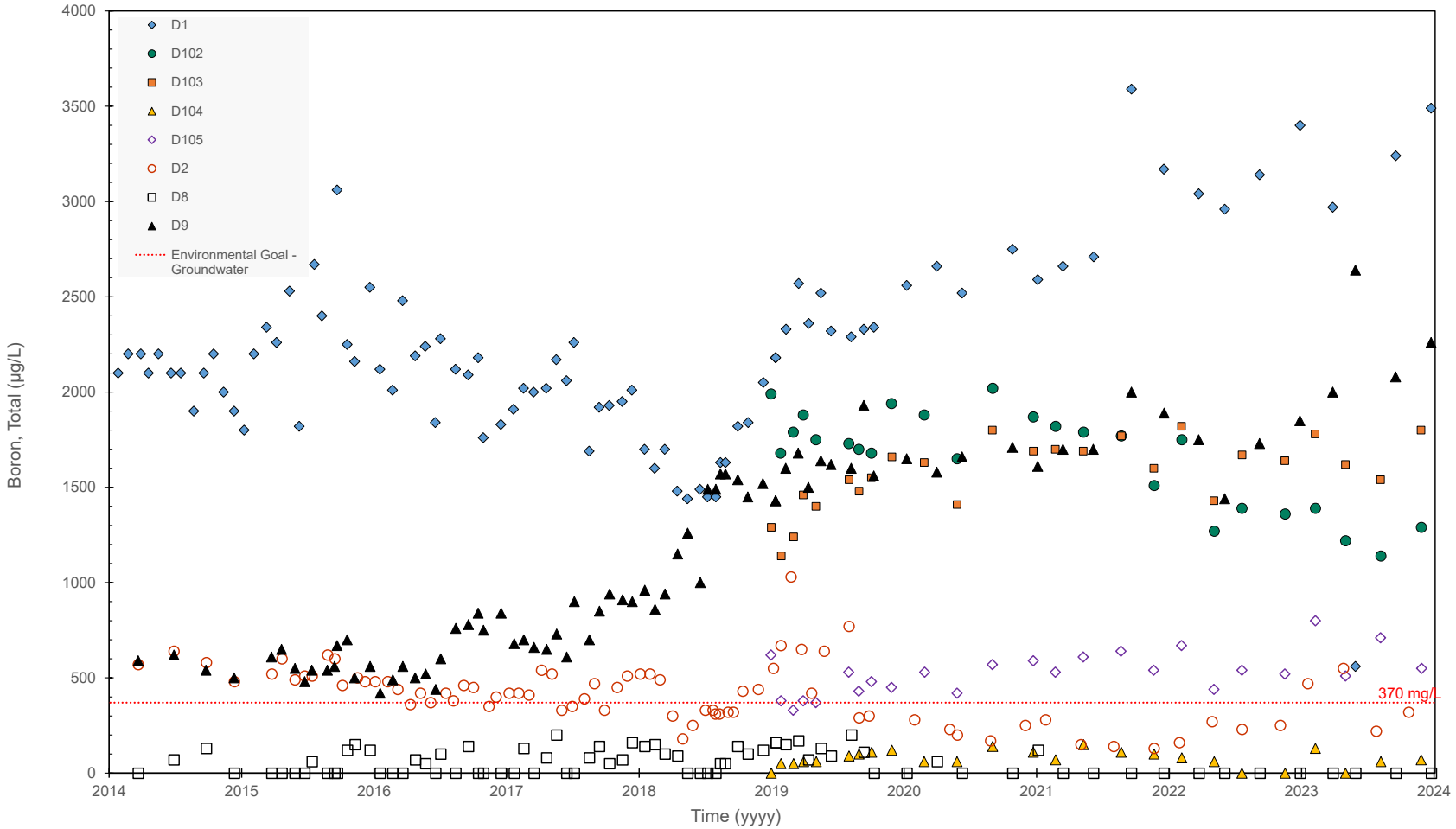

1200
1000
800
600
400
200
0
Nickel, Total (ug/L)
550.9 mg/L
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Time (yyyy)
D15
D16
D17
D18
D16A
Environmental Goal - Groundwater

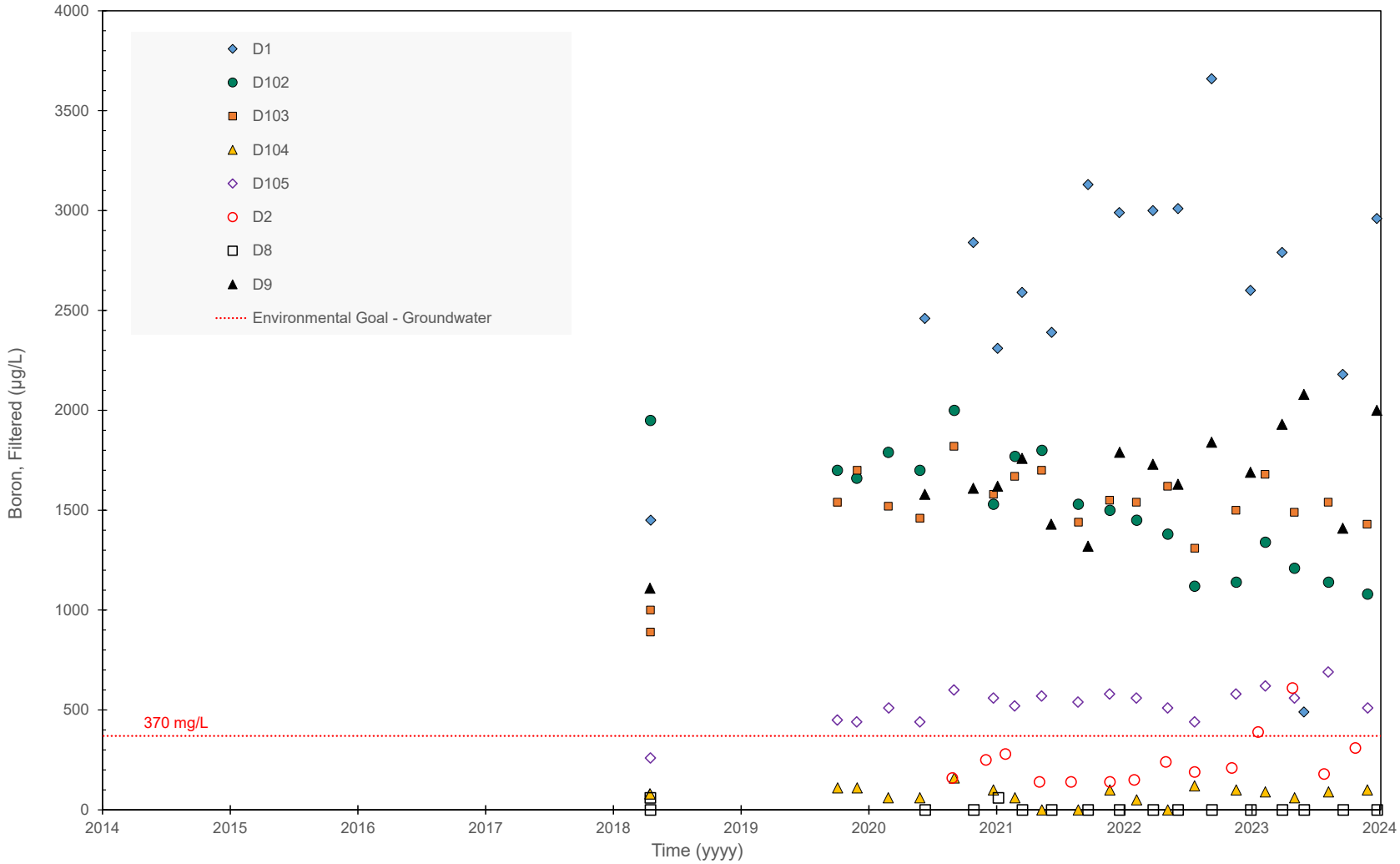

D15
D16
D17
D18
D16A
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Filtered (ug/L)
Time (yyyy)
0
200
400
600
800
1000
1200
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

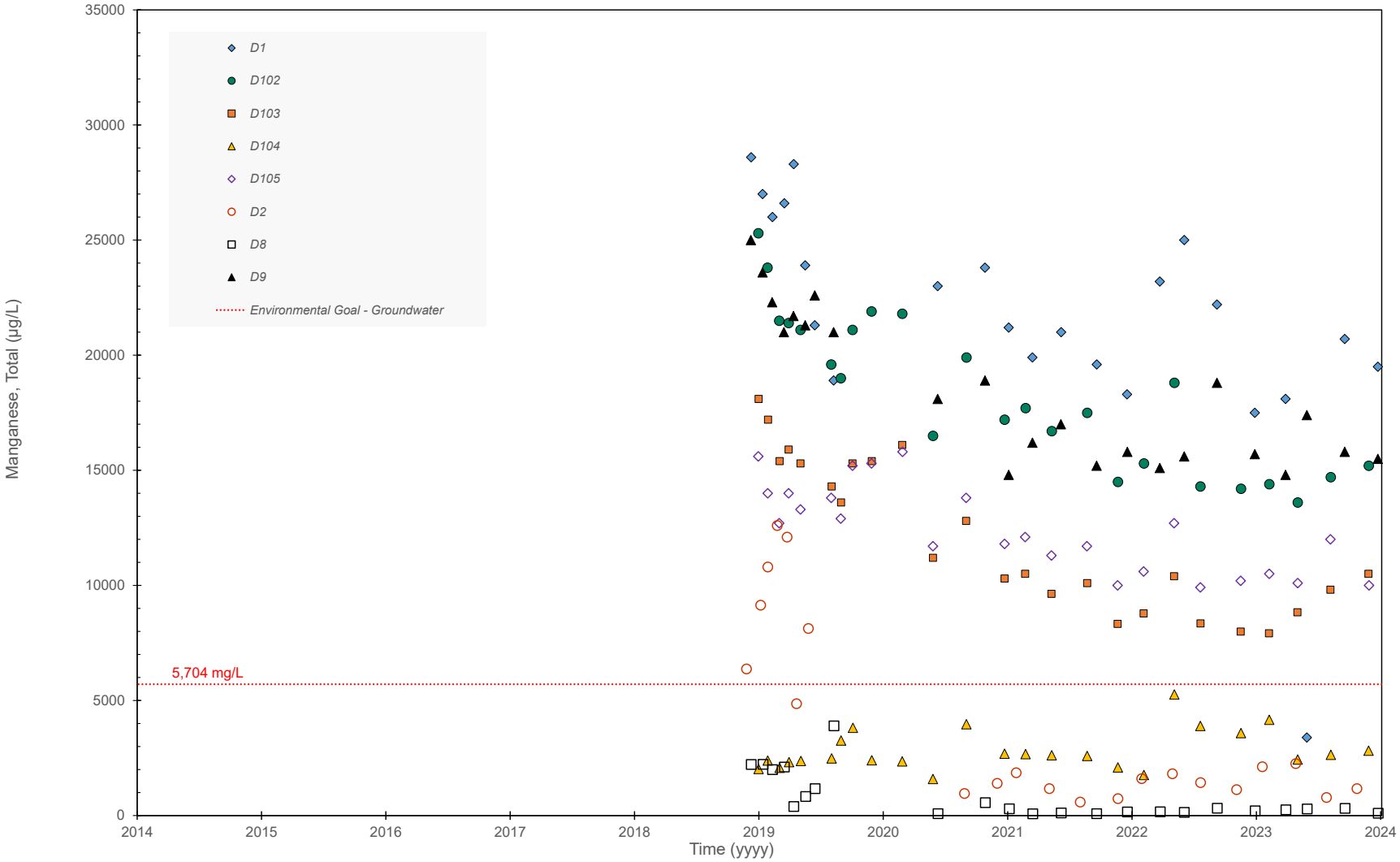

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
1500 mg/L
Total Dissolved Solids (mg/L)
Time (yyyy)
0
2000
4000
6000
8000
10000
12000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

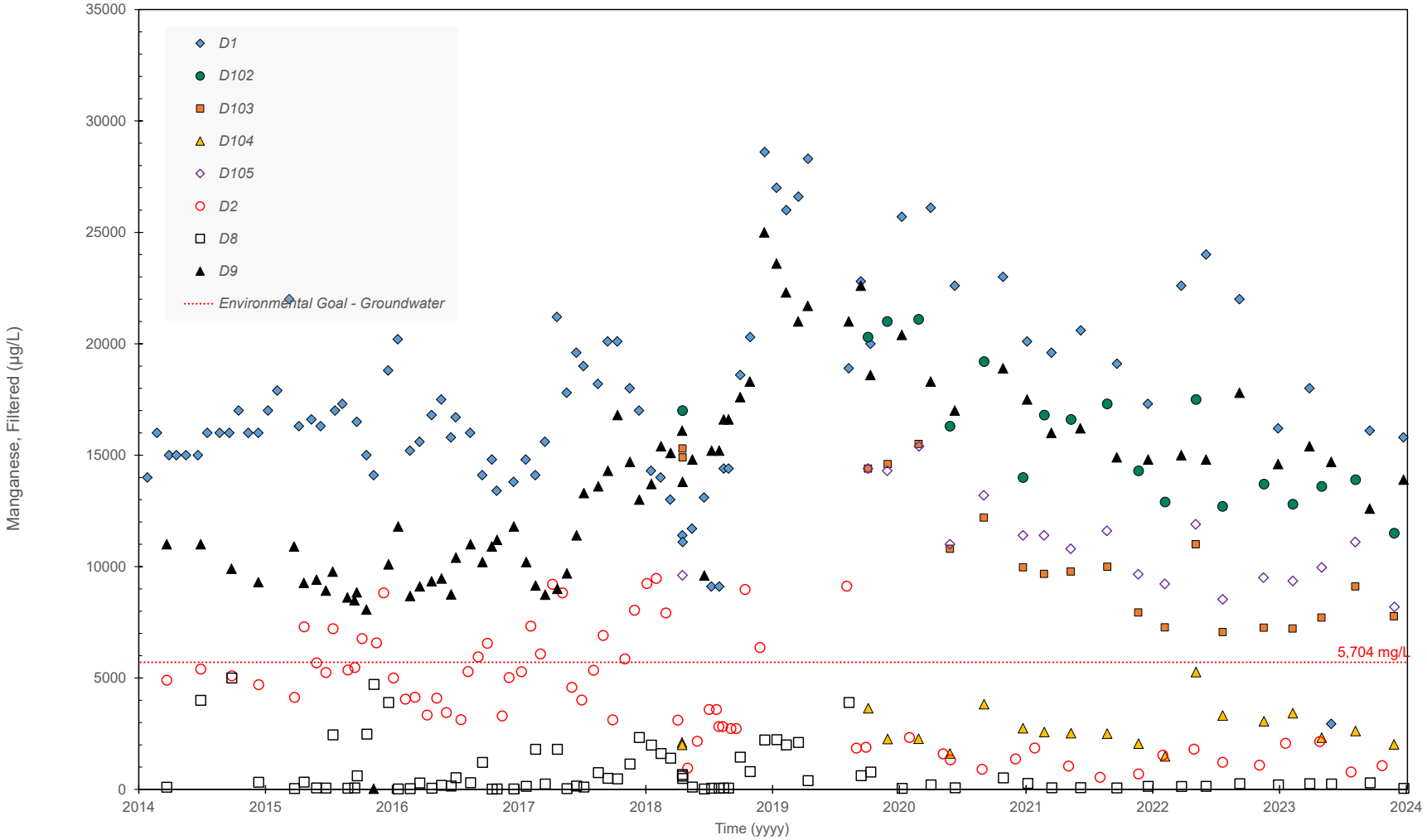

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
350 mg/L
Chloride (mg/L)
Time (yyyy)
0
200
400
600
800
1000
1200
1400
1600
1800
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

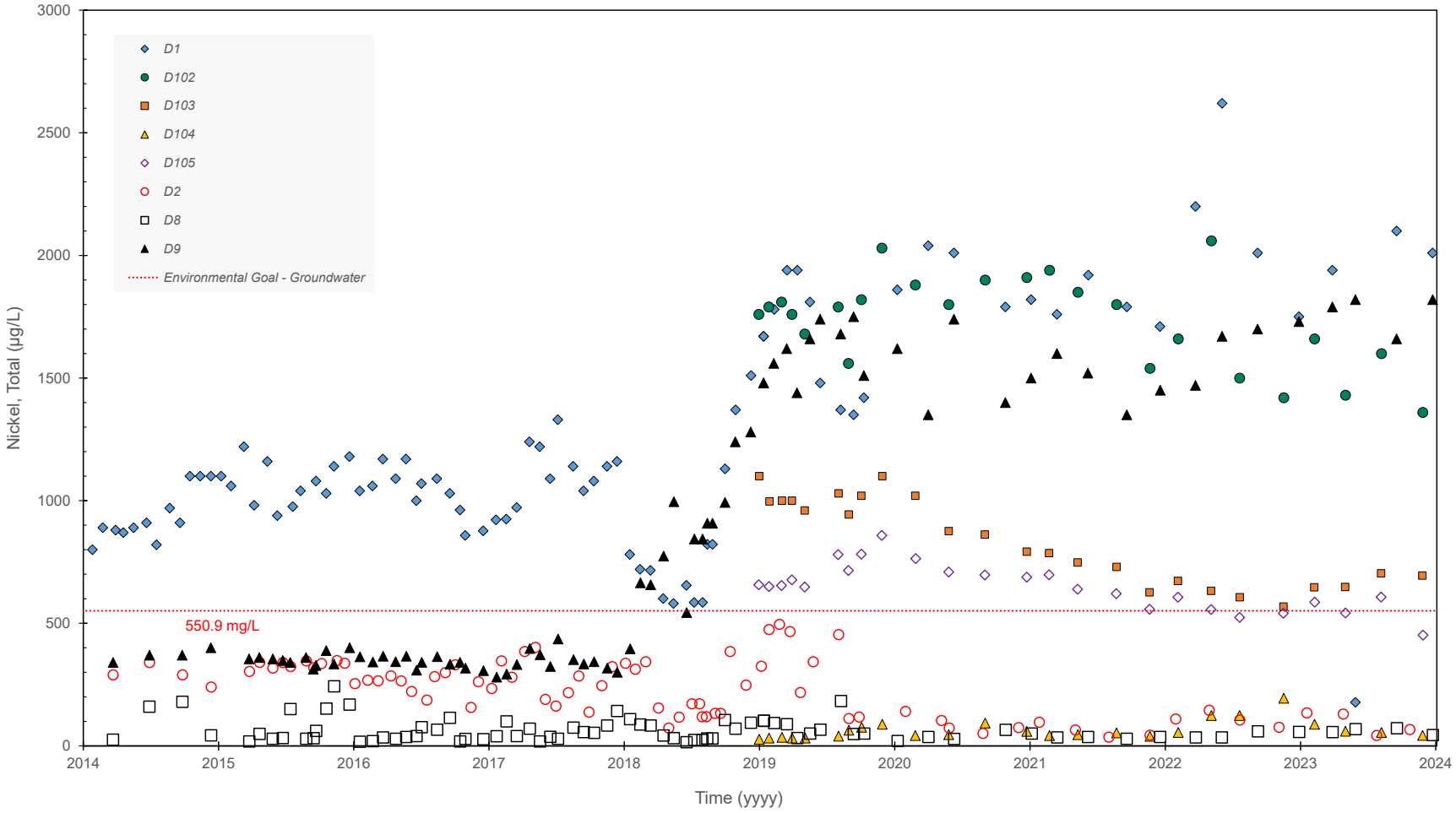

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
1,000 mg/L
Sulfate (as SO4) (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

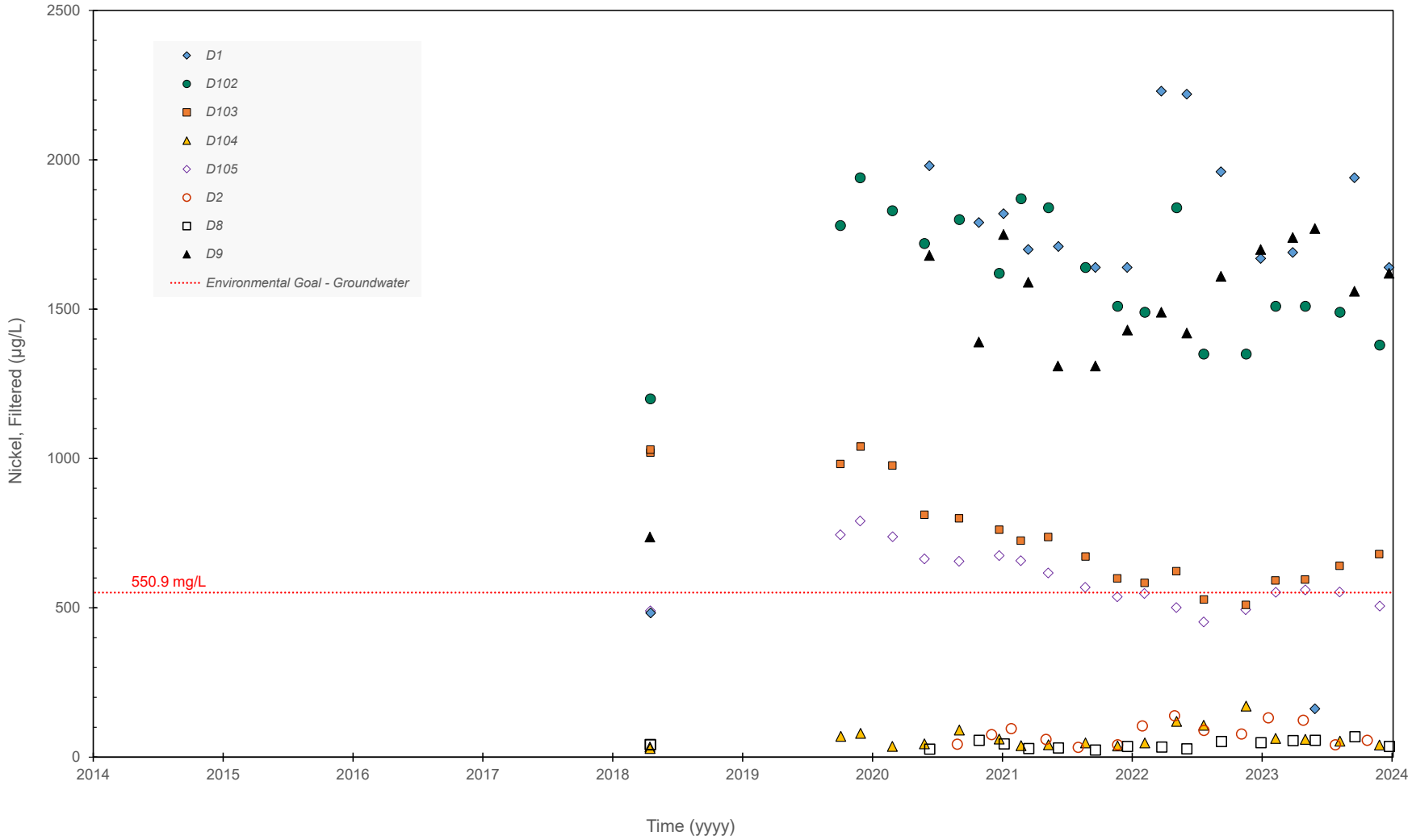

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
370 mg/L
Boron, Total (µg/L)
Time (yyyy)
0
500
1000
1500
2000
2500
3000
3500
4000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

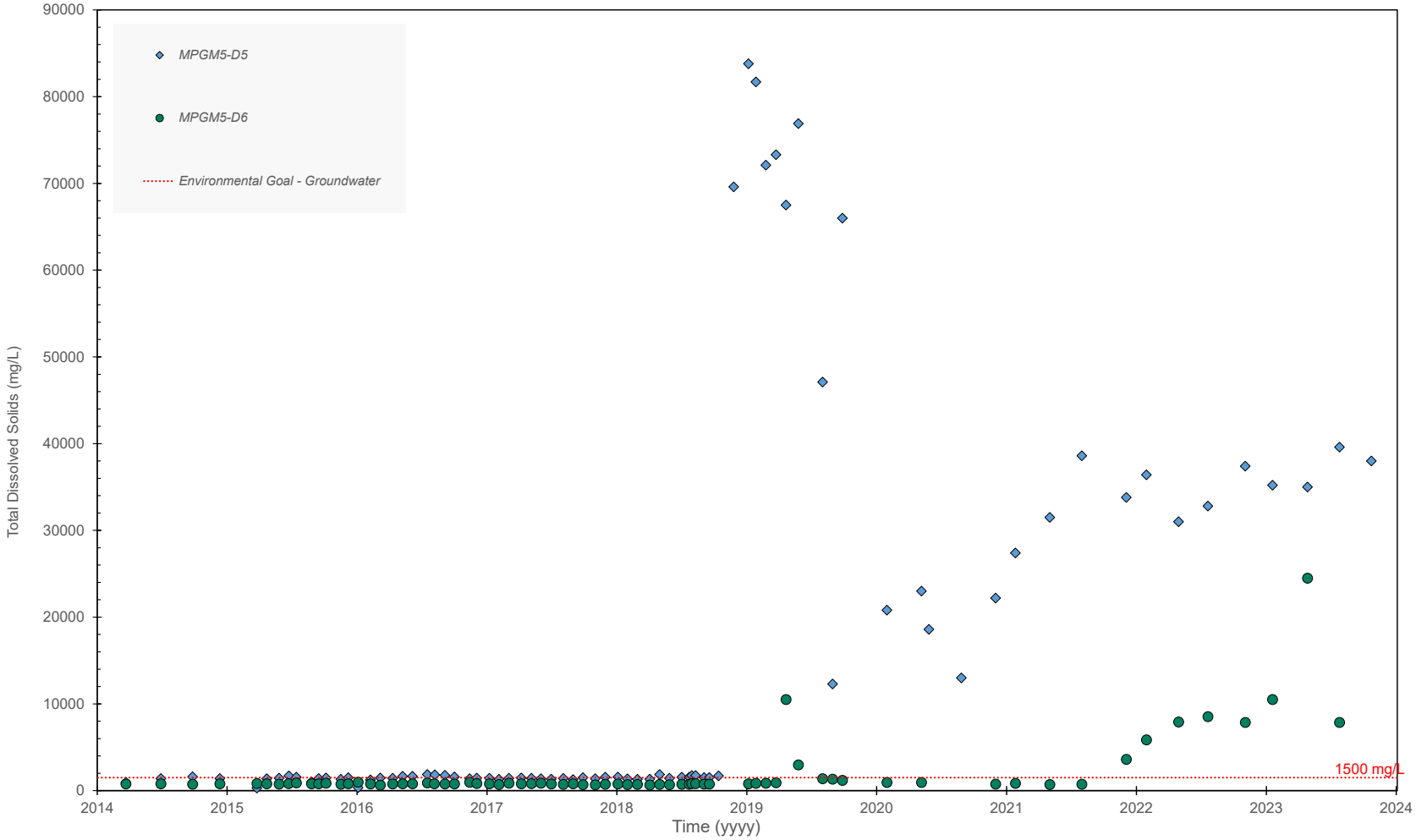

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
370 mg/L
Boron, Filtered (µg/L)
Time (yyyy)
0
500
1000
1500
2000
2500
3000
3500
4000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

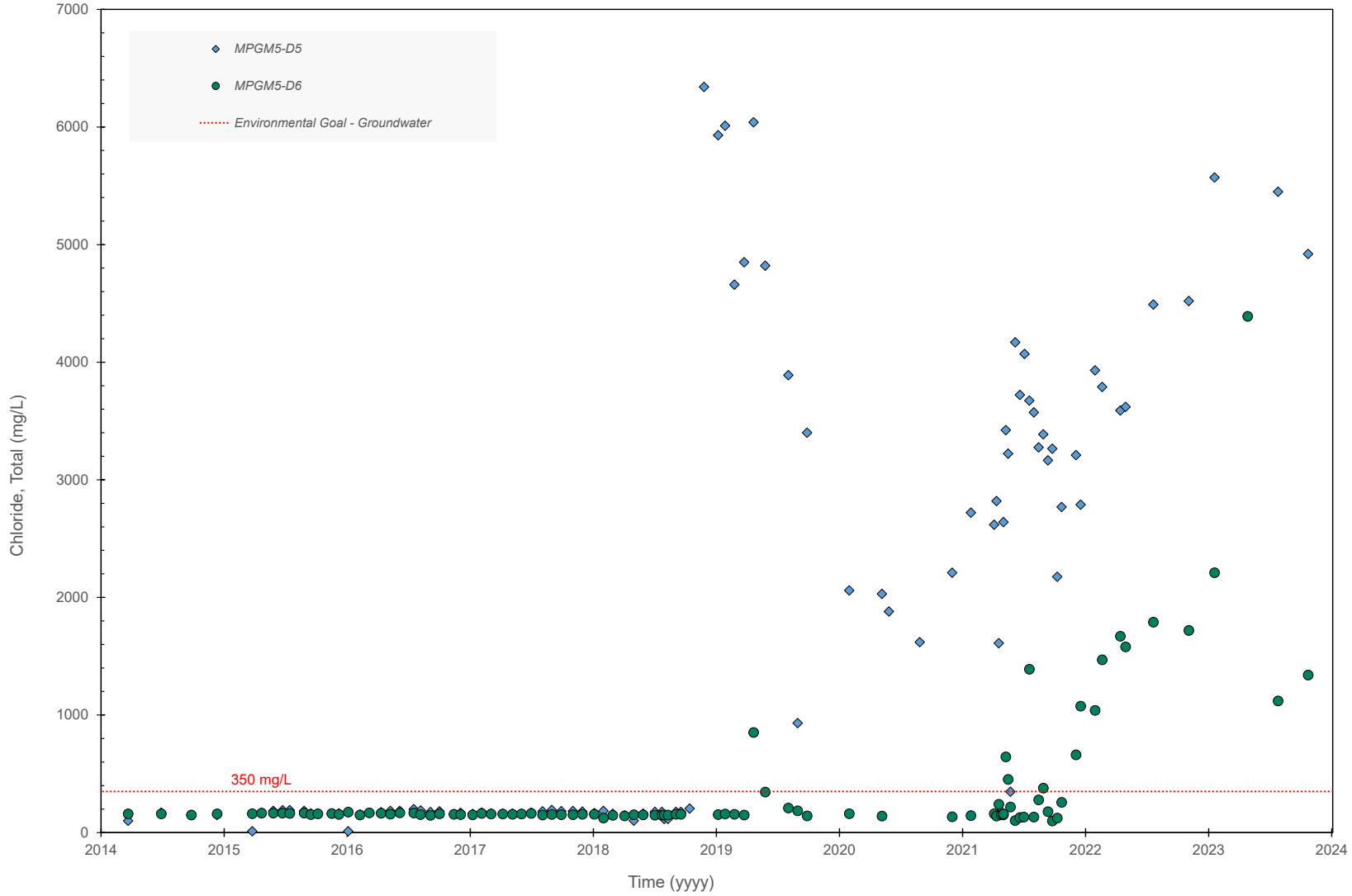

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
5,704 mg/L
Manganese, Total (µg/L)
Time (yyyy)
35000
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

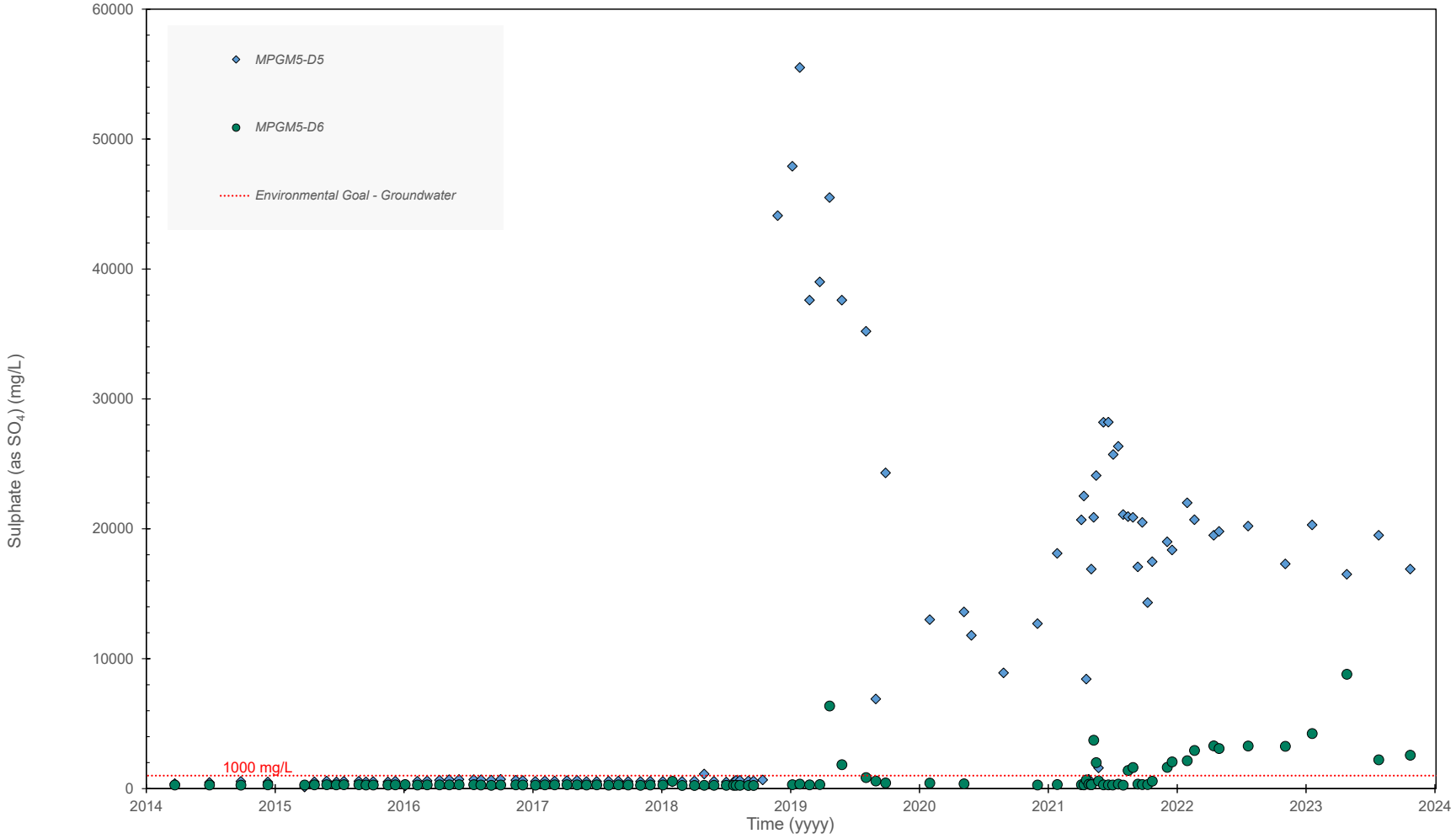

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
5,704 mg/L
Manganese, Filtered (µg/L)
Time (yyyy)
35000
30000
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

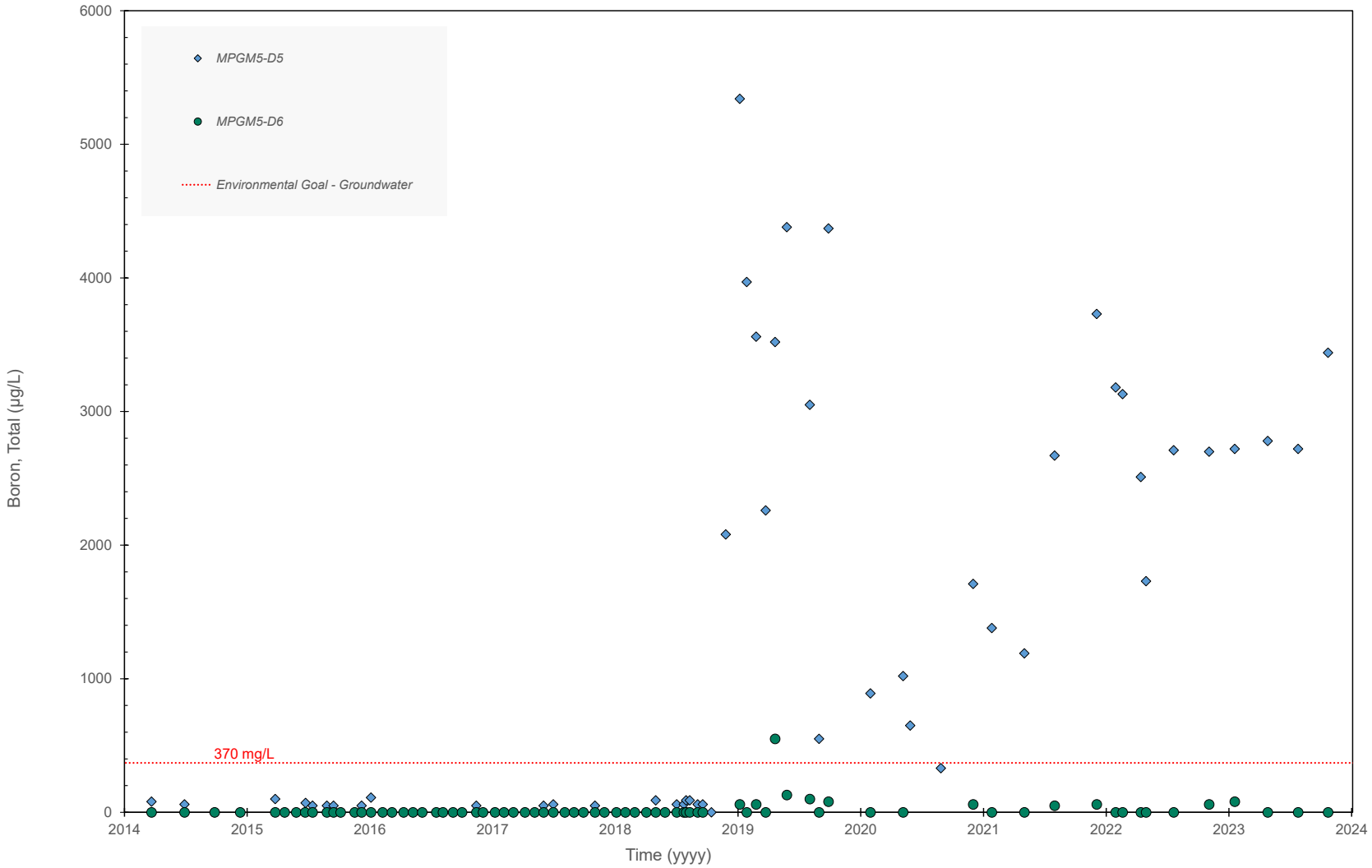

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Total (µg/L)
Time (yyyy)
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

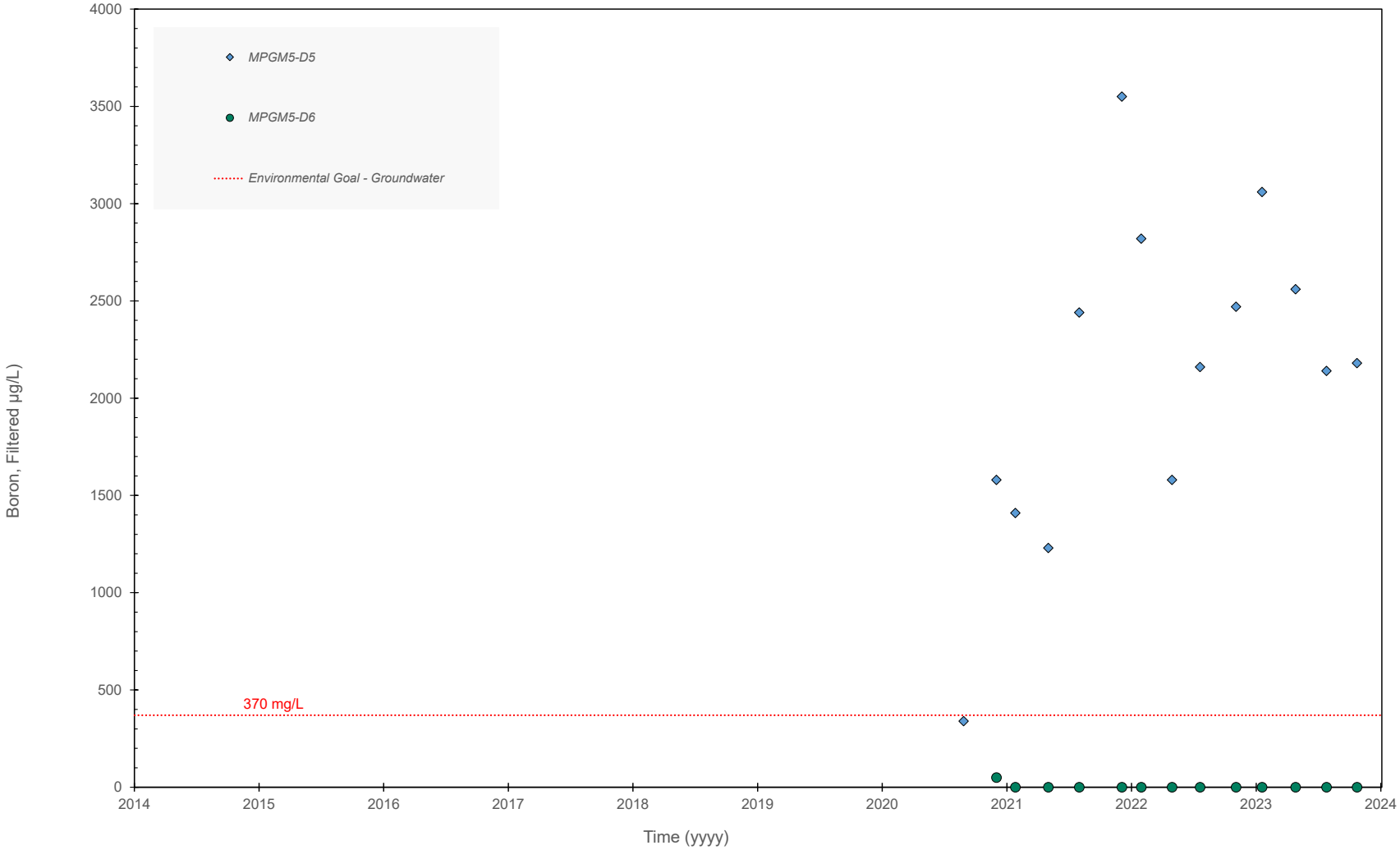

D1
D102
D103
D104
D105
D2
D8
D9
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Filtered (µg/L)
Time (yyyy)
0
500
1000
1500
2000
2500
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

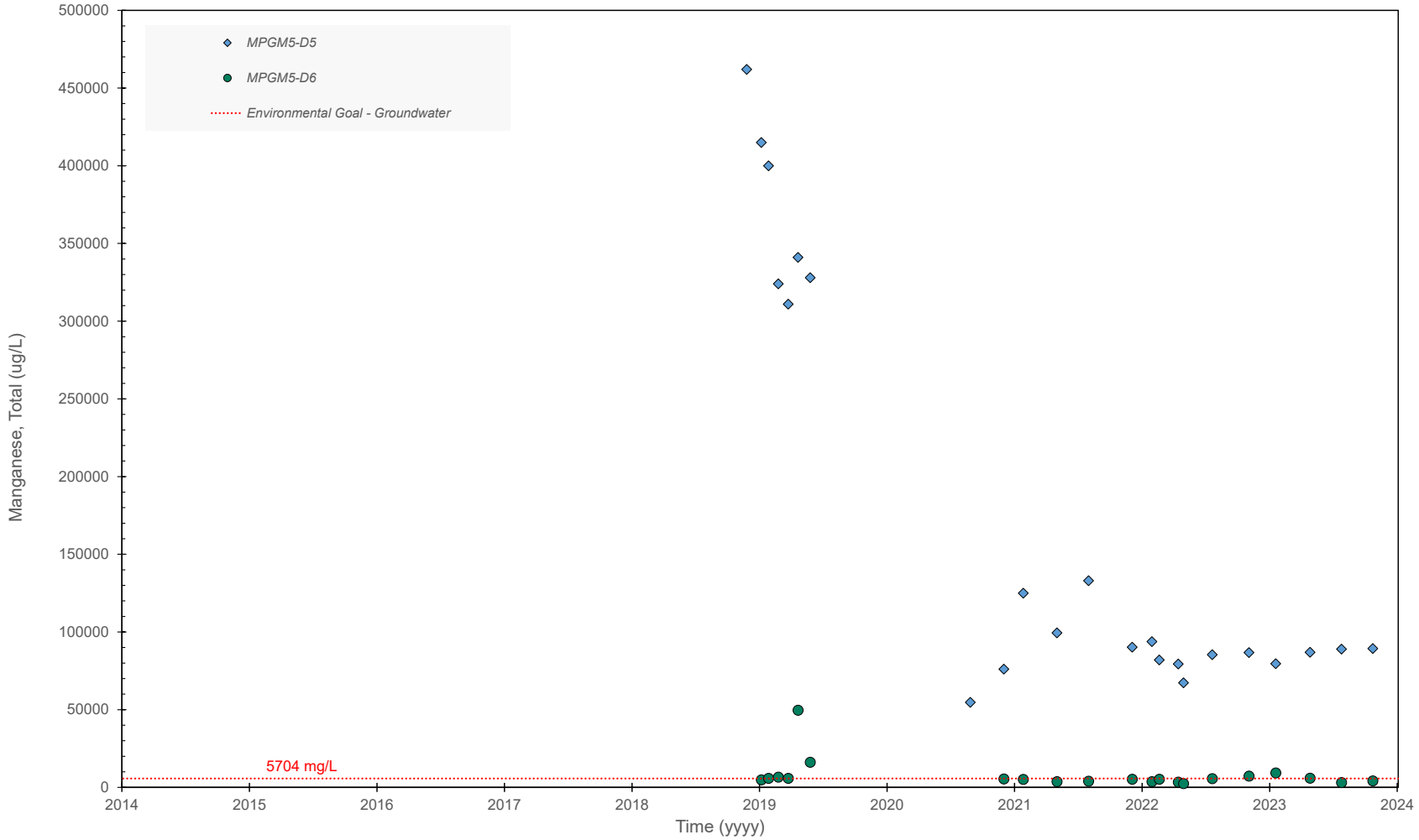

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
1500 mg/L
Total Dissolved Solids (mg/L)
Time (yyyy)
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

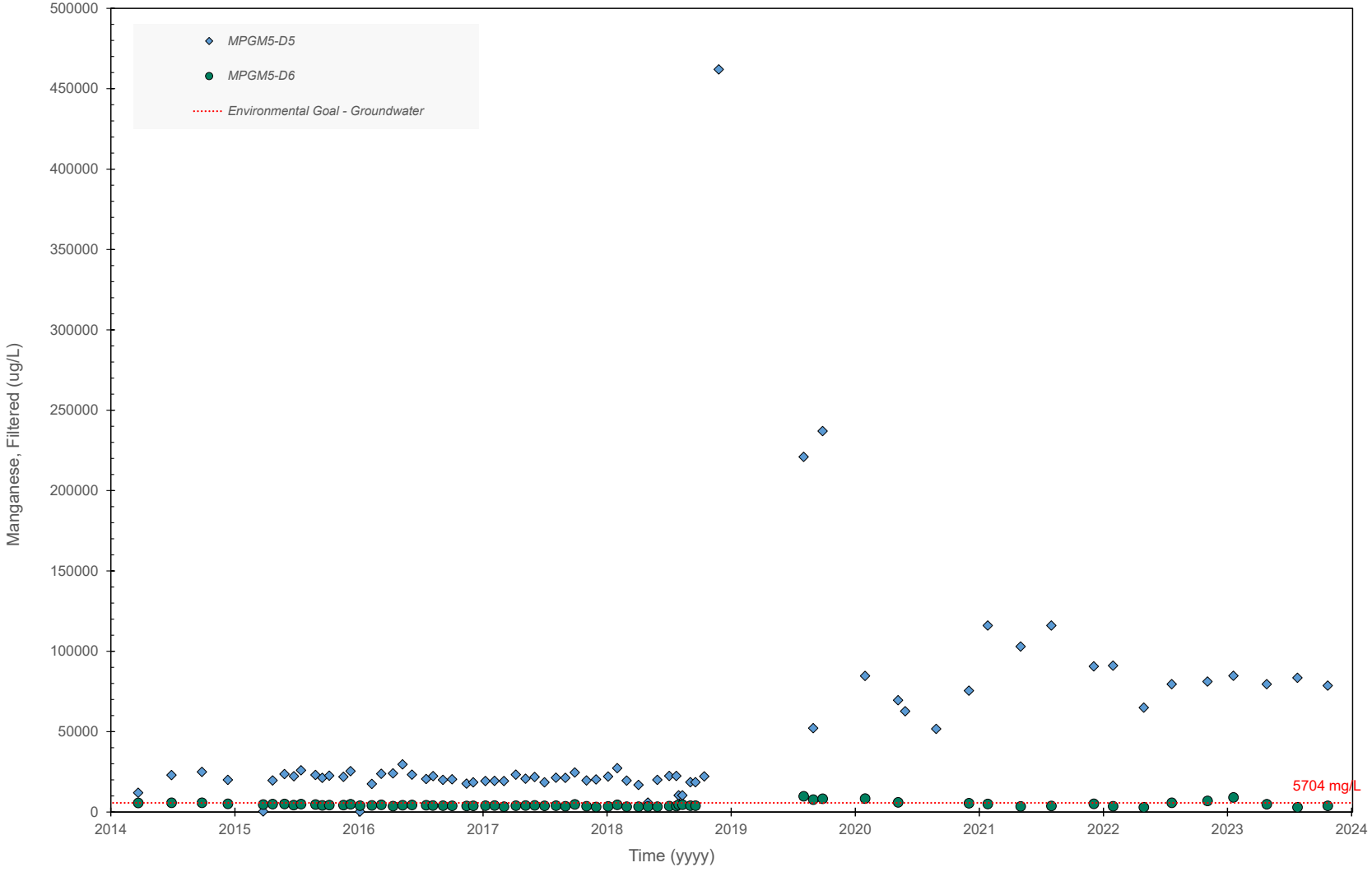

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
350 mg/L
Chloride, Total (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

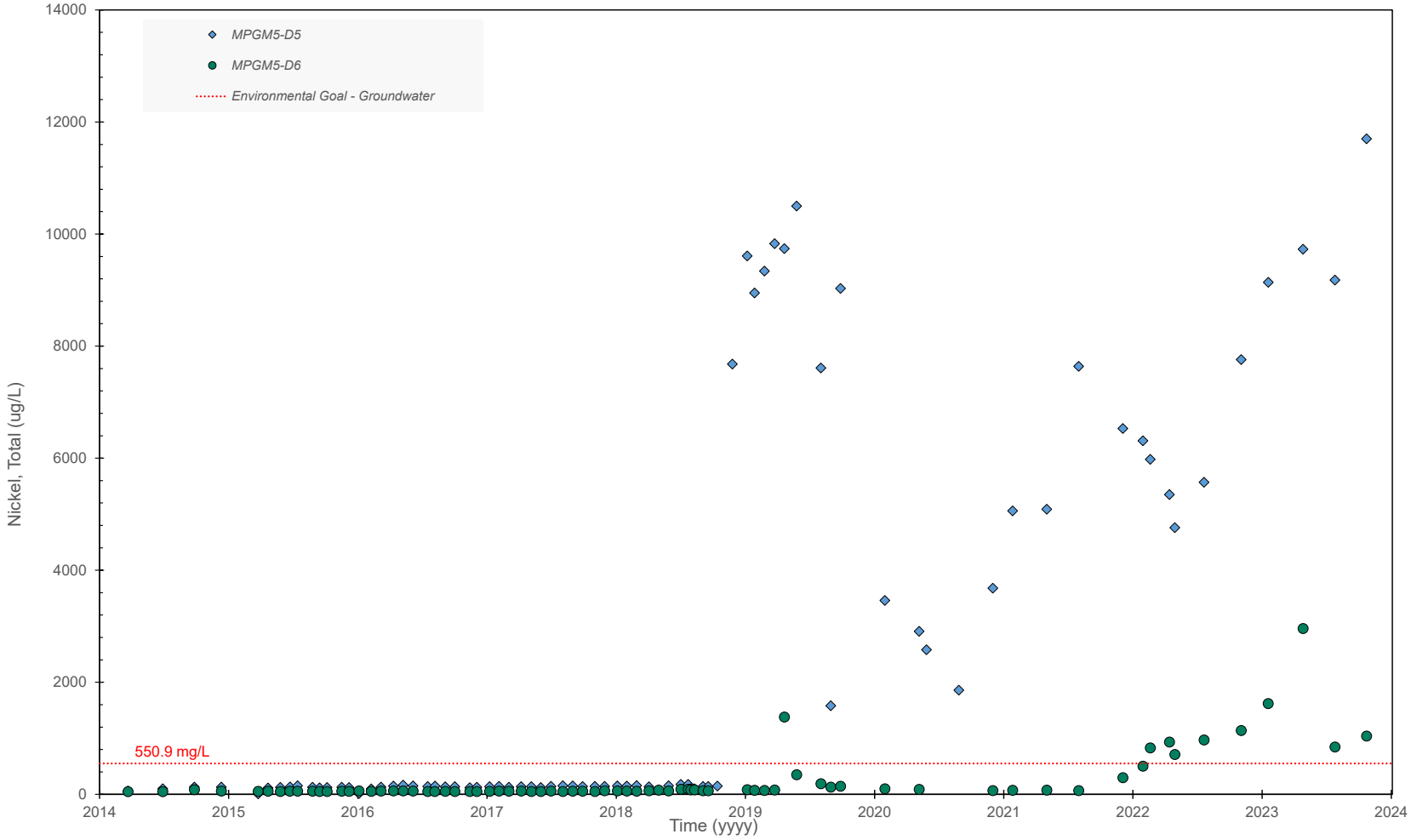

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
1000 mg/L
Sulphate (as SO_4) (mg/L)
Time (yyyy)
60000
50000
40000
30000
20000
10000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

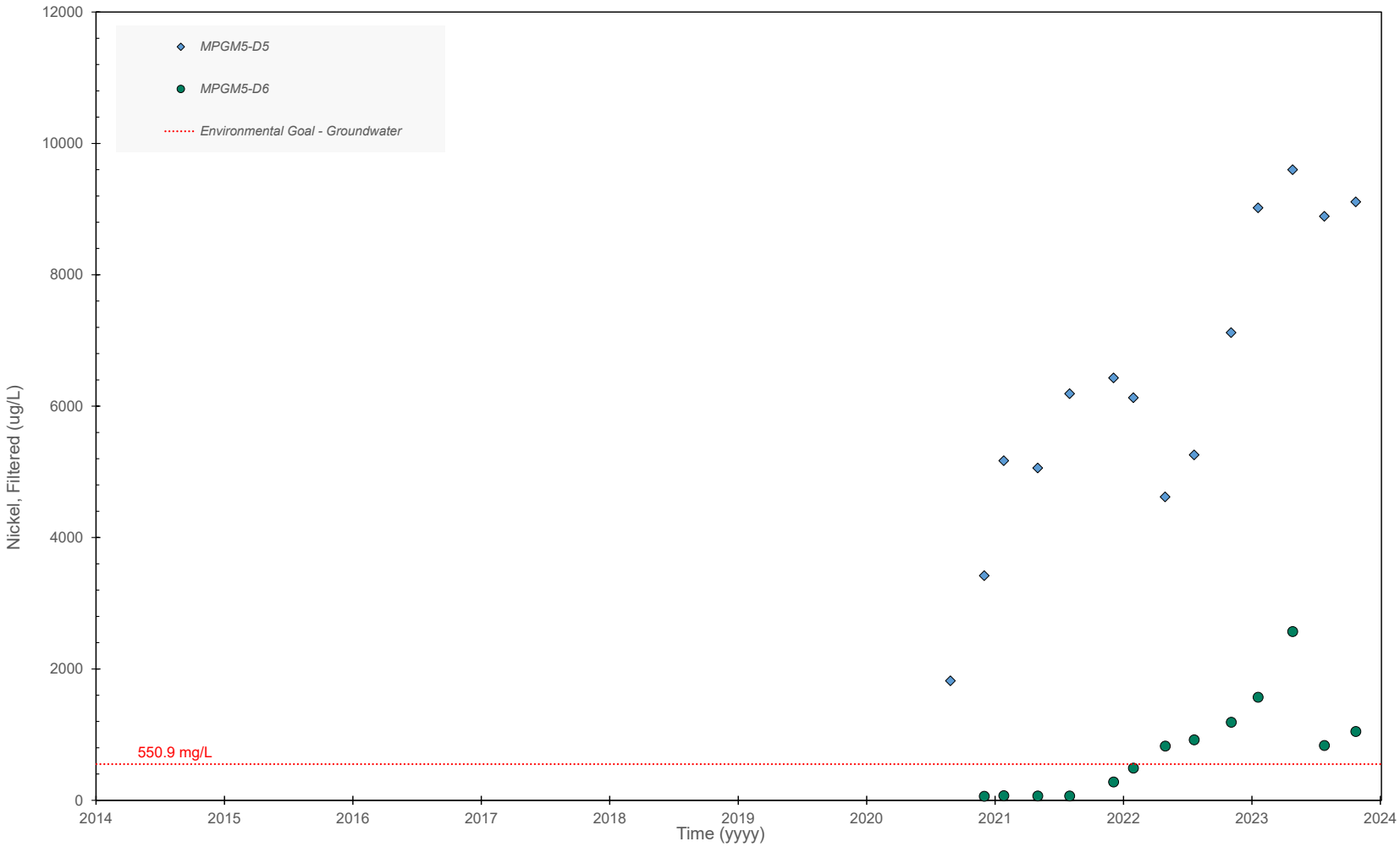

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
370 mg/L
Boron, Total (µg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

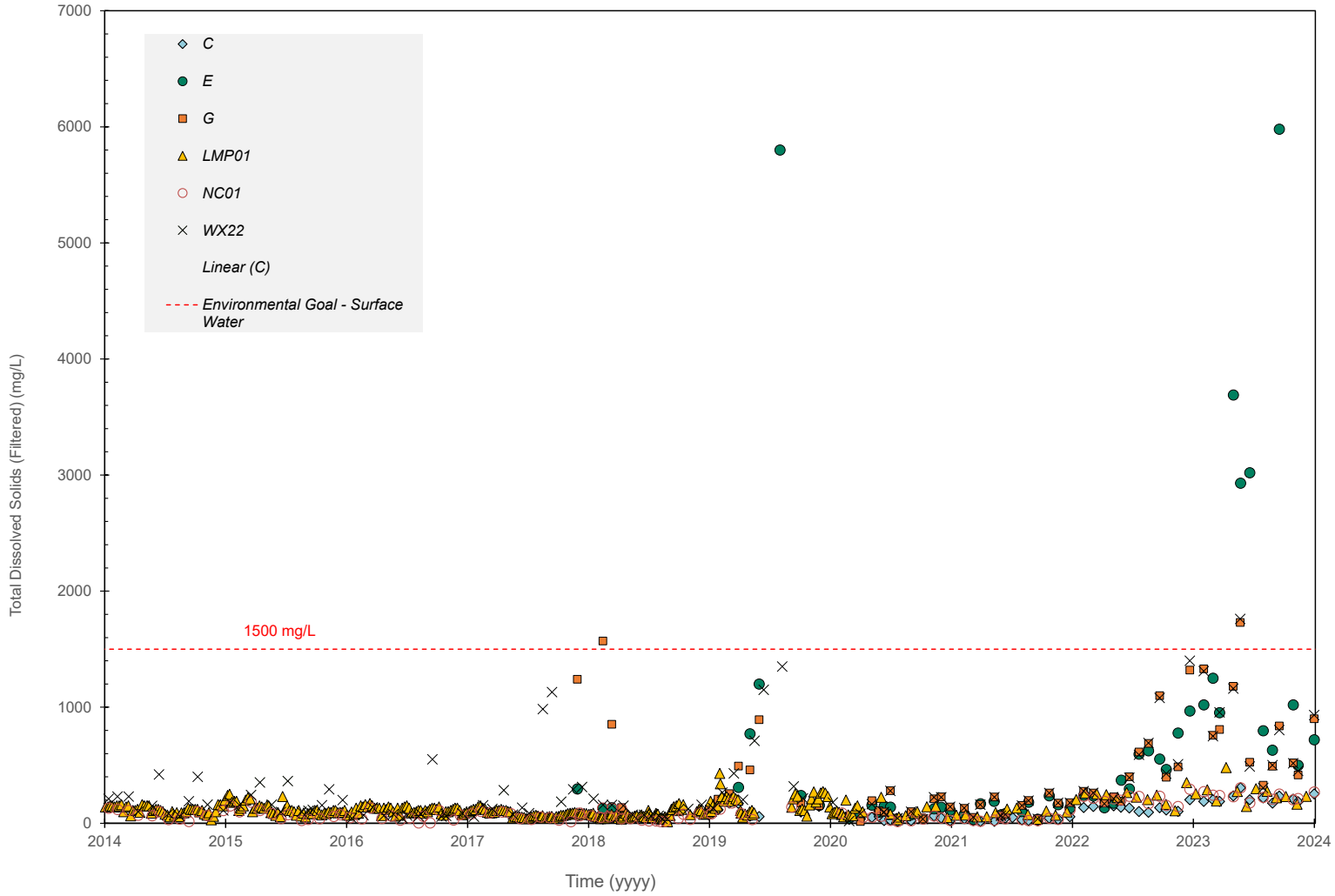

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
370 mg/L
Boron, Filtered µg/L)
Time (yyyy)
4000
3500
3000
2500
2000
1500
1000
500
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

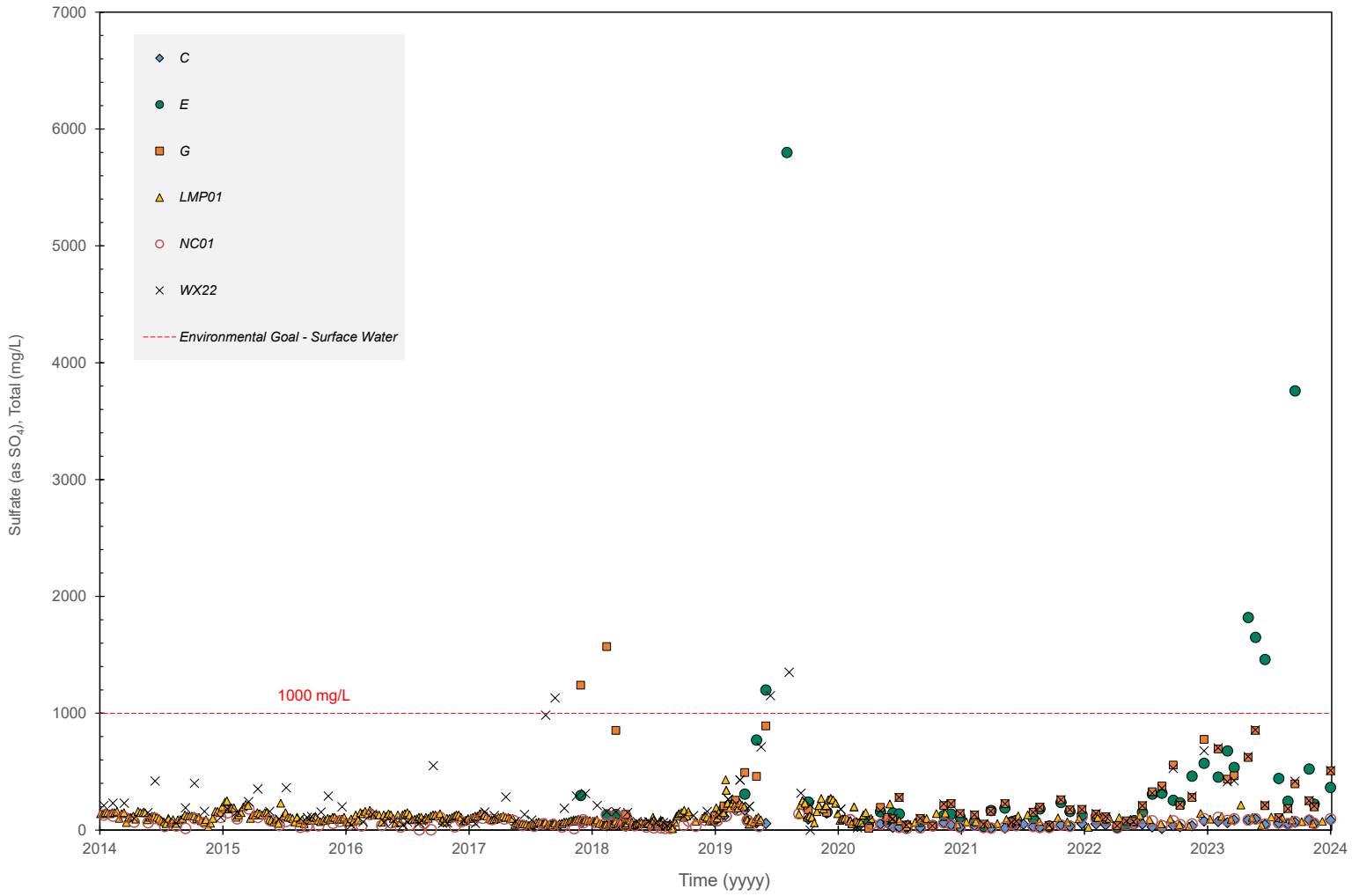

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
5704 mg/L
Manganese, Total (ug/L)
Time (yyyy)
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

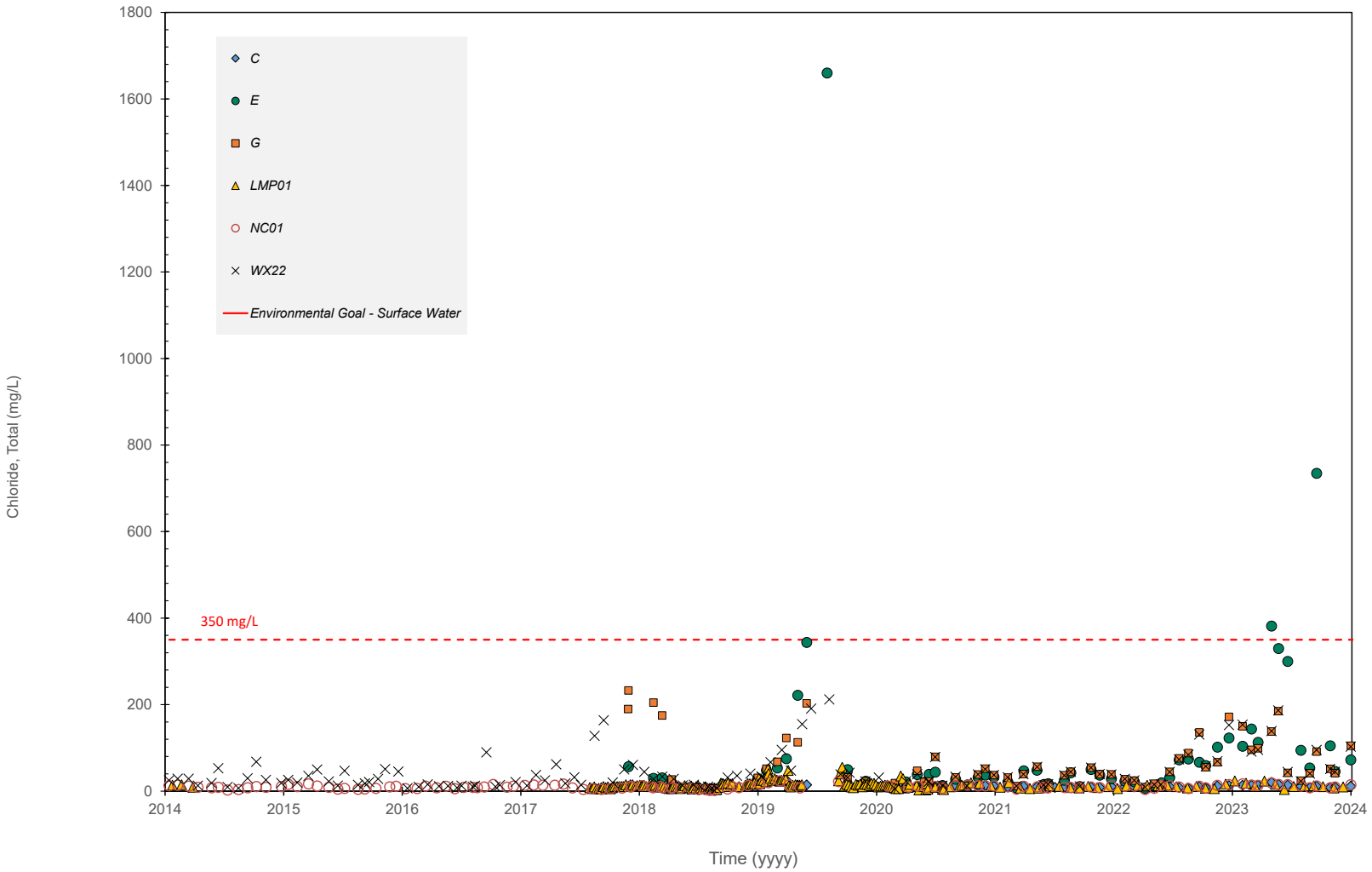

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
Manganese, Filtered (ug/L)
500000
450000
400000
350000
300000
250000
200000
150000
100000
50000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Time (yyyy)
5704 mg/L

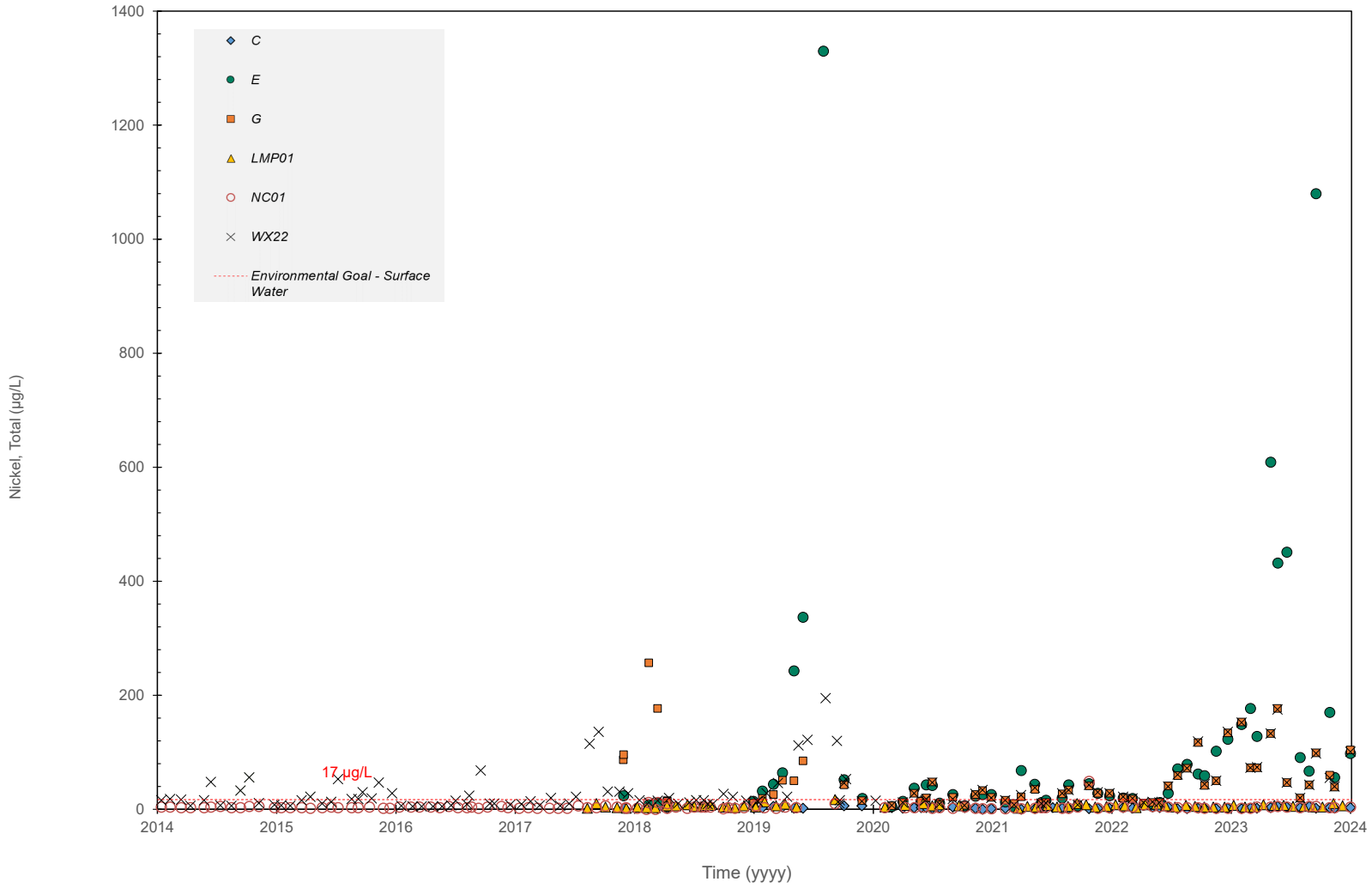

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
550.9 mg/L
Nickel, Total (ug/L)
Time (yyyy)
0
2000
4000
6000
8000
10000
12000
14000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

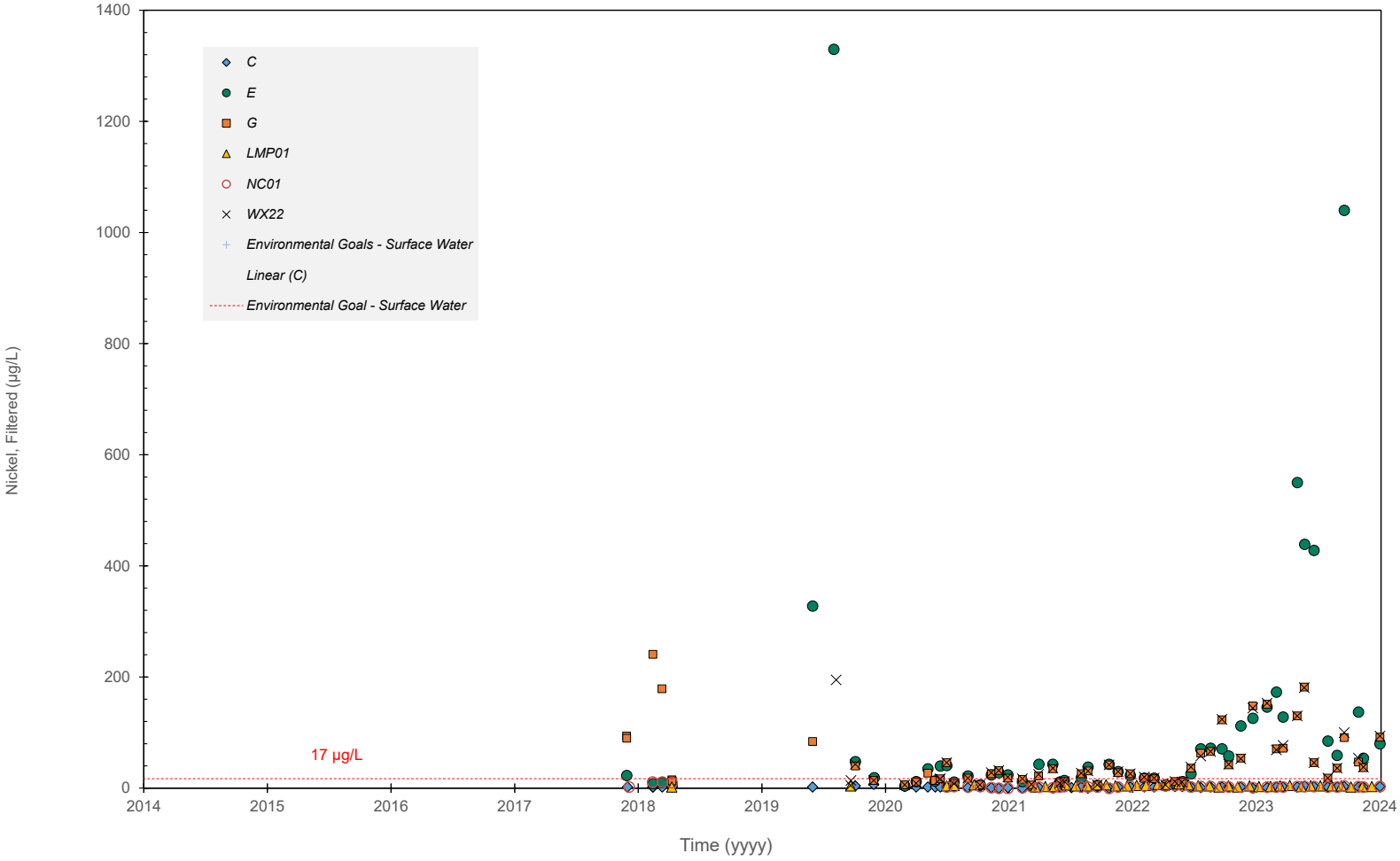

MPGM5-D5
MPGM5-D6
Environmental Goal - Groundwater
Nickel, Filtered (ug/L)
Time (yyyy)
550.9 mg/L
0
2000
4000
6000
8000
10000
12000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

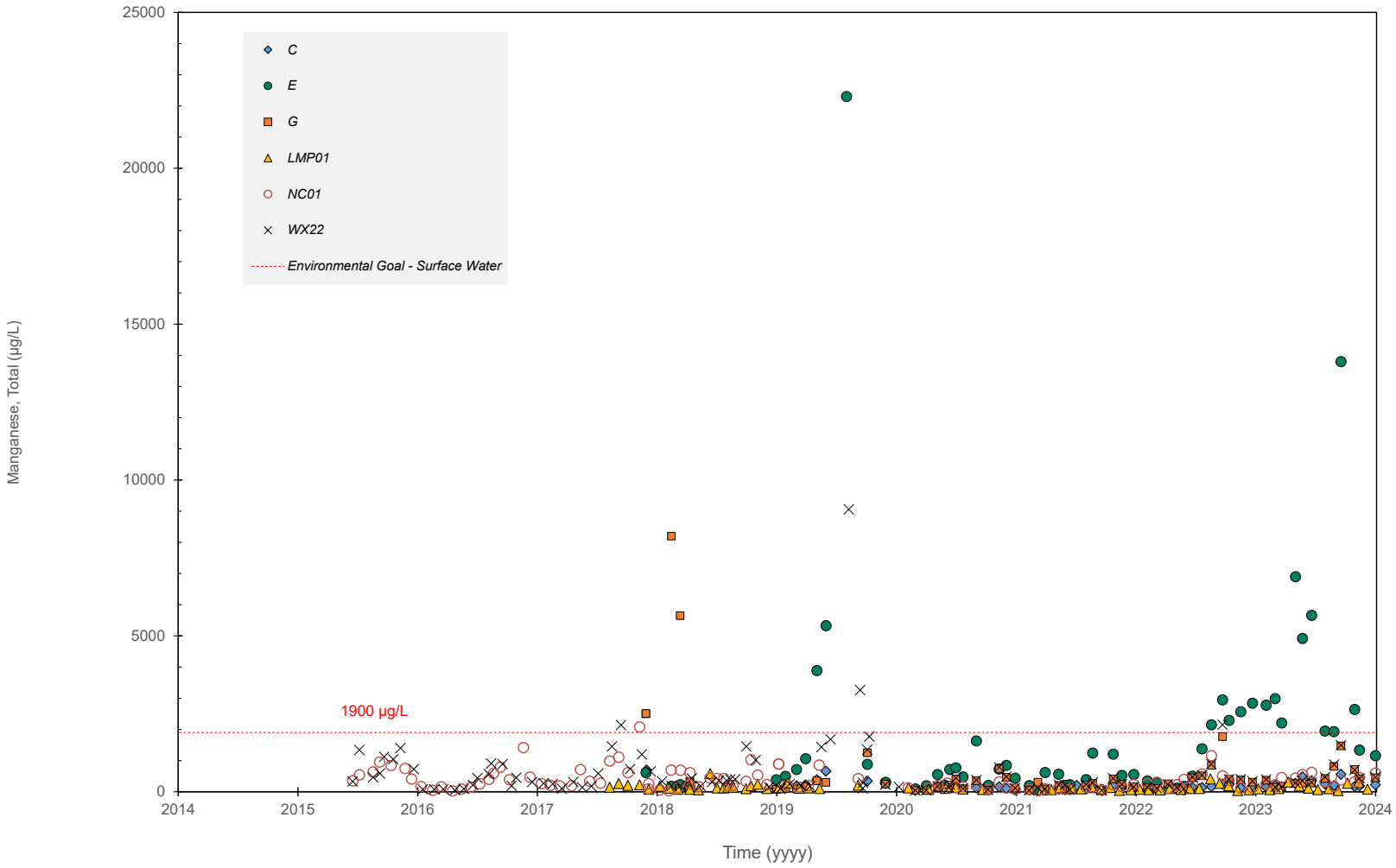

C
E
G
LMP01
NC01
WX22
Linear (C)
Environmental Goal - Surface Water
1500 mg/L
Total Dissolved Solids (Filtered) (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

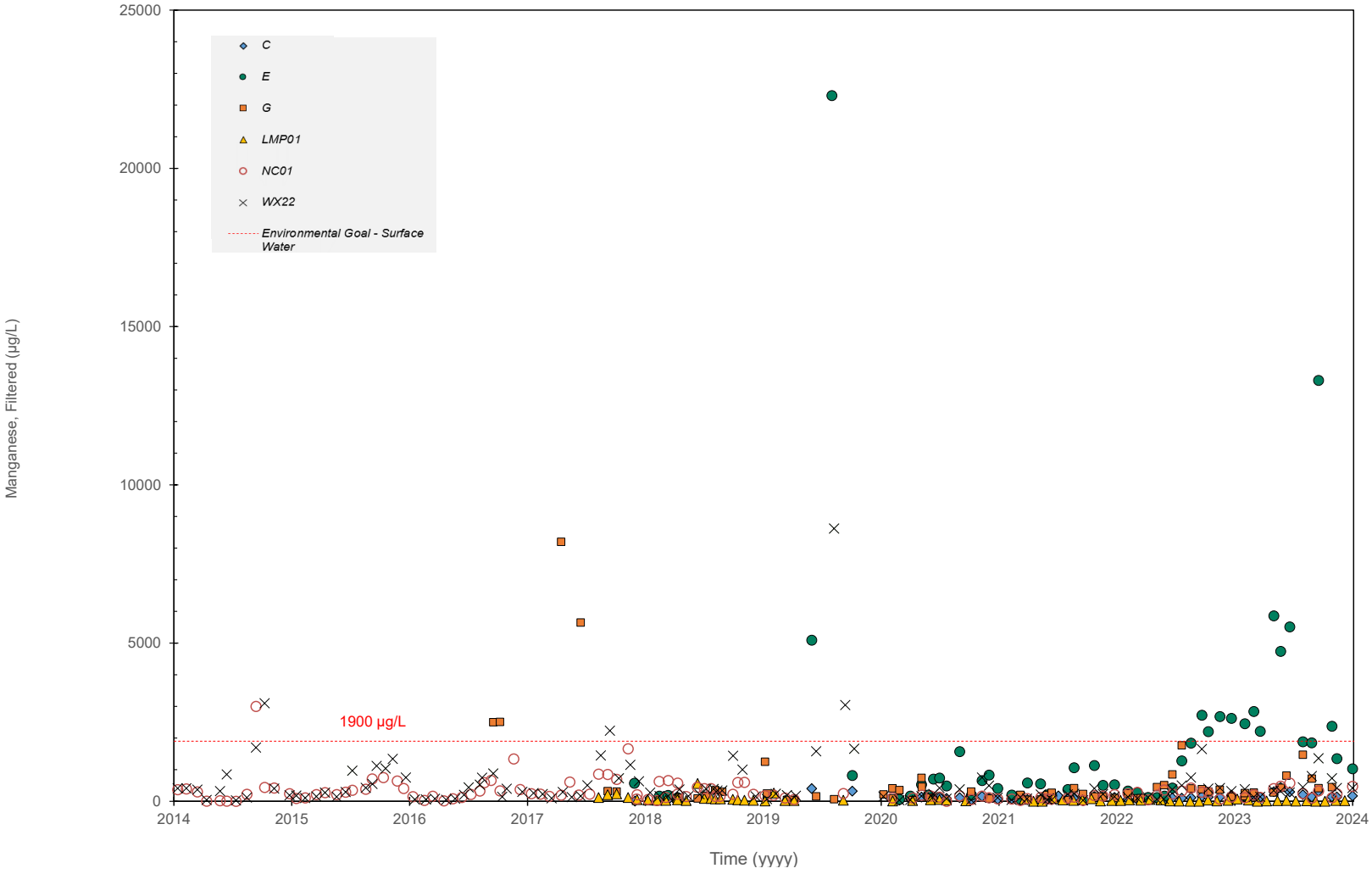

C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
1000 mg/L
Sulfate (as SO4), Total (mg/L)
Time (yyyy)
0
1000
2000
3000
4000
5000
6000
7000
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

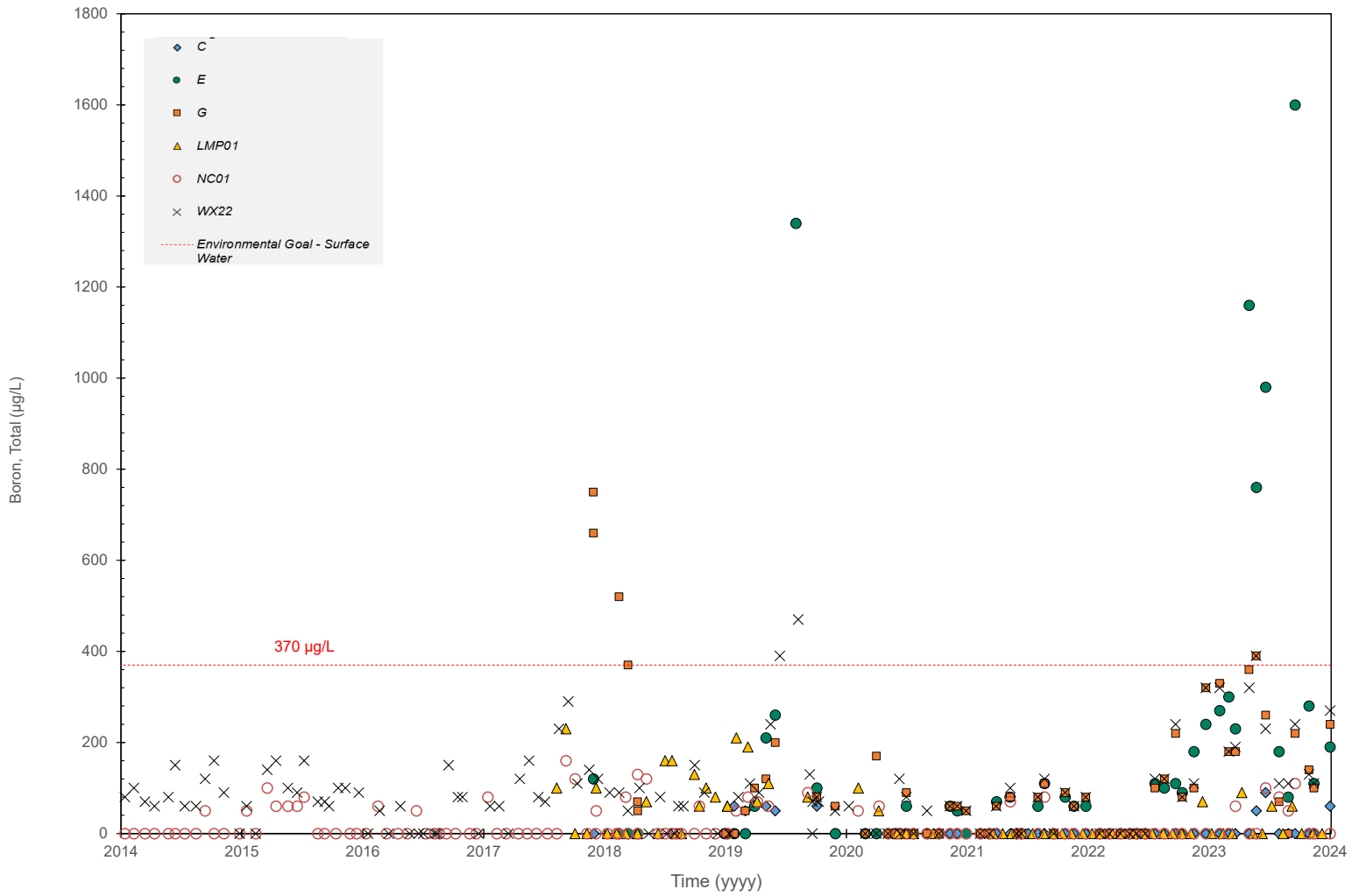

C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
350 mg/L
Chloride, Total (mg/L)
Time (yyyy)
0
200
400
600
800
1000
1200
1400
1600
1800
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

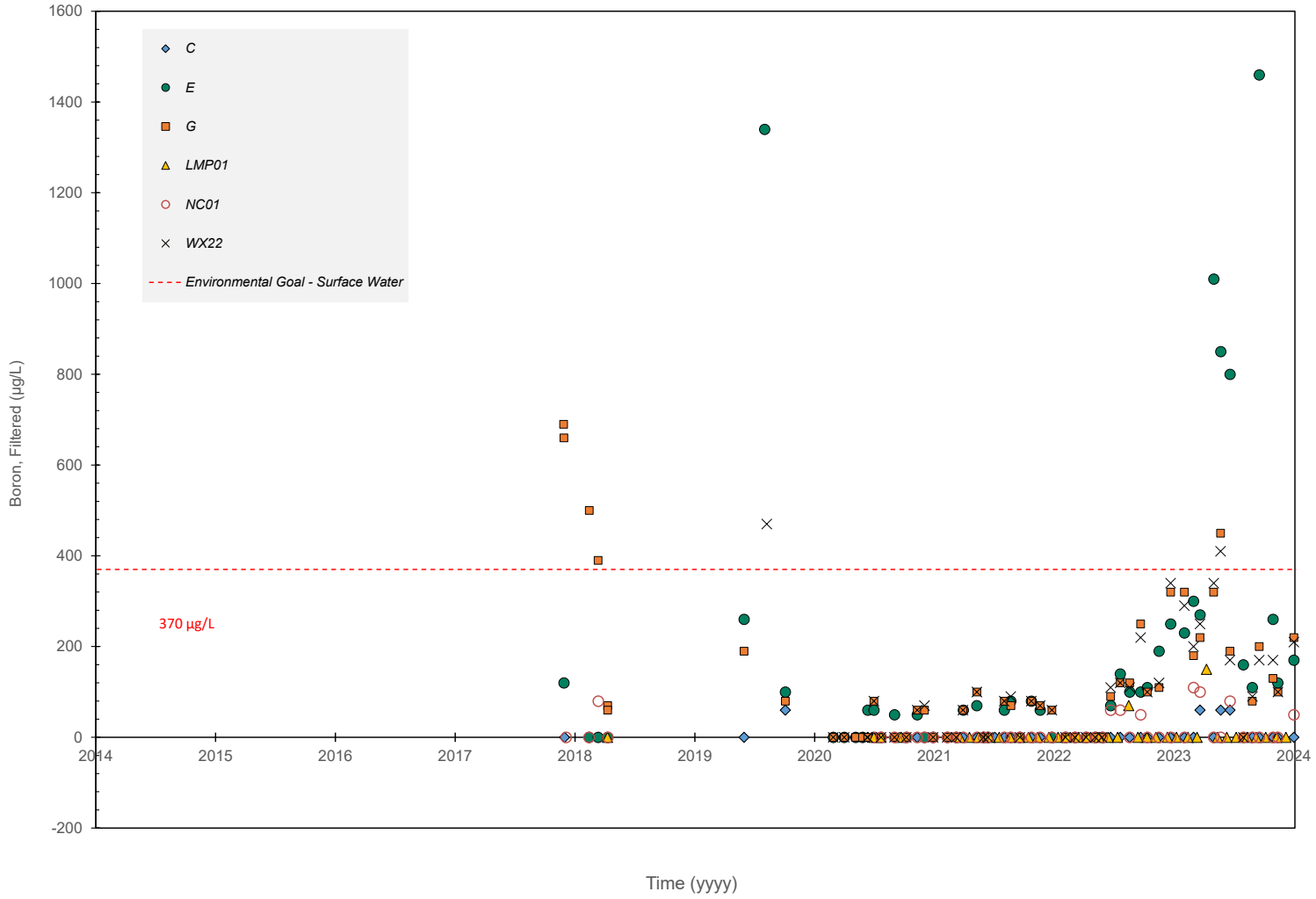

C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
17 µg/L
Nickel, Total (µg/L)
Time (yyyy)
0
200
400
600
800
1000
1200
1400
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


1400
1200
1000
800
600
400
200
0
Nickel, Filtered (µg/L)
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Time (yyyy)
C
E
G
LMP01
NC01
WX22
Environmental Goals - Surface Water
Linear (C)
Environmental Goal - Surface Water
17 µg/L


C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
1900 µg/L
Manganese, Total (µg/L)
Time (yyyy)
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
1900 µg/L
Manganese, Filtered (µg/L)
Time (yyyy)
25000
20000
15000
10000
5000
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
370 µg/L
Boron, Total (µg/L)
Time (yyyy)
0
200
400
600
800
1000
1200
1400
1600
1800
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024


C
E
G
LMP01
NC01
WX22
Environmental Goal - Surface Water
370 µg/L
Boron, Filtered (µg/L)
Time (yyyy)
1600
1400
1200
1000
800
600
400
200
0
-200
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024

Appendix E Roles and Responsibilities

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Role	Responsibilities
Owner (EnergyAustralia)	EnergyAustralia is the owner of and ultimately responsible for the MPAR. EnergyAustralia is represented in this role by the Contractor Administrator.
Assets and Production Leaders (EnergyAustralia)	EnergyAustralia Leaders are responsible for their area of business to ensure: • Provision of adequate resourcing to meet Regulatory requirements; • The MPAR (contract) has safety assessments at key milestones (including project initiation, contractor selection, site establishment, project completion); • EnergyAustralia contract administration staff comply with EnergyAustralia procedures; • Adequate training and competencies are established and maintained; • Contract reviews are performed to ascertain contractor and ash placement performance; • Operational imperatives are communicated to monitor potential repository capacity constraints. • Overall responsibility to maintain a safe work place. • Overall responsibility for compliance with Regulatory approvals.
Contractor Administrator / Plant Asset Owner (EnergyAustralia)	EnergyAustralia Contractor Administrator is responsible for the following tasks • Contractor Administrator for the MPAR. • Manage the contractor's relationship and obligations with EnergyAustralia are met. • Monitor the contractor's performance (quality, cost & time). • Review contract performance (workshop delivery process). • Provide co-ordination between contractor and EnergyAustralia. • Filing and storage of information, records, designs, contractor reports, as built details and surveys. • Ensure contractor staff receive site access induction and relevant training for EnergyAustralia land areas (i.e. Contractor manages MPAR in this regard). • All works comply with EnergyAustralia safety rules and site procedures (noting that the Contractor have a site-specific Safety Management Manual for the Ash Repositories that is approved by EnergyAustralia). • The contractor (and its employees, sub-contractors or agents) are provided with, and understand the known hazards associated with work, safety and the environmental requirements and the scope of work. • Approve use of a sub-contractor by the Contractor; • There is compliance with statutory requirements, EPL 13007 and the Mt Piper Consent. • Contract reviews are performed to ascertain contractor and project performance. • Responsible for communicating environmental obligations set out in this WMP, Environmental Licences, contracts and the ROP. • Working in conjunction with the operations team, environmental team and the project manager to ensure Environmental Management aspects are incorporated into Project design, procurement, contracts management, planning/ scheduling and construction. • Carry out and/or participate in investigations of environmental incidents or environmental near misses as required. • Procuring and communicating the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS and Capping detailed designs.

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Role	Responsibilities
	• Procuring suitable materials for installation of the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS and Capping in accordance with the detailed design technical specifications. • Engaging a suitably qualified, experienced and independent person to ensure structural stability of the ash placement area.
Environmental Representative (ER) / NSW Environment Leader (EnergyAustralia)	The Environmental Representative for the Ash Repositories was appointed by EnergyAustralia and approved by DPHI as part of the LNAR OEMP. The Environmental Representative's responsibilities include: • Overseeing the development and implementation of environmental management plans and monitoring programs required under statutory requirements, EPL 13007 and the Mt Piper Consent, and advise the Proponent (EnergyAustralia) upon the achievement of these plans/programs. • Consider and advise the Proponent on its compliance obligations against all matters specified in the relevant conditions of the Mt Piper Consent, as detailed in Section 1.2 • Review Contractor's ROP prior to Contractor engagement. • Advising EnergyAustralia and the Contractor (see below) about how to achieve environmental implementation outcomes during construction and operation. • Having the authority and independence to recommend to EnergyAustralia reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts. In failing such steps, the ER will recommend to the Proponent that relevant activities are to be ceased as soon as reasonably practicable if there is a significant risk that an adverse impact on the environment is likely to occur. • Identification and implementation of controls to minimise environmental risk. • Scheduling monitoring and management activities, and analysis of data in accordance with the approach presented in Section 5. • Scheduling annual environmental audits of the Ash Repositories. • Preparation and timely submission of the reporting required by Condition 44 and Condition 45 of the Mt Piper Consent. • Ensuring public access to information. • Undertaking community consultation and managing complaints and/or enquiries in accordance with EnergyAustralia protocols and procedures. • Ensuring complaints are resolved satisfactorily. • Report on environmental incidents and/or non-compliances to relevant government authorities. • Responsible for carrying out environmental monitoring associated with the MPAR as required by the relevant Regulatory approvals, licences and this WMP. • Participate and/or lead investigations into environmental incidents. • Ensure the MPPS Pollution Incident Response Management Plan is maintained and applicable to the MPAR. • Undertaking regular environmental inspections and as required. • Review, updating and communicating this WMP as necessary. • Ensuring that this WMP is prepared by a suitably qualified and experienced person/s, and in consultation with DCCEEW Water, WaterNSW and the EPA. • Tracking of environmental non-conformances and associated corrective actions as required.
Project Manager/ Site Manager (Contractor Manager)	The Contractor's Project Manager/ Site Manager (or their delegate) roles and responsibilities include: • Responsible for environmental staff training.

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Role	Responsibilities
	• Responsible for preparing and updating the ROP as necessary. • Responsible for updating the Monthly Client Report (to EnergyAustralia) with environmental results from the previous month and report on any trends. • Responsible for implementing this WMP as part of their overall operations including familiarising staff with its mitigation measures. • Manages, implements and ensures compliance against the contract administered by EnergyAustralia and reports back to the Contract administrator (EnergyAustralia) about any non-conformances or non- compliances or matters concerning the operation of the ash repository. • Oversees environmental and operational activities and provides direction. • Controls and manages overall contractual budget for the Project. • Ensuring environmental risk management is incorporated into project processes. • Establishing lines of control and assigning environmental responsibilities and accountabilities to EnergyAustralia project personnel (the Contract Administrator). • Ensuring overarching systems are provided for risk management, health, safety and emergency measures. • Ensuring Environmental Management aspects are incorporated into day to day operations, planning/ scheduling and construction of the MPAR including MPAR Phase 1 Capping and Drainage and MPAR Zone 2 LBMS and Capping. • Ensuring environmental requirements are acknowledged and implemented for relevant MPAR operations under the Mt Piper Consent. • Ensuring quality assurance inspections audits are carried out and documented, and outcomes are reviewed actioned where required. • Procedures are implemented to manage sub-contractor performance. • Ensuring environmental incidents are recorded and reported as soon as practicable to EnergyAustralia in accordance with procedures and mitigation measures are implemented to minimise the possibility of the same incident happening again; • Notify the Contract Administrator if a complaint has been received. • Identification and implementation of controls to minimise environmental risk. • Notify the Contract Administrator if an environmental incident or environmental near miss has occurred, including the outcomes of any investigations. • Carry out and/or participate in investigations of environmental incidents or environmental near misses as required. • Ensuring adequate dust management controls are implemented • Managing and monitoring pond levels associated with the leachate management system. • Supervise, monitor and maintain adequate Quality Assurance and Quality Control (QA/QC) records during the installation and commissioning of the leachate barrier and leachate management systems. • Daily observational monitoring of site environmental conditions and impact control measures. • Ensuring that the installation of the MPAR Phase 1 Capping and Drainage and the MPAR Zone 2 LBMS and Capping are carried out in accordance with the Technical Specifications and drawings prepared by the design expert. • Tracking of environmental non-conformances and associated corrective actions (as required).

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Role	Responsibilities
Team Leader – Operations (Contractor)	The Contractor's Operations Team leader is responsible for supervising the day-to-day operations of a team of people that work on the ash repository. Their additional roles are: • Responsible for overseeing, guiding and training any new staff in day to day ash placement activities. • Managing the operations personnel. • Liaising and co-ordinating work on the ash repository in conjunction with other groups i.e. environmental team. • Responsible for overseeing compaction and ensuring that is completed correctly. • Deals with day-to-day issues on the ash repository including traffic movements. • Implements and oversee safety. • Working in conjunction with the environmental team and the project manager to ensure Environmental Management aspects are incorporated into Project design, procurement, contracts management, planning/ scheduling and construction. • Reports back to the Project Manager.
Project foreman (Contractor)	The Contractor's project foreman responsibilities include: • Co-ordinates machinery and plant operator's onsite and in accordance with the team leader's requirements. • Liaises with team leaders and project manager on a daily basis. • Ensures correct mitigation measures are being carried out in accordance with this WMP and contractual arrangements.
Operators – mobile and fixed plant	The Contractor's plant operators' responsibilities include: • Driving and / or operating machinery and/or plant on the ash repository in accordance with work place procedures and safety requirements. • Hauling, placing and compacting ash and operating water carts for dust suppression. • Operating and maintaining the sprinkler systems across the ash repository for dust suppression and revegetation. • Operating and maintaining sediment control structures and water pumping systems. • Pegging out ash placement benches and batters, and conducting ash compaction tests and water sampling.

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Appendix F Monitoring Program

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Monitoring Location	Location Type	Monitored Feature	Proposed Sampling Frequency	Rationale for Inclusion
MPGM4/D1	Groundwater		Quarterly	Existing monitoring well located north east (downgradient) of the MPAR and adjacent to Wangcol Creek
MPGM4/D2	Groundwater		Quarterly	Existing monitoring well downgradient of the mine spoil area and adjacent to Wangcol Creek
MPGM4/D3	Groundwater	Background	Quarterly	Existing background montitoring well located north (cross-gradient) of the MPAR
MPGM4/D4	Groundwater	Background	Quarterly	Existing background monitoring well located north west (upgradient) of the MPAR
MPGM4/D5	Groundwater	Background	Quarterly	Existing background monitoring well located north west (upgradient) of the MPAR
MPGM4/D8	Groundwater		Quarterly	Existing monitoring well located north east (downgradient) of the MPAR and adjacent to the northern side of Wangcol Creek
MPGM4/D9	Groundwater		Quarterly	Existing monitoring well located north east (downgradient) of the MPAR and adjacent to Wangcol Creek
MPGM4/D10	Groundwater		Quarterly	Existing monitoring well located east (downgradient) of the MPAR/LNAR and adjacent to LNAR 2
MPGM4/D15	Groundwater		Quarterly	Existing monitoring well located to the south of the MPAR, adjacent LNAR 5 along the former Huons Gully alignment
MPGM4/D16A	Groundwater		Quarterly	Existing monitoring well located south of the MPAR/LNAR, along the LSAR boundary
MPGM4/D17	Groundwater		Quarterly	Existing monitoring well located south east of the MPAR, within the LNAR
MPGM4/D18	Groundwater		Quarterly	Existing monitoring well located south east of the MPAR, south of LNAR 2
MPGM4/D19	Groundwater		Quarterly	Existing monitoring well located east (downgradient) of the MPAR/LNAR
MPGM5/D5	Groundwater	Adjacent Brine Waste Pond A	Quarterly	Existing leak detection bore adjacent (downgradient) Brine Waste Pond A
MPGM5/D6	Groundwater	Adjacent Brine Waste Pond B	Quarterly	Existing leak detection bore adjacent (downgradient) Brine Waste Pond B
D102	Groundwater		Quarterly	Existing monitoring well located north east (downgradient) of the MPAR and adjacent to Wangcol Creek. Nested with D9
D103	Groundwater		Quarterly	Existing montioring well located east (downgradient) of the MPAR and adjacent to Wangcol Creek
D104	Groundwater		Quarterly	Existing montioring well located east (downgradient) of the MPAR and adjacent to Wangcol Creek
D105	Groundwater		Quarterly	Existing montioring well located east (downgradient) of the MPAR, the mine spoil area, and adjacent to Wangcol Creek
D106	Groundwater		Quarterly	Existing monitoring well located north (cross-gradient) of the MPAR and adjacent to Wangcol Creek
D107	Groundwater		Quarterly	Existing monitoring well located north (cross-gradient) of the MPAR and adjacent to Wangcol Creek
D110	Groundwater		Quarterly	Existing monitoring well located east of the MPAR, within / immediately adjacent LNAR North
D113	Groundwater		Quarterly	Existing monitoring well located east (downgradient) of the MPAR/LNAR. Nested with D19
D117	Groundwater		Quarterly	Existing monitoring well located east of the MPAR, within / immediately adjacent LNAR North
D119	Groundwater		Quarterly	Existing monitoring well located to the south (upgradient) of the MPAR
MPGM/24	Groundwater	Adjacent Settling Pond D	Quarterly	Existing leak detection bore located north west of Settling Pond D
MPGM/25	Groundwater	Adjacent Settling Pond D	Quarterly	Existing leak detection bore located north west of Settling Pond D
MPGM/26	Groundwater	Adjacent Settling Pond D	Quarterly	Existing leak detection bore located south east of Settling Pond D
MPGM/27	Groundwater	Adjacent Settling Pond D	Quarterly	Existing leak detection bore located south east of Settling Pond D

Note: This list of monitoring locations meets and exceeds the requirements of EPL 13007.

Location	Location Type	Monitored Feature	Frequency	Rationale for Inclusion
LDP12	Surface Water	Coal Settling Pond (CSP) Discharge	As required during discharge	Monitoring is required as part of the EPL #13007.
LMP01	Surface Water	Wangcol Creek	Monthly	Located north west of the MPAR and immedately downstream of the FHP. It is located in an upstream position to the Ash Repositories and is the location where water from the headwaters of Wangcol Creek flows out from the MPPS operational area, downstream of the FHP.
NC01	Surface Water	Wangcol Creek	Monthly	Located midstream in the monitored area of Wangcol Creek, upstream to the Ash Repositories.
SW_C	Surface Water	Wangcol Creek	Monthly	Located within Wangcol Creek, the monitored location is midstream of the monitored area of Wangcol Creek and near groundwater monitoring bore D107.
SW_E	Surface Water	Wangcol Creek	Monthly	Located within Wangcol Creek, downstream of the former open cuts "Area D" and "Area E" between the locations of groundwater monitoring bores D9 and D105.
WX22 / SW_F	Surface Water	Wangcol Creek	Monthly	Located in Wangcol Creek at a stream gauge to the east / downstream of the Ash Repositories. Also serves as a WaterNSW monitoring point 212055.
SW_G	Surface Water	Wangcol Creek	Monthly	Located within the downstream portion of Wangcol Creek, and downstream of WX22, within a former open cut mine working and in the vicinity of groundwater monitoring bore D103.
SW_I	Surface Water	Settling basin, beyond energy dissipator	Monthly	Surface water quality and flow beyond the energy dissipator, prior to discharge to Wangcol Creek, is proposed to be monitored monthly for 1 year after construction to assess performance relative to the design objectives. Pending the review of monitoring results, after this period, performance will be assessed through visual inspection of the drop structures and energy dissipators.

Note: Sampling of the CSP is conducted routinely at times when discharge is not occurring. These samples are differentiated as CSP (not discharging) and LDP12 (when discharge is occurring). The data from LDP12 and CSP is not representative of instream conditions. Data from LDP12 is regulated by EPL 13007, and is not regulated by the Environmental Goals or ANZG guidelines.
This list of monitoring locations meets the requirements of EPL 13007.

Suite	Parameter	Groundwater	Surface Water
Metals*	Aluminium	X	X
	Antimony	X	X
	Arsenic	X	X
	Arsenic III	X**	X**
	Arsenic V	X**	X**
	Barium	X	X
	Beryllium	X	X
	Boron	X	X
	Cadmium	X	X
	Chromium	X	X
	Chromium III	X**	X**
	Chromium VI	X**	X**
	Cobalt	X	X
	Copper	X	X
	Iron	X	X
	Lead	X	X
	Manganese	X	X
	Mercury	X	X
	Molybdenum	X	X
	Nickel	X	X
	Selenium	X	X
	Silver	X	X
	Vanadium	X	X
	Zinc	X	X
Major ions / physical properties	Fluoride	X	X
	Chloride	X	X
	Chloride (dissolved) ***	X	X
	Calcium	X	X
	Magnesium	X	X
	Sulfate	X	X
	Sulfate (dissolved) ***	X	X
	Carbonate alkalinity	X	X
	Bicarbonate alkalinity	X	X
	Hydroxide alkalinity	X	X
	Total alkalinity	X	X
	Hardness (as CaCO3)	X	X
	Dissolved Organic Carbon	X	X
	Potassium	X	X
	Sodium	X	X
	Cyanide (total)	X	X
	Turbidity (NTU)	-	X
	Total suspended solids (TSS)	-	X
	Total dissolved solids (TDS)	X	X
Nutrients	Total phosphorus	X	X
	Nitrogen (as N)	X	X
	Total Kjeldahl Nitrogen (TKN)	X	X
	Nitrate	X	X
	Nitrite	X	-
	Nitrate and nitrite (as N)	X	X
	Ammonia (as N)	X	X
	Filterable reactive phosphorus	X	X
Field measurements	pH	X	X
	Dissolved oxygen (mg/L)	X	X
	Oxidation reduction potential (millivolts)	X	X
	Depth to water (m AHD / m bTOC)	X	-
	Total bore depth (m AHD / m bTOC)	X	-
	Recharge during sampling	X	-
	Electrical conductivity (µS/cm)	X	X

* Groundwater and surface water samples will be analysed for dissolved metals only (field filtered at 0.45 µm), with the exception of iron which will include total (unfiltered) and dissolved (field filtered) analysis for surface water samples.
** Speciated Chromium and Speciated Arsenic will be analysed on a biannual basis for groundwater and surface water.
*** Groundwater and surface water samples will be analysed for total (unfiltered) and dissolved (field filtered at 0.45 µm) analysis of sulfate and chloride.

This analytical schedule meets and exceeds the requirements of EPL 13007.

m AHD = metres Australia Height Datum, m bTOC = metres below top of casing, µS/cm = microSiemens per centimetre, mg/L = milligrams per litre

Appendix G Environmental Goals

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			WMP Guideline	Source of Criteria
FIELD	Dissolved Oxygen (Field)	% Saturation	-	
	Electrical Conductivity (Field)	µS/cm	2200	Environmental Goals
	pH (Field)	pH Units	6.5 - 8.0	Environmental Goals
	Oxidation reduction potential / Redox (Field)	mV	-	
MAJOR IONS	Calcium	mg/L	1000	ANZECC (2000) Livestock Drinking Water
	Calcium Carbonate (Hardness)	mg/L	200	NHMRC (2011) ADWG Drinking Water
	Total Alkalinity	mg/L	-	
	Hydroxide Alkalinty (as CaCO3)	mg/L	-	
	Bicarbonate Alkalinity (as CaCO3)	mg/L	-	
	Carbonate Alkalinity (as CaCO3)	mg/L	-	
	Cyanide	µg/L	7	ANZG (2018)
	Chloride	mg/L	350	Environmental Goals
	Fluoride	mg/L	1.5	Environmental Goals
	Magnesium	mg/L	-	
	Potassium	mg/L	-	
	Sodium	mg/L	180	NHMRC (2011) ADWG Aesthetic Criteria
	Sulfate (as SO4)	mg/L	1000	Environmental Goals
NUTRIENTS	Total Phosphorus	µg/L	20	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Filterable Reactive Phosphorus	µg/L	15	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Dissolved Organic Carbon	mg/L	-	
	Ammonia	µg/L	900	ANZG (2018)
	Ammonium	µg/L	-	
	Nitrogen	µg/L	250	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Nitrate	µg/L	11000	NZ MoE, NIWA (2013) from ANZG (2018)
	Nitrite (as NO2-)	µg/L	30000	ANZECC (2000) Livestock Drinking Water
	Total Kjeldahl Nitrogen (TKN)	mg/L	-	
	Nitrite + Nitrate (as N) / Oxides of Nitrogen (NOx)	µg/L	15	ANZECC 2000 Physical and Chemical Stressors - Upland River
PHYSICAL	Total Dissolved Solids (TDS) (Filtered)	mg/L	1500	Environmental Goals
	Total Suspended Solids (TSS)	mg/L	-	
	Turbidity (NTU)	NTU	2-25	ANZECC 2000 Physical and Chemical Stressors - Upland River
METALS	Aluminium	µg/L	0.8 | 55 [1]	ANZG (2018)
	Antimony	µg/L	9	ANZG (2018)
	Arsenic	µg/L	24	Environmental Goals
	Arsenic III	µg/L	24	ANZG (2018)
	Arsenic V	µg/L	13	ANZG (2018)
	Barium	µg/L	700	Environmental Goals
	Beryllium	µg/L	100	Environmental Goals
	Boron	µg/L	370	Environmental Goals
	Cadmium	µg/L	0.85	Environmental Goals
	Chromium (VI + III)	µg/L	2	Environmental Goals
	Chromium (VI)	µg/L	1	ANZG (2018)
	Chromium (III)	µg/L	3.3	Environmental Goals
	Cobalt	µg/L	1.4	ANZG (2018)
	Copper	µg/L	3.5	Environmental Goals
	Iron	µg/L	300	Environmental Goals
	Lead	µg/L	5	Environmental Goals
	Manganese	µg/L	1900	Environmental Goals
	Mercury	µg/L	0.06	Environmental Goals
	Molybdenum	µg/L	10	Environmental Goals
	Nickel	µg/L	17	Environmental Goals
	Selenium	µg/L	5	Environmental Goals
	Silver	µg/L	0.05	Environmental Goals
	Vanadium	µg/L	6	ANZG (2018)
	Zinc	µg/L	116	Environmental Goals

Note:
1. For aluminium, ANZG (2018) Guideline applies 0.8 µg/L if the pH is < 6.5 and 55 µg/L if the pH is > 6.5

			WMP Guideline	Source of Criteria
FIELD	Dissolved Oxygen (Field)	% Saturation	-	
	Electrical Conductivity (Field)	µS/cm	2600	Environmental Goals
	pH (Field)	pH Units	6.5 - 8.0	Environmental Goals
	Oxidation reduction potential / Redox (Field)	mV	-	
MAJOR IONS / PHYSICAL PROPERTIES	Total Alkalinity	mg/L	-	
	Hydroxide Alkalinty (as CaCO3)	mg/L	-	
	Bicarbonate Alkalinity (as CaCO3)	mg/L	-	
	Carbonate Alkalinity (as CaCO3)	mg/L	-	
	Calcium	mg/L	1000	ANZECC (2000) Livestock Drinking Water
	Calcium Carbonate (Hardness)	mg/L	200	NHMRC (2011) ADWG Drinking Water
	Cyanide	µg/L	7	ANZG (2018)
	Chloride	mg/L	350	Environmental Goals
	Fluoride	mg/L	1.5	Environmental Goals
	Magnesium	mg/L	-	
	Potassium	mg/L	-	
	Sodium	mg/L	180	NHMRC (2011) ADWG Aesthetic Criteria
	Sulfate (as SO4)	mg/L	1000	Environmental Goals
	Total Dissolved Solids (TDS) (Filtered)	mg/L	2000	Environmental Goals
NUTRIENTS	Total Phosphorus	µg/L	20	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Filterable Reactive Phosphorus	µg/L	15	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Dissolved Organic Carbon	mg/L	-	
	Ammonia	µg/L	900	ANZG (2018)
	Nitrogen	µg/L	250	ANZECC 2000 Physical and Chemical Stressors - Upland River
	Nitrate	µg/L	2400	NZ MoE, NIWA (2013) from ANZG
	Nitrite + Nitrate (as N) / Oxides of Nitrogen (NOx)	µg/L	15	ANZECC 2000 Physical and Chemical Stressors - Upland River
METALS	Aluminium	µg/L	0.8 | 55 [1]	ANZG (2018)
	Antimony	µg/L	9	ANZG (2018)
	Arsenic	µg/L	24	Environmental Goals
	Arsenic III	µg/L	24	ANZG (2018)
	Arsenic V	µg/L	13	ANZG (2018)
	Barium	µg/L	700	Environmental Goals
	Beryllium	µg/L	100	Environmental Goals
	Boron	µg/L	370	Environmental Goals
	Cadmium	µg/L	2	Environmental Goals
	Chromium (VI + III)	µg/L	5	Environmental Goals
	Chromium (VI)	µg/L	1	ANZG (2018)
	Chromium (III)	µg/L	3.3	Environmental Goals
	Cobalt	µg/L	1.4	ANZG (2018)
	Copper	µg/L	5	Environmental Goals
	Iron	µg/L	664	Environmental Goals
	Lead	µg/L	5	Environmental Goals
	Manganese	µg/L	5704	Environmental Goals
	Mercury	µg/L	0.06	Environmental Goals
	Molybdenum	µg/L	10	Environmental Goals
	Nickel	µg/L	550.9	Environmental Goals
	Selenium	µg/L	5	Environmental Goals
	Silver	µg/L	0.05	Environmental Goals
	Vanadium	µg/L	6	ANZG (2018)
	Zinc	µg/L	908	Environmental Goals

Note:
1. For aluminium, ANZG (2018) Guideline applies 0.8 µg/L if the pH is < 6.5 and 55 µg/L if the pH is > 6.5

Appendix H Example Inspection Form

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Details				
Person completing form		Date / Time		
Company and role		Monitoring period		
Photographs included?				
Daily weather conditions	Rainfall:		Overhead	
	Temperature:	Min:	Max:	Wind
Monthly weather conditions	Rainfall:	Min:	Max:	Average:
	Temperature:	Min:	Max:	Average:
MPAR Capping and Zone 2 footprint *(include location of potential issues and whether controls are required)*				
General condition				
Revegetation status				
Unsuitable vegetation, trees, etc.				
Slashing or maintenance required				
Evidence of erosion				
Condition of batter slopes				
Exposed capping layers				
Other damage identified?				
Action taken				
Existing batters and benches *(include location of potential issues and whether controls are required)*				
General condition				
Revegetation status				
Unsuitable vegetation, trees, etc.				
Slashing or maintenance required				
Evidence of erosion (on- and off-site)				
Condition of drop-chutes				
Condition of energy dissipator/s				
Condition of settling basin and outlet				
Condition of storage ponds				
Action taken				
Fences				
Damages identified / location				
Action taken				
Weeds (known or suspected)				
Location				
Species				
Maturity				
Density				
Action taken				

Animal Pests			
Species / quantity / impact			
Action taken			
Revegetation Plantings (refer image below)			
General condition			
Height of plantings			
Mortalities			
Problem areas / impact			
Action taken			
Summary of corrective actions			
Action	Responsible party	Timeframe	Verification
Additional notes			

General considerations:

- Have the capping footprints been assessed in their entirety?
- Have the batters and benches been assessed in their entirety?
- Have all drainage lines been assessed for erosion?
- Has the entire MPAR perimeter been walked?
- Has the location of potential issues been identified and comment regarding controls included?
- Are there any items which require urgent attention due to implications for integrity of the capping footprint or potential public health/safety or environmental risks?
- Refer back to the action triggers and responses in the WMP when considering corrective actions.